GMS6-CR6(SIRF-IV)

Fast Acquisition Enhanced Sensitivity 48 Channel GPS Sensor Module

The GMS6-CR6 is a compact all-in-one GPS module solution intended for a broad range of Original Equipment Manufacturer (OEM) products, where fast and easy system integration and minimal development risk is required.

The receiver continuously tracks all satellites in view and provides accurate satellite positioning data. The GMS6-CR6 is optimized for applications requiring high-performance, low cost, and maximum flexibility; suitable for a wide range of OEM configurations including handhelds, sensors, asset tracking, PDA-centric personal navigation system, and vehicle navigation products.

The GMS6-CR6 is capable of keeping up to 6 hours records or positions, including longitude, latitude, speed, UTC, and tag data. The location histories can be exported to mapping software such as Google Earth or TrackMaker

Its 48 parallel channels and provide fast satellite signal acquisition and short startup time. Acquisition sensitivity of –147dBm and tracking sensitivity of –163dBm offers good navigation performance even in urban canyons having limited sky view..

Satellite-based augmentation systems, such as WAAS and EGNOS, are supported to yield improved accuracy. Besides it also supports SAGPS function and fixed in the short time.

RS232-level serial interface are provided on the interface connector. Supply voltage of 3.3V~6.0V is supported.

Users can modify NMEA sentences or Binary code by the extra flash memory.

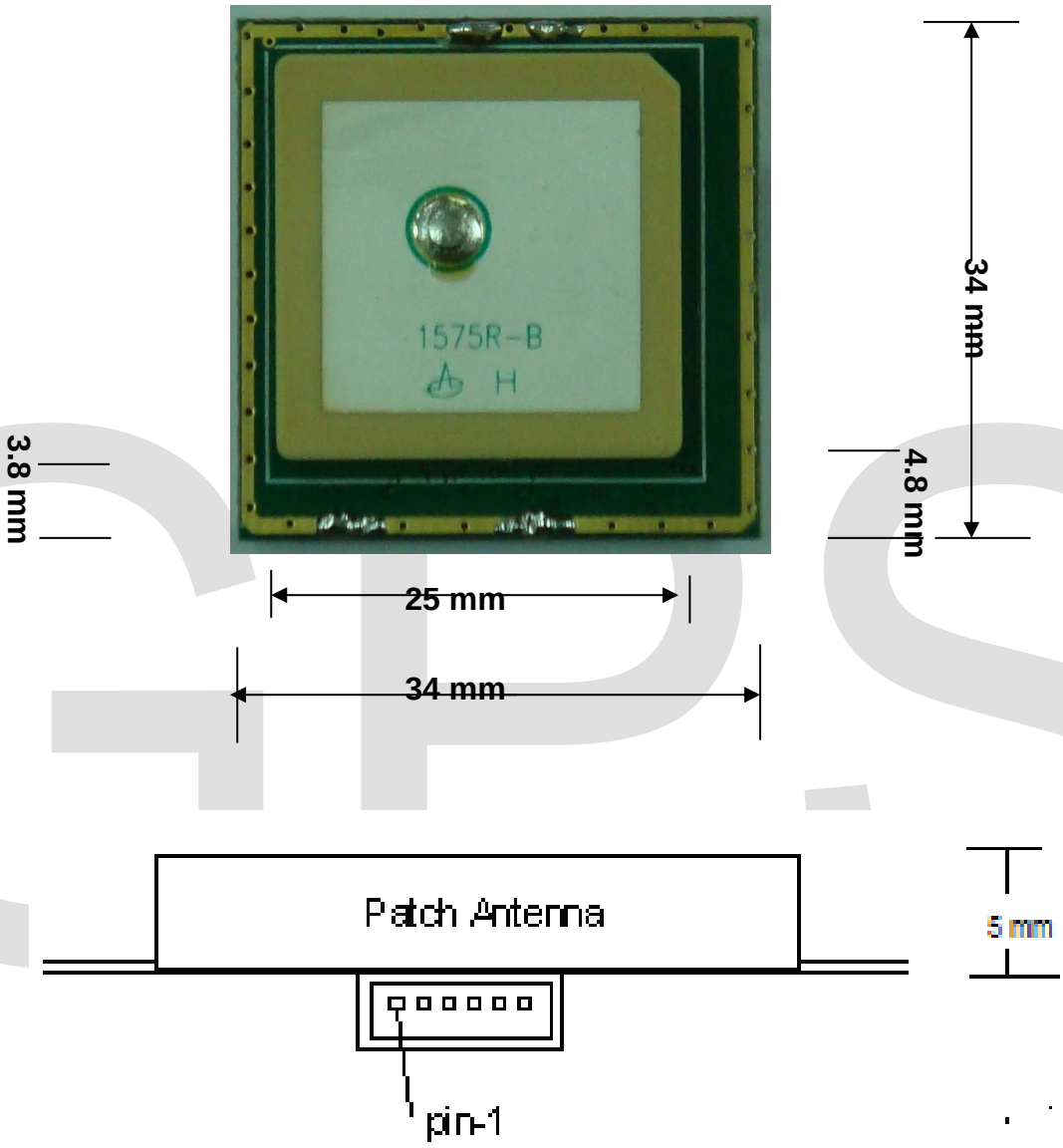
FEATURES

- 48 track verification channels
- Tracking sensitivity -163dBm
- Acquisition sensitivity –147dBm
- Cold start < 34 seconds
- Hot start < 1sec under open sky
- 2.5m CEP accuracy
- SBAS (WAAS, EGNOS) support
- Support SAGPS function
- Support 6 hours data logger.
- Log data can be exported to mapping software such as Google Earth and TrackMaker
- Logging data interval programmable: by time or distance
- < 35mA with Tracking current
- Dimension: 34 x 34 x 9.20 mm

TECHNICAL SPECIFICATIONS

Receiver Type	48 parallel channels, L1 C/A code
Accuracy	Position 2.5m CEP Velocity 0.1m/sec
Startup Time (average)	< 1sec hot start < 34sec cold start
Signal Reacquisition	1s
Sensitivity	-150dBm acquisition -160dBm tracking
Update Rate	1Hz standard (5Hz/10Hz special order)
Dynamics	4G (39.2m/sec$_2$)
Serial Interface	LVTTL level
Protocol	NMEA-0183 V3.01 GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG, ~~4800~~9600*baud, 8, N, 1
Datum	Default WGS-84 User definable
Input Voltage	3.3~6V DC +/-10%
Power Consumption	< 35mA (1Hz standard version,tracking)
Dimension	34mm L x 34mm W x 9.2mm H
Weight:	14g
Operating Temperature	-40^{o}C ~ +85^{o}C
Humidity	5% ~ 95%
Operating Temperature	-40^{o}C ~ +85^{o}C
Humidity	5% ~ 95%

Mechanical Dimension



GM-CT6 ***Lateral View***

PINOUT DESCRIPTION

Pin Number	Signal Name	Description
1	Ground	Power and signal ground
2	Power	3.3V ~ 6.0V DC input
3	Serial Data In 2	Asynchronous serial input at RS-232 level, to input command message
4	Serial Data Out 2	Asynchronous serial output at RS-232 level, to output NMEA message
5	Serial Data In 1	Asynchronous serial input at TTL level, to input command message
6	Serial Data Out 1	Asynchronous serial output at TTL level, to output NMEA message

NMEA Messages

The serial interface protocol is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. This standard is fully define in "NMEA 0183, Version 3.01" The standard may be obtained from NMEA, www.nmea.org

GGA - GPS FIX DATA
Time, position and position-fix related data (number of satellites in use, HDOP, etc.).

Format:
$GPGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,M,<10>,M,<11>,<12>,*<13><CR><LF>

Example:
$GPGGA,104549.04,2447.2038,N,12100.4990,E,1,06,01.7,00078.8,M,0016.3,M,,*5C<CR><LF>

Field	Example	Description
1	104549.04	UTC time in hhmmss.ss format, 000000.00 ~ 235959.99
2	2447.2038	Latitude in ddmm.mmmm format Leading zeros transmitted
3	N	Latitude hemisphere indicator, 'N' = North, 'S' = South
4	12100.4990	Longitude in dddmm.mmmm format Leading zeros transmitted
5	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
6	1	Position fix quality indicator 0: position fix unavailable 1: valid position fix, SPS mode 2: valid position fix, differential GPS mode
7	06	Number of satellites in use, 00 ~ 12
8	01.7	Horizontal dilution of precision, 00.0 ~ 99.9
9	00078.8	Antenna height above/below mean sea level, -9999.9 ~ 17999.9
10	0016.3	Geoidal height, -999.9 ~ 9999.9
11		Age of DGPS data since last valid RTCM transmission in xxx format (seconds) NULL when DGPS not used
12		Differential reference station ID, 0000 ~ 1023 NULL when DGPS not used
13	5C	Checksum

Note: The checksum field starts with a '*' and consists of 2 characters representing a hex number. The checksum is the exclusive OR of all characters between '$' and '*'.

GLL - LATITUDE AND LONGITUDE, WITH TIME OF POSITION FIX AND STATUS
Latitude and longitude of current position, time, and status.

Format:
$GPGLL,<1>,<2>,<3>,<4>,<5>,<6>,<7>*<8><CR><LF>

Example:
$GPGLL,2447.2073,N,12100.5022,E,104548.04,A,A*65<CR><LF>

Field	Example	Description
1	2447.2073	Latitude in ddmm.mmmm format Leading zeros transmitted
2	N	Latitude hemisphere indicator, ‘N’ = North, ‘S’ = South
3	12100.5022	Longitude in dddmm.mmmm format Leading zeros transmitted
4	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
5	104548.04	UTC time in hhmmss.ss format, 000000.00 ~ 235959.99
6	A	Status, ‘A’ = valid position, ‘V’ = navigation receiver warning
7	A	Mode indicator ‘N’ = Data invalid ‘A’ = Autonomous ‘D’ = Differential ‘E’ = Estimated
8	65	Checksum

GSA - GPS DOP AND ACTIVE SATELLITES
GPS receiver operating mode, satellites used for navigation, and DOP values.

Format:
$GPGSA,<1>,<2>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<3>,<4>,<5>,<6>*<7><CR><LF>

Example:
$GPGSA,A,3,26,21,,,09,17,,,,,,,10.8,02.1,10.6*07<CR><LF>

Field	Example	Description
1	A	Mode, 'M' = Manual, 'A' = Automatic
2	3	Fix type, 1 = not available, 2 = 2D fix, 3 = 3D fix
3	26,21,,,09,17,,,,,,	PRN number, 01 to 32, of satellite used in solution, up to 12 transmitted
4	10.8	Position dilution of precision, 00.0 to 99.9
5	02.1	Horizontal dilution of precision, 00.0 to 99.9
6	10.6	Vertical dilution of precision, 00.0 to 99.9
7	07	Checksum

GSV - GPS SATELLITE IN VIEW

Number of satellites in view, PRN number, elevation angle, azimuth angle, and C/No. Only up to four satellite details are transmitted per message. Additional satellite in view information is sent in subsequent GSV messages.

Format:

$GPGSV,<1>,<2>,<3>,<4>,<5>,<6>,<7>,…,<4>,<5>,<6>,<7> *<8><CR><LF>

Example:

$GPGSV,2,1,08,26,50,016,40,09,50,173,39,21,43,316,38,17,41,144,42*7C<CR><LF>
$GPGSV,2,2,08,29,38,029,37,10,27,082,32,18,22,309,24,24,09,145,*7B<CR><LF>

Field	Example	Description
1	2	Total number of GSV messages to be transmitted
2	1	Number of current GSV message
3	08	Total number of satellites in view, 00 ~ 12
4	26	Satellite PRN number, GPS: 01 ~ 32, SBAS: 33 ~ 64 (33 = PRN120)
5	50	Satellite elevation number, 00 ~ 90 degrees
6	016	Satellite azimuth angle, 000 ~ 359 degrees
7	40	C/No, 00 ~ 99 dB Null when not tracking
8	7C	Checksum

RMC - RECOMMANDED MINIMUM SPECIFIC GPS/TRANSIT DATA
Time, date, position, course and speed data.

Format:
$GPRMC,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>*<13><CR><LF>

Example:
$GPRMC,104549.04,A,2447.2038,N,12100.4990,E,016.0,221.0,250304,003.3,W,A*22<CR><LF>

Field	Example	Description
1	104549.04	UTC time in hhmmss.ss format, 000000.00 ~ 235959.99
2	A	Status, ‘V’ = navigation receiver warning, ‘A’ = valid position
3	2447.2038	Latitude in dddmm.mmmm format Leading zeros transmitted
4	N	Latitude hemisphere indicator, ‘N’ = North, ‘S’ = South
5	12100.4990	Longitude in dddmm.mmmm format Leading zeros transmitted
6	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
7	016.0	Speed over ground, 000.0 ~ 999.9 knots
8	221.0	Course over ground, 000.0 ~ 359.9 degrees
9	250304	UTC date of position fix, ddmmyy format
10	003.3	Magnetic variation, 000.0 ~ 180.0 degrees
11	W	Magnetic variation direction, ‘E’ = East, ‘W’ = West
12	A	Mode indicator ‘N’ = Data invalid ‘A’ = Autonomous ‘D’ = Differential ‘E’ = Estimated
13	22	Checksum

VTG - COURSE OVER GROUND AND GROUND SPEED

Velocity is given as course over ground (COG) and speed over ground (SOG).

Format:

GPVTG,<1>,T,<2>,M,<3>,N,<4>,K,<5>*<6><CR><LF>

Example:

$GPVTG,221.0,T,224.3,M,016.0,N,0029.6,K,A*1F<CR><LF>

Field	Example	Description
1	221.0	True course over ground, 000.0 ~ 359.9 degrees
2	224.3	Magnetic course over ground, 000.0 ~ 359.9 degrees
3	016.0	Speed over ground, 000.0 ~ 999.9 knots
4	0029.6	Speed over ground, 0000.0 ~ 1800.0 kilometers per hour
5	A	Mode indicator 'N' = Data invalid 'A' = Autonomous 'D' = Differential 'E' = Estimated
6	1F	Checksum

ZDA TIME AND DATE

Format:

$GPZDA,<1>,<2>,<3>,<4>,<5>,<6>*<7><CR><LF>

Example:

$GPZDA,104548.04,25,03,2004,,*6C<CR><LF>

Field	Example	Description
1	104548.04	UTC time in hhmmss.ss format, 000000.00 ~ 235959.99
2	25	UTC time: day (01 ... 31)
3	03	UTC time: month (01 ... 12)
4	2004	UTC time: year (4 digit year)
5		Local zone hour Not being output by the receiver (NULL)
6		Local zone minutes Not being output by the receiver (NULL)
7	6C	Checksum

Binary Messages

See *Binary Message Protocol User's Guide* for detailed descriptions.

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