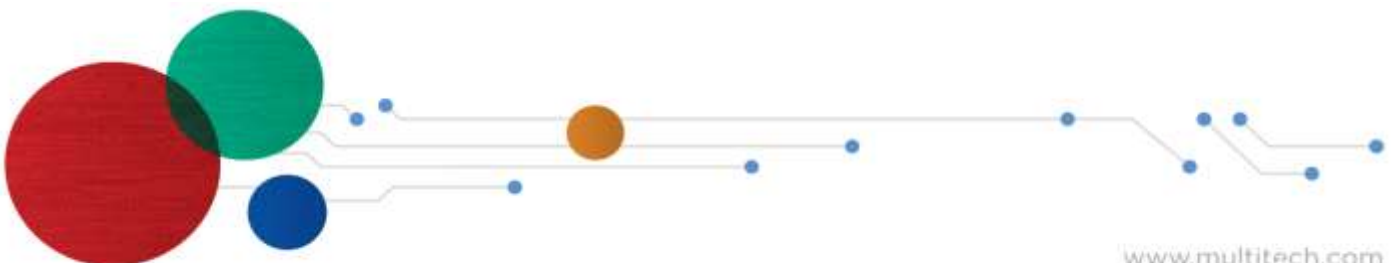




# SocketModem<sup>®</sup> Cell GPRS

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## MTSMC-G3 Device Guide



## SocketModem Cell GPRS G3 Device Guide

S000543, Version C

MTSMC-G3

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### Warranty

To read the warranty statement for your product, please visit: <http://www.multitech.com/warranty.go>.

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# Device Overview

## Description

SocketModem Cell GPRS models are complete ready-to-integrate communication devices that offer standards-based quad-band GSM/GPRS Class 10 performance. These quick-to-market communications devices allow developers to add wireless communication to products with a minimum of development time and expense. It uses industry-standard open interfaces and Multi-Tech's Universal Socket design.

## Product Build Options

Product	Description	Region
MTSMC-G3	2G GSM/GPRS Class 10 Quad-band SocketModem	Europe
<b>Developer Kit</b>		
MTSMI-UDK	Universal Developer Kit	Global

### Notes:

To connect these to a network, you need a SIM card for your network. Contact your network carrier to obtain a SIM card.

All builds can be ordered individually or in 50-packs.

The complete product code may end in .Rx, for example MTSMC-G3.Rx, where R is revision and x is the revision number.

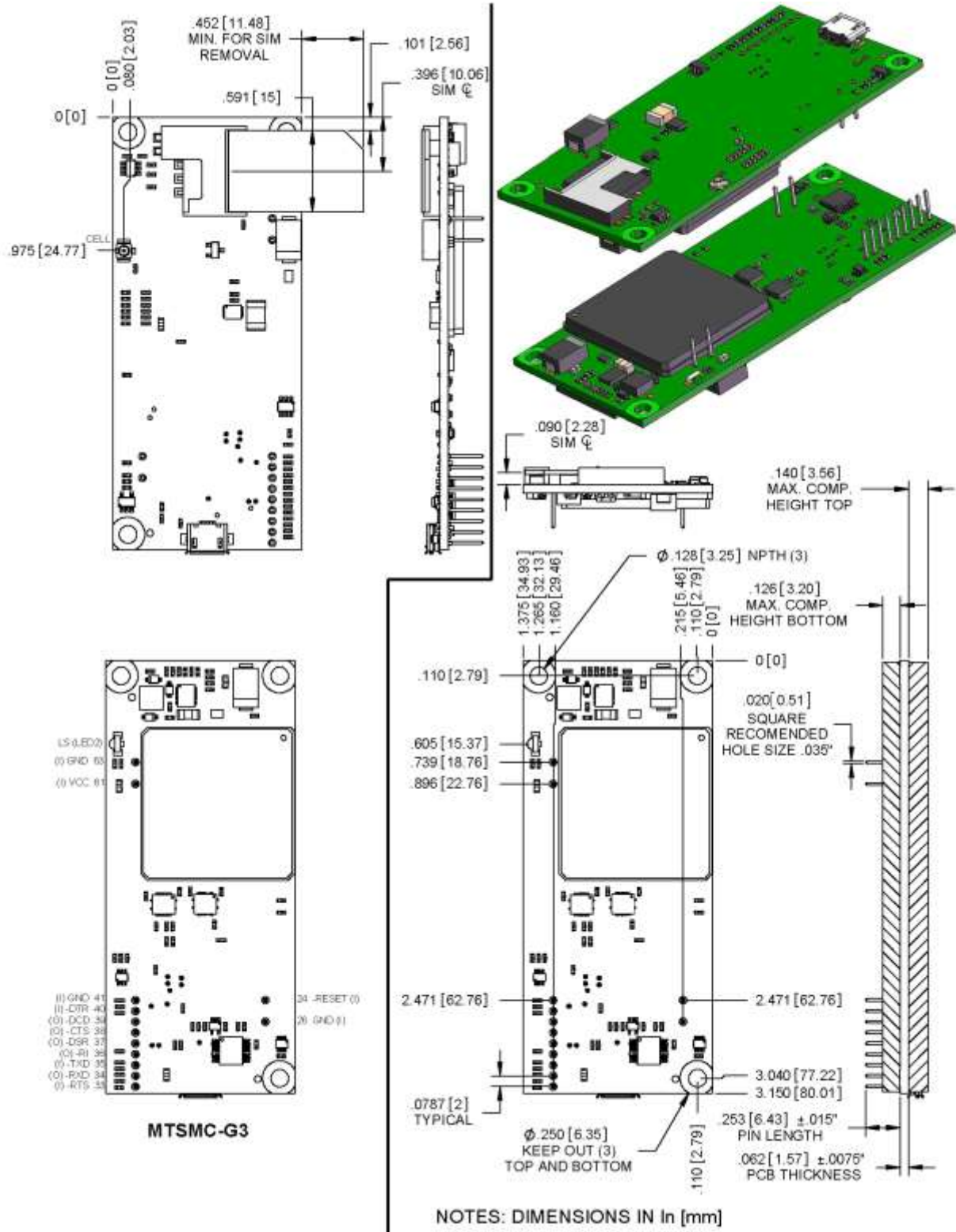
## Documentation

The following documentation is available on the MultiTech website at <https://www.multitech.com/models/92503289LF>.

- **Device Guides** – This document. Provides model-specific specifications and developer information.
- **Universal Socket Developer Guide** – Provides an overview, safety and regulatory information, design considerations, schematics, and general device information.
- **AT Command Guide** – Use the following AT Command Guides with GPRS devices:
  - S000545 for G3 Modems

# Mechanical Drawings

## MTSMC-G3 Builds



# Specifications

## Technical Specifications

Category	Description
<b>General</b>	
Standards	GPRS Class 10
Frequency Bands	Quad-band EGSM 850/900/1800/1900 MHz
<b>Speed, Format</b>	
Serial/Data Speed	Serial interface supports DTE speeds up to 921.6Kbps Packet data up to 85.6Kbps
Data Format	10 bit serial asynchronous GPRS Data: Class 10 Mobile Station Class B Coding Scheme 1 to 4 PBCCH Support GERAN Feature Package 1 support
<b>Physical Description</b>	
Weight	1 oz. (28g)
Dimensions	3.15" x 1.375" (80.010 mm x 34.93 mm)
<b>Connectors</b>	
Antenna Connector	Surface mount UFL one cellular
SIM Holder	Standard 1.8V and 3V
<b>Environment</b>	
Operating Temperature	-40° C to +85° C
Storage Temperature	-40 °C to +85°C
Humidity	10% to 90%
<b>Power Requirements</b>	
Operating Voltage	3.3V - 5V
Input Power	3.3 - 5VDC
<b>IP, SMS</b>	
Supported IP Protocols	FTP, SMTP, TCP and UDP.
SMS	Point-to-point mobile originated and mobile terminated SMS Concatenated SMS supported Text and PDU mode SMS over GPRS
<b>Certifications, Compliance</b>	
EMC Compliance	EN55022 EN55024
Radio Compliance	EN 301 511 EN 301 489-1 EN 301 489-7
Safety Compliance	IEC 60950-1

**Note:** Radio performance may be affected by temperature extremes. This is normal.

## Mounting Hardware

The board has three mounting holes at corners. Use #4 or M3 hardware for mounting the SocketModem to the board. Refer to the Mechanical Drawings for more information.

### Recommended Parts

Manufacturer	Part	Part Number
PEM PennEngineering	Surface Mount Standoff	SMTSO-M3-4ET
RAF Electronic Hardware	3/16" Hex Female Standoff	2051T-440-S-12 Zinc
RAF Electronic Hardware	4.5mm Hex Female Standoff	1251-3005-S-12 Zinc

## Device Reset

The SocketModem is ready to accept commands after a fixed amount of time ("X" Time) after power-on or reset.

Model	Time Constant	"X" Time	Minimum Reset Pulse <sup>1</sup>	Maximum Reset Pulse
MTSMC-G3	250 ms	6 seconds	200 $\mu$ s	Less than 1 second

<sup>1</sup>The SocketModem may respond to a shorter reset pulse.

### Reset GPRS

Use this signal to force a reset procedure by providing low level during reset of at least 500 $\mu$ s. The signal is considered an emergency reset only. A reset procedure is already driven by internal hardware during the power-up sequence. If no external reset is necessary, leave this input open. If using emergency reset, it has to be driven by an open collector or an open drain.

## Powering Down Your Device

**CAUTION:** Failing to properly shutdown the device before removing power may corrupt your device's file system.

To properly power down your device, use the following sequence:

1. Issue the AT#SHDN command.
2. Wait 30 seconds.
3. Power off the device. Disconnect power from the device.

## RS-232 Signal DC Electrical Characteristics

Units: Volts

Applies to the following pins:

Pin	Signal Name	Pin	Signal Name
J33	-RTS	J37	-DSR
J34	-RXD	J38	-CTS
J35	-TXD	J39	-DCD
J36	-RI	J40	-DTR

Parameter	Minimum	Maximum
<b>3.3 Volt Powered</b>		
Input Low Level	0	0.55
Input High Level	1.5	3.3
Output Low Level	0	0.55
Output High Level	2.35	3.3
<b>5 Volt Powered</b>		
Input Low Level	0	0.8
Input High Level	2.3	5
Output Low Level	0	0.55
Output High Level	3.7	5

### Absolute Maximum Rating

All models can run with an input voltage of either 3.3V or 5V. The maximum voltage on any signal pin equals the input voltage.

### Electrical Characteristics Other Pins

Pin	Signal Name	VIL		VIH		VOL		VOH	
		Min	Max	Min	Max	Min	Max	Min	Max
J24	-RESET		0.8	2.0		--	--	--	--
J26	GND	--	--	--	--	--	--	--	--
J41	GND	--	--	--	--	--	--	--	--
J61	VCC	--	--	--	--	--	--	--	--
J63	GND	--	--	--	--	--	--	--	--



## Pinout Specifications

Pin	Signal Name	Logic Level Voltage <sup>1</sup>	I/O	Description
J24	–RESET	3.3 – 5.0	I	Device reset (active low)
J26	GND	GND	GND	Ground
J33	–RTS	5.0	I	Request to send (active low)
J34	–RXD	5.0	O	Received data (active low)
J35	–TXD	5.0	I	Transmitted data (active low)
J36	–RI	5.0	O	Ring indicator (active low)
J37	–DSR	5.0	O	Data set ready (active low)
J38	–CTS	5.0	O	Clear to send (active low)
J39	–DCD	5.0	O	Data carrier detect (active low)
J40	–DTR	5.0	I	Data terminal ready (active low)
J41	GND	GND	GND	Ground
J61	VCC	5.0	PWR	DC input power
J63	GND	GND	GND	Ground

<sup>1</sup> A hyphen (-) indicates a range of acceptable logic levels.

## Power Measurements

Multi-Tech Systems, Inc. recommends that you incorporate a 10% buffer into your power source when determining product load.

Radio Protocol	Sleep Mode Current (Amps)	Cellular Call Box Connection No Data (Amps)	Average Measured Current (Amps) at Maximum Power	Average TX Pulse Amplitude Current (Amps)	Total Inrush Charge measured in Millicoulombs (mC)
<b>3.3 Volts</b>					
<b>GSM 850 Mhz</b>	0.032	0.054	0.358	1.85	14.02
<b>5 Volts</b>					
<b>GSM 850 Mhz</b>	0.028	0.042	0.223	1.1	13.96

**Maximum Power:** The continuous current during maximum data rate with the radio transmitter at maximum power.

**TX Pulse:** The average peak current during a GSM850 transmission burst period. The transmission burst duration for GSM850 varies depending on what transmission scheme is being deployed (GPRS Class 8, Class 10, GSM, etc.).

**In-Rush Charge:** Total inrush charge at power on.

## EMC, Safety, and R&TTE Directive Compliance

Hereby, MULTI-TECH SYSTEMS INC, declares that this Socket Wireless Module is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

RF spectrum use (R&TTE art. 3.2)	EN 301 511 V9.0.2 EN 300 440-2 V1.4.1 <sup>(1)</sup>
EMC (R&TTE art. 3.1b)	EN 301 489-1 V1.9.2 EN 301 489-3 V1.4.1 <sup>(1)</sup> EN 301 489-7 V1.3.1
Health & Safety (R&TTE art. 3.1a)	EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 EN 62311:2008

<sup>(1)</sup>Only applicable to MTSMC-G3-MI-GP and MTSMC-G3-GP product version.

The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1995/5/EC has been followed with the involvement of the following Notified Body:

AT4 wireless, S.A.  
Parque Tecnológico de Andalucía  
C/ Severo Ochoa 2  
295990 Campanillas – Málaga  
SPAIN  
Notified Body No: 1909

Thus, the following marking is included in the product:



The image shows the CE marking followed by the number 1909, indicating the Notified Body responsible for the conformity assessment.

There is no restriction for the commercialization of this device in all the countries of the European Union.

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 2004/108/EC of 15 December 2004 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 2006/95/EC of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

and

Council Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

# Application Notes

## LED Interface

The LED signal indicates the SocketModem working status.

### LED 2 – Link Status

LED 1 Signal	Link Status LED	
OFF	Download mode or switched OFF	
ON	Continuously lit	Switched ON (not registered on the network)
	Blinking	Switched ON (registered on the network)

## RF Performances

RF performances are compliant with the 3GPP release 4.

### Receiver Features

Category	Description
850 GSM Sensitivity	-108 dBm
900 E-GSM Sensitivity	-108 dBm
1800 DCS Sensitivity	-108 dBm
1900 PCS Sensitivity	-108 dBm

### Transmitter Features

Category	Description
Maximum output power (GSM/E-GSM)	+33 dBm $\pm$ 2 dB
Maximum output power (DCS/PCS)	+30 dBm $\pm$ 2 dB

## RF Connection and Antenna

The RF connector on the SocketModem is a UFL standard type. See the Universal Socket Developer Guide for antenna details.

## Changing the Quad Band

If for any reason, such as moving the modem from one geographical area to another, you want to change the band, you can accomplish this by using the **#BND** AT Command.

### Changing the GSM Band

To change the GSM band, use a terminal application such as HyperTerminal for entering the AT Command.

1. Start the terminal application.
2. Type **AT+BND=<Band>**. Press **Enter**.  
For **<Band>**, enter the option you desire:

**0** = GSM 900MHz + DCS 1800MHz

**1** = GSM 900MHz + PCS 1900MHz

**2** = GSM 850MHz + DCS 1800MHz

**3** = GSM 850MHz + PCS 1900MHz

#### Example:

AT+BND=0. Press Enter.