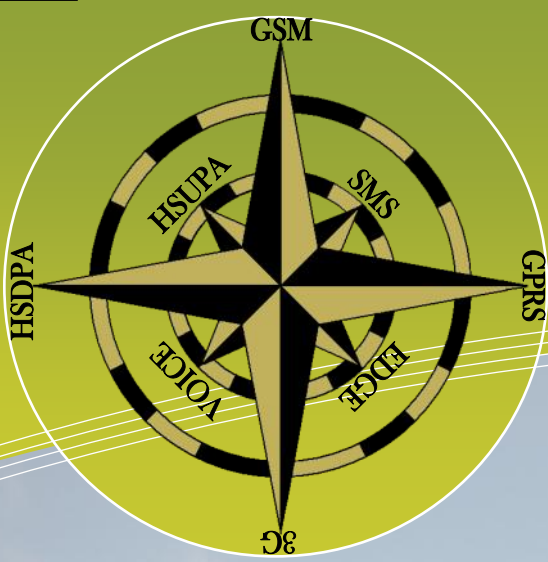
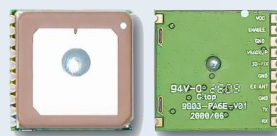
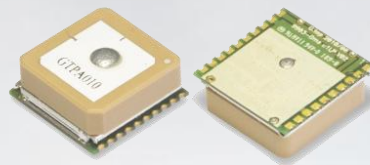


Shortforms & Application Notes



True Freedom shouldn't come at great cost

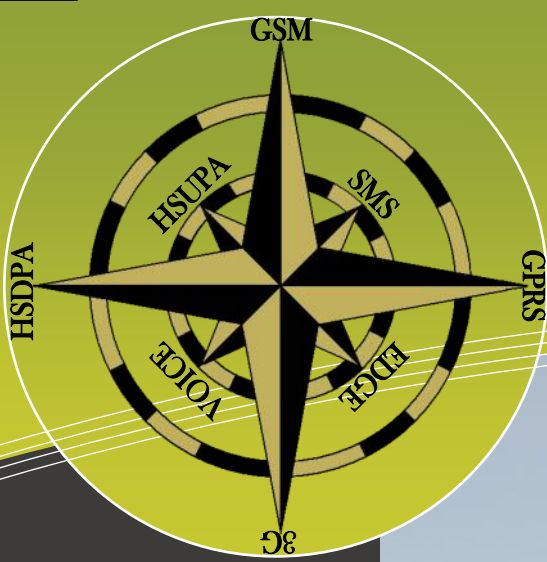


The Wireless, RF and Connector People
GSM/GPRS/3G and GPS modules and modems, antennas and accessories
Wireless interfacing solutions for embedded designs



SIM900

MINIATURE QUAD-BAND GSM / GPRS SURFACE MOUNT MODULE



OVERVIEW

The SIM900 is the first member of a new family of ARM926EJ-S based modules doubling the core performance frequency versus traditional ARM7 based solutions. At the same time, with advanced and innovative design, the SIM900 can reduce sleep mode power consumption, providing a power saving of up to 40% compared to current industry averages.

It is delivered in an SMT package size of 24x24x3mm

Considering the high performance, low power, and small size, SIM900 is an ideal wireless module for many M2M applications where cost is a critical issue.

GENERAL FEATURES

- Quad Band 850 / 900 / 1800 / 1900 MHz
- GPRS Multi-slot class 10 / 8
- GPRS Mobile Station class B
- Compliant to GSM phase 2 / 2+
 - Class 4 (2W @ 850 / 900 MHz)
 - Class 1 (1W @ 1800 / 1900 MHz)
- Dimensions: 24 x 24 x 3mm
- Weight: 7g
- Control via AT Commands (GSM 07.07, 07.05 and SIMCOM enhanced AT Commands)
- SIM Application Toolkit
- Supply Voltage Range 3.4V—4.5V
- Low Power Consumption
- Normal Operating temperature: -40°C to +85°C

INTERFACES

- Interface to External SIM 3V / 1.8V
- Analog Audio Interface
- RTC backup
- Two Serial Interfaces
- Antenna Pad

FAX SPECIFICATIONS

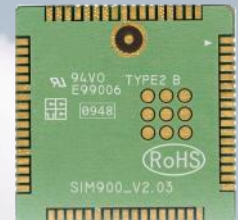
- Group3, Class 1

DRIVERS

- MUX Driver

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode



DATA SPECIFICATIONS

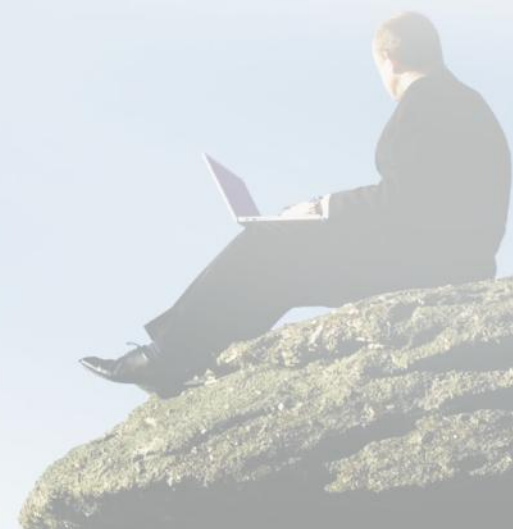
- GPRS Class 10: max 85.6 kbps downlink
- PBCCH support
- Coding Schemes CS 1, 2, 3, 4
- CSD up to 14.4 kbps
- USSD
- Transparent and Non Transparent Mode
- PPP-stack

VOICE SPECIFICATIONS

- Tricodex
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- Hands-free operation (Echo Suppression)

COMPATIBILITY

- AT Cellular Command Interface



SIM900B

QUAD-BAND GSM / GPRS BOARD-TO-BOARD MOUNT MODULE



OVERVIEW

The SIM900 was the first member of a new family of ARM926EJ-S based modules doubling the core performance frequency versus traditional ARM7 based solutions. At the same time, with advanced and innovative design, the SIM900 can reduce sleep mode power consumption, providing a power saving of up to 40% compared to current industry averages.

The SIM900B is the second family member, providing the same performance improvements, while substantially reducing cost.

Considering the high performance, low power, and small size, SIM900B is an ideal wireless module for many M2M applications where cost is a critical issue.

GENERAL FEATURES

- Quad Band 850 / 900 / 1800 / 1900 MHz
- GPRS Multi-slot class 10 / 8
- GPRS Mobile Station class B
- Compliant to GSM phase 2 / 2+
 - Class 4 (2W @ 850 / 900 MHz)
 - Class 1 (1W @ 1800 / 1900 MHz)
- Dimensions: 40 x 33 x 3mm
- Weight: 7g
- Control via AT Commands (GSM 07.07, 07.05 and SIMCOM enhanced AT Commands)
- SIM Application Toolkit
- Supply Voltage Range
 - Normal: 3.4V—4.5V
 - Extreme: 3.1V—4.7V (Set via AT command: AT+VR=1)
- Low Power Consumption
- Normal Operating temperature: -30°C to +80°C

INTERFACES

- 60 Pin Board-to-board Connector Interface to External SIM 3V / 1.8V
- Two Analog Audio Interfaces
- RTC backup
- Serial Interfaces
- Embedded SIM (option)
- Embedded SIM Holder (option)
- Keypad
- GPIO
- PWM
- ADC
- Antenna Connector

FAX SPECIFICATIONS

- Group3, Class 1



DATA SPECIFICATIONS

- GPRS Class 10: max 85.6 kbps downlink
- PBCCH support
- Coding Schemes CS 1, 2, 3, 4
- CSD up to 14.4 kbps
- USSD
- Transparent and Non Transparent Mode
- PPP-stack

VOICE SPECIFICATIONS

- Tricodec
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- Hands-free operation (Echo Suppression)
- AMR
 - Half Rate (HR)
 - Full Rate (FR)

DRIVERS

- MUX Driver

COMPATIBILITY

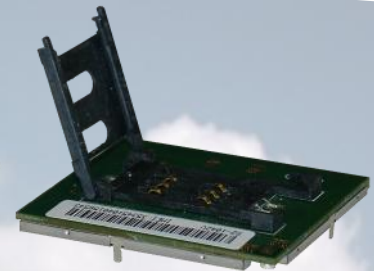
- AT Cellular Command Interface

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode

SIM900BE

QUAD-BAND GSM / GPRS BOARD-TO-BOARD MOUNT MODULE
WITH SIM CARD HOLDER



OVERVIEW

The SIM900 was the first member of a new family of ARM926EJ-S based modules doubling the core performance frequency versus traditional ARM7 based solutions. At the same time, with advanced and innovative design, the SIM900 can reduce sleep mode power consumption, providing a power saving of up to 40% compared to current industry averages.

The SIM900BE is the third family member, providing the same performance, while reducing cost by the further addition of an onboard SIM card holder.

The high performance, low power, and small size of the SIM900BE makes it an ideal wireless module for many M2M applications.

GENERAL FEATURES

- Quad Band 850 / 900 / 1800 / 1900 MHz
- GPRS Multi-slot class 10 / 8
- GPRS Mobile Station class B
- Compliant to GSM phase 2 / 2+
 - Class 4 (2W @ 850 / 900 MHz)
 - Class 1 (1W @ 1800 / 1900 MHz)
- Dimensions: 40 x 33 x 3mm
- Weight: 7g
- Control via AT Commands (GSM 07.07, 07.05 and SIMCOM enhanced AT Commands)
- SIM Application Toolkit
- Supply Voltage Range
 - Normal: 3.4V—4.5V
 - Extreme: 3.1V—4.7V (Set via AT command: AT+VR=1)
- Low Power Consumption
- Normal Operating temperature: -30°C to +80°C

INTERFACES

- 60 Pin Board-to-board Connector Interface to External SIM 3V / 1.8V
- Two Analog Audio Interfaces
- RTC backup
- Serial Interfaces
- Embedded SIM (option)
- Embedded SIM Holder (option)
- Keypad
- GPIO
- PWM
- ADC
- Antenna Connector

FAX SPECIFICATIONS

- Group3, Class 1

DATA SPECIFICATIONS

- GPRS Class 10: max 85.6 kbps downlink
- PBCCH support
- Coding Schemes CS 1, 2, 3, 4
- CSD up to 14.4 kbps
- USSD
- Transparent and Non Transparent Mode
- PPP-stack

VOICE SPECIFICATIONS

- Tricodec
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- Hands-free operation (Echo Suppression)
- AMR
 - Half Rate (HR)
 - Full Rate (FR)

DRIVERS

- MUX Driver

COMPATIBILITY

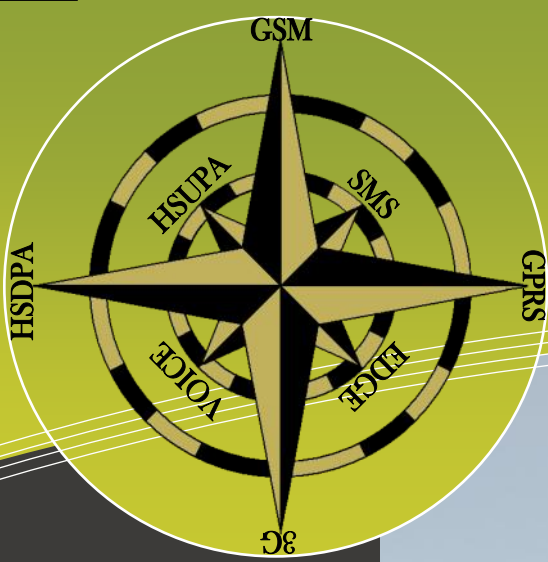
- AT Cellular Command Interface

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode

SIM5215E

WCDMA / HSPA / GSM / GPRS / EDGE PLUG-IN MODULE



OVERVIEW

The SIM5215 is a Dual-band WCDMA and Tri-band GSM / GPRS / EDGE Module with supports WCDMA 384kbps for data transfer.

With rich application capability like embedded LUA script, TCP / UDP / FTP / HTTP / SMTP / POP3 and MMS, this module presents the engineer with flexibility and ease of integration.

The module is ideal for a wide range of products, including AMR, gateway, Telematics, Tracking Solutions, Security and more.

GENERAL FEATURES

- SIM5215A:
 - Dual-Band UMTS / HSDPA 850 / 1900MHz
 - GSM / GPRS 850 / 900 / 1900MHz
- SIM5215E:
 - Dual Band UMTS / HSDPA 900 / 2100MHz
 - GSM / GPRS 850 / 900 / 1800MHz
 - GPRS multi-slot class 12
 - EDGE multi-slot class 12
 - WCDMA 3GG release 99
 - Output Power:
 - UMTS 2100 / 900MHz: 0.25W
 - GSM 850 / 900MHz: 2W
 - DCS 1800MHz: 1W
 - Control via AT commands
 - Supply Voltage range: 3.3V to 4.2V
 - Operating Temperature: -30°C to +85°C
 - Dimension: 36 x 26 x 4.7mm

INTERFACES

- USB 2.0
- UART
- USIM Car
- ADC
- GPIO
- I2C
- Micro-SD Card

SMS SPEC

- Point to point MO and MT
- Text and PDU mode

CSD, NETWORK IDENTITY AND TIMEZONE SPEC

- Support in GSM and WCDMA



DATA SPECIFICATIONS

- WCDMA:
 - max 384Kbps (DL & UL)
- EDGE Class:
 - max 236.8Kbps (DL), max 118Kbps (UL)
- GPRS:
 - max 85.6Kbps (DL), max 42.8Kbps (UL)
- CSD:
 - GSM Data rate 14.4Kbps
 - WCDMA Data rate 57.6Kbps

VOICE SPECIFICATIONS

- Tricodex
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- AMR
- DTMF

SUPPORT EMBEDDED SCRIPT

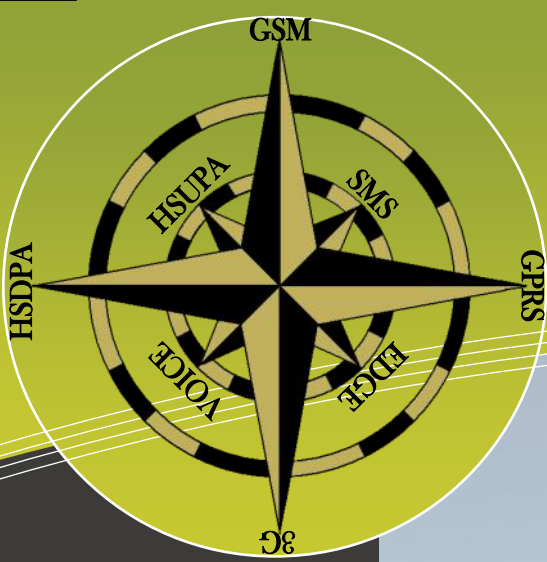
- LUA Script Language

OTHER FEATURES

- USB Driver for Microsoft Windows 2000 / XP / Vista
- USB Driver for Linux 2.6.16
- Firmware update via USB
- MMS
- TCP / IP
- FTP / HTTP / SMTP / POP3
- FOTA
- USB Audio

SIM5216E

WCDMA / HSPA / GSM / GPRS / EDGE PLUG-IN MODULE



OVERVIEW

The SIM5216 is a Dual-band WCDMA and Tri-band GSM / GPRS / EDGE Module with supports WCDMA 3.76Mbps (DL) and 384kbps (UL) for data transfer.

With rich application capability like embedded LUA script, TCP / UDP / FTP / HTTP / SMTP / POP3 and MMS, this module presents the engineer with flexibility and ease of integration.

The module is ideal for a wide range of products, including AMR, gateway, Telematics, Tracking Solutions, Security and more.

GENERAL FEATURES

- SIM5215A:
 - Dual-Band UMTS / HSDPA 850 / 1900MHz
 - GSM / GPRS 850 / 900 / 1900MHz
- SIM5215E:
 - Dual Band UMTS / HSDPA 900 / 2100MHz
 - GSM / GPRS 850 / 900 / 1800MHz
 - GPRS multi-slot class 12
 - EDGE multi-slot class 12
 - WCDMA 3GG release 99
 - Output Power:
 - UMTS 2100 / 900MHz: 0.25W
 - GSM 850 / 900MHz: 2W
 - DCS 1800MHz: 1W
 - Control via AT commands
 - Supply Voltage range: 3.3V to 4.2V
 - Operating Temperature: -30°C to +85°C
 - Dimension: 36 x 26 x 4.7mm

INTERFACES

- USB 2.0
- UART
- USIM Car
- ADC
- GPIO
- I2C
- Micro-SD Card

SMS SPEC

- Point to point MO and MT
- Text and PDU mode

CSD, NETWORK IDENTITY AND TIMEZONE SPEC

- Support in GSM and WCDMA



DATA SPECIFICATIONS

- WCDMA:
 - max 3.76Mbps (DL) / 384kbps (UL)
- EDGE Class:
 - max 236.8Kbps (DL), max 118Kbps (UL)
- GPRS:
 - max 85.6Kbps (DL), max 42.8Kbps (UL)
- CSD:
 - GSM Data rate 14.4Kbps
 - WCDMA Data rate 57.6Kbps

VOICE SPECIFICATIONS

- Tricodect
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- AMR
- DTMF

SUPPORT EMBEDDED SCRIPT

- LUA Script Language

OTHER FEATURES

- USB Driver for Microsoft Windows 2000 / XP / Vista
- USB Driver for Linux 2.6.16
- Firmware update via USB
- MMS
- TCP / IP
- FTP / HTTP / SMTP / POP3
- FOTA
- USB Audio

SIM5218E

WCDMA / HSPA / GSM / GPRS / EDGE PLUG-IN MODULE



OVERVIEW

The SIM5218E is a WCDMA / HSPA / GSM / GPRS / EDGE module solution supporting up to 7.2Mbps downlink speed and 5.76Mbps uplink speed data service. It also has strong capability with rich interfaces including UART, USB2.0, SD Card, Video Call with Camera Sensor Interface, GPS, I2C, GPIO, WCDMA Equaliser and WCDMA Diversity.

With its high speed functionality and strong interfacing capabilities, SIM5218E is ideal for a wide range of products including USB modems, gateways, routers, PDAs, Video Phone.

GENERAL FEATURES

- HSDPA 7.2Mbps / HSUPA 5.76Mbps
- UMTS / HSDPA / HSUPA 850 / 1900 / 2100 MHz
- Quad-Band GSM 850 / 900 / 1800 / 1900 MHz
- GPRS & EDGE multi-slot class 12
- UMTS / HSDPA 3GPP release 5
- UMTS / HSUPA 3GPP release 6
- GSM 3GPP release 99
- Output Power
 - UMTS 2100 / 1900 / 850: 0.25W
 - GSM850 / PCS 1900: 2W
 - DCS1800 / PCS 1900: 1W
- Control via AT commands
- Supply Voltage Range: 3.4V ~ 4.2V
- Temperature Range
 - Normal Operation: -15°C to +55°C
 - Restricted operation: -20°C to +70°C
 - Storage temperature: -40°C to +85°C
- Dimension: 58 x 26 x 4.5mm

INTERFACES

- Embedded SIM card option
- USB 2.0
- UART
- SIM Card
- Audio: 2 Microphones, 3 Speakers
- Video (Camera)
- I2C
- GPIO

SMS SPEC

- Point to point MO and MT
- Text and PDU mode

CSD, NETWORK IDENTITY AND TIMEZONE SPEC

- Support in GSM and WCDMA

DATA SPECIFICATIONS

- HSDPA:
 - max 7.2mbps (DL)
 - UE Category; 4, 6, 8, 12
- HSUPA:
 - max 5.76Mbps (UL)
- HSUPA + HSDPA
 - max 2.0Mbps (UL) + 3.6Mbps (DL)
- WCDMA:
 - max 384Kbps (DL & UL)
- EDGE Class:
 - max 236.8Kbps (DL), max 118Kbps (UL)
- GPRS:
 - max 85.6Kbps (DL), max 42.8Kbps (UL)
- CSD:
 - GSM Data rate 14.4Kbps
 - WCDMA Data rate 57.6Kbps

VOICE SPECIFICATIONS

- Tricodec
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- AMR
- DTMF

VIDEO CALL SPEC

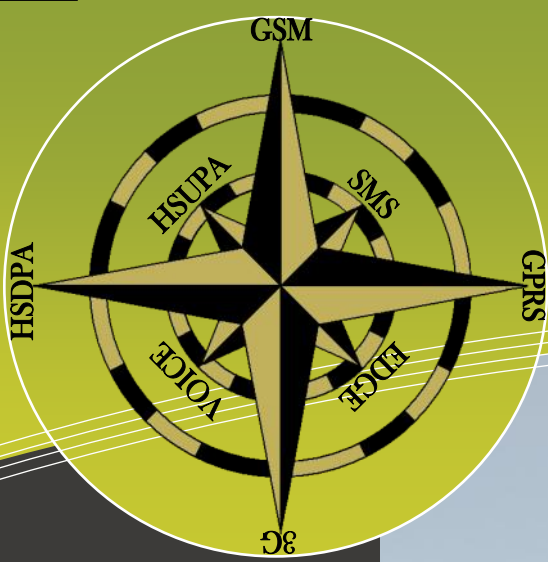
- DTMF on H245
- Supports standard WCDMA 64kbps (CS) Video Call

OTHER FEATURES

- USB Driver for Microsoft Windows 2000 / XP / Vista
- USB Driver for Linux 2.6.16
- Firmware update via USB
- WCDMA Diversity
- WCDMA Equalizer
- A-GPS Positioning: MS-Based, MS-Assisted

SIM5220

HIGH SPEED HSDPA, 3G & EDGE PCI EXPRESS MINI CARD MODULE



OVERVIEW

The SIM5220 is a powerful PCI Express Mini-Card form factor module which is embedded into laptop or PDA devices for high speed data connectivity purposes, providing HSDPA, 3G and EDGE capability.

The industry standard PCI Express modem layout provides customers with a generic platform solution which will cater for future upgrades.

The product also features an embedded hardware GPS, further enhancing the capabilities of the product and making it suitable as a time base in timing critical environments, as well as providing location based information.

GENERAL FEATURES

- HSDPA 7.2Mbps / HSUPA 5.76Mbps
- Dual band UMTS / HSDPA / HSUPA 900 / 2100 MHz
- Quad-Band GSM 850 / 900 / 1800 / 1900 MHz
- GPRS & EDGE multi-slot class 12
- UMTS / HSDPA 3GPP release 5 / 6
- GSM 3GPP release 99
- Output Power
 - UMTS 2100: 0.25W
 - GSM850 / GSM900: 2W
 - DCS1800 / PCS 1900: 1W
- Control via AT commands
- Supply Voltage Range: 3.4V ~ 4.4V
- Temperature Range
 - Normal Operation: -15°C to +55°C
 - Storage temperature: -40°C to +85°C
- Dimension: 51 x 30 x 3.25mm

VOICE SPECIFICATIONS

- Tricodex
 - Half Rate (HR)
 - Full Rate (FR)
 - Enhanced Full Rate (EFR)
- AMR

SMS SPEC

- Point to point MO and MT
- Text and PDU mode

INTERFACES

- USB 2.0
- AT interface with standard modem emulation
- SIM Card
- Standard PCI Express Mini-Card Interface



DATA SPECIFICATIONS

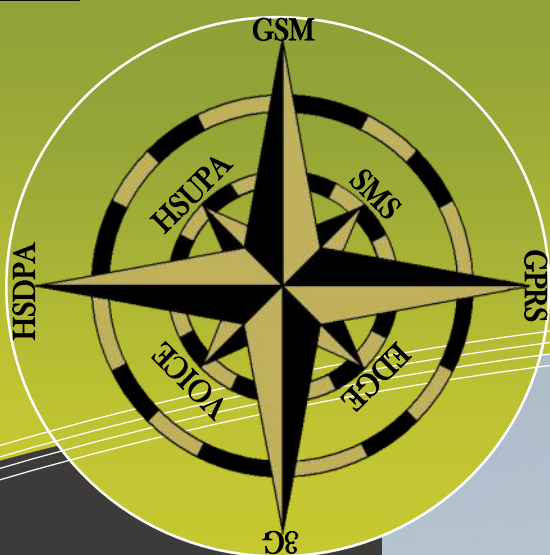
- HSDPA:
 - max 7.2mbps (DL)
 - UE Category; 6, 8, 12
- HSUPA:
 - max 5.76Mbps (UL)
- UMTS
 - max 384Kbps (DL & UL)
- EDGE Class:
 - max 236.8Kbps (DL), max 118Kbps (UL)
- GPRS:
 - max 85.6Kbps (DL), max 42.8Kbps (UL)
- CSD:
 - GSM Data rate 14.4Kbps
 - UMTS Data rate 57.6Kbps

OTHER FEATURES

- Drivers for Microsoft Windows 2000 / XP / Vista / Linux
- A-GPS Positioning: MS-Based, MS-Assisted

U9T-W7

HIGH SPEED USB 3G / HSDPA / HSUPA PLUG AND PLAY MODEM



OVERVIEW

The U9T-W7 is a high speed, 3G / HSDPA / HSUPA plug and play USB modem, based on Qualcomm MSM7200 chipset.

It is a plug and play device, supporting all popular operating systems.

The U9T-W7 provides instant internet access using your own SIM card, anywhere, anytime.



GENERAL FEATURES

- WCDMA / UMTS 2100MHz
- GSM / GPRS / EDGE: 900 / 1800MHz
- Uses Qualcomm chipset MSM7200 internally
- Internet, data and SMS service
- Always online
- Input Voltage: 5V
- Standby Current: 10mA
- Working Current: 200 - 300mA
- Dimensions: 76 x 29 x 12.5mm Incl USB Cap and Antenna
- Low Power Consumption
- OS Support: Windows 2000, XP, 7, Linux, Vista, MAC
- Normal operating Temp: -10°C to +55°C
- Weight: 26g
- Dimensions: 88 x 27 x 9.8mm

INTERFACES

- Movable 3V SIM card slot
- USB 2.0 HS
- Status LED

SOFTWARE FEATURES

- SMS
- Phone Book
- SIM Management
- PDP Profile Management
- Auto-Run install
- Plug and Play

DATA SPECIFICATIONS

- HSDPA: max 7.2Mbps (DL)
- HSUPA: max 5.76Mbps (UL)
- UMTS (WCDMA) up to 384 kbps
- EDGE up to 237 kbps
- GPRS up to 85.6 kbps
- Embedded High sensitivity Internal Antenna



SIM340RS232

QUAD BAND INDUSTRIAL GSM / GPRS MODEM



OVERVIEW

The SIM340RS232 is a ready to use GPRS Quad band modem in a robust casing.

It features an industry standard SMA antenna connector, allowing for a wide variety of antennas to be deployed, depending on customer application and environment.

The modem is fitted with a standard and readily available power supply connector.

Internally, the product uses the SIM340, employing standard and enhanced AT commands.

GENERAL FEATURES

- Quad Band 850 / 900 / 1800 / 1900 MHz
- Complies with ETSI GSM Phase 2+
- Industrial, Aluminium Casing
- GPRS Class 10
- Send and Receive data, fax and SMS
- Uses SIM340DZ internally
- Includes full TCP / IP stack
- SIM Application Toolkit
- DTMF Function
- Always on-line
- Output Power:
 - Class 4 (2W @ 850 / 900MHz)
 - Class 1 (1W @ 1800 / 1900MHz)
- Input Voltage: 6V-36V DC
- Input Current: 1A-2A
- Standby Current: 56mA
- Working Current: 100mA-140mA
- Size: 76 x 54 x 25mm
- Weight: 100g

INTERFACES

- 3V SIM card slot
- DB9 RS232 Interface
- SMA Antenna Connector

FAX SPECIFICATIONS

- Group3, Class 1

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode



DATA SPECIFICATIONS

- GPRS Class 10: max 85.6 kbps downlink
- PBCCH support
- Coding Schemes CS 1, 2, 3, 4
- CSD up to 14.4 kbps
- USSD
- Non Transparent Mode
- PPP-stack

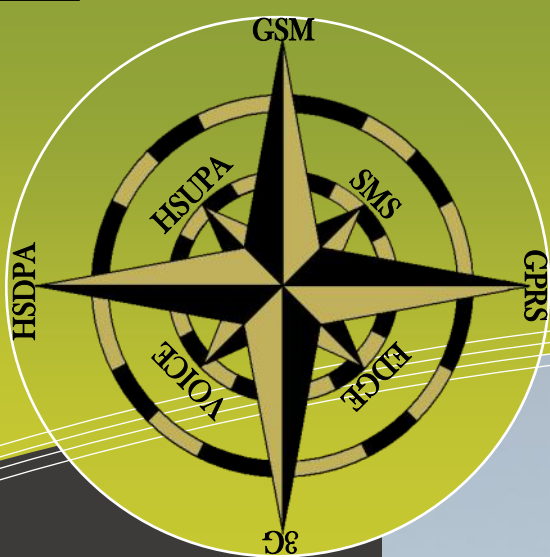
ACCESSORIES

- AC / DC Adapter (included)
- RS232 Cable (included)
- 2 Mounting Plates (included)
- CD (included)
- Antenna (optional)



SIM340USB

QUAD BAND INDUSTRIAL GSM / GPRS MODEM



OVERVIEW

The SIM340RS232 is a ready to use GPRS Quad band modem in a robust casing.

It features an industry standard SMA antenna connector, allowing for a wide variety of antennas to be deployed, depending on customer application and environment.

The modem is fitted with a standard and readily available power supply connector.

Internally, the product uses the SIM340, employing standard and enhanced AT commands.

GENERAL FEATURES

- Quad Band 850 / 900 / 1800 / 1900 MHz
- Complies with ETSI GSM Phase 2+
- Industrial, Aluminium Casing
- GPRS Class 10
- Send and Receive data, fax and SMS
- Uses SIM340DZ internally
- Includes full TCP / IP stack
- SIM Application Toolkit
- DTMF Function
- Always on-line
- Output Power:
 - Class 4 (2W @ 850 / 900MHz)
 - Class 1 (1W @ 1800 / 1900MHz)
- Input Voltage: 6V-36V DC
- Input Current: 1A-2A
- Standby Current: 56mA
- Working Current: 100mA-140mA
- Size: 76 x 54 x 25mm
- Weight: 100g

INTERFACES

- 3V SIM card slot
- DB9 RS232 Interface
- SMA Antenna Connector

FAX SPECIFICATIONS

- Group3, Class 1

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode



DATA SPECIFICATIONS

- GPRS Class 10: max 85.6 kbps downlink
- PBCCH support
- Coding Schemes CS 1, 2, 3, 4
- CSD up to 14.4 kbps
- USSD
- Non Transparent Mode
- PPP-stack

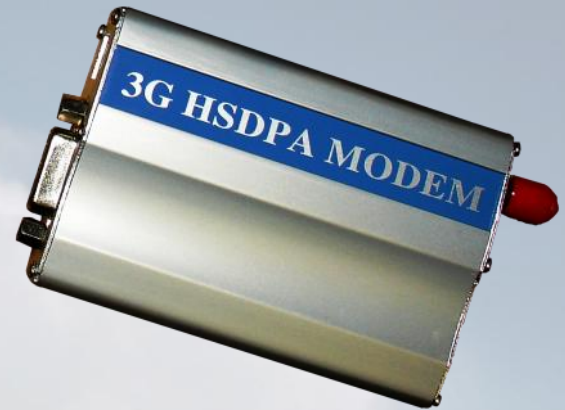
ACCESSORIES

- AC / DC Adapter (included)
- RS232 Cable (included)
- 2 Mounting Plates (included)
- CD (included)
- Antenna (optional)



SIM5210RS232

QUAD BAND INDUSTRIAL GSM / GPRS / EDGE / 3G / WCDMA /
HSDPA MODEM



OVERVIEW

The SIM5210RS232 is a ready to use Quad Band GSM / GPRS / EDGE / 3G / WCDMA / HSDPA modem in a robust casing.

It features an industry standard SMA antenna connector, allowing for a wide variety of antennas to be deployed, depending on customer application and environment.

The modem is fitted with a standard and readily available power supply connector.

Internally, the product uses the SIM5210, employing standard and enhanced AT commands.

GENERAL FEATURES

- UMTS / WCDMA / HSDPA: 2100MHz
- GSM / GPRS / EDGE: 850 / 900 / 1800 / 1900MHz
- Complies with ETSI GSM Phase 2+
- Industrial, Aluminium Casing
- GPRS Class 12
- EDGE Class 12
- UMTS / HSDPA 3GPP release 5
- GSM 3GPP release 99
- Uses SIM5210 internally
- Includes full TCP / IP stack
- Internet, data and SMS service
- SIM Application Toolkit
- DTMF Function
- Always on-line
- Output Power:
 - Class 4 (2W @ 850 / 900MHz)
 - Class 1 (1W @ 1800 / 1900MHz)
 - Class 3 (0.25W @ 2100MHz)
- Input Voltage: 7V-35V DC
- Input Current: 1A-2A
- Standby Current: 56mA
- Working Current: 100mA-140mA
- Working Temperature: -20°C to +55°C
- Storage Temperature: -25°C to +65°C
- Size: 76 x 54 x 25mm
- Weight: 100g

INTERFACES

- 3V SIM card slot
- DB9 RS232 Interface
- SMA Antenna Connector

DATA SPECIFICATIONS

- CSD data rate up to 14.4 kbps
- GPRS Class 12: max 85.6Kbps (DL), Max 42.8Kbps (UL)
- EDGE Class 12: max 236.8Kbps (DL), max 118Kbps (UL)
- WCDMA data rate 57.6Kbps
- HSDPA: max 7.2Mbps (DL)
- UE Category 6, 8, 12
- WCDMA: max 384Kbps (DL), max 384Kbps (UL)

ACCESSORIES

- AC / DC Adapter (included)
- RS232 Cable (included)
- 2 Mounting Plates (included)
- CD (included)
- Antenna (optional)

SMS VIA GSM / GPRS SPECIFICATIONS

- Point to Point MO and MT
- SMS Cell broadcast
- Text and PDU mode



SIM20A

SHORT RANGE RF TRANSCEIVER



OVERVIEW

The SIM20A is a short range transceiver module, operating in the 433Mhz band.

This highly integrated half -duplex, multi-channel low power wireless module includes a high speed MCU and high performance RF chip, delivering high receive sensitivity, and programmable transmitting power and data-rates.

It provides a means of creating an RF network, and remaining within the SIMCom stable. By using this device along with a SIMCom GSM device, a remote gateway may be established, where all support comes from one manufacturer.

GENERAL FEATURES

- Operating frequency: 433MHz - 434.79MHz
- Low Power consumption
- Power Supply:
 - VCC: 3.0V to 3.6V
- Working Temp: -30°C to +80°C
- Dimension: 21 x 13.8 x 2.6mm
- SMD Mount
- Flexible Software setting options
- Control via AT commands

SPECS FOR SRD RF

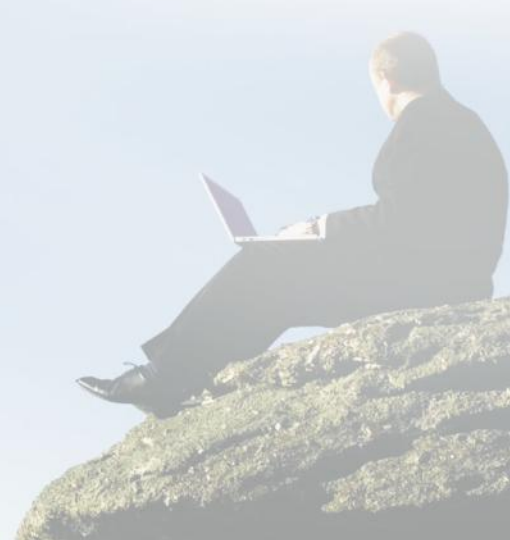
- Max TX power: 18dBm
- Receive Sensitivity: -118dBm @ 2400bps
- Tx Distance: 1500m @ 9600bps (Open Sky)
- Supports continuous frequency tuning
- Modulation Scheme: GFSK
- Frequency Interval: 100kHz
- Sleep Current Consumption: 16uA
- Rx Current Consumption: 26mA
- Tx Current Consumption: 80mA @ 18dBm, peak value
- Supports peer to peer Tx & Broadcast
- Adapts to mass data Tx

INTERFACES

- 22 Surface Mount Pads Include:
 - Power
 - Ground
 - Antenna
 - UART
 - SPI (Reserved)
 - IIC (Reserved)
 - Download Interface

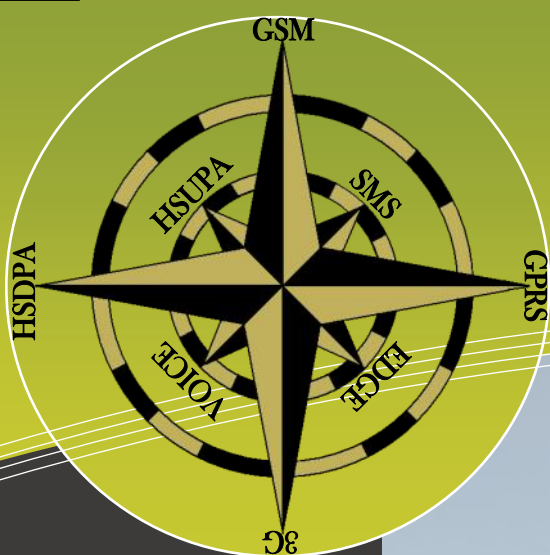
STANDARDS

- ETSI EN 300-220
- FCC part 15
- Chinese SRD Regulatory Standards



FGPMMOPA6B

MINIATURE GPS MODULE WITH INTEGRATED PATCH ANTENNA



OVERVIEW

The FGPMMOPA6B is a complete GPS module supporting NMEA data structure.

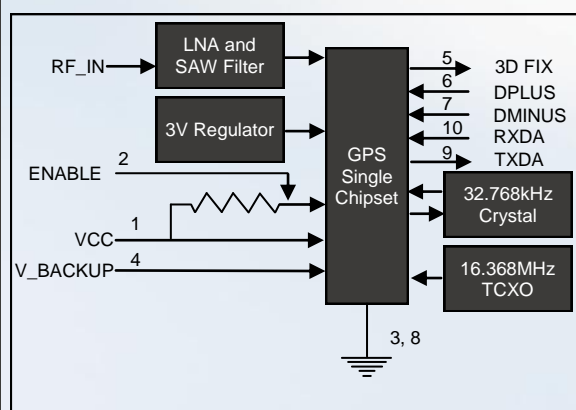
In addition to high sensitivity and fast acquisition times, the device also features a built-in patch antenna.

The small form-factor and integrated additional hardware provides customers with a simple implementation and rapid design cycle, drastically reducing time to market.

GENERAL FEATURES

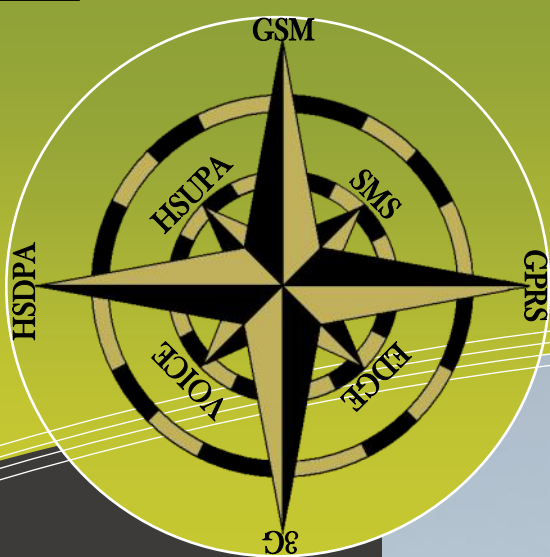
- Frequency: 1575.42 MHz
- Sensitivity:
 - Acquisition: -148dBm Cold Start
 - Reacquisition: 160dBm
 - Tracking: -165dBm
- Channels: 66
- Time to First Fix:
 - Hotstart: 1 second typical
 - Warm Start: 33 seconds typical
 - Cold Start: 35 seconds typical
- Update Rate: 1hz default, max 10hz
- Baudrate: 9600 bps default
- DGPS: RTCM Protocol / SBAS (default) [WAAS, EGNOS, MSAS, GAGAN]
- AGS Supported
- Power Supply:
 - VCC: 3.3V to 5.5V
 - VBackup: 2.0V to 4.0V
- Power Consumption:
 - 48mA Acquisition
 - 37mA Tracking
 - 15uA Shut down current typical
- Working Temp: -40°C to +85°C
- Dimension: 16 x 16 x 6mm
- SMD Mount
- Jammer Detection and Reduction
- Multi path detection and compensation

BLOCK DIAGRAM



FGPMMOPA6E

MINIATURE GPS MODULE WITH INTEGRATED PATCH ANTENNA,
ACCOMMODATING EXTERNAL ANTENNA



OVERVIEW

The FGPMMOPA6BE is a complete GPS module supporting NMEA data structure.

In addition to high sensitivity and fast acquisition times, the device also features a built-in patch antenna, and can also accommodate an external antenna, and has the antenna switching circuitry included within the module.

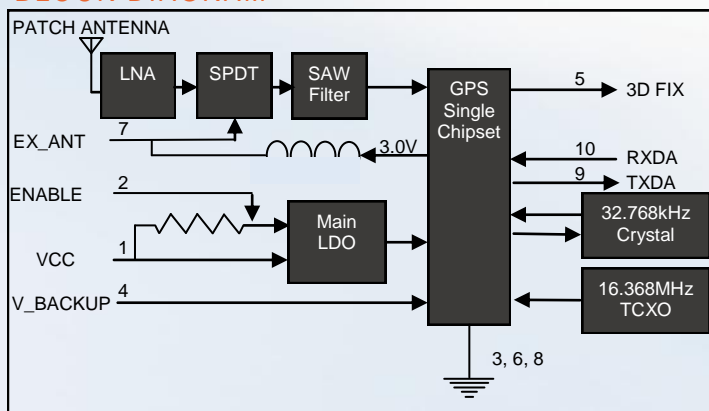
The small form-factor and integrated additional hardware provides customers with a simple implementation and rapid design cycle, drastically reducing time to market.



GENERAL FEATURES

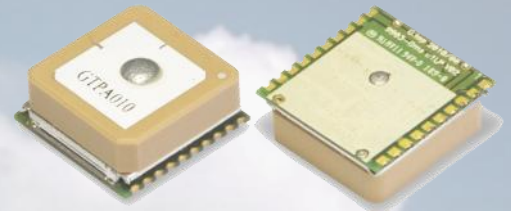
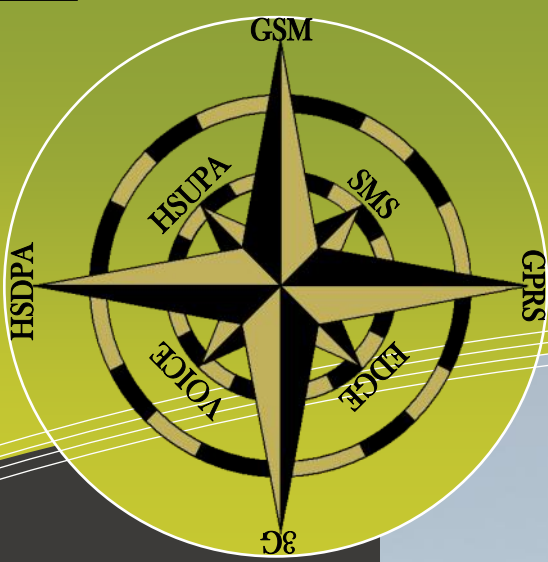
- Frequency: 1575.42 MHz
- Sensitivity:
 - Acquisition: -148dBm Cold Start
 - Reacquisition: 160dBm
 - Tracking: -165dBm
- Channels: 66
- Time to First Fix:
 - Hotstart: 1 second typical
 - Warm Start: 33 seconds typical
 - Cold Start: 35 seconds typical
- Update Rate: 1hz default, max 10hz
- Baudrate: 9600 bps default
- DGPS (WAAS / EGNOS / MSAS / GAGAN) support (Default: Enable)
- AGS Supported
- Power Supply:
 - VCC: 3.3V to 5.5V
 - VBackup: 2.0V to 4.0V
- Power Consumption:
 - 48mA Acquisition
 - 37mA Tracking
 - 15uA Shut down current typical
- Working Temp: -40°C to +85°C
- Dimension: 16 x 16 x 6mm
- SMD Mount
- Jammer Detection and Reduction
- Multi path detection and compensation
- Direct interface and switch for external antenna

BLOCK DIAGRAM



GMS-U1LP

MINIATURE GPS MODULE WITH INTEGRATED PATCH ANTENNA, AC-COMMODATING EXTERNAL ANTENNA, USB, ANTENNA SHORT CIRCUIT PROTECTION, MAGNETIC VARIATION COMPENSATION



OVERVIEW

The GMS-U1LP is a complete GPS module supporting NMEA data structure.

The device blends the performance of the GMS-U1 with the compact package of the PA6 series.

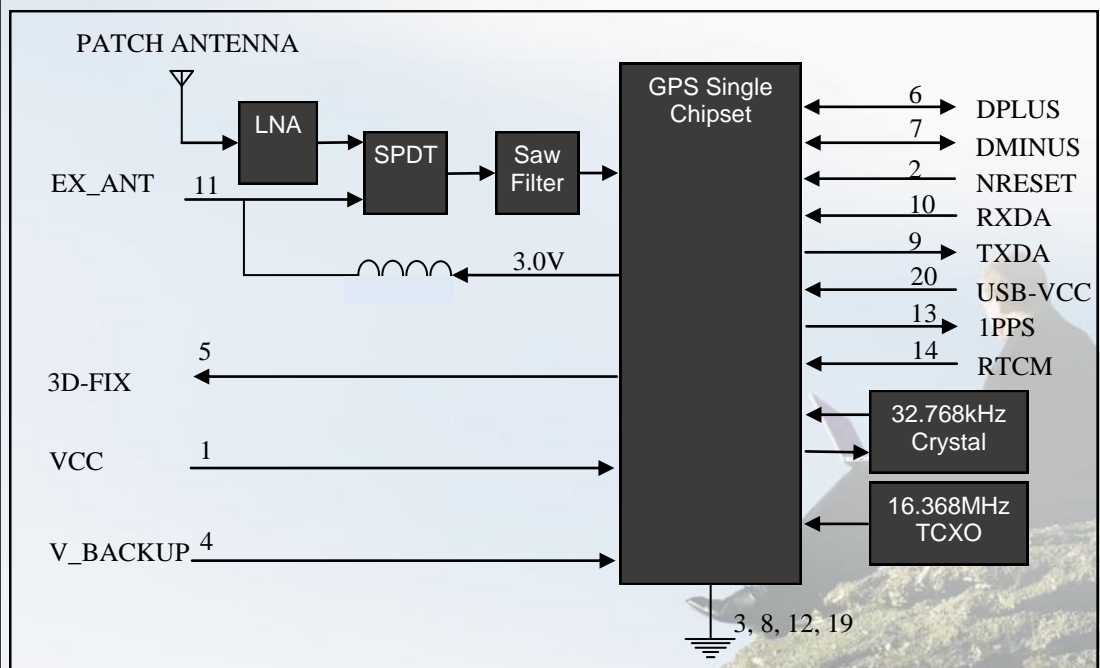
In addition to delivering extremely low power, the module features both a USB and UART interface, and software configurable magnetic variation support.

The small form factor (16 x 16 x 6mm) and the high level of integration makes this a near perfect device for any device requiring GPS functionality.

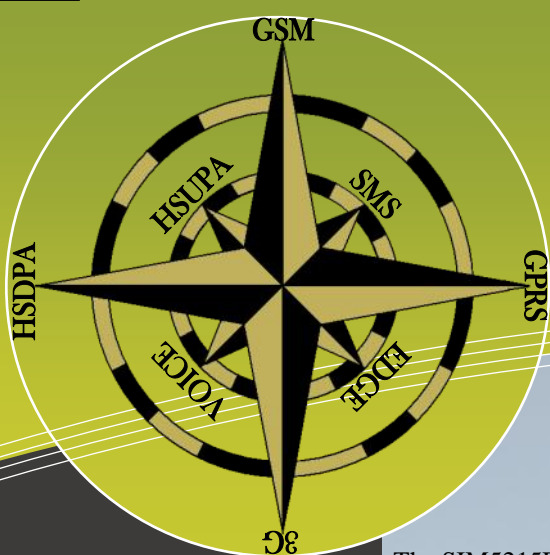
GENERAL FEATURES

- Frequency: 1575.42 MHz
- Sensitivity:
 - Acquisition: -148dBm Cold Start
 - Reacquisition: 160dBm
 - Tracking: -165dBm
- Channels: 66
- Time to First Fix:
 - Hotstart: 1 second typical
 - Warm Start: 33 seconds typical
 - Cold Start: 35 seconds typical
- Update Rate: 1hz default, max 10hz
- Baudrate: 9600 bps default
- DGPS (WAAS / EGNOS / MSAS / GAGAN) support (Default: Enable)
- AGS Supported
- Power Supply:
 - VCC: 3.0V to 3.6V
 - VBackup: 2.0V to 4.3V
- Power Consumption:
 - 30mA Acquisition
 - 24mA Tracking
 - 15uA Shut down current typical
- Working Temp: -40°C to +85°C
- Dimension: 16 x 16 x 6mm
- SMD Mount
- Jammer Detection and Reduction
- Multi path detection and compensation
- Direct interface and switch for external antenna, with short-circuit protection
- Magnetic Variation support (software configurable)USB Interface Support (Desktop Windows and Linux Platform)

BLOCK DIAGRAM



Application Note—SIM5215E and SIM5218E Compatibility



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INTRODUCTION

The SIM5215E and the SIM5218E are two highly capable devices, rich in features and low in cost. But they are meant for 2 very different markets. Or are they really? We explore this question.

AT A GLANCE

At first glance, the 2 modules look vastly different. The SIM5215E is a 3G module, but it appears to be of almost archaic origin. With a data limit of 384kbps, the device is barely recognizable as 3G. And yet this innovative product has been the recipient of recent awards, not least of which was the GSMA Award for the “The Best Low Bandwidth 3G module” in late 2009. This award recognized the innovative approach which SIMCom® had taken. The fact is that there are many products where 3G is simply not required, but the GSM networks worldwide do not necessarily cater well for this—in many cases new products are not being approved for use on the GSM networks, unless they adhere to a minimum



SIM5215E - 3G Low bandwidth

criteria, which is normally a 3G requirement, with fallback to 2G being the accepted norm. The result is that products which do not require 3G speeds are being forced onto 3G technology backbones not out of actual technical necessity, but more as a result of network compliance. The first problem with this is cost, because 3G technology costs more than 2G. As soon as hardware cost starts to rise, many applications which were borderline viable, are now rendered non-viable due to the cost of the initial investment. And this is where the SIM5215E comes into its own—it is specifically a low cost 3G module, which meets the Network Compliance requirements, but does not leave a hole in the wallet.

So now there is a low cost entry into the 3G market. But what about future proofing? What if the market wants higher speed down the line, and is prepared to pay more for it. This is where the bigger brother, the HSDPA / HSUPA, 7.2Mbps



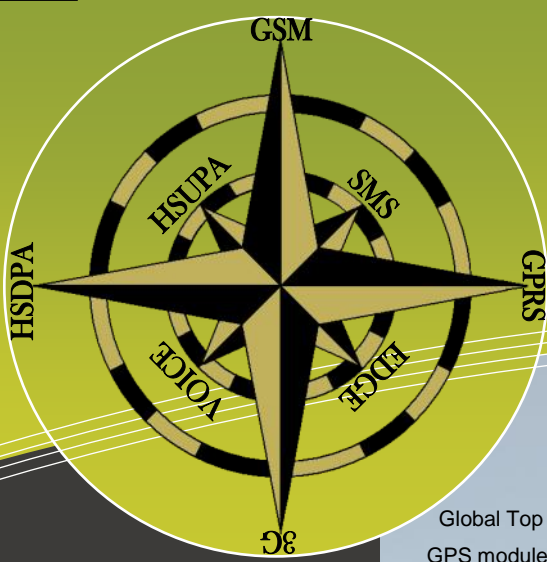
SIM5218E - high speed, with GPS

(DL) / 5.76Mbps (UL), SIM5218E starts to become attractive. Not only is it pin, footprint and power supply compatible with its smaller counterpart, the SIM5215E, but it also offers basic AT command compatibility as well. Both devices feature a seamless interface to an external Micro-SD card, and both devices feature a direct camera interface. In addition, to this, the high speed variant, SIM5218E, also features an embedded GPS.

Now consider a security application - the SIM5215E is selected for cost. The unit drives a camera which takes snapshots and stores them seamlessly to the Micro-SD card for later retrieval, on demand. The SIM5215E is perfect for this. But as is always the case, when you give the end customer a finger, they want the entire hand. What if the same security product had a more powerful variant, capable of delivering the same info, as well as the ability to initiate a video call on demand? The SIM5215E can do this, but the high bandwidth SIM5218E will do the same with much higher clarity. Add to this the ability to timestamp frames via the GPS timebase, and you suddenly have 2 very different products, both using exactly the same base-board, the only difference being the GSM module.

This is the true power of the SIMCom® SIM5215E and SIM5218E. They are such different products, and yet in seeming contradiction to this statement they have so much in common.

Application Note—PA6B and PA6E Compatibility



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Compatibility between PA6B and PA6E GPS Modules

Global Top has announced the release of a 2 new GPS module, FGPMOPA6B, and FGPMOPA6E. Both modules are physically the same size, and according to Global Top, this is the world’s smallest (16mm x 16mm), single-chip, complete solution, GPS Module Engine Board with a finely tuned, high-sensitivity Patch on Top (POT) ceramic antenna utilizing SmartAntenna Structure. These tiny GPS modules present an ideal solution for those who want to incorporate GPS receiver functions into their own design without worrying about RF noise interference or any additional antenna fine tuning adjustment. Because of their high sensitivity, they are able to excel in tracking performances under urban landscapes or other environments where GPS signals can be difficult to acquire.

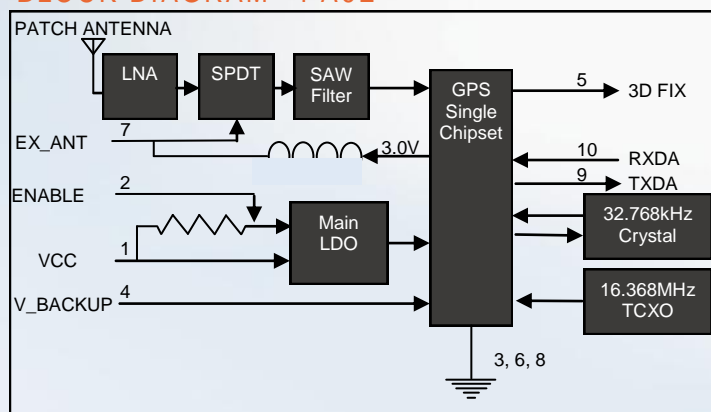
Their design is powered by MediaTek Inc. (MTK) 66 channels single chip architecture, the leading digital

fabless semiconductor company for wireless communications and digital media solutions. These GPS module engine boards have an extraordinary compact design with excellent tracking performances, accurate positioning and highest of sensitivity. Because of its size and SMD type design, it is ideal for use in small-form factor device design and can be integrated easily with maximum degree of flexibility. It is the best choice for any system designer who wishes to simplify GPS system integration process of their own electronic design.

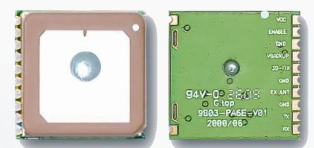
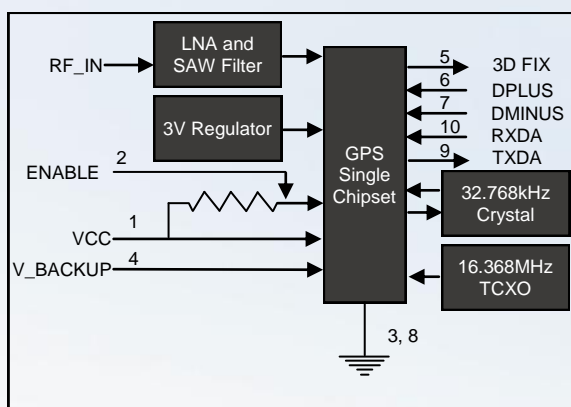
The difference between the PA6B and the PA6E is that the latter also accommodates an external antenna interface, and includes the switching circuitry for selecting between the integrated patch antenna, or the external antenna. This is a major advantage in security environments, where it is common practice to remove the external GPS antenna, which would normally ren-

...smallest single chip complete solution GPS Module ...with Patch on Top...

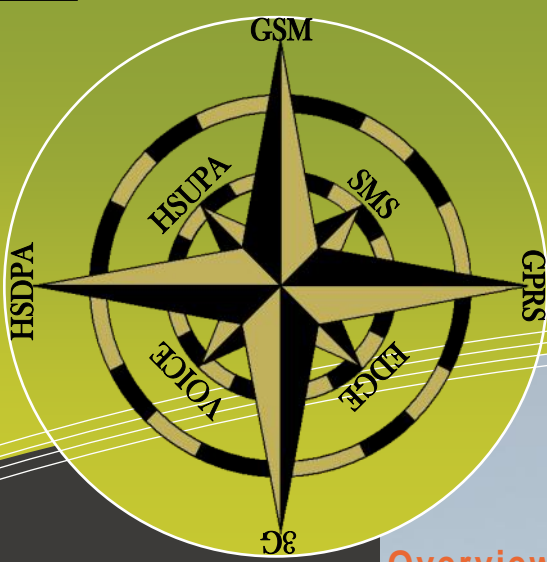
BLOCK DIAGRAM—PA6E



BLOCK DIAGRAM—PA6B



Application Note—Industrial RF Field Trials with SIM20A



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Overview

The SIM20A is a shortrange transceiver, operating in the 433-434.79MHz Frequency Band. On paper, the device is capable of 1500m transmission distance. Whereas this looks very well and good, we know that these sort of specs are achieved under very carefully controlled conditions, using costly high gain directional antennas, in perfect line-of-sight conditions.

On numerous occasions, clients have asked us what the “expected specs” are, under ‘South African Conditions’. Although this is an open ended question and cannot really be answered with any sort of exactness, we decided to run some tests under conditions which are as close to typical industry deployments as possible.

In putting the paper specs to the test under more “South African” type of conditions., we used a low cost and readily available quarter wavelength stubby antenna, and took the devices into two very standard South African environments.

In selecting our test environments and test equipment setup, we considered the target market where the devices are most likely to be deployed. The SIM20A is basically a mesh network RF device; a RF module which is able to function as a transceiver, or a transceiver plus repeater. The repeater capability lends itself to a wide variety of applications, where one is no longer reliant on pure line of sight transmission; although line of sight is the limiting and important factor, the repeater functionality allows one to extend the range beyond pure line of sight

ENVIRONMENT 1—Rural Area Testing

Farming applications are notoriously difficult to manage via RF networking. Ideally, one needs a low power consumption device capable of reasonably long transmission distances. Antennas should not draw unwanted attention to the location of units, mainly due to concerns over vandalism and security.

In selecting a test area, we looked for a location which presented simple diversity; we needed flat areas with

between the data source and the end point.



The first environment we selected was out in the open, in the Meyerton area. We chose this environment in order to simulate a rural / farming type of deployment. We tested the device along a straight sand road, then over a small hill, and finally through dense foliage.

The second environment involved an early morning rise, and a drive out to an underground coal mine in Secunda. We tested the device underground, within the confines of bedrock tunnels. The testing was carried out on straight paths, around corners, with the coal train vehicle between the source and end points, and also within close proximity of heavy underground mining machinery.

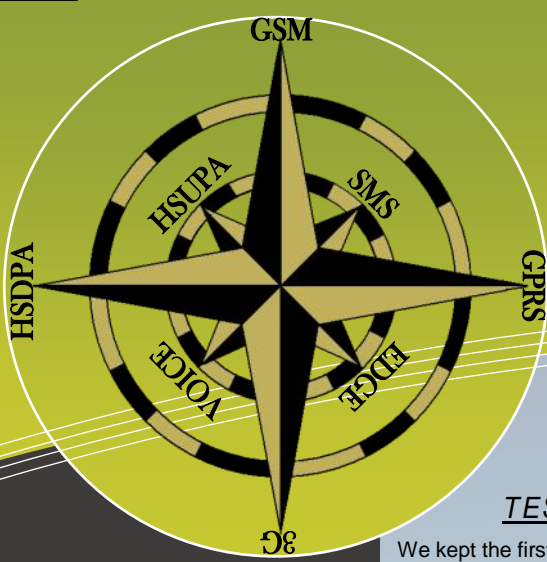
Although test results will most certainly differ, depending on weather and environmental conditions, we found the results of the testing extremely positive, and hope that this information will provide some useful insight for any industrial applications, where RF mesh networking is being considered as a possible solution for communications. We must however caution, that these test results are not a benchmark for all such applications, and it is important that clients carry out their own testing within their specific environments, in order to ensure that their RF network is reliable and trouble free.

clear line of sight, we needed hills, and we needed dense foliage. The Meyerton area presented all three, and we chose to carry out the testing under clear skies.



Application Note—Industrial RF Field Trials with SIM20A

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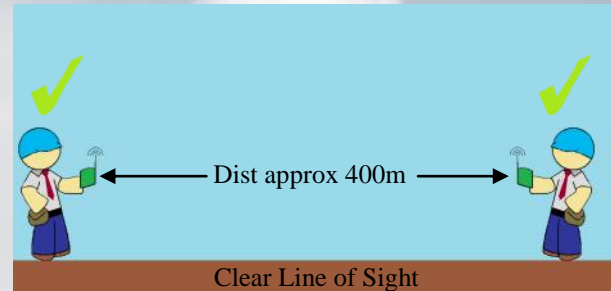
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TEST 1: Uninterrupted Line of Sight in Open Air

We kept the first test as simple as possible. The testing was carried out on a flat gravel road, using the quarter wavelength stubby antenna, and line of sight was maintained.

With the device baudrate set to 115200, we achieved reliable communications at an effective over-the-air datarate of 2400bps, over a distance of up to 340m.

In this scenario, for peace of mind, we recommend 350m as a safe and conservative distance.

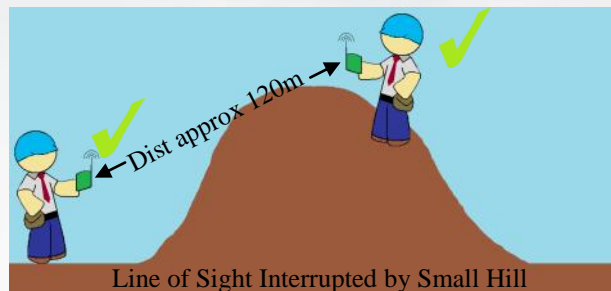


TEST 2: Small Hill Interrupting Line of Sight in Open Air

In the second test, using the same set of equipment, we tested reliable transmission distance when line of sight was interrupted by a small hill, with one test unit just over the line of sight of the crest of the hill.

With the device baudrate set to 115200, we achieved reliable communications at an effective over-the-air datarate of 2400bps, over a distance of up to 120m.

In this scenario, for peace of mind, we would recommend 100m as a safe and conservative distance.

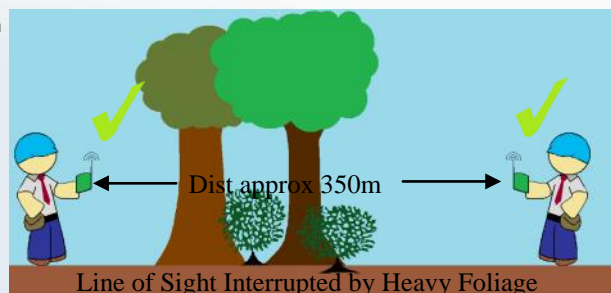


TEST 3: Dense Foliage Interrupting clear Line of Sight

In our third test we again used the same set of equipment, this time testing for reliable transmission distance when our line-of-sight was interrupted by dense foliage, such as trees, bushes and other natural obstructions.

With the device baudrate set to 115200, we achieved reliable communications at an effective over-the-air datarate of 2400bps, over a distance of up to 350m.

In this scenario, for peace of mind, we would recommend 300m as a safe and conservative distance.

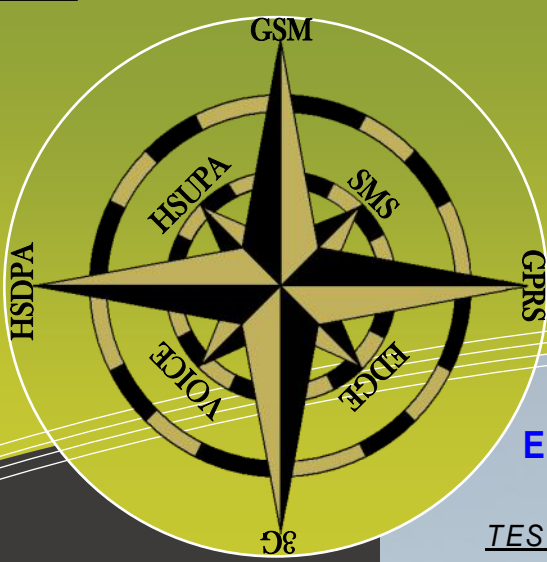


RESULTS SUMMARY TABLE—ENVIRONMENT 1

	CLEAR LINE OF SIGHT	INTERRUPTED BY HILL	INTERRUPTED BY FOLIAGE
DEVICE BAUDRATE	115200bps	115200bps	115200bps
EFFECTIVE BAUDRATE	2400bps	2400bps	2400bps
MEASURED DIST	400m	120m	350m
RECOMMENDED DIST	350m	100m	300m

Application Note—Industrial RF Field Trials with SIM20A

...continued



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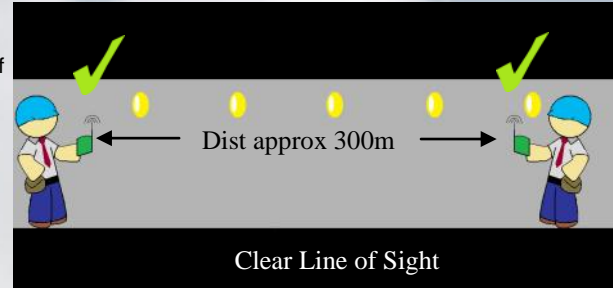
ENVIRONMENT 2—Industrial / Mining Testing

TEST 1: Uninterrupted Line of Sight in a Mining Tunnel

We kept the first test as simple as possible. The testing was carried out in an uninterrupted stretch of underground tunnel. The height of the tunnel, from floor to ceiling, was approximately 2m, and the walls themselves were bedrock, lined with coal.

With the device baudrate set to 115200, we achieved reliable communications at an effective over-the-air data rate of 2400bps, over a distance of up to 300m.

In this scenario, for peace of mind, we recommend 280m as a safe and conservative distance.



TEST 2: Coal Train Interrupting Line of Sight in Mining Tunnel

In the second test, using the same set of equipment, we tested reliable transmission distance when line of sight was interrupted by a moving coal train.

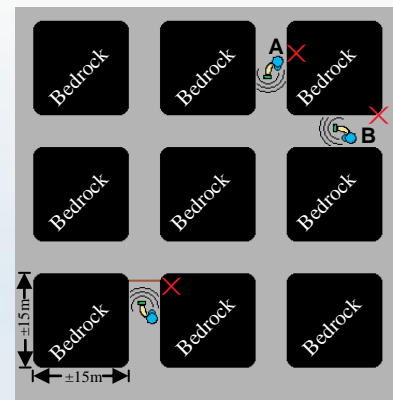
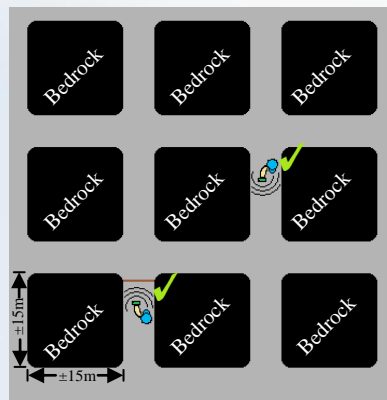
The coal train took up a significant portion of the tunnel, and as a result, when the train moved between us, communications was completely negligible, regardless of the distance between the source and destination.



TEST 3: Bedrock Support Pillars Interrupting Line of Sight

In the third test, we moved into an area of the mine containing a number of bedrock support pillars of approximately 15m x 15m, forming grid pattern passages of roughly 4m in width. The height from floor to ceiling was still approximately 2m.

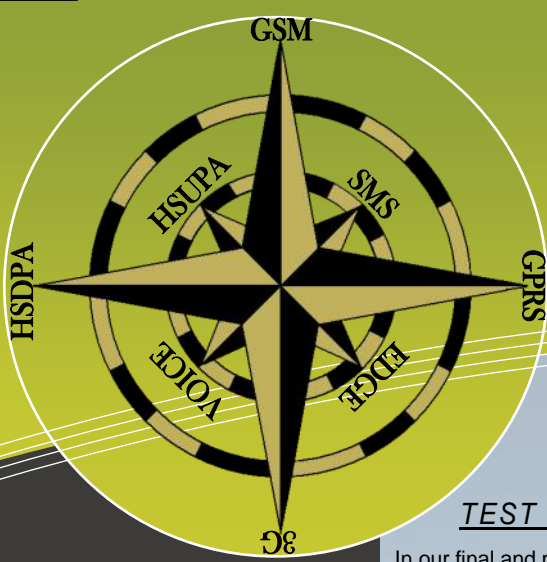
In addition to the pillars, there were also a number of industrial dust curtains, which ran the full width and height of the passages. Our testing was conducted with one person remaining stationary behind one such dust curtain.



We found that the signal attenuated very rapidly. Although we found that the RF communications was reliable through one dust curtain, and around two corners of bedrock, we noted that this communications was reliable only up to approximately 30m, thereafter the transmission was quickly lost, regardless of whether we moved around any further corners or not, pictured as positions A and B above.

Application Note—Industrial RF Field Trials with SIM20A

...continued



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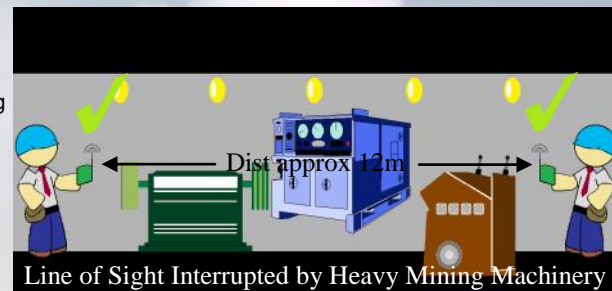
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TEST 4: Heavy Operational Mining Machinery Interrupting Line of Sight

In our final and most gruelling test, we tested the devices while in the vicinity of running mining machinery, whilst remaining underground. This sort of machinery is notorious within the RF arena for being a source of tremendous spurious noise, ultimately leading to severe attenuation of signal strength.

In this environment, we found that we could successfully operate over a distance of approximately 12m.



SUMMARY TABLE—ENVIRONMENT 2

	CLEAR LINE OF SIGHT	INTERRUPTED BY COAL TRAIN	INTERRUPTED BY PILLAR SUPPORTS	INTERRUPTED BY MACHINES
DEVICE BAUDRATE	115200bps	115200bps	115200bps	115200bps
EFFECTIVE BAUDRATE	2400bps	2400bps	2400bps	2400bps
MEASURED DIST	300m	0m	30m / 2 Corners	12m
RECOMMENDED DIST	280m	0m	25m / 2 Corners	10m

CONCLUSIONS AND RECOMMENDATIONS

Overall, the SIM20A performed well, and is suitable for a wide variety of applications.

In rural, farming applications, the device performs very well, and with low cost hardware, one can make use of the repeater functionality and low cost quarter wavelength stubby antennas to set up a reasonably sized RF mesh network. The datarate over the air is reasonable for most industrial, and low cost applications, and the cost of deployment is not prohibitive, provided one takes a bit of common sense care when setting up the network. By and large, the setup should be fairly simple.

In mining applications, there are many more challenges to be considered. Although our testing along a straight tunnel was successful up to 300m, one needs to keep in mind that the tunnels are narrow, and as soon as a coal train (which took up about 80% of the tunnel) moved between the two test points, it was not possible to get any sort of RF data transmission between the test points, until the train had moved out of the way. This immedi-

ately means that it is necessary for the designer to implement a suitable level of error checking into the system, so that if acknowledgements are not received, the data can be re-transmitted. When we tested the devices within the area of the bedrock support pillars, repeaters at key corners would have extended the range very significantly, and so although the testing was successful through only one dust curtain and around 2 corners, we most certainly consider this successful and usable. In the area of the heavy machinery, 10m was also acceptable, as this is an area where many RF devices fail.

Although our testing was limited to one mine, and one therefore has to consider factors such as bedrock material, width of mining shafts, variation of materials used in mines (such as the dust curtains), overall we found the SIM20A performed well under extremely tough conditions, and are therefore confident that this low cost device can provide suitable and reliable RF connectivity in many low datarate industrial applications.

DISCLAIMER

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