WW-352, WWAN Mini PCIe Card with SIM Holder/GNSS Options

RoHS Compliant



Overview

WW-352 PCI Express Mini Card is designed based on Gemalto / Cinterion 3G/2.5G wireless WAN technologies. Not only exhibits excellent hardware/radio frequency performance, it also supports rich software for fast product development. Following the PCI Express Mini Card standard, it could be easily applied in devices with PC architecture.

In addition to WWAN, features of (a) ultra-sensitive GNSS (GPS & GLONASS), (b) SIM card holder, and (c) PCM for voice application are available for increasing your product value in just one card.

Applications

- Industrial PC / Netbook PC / Tablet PC / SBC
- Financial / Security / Payment / Inventory / Healthcare
- Kiosk /Digital Signage / Intelligent Vending Machine
- POS / Automatic Meter Reading
- School Bus / Transit / Taxi / Police
- Tracking & Tracing / Fleets Management
- Mobile Internet Terminal / Fixed Wireless Terminal
- Remote Monitoring / Telematics / Tele-health

Features

- PCI Express Mini Card standard V1.2 compliant
  - Communication via USB
  - Network status indication
  - Airplane mode support
  - Remote host wakeup support
- Powered by Gemalto EHS5x module
  - Dual-band UMTS/HSPA+WCDMA
    - 2100, 900 (MHz, -E: Europe, -E8: RIC)
    - 1900, 850 (MHz, -US: North America)
  - GSM/GPRS/ EDGE dual-band support
    - 1800, 900 (MHz, -E: Europe, -E8: RIC)
    - 1900, 850 (MHz, -US: North America)
- Downlink 7.2 Mbps/Uplink 5.76Mbps
- Abnormal temperature protection (out of -40~90℃)
  - Automatic GPRS multi-slot class change
- Rich driver/RIL support for various platforms
- Rich internet communication protocol support
  - TCP/IP stack access via AT commands
  - FTP, ICMP, DNS, TCP server & client, UDP client etc.
  - HTTP, SMTP, POP3, Transparent mode
- Proprietary support of voice via PCM
- Option of micro SIM card holder
- Option of high performance GNSS (GPS&GLONASS)
  - GNSS antenna short circuit protection
- Customer's IMEI on request
- Rich certificates for the attached module
  - Australia Government (-E & -US)
  - Canada Government IC (-US)
  - Canada Rogers (-US)
  - China Government (SRRC/CCC for –E, -E8)
  - Europe GCF/R&TTE (-E, -E8)
  - Israel Government (-E)
  - Mexico COFETEL Government (new name IFT; -E & -US)
  - Singapore IDA Gov. (-E)
  - South Africa ICASA Gov. (-E)
  - South Africa MTN (-E)

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- South Africa Vodacom (-E)
- Taiwan Government (-E, -E8)
- Turkey Government (-E)
- USA FCC/IC/PTCRB/UL Gov. (-US)
- USA AT&T (-US)

- Industrial grade operating temperature

Technical Specifications

Wireless WAN

Core Engine	Gemalto EHS5-E/-E8/-US module
Frequency bands	GSM/GPRS/EDGE: Dual-band 900/1800 MHz (-E, -E8) 850/1900 MHz (-US) UMTS/HSPA+: Dual-band 900/2100 MHz (-E, -E8) 850/1900 MHz (-US)
GSM class	Small MS
Output power	**Class 4** (+33dBm ±2dB) for EGSM850 (-US) **Class 4** (+33dBm ±2dB) for EGSM900 (-E/-E8) **Class 1** (+30dBm ±2dB) for GSM1800 (-E/-E8) **Class 1** (+30dBm ±2dB) for GSM1900 (-US) **Class E2** ● (+27dBm ± 3dB) for GSM 850 8-PSK (-US) ● (+27dBm ± 3dB) for GSM 900 8-PSK (-E/-E8) ● (+26dBm +3 /-4dB) for GSM 1800 8-PSK (-E/-E8) ● (+26dBm +3 /-4dB) for GSM 1900 8-PSK (-US) **Class 3** ● (+24dBm +1/-3dB) for UMTS 2100, WCDMA FDD Band I (-E/-E8) ● (+24dBm +1/-3dB) for UMTS 1900,WCDMA FDD Band II (-US) ● (+24dBm +1/-3dB) for UMTS 900, WCDMA FDD Band VIII (-E/-E8) ● (+24dBm +1/-3dB) for UMTS 850, WCDMA FDD Band V (-US)
HSPA Features/ 3GPP Release 6, 7	Down Link 7.2Mbps, Up Link 5.76Mbps HSDPA Cat.8 / HSUPA Cat.6 data rates Compressed mode (CM) supported according to 3GPP TS25.212
UMTS Features/ 3GPP Release 4	PS data rate – 384 kbps DL / 384 kbps UL CS data rate – 64 kbps DL / 64 kbps UL
GSM/GPRS/ EGPRS Features	Data transfer GPRS: ● Multi-slot Class 12 ● Full PBCCH support ● Mobile Station Class B ● Coding Scheme 1 – 4 EGPRS: ● Multi-slot Class 12 ● EDGE E2 power class for 8 PSK ● Downlink coding schemes – CS 1-4, MCS 1-9 ● Uplink coding schemes – CS 1-4, MCS 1-9 ● SRB loopback and test mode B ● 8-bit, 11-bit RACH ● PBCCH support ● 1 phase/2 phase access procedures ● Link adaptation and IR ● NACC, extended UL TBF ● Mobile Station Class B CSD: ● V.110, RLP, non-transparent ● 9.6kbps ● USSD SMS ● Point-to-point MT and MO ● Cell broadcast ● Text and PDU mode

	● Storage: SIM card plus SMS locations in mobile equipment
AT commands	Hayes 3GPP TS 27.007, TS 27.005, Gemalto M2M AT commands for RIL compatibility
SIM	SIM Application Toolkit: SAT Release 99 Support of 3V and 1.8V SIM cards

GNSS (GPS & GLONASS) + option

Receiver Type	SiRFstarV - 52 channels, L1 frequency, C/A code GPS & QZSS:1575.42MHz GLONASS: 1598.0625~1605.375MHz
Horizontal Position Accuracy	< 2.5m (Autonomous) (50% 24hr static, -130dBm)
Velocity Accuracy	<0.01 m/s (speed, autonomous) <0.01° (heading) (50%@30m/s)
Time To First Fix Hot start Warm start Cold start	Autonomous (50% -130dBm) <1sec <30sec <35sec
Sensitivity (Autonomous)	Acquisition: -146dBm (GPS) Tracking: -165dBm (GPS), -163dBm(GLONASS) Navigation: -160dBm (GPS), -159dBm(GLONASS) (-142dBm 28dB-Hz with 4dB noise figure)
Max. Update Rate	5Hz
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr.
Protocol Support	NMEA V4.00, 115200 bps (default) GGA, GSA, GSV, RMC, VTG
SBAS Support	WAAS, EGNOS, MSAS,GAGAN
Dynamics	<4g
Power Consumption	

+ **Note. According to IC Spec**

Windows Platform support

Windows XP, Vista, 7, 8 (Connection Manager for 7, 8)
RIL for Pocket PC and Smartphone - Windows Mobile 6, Windows CE 6, Windows Embedded Compact 7, and Windows Embedded Compact 2013

Linux Platform support

Compatible with standard USB kernel drivers

Mac OS/X Platform support

Android Platform support

From Android 2.1 up to latest 5.1 and keeps updating

Electrical Data

Power Supply	3.3 ± 0.3 V (VCC)
Power Consumption Airplane mode Full function mode&	(For WW-3520, w/o GPS) 53 mA 3G/2100MHz, RSSI -88 dBm: Max. 300mA, Average 250mA 2G/900MHz, RSSI -100 dBm: Max. 490mA, Average 250mA

& Measurement during data communication, values depend on cellular environment, antenna efficiency etc.

Environmental Data

WWAN Board temperature of EHS5-E8/-E/-US	-40 ~ 85℃*+: -30 ~ 85℃+ (fully functional) -40 ~ -30℃* (extended)
GNSS Operating temperature/	-40 ~ 85℃

* Occasional deviations from spec may occur

+ Airflow: min. 1 m/s

Mechanical Data (mm) - (full-mini card)

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30 x 50.9 x 4.4 (w/o SIM holder)

30 x 50.9 x 4.65 (w/ SIM holder)

Weight

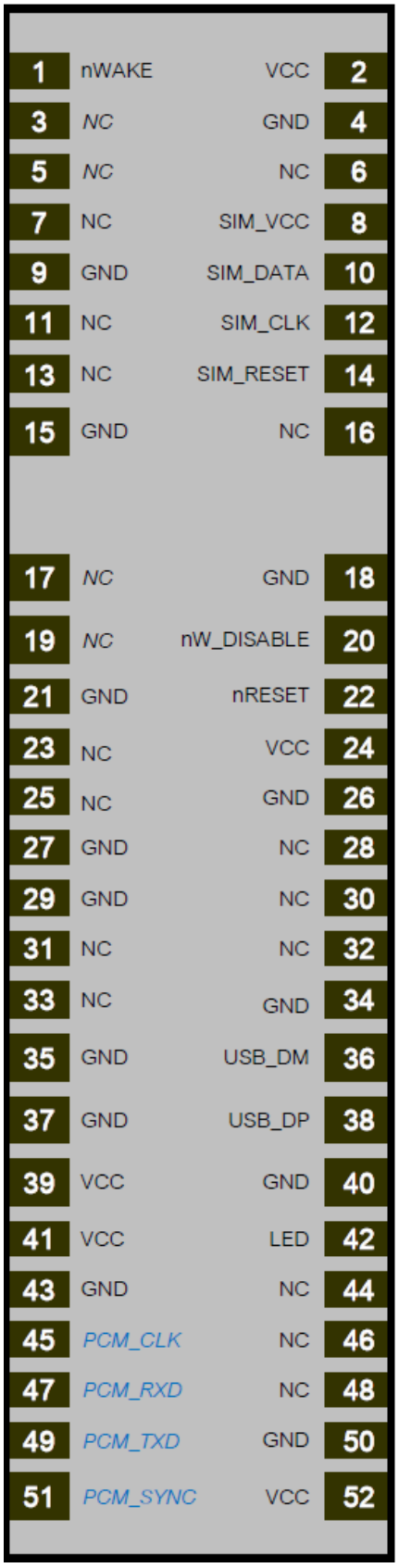
WW-3520S	7.3 g	WW-3520U	7.5 g
WW-3523S	7.9 g	WW-3523U	8.1 g

52-Pin Definition

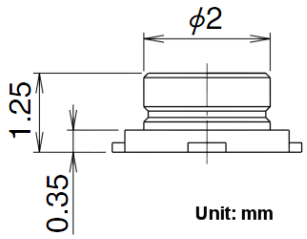
Name	PINs	Function	I/O
VCC	2,24,39,41,52	3.3V power supply, Min 3.0V, Max 3.6V	Input
GND	4,9,15,18,21,26 ,27,29,34,35,37 ,40,43,50	Ground	Input
USB_DM	36	USB data signal minus	I/O
USB_DP	38	USB data signal plus	I/O
LED	42	Open Drain active Low WWAN status indicator;	Output
SIM_VCC	8[!]	Power for SIM card	Output
SIM_DATA	10[!]	SIM data signal	I/O
SIM_CLK	12[!]	SIM clock signal	Output
SIM_RESET	14[!]	SIM reset signal	Output
nWAKE	1	Open drain, active low wakeup signal	Output
nW_DISABLE	20	Active low radio control signal, internal pull-up	Input
nRESET	22	Active low, min 10ms reset signal	Input
PCM_CLK[#]	45	PCM clock	Output
PCM_RXD[#]	47	PCM data into card	Input
PCM_TXD[#]	49	PCM data out of card	Output
PCM_SYNC[#]	51	PCM synchronization	Output
NC	Remaining pins	No connection	-

[!] Leave these pins open if SIM card was built-in

[#] Reserved pins used, proprietary

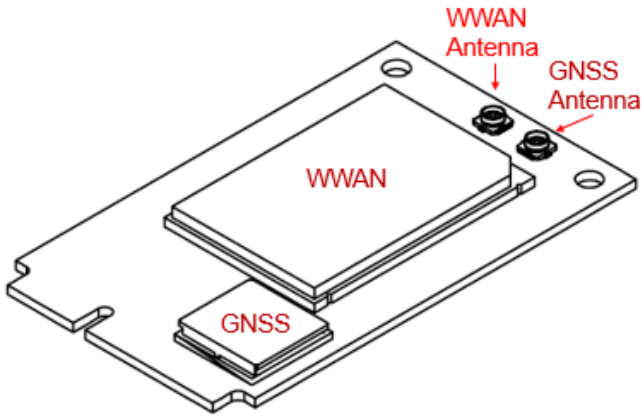


RF Connector: I-PEX Receptacle



Note. Corresponding plug cable: diameter of 1.13mm

Ordering Information



WW-352xy, where x = 0~5 as shown below

WW-	3520	3521	3522	3523	3524	3525
Region	-E8	-E	-US	-E8	-E	-US
GNSS	-	-	-	Y	Y	Y

-E8: RIC (Russia, India, greater China)

-E: EMEA

-US: North America

WW-352xy, where y = S, U as shown below

Feature \ Model	S	U
SIM Card Holder	-	Y

E.g. WW-3523U: with GNSS and SIM holder for regions of Russia, India, and greater China.

WW-3520U is the default standard product

* Connection Manager for PC Windows available

*This document is subject to change without notice.

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