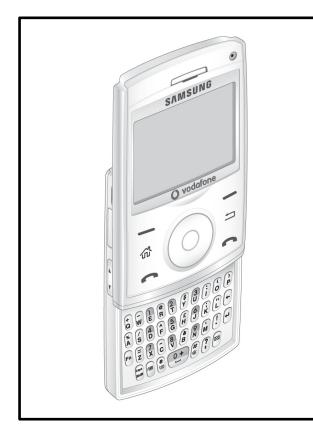


## **GSM TELEPHONE SGH-1620**

# SERVICE Manual

#### **GSM TELEPHONE**



#### **CONTENTS**

- Safety Precautions
- Specification
- Product Function
- Array course control
- Exploded View and Parts list
- MAIN Electrical Parts List
- Disassembly and Assembly 7. Instructions
- 8. Block Diagrams
- 9. PCB Diagrams
- 10. Chart of Troubleshooting
- 11. Reference data

## SAMSUNG ELECTRONICS



#### GSPN (Global Service Partner Network)

| Country          | Web Site                  |
|------------------|---------------------------|
| North America    | service.samsungportal.com |
| Latin America    | latin.samsungportal.com   |
| CIS              | cis.samsungportal.com     |
| Europe           | europe.samsungportal.com  |
| China            | china.samsungportal.com   |
| Asia             | asia.samsungportal.com    |
| Mideast & Africa | mea.samsungportal.com     |

## 2. Specification

#### 2-1. GSM/WCDMA General Specification

|                                     | EGSM 900<br>Phase 2      | DCS1800<br>Phase 1       | PCS1900                  |
|-------------------------------------|--------------------------|--------------------------|--------------------------|
| Freq. Band[MHz]<br>Uplink/Downlink  | 880~915<br>925~960       | 1710~1785<br>1805~1880   | 1850~1910<br>1930~1990   |
| ARFCN range                         | 0~124 & 975~1023         | 512~885                  | 512~810                  |
| Tx/Rx spacing                       | 45 MHz                   | 95 MHz                   | 80 MHz                   |
| Mod. Bit rate/<br>Bit Period        | 270.833 kbps<br>3.692 us | 270.833 kbps<br>3.692 us | 270.833 kbps<br>3.692 us |
| Time Slot<br>Period/Frame<br>Period | 576.9 us<br>4.615 ms     | 576.9 us<br>4.615 ms     | 576.9 us<br>4.615 ms     |
| Modulation                          | 0.3 GMSK                 | 0.3 GMSK                 | 0.3 GMSK                 |
| MS Power                            | 33 dBm~5 dBm             | 30 dBm∼0 dBm             | 30 dBm∼0 dBm             |
| Power Class                         | 5 pcl ~ 19 pcl           | 0 pcl ~ 15 pcl           | 0 pcl ~ 15 pcl           |
| Sensitivity                         | -102 dBm                 | -100 dBm                 | -100 dBm                 |
| TDMA Mux                            | 8                        | 8                        | 8                        |
| Cell Radius                         | 35 Km                    | 2 Km                     | -                        |

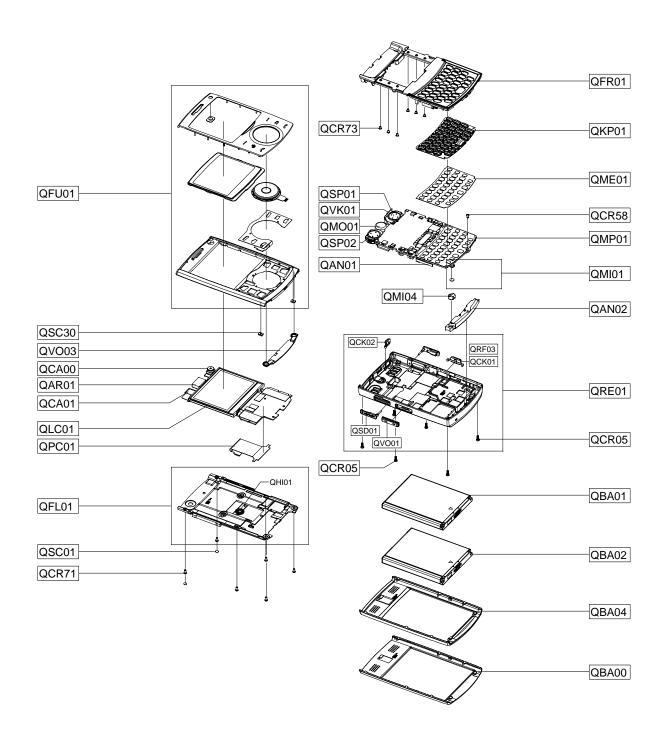
#### 2-2. GSM TX power class

| EGSM900  |
|----------|
|          |
| 33±2 dBm |
| 31±2 dBm |
| 29±2 dBm |
| 27±2 dBm |
| 25±2 dBm |
| 23±2 dBm |
| 21±2 dBm |
| 19±2 dBm |
| 17±2 dBm |
| 15±2 dBm |
| 13±2 dBm |
| 11±3 dBm |
| 9± 3dBm  |
| 7±3 dBm  |
| 5±3 dBm  |
|          |
|          |

| TX Power      |          | TX Power      |          |
|---------------|----------|---------------|----------|
| control level | DCS1800  | control level | PCS1900  |
| 0             | 30±3 dBm | 0             | 30±3 dBm |
| 1             | 28±3 dBm | 1             | 28±3 dBm |
| 2             | 26±3 dBm | 2             | 26±3 dBm |
| 3             | 24±3 dBm | 3             | 24±3 dBm |
| 4             | 22±3 dBm | 4             | 22±3 dBm |
| 5             | 20±3 dBm | 5             | 20±3 dBm |
| 6             | 18±3 dBm | 6             | 18±3 dBm |
| 7             | 16±3 dBm | 7             | 16±3 dBm |
| 8             | 14±3 dBm | 8             | 14±3 dBm |
| 9             | 12±4 dBm | 9             | 12±4 dBm |
| 10            | 10±4 dBm | 10            | 10±4 dBm |
| 11            | 8±4 dBm  | 11            | 8±4 dBm  |
| 12            | 6±4 dBm  | 12            | 6±4 dBm  |
| 13            | 4±4 dBm  | 13            | 4±4 dBm  |
| 14            | 2±5 dBm  | 14            | 2±5 dBm  |
| 15            | 0±5 dBm  | 15            | 0±5 dBm  |

## 5. Exploded View and Parts List

#### 5-1. Cellular phone Exploded View



#### 5-2. Cellular phone Parts list

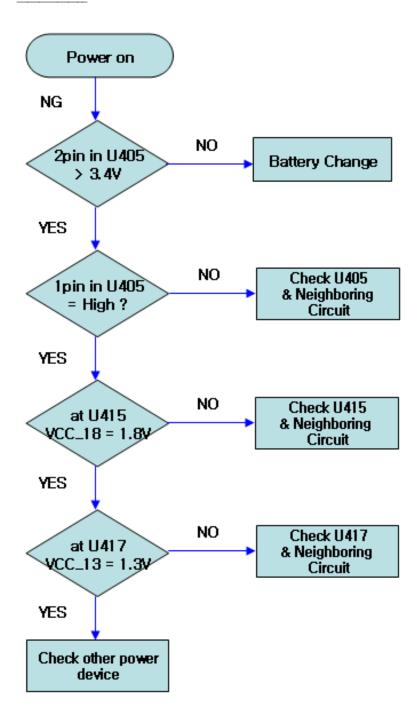
| Design LOC | Description                    | SEC CODE    |
|------------|--------------------------------|-------------|
| QAN01      | INTENNA-BLUETOOTH FPCB         | GH42-01242A |
| QAN02      | INTENNA-SGHI620                | GH42-01164A |
| QAR01      | AUDIO-RECEIVER                 | 3009-001276 |
| QBA00      | ASSY COVER-STD BATT            | GH98-06204B |
| QBA01      | INNER BATTERY PACK-1200MAH,BLK | GH43-02821A |
| QBA02      | INNER BATTERY PACK-1500MAH,BLK | GH43-02888A |
| QBA04      | ASSY COVER-EXT BATT            | GH98-06205B |
| QCA00      | CAMERA MODULE                  | GH59-04159A |
| QCA01      | CAMERA MODULE-SELF-I620        | GH59-04489A |
| QCK01      | PMO KEY-CAMERA                 | GH72-42863B |
| QCK02      | PMO KEY-POWER                  | GH72-42861B |
| QCR05      | SCREW-MACHINE                  | 6001-001478 |
| QCR58      | SCREW-MACHINE                  | 6001-001870 |
| QCR71      | SCREW-MACHINE                  | 6001-002095 |
| QCR73      | SCREW-MACHINE                  | 6001-002102 |
| QFL01      | ASSY COVER-SLIDE LOWER         | GH98-03976B |
| QFR01      | ASSY CASE-FRONT                | GH98-03978B |
| QFU01      | ASSY COVER-SLIDE UPPER         | GH98-05641B |
| QHI01      | ASSY HINGE-SLIDE               | GH98-04165B |
| QKP01      | ASSY KEYPAD-(FRAN/BLK)         | GH98-06189B |
| QLC01      | MEA-LCD MODULE KIT             | GH97-07916A |
| QME01      | DOME SHEET-DOME SHEET 37 KEY,I | GH59-04350A |
| QMI01      | MICROPHONE-ASSY-SGHI620        | GH30-00353A |
| QMI04      | RMO RUBBER-MIC HOLDER          | GH73-09899A |
| QMO01      | MOTOR DC-SGHI620               | GH31-00354A |
| QMP01      | PBA MAIN-SGHI620               | GH92-03450A |
| QPC01      | MEA-SLIDE FPCB KIT             | GH97-07917A |
| QRE01      | ASSY CASE-REAR                 | GH98-03979B |
| QRF03      | PMO COVER-EAR/IF               | GH72-37817B |
| QSC01      | TAPE-SCREW                     | GH74-32764B |
| QSC30      | PMO-DAMPER BTM                 | GH72-39894A |
| QSD01      | PMO COVER-MICRO SD             | GH72-37830B |
| QSP01      | SPEAKER                        | 3001-002181 |
| QSP02      | SPEAKER                        | 3001-002183 |
| QVK01      | KEY FPCB-POWER 1 KEY FPC, I620 | GH59-04346A |
| QVO01      | PMO KEY-VOLUME                 | GH72-42862B |
| QVO03      | PMO DECO-SIDE                  | GH72-37853B |

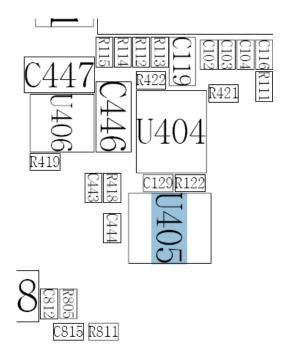
| Description                    | SEC CODE    |
|--------------------------------|-------------|
| CBF INTERFACE-DLC,X830,BLK,PCB | GH39-00720A |
| ADAPTOR-SGHE690,BLK,EU,A_TYPE  | GH44-01361A |
| CHARGER-BTC,BLK,I620           | GH44-01732A |
| EARPHONE-EARPHONE,20P,B-TYPE   | GH59-03883A |
| TAPE-REAR A                    | GH74-32822B |
| TAPE-REAR B                    | GH74-32823B |
| LABEL(R)-WATER SOAK            | GH68-09361A |
| TAPE-DOME SHHET A              | GH74-33527A |
| TAPE-DOME SHHET B              | GH74-33528A |
| TAPE GASK                      | GH74-33482A |
| TAPE-LCD PCB                   | GH74-33526A |
| TAPE GASK                      | GH74-33529A |
| TAPE GASK                      | GH74-33715A |
| LABEL(R)-WATER SOAK            | GH68-09361A |
| BAG PE                         | 6902-000634 |
| LABEL(P)-UNIT SEAL             | GH68-00518B |
| LABEL(P)-OPEN MP3              | GH68-11246A |
| LABEL(R)-MAIN(XEF)             | GH68-15474G |
| CUSHION-CASE(EU)               | GH69-05645A |
| BOX(P)-UNIT MAIN(EU)           | GH69-05656A |
| S/W CD-MS COMPANION,I620(OPEN) | GH46-00492A |
| MANUAL USERS-QRG FRENCH        | GH68-16226A |
| AS-IC-MCP UMTS                 | GH81-06872A |

## 10. Flow Chart of TroubleShooting

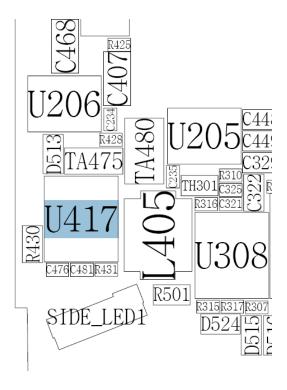
#### 10-1. Power On

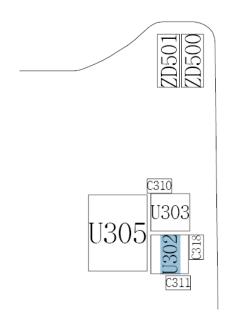
PDA Part

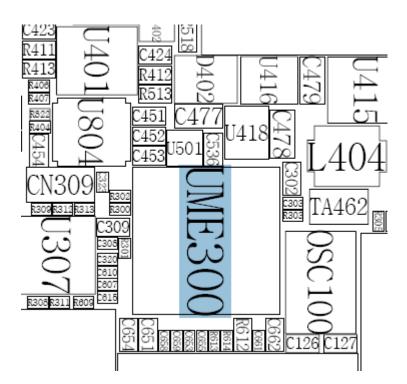


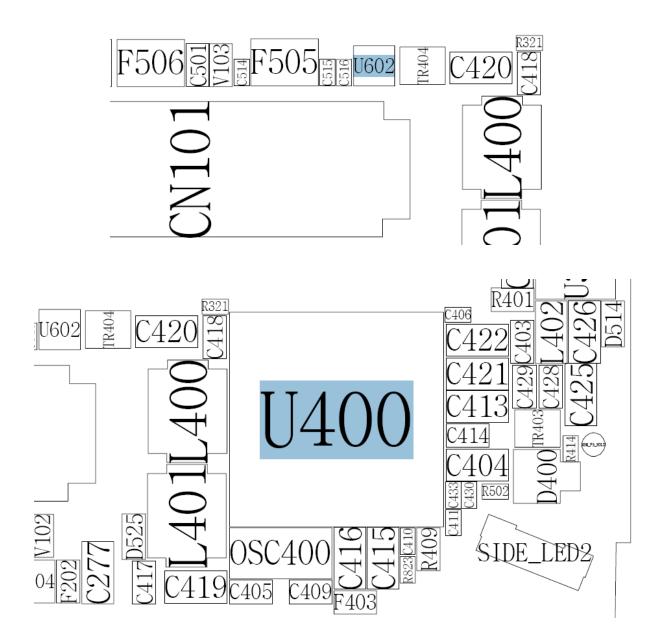


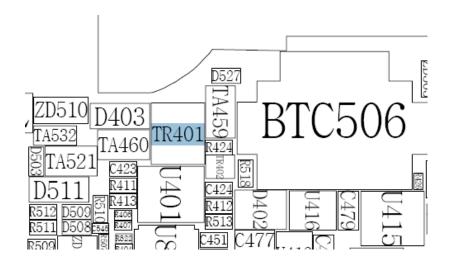


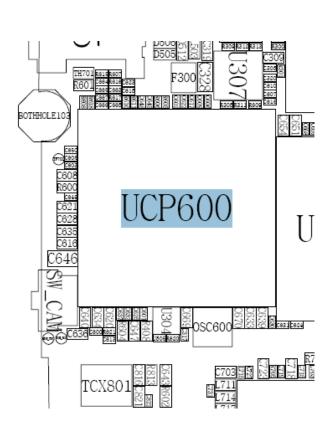


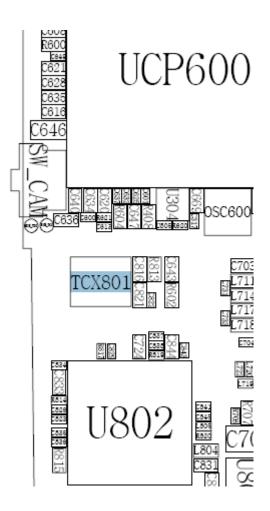




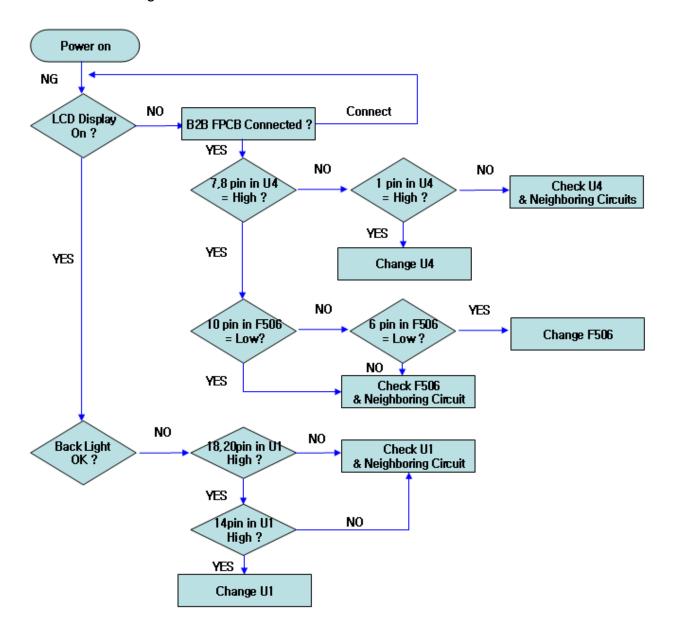




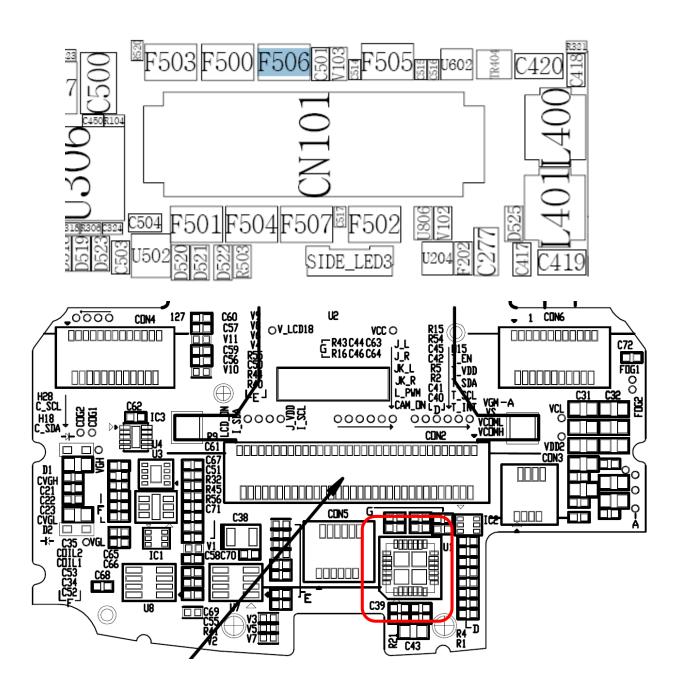




#### 10-2. LCD Working

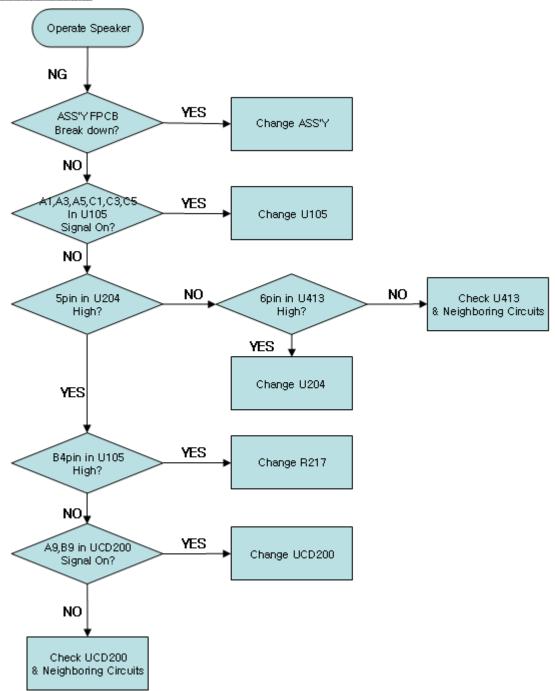


- - - - -

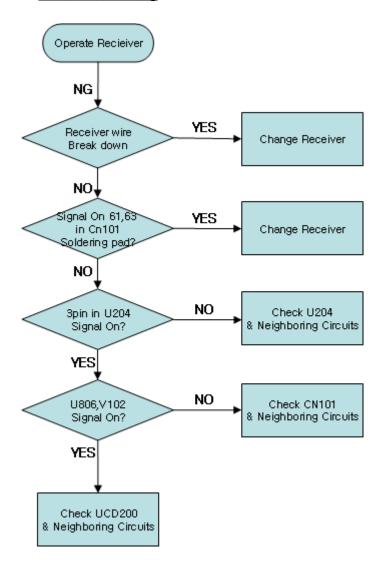


#### 10-3. Audio Working

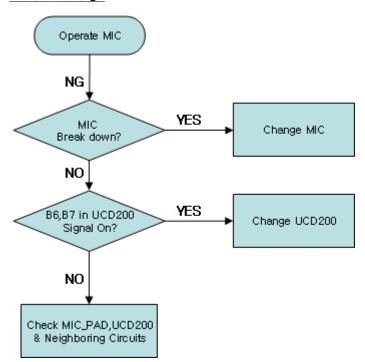
#### • Speaker Working



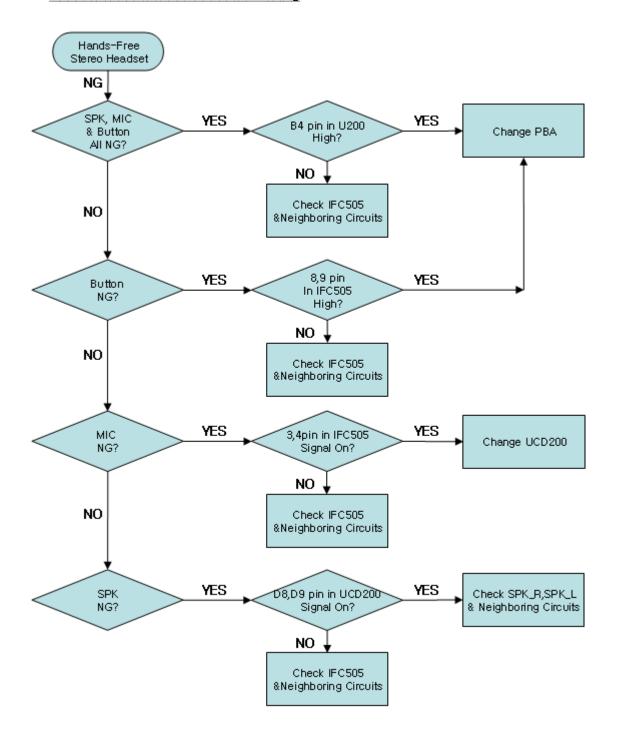
#### Reciever Working



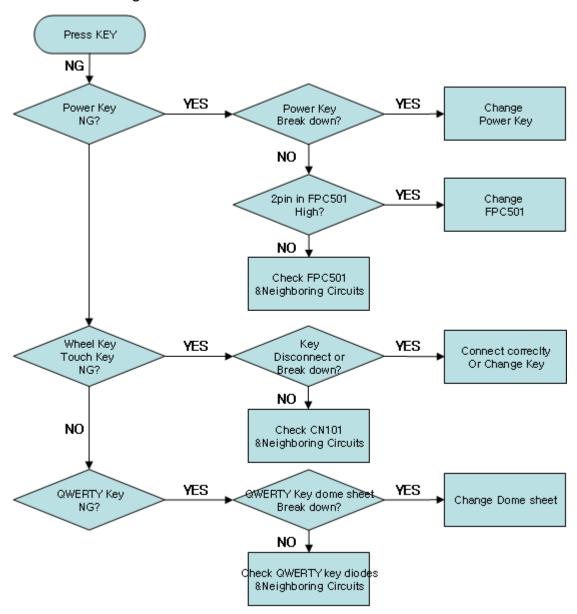
#### MIC Working



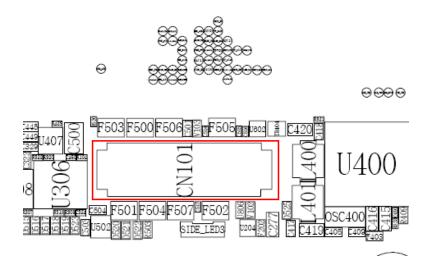
#### Hands-Free Stereo Headset Working



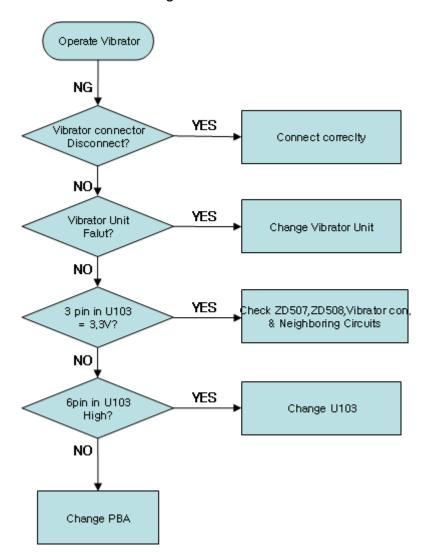
#### 10-4. KEY Working

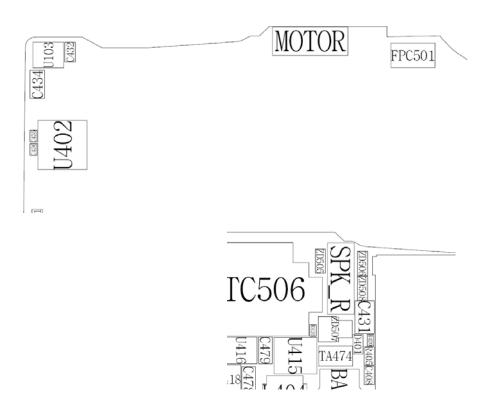




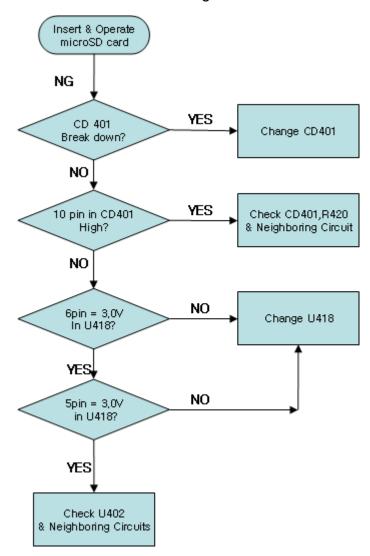


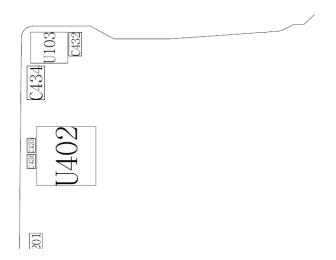
#### 10-5. Vibrator Working

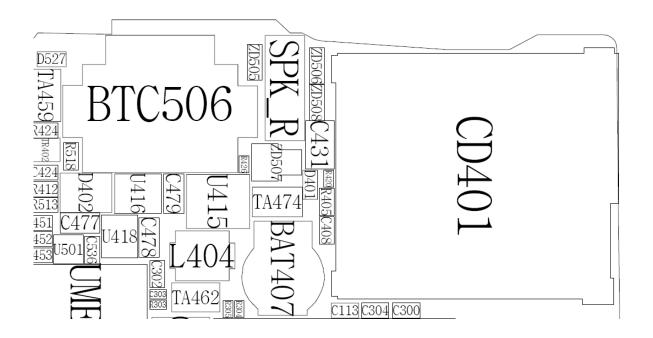




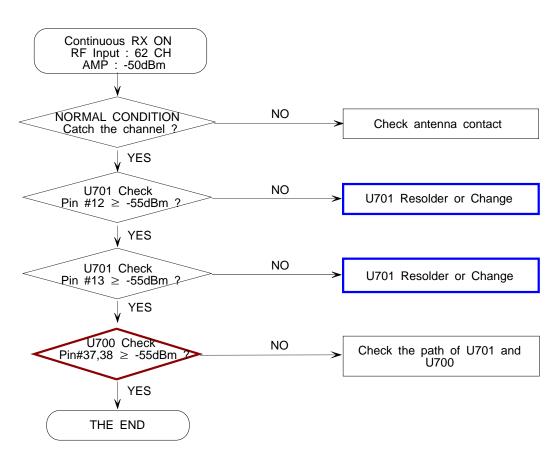
#### 10-6. T-Flash Card Working



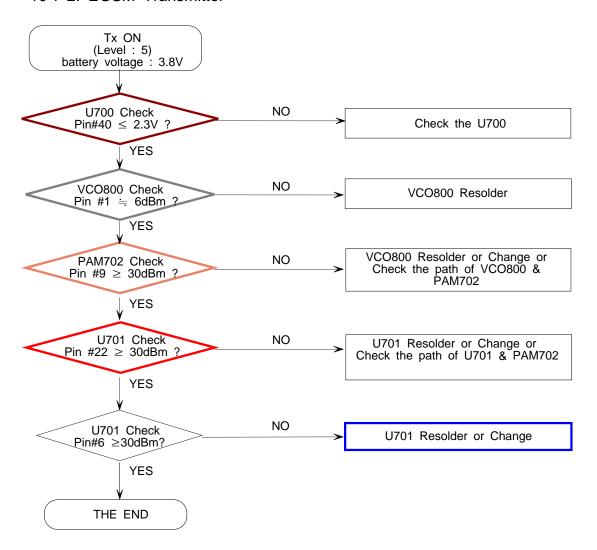




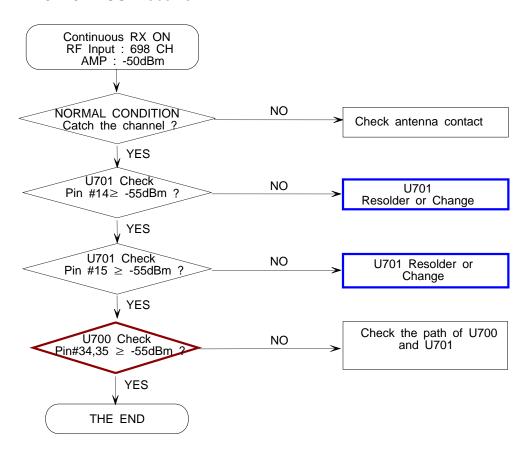
#### 10-7.RF 10-7-1. EGSM Receiver



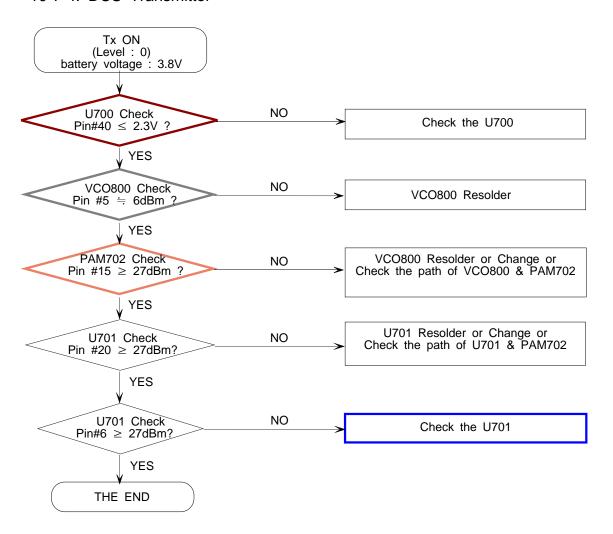
#### 10-7-2. EGSM Transmitter



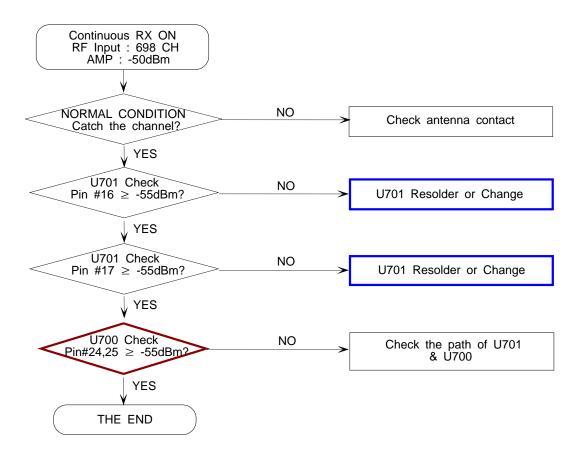
#### 10-7-3. DCS Receiver



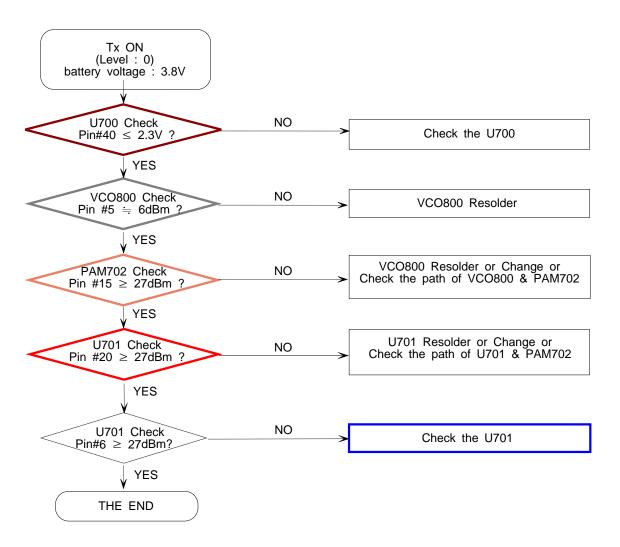
#### 10-7-4. DCS Transmitter

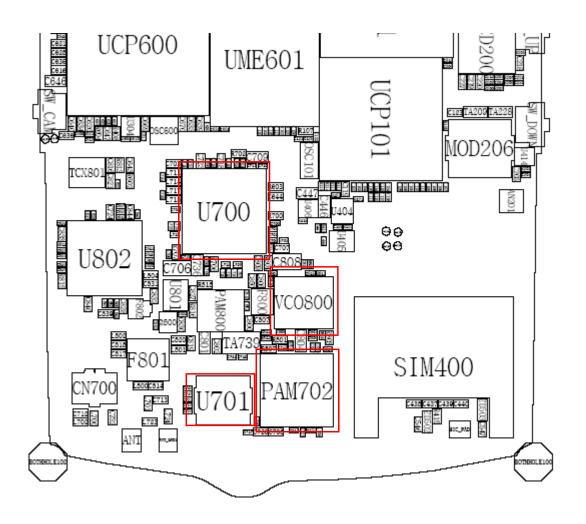


#### 10-7-5. PCS Receiver

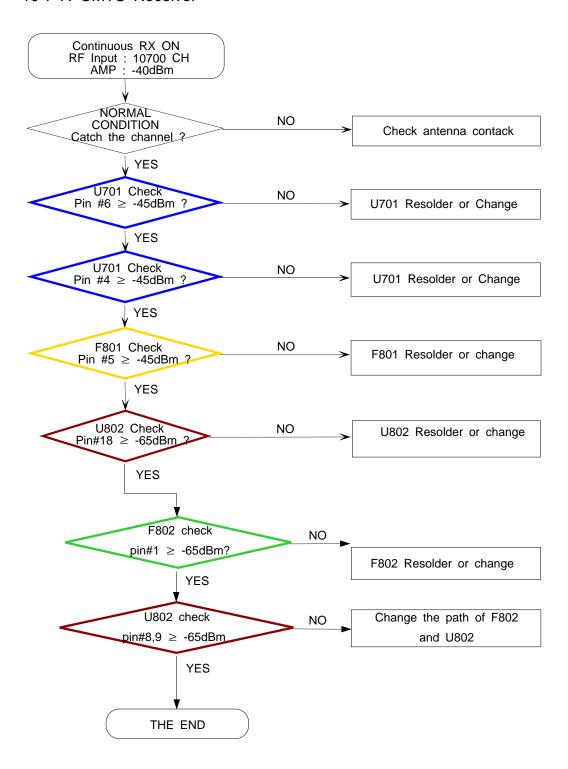


#### 10-7-6. PCS Transmitter

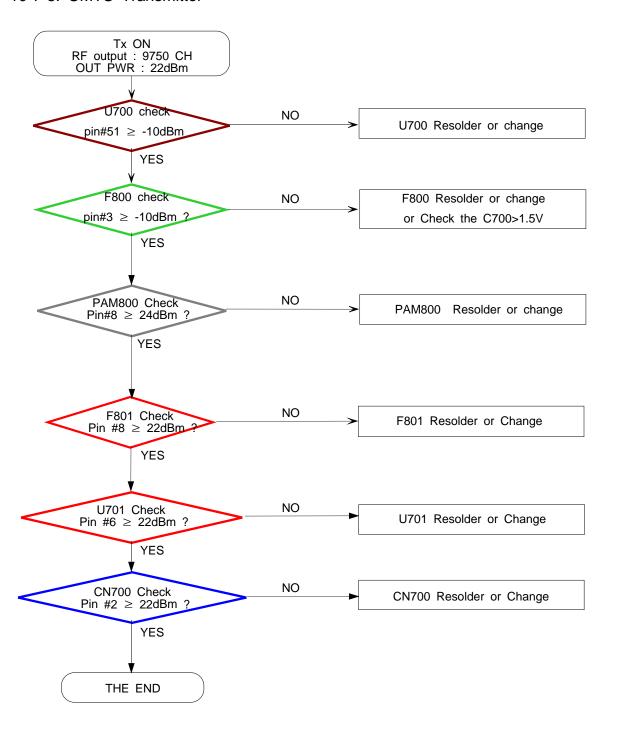


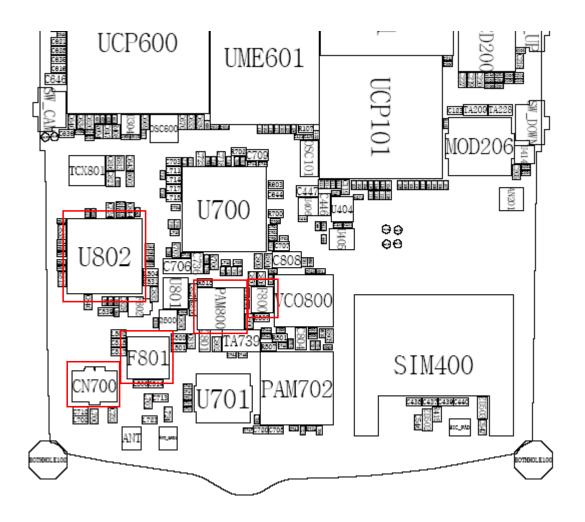


#### 10-7-7. UMTS Receiver



#### 10-7-8. UMTS Transmitter





### 4. Array course control

- Pre Built (For Zigbox Users)
- 1. Install the SAMSUNG Mobile USB Driver
  - 1.1 Unzip the Samsung Mobile USB Driver
  - 1.2 Execute "setup.exe" to install the SAMSUNG USB Driver
- 2. Install the PHONE Driver
  - 1.1 Unzip the Phone Driver
- 1.2 Execute "setup.exe" to install the PHONE Driver
- 3. Install the ACTIVESYNC 4.5
  - 1.1 Unzip the ActiveSync 4.5
  - 1.2 Execute "setup.exe" to install the ActiveSync 4.5
  - 1.3 Uncheck the Allow USB connections and press "OK"



- Physical Settings
- 1. Setting Physical Environment



1.1 Connect the USB cable to PC



1.2 Set the both JIG and PWR switch to OFF



## 1.3 Connect the Data Cable to Device



- Downloading the Image
- 1. Execute the WCEDownloader v1.1Single
  - 1.1 Unzip the WCEDownloader
  - 1.2 Execute WCEDownloader v1.1Single.exe to  $R\underline{\mu}\underline{n}_3$  Program



1.3 Download wave image from our FTP site.





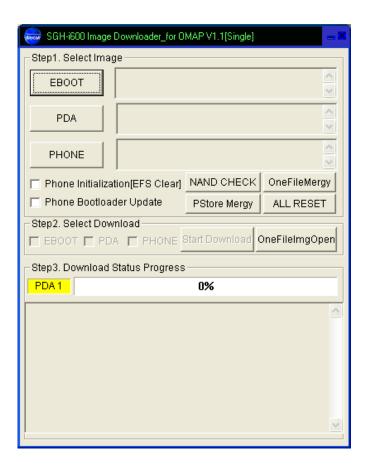


- I620V\_rev08\_eboot.nb0 : Eboot ROM Image

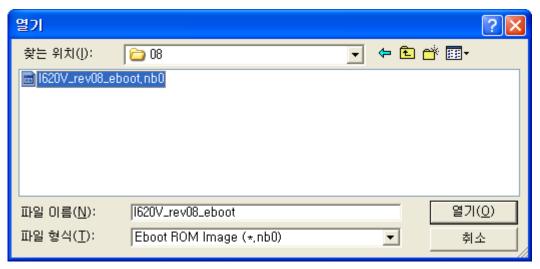
- ONENAND.bin : PDA ROM Image

- I620BUGD5\_CP\_yyyy-mm-dd.bin : Phone Binary

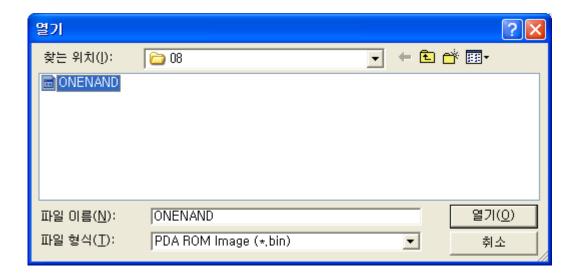
1.4 Load the Image File to Download



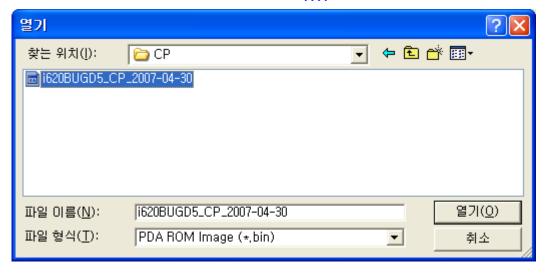
- Press "EBOOT" and Select I620V\_rev08\_eboot.nb0 to download



- Press "PDA" and Select ONENAND.bin to download



- Press "PHONE" and Select i620BUGD5\_CP\_yyyy-mm-dd.bin to download



1.5 Press the ENTER Button



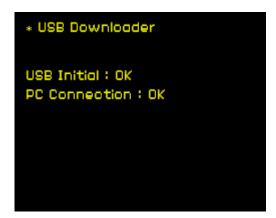
Press the ENTER Button.

While pressing the Enter button, set the both JIG and PWR switch to ON. Do not release the Enter button yet!!

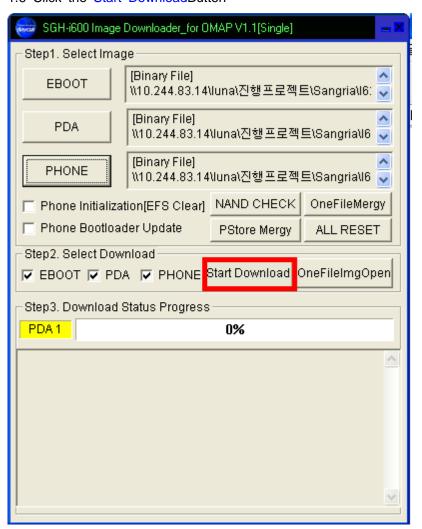


Do not release the Enter button yet!!

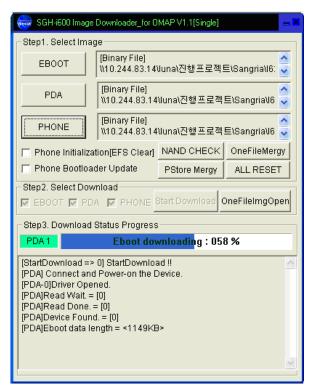
Following paragraph is seen in your device, then you can release the Enter button.  $\frac{4-7}{}$ 



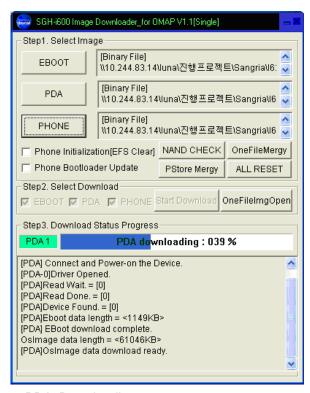
1.6 Click the Start DownloadButton



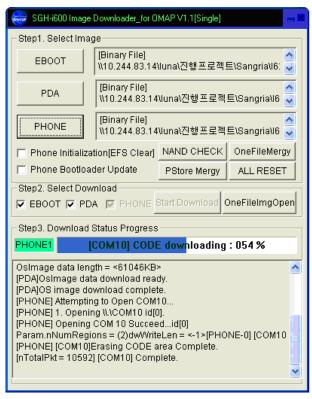
1.7 The download process starts sequentially



< Eboot Downloading >



< PDA Downloading >



< PHONE Downloading >

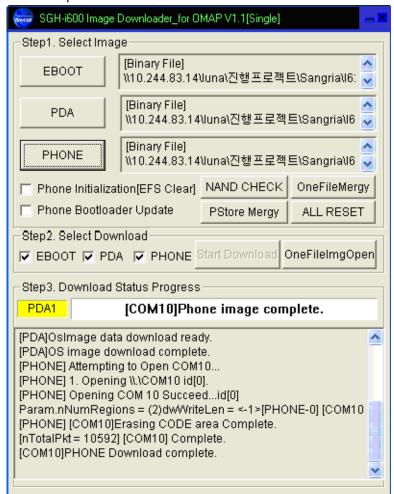
\* Sometimes you can see the following message when you are downloading the Phone Image. If you see the "Port open fail" message, you make a try to use another USB ports.

```
[PHONE] COM[10] Port open fail.id[0]
[PHONE] Attempting to Open COM8...
[PHONE] 1. Opening COM8: id[0].
[PHONE] Opening COM 8 Succeed...id[0]
Param.nNumRegions = (2)dwWriteLen = <-1>[PHONE-0] [COM8]\
[PHONE] [COM8]Erasing CODE area Complete.
[nTotalPkt = 10617] [COM8] Complete.
```

When the Eboot & PDA download process starts, you can see the following progress bar. But Phone download process starts, progress bar4 can't seen in your device.



#### 3. 7 Completed Download.



If the download finishes successfully, device resetting performs automatically.



Congratulations~! All processes are completed.

- Pre Built (For USB Cable Users)
- 1. Install the SAMSUNG Mobile USB Driver
  - 1.1 Unzip the Samsung Mobile USB Driver
  - 1.2 Execute "setup.exe" to install the SAMSUNG USB Driver
- 2. Install the PHONE Driver
  - 1.1 Unzip the Phone Driver
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- 3. Install the ACTIVESYNC 4.5
  - 1.1 Unzip the ActiveSync 4.5
  - 1.2 Execute "setup.exe" to install the ActiveSync 4.5
  - 1.3 Uncheck the Allow USB connections and press "OK"



- Physical Settings
- 1. Setting Physical Environment
  - 1.1 Connect the USB cable to PC



## 1.2 Connect the Data Cable to Device



- Downloading the Image
- 1. Execute the WCEDownloader v1.1Single
  - 1.1 Unzip the WCEDownloader
  - 1.2 Execute WCEDownloader v1.1Single.exe to Run Program



1.3 Download wave image from our FTP site.



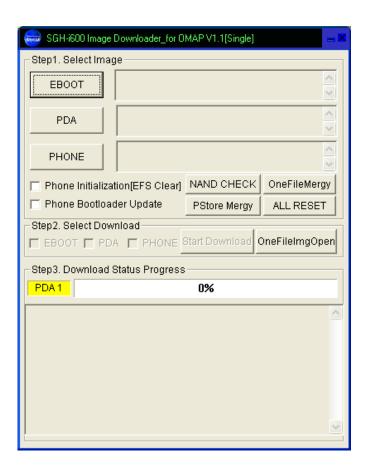




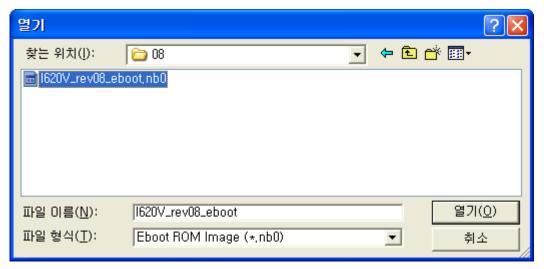
- I620V\_rev01\_eboot.nb0 : Eboot ROM Image

ONENAND.bin : PDA ROM ImageI620BUGC2\_CP.bin : Phone Binary

1.4 Load the Image File to Download



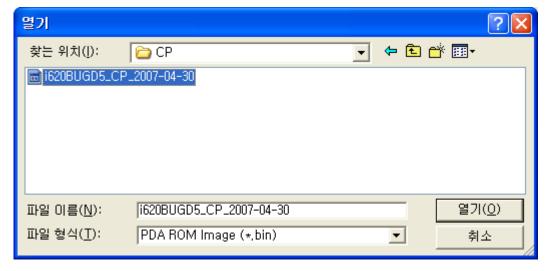
- Press "EBOOT" and Select I620V\_rev08\_eboot.nb0 to download



- Press "PDA" and Select ONENAND.bin to download



- Press "PHONE" and Select i620BUGD5\_CP\_yyyy-mm-dd.bin to download



#### 1.5 Press the ENTER Button



Press the ENTER Button.

While pressing the Enter button, press the POWER Button.

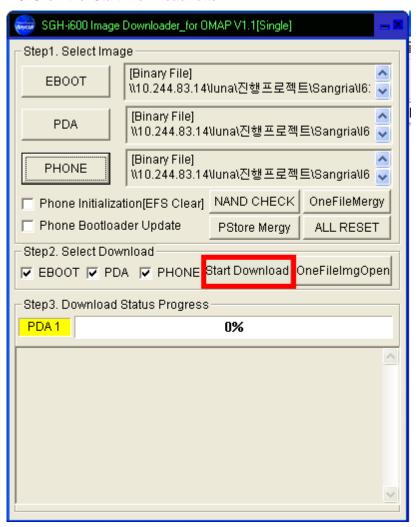


Do not release the Enter button yet!!

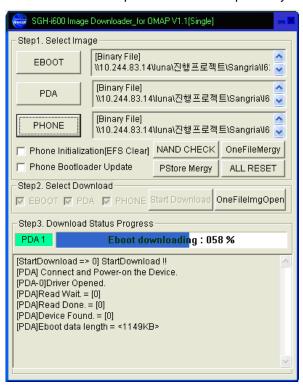
Following paragraph is seen in your device, then you can release the Enter button.



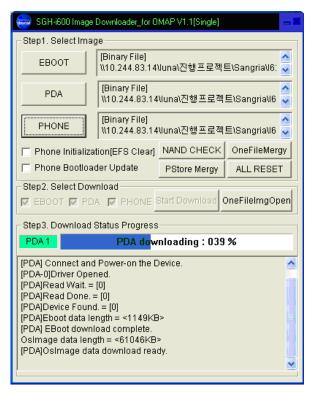
#### 1.6 Click the Start DownloadButton



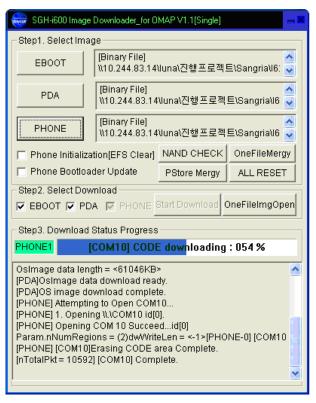
1.7 The download process starts sequentially



< Eboot Downloading >



< PDA Downloading >



< PHONE Downloading >

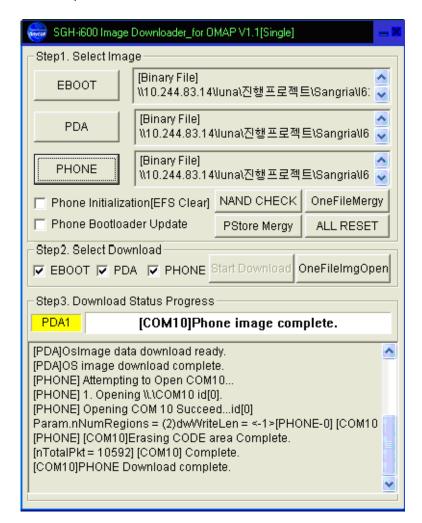
\* Sometimes you can see the following message when you are downloading the Phone Image. If you see the "Port open fail" message, you make a try to use another USB ports.

```
[PHONE] COM[10] Port open fail.id[0]
[PHONE] Attempting to Open COM8...
[PHONE] 1. Opening COM8: id[0].
[PHONE] Opening COM 8 Succeed...id[0]
Param.nNumRegions = (2)dwWriteLen = <-1>[PHONE-0] [COM8]\
[PHONE] [COM8]Erasing CODE area Complete.
[nTotalPkt = 10617] [COM8] Complete.
```

When the Eboot & PDA download process starts, you can see the following progress bar. But Phone download process starts, progress bar4-cân't seen in your device.



#### 3. 7Completed Download.

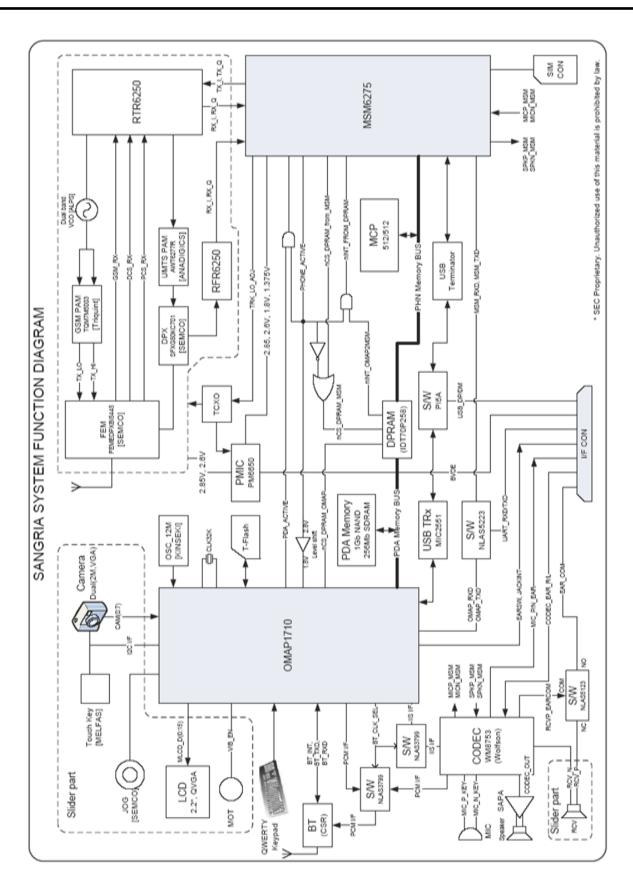


If the download finishes successfully, device resetting performs automatically.

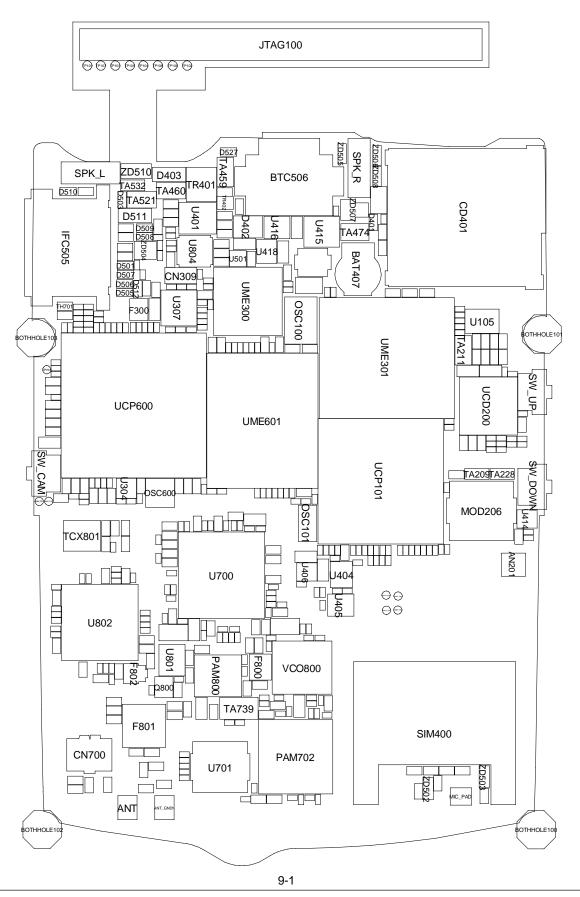


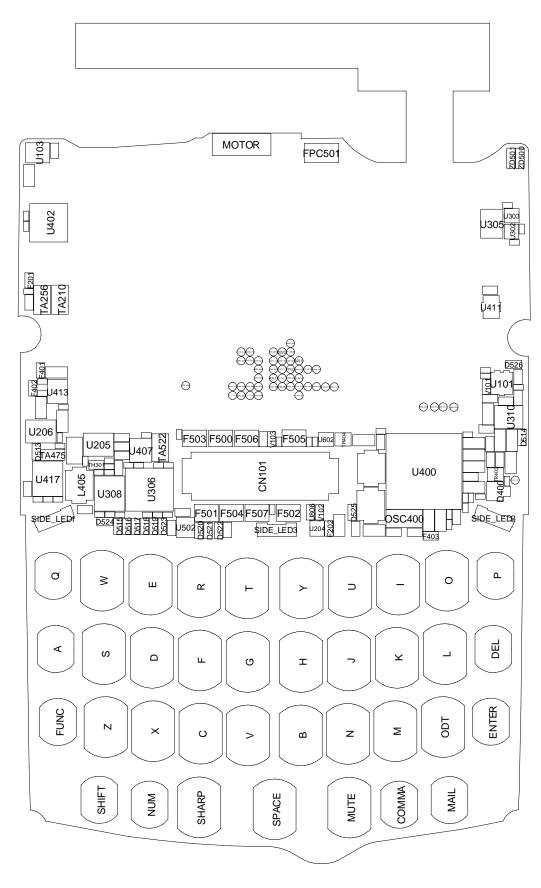
Congratulations~! All processes are completed.

# 8. Block Diagrams



# 9. PCB Diagrams





# 6. MAIN Electrical Parts List

| SEC CODE    | Design LOC | Discription     | STATUS |
|-------------|------------|-----------------|--------|
| 0401-001144 | D402       | DIODE-SWITCHING | SA     |
| 0403-001427 | ZD510      | DIODE-ZENER     | SA     |
| 0403-001547 | D403       | DIODE-ZENER     | SA     |
| 0403-001547 | D511       | DIODE-ZENER     | SA     |
| 0406-001167 | ZD504      | DIODE-TVS       | SA     |
| 0406-001201 | ZD502      | DIODE-TVS       | SA     |
| 0406-001201 | ZD503      | DIODE-TVS       | SA     |
| 0406-001210 | ZD500      | DIODE-TVS       | SA     |
| 0406-001210 | ZD501      | DIODE-TVS       | SA     |
| 0406-001210 | ZD505      | DIODE-TVS       | SA     |
| 0406-001210 | ZD506      | DIODE-TVS       | SA     |
| 0406-001210 | ZD508      | DIODE-TVS       | SA     |
| 0406-001231 | D401       | DIODE-TVS       | SA     |
| 0406-001231 | D501       | DIODE-TVS       | SA     |
| 0406-001231 | D503       | DIODE-TVS       | SA     |
| 0406-001231 | D505       | DIODE-TVS       | SA     |
| 0406-001231 | D506       | DIODE-TVS       | SA     |
| 0406-001231 | D507       | DIODE-TVS       | SA     |
| 0406-001231 | D508       | DIODE-TVS       | SA     |
| 0406-001231 | D509       | DIODE-TVS       | SA     |
| 0406-001231 | D510       | DIODE-TVS       | SA     |
| 0406-001231 | D512       | DIODE-TVS       | SA     |
| 0406-001231 | D513       | DIODE-TVS       | SA     |
| 0406-001231 | D514       | DIODE-TVS       | SA     |
| 0406-001231 | D515       | DIODE-TVS       | SA     |
| 0406-001231 | D516       | DIODE-TVS       | SA     |
| 0406-001231 | D517       | DIODE-TVS       | SA     |
| 0406-001231 | D518       | DIODE-TVS       | SA     |
| 0406-001231 | D519       | DIODE-TVS       | SA     |
| 0406-001231 | D520       | DIODE-TVS       | SA     |
| 0406-001231 | D521       | DIODE-TVS       | SA     |
| 0406-001231 | D522       | DIODE-TVS       | SA     |
| 0406-001231 | D523       | DIODE-TVS       | SA     |
| 0406-001231 | D524       | DIODE-TVS       | SA     |
| 0406-001231 | D525       | DIODE-TVS       | SA     |
| 0406-001231 | D526       | DIODE-TVS       | SA     |

| SEC CODE                   | Design LOC   | Discription                         | STATUS |
|----------------------------|--------------|-------------------------------------|--------|
| 0406-001231                | D527         | DIODE-TVS                           | SA     |
| 0407-000115                | ZD507        | DIODE-ARRAY                         | SA     |
| 0407-001002                | D400         | DIODE-ARRAY                         | SA     |
| 0504-001151                | Q800         | TR-DIGITAL                          | SA     |
| 0504-001171                | TR402        | TR-DIGITAL                          | SA     |
| 0504-001171                | TR403        | TR-DIGITAL                          | SA     |
| 0504-001171                | TR404        | TR-DIGITAL                          | SA     |
| 0505-001165                | TR401        | FET-SILICON                         | SA     |
| 0601-002268                | SIDE_LED1    | LED                                 | SA     |
| 0601-002268                | SIDE_LED2    | LED                                 | SA     |
| 0601-002268                | SIDE_LED3    | LED                                 | SA     |
| 0801-002321                | U306         | IC-CMOS LOGIC                       | SA     |
| 0801-002529                | U305         | IC-CMOS LOGIC                       | SA     |
| 0801-003016                | U302         | IC-CMOS LOGIC                       | SA     |
| 0801-003016                | U602         | IC-CMOS LOGIC                       | SA     |
| 0801-003022                | U303         | IC-CMOS LOGIC                       | SA     |
| 0801-003052                | U304         | IC-CMOS LOGIC                       | SA     |
| 0801-003136                | U501         | IC-CMOS LOGIC                       | SA     |
| 0904-002074                | UCP101       | IC-DSP                              | SA     |
| 1001-001351                | CN309        | IC-ANALOG MULTIPLEX                 | SA     |
| 1001-001394                | U204         | IC-ANALOG SWITCH                    | SA     |
| 1001-001405                | U205         | IC-ANALOG MULTIPLEX                 | SA     |
| 1001-001405                | U206         | IC-ANALOG MULTIPLEX                 | SA     |
| 1001-001410                | U411         | IC-ANALOG SWITCH                    | SA     |
| 1002-001488                | U308         | IC-D/A CONVERTER                    | SA     |
| 1003-001984                | U402         | IC-LEVEL DRIVER                     | SA     |
| 1009-001023                | U101         | IC-HALL EFFECT S/W                  | SA     |
| 1106-001511                | UME300       | IC-SRAM                             | SA     |
| 1108-000043                | UME301       | IC-MCP                              | SA     |
| 1108-000088                | UME601       | IC-MCP                              | SA     |
| 1201-002232                | U105         | IC-AUDIO AMP                        | SA     |
| 1201-002288                | PAM702       | IC-POWER AMP                        | SA     |
| 1201-002347                | PAM800       | IC-POWER AMP                        | SA     |
|                            |              |                                     | 1 0.   |
| 1203-002716                | U416         | IC-VOL. DETECTOR                    | SA     |
| 1203-002716<br>1203-003531 | U416<br>U103 | IC-VOL. DETECTOR IC-POSI.FIXED REG. | SA     |

| SEC CODE    | Design LOC | Discription         | STATUS |
|-------------|------------|---------------------|--------|
| 1203-003688 | U414       | IC-POSI.FIXED REG.  | SA     |
| 1203-003737 | U502       | IC-POSI.FIXED REG.  | SA     |
| 1203-003787 | U406       | IC-POSI.FIXED REG.  | SA     |
| 1203-003823 | U401       | IC-BATTERY          | SA     |
| 1203-003919 | U417       | IC-DC/DC CONVERTER  | SA     |
| 1203-003924 | U405       | IC-VOL. DETECTOR    | SA     |
| 1203-004102 | U400       | IC-POWER SUPERVISOR | SA     |
| 1203-004120 | U413       | IC-MULTI REG.       | SA     |
| 1203-004120 | U418       | IC-MULTI REG.       | SA     |
| 1203-004142 | U404       | IC-RESET            | SA     |
| 1203-004458 | U407       | IC-POSI.FIXED REG.  | SA     |
| 1205-002272 | U307       | IC-TRANSCEIVER      | SA     |
| 1205-002645 | U700       | IC-TRANSCEIVER      | SA     |
| 1205-002719 | UCD200     | IC-CODEC            | SA     |
| 1205-002781 | U802       | IC-RECEIVER         | SA     |
| 1205-002784 | U310       | IC-SWITCH           | SA     |
| 1205-002874 | U804       | IC-SWITCH           | SA     |
| 1205-003243 | UCP600     | IC-MODEM            | SA     |
| 1209-001577 | U801       | IC-DETECTOR         | SA     |
| 1404-001221 | TH301      | THERMISTOR-NTC      | SA     |
| 1404-001221 | TH701      | THERMISTOR-NTC      | SA     |
| 1405-001082 | U806       | VARISTOR            | SA     |
| 1405-001082 | V101       | VARISTOR            | SA     |
| 1405-001082 | V102       | VARISTOR            | SA     |
| 1405-001082 | V103       | VARISTOR            | SA     |
| 2007-000137 | R602       | R-CHIP              | SA     |
| 2007-000140 | R603       | R-CHIP              | SA     |
| 2007-000141 | R511       | R-CHIP              | SA     |
| 2007-000141 | R512       | R-CHIP              | SA     |
| 2007-000145 | R702       | R-CHIP              | SA     |
| 2007-000157 | R403       | R-CHIP              | SA     |
| 2007-000162 | R518       | R-CHIP              | SA     |
| 2007-000166 | R513       | R-CHIP              | SA     |
| 2007-000167 | R107       | R-CHIP              | SA     |
| 2007-000170 | R424       | R-CHIP              | SA     |
| 2007-000171 | L802       | R-CHIP              | SA     |

| SEC CODE    | Design LOC | Discription | STATUS |
|-------------|------------|-------------|--------|
| 2007-000172 | R803       | R-CHIP      | SA     |
| 2007-000831 | R211       | R-CHIP      | SA     |
| 2007-000831 | R212       | R-CHIP      | SA     |
| 2007-000831 | R214       | R-CHIP      | SA     |
| 2007-000831 | R216       | R-CHIP      | SA     |
| 2007-001119 | R413       | R-CHIP      | SA     |
| 2007-001284 | R801       | R-CHIP      | SA     |
| 2007-001292 | R804       | R-CHIP      | SA     |
| 2007-001298 | R408       | R-CHIP      | SA     |
| 2007-001298 | R604       | R-CHIP      | SA     |
| 2007-001313 | R807       | R-CHIP      | SA     |
| 2007-003010 | R508       | R-CHIP      | SA     |
| 2007-003010 | R509       | R-CHIP      | SA     |
| 2007-007013 | R415       | R-CHIP      | SA     |
| 2007-007107 | R600       | R-CHIP      | SA     |
| 2007-007107 | R601       | R-CHIP      | SA     |
| 2007-007137 | R510       | R-CHIP      | SA     |
| 2007-007142 | R401       | R-CHIP      | SA     |
| 2007-007306 | R813       | R-CHIP      | SA     |
| 2007-007306 | R818       | R-CHIP      | SA     |
| 2007-007316 | R411       | R-CHIP      | SA     |
| 2007-007316 | R612       | R-CHIP      | SA     |
| 2007-007318 | R700       | R-CHIP      | SA     |
| 2007-007318 | R816       | R-CHIP      | SA     |
| 2007-007468 | R409       | R-CHIP      | SA     |
| 2007-007491 | R706       | R-CHIP      | SA     |
| 2007-007491 | R815       | R-CHIP      | SA     |
| 2007-007698 | R405       | R-CHIP      | SA     |
| 2007-007741 | R220       | R-CHIP      | SA     |
| 2007-007741 | R221       | R-CHIP      | SA     |
| 2007-007741 | R222       | R-CHIP      | SA     |
| 2007-007741 | R223       | R-CHIP      | SA     |
| 2007-007741 | R322       | R-CHIP      | SA     |
| 2007-007741 | R616       | R-CHIP      | SA     |
| 2007-007741 | R617       | R-CHIP      | SA     |
| 2007-007798 | R501       | R-CHIP      | SA     |

| SEC CODE    | Design LOC | Discription | STATUS |
|-------------|------------|-------------|--------|
| 2007-007798 | R503       | R-CHIP      | SA     |
| 2007-008045 | R122       | R-CHIP      | SA     |
| 2007-008045 | R703       | R-CHIP      | SA     |
| 2007-008045 | R802       | R-CHIP      | SA     |
| 2007-008045 | R805       | R-CHIP      | SA     |
| 2007-008045 | R811       | R-CHIP      | SA     |
| 2007-008045 | R814       | R-CHIP      | SA     |
| 2007-008051 | R701       | R-CHIP      | SA     |
| 2007-008052 | R112       | R-CHIP      | SA     |
| 2007-008052 | R113       | R-CHIP      | SA     |
| 2007-008052 | R114       | R-CHIP      | SA     |
| 2007-008052 | R115       | R-CHIP      | SA     |
| 2007-008052 | R708       | R-CHIP      | SA     |
| 2007-008055 | R101       | R-CHIP      | SA     |
| 2007-008055 | R108       | R-CHIP      | SA     |
| 2007-008055 | R110       | R-CHIP      | SA     |
| 2007-008055 | R111       | R-CHIP      | SA     |
| 2007-008055 | R119       | R-CHIP      | SA     |
| 2007-008055 | R120       | R-CHIP      | SA     |
| 2007-008055 | R300       | R-CHIP      | SA     |
| 2007-008055 | R301       | R-CHIP      | SA     |
| 2007-008055 | R302       | R-CHIP      | SA     |
| 2007-008055 | R303       | R-CHIP      | SA     |
| 2007-008055 | R305       | R-CHIP      | SA     |
| 2007-008055 | R306       | R-CHIP      | SA     |
| 2007-008055 | R307       | R-CHIP      | SA     |
| 2007-008055 | R310       | R-CHIP      | SA     |
| 2007-008055 | R315       | R-CHIP      | SA     |
| 2007-008055 | R316       | R-CHIP      | SA     |
| 2007-008055 | R318       | R-CHIP      | SA     |
| 2007-008055 | R406       | R-CHIP      | SA     |
| 2007-008055 | R407       | R-CHIP      | SA     |
| 2007-008055 | R414       | R-CHIP      | SA     |
| 2007-008055 | R418       | R-CHIP      | SA     |
| 2007-008055 | R420       | R-CHIP      | SA     |
| 2007-008055 | R506       | R-CHIP      | SA     |

| SEC CODE    | Design LOC | Discription | STATUS |
|-------------|------------|-------------|--------|
| 2007-008055 | R614       | R-CHIP      | SA     |
| 2007-008055 | R620       | R-CHIP      | SA     |
| 2007-008055 | U805       | R-CHIP      | SA     |
| 2007-008135 | R430       | R-CHIP      | SA     |
| 2007-008213 | R707       | R-CHIP      | SA     |
| 2007-008478 | R202       | R-CHIP      | SA     |
| 2007-008478 | R203       | R-CHIP      | SA     |
| 2007-008478 | R207       | R-CHIP      | SA     |
| 2007-008478 | R208       | R-CHIP      | SA     |
| 2007-008483 | R205       | R-CHIP      | SA     |
| 2007-008483 | R426       | R-CHIP      | SA     |
| 2007-008483 | R428       | R-CHIP      | SA     |
| 2007-008486 | R217       | R-CHIP      | SA     |
| 2007-008486 | R421       | R-CHIP      | SA     |
| 2007-008486 | R431       | R-CHIP      | SA     |
| 2007-008516 | R104       | R-CHIP      | SA     |
| 2007-008516 | R118       | R-CHIP      | SA     |
| 2007-008516 | R201       | R-CHIP      | SA     |
| 2007-008516 | R304       | R-CHIP      | SA     |
| 2007-008516 | R320       | R-CHIP      | SA     |
| 2007-008516 | R419       | R-CHIP      | SA     |
| 2007-008516 | R423       | R-CHIP      | SA     |
| 2007-008516 | R425       | R-CHIP      | SA     |
| 2007-008516 | R605       | R-CHIP      | SA     |
| 2007-008516 | R606       | R-CHIP      | SA     |
| 2007-008516 | R607       | R-CHIP      | SA     |
| 2007-008516 | R608       | R-CHIP      | SA     |
| 2007-008516 | R609       | R-CHIP      | SA     |
| 2007-008516 | R610       | R-CHIP      | SA     |
| 2007-008516 | R611       | R-CHIP      | SA     |
| 2007-008531 | R105       | R-CHIP      | SA     |
| 2007-008531 | R502       | R-CHIP      | SA     |
| 2007-008531 | R705       | R-CHIP      | SA     |
| 2007-008531 | R817       | R-CHIP      | SA     |
| 2007-008531 | R819       | R-CHIP      | SA     |
| 2007-008542 | C721       | R-CHIP      | SA     |

| SEC CODE    | Design LOC | Discription | STATUS |
|-------------|------------|-------------|--------|
| 2007-008542 | R520       | R-CHIP      | SA     |
| 2007-008544 | R200       | R-CHIP      | SA     |
| 2007-008544 | R206       | R-CHIP      | SA     |
| 2007-008579 | R809       | R-CHIP      | SA     |
| 2007-008579 | R810       | R-CHIP      | SA     |
| 2007-008581 | R806       | R-CHIP      | SNA    |
| 2007-008588 | R102       | R-CHIP      | SA     |
| 2007-008588 | R103       | R-CHIP      | SA     |
| 2007-008588 | R709       | R-CHIP      | SA     |
| 2007-008616 | R412       | R-CHIP      | SA     |
| 2007-008806 | R812       | R-CHIP      | SA     |
| 2007-009108 | R317       | R-CHIP      | SA     |
| 2007-009111 | R308       | R-CHIP      | SA     |
| 2007-009111 | R311       | R-CHIP      | SA     |
| 2007-009115 | R312       | R-CHIP      | SA     |
| 2007-009115 | R313       | R-CHIP      | SA     |
| 2007-009155 | R404       | R-CHIP      | SNA    |
| 2007-009155 | R422       | R-CHIP      | SNA    |
| 2007-009155 | R822       | R-CHIP      | SNA    |
| 2007-009170 | R507       | R-CHIP      | SA     |
| 2007-009170 | R615       | R-CHIP      | SA     |
| 2007-009170 | R618       | R-CHIP      | SA     |
| 2007-009170 | R823       | R-CHIP      | SA     |
| 2007-009402 | R309       | R-CHIP      | SA     |
| 2007-009402 | R321       | R-CHIP      | SA     |
| 2203-000233 | C408       | C-CER,CHIP  | SA     |
| 2203-000233 | C437       | C-CER,CHIP  | SA     |
| 2203-000233 | C546       | C-CER,CHIP  | SA     |
| 2203-000233 | C547       | C-CER,CHIP  | SA     |
| 2203-000233 | C827       | C-CER,CHIP  | SA     |
| 2203-000254 | C644       | C-CER,CHIP  | SA     |
| 2203-000254 | C802       | C-CER,CHIP  | SA     |
| 2203-000254 | C816       | C-CER,CHIP  | SA     |
| 2203-000425 | C405       | C-CER,CHIP  | SA     |
| 2203-000425 | C409       | C-CER,CHIP  | SA     |
| 2203-000489 | C639       | C-CER,CHIP  | SA     |

| 2203-000550         C123         C-CER,CHIP         SA           2203-000550         C126         C-CER,CHIP         SA           2203-000550         C127         C-CER,CHIP         SA           2203-000627         C669         C-CER,CHIP         SNA           2203-000627         C670         C-CER,CHIP         SNA           2203-000679         C438         C-CER,CHIP         SA           2203-000812         C707         C-CER,CHIP         SA           2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-00095         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002668   | SEC CODE    | Design LOC | Discription | STATUS |
|---|-------------|------------|-------------|--------|
| 2203-000550         C127         C-CER,CHIP         SA           2203-000627         C669         C-CER,CHIP         SNA           2203-000627         C670         C-CER,CHIP         SNA           2203-000679         C438         C-CER,CHIP         SA           2203-000812         C707         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-00243         C809         C-CER,CHIP         SA           2203-00243         C809         C-CER,CHIP         SA           2203-005053  | 2203-000550 | C123       | C-CER,CHIP  | SA     |
| 2203-000627         C669         C-CER,CHIP         SNA           2203-000627         C670         C-CER,CHIP         SNA           2203-000679         C438         C-CER,CHIP         SA           2203-000812         C707         C-CER,CHIP         SA           2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000892         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-005053 <td>2203-000550</td> <td>C126</td> <td>C-CER,CHIP</td> <td>SA</td> | 2203-000550 | C126       | C-CER,CHIP  | SA     |
| 2203-000627         C670         C-CER,CHIP         SNA           2203-000679         C438         C-CER,CHIP         SA           2203-000812         C707         C-CER,CHIP         SA           2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-00095         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-00101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C632         C-CER,CHIP         SA           2203-001243         C809         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053   | 2203-000550 | C127       | C-CER,CHIP  | SA     |
| 2203-000679         C438         C-CER,CHIP         SA           2203-000812         C707         C-CER,CHIP         SA           2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005390  | 2203-000627 | C669       | C-CER,CHIP  | SNA    |
| 2203-000812         C707         C-CER,CHIP         SA           2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005390  | 2203-000627 | C670       | C-CER,CHIP  | SNA    |
| 2203-000812         C713         C-CER,CHIP         SA           2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005450  | 2203-000679 | C438       | C-CER,CHIP  | SA     |
| 2203-000812         C814         C-CER,CHIP         SA           2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-000996         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005480  | 2203-000812 | C707       | C-CER,CHIP  | SA     |
| 2203-000812         C817         C-CER,CHIP         SA           2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C820         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005480  | 2203-000812 | C713       | C-CER,CHIP  | SA     |
| 2203-000995         C647         C-CER,CHIP         SA           2203-000995         C734         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005990         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482  | 2203-000812 | C814       | C-CER,CHIP  | SA     |
| 2203-000995         C734         C-CER,CHIP         SA           2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005571  | 2203-000812 | C817       | C-CER,CHIP  | SA     |
| 2203-000995         C806         C-CER,CHIP         SA           2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571  | 2203-000995 | C647       | C-CER,CHIP  | SA     |
| 2203-001101         C240         C-CER,CHIP         SA           2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571  | 2203-000995 | C734       | C-CER,CHIP  | SA     |
| 2203-001101         C241         C-CER,CHIP         SA           2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571  | 2203-000995 | C806       | C-CER,CHIP  | SA     |
| 2203-001101         C261         C-CER,CHIP         SA           2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682  | 2203-001101 | C240       | C-CER,CHIP  | SA     |
| 2203-001101         C264         C-CER,CHIP         SA           2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-001101 | C241       | C-CER,CHIP  | SA     |
| 2203-001259         C832         C-CER,CHIP         SA           2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-001101 | C261       | C-CER,CHIP  | SA     |
| 2203-002443         C809         C-CER,CHIP         SA           2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-001101 | C264       | C-CER,CHIP  | SA     |
| 2203-002668         C712         C-CER,CHIP         SA           2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-001259 | C832       | C-CER,CHIP  | SA     |
| 2203-002709         C840         C-CER,CHIP         SA           2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-002443 | C809       | C-CER,CHIP  | SA     |
| 2203-005053         C724         C-CER,CHIP         SA           2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-002668 | C712       | C-CER,CHIP  | SA     |
| 2203-005053         C828         C-CER,CHIP         SA           2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-002709 | C840       | C-CER,CHIP  | SA     |
| 2203-005053         C839         C-CER,CHIP         SA           2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005053 | C724       | C-CER,CHIP  | SA     |
| 2203-005390         C820         C-CER,CHIP         SA           2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-005053 | C828       | C-CER,CHIP  | SA     |
| 2203-005395         C807         C-CER,CHIP         SA           2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005053 | C839       | C-CER,CHIP  | SA     |
| 2203-005450         C720         C-CER,CHIP         SA           2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-005390 | C820       | C-CER,CHIP  | SA     |
| 2203-005480         C643         C-CER,CHIP         SA           2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005395 | C807       | C-CER,CHIP  | SA     |
| 2203-005482         C254         C-CER,CHIP         SA           2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-005450 | C720       | C-CER,CHIP  | SA     |
| 2203-005482         C533         C-CER,CHIP         SA           2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005480 | C643       | C-CER,CHIP  | SA     |
| 2203-005571         C401         C-CER,CHIP         SA           2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-005482 | C254       | C-CER,CHIP  | SA     |
| 2203-005571         C412         C-CER,CHIP         SA           2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005482 | C533       | C-CER,CHIP  | SA     |
| 2203-005571         C431         C-CER,CHIP         SA           2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA  | 2203-005571 | C401       | C-CER,CHIP  | SA     |
| 2203-005682         C252         C-CER,CHIP         SA           2203-005682         C716         C-CER,CHIP         SA   | 2203-005571 | C412       | C-CER,CHIP  | SA     |
| 2203-005682 C716 C-CER,CHIP SA  | 2203-005571 | C431       | C-CER,CHIP  | SA     |
| ·   | 2203-005682 | C252       | C-CER,CHIP  | SA     |
| 2203-005682 C719 C-CER,CHIP SA  | 2203-005682 | C716       | C-CER,CHIP  | SA     |
|   | 2203-005682 | C719       | C-CER,CHIP  | SA     |

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|-------------|------------|-------------|--------|
| 2203-005682 | C722       | C-CER,CHIP  | SA     |
| 2203-005682 | C726       | C-CER,CHIP  | SA     |
| 2203-005682 | C728       | C-CER,CHIP  | SA     |
| 2203-005682 | C730       | C-CER,CHIP  | SA     |
| 2203-005682 | C742       | C-CER,CHIP  | SA     |
| 2203-005682 | C813       | C-CER,CHIP  | SA     |
| 2203-005682 | C851       | C-CER,CHIP  | SA     |
| 2203-005682 | C852       | C-CER,CHIP  | SA     |
| 2203-005682 | L705       | C-CER,CHIP  | SA     |
| 2203-005683 | C465       | C-CER,CHIP  | SA     |
| 2203-005683 | C467       | C-CER,CHIP  | SA     |
| 2203-005683 | C541       | C-CER,CHIP  | SA     |
| 2203-005683 | C544       | C-CER,CHIP  | SA     |
| 2203-005717 | C131       | C-CER,CHIP  | SA     |
| 2203-005725 | C476       | C-CER,CHIP  | SA     |
| 2203-005729 | C812       | C-CER,CHIP  | SA     |
| 2203-005729 | C815       | C-CER,CHIP  | SA     |
| 2203-005731 | C121       | C-CER,CHIP  | SA     |
| 2203-005731 | C122       | C-CER,CHIP  | SA     |
| 2203-005732 | C743       | C-CER,CHIP  | SA     |
| 2203-005736 | C410       | C-CER,CHIP  | SA     |
| 2203-005736 | C803       | C-CER,CHIP  | SA     |
| 2203-005736 | C811       | C-CER,CHIP  | SA     |
| 2203-005736 | C823       | C-CER,CHIP  | SA     |
| 2203-005736 | C834       | C-CER,CHIP  | SA     |
| 2203-005736 | C835       | C-CER,CHIP  | SA     |
| 2203-005736 | C841       | C-CER,CHIP  | SA     |
| 2203-005736 | C843       | C-CER,CHIP  | SA     |
| 2203-005777 | L708       | C-CER,CHIP  | SA     |
| 2203-005779 | C514       | C-CER,CHIP  | SA     |
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| 2203-005779 | C517       | C-CER,CHIP  | SA     |
| 2203-005789 | L713       | C-CER,CHIP  | SA     |
| 2203-005806 | C116       | C-CER,CHIP  | SNA    |
| 2203-005806 | C655       | C-CER,CHIP  | SNA    |

| SEC CODE    | Design LOC | Discription | STATUS |
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| 2203-005806 | C715       | C-CER,CHIP  | SNA    |
| 2203-005806 | C727       | C-CER,CHIP  | SNA    |
| 2203-005806 | C822       | C-CER,CHIP  | SNA    |
| 2203-005806 | C829       | C-CER,CHIP  | SNA    |
| 2203-005808 | C705       | C-CER,CHIP  | SA     |
| 2203-005808 | C714       | C-CER,CHIP  | SA     |
| 2203-005808 | C826       | C-CER,CHIP  | SA     |
| 2203-006048 | C432       | C-CER,CHIP  | SA     |
| 2203-006194 | C102       | C-CER,CHIP  | SA     |
| 2203-006194 | C103       | C-CER,CHIP  | SA     |
| 2203-006194 | C306       | C-CER,CHIP  | SA     |
| 2203-006194 | C443       | C-CER,CHIP  | SA     |
| 2203-006194 | C602       | C-CER,CHIP  | SA     |
| 2203-006194 | C605       | C-CER,CHIP  | SA     |
| 2203-006194 | C610       | C-CER,CHIP  | SA     |
| 2203-006194 | C617       | C-CER,CHIP  | SA     |
| 2203-006194 | C618       | C-CER,CHIP  | SA     |
| 2203-006194 | C630       | C-CER,CHIP  | SA     |
| 2203-006194 | C631       | C-CER,CHIP  | SA     |
| 2203-006194 | C632       | C-CER,CHIP  | SA     |
| 2203-006194 | C637       | C-CER,CHIP  | SA     |
| 2203-006194 | C653       | C-CER,CHIP  | SA     |
| 2203-006194 | C658       | C-CER,CHIP  | SA     |
| 2203-006194 | C710       | C-CER,CHIP  | SA     |
| 2203-006194 | C729       | C-CER,CHIP  | SA     |
| 2203-006194 | C737       | C-CER,CHIP  | SA     |
| 2203-006194 | C738       | C-CER,CHIP  | SA     |
| 2203-006194 | C824       | C-CER,CHIP  | SA     |
| 2203-006257 | C501       | C-CER,CHIP  | SA     |
| 2203-006260 | C439       | C-CER,CHIP  | SA     |
| 2203-006260 | C440       | C-CER,CHIP  | SA     |
| 2203-006305 | C125       | C-CER,CHIP  | SA     |
| 2203-006305 | C481       | C-CER,CHIP  | SA     |
| 2203-006305 | C740       | C-CER,CHIP  | SA     |
| 2203-006305 | C741       | C-CER,CHIP  | SA     |

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| 2203-006324 | C413       | C-CER,CHIP  | SA     |
| 2203-006324 | C421       | C-CER,CHIP  | SA     |
| 2203-006324 | C422       | C-CER,CHIP  | SA     |
| 2203-006324 | C434       | C-CER,CHIP  | SA     |
| 2203-006324 | C801       | C-CER,CHIP  | SA     |
| 2203-006324 | C804       | C-CER,CHIP  | SA     |
| 2203-006379 | C700       | C-CER,CHIP  | SA     |
| 2203-006423 | C101       | C-CER,CHIP  | SA     |
| 2203-006423 | C104       | C-CER,CHIP  | SA     |
| 2203-006423 | C105       | C-CER,CHIP  | SA     |
| 2203-006423 | C106       | C-CER,CHIP  | SA     |
| 2203-006423 | C107       | C-CER,CHIP  | SA     |
| 2203-006423 | C108       | C-CER,CHIP  | SA     |
| 2203-006423 | C109       | C-CER,CHIP  | SA     |
| 2203-006423 | C110       | C-CER,CHIP  | SA     |
| 2203-006423 | C111       | C-CER,CHIP  | SA     |
| 2203-006423 | C112       | C-CER,CHIP  | SA     |
| 2203-006423 | C114       | C-CER,CHIP  | SA     |
| 2203-006423 | C115       | C-CER,CHIP  | SA     |
| 2203-006423 | C117       | C-CER,CHIP  | SA     |
| 2203-006423 | C118       | C-CER,CHIP  | SA     |
| 2203-006423 | C124       | C-CER,CHIP  | SA     |
| 2203-006423 | C128       | C-CER,CHIP  | SA     |
| 2203-006423 | C129       | C-CER,CHIP  | SA     |
| 2203-006423 | C130       | C-CER,CHIP  | SA     |
| 2203-006423 | C203       | C-CER,CHIP  | SA     |
| 2203-006423 | C204       | C-CER,CHIP  | SA     |
| 2203-006423 | C212       | C-CER,CHIP  | SA     |
| 2203-006423 | C213       | C-CER,CHIP  | SA     |
| 2203-006423 | C215       | C-CER,CHIP  | SA     |
| 2203-006423 | C224       | C-CER,CHIP  | SA     |
| 2203-006423 | C231       | C-CER,CHIP  | SA     |
| 2203-006423 | C234       | C-CER,CHIP  | SA     |
| 2203-006423 | C235       | C-CER,CHIP  | SA     |
| 2203-006423 | C303       | C-CER,CHIP  | SA     |

| 2203-006423         C308         C-CER,CHIP           2203-006423         C310         C-CER,CHIP           2203-006423         C311         C-CER,CHIP           2203-006423         C313         C-CER,CHIP           2203-006423         C317         C-CER,CHIP           2203-006423         C318         C-CER,CHIP           2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP           2203-006423         C435         C-CER,CHIP | SA<br>SA<br>SA<br>SA |
|---|----------------------|
| 2203-006423         C311         C-CER,CHIP           2203-006423         C313         C-CER,CHIP           2203-006423         C317         C-CER,CHIP           2203-006423         C318         C-CER,CHIP           2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP   | SA<br>SA             |
| 2203-006423         C313         C-CER,CHIP           2203-006423         C317         C-CER,CHIP           2203-006423         C318         C-CER,CHIP           2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   | SA                   |
| 2203-006423         C317         C-CER,CHIP           2203-006423         C318         C-CER,CHIP           2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   |                      |
| 2203-006423         C318         C-CER,CHIP           2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   | SA                   |
| 2203-006423         C320         C-CER,CHIP           2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   |                      |
| 2203-006423         C321         C-CER,CHIP           2203-006423         C323         C-CER,CHIP           2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   | SA                   |
| 2203-006423       C323       C-CER,CHIP         2203-006423       C324       C-CER,CHIP         2203-006423       C325       C-CER,CHIP         2203-006423       C406       C-CER,CHIP         2203-006423       C411       C-CER,CHIP         2203-006423       C430       C-CER,CHIP         2203-006423       C433       C-CER,CHIP   | SA                   |
| 2203-006423         C324         C-CER,CHIP           2203-006423         C325         C-CER,CHIP           2203-006423         C406         C-CER,CHIP           2203-006423         C411         C-CER,CHIP           2203-006423         C430         C-CER,CHIP           2203-006423         C433         C-CER,CHIP   | SA                   |
| 2203-006423       C325       C-CER,CHIP         2203-006423       C406       C-CER,CHIP         2203-006423       C411       C-CER,CHIP         2203-006423       C430       C-CER,CHIP         2203-006423       C433       C-CER,CHIP   | SA                   |
| 2203-006423       C406       C-CER,CHIP         2203-006423       C411       C-CER,CHIP         2203-006423       C430       C-CER,CHIP         2203-006423       C433       C-CER,CHIP   | SA                   |
| 2203-006423       C411       C-CER,CHIP         2203-006423       C430       C-CER,CHIP         2203-006423       C433       C-CER,CHIP   | SA                   |
| 2203-006423 C430 C-CER,CHIP<br>2203-006423 C433 C-CER,CHIP  | SA                   |
| 2203-006423 C433 C-CER,CHIP   | SA                   |
| , , , , , , , , , , , , , , , , , , ,   | SA                   |
| 2203-006423 C435 C-CER,CHIP   | SA                   |
|   | SA                   |
| 2203-006423 C436 C-CER,CHIP   | SA                   |
| 2203-006423 C444 C-CER,CHIP   | SA                   |
| 2203-006423 C450 C-CER,CHIP   | SA                   |
| 2203-006423 C600 C-CER,CHIP   | SA                   |
| 2203-006423 C601 C-CER,CHIP   | SA                   |
| 2203-006423 C603 C-CER,CHIP   | SA                   |
| 2203-006423 C606 C-CER,CHIP   | SA                   |
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| 2203-006423 C613 C-CER,CHIP   | SA                   |
| 2203-006423 C615 C-CER,CHIP   | SA                   |
| 2203-006423 C622 C-CER,CHIP   | SA                   |
| 2203-006423 C623 C-CER,CHIP   | SA                   |
| 2203-006423 C624 C-CER,CHIP   | SA                   |
| 2203-006423 C625 C-CER,CHIP   | SA                   |
| 2203-006423 C645 C-CER,CHIP   | SA                   |
| 2203-006423 C648 C-CER,CHIP   | SA                   |
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| 2203-006423 C650 C-CER,CHIP   | SA                   |
| 2203-006423 C659 C-CER,CHIP   | SA<br>SA             |

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|-------------|------------|-------------|--------|
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| 2203-006423 | C663       | C-CER,CHIP  | SA     |
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| 2203-006423 | C702       | C-CER,CHIP  | SA     |
| 2203-006423 | C704       | C-CER,CHIP  | SA     |
| 2203-006423 | C745       | C-CER,CHIP  | SA     |
| 2203-006423 | C805       | C-CER,CHIP  | SA     |
| 2203-006423 | C836       | C-CER,CHIP  | SA     |
| 2203-006423 | C837       | C-CER,CHIP  | SA     |
| 2203-006423 | C838       | C-CER,CHIP  | SA     |
| 2203-006423 | C853       | C-CER,CHIP  | SA     |
| 2203-006426 | C845       | C-CER,CHIP  | SNA    |
| 2203-006556 | C731       | C-CER,CHIP  | SA     |
| 2203-006556 | C733       | C-CER,CHIP  | SA     |
| 2203-006562 | C113       | C-CER,CHIP  | SA     |
| 2203-006562 | C119       | C-CER,CHIP  | SA     |
| 2203-006562 | C218       | C-CER,CHIP  | SA     |
| 2203-006562 | C227       | C-CER,CHIP  | SA     |
| 2203-006562 | C300       | C-CER,CHIP  | SA     |
| 2203-006562 | C302       | C-CER,CHIP  | SA     |
| 2203-006562 | C309       | C-CER,CHIP  | SA     |
| 2203-006562 | C319       | C-CER,CHIP  | SA     |
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| 2203-006562 | C326       | C-CER,CHIP  | SA     |
| 2203-006562 | C327       | C-CER,CHIP  | SA     |
| 2203-006562 | C329       | C-CER,CHIP  | SA     |
| 2203-006562 | C403       | C-CER,CHIP  | SA     |
| 2203-006562 | C414       | C-CER,CHIP  | SA     |
| 2203-006562 | C423       | C-CER,CHIP  | SA     |
| 2203-006562 | C424       | C-CER,CHIP  | SA     |
| 2203-006562 | C448       | C-CER,CHIP  | SA     |
| 2203-006562 | C451       | C-CER,CHIP  | SA     |
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|-------------|------------|-------------|--------|
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| 2203-006562 | C461       | C-CER,CHIP  | SA     |
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| 2203-006562 | C504       | C-CER,CHIP  | SA     |
| 2203-006562 | C536       | C-CER,CHIP  | SA     |
| 2203-006562 | C608       | C-CER,CHIP  | SA     |
| 2203-006562 | C616       | C-CER,CHIP  | SA     |
| 2203-006562 | C620       | C-CER,CHIP  | SA     |
| 2203-006562 | C621       | C-CER,CHIP  | SA     |
| 2203-006562 | C628       | C-CER,CHIP  | SA     |
| 2203-006562 | C633       | C-CER,CHIP  | SA     |
| 2203-006562 | C634       | C-CER,CHIP  | SA     |
| 2203-006562 | C635       | C-CER,CHIP  | SA     |
| 2203-006562 | C640       | C-CER,CHIP  | SA     |
| 2203-006562 | C651       | C-CER,CHIP  | SA     |
| 2203-006562 | C654       | C-CER,CHIP  | SA     |
| 2203-006562 | C662       | C-CER,CHIP  | SA     |
| 2203-006562 | C703       | C-CER,CHIP  | SA     |
| 2203-006562 | C718       | C-CER,CHIP  | SA     |
| 2203-006562 | C723       | C-CER,CHIP  | SA     |
| 2203-006562 | C833       | C-CER,CHIP  | SA     |
| 2203-006562 | C844       | C-CER,CHIP  | SA     |
| 2203-006617 | C664       | C-CER,CHIP  | SA     |
| 2203-006617 | C667       | C-CER,CHIP  | SA     |
| 2203-006648 | C545       | C-CER,CHIP  | SA     |
| 2203-006681 | C830       | C-CER,CHIP  | SA     |
| 2203-006824 | C229       | C-CER,CHIP  | SA     |
| 2203-006824 | C230       | C-CER,CHIP  | SA     |
| 2203-006824 | C277       | C-CER,CHIP  | SA     |
| 2203-006824 | C328       | C-CER,CHIP  | SA     |
| 2203-006824 | C402       | C-CER,CHIP  | SA     |
| 2203-006824 | C407       | C-CER,CHIP  | SA     |
| 2203-006824 | C415       | C-CER,CHIP  | SA     |
| 2203-006824 | C416       | C-CER,CHIP  | SA     |
| 2203-006824 | C419       | C-CER,CHIP  | SA     |
|             |            |             |        |

| SEC CODE    | Design LOC | Discription    | STATUS |
|-------------|------------|----------------|--------|
| 2203-006824 | C425       | C-CER,CHIP     | SA     |
| 2203-006824 | C426       | C-CER,CHIP     | SA     |
| 2203-006824 | C446       | C-CER,CHIP     | SA     |
| 2203-006824 | C447       | C-CER,CHIP     | SA     |
| 2203-006824 | C468       | C-CER,CHIP     | SA     |
| 2203-006824 | C471       | C-CER,CHIP     | SA     |
| 2203-006824 | C477       | C-CER,CHIP     | SA     |
| 2203-006824 | C478       | C-CER,CHIP     | SA     |
| 2203-006824 | C479       | C-CER,CHIP     | SA     |
| 2203-006824 | C646       | C-CER,CHIP     | SA     |
| 2203-006838 | C205       | C-CER,CHIP     | SA     |
| 2203-006838 | C219       | C-CER,CHIP     | SA     |
| 2203-006838 | C220       | C-CER,CHIP     | SA     |
| 2203-006838 | C304       | C-CER,CHIP     | SA     |
| 2203-006838 | C417       | C-CER,CHIP     | SA     |
| 2203-006838 | C418       | C-CER,CHIP     | SA     |
| 2203-006838 | C428       | C-CER,CHIP     | SA     |
| 2203-006838 | C429       | C-CER,CHIP     | SA     |
| 2203-006838 | C449       | C-CER,CHIP     | SA     |
| 2203-006838 | C636       | C-CER,CHIP     | SA     |
| 2203-006838 | C821       | C-CER,CHIP     | SA     |
| 2203-006847 | C711       | C-CER,CHIP     | SA     |
| 2203-006896 | C810       | C-CER,CHIP     | SA     |
| 2301-001200 | C808       | C-FILM,SMD-PPS | SA     |
| 2301-001213 | C706       | C-FILM,SMD-PPS | SA     |
| 2301-001735 | C736       | C-FILM,SMD     | SA     |
| 2301-001807 | C709       | C-FILM,SMD     | SA     |
| 2404-001274 | TA739      | C-TA,CHIP      | SA     |
| 2404-001281 | TA210      | C-TA,CHIP      | SA     |
| 2404-001281 | TA211      | C-TA,CHIP      | SA     |
| 2404-001377 | TA209      | C-TA,CHIP      | SA     |
| 2404-001377 | TA228      | C-TA,CHIP      | SA     |
| 2404-001381 | TA532      | C-TA,CHIP      | SA     |
| 2404-001396 | TA475      | C-TA,CHIP      | SA     |
| 2404-001411 | TA474      | C-TA,CHIP      | SA     |
| 2404-001411 | TA522      | C-TA,CHIP      | SA     |

| SEC CODE    | Design LOC | Discription  | STATUS |
|-------------|------------|--------------|--------|
| 2404-001474 | TA256      | C-TA,CHIP    | SA     |
| 2404-001474 | TA459      | C-TA,CHIP    | SA     |
| 2404-001474 | TA460      | C-TA,CHIP    | SA     |
| 2404-001474 | TA521      | C-TA,CHIP    | SA     |
| 2703-001734 | C850       | INDUCTOR-SMD | SA     |
| 2703-001748 | L724       | INDUCTOR-SMD | SA     |
| 2703-001750 | L804       | INDUCTOR-SMD | SA     |
| 2703-001938 | L701       | INDUCTOR-SMD | SA     |
| 2703-001990 | L702       | INDUCTOR-SMD | SA     |
| 2703-002207 | C800       | INDUCTOR-SMD | SA     |
| 2703-002597 | L800       | INDUCTOR-SMD | SA     |
| 2703-002768 | L404       | INDUCTOR-SMD | SNA    |
| 2703-002768 | L405       | INDUCTOR-SMD | SNA    |
| 2703-002782 | L400       | INDUCTOR-SMD | SA     |
| 2703-002782 | L401       | INDUCTOR-SMD | SA     |
| 2703-002794 | L803       | INDUCTOR-SMD | SA     |
| 2703-002795 | R820       | INDUCTOR-SMD | SNA    |
| 2703-002798 | L712       | INDUCTOR-SMD | SNA    |
| 2703-002798 | L716       | INDUCTOR-SMD | SNA    |
| 2703-002798 | L719       | INDUCTOR-SMD | SNA    |
| 2703-002798 | L722       | INDUCTOR-SMD | SNA    |
| 2703-002819 | L711       | INDUCTOR-SMD | SA     |
| 2703-002819 | L714       | INDUCTOR-SMD | SA     |
| 2703-002819 | L717       | INDUCTOR-SMD | SA     |
| 2703-002819 | L718       | INDUCTOR-SMD | SA     |
| 2703-002858 | L805       | INDUCTOR-SMD | SA     |
| 2703-002870 | L703       | INDUCTOR-SMD | SA     |
| 2703-002870 | L709       | INDUCTOR-SMD | SA     |
| 2703-002870 | L715       | INDUCTOR-SMD | SA     |
| 2703-002901 | L706       | INDUCTOR-SMD | SNA    |
| 2703-002906 | L806       | INDUCTOR-SMD | SA     |
| 2703-002906 | L807       | INDUCTOR-SMD | SA     |
| 2703-002907 | L707       | INDUCTOR-SMD | SNA    |
| 2703-002907 | L710       | INDUCTOR-SMD | SNA    |
| 2703-002919 | C717       | INDUCTOR-SMD | SA     |
| 2801-004318 | OSC100     | CRYSTAL-SMD  | SA     |

| SEC CODE    | Design LOC | Discription           | STATUS |
|-------------|------------|-----------------------|--------|
| 2801-004466 | OSC101     | CRYSTAL-SMD           | SA     |
| 2801-004466 | OSC400     | CRYSTAL-SMD           | SA     |
| 2802-001182 | OSC600     | RESONATOR-CERAMIC     | SA     |
| 2806-001377 | VCO800     | OSCILLATOR-VCO        | SA     |
| 2809-001280 | TCX801     | OSCILLATOR-VCTCXO     | SA     |
| 2901-001283 | F300       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F500       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F501       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F503       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F504       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F506       | FILTER-EMI SMD        | SA     |
| 2901-001286 | F507       | FILTER-EMI SMD        | SA     |
| 2901-001353 | F502       | FILTER-EMI/ESD        | SA     |
| 2901-001353 | F505       | FILTER-EMI/ESD        | SA     |
| 2904-001622 | F802       | FILTER-SAW            | SA     |
| 2904-001704 | F800       | FILTER-SAW            | SA     |
| 2910-000010 | F801       | DUPLEXER-SAW          | SA     |
| 2911-000048 | U701       | DUPLEXER-FEM          | SA     |
| 3301-001208 | L402       | BEAD-SMD              | SA     |
| 3301-001342 | F201       | BEAD-SMD              | SA     |
| 3301-001342 | F202       | BEAD-SMD              | SA     |
| 3301-001342 | F401       | BEAD-SMD              | SA     |
| 3301-001342 | F402       | BEAD-SMD              | SA     |
| 3301-001342 | F403       | BEAD-SMD              | SA     |
| 3301-001342 | L101       | BEAD-SMD              | SA     |
| 3301-001729 | L503       | BEAD-SMD              | SA     |
| 3404-001303 | SW_CAM     | SWITCH-TACT           | SA     |
| 3404-001303 | SW_DOWN    | SWITCH-TACT           | SA     |
| 3404-001303 | SW_UP      | SWITCH-TACT           | SA     |
| 3705-001421 | CN700      | CONNECTOR-COAXIAL     | SA     |
| 3709-001448 | CD401      | CONNECTOR-CARD EDGE   | SA     |
| 3709-001493 | SIM400     | CONNECTOR-CARD EDGE   | SA     |
| 3710-002442 | IFC505     | SOCKET-INTERFACE      | SA     |
| 3710-002467 | MOTOR      | SOCKET-BOARD TO BOARD | SA     |
| 3710-002467 | SPK_L      | SOCKET-BOARD TO BOARD | SA     |
| 3710-002467 | SPK_R      | SOCKET-BOARD TO BOARD | SA     |

| SEC CODE    | Design LOC | Discription           | STATUS |
|-------------|------------|-----------------------|--------|
| 3711-005945 | CN101      | HEADER-BOARD TO BOARD | SA     |
| 3711-006137 | BTC506     | HEADER-BATTERY        | SA     |
| 4302-001181 | BAT407     | BATTERY-LI(2ND)       | SA     |
| 4709-001413 | MOD206     | BLUETOOTH MODULE      | SA     |

## 11. Reference data

## 11-1. Reference Abbreviate

**AAC**: Advanced Audio Coding. **AVC**: Advanced Video Coding.

BER: Bit Error Rate

BPSK: Binary Phase Shift Keying

CA: Conditional Access

**CDM**: Code Division Multiplexing

C/I: Carrier to Interference

**DMB**: Digital Multimedia Broadcasting

EN : European StandardES : Elementary Stream

ETSI: European Telecommunications Standards Institute

MPEG: Moving Picture Experts Group

PN: Pseudo-random Noise

PS : Pilot Symbol

QPSK: Quadrature Phase Shift Keying

RS : Reed-Solomon
SI : Service Information

TDM: Time Division Multiplexing

TS: Transport Stream

## 1. Safety Precautions

## 1-1. Repair Precaution

- Repair in Shield Box, during detailed tuning.
   Take specially care of tuning or test,
   because specipicty of cellular phone is sensitive for surrounding interference(RF noise).
- Be careful to use a kind of magnetic object or tool,
   because performance of parts is damaged by the influence of manetic force.
- Surely use a standard screwdriver when you disassemble this product, otherwise screw will be worn away.
- Use a thicken twisted wire when you measure level.
   A thicken twisted wire has low resistance, therefore error of measurement is few.
- Repair after separate Test Pack and Set because for short danger (for example an overcurrent and furious flames of parts etc) when you repair board in condition of connecting Test Pack and tuning on.
- Take specially care of soldering, because Land of PCB is small and weak in heat.
- Surely tune on/off while using AC power plug, because a repair of battery charger is dangerous when tuning ON/OFF PBA and Connector after disassembing charger.
- Don't use as you pleases after change other material than replacement registered on SEC System.
  - Otherwise engineer in charge isn't charged with problem that you don't keep this rules.

## 1-2. ESD(Electrostatically Sensitive Devices) Precaution

Several semiconductor may be damaged easily by static electricity. Such parts are called by ESD(Electrostatically Sensitive Devices), for example IC,BGA chip etc. Read Precaution below. You can prevent from ESD damage by static electricity.

- Remove static electricity remained your body before you touch semiconductor or parts with semiconductor. There are ways that you touch an earthed place or wear static electricity prevention string on wrist.
- Use earthed soldering steel when you connect or disconnect ESD.
- Use soldering removing tool to break static electricity. , otherwise ESD will be damaged by static electricity.
- Don't unpack until you set up ESD on product. Because most of ESD are packed by box and aluminum plate to have conductive power, they are prevented from static electricity.
- You must maintain electric contact between ESD and place due to be set up until ESD is connected completely to the proper place or a circuit board.

# 3. Product Function

## **Main Function**

- Message, Internet, Messenger
- Camera
- Windows Media Player
- Google Maps
- Bluetooth

# www.s-manuals.com