



HTC Corporation.

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A03

Doc. Title

**Converse Service Manual**

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# Converse Service Manual

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HTC Proprietary

Confidential Treatment Requested

Rev. A03

HTC Corporation.

*Engineering Mobility*

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SM-TP002-0706



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REV	DATE	CONTENTS	DEPT	REVISED	STAGE
AX01	2008/7/17	Fist Draft	PSE	Marc Tsai	PVT
A01	2008/12/24	Formal release	PSE	Marc Tsai	MV
A02	2008/12/36	Add UMA test flow at page.52	PSE	Marc Tsai	MV
A03	2009/01/15	Modify repair code at page.70	PSE	Marc Tsai	MP



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## 1. Introduction

- This manual provides the technical information to support the service activities of this product.
- This document contains highly confidential information, so any or all of this document should not be revealed to any third party.
  - Chapter 1: Introduction-This Chapter is about Products features and basic Product function. After reading this chapter, you will know what feature the product has and basic hardware operation. Also you will know how to perform soft-rest and hard-rest in this chapter.
  - Chapter 2: Device Disassembling and Assembling Procedure- After reading this chapter, you will learn how to disassemble and assemble the product. Also, you will know what tools to use and the torque. Please follow the instruction to disassemble the unit to prevent from damaging the unit.
  - Chapter 3: ROM Re-flash Procedure- After reading this chapter, you will learn how to perform the ROM image re-flesh by using RUU and SD-Card. Also you can find the steps of enter the boot loader mode.
  - Chapter 4: DIAGNOSTIC PROGRAM- After reading this chapter, you will learn
    - How to use the diagnostic program to perform unit function test
    - How to test some functions in Windows Mobile mode (ex. WLAN, Bluetooth, and USB etc...)
  - Chapter 5: Power measurement test- After reading this chapter, you will learn how to use MB leakage test procedure and battery run-down test (Battery Capacity Measurement).
  - Chapter 6: Cosmetic Inspection Criteria- After reading this chapter you will learn the appearance quality inspection criteria, ex. Display, bezel, and housing etc...
  - Chapter 7: Generic Troubleshooting- After reading this chapter, you will learn how to do generic trouble-shooting.
  - Chapter 8: Generic Labeling Plan- In this chapter, you will find generic labels for reference, ex. Regulation label, and battery label etc...
  - Chapter 9: Generic Spare Part List and Photos- In this chapter, you will find Spar parts reference list and photos for repairing, including unit and Board level.
  - Chapter 10: RF Antenna Specification- Reference Spec for RF test.

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## 1.1 Product Features

### Target

- Schedule: July, 2008 (Orange, TMUS)

### Platform

- EDGE/UMA phone with sliding 12 or 20 keys keypad
- Quad-band EDGE/GPRS/GSM, Bluetooth, WiFi and 2 mega-pixel camera
- Microsoft Windows Mobile 6.1 Standard

### Dimension

- 103mm (L) x 52mm(W) x 16mm(T)
- Weight: 120g (with battery) [TBD]

### Processor/Chipset

- TI Neptune, 260MHz

### Memory

- ROM: 256 MB ROM
- RAM: 128 MB DDR

### LCD Module

- 2.6" 262K colors QVGA resolution (OS support 16 bit colors only)
- LED backlight

### GSM/EDGE Function

- Internal antenna
- Quad-band (850/900/1800/1900)
  - 850: 824-849, 869-894MHz
  - 900: 880-915, 925-960MHz
  - 1800: 1710-1785, 1805-1880MHz
  - 1900: 1850-1910, 1930-1990MHz
- Generic Services

- Call Holding, Waiting, Forwarding
- Call Barring
- CLI (Calling Line Identity)
- SMS (Short Message Service)
  - SMSMT, SMSMO, SM Reply, SM Replace, SM Acknowledgement, 8 Bits SMS Data
  - Concatenated messages, up to 640 characters
  - Display own number, telephone number storage capability in terminal and SIM card
- Network selection
- Cell broadcast
- Multi-party conference capability
- Phase 2+ Unstructured Supplementary Service Data
- Audio Codec: AMR/EFR/FR/HR
- Network Lock
- CPHS partial
- EGPRS class B
- Multi-slot standard class 10
- MO/MT SMS over GPRS
- PBCCH
- SIM
  - 1.8 / 3V of UICC
  - SIM Application Tool Kit release 98 class 3 and 99 partial
  - Over the Air (OTA) programming
  - Fixed Dialing Number (FDN)
  - Abbreviation Dial Number (ADN)
  - Security Pin 1 & 2 control

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- SIM+/ USB
- EAP-SIM support

#### UMA Functional Block

- Transparent Rove in and Rove out to UMAN including discovery and registration
- Handover
  - Dynamic handover to/from GERAN
  - Dynamic handover between access points in UMAN
- Indicator when UMAN is attached
- Support access UMAN via WiFi
- AMR codec support
- 2 Voice samples per RTP
- DTX (Discontinuous transmission)
- Security
  - 802.11i compliant (WEP, WPA, WPA2)
  - Authentication by EAP-SIM should follow 3GPP TS 23.234
  - IPSec (IKE v2) should be supported

#### Motion G-sensor

- Tri-Axis Accelerometer
- Resolution: 1.22 milli-g
- Auto portrait / landscape mode change when device orientation change

#### Digital Camera (manufacture option)

- Color CMOS 2 mega-pixel camera

#### Keyboard/button/Switch

- 2 soft keys
- Home key
- Back key
- Send phone button

- Quick press: Start a phone call
- Long press (Press & Hold): Switch on or off the Loud Speaker
- End button (wake-up key)
  - Press to end a call
- Camera capture button (bottom right)
  - 5-way navigation pad with spin wheel navigation
- Power button
- Volume Up and Volume Down button (position: top-left)
- Sliding 12 keys or 20 keys numerical dialing pad
  - 2 skus: 12 keys (Orange) and 20 keys (TM-US)
  - Integrated numerical dialing pad and Qwerty keyboard
  - Cap and Function mode indicator
  - Auto sound effect when sliding out/ close
  - Auto display on when sliding out

#### Notification

- One bi-color LED (Green and Red) for GSM/GPRS/EDGE standby, GSM/GPRS/EDGE network status, event notification, power charging status, and low battery
- One bi-color LED (Blue and Green) for Bluetooth (Blue) and WiFi (green) connectivity status
- Notification by LED, sound, message, vibration

#### Audio

- Built-in microphone
- Receiver
- Loud speaker for Hands-Free supported
- Full duplex

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- Audio sampling rate
- 16-bits with 8KHz, 11KHz, 22KHz, 44.1KHz
- AMR/AAC/WAV/WMA/MP3 codec
- Audio Path Routing for Phone and VoIP over WLAN
- Bluetooth [Phone only]
- Receiver
  - Speaker
- Headset

## HAC

### Connectivity & Interface

- Bluetooth
- Compliant with v2.0 EDR support [2.1 when available]
- Class 2 transmit power
- Supported profiles:
  - GAP (generic access profile)
  - SPP (serial port profile)
  - OPP (object push profile)
  - PAN (pan area profile)
  - GOEP (generic object exchange profile)
  - ActiveSync (legacy application via SPP)
  - HSP (headset profile)
  - HFP (handsfree profile)
  - A2DP (Advanced Audio Distribution profile)
  - AVRCP (Audio/Video Remote control Profile)
  - Service Discovery Profile
  - SAP (SIM Access Profile)
  - HID (Human interface device profile)
  - FTP (File Transfer profile)
  - PBAP (Phone Book Access Profile)
  - DUN (Dialup Profile)
- WiFi
- Internal WLAN antenna
- IEEE 802.11b/g
- Data rate auto fallback for extended range

- ELP mode
- Security 802.11i and AES
- WPA/WPA 2 authentication – WEP (64 & 128bit), PSK, EAP-TLS, PEAP, LEAP
- Signaling interfaces between the terminal device and the servers: mutually authenticated and encrypted utilizing TLS (RFC 2246) with RC4 encryption with SGA1 used as the message integrity check
- QoS
  - 802.11 WME QoS
  - 802.11e
  - Fast AP to AP handover
  - Packet tagging & prioritization
  - Site survey, trace route (hidden feature), seamless-secure roaming, and VLAN support
  - WMM certification [TBD]
  - UAPSD support
  - HTC ExtUSB 11-pin mini-USB
  - USB 2.0 with full speed
  - Support HTC2Wire
  - Support audio jack
  - Support ActiveSync to PC/NB
  - Support charging capability
  - Mass storage profile support
  - microSD card slot
  - Support SD 2.0/ SDHC
  - External RF connector with cover
- Power**
  - GSM talk time: 4~8hrs [base on level5~12]
  - GSM standby time: 220~340hrs [base on level5~12]
  - UMA talk time: > 8hrs. [11Mbps AP, G711]
  - UMA standby time: > 120hrs. [DTIM=3, DRX=5]
  - WMA: 12 hours [base on NSTL test case]
  - WMV: 8 hours [base on NSTL test case]

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- ☐ Charging time: 2.5~3 hrs [base on OFF mode at 25 ]
- ☐ Battery
- ☐ Rechargeable battery, 1100 mAh
- ☐ AC Adapter:
- ☐ AC input rating: 100 ~ 240 VAC, 50/60Hz
- ☐ DC output: 5V, 1A

**Hanger Hole**

**Accessories**

- ☐ Quick Start Guide [Inbox]
- ☐ CD (User manual & Sync. software) [Inbox]
- ☐ Travel Charger (interchangeable prong and w/o power cord) [Inbox]
- ☐ USB Sync Cable (mini-USB/USB, 73H00131-04M) [Inbox]
- ☐ Battery with battery cover [Inbox]
- ☐ Wired Stereo Headset (HS 168 or HS 200) [Inbox]
- ☐ Pouch
- ☐ 3.5 mm Audio Adaptor with Microphone plus 3.5mm stereo headset, HS U110
- ☐ Wired Remote Controller with Earphone, RC E100
- ☐ Mono Bluetooth Headset, BH M100
- ☐ Mono Bluetooth Headset, BH M200
- ☐ Stereo Bluetooth Headset, BH S100
- ☐ Bluetooth Keyboard
- ☐ Y-Cable 11 pin to 5pin + 6pin
- ☐ Y-Cable 11 pin to 5pin + 3.5 mm Audio Jack
- ☐ 4-in-1 multifunction audio cable
- ☐ Car Charger

**Car Holder**

- ☐ TTY Adapter through 2.5mm audio jack adapter [for US product only]

**Compatibility Test**

- ☐ Handsfree Carkit : Parrot CK3400LS, Parrot MK6100,

- Parrot Minikit, Audi, BMW & Mercedes incar solutions
- ☐ Bluetooth Conference: Parrot Conference
- ☐ Bluetooth Speaker: Parrot Boombox
- ☐ SanDisk memory cards (including SDHC 2.0 format)

**Microsoft Windows Mobile 6.1 Standard**

- ☐ Microsoft Outlook Mobile
  - ☐ Messaging (SMS/E-mail), Contacts, Calendar, Tasks, Email Set Up Wizard
  - ☐ Microsoft Internet Explorer Mobile
  - ☐ Microsoft Media Player Mobile
  - ☐ Microsoft ActiveSync
  - ☐ Microsoft Windows Mobile Update
  - ☐ Microsoft Windows Mobile Marketplace
  - ☐ Internet Sharing
  - ☐ Pictures & Videos
  - ☐ Graphics: JPEG, GIF87a, GIF89a, PNG, WBMP
  - ☐ Games
  - ☐ File Explorer
  - ☐ Task Manager
  - ☐ Device Management
  - ☐ Security Enhancement
  - ☐ Storage Card Encryption, Device Lock
  - ☐ Microsoft Office Mobile
  - ☐ Word, Excel & PowerPoint Mobile
  - ☐ Microsoft Windows Live!
  - ☐ Windows Live Messenger
  - ☐ Windows Live Mail (Push Mail)
  - ☐ Windows Live Contacts
  - ☐ Windows Live Search
  - ☐ Windows Live Spaces
  - ☐ Microsoft Smart Dial
  - ☐ Microsoft Remote Desktop Mobile
- Windows Mobile Enhancement**
- ☐ DirectShow Filters

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- ☐ Audio Playback Format: eAAC+ (.aac), AAC+ (.aac), AAC (.aac), AMR-NB (.amr), AMR-WB (.awb), MPEG-4 (.m4a), MIDI (.mid)
- ☐ Video Playback Format: H.264 (.mp4/.3gp), H.263 (.3gp), MPEG-4 (.mp4), Motion JPEG (.avi)
- ☐ H263, MPEG4: 30fps decoding for QVGA resolution
- ☐ Video scaling up to full VGA display
- ☐ Pictures & Videos enhancement
- ☐ Link camera icon to In-house camera & camcorder application
- ☐ Thumbnail view for video files:
  - ☐ AVI (.avi)
  - ☐ H.263 (.3gp)
  - ☐ MPEG-4 (.mp4)
  - ☐ H.264 (.mp4/.3gp)
- ☐ Ring Tone enhancement
- ☐ MIDI
- ☐ 40 polyphonic & Standard MIDI format 0 and 1 (SMF) / SP MIDI
- ☐ Ring Tone support codec (format):
  - ☐ eAAC+ (.aac) / AAC+ (.aac) / AAC (.aac) / AMR-NB (.amr) / AMR-WB (.awb) / QCP (.qcp/.3g2) / MIDI (.mid) / MP3 (.mp3) / MPEG4-Audio (.mp4) / WMA (.wma) / Wave (.wav)
- ☐ Phone Canvas Enhancement
- ☐ Input Method Enhancement
- ☐ Prediction, completion and correction
- Value added applications**
  - ☐ Telephony
  - ☐ UMA
  - ☐ Multimedia
  - ☐ (HTC) Camera
  - ☐ Camera Mode
  - ☐ Encoding format: JPEG

- ☐ Resolution: QXGA 2048x1536, UXGA 1600x 1200, SXGA 1280x960, VGA 640x480, QVGA 320x240, QQVGA 160x120
- ☐ Digital Zooming: at least 8X
- ☐ Camcorder Mode
  - ☐ 15 fps encoding for QVGA resolution
  - ☐ Encoding format
    - ☐ H.263 + AMR-NB
    - ☐ MPEG4 + AMR-NB
    - ☐ Motion JPEG + PCM (AVI)
  - ☐ Effects: Grayscale, Sepia, Cool, Negative
  - ☐ "Property" adjustment
  - ☐ Camera Album access
  - ☐ Album
  - ☐ Audio Manager (Exclude US SKU)
  - ☐ Audio Booster
  - ☐ Streaming Media Player
  - ☐ A 3GPP PSS based client solution
  - ☐ Support RTSP/RTP based streaming protocol
  - ☐ MP3 Trimmer (for non-US SKU)
- ☐ Messaging
  - ☐ MMS Client
  - ☐ OMA MMS (v1.2 or above)
- ☐ Tools & Utilities
  - ☐ Voice recorder
  - ☐ Zip
  - ☐ Backup tool
  - ☐ Bluetooth (FTP) Explorer
  - ☐ Document viewer – PDF
  - ☐ Connection setup [HTC version]
  - ☐ OMA DRM Engine:
    - ☐ OMA 1.0 / 2.0 when available
    - ☐ Multi-DRM support : MSFT & OMA DRM
  - ☐ Java virtual machine

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- JSR 185 JTWI
- JSR 75 PIM access
- JSR 120 Wireless Messaging API
- JSR 135 Mobile Media API
- Document printing – word, excel, power point, e-mail, notes
- Voice speed dial
- Comm manager
- STK
- SIM manager
- Symbol Table SIP
- Shortcuts
- User Interface
- Action Screen
- Auto Power On when KB slide out
- Sound Effect of Sliding
- User customizable sounds

**Value added applications [Developing status: TBD]**

- Tools & Utilities
- Quick Tour

**Optional Value Added Applications**

- Telephony
- VoIP Client
- Messaging
- Push Mail
- RIM Blackberry
- Visto
- Audio postcard [For TMUS]
- Tools & Utilities
- Business card reader
- RSS Reader & Podcast

- GPRS Monitor
- AntiVirus
- Java Virtual machine
- JSR 179 Location API
- JSR 184 Mobile 3D Graphics API
- Flash Lite 2.1 pIE plug-in
- Flash Lite 2.1 player
- MyFaves [For TMUS]
- User Interface
- HTC Home for SP [For Orange]
- Auto Configurations
- Opera Browser

**Optional Value Added Applications [Developing status: TBD]**

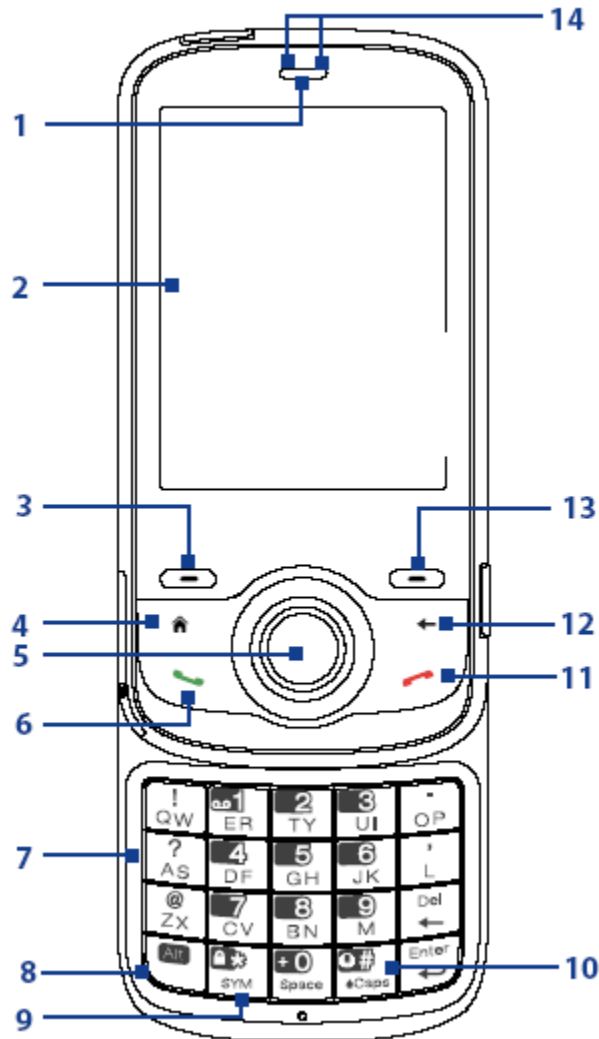
- Tools & Utilities
  - Clock
  - Alarm ring tone support: eAAC+ (.aac)/ AAC+ (.aac)/ AAC (.aac)/ AMR-NB (.amr)/ AMR-WB (.awb)/ QCP (.qcp)/ MIDI (.mid)/ MP3 (.mp3)/ MPEG4-Audio (.mp4)/ WMA (.wma)/ Wave (.wav)
- Snooze

**Regulatory**  GCF certification [Operator dependent]

- R&TTE: EMC / EMI, Safety SAR
- FCC Approval
- FCC HAC (Hearing Aid Compatibility)
- PTCRB Approval [Operator dependent]
- WiFi Certification
- BQB (Bluetooth Qualification Body) certification
- Windows Mobile Logo (NTSL)
- USB certification

## 1.2 Product overview

- [Front side](#)





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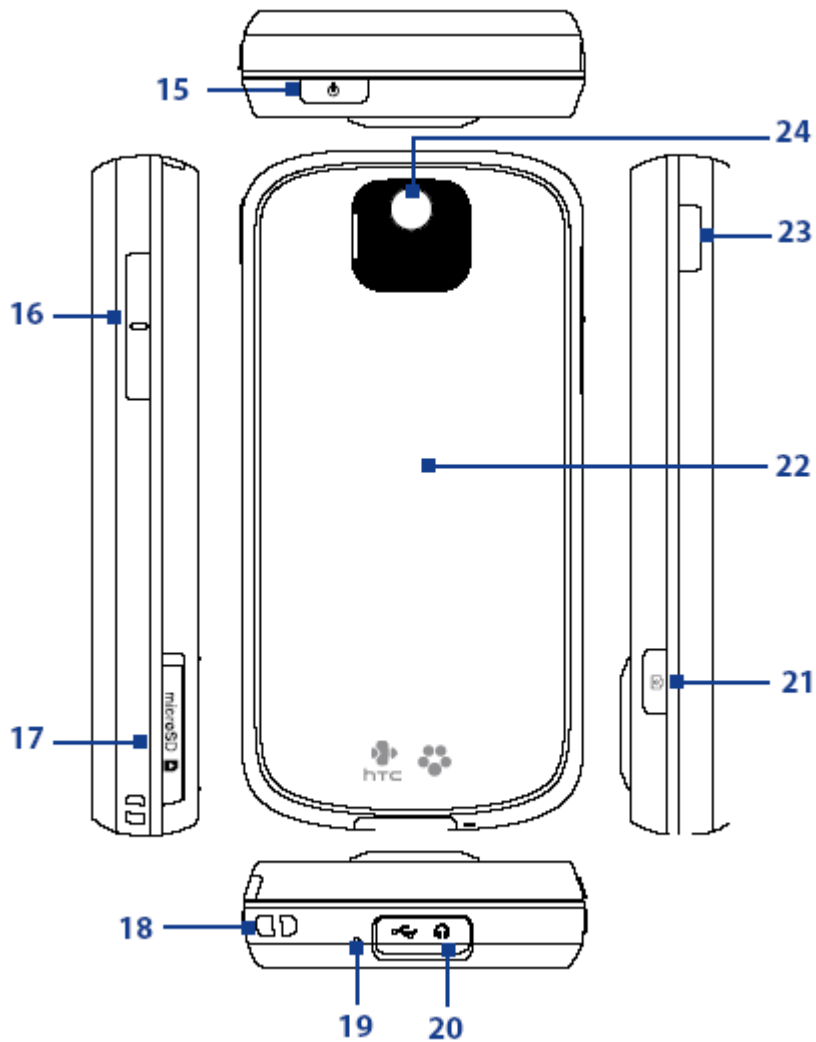
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Item	Function
1. Receiver	Listen to a phone call.
2. Display Screen	2.6-inch 320 x 240 QVGA LCD with white LED back light
3. Left SOFT KEY	Press to perform the command shown in the label above the button.
4. HOME	Press to go to the Home Screen.
5. NAVIGATION WHEEL/CENTER SELECT Key	Use to scroll left, right, up, or down. You can either turn the wheel or press the wheel to scroll through items or screens. Press the center to use as the <b>CENTER SELECT</b> Key. The <b>NAVIGATION WHEEL</b> also features an LED indicator for certain phone alerts. For more information, see "Navigation Wheel Alerts" in this chapter.
6. SEND	Press to dial a phone number, answer a call, switch to another call, or put a call on hold. Press and hold to activate/deactivate speakerphone mode.
7. 20-key QWERTY Keyboard	Slide up the front panel of the phone to reveal the keyboard. Use to dial phone numbers, enter information, and write messages.
8. Alt Key	Press once to type symbols and enter numbers in text fields. Press twice for continuous symbol or number entries.
9. Symbol Key	Press to open the Symbol pad.
10. Caps Key	Press to type a single capital letter; press twice to type in all caps.
11. END	Press to end a call.
12. BACK	Press to go to the previous screen, or backspace over characters.
13. Right SOFT KEY	Press to perform the command shown in the label above the button.
14. LED Indicators	The left LED indicators (green/red/amber) notify you of the battery and network status of your phone, while the right indicators (blue/green) notify you of Bluetooth and Wi-Fi connectivity status. For more information, see "LED indicator lights" in this chapter.





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Item	Function
<b>15. POWER</b>	Press and hold for about 3 seconds to turn the phone on or off.
<b>16. VOLUME CONTROL</b>	Adjust the volume of your phone. Press the Up-arrow button to increase the volume; press the Down-arrow button to decrease the volume.
<b>17. microSD™ card slot</b>	Remove the cover to insert a microSD™ card.
<b>18. Lanyard/Strap Holder</b>	Attach a strap to carry the device.
<b>19. Microphone</b>	Speak into the microphone when receiving or making a phone call or during voice recording.
<b>20. Sync Connector/ Earphone Jack</b>	Use for synchronizing data or recharging the battery. Remove the cover to connect the earphone to listen to audio media or use the phone's hands-free kit.
<b>21. CAMERA</b>	Press to open the Camera program.
<b>22. Back Cover</b>	Remove to insert the battery and SIM card.
<b>23. SHORTCUT KEY</b>	Press or press and hold to open phone applications. By default, briefly pressing this button calls up the Messaging screen; pressing and holding this button activates Wi-Fi Quick Connect. See "Shortcut Key" in this chapter for more details.
<b>24. Camera Lens</b>	

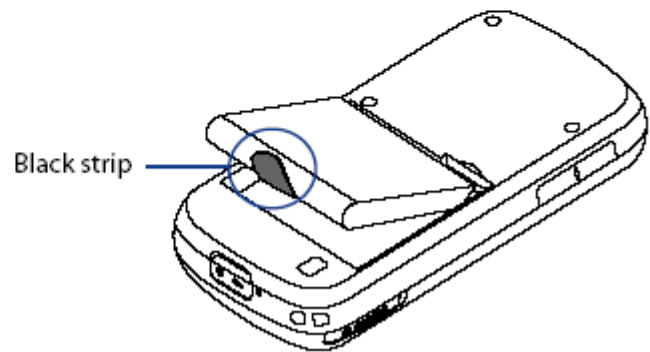
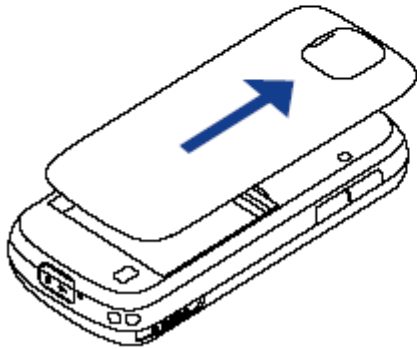
- **Install the SIM card**

Your SIM (Subscriber Identity Module) card is given to you by T-Mobile and contains your basic subscriber information, such as your phone number and your address book.

Before you begin, ensure that the phone is turned off.

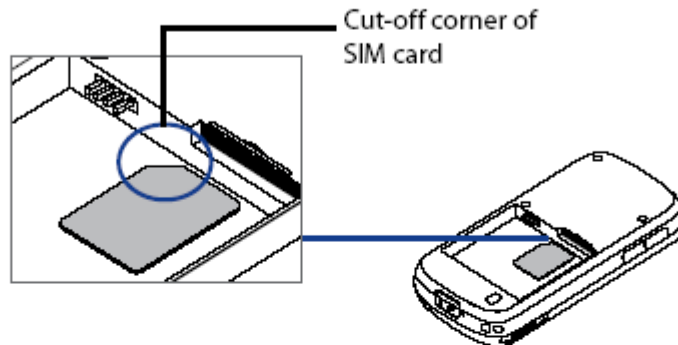
**Open the cover and remove the battery**

1. Hold the phone in one hand facing down in the palm of your hand, and then with your other hand, slide the back cover upward to remove it.
2. Remove the battery by lifting the black strip from the bottom end.



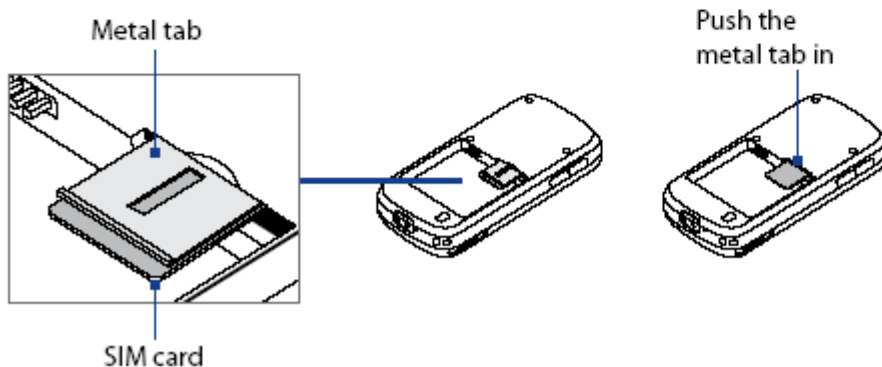
### Insert the SIM card

Insert the SIM card into the slot at the top-right corner (underneath the metal tab) with its gold-plated contacts facing down. Push the SIM card all the way in until the SIM card locks into place. After inserting the SIM card, push the metal tab upwards. Make sure that it is fully pushed in.



### Remove the SIM card

1. Pull the metal tab out (the SIM card will slide down along with metal tab).
2. Push the metal tab in and then slide out the SIM card.





- [Install the SD card](#)

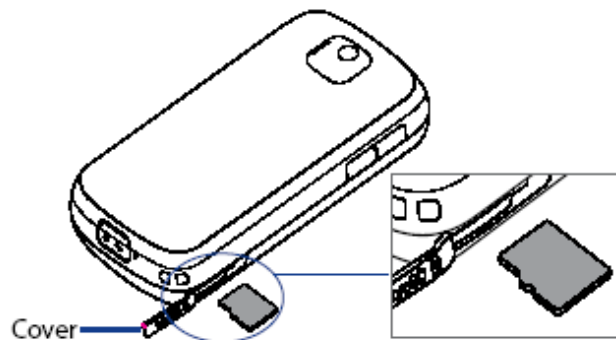
You can install a microSD™ (Secure Digital) card on your phone to have an alternative storage place for your images, video, music, and other phone data.

**Note** A microSD card is not shipped with the phone.

**To install the microSD card**

1. Open the cover on the right side of the phone.
2. Insert the microSD card into the slot with its gold contacts facing up.

To remove, press the microSD card to pop it out of the slot.



- [Charge the battery](#)

You can charge the battery by using either the AC adapter or the USB cable that came in the box.

**Note** You should only use the AC adapter and USB cable that came in the box to charge the battery of the phone.

**Use the AC adapter**

1. Plug the AC adapter plug to an electrical outlet.
2. Insert the USB end of the AC adapter to the sync connector port at the side of the phone. The battery is fully charged after about 3 hours.

**Use the USB cable**

1. Insert the big USB plug end to a USB port on your computer.
2. Insert the small USB plug end to the sync connector port at the side of the phone.

- [To perform a hard reset](#)

**Warning!** Your device will be set back to factory default settings. Please ensure any additional installed programs and/or user data have been backed up before a hard reset is performed.

1. Hold the **Soft1** and **Soft2 Key** and Press the **RESET Button** at the same time
2. Press **SEND** Button to confirm hardware reset
3. Press **OK Button** to double confirm hardware reset



HTC Corporation.

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## 2. Device Disassembling and Assembling Procedure

### 2.1 Tools list

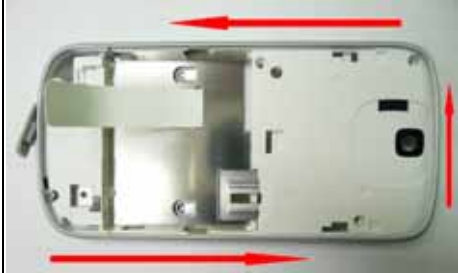
level	No.	Item	Vendor	P/N
L 1	1	Mini USB DATA interface Cable		
	2	Earphone Headset		
	3	AC Adapter		
	4	WLAN AP		
	5	Micro Memory Card with Diag. test program (need be encoded by HTC)	HTC design	DCT-00061
	6	micro SD memory card for ROM code re-flash ( must be encoded by HTC)	HTC design	DCT-00061
	7	SD card reader		
	8	USB hub		
	9	Unit current consumption test fixture	HTC design	MLT-00001
	10	Power supply		
	11	Current Meter		
	12	Mobile tester		
	11	Special Made Plastic Stick	HTC special tools	RTT-00006
	12	Hand tools		
	13	Label printer(400 dpi resolution and up)		
L 2.5	14	Lead-free Soldering station		
	15	Air heater		

## 2.2 Disassembling procedure

	<ol style="list-style-type: none"> <li>1. Glove and Lens Cleaning Cloth</li> <li>2. Philip Screw Driver 00.</li> <li>3. Torx Screw Driver T5</li> <li>4. Plastic Tweezers.</li> <li>5. Special Made Plastic Stick.</li> <li>6. ESD Wrist Strap</li> </ol>
	<ol style="list-style-type: none"> <li>1. Remove the battery cover</li> </ol>
	<ol style="list-style-type: none"> <li>2. Remove the battery</li> </ol>
	<ol style="list-style-type: none"> <li>3. Remove the antenna cover by inserting the plastic stick in to the gap</li> </ol>
	<ol style="list-style-type: none"> <li>4. Unfasten the screws at the location indicated.</li> </ol>



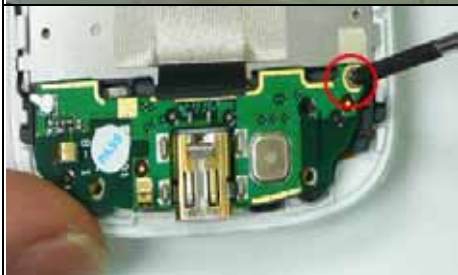
5. Use the flat plastic stick to slide through the gap between keyboard upper cover and keyboard bottom cover.



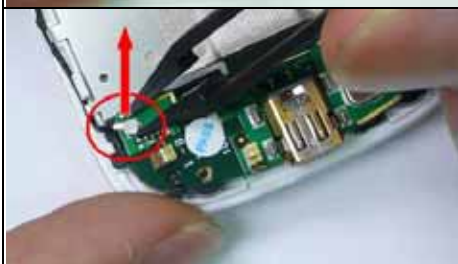
6. Remove the keypad bottom cover as shown.



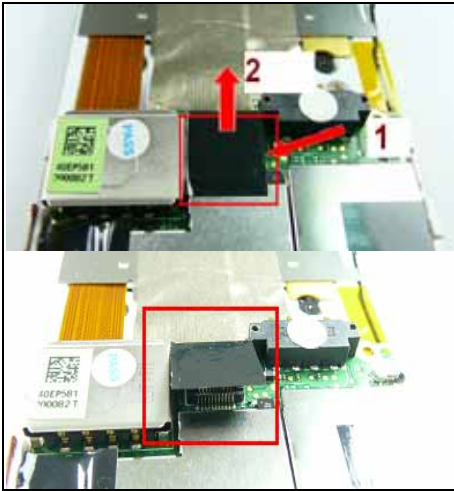
7. Disassemble speaker from keyboard bottom cover.



8. Unfasten the screws at the location indicated.



9. Disassemble the cable from the I-O board.



10. Remove the mylar and Disconnect the I-O board connector form the Main board



11. Disassemble Voice FPC by unlocking connector.

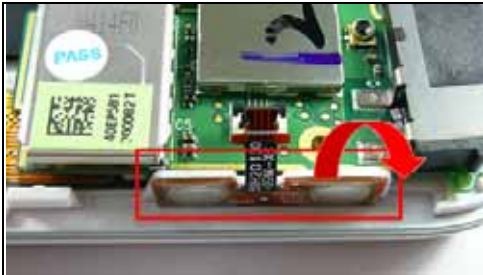


12. Remove the mylar



13. Unlock Volume FPC by unlocking connector





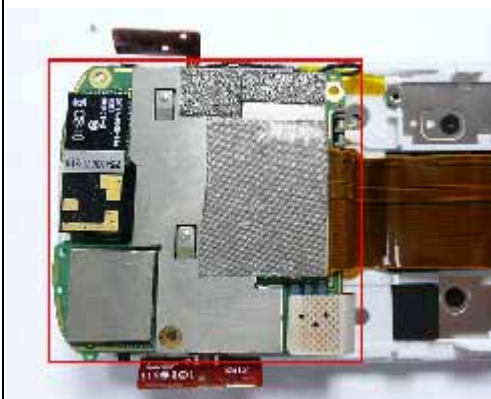
14. Separate the volume FPC from the display upper cover



15. Slide out the keypad

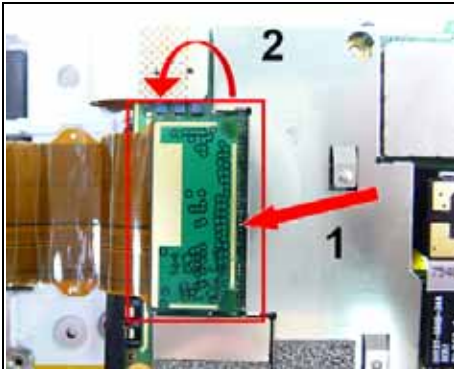


16. Turn over the Main Board

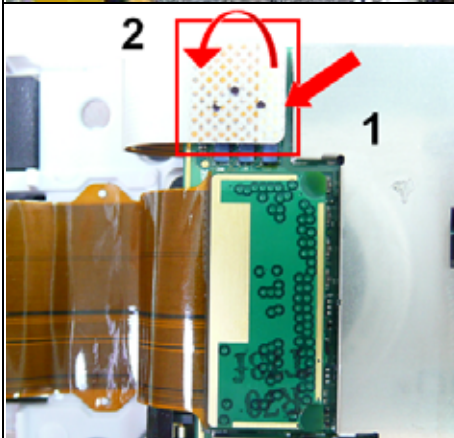


17. Remove the Mylar on the RF board connector

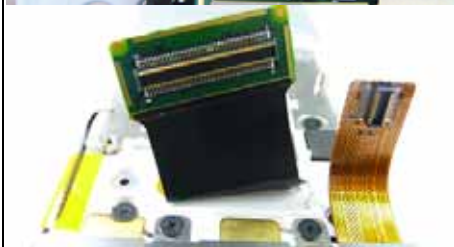




18. Disassemble RF board connector from the Main board.



19. Disassemble number keypad FPC connector from the Main board.

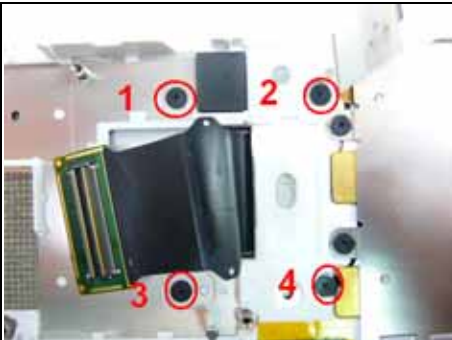


20. Disassemble the camera module from Main Board



21. Remove the RF board FPC from keyboard upper cover.





22. Unfasten the screws at the location indicated.



23. Remove the Keypad Bezel

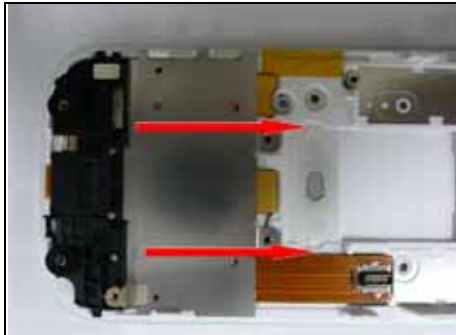


24. Disassemble the keypad



25. Unfasten the screws at the location indicated.





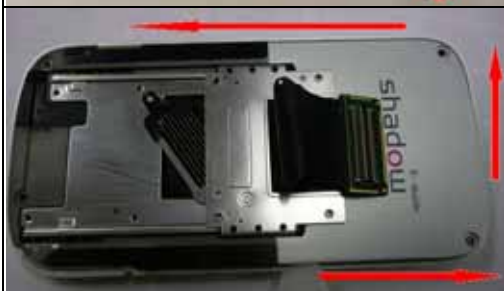
26. Remove the number keypad FPC from keyboard upper board.



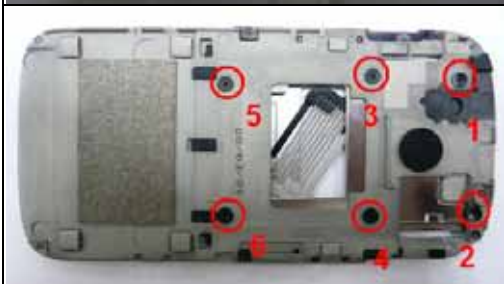
27. Remove the keypad FPC from the supporter



28. Unfasten four screws from display button cover.



29. Hold the flat plastic stick vertically and slide through the gap to separate the display bottom cover



30. Unfasten the six screws to separate display bottom cover



31. Unfasten the screws at location indicated.



32. Remove the mylar form LCD FPC



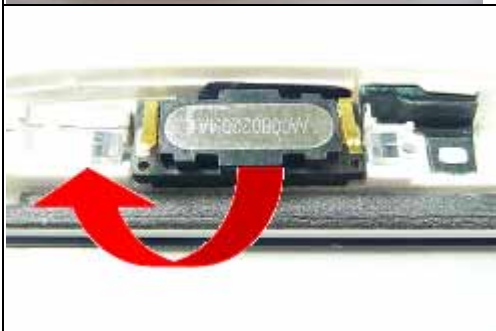
33. Unlock the LCD FPC and remove it



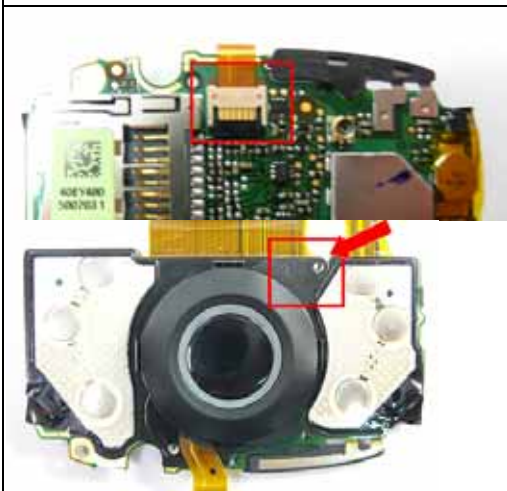
34. Use the white stick to release the LCD from the display upper cover hook



35. Remove LCD form the display upper cover

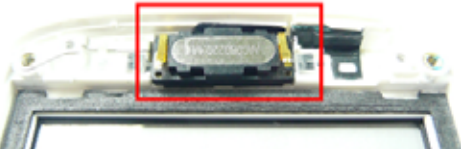
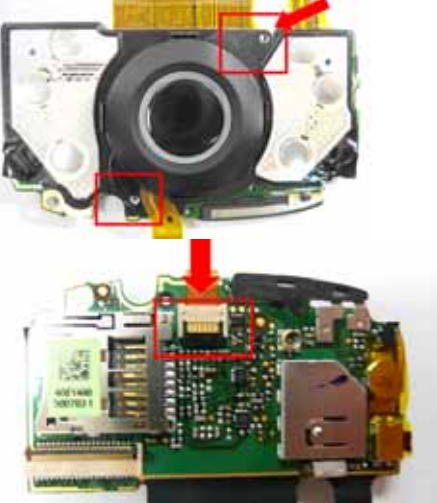
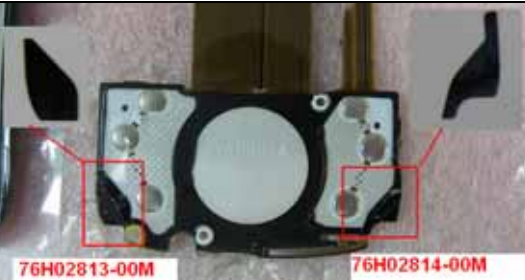



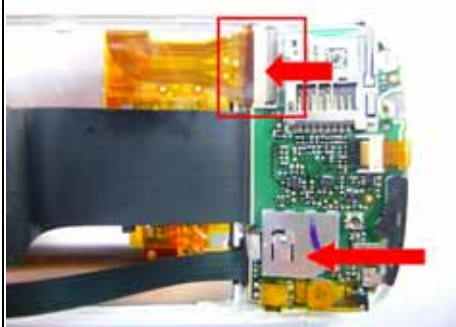
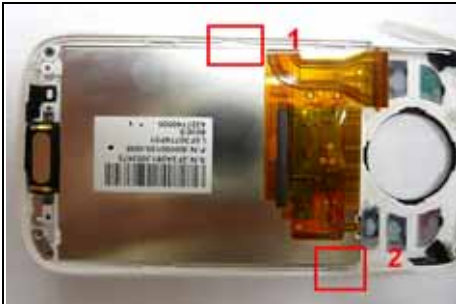
36. Disassemble receive from display upper cover.



37. Disassemble the scroll-wheel from upper board

### 2.3 Assembling procedure

	<p>1. Attach the receiver to display upper cover</p>
	<p>2. Assemble Scroll-Wheel on the RF upper board 3. Match the wheel with the point for correct position 4. Insert the FPC into the connector and lock it.</p>
	<p>5. Stick mylar on the RF board as shown</p>
	<p>6. Combine LCD with display upper cover.</p>




7. Insert the LCD FPC into RF board connector and lock it.



8. Stick the mylar(76H02806-00M) on RF board connector.



9. Stick the mylar and EMI on RF board

Part No.	76H02277-00M	
Description	Mylar,Caption,Side-Key	
Q'ty	2	
Repair Code	N/A	
Refridishment	No	

Part No.	72H02750-00M	
Description	EMI Gasket,on upper board	
Q'ty	1	
Repair Code	N/A	
Refridishment	No	

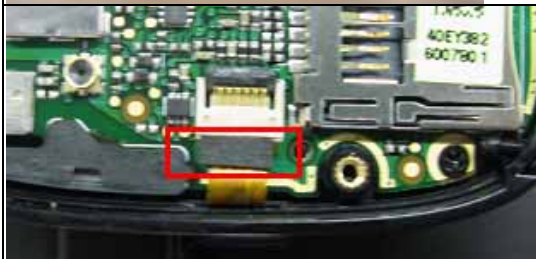




10. Fasten three screws on RF upper board.

P/N: 72H02729-00M\*3

NOTE: SCREW TORQUE :0.5KGF/CM2



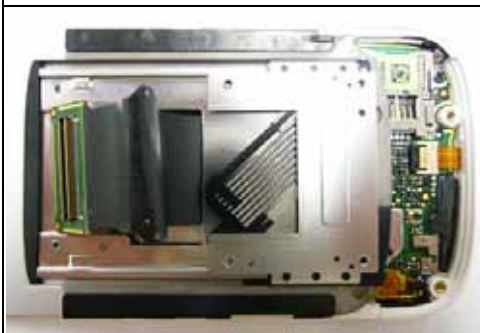
11. Stick Sponge on the Switch connector as shown.



12. Fasten 6 screws on the display bottom cover.

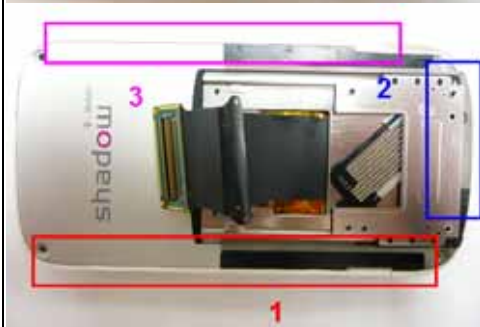
P/N: 72H02258-01M\*6

NOTE: SCREW TORQUE : 0.8KGF/CM2



13. Insert the RF upper board FPC through the hole

14. Press the area around the display bottom cover to combine the upper and bottom cover.

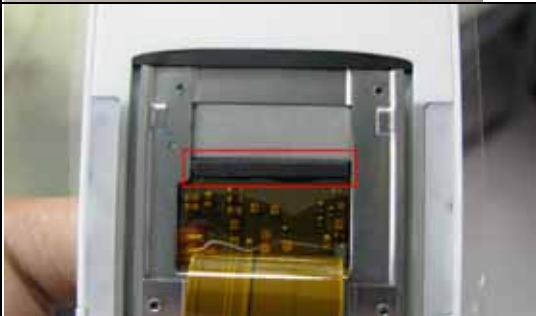





15. Fasten four screws on the display bottom cover.

P/N: 72H01706-01M\*4

NOTE: SCREW TORQUE : 1.2KGF/CM2

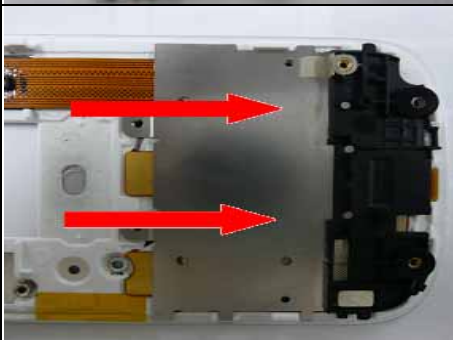


16. Stick Sponge on LCM as shown

Part No.	76H02812-00M	
Description	Sponge,ABJ assy,LCD	
Qty	1	
Repair Code	N/A	
Refurbishment	No	



17. Attach the Keypad FPC to the supporter



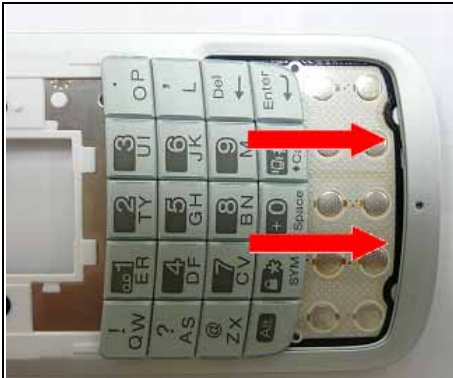
18. Combine the keypad FPC with keypad housing



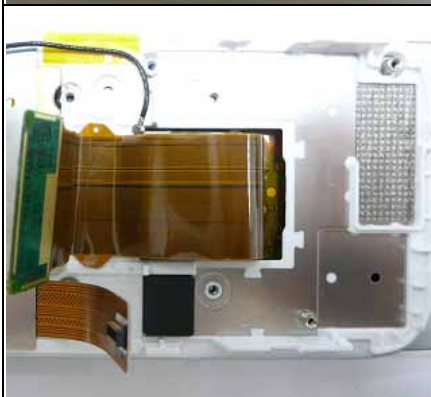
19. Fasten the screws at the location indicated

P/N: 72H02258-01M\*2

NOTE: SCREW TORQUE : 0.8KGF/CM2



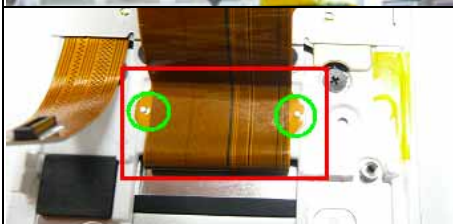
20. Remove the release paper on the Keypad and attach it to the FPC



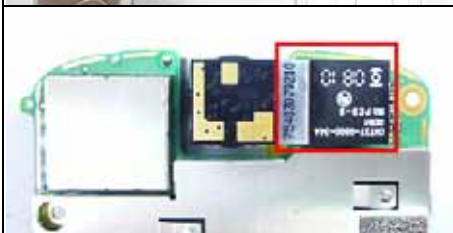
21. Insert the RF upper board FPC through the hole  
22. Fasten four screws as shown

P/N: 72H02832-01M\*4

NOTE: SCREW TORQUE : 0.8KGF/CM2

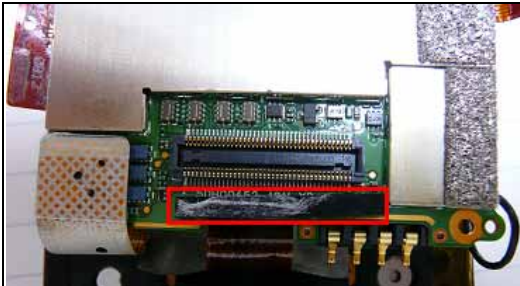


23. Match the FPC with the guide pins



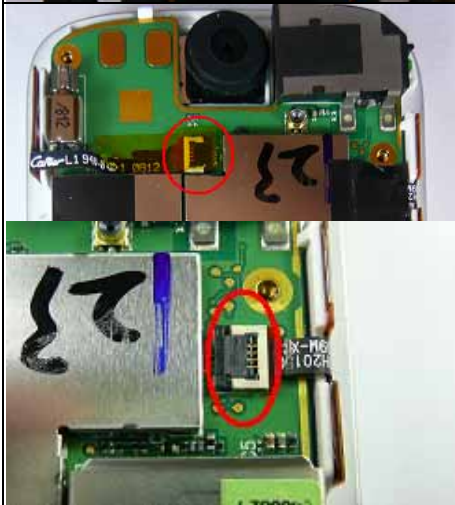
24. Install the Camera module on the Main Board





25. Stick Rubber on M/B


Part No.	76H02816-00M	
Description	Rubber MB Ix 80p com,silicone	
Q'ty	1	
Repair Code	G114 J	
Rebuildment	No	

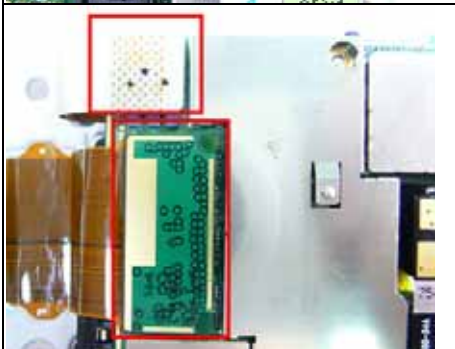


26. Insert Side key-Volume FPC and Key-Voice FPC on the Main Board

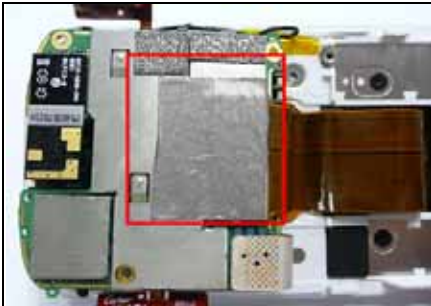


27. Stick mylar on volume FPC.

Part No.	76H02817-00M	
Description	Mylar volume key,shade	
Q'ty	1	
Repair Code	N/A	
Rebuildment	No	

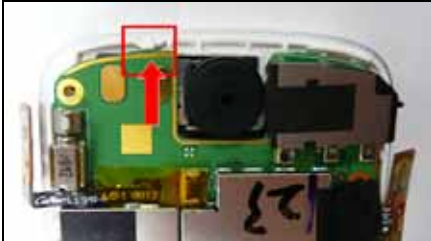


28. Combine the Keypad FPC with MAIN BOARD  
29. Combine the RF board FPC with MAIN BOARD

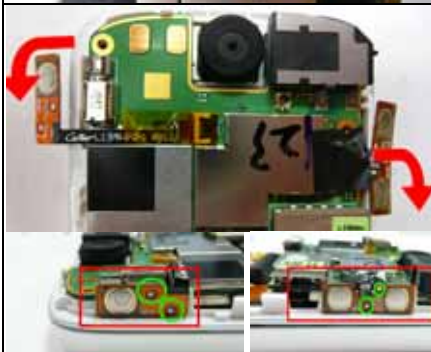


30. Stick a gasket on the Main Board

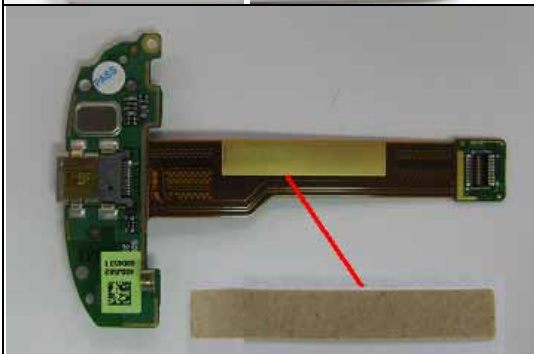
Part No.	72H02752-00M	
Description	Conductive Fabric,EMC_Audio,N UM_support	
Qty	1	
Repair Code	N/A	
Refurbishment	No	




31. Insert M/B into keyboard upper cover

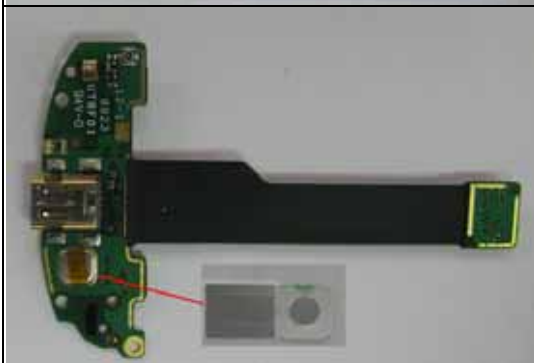


32. Attach key-voice bottom FPC and side key-volume bottom FPC on the keyboard upper cover.




33. Stick double tape on I-O board

Part No.	76H02819-00M	
Description	Adhesive-Double Tape,I/O board	
Qty	1	
Repair Code	N/A	
Refurbishment	No	



34. Stick double tape on MIC.

Part No.	76H02820-00M	
Description	Adhesive-Double Tape,Mic rubber	
Qty	1	
Repair Code	N/A	
Refurbishment	No	



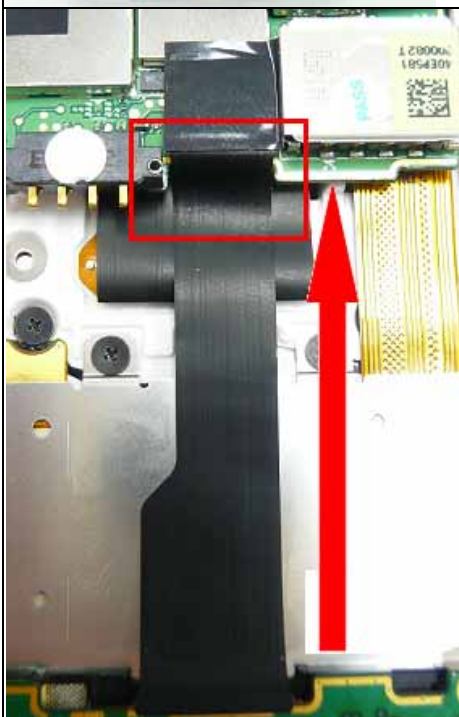
35. Insert I-O board on the keyboard upper cover.



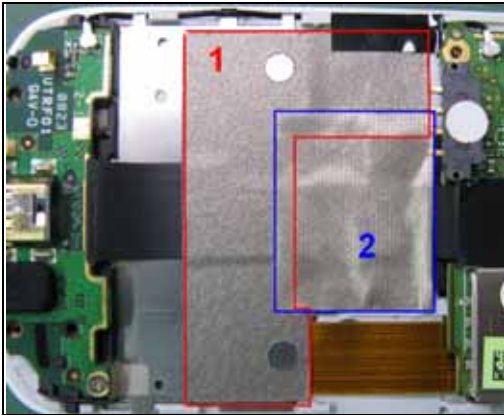
36. Fasten one screw on the I-O board.

P/N: 72H00651-00M\*1

NOTE: **SCREW TORQUE : 0.7KGF/CM2**




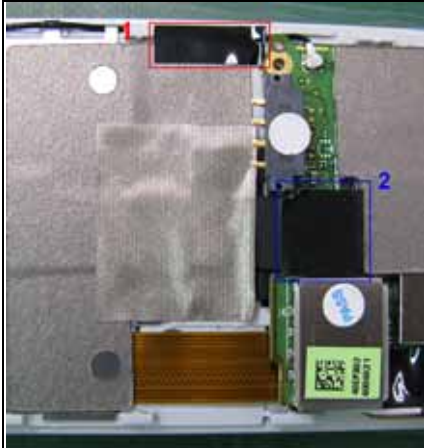
37. Connect the I-O board FPC with Main Board



38. Attach the Mylar to the IO-board FPC  
I.

II.


Part No.	72H02751-00M	
Description	Conductive Fabric, on 80pin, MB and LPBD	
Q'ty	2	
Repair Code	N/A	
Rebuildment	No	



39. Stick mylar as the location indicated  
I.

II.

Part No.	76H02815-00M	
Description	Mylar gasket marking, 28*5*0.5mm,	
Q'ty	1	
Repair Code	N/A	
Rebuildment	No	

Part No.	76H03815-00M	
Description	Mylar shade black	
Q'ty	1	
Repair Code	N/A	
Rebuildment	No	



40. Attach the speaker to the keyboard bottom cover

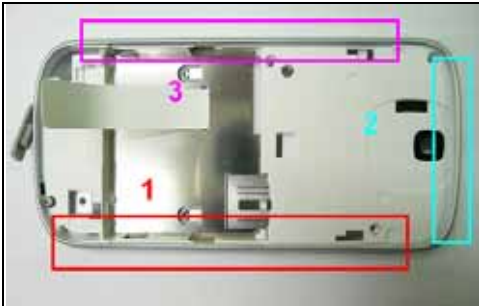


41. Insert the cable into the gap between Main Board and I-O board.

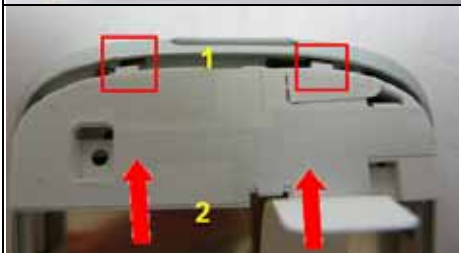


42. Combine the keyboard bottom cover with the Keyboard Upper Cover.





43. Fasten five screws on the Keyboard bottom Cover



44. Insert antenna on the Keyboard bottom Cover and lock it.



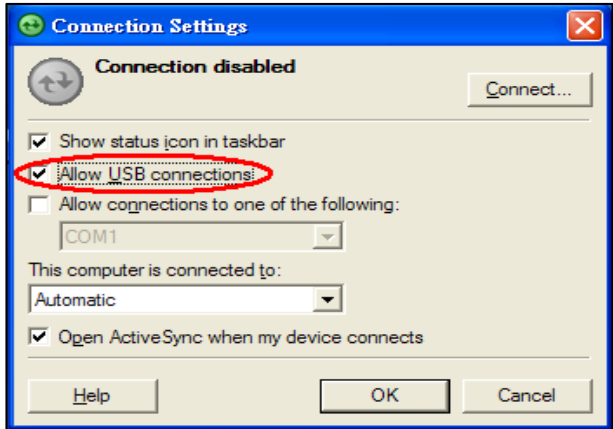

45. Insert battery into Keyboard bottom Cover.






46. Assemble the Battery Cover

### 3. ROM Re-flash Procedure

#### 3.1 ROM upgrade thru RUU (Re-flash Upgrade Utility)

Connect device to PC	
<ol style="list-style-type: none"> <li>I. Setting and allow USB connections in Microsoft ActiveSync.</li> <li>II. Connect your device and desktop/ or laptop via USB cable.</li> <li>III. Check the pop-up message from Microsoft ActiveSync when device is synchronized with PC.</li> </ol>	
Download ROM Image from SDO	
<ol style="list-style-type: none"> <li>I. Download OS image from SDO. <a href="http://htcscm10.htc.com.tw/SDO">http://htcscm10.htc.com.tw/SDO</a></li> <li>II. Un-zip the file and execute RUU program.</li> </ol>	

RUU - 1	
<p>III. Read the pop-up message form ROM update utility and select the "I understand..." checkbox.</p> <p>IV. Click "Next" to proceed.</p>	
RUU - 2	
<p>V. Read the pop-up message form ROM update utility to follow and perform the instructions and select the "I completed..." checkbox.</p> <p>VI. Click "Next" to proceed.</p>	
RUU - 3	
<p>VII. Current image version confirmation.</p> <p>VIII. Click "Update" to proceed.</p>	

**RUU - 4**

- IX. Double verify the ROM revision which you want to update before re-flash procedure.
- X. Click "Next" to proceed.



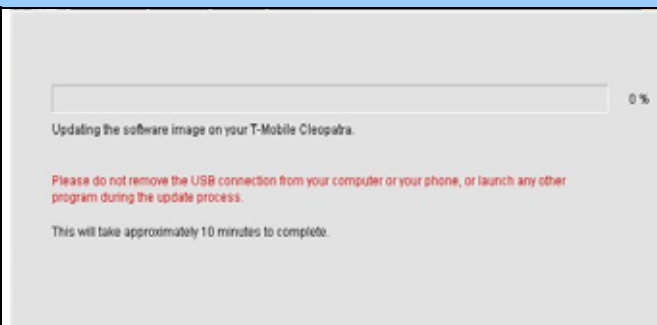
**RUU - 5**

- XI. Read the information from pop-up message and the OS update procedure will takes 10 minutes long.
- XII. Click "Next" to proceed.



**RUU - 6**

- XIII. You can see the update progress from your PC and in your device.




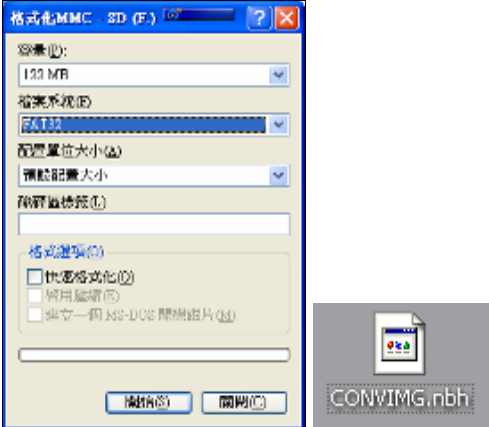


**RUU - 7**

XIV. The OS upgrade is finished, click "Finish" to close the utility.



### 3.2 Rom Image upgrade thru SD card

Download ROM Image from SDO	
<p>I. Download ROM image from SDO.  <a href="http://htcscm10.htc.com.tw/SDO">http://htcscm10.htc.com.tw/SDO</a></p> <p>II. Un-zip the image file.</p>	
Format SD card and copy image file to SD card	
<p>III. Select file system and format the SD card to FAT32 mode.</p> <p>IV. Copy image file CONVIMG.nbh to the micro SD card and rename to <b>CONVIMG.NBH</b>.</p>	
SD Upgrade - 1	
<p>V. Turn the device power off and insert Diagnostic SD card.</p> <p>VI. Press and hold <b>Power+Camera</b> button, to entry Boot loader mode.</p> <p>VII. Press <b>Action</b> button to start upgrade procedure.</p>	



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Revised Date

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### SD Upgrade - 2

VIII. Reading source code from SD card.

[Note]: This process will takes 10 mins, please don't power off the device.

IX. After finish, press restart to reboot.



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Revised Date 2009/01/15 A03

Doc. Title **Converse Service Manual**

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## 4. DIAGNOSTIC PROGRAM

### 4.1 List of Diagnostic / WinCE Test Items

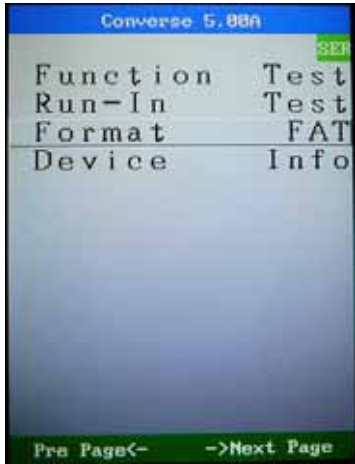

Mode	No	Item	Description	Remark
Diagnostic	<b>Function Test</b>			
	1	Auto test	Auto Regular Tests (Display, B.L, Vibrator, etc...)	
	2	Display Test	Color bar/R/G/B/Black/White/Gray pattern.	
	3	Button Test	Record, Capture, App1(Send), App2(IE), Volume up, Volume down, Key up, Key down, Key left, Key right, Key action, Soft1, Soft2, Send, End, Start, OK	
	4	Vibrator Test	Vibrator on test.	
	5	LED Test	Red, Green, BT, WL, Key Led	
	6	B. L Test	Front light test (On/Dim/Off).	
	7	SD test	SD card Read/Write test.	
	8	MegaSIM test	MegaSim Test	
	9	Battery test	Voltage,Current,Tempature,Batt Cap	
	10	ROM Checksum Test	ROM size	
	<b>Run-in Test</b>			
	1	2 Hour	1 Hour Run-in Test/Press Soft1 key.	Option
	2	4 Hours	4 Hours Run-in Test/Press Start key.	Option
	3	8 Hours	8 Hours Run-in Test/Press OK key.	Option
	4	12 Hours	12 Hours Run-in Test/Press OK key.	Option
	<b>Format Storage (Personal information, talk times)</b>			
	<b>Device Info</b>			
	Win CE	1	USB Test	USB link test (Microsoft ActiveSync).
2		Camera Test	Camera test.	
3		Bluetooth Test	Bluetooth test.	
4		WLAN Test	WLAN test.	
5		GPRS Test	GPRS Test	

### Test Procedure

How to select test item: Using navigation button -"Up" or "Down" to select the test items

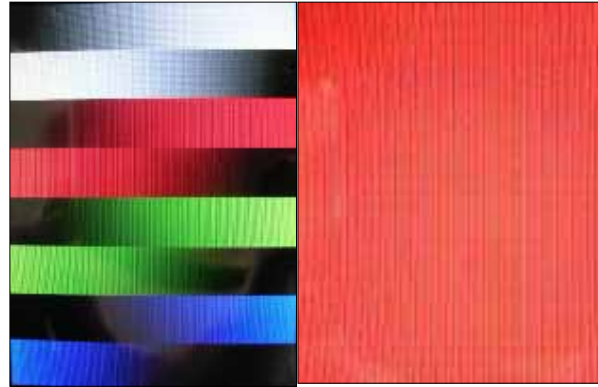
How to execute the test program: Press "Action" button to start each of test items.

### Diagnostic

Main Menu/Function Test Menu	
<ol style="list-style-type: none"> <li>I. Turn the device power off and insert Diagnostic SD card.</li> <li>II. Press and hold <b>Power + Capture</b> button, including <b>Reset</b> button, and then enter Diagnostic mode.</li> <li>III. Using to select the test item and move to next page as well.</li> <li>IV. Select item "Function Test" to find the Function test menu.</li> </ol>	
Auto Test	
<ol style="list-style-type: none"> <li>I. Press the Action key to start the Auto-test.</li> <li>II. It will perform the regular tests, please follow the system instruction to do the test.</li> </ol>	

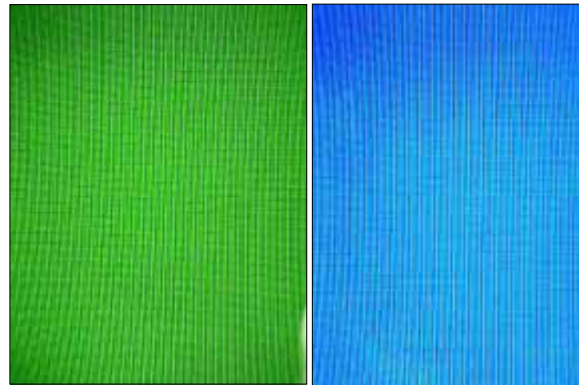
**Display Test (and RED/ GREEN pattern)**

- I. Press Action key to select Display Test on Function test menu.
- II. After the test pattern is show up, please check the pattern if any un-uniform color or chromatist.
- III. Press Action key to continue the next test pattern.



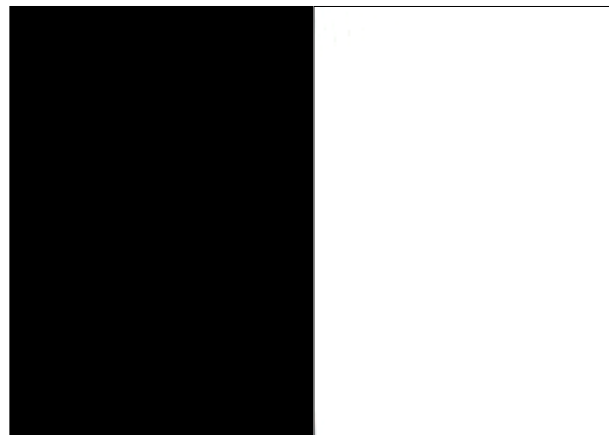
**Display Test (BLUE/ BLACK pattern)**

- V. Press Action key to continue the next test pattern.



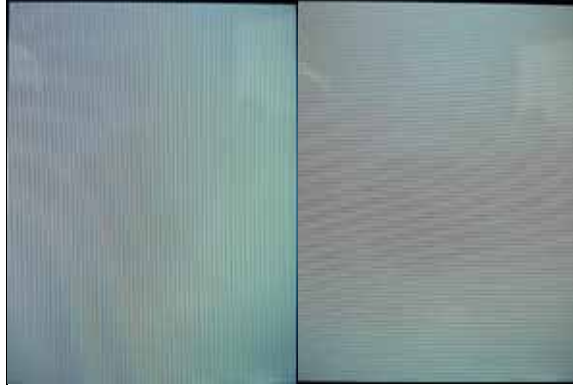
**Display Test (WHITE/Color bar pattern)**

- VI. Press Action key to continue the next test pattern.



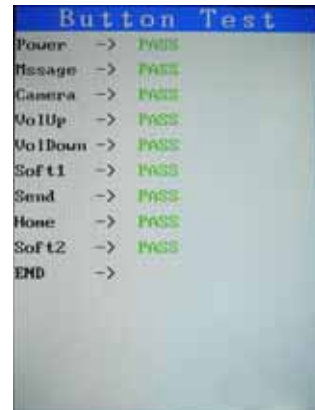
**Display Test (Words pattern)**

VII. Press Action key to exit and return to Function test menu.



**Button Test**

- I. Press Action key to select Button Test on Function test menu.
- II. Follow the instruction on screen to perform the Key/Button test (**Power, Message, Camera, VolUp, VolDown, Soft1, Send, Home, Soft2, End, Back, Up, Down, Left, Right, Action, Q, 1, 2, 3, O, A, 4, 5, 6, L, Z, 7, 8, 9, DEL, ALT, \*, 0, #, Enter**).
- III. The screen will return to Function test menu after the test is finished.



**Vibrator Test**

- I. Press Action key to select Vibrator Test on Function test menu.
- II. Press Action key to exit and return to Function test menu.



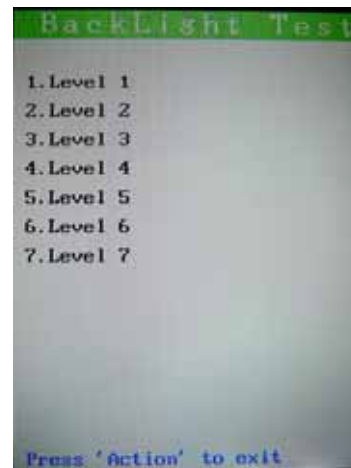
**LED Test**

- I. Press Action key (Jog-ball) to select LED Test on Function test menu.
- II. Press Action key (Jog-ball) and follow the instruction on screen to perform the LED inspection test (**Red, Green, AMBER BT, WLAN, and Keypad**).
- III. Press Action key to exit and return to Function test menu.



**B. L Test**

- I. Press Action key to select B.L Test on Function test menu.
- II. Press Action key to switch the LCD backlight level from Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7. Press Action key to exit and return to Function test menu.




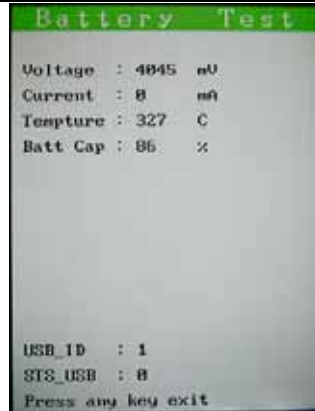
**SD Card Test**


- I. Press Action key to select SD Card Test
- II. If success, press Action key to exit and return to Function test menu.





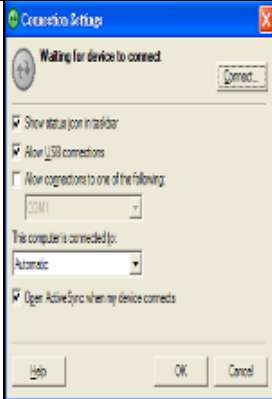

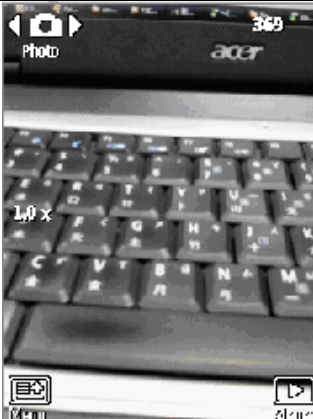
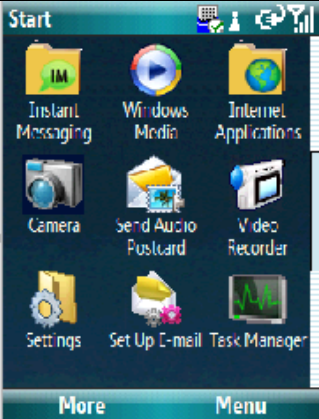
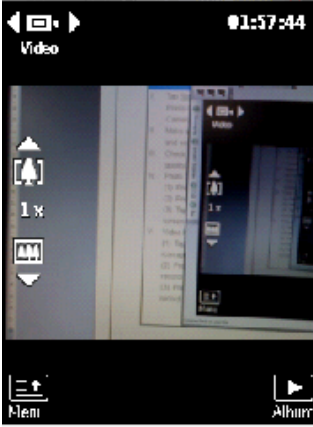
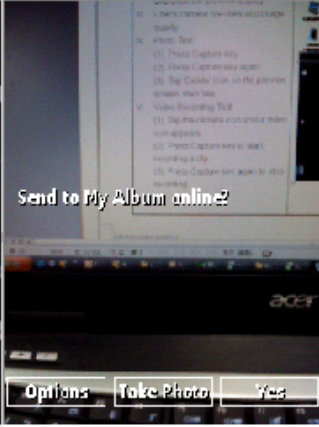


MegaSIM Test	
<p>III. Press the Action key to start the MegaSIM Test. Note. If your unit doesn't support MegaSim, you don't have to perform the test.</p>	

Battery test	
<p>I. Press the Action key to start Battery Test, then press Action key return to Function test menu</p>	

ROM Checksum Test	
<p>IV. Press Action key to select V. The Rom Checksum will be displayed on the screen</p>	

**WinCE Test**

USB Test	
<p>I. Start up the Microsoft® ActiveSync® program in the PC.</p> <p>II. Insert USB cable and connect unit to desktop/ or laptop.</p> <p>III. The USB to PC icon -&gt; is appears on the Today screen when your device is connected to your desktop/ or laptop.</p>	 
Camera Test	
<p>I. Tap <u>Start-&gt;Program-&gt;Camera</u> or Press Camera button to turn on the Camera.</p> <p>II. Make sure the device will present and enter the preview display.</p> <p>III. Check camera pre-view and image quality.</p> <p>IV. Photo Test:            (1). Press Capture key.            (2). Press Capture key again.            (3). Tap 'Delete' icon on the preview screen, then Yes.</p> <p>V. Video Recording Test            (1). Tap the camera icon until a video icon appears.            (2). Press Capture key to start recording a clip.            (3). Press Capture key again to stop recording.</p>	   

- (4). On the preview screen, tap the 'Magnifier' icon to view the captured video clip.
- (5). Tap X. to close the camera program
- (6). Tap the 'Browser' icon and choose My video.
- (7). Tap and Hold on the clip and select Delete.
- (8). Tap X and then X to exit.

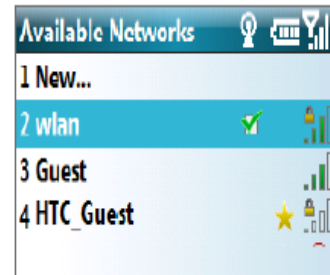
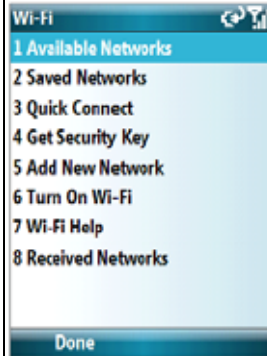
**Bluetooth Test - 1**

- I. Tap icon Comm Manager on the Today screen and turn on Bluetooth.



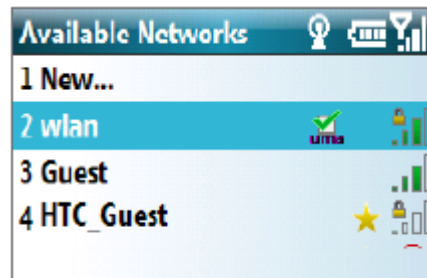
**WLAN Test**

- I. Tap icon Comm Manager on the Today screen and turn on WLAN.
- II. Select the hot-spot/ or access point which searchable and appears on screen.
- III. Key in the Network Key (if needed), then Connect.
- IV. Once the hot-spot (access point) is connected, press the IE button or click the IE icon and logon Internet.



**UMA test**

1. Select the network with checkmark for UMA mode.
2. When UMA is enabled ,make phone call to make sure the device can dial the phone call under UMA mode.



UMA Network



**UMA modes**

Phone on	Wi-Fi on	Phone and Wi-Fi on
GSM only	UMA only	UMA / GSM (preferred mode)

## 5. Power measurement test

### 5.1 Main board leakage current Test Procedure

This is a quick method to measure if any abnormal leakage current on main board which caused high power consumption compare to GOOD main board.

#### Equipment list



#### 1. Control box



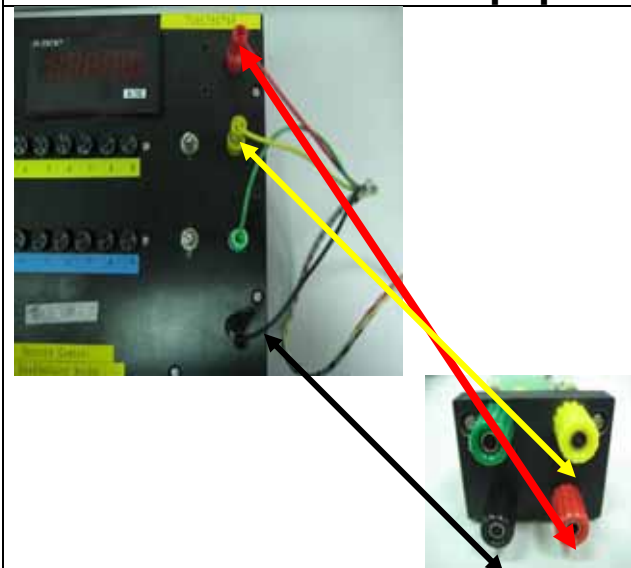
#### 2. 4 colors cable

- Cable A: Red
- Cable B: Yellow
- Cable C: Green
- Cable D: Black



**C. types Jig**  
Jig - C (4 pins-Short)

### Equipment set up



1. Connect control box and jig through 4 colors cable with red, black and yellow

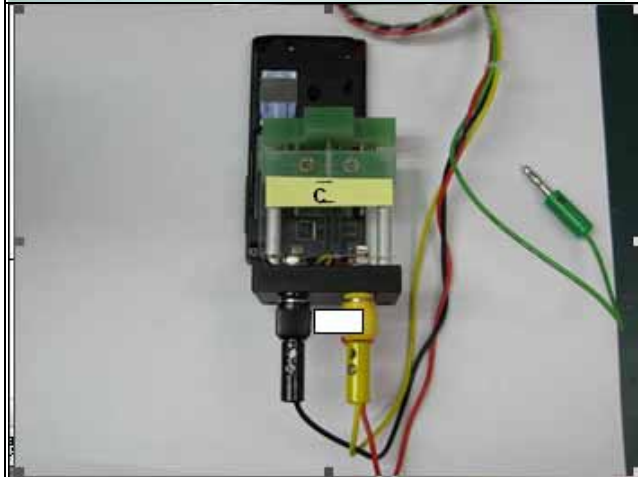




2. Set up each button by row A~D according to product specification Following is an setting for Converse

MODEL	JIG TYPE	Button set up matrix			
		A	B	C	D
Converse	C	1	8	2	1

It means, press button A1,B8,C2,D1

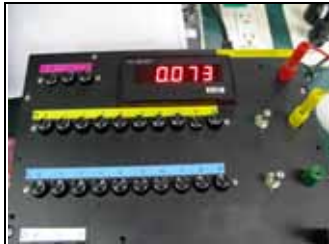


3. Install jig to device (the photo is for reference only)

### Start testing



1. Turn on control box power button



2. Press Power button to turn on the Device



3. In "main page", Check phone status, Click "Turn on Airplane mode"  
Set the unit to :  
\* Airplane mode  
\* Make sure all RF function is off (phone, BT, Wifi..)

## Idle current test

4. Measure Idle mode current. Idle current value must under **220mA**, if over the criteria, it means M/B failed, please replace M/B for repair. (condition : Display on / BL default / KB LED off / GSM standby / WiFi off / BT off)

## Sleep current test

5. After idle current checked, Switch OFF the unit. Unit is turn off and no display. sleep current value must under **20mA**, if over the criteria, it means M/B failed, please replace M/B for repair.

### Conclusion:

If current consumption is passed at both of idle and sleep mode, it means M/B is GOOD. If there is any item FAILED at idle or sleep mode, it means M/B is failed, please replace M/B for repair.

## 6. Cosmetic Inspection Criteria

### 6.1 Classes definition of inspective area

- Class A area => The front side of main unit involve all buttons and LED lens except LCD.
- Class C area => 4 sides and back views of main unit.
- Class D area => The socket of battery, inner side of battery cover.

Photo of inspection areas

<b>CLASS A</b>	
<b>CLASS B</b>	

<b>CLASS C</b>	
<b>CLASS D</b>	

**IT IS GENERIC COSMETIC INSPECTION CRITERIA FOR ALL PRODUCTS IF THERE HAVE ANY CONFLICT WITH THESE GENERIC CRITERIONS; PLEASE FOLLOW THE PRODUCT INSPECTION CRITERIA RESPECTIVELY.**

Description

- **D:** Diameter / **L:** Length / **W:** Width / **N:** Number of defects/ **S:** Distance from dot to dot
- Inspecting distance: 30 ± 5cm / Mechanical inspection angle : 90 degrees /
- LCM inspection angle : 90±15 degrees / Inspection time:5 secs per surface.
- Ambient illumination is to be 500-1100 lux
- The inspection condition of Newton ring:
  - a. Inspection distance: 30cm / Inspection time: 5 sec
  - b. Ambient illumination is to be 500-1000 Lux (Incandescent lamp)
  - c. Inspection should be performed under the condition that LCD screen could reflect the mirror image of lamp.
  - d. The criteria of Newton ring's tinges and measure of area must follow up the worst-case sample.



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## 6.2 Display inspection

Inspection Defects		Accept Level	Level	
Electrical Characteristic Defects	Bright Dots	Single	Red+ Green+ Blue 3, S $\geq$ 5mm.	Minor
		2 adjacent	0	Minor
		3 or more adjacent	0	Minor
	Dark Dots	Single	Total Number 2, S $\geq$ 5mm.	Minor
		2 adjacent	0	Minor
	Dark or Bright lines	0	Minor	
	All Allowable Dots Defects	Total Number 3, S $\geq$ 5mm.	Minor	
Shift and tilt of screen viewed area	The black edge around display area must be detected by front view.	Minor		
Foreign Scratch, Objects or Lint on power off status	Scratch	0.03 < W 0.1 (mm) L 5 (mm), N 2 (mm)	Minor	
	Lint (linear foreign objects)	0.03 < W 0.1 (mm) 0.3 < L 3.0 (mm) N 5	Minor	
	Spots	0.1 < D 0.3 (mm), N 4	Minor	
	Fish eye on film	0.1 < D 0.4 (mm), N 4	Minor	
	Breakage on film surface	Not acceptable	Minor	
	Total acceptable defect quantity	10	Minor	



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### 6.3 Main unit inspection

#### GAP & STEP INSPECTIONS

Description		Accept Criteria
1.	Gap between ME parts.	1.5 (mm)
2.	Stylus	Stylus assembly protruding, loose, missing, falling and deformed is not allowed.
3.	Others, refer to production release spec	Others, refer to production release spec

#### OTHERS

Scratch		
Description	Accept Criteria	
Class A	Exposure of substrate do not accept Scratch : L 4mm ,W 0.2mm ,N 2, S 10mm	MI
Class C	Label area don't care Exposure of substrate do not accept Scratch : L 10mm ,W 0.4mm ,N 5, S 5mm	MI
Contamination dot/Granule dot/Cave granule		
Description	Accept Criteria	
Class A	D 0.5mm ,N 2,S 15 mm (Ignored if D D 0.15mm)	MI
Class C	D<0.9mm ,N 4,S 10 mm	MI
Burr		
Description	Accept Criteria	
Burr.	Don't accept hand scrape	MI
Imprint mark		
Description	Accept Criteria	
Class A	0.25 diameter 0.65mm ,N 3	MI
Bright mark		
Description	Accept Criteria	
Class A	L 2.5mm,W 0.25mm,N 3	MI
Class C	L 3.0mm,W 0.3mm,N 5	MI
Lint		
Description	Accept Criteria	
Class A	L 3mm , W 0.2mm ,N 2, S 5 mm	MI
Class C	L 10mm , W 0.3 mm ,N 3	MI

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## 7. Generic Troubleshooting

### 1 . Main Unit Does Not Respond to Power Button

- (1) Connect the AC adapter, maybe the battery pack is exhaust and wait few minutes for battery recharging.
- (2) Check if battery installed well.
- (3) Check the Power Button whether it's damaged.
- (4) Replace another battery pack.
- (5) Try to start boot-loader mode [refer to section 4.2]. Re-flash ROM if boot loader mode is enabled.
- (6) Check all connectors including LCD FPC to Main Board.
- (7) Replace Main Board if necessary.
- (8) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

### 2 . Buttons Do Not Respond

- (1) Try to cold boot the unit then tries again.
- (2) Dismantle the unit; check the status of switches on the Main Board and the plastic parts of the Button not responding.
- (3) Try with another Main Board or Front Bezel.
- (4) Replace Main Board or Front Bezel if necessary.
- (5) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

### 3 . Unusual Vertical / Horizontal lines or partial display

- (1) Check the connection of LCM FPC whether is properly connected.
- (2) Try to cold boot the unit then tries again.
- (3) Try to re-flash the ROM code.
- (4) Try with another LCM.
- (5) Try with another Main Board.
- (6) Replace LCM if necessary
- (7) Replace Main Board if necessary.
- (8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

### 4 . Back Light Does Not Turn ON/OFF

- (1) Check the connection of LCM FPC whether is properly connected.

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- (2) Try to re-flash the ROM code.
- (3) Try with another LCM.
- (4) Try with another Main Board.
- (5) Replace LCM if necessary
- (6) Replace Main Board if necessary.
- (7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

#### **5 . CF/SD Card cannot be used**

- (1) Check whether CF/SD Card is fully inserted to the slot until you hear a click.
- (2) Try to re-flash the ROM code.
- (3) Try with another CF/SD Card.
- (4) Try with another Main Board.
- (5) Replace Main Board if necessary.
- (6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

#### **6 . PC Connection not possible**

- (1) If test result is NFF, it is possible caused by user connect cradle to computer before ActiveSync is installed.
- (2) Check whether "Connection Settings" in the MS ActiveSync is properly set.
- (3) Check whether it connects with other cables or cradle, customer's cable might be damaged.
- (4) Check the external appearance of the connector on the unit whether it is physically damaged.
- (5) Try to re-flash the ROM code.
- (6) Replace Main Board if necessary.
- (7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

#### **7 . Battery Pack does not start**

- (1) Make sure the battery cover is closed properly.
- (2) Connect to the AC Adapter and see if it takes charge. Also check AC Adapter condition.
- (3) Check whether AC Adapter is functioning properly.
- (4) Check whether the condition of Battery Charging status is correct.
- (5) Check the appearance of Battery Pack if any abnormal..
- (6) Try with another Battery Pack or Replace Battery Pack if necessary



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(7) Try with another Main Board or Replace Main Board if necessary.

(8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

### 8 . Battery discharges quickly even after fully charged

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

### 9 . Battery Pack does not recharge

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct. Charge should be done no more than 4 hours.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.



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## 10 . No Sound from Speaker or Distorted sound

- (1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.
- (2) Make sure it's not MUTED.
- (3) Try to re-flash the ROM code.
- (4) Clean up the speaker connection side on MB if there is any contamination.
- (5) Dismantle and Check whether the Speaker is properly installed (Orientation)
- (6) Replace Speaker if necessary.
- (7) Replace Main Board if necessary.
- (8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 11 . No Recorded Sound or Distorted sound

- (1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.
- (2) Make sure it's not MUTED.
- (3) Try to re-flash the ROM code.
- (4) Dismantle and Check whether the Microphone is properly installed.
- (5) Replace Microphone if necessary.
- (6) Replace Main Board if necessary.
- (7) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

## 12 . Wireless connection (WLAN/BT) not functioning

- (1) Make sure the wireless environment is OK before connecting to WLAN.
- (2) Make sure the wireless connection setting has properly set.
- (3) Make a life connection with Internet or another device.
- (4) Try to re-flash the ROM code.
- (5) Try with another main board if necessary
- (6) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

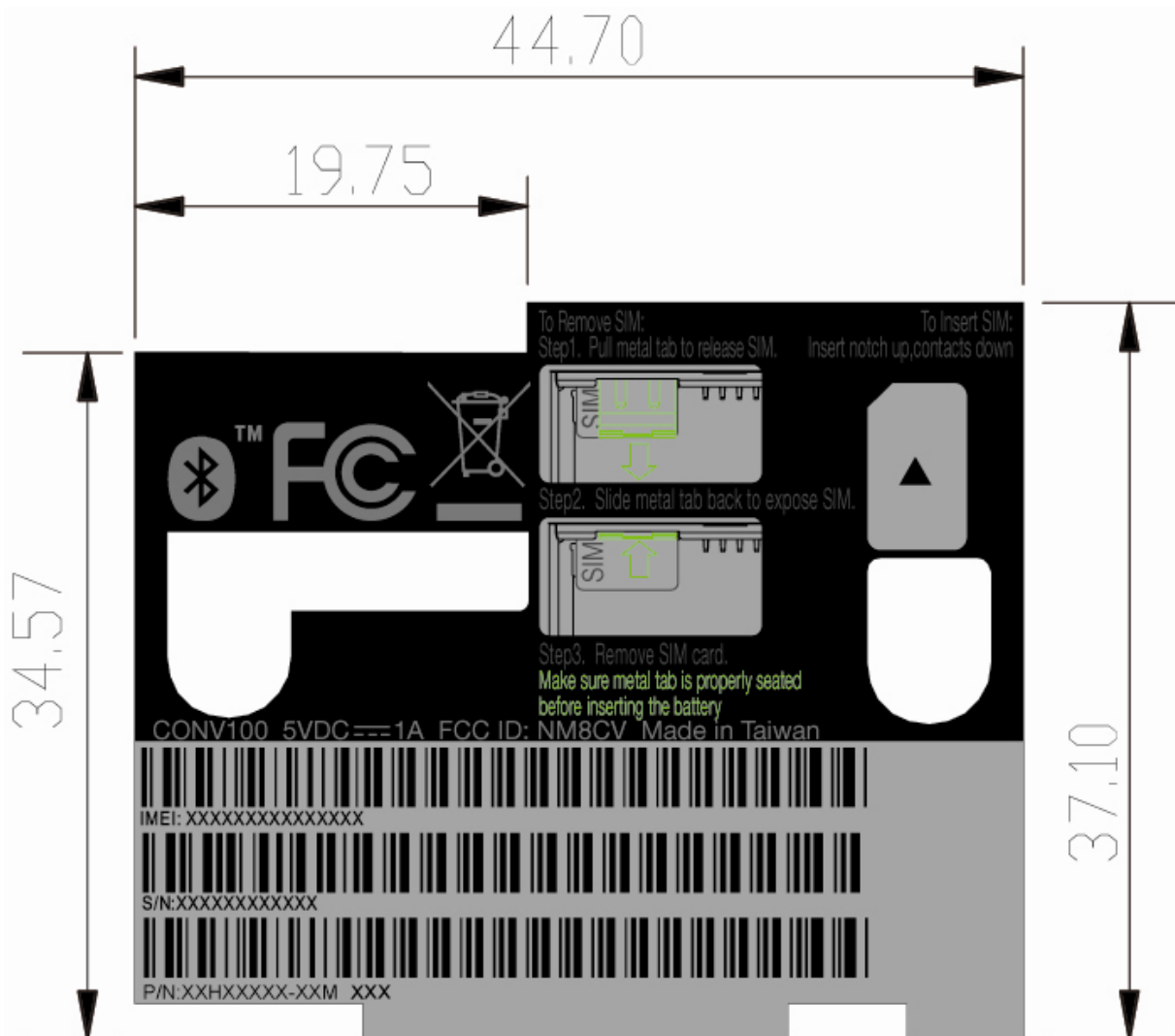
## 8. Generic Labeling Plan

### Agency label

#### 8.1 Agency label-CONV100-black ID

HTC P/N: 77H00613-00M

Size: 44.7 X 37.1mm

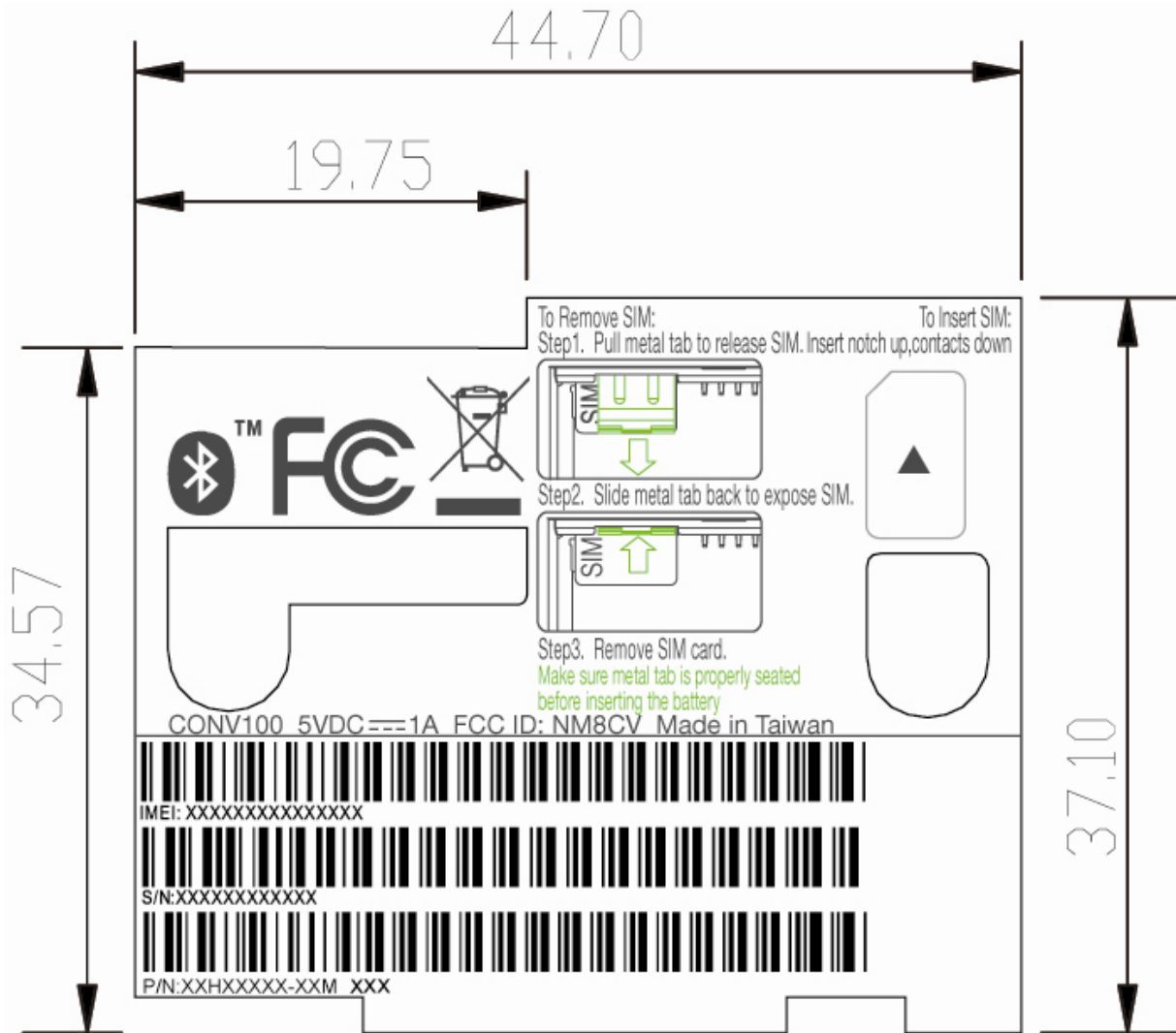


HTC P/N	Description

### 8.2 Agency label-CONV100-white ID

HTC P/N: 77H00613-01M

Size: 44.7 X 37.1mm



HTC P/N	Description



### 8.3 Unit label location explanation

Water sensitive label

HTC P/N: 77H00675-00M

Qty: 2

Tamper evident label

HTC P/N: 77H00615-00M

Qty: 1





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## 9. Generic Spare Part List and Photos

### 9.1 SPL for Repair

Item	P/N	Description	Qty	Substitute
1	51H10091-00M	Rigid-Flex Board ASSY,Upper Board	1	
2	51H00452-01M	PCBA-MAIN BOARD	1	
3	54H00282-00M	Camera Module	1	
4	36H00693-00M	Speaker	1	
5	73H20150-41M	FPC,Key-Volume	1	
6	73H20162-41M	FPC ,Side Key-Hot Key	1	
7	76H02813-00M	Mylar,LED,UPBD,R	1	
8	72H2750-00M	EMI Gasket,on upper board	1	
9	37H00012-00M	Antenna Pre-Assy,TMOUS GSM antenna	1	
10	76H02819-00M	Adhesive-Double Tape,IO board	1	
11	72H02751-00M	Conductive Fabric,on 80pin,MB and UPBD	2	
12	76H02812-00M	Sponge,AB assy,LCD,SCF100	1	
13	72H02729-00M	Screw,FPH,M1.4x2,CR3,Black	3	
14	72H01706-01M	Screw,M1-6,L2-8,T5	4	
15	72H00651-00M	SCREW-M1.4X2.3L+NY_N3i	1	
16	74H01244-00M	Bezel Pre-Assy,display upper cover assy	1	
17	72H02752-00M	Conductive Fabric,EMC_Audio,NUM_support	1	
18	73H00293-00M	Cable,CBAFR-001-057A,ACON,coaxial,57mm	1	
19	76H02657-00M	Rubber,Camera,silicone	1	
20	76H02815-00M	Mylar,shade,black	1	
21	74H01242-00M	Housing Pre-Assy,Keyboard Upper Cover	1	
22	74H01243-00M	Cover Pre-Assy,Battery	1	
23	51H10085-00M	Rigid-Flex Board ASSY,IO-BOARD	1	
24	60H00105-00M	TFT-LCD Module	1	
25	36H00698-00M	Receiver	1	

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26	74H01239-00M	Slider Hinge	1	
27	76H02817-00M	Mylar,volume key,shade	1	
28	76H02277-00M	Mylar,Capton,Side Key	2	
29	76H02814-00M	Mylar,LED,UPBD	1	
30	76H02806-00M	Tape,LCD FPC connector	1	
31	73H20148-41M	FPC Pre-Assy,Number Key	1	
32	76H02820-00M	Adhesive-Double Tape,Mic rubber	1	
33	76H02816-00M	Rubber,MB,fix 80p conn,silicone	1	
34	76H02818-00M	Mylar,gasket masking,28*5*0.5mm,	1	
35	77H00675-00M	Water Sensitive Label,MING JYE,5*5mm	1	
36	72H02258-01M	Screw,0.3*1,Black	8	
37	72H02595-01M	Screw,for CD cover	5	
38	72H02832-00M	Screw,PH,FD,M1.4xL1.4	4	
39	74H01241-00M	Housing Pre-Assy,keyboard bottom cover	1	
40	74H01245-00M	Keypad Pre-Assy,Number Key	1	
41	76H02805-00M	Rubber,MIC,Silicon,	1	
42	74H01246-00M	Support Pre-Assy,Number Key	1	
43	74H01250-00M	Chassis Pre-Assy,Display,Bottom Cover	1	
44	36H00737-00M	Switch,,scrollwheel with 5-way	1	
45	35H00063-13M	BATTERY_LHON,1100mAh,3.7V,	1	

**NOTE:**

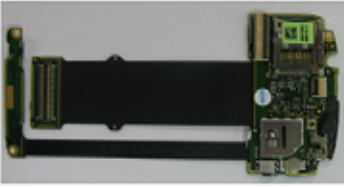
**THE PHOTO OF SPL IS GENERIC AND ONLY FOR REFERENCE, THE COLOR AND APPEARANCE MAY BE DIFFERENT FROM THE SHIPPED PARTS, IF YOU WANT TO APPLY THOSE PARTS, PLEASE CONTACT YOUR SERVICE ACCOUNT MANAGER FOR MORE INFORMATION.**

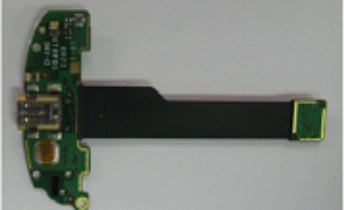
**AS FOR PICTURE, PLEASE REFER TO THE TABLE AS BELOW.**


**FOR REFURBISHMENT PARTS, THE TABLE IS FOR YOUR REFERENCE. YOU CAN DO THE REFURBISHMENT ONLY WHEN YOUR SERVICE MODEL IS ALLOWED TO DO THE REFURBISHMENT.**

**Picture for SPL 80H Kernel and Accessories**

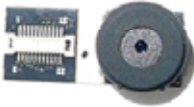
(Part no on picture is for Generic version only, please check SPL for detail per customer)

Part No.	51H10091-00M	
Description	Rigid-Flex Board ASSY, Upper Board	
Q'ty	1	
Repair Code	M201.2	
Return to HTC	No	
Refurbishment	No	

Part No.	51H10085-00M	
Description	Rigid-Flex Board ASSY, JO-BOARD	
Q'ty	1	
Repair Code	M104.1	
Return to HTC	No	
Refurbishment	No	

Part No.	51H00452-01M	
Description	PCBA-MAIN BOARD	
Q'ty	1	
Repair Code	M101	
Return to HTC	Yes	
Refurbishment	No	

Part No.	60H00105-00M	
Description	TFT-LCD Module	
Q'ty	1	
Repair Code	L101	
Return to HTC	Yes	
Refurbishment	No	


Part No.	54H00282-00M	
Description	Camera Module	
Q'ty	1	
Repair Code	G117	
Return to HTC	Yes	
Refurbishment	No	

Part No.	36H00698-XXM	
Description	Receiver	
Q'ty	1	
Repair Code	G103.1	
Return to HTC	No	
Refurbishment	No	


Part No.	36H00693-XXM	
Description	Speaker	
Q'ty	1	
Repair Code	G103	
Return to HTC	No	
Refurbishment	No	


Part No.	74H01239-00M	
Description	Slider Hinge	
Q'ty	1	
Repair Code	C112.4	
Return to HTC	No	
Refurbishment	No	

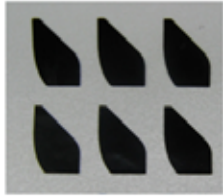
Part No.	73H20150-41M	
Description	X'	
Q'ty	1	
Repair Code	C122.3	
Return to HTC	No	
Refurbishment	No	


Part No.	76H02817-00M	
Description	Mylar, volume key, shade	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

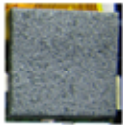
<b>Part No.</b>	73H20162-41M	
<b>Description</b>	FPC ,Side Key-Hot Key	
<b>Q'ty</b>	1	
<b>Repair Code</b>	C122	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	


<b>Part No.</b>	76H02277-00M	
<b>Description</b>	Mylar,Capton,Side Key	
<b>Q'ty</b>	2	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	


<b>Part No.</b>	76H02813-00M	
<b>Description</b>	Mylar,LED,UPBD,R	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	

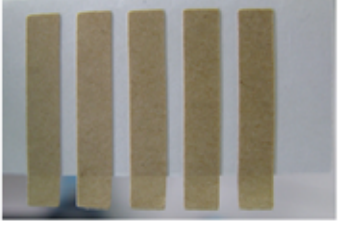
<b>Part No.</b>	76H02814-00M	
<b>Description</b>	Mylar,LED,UPBD	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	

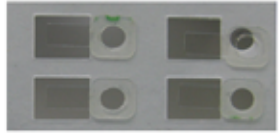
<b>Part No.</b>	72H02750-00M	
<b>Description</b>	EMI Gasket,on upper board	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	

<b>Part No.</b>	76H02806-00M	
<b>Description</b>	Tape,LCD FPC connector	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	


<b>Part No.</b>	37H00012-00M	
<b>Description</b>	Antenna Pre-Assy,TMOUS GSM antenna	
<b>Q'ty</b>	1	
<b>Repair Code</b>	G114.1	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	

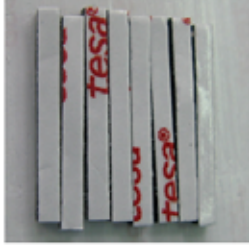
<b>Part No.</b>	73H20148-41M	
<b>Description</b>	FPC Pre-Assy,Number Key	
<b>Q'ty</b>	1	
<b>Repair Code</b>	C122.1	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	YES	

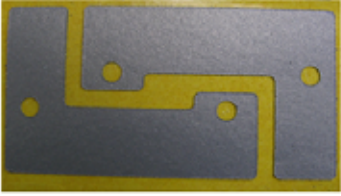
<b>Part No.</b>	76H02819-00M	
<b>Description</b>	Adhesive-Double Tape,JO board	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	

<b>Part No.</b>	76H02820-00M	
<b>Description</b>	Adhesive-Double Tape,Mic rubber	
<b>Q'ty</b>	1	
<b>Repair Code</b>	N/A	
<b>Return to HTC</b>	No	
<b>Refurbishment</b>	No	




Part No.	72H02751-00M	
Description	Conductive Fabric,on 80pin,MB and UPBD	
Q'ty	2	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	76H02816-00M	
Description	Rubber,MB,fix 80p conn,silicone	
Q'ty	1	
Repair Code	G114.2	
Return to HTC	No	
Refurbishment	No	

Part No.	72H02936-00M	
Description	EMI Absorber, key support	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	76H02818-00M	
Description	Mylar,gasket masking,28*5*0.5mm,	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	76H02812-00M	
Description	Sponge,AB assy,LCD	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	77H00675-00M	
Description	Water Sensitive Label,5*5mm	
Q'ty	1	
Repair Code	Q12.1	
Return to HTC	No	
Refurbishment	No	


Part No.	72H02729-00M	
Description	Screw	
Q'ty	3	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	

Part No.	72H02258-01M	
Description	Screw	
Q'ty	8	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	


Part No.	72H01706-01M	
Description	Screw	
Q'ty	4	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	

Part No.	72H02595-01M	
Description	Screw,for CD cover	
Q'ty	5	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	





Part No.	72H00651-00M	
Description	Screw	
Q'ty	1	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	

Part No.	72H02832-00M	
Description	Screw	
Q'ty	4	
Repair Code	O05	
Return to HTC	No	
Refurbishment	No	

Part No.	74H01244-00M	
Description	Bezel Pre-Assey,display upper cover assy	
Q'ty	1	
Repair Code	C101.5	
Return to HTC	No	
Refurbishment	Yes	

Part No.	74H01241-00M	
Description	Housing Pre-Assey,keyboard bottom cover assy	
Q'ty	1	
Repair Code	C102.6	
Return to HTC	No	
Refurbishment	Yes	

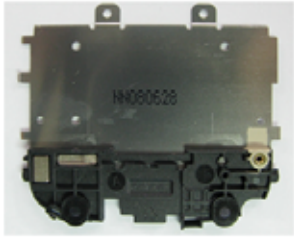
Part No.	72H02752-00M	
Description	Conductive Fabric,EMC_Audio,N UM_support	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	


Part No.	74H01245-00M	
Description	Keypad Pre-Assey,Number Key	
Q'ty	1	
Repair Code	C109	
Return to HTC	No	
Refurbishment	Yes	

Part No.	73H00293-00M	
Description	Cable,CBAFR-001-057A,ACON,coaxial,5 7mm	
Q'ty	1	
Repair Code	B108	
Return to HTC	No	
Refurbishment	No	

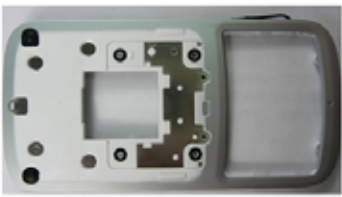
Part No.	76H02805-00M	
Description	Rubber,MIC,Silicon	
Q'ty	1	
Repair Code	G114.2	
Return to HTC	No	
Refurbishment	No	

Part No.	76H02657-00M	
Description	Rubber,Camera,silicone	
Q'ty	1	
Repair Code	G114.2	
Return to HTC	No	
Refurbishment	No	

Part No.	74H01246-00M	
Description	Support Pre-Assey,Number Key	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	76H02815-00M	
Description	Mylar,shade,black	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

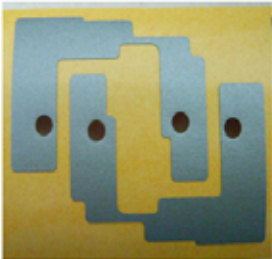
Part No.	74H01250-00M	
Description	Chassis Pre-Asy, Display, Bottom Cover	
Q'ty	1	
Repair Code	C102.5	
Return to HTC	No	
Refurbishment	Yes	

Part No.	74H01242-00M	
Description	Housing Pre-Asy, Keyboard Upper Cover	
Q'ty	1	
Repair Code	C101.6	
Return to HTC	No	
Refurbishment	Yes	

Part No.	36H00737-00M	
Description	Switch, WHK1937RLW CB, SAMSUNG, scrollw heel with 5-way	
Q'ty	1	
Repair Code	C105	
Return to HTC	No	
Refurbishment	Yes	

Part No.	74H01243-00M	
Description	Cover Pre-Asy, Battery	
Q'ty	1	
Repair Code	C112	
Return to HTC	No	
Refurbishment	No	

Part No.	35H00063-13M	
Description	BATTERY LI-ION, 1100mAh, 3.7V,	
Q'ty	1	
Repair Code	B101	
Return to HTC	Yes	
Refurbishment	No	

Part No.	72H02935-00M	
Description	EMI Absorber, C part	
Q'ty	1	
Repair Code	N/A	
Return to HTC	No	
Refurbishment	No	

Part No.	XXXXXXXXXX-XXX	
Description		
Q'ty		
Repair Code		
Return to HTC		
Refurbishment	Yes/No	

## 9.2 Board Level 2.5 Repairs

### ■ Basic Repair Instructions for Component Replacement:

- Step 1 Place the solder-proof tape to cover the surrounding area of the components which being replaced.  
*Warning : DO NOT overheat the tape and components to avoid the tape melted and the components damaged*
- Step 2 Use Heater Gun (HAKO850B, set the temperature between 350°C, Air Speed 3~5) to remove the components.
- Step 3 Wait till the temperature cool down before removing the solder-proof tape to avoid other components being removed
- Step 4 After the damaged or defective components have been replaced; clear the surroundings for solder and flux residues.

Notice:

- A. Check the polarity and the position of the components, it can't be shifted, reversed or lifted.
- B. All the parts of the PCB should be checked if it is missing or not.
- C. The OP must to wear antistatic wrist strap .Don't put boards together and avoid hitting them.
- D. When you solder and repair that the soldering iron temperature must be setup 415 . (The temperature range is 415 ±5 ),and the solder wire's diameter is 0.4/0.5/0.6mm(SAC 305 (1.1%))
- E. Please be noticed to follow below steps for main board repair which is equipped with **Golden**

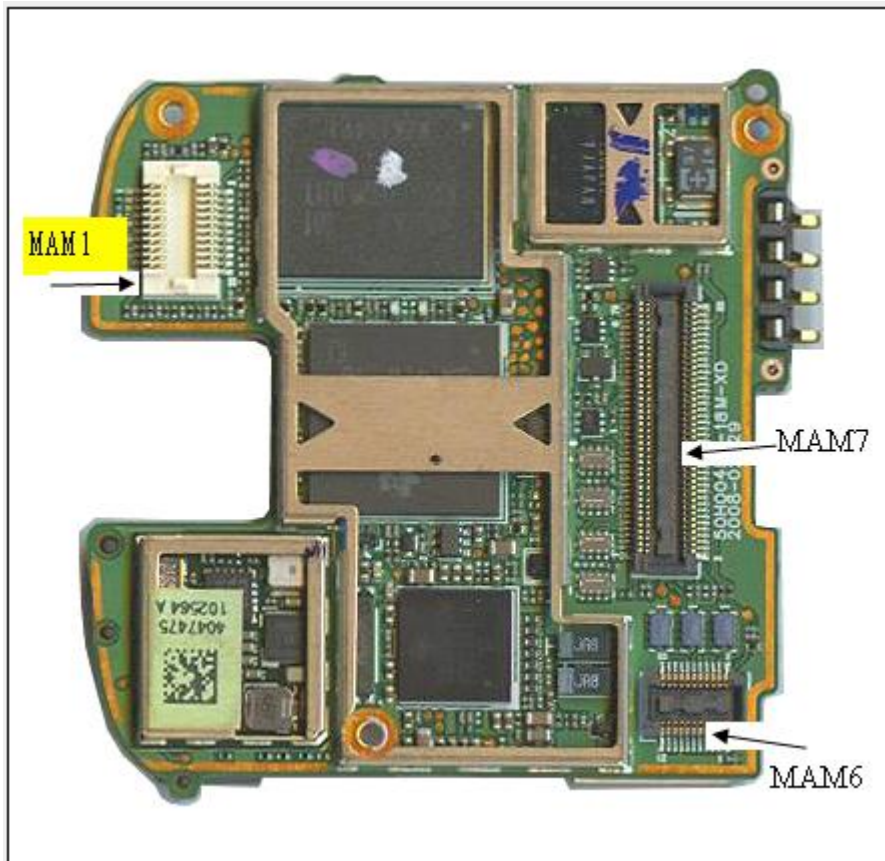
**Capacitor:**

1. When replacing level 2.5 components located around the golden capacitor:
  - I. The temperature of the hot air blower must be under 400°c
  - II. When apply the hot air to the part / component, the heating time must be under 20 seconds (including the time of removing and soldering)
  - III. The temperature of the soldering iron must be under 350°c
  - IV. When apply the solder tip to the part / component, the heating time must be under 5 seconds
  - V. The solder tip must not contact with the golden capacitor
2. For BGA replacement: The golden capacitor must be removed before perform pre-heating, heating, soldering and de-soldering process, and then it must be replaced with a new one (please refer to 1.c. and 1.d. steps)
3. For main board which failed to pass the function test, the golden capacitor must be replaced with a new one and must follow below soldering criteria: The temperature of the soldering iron must be under 350°c When apply the solder tip to the part / component, the heating time must be under 5 seconds The solder tip must not have a contact with the body of golden capacitor

**51H00452-00M PCBA-MAIN BOARD(Side A)**

Location	P/N	Description	Q'ty	Description
MAM1	75H00610-00M	Connector B to B,70mohm,22P,0.4pitch,0.3A,60V	1	Camera Connector
MAM7	75H00704-00P	Connector B to B,80P,0.4pitch,0.3A,60V,70mohm	1	RF board Connector
MAM6	75H00592-00P	Connector B to B,70mohm,22P,0.4pitch,0.0003A,60V	1	Keypad FPC Connector

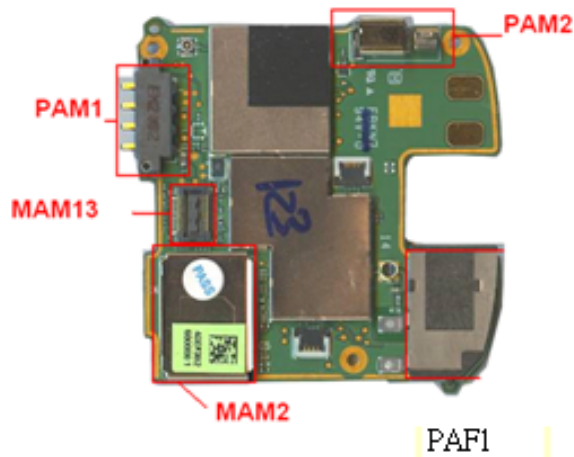
**SIDE A PHOTO AND COMPONENT LOCATION**



**Ø 51H00452-XXM PCBA-MAIN BOARD(Side B)**

Location	P/N	Description	Q'ty	Description
PAM2	36H00665-00M	Vibrator,BHT-3285,SANYO,SMT Type,70/-20degC	1	Vibrator
MAM2	75H00738-00M	Connector SIM Card,50mohm,8P,2.54mmPitch	1	SIM card Connector
MAM13/MAM6	75H00592-00P	Connector B to B,70mohm,22P,0.4pitch,0.0003A,60V	1	I-O board Connector
PAM1	75H00519-00M	Connector Device,4P,2.5Pitch,2A	1	Battery Connector

**Side B Photo and Component Location**



## 10. RF Antenna Specification

Converse GSM Antenna Test Specification					
Item	Test Name	TX Level	TCH	1st Downlink cell power	note
1	Wait_Signal	0	600	-65	
2	Power_Class	0	600	-65	
PCS 1900 Receiver Test					
3	Fast Bit Error Rate	0	512	-104	<= 2 %
4	Fast Bit Error Rate	0	661	-104	
5	Fast Bit Error Rate	0	810	-104	
PCS 1900 Transmitter Test					
6	TX Power	0	512	-65	>= 28 dbm
7	TX Power	0	661	-65	
8	TX Power	0	810	-65	
GSM 850 Receiver Test (For US SKU)					
9	Fast Bit Error Rate	5	128	-104	<= 2 %
10	Fast Bit Error Rate	5	190	-104	
11	Fast Bit Error Rate	5	251	-104	
GSM 850 Transmitter Test (For US SKU)					
12	TX Power	5	128	-65	>= 29 dbm
13	TX Power	5	190	-65	
14	TX Power	5	251	-65	
EGSM 900 Receiver Test (For EU SKU)					
9	Fast Bit Error Rate	5	975	-104	<= 2 %
10	Fast Bit Error Rate	5	38	-104	
11	Fast Bit Error Rate	5	124	-104	
EGSM 900 Transmitter Test (For EU SKU)					
12	TX Power	5	975	-65	>= 29 dbm
13	TX Power	5	42	-65	
14	TX Power	5	124	-65	
DCS 1800 Receiver Test					
21	Fast Bit Error Rate	0	512	-104	<= 2 %
22	Fast Bit Error Rate	0	699	-104	
23	Fast Bit Error Rate	0	885	-104	
DCS 1800 Transmitter Test					
24	TX Power	0	512	-65	>= 27 dbm
25	TX Power	0	699	-65	
26	TX Power	0	885	-65	



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