AirPrime MC73xx Mini Card / WP76xx Accessory Board

Comparison Guide

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Rev. 1

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Corporate and product information	Web: sierrawireless.com

Revision History

Revision number	Release date	Changes
1	March 2020	Document creation

Contents

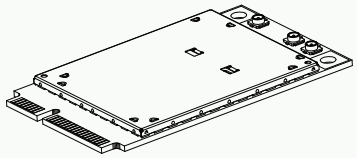
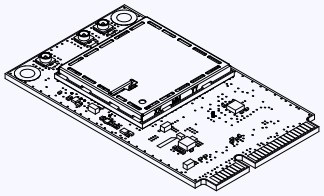
1: Introduction

This document provides information for developers planning to migrate from AirPrime MC73xx modules to AirPrime WP76xx accessory boards. Included is a features comparison, plus summaries of RF, interface, and mechanical differences between MC73xx modules and WP76xx Accessory Boards.

2: Features Comparison

The following table summarizes the key RF, interface, and mechanical features of the MC73xx modules and WP76xx Accessory Boards.

Table 2-1: Features Comparison

	MC7304	MC7330	MC7350	MC7354	WP7607 Accessory Board	WP7610 Accessory Board
Note: MC73xx modules and WP76xx Accessory Boards are footprint-compatible.						
RF						
GSM/EDGE	4-band	4-band	-	4-band	2-band	-
UMTS, HSDPA, HSUPA	4-band	5-band	-	5-band	2-band	3-band
LTE	5-band	3-band	3-band	6-band	6-band	8-band
CDMA	-	-	3-band	3-band	-	-
Stand-alone GNSS	GPS, GLONASS				GPS, GLONASS, Galileo, BeiDou	
A-GPS	Yes				Yes	
A-GNSS	Yes				Yes	
gpsOneXtra/IZat™ Gen8C Engine	gpsOneXtra				IZat™ Gen8C Engine	
Interfaces						
USB (full speed/high speed)	1				1	
SIM(1.8V/3V)	1				1	
Antenna connector	3				3	
Digital audio (PCM or I^2S)	1				1	
GPIO	4				4	
Flash LED	1				1	
I^2C	1				1	
Mechanical						
Operating temperature	-30 to +70 °C				-30 to +70 °C	
Dimensions	Length: 50.95 mm Width: 30 mm Thickness: 2.75 mm Weight: 8.6 g				Length: 50.95 mm Width: 30.05 mm Thickness: 3.95 mm Weight: 7.8 g	

3: Mini Card/Accessory Board Differences

This chapter identifies in greater detail the RF, interface, and mechanical differences between MC73xx modules and WP76xx Accessory Boards.

3.1 RF Differences

3.1.1 RF Bands

The following table describes supported RF bands and data rates for MC73xx modules and WP76xx Accessory Boards.

Table 3-1: Supported Bands (LTE, UMTS, GSM/EDGE)

Device	LTE																	UMTS, HSUPA, HSDPA							GSM/EDGE				CDMA				
	B1	B2	B3	B4	B5	B7	B8	B12	B13	B14	B17	B19	B20	B21	B25	B28	B66	B1	B2	B4	B5	B6	B8	B19	800	900	1800	1900	BC0	BC1	BC10	GPS	Voice
MC7304	Y		Y			Y	Y						Y					Y	Y		Y		Y		Y	Y	Y	Y				Y	
MC7330	Y											Y		Y				Y			Y	Y		Y	Y	Y	Y	Y				Y	
MC7350				Y					Y						Y														Y	Y	Y	Y	
MC7354		Y			Y				Y		Y				Y			Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	
WP7607 Accessory Board	Y		Y			Y	Y						Y			Y		Y					Y			Y	Y					Y	Y
WP7610 Accessory Board		Y		Y	Y			Y	Y	Y	Y						Y		Y	Y	Y											Y	Y

Table 3-2: Module Data Rates / Bandwidth

Device	Data Rates / Bandwidth
MC7304 MC7330	• GPRS Class 10, EDGE Class 12 • HSDPA 42 Mbps, HSUPA 5.76 Mbps • LTE Category 3 (100 Mbps downlink, 50 Mbps uplink)
MC7350	• CDMA IS-2000; up to 153 kbps, simultaneous forward and reverse channel • CDMA IS-856 (1xEV-DO Release A); up to 3.1 Mbps forward channel, up to 1.8 Mbps reverse channel • LTE Category 3 (100 Mbps downlink, 50 Mbps uplink)
MC7354	• EDGE Class 12 • HSDPA 42 Mbps, HSUPA 5.76 Mbps • CDMA IS-2000; up to 153 kbps, simultaneous forward and reverse channel • CDMA IS-856 (1xEV-DO Release A); up to 3.1 Mbps forward channel, up to 1.8 Mbps reverse channel • LTE Category 3 (100 Mbps downlink, 50 Mbps uplink)
WP7607 Accessory Board WP7610 Accessory Board	• (WP7607 Accessory Board only) GPRS Class 10, EDGE Class 12 • HSDPA 42 Mbps, HSUPA 5.76 Mbps • LTE Category 4 (150 Mbps downlink, 50 Mbps uplink)

3.2 RF Connectors

MC73xx modules and WP76xx Accessory Boards have three RF antenna connectors with functionality as described in Table 3-3.

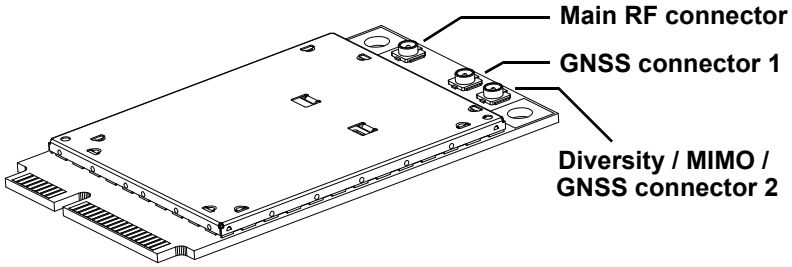


Figure 3-1: AirPrime MC73xx Mini Card RF Connectors

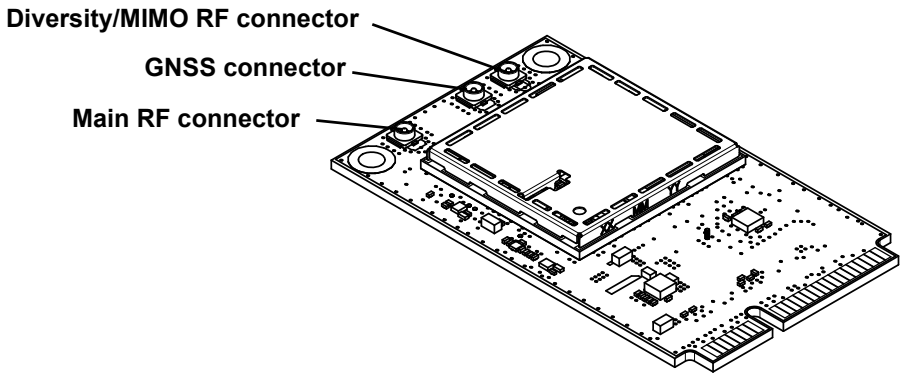


Figure 3-2: AirPrime WP76xx Accessory Board RF Connectors

Table 3-3: Antenna Connector Functionality

Device	Connector 1	Connector 2	Connector 3		Active Bias on Connector 2
	Main RF	GNSS	Diversity / MIMO	Secondary GPS	
MC7304	Yes	Yes	Yes	No	Yes
MC7330				Yes	
MC7350				No	
MC7354				Yes	
WP7607 Accessory Board	Yes	Yes	Yes	No	No
WP7610 Accessory Board				No	

3.3 Power Supply Differences

MC73xx mini cards and WP76xx accessory boards have different operating voltages, as detailed in Table 3-4.

Table 3-4: Operating Voltages

Device	Vin (Min)	Vin (Nominal)	Vin (Max)
MC73xx	3.0 V	3.3 V	3.6 V
WP76xx Accessory Boards	(WP7607) 3.2 V (WP7610) 3.4 V	3.7 V	4.3 V

3.4 Interface Differences

WP76xx accessory boards provide similar interface functionality to MC73xx mini cards, with the exceptions noted below in sections 3.4.1–3.4.2.

3.4.1 GPIO

MC73xx mini cards and WP76xx accessory boards provide four GPIOs, with three of the pins being available for antenna control functionality, as detailed in Table 3-5.

Table 3-5: GPIO Interface

Pin #	MC73xx Signal Name	WP76xx Accessory Board Signal Name
3	ANT_CTRL0/GPIO1[a]	ANT_CNTL0/GPIO1[b]
5	ANT_CTRL1/GPIO2[a]	ANT_CNTL1/GPIO2[b]
44	ANT_CTRL2/GPIO3	ANT_CNTL2/GPIO3[b]
46	DPR/GPIO4	GPIO4[b]

a. Pins 3 and 5 are named “ANT_CNTLx” in the MC73xx PTS, and “GPIOx” in the MC73xx Migration Guide
b. Accessory Board pins 3/5/44/46 map to the integrated WP module’s GPIO28/GPIO29/GPIO30/GPIO21.

3.4.2 Voltage Reference

MC73xx mini cards and WP76xx accessory boards provide a 1.8V reference voltage output, but refer to the pin name differently, as detailed in Table 3-6.

Table 3-6: Voltage Reference

Pin #	MC73xx Signal Name	WP76xx Accessory Board Signal Name
11	VCC_MSM_18_DIG	VGPIO

3.5 Unsupported WP Interfaces

WP76xx accessory boards do not provide access to the following WP76xx module interfaces:

- Control signals:
  - RESET_IN_N
  - SAFE_PWR_REMOVE
  - DR_SYNC
- UART—UART1, UART2
- HSIC
- Clocks—System, Sleep
- ADC
- SPI
- SDIO

3.6 Mechanical Differences

The following table describes the dimensions and weights of MC73xx mini cards and WP76xx accessory boards. For detailed mechanical information, refer to the specific product specifications for each device, as listed in Reference Documents on page 17.

Table 3-7: Mechanical Dimensions (Typical)

	MC7304	MC7330	MC7350	MC7354	WP7607 Accessory Board	WP7610 Accessory Board
Length (mm)	50.95				50.95	
Width (mm)	30				30.05	
Thickness (mm)	2.75				3.95	
Weight (g)	8.6				7.8	

3.7 Thermal Considerations

Additional heat dissipation techniques are highly recommended on the MC73xx mini cards and WP76xx accessory boards to ensure that they function properly.

To enhance heat dissipation:

- Maximize airflow over/around the mini card/accessory board.
- Locate the mini card/accessory board away from other heat-generating components.
- Mounting holes must be used to attach (ground) the mini card/accessory board to the main PCB ground or a metal chassis.
- You may need to add a heat sink that mounts the mini card/accessory board to the main PCB (thermal compound or pads must be used between the mini card/accessory board and the heat sink).
- You may also need active cooling to pull heat away from the mini card/accessory board.

For detailed information about additional thermal considerations, refer to the specific product specifications for each device, as listed in Reference Documents on page 17.

4: Regulatory Compliance and Industry Certifications

The following table lists the regulatory compliance and industry certifications for each MC73xx module and WP76xx accessory board. For detailed information, refer to the specific product specifications for each module, as listed in Reference Documents on page 17.

Table 4-1: Regulatory Compliance and Industry Certifications

Reg. Compliance	MC7304	MC7330	MC7350	MC7354	WP7607 Accessory Board	WP7610 Accessory Board
CE	Y					
FCC	Y		Y	Y		Y
GCF	Y				Y	Y
IC			Y	Y		Y
MIC		Y				
NCC	Y	Y	Y	Y		
PTCRB				Y		Y

5: Pinout Differences

The following table provides the pin (signal) details for MC73xx mini cards and WP76xx accessory boards.

Note: The signal names listed are as they appear in the modules' Product Technical Specification documents. Signals that have different functionality between the two series are highlighted in purple for quick reference.

Table 5-1: Pinout Comparison

Pin #	Signal Name		Function
	MC73xx	WP76xx Accessory Boards	
1	WAKE_N	WAKE_ON_WWAN_N	Wake host
2	VCC		Power supply
3	ANT_CTRL0/GPIO1	ANT_CNTL0/GPIO1	Customer-defined external switch control for multiple antennas/General purpose I/O
4	GND		Ground
5	ANT1_CTRL1/GPIO2	ANT_CNTL1/GPIO2	Customer-defined external switch control for multiple antennas/General purpose I/O
6	NC		No connect
7	NC		No connect
8	USIM_PWR	UIM1_VCC	SIM VCC supply
9	GND		Ground
10	USIM_DATA	UIM1_DATA	SIM I/O pin
11	VCC_MSM18_DIG	VGPIO	1.8V reference voltage output
12	USIM_CLK	UIM1_CLK	SIM clock
13	NC		No connect
14	USIM_RST	UIM1_RST	SIM reset
15	GND		Ground
16	NC		No connect
17	NC		No connect
18	GND		Ground
19	NC		No connect
20	W_DISABLE_N		Wireless Disable (main RF radio)
21	GND		Ground

Table 5-1: Pinout Comparison

Pin #	Signal Name		Function
	MC73xx	WP76xx Accessory Boards	
22	NC		No connect
23	NC		No connect
24	VCC		Power supply
25	NC		No connect
26	GND		Ground
27	GND		Ground
28	NC		No connect
29	GND		Ground
30	I2C_CLK		I^2C serial bus clock
31	NC		No connect
32	I2C_DATA		I^2C serial bus data
33	SYSTEM_RESET_N		Reset
34	GND		Ground
35	GND		Ground
36	USB_D-	USB_DN	USB data negative
37	GND		Ground
38	USB_D+	USB_DP	USB data positive
39	VCC		Power supply
40	GND		Ground
41	VCC		Power supply
42	WAN_LED_N		LED driver
43	GND		Ground
44	ANT_CTRL2/GPIO3	ANT_CNTL2/GPIO3	Customer-defined external switch control for multiple antennas/General purpose I/O
45	PCM_CLK/I2S_CLK		PCM/I^2S clock
46	DPR/GPIO4	GPIO4	MC73xx–Dynamic power control/General purpose I/O WP76xx—General purpose I/O
47	PCM_DOUT/I2S_DOUT	PCM_OUT/I2S_OUT	PCM/I^2S data output
48	NC		No connect
49	PCM_DIN/I2S_DIN	PCM_IN/I2S_IN	PCM/I^2S data input

Table 5-1: Pinout Comparison

Pin #	Signal Name		Function
	MC73xx	WP76xx Accessory Boards	
50	GND		Ground
51	PCM_WS/I2S_SYNC	PCM_SYNC/I2S_SYNC	PCM sync/I^2S word select
52	VCC		Power supply

6: Glossary

Table 6-1: Glossary

Term	Definition
GND	Ground
NC	Not Connected When a pin is marked as not connected, it means that no connection should be made from the pin to the application board.
PID	Product ID
USB	Universal Serial Bus
VID	Vendor ID

7: References

7.1 Web Site Support

Check source.sierrawireless.com for the latest available documentation for the AirPrime WP76xx Accessory Boards and AirPrime MC73xx modules.

7.2 Reference Documents

[1] AirPrime MC7304 Product Technical Specification and Customer Design Guidelines) (Doc# 4114634)

[2] AirPrime MC7330 Product Technical Specification and Customer Design Guidelines (Doc# 4114225)

[3] AirPrime MC7350 Product Technical Specification and Customer Design Guidelines (Doc# 4114103)

[4] AirPrime MC7354 Product Technical Specification and Customer Design Guidelines (Doc# 4114635)

[5] AirPrime WP76xx Accessory Board Product Technical Specification (Doc# 41113059)