

AMOD

GPS Module – AGP3363

Product Datasheet & Design Guide

<V1.0>

[AMOD Technology Co.,LTD](#)

Subject to changes in technology, design and availability

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AGP3363 Product Datasheet V1.0 © Copyright 2011, Amod Technology

Revision History

Version	Effective Date	Description of Changes
1.0	2011/11/7	Released

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1. Introduction

AMOD's AGP3363 GPS Module is a low-power, high-performance GPS receiver engine board. It is designed with the advanced SiRF GSD4e Device WLCSP GPS IC. The very small form factor and low power consumption of SiRF 4 GPS Module makes it duly suitable for embedded GPS applications such as cell phones and personal navigation device, asset tracking, location-based services (LBS) and security. With its robust design and the extensive support and services backed by AMOD Technology, AGP3363 is the solution of choice for the industry.

2. Key Features

- 48 parallel channels all in view tracking
- Low power consumption
 - Operating current: ~48 mA @ 3.3V \pm 10% (Non-Fix); ~38 mA (Fix)
 - Low-power mode
 - Back-up power: 3.0V \pm 10%
- High sensitivity
 - TTFF @ 35s (Cold) / 30s (Warm) / 1s (Hot)
 - Tracking sensitivity better than -163 dBm
- Small form factor
 - 13 mm x 15.5 mm x 2.5 mm
- Machine mountable (SMD module, tape and reel packed)
- SBAS (WAAS, EGNOS and MSAS) support
- Default Setting
 - Baud rate: 4800 bps (default)
 - NMEA data format: GGA/GSA/RMC/VTG/GLL X 1 GSV X 5
 - WASS ON
- Easy to use TTL interface

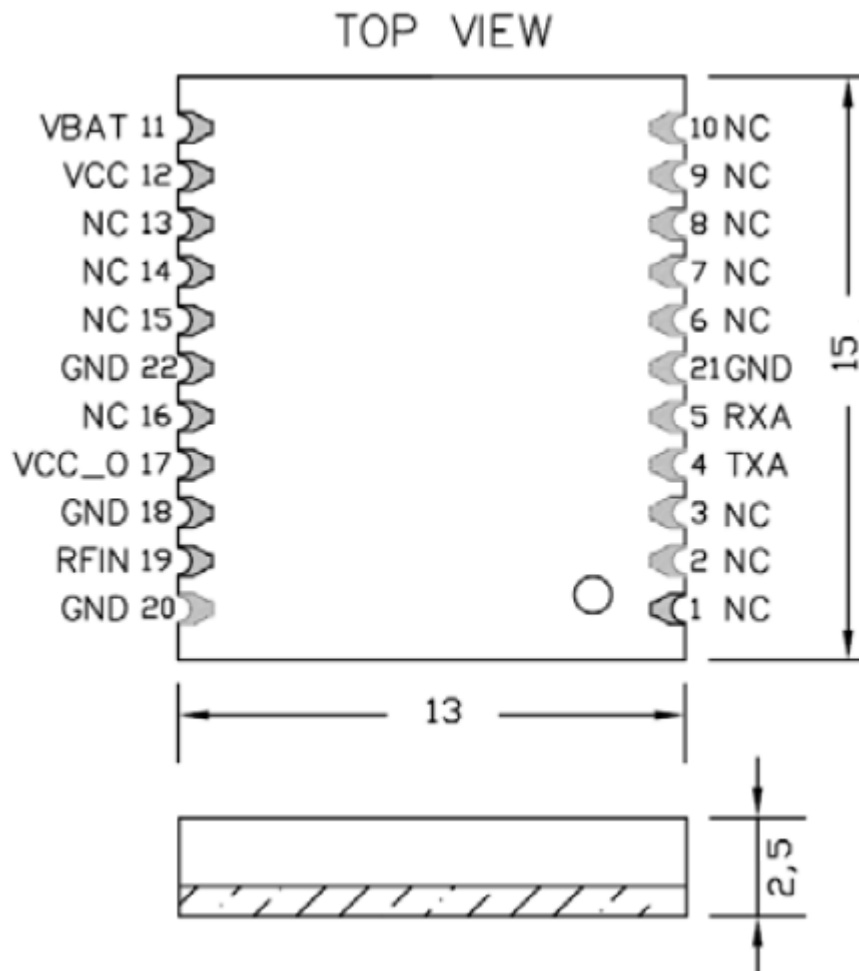
3. Applications

- Cell phones, UMPC, and personal positioning and navigation
- Asset tracking
- Security monitor and tracking
- Location-based services

4. Technical Specification

General	
Frequency	L1, 1575.42 MHz
C/A Code	1.023 MHz chip rate
Channels	48 parallel channels
Accuracy	
Position	10 m, 2D RMS
	5 m, 2D RMS, WAAS corrected
	< 2.5 m (50%), DGPS corrected
Velocity	0.1 m / sec
Time	1 sec synchronized to GPS time
Datum	
Default	WGS-84
Time to First Fix (TTFF)	
Cold Start	<35 sec
Warm Start	<30 sec
Hot Start	1 sec
Dynamic Conditions	
Altitude	18,288 m (60,000 ft.) above sea level, max.
Acceleration	4 g, max.
Velocity	515 m / sec (1000 knots), max.
Jerk	20 m / sec, max.
Power Consumption	
Supply Voltage	3.3 V \pm 10%
Operating Current (Without Antenna)	Non-Fix: ~48 mA (max ~ 60mA) Fix: ~38 mA
Back-up Power	3.0 V \pm 10%
I/O	
Serial Port	TTL
Timing Pulse	
1 pps	Synchronized to the rising edge of GPS sec.
Mechanical	
Size	13 mm x 15.5 mm x 2.5 mm
Weight	< 2.0 g
I/O	22 SMD pads

5. I/O Pin Assignment (Top View)



6. I/O Definition

Pin No.	Name	Type	Description
1	NC		
2	NC		
3	NC		
4	TXA	O	Serial Port I
5	RXA	I	Serial Port I
6	NC		
7	NC		
8	NC		
9	NC		

Pin No.	Name	Type	Description
10	NC		
11	VBAT	PWR	RTC&SRAM power supply
12	VCC	PWR	System power
13	NC		
14	NC		
15	NC		
16	NC		
17	VCC_O	PWR	RF voltage output
18	GND	PWR	Ground
19	RF_IN	I	RF signal input
20	GND	PWR	Ground
21	GND	PWR	Ground
22	GND	PWR	Ground

7. Electrical (DC) Characteristics – Operating

	Min.	Typical	Max.	Unit
DC Supply Voltage (VCC)	3.0	3.3	3.6	V
RTC supply and battery backed SRAM supply	2.5	3.0	3.6	V

8. Software Interface

- NMEA Message Output

NMEA Record	Description
GGA	Global positioning system fixed data
GLL	Geographic position – latitude/longitude
GSA	GNSS DOP and active satellites
GSV	GNSS satellites in view (0.2Hz)
RMC	Recommended minimum specific GNSS data
VTG	Course over ground and ground speed

- GGA – Global positioning system fixed data

\$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M,,,,,0000*18

Name	Example	Unit	Description
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Name	Example	Unit	Description
Message ID	\$GPGGA		GGA protocol header
UTC Position	161229.487		hhmmss.sss
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N: north ; S: south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E: east ; W: west
Position Fix Indicator	1		0 – position fix not available; 1 – GPS SPS mode, position fix valid; 2 – DGPS SPS mode, position fix valid
Satellite Used	07		Range : 00 - 12
HDOP	1.0		Horizontal dilution of precision
MSL Altitude	9.0	meter	
Units	M	meter	
Geoid Separation		meter	
Units	M	meter	
Age of differential correlator		second	NULL if DOPS is not used
Diff. ref station ID	0000		
Checksum	*18		
<CR><LF>			End of message termination

- GLL – Geographic Position – Latitude/Longitude

\$GPGLL,3723.3475,N,12158.3416,W,161229.487,A *2C

Name	Example	Unit	Description
Message ID	\$GPGLL		GLL protocol header
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N: north / S: south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	E		E: east / W: west
UTC Position	161229.467		hhmmss.ss
Status	A		A: data valid / V: data not valid
Checksum	*2C		
<CR><LF>			End of message termination

- GSA – GNSS DOP and Active Satellites

\$GPGSA,A,3,07,02,26,27,09,04,15,,,,,1.8,1.0,1.5*33

Name	Example	Unit	Description
Message ID	\$GPGSA		GSA protocol header
Mode 1	A		M: manual, forced to operate in 2D or 3D mode; A: automatic, allowed to automatically switch 2D/3D;
Mode 2	3		1: fix not available; 2: 2D; 3: 3D;
ID of Satellite Used	07		SV on Channel 1
ID of Satellite Used	02		SV on Channel 2
...			...
ID of Satellite Used			SV on Channel 11
ID of Satellite Used			SV on Channel 12
PDOP	1.8		Position dilution of precision
HDOP	1.0		Horizontal dilution of precision
VDOP	1.5		Vertical dilution of precision
Checksum	*33		*33
<CR><LF>			End of message termination

- GSV – GNSS Satellites in View

\$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*71

\$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41

Name	Example	Unit	Description
Message ID	\$GPGSV		GSA protocol header
Total Number of Messages	2		Range 1 - 3
Message Number	1		
Satellites in View	07		
Satellite ID	07		Channel 1 (Range: 01 – 32)
Elevation	79	degree	Channel 1 (Range: 00 – 90)
Azimuth	048	degree	Channel 1 (Range: 000 – 359)
SNR (C/N0)	42	dB-Hz	Channel 1 (Range: 00 – 99, null when not tracking)
...	...		
Satellite ID	27		Channel 1 (Range: 01 – 32)

Elevation	27	degree	Channel 1 (Range: 00 – 90)
Azimuth	138	degree	Channel 1 (Range: 000 – 359)
SNR (C/N0)	42	dB-Hz	Channel 1 (Range: 00 – 99, null when not tracking)
Checksum	*71		
<CR><LF>			

- RMC – Recommended Minimum Specific GNSS Data

\$GPRMC,053740.000,A,2503.6319,N,12136.0099,E,2.69,79.65,100106,...,A*53

Name	Example	Unit	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	053740.000		hhmmss.sss
Status	A		A: data valid / V: data not valid
Latitude	2503.6319		ddmm.mmmm
N/S Indicator	N		N: north / S: south
Longitude	12136,0099		dddmm.mmmm
E/W Indicator	E		E: east / W: west
Speed over Ground	2.69	knots	True
Course over Ground	79.65	Degree	
Date	100106		ddmmyy
Magnetic Variation		Degree	
Variation Sense			E: east / W: west
Mode	A		A: autonomus
Checksum	*53		
<CR><LF>			Endo

- VTG – Course Over Ground and Ground Speed

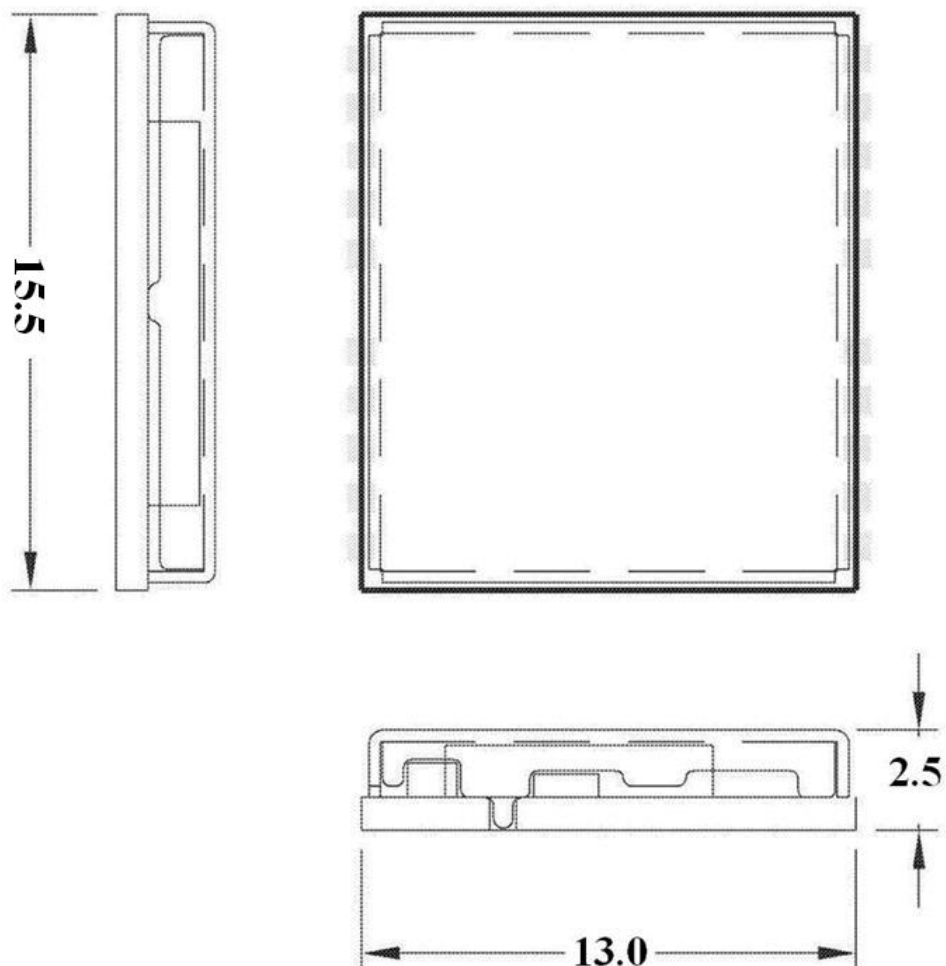
\$GPVTG,309.62,T,,M,0.13,N,0.2,K, A*23

Name	Example	Unit	Description
Message ID	\$GPVTG		VTG protocol header
Course over Ground	309.62	degrees	Measured heading
Reference	T		True
Course over Ground		degrees	Measured heading

Reference	M		Magnetic
Speed over Ground	0.13	knots	Measured speed
Units	N		E: east / W: west
Speed over Ground	0.2	knots	True
Units	K	km/hr	
Mode	A		A: autonomus
Checksum	*23		
<CR><LF>			End of message termination

9. Mechanical Specification

13 mm x 15.5 mm x 2.5 mm



11. Reference Design

