

# **M893 User's Guide**

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#### FCC RF EXPOSURE INFORMATION

In August 1996 the Federal Communications Commission (FCC) of the United States with its action in Report and Order FCC 96-326 adopted an updated safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this phone complies with the FCC guidelines and these international standards.

#### Operating Requirements

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antennas or transmitters. Please maintain 20 cm separation distance from the antenna to meet FCC RF exposure compliance requirements.

*For more information about RF exposure, please visit the FCC website at [www.fcc.gov](http://www.fcc.gov)*

**NOTE: Read the "Safety" section prior to using your WISMO Quik Q2338 Series Module.**

## 1. A Summary

### 1.1 Document Contents

This document is a summary of M893(one of YISO's wireless modem)'s hardware and software specifications.

Contents are as followings.

- Product summary and features : Describes about the M893's main features and provide pictures of product.
- Specification : Describes about the Environment specifications, Hardware, Software and Mechanism specifications.
- Modem Interface : Describes about the 100 pins for interface.

### 1.2 Revision History

| Version | Date              | Descriptions    |
|---------|-------------------|-----------------|
| V1.0    | December 28, 2007 | Initial Release |

### 1.3 Pictures of Product

- M893 Module

[Top]



Antenna Cable Connector

MM9329-2700(murata)

[Bottom]



RF Test Cable Connector

MM8430-2600 RA1(murata)

### **3. Specifications**

#### **3.1 General Specifications**

##### **3.1.1 Environmental**

- Relative Humidity : 5%~95%
- Storage Temperature : -30 °C ~ 60 °C
- Operation Temperature : -20 °C ~ +50 °C
- Vibration Stability : 1.5G peak 5 to 500Hz

##### **3.1.2 Hardware**

- CDMA Protocol : CDMA 1x-EVDO
- Power Consumption : 3.6V/700mA (Max Power)
- IF Receiving Chip : RFL6000, RFR6000
- IF Transfer Chip : RFT6100
- Chipset : Qualcomm MSM6500
- Interface
  - ❖ Interface Connector(100 Pins)

##### **3.1.3 Software**

- Data Service : IS-878P1,P2 and IS-835-B
- Baud Rate
  - ❖ DM : Default 230,400bps (variable)
- Transmitting
  - ❖ Forward-2.4Mbps
  - ❖ Reverse-153.6kbps
- SMS (IS-637) : MO,MT Support
- NAM : 5 NAM
- Product Support Tool : PST
- DM : Qualcomm CAIT

### **3.2 Electronic Specifications**

#### **3.2.1 Transmitter**

- Type of Multiplexing : Duplexer
- Normal Output Power : 0.3W
- Frequency Range : 824.70 ~ 848.31MHz (Cellular)  
1851.25 ~ 1908.75MHz (USPCS)
- Frequency Stability : Under defined Freq.  $\pm 300\text{Hz}$ (Cellular),  $\pm 150\text{Hz}$ (USPCS)
- Channel : 20ch(Cellular) , 42ch(USPCS)
- Channel Spacing : 1.23MHz(Cellular), 1.25MHz(USPCS)
- Occupied Frequency Bandwidth : Below 1.25MHz
- Oscillation Method : PLL SYNTHESIZER
- Local Oscillation Frequency : 954 ~ 980MHz(Cellular)  
1720.87 ~ 1778.37MHz(USPCS)
- Antenna Impedance : 50 ohm

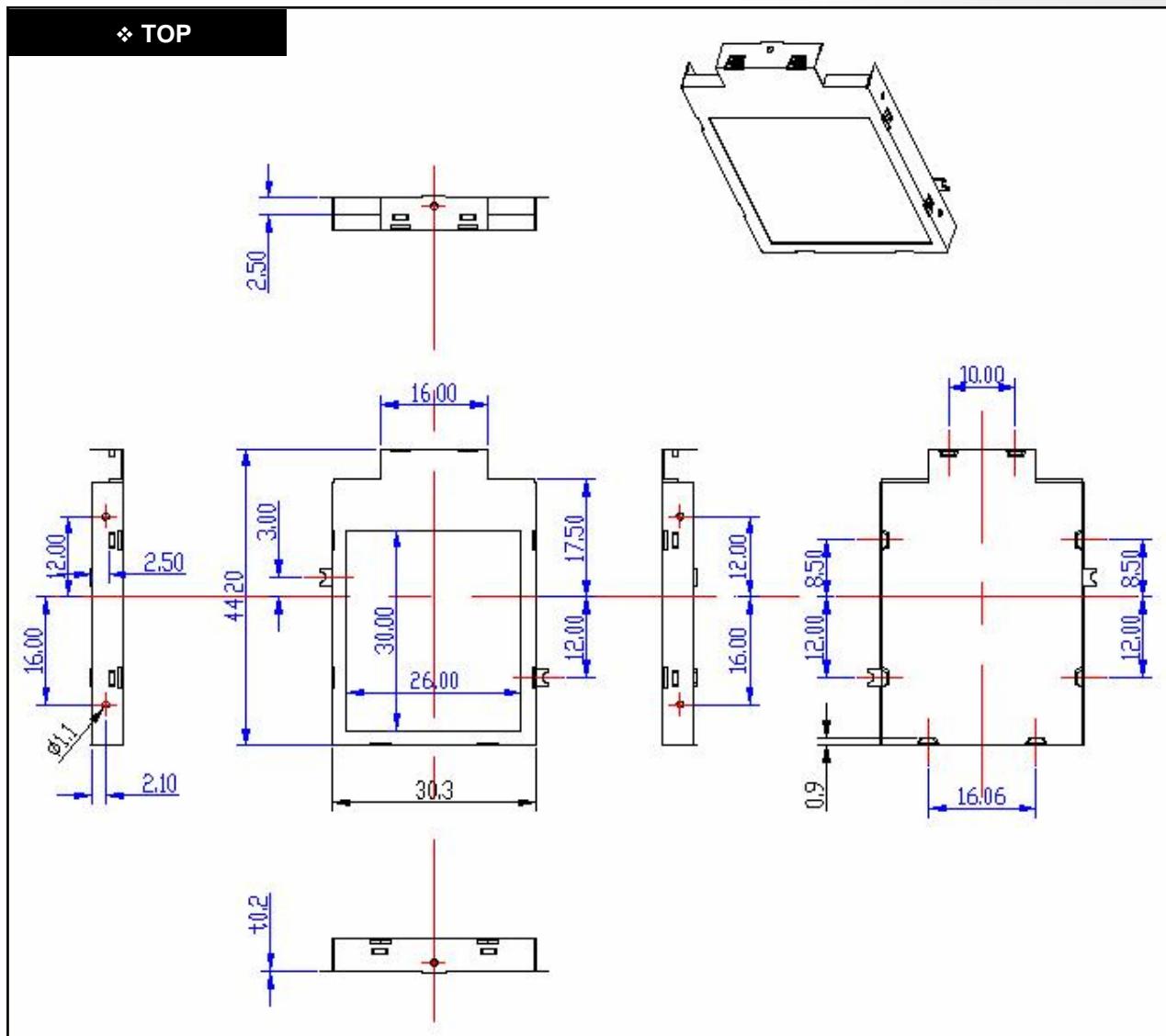
#### **3.2.2 Receive Specifications**

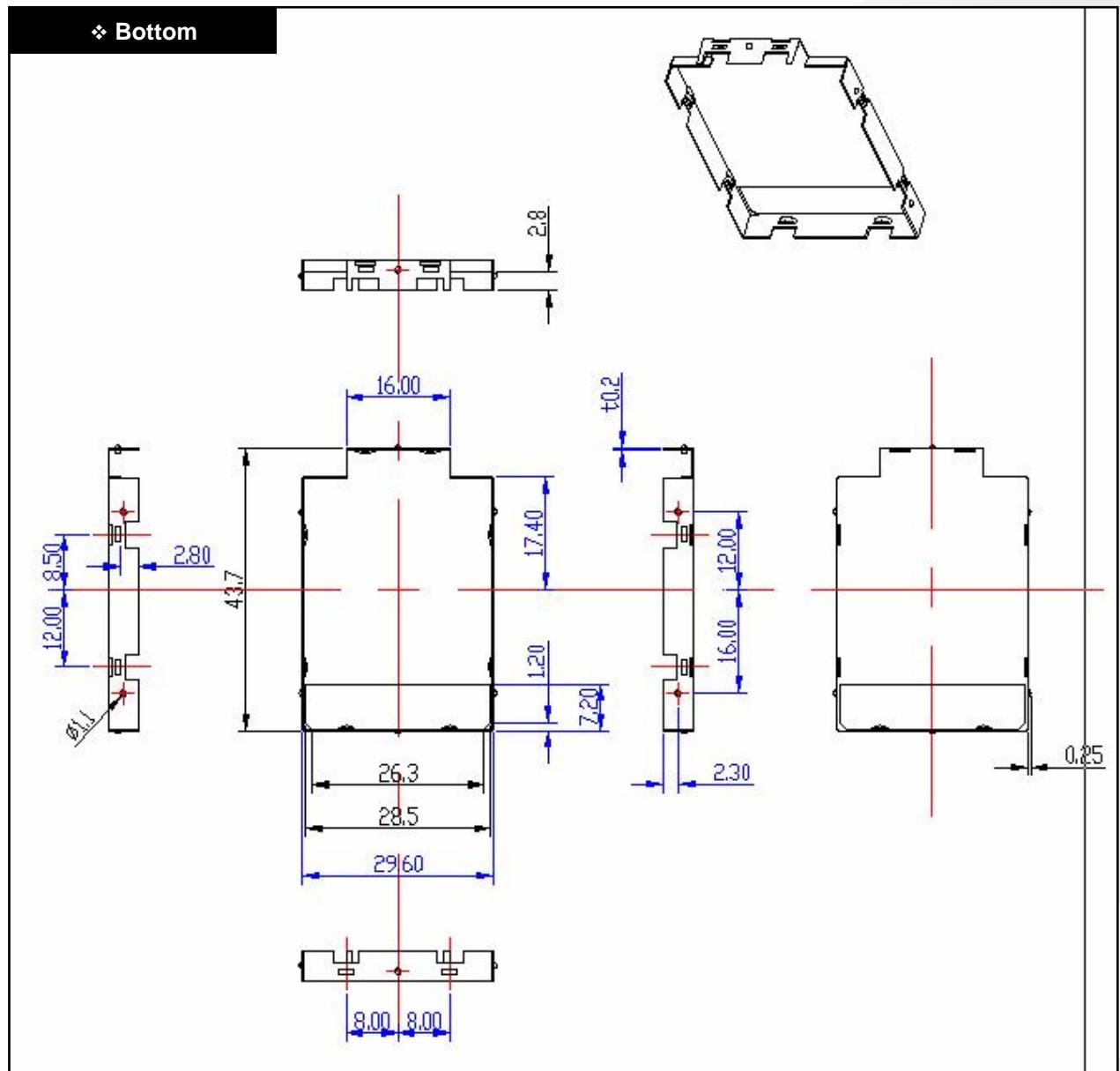
- Receive Method : Zero IF
- Frequency Range : 869.70 ~ 893.31MHz (Cellular)  
1931.25 ~ 1988.75MHz(USPCS)
- Channel : 20 ch(Cellular) , 42ch(USPCS)
- Channel Spacing : 1.23MHz(Cellular), 1.25MHz(USPCS)
- Occupied Frequency Bandwidth : Below 1.25MHz
- Oscillation Method : PLL SYNTHESIZER
- Local Oscillation Frequency : 954 ~ 980MHz (Cellular)  
1720.87 ~ 1778.37MHz (USPCS)
- Antenna Impedance : 50Ω

### 3.3 Mechanical

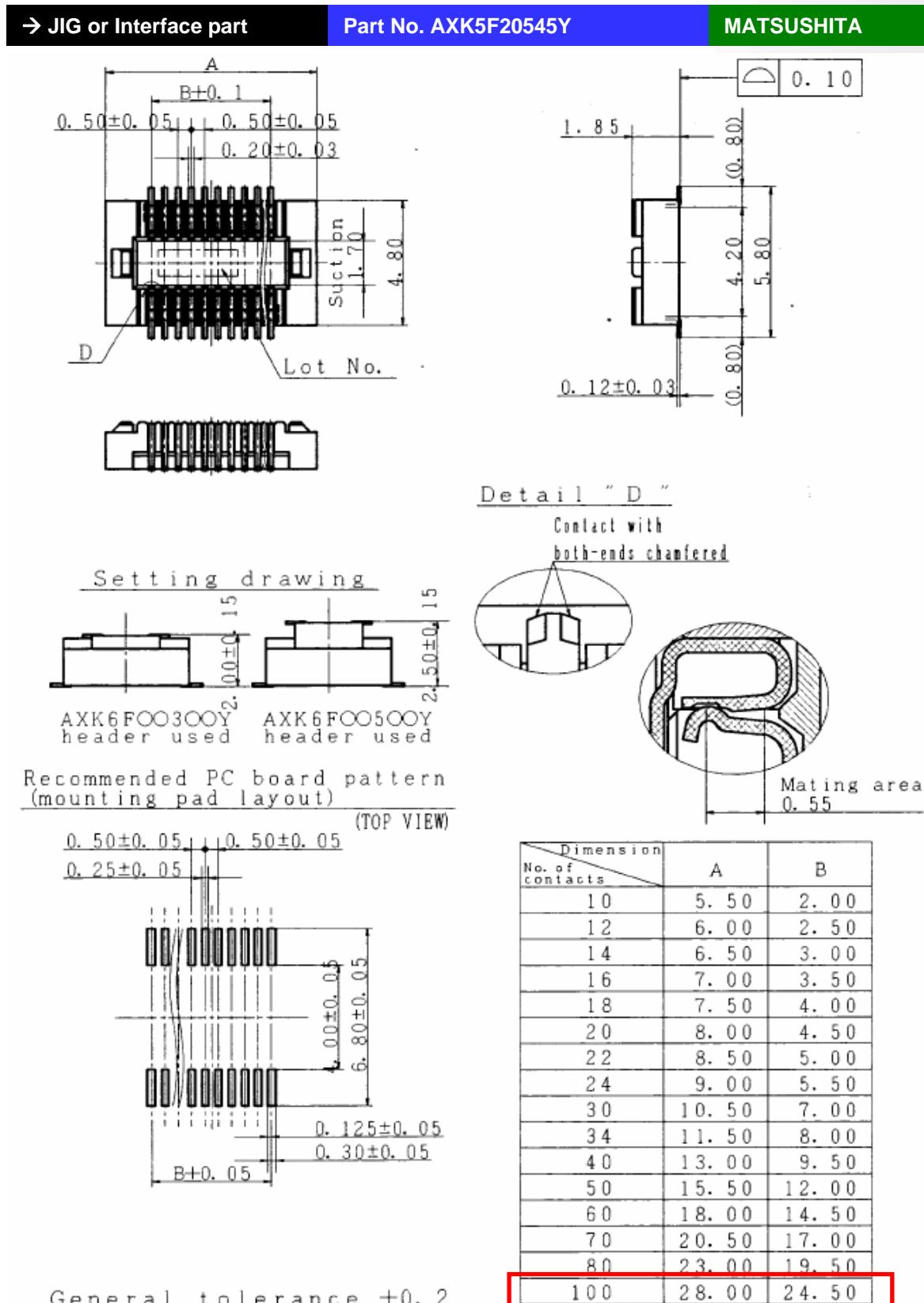
- Dimension : 30 X 45 X 5 (mm)

- Mechanical Drawing





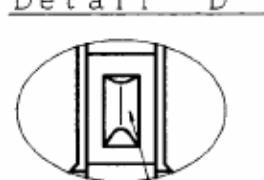
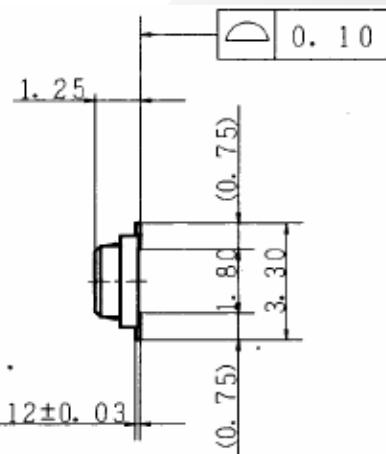
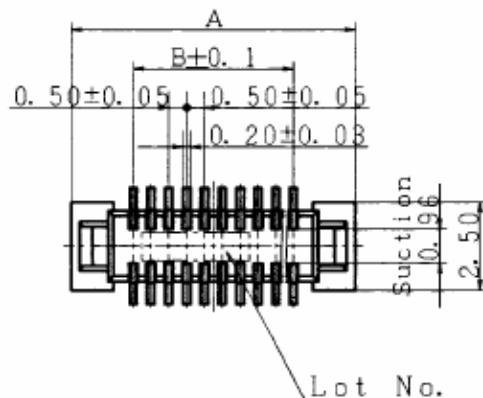
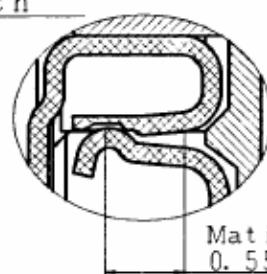
## 3.4 Interface Connector(100 Pins) Specifications



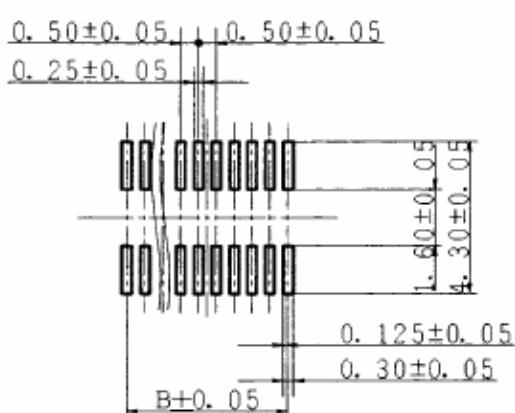
→ M893 Module part

Part No. AXK6F20345Y

MATSUSHITA

Post with  
V notchMating area  
0.55Recommended PC board pattern  
(mounting pad layout)

(TOP VIEW)



General tolerance ±0.2

| Dimension<br>No. of<br>contacts | A     | B     |
|---------------------------------|-------|-------|
| 10                              | 5.50  | 2.00  |
| 12                              | 6.00  | 2.50  |
| 14                              | 6.50  | 3.00  |
| 16                              | 7.00  | 3.50  |
| 18                              | 7.50  | 4.00  |
| 20                              | 8.00  | 4.50  |
| 22                              | 8.50  | 5.00  |
| 24                              | 9.00  | 5.50  |
| 26                              | 9.50  | 6.00  |
| 30                              | 10.50 | 7.00  |
| 32                              | 11.00 | 7.50  |
| 34                              | 11.50 | 8.00  |
| 40                              | 13.00 | 9.50  |
| 50                              | 15.50 | 12.00 |
| 60                              | 18.00 | 14.50 |
| 70                              | 20.50 | 17.00 |
| 80                              | 23.00 | 19.50 |
| 100                             | 28.00 | 24.50 |

## 4. Modem Interface

### 4.1 Pin Assignments

|                |            |           |                |
|----------------|------------|-----------|----------------|
| V_BATT(4.2V)   | <b>100</b> | <b>1</b>  | VCHARE_DC      |
| V_BATT(4.2V)   | <b>99</b>  | <b>2</b>  | VCHARE_DC      |
| GPIO           | <b>98</b>  | <b>3</b>  | GPIO           |
| GPIO           | <b>97</b>  | <b>4</b>  | GPIO           |
| GND            | <b>96</b>  | <b>5</b>  | GND            |
| /TRST          | <b>95</b>  | <b>6</b>  | VREG_UIM       |
| TDI            | <b>94</b>  | <b>7</b>  | USB_VBUS       |
| TDO            | <b>93</b>  | <b>8</b>  | USB_D+         |
| TMS            | <b>92</b>  | <b>9</b>  | USB_D-         |
| TCK            | <b>91</b>  | <b>10</b> | USB_ID         |
| /RTCK          | <b>90</b>  | <b>11</b> | A2[01]         |
| ringer         | <b>89</b>  | <b>12</b> | A2[20]         |
| GPIO           | <b>88</b>  | <b>13</b> | EBI2_DATA[00]  |
| GND            | <b>87</b>  | <b>14</b> | EBI2_DATA[01]  |
| EAR1O_P        | <b>86</b>  | <b>15</b> | EBI2_DATA[02]  |
| EAR1O_N        | <b>85</b>  | <b>16</b> | EBI2_DATA[03]  |
| MIC1_P         | <b>84</b>  | <b>17</b> | EBI2_DATA[04]  |
| MIC1_N         | <b>83</b>  | <b>18</b> | EBI2_DATA[05]  |
| MIC2_P         | <b>82</b>  | <b>19</b> | EBI2_DATA[06]  |
| HPH_R          | <b>81</b>  | <b>20</b> | EBI2_DATA[07]  |
| HPH_L          | <b>80</b>  | <b>21</b> | GND            |
| SPK_OUT_N      | <b>79</b>  | <b>22</b> | EBI2_DATA[08]  |
| SPK_OUT_P      | <b>78</b>  | <b>23</b> | EBI2_DATA[09]  |
| gpio           | <b>77</b>  | <b>24</b> | EBI2_DATA[10]  |
| EAR_DETECT     | <b>76</b>  | <b>25</b> | EBI2_DATA[11]  |
| GND            | <b>75</b>  | <b>26</b> | EBI2_DATA[12]  |
| KEYSENSE0      | <b>74</b>  | <b>27</b> | EBI2_DATA[13]  |
| KEYSENSE1      | <b>73</b>  | <b>28</b> | EBI2_DATA[14]  |
| KEYSENSE2      | <b>72</b>  | <b>29</b> | EBI2_DATA[15]  |
| KEYSENSE3      | <b>71</b>  | <b>30</b> | /LCD_CS        |
| KEYSENSE4      | <b>70</b>  | <b>31</b> | /OE2           |
| KYPAD_0        | <b>69</b>  | <b>32</b> | /WE2           |
| KYPAD_1 / GPIO | <b>68</b>  | <b>33</b> | /LCD_EN        |
| KYPAD_2 / GPIO | <b>67</b>  | <b>34</b> | LCD_BACK       |
| KYPAD_3        | <b>66</b>  | <b>35</b> | GND            |
| KYPAD_4        | <b>65</b>  | <b>36</b> | /POWER_ON      |
| KYPAD_5        | <b>64</b>  | <b>37</b> | PS_HOLD        |
| GND            | <b>63</b>  | <b>38</b> | /RSTOUT        |
| I2C_SCL        | <b>62</b>  | <b>39</b> | /RST           |
| I2C_SDA        | <b>61</b>  | <b>40</b> | /UART1_DCD     |
| GPIO           | <b>60</b>  | <b>41</b> | /UART1_RFR     |
| GPIO           | <b>59</b>  | <b>42</b> | /UART1_DTR     |
| UIM_P_CLK      | <b>58</b>  | <b>43</b> | /UART1_CTS     |
| UIM_P_RESET    | <b>57</b>  | <b>44</b> | /UART1_RI      |
| UIM_P_DATA     | <b>56</b>  | <b>45</b> | UART1_TXD      |
| GPIO           | <b>55</b>  | <b>46</b> | UART1_RXD      |
| UART2_TXD      | <b>54</b>  | <b>47</b> | /UART1_DSR     |
| UART2_RXD      | <b>53</b>  | <b>48</b> | GND            |
| GPIO           | <b>52</b>  | <b>49</b> | VREG_MSME[1,8] |
| MOTOR_DRV      | <b>51</b>  | <b>50</b> | VREG_MSMP[2,6] |

## 4.2 Pin descriptions

| Pin No. | YISO Defined        | Pad Type | Example Defined | I/O Type  | Level         | Description                       |
|---------|---------------------|----------|-----------------|-----------|---------------|-----------------------------------|
| 1       | VCHARE_DC           | V        | EXTERNAL DC     | POWER_IN  | 3.4 ~ 4.1 Vdc | Adaptor or Battery Power          |
| 2       | VCHARE_DC           | V        | EXTERNAL DC     | POWER_IN  | 3.4 ~ 4.1 Vdc | Adaptor or Battery Power          |
| 3       | GPIO                | BS-PU    | GPIO            |           |               |                                   |
| 4       | GPIO                | BS-PU    | LED_GRN         | OUT       | Active High   | Phone Status Indicator by PDA LED |
| 5       | GND                 | V        | GND             | GND       |               |                                   |
| 6       | VREG_UIM            | V        | RUIM_POWER      | OUT       | OUT/POWER     | VCC Power Supply for R-UIM Card   |
| 7       | USB_VBUS            | IS-PU    | USB_VBUS        | POWER     | 5V            |                                   |
| 8       | USB_D+              | BS-PU    | USB_D+          | IN/OUT    | DATA          | USB Differential Data(+)          |
| 9       | USB_D-              | BS-PU    | USB_D-          | IN/OUT    | DATA          | USB Differential Data(-)          |
| 10      | USB_ID              | DI       | USB_ID / TP     |           |               |                                   |
| 11      | A2[01]              |          |                 |           |               |                                   |
| 12      | A2[20]              | BS-PP    | LED_RED         | OUT       | Active High   | Phone Status Indicator by PDA LED |
| 13      | EBI2_DATA[00]       |          |                 |           |               |                                   |
| 14      | EBI2_DATA[01]       |          |                 |           |               |                                   |
| 15      | EBI2_DATA[02]       |          |                 |           |               |                                   |
| 16      | EBI2_DATA[03]       |          |                 |           |               |                                   |
| 17      | EBI2_DATA[04]       |          |                 |           |               |                                   |
| 18      | EBI2_DATA[05]       |          |                 |           |               |                                   |
| 19      | EBI2_DATA[06]       |          |                 |           |               |                                   |
| 20      | EBI2_DATA[07]       |          |                 |           |               |                                   |
| 21      | GND                 | V        | GND             | GND       |               |                                   |
| 22      | EBI2_DATA[08]       |          |                 |           |               |                                   |
| 23      | EBI2_DATA[09]       |          |                 |           |               |                                   |
| 24      | EBI2_DATA[10]       |          |                 |           |               |                                   |
| 25      | EBI2_DATA[11]       |          |                 |           |               |                                   |
| 26      | EBI2_DATA[12]       |          |                 |           |               |                                   |
| 27      | EBI2_DATA[13]       |          |                 |           |               |                                   |
| 28      | EBI2_DATA[14]       |          |                 |           |               |                                   |
| 29      | EBI2_DATA[15]       |          |                 |           |               |                                   |
| 30      | LCD_CS              | BS-PP    | LED_BLUE        | OUT       | Active High   | Phone Status Indicator by PDA LED |
| 31      | /OE2                |          |                 |           |               |                                   |
| 32      | /WE2                |          |                 |           |               |                                   |
| 33      | LCD_EN<br>USB_CTL_N | BS-PP    | CDMA_USB_READY  | OUT       | Active High   | CDMA USB Status Ready Indicator   |
| 34      | LCD_BACK            | BS-PP    | CDMA_ACTIVE     | OUT       | Active High   | CDMA Active Status to PDA         |
| 35      | GND                 | V        | GND             | GND       |               |                                   |
| 36      | POWER_ON            | DI       | PHONE_ON        | IN        | Active High   | CDMA Module Power On              |
| 37      | PS_HOLD             | BS-PP3   | PS_HOLD         | TP        |               |                                   |
| 38      | RSTOUT              |          |                 | TP        |               |                                   |
| 39      | RST                 |          | PHONE_RESET     | IN        | Active Low    | CDMA Module RESET                 |
| 40      | UART1_DCD           |          | TP              |           |               |                                   |
| 41      | UART1_RFR           | BS-PP3   | MSM_DP_RTS      | OUT       | Active Low    | PDA IF / Ready To Receive         |
| 42      | UART1_DTR           | BS-PP3   | MSM_DP_DTR      | OUT       | Active Low    | PDA IF / Data Terminal Ready      |
| 43      | UART1_LCTS          | BS-PP3   | MSM_DP_CTS      | IN        | Active Low    | PDA IF / Clear To Send            |
| 44      | UART1_RI            | BS-PP3   | TP              |           |               |                                   |
| 45      | UART1_TXD           | BS-PP3   | MSM_DP_TXD      | OUT       | DATA          | PDA IF / Tx Data                  |
| 46      | UART1_RXD           | BS-PP3   | MSM_DP_RXD      | IN        | DATA          | PDA IF / Rx Data                  |
| 47      | UART1_DSR           | BS-PP3   | MSM_DP_DSR      | IN        | Active Low    | PDA IF / Data Set Ready           |
| 48      | GND                 | V        | GND             | GND       |               |                                   |
| 49      | VREG_MSME[1,8]      | V        | MSME_1.8V       | POWER_OUT |               |                                   |
| 50      | VREG_MSMP[26]       | V        | MSMP_26V        | POWER_OUT |               | Power Output For External Device  |

## CDMA 1X EV-DO Module

### M893 User's Guide

|     |                |        |                  |          |               |   |
|-----|----------------|--------|------------------|----------|---------------|---|
| 51  | MOTOR_DRV      | BS-PP  | CDMA_ON_JIG      | IN       | Active High   | CDMA Module( High : CDMA Module Factory Mode, Low : PDA use Mode)       |
| 52  | GPIO           | BS-PP  | PAD_WAKE_UP      | OUT      | Active High   | PDA Wakeup from Suspend state for Call processing/SMS/Low Battery/Event |
| 53  | UART2_RXD      |        | DM_RXD           | IN       | DATA          | DM IF / Rx Data   |
| 54  | UART2_TXD      |        | DM_TXD           | OUT      | DATA          | DM IF / Tx Data   |
| 55  | GPIO           | BS-PP  | PDA_ACTIVE       | IN       | Active High   | PDA Active / Sleep Status check to CDMA                                 |
| 56  | UIM_P_DATA     | DI/DO  | RUIM_DATA        | IN/OUT   | DATA          | RUIM Data   |
| 57  | UIM_P_RESET    | DO     | RUIM_RESET       | OUT      | Active High   | RUIM Reset  |
| 58  | UIM_P_CLK      | DO     | RUIM_CLK         | IN/OUT   | CLK           | RUIM Clock  |
| 59  | GPIO           | BS-PP  | GPIO             | IN/OUT   |               |   |
| 60  | GPIO           | BS-PP  | GPIO             | IN/OUT   |               |   |
| 61  | I2C_SDA        |        |                  |          |               |   |
| 62  | I2C_SCL        |        |                  |          |               |   |
| 63  | GND            | V      | GND              | GND      |               |   |
| 64  | KYPAD_5        | BS-PP3 | PCM_DATA_IN      | IN       | Active High   |   |
| 65  | KYPAD_4        | BS-PP3 | PCM_SYNC         | OUT      | Active High   |   |
| 66  | KYPAD_3        | BS-PP3 | PCM_CLK          | OUT      | Active High   |   |
| 67  | KYPAD_2 / GPIO | BS-PP3 | PCM_DATA_OUT     | OUT      | Active High   |   |
| 68  | KYPAD_1 / GPIO | BS-PP  |                  |          |               |   |
| 69  | KYPAD_0        |        |                  |          |               |   |
| 70  | KEYSENSE4      |        | SEND END KEY     | IN       | Active High   | Send / End Key Detect of EXT EAR-MIC Device                             |
| 71  | KEYSENSE3      |        | GPIO             |          |               |   |
| 72  | KEYSENSE2      |        | KEY_DN           | IN       | Active High   | Key Volume Down Detect on the Key Pad@Sleep Mode                        |
| 73  | KEYSENSE1      |        | KEY_UP           | IN       | Active High   | Key Volume Up Detect on the Key Pad@Sleep Mode                          |
| 74  | KEYSENSE0      |        | GPIO             |          |               |   |
| 75  | GND            | V      | GND              | GND      |               |   |
| 76  | EAR_DETECT     | DI     | EAR_DETECT       | IN       | Active Low    | Checking the use of EXT Ear-mic Device at PDA                           |
| 77  | GPIO           | BS-PP  |                  |          |               |   |
| 78  | SPK_OUT_P      | AO     | RECEIVER OUT+    | OUT      | Analog        | Audio Differential Output to PDA Audio Amplifier Direct SPK             |
| 79  | SPK_OUT_N      | AO     | RECEIVER OUT-    | OUT      | Analog        | Audio Differential Output to PDA Audio Amplifier Direct SPK             |
| 80  | HPH_LL         | AO     | EAR_JACK-        | OUT      |               |   |
| 81  | HPH_R          | AO     | EAR_JACK+        | OUT      |               |   |
| 82  | MIC2_P         | AI     | MIC+             | IN       |               |   |
| 83  | MIC1_N         | AI     | EXTERNAL MIC-    | IN       |               |   |
| 84  | MIC1_P         | AI     | EXTERNAL MIC+    | IN       | Analog        | Audio Input( High-Z, C-MIC Input)                                       |
| 85  | EAR1O_N        | AO     | RECEIVER-        | OUT      |               |   |
| 86  | EAR1O_P        | AO     | RECEIVER+        | OUT      |               |   |
| 87  | GND            | V      | GND              | GND      |               |   |
| 88  | GPIO           | BS-PP  | DM_CTS           | IN       | Active Low    | DM IF / Clear To Send   |
| 89  | Ringer         |        | TP               |          |               |   |
| 90  | RTCK           |        | TP               |          |               |   |
| 91  | TCK            |        | TP               |          |               |   |
| 92  | TMS            |        | TP               |          |               |   |
| 93  | TDO            |        | TP               |          |               |   |
| 94  | TDI            |        | TP               |          |               |   |
| 95  | TRST           |        | TP               |          |               |   |
| 96  | GND            | V      | GND              | GND      |               |   |
| 97  | GPIO           | BS-PP  | DM_RTS           | OUT      | Active Low    | DM IF / Ready To Receive  |
| 98  | GPIO           | BS-PP  | GPIO             |          |               |   |
| 99  | V_BATT(4.2V)   | V      | INTERNAL BATTERY | POWER_IN | 3.2 ~ 4.5 Vdc | Adaptor or Battery Power  |
| 100 | V_BATT(4.2V)   | V      | INTERNAL BATTERY | POWER_IN | 3.2 ~ 4.5 Vdc | Adaptor or Battery Power  |

## 5.1 WARNING!

Read this information before use

- **Caution**

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- **FCC Compliance Information**

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received. Including interference that may cause undesired operation.

- **Information to User**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and canradiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which canbe determined by turning the equipment off and on, the user is encouraged to try to correct the interference by oneor more of the following measures:

- Reorient or relocate the receiving antenna.–Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ tvtechnician for help.