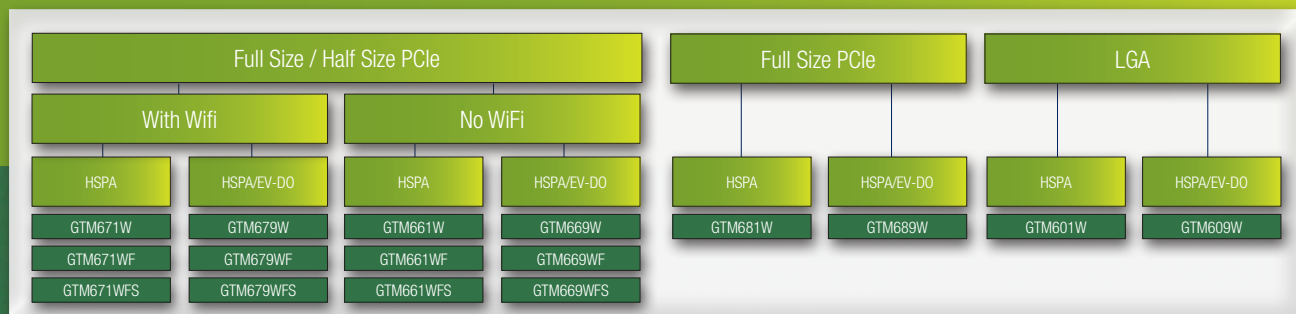


PCI Express MiniCard and LGA modules

High-speed multi-mode 3G

- > A wealth of connectivity
 - > High-speed data connectivity: 14.4Mbps downlink / 5.76Mbps uplink (HSPA)
 - > Highly-sensitive GPS
 - > Optional WiFi connectivity (GTM67x)
 - > Optional PCM voice capability (GTM66x, GTM67x, GTM60x)
 - > Optional SIM card holder and microSD card holder (GTM66x and GTM67x)
- > Worldwide 2G/3G coverage
 - > Quad-band GSM/GPRS/EDGE
 - > Quad/penta-band HSDPA/HSUPA
 - > Optional dual-band EV-DO (GTM6x9)



Embedded Modules

PCIe MiniCard – 3G+WiFi



Half Size
GTM671W (M06712),
GTM679W (M06792)

Full Size
GTM671WF (M06718),
GTM679WF (M06798)

Full Size with SIM/μSD
GTM671WFS (M06717),
GTM679WFS (M06797)

By adding a WiFi component on the 3G PCIe minicard, only one PCIe minicard slot is needed to offer both WiFi and 3G connectivity to your device, hence lowering overall device cost. This module is available in ½ size form factor or full size form factor. For the full-size module, an optional SIM card holder and micro SD card holder can be mounted which allows an all-in-one connectivity solution on a single PCIe card.

PCIe MiniCard – 3G



Half Size
GTM661W (M06612),
GTM669W (M06692)

Full Size
GTM661WF (M06618),
GTM669WF (M06698)

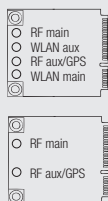
Full Size with SIM/μSD
GTM661WFS (M06617),
GTM669WFS (M06697)

Option's half-size PCIe module is developed specifically for integration in compact devices such as netbooks, tablet PCs, routers or security cameras where space is limited but a standard connector-based integration is still preferred over an LGA component that needs soldering. There is also a traditional full-size variant available with optional SIM card holder and microSD card holder.

Hardware specifications

Physical specifications

- > PCI Express Mini Card form factor, version 1.2 type H1 (half size) or type F1 (full size)
- > Dimensions: 26.8/51 x 30 x 4.2 mm
- > Weight: 9/10 g
- > Operating temperature: -10°C to +55°C
- > Operational humidity range: 10 - 90% RH non-condensing
- > Storage temperature: -40°C to +85°C
- > Storage humidity range: 5 - 95% RH non-condensing



Interfaces

- > 52-pin edge connector with
 - > USB2.0 high-speed
 - > DC power supply 3.3 V +/- 9%
 - > USIM/SIM connection – Class B and Class C
 - > W_DISABLE, WAKE, LED_WWAN, LED_WLAN, COEX signals
 - > PCM voice signal pins
 - > WiFi signal pins (PCI interface) (GTM67x only)
- > Primary and Diversity/GPS antenna, U.FL coax connector
- > Primary and Diversity WiFi antenna, U.FL coax connector (GTM67x only)
- > Optional SIM card holder (antenna side) and μSD card holder (back side) (GTM6xxWFS only)

Max. Connectivity speeds

- > GSM: 14.4 Kbps DL/14.4 Kbps UL
- > GPRS: 85.6 Kbps DL/85.6 Kbps UL (class 10/12)
- > EDGE: 236.8 Kbps DL/236.8 Kbps UL (class 10/12)
- > UMTS mode: 384 Kbps DL/384 Kbps UL
- > HSDPA mode: 14.4 Mbps (Cat 10) downlink speed
- > HSUPA mode: 5.76 Mbps (Cat 6) uplink speed
- > CDMA 1xRTT mode: 153 Kbps FL/153 Kbps RL
- > EV-DO RevA mode: 3.1 Mbps FL/1.8 Mbps RL
- > HSPA+ Rel 7 SW features: CPC (DTX/DRX), HS-SCCH-less operation, Enhanced CELL_FACH, Enhanced L2, EF-DPCH

Memory configuration

- > 128 MB NAND + 64 MB DDR MCP Memory, storing one WCDMA, one CDMA and one buffer image

Supported frequency bands

- > GSM/GPRS/EDGE: 850/900/1800/1900 MHz
- > UMTS/HSDPA/HSUPA: 800-850/900/1900/2100 MHz (B1, B2, B5, B6, B8)
- > CDMA 1xRTT/EV-DO rev0/EV-DO revA (GTM669/679 only): 800/1900 (BC0, BC1)

Current consumption

- > Typical talk current (GPS off)
 - > 3G: 630mA (WCDMA 2100@ 24dBm), 250mA (voice 2100)
 - > 2G: 300mA (EDGE 850 PCL8), 230mA (GSM voice 850@ 23dBm)
- > Typical standby current (GPS off)
 - > 3G: 1.7mA
 - > 2G: 3mA
- > Typical GPS delta current 30mA

Hardware description

- > MDM6200™ (GTM6X1) or MDM6600™ (GTM6X9) + PM8028™
- > Simultaneous Equalization and Rx Diversity on all bands (Advance Receiver Type 3i), except for GSM/GPRS/EDGE

Max. RF output power

- > Power Class 4 (2 W, 33 dBm) for GSM/GPRS 850/900 MHz bands
- > Power Class 1 (1 W, 30 dBm) for GSM/GPRS 1800/1900 MHz bands
- > Power Class E2 (0.5 W, 27 dBm) for EDGE 850/900 MHz bands
- > Power Class E2 (0.4 W, 26 dBm) for EDGE 1800/1900 MHz bands
- > Power Class 3 (0.25 W, 24 dBm) for UMTS 850/900/1900/2100 MHz bands
- > Power Class 3 (0.25 W, 24 dBm) for 1xRTT & EV-DO
- > Power 32 mW (15 dBm) for WiFi (GTM671/GTM679 only)

Typical RF conducted sensitivity

- > EDGE (850/900/1800/1900): -104.5/-107.5/-104.5/-102.5 dBm
- > WCDMA (B1/B2/B4/B5/B8): -110/-110.5/-111/-112.2/-112 dBm
- > 1x (BC0/BC1): -109.5/-108 dBm
- > EV-DO (BC0/BC1): -111/-110 dBm

GPS: gpsOne Gen8

- > Standalone GPS, Assisted GPS, gps OneXTRA™, WiFi PS
- > Wideband GPS processing (20MHz) for improved measurement accuracy
- > Tracking sensitivity -154 dBm (typical)
- > TTFF : strong signal (-130 dBm) 32s, weak signal 50s

Voice support

- > Basic Telephony and Supplementary services
- > Vocoder support for 3GPP and 3GPP2 (Narrowband and Wideband)
- > Enhanced Echo Cancellation and Noise Suppression
- > Fluence Enhanced Voice Features
- > Support for Voice Calibration & Tuning

PCIe MiniCard Full Size



GTM681W (M06812),
GTM689W (M06892)

This is the original Gobi™ 3000 design that was made by Qualcomm. Option is a Gobi licensee and can sell this module to its customers, customized and bundled with optional software (such as a connection manager or a RIL) and/or service offerings (such as specific regulatory or operator certifications).

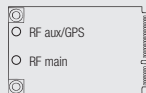
Hardware specifications

Physical specifications

- > PCI Express Mini Card form factor, v 1.2, type F2 (full size, single sided)
- > Dimensions: 51 mm x 30 mm x 3.1 mm
- > Weight: 9 g
- > Operating temperature: -30°C to +70°C
- > Storage temperature: -40°C to +85°C

Interfaces

- > 52-pin edge connector with
 - > USB2.0 high-speed
 - > DC power supply:
 - 3.2-3.6 V (CDMA/WCDMA)
 - 3.0-3.6 V (GSM)
 - > USIM/SIM connection – Class B and Class C
 - > W_DISABLE, WAKE and LED_WWAN signals
- > Primary and Diversity/GPS antenna, U.FL coax connector (primary on bottom)



Max. Connectivity speeds

- See PCIe MiniCard Half Size, except for:
- > GPRS: 85.6 Kbps DL/42.8 Kbps UL (class 10)
 - > EDGE: 236.8 Kbps DL/118.4 Kbps UL (class 10)

Memory Configuration

- > 128 MB NAND + 32 MB DDR MCP Memory, stores up to 6 FW images

Supported frequency bands

- > GSM/GPRS/EDGE: 850/900/1800/1900 MHz
- > UMTS/HSDPA/HSUPA: 800-850/900/1900/2100 MHz and AWS band (1700/2100 MHz) (B1, B2, B4, B5, B6, B8)
- > CDMA 1xRTT/EV-DO rev0/EV-DO revA (GTM689 only): 800/1900 (BC0, BC1)

Current consumption

- > Typical talk current (GPS off)
 - > 3G: 700mA (WCDMA 2100@ 23 dBm)
 - > 2G: 325mA (EDGE 850 PCL8)
- > Typical standby current (GPS off)
 - > 3G: 1.7mA
 - > 2G: 3mA
- > Typical average GPS current (radio off) 80mA

Hardware description

See PCIe MiniCard Half Size

Max. RF output power

See PCIe MiniCard Half Size

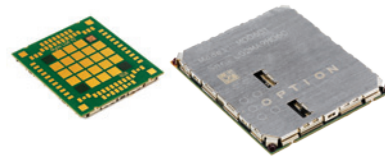
Typical RF conducted sensitivity

See PCIe MiniCard Half Size

GPS: gpsOne Gen8

See PCIe MiniCard Half Size

LGA



GTM601W (M06012),
GTM609W (M06092)

Due to its ultra-thin form factor and excellent heat dissipation characteristics this is the perfect module for integration in small consumer electronics devices or broadband M2M applications. The GPS, voice and optional EV-DO capabilities give this module a unique position. The new and improved footprint facilitates soldering.

Hardware specifications

Physical specifications

- > MCM in LGA package
- > Dimensions: 31.8 mm x 26.8 mm x 2 mm
- > Weight: 5 g
- > Operating temperature: -30°C to +80°C
- > Storage temperature: -40°C to +85°C

Interface

- > LGA with 70 signal contact pads & 25 ground/heat dissipation pads
- > USB2.0 high-speed
- > DC power supply 3.2-4.2V (single cell battery)
- > USIM/SIM connection – Class B and Class C
- > W_DISABLE, WAKE and LED_WWAN signals
- > Primary, diversity and GPS antenna contact pads
- > 4 x 4-Wire for UART/UIM/SPI/PCM/NFC/I²C/I²S communication



Max. Connectivity speeds

- See PCIe MiniCard Half Size, except for AT&T certified module:
- > GPRS: 85.6 Kbps DL/42.8 Kbps UL (class 10)
 - > EDGE: 236.8 Kbps DL/118.4 Kbps UL (class 10)

Memory Configuration

See PCIe MiniCard Half Size

Supported frequency bands

- > GSM/GPRS/EDGE: 850/900/1800/1900 MHz
- > UMTS/HSDPA/HSUPA: 800-850/900/1900/2100 MHz (B1, B2, B5, B6, B8)
- > CDMA 1xRTT/EV-DO rev0/EV-DO revA (GTM609 only): 800/1900 (BC0, BC1)

Current consumption

- > Typical talk current (GPS off)
 - > 3G: 630mA (WCDMA 2100@ 24dBm), 250mA (voice 2100)
 - > 2G: 300mA (EDGE 850 PCL8), 230 mA (GSM voice 850@ 23dBm)
- > Typical standby current (GPS off)
 - > 3G: 1.7mA
 - > 2G: 3mA
- > Typical GPS delta current 30mA

Hardware description

See PCIe MiniCard Half Size

Max. RF output power

See PCIe MiniCard Half Size

Typical RF conducted sensitivity

See PCIe MiniCard Half Size

GPS: gpsOne Gen8 with GNSS

See PCIe MiniCard Half Size
Additionally: Concurrent GPS/Glonass operation with 55SVs

Voice support

See PCIe MiniCard Half Size

Software

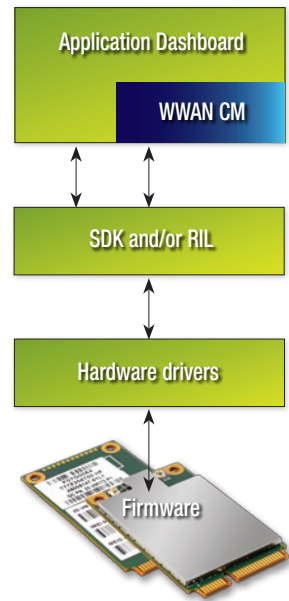
From embedded firmware to a full-featured connection manager, Option supports the entire software chain for embedded modules. Being a Qualcomm and Gobi licensee, Option has full access to the firmware that is running on the Qualcomm baseband processor. This allows Option to make customizations for its customers to support certain features or operator requirements. Drivers are available for the most popular operating systems. For some platforms such as Android™ and Windows® Mobile, a RIL (Radio Interface Layer) can be provided. For other platforms Option can deliver a SDK or a customizable connection manager.

Optional feature packs are available, like:

- > “MyCloud”; cloud computing, delivering back-up, synchronisation and file sharing functionalities.
- > uCAN® Control; a mobil data consumption and warning policy solution for end-users.

Supported operating systems:

- > Windows® XP 32 bit
- > Windows® Vista 32/64 bit
- > Windows® 7 32/64 bit (Mobile Broadband API, Sensor and Location API)
- > Linux® (kernel version 2.6.26 and higher)
- > Android™: RIL, audio HAL, GPS HAL
- > Google Chrome™
- > Windows CE/Mobile : RIL, GPS driver
- > MeeGo™



Services

Customer-specific 3G module/device



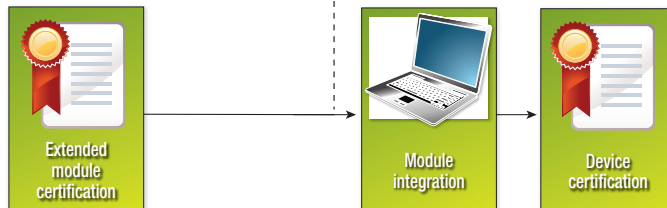
module



device



Option standard module



device



Option® offers a complete portfolio of services ranging from 3G module/device design, certification, manufacturing and integration up to certification of devices with embedded modules. These services facilitate wireless 3G integration in a wide range of mobile broadband enabled devices such as the traditional laptops and netbooks, but also e-readers, MID's, portable navigation devices and cameras. Some of the services are standard and offered free of charge when purchasing a sufficient amount of modules from Option. Other services can be offered against a certain fee.

For more detailed information about our embedded modules services, please contact your Option account manager or services@option.com. For more sales information, please contact sales@option.com.



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