Z3X TEAM

CDMA Mobile Subscriber Unit
AX260

Internal Use Only

SERVICE MANUAL

Z3X-BOX.COM

DUAL BAND, TRI MODE
[PCS/GPS/CELLULAR]
CDMA MOBILE PHONE

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CHAPTER 1. System Introduction

1. Specification

1.1 General Specification

1.1.1 Transmit/Receive Frequency Interval

1) CELLULAR : 70MHz

2) PCS : 140 MHz

1.1.2 Number of Channels (Channel Bandwidth)

1) CELLULAR : 20 Channels

2) PCS : 48 Channels

1.1.3 Operating Voltage : DC 3.3~4.2V

1.1.4 Battery Power Consumption : DC 3.7V

	SLEEP	IDLE	MAX POWER
CELLULAR	1.3 mA	170 ~ 180mA	900 mA (24 dBm)
PCS	1.3 mA	170 ~ 180mA	900 mA (24 dBm)

1.1.5 Operating Temperature : -30°C ~ +60°C

1.1.6 Frequency Stability

1) CDMA : ±0.5PPM

2) PCS : ±0.1PPM

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1.1.7 Antenna : Intenna, 50 Ω

1.1.8 Size and Weight

1) Size : 110 * 51 * 17.95 mm

2) Weight : 87 g (Approximately with standard battery)

1.1.9 Channel Spacing

1) CELLULAR : 1.25MHz

2) PCS : 1.25 MHz

1.1.10 Battery Type, Capacity and Operating Time.

Unit = Hours : Minutes

	Standard (950mAh)	
Standby Time	CELLULAR	About 130 Hours (SCI=2)
	PCS	About 130 Hours (SCI=2)
Talk time	CELLULAR	140 Minutes (+10dBm output)
	PCS	140 Minutes (+10dBm output)

1.2 Receive Specification

1.2.1 Frequency Range

1) CELLULAR : 869 MHz ~ 894 MHz

2) PCS : 1930 MHz ~ 1990 MHz

3) GPS : 1575.42 MHz

1.2.2 Local Oscillating Frequency Range :

1) CELLULAR : 1738.08 MHz ~ 1787.94 MHz

2) PCS : 1715.56 MHz ~ 1768.89 MHz

3) GPS : 3150.84 MHz

1.2.3 Sensitivity

1) CELLULAR : -104 dBm (C/N 12dB or more)

2) PCS : -104 dBm (C/N 12dB or more)

3) GPS : -148.5 dBm (w/o SA), -152 dBm (w/SA)

1.2.4 Selectivity

1) CELLULAR : 3dB C/N Degration (With Fch ± 1.25 KHz : -30dBm)

2) PCS : 3dB C/N Degration (With Fch ± 1.25 KHz : -30dBm)

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1.2.5 Interference Rejection

1) Single Tone : -30dBm at 900 kHz (CELLULAR), -30dBm at 1.25MHz(PCS)

2) Two Tone : -43dBm at 900 kHz & 1700kHz(CELLULAR), -43dBm at 1.25 MHz & 2.05 MHz

1.2.6 Spurious Wave Suppression : Maximum of -80dB

1.2.7 CDMA Input Signal Range

- Dynamic area of more than -104~ -25 dB: 79dB at the 1.23MHz band.
- Transmit Band : below –60dBm
- Receive Band : below –80dBm

1.3 Transmit Specification

1.3.1 Frequency Range

1) CELLULAR : 824MHz ~ 849MHz
2) PCS : 1850 MHz ~ 1910 MHz

1.3.2 Output Power

1) CELLULAR : 0.252 W
2) PCS: 0.276 W

1.3.3 CDMA TX Frequency Deviation :

1) CELLULAR: +300Hz or less
2) PCS: ± 150Hz

1.3.4 CDMA TX Conducted Spurious Emissions

1) CELLULAR : 900kHz : - 42 dBc/30kHz below
1.98MHz : - 54 dBc/30kHz below
2) PCS : -42 dBc / 30KHz below

1.3.5 CDMA Minimum TX Power Control

1) CELLULAR : - 50dBm below
2) PCS: -50dBm below

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1.4 MS (Mobile Station) Transmitter Frequency

1.4.1 CELLULAR mode

Ch #	Center Freq. (MHz)	Ch #	Center Freq. (MHz)
1011	824.640	404	837.120
29	825.870	445	838.350
70	827.100	486	839.580
111	828.330	527	840.810
152	829.560	568	842.040
193	830.790	609	843.270
234	832.020	650	844.500
275	833.250	697	845.910
316	834.480	738	847.140
363	835.890	779	848.370

1.4.2 PCS mode

Ch #	Center Freq (MHz)	Ch #	Center Freq (MHz)	Ch #	Center Freq (MHz)
25	1851.25	425	1871.25	825	1891.25
50	1852.50	450	1872.50	850	1892.50
75	1853.75	475	1873.75	875	1893.75
100	1855.00	500	1875.00	900	1895.00
125	1856.25	525	1876.25	925	1896.25
150	1857.50	550	1877.50	950	1897.50
175	1858.75	575	1878.75	975	1898.75
200	1860.00	600	1880.00	1000	1900.00
225	1861.25	625	1881.25	1025	1901.25
250	1862.50	650	1882.50	1050	1902.50
275	1863.75	675	1883.75	1075	1903.75
300	1865.00	700	1885.00	1100	1905.00
325	1866.25	725	1886.25	1125	1906.25
350	1867.50	750	1887.50	1150	1907.50
375	1868.75	775	1888.75	1175	1908.75

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1.5 MS (Mobile Station) Receiver Frequency

1.5.1 CELLULAR mode

Ch. #	Center Freq. (MHz)	Ch. #	Center Freq. (MHz)
1011	869.640	404	882.120
29	870.870	445	883.350
70	872.100	486	884.580
111	873.330	527	885.810
152	874.560	568	887.040
193	875.790	609	888.270
234	877.020	650	889.500
275	878.250	697	890.910
316	879.480	738	892.140
363	880.890	779	893.370

1.5.2 PCS mode

Ch #	Center Freq (MHz)	Ch #	Center Freq (MHz)	Ch #	Center Freq (MHz)
25	1931.25	425	1951.25	825	1971.25
50	1932.50	450	1952.50	850	1972.50
75	1933.75	475	1953.75	875	1973.75
100	1935.00	500	1955.00	900	1975.00
125	1936.25	525	1956.25	925	1976.25
150	1937.50	550	1957.50	950	1977.50
175	1938.75	575	1958.75	975	1978.75
200	1940.00	600	1960.00	1000	1980.00
225	1941.25	625	1961.25	1025	1981.25
250	1942.50	650	1962.50	1050	1982.50
275	1943.75	675	1963.75	1075	1983.75
300	1945.00	700	1965.00	1100	1985.00

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325	1946.25	725	1966.25	1125	1986.25
350	1947.50	750	1967.50	1150	1987.50
375	1948.75	775	1968.75	1175	1988.75

1.5.3 GPS mode

- Center Freq. : 1575.42MHz

1.6 AC Adapter : See Appendix

1.7 Cigarret Lighter Adapter : See Appendix

1.8 Portable Hands-Free Kit : Not Supported

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2. Installation

2.1 Installing a Battery Pack

1) The Battery pack is keyed so it can only fit one way. Align the groove in the battery pack with the rail on the back of the phone until the battery pack rests flush with the back of the phone.
2) Slide the battery pack forward until you hear a “click”, which locks the battery in place.

2.2 For Adapter Use

1) Plug the adapter into a wall outlet. The adapter can be operated from a 110V source. When AC power is connected to the adapter.
2) Insert the adapter jack into the phone with the installed battery pack.
Red light indicates battery is being charged.. Green light indicates battry is fully charged.

2.3 For Mobile Mount

2.3.1 Installation Position

In order to reduce echo sound when using the Hands-Free Kit, make sure that the speaker and microphone are not facing each other and keep microphone a generous distance from the speaker.

2.3.2 Cradle Installation

Choose an appropriate flat surface where the unit will not interface with driver’s movement or passenger’s comfort. The driver/user should be able to access the phone with ease. Using the four self-tapping screws provided, mount the supplied braket on the selected area. Then with the four machine screws provided, mount the counterpart on the reverse side of the reverse side of the cradle. Secure the two brackets firmly together by using the two bracket joint screws provide. The distance between the cradle and the interface box must not exceed the length of the main cable.

2.3.3 Interface Box

Choose an appropriate flat surface (somewhere under the dash on the passenger side is preferred) and mount the IB bracket with the four self-tapping screws provided. Clip the IB into the IB bracket.

2.3.4. Microphone Installation

Install the microphone either by clipping I onto the sunvisor (driver’s side) or by attaching it to door post

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(driver's side), using a velcno adhesive tape (not included).

2.3.5 Cable Connections

2.3.5.1 Power and Ignition Cables

Connect the red wire to the car battery positive terminal and the black wire to the car ground. Connect the green wire to the car ignition sensor terminal. (In order to operate HFK please make sure to connect green wire to ignition sensor terminal.) Connect the kit's power cable connector to the interface box power receptacle.

2.3.5.2 Antenna Cable Connection

Connect the antenna coupler cable connector from the cradle to the external antenna connector. (Antenna is not included.)

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CHAPTER 2. NAM Input Method
(Inputting of telephone numbers included)

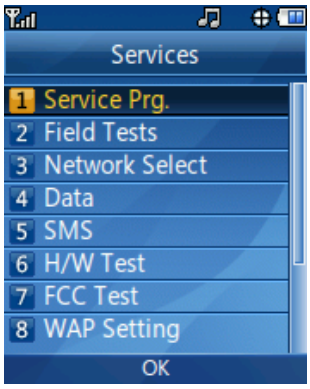
1) NAM Programming Method

1. Press “OK” button

2. Press “0” botton

3. Enter Service Code “000000”

4. you can see following Menu



5. Select ‘ Service Prog’ . and press “OK” button.
   You can see the ESN or MEID and Select OK

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6.(Phone number(MDN))

Input Mobile Phone Number(MDN) and select OK

7.(Phone number(MIN))

Input Mobile Phone Number(MIN) and select OK

8.(NAM1 Home SID)

Input the NAM1 Home SID and select OK

9. (NAM1 Name) Select “Edit”

Input the NAM1 Name and select Save

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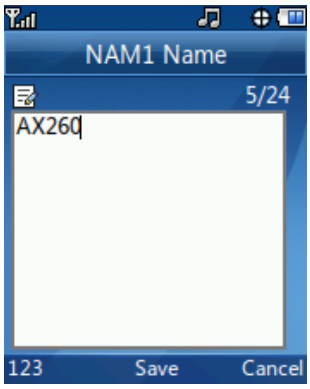
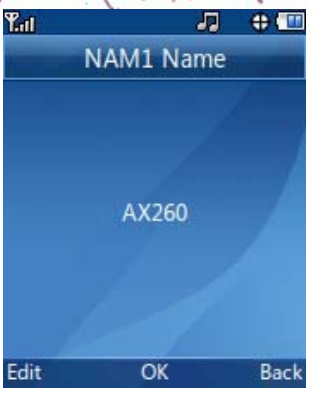
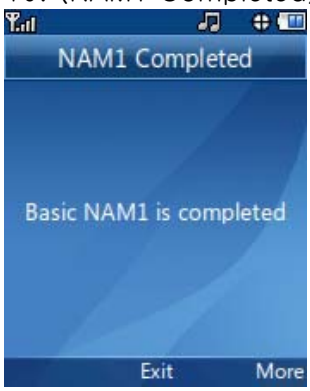




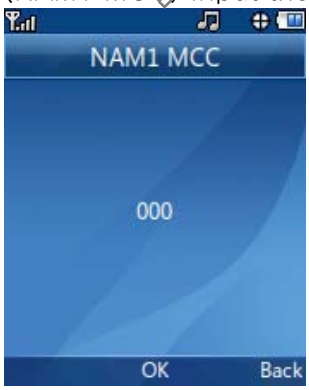
Select OK

10. (NAM1 Completed)



10-1) Select “Exit”
You can finish to edit the NAM1 menu and reset the phone

10-2) Select “More”
(NAM1 MCC) Input the NAM1 MCC and select OK



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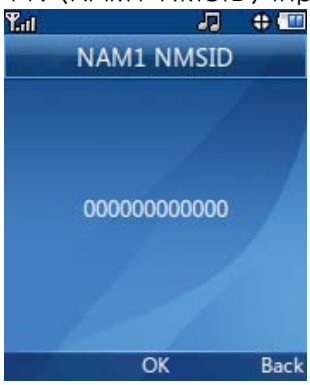
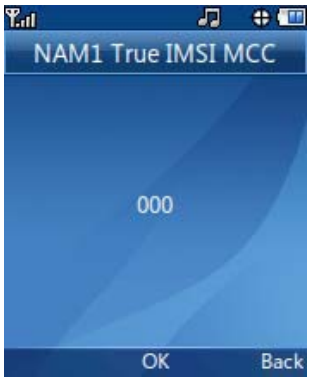
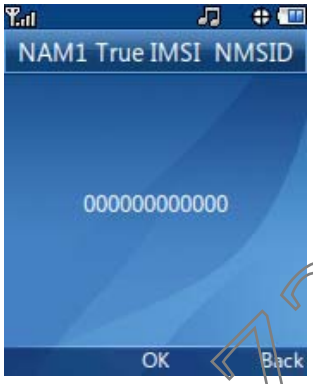
11. (NAM1 NMSID) Input the NAM1 NMSID and select OK



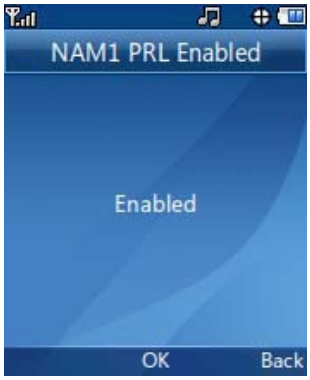
12. (NAM1 True IMSI MCC) Input the NAM1 True IMSI MCC and select OK



13. (NAM1 True IMSI NMSID) Input the NAM1 True IMSI NMSID and select OK



14. (NAM1 PRL Enabled), You can't edit this menu. select OK



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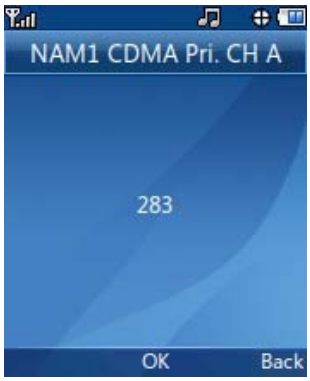
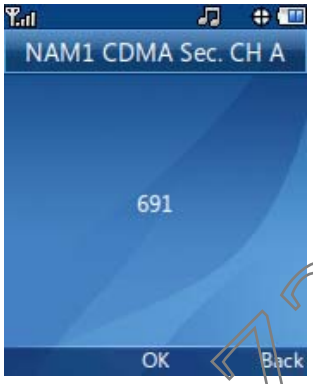
15. (CDMA Home SID/NID) Input the CDMA Home SID/NID and select OK

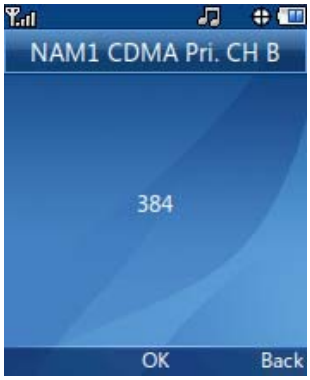
16. (NAM1 CDMA Pri. CH A) Input the NAM1 CDMA Pri. CH A and select OK



17. (NAM1 CDMA Sec. CH A) Input the NAM1 CDMA Sec. CH A and select OK



18. (NAM1 CDMA Pri. CH B) Input the NAM1 CDMA Pri. CH B and select OK



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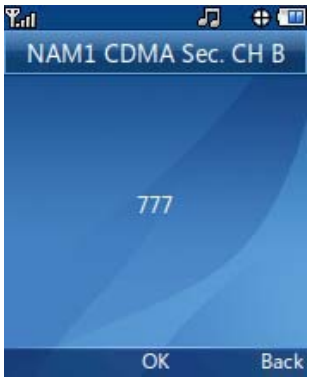
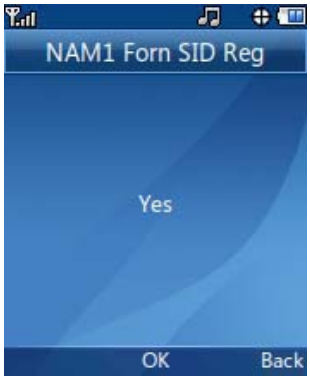
19. (NAM1 CDMA Sec. CH B) Input the NAM1 CDMA Sec. CH B and select OK



20. (Lockout SID/NID) Input the Lockout SID/NID and select OK

21. (NAM1 Home Sys Reg) Select the NAM1 Home Sys Reg(Yes/No) and select OK

22. (NAM1 Forn SID Reg) Select the NAM1 Forn SID Reg(Yes/No) and select OK



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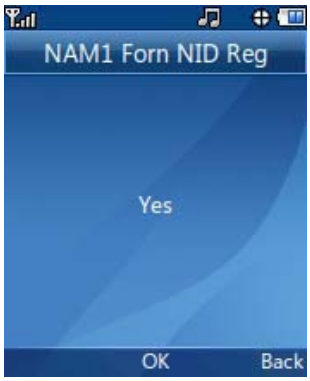
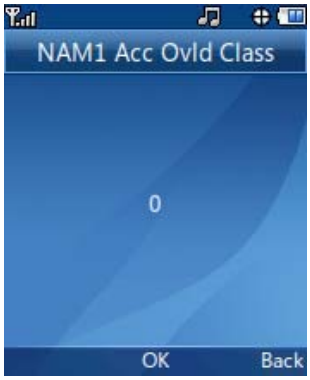
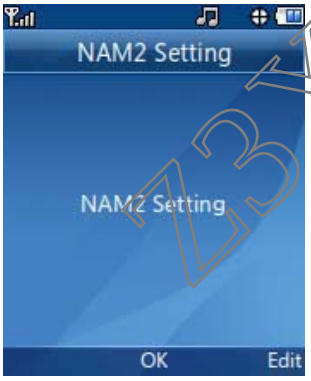
23. (NAM1 Forn NID Reg)
Select the NAM1 Forn NID Reg(Yes/No) and select OK



24. (NAM1 Acc Ovld Class).
You can't edit this menu. select OK



25. (NAM2 Setting).
25-1) select "Edit" and you can edit NAM2 Setting as NAM1 setting(#6)
25-2) select OK



26. (Phone Model). You can't edit this menu.
select OK

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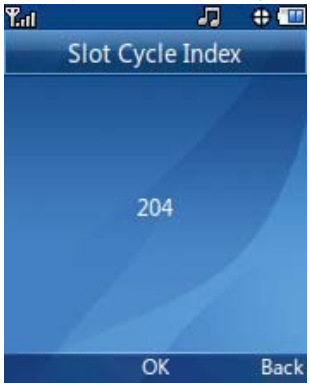
27. (Slot Cycle Index)

Input the Slot Cycle Index and select OK



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CHAPTER 3. Circuit Description

1. RF Transmit/Receive Part

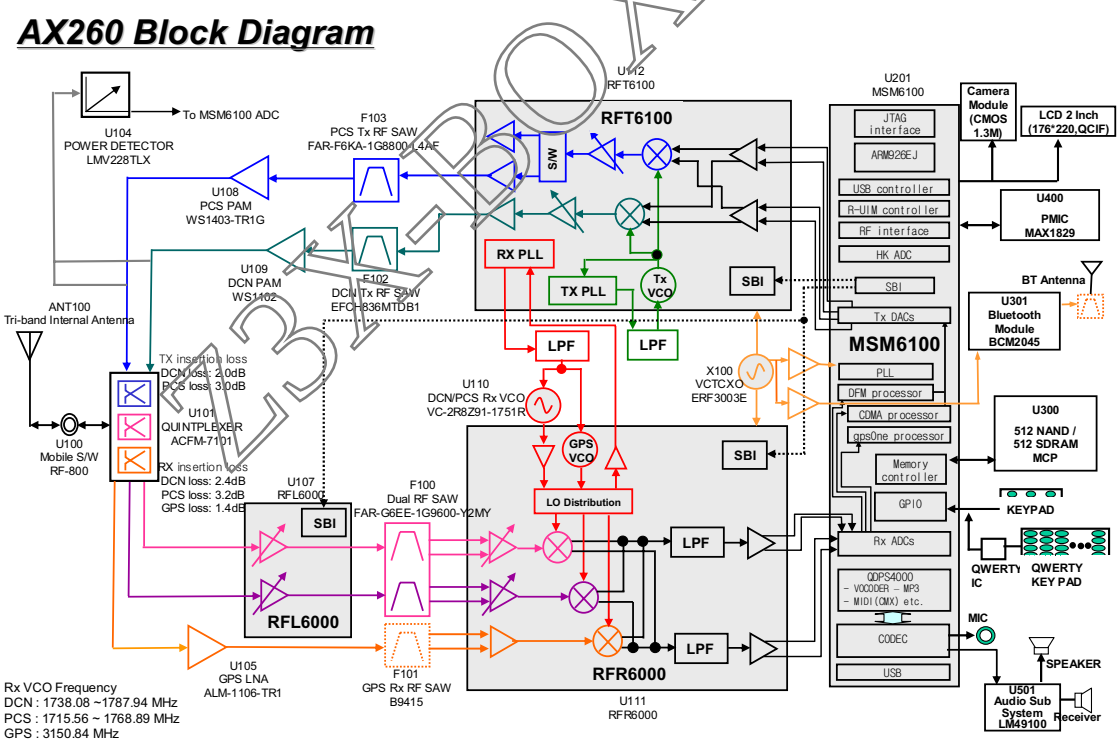
1.1 Overview

The Tx and Rx part employs the Direct-Conversion system. The Tx and Rx frequencies are respectively 824.04~848.97 and 869.04~893.97 for cellular and 1850~1910 and 1930~1990 for PCS. The block diagram is shown in [Figure 1-1]. RF signals received through the antenna are seperated by the Quintplexer.

RF Signal fed into the low noise amplifier (LNA) through the Quintplexer. Then, they are fed into RFR6000. In RFR6000, the RF signal is changed into baseband signal directly. Then, this signal is changed into digital signal by the analog to digital converter (ADC, A/D Converter), and the digital circuit part of the MSM(Mobile Station Modem) 6100 processes the data from ADC. The digital processing part is a demodulator.

In the case of transmission, RFT6100 receives OQPSK-modulated anlaog signal from the MSM6100.

The RFT6100 connects directly with MSM6100 using an analog baseband interface. In RFT6100, the baseband quadrature signals are upconverted to the Cellular or PCS frequency bands and amplified to provide signal drive After that, the RF signal is amplified by the Power Amp in order to have enough power for radiation. Finally, the RF signal is sent out to the cell site via the antenna after going through the Quintplexer.



[Figure 1-1] Block Diagram Of AX260

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1.2 Description of Receive Part Circuit

1.2.1 Quintplexer (U101)

The Quintplexer consists of the Rx bandpass filter (BPF), the Tx BPF and the GPS filter(BPF) which has the function of separating Tx, Rx and GPS signals in the full Triplex system for using the common antenna. The Tx part BPF is used to suppress noises and spurious out of the Tx frequency band. The Rx BPF is used to receive only Rx signal coming from the antenna, which is usually called preselector. It's main function is to limit the bandwidth of spectrum reaching the LNA and mixer, attenuate receiver spurious response and suppress local oscillator energy. As a result frequency sensitivity and selectivity of mobile phone increase. The specification of AX260 Quintplexer described below ;

- PCS band

	Tx	Rx	Tx to Rx (min)
Pass Band	1850~1910 MHz	1930~1990 MHz	
Insertion Loss	3.9 dB max	4.2 dB max	
Return Loss	9.0 dB min	9.0dB min	
Attenuation	43 dB min (1930~1990MHz)	52dB min (1850~1910MHz)	54 dB (1850~1910MHz) 45 dB (1930~1990MHz)

- Cellular band

	Tx	Rx	Tx to Rx (min)
Pass Band	824~849 MHz	869~894 MHz	
Insertion Loss	2.4 dB max	3.4 dB max	
Return Loss	9.0 min	9.0 min	
Attenuation	43 dB min (869~894MHz)	55 dB min (824~849MHz)	55 dB (824~849MHz) 45 dB (869~894MHz)

- GPS band

Pass Band	1574.42~1576.42MHz
Insertion Loss	1.5 dB max
Return Loss	10 min
Isolation1	34 dB min(Cell Tx → GPS)
Isolation2	34 dB min(PCS Tx → GPS)

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1.2.2 LNAs (U107)

The RFL6000 has cellular and PCS LNAs, respectively. The characteristics of Low Noise Amplifier (LNA) are low noise figure, high gain, high intercept point and high reverse isolation. The frequency selectivity characteristic of mobile phone is mostly determined by LNA.

The specification of AX260 LNAs are described below:

Parameter	Low gain		Middle gain		High gain		Units
	Cellular	PCS	Cellular	PCS	Cellular	PCS	
Gain	-19	-20	-2	-9	15.5	16	dB
Noise Figure	19	20	2	9	1.4	1.6	dB
Input IP3	25	25	20	20	6	8	dBm

1.2.3 Down-converter Mixers and GPS LNA (U111)

The RFR6000 device performs signal down-conversion for Cellular, PCS and GPS tri-band applications. It contains all the circuitry (with the exception of external filters) needed to support conversion of received RF signals to baseband signals. The three downconverting Mixers (Cellular, PCS and GPS), and an LO Buffer Amplifier to buffer the RF VCO to the RF Transmit Upconverter. The GPS LNA & mixers offer the most advanced and integrated CDMA Rx solution designed to meet cascaded Noise Figure (NF) and Third-order Intercept Point (IIP3) requirements of IS-98C and J-STD-018 specifications for Sensitivity, Two-Tone Intermodulation, and Single-tone Desense.

Operation modes and band selection are specially controlled from the Mobile Station Modem MSM6100.

The specification of AX260 Mixers are described below:

Parameter	Low gain		High gain		Units
	Cellular	PCS	Cellular	PCS	
Noise Figure	27	27	11	11	dB
Input IP3	4	3	4	3	dBm
Input IP2	50	50	75	70	dBm

1.2.4 Rx RF SAW FILTER(F100)

The main function of Rx RF SAW filter is to attenuate mobile phone spurious frequency, attenuate noise amplified by the LNA and suppress second harmonic originating in the LNA.

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1.3 Description of Transmit Part Circuit

1.3.1 RFT6100 (U112)

The RFT6100 baseband-to-RF Transmit Processor performs all Tx signal-processing functions required between digital baseband and the Power Amplifier Modulator (PAM). The baseband quadrature signals are upconverted to the Cellular or PCS frequency bands and amplified to provide signal drive capability to the PAM. The RFT6100 includes an mixers for up-converting analog baseband to RF, a programmable PLL for generating Tx and Rx LO frequency, cellular and PCS driver amplifiers and Tx power control through an 85 dB VGA. As added benefit, the single sideband upconversion eliminates the need for a band pass filter normally required between the upconverter and driver amplifier.

I, I/, Q and Q/ signals proceed from the MSM6100 to RFT6100 are analog signal. In CDMA mode, These signals are modulated by Offset Quadrature Phase Shift King (OQPSK). I and Q are 90 deg. out of phase, and I and I/ are 180 deg. The mixers in RFT6100 converts baseband signals into RF signals. After passing through the upconverters, RF signal is inputted into the Power AMP.

- RFT6100 Cellular and PCS CDMA RF Specifications

	Condition	Min.	Typ.	Max.	Units
Rated Output Power	Average CDMA Cellular Average CDMA PCS		8 10		dBm dBm
Min Output Power	Average CDMA Cellular Average CDMA PCS		-80 -78		dBm dBm
Rx band noise power	CDMA Cellular CDMA PCS		-133 -132		dBm/Hz
ACPR	Cellular: Fc±885kHz PCS: Fc±1.25MHz		-56 -56		dBc/ 30kHz

1.3.2 Power Amplifier(U108,109)

The power amplifier that can be used in the PCS and CDMA mode has linear amplification capability and high efficiency. For higher efficiency, it is made up of one MMIC (Monolithic Microwave Integrated Circuit) for which RF input terminal and internal interface circuit are integrated onto one IC after going through the AlGaAs/GaAs HBT (heterojunction bipolar transistor) process. The module of power amplifier is made up of an output end interface circuit including this MMIC. The maximum power that can be inputted through the input

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terminal is +17dBm and conversion gain is about 28dB. RF transmit signals that have been amplified through the power amplifier are sent to the Quintplexer.

1.4 Description of Frequency Synthesizer Circuit

1.4.1 Voltage Control Temperature Compensation Crystal Oscillator (VCTCXO, X100)

The temperature variation of mobile phone can be compensated by VCTCXO. The reference frequency of a mobile phone is 19.2 MHz. The receiver frequency tuning signals called TRK_LO_ADJ from MSM as 0.5 V~2.5 V DC via R and C filter in order to generate the reference frequency of 19.2 MHz and input it into the frequency synthesizer. Frequency stability depending on temperature is ±1.5 ppm.

1.4.2 Voltage Controlled Oscillator (VCO, U110)

The external VCO signal is processed by the LO generation and distribution circuits in RFR6000 to create the PCS and Cellular quadrature downconverter's LO signals. Likewise, the internal VCO signal of RFR6000 is processed to create the GPS quadrature downconverter's LO signal. In all cases, the LO signals applied at the mixer ports are at the frequency different than the VCO frequency. This assures that the VCO frequency is different than the RF frequency, an important consideration for Zero-IF processing. The VCO frequency used are 1715.56~1768.89 MHz for PCS and 1738.08~1787.94 MHz for cellular.

2. Digital/Voice Processing Part

2.1 Overview

The digital/voice processing part processes the user's commands and processes all the digital and voice signal processing in order to operate in the phone. The digital/voice processing part is made up of a keypad/LCD, receptacle part, voice processing part, mobile station modem part, memory part, and power supply part.

2.2 Configuration

2.2.1 Keypad/LCD and Receptacle Part

This is used to transmit keypad signals to MSM6100. It is made up of a keypad backlight part that illuminates the keypad, LCD part that displays the operation status onto the screen, and a receptacle that receives and sends out voice and data with external sources.

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2.2.2 Voice Processing Part

The voice processing part is made up of an audio codec used to convert MIC signals into digital voice signals and digital voice signals into analog voice signals, amplifying part for amplifying the voice signals and sending them to the ear piece, amplifying part that amplifies ringer signals coming out from MSM6100, and amplifying part that amplifies signals coming out from MIC and transferring them to the audio processor.

2.2.3 MSM (Mobile Station Modem) 6100 Part

MSM is the core elements of CDMA terminal and carries out the functions of CPU, encoder, interleaver, deinterleaver, Viterbi decoder, Mod/Demod, and vocoder.

2.2.4 Memory Part

The memory part is made up of a NAND Flash memory, SDRAM for storing data.

2.2.5 Power Supply Part

The power supply part is made up of circuits for generating various types of power, used for the digital/voice processing part.

2.3 Circuit Description

2.3.1 Keypad/LCD and Receptacle Part

Once the keypad is pressed, the key signals are sent out to MSM6100 for processing. In addition, when the key is pressed, the keypad/LCD lights up through the use of 20 LEDs. The terminal status and operation are displayed on the screen for the user with the characters and icons on the LCD.
Moreover, it exchanges audio signals and data with external sources through the receptacle, and then receives power from the battery or external batteries.

2.3.2 Audio Processing Part

MIC signals are amplified through OP AMP, inputted into the audio codec(included in MSM6100) and converted into digital signals. Oppositely, digital audio signals are converted into analog signals after going

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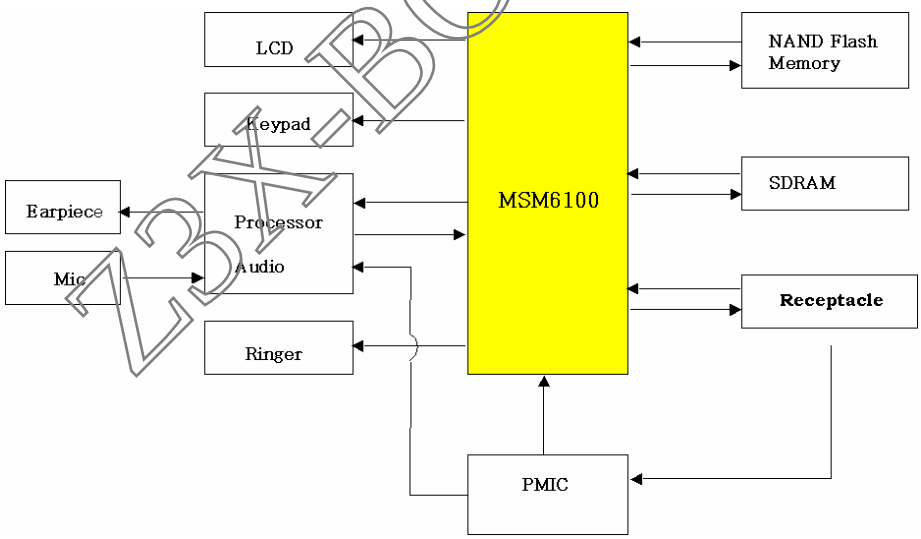
through the audio codec. These signals are amplified at the audio amplifier and transmitted to the ear-piece. The signals from MSM6100 activate the ringer by using signals generated in the timer in MSM6100.

2.3.3 MSM Part

MSM6100 is the core element of CDMA system terminal that includes ARM9TDMI microprocessor core. It supports both CDMA and Digital FM, operating in both the cellular and PCS spectrums. The subsystems within the MSM6100 include a CDMA processor, a DFM processor, a multi-standard Vocoder, an integrated CODEC with earpiece and microphone amplifiers, general-purpose ADC for subsytem monitoring, an ARM9TDMI microprocessor, and both Universal Serial Bus(USB) and an RS-232 serial interfaces supporting forward and reverse link data communications of 307.2 Kbps simultaneously. And it also contains complete digital modulation and demodulation systems for both CDMA and AMPS cellular standards, as specified in IS-95-A/B/C.

In MSM, coded symbols are interleaved in order to cope with multi-path fading. Each data channel is scrambled by the long code PN sequence of the user in order to ensure the confidentiality of calls. Moreover, binary quadrature codes are used based on walsh functions in order to discern each channel. Data created thus are 4-phase modulated by one pair of Pilot PN code and they are used to create I and Q data.

When received, I and Q data are demodulated into symbols by the demodulator, and then de-interleaved in reverse to the case of transmission. Then, the errors of data received from viterbi decoder are detected and corrected. They are voice-decoded at the vocoder in order to output digital voice data.



[Figure 2-2] Block Diagram of Digital/Voice Processing Part

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2.3.4 Memory Part

MCP contents 512 Mbits NAND flash memory and 512 Mbits SDRAM. In the Flash Memory part of MCP is programs used for terminal operation. The programs can be changed through down loading after the assembling of terminals. On the SDRAM data generated during the terminal operation are stored temporarily.

2.3.5 Power Supply Part

When the battery voltage (+4.0V) is fed and the PWR key of keypad is pressed, the power-up circuitry in PM (power management) IC (U400) is activated by the PWR_ON_SW signal, and then the LDO regulators embedded in PMIC for MSM) are operated and +1.86V_MSMC, +2.6V_MSMP and +2.6V_MSMA are generated.

The Rx part regulator (+2.9V_RX) is operated by the control signal of SLEEP/ from MSM6100.

The Tx part regulator (+2.9V_TX) is operated by the I^2C control signal from MSM6100.

2.3.6 Logic Part

The logic part consists of internal CPU of MSM, RAM, MCP. The MSM6100 receives TCXO (=19.2MHz) from X100 and controls the phone in CDMA modes. The major components are as follows:

- **CPU**

The ARM9TDMI microprocessor includes a 3 stage pipelined RISC architecture, both 32-bit ARM and 16-bit THUMB instruction sets, a 32-bit address bus, and a 32-bit internal data bus. It has a high performance and low power consumption.

- **MCP**

Flash ROM is used to store the terminal's program. Using the down-loading program, the program can be changed even after the terminal is fully assembled.

SDRAM is used to store the internal flag information, call processing data, and timer data.

- **KEYPAD**

For key recognition, key matrix is setup using KYPD[1][3][5][7][9][11][13][15][17][19] signal from MSM. 20 LEDs and backlight circuitry are included in the keypad for easy operation in the dark.

- **LCD MODULE**

LCD module contains a controller which will display the information onto the LCD by 16-bit data from the

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MSM6100. It is also supplied stable 2.8V_LCD by regulator in U400 for fine view angle and LCD reflects to improve the display efficiency. 3 LEDs are used to display LCD backlight.

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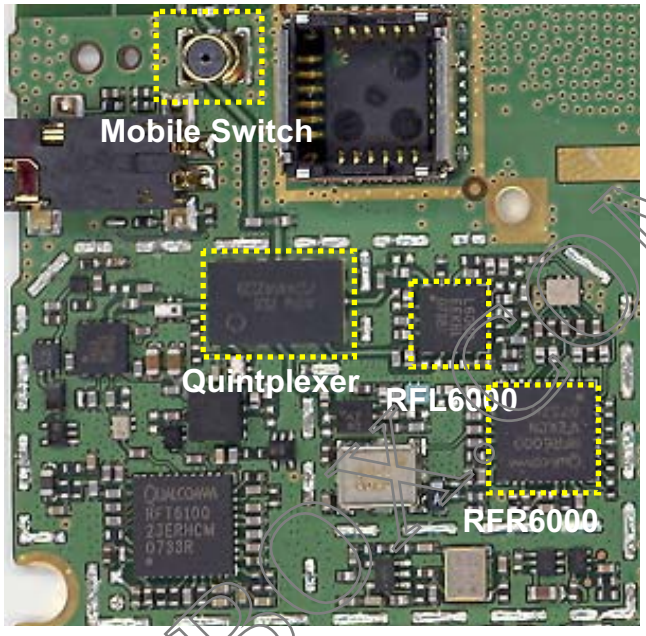
CHAPTER 4. Trouble Shooting

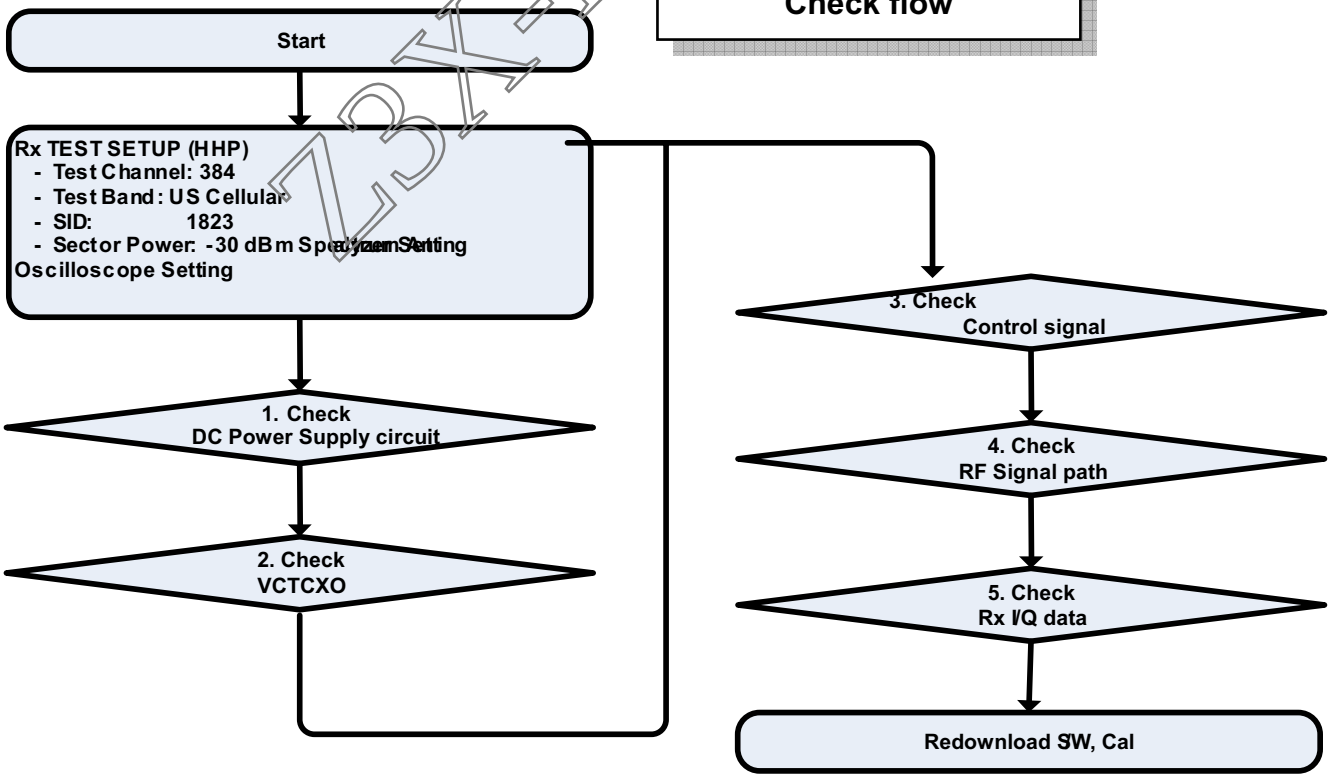
4.1 Rx Part Trouble

4.1.1 DCN Rx

Test Point



Check flow



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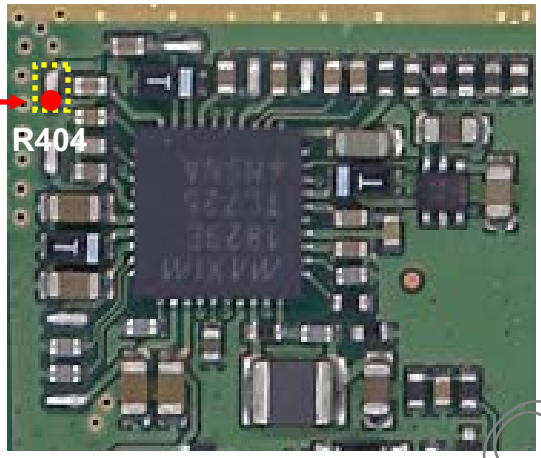
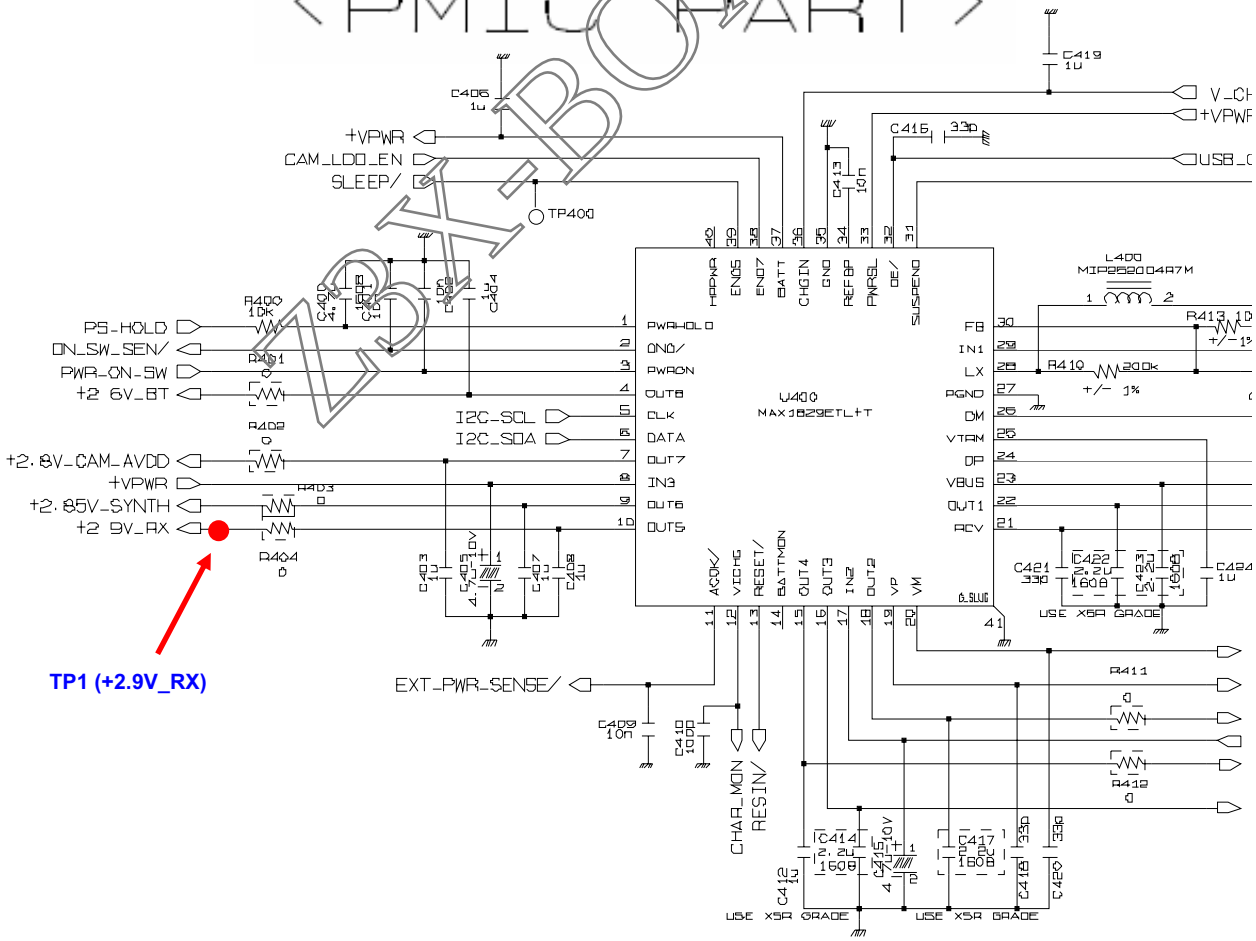
4.1.1.1 Checking DC Power supply circuit (PMIC)

Test Point



Circuit Diagram



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<PMICPART>

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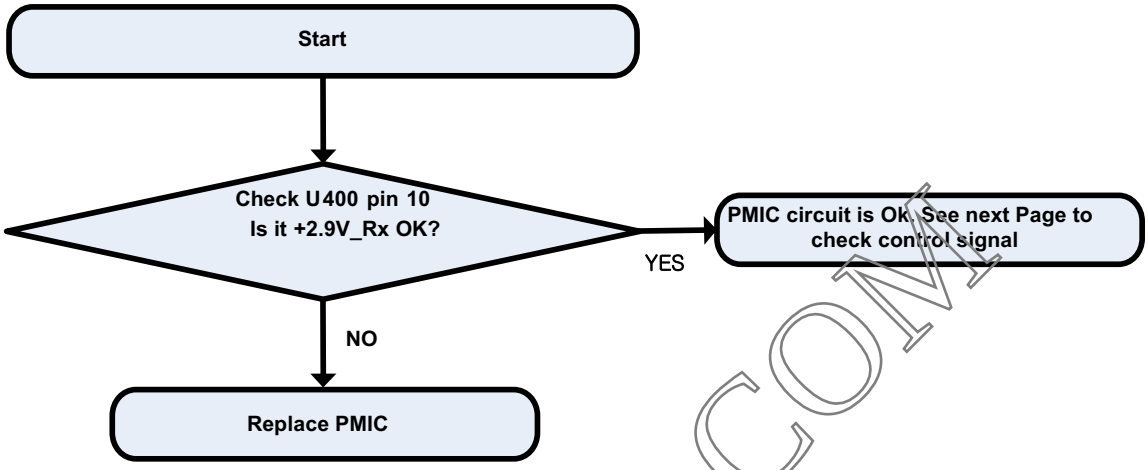
Checking Flow



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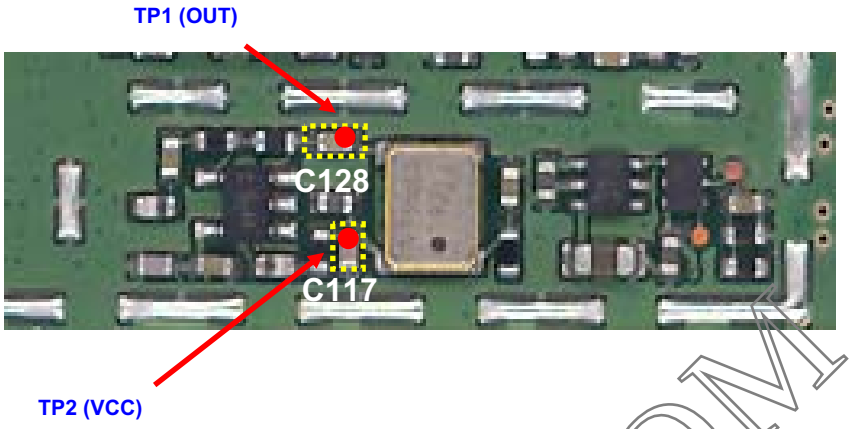
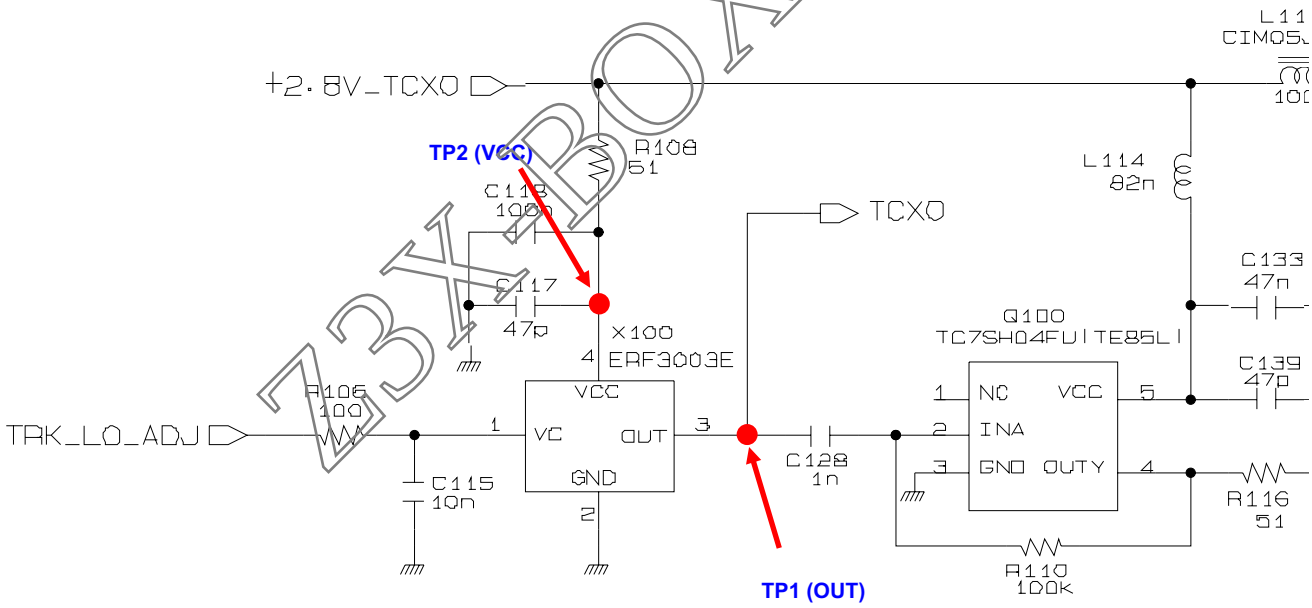
4.1.1.2 Checking VCTCXO circuit

Test Point



Circuit Diagram



/CTCXO(19.2 MHz) & BUFFER

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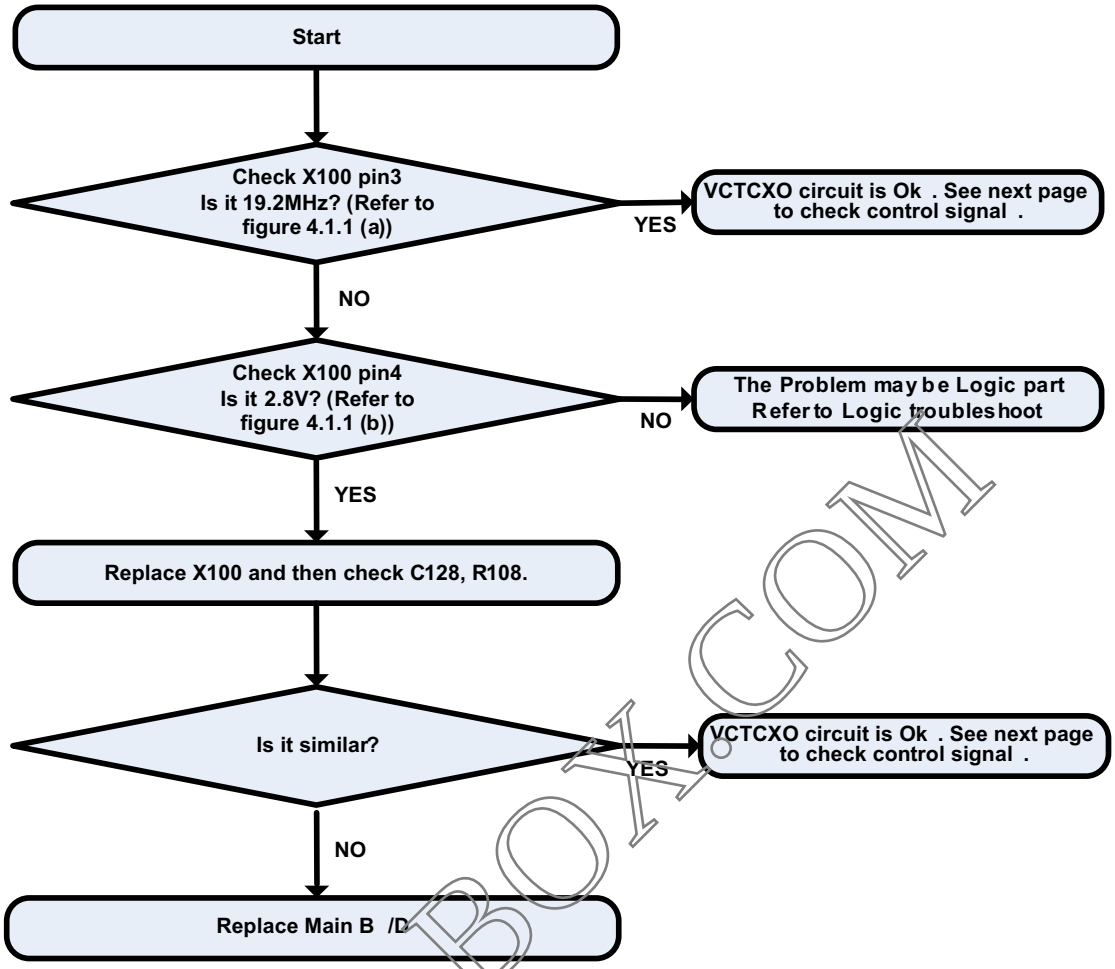
Checking Flow



Waveform

Figure 4.1.1 (a)

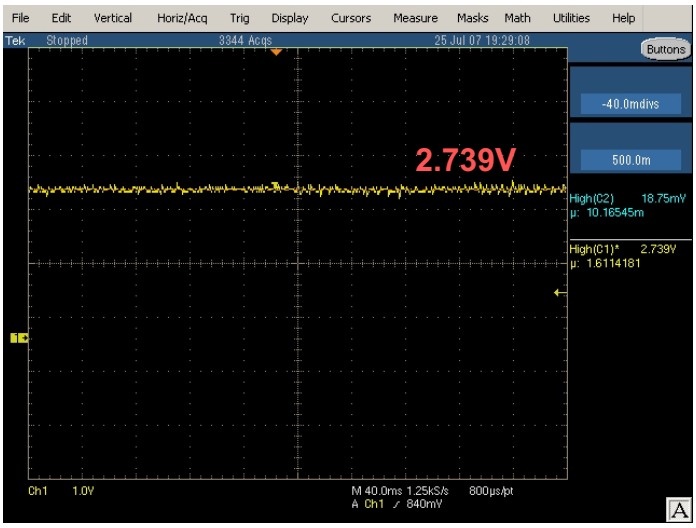


Figure 4.1.1 (b)

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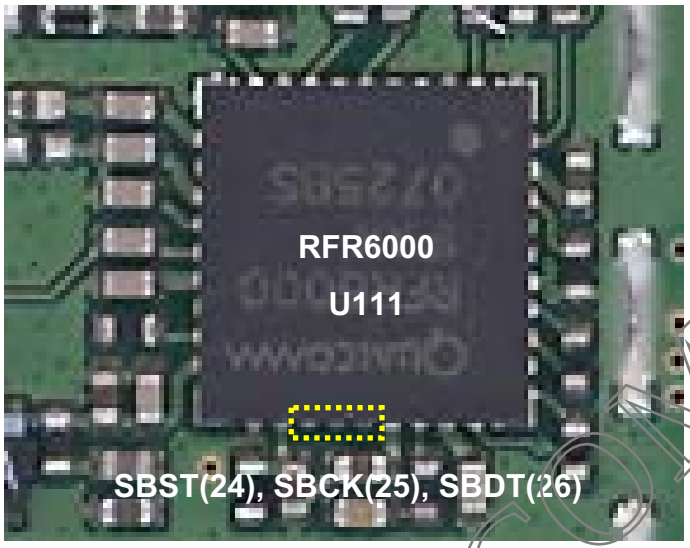
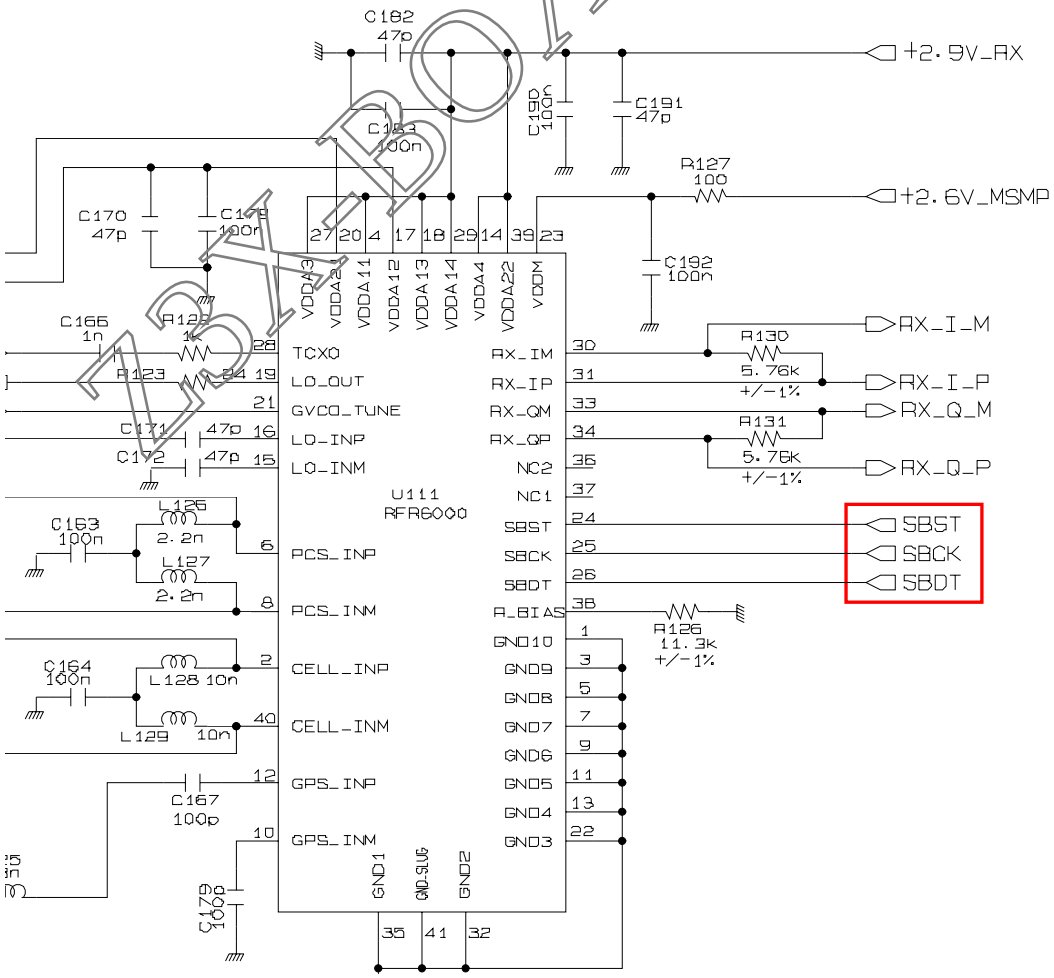
4.1.1.3 Checking Control signal

Test Point



Circuit Diagram



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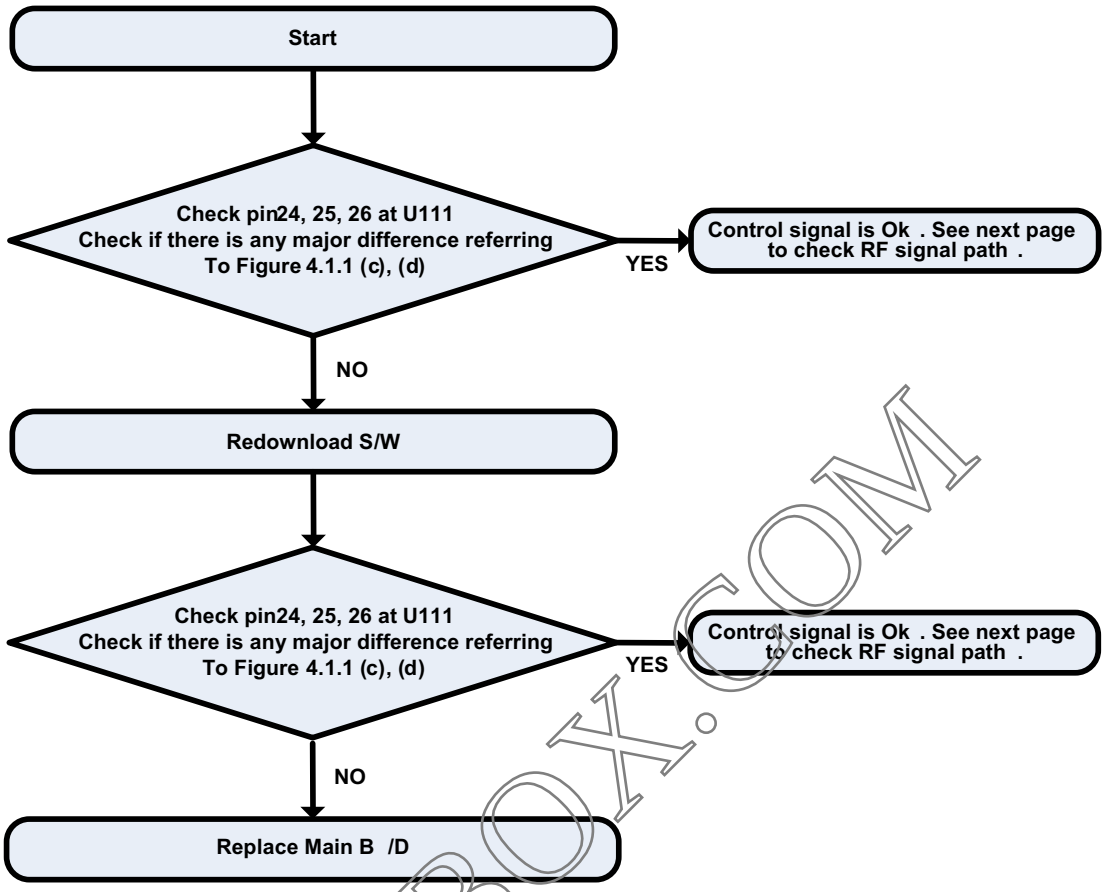
Checking Flow



Waveform

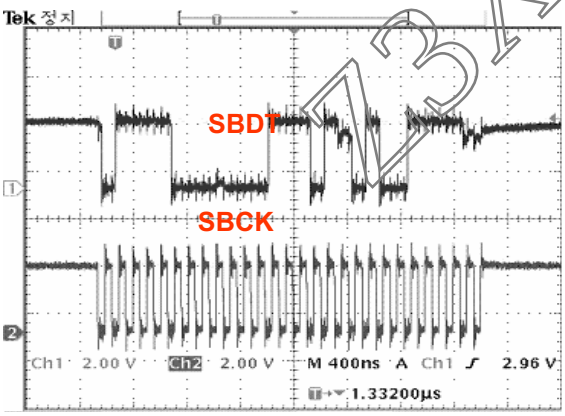


Figure 4.1.1 (c)

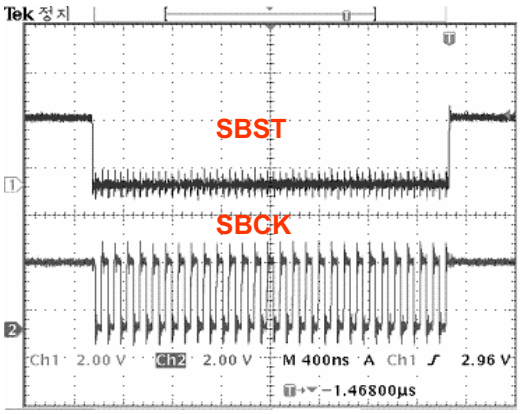


Figure 4.1.1 (d)

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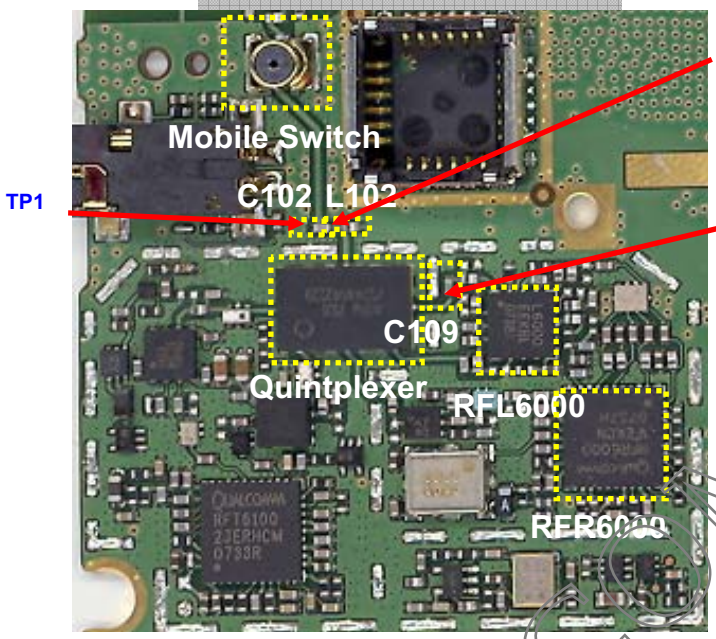
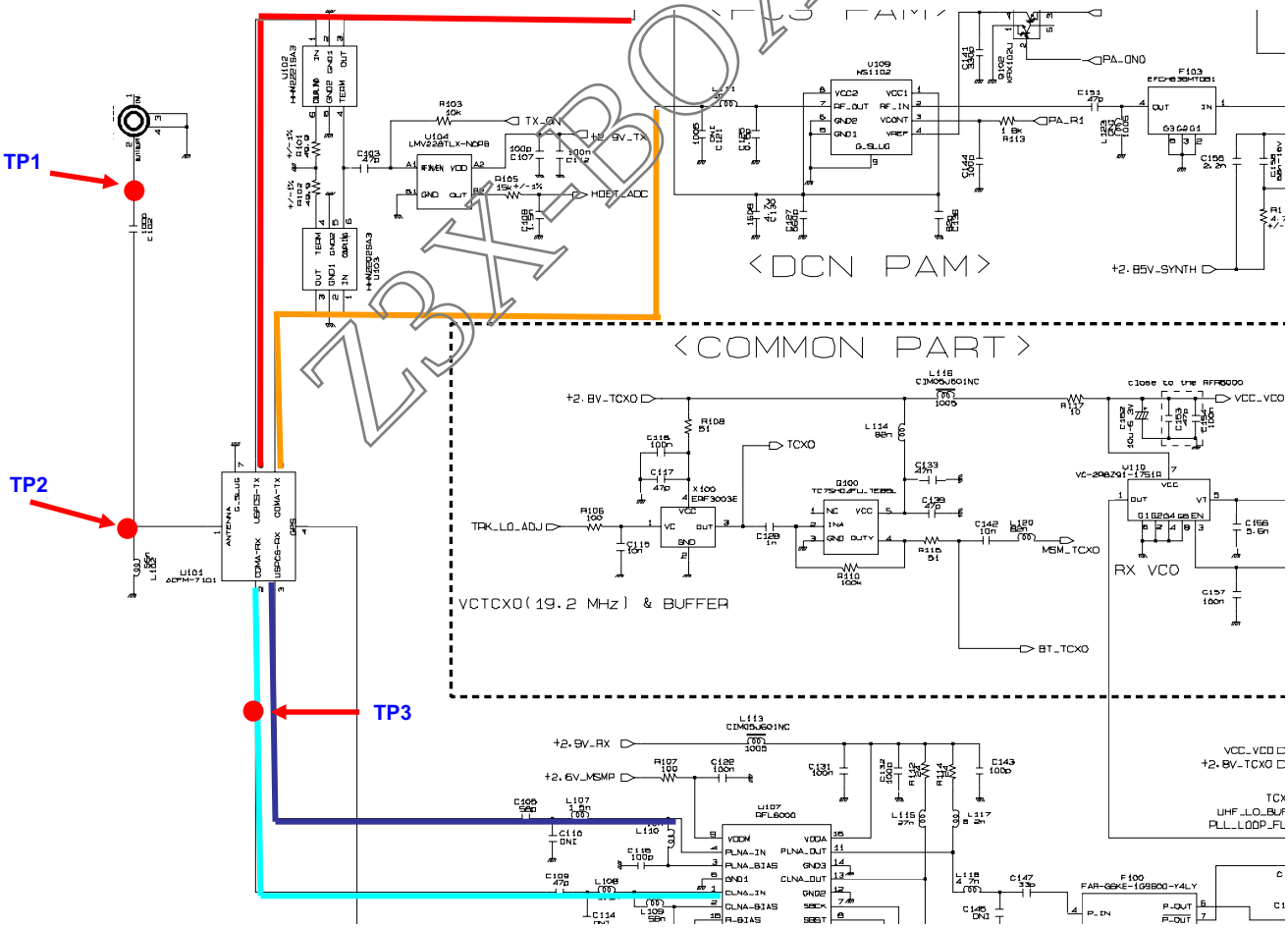
4.1.1.4 Checking RF signal path (Mobile S/W, Quintplexer)

Test Point



Circuit Diagram

PCS Tx
DCN Tx
PCS Rx
DCN Rx



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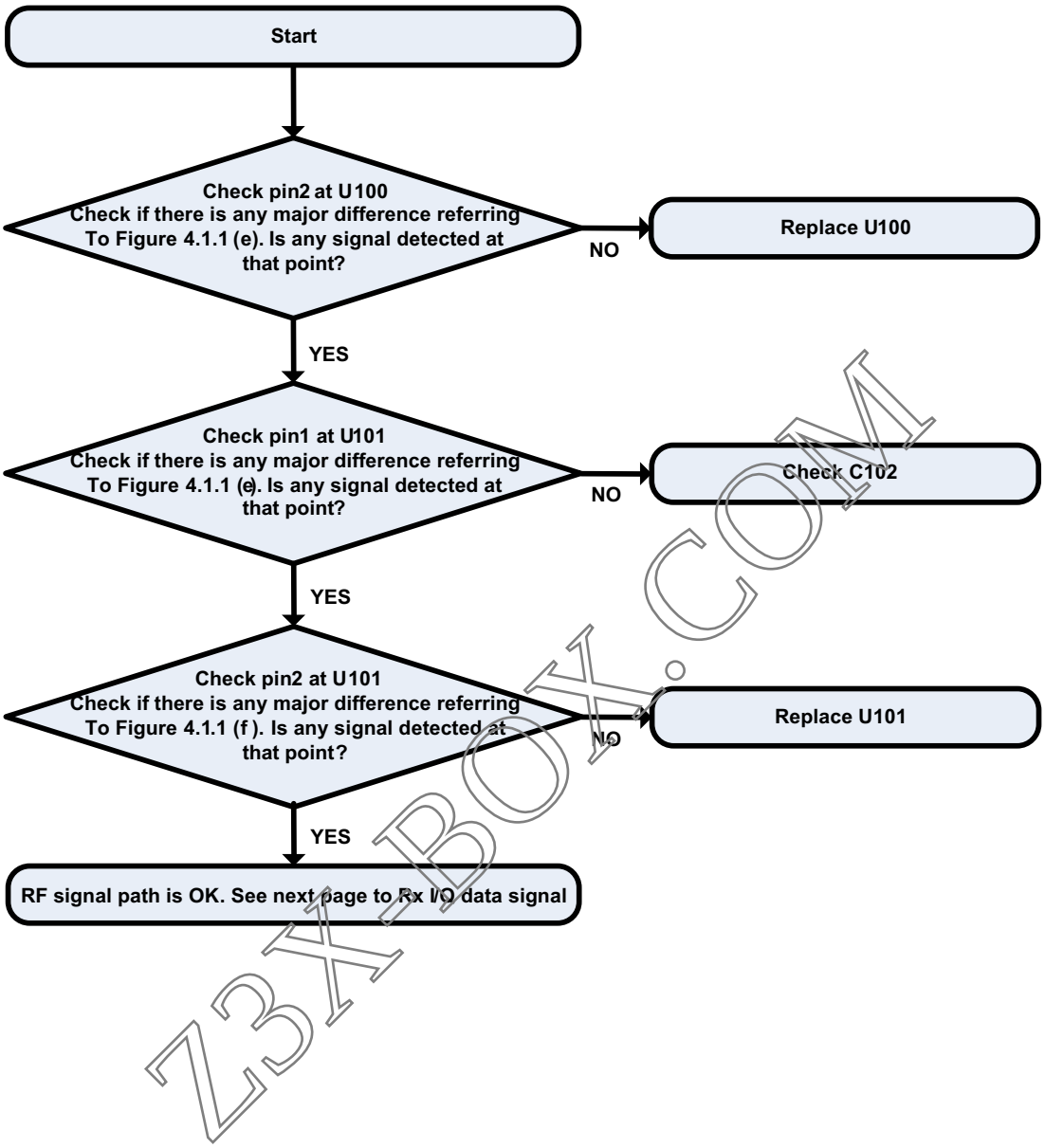
Checking Flow



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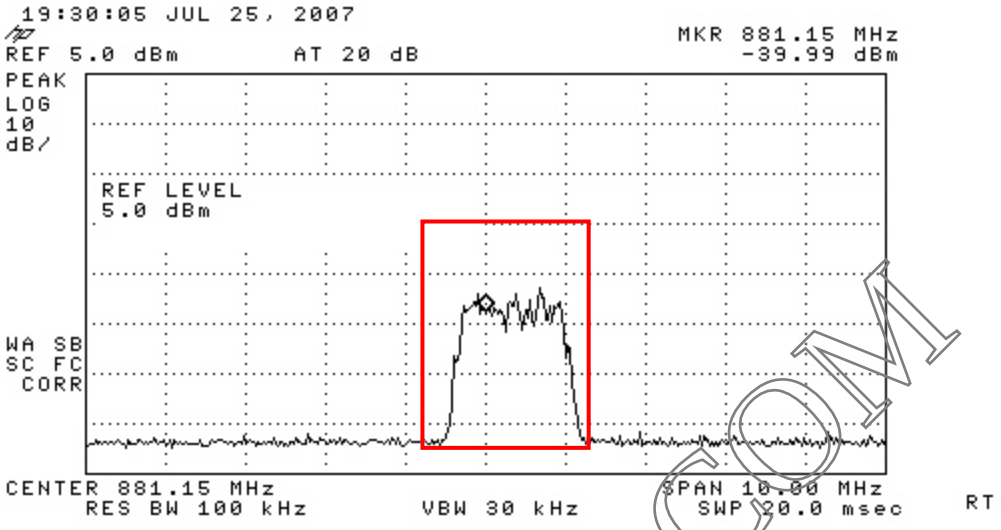
Waveform



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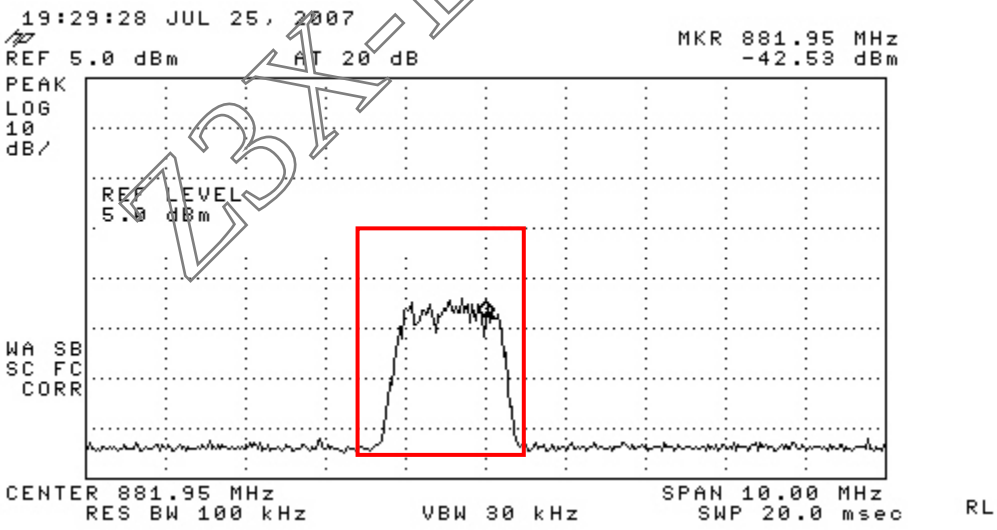

4.1.1 (f)

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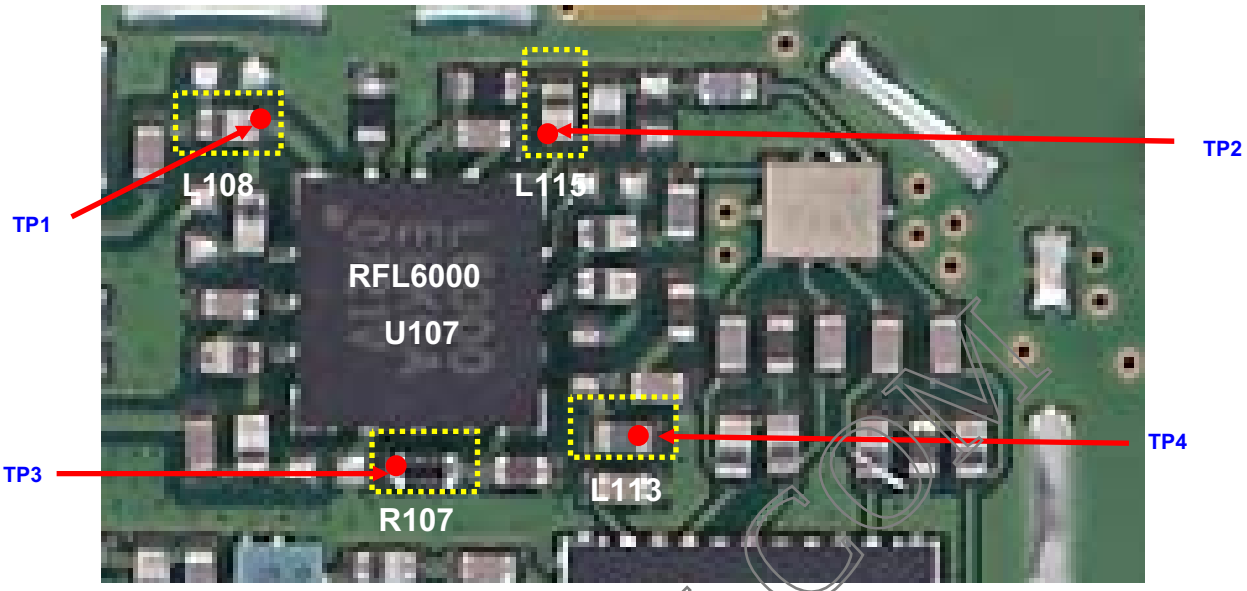
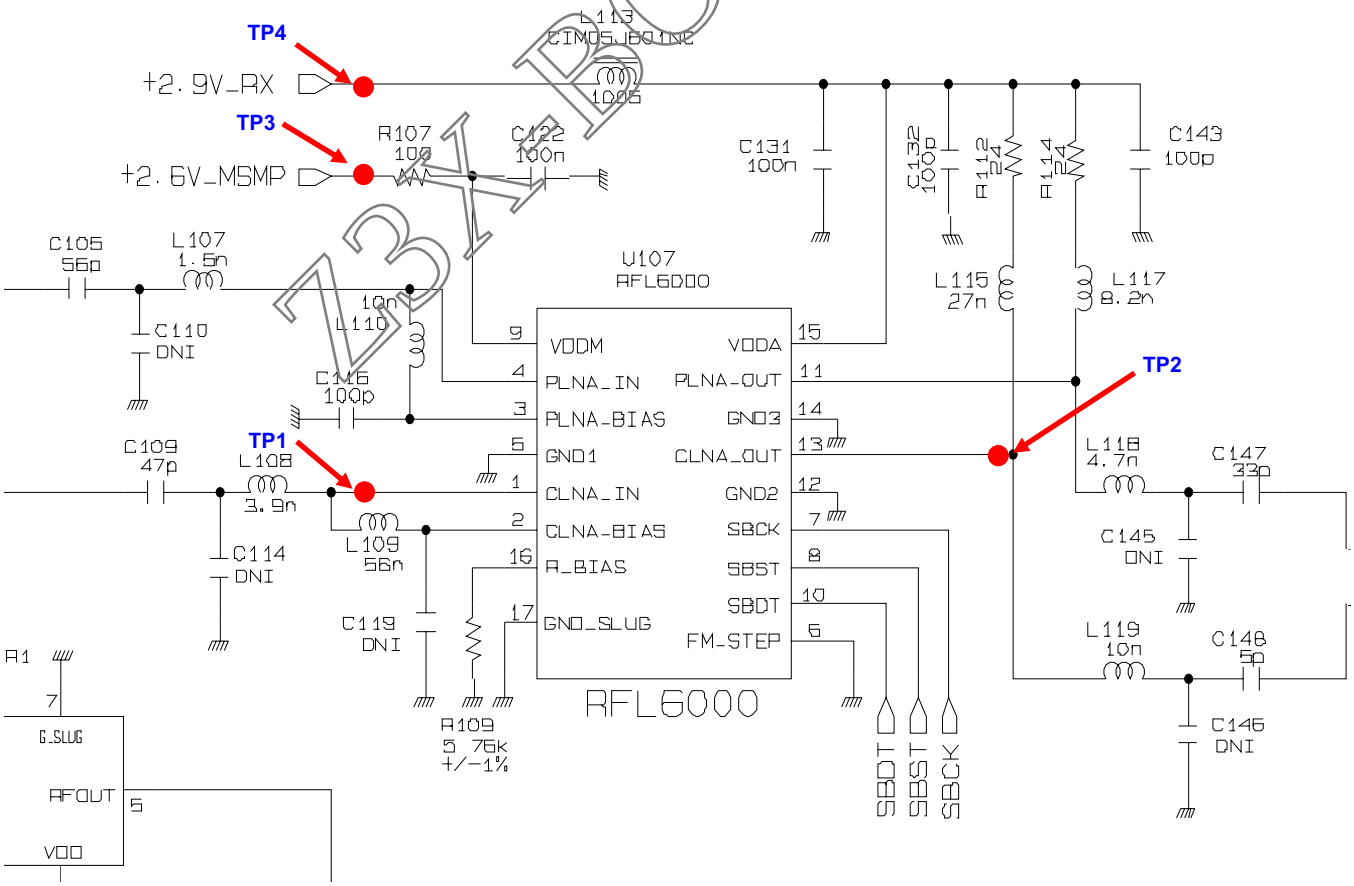
4.1.1.5 Checking LNA

Test Point



Circuit Diagram



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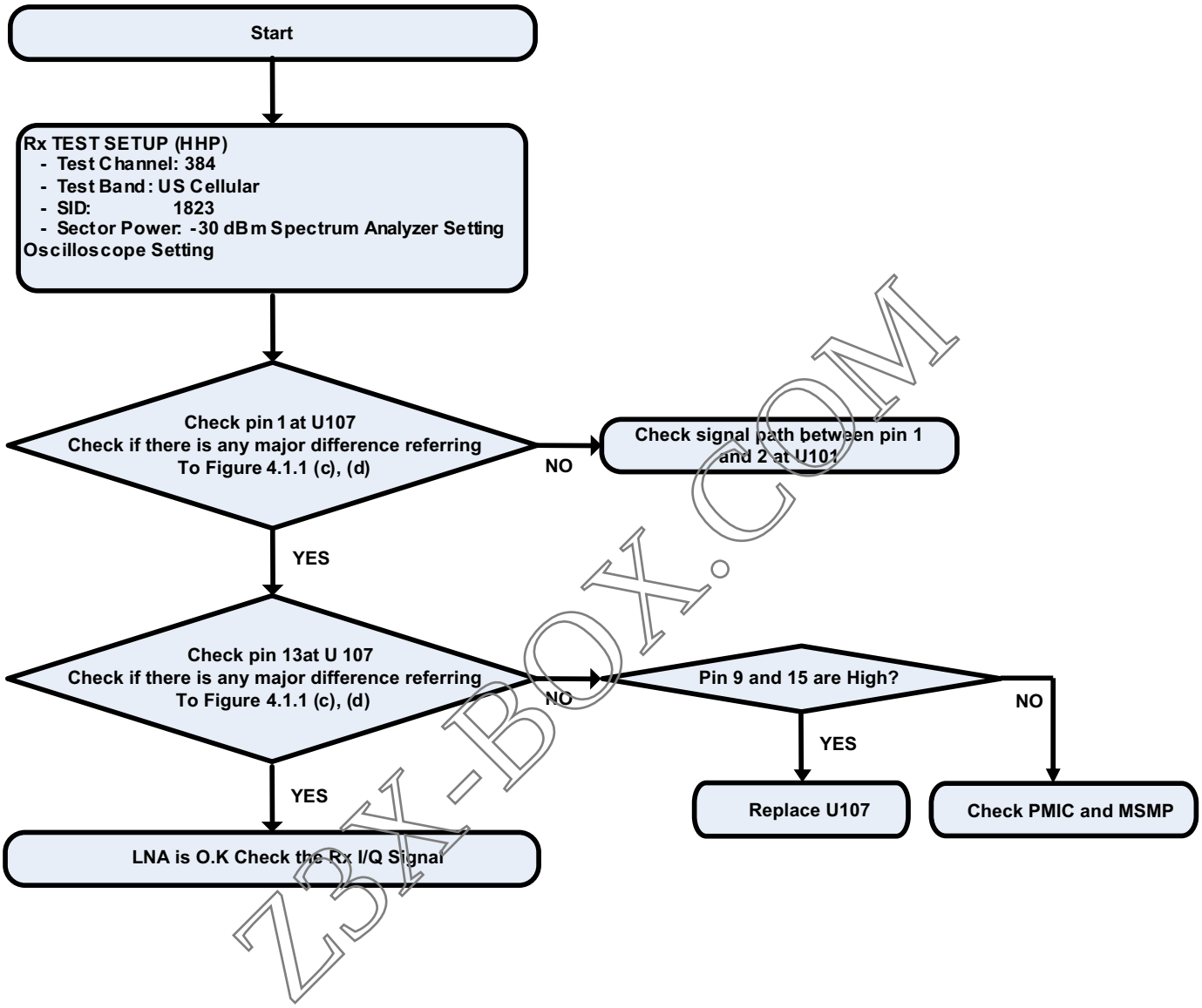
Checking Flow



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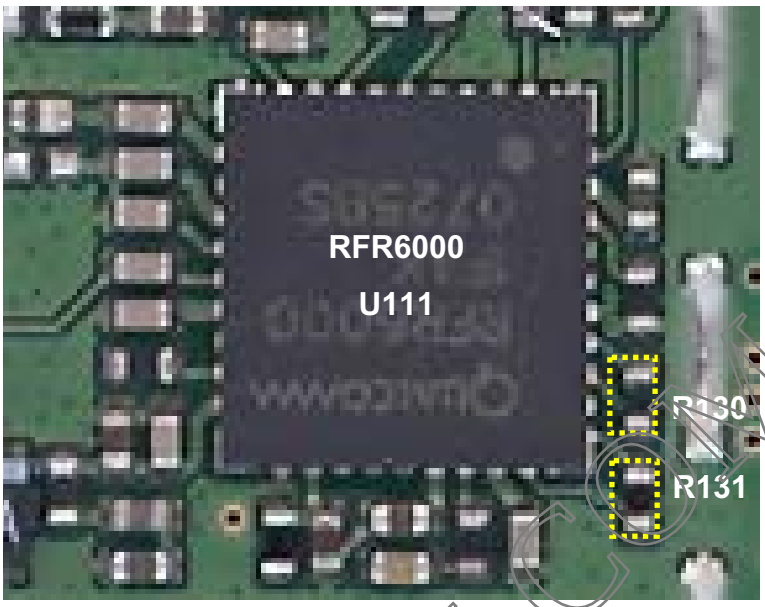
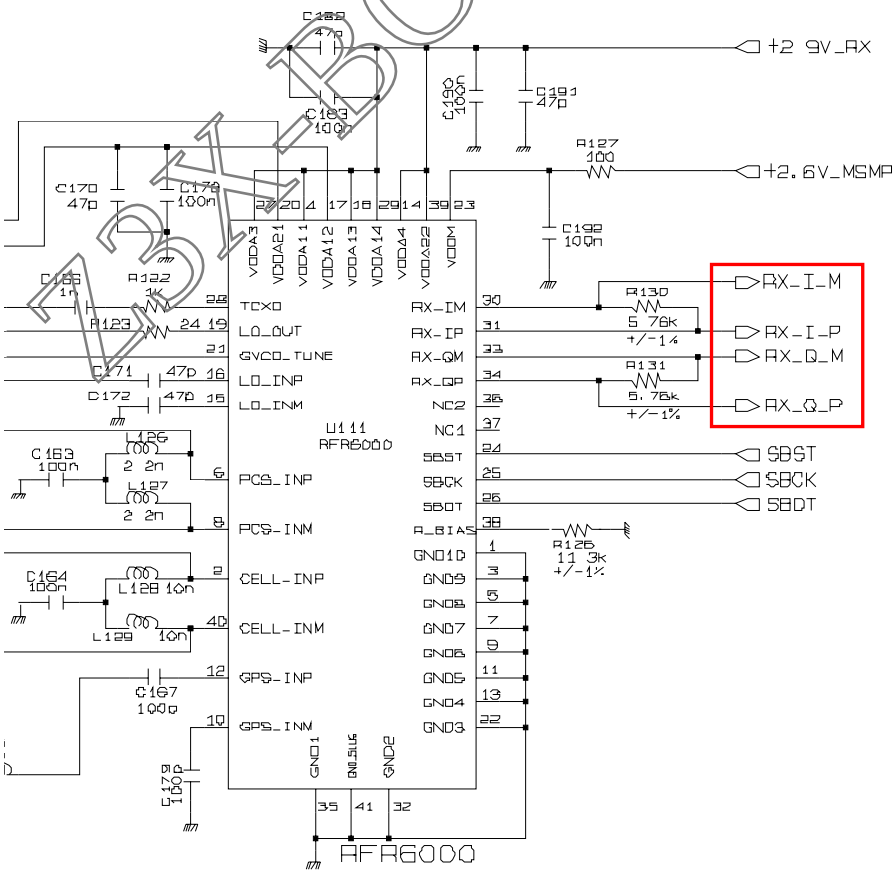
4.1.1.6 Checking Rx I/Q data

Test Point



Circuit Diagram



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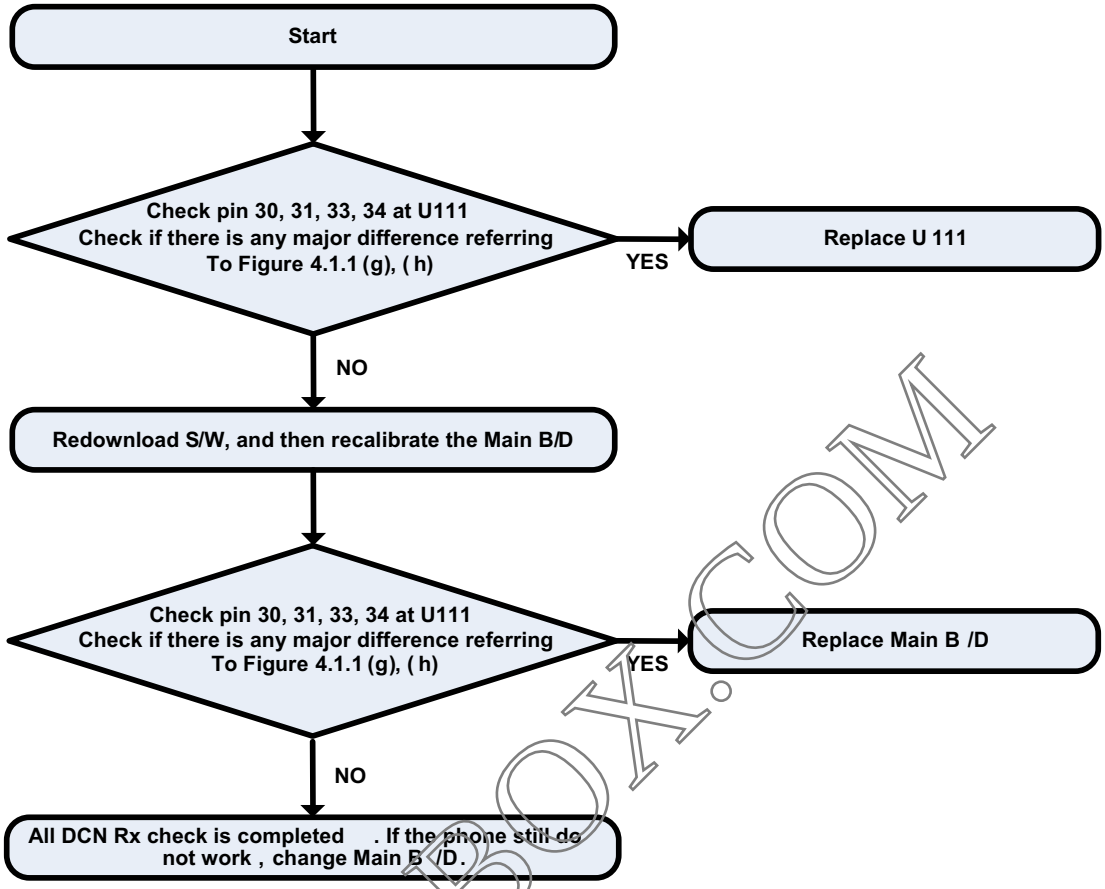
Checking Flow



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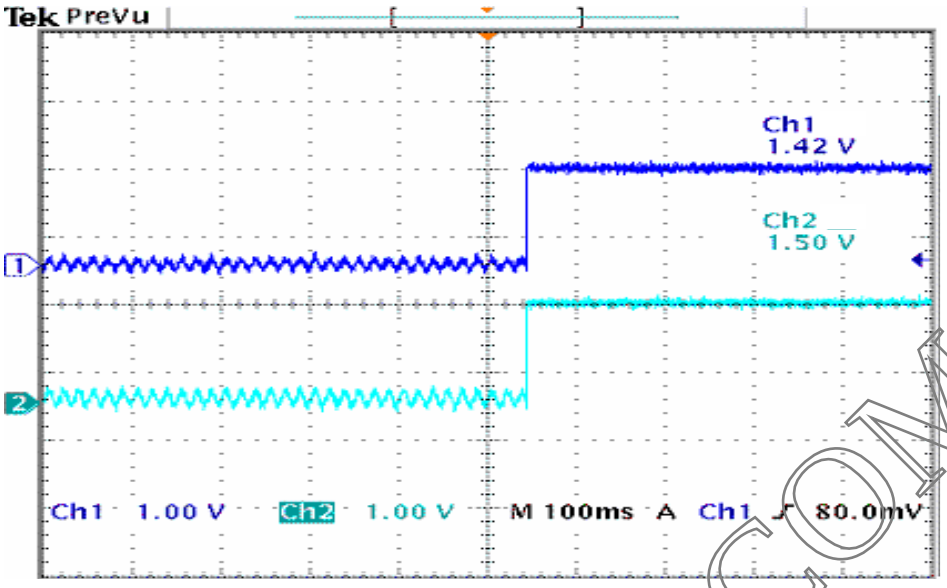
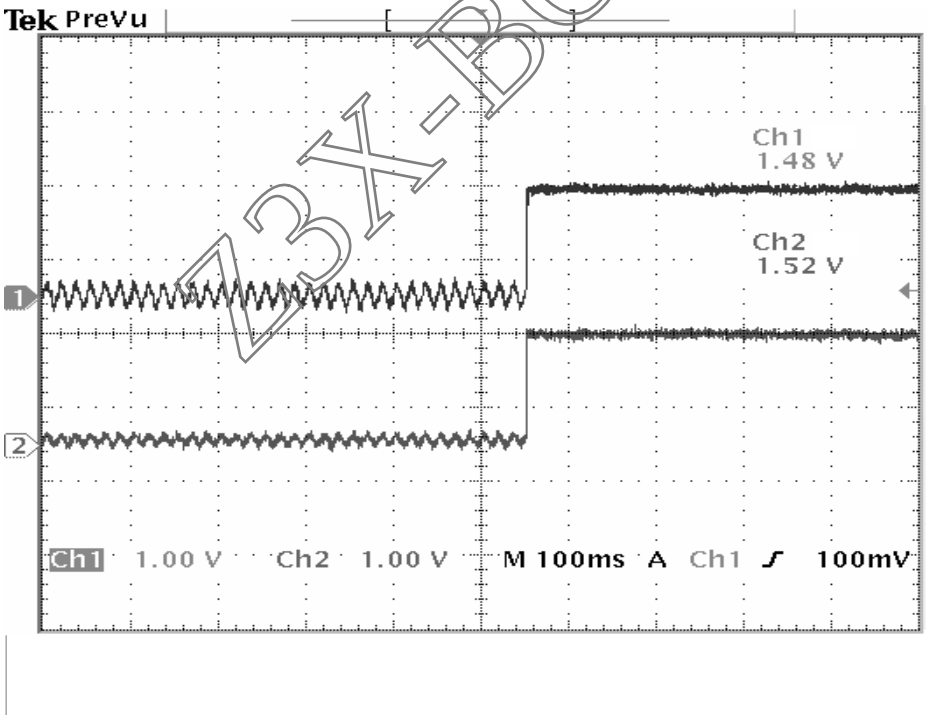
Waveform



Graph 4.1.1(g)



Graph 4.1.1(h)

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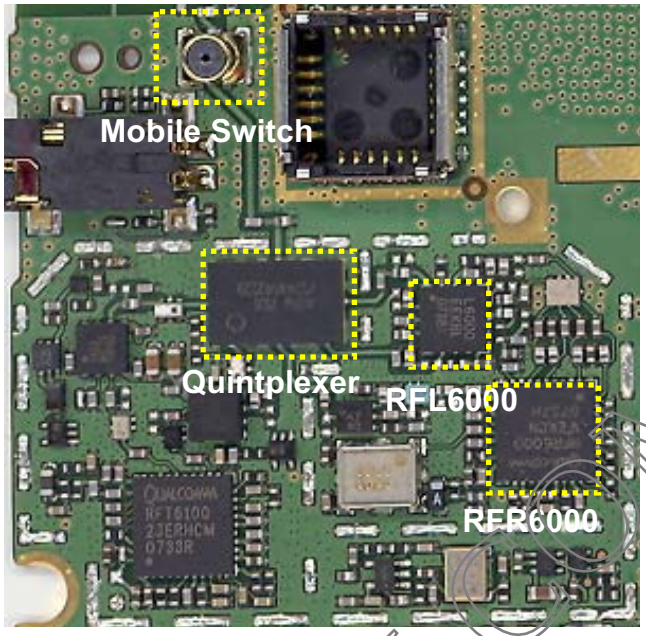
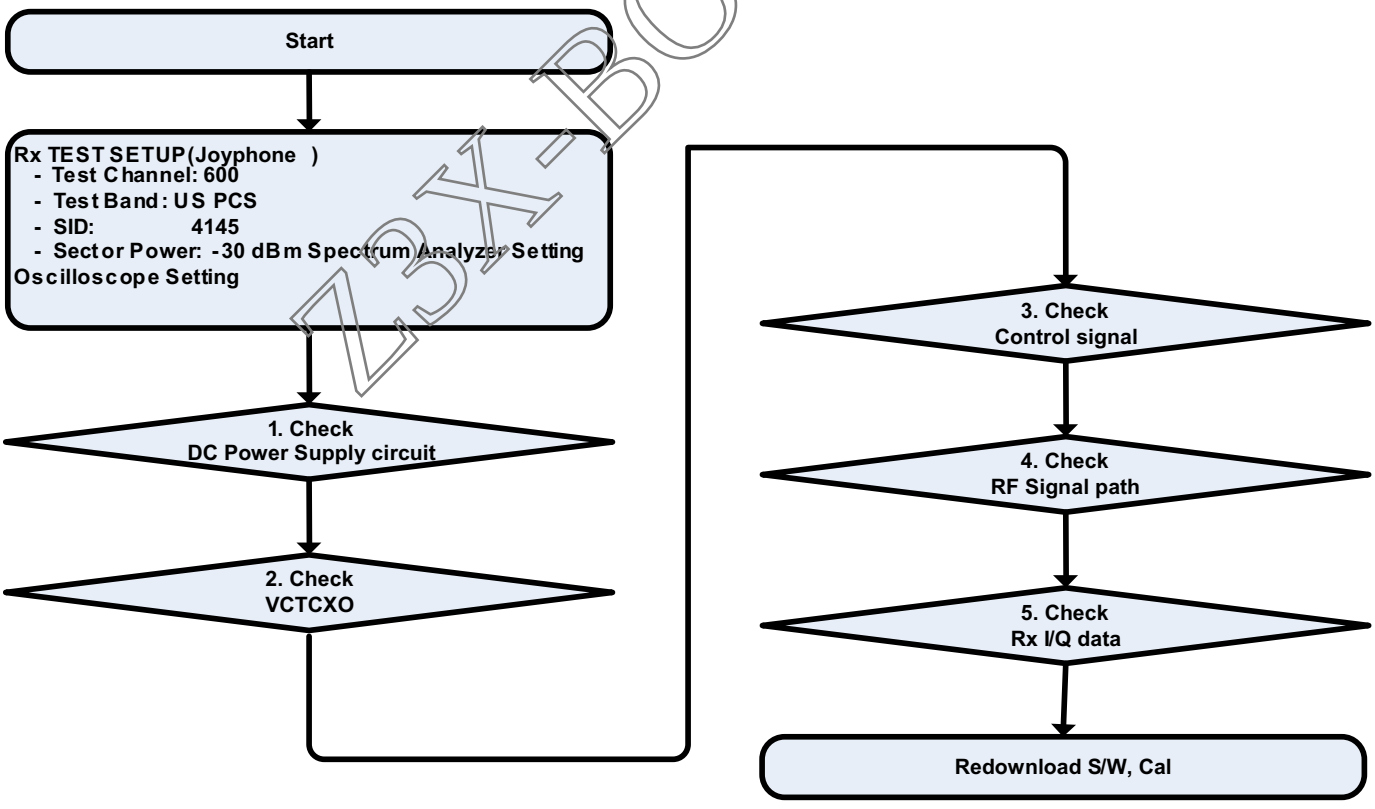
4.1.2 PCS Rx

Test Point



Checking Flow



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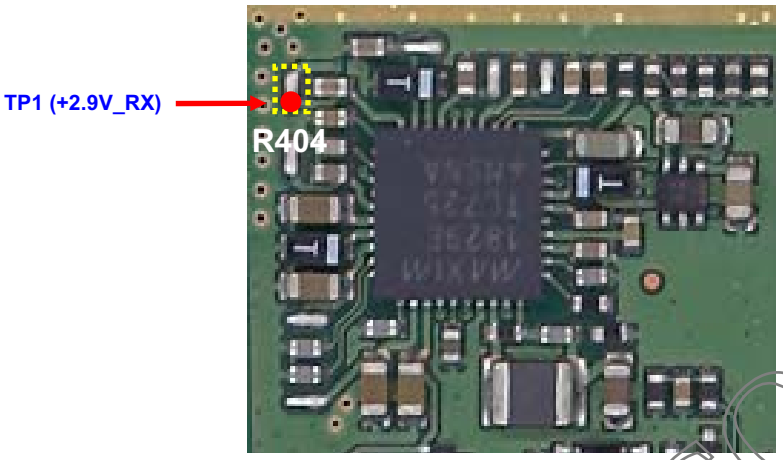
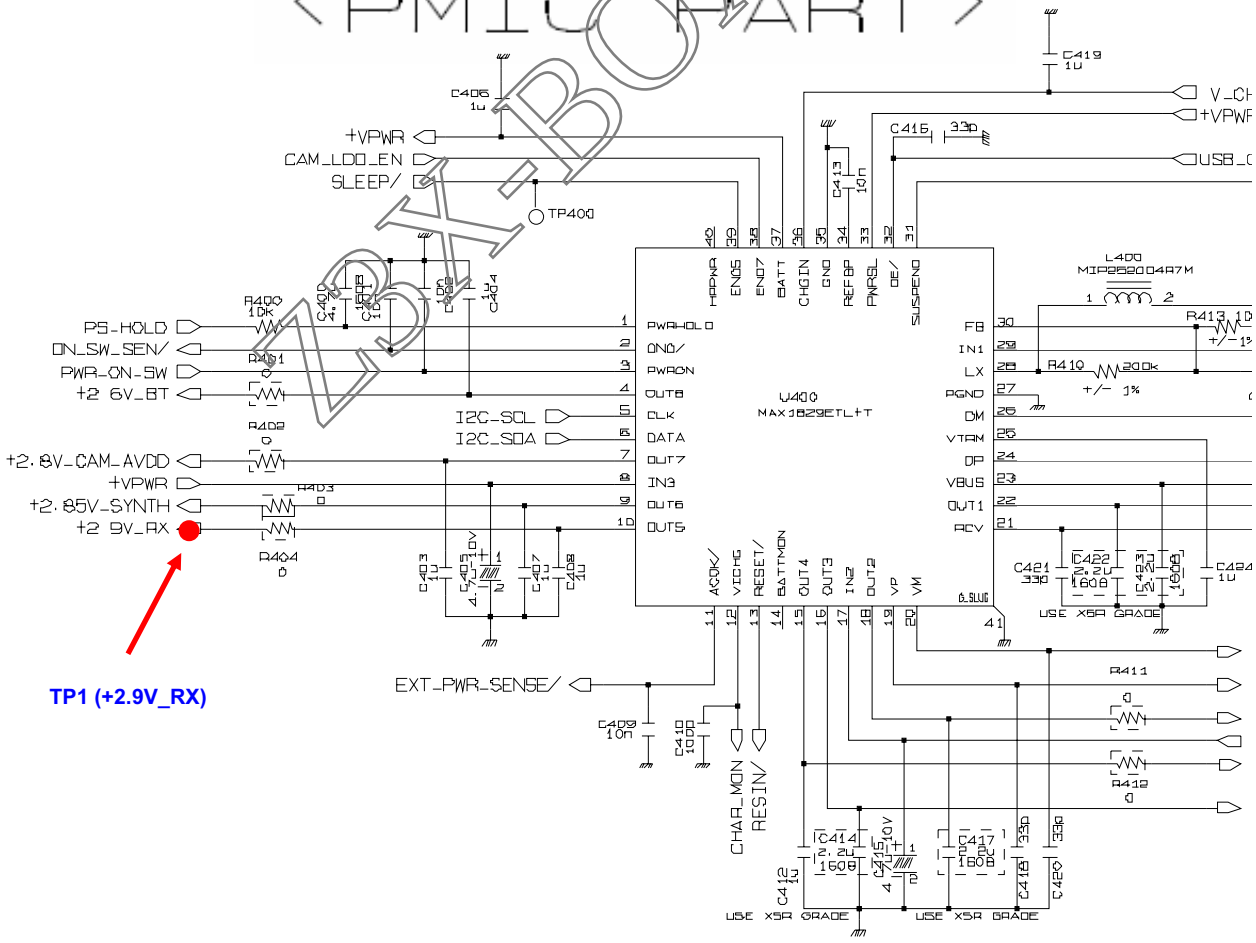
4.1.2.1 Checking DC Power supply circuit (PMIC)

Test Point



Circuit Diagram



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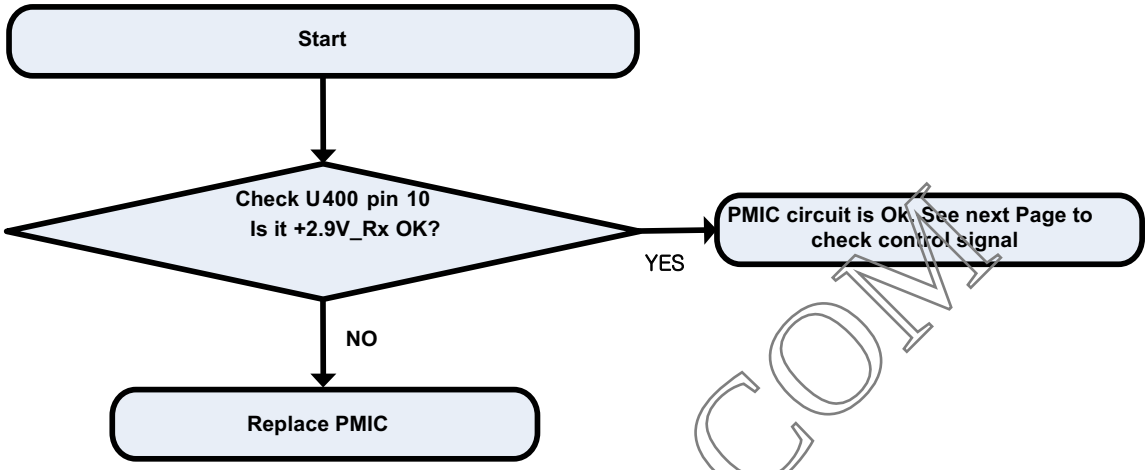
Checking Flow



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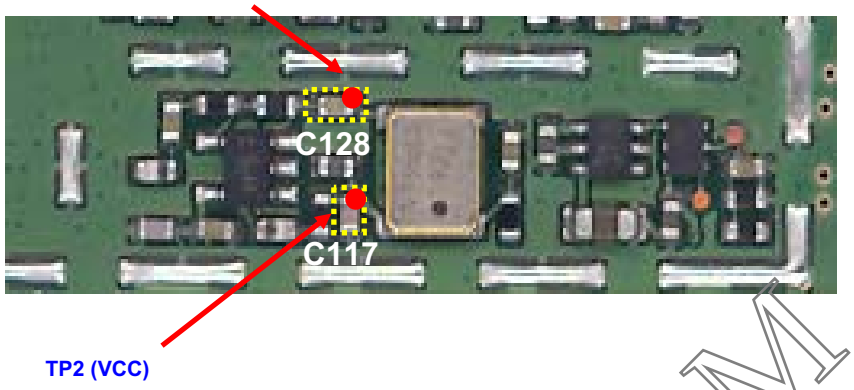
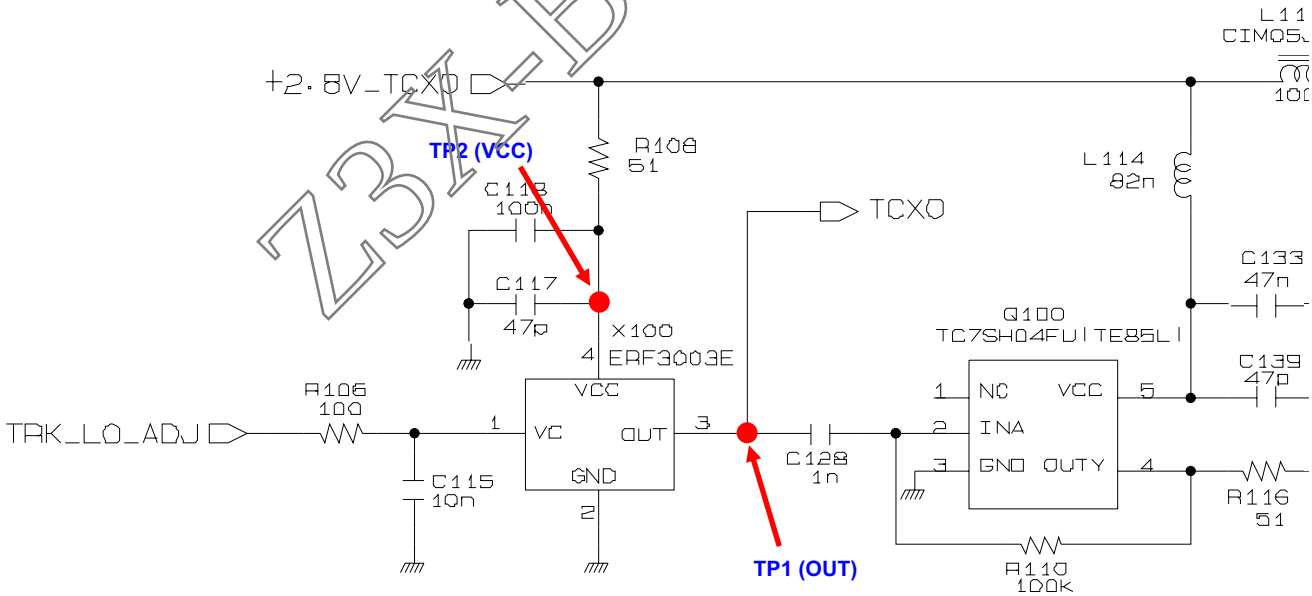
4.1.2.2 Checking VCTCXO circuit

Test Point



Circuit Diagram



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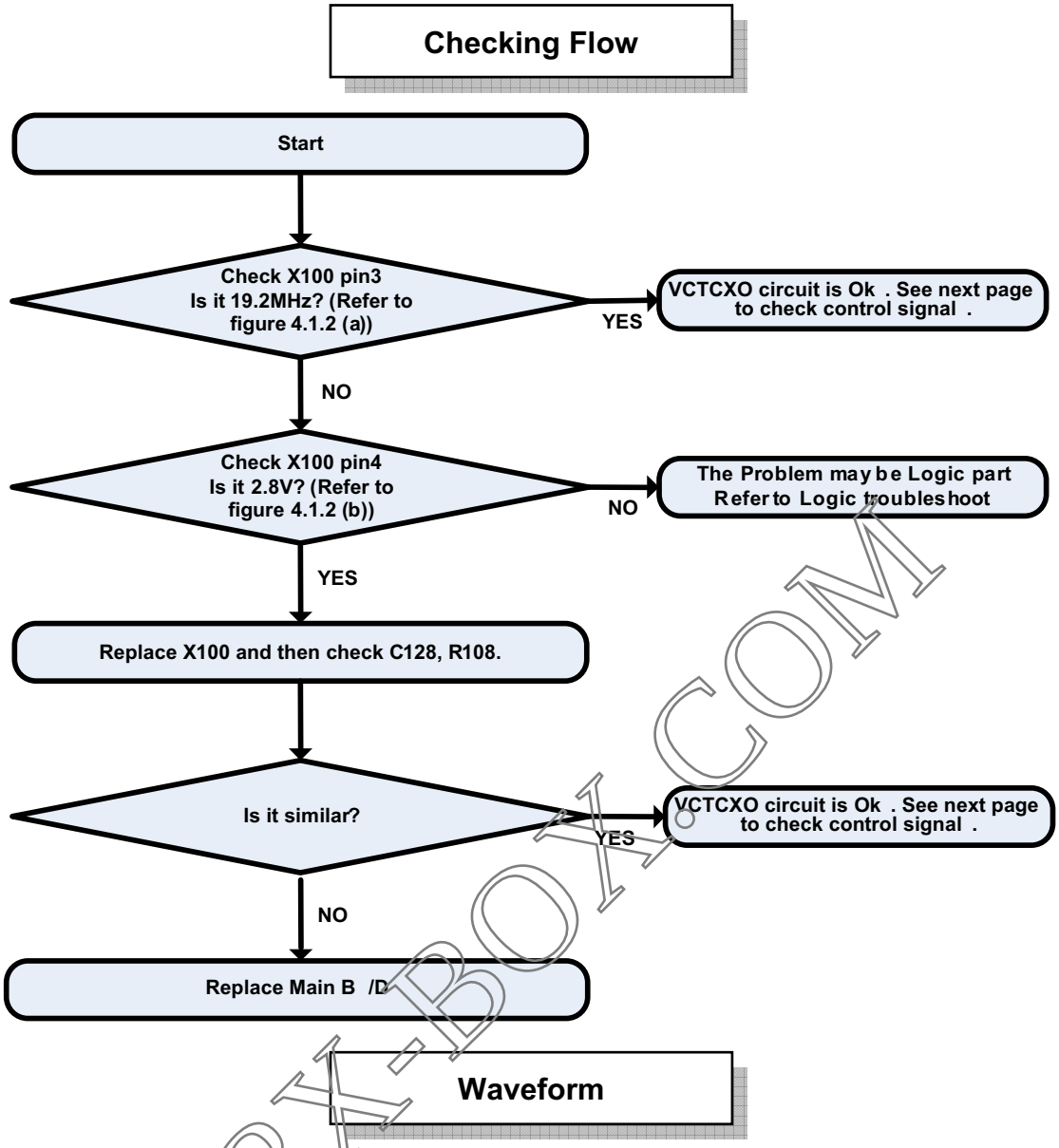
Checking Flow



Waveform

Figure 4.1.2 (a)

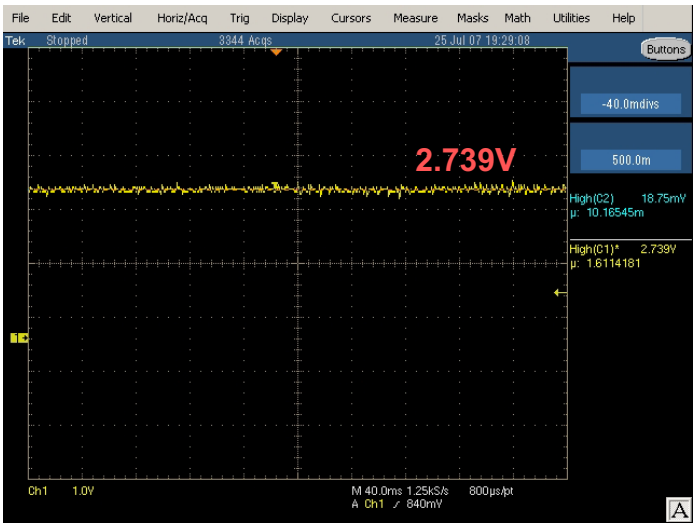


Figure 4.1.2 (b)

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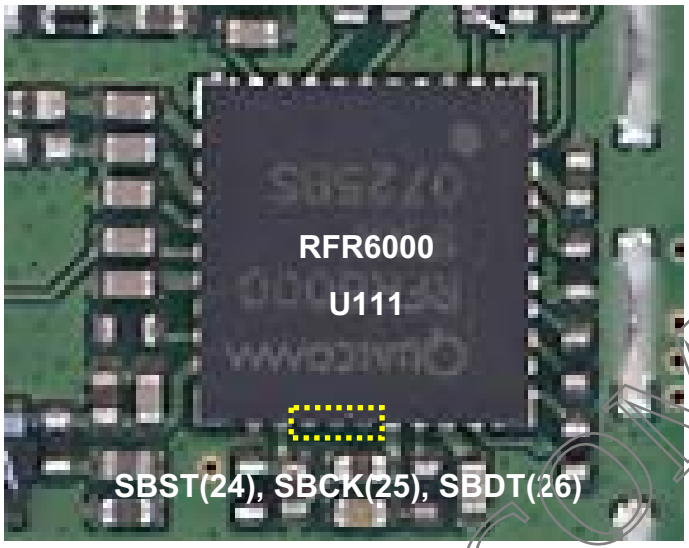
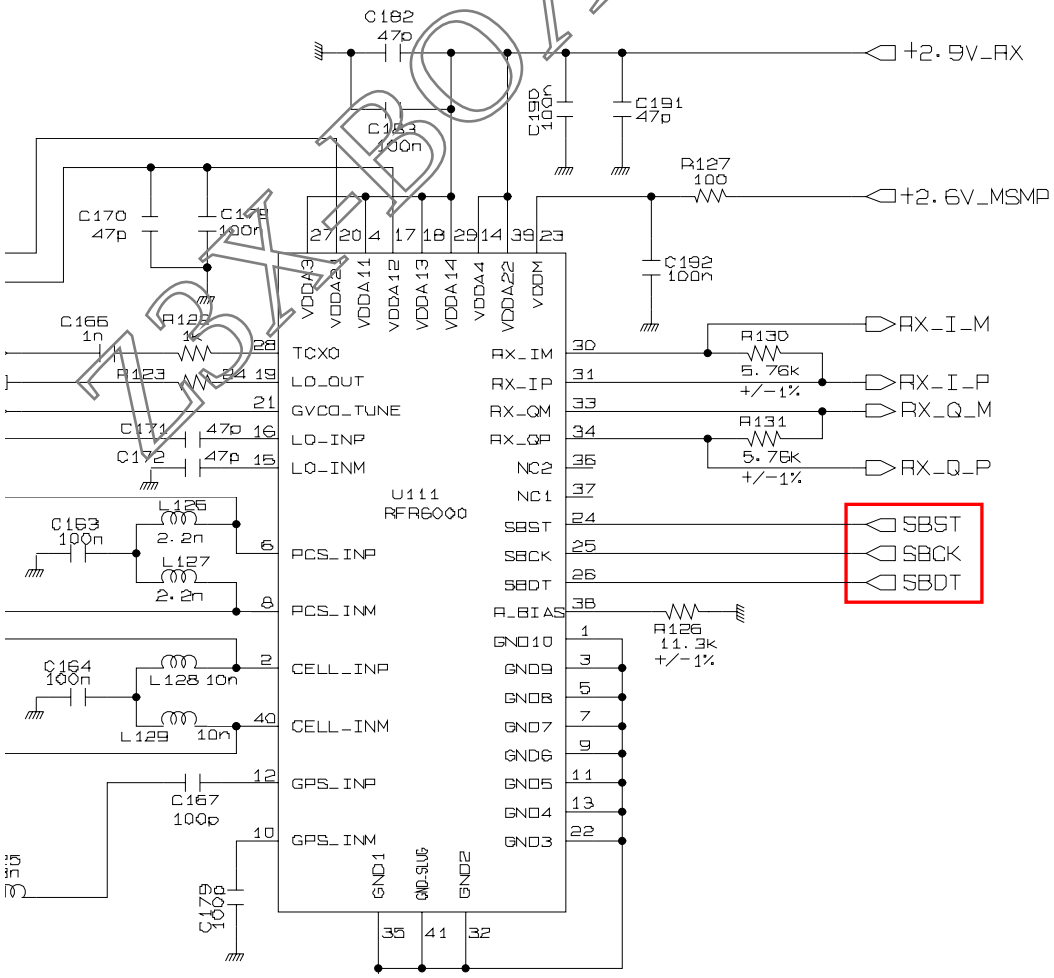
4.1.2.3 Checking Control circuit

Test Point



Circuit Diagram



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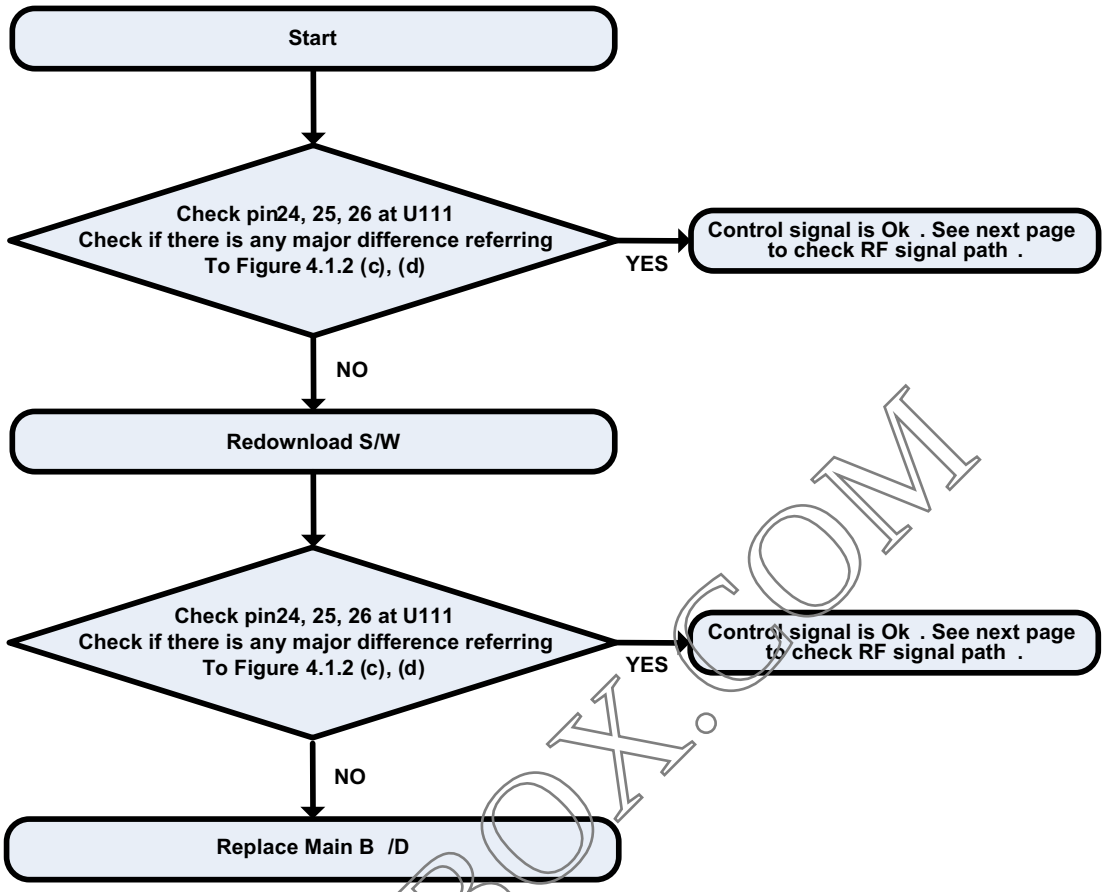
Checking Flow



Waveform

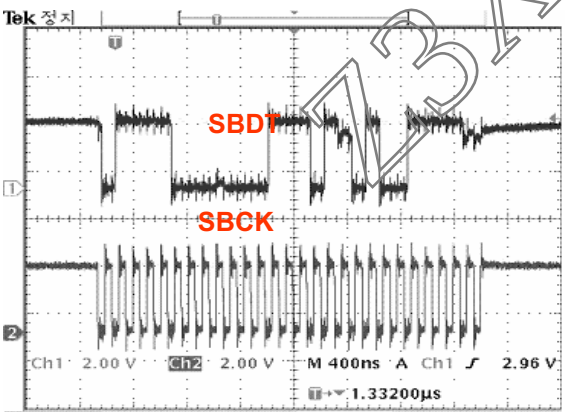


Figure 4.1.2 (c)

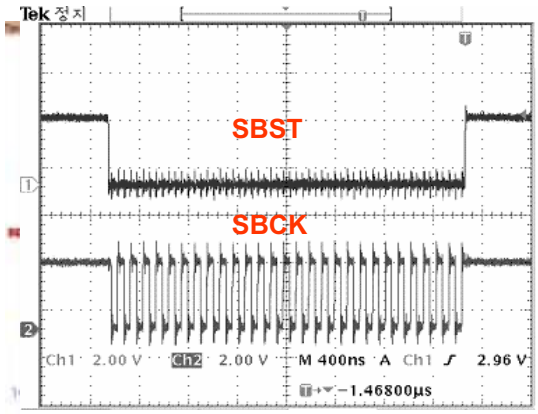


Figure 4.1.2 (d)

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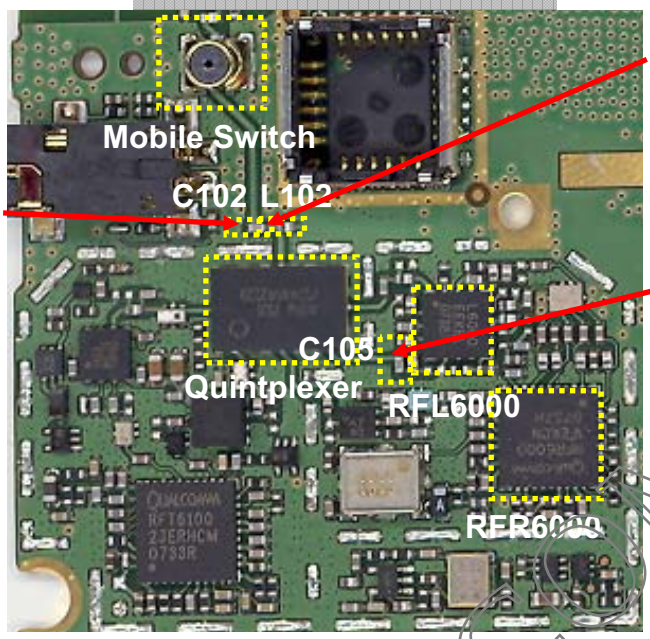
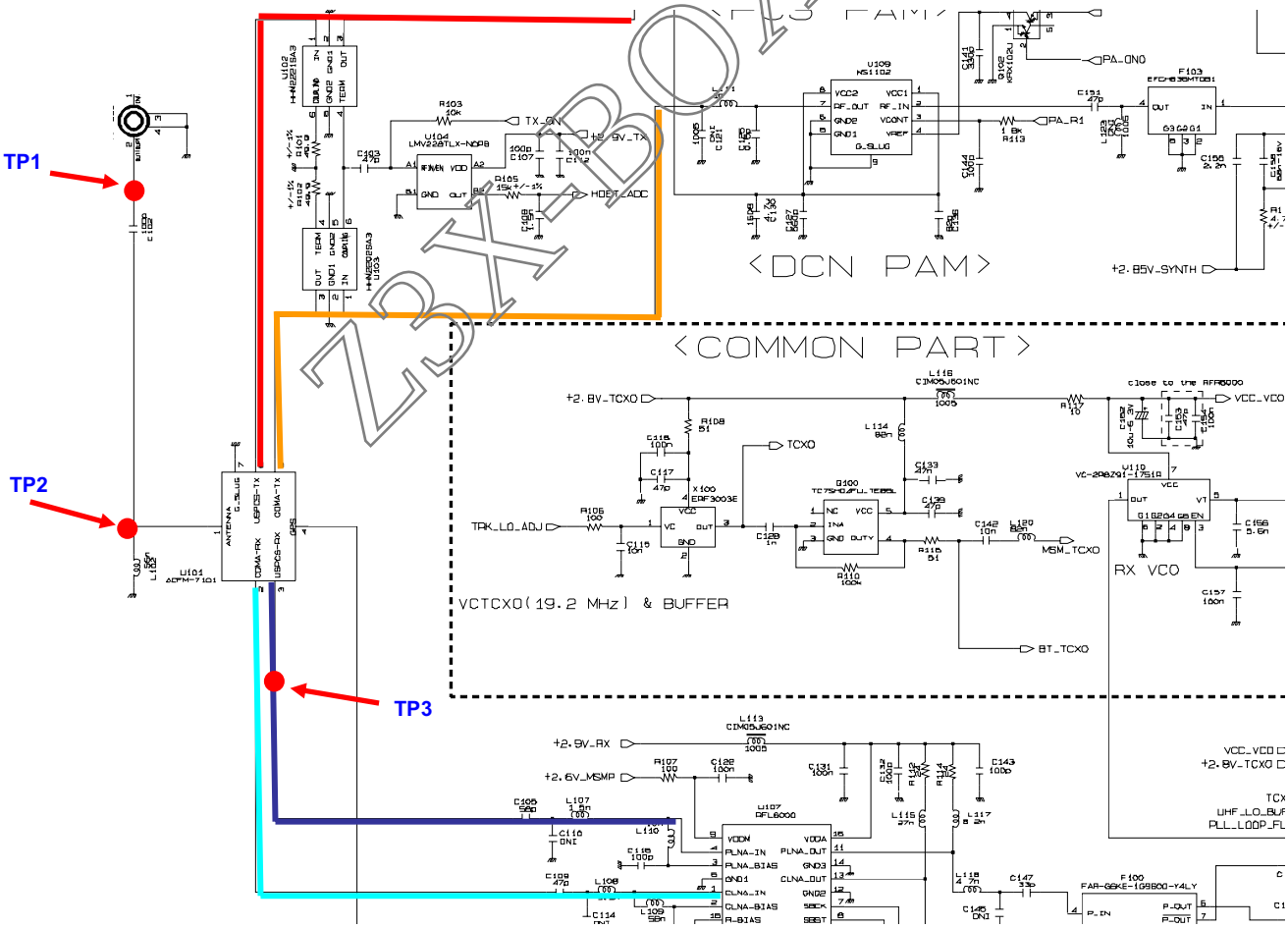
4.1.2.4 Checking RF signal path (Mobile S/W, Quintplexer)

Test Point



Circuit Diagram

PCS Tx
DCN Tx
PCS Rx
DCN Rx



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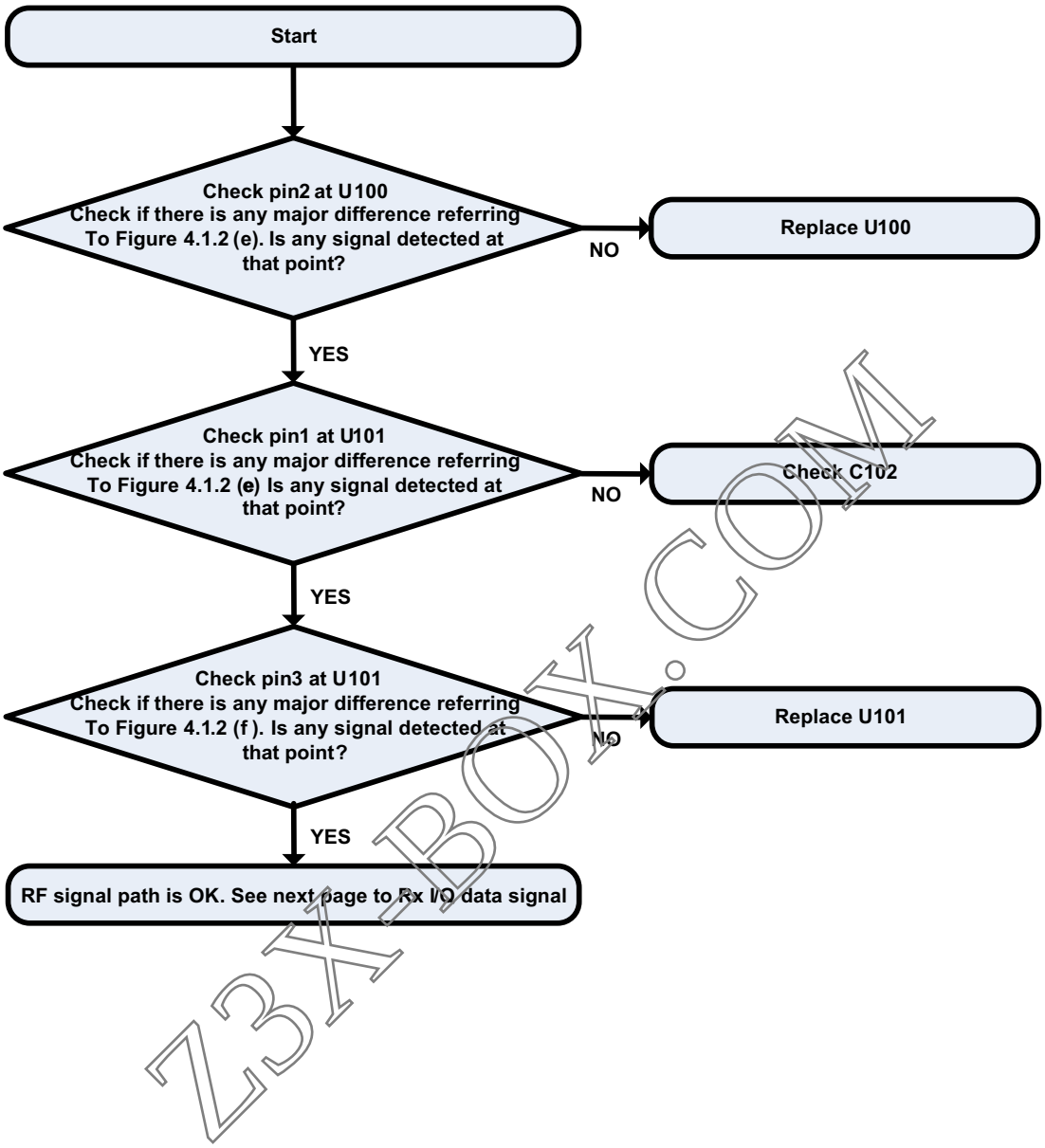
Checking Flow



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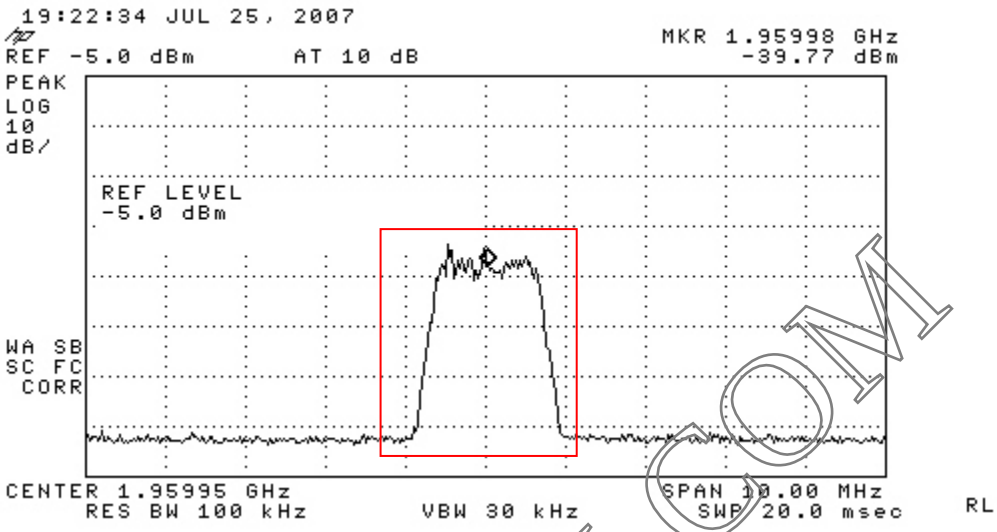
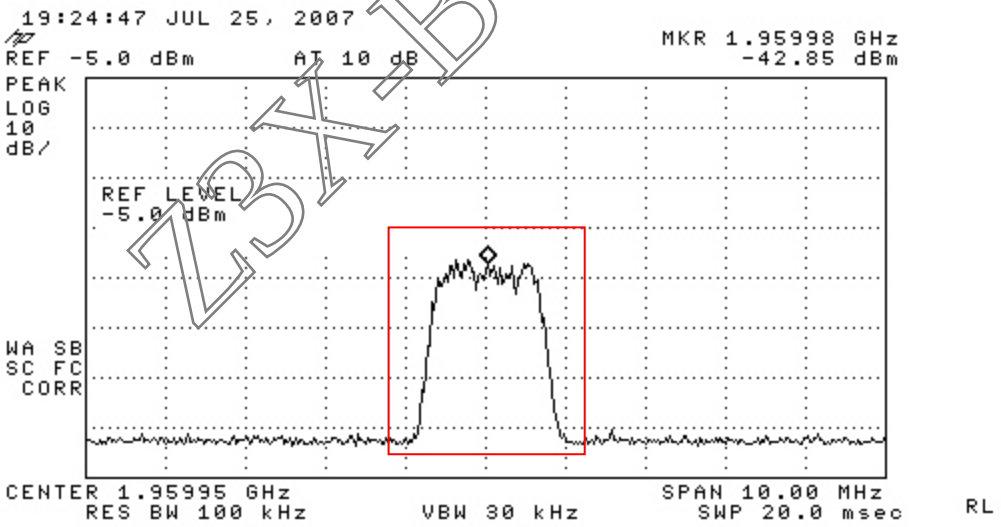
Waveform



4.1.2 (e)



4.1.2 (f)

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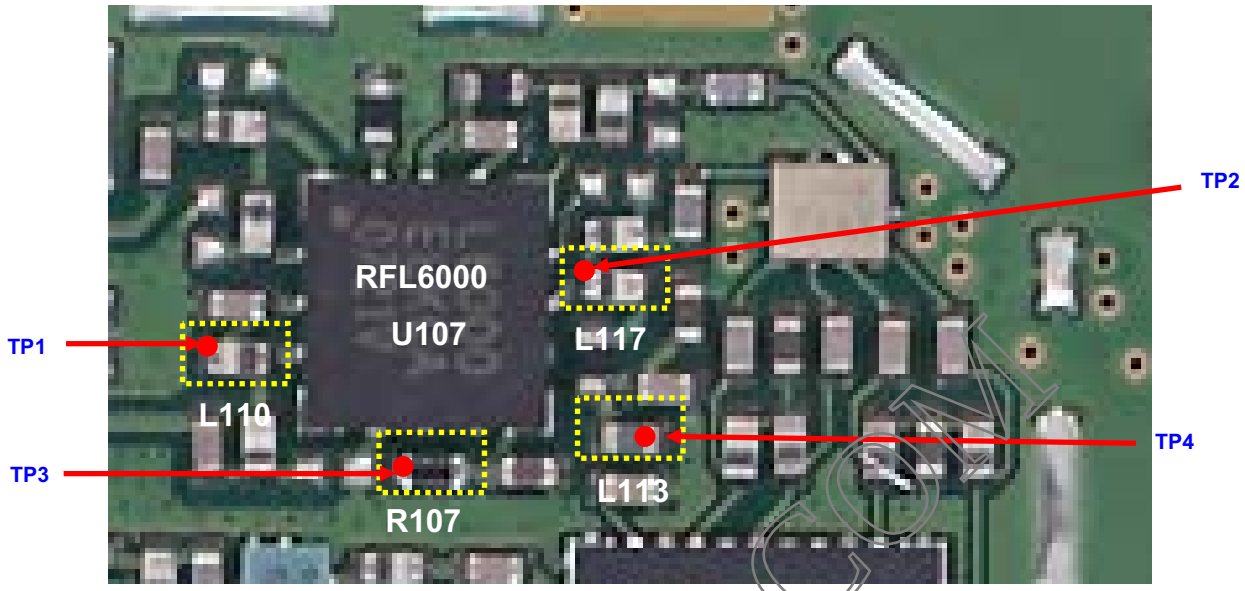
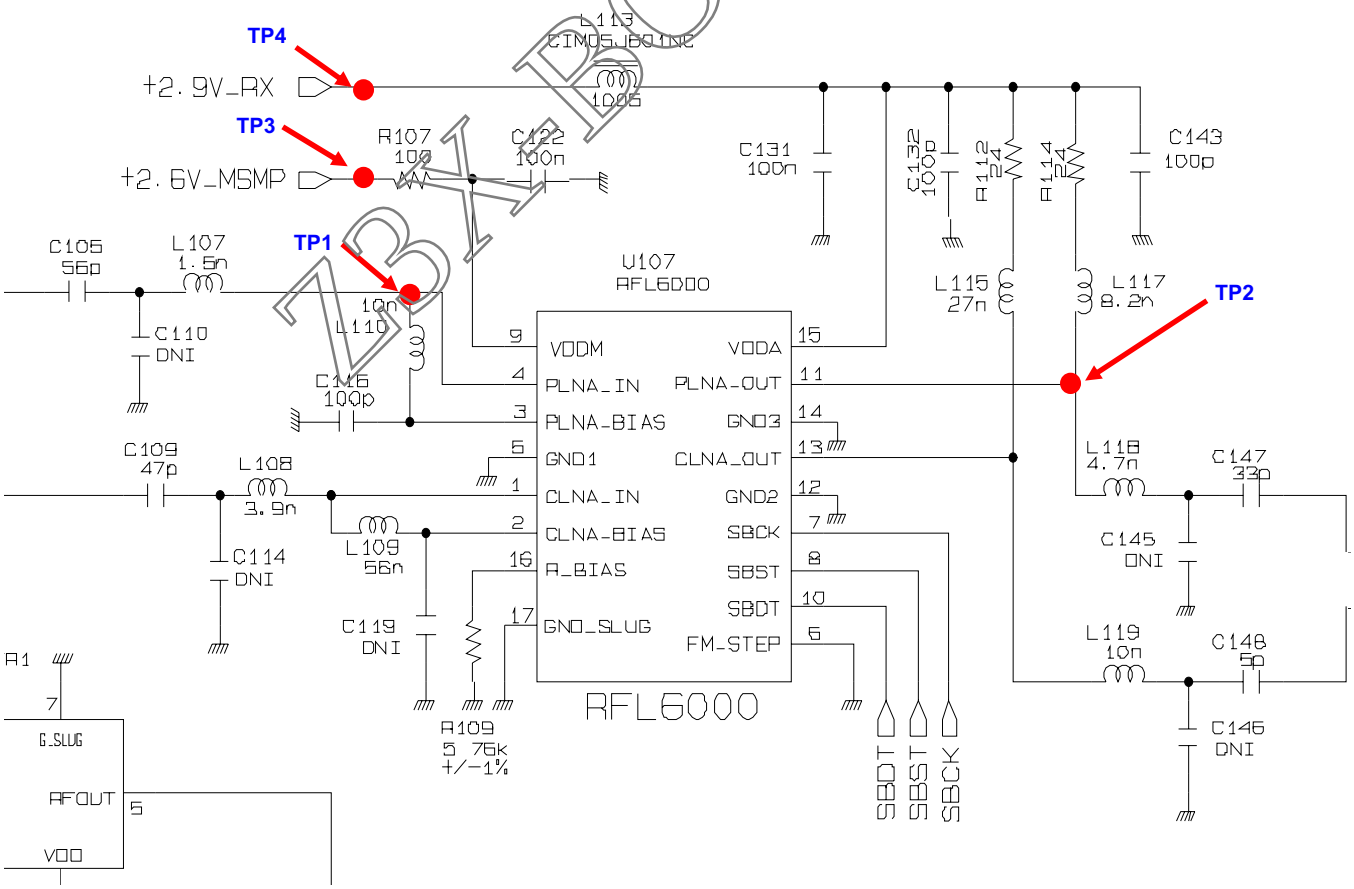
4.1.2.5 Checking LNA

Test Point



Circuit Diagram



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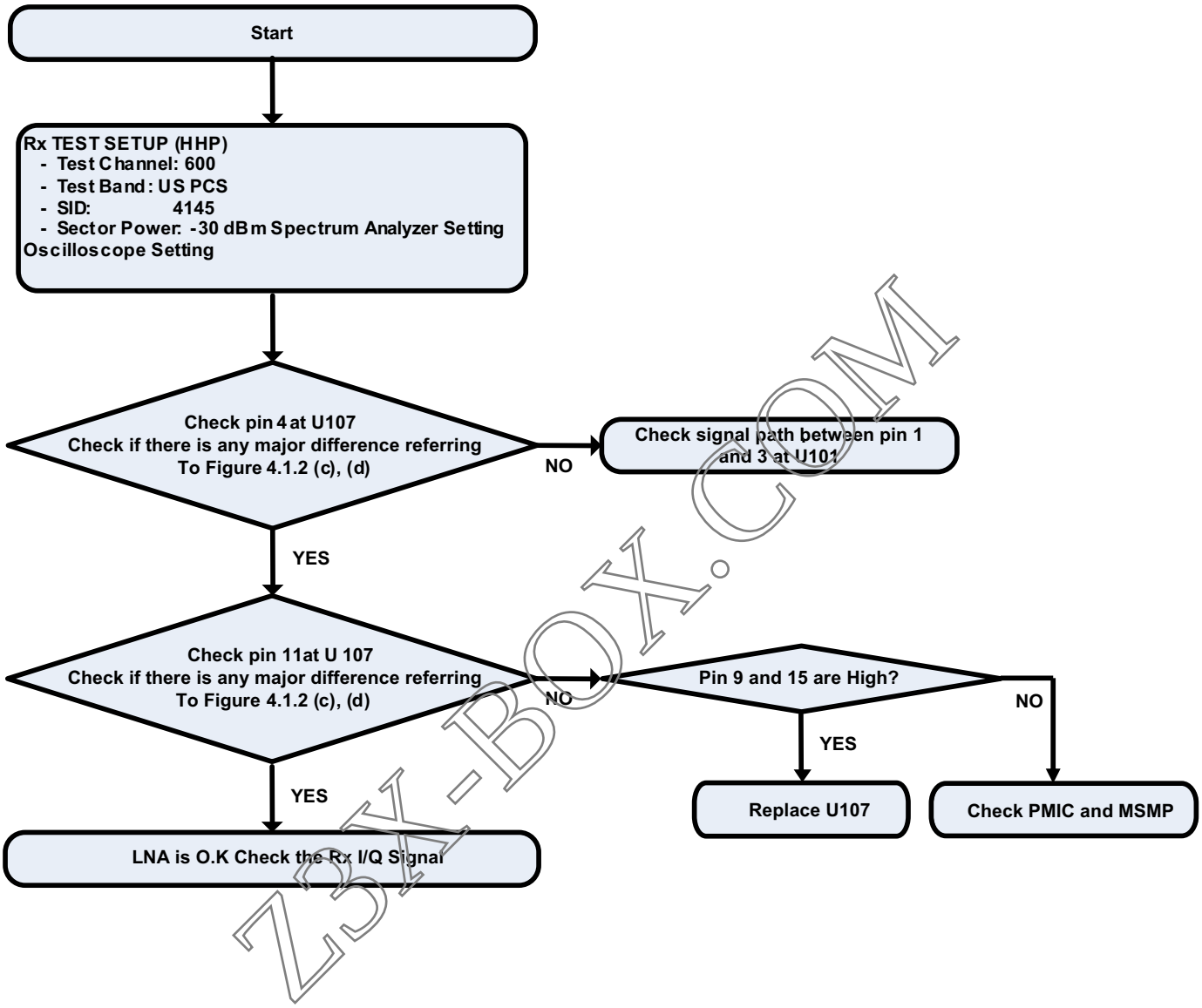
Checking Flow



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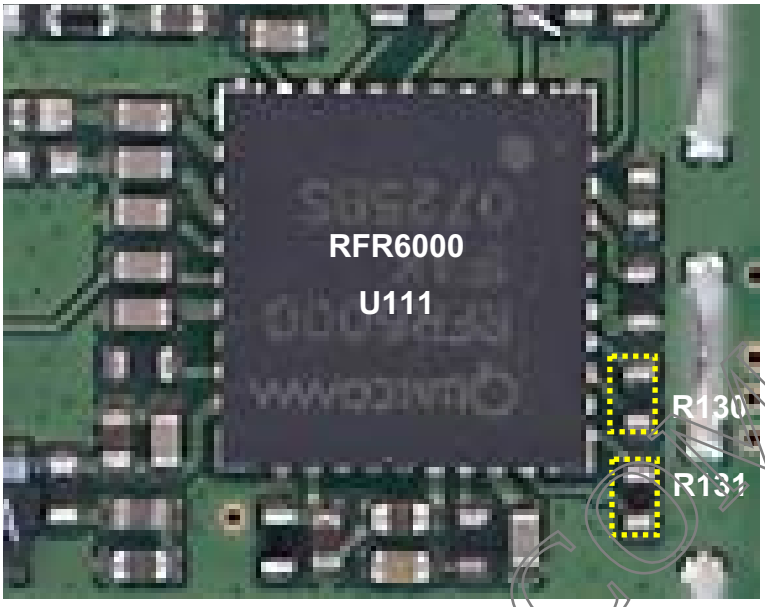
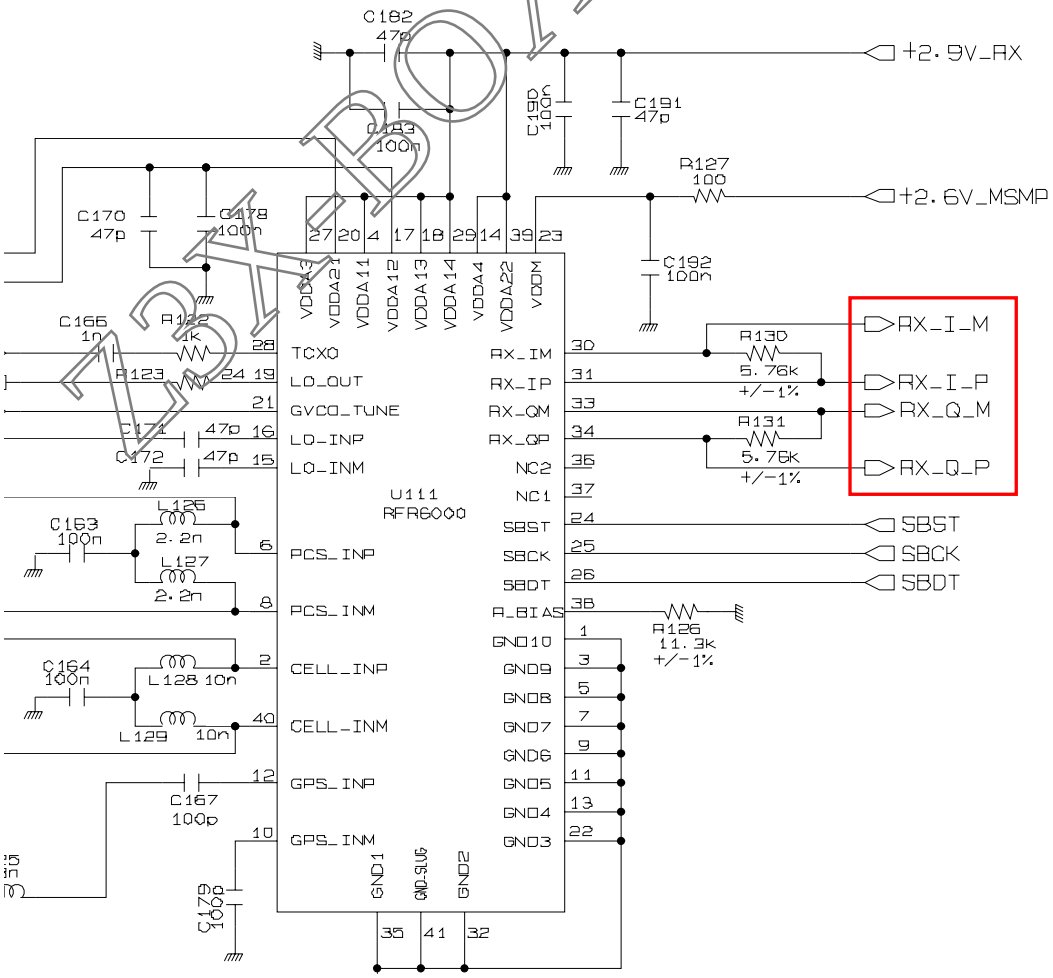
4.1.2.6 Checking Rx I/Q data

Test Point



Circuit Diagram



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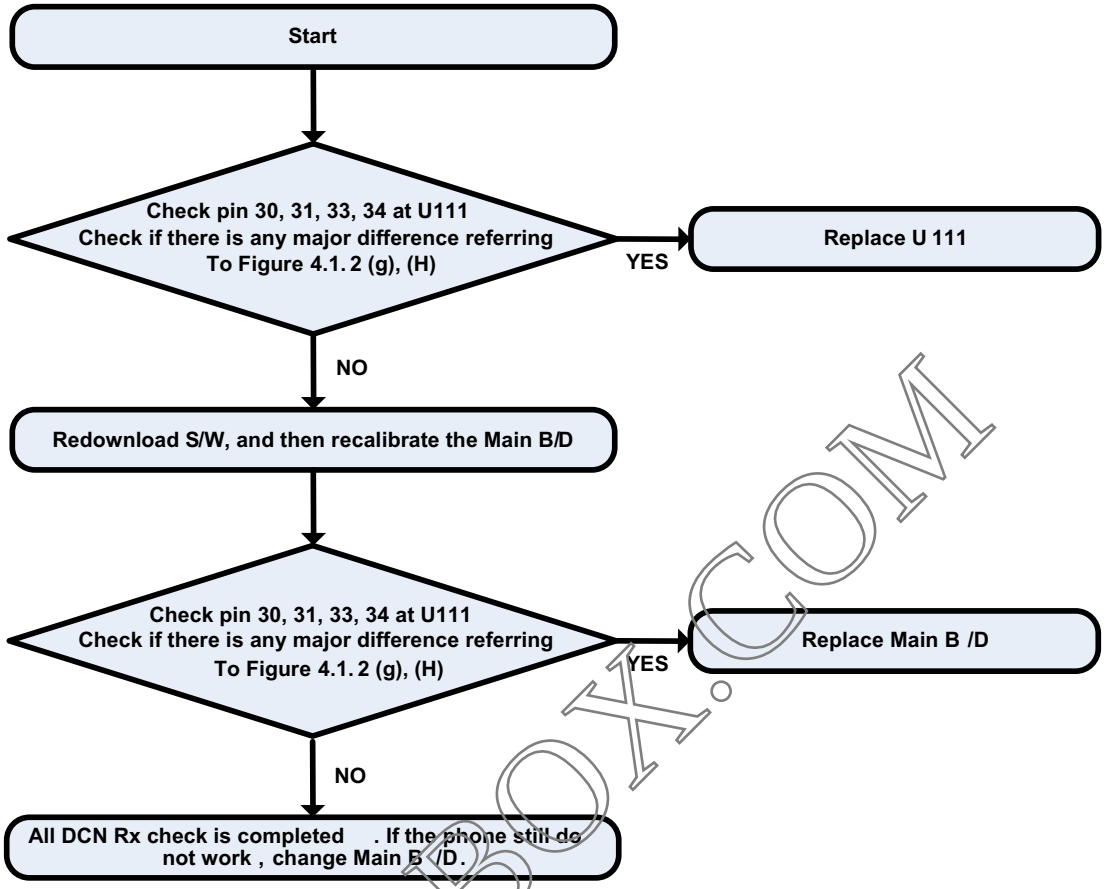
Checking Flow



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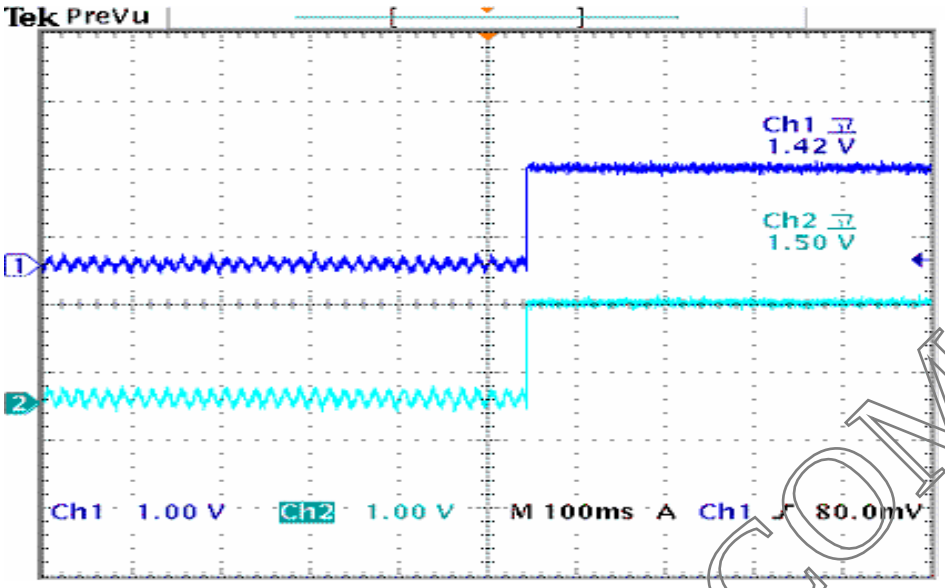
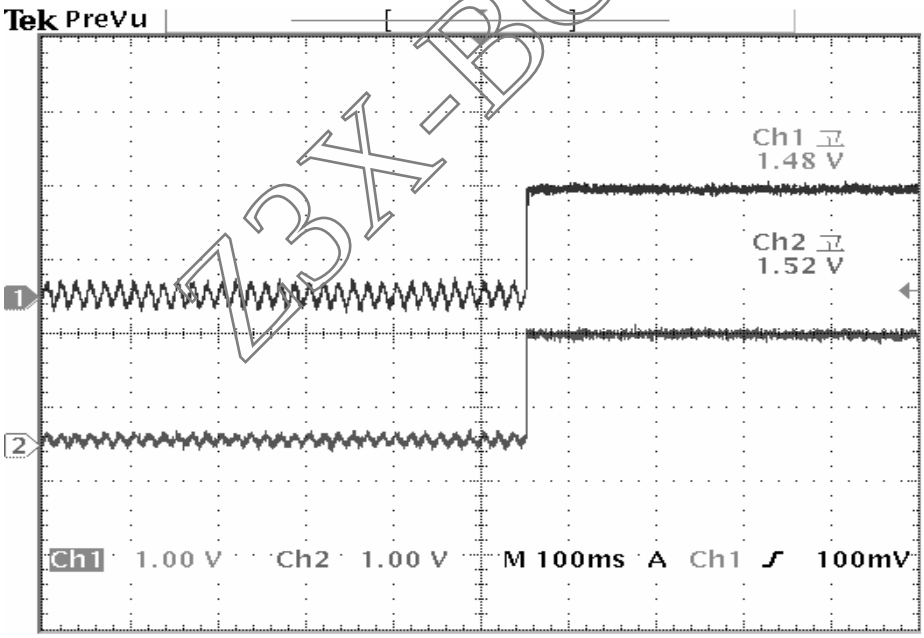
Waveform



Graph 4.1.2(g)



Graph 4.1.2(h)

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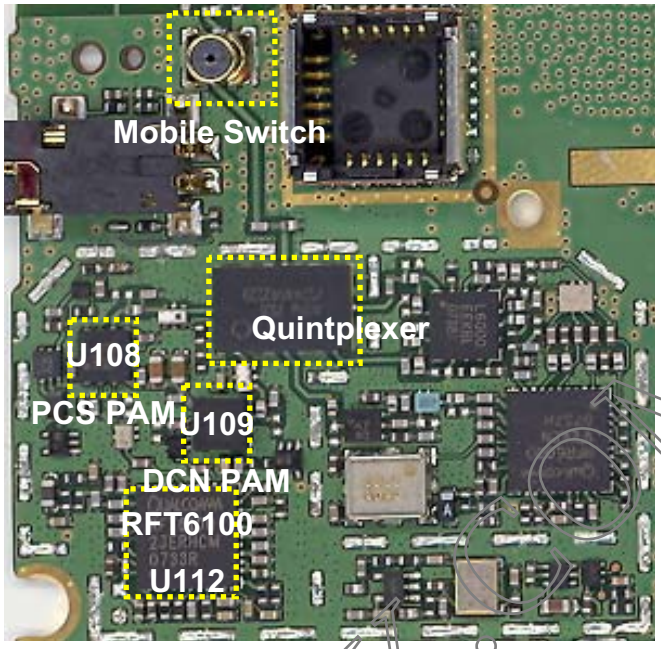
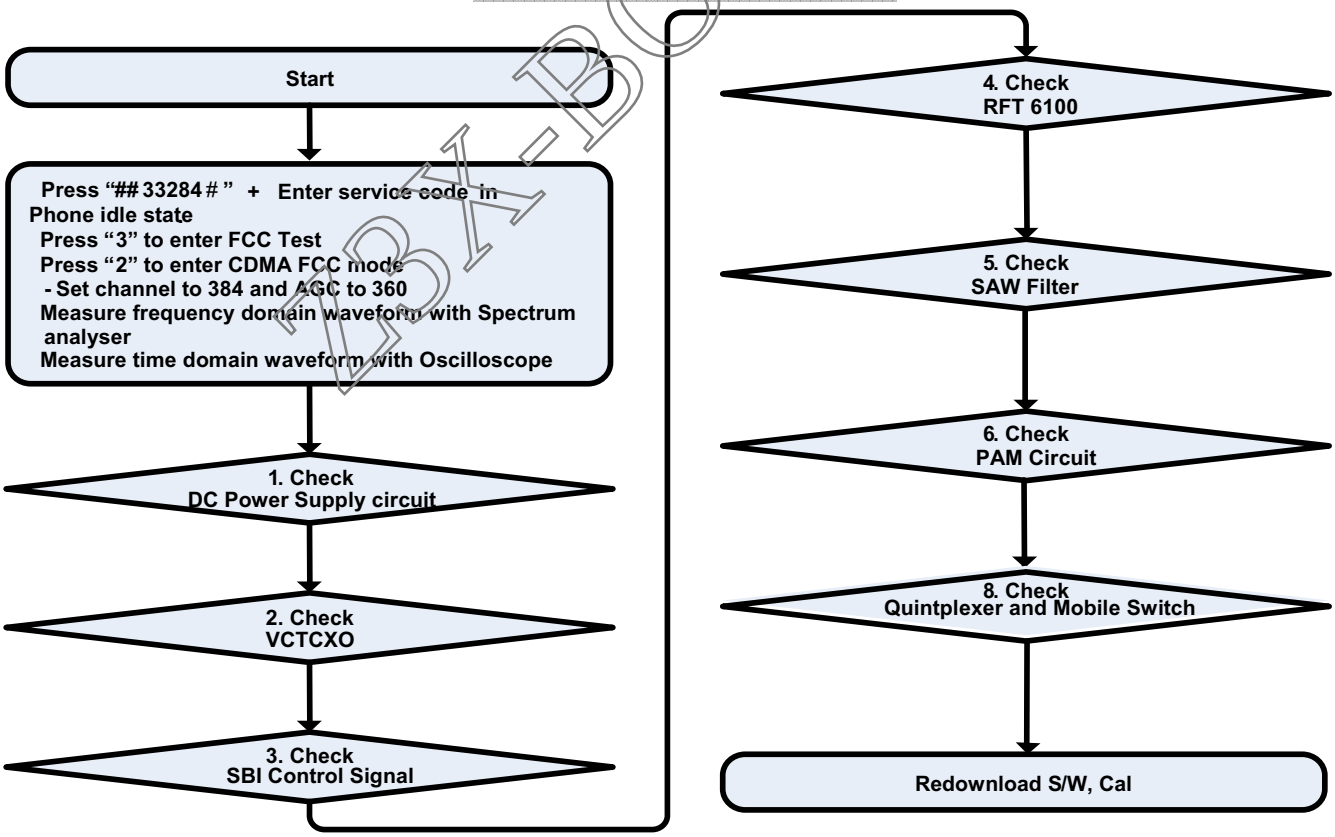
4.2 Tx Part Trouble

4.2.1 DCN Tx

Test Point



Checking Flow



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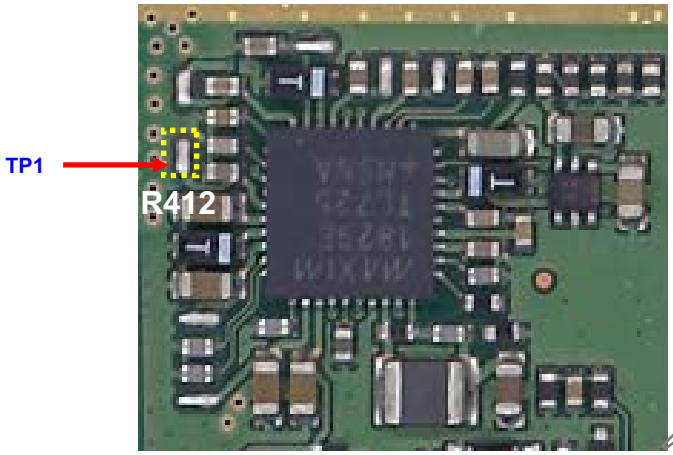
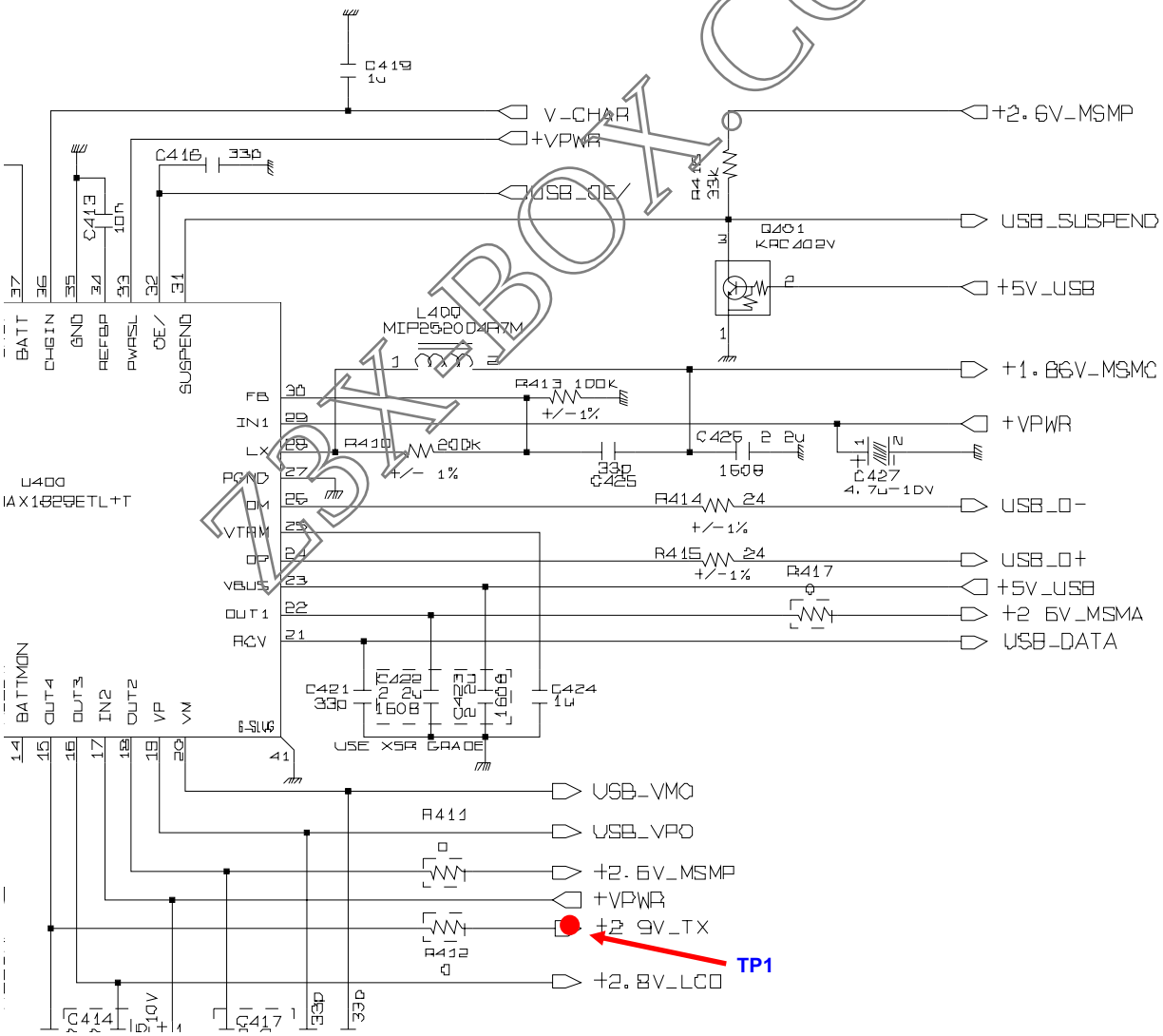
4.2.1.1 Checking DC Power supply circuit (PMIC)

Test Point



Circuit Diagram



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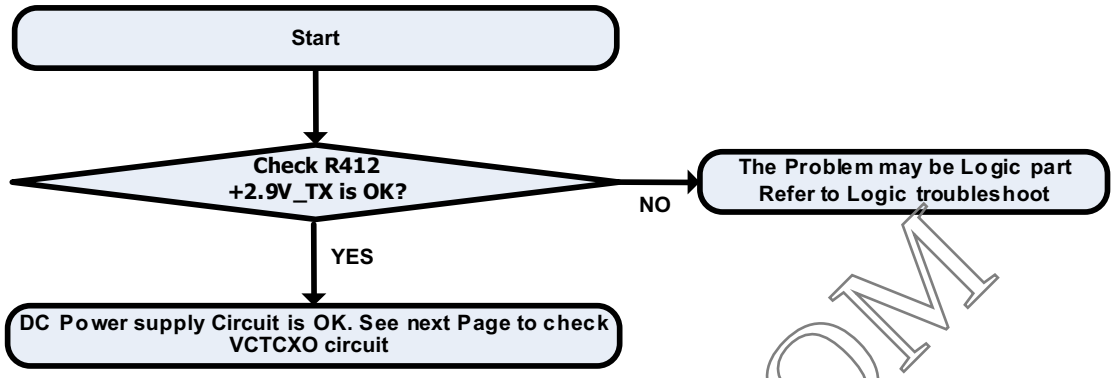
Checking Flow



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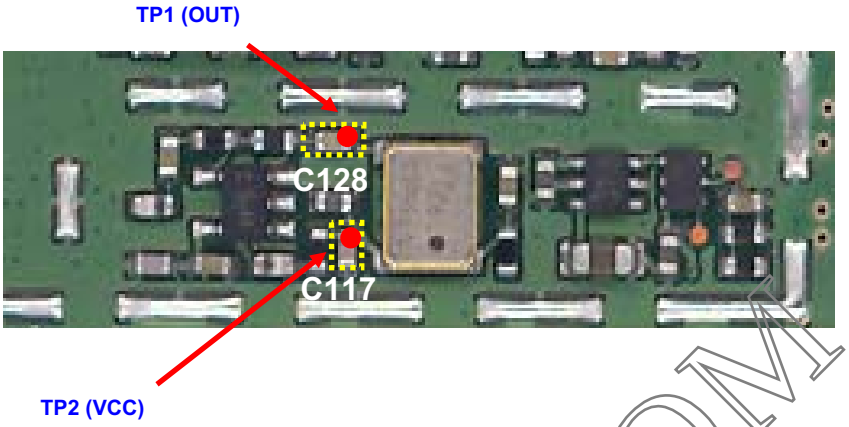
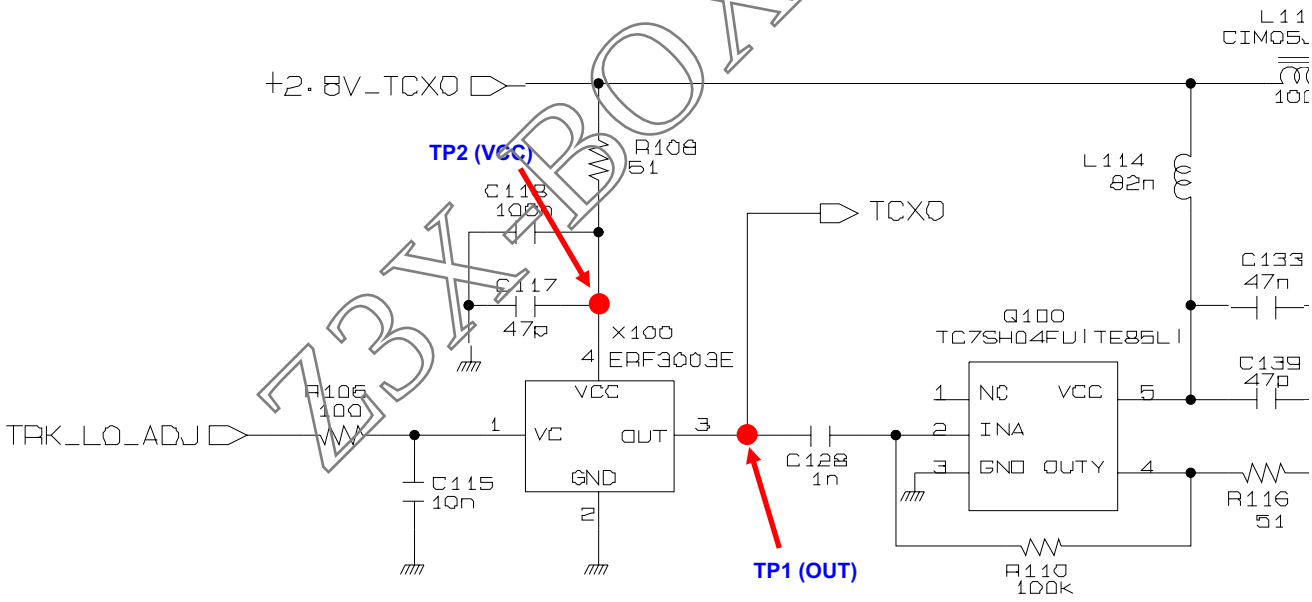
4.2.1.2 Checking VCTCXO circuit

Test Point



Circuit Diagram



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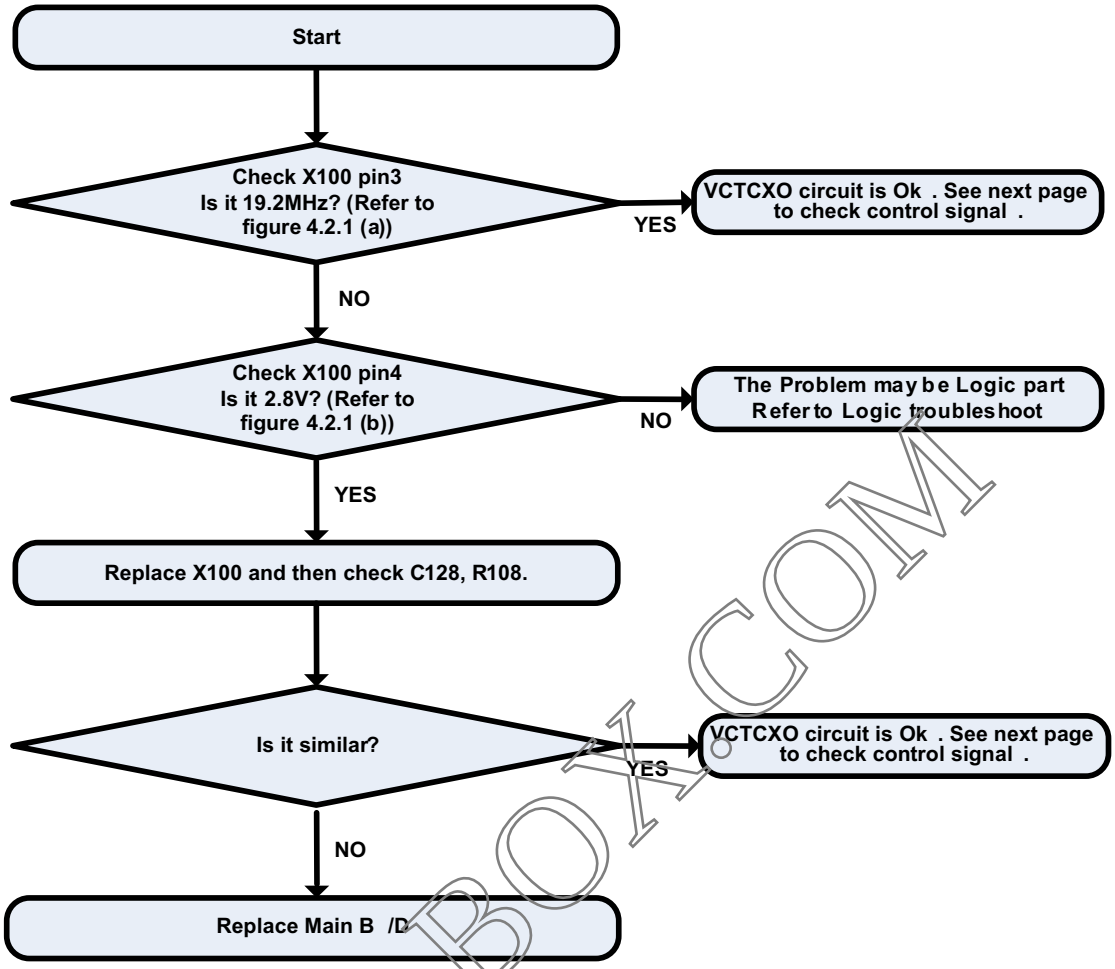
Checking Flow



Waveform

Figure 4.2.1 (a)

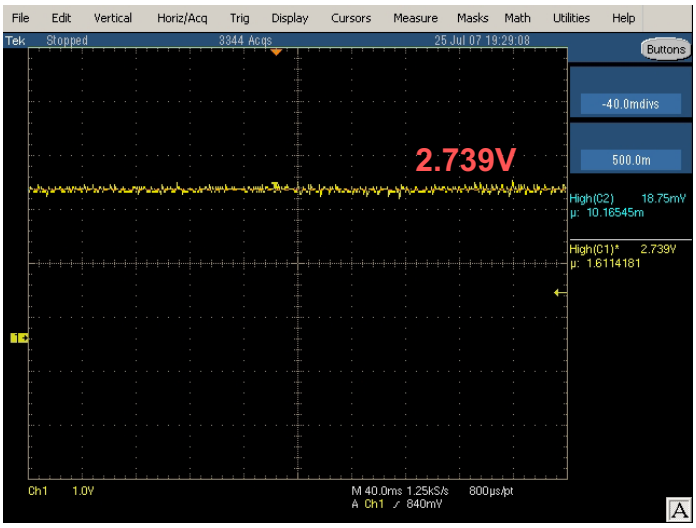


Figure 4.2.1 (b)

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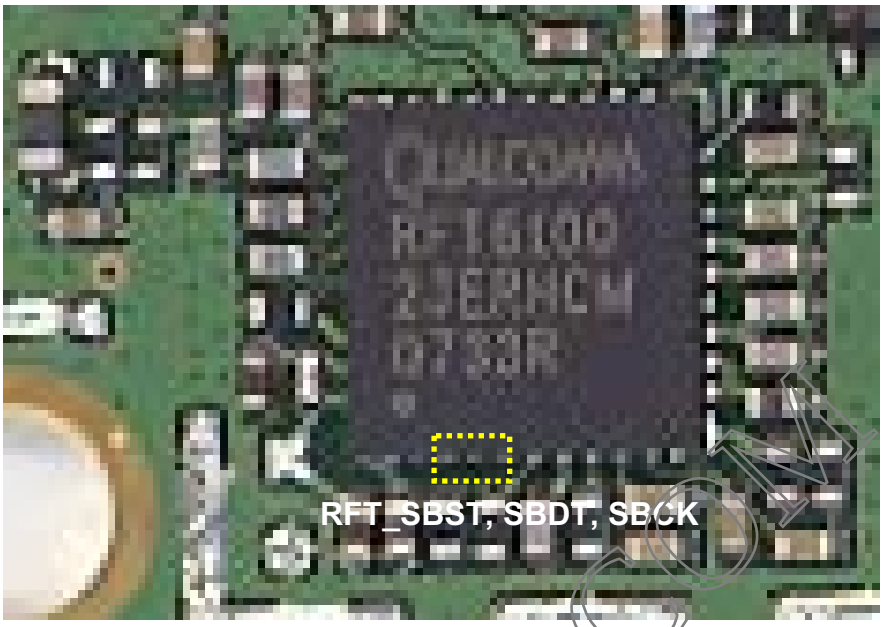
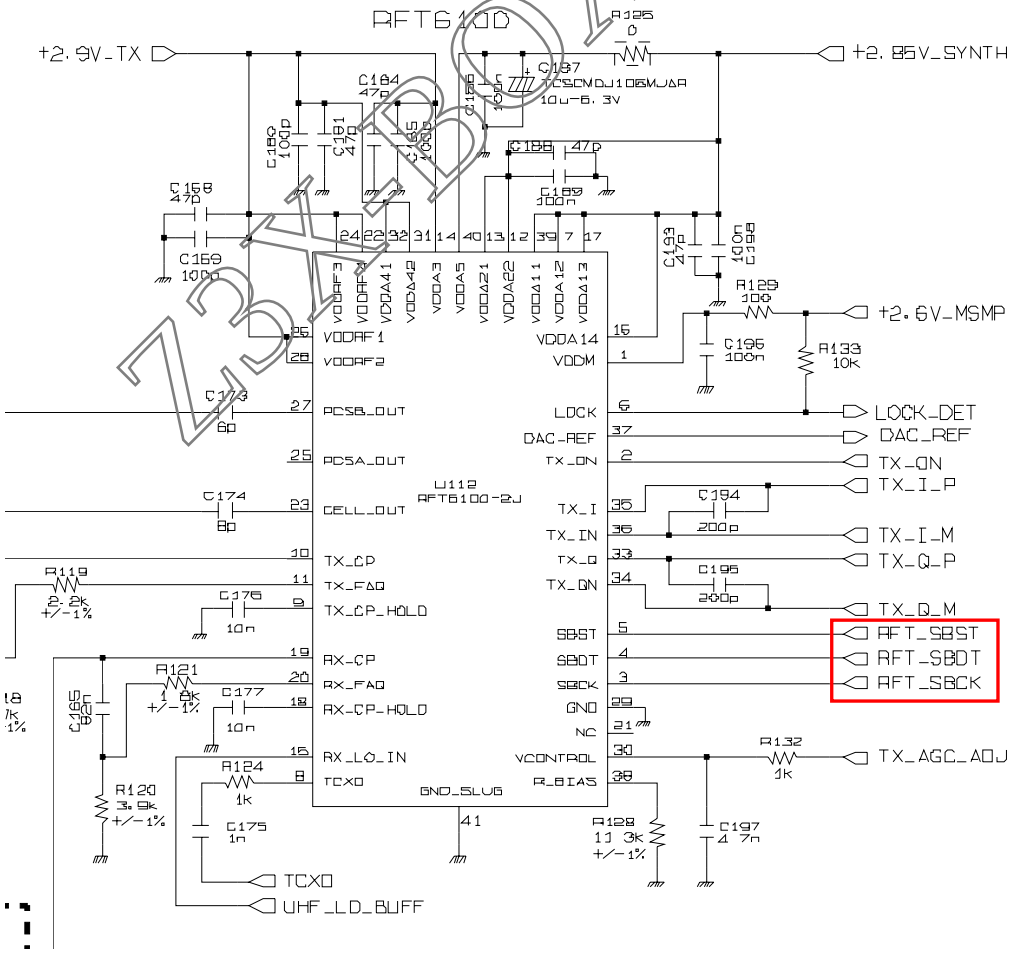
4.2.1.3 Checking SBI Control Signal

Test Point



Circuit Diagram



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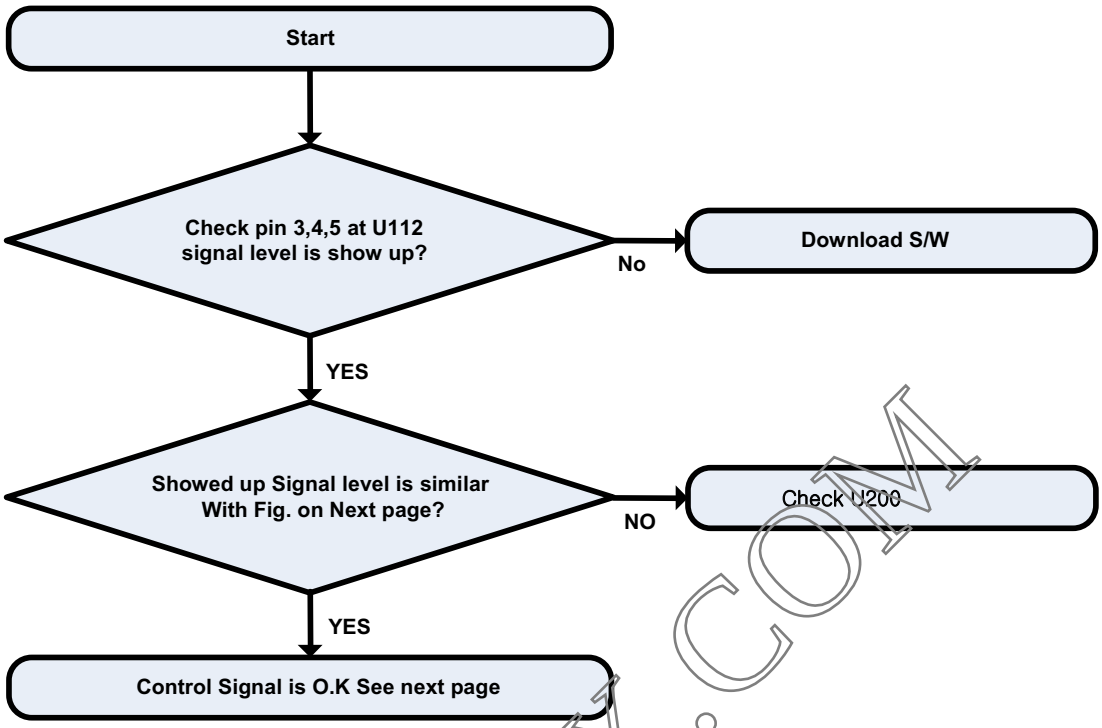
Checking Flow



Waveform

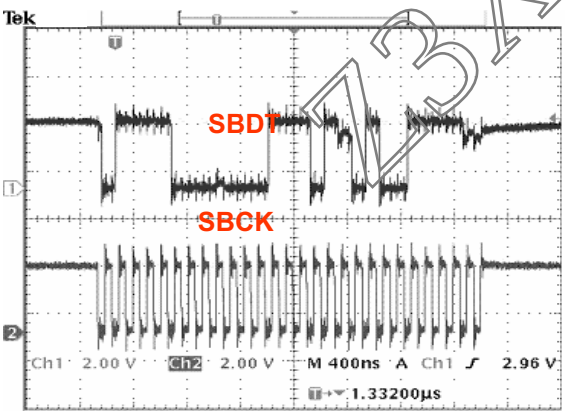


Figure 4.2.1 (c)

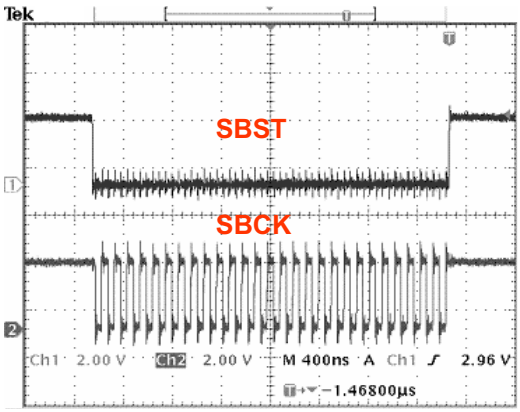


Figure 4.2.1 (d)

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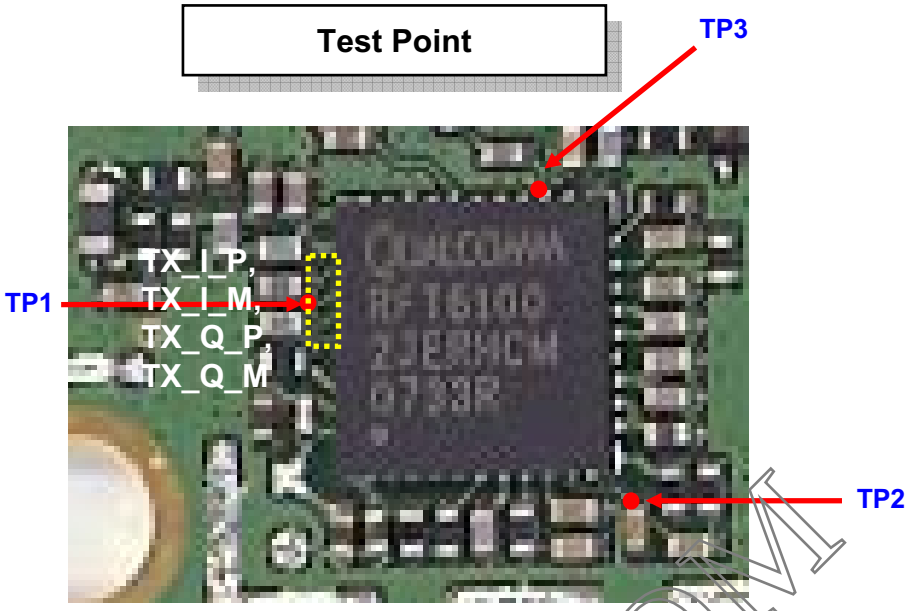
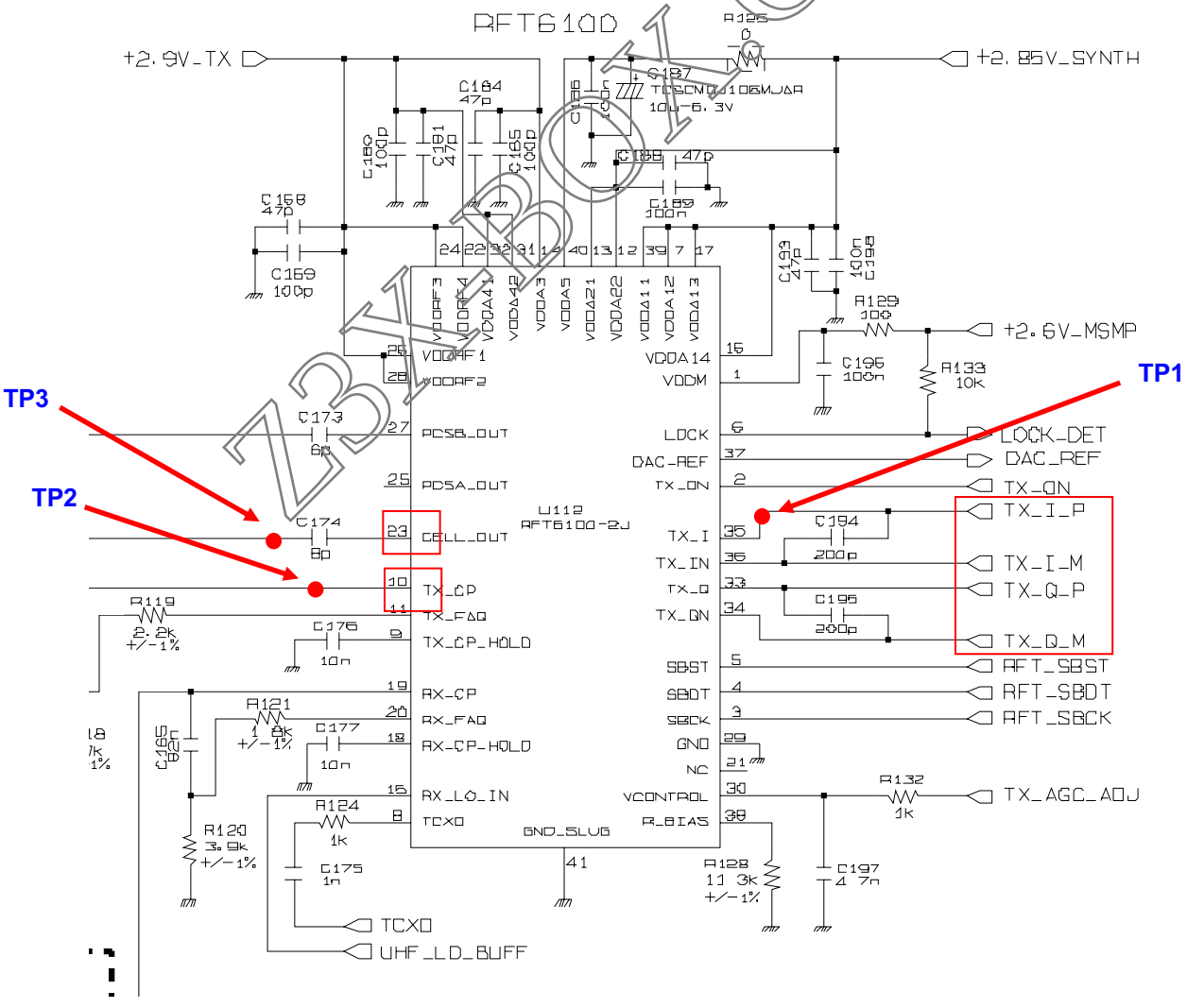
4.2.1.4Checking RFT6100 circuit

Test Point



Circuit Diagram



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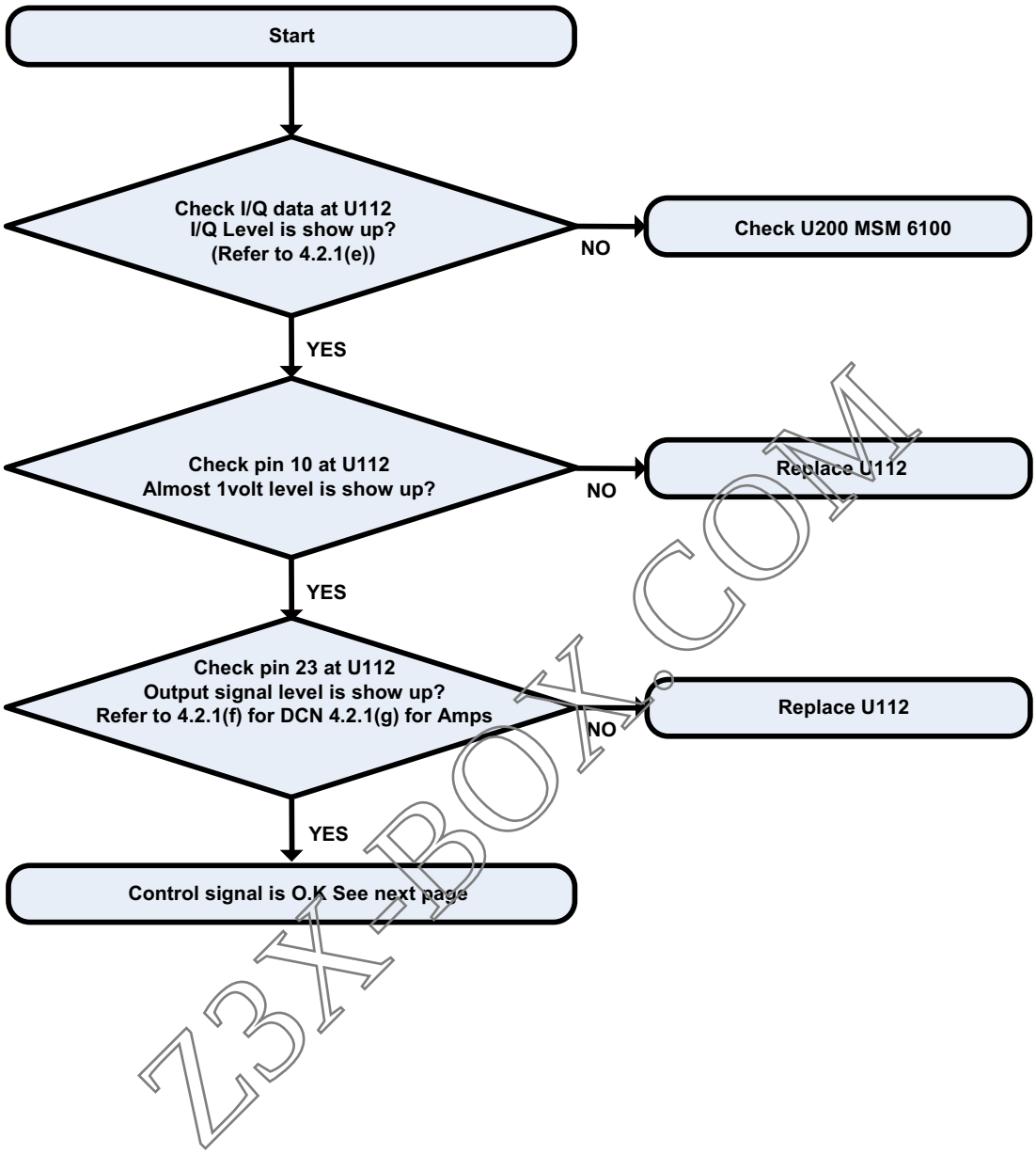
Checking Flow



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Waveform

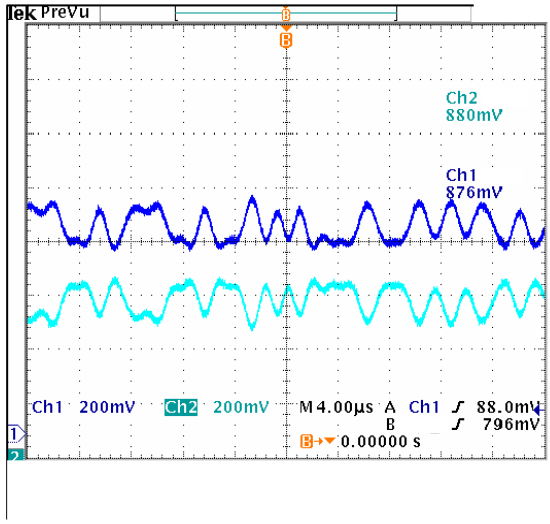

Figure 4.2.1 (e)

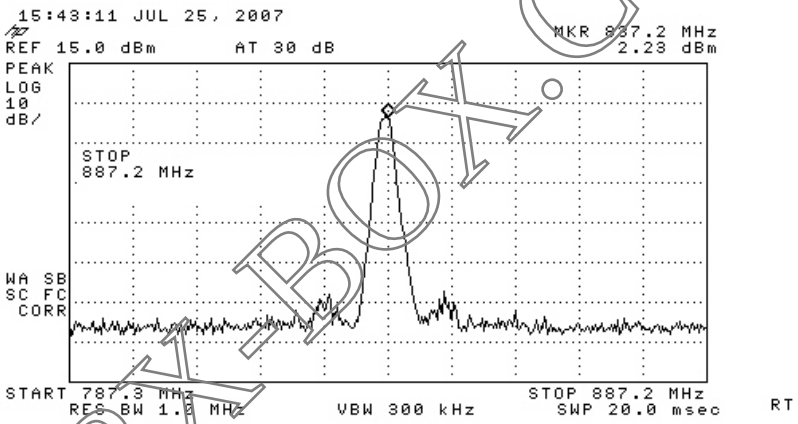

Figure 4.2.1 (f)

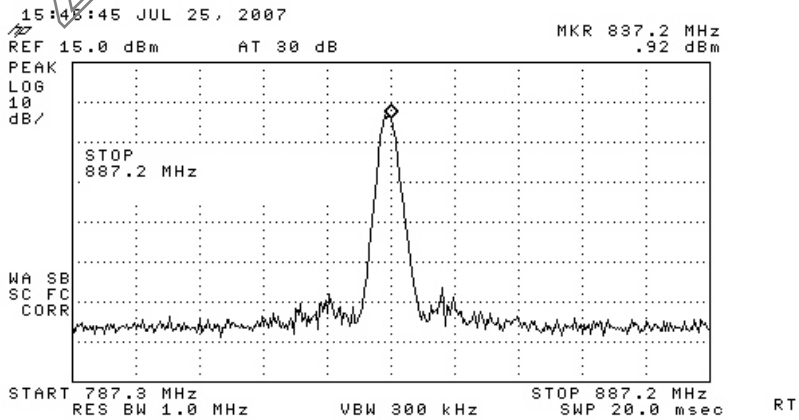

Figure 4.2.1 (g)

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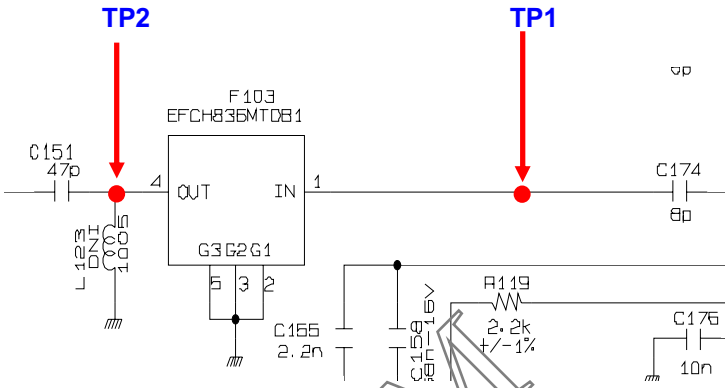
4.2.1.5 Check DCN RF Tx SAW

Test Point

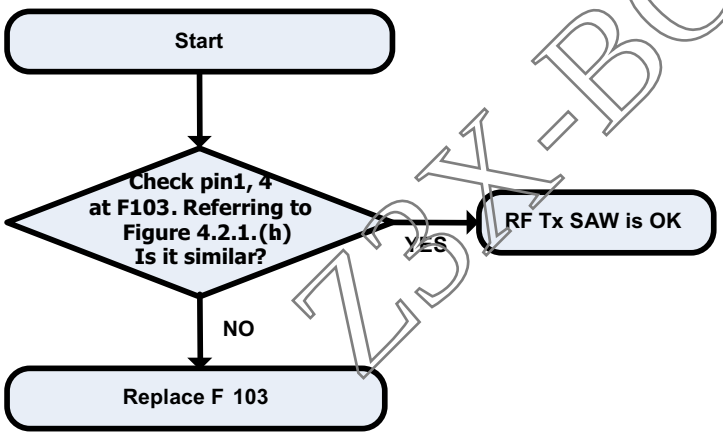
RF_OUT(TP2)

RF_IN (TP1)

Circuit Diagram



Checking Flow



Waveform

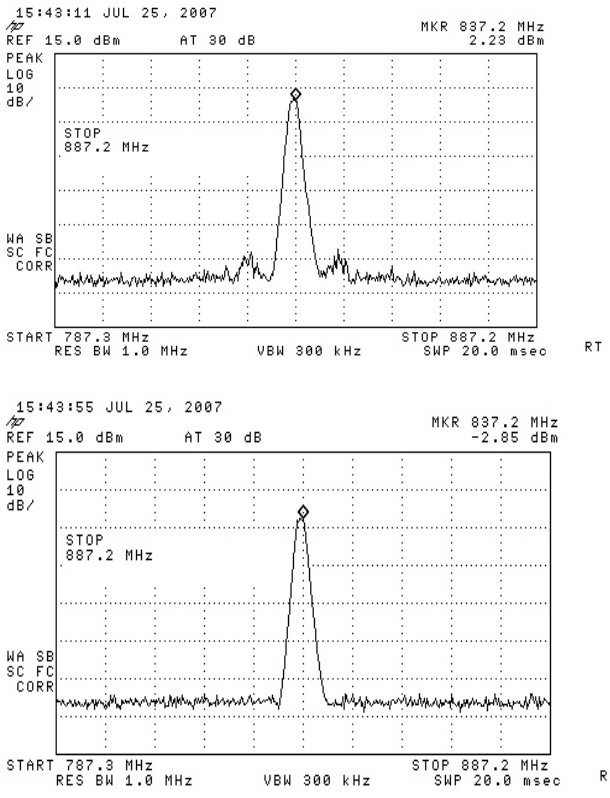


Figure 4.2.1(h)

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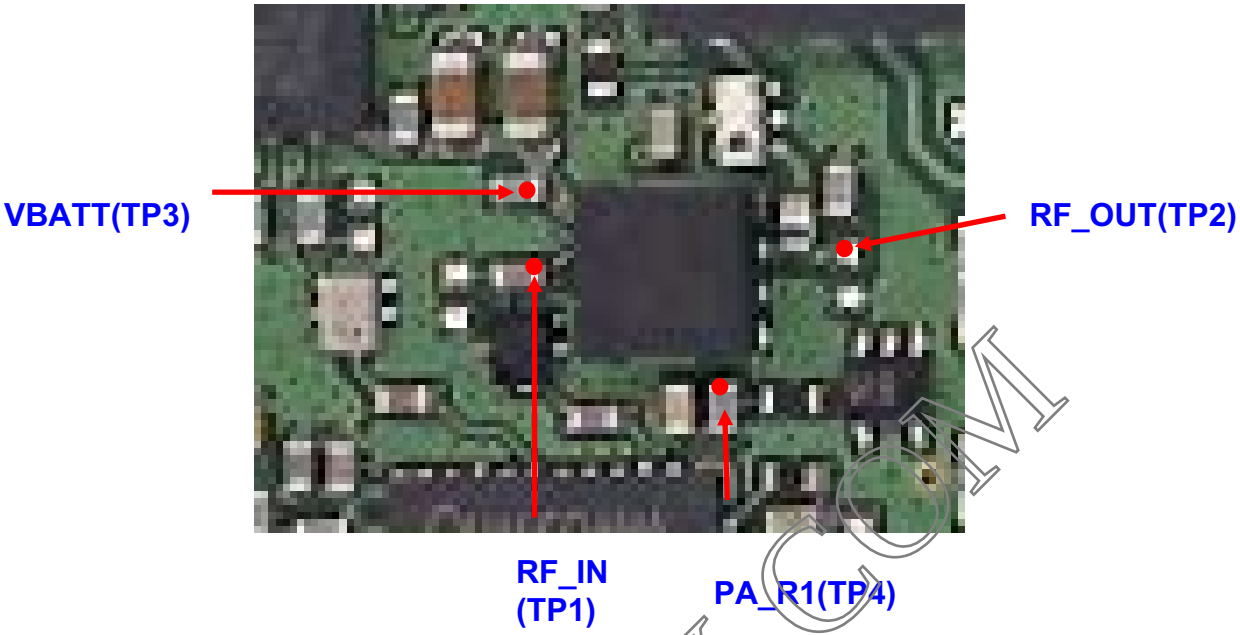
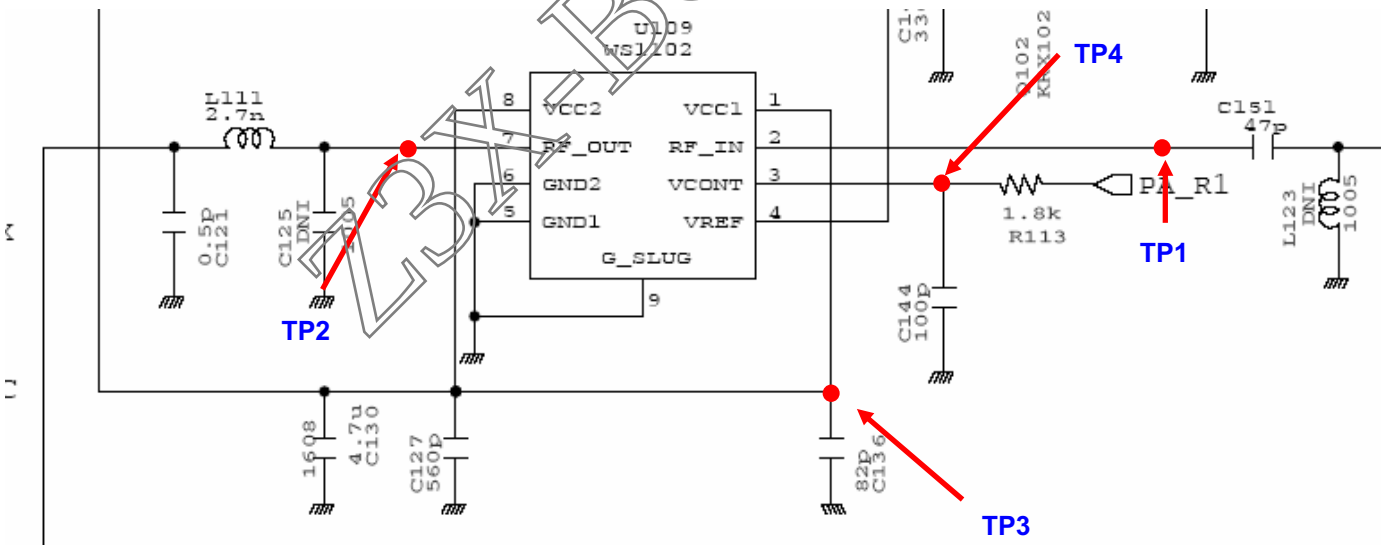
4.2.1.6 Check DCN PAM circuit

Test Point



Circuit Diagram



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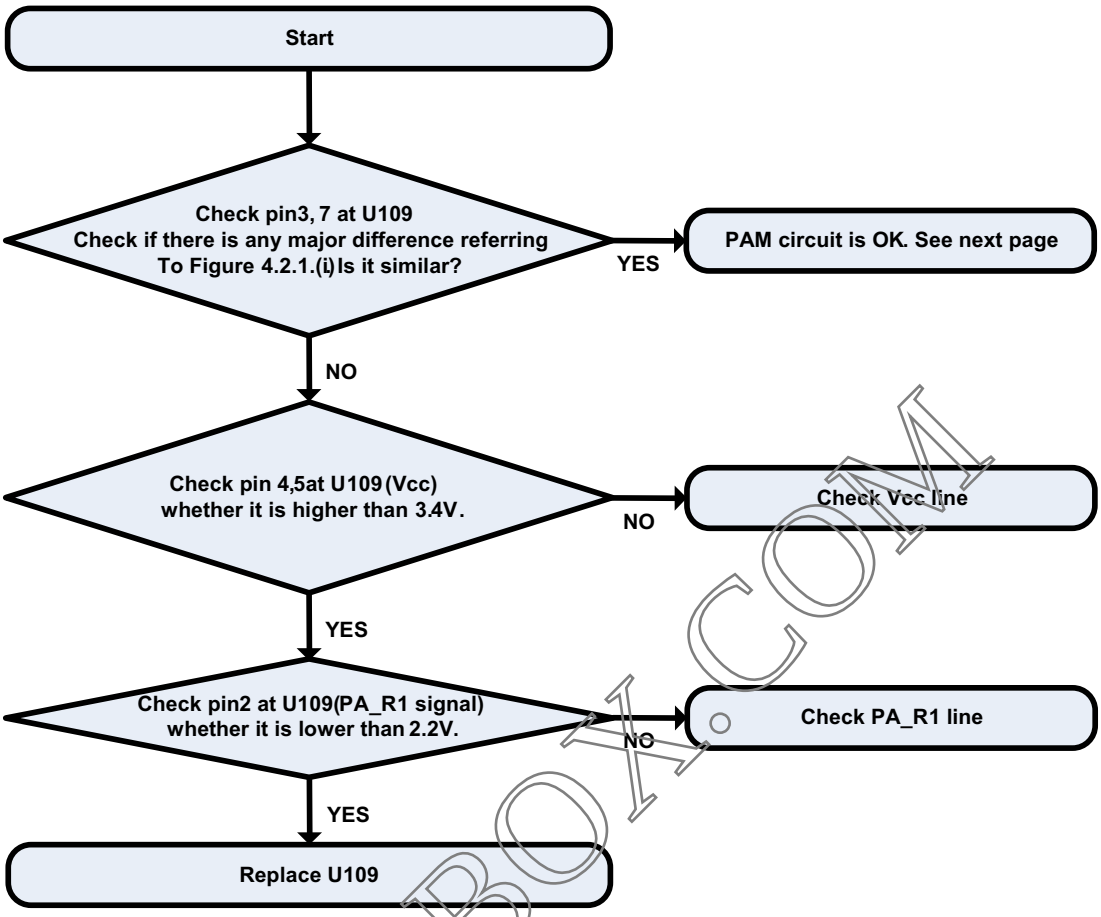
Checking Flow



Waveform

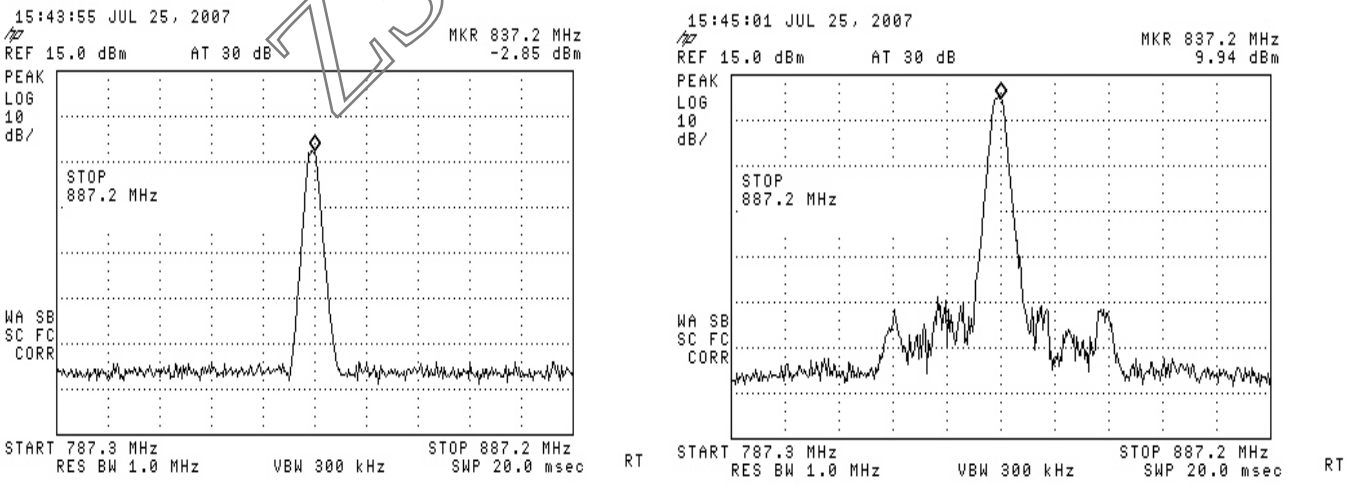


Figure 4.2.1(i)

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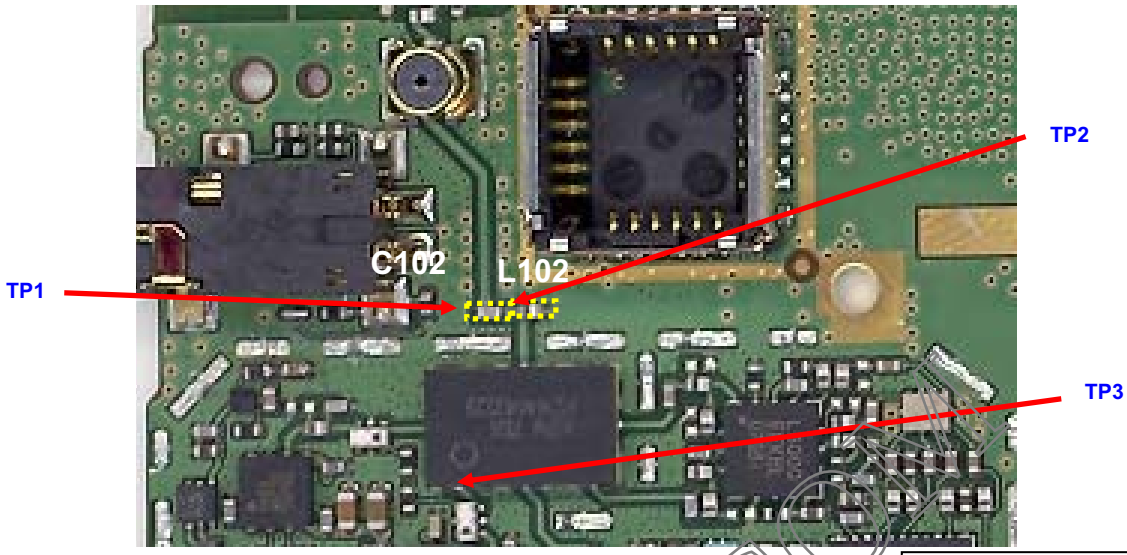
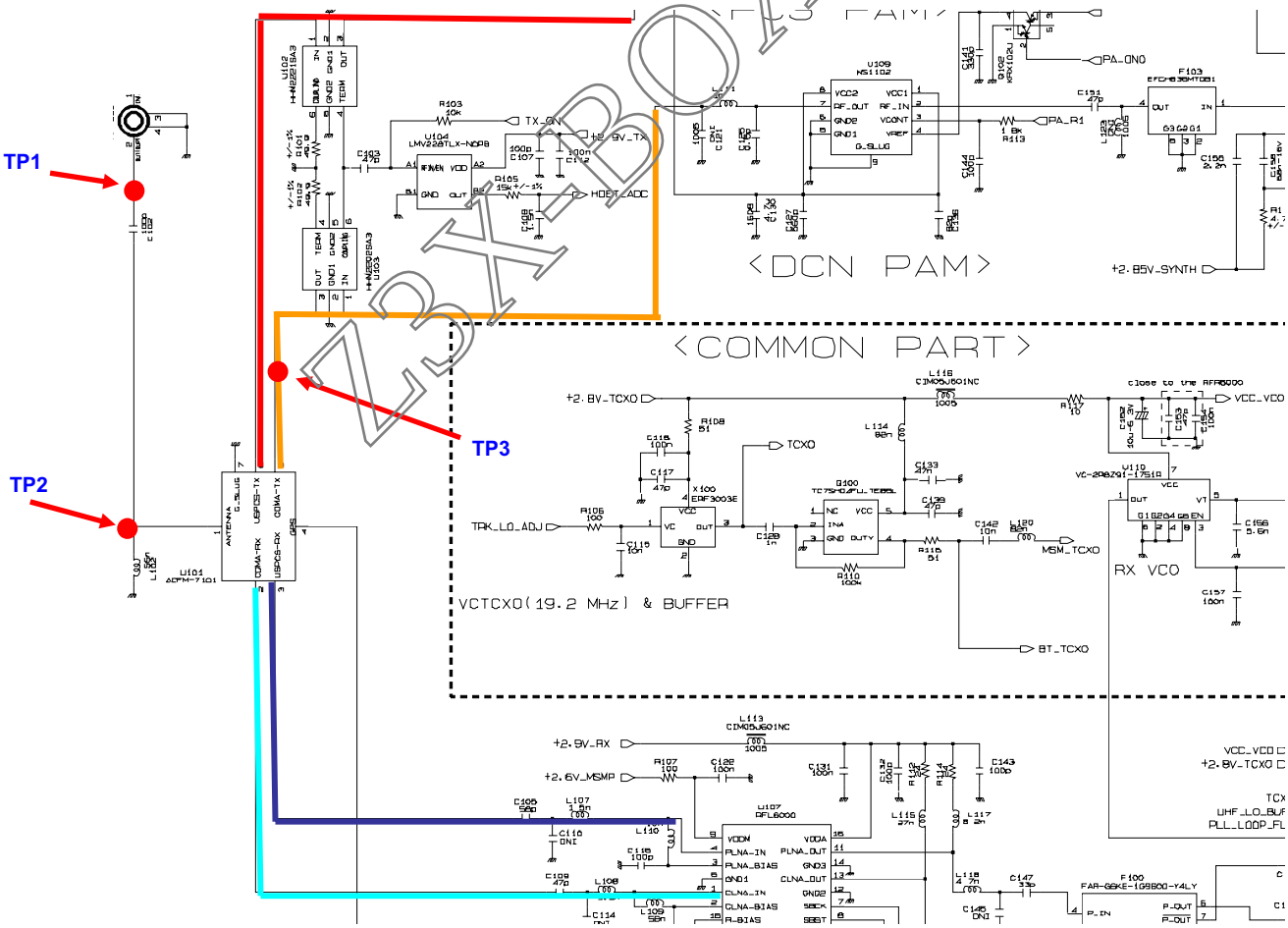
4.2.1.7 Check Quintplexer & Mobile Switch

Test Point



Circuit Diagram

PCS Tx
DCN Tx
PCS Rx
DCN Rx



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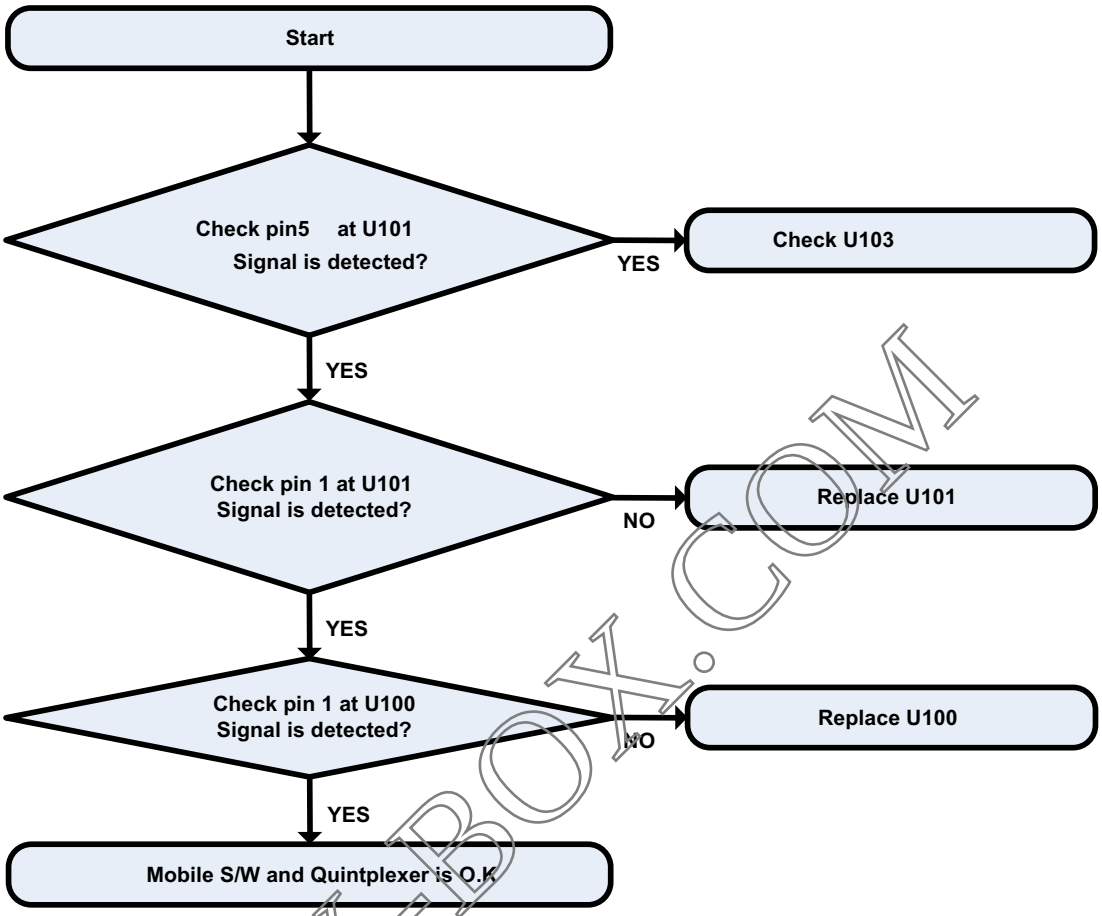
Checking Flow



Waveform

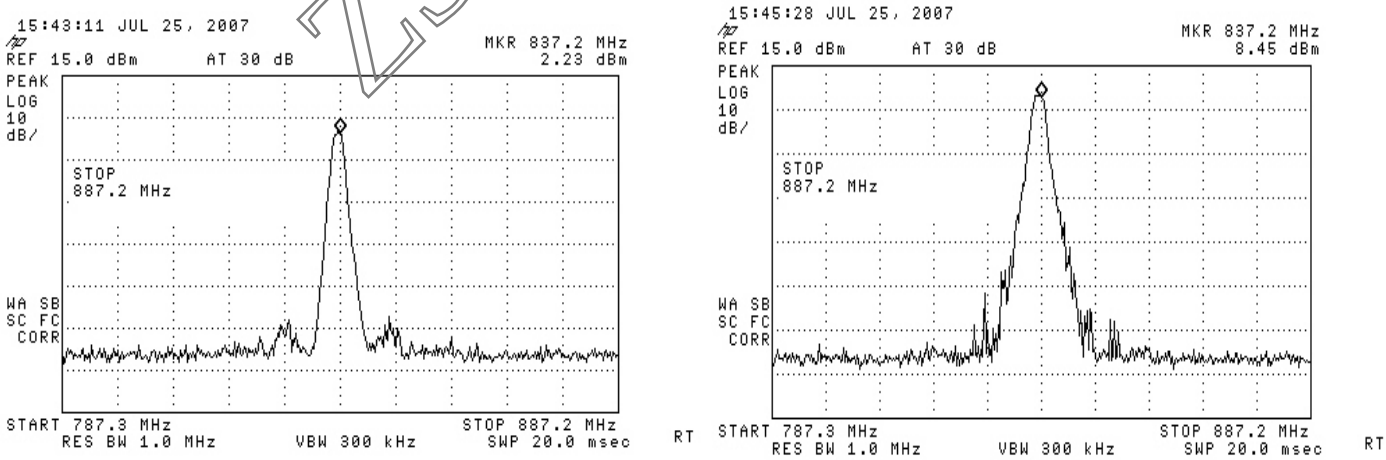


Figure 4.2.1(j)

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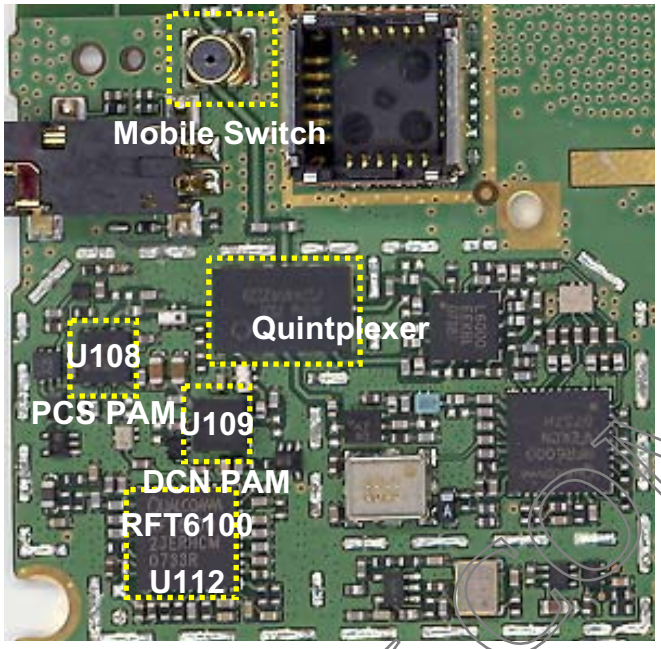
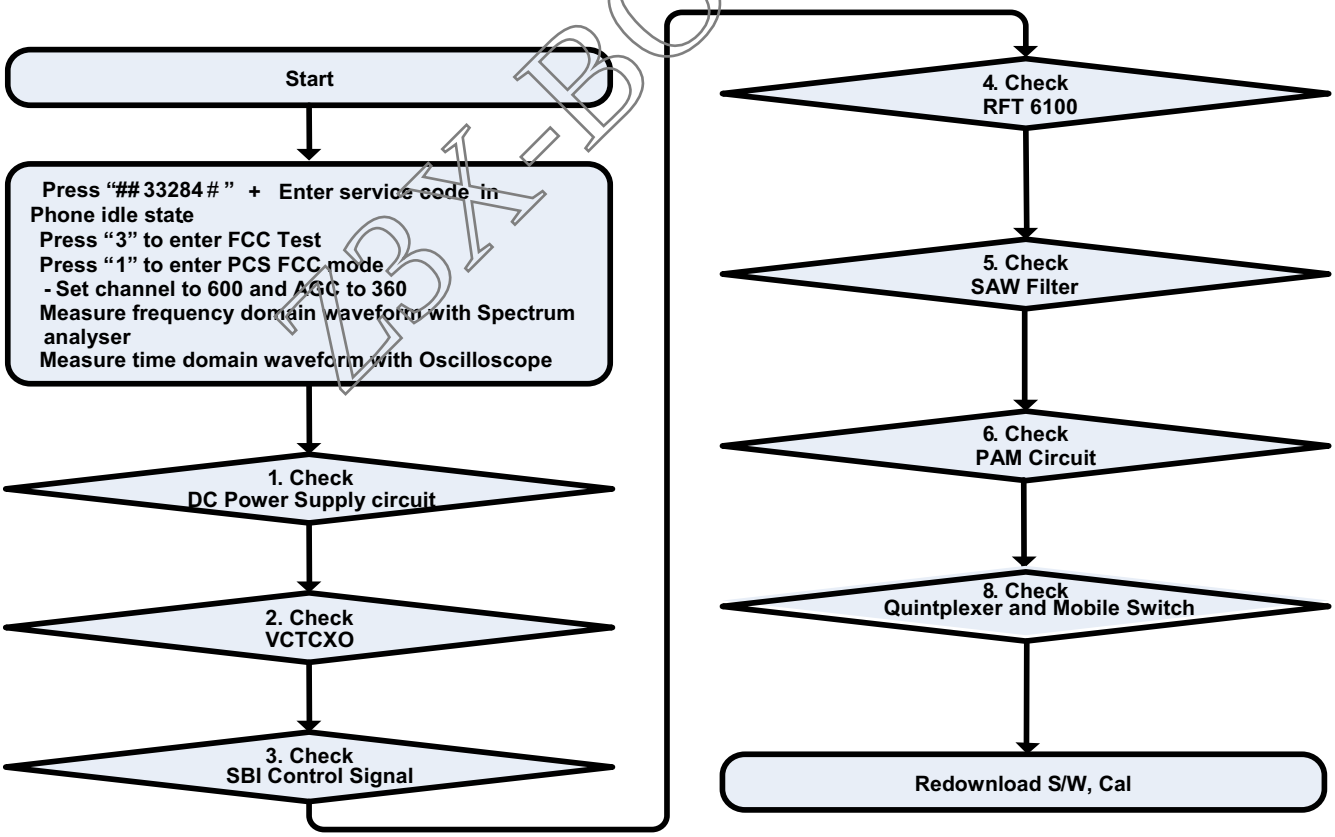
4.2.2 PCS Tx

Test Point



Circuit Diagram



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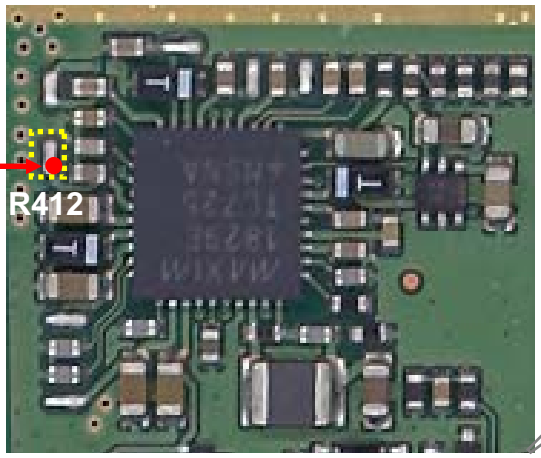
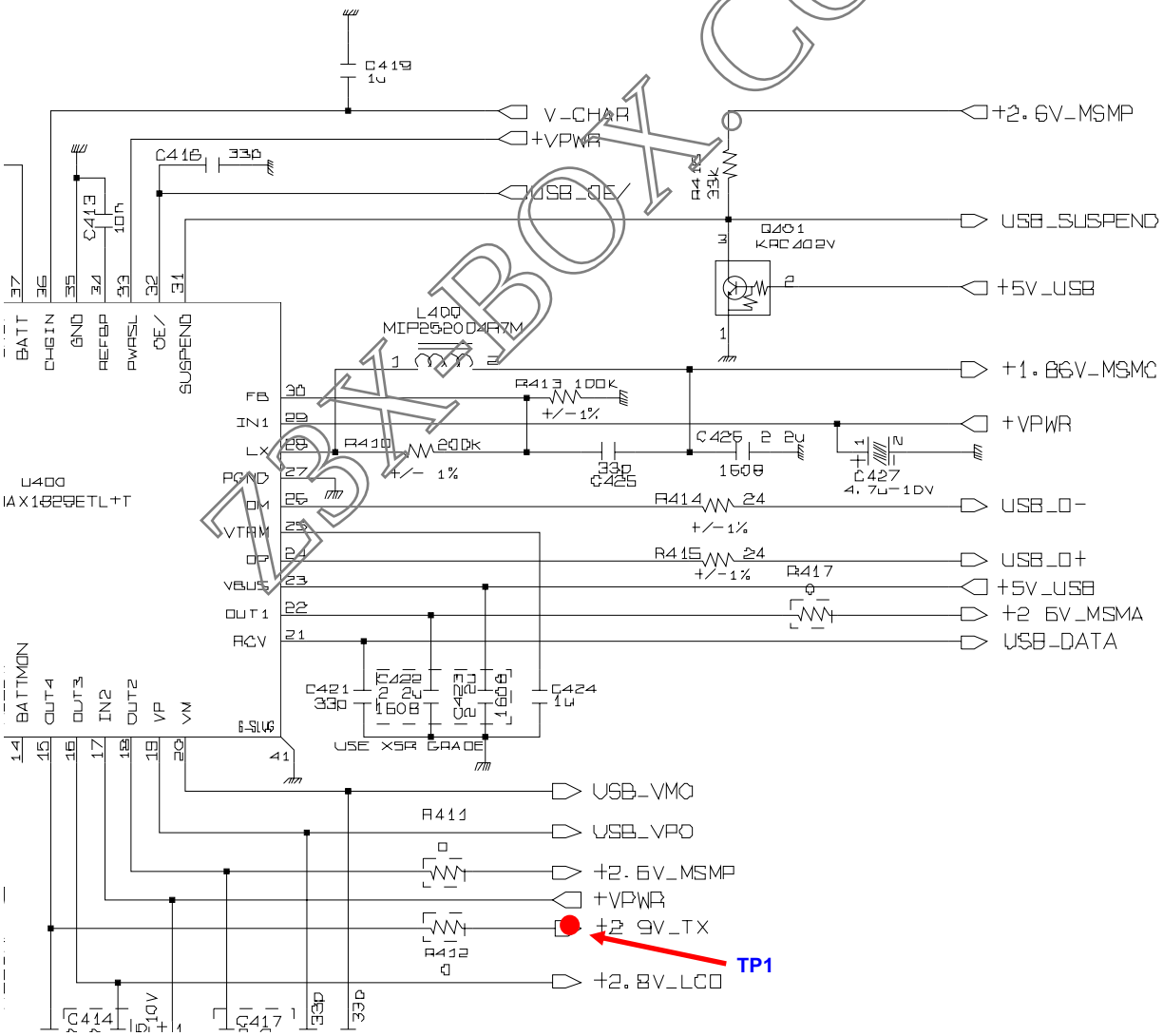
4.2.2.1 Checking DC Power supply circuit (PMIC)

Test Point



Circuit Diagram



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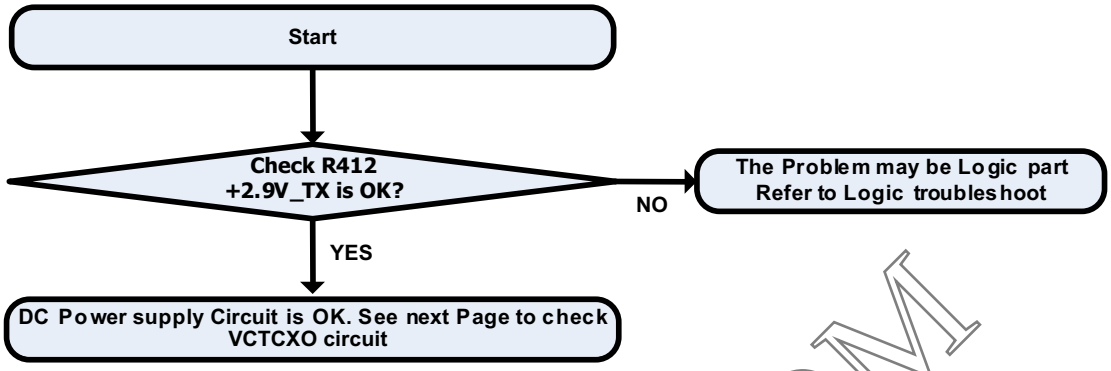
Checking Flow



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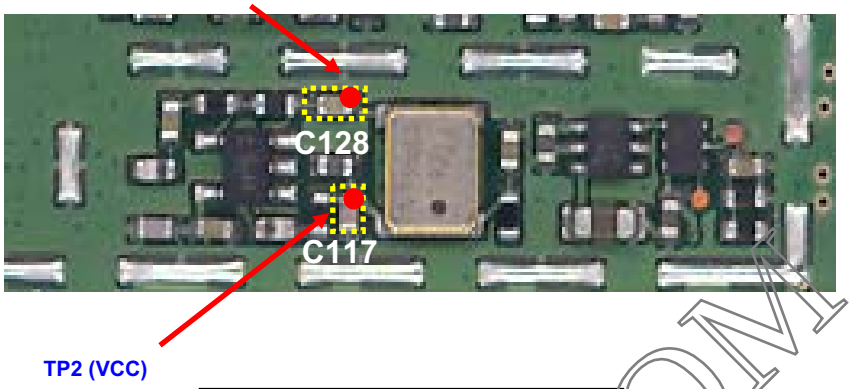
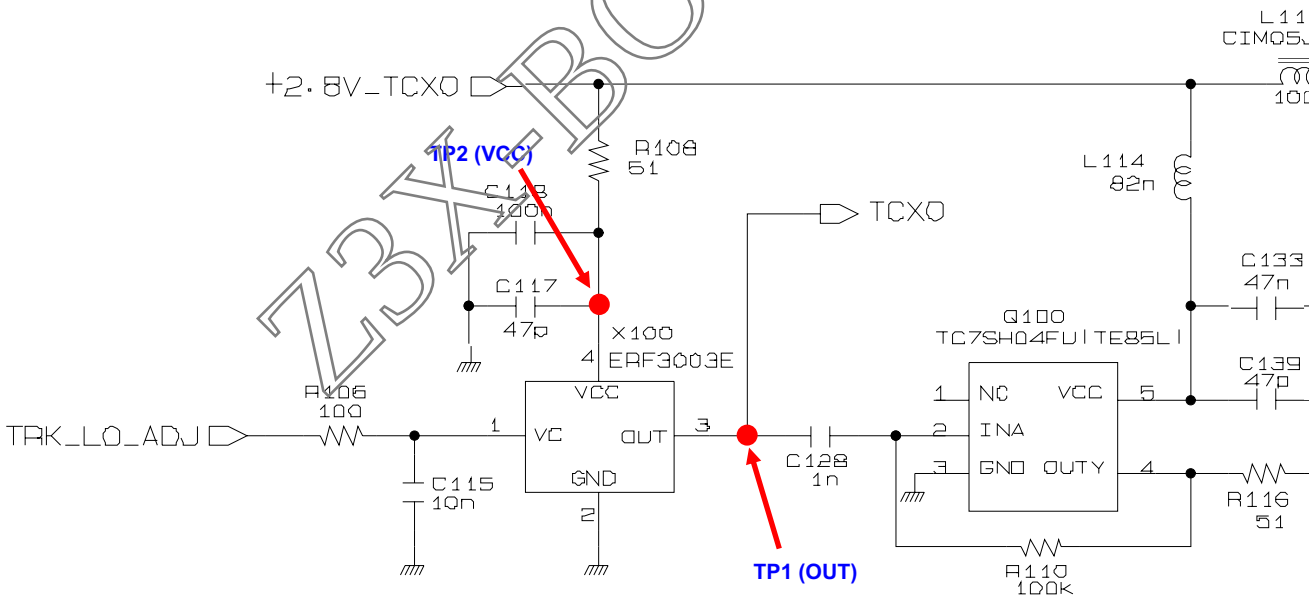
4.2.2.2 Checking VCTCXO circuit

Test Point



Circuit Diagram



/CTCXO(19.2 MHz) & BUFFER

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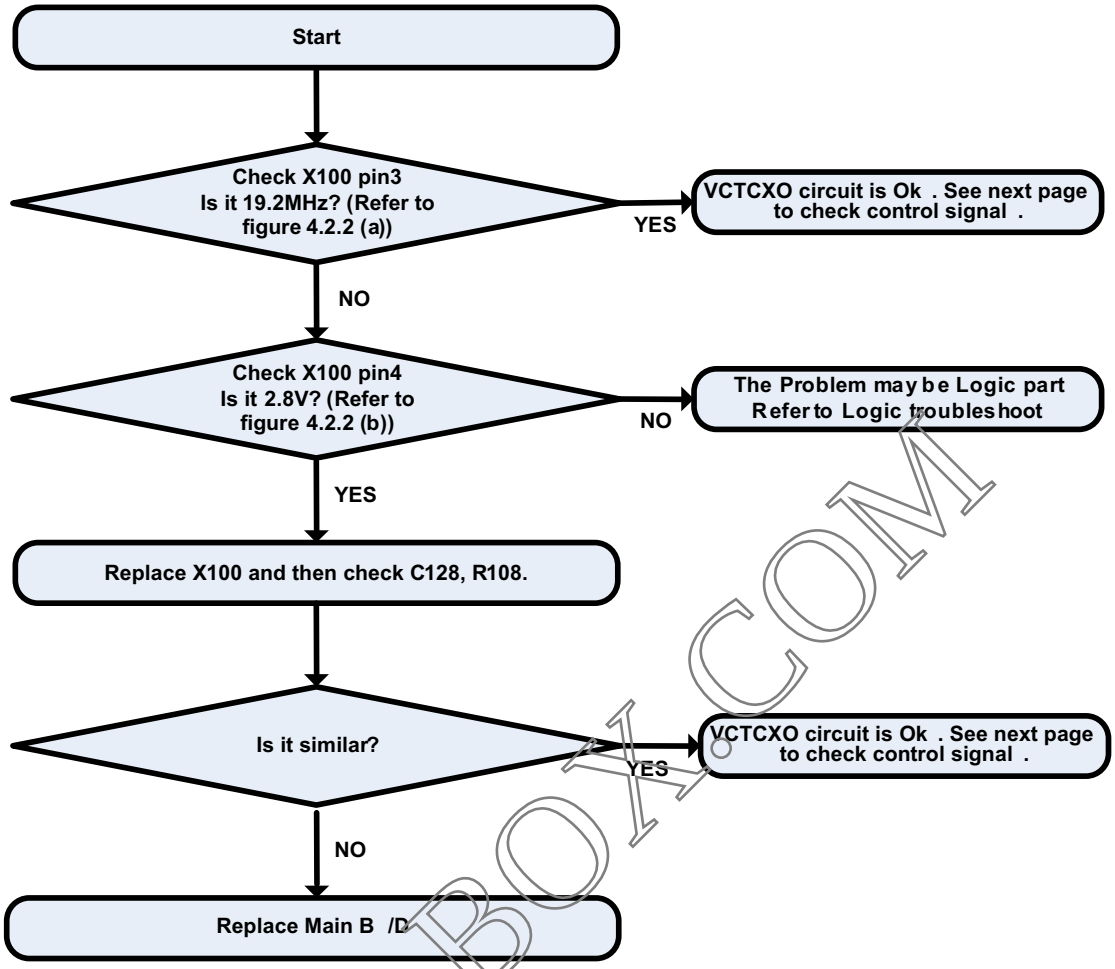
Checking Flow



Waveform

Figure 4.2.2 (a)

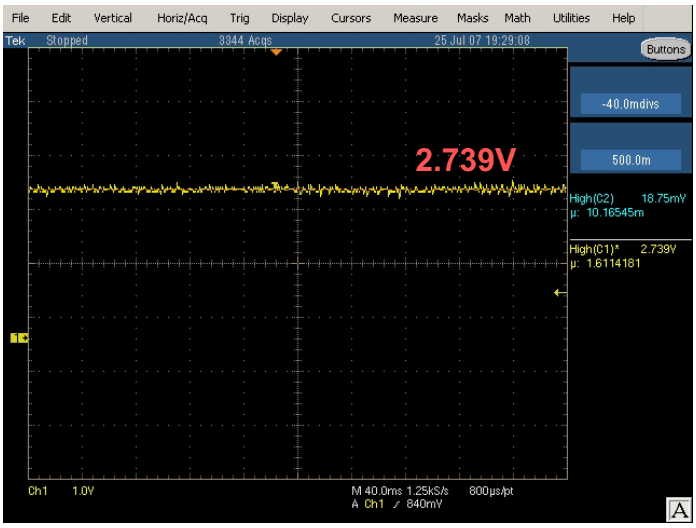


Figure 4.2.2 (b)

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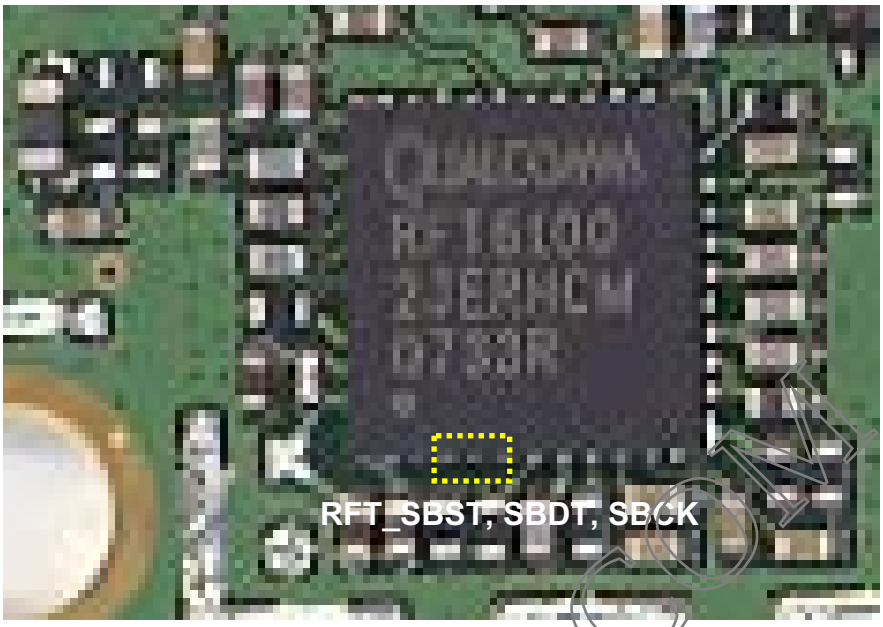
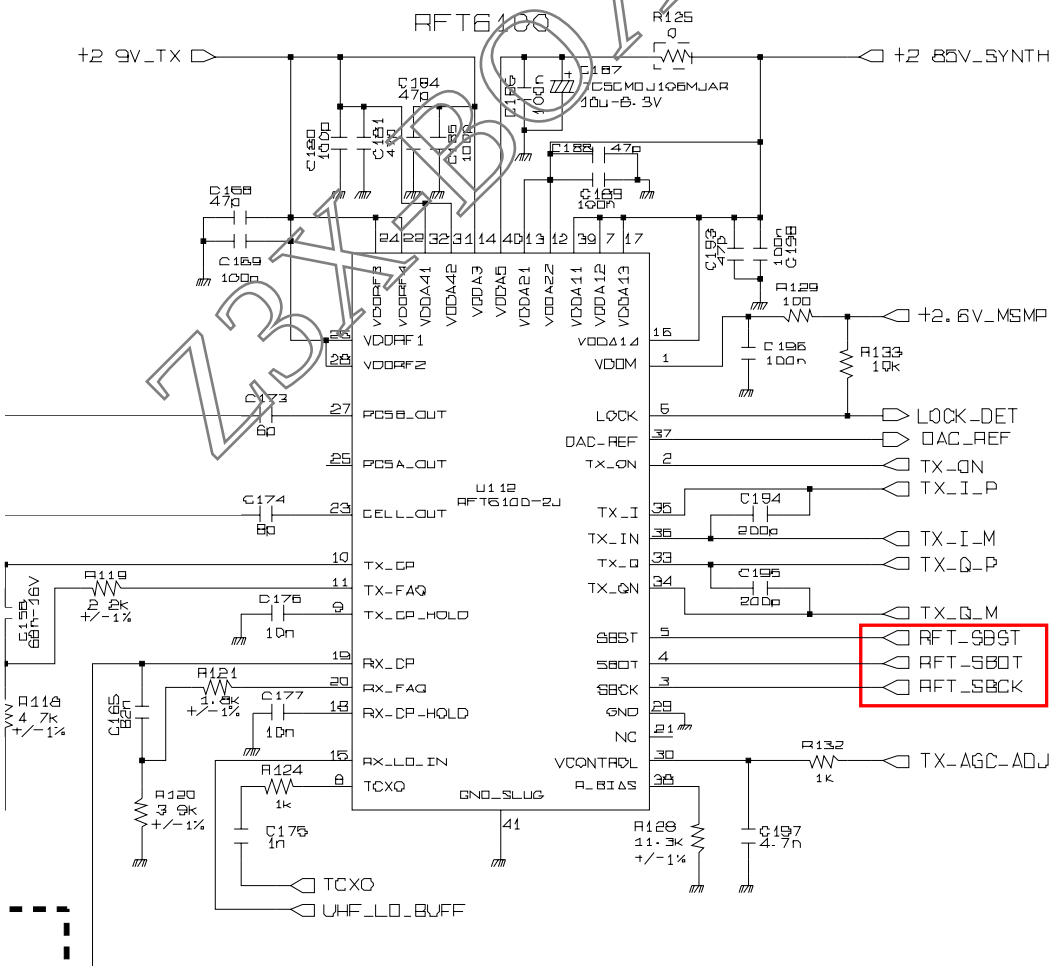
4.2.2.3 Checking SBI Control Signal

Test Point



Circuit Diagram



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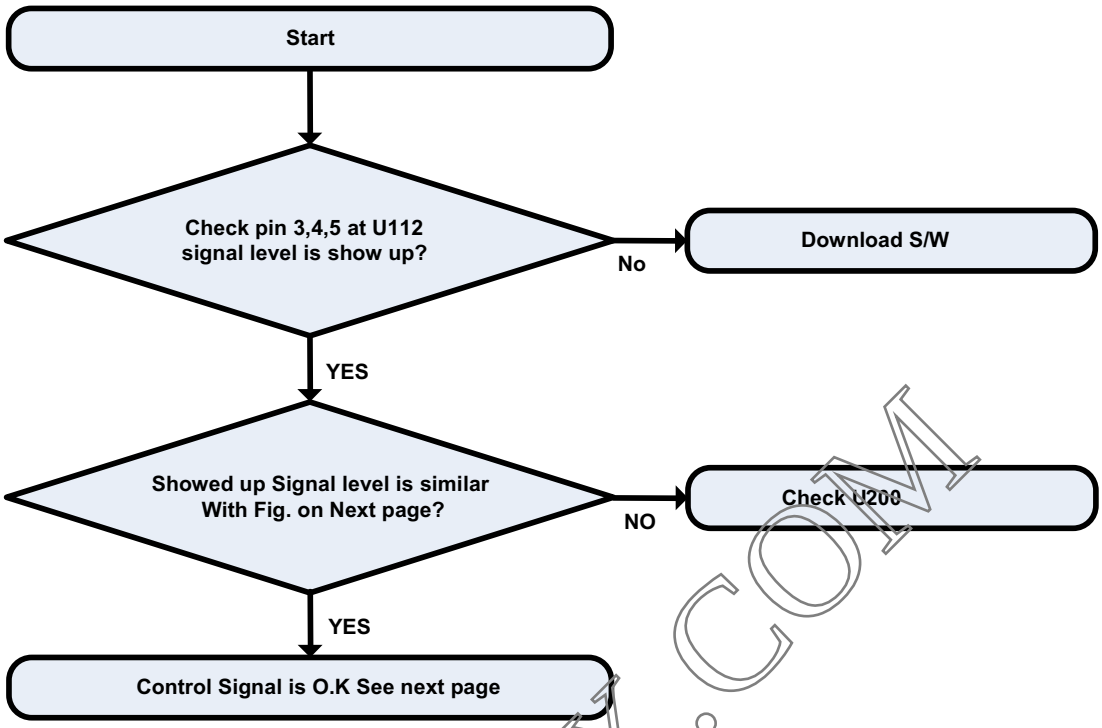
Checking Flow



Waveform

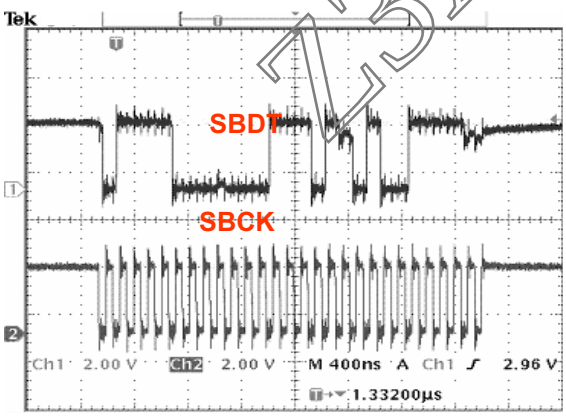


Figure 4.2.2 (c)

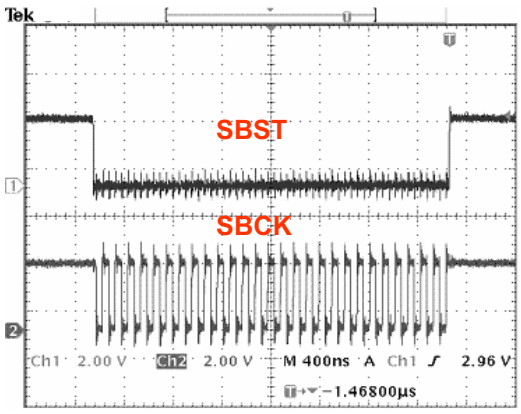


Figure 4.2.2 (d)

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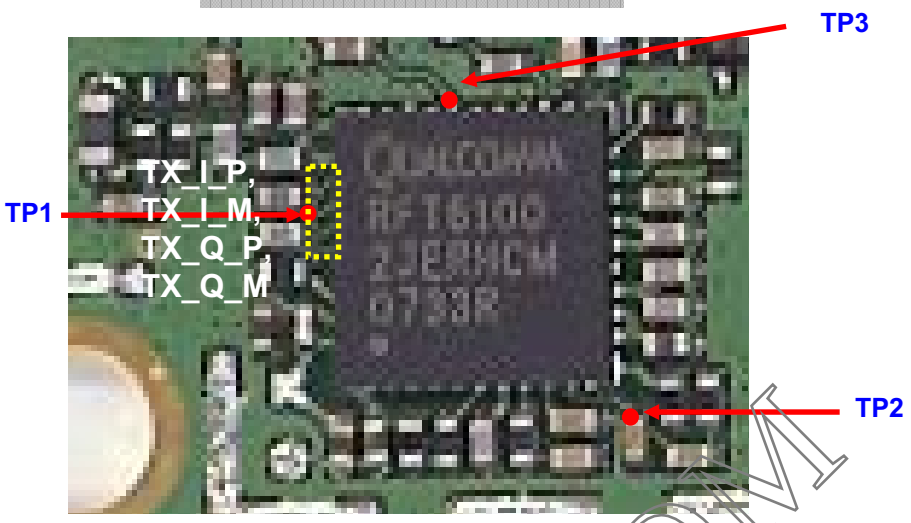
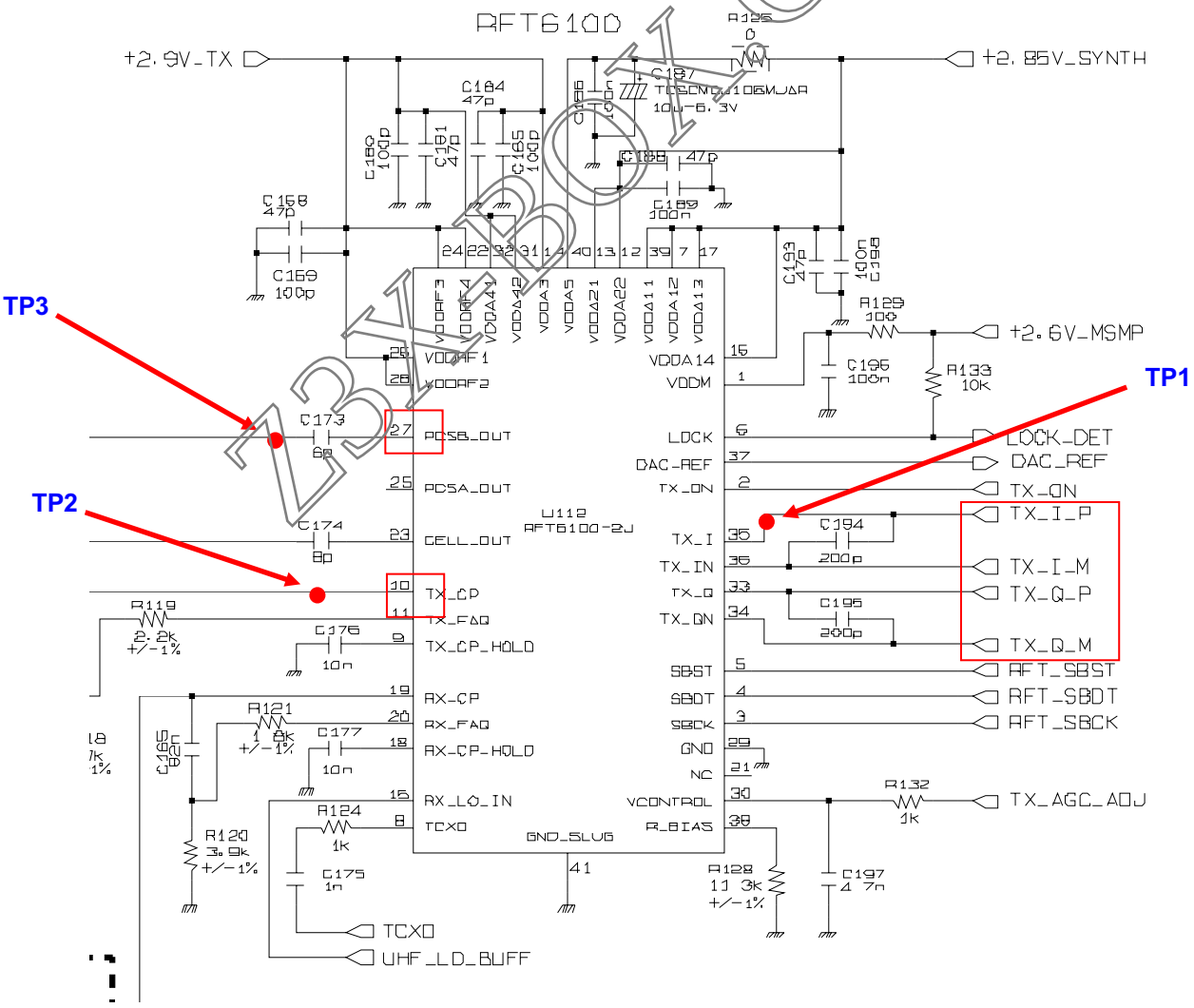
4.2.2.4 Checking RFT6100 circuit

Test Point



Circuit Diagram



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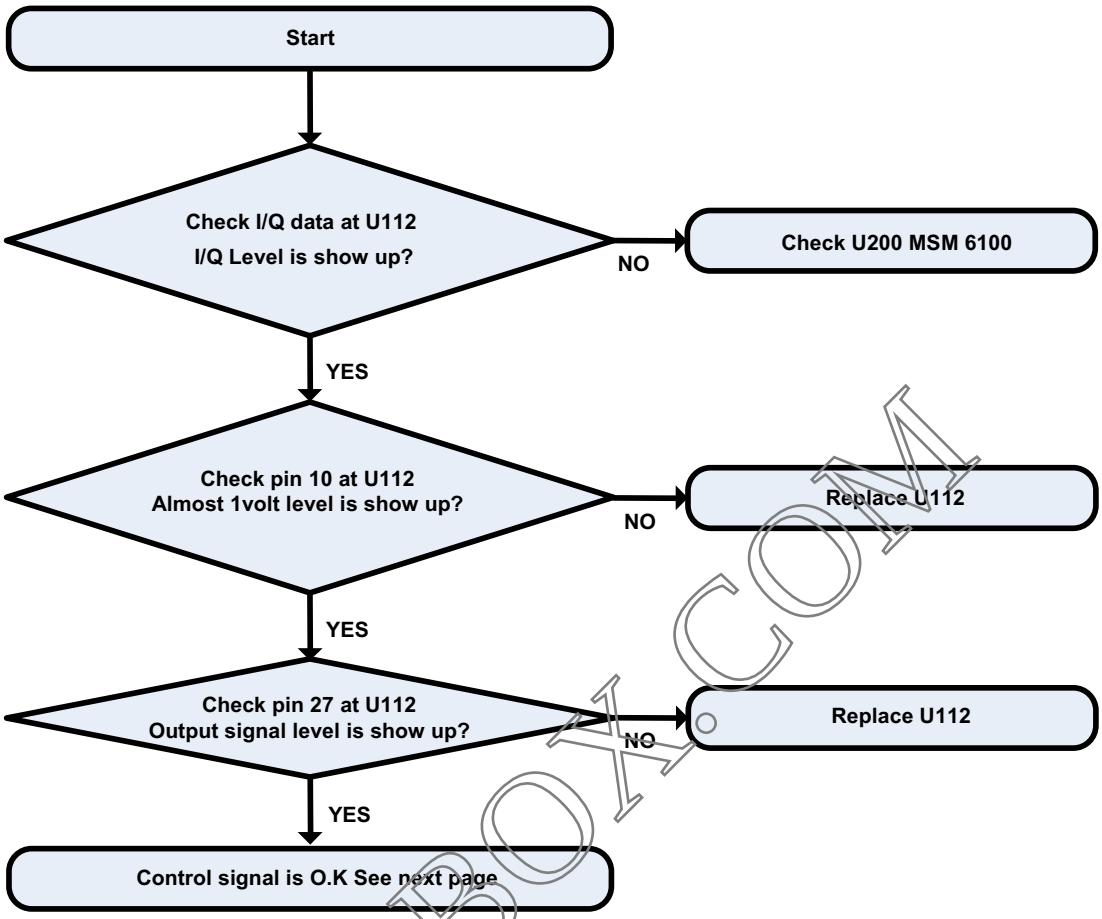
Checking Flow



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Waveform

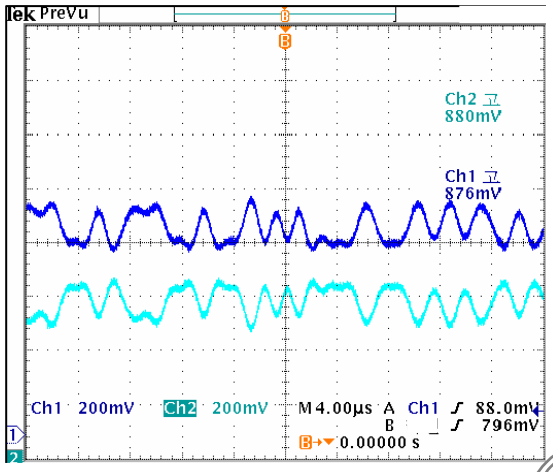

Figure 4.2.1 (e)

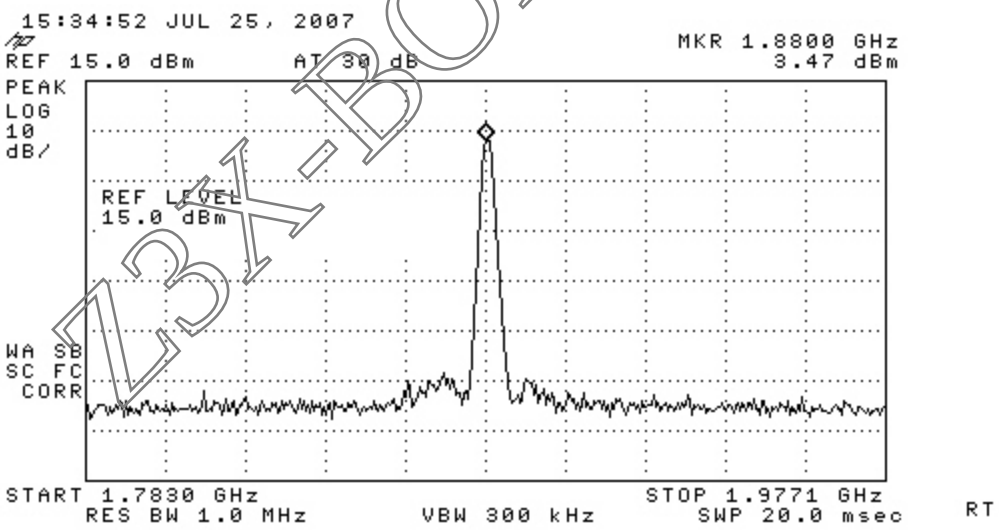

Figure 4.2.1 (f)

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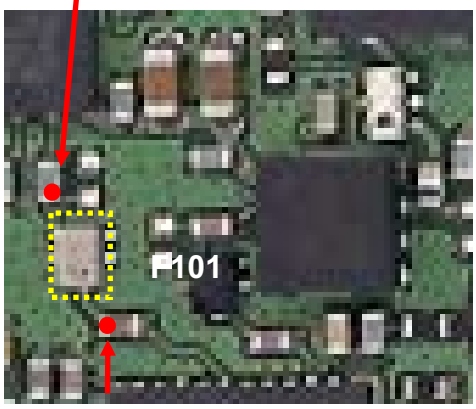
4.2.2.5 Check PCS RF Tx SAW

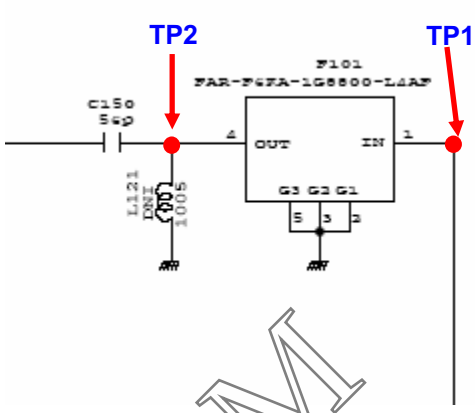
Test Point

RF_OUT(TP2)

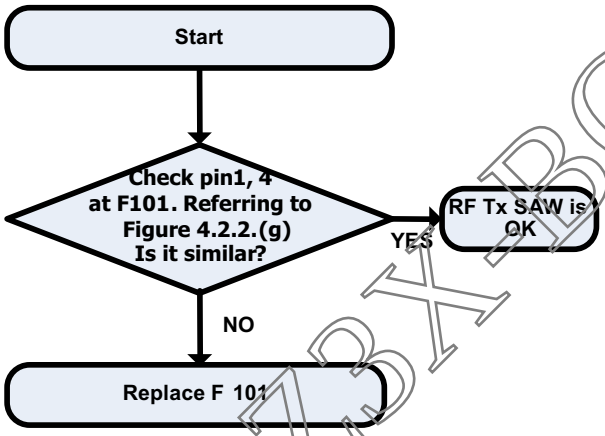


RF_IN (TP1)

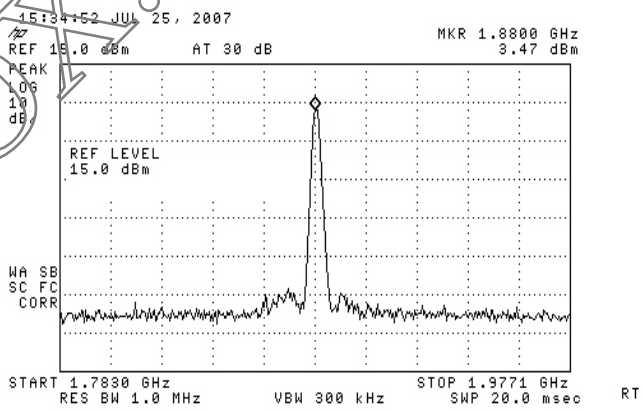
Circuit Diagram



Checking Flow



Waveform



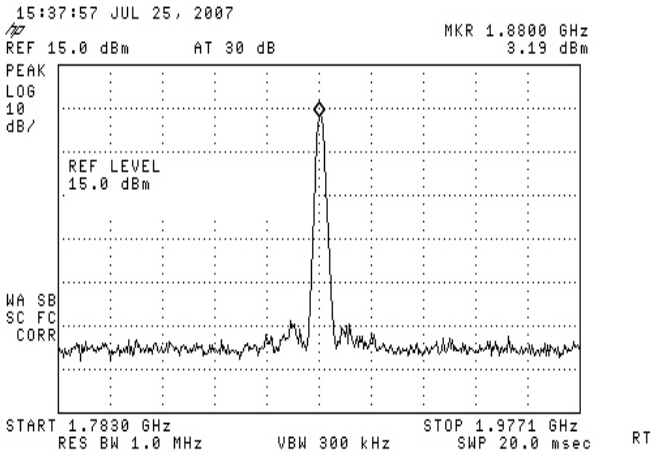


Figure 4.2.2(g)

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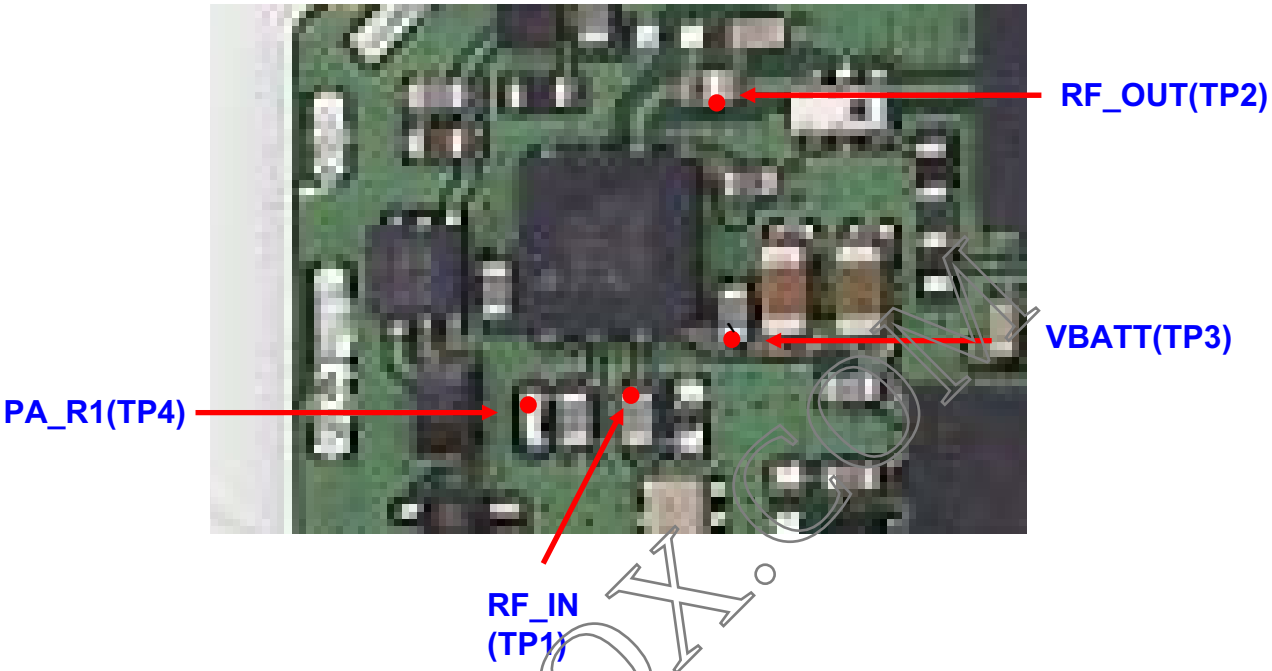
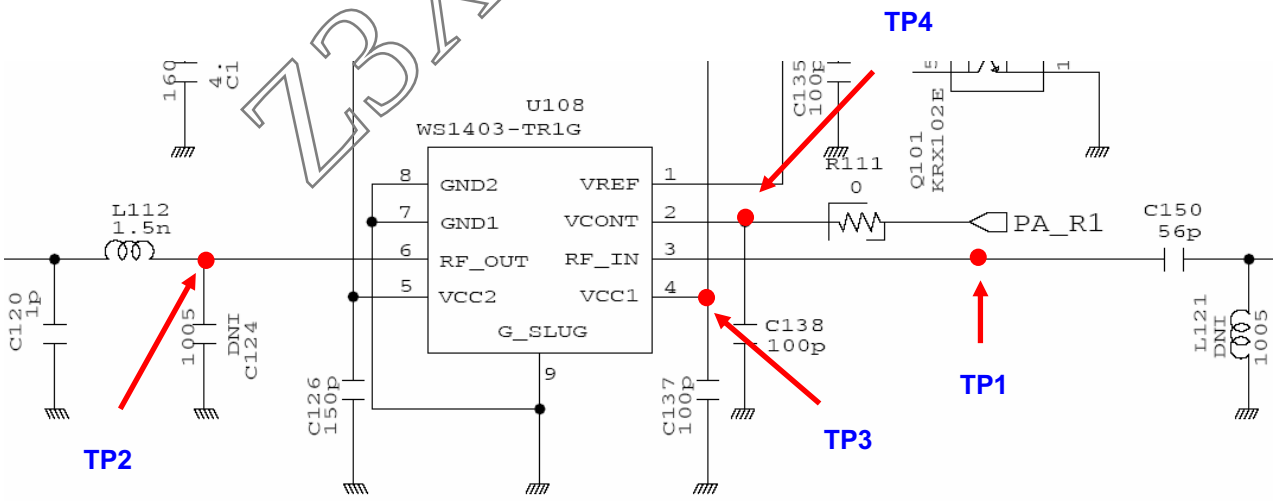
4.2.2.6 Check PCS PAM circuit

Test Point



Circuit Diagram



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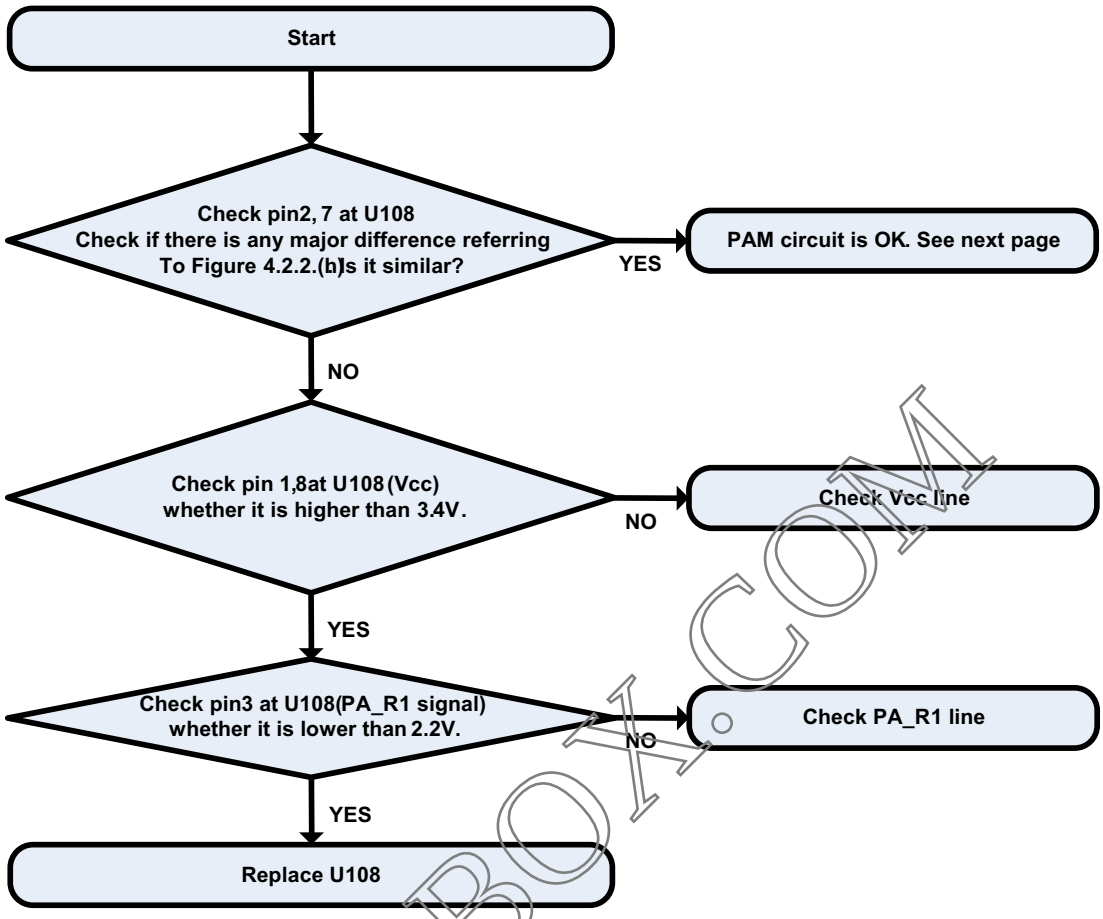
Checking Flow



Waveform

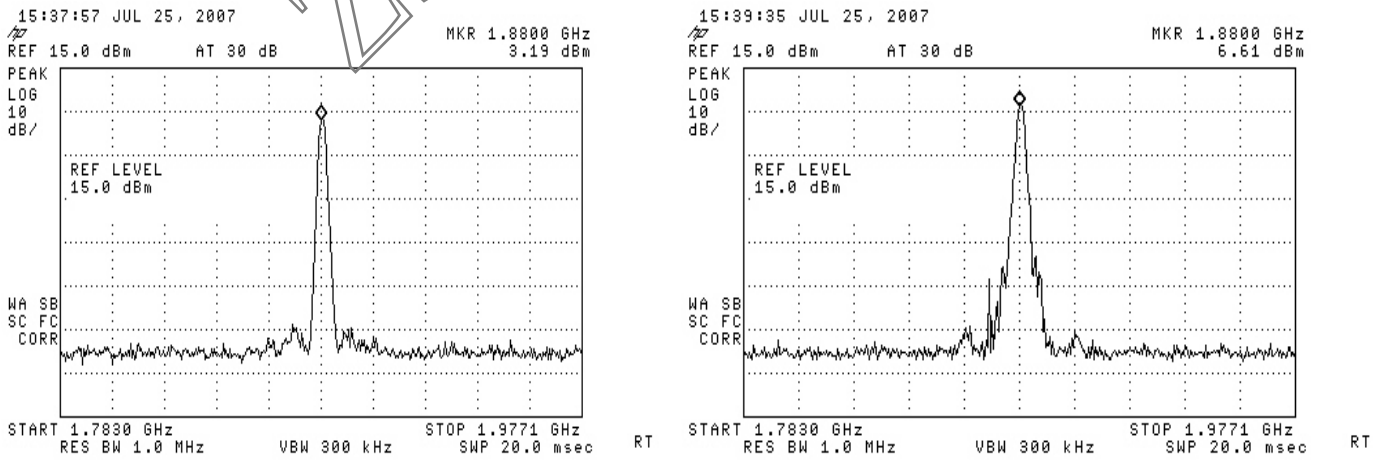


Figure 4.2.2(h)

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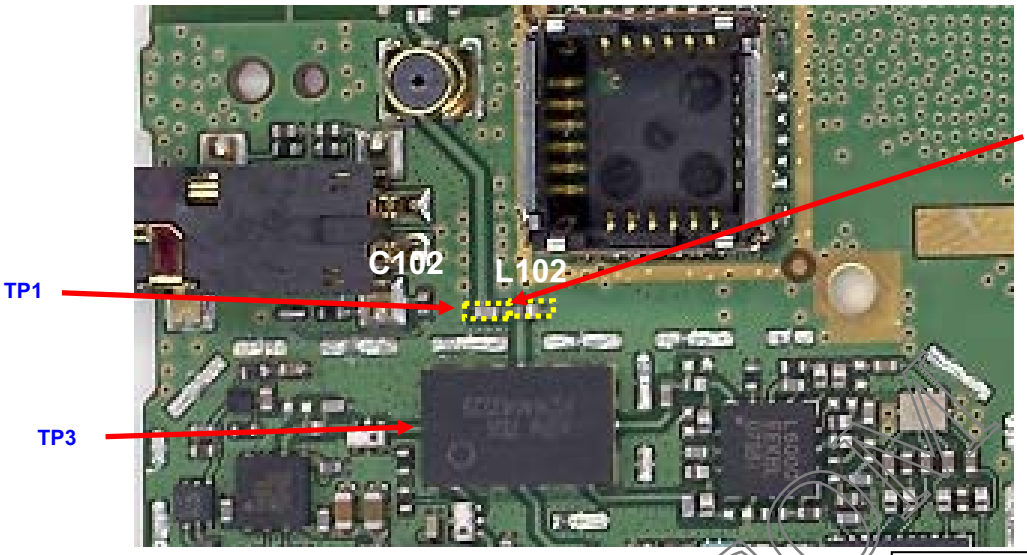
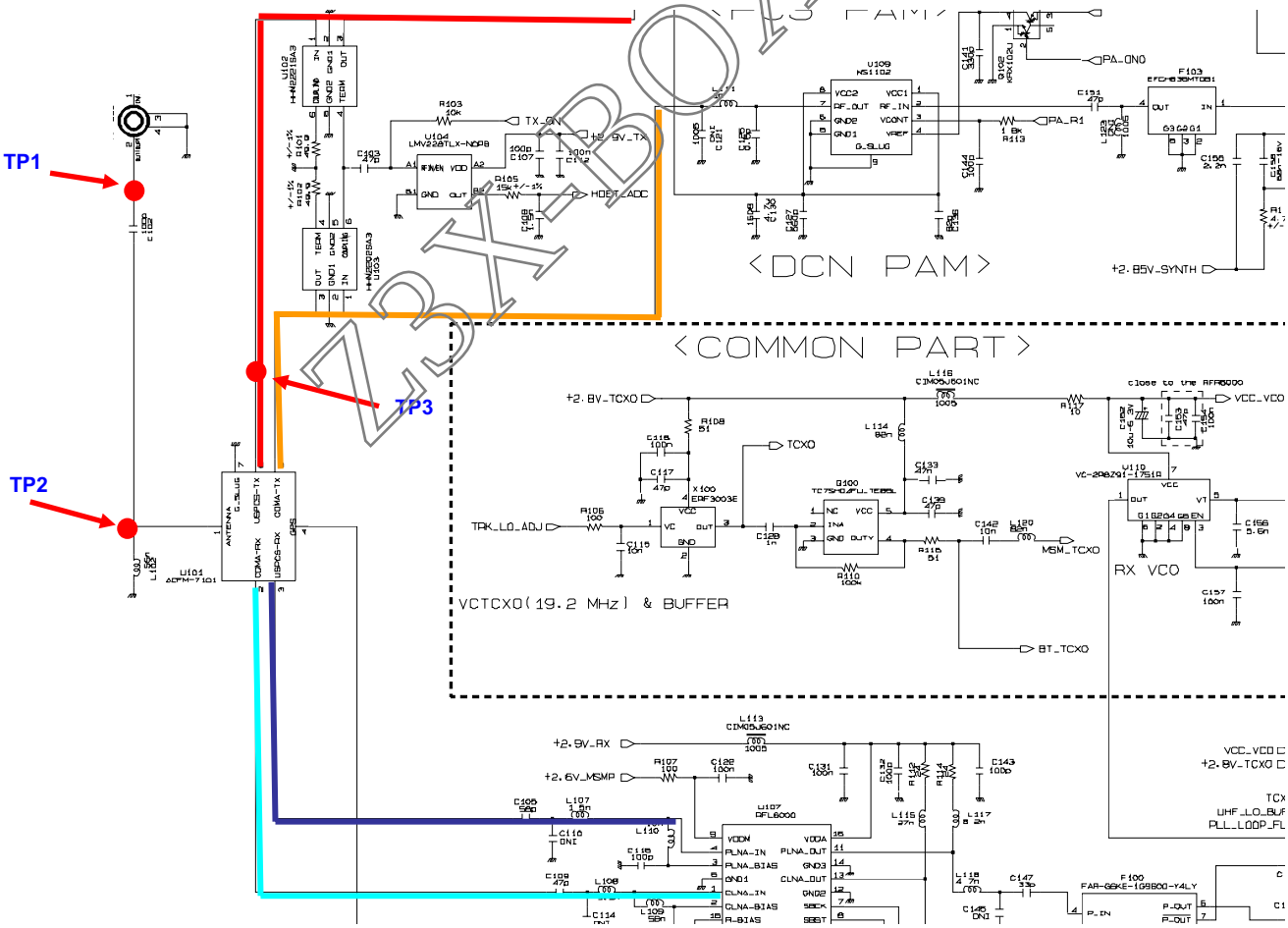
4.2.2.7 Check Quintplexer & Mobile Switch

Test Point



Circuit Diagram

PCS Tx
DCN Tx
PCS Rx
DCN Rx



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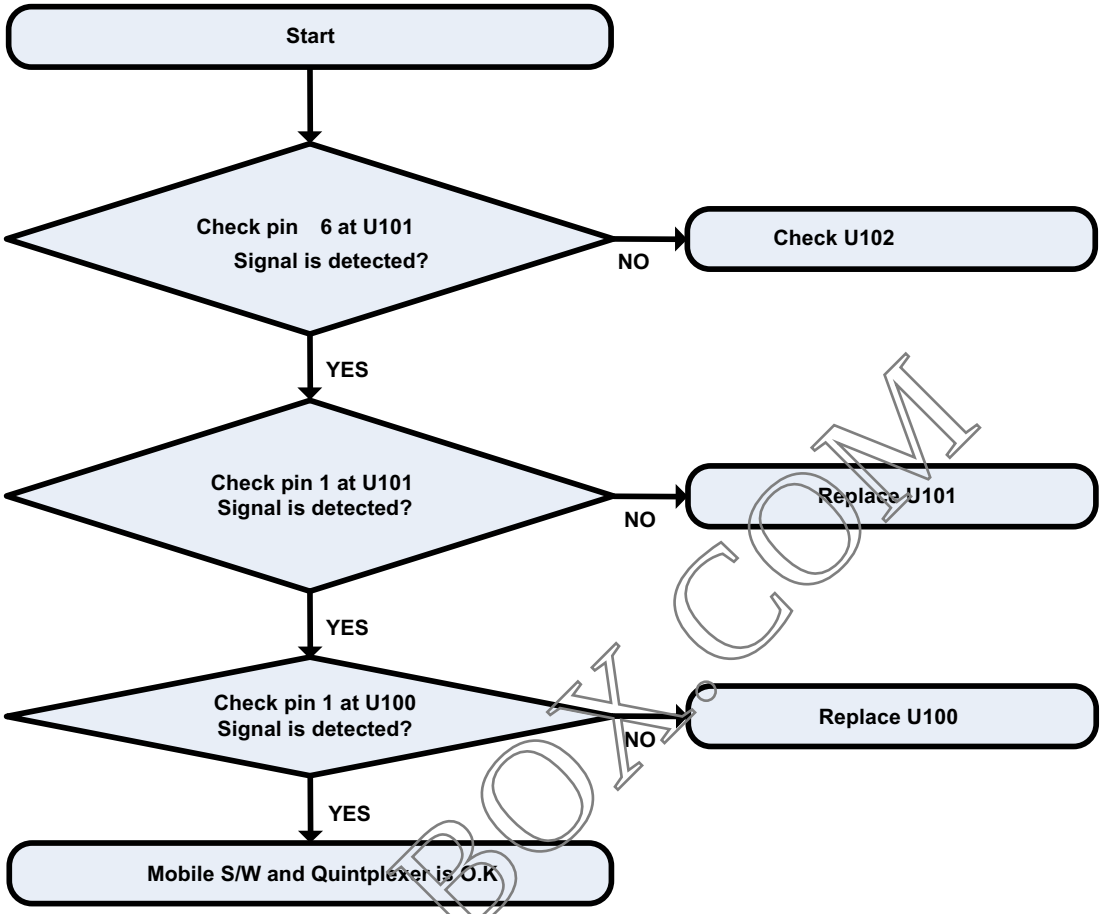
Checking Flow



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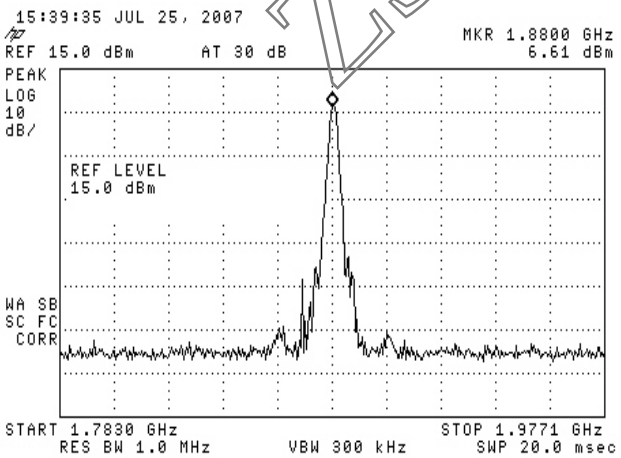
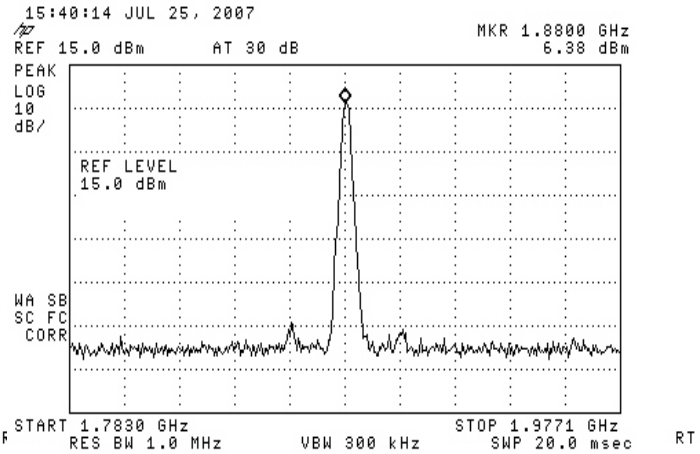
Waveform





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4.3 Logic Part Trouble Shooting

4.3.1 POWER-ON TROUBLE

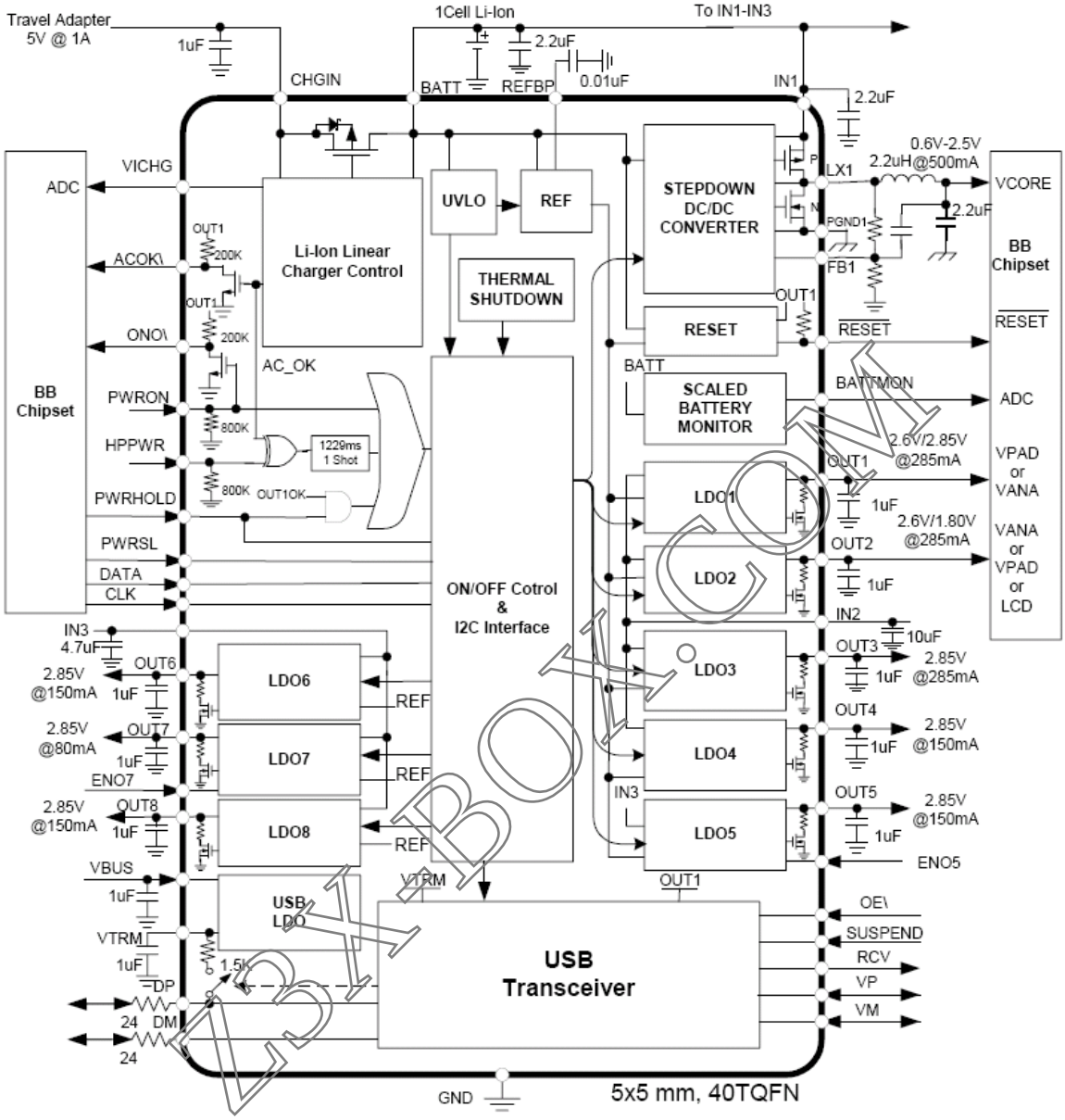

Figure 4- PMIC (MAX1829) FUNCTIONAL BLOCK DIAGRAM

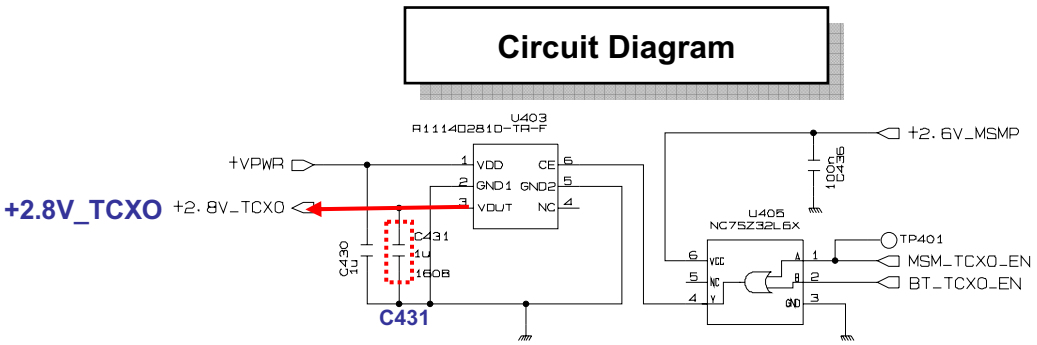

Figure 4- TCXO LDO Part

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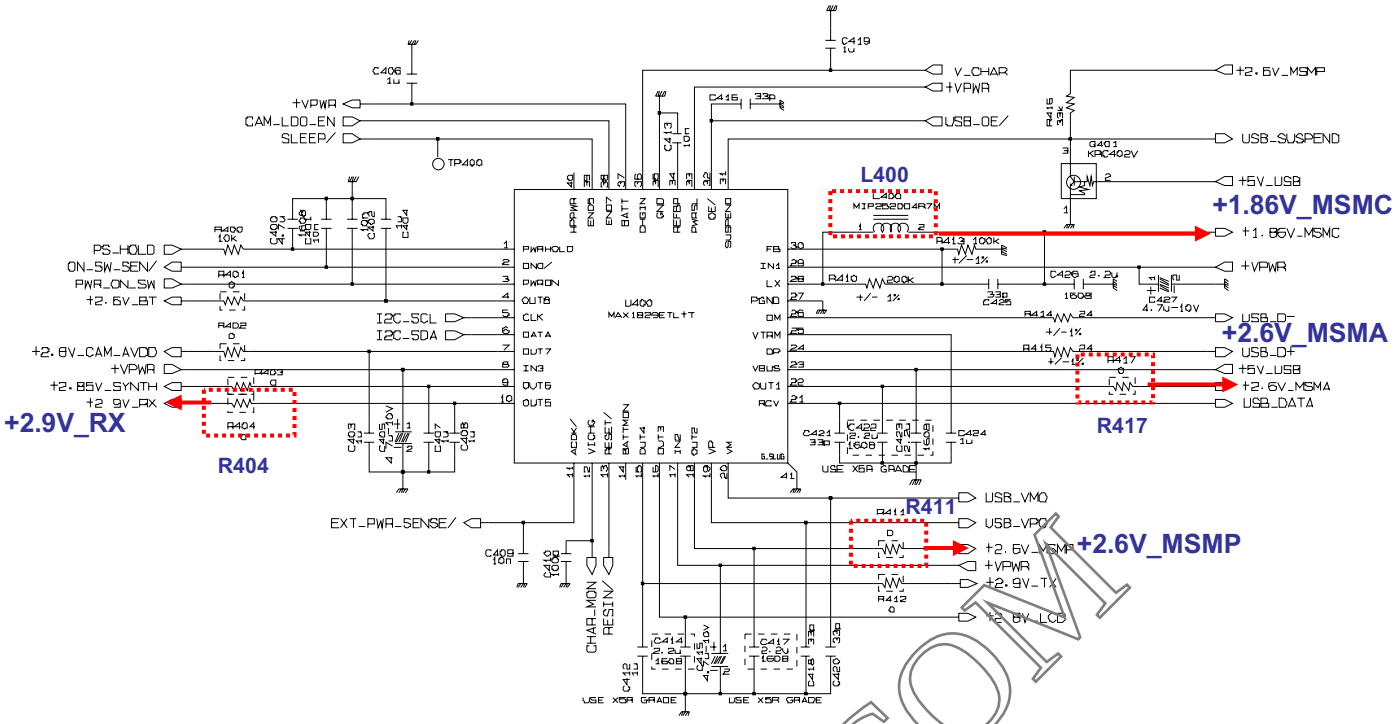
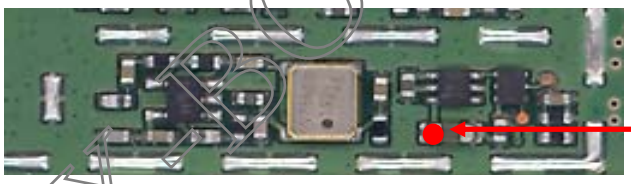
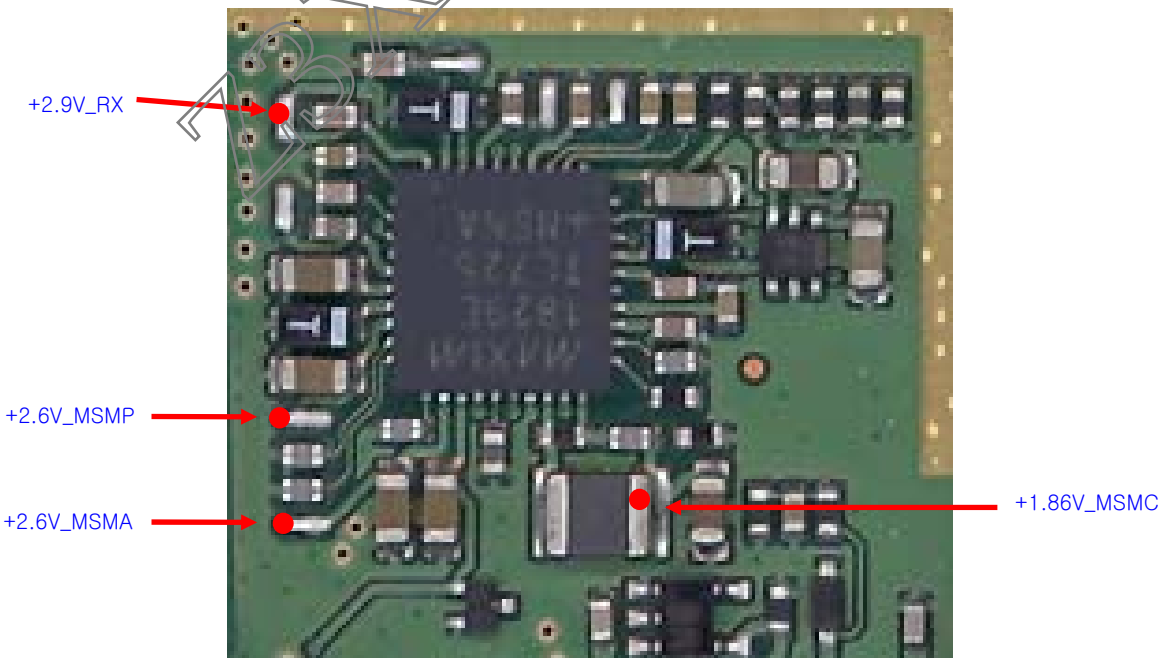


Figure 4- PMIC Part

Test point





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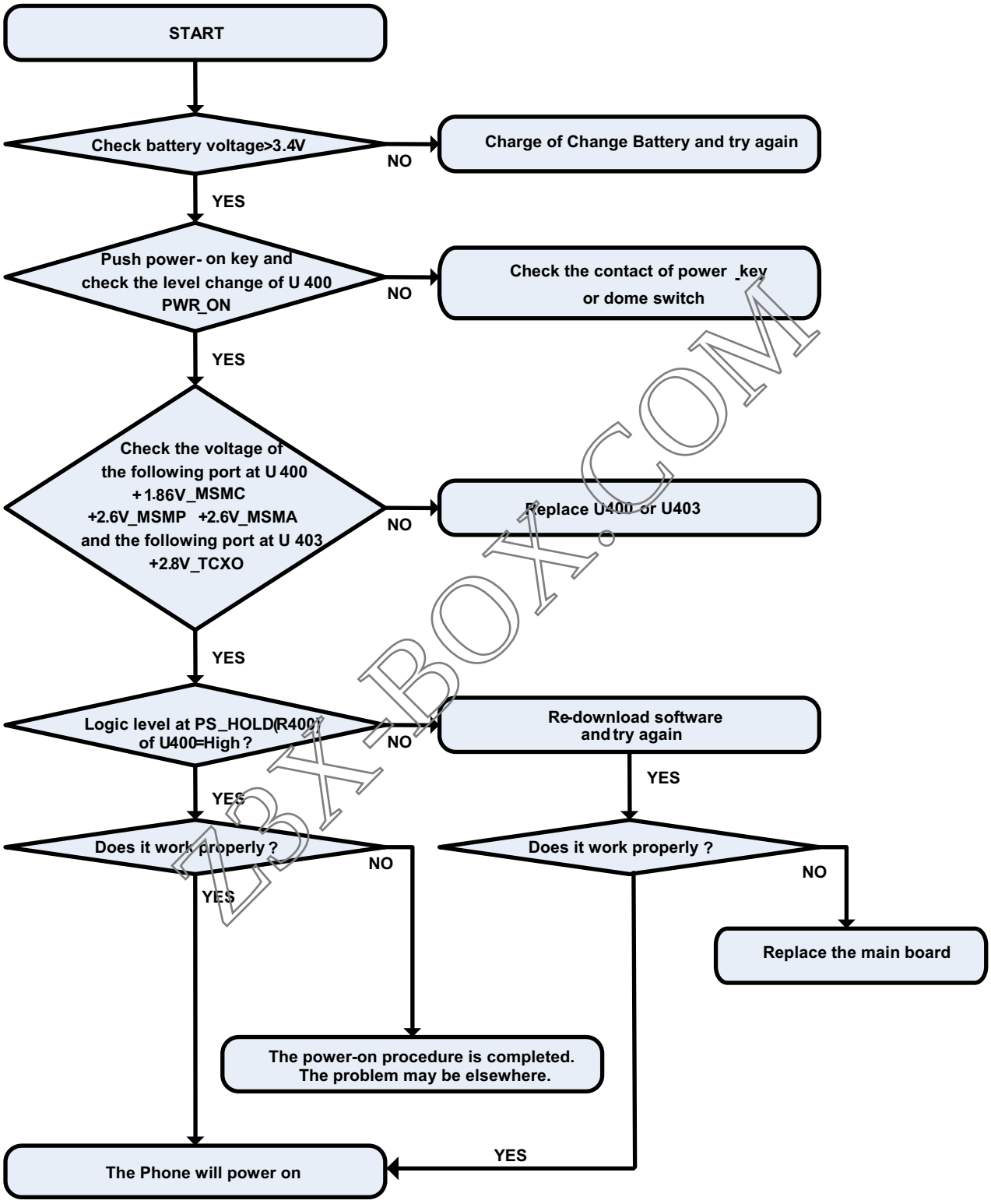

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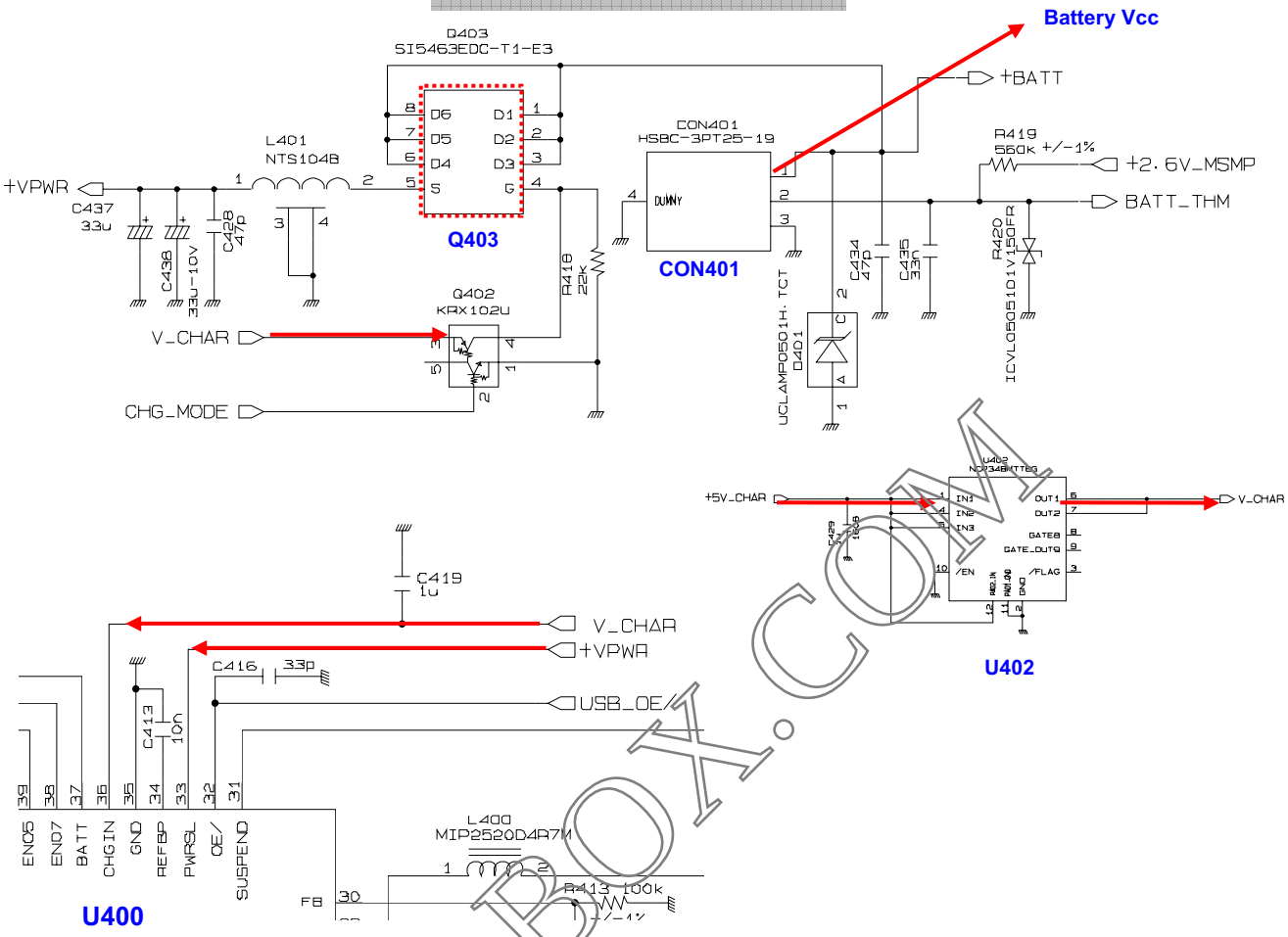
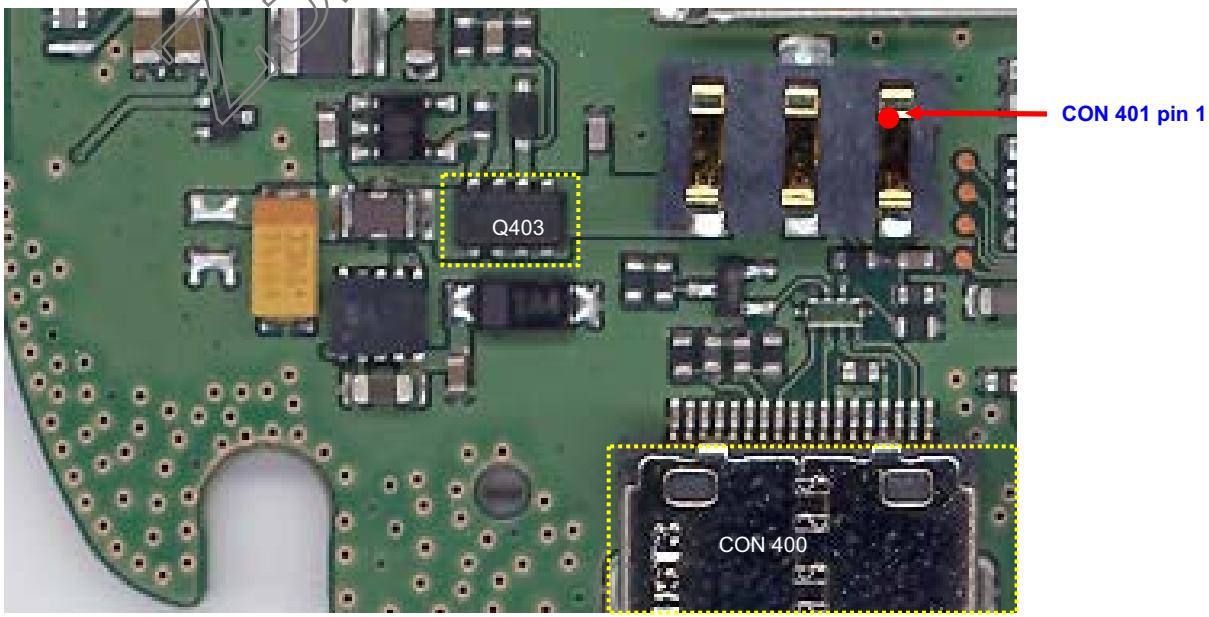
4.3.2 CHARGING TROUBLE

Circuit Diagram



Test point



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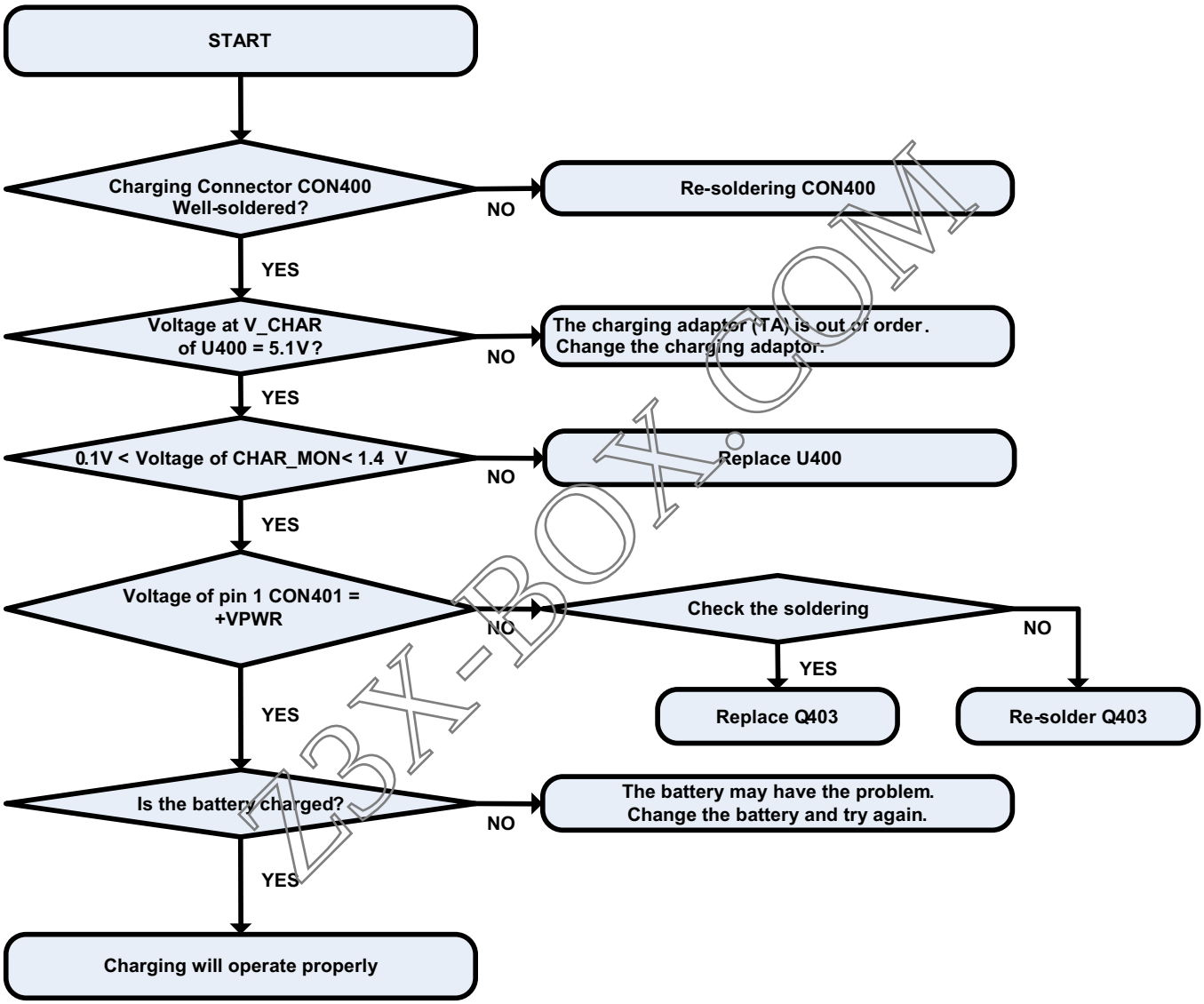
Checking Flow

SETTING : Connect the battery and the charging adaptor (TA) to the phone



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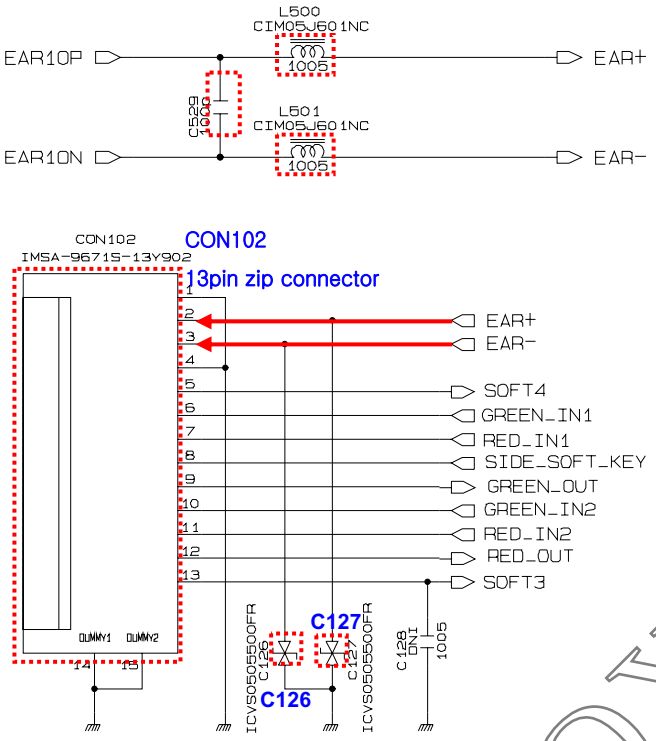
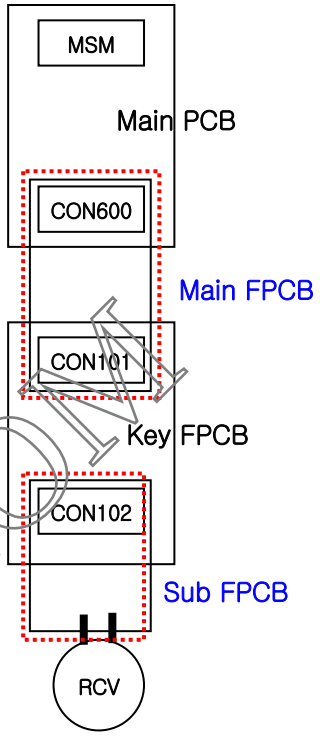
4.3.3 AUDIO - Receiver Trouble

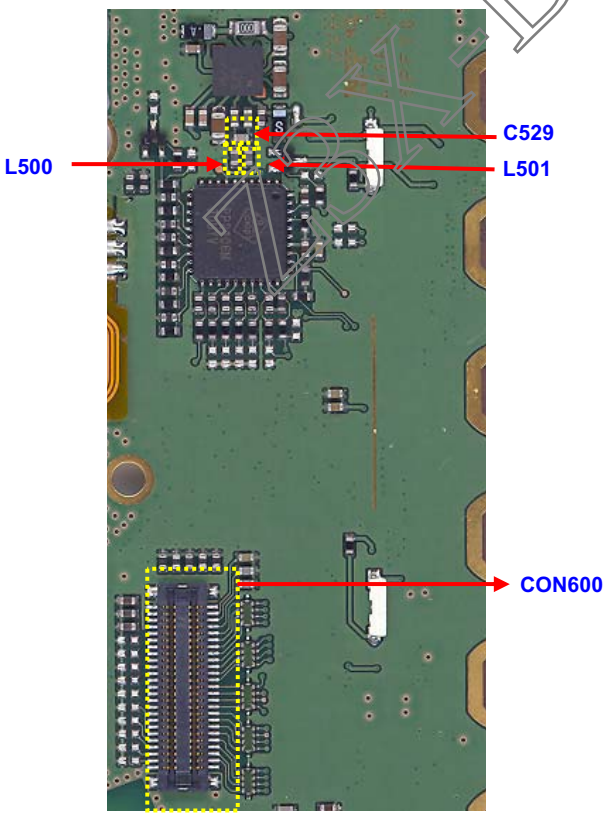
Circuit Diagram

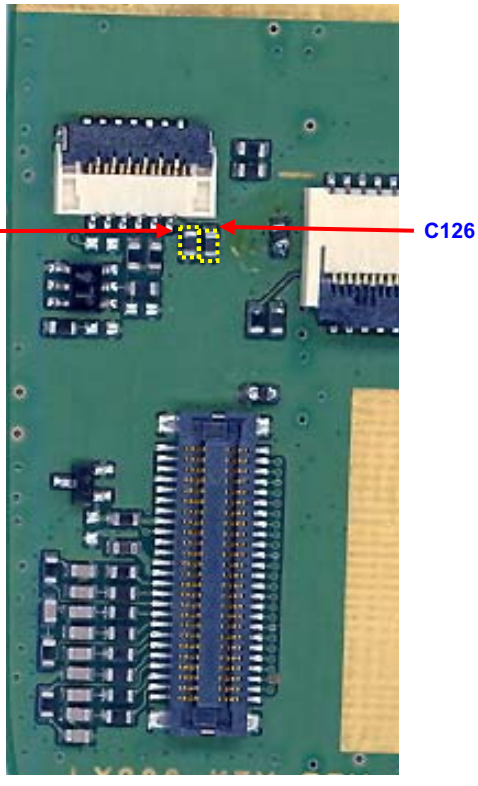


Block Diagram



Test point





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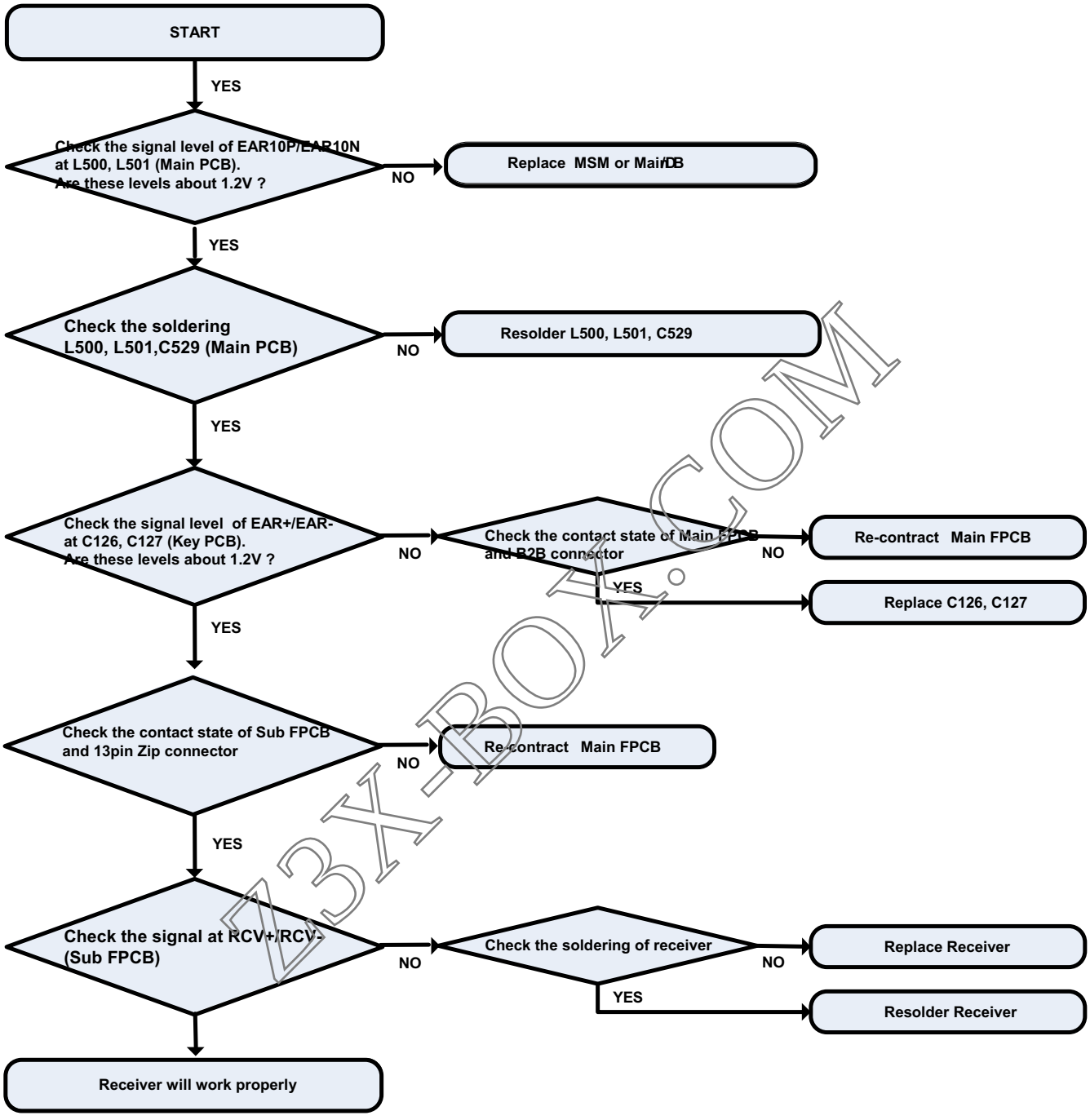
Checking Flow



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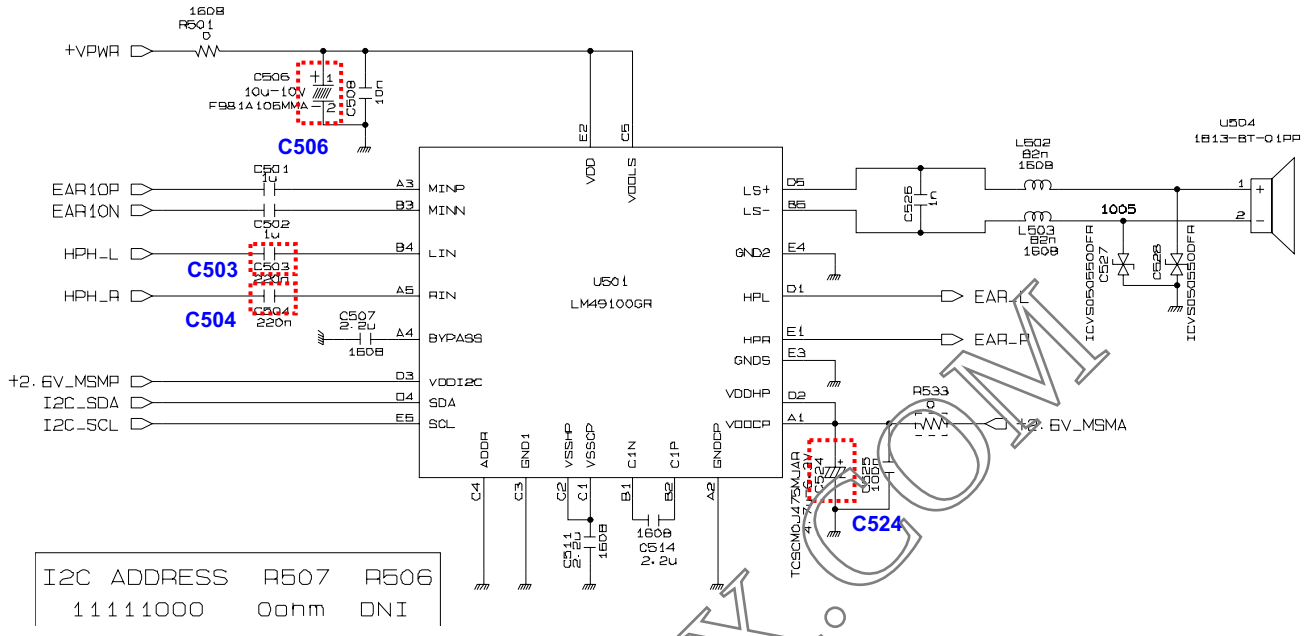
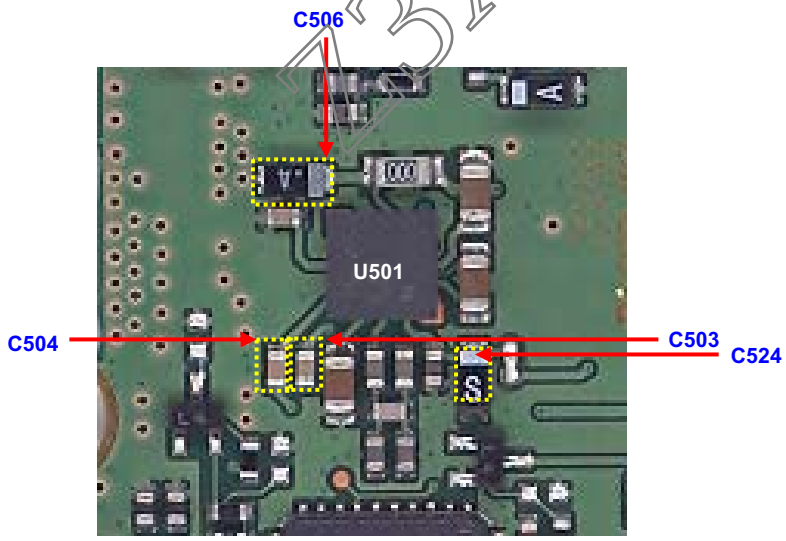
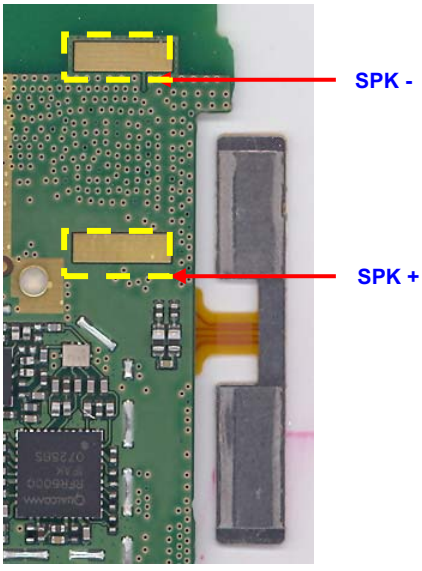
4.3.4 AUDIO - Speaker Trouble

Circuit Diagram



Test point





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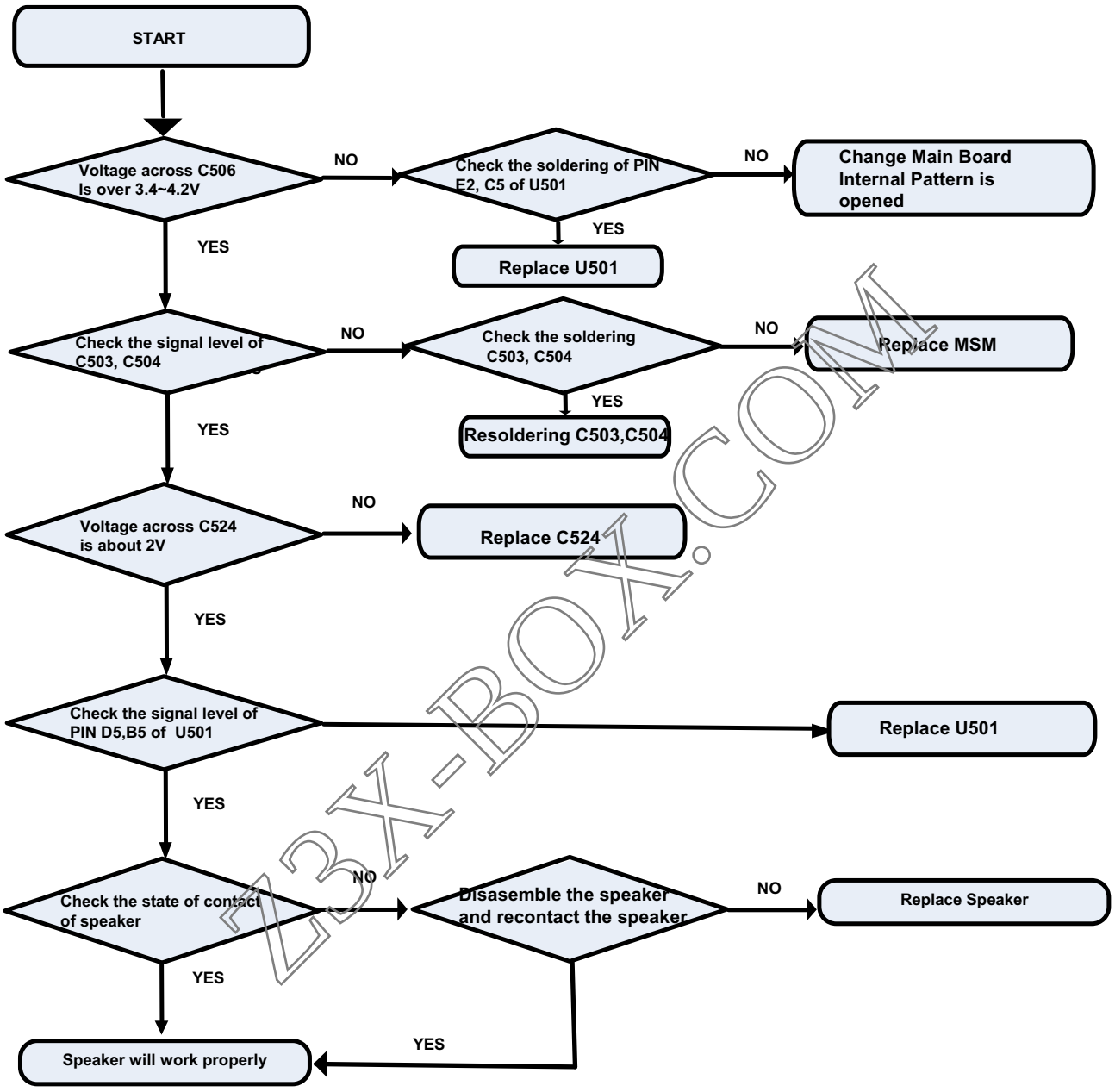
Checking Flow

SETTING : “Melody on” at sounds of test menu.



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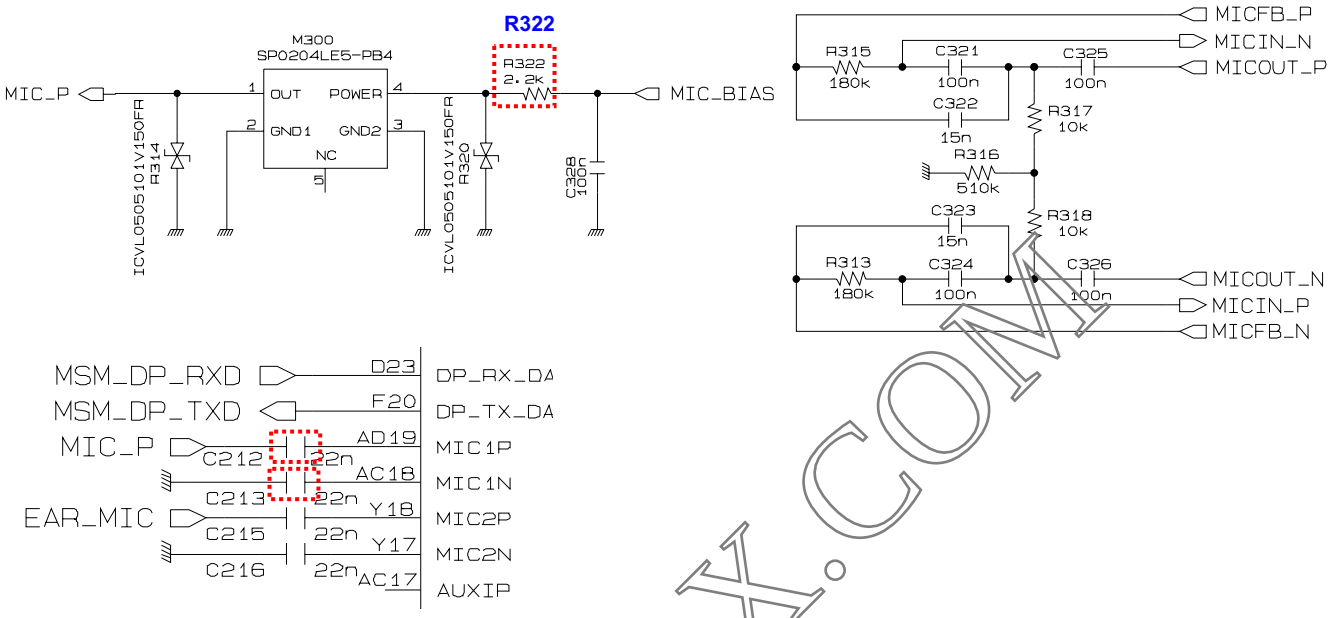
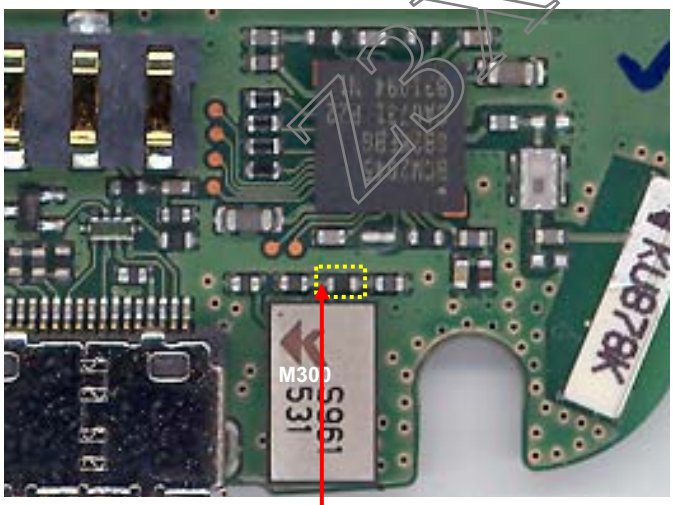
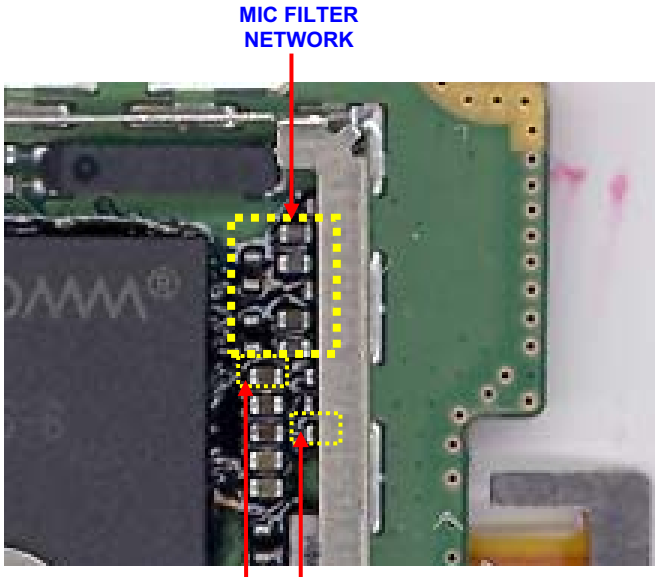
4.3.5 AUDIO - MIC Trouble

Circuit Diagram



Test point





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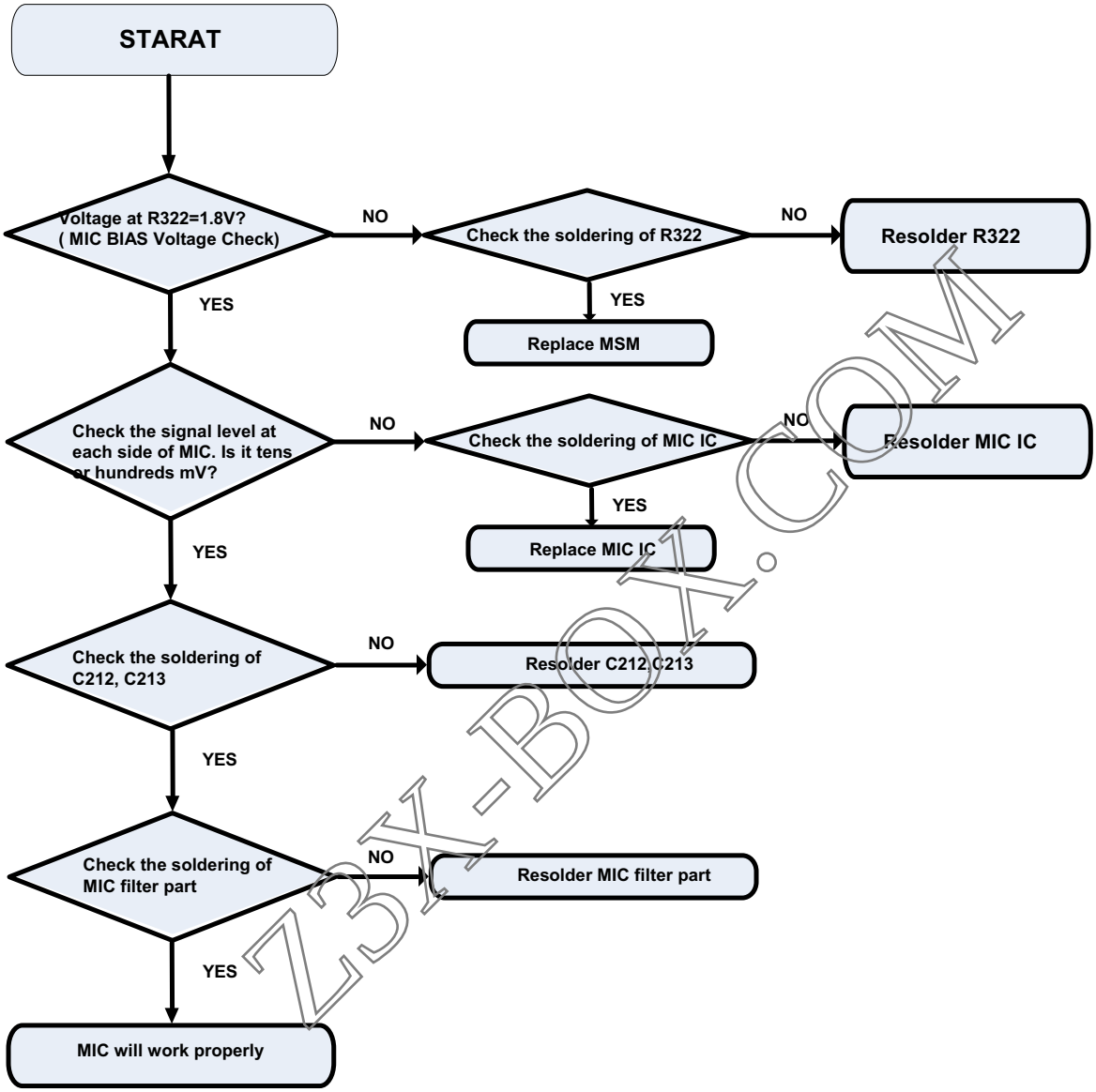
Checking Flow

SETTING : After initialize 5515C, Test Cellular or US PCS



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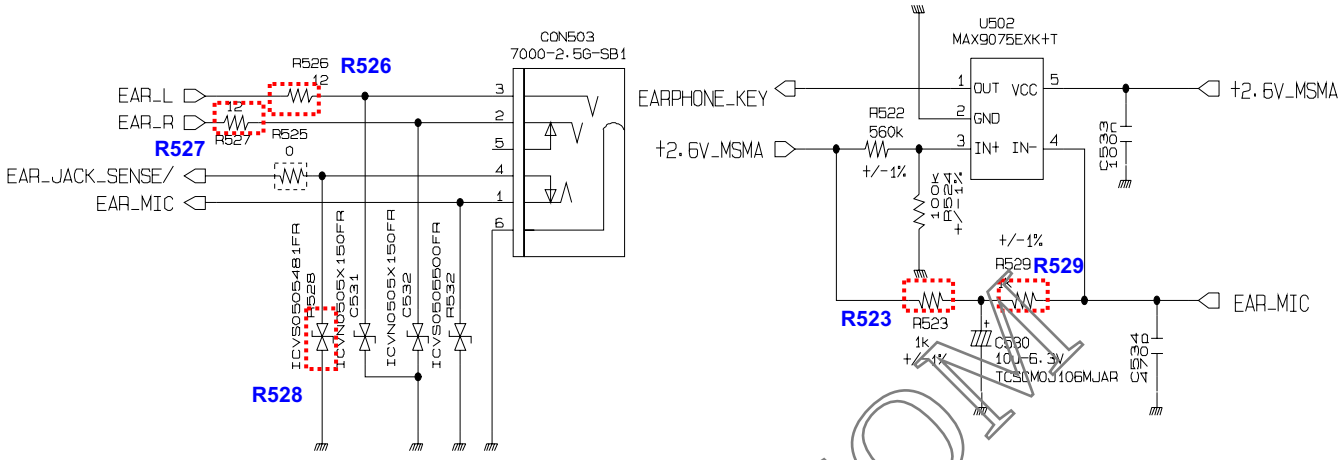
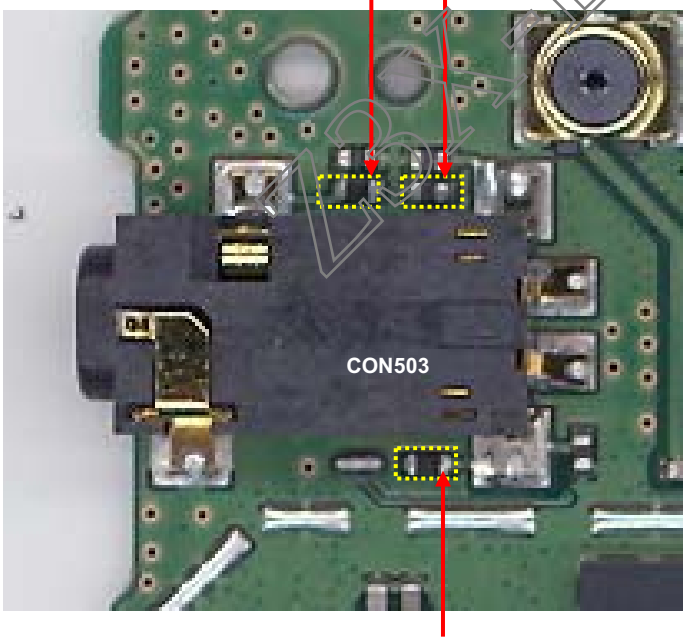
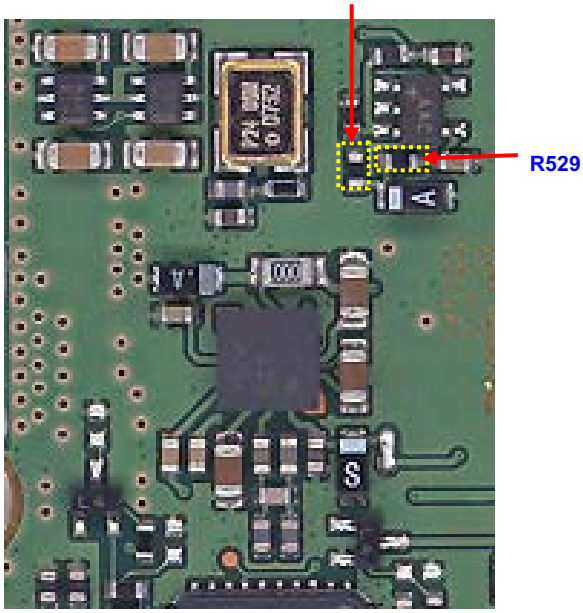
4.3.6 AUDIO - Earphone Trouble

Circuit Diagram



Test point





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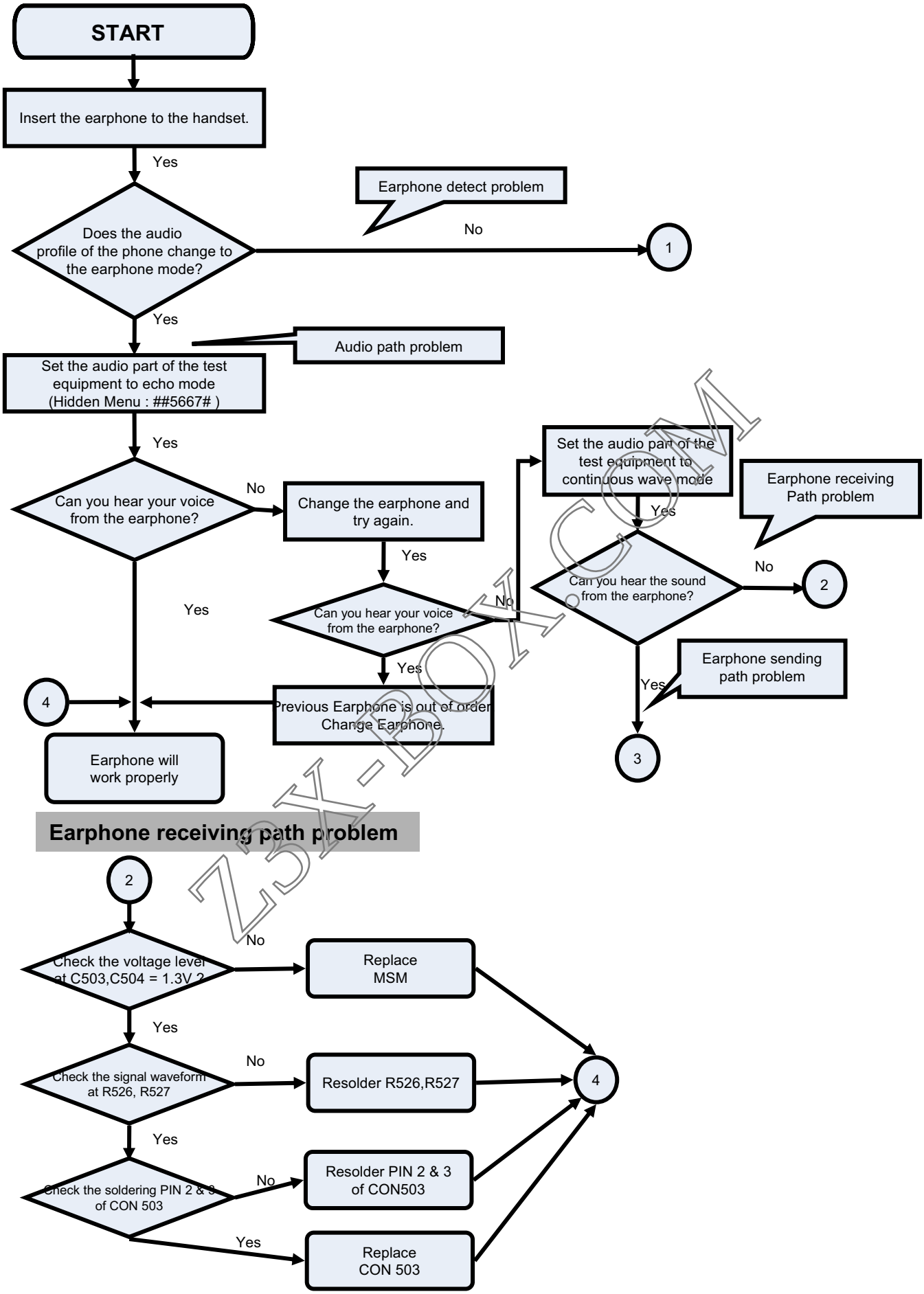
Checking Flow



Earphone receiving path problem

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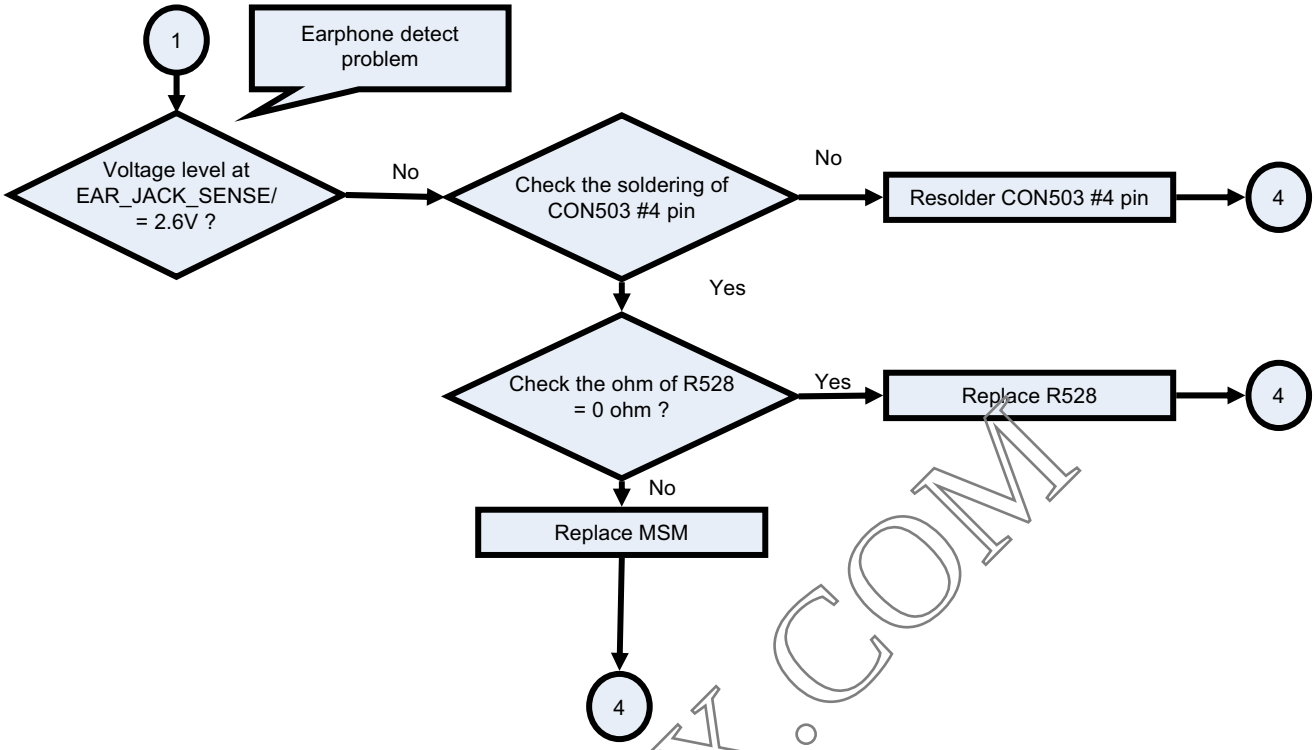
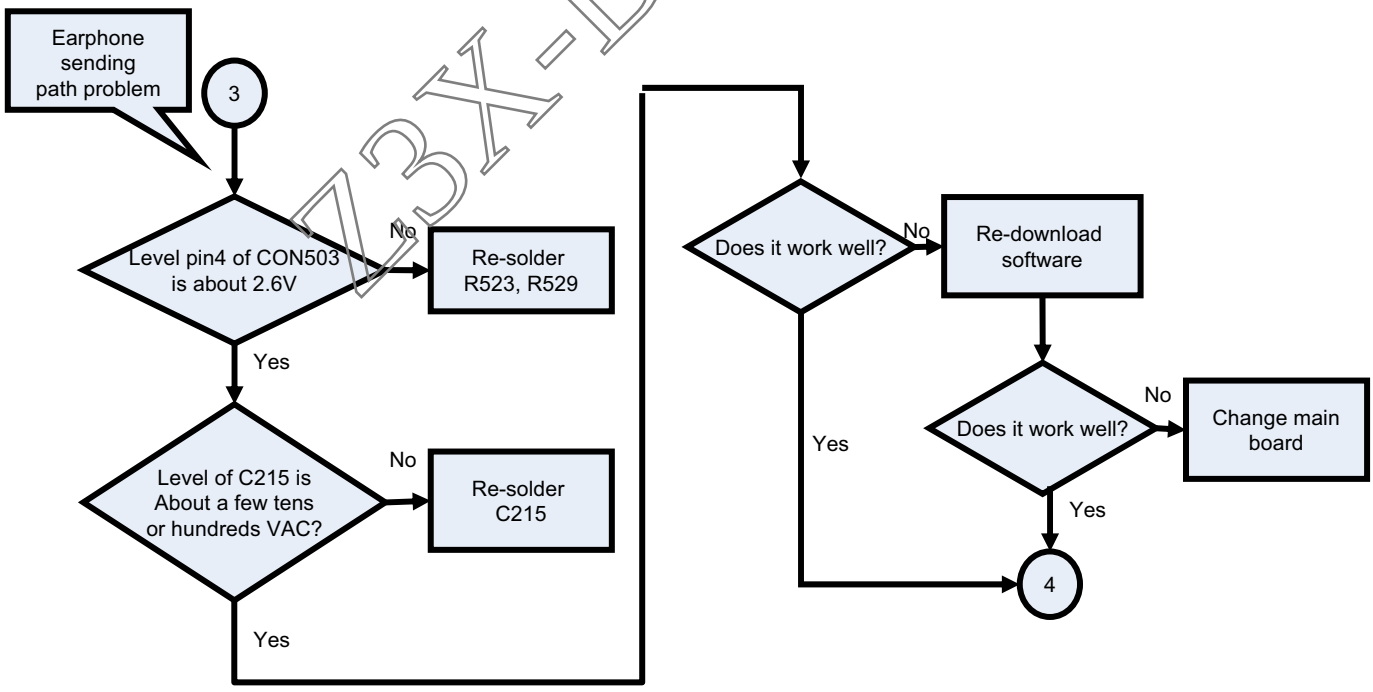
Earphone detect problem



Earphone sending path problem



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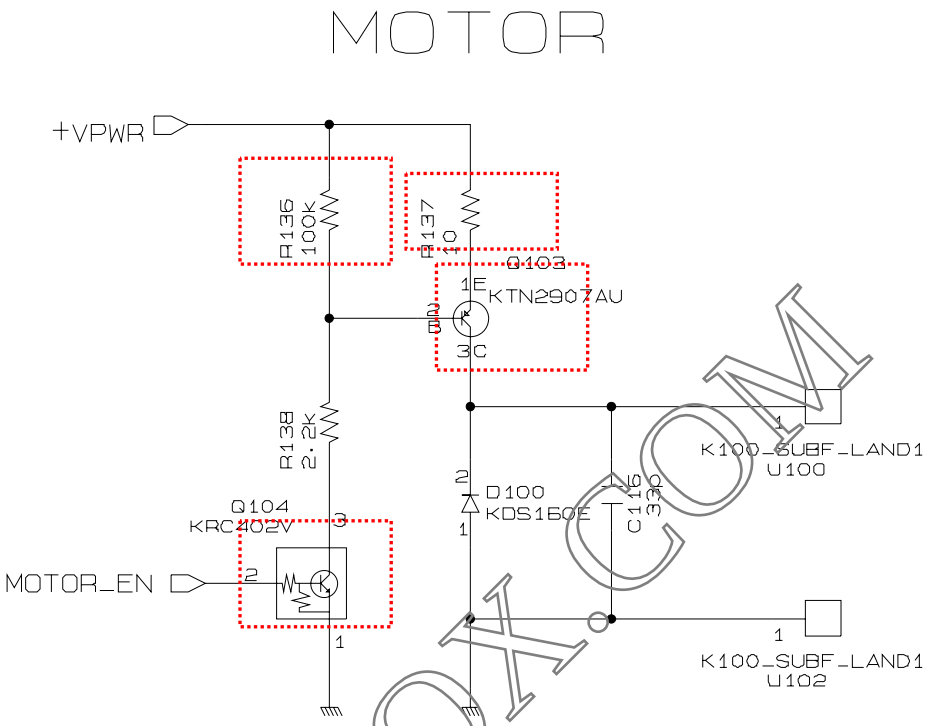
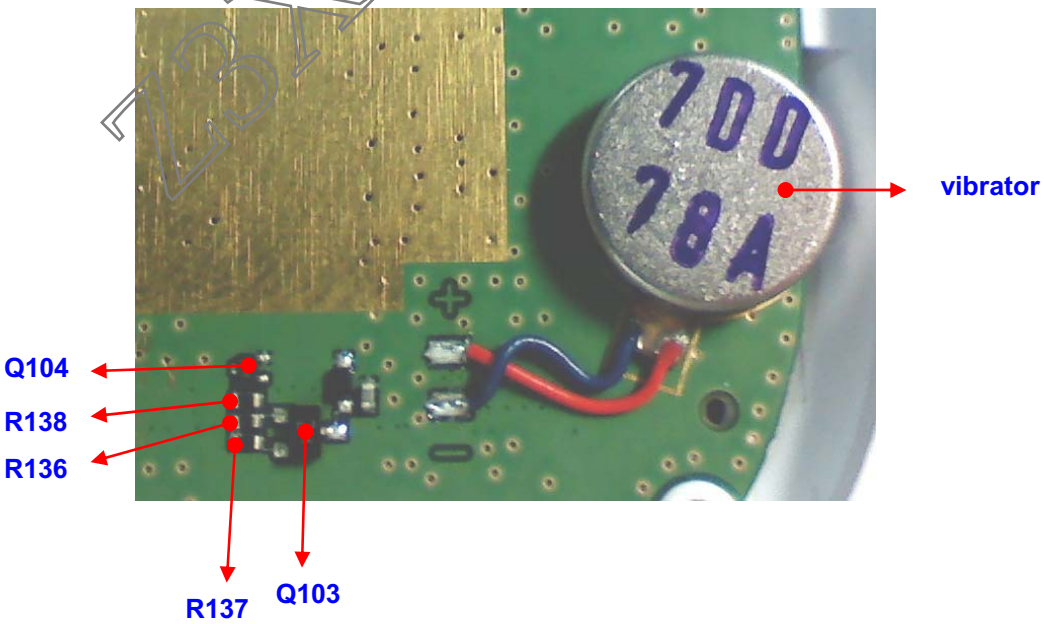
4.3.7 VIBRATOR TROUBLE

Circuit Diagram



Test point



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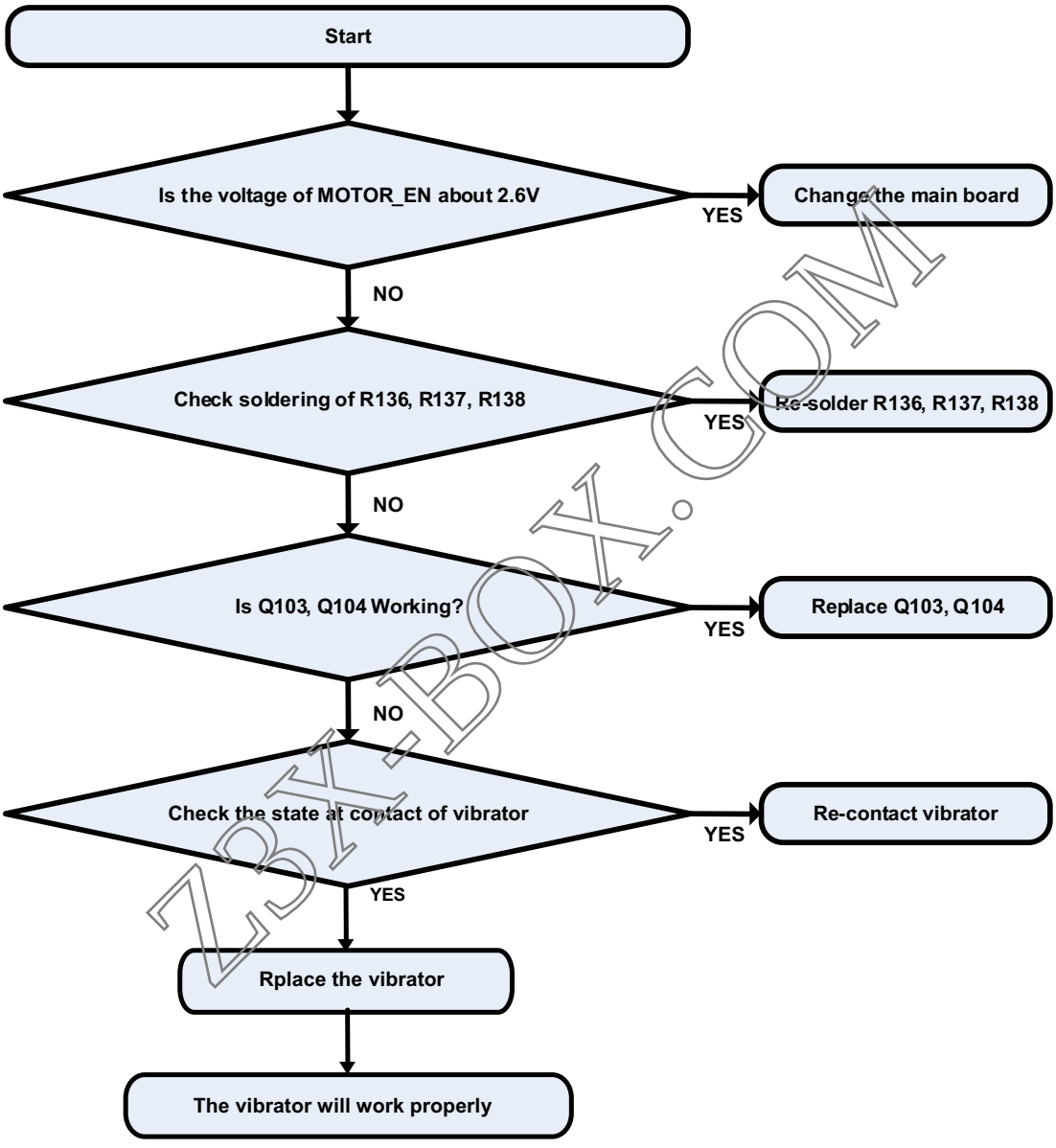
Checking Flow

➢ Setting: “ON” at the motor test of “test mode”



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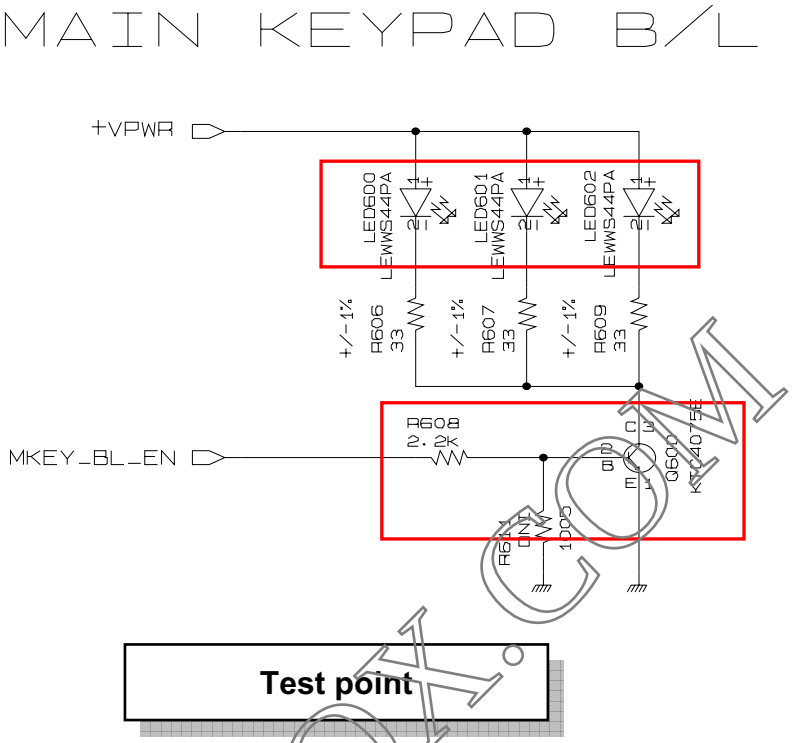
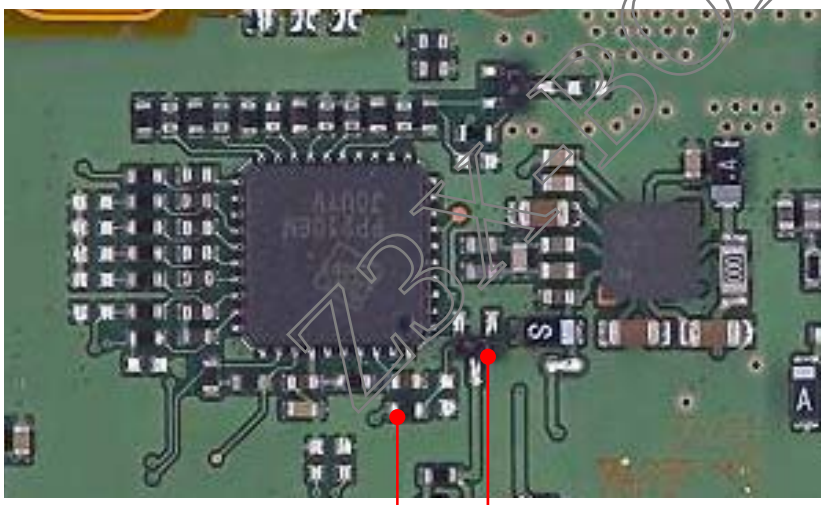
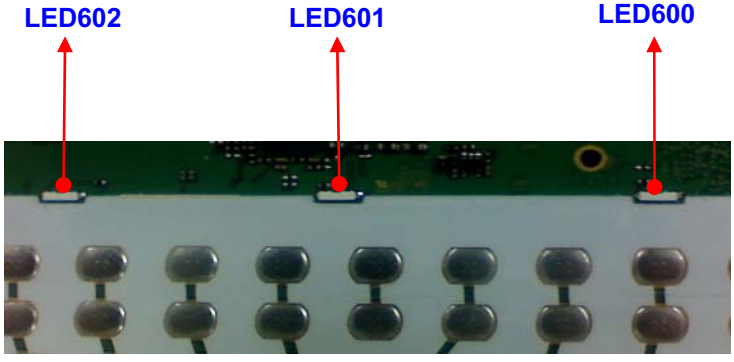
4.3.8 QWERTY KEY BACKLIGHT LED TROUBLE

Circuit Diagram



Test point





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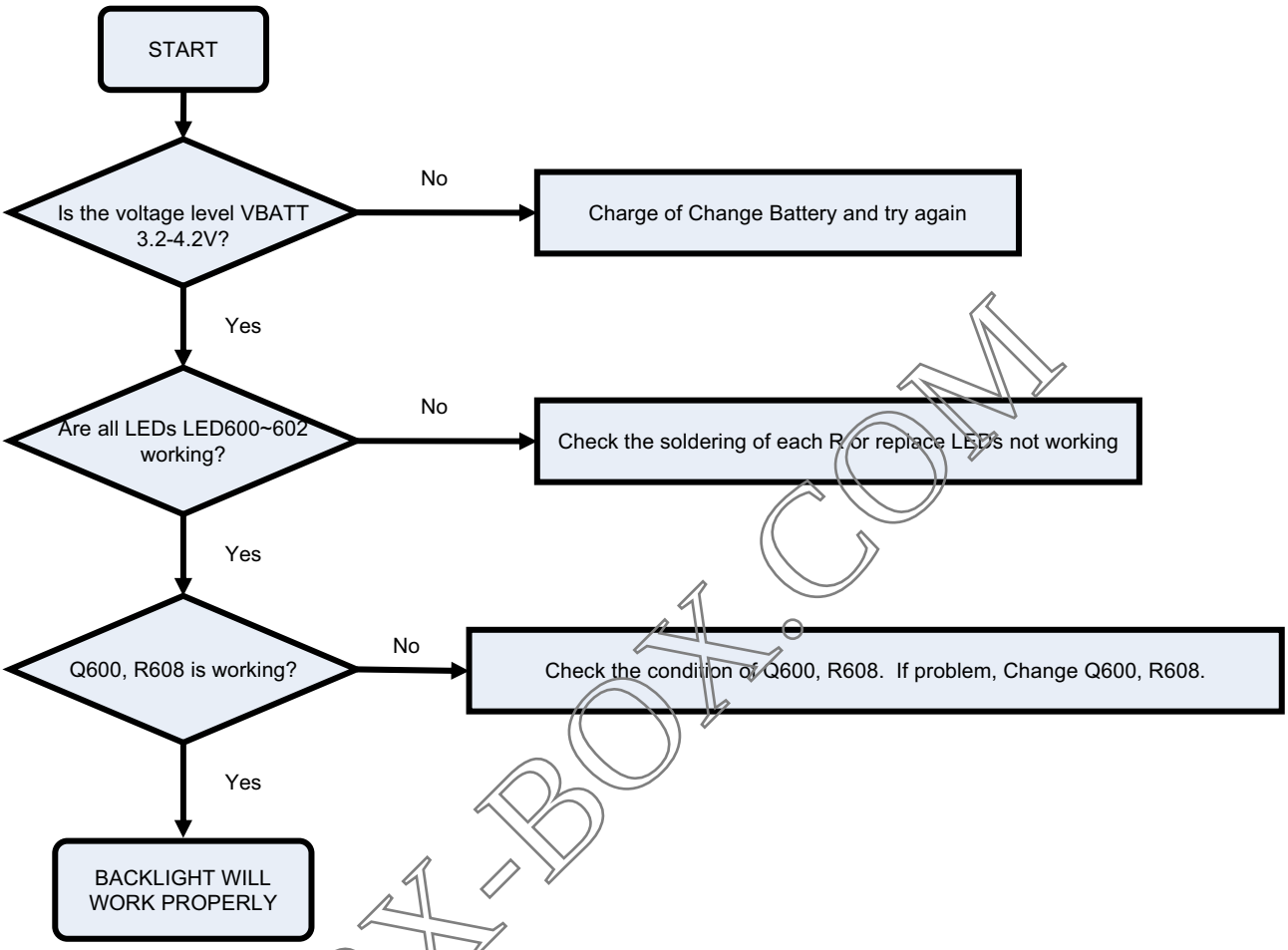
Checking Flow



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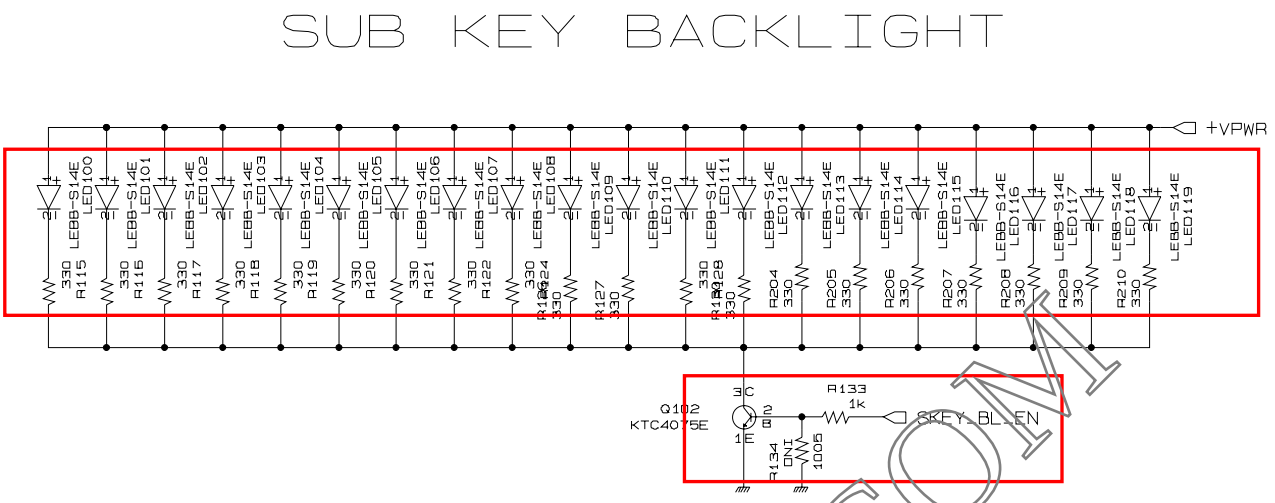
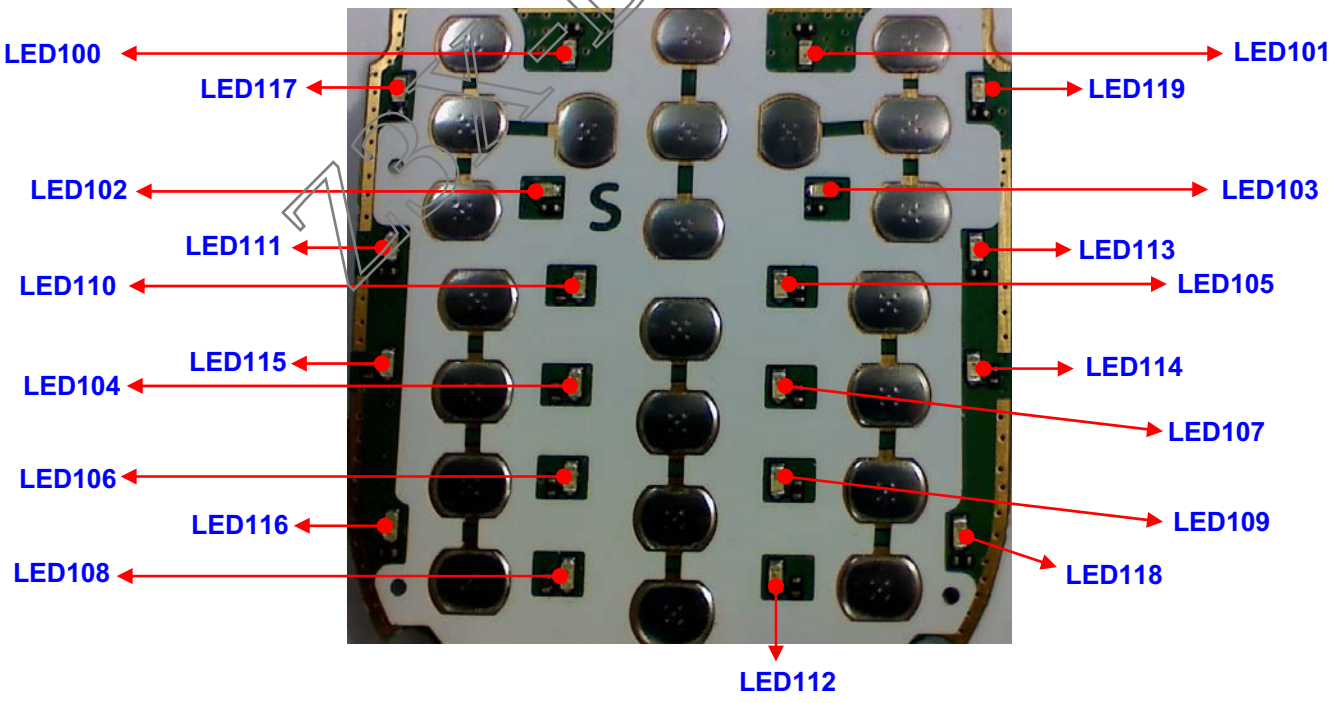
4.3.9 KEY BACKLIGHT LED TROUBLE

Circuit Diagram



Test point



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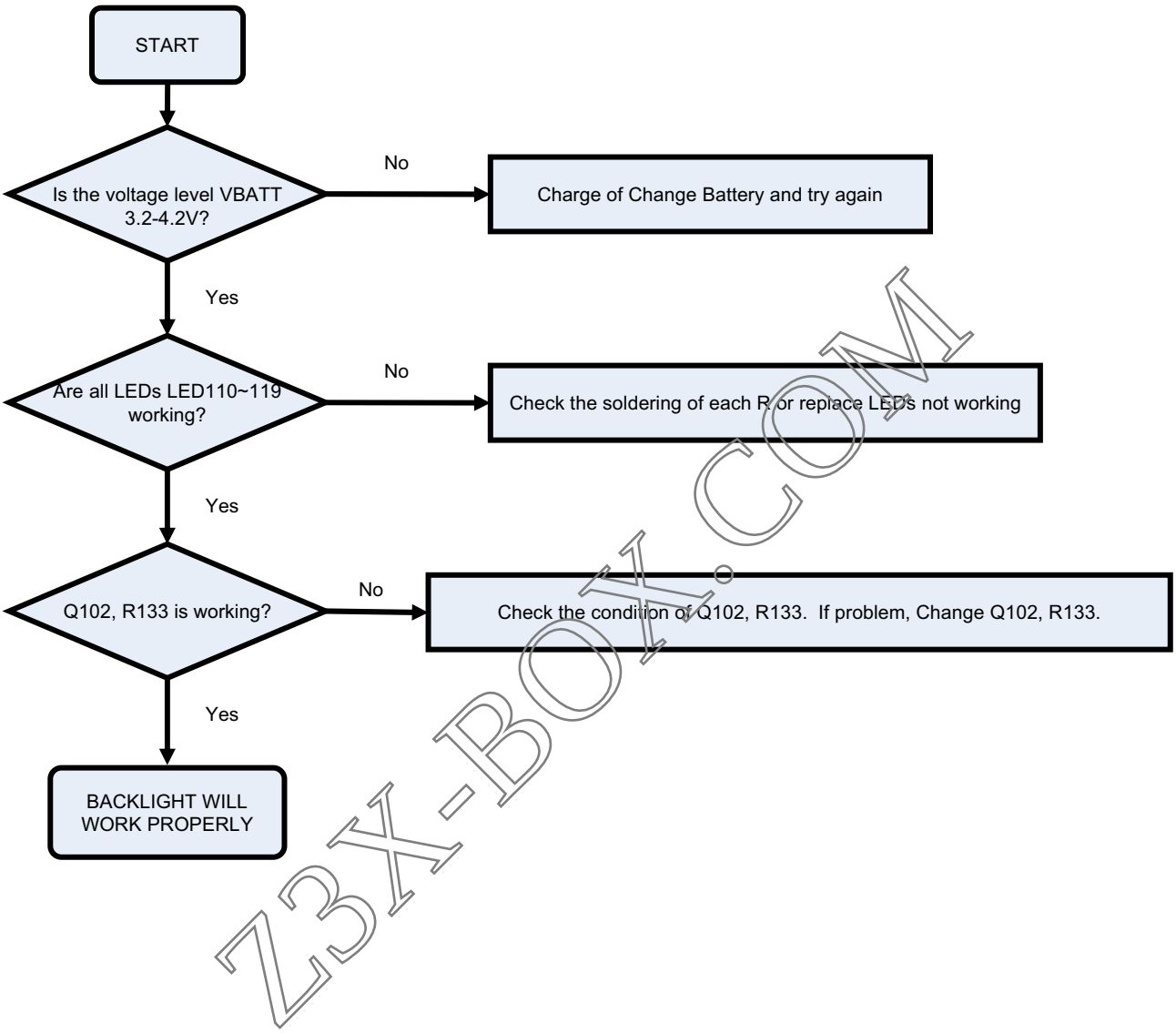
Checking Flow



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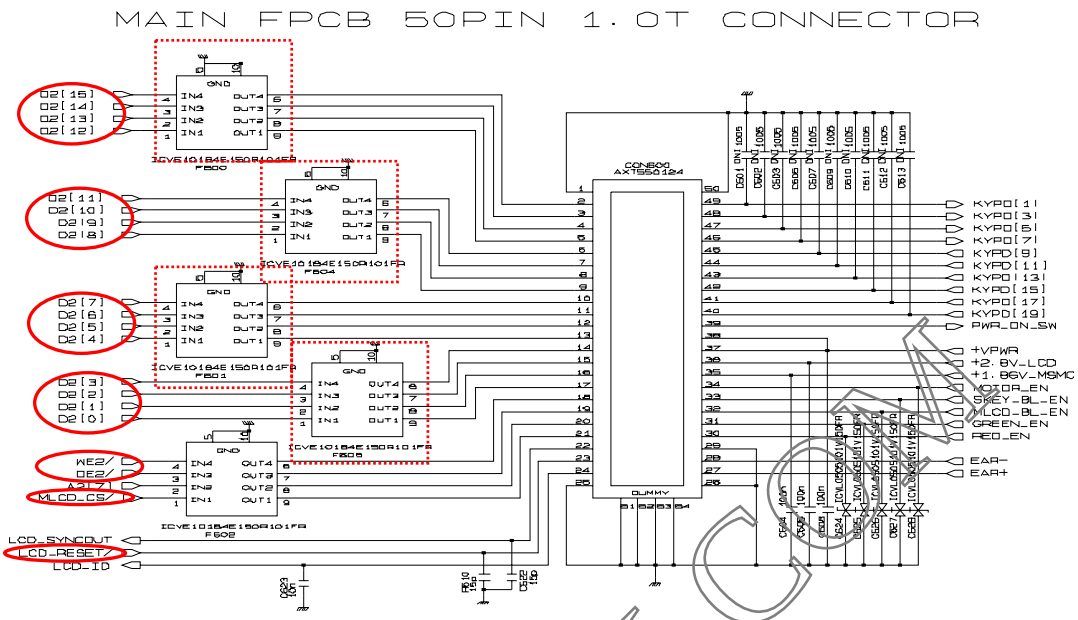
4.3.10 LCD TROUBLE

Circuit Diagram



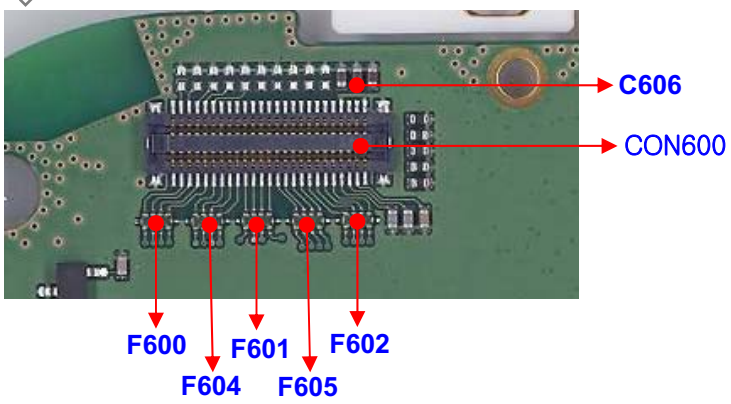
Test point

- **LCD Control signals**

  From MSM : D(0:15), LCD_RESET/, MLCD_CS/, WE2/,OE2

- **Check point**

  - The assembly status of the LCD Module
  - The Soldering of connector
  - The Soldering of EMI Filters
  - MAIN FPCB



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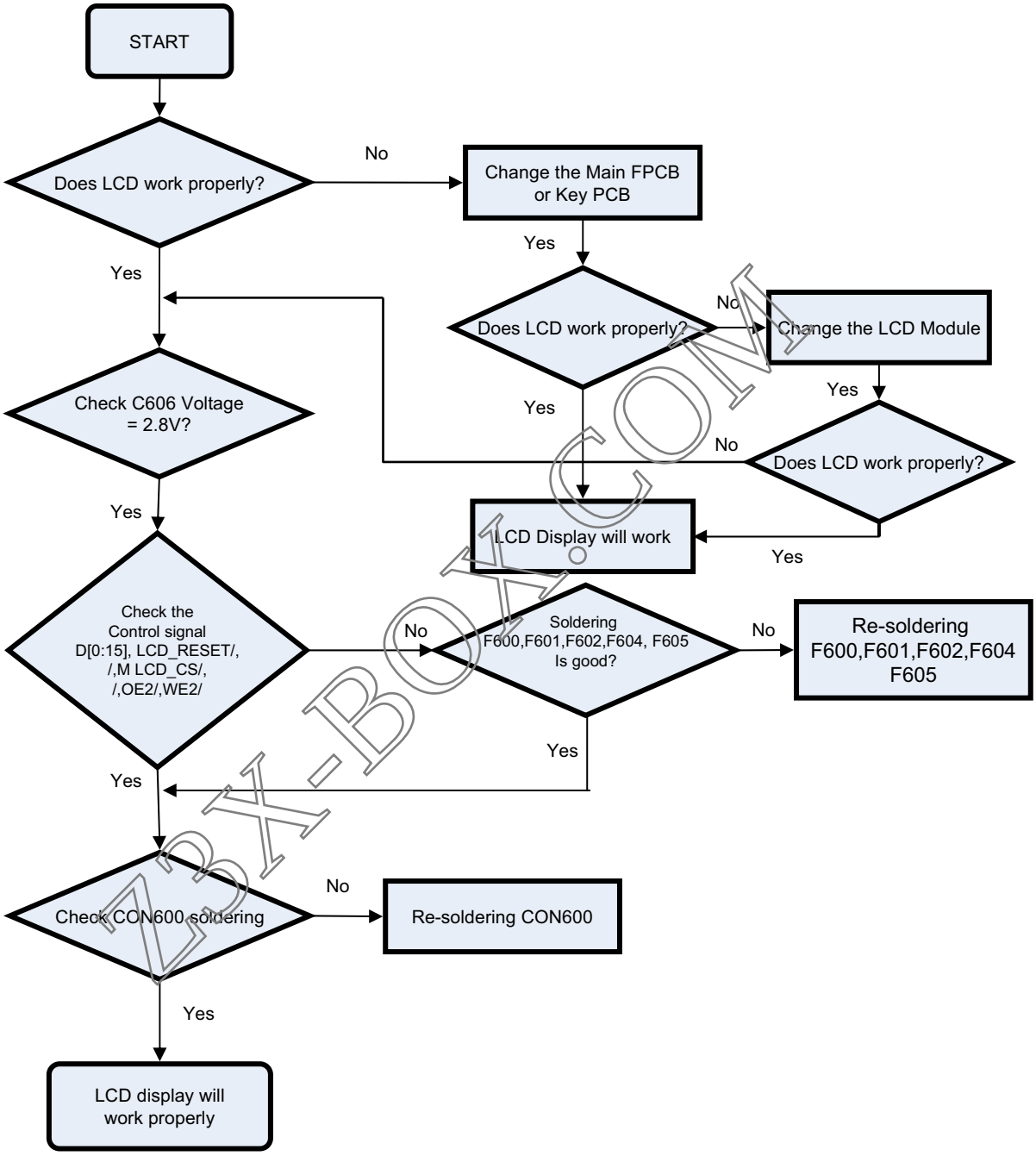
Checking Flow



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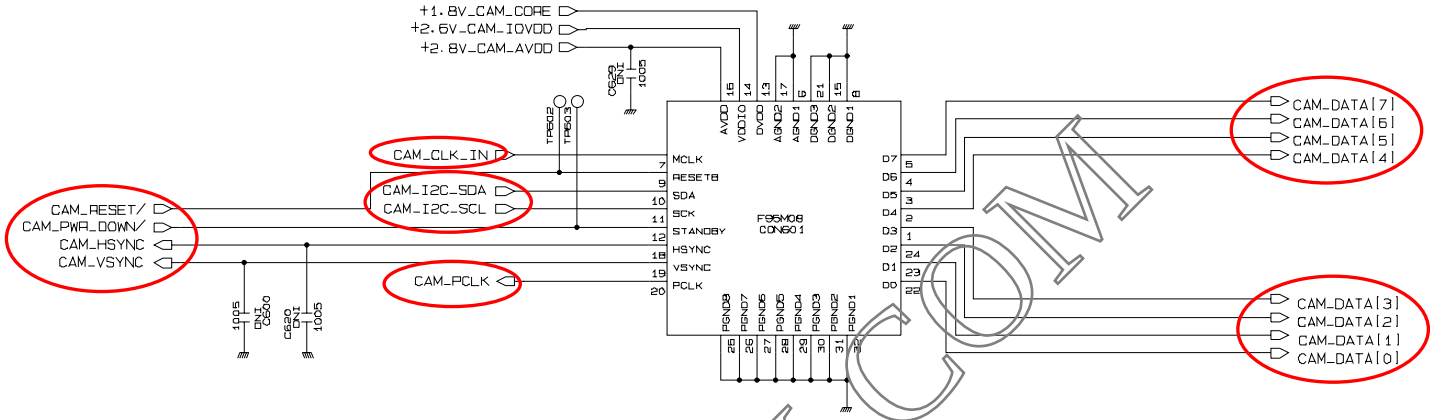
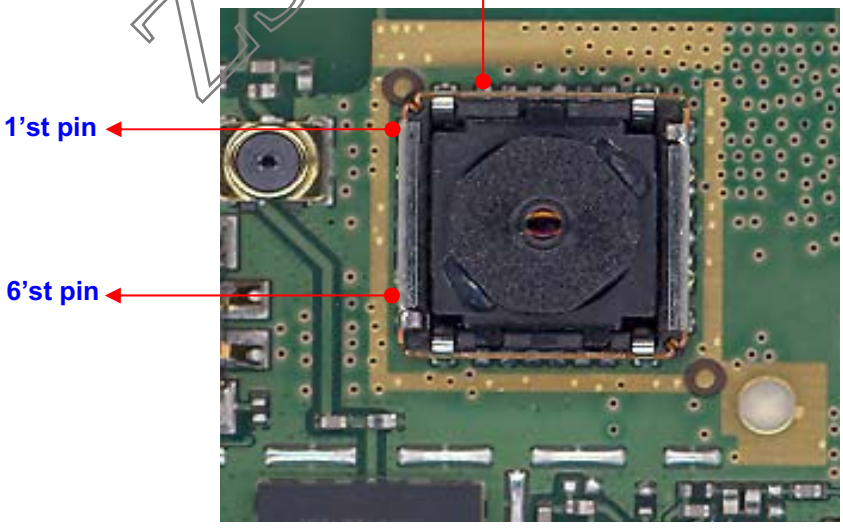
4.3.11 CAMERA TROUBLE

Circuit Diagram



Test point



Un-clockwise

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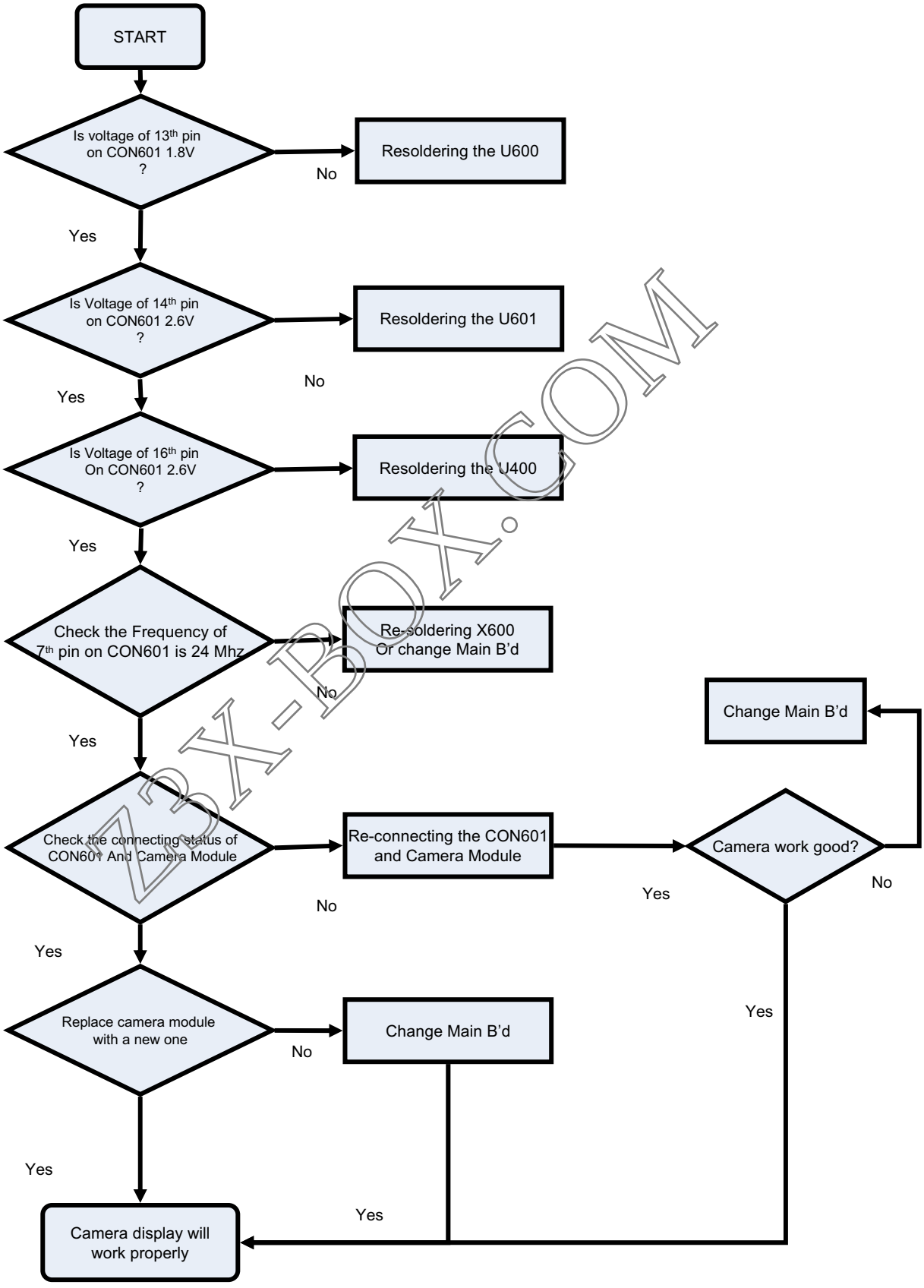
Checking Flow



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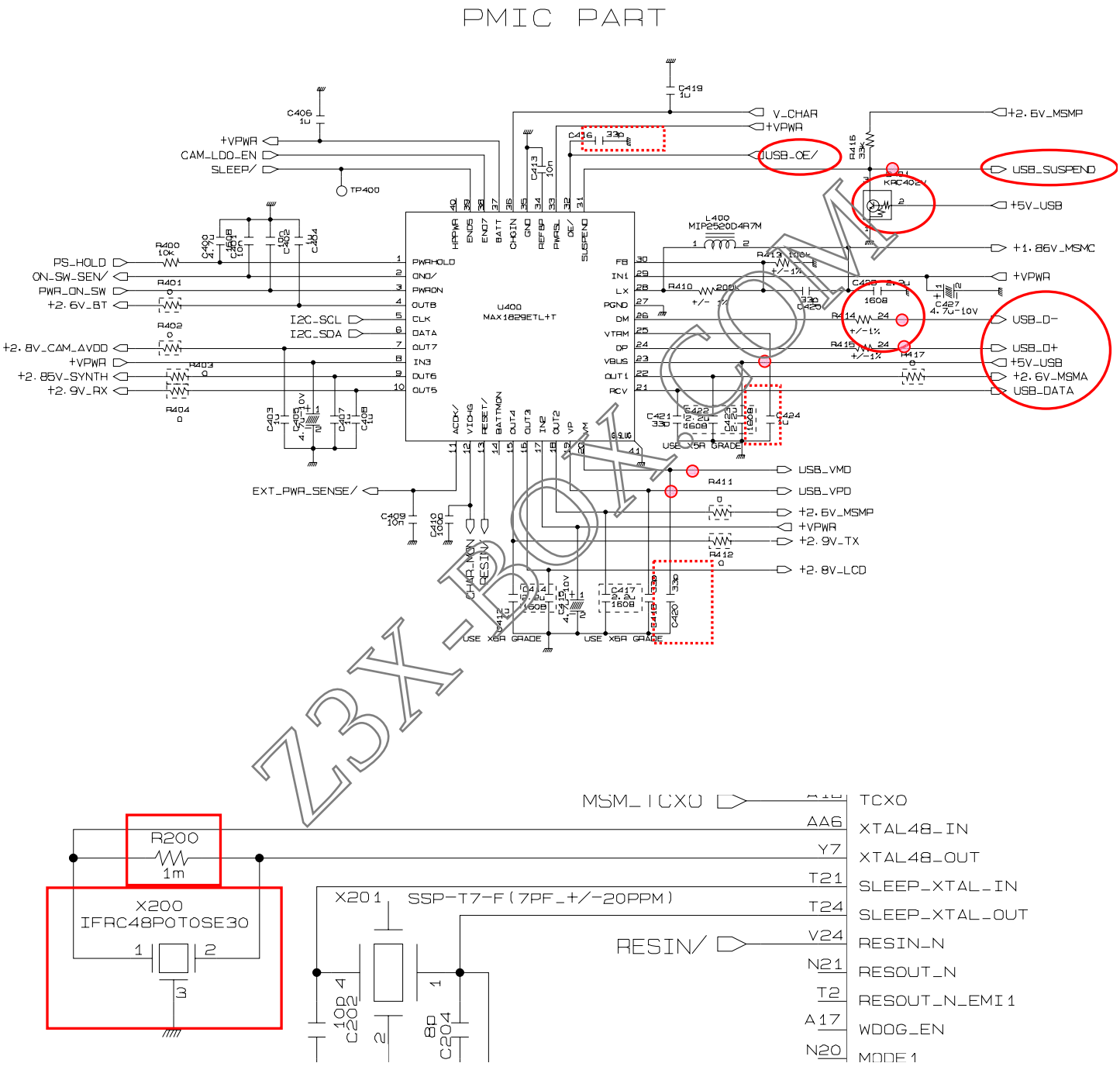
4.3.12 USB TROUBLE

Circuit Diagram



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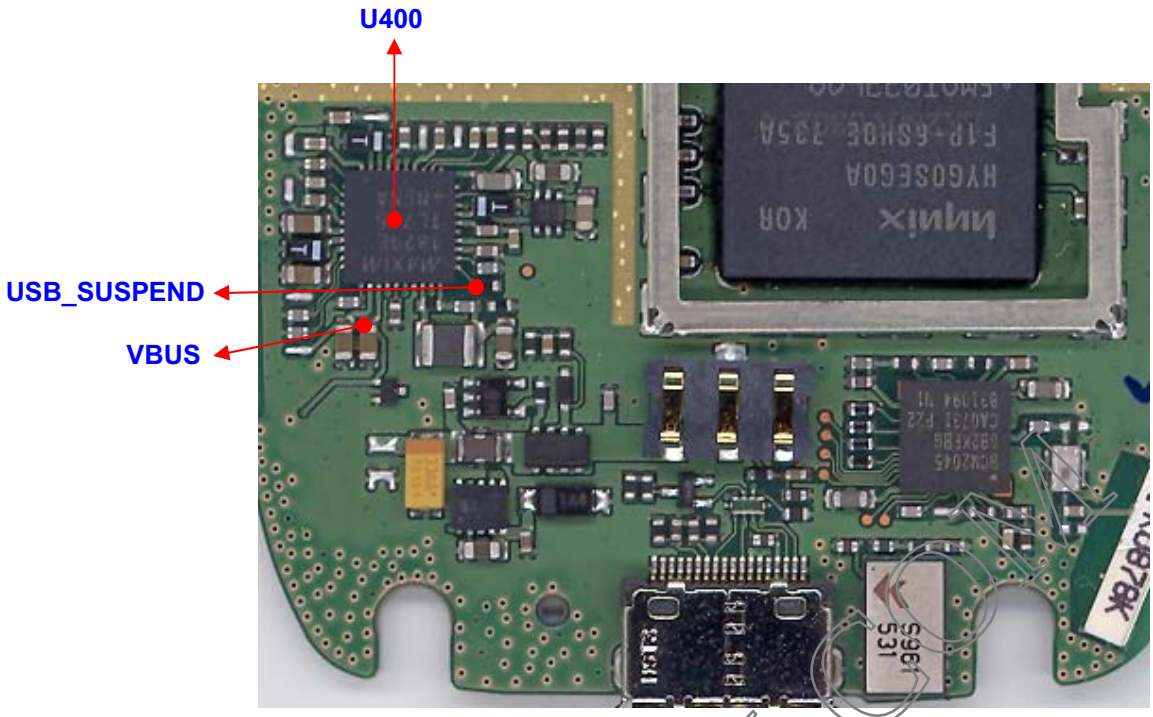
Test point



USB wave form

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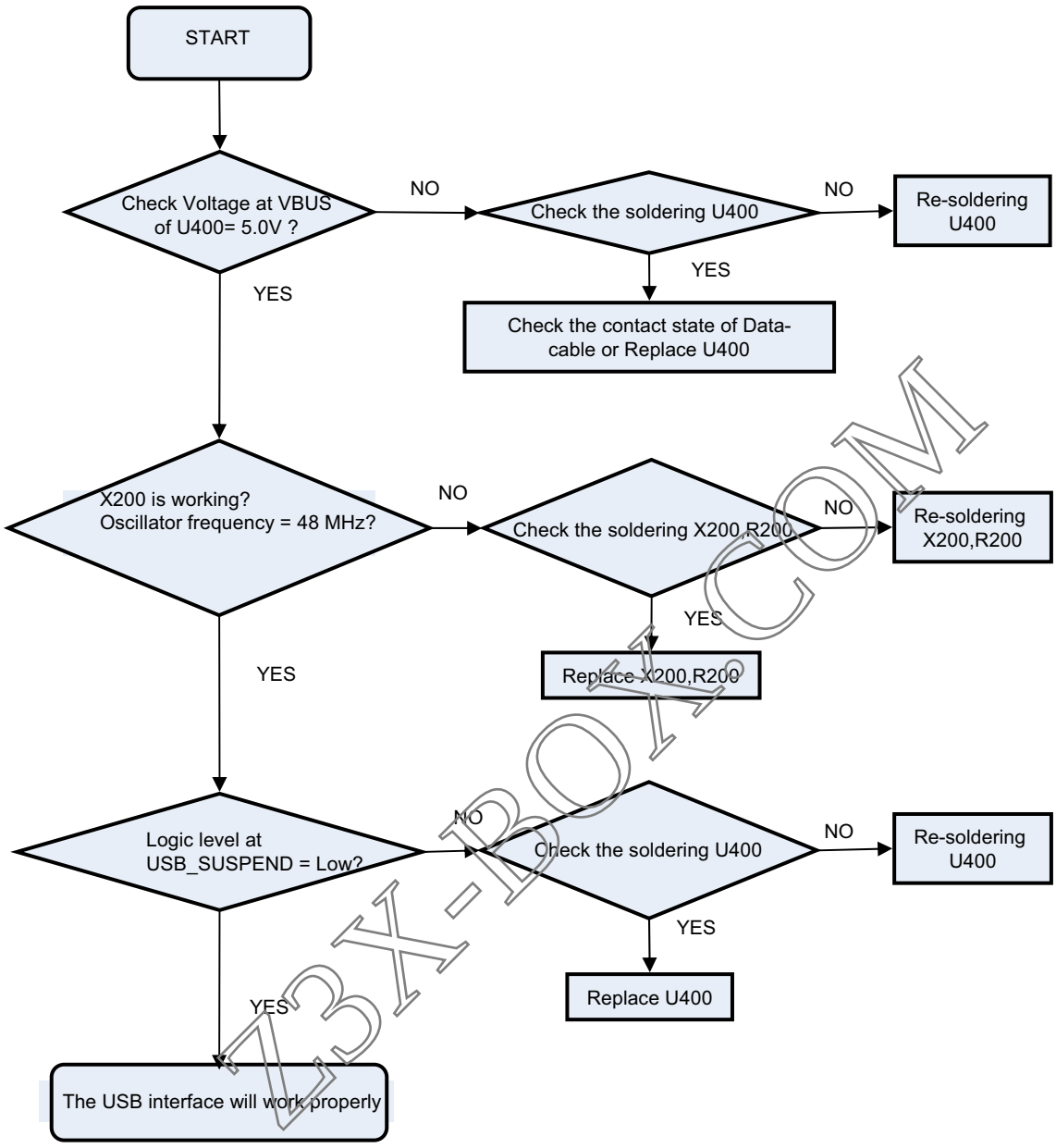
Checking Flow



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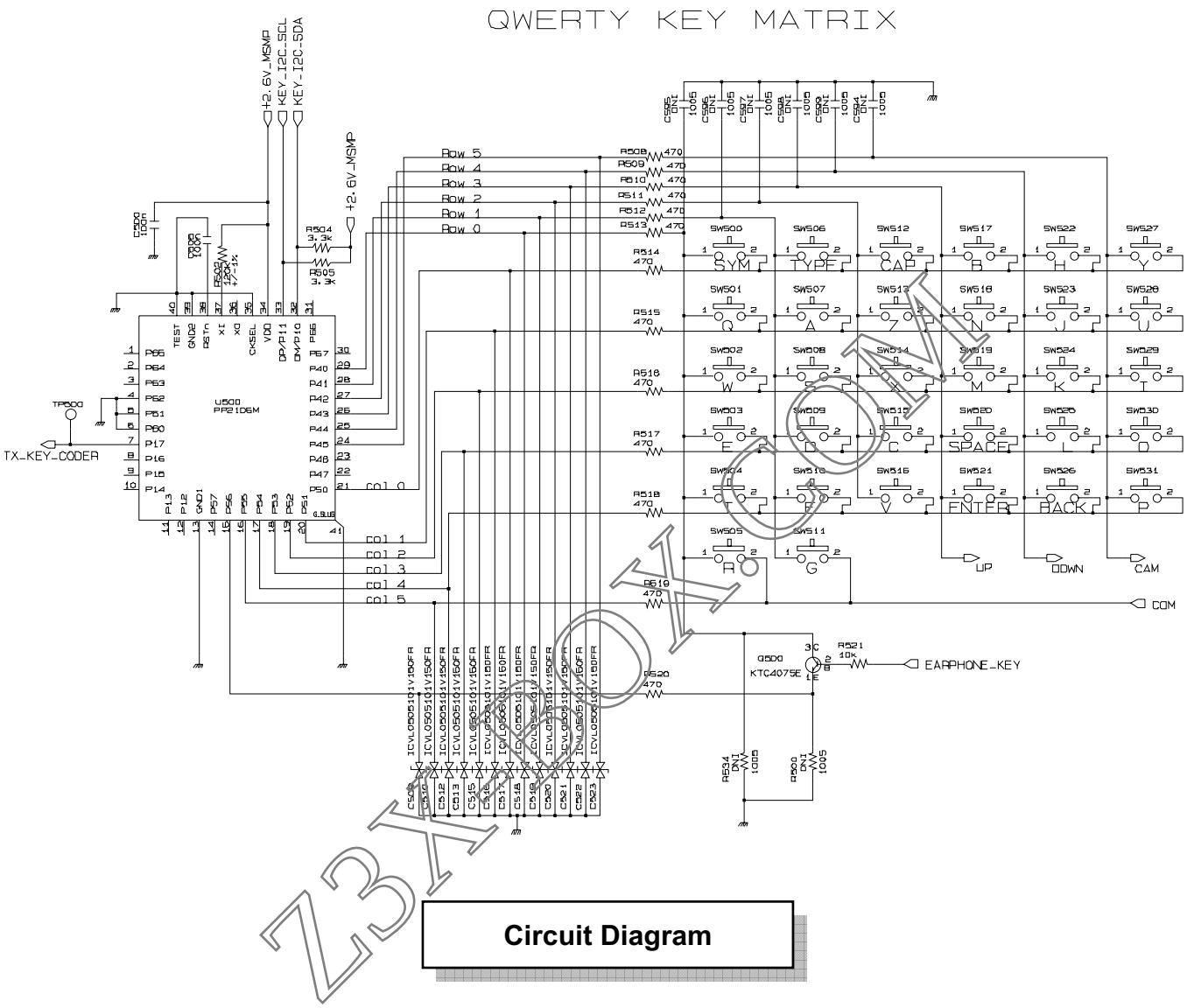
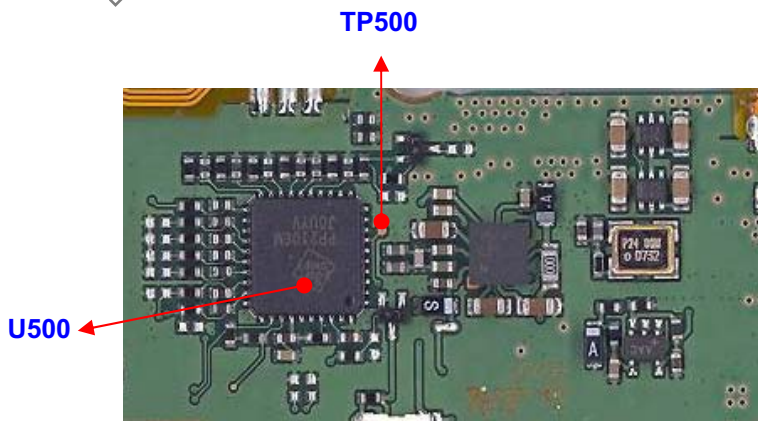
4.3.13 Qwerty Key TROUBLE

Test point



Circuit Diagram



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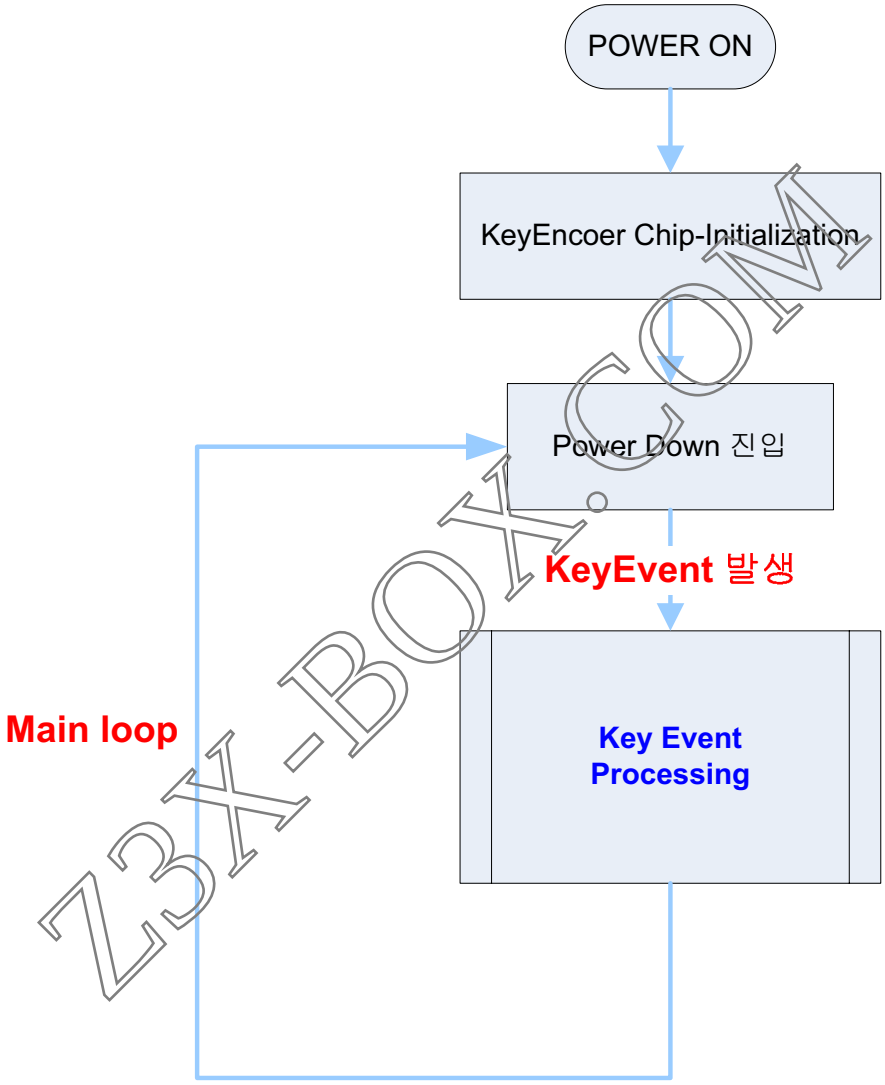
Qwerty Key Processing Diagram



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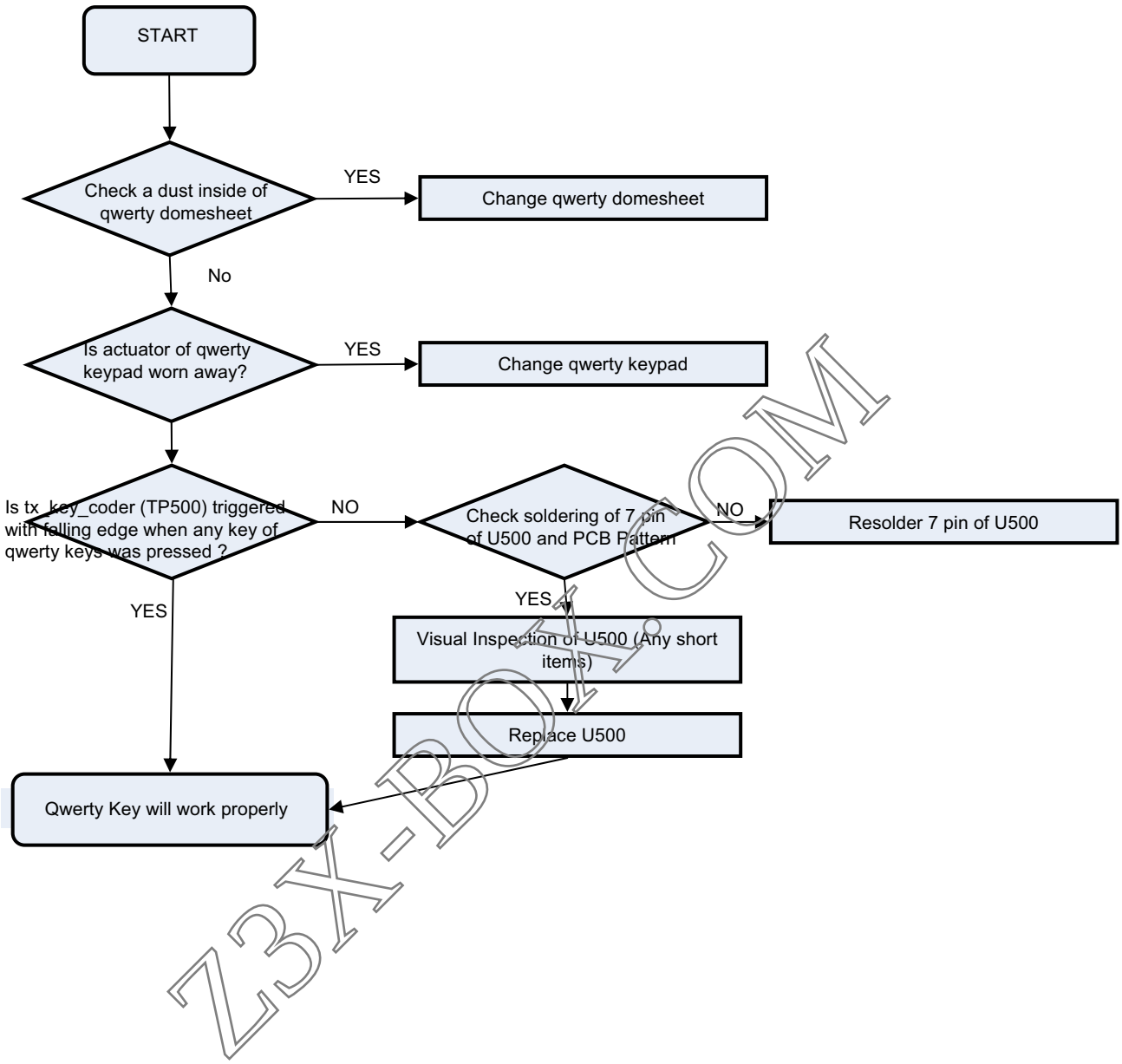
Checking Flow



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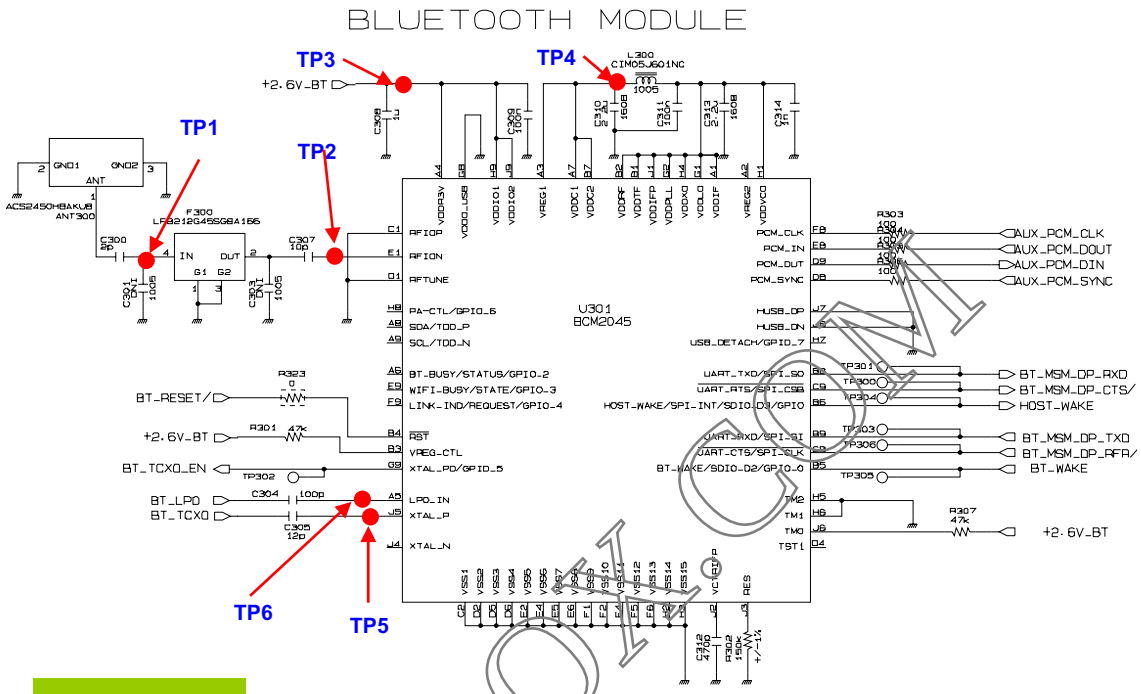
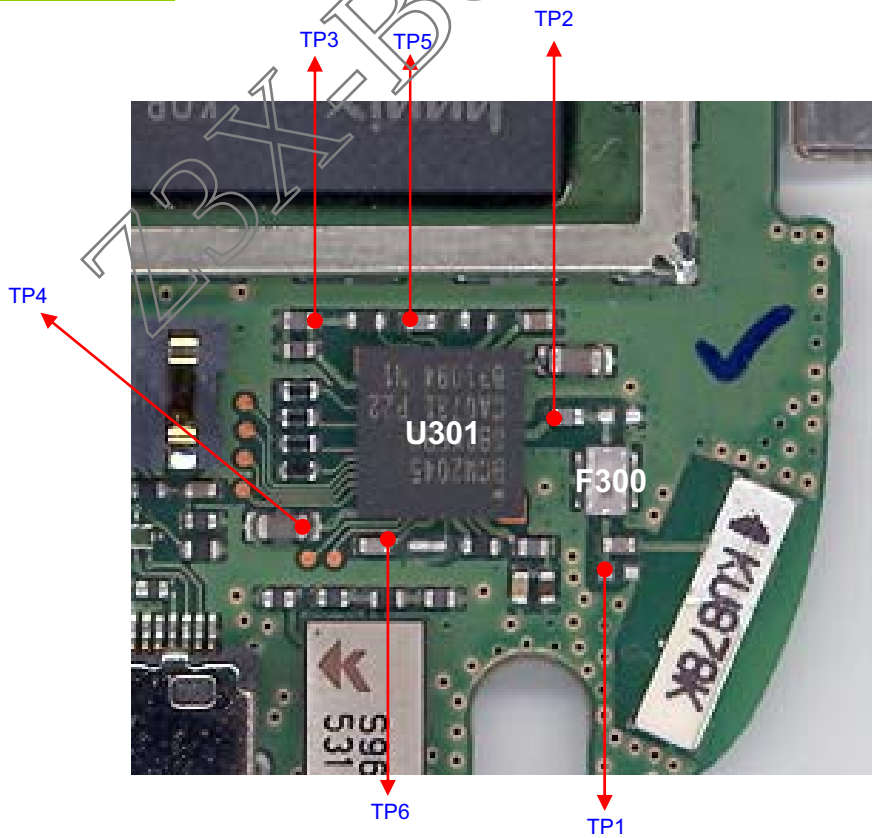
4.4 Bluetooth Part Trouble

4.4.1 Bluetooth Block

Circuit Diagram



Test Point



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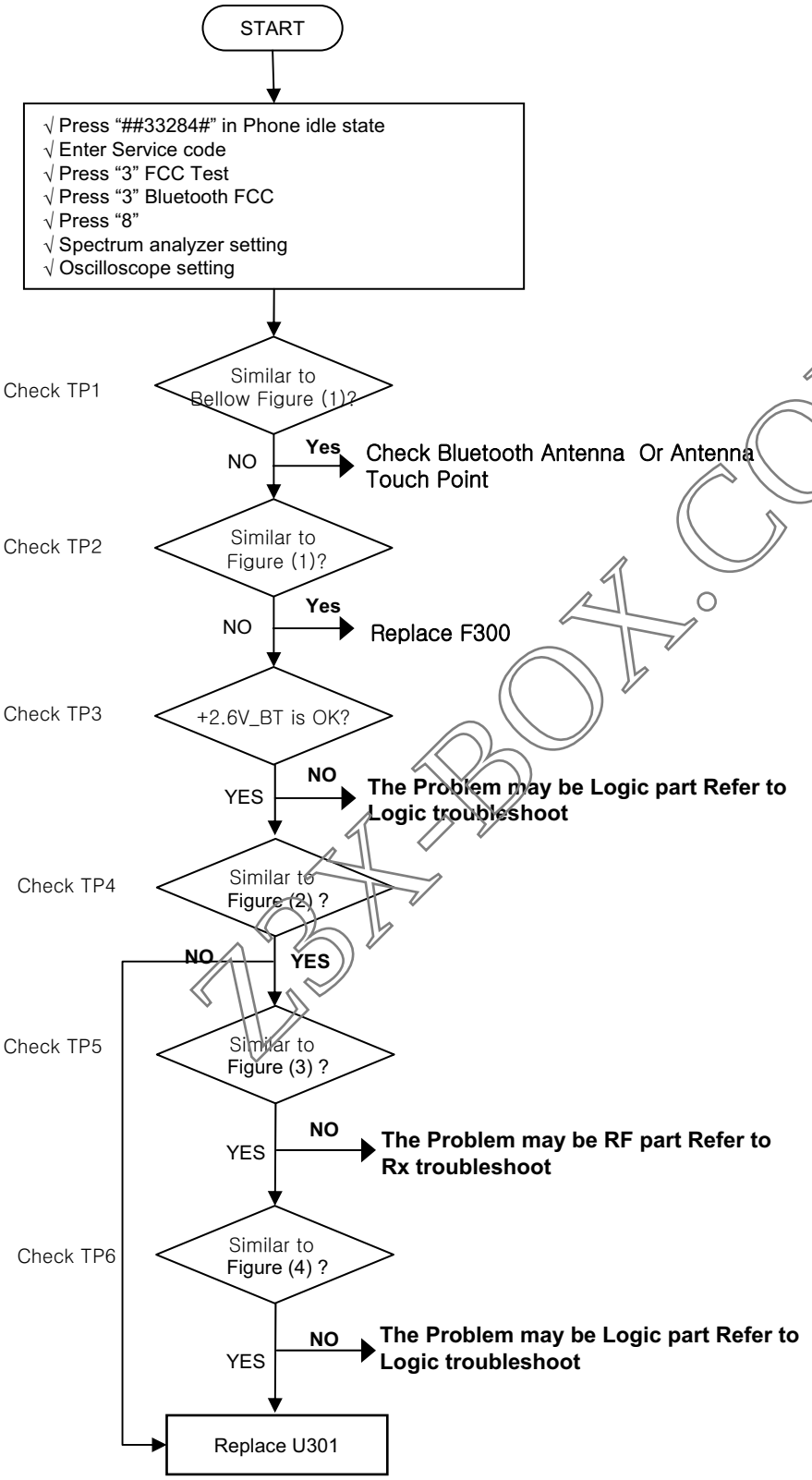
4.4.1.1 Checking Bluetooth In/Out and Power supply Circuit

Checking Flow



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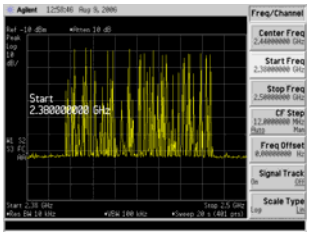
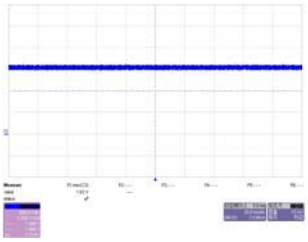
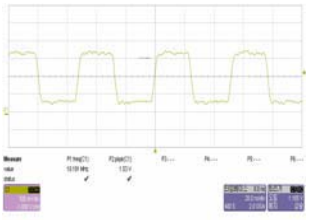


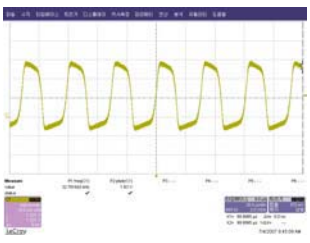
<Figure 2>



<Figure 3>



<Figure 4>



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CHAPTER 5. Safety

▣ IMPORTANT

Read This Information Before Using Your Hand-Held Portable Cellular Telephone

First introduction in 1984, the hand-held portable Cellular telephone is one of the most exciting and innovative electronic products ever developed.

With it you can stay in contact with your office, your home, emergency service, and others. For the safe and efficient operation of your phone, observe these guidelines.

Your Cellular phone is a radio transmitter and receiver. When it is ON, it receives and also sends out radio frequency (RF) energy. The phone operates in the frequency range of 824 MHz to 894 MHz and employs commonly used frequency modulation (FM) techniques. When you use your phone, the Cellular system handling your calls controls the power level at which your phone transmits. The power level can range from 0.006 of a watt to .6 of a watt.

▣ Exposure to Radio Frequency Energy

In 1991 the Institute of Electrical and Electronics Engineers (IEEE), and in 1992 the American National Standards Institute (ANSI) updates the 1982 ANSI Standard for safety levels with respect to human exposure to RF energy. Over 120 scientists, engineers, and physicians from universities, government health agencies, and industry, after reviewing the available boy of research, developed this updated Standard. In March, 1993, the US Federal Communications Commission (FCC) proposed the adoption of this updated Standard.

The design of your phone complies with this updated Standard. Of course, if you want to limit RF exposure even further than the updated ANSI Standard, you may choose to control the duration of your calls and operation your phone in the most power efficient manner.

▣ Efficient Phone Operation

For your phone to operate at the lowest power level, consistent with satisfactory call quality, please observe the following guidelines:

If your phone has an extendable antenna, extend it fully. Some models allow you to place a call with the antenna retracted. However, your phone operates more efficiently with the antenna fully extended.

Hold the phone as you would any other telephone. While speaking directly into the mouthpiece, position the antenna up and over your shoulder.

Do not hold the antenna when the phone is “IN USE”. Holding the antenna affects call quality and may cause the phone to operated at a higher power level than needed.

▣ Antenna Care and Replacement

Do not use the phone with a damaged antenna. If a damaged antenna comes into contact with skin, a minor bum may result. Replace a damaged antenna immediately. Consult your manual to see if you may change your antenna yourself. If so, use only a manufacture approves antenna. Otherwise, take your phone to a qualifies service center for repair.

Use only the supplied or approved antenna. Non-approved antennas, modifications, or attachments, could impair call quality, damage the phone, and violate FCC regulations.

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▣ Driving

Check the laws and regulations on the use of Cellular telephones in the areas where you drive. Always obey them.
Also, when using your phone while driving, please:
Give full attention to the driving. Use hands-free operation, if available, and pull off the road and park before making or answering a call if driving conditions require.

▣ Electronic Devices

Most modem electronic equipment is shielded from RF energy. However, RF energy from Cellular telephones may affect inadequately shielded electronic equipment.
RF energy may effect improperly installed or inadequately shielded electronic operating and entertainment system in motor vehicles. Check with the manufacturer or its representative to determine if these systems are adequately shielded from external RF energy. You should check with the manufacturer of any equipment that has been added to your vehicle.
Consult the manufacturer of any personal medical devices (such as pacemakers, hearing aids, etc.) to determine if they are adequately shielded from external RF energy.
Turn your phone OFF in health care facilities. When any regulations posted in the areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

▣ Aircraft

Turn your phone OFF before boarding any aircraft.
Use it on the ground only with crew permission. Do not use it in the air.
To prevent possible interference with aircraft systems, US Federal Aviation Administration (FAA) regulations require you to have permission from a crew member to use your phone while the plane is on the ground. Using your phone while the plane is in the air.

▣ Children

Do not allow children to play with your phone. It is not a toy. Children could hurt themselves or others (by poking themselves or others in the eye with the antenna, for example). Children also could damage the phone, or make calls that increase your telephone bills.

▣ Blasting Areas

To avoid interfering with blasting operations, turn you unit OFF when in a “blasting area” or in areas posted “Turn off two-way radio”. Construction crews often use remote control RF devices to set off explosives.

▣ Potentially Explosive Atmospheres

Turn your phone OFF when in any area with a potentially explosive atmosphere. It is rare, but your phone or accessories could generate sparks. Sparks in such area could cause an explosion or fire resulting in bodily injury or even death.
Areas with a potentially explosive atmosphere are often, but not always, clearly marked. They include fueling areas such as gas station; below deck on boats; fuel or chemical transfer or storage facilities; areas where the air contains chemical or particles, such as grain, dust, or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

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Do not transport or store flammable gas, liquid, or explosives in the compartment of your vehicle which contains your phone or accessories.

Vehicles using liquefied petroleum gas (such as propane or butane) must compl7y with the National Fire Protection Standard (NFPA-58). For a copy of this standard, contact the National Fire Protection Association, One Battery march Park, Quincy, MA 02269, Attn: Publication Sales Division.

Rule of Thumb: Using common sense at all times when handling, installing or using the phone. Any questions should be directed to you nearest Service Center or authorized service technician or electrician.

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CHAPTER 6. Glossary

General Terms

Abbreviated Alert. An abbreviated alert is used to remind the mobile station user that previously selected alternative routing features are still active.

AC. See Authentication Center.

Access Attempt. A sequence of one or more access probe sequences on the Access Channel containing the same message. See also Access Probe and Access Probe Sequence.

Access Channel. A Reserve CDMA Channel used by mobile stations for communicating to the base station. The Access Channel is used for short signaling message exchanges such as call origination's, responses to pages, and registrations. The Access Channel is a slotted random access channel.

Access Channel Message. The information part of an access probe consisting of the message body, length field, and CRC.

Access Channel Message Capsule. An Access Channel message plus the padding.

Access Channel Preamble. The preamble of an access probe consisting of a sequence of all-zero frames that is sent at the 4800bps rate.

Access Channel Request Message. An Access Channel message that is autonomously generated by the mobile station. See also Access Channel Response Message.

Access Channel Response Message. A message on the Access Channel generated to reply to a message received from the base station.

Access Channel Slot. The assigned time interval for an access probe. An Access Channel slot consists of an integer number of frames. The transmission of an access probe is performed within the boundaries of an Access Channel slot.

Access Probe. One Access Channel transmission consisting of a preamble and a message. The transmission is an integer number of frames in length and transmits one Access Channel message. See also Access Probe Sequence and Access Attempt.

Access Probe Sequence. A sequence of one or more access probes on the Access Channel. The same Access Channel message is transmitted in every access probe of an access attempt. See also Access Probe and Access Attempt.

Acknowledgement. A Layer 2 response by the mobile station or the base station confirming that a signaling message was received correctly.

Action Time. The time at which the action implied by a message should take effect.

Active Set. The set of pilots associated with the CDMA Channels containing Forward Traffic Channels assigned to a particular mobile station.

Aging. A mechanism through which the mobile station maintains in its Neighbor Set the pilots that have been recently sent to it from the base station and the pilots whose handoff drop timers have recently expired.

A-key. A secret, 64-bit pattern stored in the mobile station. It is used to generate update the mobile station's Shared Secret Data. The A-key is used in the mobile station authentication process.

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Analog Access Channel. An analog control channel used by a mobile station to access a system to obtain service.

Analog Color-Code. An analog signal (see Supervisory Audio Tone) transmitted by a base station on an analog voice channel and used to detect capture of a mobile station by an interfering base station or the capture of a base station by an interfering mobile station.

Analog Control Channel. An analog channel used for the transmission of digital control information from a base station to a mobile station or from a mobile station to a base station.

Analog Paging Channel. A forward analog control channel that is used to page mobile stations and send orders.

Analog Voice Channel. An analog channel on which a voice conversation occurs and on which brief digital messages may be sent from a base station to a mobile station or from a mobile station to a base station.

Authentication. A procedure used by a base station to validate a mobile station's identity.

Authentication Center (AC). An entity that manages the authentication information related to the mobile station.

Authentication Response (AUTHR). An 18-bit output of the authentication algorithm. It is used, for example, to validate mobile station registrations, origination and terminations. A method of registration in which the mobile station registers without an explicit command from the base station.

AWGN. Additive White Gaussian Noise.

Bad Frames. Frames classified as erasures (frame category 10) or9600bps frames, primary traffic only with bit errors (frame category 9). See also Good Frames.

Base Station. A station in the Domestic Public Cellular Radio Telecommunications Service, other than a mobile station, used for communicating with mobile stations. Depending upon the context, the term base station may refer to a cell, a sector within a cell, an MSC, or other part of the Cellular system. See also MSC.

Base Station Authentication Response (AUTHBS). An 18-bit pattern generated by the authentication algorithm. AUTHBS is used to confirm the validity of base station orders to update the Shared Secret Data.

Base Station Random Variable (RANDBS). A 32-bit random number generated by the mobile station for authenticating base station orders to update the Shared Secret Data.

BCH Code. See Bose-Chaudhuri-Hocquenghem Code.

Busy-Idle Bits. The portion of the data stream transmitted by a base station on a forward analog control channel that is used to indicate the current busy-idle status of the corresponding reverse analog control channel.

Call Disconnect. The process that releases the resources handling a particular call. The disconnect process beings either when the mobile station user indicates the end of the call by generating an on-hook condition or other call release mechanism, or when the base station initiates a release.

Call History Parameter (COUNT). A modulo-64 event counter maintained by the mobile station and Authentication Center that us used for clone detection.

Candidate Set. The set of pilots that have been received with sufficient strength by the mobile station to be successfully demodulated, but have not been placed in the Active Set by the base station. See also Active Set. Neighbor Set, and Remaining Set.

. See Code Division Multiple Access

CDMA Channel. The set of channels transmitted between the base station within a given CDMA frequency assignment. See also Forward CDMA Channel and Reverse CDMA Channel.

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CDMA Channel Number. An 11-bit number corresponding to the center of the CDMA frequency assignment.

CDMA Frequency Assignment. A 1.23MHz segment of spectrum centered on one of the 30KHz channels of the existing analog system.

Code Channel. A subchannel of a Forward CDMA Channels. A Forward CDMA Channel contains 64 code channels. Code channel zero is assigned to the Pilot Channel. Code channels 1 through 7 may be assigned to the either Paging Channels or the Traffic Channels. Code Channel 32 may be assigned to either a Sync Channel or a Traffic Channel. The remaining code channels may be assigned to Traffic Channels.

Code Division Multiple Access (CDMA). A technique for spread-spectrum multiple-access digital communications that creates channels through the use of unique code sequences.

Code Symbol. The output of an error-correcting encoder. Information bits are input to the encoder and code symbols are output from the encoder. See Convolutional Code.

Continuous Transmission. A mode of operation in which Discontinuous Transmission is not permitted.

Control Mobile Attenuation Code (CMAC). A 3-bit field in the Control-Filler Message that specifies the maximum authorized power level for a mobile transmitting on an analog reverse control channels.

Convolution Code. A type of error-correcting code. A code symbol can be considered as the convolution of the input data sequence with the impulse response of a generator function.

CRC. See Cyclic Redundancy Code.

Cyclic Redundancy Code (CRC). A class of linear error detecting codes which generate parity check bits by finding the remainder of a polynomial division.

Data Burst Randomizer. The function that determines which power control groups within a frame are transmitted on the Reverse Traffic Channel when the data rate is lower than 9600 bps. The data burst randomizer determines, for each mobile station, the pseudo random position of the transmitted power control groups in the frame while guaranteeing that every modulation symbol is transmitted exactly once.

DBc. The ratio (in dB) of the sideband power of a signal, measured in a given bandwidth at a given frequency offset from the center frequency of the same signal, to the total inband power of the signal. For CDMA, the total inband power of the signal is measured in a 1.23MHz bandwidth around the center frequency of the CDMA signal.

DBm. A measure of power expressed in terms of its ration (in dB) to one milliwatt.

DBm/Hz. A measure of power spectral density. DBm/Hz is the power in one Hertz of bandwidth. Where power is expressed in units of dBm.

DBW. A measure of power expressed in terns of its ration (in dB) to one Watt.

Dedicated Control Channel. An analog control channel used for the transmission of digital control information from either a base station or a mobile station.

Deinterleaving. The process of unpermuting the symbols that were permuted by the interleaver..
Deinterleaving is performed on received symbols prior to decoding.

Digital Color Code (DCC). A digital signal transmitted by a base station on a forward analog control channel that is used to detect capture of a base station by an interfering mobile station.

Dim-and-Burst. A frame in which primary traffic is multiplexed with either secondary traffic or signaling traffic.

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Discontinuous Transmission (DTX). A mode of operation in which a mobile station transmitter autonomously switches between two transmitter power levels while the mobile station is in the conversation state on an analog voice channel.

Distance-Based Registration. An autonomous registration method in which the mobile station registers whenever it enters a cell whose distance from the cell in which the mobile station last registered exceeds a given threshold.

DTMF. See Dual Tone Multifrequency.

Dual-Tone Multifrequency (DTMF). Signaling by the simultaneous transmission of two tones, one from a group of low frequencies and another from a group of high frequencies. Each group of frequencies consists of four frequencies.

Eb. The energy of an information bit.

Ec/I0. The ratio in (dB) between the pilot energy accumulated over one PN chip period (Ec) to the power spectral density in the received bandwidth (Io).

Effective Radiated Power (ERP). The transmitted power multiplied by the antenna gain referenced to a half wave dipole.

Electronic Serial Number (ESN). A 32-bit number assigned by the mobile station manufacturer, uniquely identifying the mobile station equipment.

Encoder Tail Bits. A fixed sequence of bits added to the end of a block of data to reset the convolutional encoder to a known state.

ERP. See Effective Radiated Power.

ESN. See Electronic Serial Number.

Extended Protocol. An optional expansion of the signaling message between the base station and mobile station to allow for the addition of new system features and operational capabilities.

Fade Timer. A timer kept by the mobile station as a measure of Forward Traffic Channel continuity. If the Fade timer expires, the mobile station drops the call.

Flash. An indication sent on an analog voice channel or CDMA Traffic Channel indicating that the user Directed the mobile station to invoke special processing.

Foreign NID Roamer. A mobile station operating in the same system (SID) but a different network (NID)Form the one in which service was subscribed. See also Foreign SID Roamer and Roamer.

Foreign SID Roamer. A mobile station operating in a system (SID) other than the one from which service was subscribed. See also Foreign NID Roamer and Roamer.

Forward Analog Control Channel (FOCC). An analog voice channel used from a base station to a mobile station.

Forward Analog Voice Channel (FVC). An analog voice channel used from a base station to a mobile station.

Forward CDMA Channel. A CDMA Channel form a base station to mobile stations. The Forward CDMA Channel contains one or more code channels that are transmitted on a CDMA frequency assignment using a Particular pilot PN offset. The code channels are associated with the Pilot Channel, Sync Channel, Paging Channels, and Traffic Channels. The Forward CDMA Channel always carries a Pilot Channel and may carry up to one Sync Channel, up to seven Paging Channels, and up to 63 Traffic Channels, as long as the total number of channels, including the Pilot Channel, is no greater than 64.

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Forward Traffic Channel. A code channel used to transport user and signaling traffic from the base station to the mobile station.

A basic timing interval in the system. For the Access Channel, Paging Channel, and Traffic Channel, a frame is 20 ms long. For the Sync Channel, a frame is 26.666…ms long.

Frame Category. A classification of a received Traffic Channel frame based upon transmission data rate, the Frame contents (primary traffic, secondary traffic, or signaling traffic), and whether there are detected error in the frame.

Frame Offset. A time skewing of Traffic Channel frames from System Time in integer multiples of 1.25 ms. The maximum frame offset is 18..75 ms..

Frame Quality Indicator. The CRC check applied to 9600 bps and 4800 bps Traffic Channel frames.

Global Positioning System (GPS). A US government satellite system that provides location and time Information to users. See Navstar GPS Space segment / Navigation User interfaces ICD-GPS-200 for Specifications.

Half Frame. A 10 ms interval on the paging Channel. Two half frames comprise a frame, the first half frame begins at the same time as the frame.

Handoff. The of transferring communication with a station mobile station from one base station to another.

Hard Handoff. A handoff characterized by a temporary disconnection of the Traffic Channel. Hard handoffs Occur when the mobile station is transferred between disjoint Active Sets, the CDMA frequency assignment changes, the frame offset changes, or the mobile station is directed from a CDMA Traffic Channel to an analog voice channel, See also Soft Handoff.

Hash Function. A function used by the mobile station to select one out of N available resource. The hash function distributes the available resources uniformly among a random sample of mobile stations.

HLR. See Home Location Register.

Home Location Register (HLR). The location register to which a MIN is assigned for record purposes such as subscriber information.

Home System. The Cellular system in which the mobile station subscribes for service.

Idle Handoff. The act of transferring reception of the Paging Channel from one bass station to another, when the mobile station is in the ***Mobile Station Idle State.***

Implicit Registration. A registration achieved by a successful transmission of an origination or page response on the Access Channel.

Interleaving. The process of permuting a sequence of symbols.

kHz. Kilohertz (103 Hertz).

ksps. Kilo-symbols per second (103 symbols per second).

Layer 1. See Physical Layer.

Layer 2. Layer 2 provides for the correct transmission and reception of signaling messages, including partial duplicate detection. See also Layering and Layer 3.

Layer 3. Layer 3 provides the control of the Cellular telephone systems. Signaling messages originate and terminate at layer 3. See also Layering and Layer 2.

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Local Control. An optional mobile station feature used to perform manufacturer-specific functions.

A PN sequence with period 242-1 that is used for scrambling on the Forward CDMA Channel and spreading on the Reverse CDMA Channel. The long code uniquely identifies a mobile station on both the Reverse Traffic Channel and the Forward Traffic Channel. The long code provides limited privacy. The long code also separates multiple Access Channels on the same CDMA channel. See also Public Long Code and Private Long Code.

Long Code Mask. A 42-bit binary number that creates the unique identity of the long code. See also Public Long Code, Private Long Code, Public Long Code Mask, and Private Long Code Mask.

LSB. Least significant bit.

Maximal Length Sequence (m-Sequence). A binary sequence of period 2n-1, n a positive integer, with no internal periodicities. A maximal length sequence can be generated by a tapped n-bit shift register with linear feedback.

Mcps. Megachips per second (106 chips per second).

Mean Input Power. The total received calorimetric power measured in a specified bandwidth at the antenna connector, including all internal and external signal and noise sources.

Mean Output Power. The total transmitted calorimetric power measured in a specified bandwidth at the antenna connector when the transmitter is active.

Message. A data structure that conveys control information or application information. A message consists of a length field (MSG_LENGTH), a message body (the part conveying the information), and a CRC.

Message Body. The part of the message contained between the length field (MSG_LENGTH) and the CRC field.

Message Capsule. A sequence of bits comprising a single message and padding. The padding always follows the message and may be of zero length.

Message CRC. The CRC associated with a message. See also Cyclic Redundancy Check.

Message Field. A basic named element in a message. A message field may consist of zero or more bits.

Message Record. An entry in a message consisting of one or more field that repeats in the message.

MHz. Megahertz.(106 Hertz)

MIN. See Mobile Station Identification Number.

Mobile Protocol Capability Indicator (MPCI). A 2-bit field used to indicate 속 mobile station's capabilities.

Mobile Station. A station in the Domestic Public Cellular Radio Telecommunications Service intended to be used while in motion or during halts at unspecified points. Mobile station include portable units (e.g., handheld personal units) and units installed in vehicles.

Mobile Station Class. Mobile station classes define mobile station characteristics such as slotted operation and transmission power.

Mobile Station Identification Number (MIN). The 34-bit number that is a digital representation of the 10-digit directory telephone number assigned to a mobile station.

Mobile Station Originated Call. A call originating from a mobile station.

Mobile Station Terminated Call. A call received by a mobile station (not to be confused with a disconnect or call release).

Mobile Switching Center (MSC). A configuration of equipment that provides Cellular radiotelephone service. Also called the Mobile Telephone Switching Office (MTSO)

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Modulation Symbol. The output of the data modulator before spreading. On the Reverse Traffic Channel, 64-ary orthogonal modulation is used and six code symbol (when the data rate is 9600bps) or each repeated code symbol (when the data rate is less than 9600bps) is one modulation symbol.

Ms. Millisecond.

MSB. Most significant bit.

MSC. See Mobile Switching Center.

Multiplex Option. The ability of the multiplex sublayer and lower layer to be tailored to provide special capabilities. A multiplex option defines such characteristics as the frame format and the rate decision rules. See also Multiplex Sublayer.

Multiplex Sublayer. One of the conceptual layers of the system that multiplexes and demultiplexes primary traffic, secondary traffic, and signaling traffic.

NAM. See Number Assignment Module.

Narrow Analog. A type of voice channel that uses 10kHz channel spacing and subaudible signaling.

Neighbor Set. The set of pilots associated with the CDMA Channel that are probable candidates for handoff. Normally, the Neighbor Set consists of the pilots associated with CDMA Channel that cover geographical areas near the mobile station. See also Active Set, Candidate Set, and Remaining Set.

A network is a subset of a Cellular system, such as an area-wide Cellular network, a private group of base stations, or a group of base stations set up to handle a special requirement. A network can be as small or as large as needed, as long as it is fully contained within a system. See also System.

Network Identification (NID). A number that uniquely identifies a network within a Cellular system. See also System Identification.

NID. See Network Identification.

Non-Autonomous Registration. A registration method in which the base station initiates registration. See also Autonomous Registration.

Non-Slotted Mode. An operation mode of the mobile station in which the mobile station continuously monitors the Paging Channel when in the Mobile Station Idle State.

Ns. Nanosecond.

NULL. Not having any value.

Null Traffic Channel Data. One or more frames of 16 '1's followed by eight '0's sent at the 1200bps rate. Null Traffic Channel data is sent when no service option is active and no signaling message is being sent. Null Traffic Channel data serves to maintain the connectivity between the mobile station and the base station.

Number Assignment Module (NAM). A set of MIN-related parameters stored in the mobile station.

Numeric Information. Numeric information consists of parameters that appear as numeric fields in message exchanged by the base station and the mobile station and information used to describe the operation of the mobile station.

OLC. See Overload Class (CDMA) or Overload Control (analog).

Optional Field. A field defined within a message structure that is optionally to the message recipient.

Order. A type of message that contains control codes for either the mobile station or the base station.

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Ordered Registration. A registration method in which the base station orders the mobile station to send registration related parameters.

Overhead Message. A message sent by the base station on the Paging Channel to communicate base-station-specific and system-wide information to mobile station.

Overload Class. The means used to control system access by mobile stations, typically in emergency or other overload conditions. Mobile station are assigned one (or more) of sixteen overload classed, Access to the CDMA system can then be controlled on a per class basis by persistence values transmitted by the base station.

Overload Control (OLC). A means reverse analog control channel accesses by mobile stations. Mobile station are assigned one(or more) of sixteen control levels. Access is selectively restricted by a base station setting one or more OLC bits in the Overload Control Global Action Message.

Packet. The unit of information exchanged between the service option applications of the base station and the mobile station.

Padding. A sequence of bits used to fill from the end of a message to the end of a message capsule, typically to the end of the frame or half frame. All bits in the padding are '0'.

Paging. The act of seeking a mobile station when a call has been placed to that mobile station.

Paging Channel (Analog). See Analog Paging Channel.

Paging Channel (CDMA). A code channel in a Forward CDMA Channel used for transmission of control information and pages from a base station to a mobile station.

Paging Channel Slot. An 80ms interval on the Paging Channel. Mobile station operating in the slotted mode are assigned specific slots in which day monitor messages from the base station.

Parameter-Change Registration. A registration method in which the mobile station registers when certain of its stored parameters change.

Parity Check Bits. Bits added to a sequence of information bits to provide error detection, correction, or both.

Persistence. A probability measure used by the mobile station to determine if it should transmit in a given Access Channel Slot.

Physical Layer. The part of the communication protocol between the mobile station and the base station that is responsible for the transmission and reception of data. The physical layer in the transmitting station is presented a frame by the multiplex sublayer and transforms it into an over-the-air waveform. The physical layer in the receiving station transforms the waveform back into a frame and presents it to the multiplex sublayer above it.

Pilot Channel. An unmodulated, direct-sequence spread spectrum signal transmitted continuously by each CDMA base station. The Pilot Channel allows a mobile station to acquire the timing of the Forward CDMA Channel, provides a phase reference for coherent demodulation, and provides a means for signal strength comparisons between base station for determining when to handoff.

Pilot PN Sequence. A pair of modified maximal length PN sequences with period 215 used to spread the Forward CDMA Channel and the Reserve CDMA Channel. Different base station are identified by different pilot PN sequence offsets.

Pilot PN Sequence Offset Index. The PN offset in units of 64 PN chips of a pilot, relative to the zero offset pilot PN sequence.

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PN Chip. One bit in the PN sequence.

PN Sequence. Pseudonoise sequence. A periodic binary sequence.

Power Control Bit. A bit sent in every 1.25ms interval on the Forward Traffic Channel to signal the mobile station to increase or decrease its transmit power.

Power Control Group. A 1.25ms interval on the Forward Traffic Channel and the Reverse Traffic Channel.

See also Power Control Bit.

Power-Down Registration. Au autonomous registration method in which the mobile station registers on power up.

PPM. Parts per million.

Preamble. See Access Channel Preamble and Traffic Channel Preamble.

Primary CDMA Channel. A CDMA Channel at a pre-assigned frequency assignment used by the mobile station for initial acquisition. See also Secondary CDMA Channel.

Primary Paging Channel (CDMA). The default code channel (code channel 1) assigned for paging on a CDMA Channel.

Primary Traffic. The main traffic stream carried between the mobile station and the base station, supporting the active primary service option, on the Traffic Channel. See also Secondary Traffic, Signaling Traffic, and Servic3e Option.

Private Long Code. The long code characterized by the private long code mask. See also Long Code.

Private Long Code Mask. The long code mask used to form the private long code. See also Public Long Code Mask and Long Code.

Public Long Code. The long code characterized by the public long code mask.

Public Long Code Mask. The long code mask used to form the private long code. The mask contains the ESN of the mobile station. See also Private Long Code Mask and Long Code.

Punctured Code. An error-correcting code generated from another error-correcting code by deleting (i.e., puncturing) code symbols from the code output.

Quick Repeats. Additional transmissions of identical copies of a message within a short interval to increase the probability that the message is received correctly.

Receive Objective Loudness Rating (ROLR). A perceptually weighted transducer gain of telephone receivers relating electrical excitation from a reference generator to sound pressure at the earphone. The receive objective loudness tating is normally specified in dB relative to one Pascal per millivolt. See IEEE Standard 269-1992, IEEE Standard 661-1979, CCITT Recommendation P.76, and CCITT Recommendation P.79.

Registration. The process by which a mobile station identifies its location and parameters to a base station.

Registration Zone. A collection of one or more base stations treated as a unit when determining whether a mobile station should perform zone-based registration.

Release. A process that the mobile station and base station use to inform each other of call disconnect.

The set of all allowable pilot offsets as determined by PILOT_INC, excluding the pilot offsets of the pilots in the Active Set, Candidate Set, and Neighbor Set. See also Active Set, Candidate Set, and Neighbor Set.

Request. A layer 3 message generated by either the mobile station or the base station to retrieve information, ask for service, or command an action.

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Response. A layer 3 message generated as a result of another message, typically a request.

Reverse Analog Control (RECC). The analog control channel used from a mobile station to a base station.

Reverse Analog Voice Channel (RVC). The analog voice channel used from a mobile station to a base station.

Reverse CDMA Channel. The CDMA Channel from the mobile station to the base station. From the base station's perspective, the Reverse CDMA Channel is the sum of all mobile station transmissions on a CDMA frequency assignment.

Reverse Traffic Channel. A Reverse CDMA Channel used to transport user and signaling traffic from a single mobile station to one or more base stations.

Roamer. A mobile station operating in a Cellular system (or network) other than the one from which service was subscribed. See also Foreign NID Roamer and Foreign SID Roamer.

ROLR. See Receive Objective Loudness Rating.

SAT. See Supervisory Audio Tone.

Scan of Channels. The procedure by which a mobile station examines the signal strength of each forward analog control channel.

SCI. Synchronized Capsule Indicator bit.

Search Window. The range of PN sequence offsets that a mobile station searches for a pilot.

Secondary CDMA Channel. A CDMA Channel at a preassigned frequency assignment used by the mobile station for initial acquisition. See also Primary CDMA Channel.

Secondary Traffic. An additional traffic stream that can be carried between the mobile station and the base station on the Traffic Channel. See also Primary Traffic and Signaling Traffic.

Seizure Precursor. The initial digital sequence transmitted by a mobile station to a base station on a reverse analog control channel.

Seizure Option. A service capability of the system. Service options may be applications such as voice, data, or facsimile.

Shard Secret Data (SSD). A 128-bit pattern stored in the mobile station (in semi-permanent memory) and known by the base station. SSD is a concatenation of two 64-bit subsets: SSD_A, which is used to support the authentication procedures and SSD_B, which serves as one of the inputs to the process generating the encryption mask and private long code.

Short Message Services (SMS). A suite of services which include SMS Text Delivery, Digital Paging (i.e., Call Back Number – CBN), and Voice Mail Notification (VMN).

SID. See System Identification.

Signaling Tone. A 10kHz tone transmitted by a mobile station on an analog voice channel to: 1) confirm orders, 2)signal flash requests, and 3) signal release requests.

Signal Traffic. Control message that are carried between the mobile station and base station on the Traffic Channel. See also Primary Traffic and Secondary Traffic.

Slot Cycle. A periodic interval at which a mobile station operating in the slotted monitors the Paging Channel.

Slotted Mode. An operation mode of the mobile station in which the mobile station monitors only selected slots on the Paging Channel when in the Mobile Station Idle State.

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Soft Handoff. A handoff occurring while the mobile station is in the Mobile Station Control on the Traffic Channel State. This handoff is characterized by commencing communications with a new base station on the same CDMA frequency assignment before terminating communications with the old base station. See also Hard Handoff.

SOM. Start-of-Message Bit.

SPS. Symbols per second.

- An identification of certain characteristics of a mobile station. Classes are defined in Table 2.3.3-1.

Status Information. The following status information is used to describe mobile station operation when using the analog system.

■Serving-System Status. Indicates whether a mobile station is turned to channels associated with System A or System B.

■ First Registration ID Status. A status variable used by the mobile station in association with its processing of received Registration ID messages.

■ First Location Area ID Status. A status variable used by the mobile station in association with its processing of received Location Area ID messages.

■ Location Registration ID Status. A status variable used by the mobile station in association with its processing of power-up registration and location-based registration.

■ First Idle ID Status. A status variable used by the mobile station in association with its processing of the Idle Task.

■ Local Control Status. Indicates whether a mobile station must respond to local control messages.

■ Roam Status. Indicates whether a mobile station is in its home system.

■ Termination Status. Indicates whether a mobile station must terminate the call when it is on an analog voice channel.

Supervisory Audio Tone (SAT). One of three tones in the 6 kHz region that is transmitted on the forward analog voice channel by a base station and transponder on the reverse analog voice channel by as mobile station.

Supplementary Digital Color Code (SDCC1, SDCC2). Additional bits assigned to increase the number of color codes from four to sixty four, transmitted on the forward analog control channel.

Symbol. See Code Symbol and Modulation Symbol.

Sync Channel. Code channel 32 in the Forward CDMA Channel which transports the synchronization message to the mobile station.

Sync Channel Superframe. An 80ms interval consisting of three Sync Channel frames (each 26.666…ms in length).

System. A system is a Cellular telephone service that covers a geographic area such as a city. Metropolitan region, country, or group of countries. See also Network.

System Time. The time reference used by the system. System Time is synchronous to UTC time (except for leap seconds) and used the same time origin as GPS time. Offset by the propagation delay from the base station to the mobile station. See also Universal coordinated Time.

Timer-Based Registration. A registration method in which the mobile station registers whenever a counter reaches a predetermined value. The counter is incremented an average of once per 80 ms period.

Time Reference. A reference established by the mobile station that is synchronous with the earliest arriving multipath component used for demodulation.

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TOLR. See Transmit Objective Loudness Rating.

Traffic Channel. A communication path between a mobile station and base station used for user and signaling traffic. The term Traffic Channel implies a Forward Traffic Channel and Reverse Traffic Channel pair. See also Forward Traffic Channel and Reverse Traffic Channel.

Traffic Channel Preamble. A sequence of all-zero frames that is sent at the 9600 bps rate by the mobile station on the Reverse Traffic Channel. The Traffic Channel preamble is sent during initialization of the Traffic Channel.

Transmit Objective Loudness Rating (TOLR). A perceptually weighted transducer gain of telephone transmitters relation sound pressure at the microphone to voltage at a reference electrical termination. It is normally specified in dB relative to one millivolt per Pascal. See IEEE Standard 269-1992, IEEE Standard 661-1979, CCITT Recommendation P.76 , and CCITT Recommendation. P.79

Unique Challenge-Response Procedure. An exchange of information between a mobile station and a base station for the purpose of confirming the mobile station's identity. The procedure is initiated by the base station and is characterized by the use of a challenge-specific random number (i.e., RANDU) instead of the random variable broadcast globally (RAND).

Unique Random Variable (RANDU). A 24-bit random number generated by the base station in support of the Unique Challenge-Response procedure.

Universal Coordinated Time (UTC). An internationally agreed-upon time scale maintained by the Bureau International de l'Heure (BIH) used as the time reference by nearly all commonly available time and frequency distribution systems i.e., WWW, WWVH, LORAN-C, Transit, Omega, and GPS.

UTC. Universal Temps Coordine. See Universal Coordinated Time.

Voice Channel. See Analog Voice Channel.

Voice Mobile Attenuation Code (VMAC). A 3-bit field in the Extended Address Word commanding the initial mobile power level when assigning a mobile station to an analog voice channel.

Voice Privacy. The process by which user voice transmitted over a CDMA Traffic Channel is a afforded a modest degree of protection against eavesdropping over the air.

Walsh Chip. The shortest identifiable component of a Walsh function. There are 2N Walsh chips in one Walsh function where N is the order of the Walsh function. On the Forward CDMA channel one Walsh chip equals 1/1.2288MHz, or 813.802…ns. On the Reverse CDMA Channel, one Walsh chip equals 4/1.2288MHz, or 3.255…μs.

Walsh Function. One of 2N time orthogonal binary functions (note that the functions are orthogonal after mapping '0' to 1 and '1' to –1).

Zone-Based Registration. An autonomous registration method in which the mobile station registers whenever it enters a zone that is not in the mobile station's zone list.

μs. Microsecond

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Appendix

1. Assembly and Disassembly diagram
2. Block and Circuit diagram
3. Part List
4. Component Layout
5. BGA Pin Map

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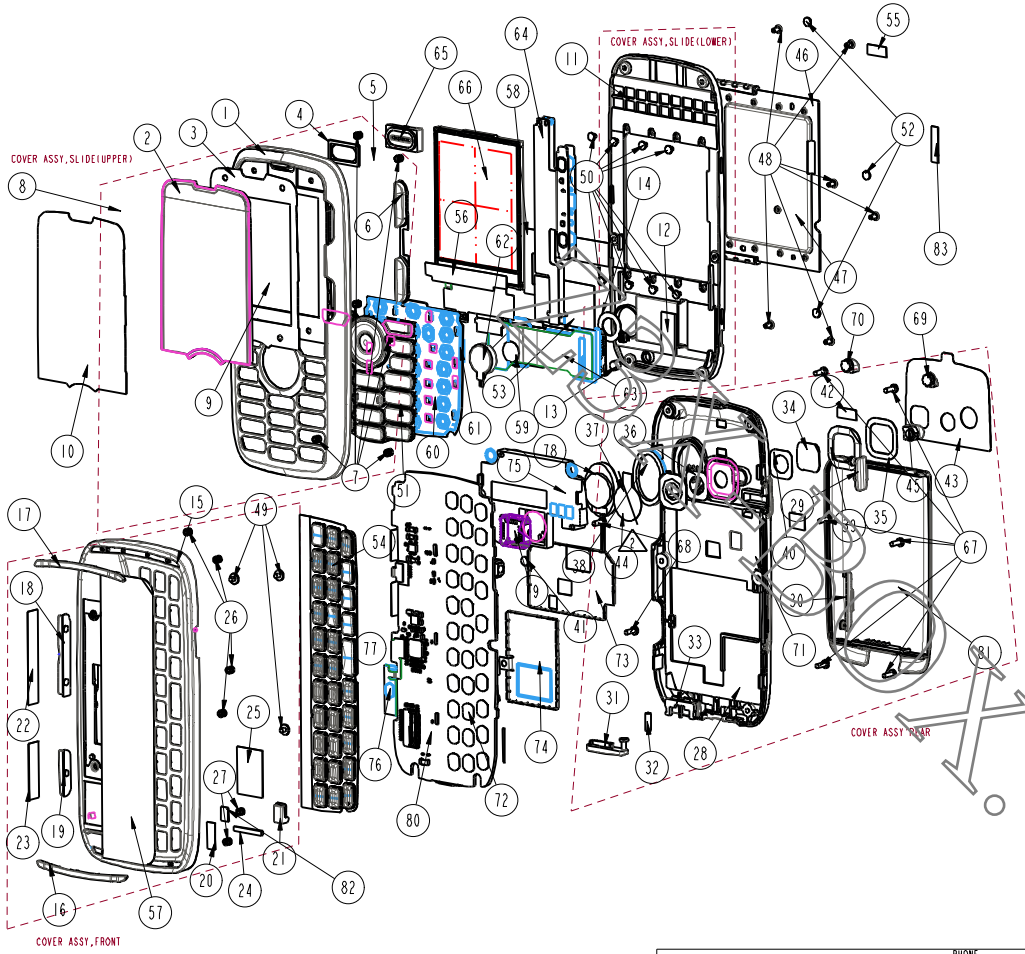


COVER ASSY', SLIDE				
83	INSULATOR[SIDEKEY]	1	MIDZ0140801	
10	TAPE,PROTECTION[LABEL,FREE]	1	MTAB0227301	
66	LCD MODULE	1	SVLM0024004	
65	RECEIVER	1	SURY0012602	
64	PCB,FLEXIBLE[LCD]	1	SACY0032715	
63	PCB,FLEXIBLE[SLIDE]	1	SACY0032714	
62	VIBRATOR-MOTOR	1	SJMY0008405	
61	PCB ASSY,SUB,SMT	1	SAJE0013702	
60	DOME ASSY-METAL[SLIDE]	1	ADCA0071201	
59	TAPE,MOTOR	1	MTAF0114001	
58	TAPE,SHIELD[LCD]	1	MTAC0059201	
57	TAPE,PROTECTION[KEYPAD]	1	MTAB0195301	
56	PAD,LCD[DRIVE,IC]	1	MPBG0067901	
55	LABEL[LID]	1	MLAJ0038303	
54	KEYPAD,MAIN	1	MKAG0001403	
53	INSULATOR[LCD]	1	MIDZ0140701	
52	CAP,SCREW[FOLDER,SHHET]	3	MCCH0113903	
51	BUTTON,DIAL	1	MBJA0025403	
50	SCREW MACHINE,BIND	8	GMZ70119003	
49	SCREW MACHINE,BIND	3	GMCY0011503	
48	SCREW MACHINE,BIND	6	GMCY0011201	
47	TAPE,SHIELD	1	MTAC0062301	
46	RAIL ASSY,SLIDE	1	ARDY0002703	

COVER ASSY'REAR				
45	CAP,MOBILE SWITCH	1	MCCF0045303	
44	TAPE,PROTECTION[WINDOW,CAM,IN]	1	MTAB0195201	
43	TAPE,PROTECTION[WINDOW,CAM,OUT]	1	MTAB0191001	
42	LABEL,QUALCOMM	1	MLAN0000603	
41	LABEL, A/S	1	MLAB0000601	
40	TAPE,WINDOW[CAMERA]	1	MTAD0071601	
39	TAPE,DECO [CAMERA]	1	MTAA0142001	
38	PAD,SPEAKER	1	MPBN0046801	
37	PAD,CAMERA [LARGE]	1	MPBT0048101	
36	PAD,CAMERA [SMALL]	1	MPBT0044301	
35	DECO,CAMERA	1	MDAD0032101	
34	WINDOW,CAMERA	1	MWAE0027501	
33	LOCKER,BATTERY	1	MLEA0040203	
32	SPRING,LOCKER	1	MSDC0004101	
31	CAP,RECEPTACLE	1	MCCE0039103	
30	CAP,MULTIMEDIA CARD	1	MCCG0008903	
29	CAP,EARPHONE JACK	1	MCCC0046703	
28	COVER,REAR	1	MCJN0083004	
84	TAPE,PROTECTION[SHEET REAR]	1	MTAB0222704	

COVER ASSY,FRONT				
82	PAD[LIGHTING,2]	1	MPBZ0193101	
27	INSERT,NUT	2	MICE0003701	
26	INSERT,NUT	4	MICE0003601	
25	PAD,CONNECTOR	1	MPBU0010401	
24	PAD[LIGHTING]	1	MPBL0088101	
23	TAPE,PROTECTION[BUTTON,CAMERA]	1	MTAB0181201	
22	TAPE,PROTECTION[BUTTON,VOLUME]	1	MTAB0181301	
21	FILTER,MIKE	1	MFBD0026201	
20	HOLDER,MIKE	1	MHGF0004501	
19	BUTTON,SIDE[CAMERA]	1	MBJL0044403	
18	BUTTON,SIDE[VOLUME]	1	MBJL0044503	
17	DECO,FRONT[POM,2]	1	MDAG0029203	
16	DECO,FRONT[POM,1]	1	MDAG0029103	
15	COVER,FRONT	1	MCJK0074403	

COVER ASSY,SLIDE(LOWER)				
14	PAD,MOTOR	1	MPBJ0046401	
13	MAGNET,SWITCH	1	MMAA0000301	
12	PAD,MSM[PORON B2B]	1	MPBL0005801	
11	COVER,SLIDE(LOWER)	1	MCJV0012303	

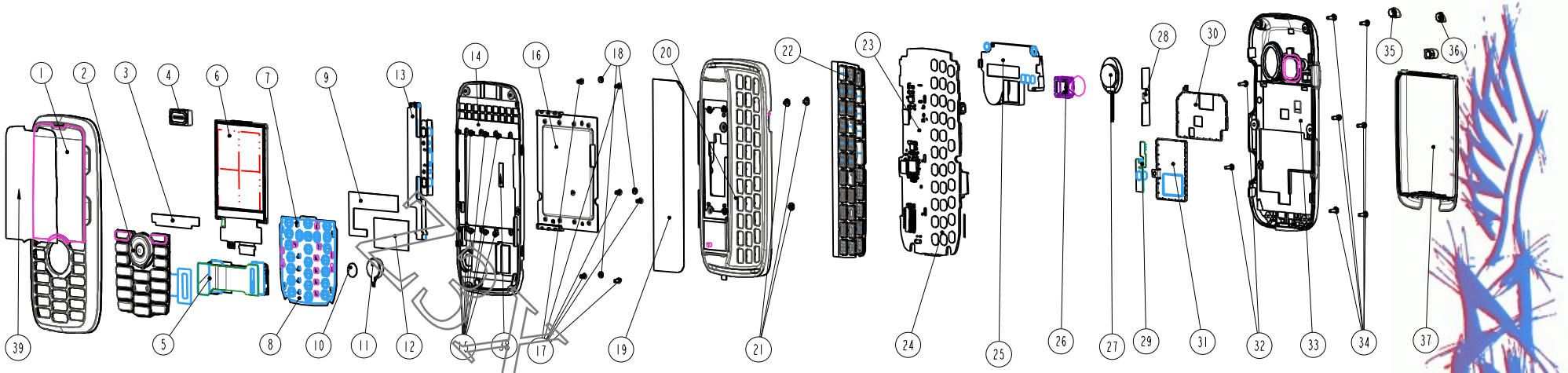
COVER ASSY,SLIDE(UPPER)				
9	TAPE,PROTECTION[BUTTON]	1	MTAB0181501	
8	TAPE,PROTECTION[WINDOW]	1	MTAB0181401	
7	INSERT,NUT	6	MICE0003601	
6	BUTTON[WINDOW]	1	MBJZ0012002	
5	PAD,LCD	1	MPBG0066901	
4	PAD,RECEIVER	1	MPBM0819101	
3	TAPE,WINDOW	1	MTAD0071701	
2	WINDOW ASSY, LCD	1	AWAB0828704	
1	COVER,SLIDE(UPPER)	1	MCJW0814503	

PHONE				
81	COVER,BATTERY	1	SBPP0024703	
80	PCB ASSY,MAIN,SMT	1	SAFT0689215	
79	CAMERA	1	SVCY0014401	
78	SPEAKER	1	SUSY0025701	
77	PCB,SIDEKEY[VOLUME]	1	SPKY0050401	
76	PCB,SIDEKEY[CAMERA]	1	SPKY0050301	
75	ANTENNA MOBILE,FIXED	1	SNWE0038401	
74	CAN-SHIELD[LID,LOWER]	1	MCBA0021301	
73	CAN,SHIELD[LID,UPPER]	1	MCBA0030001	
72	DOME ASSY,METAL[MAIN]	1	ADCA0071101	
71	LABEL,APPROVAL	1	MLAA0051201	
70	CAP,SCREW[REAR,RIGHT]	1	MCCH0110803	
69	CAP,SCREW[REAR,LEFT]	1	MCCH0110903	
68	SCREW MACHINE,BIND	2	GMCY0012801	
67	SCREW MACHINE,BIND	6	GMCY0005903	
NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK

<COLOR TABLE>

PRODUCT TPSA00147##		PHONE APEY04328##		COVER ASSY,SLIDE(UPPER) ACGS00137##		COVER ASSY,SLIDE(LOWER) ACGR00118##		COVER ASSY,FRONT ACGK00925##		COVER ASSY,REAR ACGM01099##		RAIL ASSY,SLIDE ARDY00027##		BUTTON, DIAL MBJA00254##		CAP,SCREW[FOLDER,SHHET] MCCH01139##	
02	GRAPHITE GRAY	06	GRAPHITE GRAY	03	GRAPHITE GRAY	03	GRAPHITE GRAY	03	DARK SILVER	04	GRAPHITE GRAY	03	GRAPHITE GRAY	03	DARK SILVER	03	GRAPHITE GRAY
06	ORANGE	04	ORANGE	04	ORANGE	04	ORANGE	04	GRAY	05	ORANGE	04	ORANGE	04	GRAY	04	ORANGE
07	LIGHT BLUE	05	LIGHT BLUE	05	LIGHT BLUE	05	LIGHT BLUE	05	SILVER	06	LIGHT BLUE	05	LIGHT BLUE	05	SILVER	05	LIGHT BLUE

KEYPAD,MAIN MKAG00014##		CAP,SCREW[REAR,LEFT] MCCH01108##		CAP,SCREW[REAR,RIGHT] MCCH01109##		TAPE,PROTECTION[SHEET REAR] MTAB02227##	
03	DARK SILVER	03	GRAPHITE GRAY	03	GRAPHITE GRAY	04	GRAPHITE GRAY
04	GRAY	04	ORANGE	04	ORANGE	05	ORANGE
05	SILVER	05	LIGHT BLUE	05	LIGHT BLUE	06	LIGHT BLUE



NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK
19	TAPE,PROTECTION[KEYPAD]	1	MTAB0195301	
18	CAP,SCREW[FOLDER,SHHET]	3	MCCH0113901	
17	SCREW MACHINE,BIND	6	GMEY0011201	
16	RAIL ASSY,SLIDE	1	ARDY0002701	
15	SCREW MACHINE,BIND	8	GMZZ0019003	
14	COVER ASSY,SLIDE(LOWER)	1	ACGR0011801	
13	PCB,FLEXIBLE[LCD]	1	SACY0032715	
12	INSULATOR[LCD]	1	MIDZ0140701	
11	VIBRATOR,MOTOR	1	SJMY0008405	
10	TAPE,MOTOR	1	MTAF0014001	
9	TAPE,SHIELD[LCD]	1	MTAC0059201	
8	DOME ASSY,METAL[SLIDE]	1	ADCA0071201	
7	PCB ASSY,SUB,SMT	1	SAJE0013702	
6	LCD,MODULE	1	SVLM0024001	
5	PCB,FLEXIBLE[SLIDE]	1	SACY0032714	
4	RECEIVER	1	SURY0012602	
3	PAD,LCD[DRIVE,IC]	1	MPBG0067901	
2	BUTTON, DIAL	1	MBJA0025401	
1	COVER ASSY,SLIDE(UPPER)	1	ACGS0013701	

NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK
39	TAPE,PROTECTION[LABEL,FREE]	1	MTAB0181601	
38	INSULATOR[SIDEKEY]	1	MIDZ0140801	
37	KEYPAD,MAIN	1	MKAG0001401	
36	CAP,SCREW[REAR,LEFT]	1	MCCH0110801	
35	CAP,SCREW[REAR,RIGHT]	1	MCCH0110901	
34	SCREW MACHINE,BIND	6	GMEY0005903	
33	COVER ASSY,REAR	1	ACGM0109901	
32	SCREW MACHINE,BIND	2	GMEY0012601	
31	CAN,SHIELD[LID,LOWER]	1	MCBA0021301	
30	CAN,SHIELD[LID,UPPER]	1	MCBA0030001	
29	PCB,SIDEKEY[VOLUME]	1	SPKY0050401	
28	PCB,SIDEKEY[CAMERA]	1	SPKY0050301	
27	SPEAKER	1	SUSY0025701	
26	CAMERA	1	SVCY0014401	
25	ANTENNA,MOBILE,FIXED	1	SNMF0034301	
24	DOME ASSY,METAL[MAIN]	1	ADCA0071101	
23	PCB ASSY,MAIN,SMT	1	SAFE0069209	
22	KEYPAD,MAIN	1	MKAG0001401	
21	SCREW MACHINE,BIND	3	GMEY0011503	
20	COVER ASSY,FRONT	1	ACGK0092501	

<COLOR TABLE>

PRODUCT TPSA00147##		PHONE APEY04328##		COVER ASSY,SLIDE(UPPER) ACGS00137##		COVER ASSY,SLIDE(LOWER) ACGR0011##8##		COVER ASSY,FRONT ACGK00925##		COVER ASSY,REAR ACGM01099##		RAIL ASSY,SLIDE ARDY00027##		BUTTON, DIAL MBJA00254##		CAP,SCREW[FOLDER,SHHET] MCCH0113##9##	
02	GRAPHITE GRAY	06	GRAPHITE GRAY	03	GRAPHITE GRAY	03	GRAPHITE GRAY	03	DARK SILVER	04	GRAPHITE GRAY	03	GRAPHITE GRAY	03	DARK SILVER	03	GRAPHITE GRAY
06	ORANGE	04	ORANGE	04	ORANGE	04	ORANGE	04	GRAY	05	ORANGE	04	ORANGE	04	GRAY	04	ORANGE
07	LIGHT BLUE	05	LIGHT BLUE	05	LIGHT BLUE	05	LIGHT BLUE	05	SILVER	06	LIGHT BLUE	05	LIGHT BLUE	05	SILVER	05	LIGHT BLUE

KEYPAD,MAIN MKAG00014##		CAP,SCREW[REAR,LEFT] MCCH0110##8##		CAP,SCREW[REAR,RIGHT] MCCH0110##9##		TAPE,PROTECTION[SHEET REAR] MTAB02227##	
03	DARK SILVER	03	GRAPHITE GRAY	03	GRAPHITE GRAY	04	GRAPHITE GRAY
04	GRAY	04	ORANGE	04	ORANGE	05	ORANGE
05	SILVER	05	LIGHT BLUE	05	LIGHT BLUE	06	LIGHT BLUE

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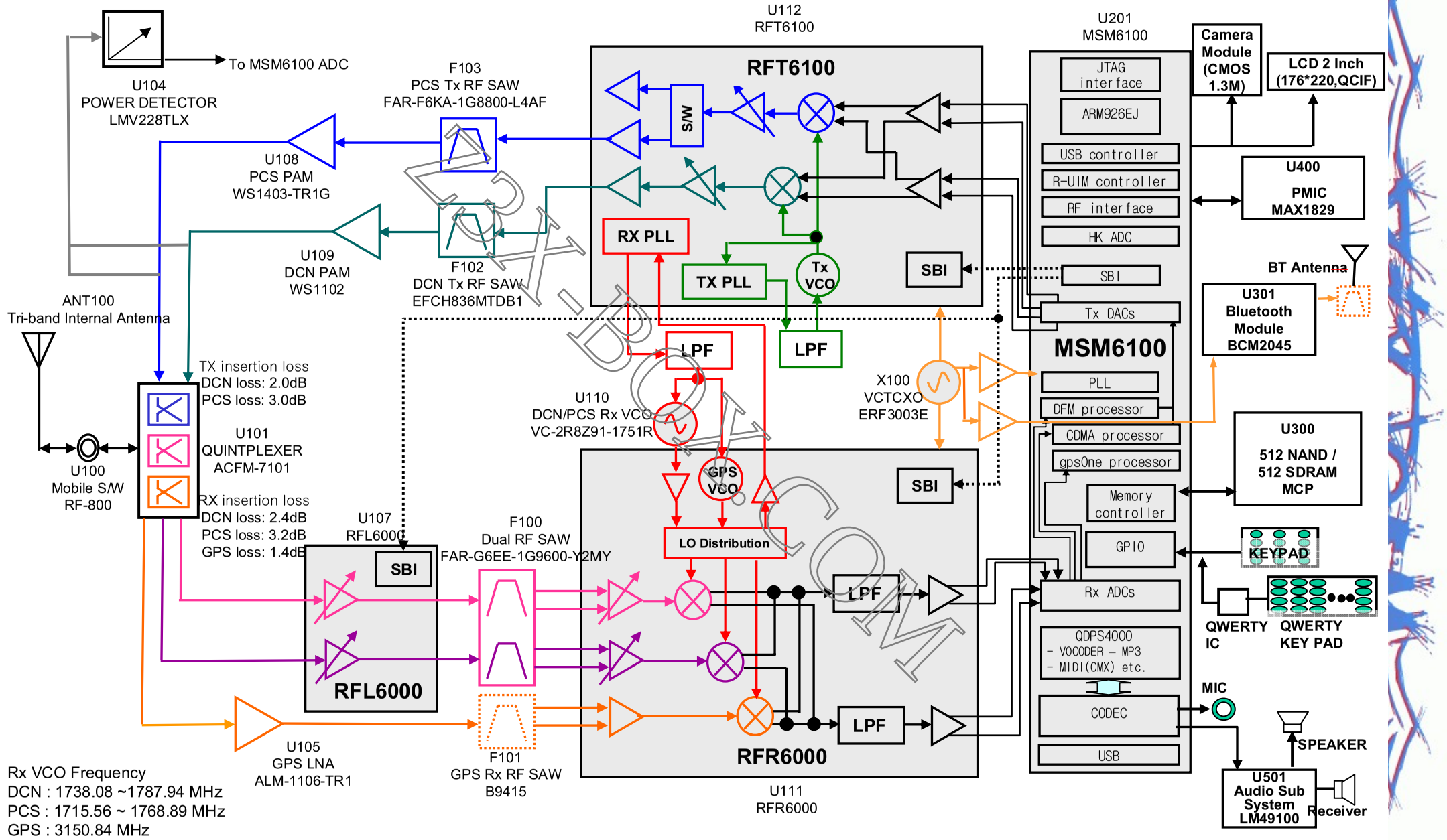
AX260 Block Diagram



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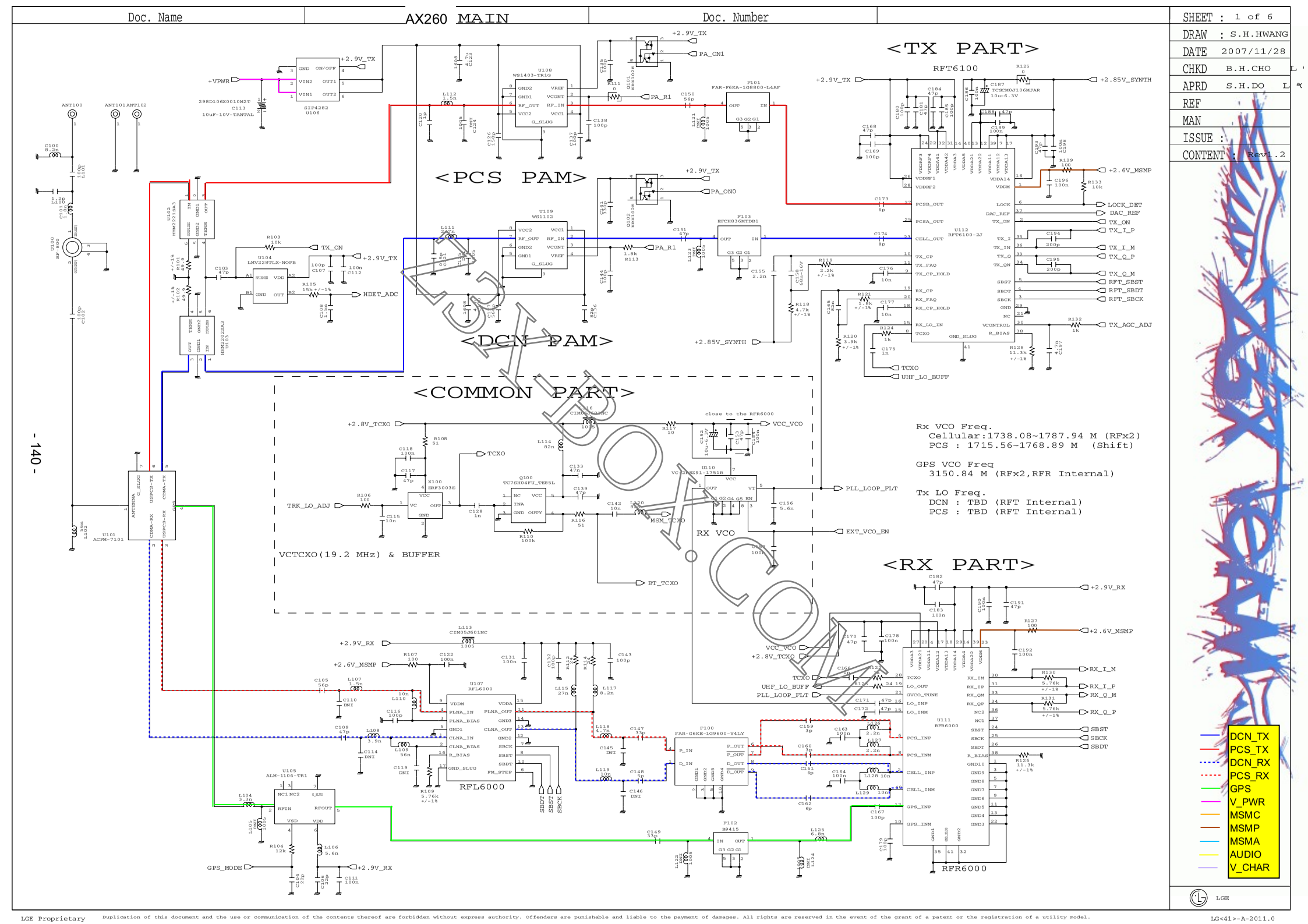
ISSUE :
CONTENT : Rev1.2



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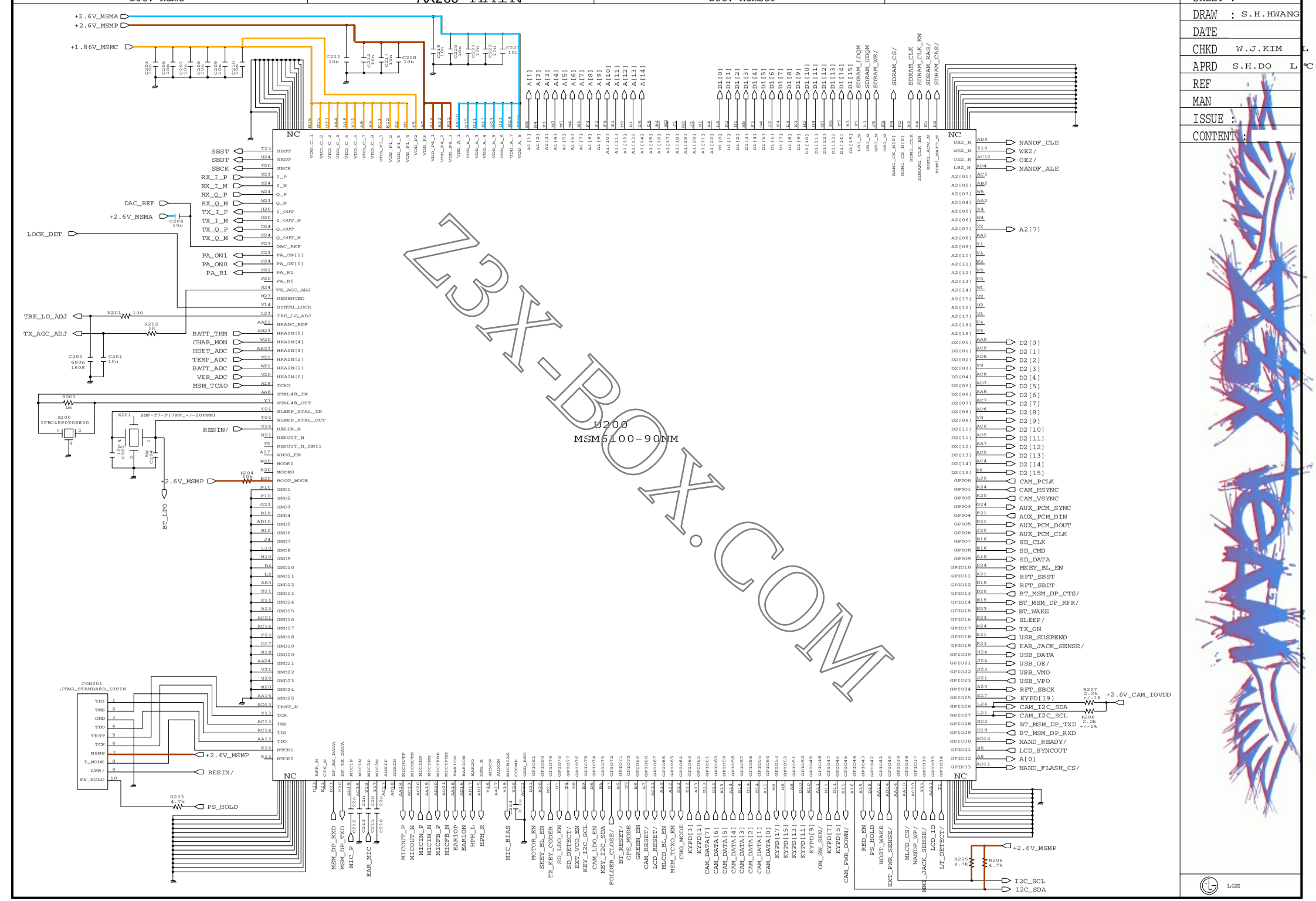

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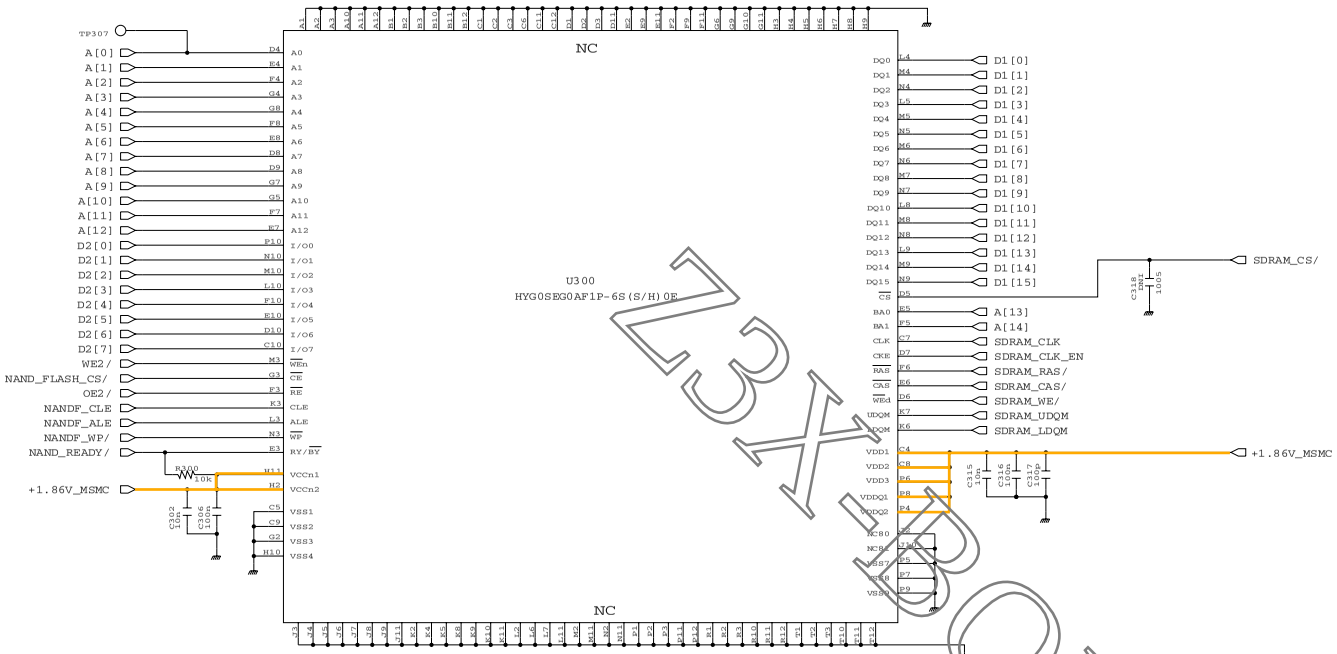
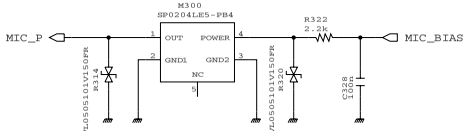
N1 N7 N7 NS N7 N+ N7 N1 N7 N1
LG<41>-A-2011.0

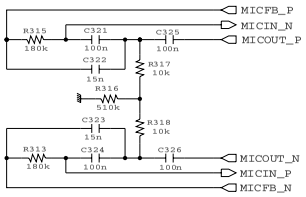
HYNIX MCP (512Mb NAND FLASH + 512Mb SDRAM)



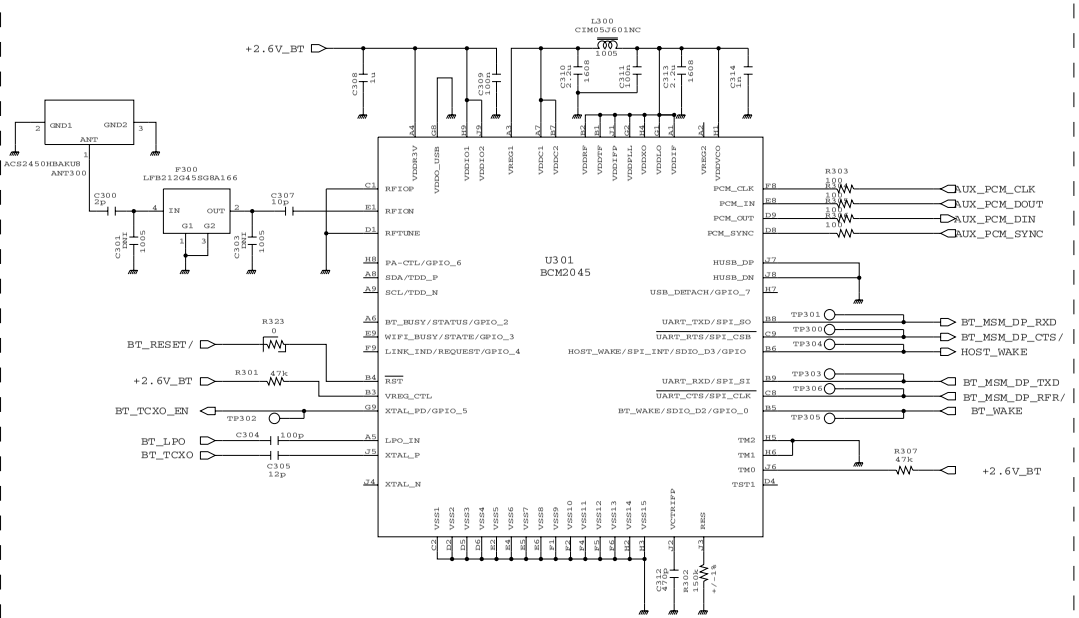
MICROPHONE



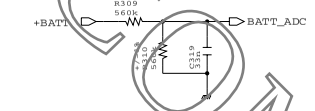
MIC FILTER NETWORK



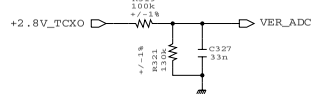
BLUETOOTH MODULE



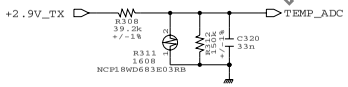
BATT LEVEL CHECK



PCB REVISION ADC



TEMP. ADC



Rev.	R319	R321	ADC_Volt
A	100K	5.6K	0.15V
B	100K	12K	0.30V
C	100K	19.1K	0.45V
D	100K	47K	0.89V
E	100K	56K	1.01V
H	100K	75K	1.20V
1.0	100K	100K	1.40V
1.1	100K	130K	1.58V
1.2	100K	180K	1.80V
1.3	100K	240K	1.98V
1.4	100K	360K	2.19V
1.5	100K	560K	2.38V

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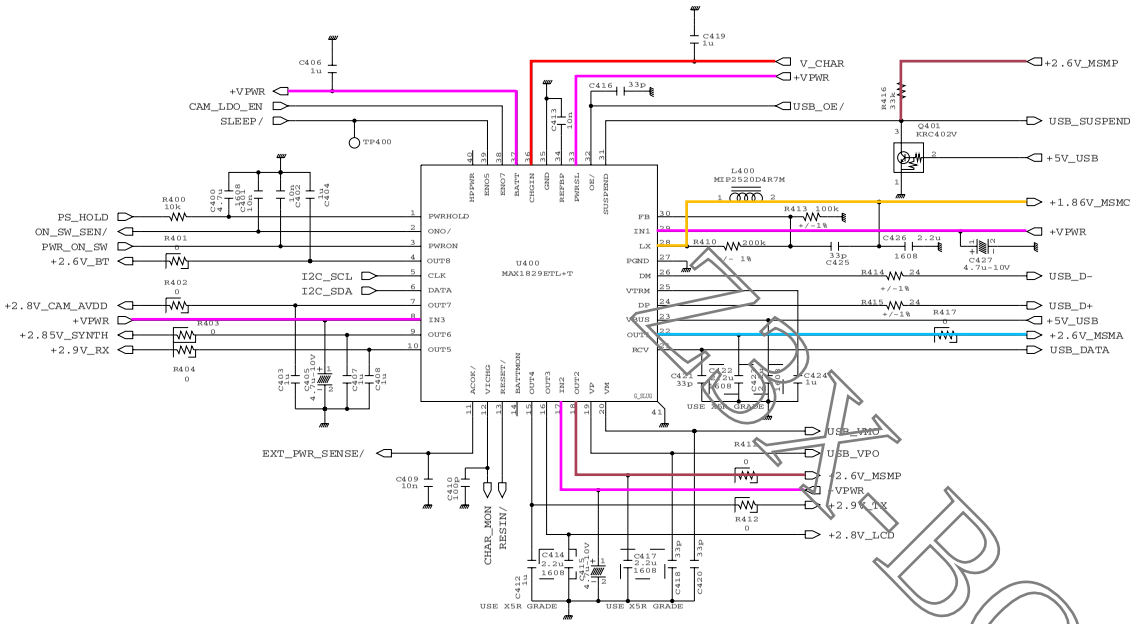
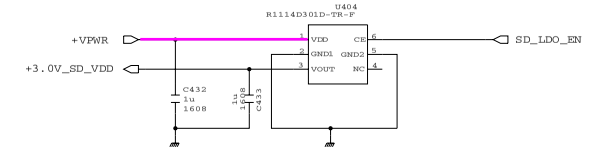
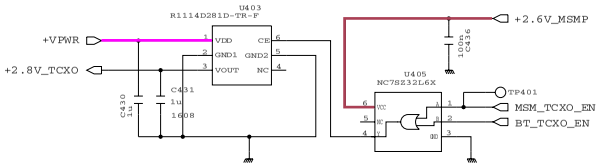
PMIC PART



+3.0V_SD_VDD_LDO



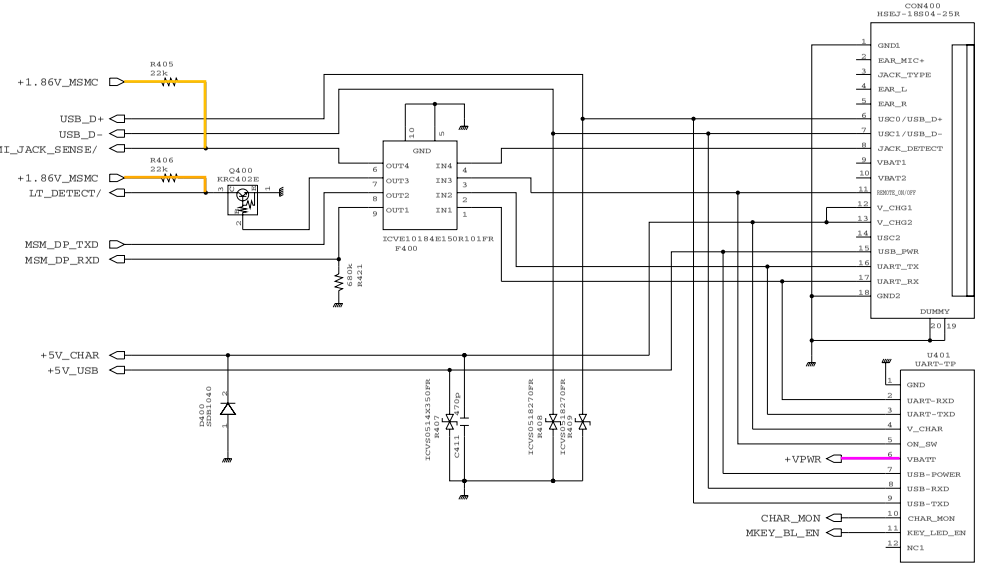
+2.8V_TCXO_LDO



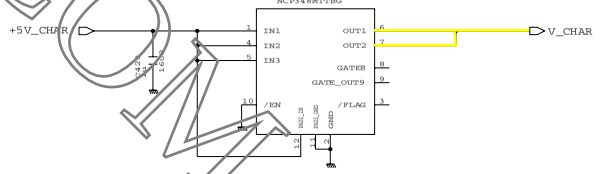
PMIC LDO output

	PWR S/L	BUCK	LDO1	LDO2	LDO3	LDO4	LDO5	LDO6	LDO7	LDO8
Default Voltage	GND/IN BUCK -> 1 -> 2 -> 3	+1.867	+2.6V	+2.6V	+2.85V	+2.85V	+2.85V	+2.85V	+2.85V	+2.85V
Programmable Voltage		0.6 ~ 2.5V			2.80 2.85 2.9 3.0	2.6 2.85 2.9 3.0	2.6 2.85 2.9 3.0	1.3 1.5 1.8 2.5 2.8 2.85 3.0 3.3	2.8 2.85 2.9 3.0	1.8 2.6 2.7 2.8 2.85 3.0 3.1 3.3
OutPut Current		500mA	300mA	300mA	300mA	150mA	150mA	150mA	80mA	150mA
Default ON		ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
Control method		I2C	I2C	I2C	I2C	I2C	EN_5	I2C	EN_7	I2C
QWERTY		+1.86V_MSMC	+2.6V_MSMA	+2.6V_MSMP	+2.8V_LCD	+2.9V_TX	+2.9V_RX	+2.8V_BT	+2.8V_CAM_AVDD	+2.6V_SYNTH

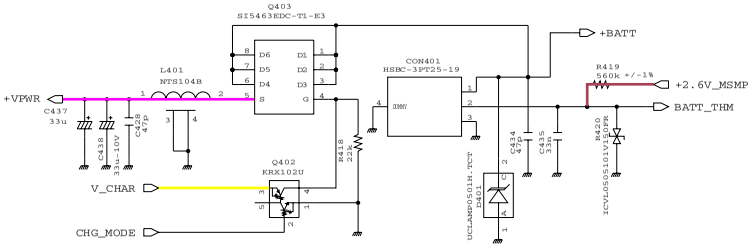
18PIN MMI CONNECTOR



OVP CIRCUIT



BATTERY CONNECTOR



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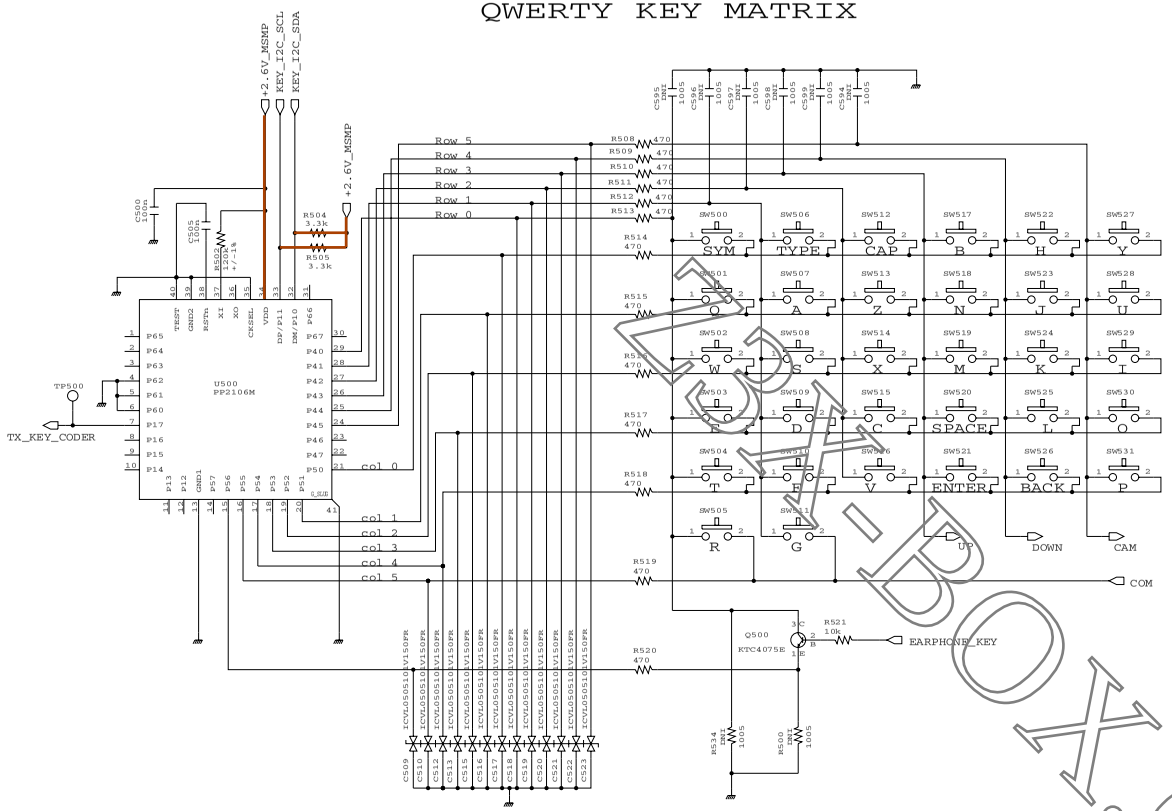
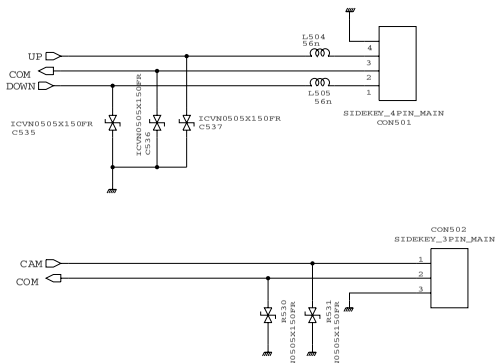
QWERTY KEY MATRIX



SIDE KEY PAD



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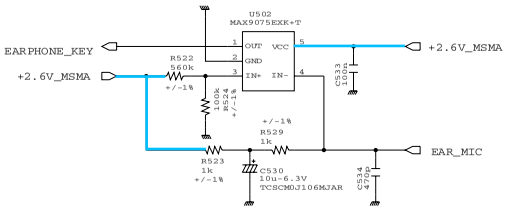
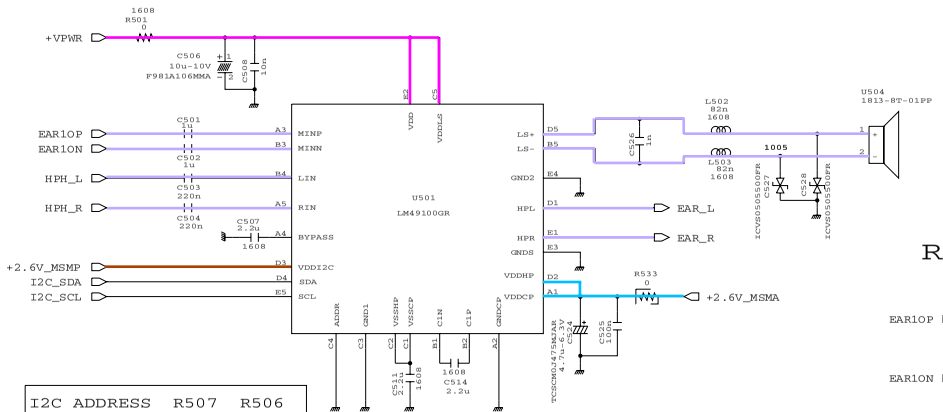
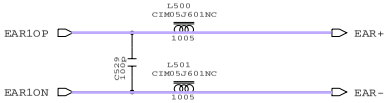


AUDIO SUBSYSTEM

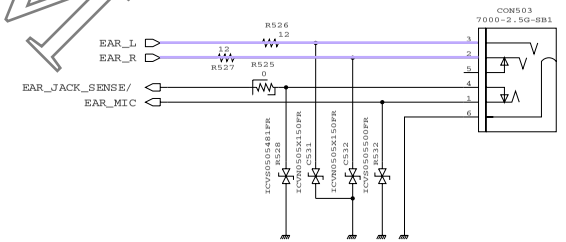


I2C ADDRESS	R507	R506
11111000	0ohm	DNI
11111010	DNI	0ohm

RECEIVER PATH



EAR JACK



LGE Proprietary

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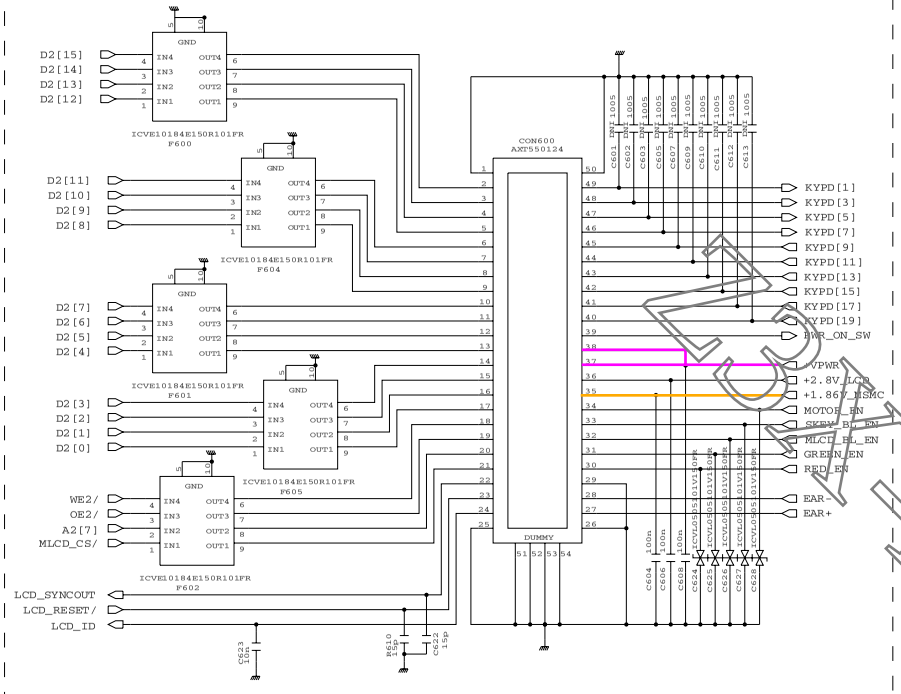
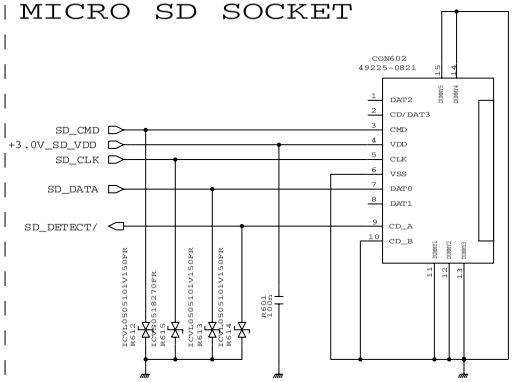
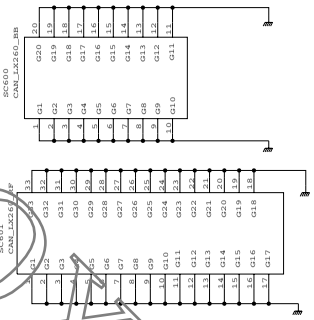
MAIN FPCB 50PIN 1.0T CONNECTOR



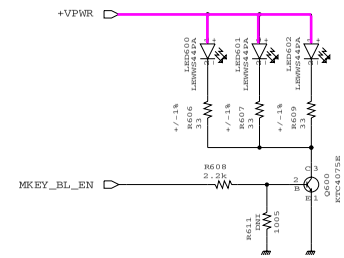
MICRO SD SOCKET



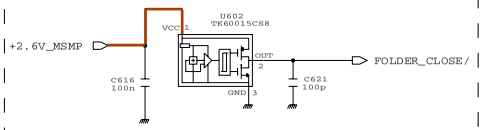
SHIELD CAN



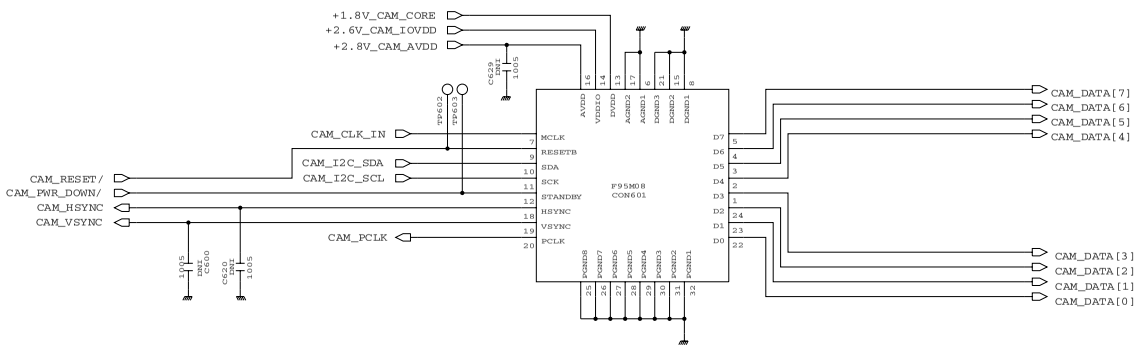
MAIN KEYPAD B/L



FOLDER SWITCH

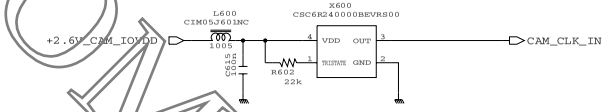


CAMERA SOCKET

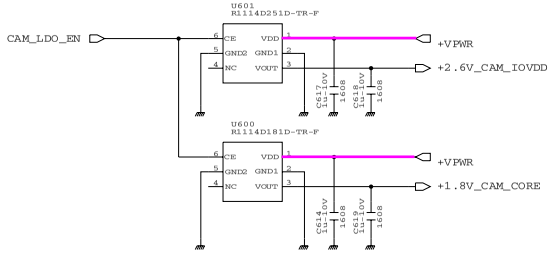


CAMERA TCXO

24MHz



[+2.6V,+1.8V_CAMERA_VDD]



MANUAL BOX.COM

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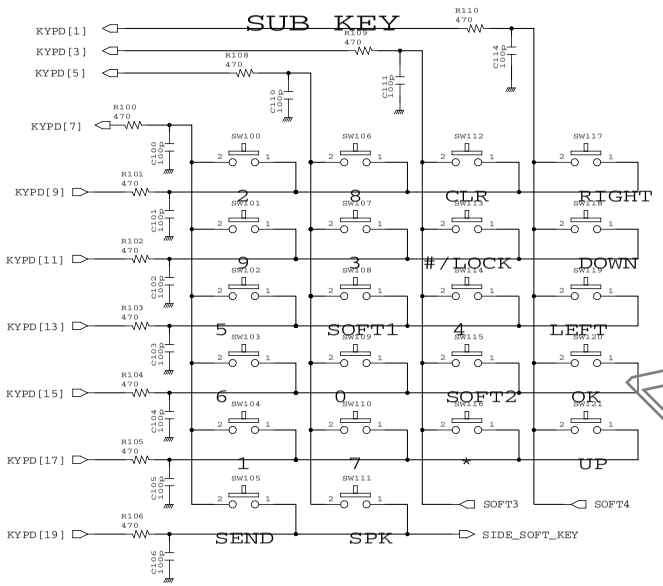
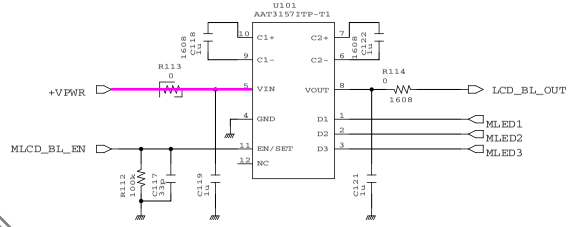
Doc. Name	AX260 KEY	Doc. Number	

SHEET : 1 of 2
DRAW : S.H.HWANG
DATE
CHKD W.J.KIM
APRD S.H.DO
REF
MAN
ISSUE :
CONTENT :

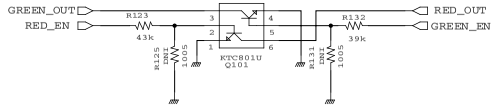
SUB KEY



LCD B/L CHARGE PUMP



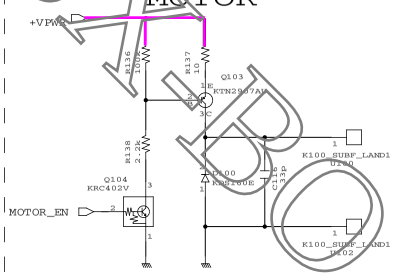
DUAL INDICATOR DRIVER



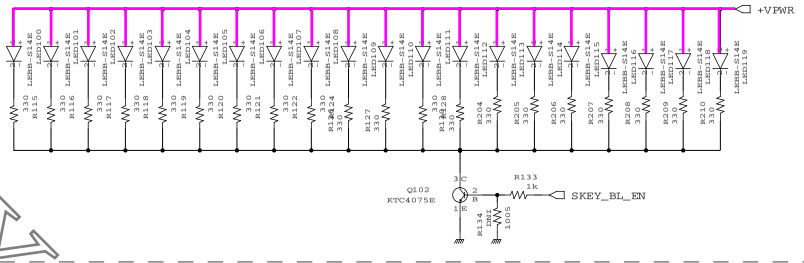
POWER SWITCH

PWR/END

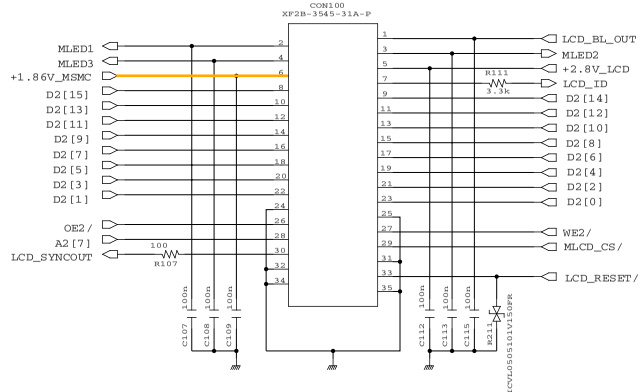
MOTOR



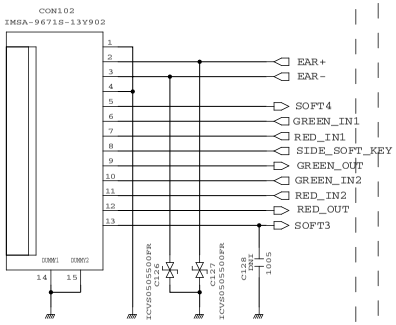
SUB KEY BACKLIGHT

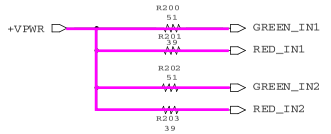


35PIN LCD ZIP TYPE CONNECTOR

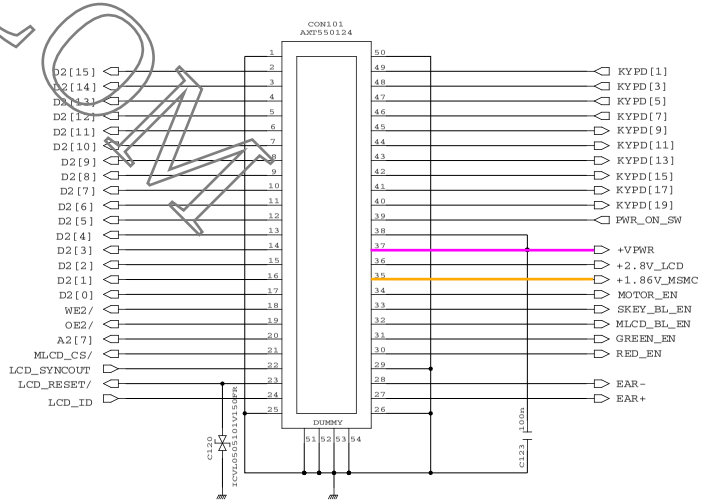


13PIN SUB FPCB CON





SUB FPCB 50PIN 1.0T CONNECTOR



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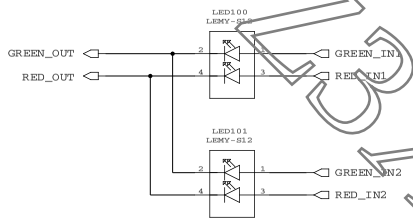
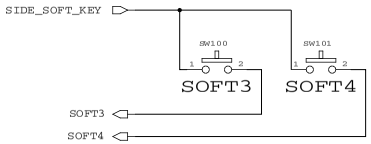
Doc. Name	AX260 SUB FPCB	Doc. Number	

SHEET : 1 of 1
DRAW : S.H.HWANG
DATE
CHKD W.J.KIM
APRD S.H.DO
REF
MAN
ISSUE :
CONTENT :

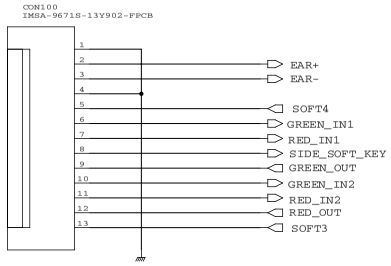
DUAL INDICATOR



SOFT KEY



13PIN SUB FPCB



RECEIVER

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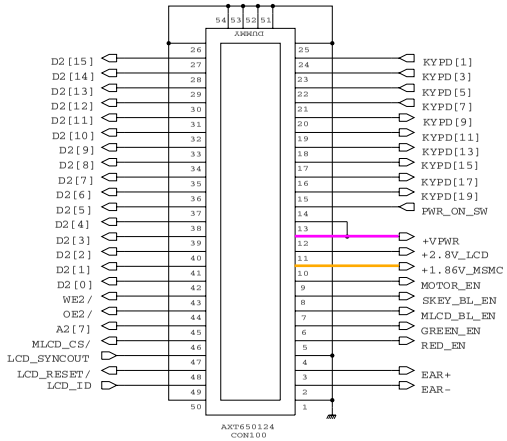
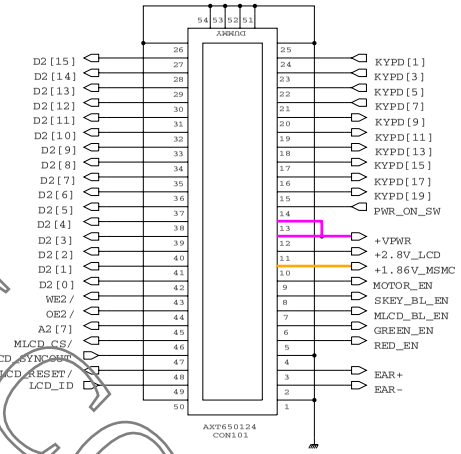
Doc. Name	AX260 MAIN FPCB	Doc. Number	

SHEET : 1 of
DRAW : S.H.HWA
DATE
CHKD W.J.KIM
APRD S.H.DO
REF
MAN
ISSUE :
CONTENT :

MAIN FPCB 50PIN 1.0T CONNECTOR



SUB FPCB 50PIN 1.0T CONNECTOR



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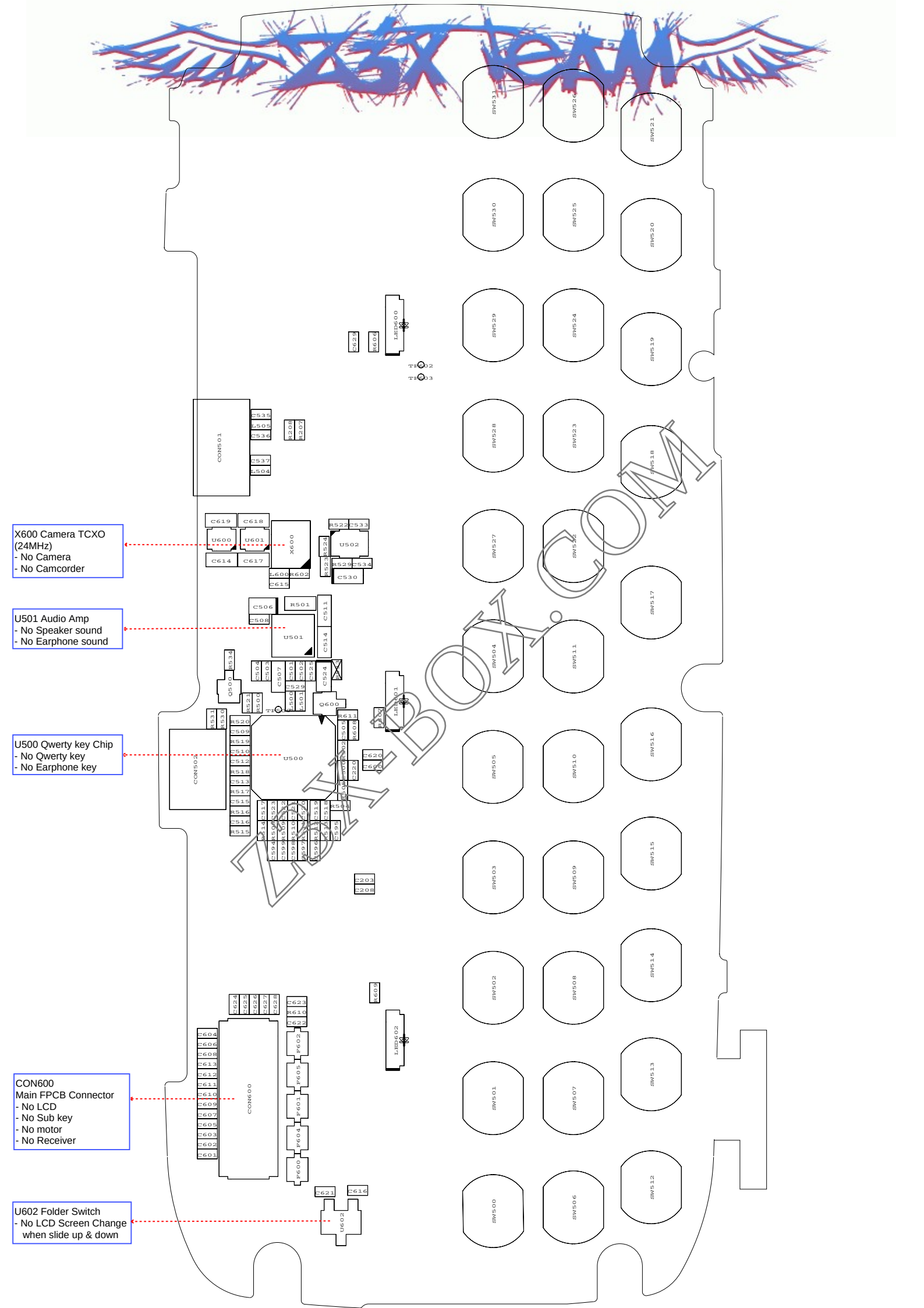
X600 Camera TCXO (24MHz)
- No Camera
- No Camcorder
U501 Audio Amp
- No Speaker sound
- No Earphone sound
U500 Qwerty key Chip
- No Qwerty key
- No Earphone key
CON600
Main FPCB Connector
- No LCD
- No Sub key
- No motor
- No Receiver
U602 Folder Switch
- No LCD Screen Change when slide up & down
CON501
X600
U501
U500
U602
CON600
LED600
LED601
LED602
Q500
Q600
U502
U600
U601
SW500
SW501
SW502
SW503
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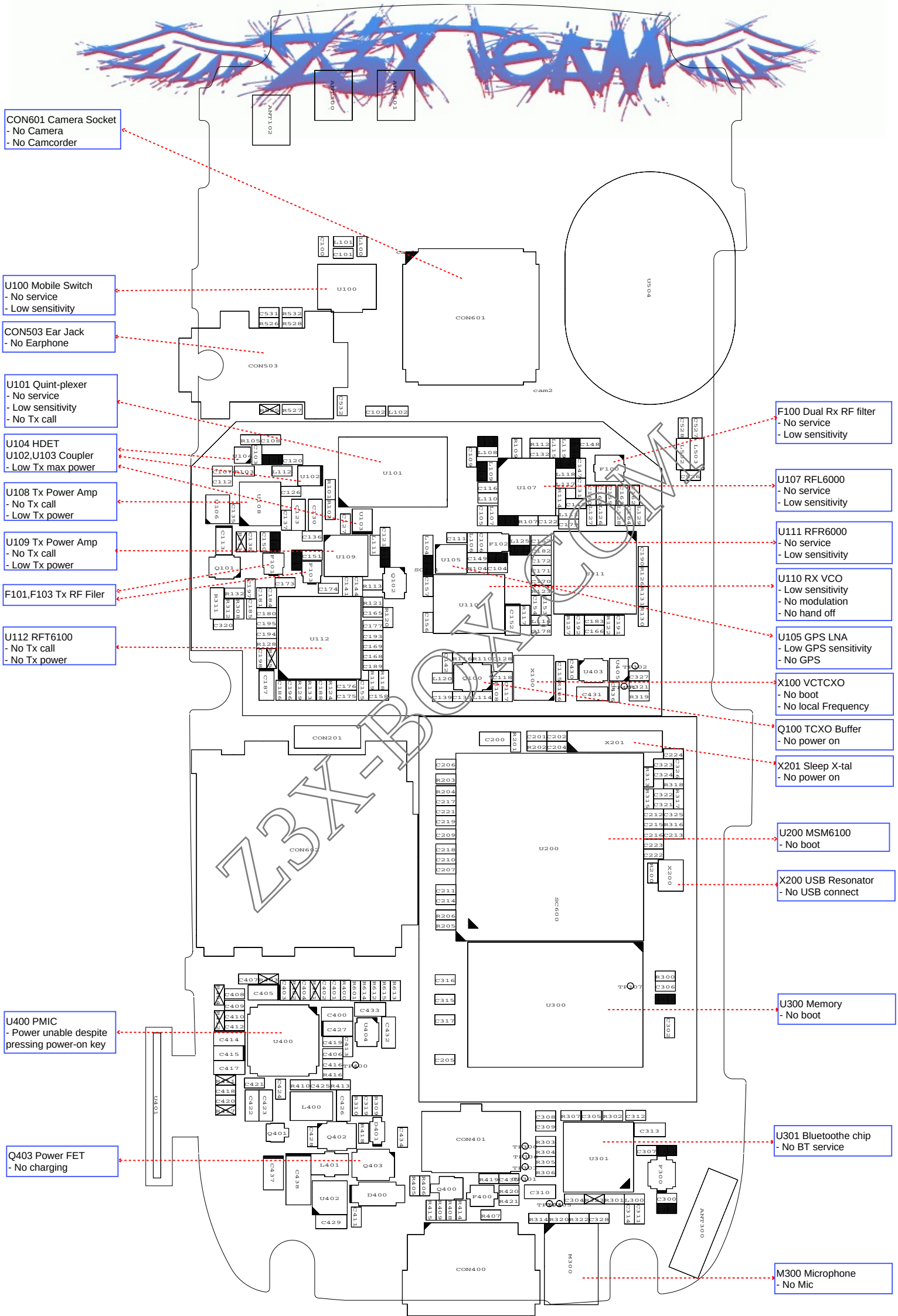
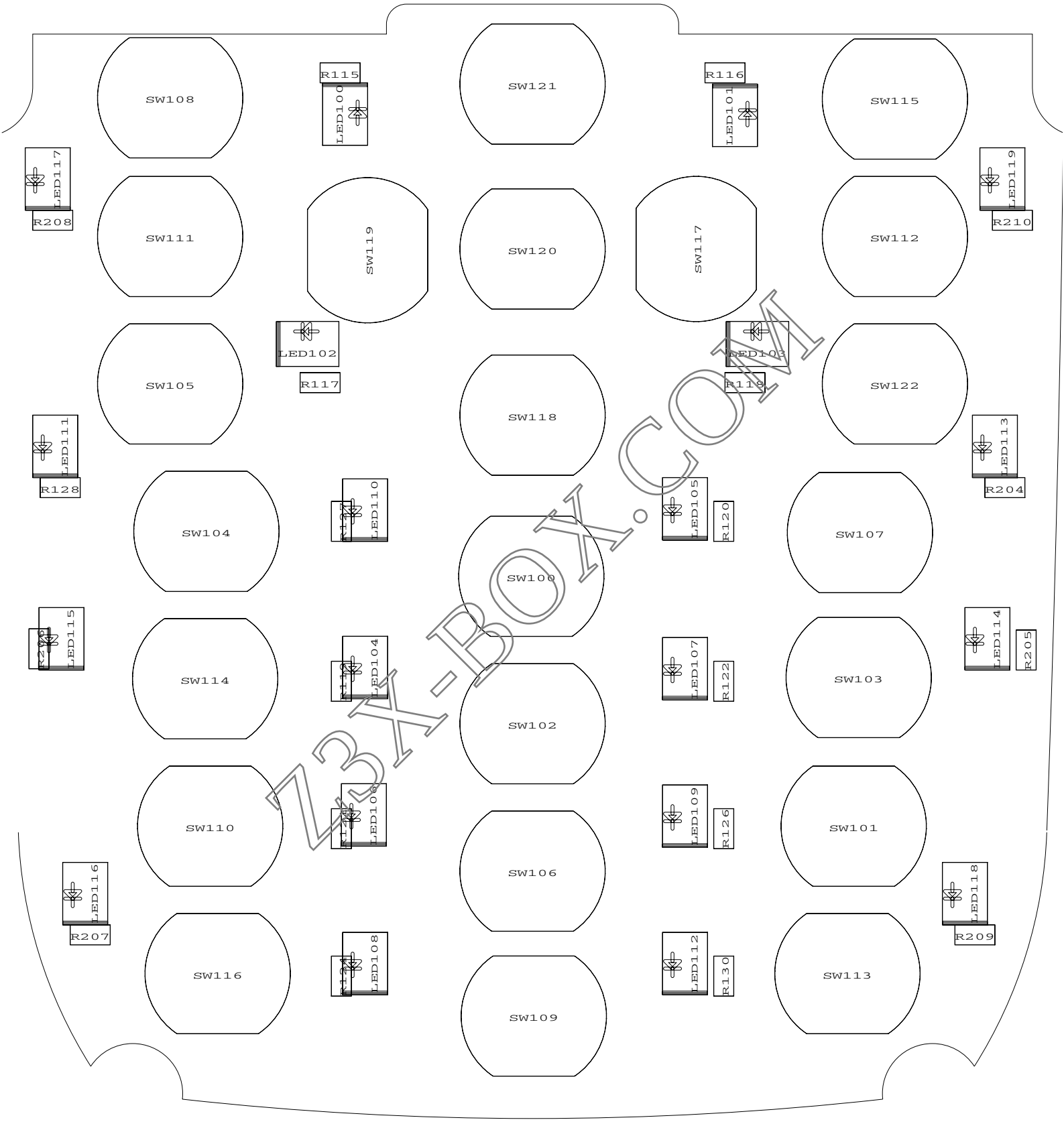
SW531


CON601 Camera Socket
- No Camera
- No Camcorder
U100 Mobile Switch
- No service
- Low sensitivity
CON503 Ear Jack
- No Earphone
U101 Quint-plexer
- No service
- Low sensitivity
- No Tx call
U104 HDET
U102,U103 Coupler
- Low Tx max power
U108 Tx Power Amp
- No Tx call
- Low Tx power
U109 Tx Power Amp
- No Tx call
- Low Tx power
F101,F103 Tx RF Filer
U112 RFT6100
- No Tx call
- No Tx power
U400 PMIC
- Power unable despite pressing power-on key
Q403 Power FET
- No charging
F100 Dual Rx RF filter
- No service
- Low sensitivity
U107 RFL6000
- No service
- Low sensitivity
U111 RFR6000
- No service
- Low sensitivity
U110 RX VCO
- Low sensitivity
- No modulation
- No hand off
U105 GPS LNA
- Low GPS sensitivity
- No GPS
X100 VCTCXO
- No boot
- No local Frequency
Q100 TCXO Buffer
- No power on
X201 Sleep X-tal
- No power on
U200 MSM6100
- No boot
X200 USB Resonator
- No USB connect
U300 Memory
- No boot
U301 Bluetoothe chip
- No BT service
M300 Microphone
- No Mic

KEY PCB TOP



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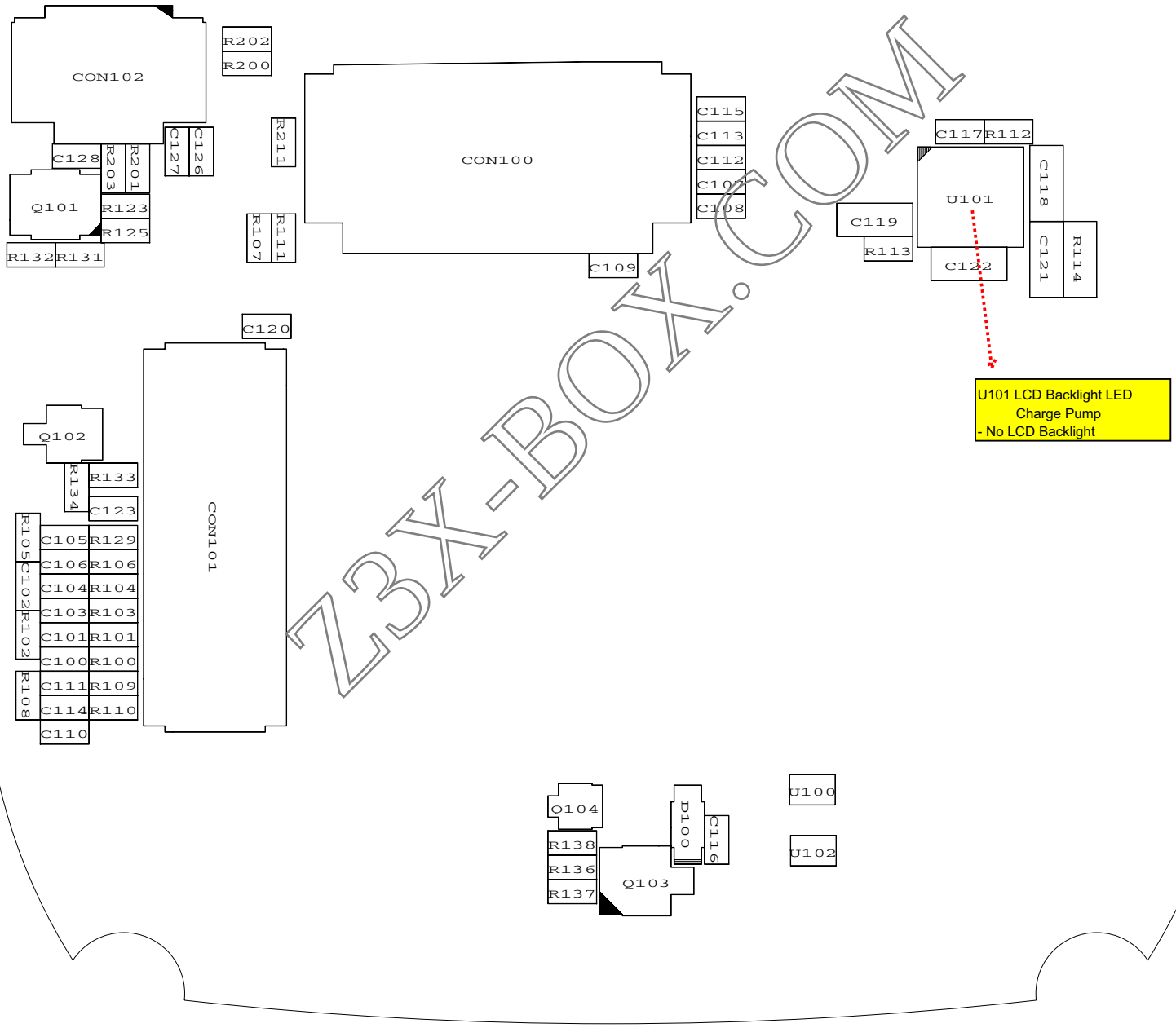
KEY PCB BOT



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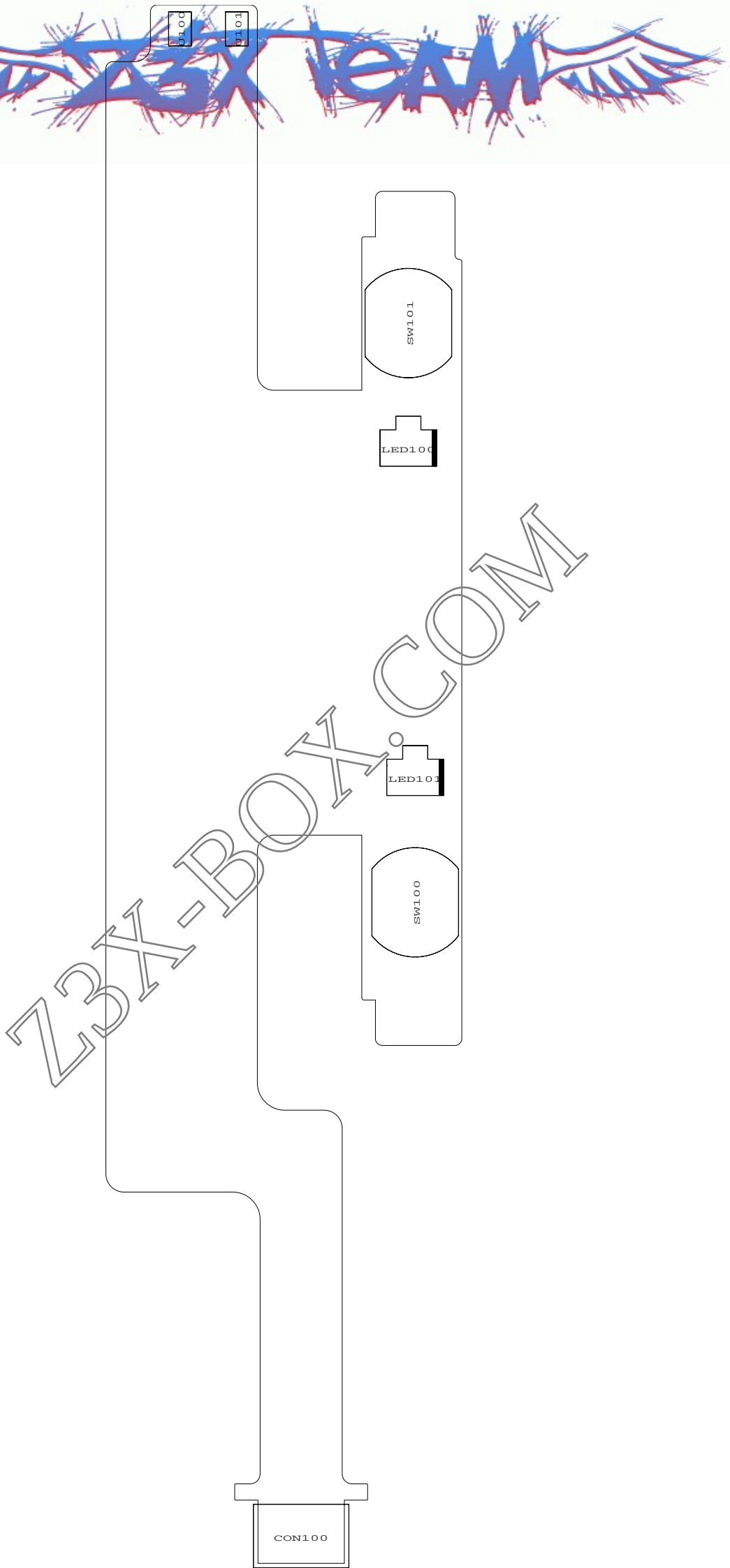
SUB FPCB TOP



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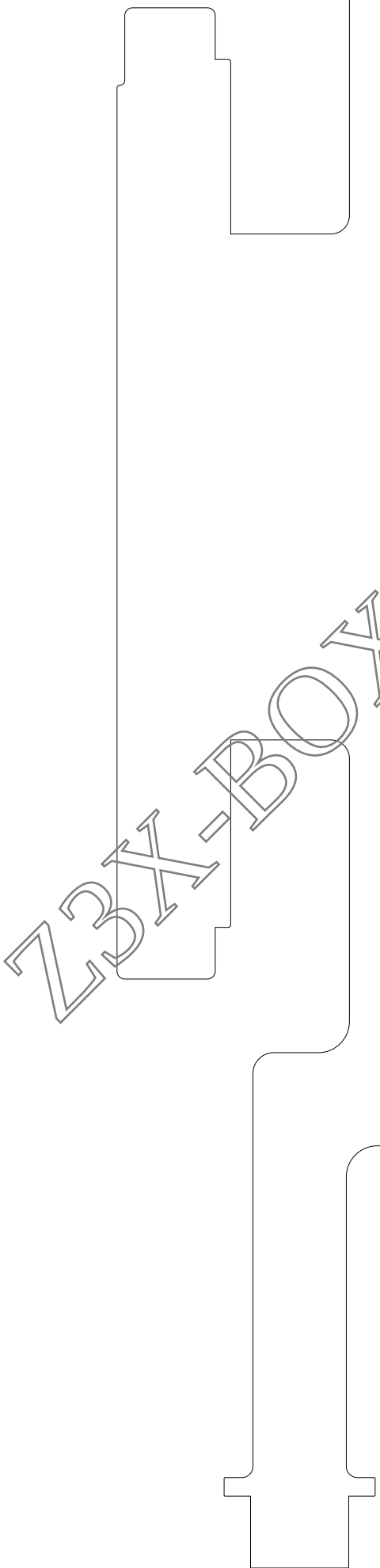
SUB FPCB BOT



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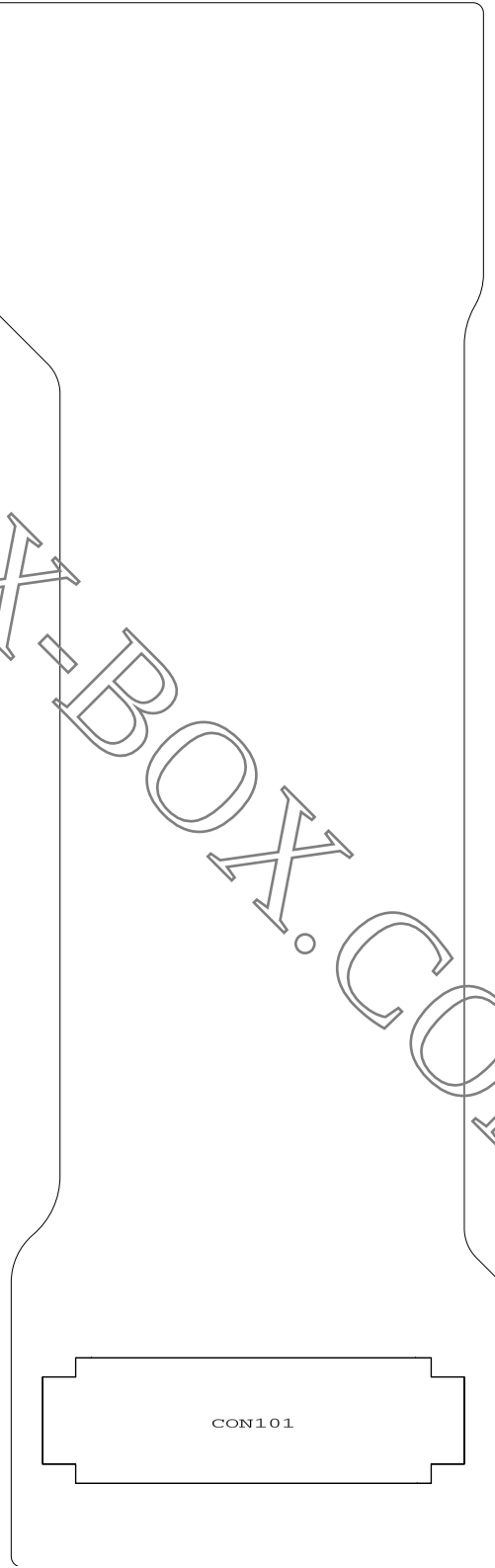
MAIN FPCB TOP



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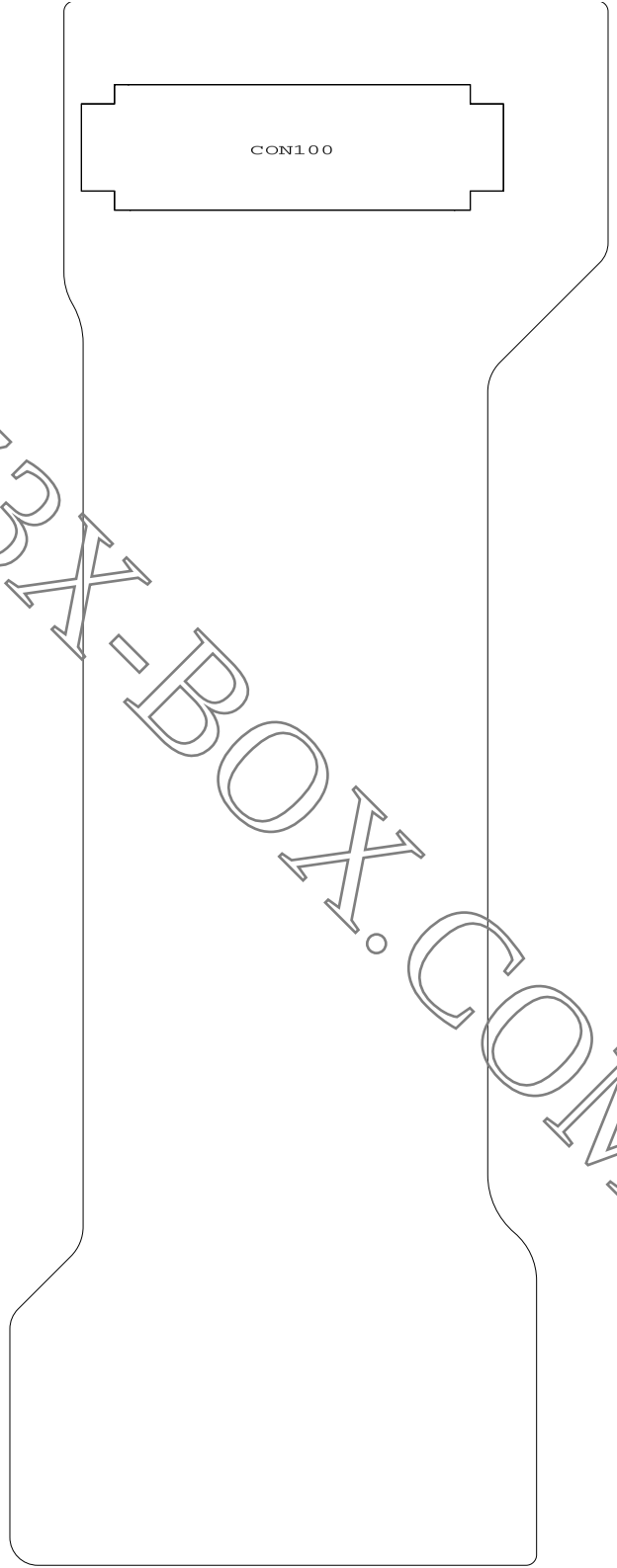
MAIN FPCB BOT



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MAIN PCB Part List TOP

Zuken)Desig-No	Component-Name	ItemNo	Value
C203,C208,C220,C508,C623	MCH153CN103KK	ECCH0000155	10n
C500,C505,C525,C533,C604,C606,C608,C615,C616	C1005JB0J104KT	ECCH0002001	100n
C501,C502	C1005X5R1A105KT	ECZH0001215	1u
C503,C504	C1005X5R1A224KT	ECZH0001216	220n
C506	F981A106MMA	ECTH0001902	10u-10V
C507,C511,C514	GRM39X5R225K10	ECCH0005603	2.2u
C509,C510,C512,C513,C515,C516,C517,C518,C519,C520,C521,C522,C523,C624,C625,C626,C627,C628	ICVL0505101V150FR	SEVY0003601	5.6V-100p
C524	TCSCM0J475MJAR	ECTH0003703	4.7u-6.3V
C529,C621	C1005C0G1H101JT	ECZH0000813	100p
C530	TCSCM0J106MJAR	ECTH0003701	10u-6.3V
C534	C1005X7R1H471KT	ECZH0001121	470p
C535,C536,C537,R530,R531	ICVN0505X150FR	SEVY0004101	5.6V-360p
C614,C617,C618,C619	C1608X5R1A105KT	ECZH0001420	1u-10V
C622,R610	MCH155C150J	ECCH0000112	15p
CON600	AXT550124	ENBY0041901	SOCKET
F600,F601,F602,F604,F605	ICVE10184E150R101FR	SFEY0010501	100Ohm-15pF
L500,L501,L600	CIM05J601NC	SFBH0006806	600
L504,L505	1005GC2T56NJ00	ELCH0004729	56n
LED600,LED601,LED602	LEWWS44PA	EDLH0013701	WHITE
Q500,Q600	KTC4075E	EQBN0007601	
R207,R208	MCR01MZSF2201	ERHZ0000243	2.2k
R501	MCR03EZH0000	ERHZ0000601	0
R502	MCR01MZSF1203	ERHZ0000213	120k
R504,R505	MCR01MZSJ332	ERHZ0000465	3.3k
R508,R509,R510,R511,R512,R513,R514,R515,R516,R517,R518,R519,R520	MCR01MZSF4700	ERHZ0000285	470
R521	MCR01MZSJ103	ERHZ0000405	10k
R522	MCR01MZSF5603	ERHZ0000301	560k
R523,R529	MCR01MZSF1001	ERHY0003201	1k
R524	MCR01MZSF1003	ERHZ0000204	100k
R602	MCR01MZSJ223	ERHZ0000444	22k
R606,R607,R609	MCR01MZSF33R0	ERHZ0000270	33
R608	MCR01MZSJ222	ERHZ0000443	2.2k
U500	PP2106M	EUSY0300001	
U501	LM49100GR	EUSY0336601	
U502	MAX9075EXK+T	EUSY0156301	
U600	R1114D181D-TR-F	EUSY0294701	1.8V-150mA
U601	R1114D251D-TR-F	EUSY0299301	2.5V-150mA
U602	TK60015CS8	EUSY0268102	
X600	CSC6R240000BEVRS00	EXSY0021303	24MHz-50PPM-15pF

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MAIN PCB Part List BOT

Zuken)Desig-No	Component-Name	ItemNo	Value
ANT300	ACS2450HBAKU8	SNGF0020101	
C100,C120	C1005C0G1H010CT	ECZH0000802	1p
C101,L111	1005GC2T2N7S00	ELCH0004708	2.7n
C102,C107,C116,C132,C135,C138,C143,C144,C167,C169,C179,C180,C185,C304,C317,C410,L101,C137	C1005C0G1H101JT	ECZH0000813	100p
C103,C109,C117,C139,C151,C153,C168,C170,C171,C172,C181,C182,C184,C188,C191,C193,C428,C434	MCH155A470JK	ECCH0000122	47p
C104,C106	MCH155A220JK	ECCH0000115	22p
C105,C150	C1005C0G1H560JT	ECZH0000841	56p
C108	MCH155CN152KK	ECCH0000145	1.5n
C111,C112,C118,C122,C131,C154,C157,C163,C164,C178,C183,C186,C189,C190,C192,C196,C198,C306,C309,C311,C316,C321,C324,C325,C326,C328,C436,R601	C1005JB0J104KT	ECCH0002001	100n
C113	298D106X0010M2T	ECTH0005601	
C115,C142,C176,C177,C201,C205,C206,C207,C209,C210,C211,C214,C217,C218,C219,C221,C222,C223,C302,C315,C401,C402,C409,C413	MCH153CN103KK	ECCH0000155	10n
C121	C1005CH1H0R5BB	ECZH0001002	0.5p
C123,C130	C1608Y5V0J475ZT	ECZH0026301	4.7u
C126		ECCH0000187	150p
C127		ECZH0003118	560p
C128,C166,C175,C314,C526	MCH155CN102KK	ECCH0000143	1n
C133	C1005JB1A473KT	ECCH0002002	47n
C136		ECCH0000127	82p
C141	C1005X7R1H331KT	ECCH0000137	330p
C147,C149,C416,C418,C420,C421,C425	C1005C0G1H330JT	ECZH0000830	33p
C148	C1005C0G1H050CT	ECZH0000806	5p
C152,C187	TCSCM0J106MJAR	ECTH0003701	10u-6.3V
C155	MCH155CN222KK	ECCH0000147	2.2n
C156	C1005X7R1E562KT	ECZH0001107	5.6n
C158	GRM36X7R683K16PT	ECZH0003124	68n-16V
C159,C160	MCH155A030C	ECCH0000104	3p
C161,C162,C173	MCH155A060DK	ECCH0000107	6p
C165	GRM36X5R823K10	ECZH0003004	82n
C174,C204	MCH155A080DK	ECCH0000109	8p
C194,C195	C1005C0G1H201JT	ECZH0000849	200p
C197	C1005X7R1E472KT	ECZH0001106	4.7n
C200	C1608X5R1A684M	ECCH0000287	680n
C202,C307	MCH155A100D	ECCH0000110	10p
C212,C213,C215,C216	C1005Y5V1C223ZT	ECZH0001202	22n
C224	GRM36X5R104K10PT	ECCH0000182	0.1u
C300	C1005C0G1H020CT	ECZH0000803	2p
C305	C1005C0G1H120JT	ECZH0000816	12p
C308,C412,C424,C430	C1005X5R1A105KT	ECZH0001215	1u
C310,C313,C426	C1608Y5V1A225ZT	ECZH0001511	2.2u
C312,C411	C1005X7R1H471KT	ECZH0001121	470p
C319,C320,C327,C435	MCH153CN333KK	ECCH0000161	33n

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C322,C323	C1005Y5V1C153ZT	ECZH0001208	15n
C400	C1608X5R0J475KT	ECCH0006201	4.7u
C403,C404,C406,C407,C408,C419	GRM155R60J105KE19D	ECCH0004904	1u
C405,C415,C427	TCSCM1A475MJAR	ECTH0003704	4.7u-10V
C414,C417,C422,C423	GRM39X5R225K10	ECCH0005603	2.2u
C429,C431,C433	GRM39X5R105K25PT	ECZH0003503	1u
C432	GRM39X5R105K6.3PT	ECZH0003501	1u
C437	572D336X0010P2T	ECTZ0005603	33u
C438	TLJS336M010R1500	ECTH0005502	33u-10V
C527,C528,R532	ICVS0505500FR	SEVY0005402	5.6V-50p
C531,C532	ICVN0505X150FR	SEVY0004101	5.6V-360p
CON400	HSEJ-18S04-25R	ENRY0006401	
CON401	HSBC-3PT25-19	ENZY0019801	
CON503	7000-2.5G-SB1	ENJE0003101	
CON601	F95M08	ENSY0020101	
CON602	49225-0821	ENSY0014701	
D400	SDB1040	EDSY0017701	
D401	UCLAMP0501H.TCT	EDTY0007501	
F100	FAR-G6KE-1G9600-Y4LY	SFSB0001201	881.5
F101	FAR-F6KA-1G8800-L4AF	SFSY0032501	1880MHz
F102	B9415	SFSY0033401	1575.42MHz
F103	EFCH836MTDB1	SFSY0030301	836.5MHz
F300	LFB212G45SG8A166	SFCY0000901	2450MHz
F400	ICVE10184E150R101FR	SFEY0010501	100Ohm-15pF
L100	1005GC2T22NJ00	ELCH0004711	22n
L102,L109	1005GC2T56NJ00	ELCH0004729	56n
L104	LL1005-FH3N3S	ELCH0001405	3.3n
L106	1005GC2T5N6S00	ELCH0004718	5.6n
L107,L112	1005GC2T1N5J00	ELCH0004726	1.5n
L108	1005GC2T3N9S00	ELCH0004712	3.9n
L110,L119,L128,L129	1005GC2T10NJ00	ELCH0004706	10n
L113,L116,L300	CIM05J601NC	SFBH0006806	600
L114,L120	1005GC2T82NJ00	ELCH0004717	82n
L115	1005GC2T27NJ00	ELCH0004715	27n
L117	1005GC2T8N2J00	ELCH0004705	8.2n
L118	1005GC2T4N7S00	ELCH0004704	4.7n
L125	1005GC2T6N8J00	ELCH0004713	6.8n
L126,L127	1005GC2T2N2S00	ELCH0004721	2.2n
L400	MIP2520D4R7M	ELCP0008001	4.7u
L401	NTS104B	SFEY0006001	
L502,L503	LL1608-FS82NJ	ELCH0004202	82n
M300	SP0204LE5-PB4	SUMY0010602	
Q100	TC7SH04FU(TE85L)	EUSY0073401	
Q101,Q102	KRX102E	EQBA0000602	
Q400	KRC402E	EQBN0012401	
Q401	KRC402V	EQBN0012402	
Q402	KRX102U	EQBA0000601	
Q403	SI5463EDC-T1-E3	EQFP0004801	
R101,R102	MCR01MZSF49R9	ERHZ0000291	49.9
R103,R133,R204,R300,R400	MCR01MZSJ103	ERHZ0000405	10k
R104	MCR01MZSF1202	ERHZ0000212	12k

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R105	MCR01MZSF1502	ERHZ0000221	15k
R106,R107,R127,R129,R201,R303,R304,R305,R306	MCR01MZSJ101	ERHY0003301	100
R108,R116	MCR01MZSJ510	ERHZ0000490	51
R109,R130,R131	MCR01MZSF5761	ERHZ0003202	5.76k
R110	MCR01MZSJ104	ERHZ0000406	100k
R112,R114,R123,R414,R415	MCR01MZSF24R0	ERHZ0000325	24
R113		ERHY0003401	1.8K
R117	MCR01MZSJ100	ERHZ0000402	10
R118	MCR01MZSF4701	ERHZ0000286	4.7k
R119	MCR01MZSF2201	ERHZ0000243	2.2k
R120	MCR01MZSF3901	ERHZ0000278	3.9k
R121	MCR01MZSF1801	ERHZ0000229	1.8k
R122,R124,R132,R202	MCR01MZSJ102	ERHZ0000404	1k
R126,R128	MCR01MZSF1132	ERHZ0003203	11.3k
R200	MCR01MZSF1004	ERHZ0000205	1m
R203,R205,R206	MCR01MZSJ472	ERHZ0000485	4.7k
R301,R307	MCR01MZSF4702	ERHZ0000287	47k
R302,R312	MCR01MZSF1503	ERHZ0000222	150k
R308	MCR01MZSF3922	ERHZ0000281	39.2k
R309,R310,R419	MCR01MZSF5603	ERHZ0000301	560k
R311	NCP18WD683E03RB	SETY0001401	
R313,R315	MCR01MZSJ184	ERHZ0000433	180k
R314,R320,R420,R612,R613,R614	ICVL0505101V150FR	SEVY0003601	5.6V-100p
R316	MCR01MZSJ514	ERHZ0000494	510k
R317,R318	MCR01MZSF1002	ERHZ0000203	10k
R319,R413	MCR01MZSF1003	ERHZ0000204	100k
R321		ERHZ0000231	180k
R322	MCR01MZSJ222	ERHZ0000443	2.2k
R405,R406,R418	MCR01MZSJ223	ERHZ0000444	22k
R407	ICVS0514X350FR	SEVY0004201	14V-120p
R408,R409,R615	ICVS0518270FR	SEVY0005403	18V-27p
R410	MCR01MZSF2003	ERHZ0000238	200k
R416	MCR01MZSJ333	ERHZ0000466	33k
R421	MCR01MZSJ684	ERHZ0000508	680k
R526,R527	MCR01MZSF12R0	ERHZ0000348	12
R528	ICVS0505481FR	SEVY0007901	5.6V-480p
SC600	CAN_LX260_BB	TEST	
SC601	CAN_LX260_RF	TEST	
U100	RF-800	ENWY0004401	
U101	ACFM-7101	SMZY0009901	
U102	HHM2221SA3	SCDY0003201	
U103	HHM2202SA3	SCDY0003202	
U104	LMV228TLX-NOPB	EUSY0186102	
U105	ALM-1106-TR1	EUSY0265501	
U106	SIP4282	EQFP0009001	
U107	RFL6000	EUSY0133701	
U108	WS1403-TR1G	SMPY0018301	
U109	WS1102	SMPY0012401	
U110	VC-2R8Z91-1751R	EXSC0007001	
U111	RFR6000	EUSY0133801	

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U112	RFT6100-2J	EUSY0133602	
U200	MSM6100-90NM	EUSY0152202	
U300	HYG0SEG0AF1P-6S(S/H)0E	EUSY0331001	
U301	BCM2045	EUSY0300201	
U400	MAX1829ETL+T	EUSY0284701	
U402	NCP348MTTBG	EUSY0319201	
U403	R1114D281D-TR-F	EUSY0232812	2.8V-150mA
U404	R1114D301D-TR-F	EUSY0232816	3.0V-150mA
U405	NC7SZ32L6X	EUSY0300601	OR-GATE
X100	ERF3003E	EXSK0004802	19.2MHz_1.5PPM_2.8V
X200	IFRC48P0T0SE30	EXRY0002601	
X201	SSP-T7-F(7PF_+/-20PPM)	EXXY0016001	32.768KHz,20PPM,7pF,65Kohm

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KEY PCB Part List

Zuken)Desig-No	Component-Name	ItemNo	Value	Side
LED100,LED101,LED102,LED103,LED104,LED105,LED106,LED107,LED108,LED109,LED110,LED111,LED112,LED113,LED114,LED115,LED116,LED117,LED118,LED119	LEBB-S14E	EDLH0004501		TOP
R115,R116,R117,R118,R119,R120,R121,R122,R124,R126,R127,R128,R130,R204,R205,R206,R207,R208,R209,R210	MCR01MZSF3300	ERHZ0000326	330	TOP
C100,C101,C102,C103,C104,C105,C106,C110,C111,C114	C1005C0G1H101JT	ECZH0000813	100p	BOT
C107,C108,C109,C112,C113,C115,C123	C1005JB0J104KT	ECCH0002001	100n	BOT
C116,C117	C1005C0G1H330JT	ECZH0000830	33p	BOT
C118,C119,C121,C122	GRM39X5R105K25PT	ECZH0003503	1u	BOT
C126,C127	ICVS0505500FR	SEVY0005402	5.6V-50p	BOT
CON100	XF2B-3545-31A-P	ENQY0010901		BOT
CON101	AXT550124	ENBY0041901	SOCKET	BOT
CON102	IMSA-9671S-13Y902	ENQY0013804	STRAIGHT	BOT
D100	KDS160E	EDSY0009901		BOT
Q101	KTC801U	EQBN0011801		BOT
Q102	KTC4075E	EQBN0007601		BOT
Q103	KTN2907AU	EQBP0004102		BOT
Q104	KRC402V	EQBN0012402		BOT
R100,R101,R102,R103,R104,R105,R106,R108,R109,R110	MCR01MZSJ471	ERHZ0000484	470	BOT
R107	MCR01MZSJ101	ERHY0003301	100	BOT
R111	MCR01MZSJ332	ERHZ0000465	3.3k	BOT
R112,R136	MCR01MZSJ104	ERHZ0000406	100k	BOT
R114	MCR03EZHJ000	ERHZ0000701	0	BOT
R123	MCR01MZSJ433	ERHZ0000481	43k	BOT
R129	MCR01MZSJ102	ERHZ0000404	1k	BOT
R132	MCR01MZSJ393	ERHZ0000476	39k	BOT
R133	MCR01MZSF1001	ERHY0003201	1k	BOT
R137	MCR01MZSJ100	ERHZ0000402	10	BOT
R138	MCR01MZSJ222	ERHZ0000443	2.2k	BOT
R200,R202	MCR01MZSJ510	ERHZ0000490	51	BOT
R201,R203	MCR01MZSJ390	ERHZ0000473	39	BOT
R211,C120	ICVL0505101V150FR	SEVY0003601	5.6V-100p	BOT
U101	AAT3157ITP-T1	EUSY0238702		BOT

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Main FPCB Part List

Zuken)Desig-No	Component-Name	Maker-PN	ItemNo	Qty	Side
CON100	AXT650124	MATSUSHITA	ENBY0042001	1	TOP
CON101	AXT650124	MATSUSHITA	ENBY0042001	1	BOT

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SUB FPCB Part List

Zuken)Desig-No	Component-Name	ItemNo	Value	Side
LED100,LED101	LEMY-S12	EDLM0007001		TOP

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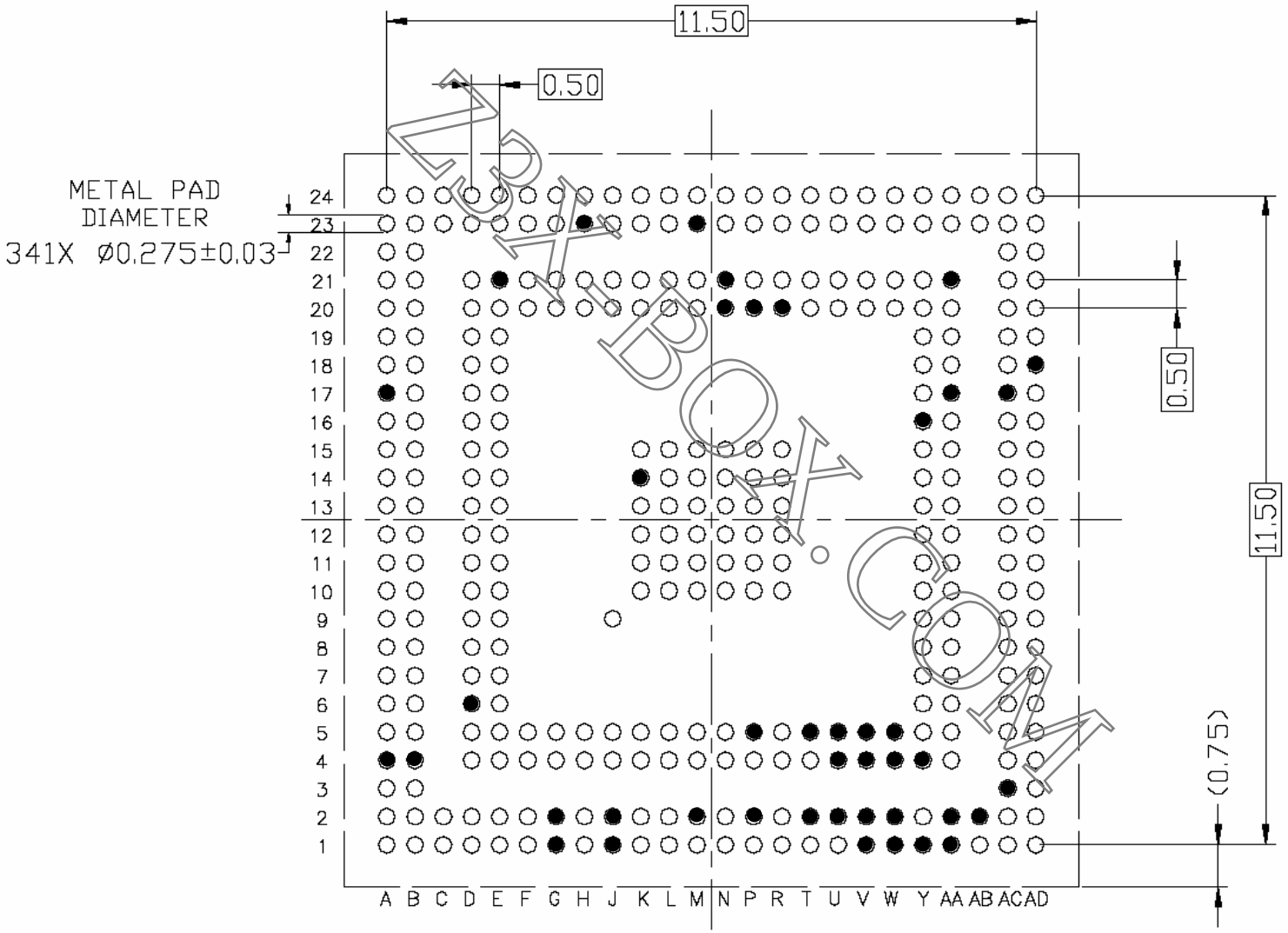
U200 MSM6100

● 미사용
○ 사용



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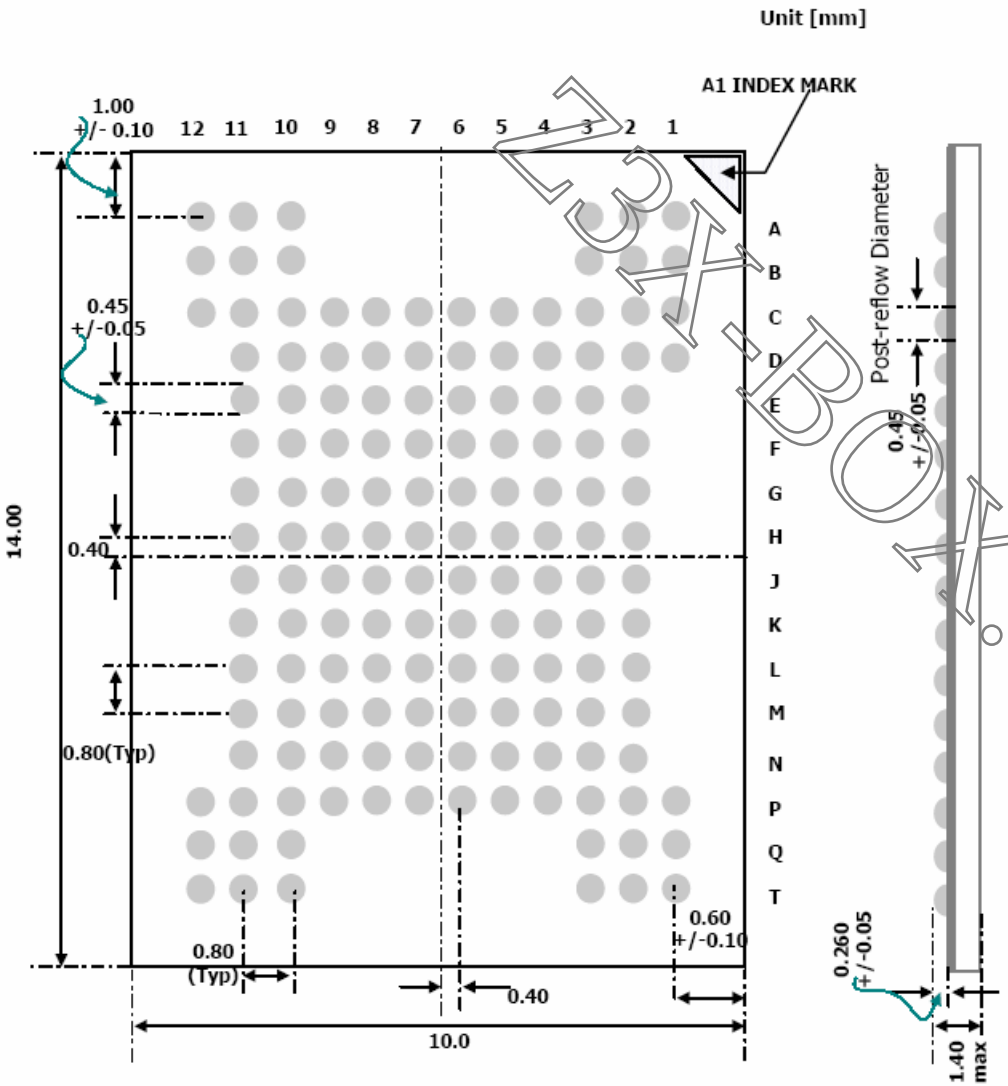
EUSY0152202

U300 HYG0SEG0AF1P-6S(S/H)0E

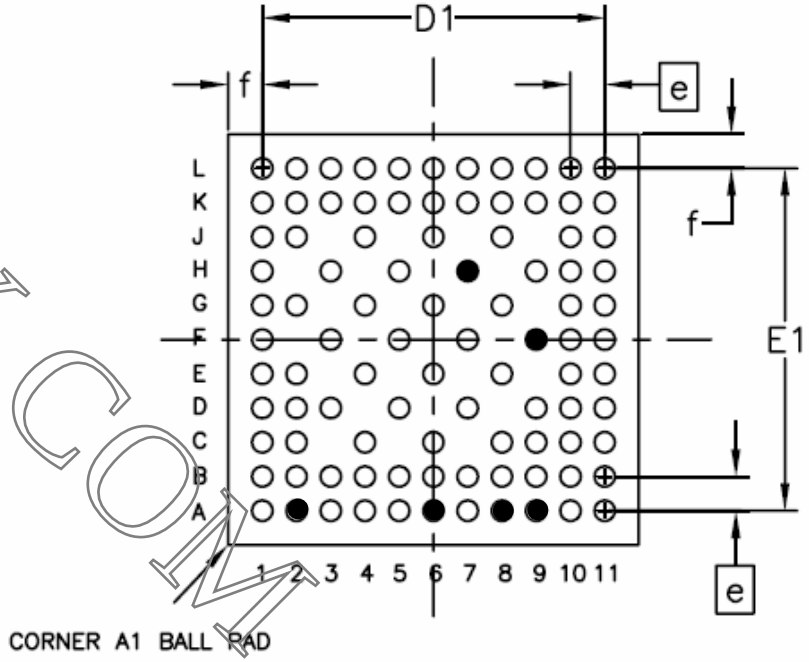
149 Ball 0.8mm pitch 10.0mm x 14.0mm FBGA



EUSY0331001

U301 BCM2045

● 미사용
○ 사용



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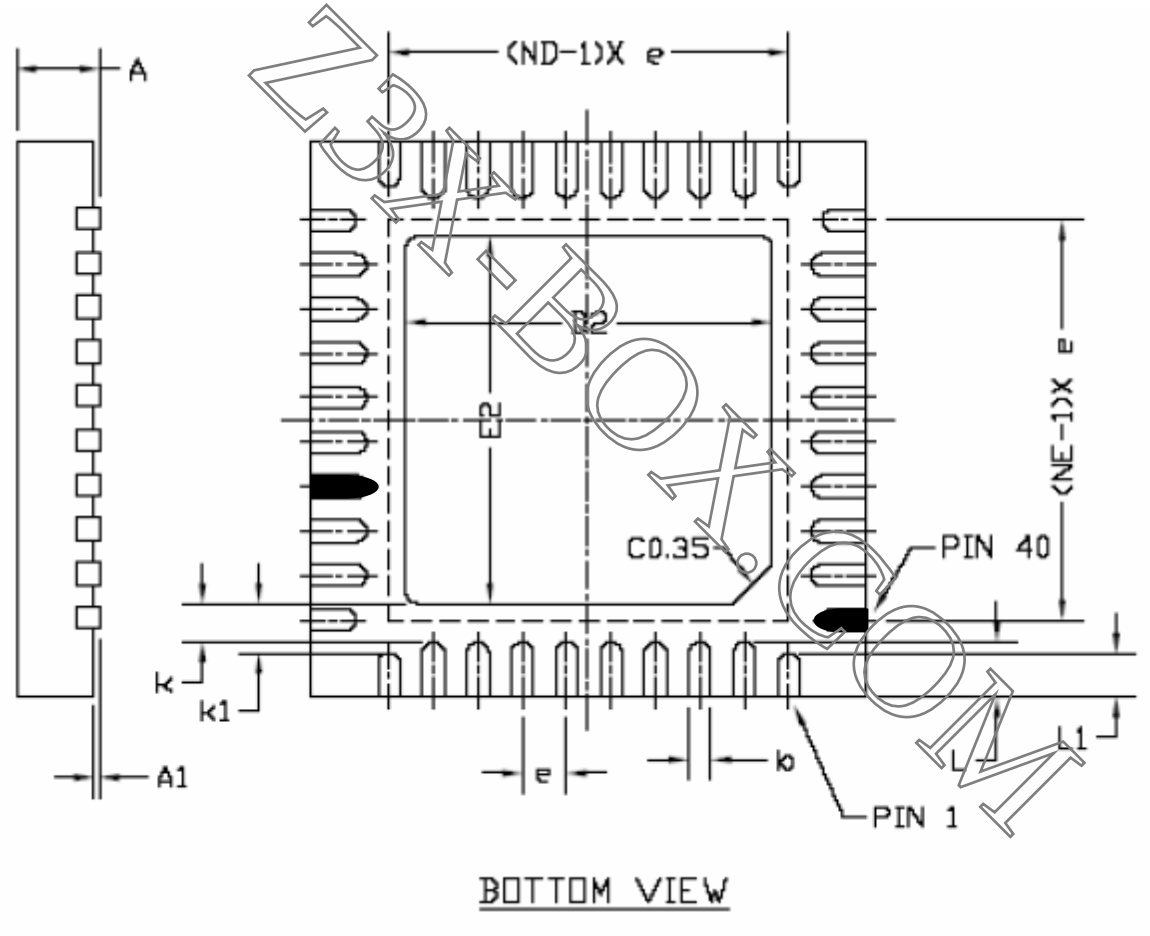
U400 MAX1829ETL+T

미사용
사용



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