

11. Conical - Dual-Band for PCS & GPS

- Manufacture: QUALCOMM Inc.
- Model Number: CV90-53293
- Rated Gain: 1 dBi at 1850 Mhz / 1.6 dBi at 1990 Mhz



12. Multi Mode/Multi Band for Cellular, PCS & GPS

- Manufacture: QUALCOMM Inc.
- Model Number: CV90-J2108
- Rated Gain: 2.9 dBi at 1850 / 4dBi at 1990 Mhz



Factory tests

Each Module undergoes functional testing per specifications using the RF test connector. No radiated tests are performed. The 50 ohm coaxial RF interfaces are verified. The manufactured end item needs to be verified for functionality of the antenna system and audio circuits if used.

Regarding development and testing of OEM device using Module:

- OEM must follow standards for voice and data as indicated by TIA.
- OEM must follow standards for AT commands to send data to the Module/phone.
- OEM may require constant activation of device by desired carrier for ongoing testing.

Regarding certification of device on carrier's network for U.S. market:

Upon accepting the Module as a tested component to the OEM's device, the carrier provides direction to the OEM as to further testing that may be required on the OEM's part.

Please note that service providers may require the OEM's product to pass some basic over-the-air testing before it can be active on a provider's network. This will ensure the service provider that the network will not be adversely affected during an OEM's product development.

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Module Developer's Kit

The Module Developer's Kit (MDK) is used to assist in development of end-user applications for the CDMA Module. The MDK facilitates integration through the serial and digital codec pulse code modulation (PCM) interface options. Contents of the MDK are illustrated below.



Module and
Interface Board



Travel Charger*



Audio Headset*



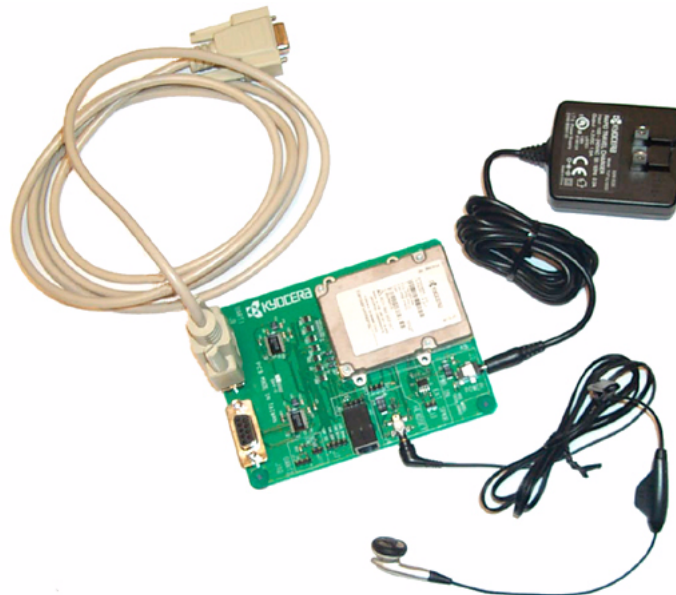
9-pin RS 232
Cable Assembly*
(qty: 2)



Module Documentation**
CD-ROM



MMCX-to-SMA
Adapter (qty: 2)



* Kit may include alternate components.

** Documentation includes Data Book (this document), User's Guide, and Reference Guide.

It should be clearly understood that the software in the MDK (specifically, the code in the *Kyocera 200 Module User's Guide*, 82-M8863-1) is provided for sample purposes only. The MDK software is not warranted as the basis for a deployed implementation.

The KWC CDMA Module Developer's Kit arrives having been tested as described in the Module Testing & Integration chapter. Testing should be duplicated at the integrator's/customer's facility. KWC can provide advice as to the type of test equipment needed.

This Module testing should be separate from the testing to be performed on the end product (with the Module installed). KWC offers a warranty for the CDMA Module, from the date of shipment from KWC's facility. This warranty provides the customer with a remedy for defective Modules within the warranty period and subject to all other warranty provisions.

KWC requests that the integrator retain several Modules as backup in case of failure. It is assumed that you maintain a first level of returned Module testing in your QA department prior to returning the Module to KWC. This alleviates the question of whether the failure is in the Module or the end product. "No trouble found" (NTF) occurrences on Modules returned to KWC will result in fees. KWC reserves the right, at its own discretion, to repair, replace, or issue a trade credit for any defective Module under warranty.

Warranty repair excludes warranty claims on products that have been subject to misuse, neglect, improper storage or installation, or that have been repaired, modified, or altered by a facility other than a KWC-authorized service center or a KWC-certified repair center. In all cases, the final testing of the KWC line is the sole controlling determination of Module performance.

14 Mechanical Specifications

Mating connectors

The following connectors mate with the Module.

- **Module RF Connector Mate**
Standard MMCX plug, available from several manufacturers including Amp, Radiall, and Telegartner
- **Module Interface Connector Mate**
Manufacturer: MOLEX Inc., www.molex.com
Manufacturer's Part Number: 54230-0509
Kyocera MCN: 449-24545-0509

54230-0509 is the tape and reel version with only a fitting nail/solder tab for retention. 54230-0508 is the tape and reel version with fitting nail and pcb peg (goes into the pcb and helps pick and place alignment). Although the -0509 is not on the Molex Web site, it is available.

Parts can be ordered based on the manufacturer's part number, not Kyocera's internal MCN (Material Control Number).

Other suppliers for this part are:

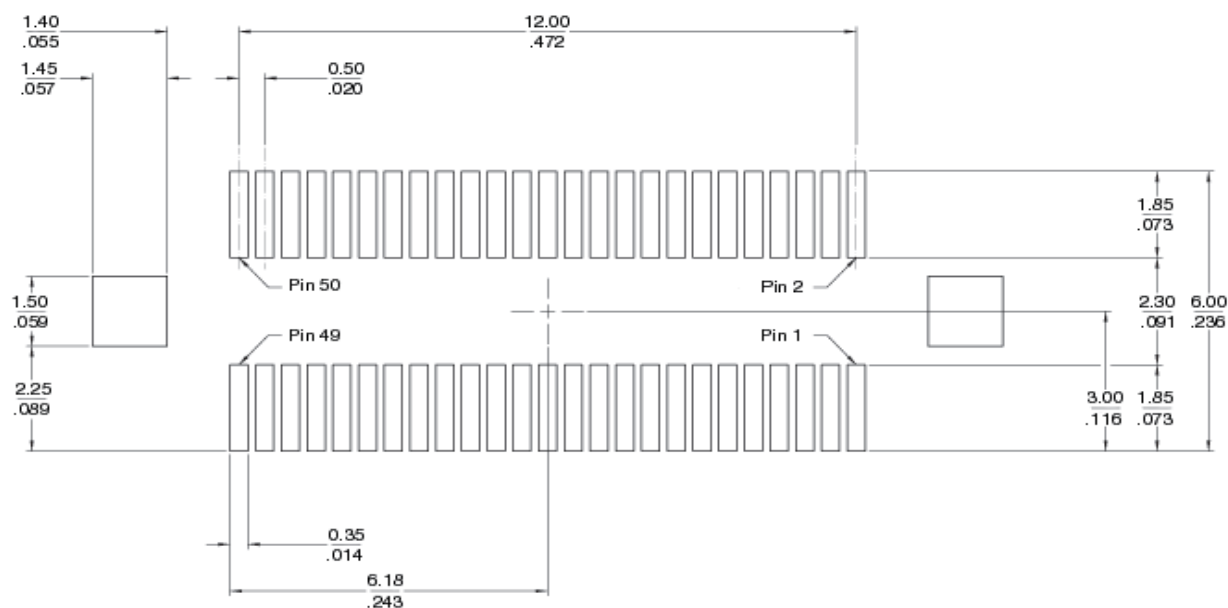
eeParts, Inc., <http://www.eeparts.com>
1150 Hayden Dr, Ste 100
Carrollton, TX 75006
Phone: 469-574-2333/Fax: 469-574-2389

Sager Electronics, <http://www.sager.com>
97 Libbey Industrial Pkwy
Weymouth, MA 02189
Phone: 800-SAGER-800

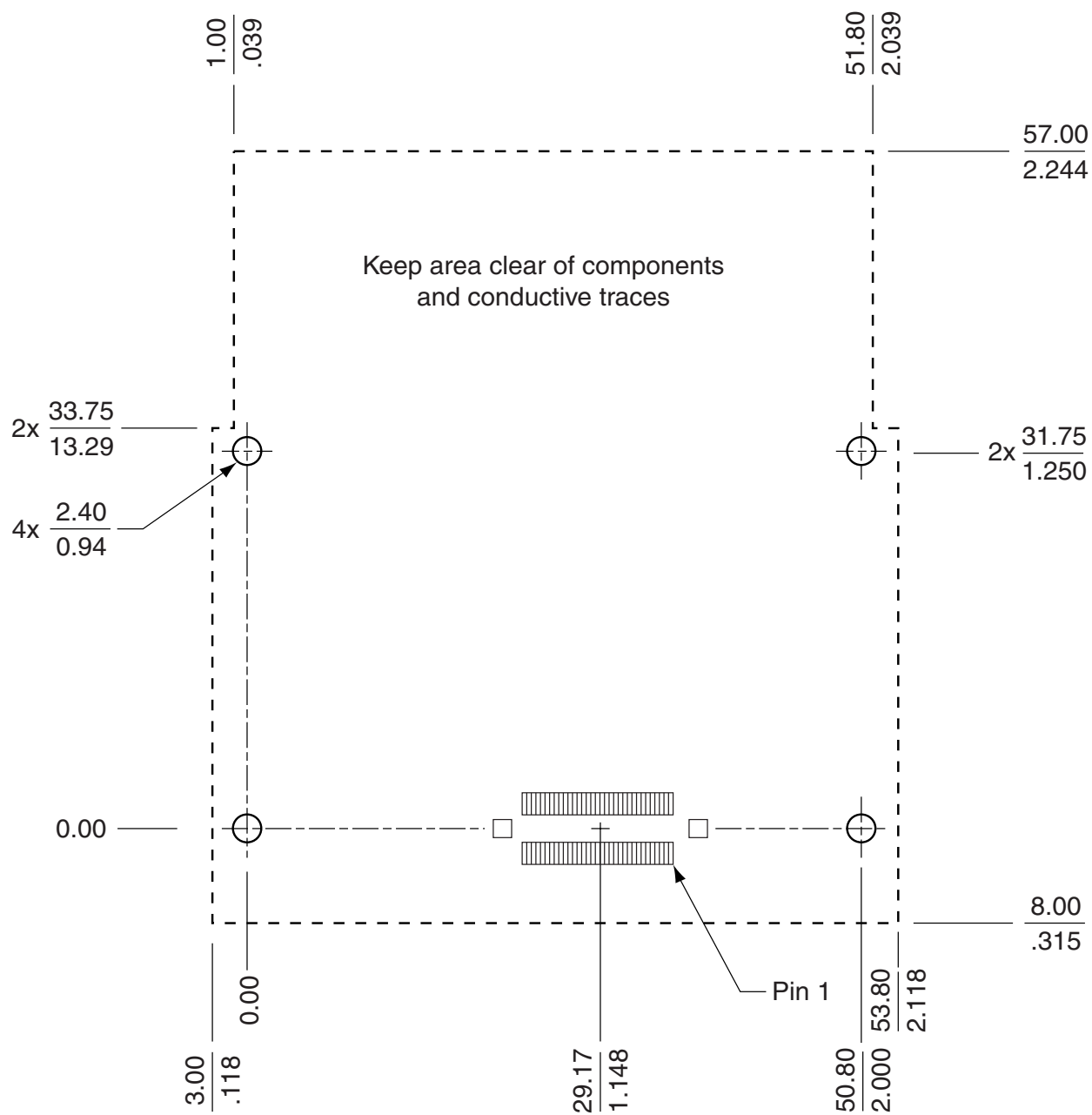
Drawings

The following technical drawings are included in this chapter:

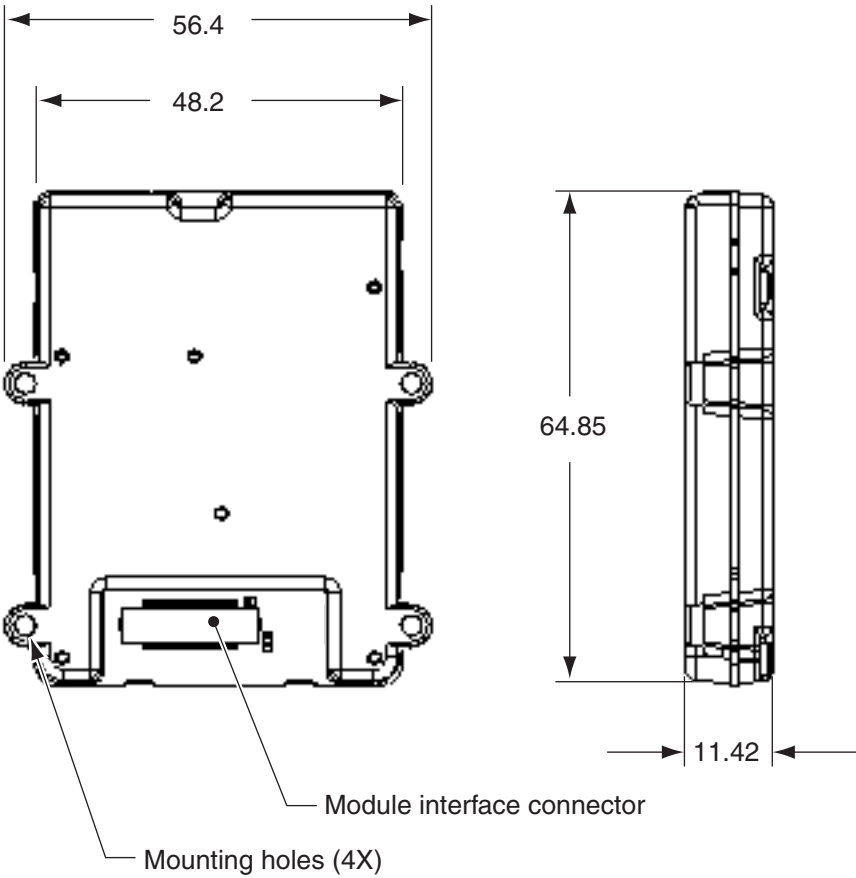
- Land pattern and pin assignment for Module interface mating connector
- Mounting hole and land pattern placement guidelines with recommended mounting hardware
- Module overall dimensioned drawing
- Module exploded view



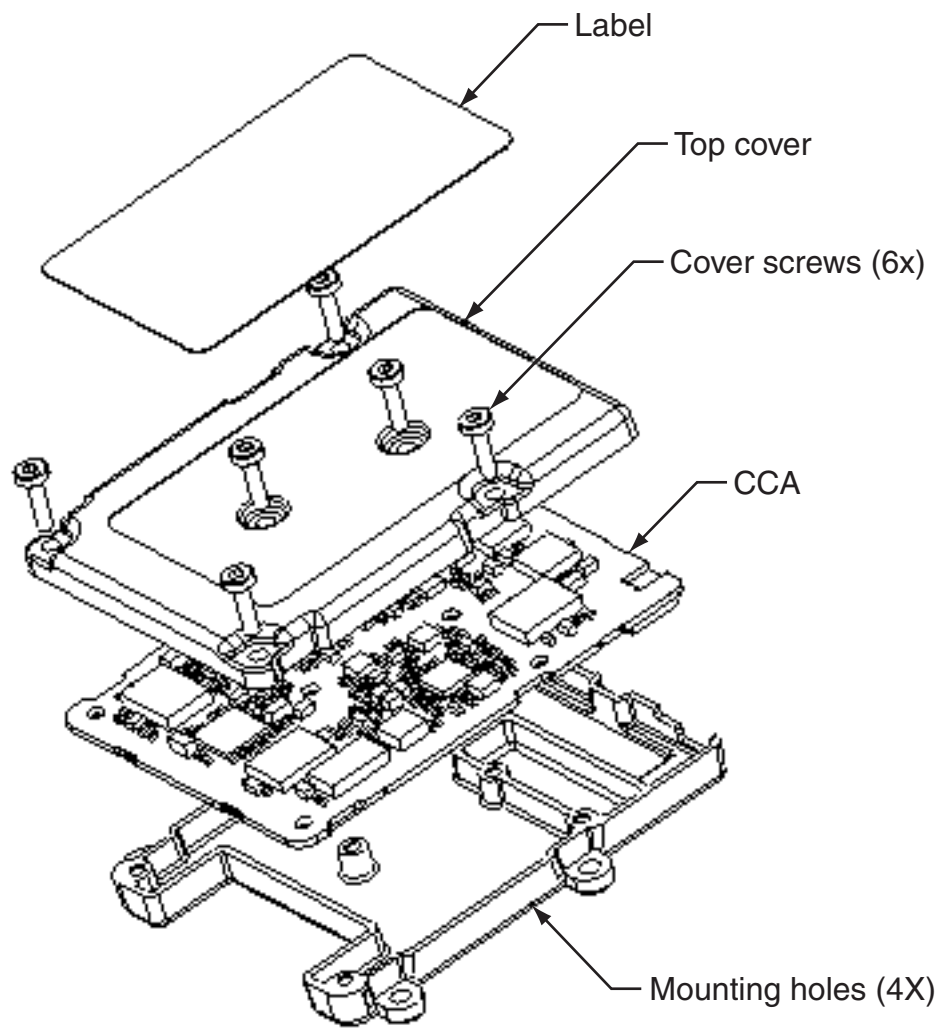
Land pattern and pin assignment for the Module interface mating connector



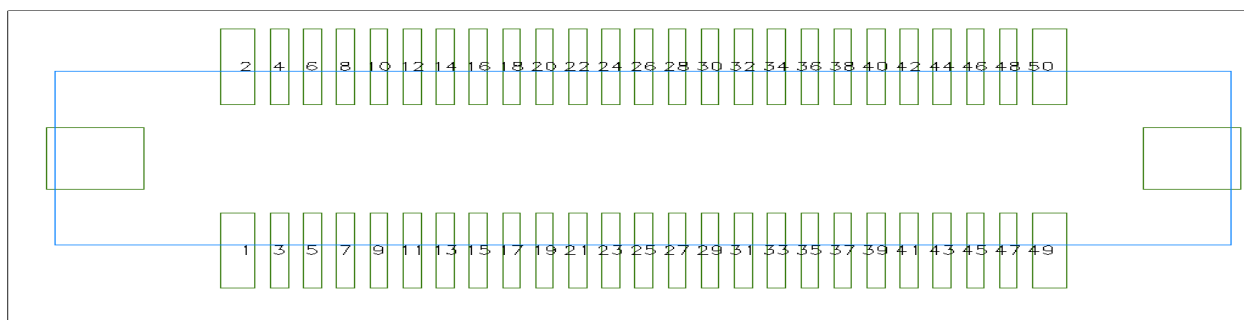
Mounting hole and land pattern placement guidelines



Module outside dimensions (mm)

**Module exploded view**

15 Assignments and Signal Definitions



50-pin Module interface connector pin assignments (viewed looking down on connector)

*Signal definitions of 50-pin Module interface connector
(Input/output are in reference to Module.)*

Pin #	Signal Name	Comment	Modem Signal Level	Type
1	VPH_PWR	Power to the CDMA transceiver	3.6 VDC min to 4.2 VDC max	Power input ⁽⁶⁾
2	GND	Signal and power return	GROUND	
3	VPH_PWR	Power to the CDMA transceiver	3.6 VDC min to 4.2 VDC max	Power input ⁽⁶⁾
4	GND	Signal and power return	GROUND	
5	VPH_PWR	Power to the CDMA transceiver	3.6 VDC min to 4.2 VDC max	Power input ⁽⁶⁾
6	GND	Signal and power return	GROUND	
7	VPH_PWR	Power to the CDMA transceiver	3.6 VDC min to 4.2 VDC max	Power input ⁽⁶⁾
8	GND	Signal and power return	GROUND	
9	VPH_PWR	Power to the CDMA transceiver	3.6 VDC min to 4.2 VDC max	Power input ⁽⁶⁾
10	GND	Signal and power return	GROUND	
11	VEXT#	Indicates that external power is being used	0 to VPH_PWR max	Analog control
12	N/C	No connection		
13	N/C	No connection		
14	LED_EN#	Enable external LED	0 to VPH_PWR max	Analog control
15	N/C	No connection		
16	LED_DRV	External LED drive	10 mA LED drive	Analog output

*Signal definitions of 50-pin Module interface connector
(Input/output are in reference to Module.)*

Pin #	Signal Name	Comment	Modem Signal Level	Type
17	N/C	No connection		
18	XCVR_DET	Indicates that transceiver is on		Digital output ⁽²⁾
19	N/C	No connection		
20	N/C	No connection		
21	XCVR_EN#	CDMA transceiver primary power enable	0 to VPH_PWR max	Analog input
22	MSM_DP_TXD	UART1 - transmit data	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
23	MSM_DP_RXD	UART1 - receive data	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ⁽²⁾
24	MSM_DP_CTS#	UART1 - clear to send	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ⁽²⁾
25	MSM_DP_RTS#	UART1 - ready for receive	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
26	MSM_DP_DTR#	UART1 - data terminal ready	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ^(2,3)
27	MSM_DP_RI#	UART1 - ring indicator	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
28	MSM_DP_DCD#	UART1 - data carrier detect	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
29	HS_PRE#	Headset detection input to MSM	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ^(2,3)
30	GND	Signal and power return	GROUND	
31	MSM_DP_TXD2	UART2 - transmit data	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
32	MSM_DP_RXD2	UART2 - receive data	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ⁽²⁾
33	MSM_DP_CTS2#	UART2 - clear to send	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Digital input ⁽²⁾
34	MSM_DP_RTS2#	UART2 - ready for receive	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽¹⁾
35	GND	Signal and power return	GROUND	
36	CAR_SCL	Analog Carkit SCL line	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Input/output
37	CAR_SDA	Analog Carkit SDA line	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Input/output ⁽¹⁾
38	CAR_MIC+	Analog carkit microphone input	$V_{IH}(\text{min}) = 1.9\text{V}$, $V_{IL}(\text{max}) = 0.9\text{V}$	Analog input ⁽²⁾
39	CAR_SPKR+	Analog Carkit Speaker output	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Analog output ⁽¹⁾
40	GND	Signal and power return	GROUND	

*Signal definitions of 50-pin Module interface connector
(Input/output are in reference to Module.)*

Pin #	Signal Name	Comment	Modem Signal Level	Type
41	HS_SPEAKER	Headset speaker audio output	1.5Vpp, 8.8mW into 32 ohm load	Analog output ⁽¹⁾
42	GND	Signal and power return	GROUND	
43	MAIN_MIC+	Main microphone positive input	1.8VDC nominal, -3Mv rms	Electret microphone input ⁽⁴⁾
44	MAIN_MIC-	Handset microphone negative terminal	GROUND	
45	GND	Signal and power return	GROUND	
46	EAR_SPKR+	Main speaker positive audio output	1.2VDC nominal, 3V pp with pin 47	Bridge amp output ⁽⁵⁾
47	EAR_SPKR-	Main speaker negative audio terminal	1.2VDC nominal, 3V pp with pin 46	
48	HS_MIC+	Headset microphone input	1.8VDC nominal, ~3Mv rms	Electret microphone input ⁽⁴⁾
49	GND	Ground for headset microphone	GROUND	
50	LSPKR_ON	Loudspeaker amp control output	$V_{OH}(\text{min}) = 2.4\text{V}$, $V_{OL}(\text{max}) = 0.5\text{V}$	Digital output ⁽²⁾

Notes:

1. Input connected directly to MSM. Do not exceed $V_{(\text{max})}$ of 3.1V; damage to MSM may result.
2. Output connected directly to MSM. Do not exceed $V_{(\text{max})}$ of 2.8V; damage to MSM may result.
3. 10K ohm pull-up resistor inside Module.
4. Input for standard electret microphone. 1.8V supplied via 2.2K ohm resistor inside Module.
5. Pins 46 and 47 are bridge (differential) amp outputs capable of driving 35 mW into a 32 ohm speaker connected between these pins.
6. 1200 mA required for full analog transmission capabilities.

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Module Developer's Kit Schematic

There are two earlier versions of the Module Developer's Kit (MDK) interface board.

If the interface board in your MDK has an identifier of either K4020 or K4021, you may request a schematic diagram by emailing module-support@kyocera-wireless.com.

