



CELLULAR GSM/GPRS MODEM with MOTOROLA G20 MODULE

Specification



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February, 2006**

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CELLULAR GSM/GPRS MODEM WITH MOTOROLA G20 MODULE



Cellular GSM/GPRS Modem with MOTOROLA G20 Module is the extremely small dimensions board. The board could be used in any system or product that needs to transfer data information or voice. Thus, it significantly enhances the system's capabilities, transforming it from a standalone, isolated product to a powerful component connected to communication nets. The modem allows your GNSS receiver to be operating as a multifunctional base or rover, access it from the Internet even in the field, to use CORS, NTRIP and other available RTK networks. The modem has two models, one for North America Frequency bands (850/1900 MHz), and one for European Bands (900/1800 MHz).

Specification

Component	Details
Technical	
Operating Systems	EGSM: 900/1800 MHz GSM: 850/1900 MHz
Tx power	0.6 W, 850 MHz 2 W, 900 MHz 1 W, 1800/1900 MHz
GPRS	Multi-slot class 8 (4 down; 1 up) Max BR 85.6 Kbps Class B GSM 07.10 multiplexing protocol Coding scheme CS1-CS4
CSD	Max BR 14.4 Kbps
SMS	MO/MT Text and PDU modes Cell broadcast
FAX Class 1	
Interfaces	
One serial port	Data and Command port
Electrical Interface	UART or RS-232C (manual selectable)
Data Rates	BR from 300 bps to 115 Kbps Auto BR from 300 bps to 115 bps
SIM Card	Local SIM connectivity 32 K SIM 3.0 V
Connectors	20-PIN HOST (DTE) 8-pin SIM CARD 5-pin HEADSET RF MMCX HOST MODEM RF MMCX ANTENNA
Voice Features	
Telephony	
Differential analog audio lines	

Component	Details
Vocoders EFR/ER/AMR	
DTMF support	
GSM Supplementary Service	
USSD Phase II	
Call forwarding	
Call hold, waiting and multiparty	
Call diverting	
Calling Line Identify	
AOC	
Call barring	
Missed-call indicator	
Control/Status Indicators	
GPRS Coverage	
Wakeup	
Tx enable	
Reset	
Emergency and Locations	
FCC E911 Phase II Location Mandate using EODT	
Command Set	
GSM 07.05 AT Commands	
GSM 07.07 AT Commands	
Motorola proprietary AT Commands	
Power Input	
Input Voltage	+6...20 VDC

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Component	Details
Power Consumption (during a call)	
GSM 850	0.4 ...1 W
GSM 900	0.4 ...0.75 W
DCS 1800	0.4...0.9 W
PCS 1900	0.4...0.9 W
Mechanical	
Dimension	100 mm x 4.5 mm x 12.32 mm
Weight	30 g
Environmental	
Operation Temperature:	-20 °C to +60 °C
Functional Temperature	-20 °C to +70 °C
Storage Temperature	-40 °C to +85 °C
Humidity	95% non-condensing
Antenna Performance Recommendations	
Frequencies	
GSM 850	TX 824-849 MHz RX 869-893 MHz
GSM 900	TX 880-915 MHz RX 925-960 MHz
DCS 1800	TX 1710-1785 MHz RX 1805-1880 MHz
PCS 1900	TX 1850-1910 MHz RX 1930-1990 MHz
Gain	0 dBi gain or greater
Impedance	50 Ohm
VSWR	Typical: 1.5:1 Worst case: 2.5:1

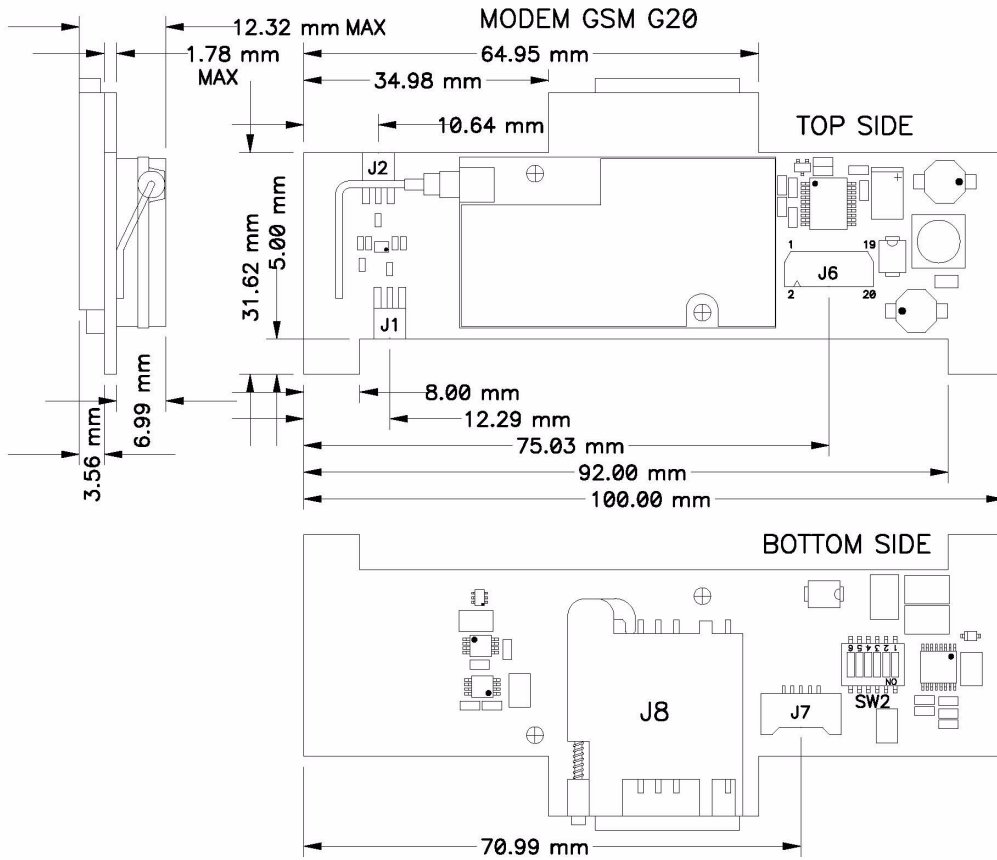
Antenna Installation

A minimum separation distance of 20 cm needs to be maintained between the antenna and all persons. The transmitter effective radiated power must be less than 3.0 Watts ERP (4.9 Watts or 36.9 dBm EIRP). This required that the combination of antenna gain and feed line loss does not exceed 16 dBi

Features

- One serial ports
- EGSM: 900/1800 MHz for Europe or GSM: 850/1900 MHz Module for North America
- Low power consumption gives extended battery life for portable applications
- Compact footprint
- 6 to 20 VDC voltages
- SIM card on-board
- External reset pin
- GPRS coverage indicator
- Headset connector
- Additional input antenna port to use Host and Cellular modem with one antenna port

Dimensions and Layout



External Connectors

Main HOST (DTE) connector (J6)

2 row x 10 pin, HIROSE P/N DF20F-20DP-1H

Pin#	Signal Name	Description	I/O	Comments
1	GND	Ground	-	
3	VIN	Power Supply	I	Analog DC, +6V to +20 VDC
5	G20_TXD1	G20 UART TXD signal	O	Logic, high +2.8 V, 69 kOhm pull-up
7	G20_CTS1	G20 UART CTS signal	I	Logic, high +2.8 V, 69 kOhm pull-up
9	WAKEUP_IN	G20 wakeup input	I	Logic, high +2.8 V, 22 kOhm pull-up
11	G20_RESET	G20 reset output	O	Logic, high +2.8 V
13	ANT_DET	Antenna Connection Detect	O	Logic, high +2.8 V, 47 kOhm pull-up
15	G20_ON	When G20-ON is high at least 600 ms, then G20 is on. When G20-ON is low at least 300 ms, then G20 is off.	I	Logic, high +(2.8...4) V, 47 kOhm pull-down
17	DTR UART	Data Terminal Ready signal	I	Logic, high +2.8 V, 69 kOhm pull-up
19	CD UART	Carrier detect signal	O	Logic, high +2.8 V, 69 kOhm pull-up
2	GND	Ground	-	
4	VIN	Power Supply	I	Analog DC, +6V to +20 VDC
6	G20_RXD1	G20 UART RXD signal	I	Logic, high +2.8 V, 69 kOhm pull-up
8	G20_RTS1	G20 UART RTS signal	O	Logic, high +2.8 V, 69 kOhm pull-up
10	WAKEUP_OUT	G20 wakeup output	O	Logic, high +2.8 V
12	TX_EN	GSM Transmit indicator	O	Logic, high +2.8 V, 22 kOhm pull-up
14	GPRS_DET	GPRS Coverage indicator	O	Logic, high +2.8 V, 69 kOhm pull-up

16	SUPPLY_ON	When SUPPLY_ON is high or left open, then modem power supply is on. When SUPPLY_ON is low, then modem power supply is off.	I	Logic, high +(2.8...4) V, low +(0...0.4) V
18	DSR UART	Data Set Ready signal	O	Logic, high +2.8 V, 69 kOhm pull-up
20	RI UART	Ring Indicator signal	O	Logic, high +2.8 V, 69 kOhm pull-up

Auxiliary HEADSET connector (J5)

1 row x 5 pin, MOLEX P/N 53780-0590

Pin#	Signal Name	Description	I/O	Comments
1	HDST_MIC	Microphone Input	I	Audio, Max 12.0 mVrms
2	GND	Ground	-	
3	HDST_INT	Headset-detect interrupt	O	Logic, high +2.8 V 4
4	3V		O	
5	HDST_SPK	Speaker	O	

Auxiliary SIM CARD connector (J4)

1 row x 8 pin, MOLEX P/N 91228-0001

Pin#	Signal Name	Description	I/O	Comments
7	SIMPRES	SIM-presence detect	I	Logic, high + 2.8 V
3	SIMCLK	SIM clock	O	Logic, high + (1.8...3.0) V
1	SIMVCC	SIM VCC	O	Analog DC, + (1.8...3.0) V
6	SIMDATA	SIM serial data	I/O	Logic, high + (1.8...3.0) V
2	SIMRST	SIM reset	O	Logic, high + (1.8...3.0) V
4	GND	Ground	-	
8	GND	Ground	-	

RF Connectors

J2 is antenna input/ output connector

J1 is a HOST MODEM antenna input/ output connector

These connectors are MMCX Jack, MICROMATE Edge Mount, AMPHENOL P/N 908-22100.

Acronym/Term	Definition/Description
AOC	Advice of Charge
CSD	Circuit-switched Data
DCE	Data Communication Equipment (such as modems)
DCS	Digital Cellular System (GSM in the 1800 MHz band)
DTE	Data Terminal Equipment
DTMF	Dual-Tone Multi-Frequency
EGSM	Extended Global System for Mobile Communications
GPRS	General Packed Radio Service
GSM	Global System for Mobile Communications
MMCX	Miniature Micro Coax
MO	Mobile Originated
MT	Mobile Terminated
PCS	Personal Communication System (also known as GSM 1900)
PDU	Packet Data Unit
SIM	Subscriber Identify Module
SMS	Short Message Service
UART	Universal Asynchronous Receiver Transmitter
USSD	Unstructured Supplementary Services Data

