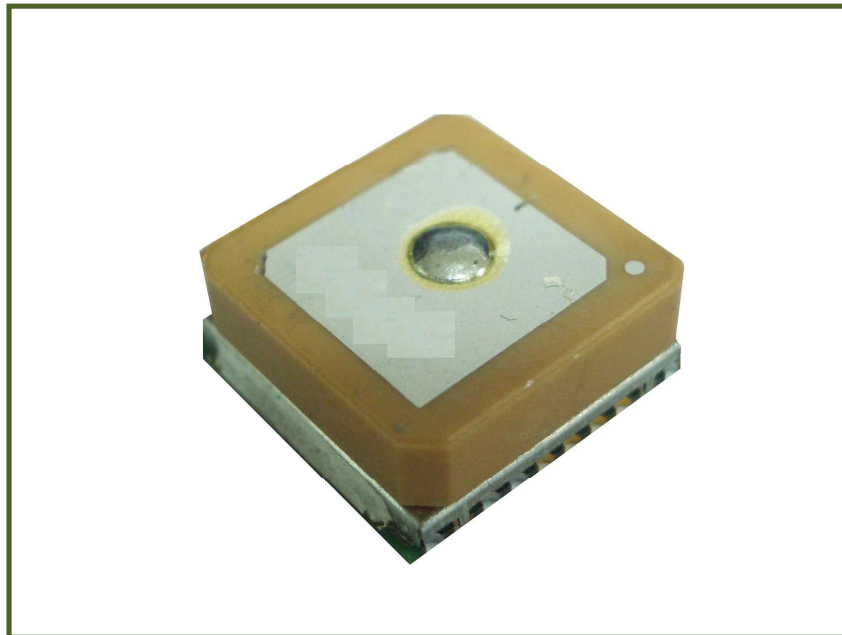


GPS Data Receiver & Antenna Module (Small Size)

NR-GPSMA Ver 7.0



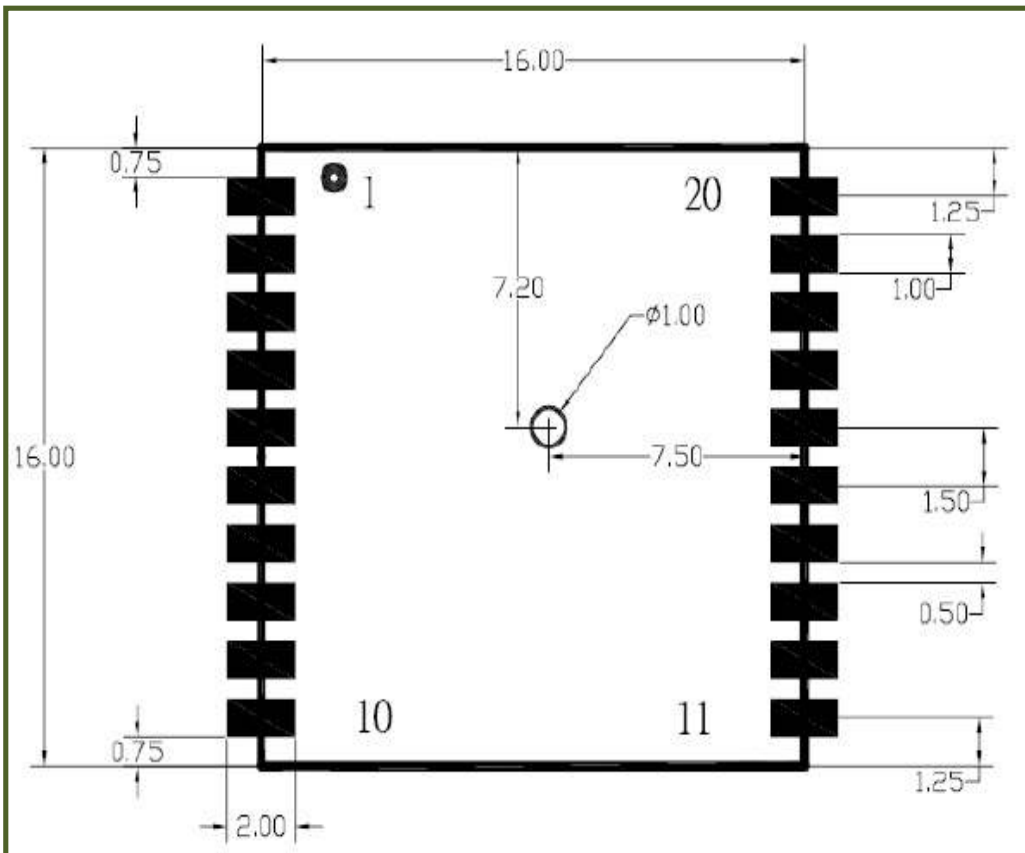
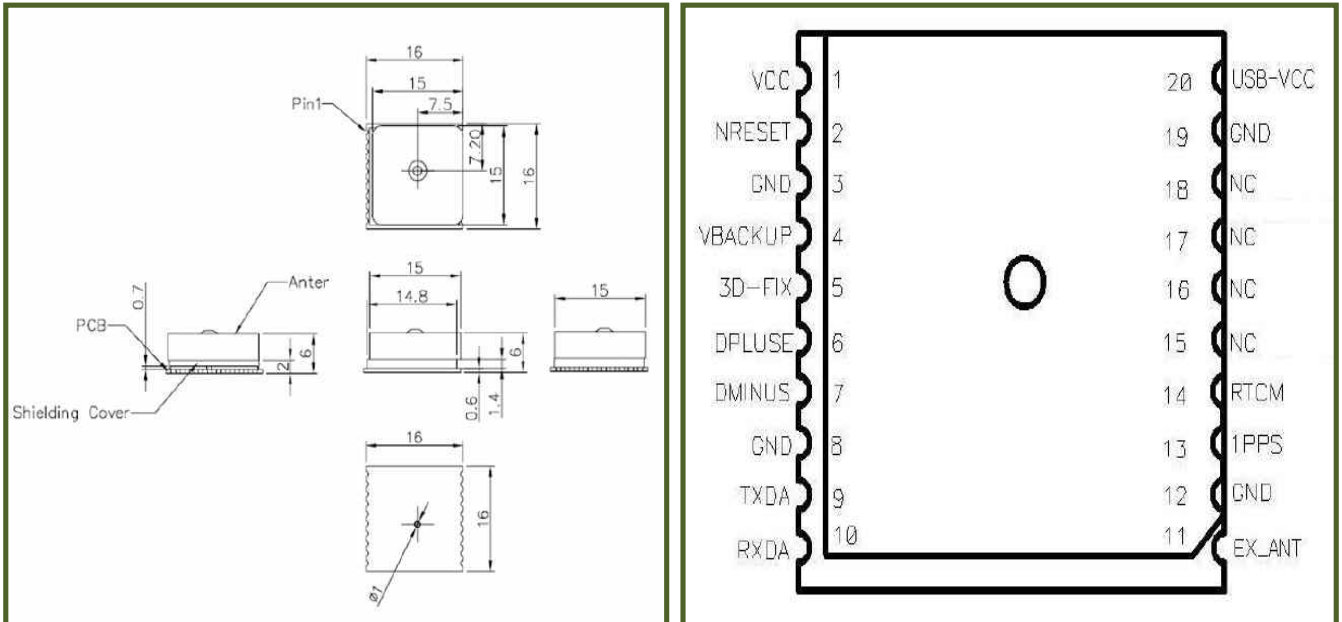
1 . GPS Data Receiver & Antenna Module (Small Size).

- . It is small sized and can receive the GPS data. (Included antenna)
- . It can be received in 66 satellites with high sensitivity. (-165dBm)
- . Received a number of ways.(DGPS(WAAS/EGNOS/MSAS/GAGAN)
- . TTL-UART and USB Interface are supported.
- . It has low power consumption so it is advantageous when battery operated.
- . Compact size(16mm X 16mm) to fit into a small space.

2. GPS Data Receiver & Antenna Module Specification.

Item	Specification
GPS Solution	MTK MT3329
Frequency	L1, 1575.42MHz
Sensitivity	Acquisition -148dBm, cold start Reacquisition -160dBm Tracking -165dBm
Channel	66 channels
TTF	Hot start: 1 second typical Warm start: 33 seconds typical Cold start: 35 seconds typical
Position Accuracy	Without aid:3.0m 2D-RMS DGPS(RTM,SBAS(WAAS,EGNOS,MSAS)):2.5m 2D-RMS
Velocity Accuracy	Without aid : 0.1m/s DGPS(RTM,SBAS(WAAS,EGNOS,MSAS)):0.05m/s
Acceleration Accuracy	Without aid: 0.1 m/s ² DGPS(RTM,SBAS(WAAS,EGNOS,MSAS)):0.05m/s ²
Timing Accuracy (1PPS output)	100 ns RMS
Altitude	Maximum 18,000m (60,000 feet)
Velocity	Maximum 515m/s (1000 knots)
Acceleration	Maximum 4G
Update Rate	1Hz (default), maximum 10Hz
Baud Rate	9600 bps (default)
DGPS	RTCM protocol(configurable by firmware) or SBAS(default) [WAAS, EGNOS, MSAS,GAGAN]
AGPS	Support
Power Supply	VCC : 3V to 3.6V ; VBACKUP : 2.0V to 4.3V
Current Consumption	30mA acquisition, 24mA tracking Shut-down current consumption 20uA typical
Dimension	1 16x16x6m, SMD

3. GPS Data Receiver & Antenna Module Size & Pin Information



Pin	Name	I/O	Description & Note
1	VCC	PI	Main DC Power Input
2	NRESET	I	Reset Input, Low Active
3	GND	P	Ground
4	VBACKUP	PI	Backup Power Input for RTC & Navigation Data Retention
5	3D-FIX	O	3D-Fix Indicator
6	DPLUSE	I/O	USB Port D+
7	DMINUS	I/O	USB Port D-
8	GND	P	Ground
9	TXDA	O	Serial Data Output for NMEA Output (UART TTL)
10	RXDA	I	Serial Data Input for Firmware Update (UART TTL)
11	EX_ANT	I	External antenna 3.0V input and output for external antenna. The maximum consumption current for the GPS antenna is limited to 30mA. When a 3mA or higher current is detected, the IC will acknowledge the external antenna as functional. In the event of short circuit occurring at external antenna, the module will limit the drawn current to a safe level.
12	GND	P	Ground
13	1PPS	O	1PPS Time Mark Output 2.8V CMOS Level
14	RTCM	I	Serial Data Input for DGPS RTCM Data Streaming
15	NC	I	NC
16	NC	O	NC
17	NC	I/O	NC
18	NC	I/O	NC
19	GND	P	Ground
20	USB-VCC	PI	USB DC Power Input

4. GPS Data Receiver & Antenna Module Receive Data Format.

Table-1: NMEA Output Sentence	
Option	Description
GGA	Time, position and fix type data.
GSA	GPS receiver operating mode, active satellites used in the
GSV	The number of GPS satellites in view satellite ID numbers, elevation, azimuth, and SNR values.
RMC	Time, date, position, course and speed data. Recommended Minimum Navigation Information.
VTG	Course and speed information relative to the ground.

Table-2: GGA Data Format

Name	Example	Units	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	064951.000		hhmmss.sss
Latitude	2307.1256	ddmm.mmmm	
N/S Indicator	N	N=north or S=south	
Longitude	12016.4438	dddmm.mmmm	
E/W Indicator	E	E=east or W=west	
Position Indicator	Fix 1	See Table-3	
Satellites Used	8		Range 0 to 14
HDOP	0.95		Horizontal Dilution of Precision
MSL Altitude	39.9	meters	Antenna Altitude above/below mean-sea level
Units	M	meters	Units of antenna altitude
Geoidal Separation	17.8	meters	
Units	M	meters	Units of geoid separation
Age of Diff. Corr.		second	Null fields when DGPS is not used
Checksum	*65		
<CR> <LF>			End of message termination

Table-3: Position Fix Indicator

Value	Description
0	Fix not available
1	GPS fix
2	Differential GPS fix

Table-4: GSA Data Format

Name	Example	Units	Description
Message ID	\$GPGSA		GSA protocol header
Mode 1	A		See Table-5
Mode 2	3		See Table-6
Satellite Used	29		SV on Channel 1
Satellite Used	21		SV on Channel 2
....
Satellite Used			SV on Channel 12
PDOP	2.32		Position Dilution of Precision
HDOP	0.95		Horizontal Dilution of Precision
VDOP	2.11		Vertical Dilution of Precision
Checksum	*00		
<CR> <LF>			End of message termination

Table-5: Mode 1

Value	Description
M	Manual—forced to operate in 2D or 3D mode
A	2D Automatic—allowed to automatically switch 2D/3D

Table-6: Mode 2

Value	Description
1	Fix not available
2	2D (< 4 SVs used)
3	3D (4 SVs used)

Table-7: GSV Data Format

Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages	3		Range 1 to 3 (Depending on the number of satellites tracked, multiple messages of GSV data may be required.)
Message Number1	1		Range 1 to 3
Satellites in View	09		
Satellite ID	29		Channel 1 (Range 1 to 32)
Elevation	36	degrees	Channel 1 (Maximum 90)
Azimuth	029	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, (null when not tracking)
....
Satellite ID	15		Channel 4 (Range 1 to 32)
Elevation	21	degrees	Channel 4 (Maximum 90)
Azimuth	321	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/No)	39	dBHz	Range 0 to 99, (null when not tracking)
Checksum	*7D		
<CR> <LF>			End of message termination

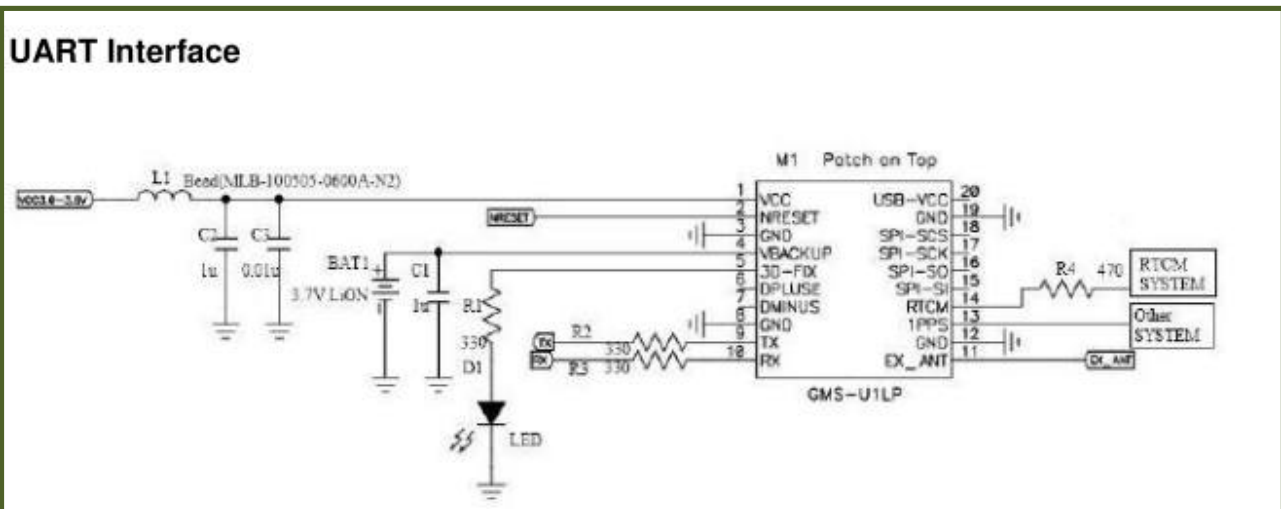
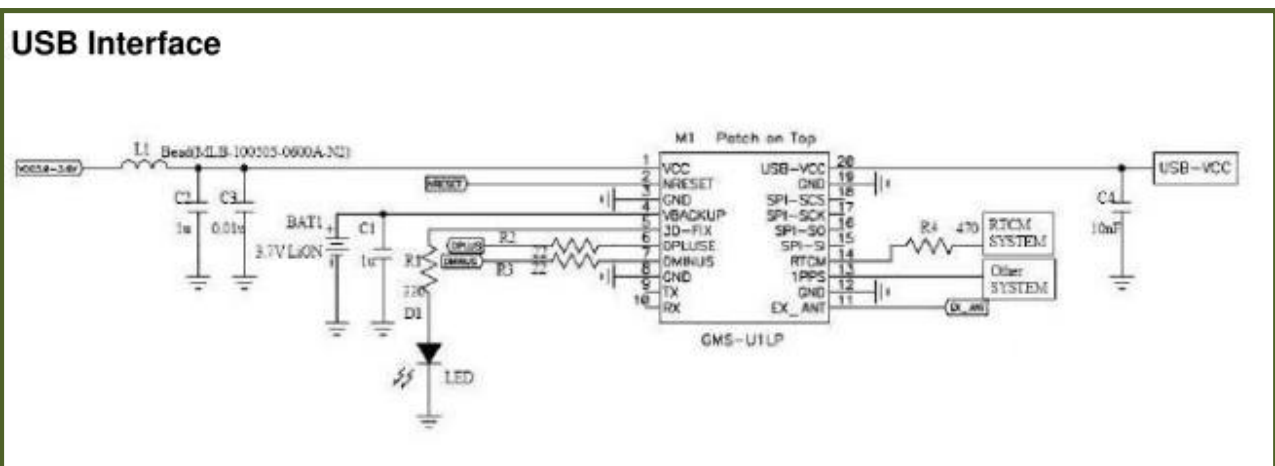
Table-8: RMC Data Format

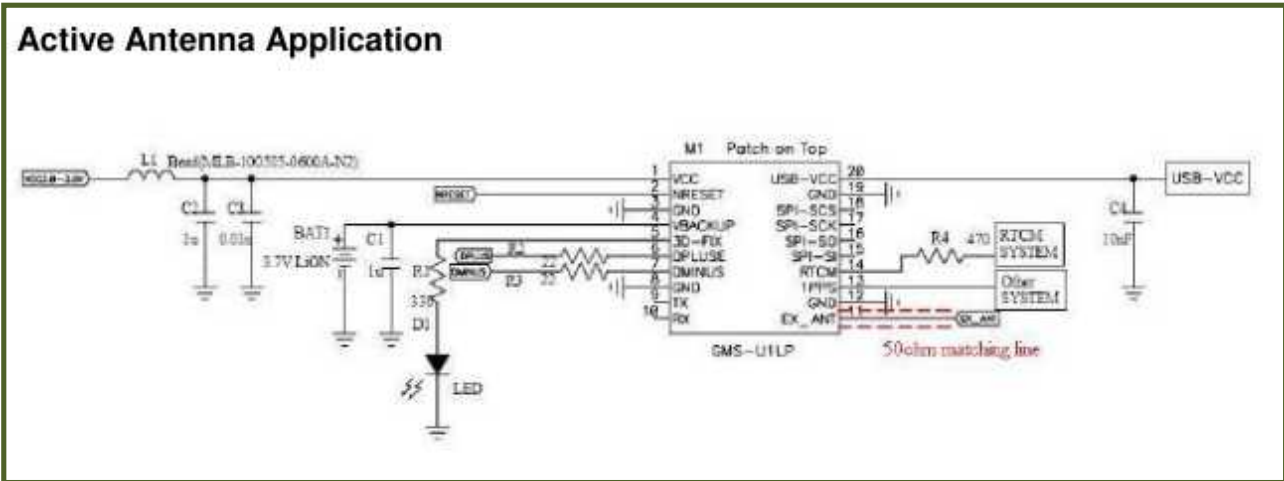
Name	Example	Units	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	064951.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2307.1256		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12016.4438		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed over Ground	0.03	knots	
Course over Ground	165.48	degrees	True
Date	260406		ddmmyy
Magnetic Variation	3.05,W	degrees	E=east or W=west
Mode	A		A= Autonomous mode D= Differential mode E= Estimated mode

Table-9: VTG Data Format

Name	Example	Units	Description
Message ID	\$GPVTG		VTG protocol header
Course	165.48	degrees	Measured heading
Reference	T		True
Course		degrees	Measured heading
Reference	M		
Speed	0.03	knots	Measured horizontal speed
Units	N		Knots
Speed	0.06	km/hr	Measured horizontal speed
Units	K		Kilometers per hour
Mode	A		A= Autonomous mode D= Differential mode E= Estimated mode
Checksum	*06		
<CR> <LF>			End of message termination

5. GPS Data Receiver & Antenna Module Test Circuit.





******* Caution*******

1. Check the features first to connect with other equipment.
2. This circuit is strictly tested.
3. The developer, manufacturer or dealer is not responsible for any malfunctioning/damage caused by connection with other equipment.
4. Appropriate permit /approval is required for some products utilizing this module, depending on functions and usages.

● For more information and inquiry, please refer to the sites below.

R&D : <http://www.neotics.co.kr>

E-Mail : neotics@neotics.co.kr

Sales : <http://www.logiccamp.co.kr>

E-Mail : sales@logiccamp.co.kr