

Multiband GNSS Integrated Antenna & Receiver

M-GNSSB-ANT-RX Previously named SI-L1560-01

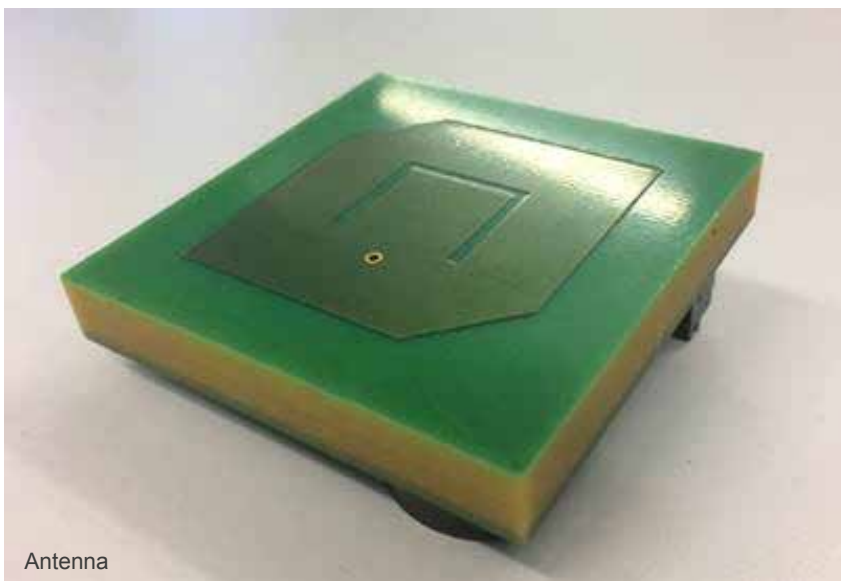
Multiband GNSS Antenna with Integrated Receiver

Overview

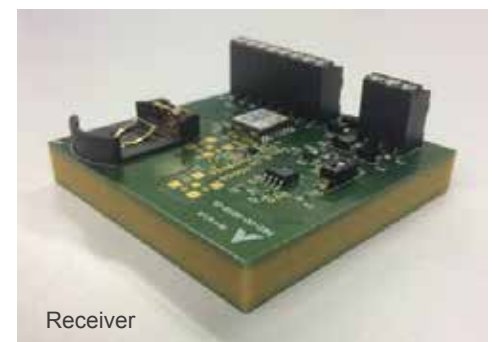
This M-GNSSB-ANT-RX integrated GNSS antenna and receiver provides operation over the approximate frequency range 1560MHz to 1610MHz and covers the GPS L1 and BeiDou B1 bands.

By providing multiple frequency coverage, dilution of precision (DOP) is improved and therefore by having a lock on the greatest number of satellites, the best possible accuracy is obtained.

The M-GNSSB-ANT (previously SI-L1560) option is available without the integrated receiver.



Antenna



Receiver

Features

- Small profile of 58 x 58 x 9mm makes it ideal for mounting in confined spaces.
- Typically the axial ratio is maintained at <3dB across the entire band with gain of 2-3 dB.

Applications

- Transportation.
 - Road user.
 - Rail operators.
 - Harbour traffic.
 - HGVs and logistics fleets.
- Defence.
- Hiking.
- Urban canyons (tall buildings).

Antenna Performance (M-GNSSB-ANT)

The antenna has a typical axial ratio of <math><3\text{dB}</math> across the 1560MHz to 1610MHz frequency band with a typical RHCP gain of 3dB.

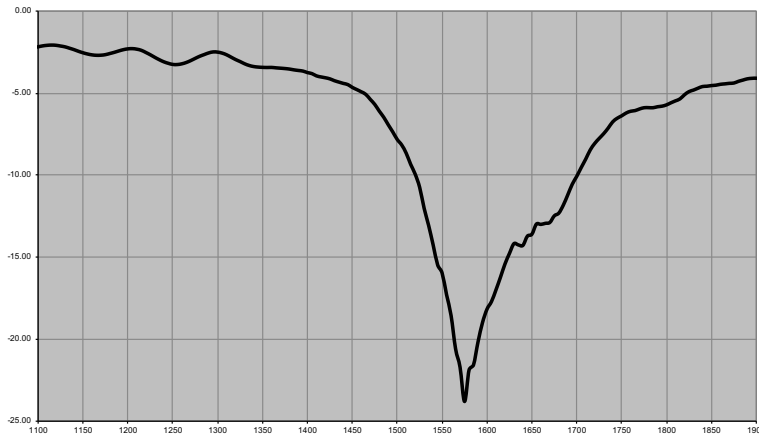


Figure 1
Return Loss

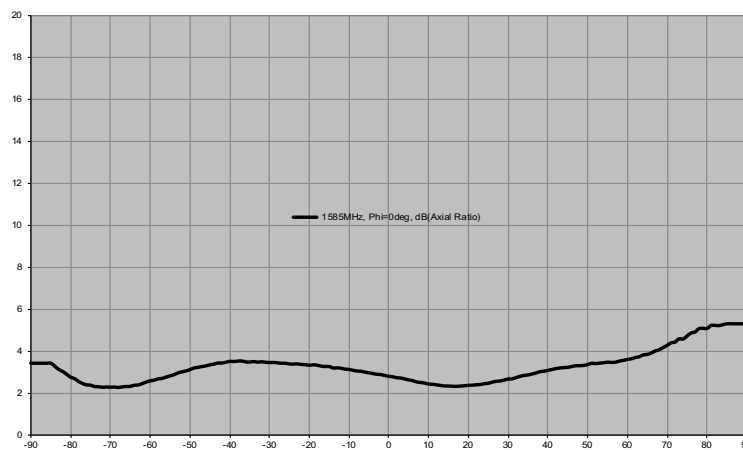


Figure 2
Axial Ratio

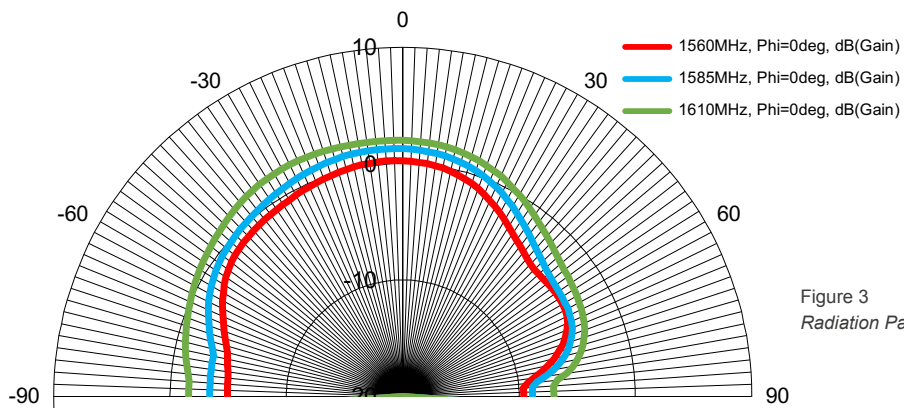


Figure 3
Radiation Pattern

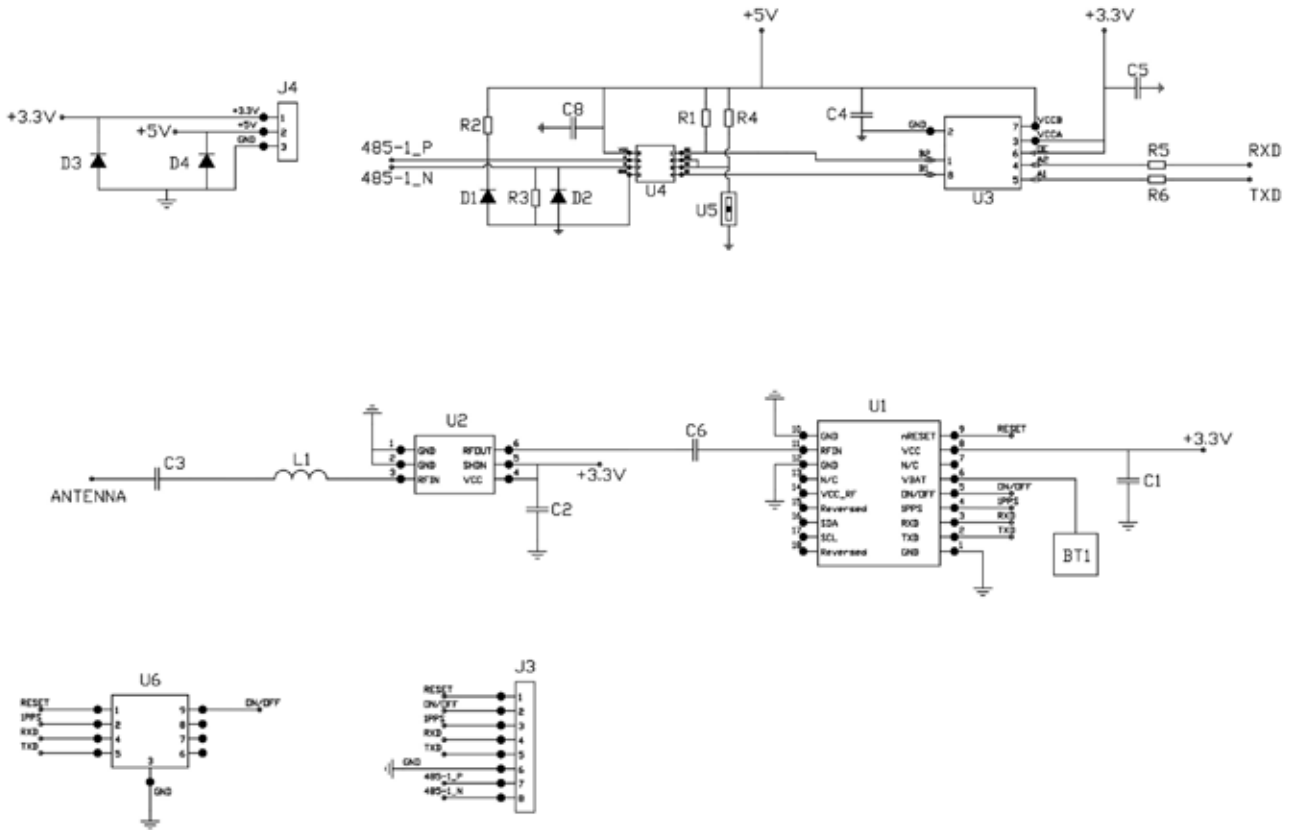
GNSS Receiver (M-GNSSB-ANT-RX)

The receiver is biased from a 3.3V d.c. supply connected at J4_1 with ground connected to J4_3 and a 5V supply connected at to J4_2 if an RS485 output is required. As it typically draws only 25mA, it can easily be run from a battery supply. The positional output information comes in RS485 format and appears on PIN 7(P) and PIN 8(N) of J3 (J3_7, J3_8). For UART output, J4_2 can be disconnected with components R5 and R6 removed and signals can be received on pins J4_4 and J4_5. No digital decoding is performed on this board.

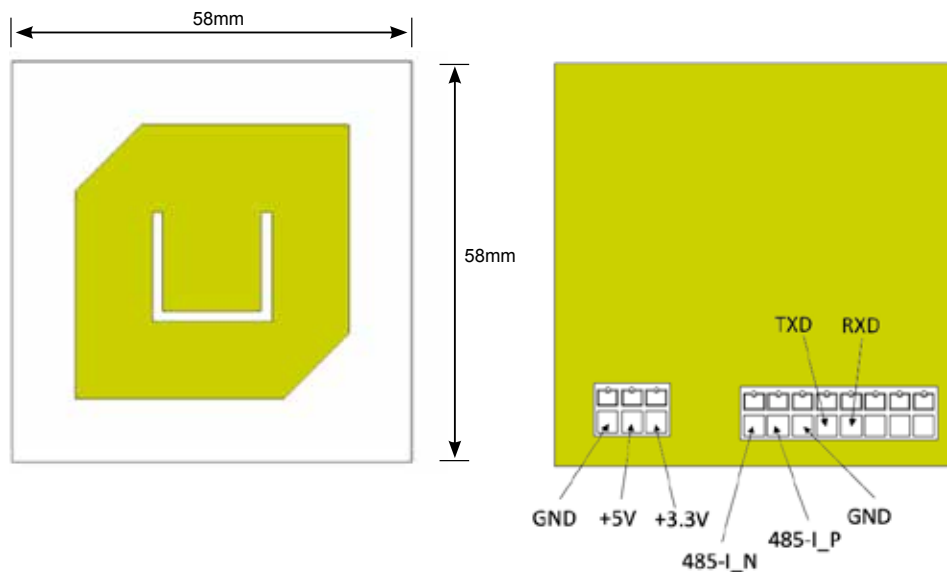
The data, which is outputted in binary format, can be translated into an ASCII string and appears in NMEA format, where:-

Message Component	Description
\$AAAAA	Specific satellite system used
HHMMSS.SS	UTC time in hours, minutes, and seconds of the position
DDMM.MMMMM	Latitude in degrees, minutes, and decimal minutes
K	Latitude indicator; value is N (North latitude) or S (South latitude)
DDMM.MMMMM	Longitude in degrees, minutes, and decimal minutes
L	Longitude indicator; value is E (East longitude) or W (West longitude)
N	Quality indicator; value is: 0 = no position 1 = undifferentially corrected position (autonomous) 2 = differentially corrected position (SBAS, DGPS, L-band DGPS service, L-Dif and e-Dif) 4 = RTK fixed integer (Crescent RTK, Eclipse RTK), L-band high precision services converged 5 = RTK float, L-band high precision services converging
QQ	Number of satellites used in position solution
P.P	Horizontal dilution of precision (HDOP)
A.A	Antenna altitude, in meters, re: mean-sea-level (geoid)
M	Units of antenna altitude (M = meters)
G.G	Geoidal separation (in meters)
M	Units of geoidal separation (M = meters)
SSS	Age of differential corrections, in seconds
RRRR	Differential reference station ID
*CC	Checksum
<CR>	Carriage return
<LF>	Line feed

Receiver Schematic (M-GNSSB-ANT-RX)



Dimensions (M-GNSSB-ANT Option)



Bill of Materials (M-GNSSB-ANT-RX)

Designator	Description
BT1	S8421-45R, Backup Battery Coin Cell Holder, Suitable for CR2032
C1	10uF 0805, 10%, 6.3 V, X5R
C2, C4, C5, C8	0.1uF 0402, 10%, 6.3 V, X5R
C3, C6	27pF 0402, 10%, 6.3 V, X5R
D1, D2	SMAJ15A-E3/5A, Transient Voltage Suppressor
D3, D4	SMAJ6.0A-E3/61, Transient Voltage Suppressor
J3	8-pin Terminal Block, 3.5mm pitch, 24-16 AWG
J4	3-pin Terminal Block, 3.5mm pitch, 24-16 AWG
L1	6.8nH inductor
R1, R4	10kR 0603, 1%
R2, R3	1kR 0603, 1%
R5, R6	0R 0603, 1% (required for RS485 output only)
U1	ATGM336H-5N
U2	AT2659
U3	TXS0102DCUR, 2-Bit Bidirectional Voltage-Level Translator for Open-Drain and Push-Pull Applications
U4	LTC1483IS8
U5	A6S1101H , DIP Switch, 1 circuit, SPST, SMD, 24 VDC
U6	TVS diode, 3.3 V reverse stand-off voltage, ESD/EFT/Surge protection

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