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GPS/AVIATION
SPECIAL PURPOSE ANTENNAS

GPS/Aviation Special Purpose Antennas

3971D-DH Low Noise Permanent Mount GPS Antenna

The 3971D-DH-W Permanent Mount GPS Antenna provides 28 dBd of gain and has one of the industry's lowest noise figures. It provides clear GPS signal reception while minimizing loss-of-lock even in less than ideal conditions and is the optimum choice for GPS Tracking and Timing applications with long cable runs and stand alone GPS applications The 3971D-DH-W features a precision tuned custom ceramic patch element, ESD circuit protection and a high rejection SAW filter. Available in an all-plastic, non-corrosive white cone-shaped radome for fixed installations.

Features

- Weather proof, all-plastic, non-corrosive, cone-shaped enclosure
- Unique radome sheds water and ice, while eliminating problems associated with bird perching
- 28dB gain
- Low current: 8mA (typ)
- ¾ inch thru-hole or bracket mount
- Voltage range 2.7 to 5.5 V

Low Noise Amplifier Specifications

Nominal Gain: 28 dB @ 3.3V
Noise Figure: 0.8 dB (typical)
Out-of-Band Signal Rejection: > 30 dB @ -/+ 30 MHz
Voltage: 2.7-5 VDC

RF/Electrical Specifications

Center Frequency	Nominal Gain	Current Draw
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2 dBic @ 20°	8 mA (typical)

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
2.36" x 1.73" (60 x 44 mm)	.11 lbs (50 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

Housing	Connector	Mounting Method
GE Lexan® EXL9330	TNC jack	¾" thru-hole or bracket mount*

Environmental Specifications

Temperature Range	Weatherproof
-40°C to +85°C operating	IP67

Models

Part Number	Description
3971D-DH	Black radome
3971D-DH-W	White radome

***Order MMK1925 bracket for compatible mounting**

3971D-HR-DH High Rejection Permanent Mount GPS Antenna

The 3971D-HR-DH, permanent mount GPS Antenna provides 28 dB gain and superior out-of-band rejection performance and is the optimum choice for GPS Tracking and Timing applications with high RF fields. It features a precision tuned custom ceramic patch element for maximum signal reception, 15KV ESD circuit protection, a 3 stage LNA circuit and dual high rejection SAW filters. This enables the 3971D-HR-DH to provide a reliable and clear GPS signal while minimizing loss-of-lock, even when conditions are less than ideal. Available in an all-plastic, non-corrosive conical package for vehicle mounting or fixed installations.

Features

- Weather proof, all-plastic, non-corrosive, cone-shaped enclosure
- ¾ inch thru-hole or bracket mount
- Unique radome sheds water and ice, while eliminating problems associated with bird perching
- Very high rejection dual SAW filer for superior out-of-band rejection
- Voltage range: 2.7 to 5.5 V
- Low current draw: 8 mA @ 3.3 VDC

RF/Electrical Specifications

Center Frequency	Nominal Gain	Polarization	Current Draw
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	8 mA @ 3.3 VDC

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
2.36” x 1.73” (60 x 44 mm)	.11 lbs (50 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

Housing	Connector	Mounting Method
GE Lexan® EXL9330	TNC jack	¾” thru-hole or bracket mount*

Environmental Specifications

Temperature Range	Weatherproof
-40°C to +85°C operating	IP67

Models

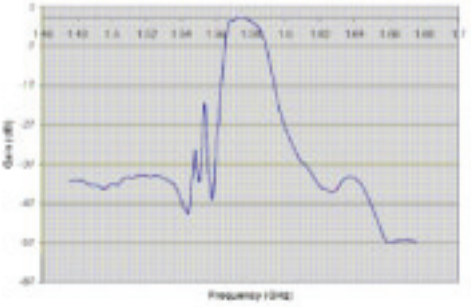
Part Number	Description
3971D-HR-DH	Black radome
3971D-HR-DH-W	White radome

***Order MMK1925 bracket for compatible mounting**

Low Noise Amplifier Specifications

Nominal Gain: 28 dB
Noise Figure: 3.1 dB (typical)
Out-of-Band Signal Rejection: See chart below
Voltage: 2.7-5.5 VDC
ESD Circuit Protection: 15 KV

Out-of-band Filter Rejection



3978D-DH High Gain Permanent Mount GPS Antenna

The 3978D-DH-W high gain permanent mount GPS Antenna provides 40 dB gain and great high out-of-band rejection performance and is the optimum choice for GPS Tracking and Timing applications with long cable runs and stand alone GPS applications. It features a precision tuned custom ceramic patch element for maximum signal reception, 15KV ESD circuit protection, a very low noise (0.5 dB) 3 stage LNA circuit and a SAW filter. This enables the 3978D-DH-W to provide a reliable and clear GPS signal while minimizing loss-of-lock, even when conditions are less than ideal. Available in an all-plastic, non-corrosive low profile package for vehicle mounting.

Features

- Weather proof, all-plastic, non-corrosive, cone-shaped enclosure
- ¾ inch thru-hole or bracket mount
- Unique radome sheds water and ice, while eliminating problems associated with bird perching
- Voltage range: 2.7 to 5.5 V
- High gain: 40 dB (typical)
- Low noise figure: 0.5dB

Low Noise Amplifier Specifications

Nominal Gain: 40 dB
Noise Figure: 0.5 dB (typical)
Out-of-Band Signal Rejection: > 35dB @ ±40 MHz
Voltage: 2.7-5 VDC
ESD Circuit Protection: 15 KV

RF/Electrical Specifications

Center Frequency	Nominal Gain	Polarization	Current Draw
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	15 mA @ 5.5 VDC

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
2.36” x 1.73” (60 x 44 mm)	.11 lbs (50 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

Housing	Connector	Mounting Method
GE Lexan® EXL9330	TNC jack	¾” thru-hole or bracket mount*

Environmental Specifications

Temperature Range	Weatherproof
-40°C to +85°C operating	IP67

Models

Part Number	Description
3978D-DH	Black radome
3978D-DH-W	White radome

***Order MMK1925 bracket for compatible mounting**

3978D-HR-DH High Gain & High Rejection Permanent Mount GPS Antenna

The 3978D-HR-DH-W high gain, permanent mount GPS Antenna provides 40 dB gain and superior out-of-band rejection performance and is the optimum choice for GPS Tracking and Timing applications with long cable runs and stand alone GPS applications. It features a precision tuned custom ceramic patch element for maximum signal reception, 15KV ESD circuit protection, a 3 stage LNA circuit and dual high rejection SAW filters. This enables the 3978D-HR-DH to provide a reliable and clear GPS signal while minimizing loss-of-lock, even when conditions are less than ideal. Available in an all-plastic, non-corrosive conical package for vehicle mounting or fixed installations.

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Features

- Weather proof, all-plastic, non-corrosive, cone-shaped enclosure
- ¾ inch thru-hole or bracket mount
- Unique radome sheds water and ice, while eliminating problems associated with bird perching
- Very high rejection dual SAW filer for superior out-of-band rejection
- Voltage range: 2.7 to 5.5 V
- High gain: 40 dB (typical)

RF/Electrical Specifications

Center Frequency	Nominal Gain	Polarization	Current Draw
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	15 mA @ 5.5 VDC

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
2.36” x 1.73” (60 x 44 mm)	.11 lbs (50 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

Housing	Connector	Mounting Method
GE Lexan® EXL9330	TNC jack	¾” thru-hole or bracket mount*

Environmental Specifications

Temperature Range	Weatherproof
-40°C to +85°C operating	IP67

Models

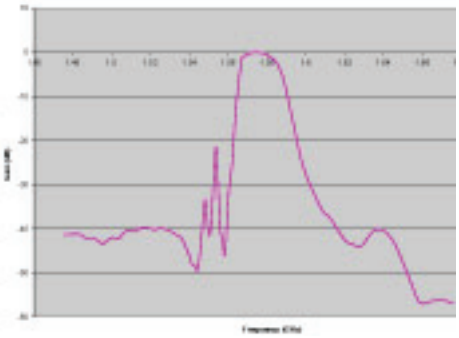
Part Number	Description
3978D-HR-DH	Black radome
3978D-HR-DH-W	White radome

***Order MMK1925 bracket for compatible mounting**

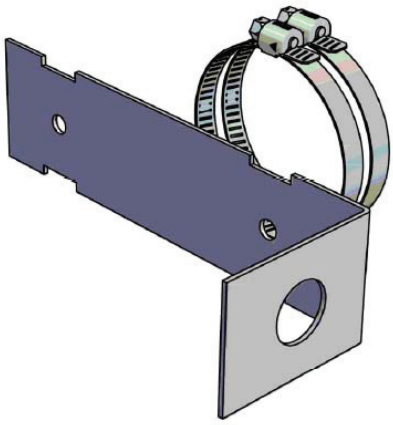
Low Noise Amplifier Specifications

Nominal Gain: 40 dB
Noise Figure: 3.1 dB (typical)
Out-of-Band Signal Rejection: See chart below
Voltage: 2.7-5.5 VDC
ESD Circuit Protection: 15 KV

Out-of-band Filter Rejection



MMK1925 Mounting Bracket for the 397XD Series



MMK1925

The MMK1925 Stainless steel “L” bracket mount was designed for wall or pipe mount installations. The mount comes with two hose clamps and can be used on a 2” maximum diameter mast. The bracket is 6” long with a 3/4” diameter hole for mounting the antenna.

Features

- Designed for wall or pipe mount installations
- RoHS Complaint

Antenna Used with MMK1925

Model
3971D
3971D-DH
3977D
3978D
3978D-DH
3971D-HR-DH
3978D-HR-DH

GPS-TMG-20N, 20 dB Internal Amplifier

The GPS-TMG-20 timing reference antennas are specifically designed for long-lasting, trouble-free deployments in congested cell-site applications. Their 20 dB high gain amplifier is well suited to address attenuation issues associated with applications requiring longer cable runs.

The proprietary quadrifiliar helix design, coupled with multistage filtering provides superior out-of-band rejection and lower elevation pattern performance than traditional patch antennas.

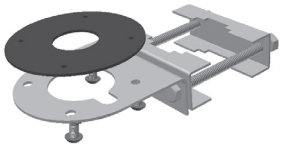
Their unique radome shape sheds water and ice, while eliminating problems associated with bird perching. The antenna may be purchased by itself or with pipe mounting hardware. Custom models or site kits options are also available.

This antenna is made of materials that fully comply with provisions stipulated by EU directives RoHS 2002/95/EC.

This antenna also features ESD, reverse polarity protection and transit voltage suppression.

GPS-TMG-20N

GPS-TMG-MRNMNT



GPS-TMG-LMNT

Antenna Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization
1575.42 +/- 10 MHz	3.5 dBic	50 ohms	< 1.5:1	Right hand circular

Connector	Input/Output
N, female (one - bottom fed)	• ESD protected • Reverse polarity protection • Transient voltage suppression on output

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Shipping Weight	Radome Color
5” H x 3.2” D (126 H x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 x 112 x 96 mm)	0.6 lbs (0.3 kg)	1.9 lbs (0.9 kg)	White

Environmental Specifications

Temperature Range	Humidity
- 40˚C to + 85˚C	95%

Mounting

All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

Model	Options
GPS-TMG-20N	Does not include mounting hardware.
GPS-TMG-20NMS	Includes universal mounting hardware consisting of collar (GPS-TMG-MNT) and pipe clamp (GPS-TMG-LMNT).
GPS-TMG-20NCS	Includes economy collar mount (GPS-TMG-MRNMNT).

Low Noise Amplifier Specifications

Frequency Band: 1575.42 center frequency 3 dB bandwidth +/- 10 MHz
Amplifier Gain: 20 dB +/- 3 dB
Nominal Impedance: 50 ohms
Output VSWR: < 2.0:1
Maximum Noise Figure: ≤ 2.5 dB @ +25˚C including pre-selector
DC Voltage: 3.3 - 9.0 V (regulated)
DC Current: 20 mA, 30 mA max @ 5V
Polarization: Right hand circular
Filtering: 3 stage filters including pre-selector
Out of band rejection: -60 dB @ 1575.42 +/- 50 MHz

GPS-TMG-26N

GPS-TMG-26N, 26 dB Internal Amplifier

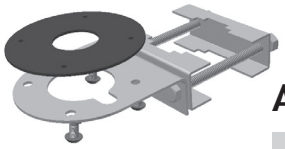
The GPS-TMG-26 timing reference antennas feature a 26 dB amplifier specifically designed to support long-lasting, trouble-free deployments in congested cell-site applications.

The proprietary quadrifiliar helix design, coupled with multi-stage filtering provides superior out-of-band rejection and lower elevation pattern performance than traditional patch antennas.

Their unique radome shape sheds water and ice, while eliminating problems associated with bird perching. The antenna may be purchased by itself or with pipe mounting hardware. Custom models or site kits options are also available.

This antenna is made of materials that fully comply with provisions stipulated by EU directives RoHS 2002/95/EC.

GPS-TMG-MRNMNT



GPS-TMG-LMNT

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Low Noise Amplifier Specifications

Frequency Band (MHz): 1575.42 +/- 10 MHz
Amplifier Gain: 26 dB +/- 3 dB
Nominal Impedance: 50 ohms
Output VSWR: < 2.0:1
Maximum Noise Figure: ≤ 2.5 dB @ +25°C including pre-selector
DC Voltage: 3.3- 9.0 V (regulated)
DC Current: ≤ 35 mA
Filtering: 3 stage filtering including pre-selector
Bandwidth: ≥ 60 dB @ +/- 50 MHz off center frequency

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Connector
1575.42 +/- 10 MHz	3.5 dBic	50 ohms	≤1.5:1	Right hand circular	N, female (one - bottom fed)

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Shipping Weight	Radome Color
5.0” H x 3.2” D (126 H x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 L x 112 x 96 mm)	0.6 lbs (0.3 kg)	1.9 lbs (0.9 kg)	White

Environmental Specifications

Temperature Range	Humidity
- 40°C to + 85°C	95%

Mounting

All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

Model	Options
GPS-TMG-26N	Does not include mounting hardware.
GPS-TMG-26NMS	Includes universal mounting hardware consisting of collar (GPS-TMG-MNT) and pipe clamp (GPS-TMG-LMNT).
GPS-TMG-26NCS	Includes economy collar mount (GPS-TMG-MRNMNT).

GPS-TMG-40N, 40 dB Internal Amplifier

The GPS-TMG-40 timing reference antennas are specifically designed for long-lasting, trouble-free deployments in congested cell-site applications. Their 40 dB high gain amplifier is well suited to address attenuation issues associated with applications requiring longer cable runs.

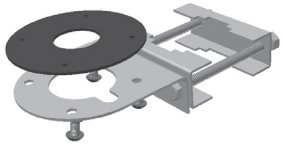
The proprietary quadrifiliar helix design, coupled with multi-stage filtering provides superior out-of-band rejection and lower elevation pattern performance than traditional patch antennas.

Their unique radome shape sheds water and ice, while eliminating problems associated with bird perching. The antenna may be purchased by itself or with pipe mounting hardware. Custom models or site kits options are also available.

This antenna is made of materials that fully comply with provisions stipulated by EU directives RoHS 2002/95/EC.

This antenna also features ESD, reverse polarity protection and transit voltage suppression.

GPS-TMG-40N



GPS-TMG-LMNT

GPS-TMG-MRNMNT

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Connector
1575.42 +/- 10 MHz	3.5 dBic	50 ohms	≤ 1.5:1	Right hand circular	N, female (one - bottom fed)

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Shipping Weight	Radome Color
5.0” H x 3.2” D (126 H x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 x 112 x 96 mm)	0.6 lbs (0.3 kg)	1.9 lbs (0.9 kg)	White

Environmental Specifications

Temperature Range	Humidity
- 40˚C to + 85˚C	95%

Mounting

All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

Model	Options
GPS-TMG-40N	Does not include mounting hardware.
GPS-TMG-40NMS	Includes universal mounting hardware consisting of collar (GPS-TMG-MNT) and pipe clamp (GPS-TMG-LMNT).
GPS-TMG-40NCS	Includes economy collar mount (GPS-TMG-MRNMNT).

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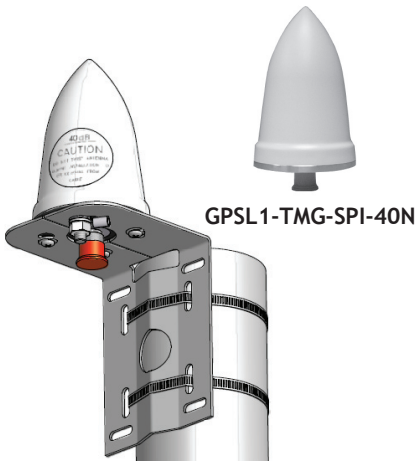
Low Noise Amplifier Specifications

Frequency Band (MHz): 1575.42 +/- 12 MHz
Amplifier Gain: 40 dB +/- 4 dB
Nominal Impedance: 50 ohms
Output VSWR: < 2.0:1
Maximum Noise Figure: < 2.5 dB @ +25˚C
DC Voltage: 3.3-9.0 V (regulated)
DC Current: ≤ 40 mA
Filtering: 3 stage filtering including pre-selector
Bandwidth: ≥ 60 dB @ +/- 50 MHz off center frequency



GPSL1-TMG-SPI-40N

GPSL1-TMG-SPI-40NCB

GPSL1-TMG-SPI-40N, 40 dB Internal Amplifier with Integrated Lightning Protection

The GPSL1-TMG-SPI-40N timing reference antennas are specifically designed for long-lasting, trouble-free deployments in congested cell-site applications. The low noise, high gain amplifier is well suited to address attenuation issues associated with applications requiring longer cable runs.

The proprietary quadrifiliar helix design, coupled with multistage filtering provides superior out-of-band rejection and lower elevation pattern performance than traditional patch antennas.

Their unique radome shape sheds water and ice, while eliminating problems associated with bird perching. The antenna comes with surge compliant mounting that addresses industry grounding requirements. Custom models or site kits options are also available.

This antenna is made of materials that fully comply with provisions stipulated by EU directives RoHS 2002/95/EC.

The antenna provides integrated, on-board lightning protection capability that alleviates the need for downstream, in-line surge suppressors.

The antenna also features ESD, reverse polarity protection and transit voltage suppression.

Low Noise Amplifier Specifications

Frequency Band: 1575.42 +/-10 MHz
Amplifier Gain: 40 dB +/- 4 dB
Nominal Impedance: 50 ohms
Output VSWR: <2.0:1
Maximum Noise Figure: < 2.5 dB @ +25°C including pre-selector
DC Voltage: 3.3-9.0 V (operating) ≤28.0 V (survivability)
DC Current: < 30 mA @ 5 V
Filtering: 3 stage filtering including pre-selector
Out of Band Rejection: ≥ -60 dB @ +/- 50 MHz off center frequency
Lightening Protection Compliance: Per EN61000-4-5 Level 4

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Connector
1575.42 +/- 10 MHz	3.5 dBic	50 ohms	<1.5:1	Right hand circular	N, female (one - bottom fed)

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Radome Color
7.25” H x 3.2” D (184 x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 x 112 x 96 mm)	0.75 lbs (0.34 kg)	White

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C	95%

Mounting

All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

Model	Options
GPSL1-TMG-SPI-40N	Does not include mounting hardware.
GPSL1-TMG-SPI-40NCB	Includes heavy duty mount (GPS-TMG-MHD), a grounding screw and lug nut

40 dB GPS L1/GLONASS L1/GALILEO E1 Timing Antenna with Integrated Lightning Protection

GPSGL-TMG-SPI-40N

GPSGL-TMG-SPI-40NCB

The GPSGL-TMG-SPI-40N timing reference antennas are specifically designed for long-lasting, trouble-free deployments in congested cell-site applications. The low noise, high gain amplifier is well suited to address attenuation issues associated with applications requiring longer cable runs.

The proprietary quadrifiliar helix design, coupled with multistage filtering provides superior out-of-band rejection and lower elevation pattern performance than traditional patch antennas. This multiband antenna covers GPS L1, GALILEO L1 as well as GLONASS E1 frequencies.

Their unique radome shape sheds water and ice, while eliminating problems associated with bird perching. The antenna comes with surge compliant mounting that addresses industry grounding requirements. Custom models or site kits options are also available.

This antenna is made of materials that fully comply with provisions stipulated by EU directives RoHS 2002/95/EC.

The antenna provides integrated, on-board lightning protection capability that alleviates the need for downstream, in-line surge suppressors.

The antenna also features ESD, reverse polarity protection and transit voltage suppression.

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Connector
1575.42 +/-10 MHz 1602-1615 MHz	≥ 3.5 dBic ≥ 3 dBic	50 ohms	<1.5:1	Right hand circular	N, female (one - bottom fed)

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Radome Color
7.25” H x 3.2” D (184 x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 x 112 x 96 mm)	0.75 lbs (0.34 kg)	White

Environmental Specifications

Temperature Range	Humidity
-40˚C to +85˚C	95%

Mounting

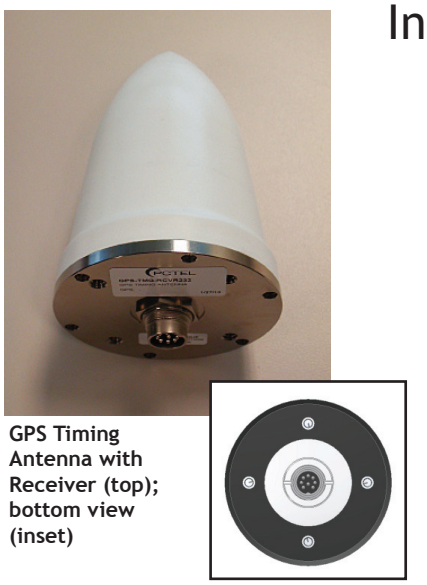
All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

Model	Options
GPSGL-TMG-SPI-40N	Does not include mounting hardware.
GPSGL-TMG-SPI-40NCB	Includes heavy duty mount (GPS-TMG-MHD), a grounding screw and lug nut

Low Noise Amplifier Specifications

Frequency Band: 1590 +/-30 MHz
Amplifier Gain: 40 dB +/- 4 dB @ GPS L1 & GALILEO E1 38 dB +/- 4 dB @ GLONASS L1
Nominal Impedance: 50 ohms
Output VSWR: <2.0:1
Maximum Noise Figure: < 2.5 dB @ +25˚C including pre-selector
DC Voltage: 3.3-9.0 V (operating) ≤28.0 V (survivability)
DC Current: < 40 mA
Filtering: 3 stage filtering including pre-selector
Out of Band Rejection: ≥ -60 dB @ f ≤ 1530 MHz ≥ -60 dB @ f ≥ 1660 MHz
Lightening Protection Compliance: Per EN61000-4-5 Level 4

GPS Timing, 40dB With Integrated Receiver And Integrated Lightning Protection



GPS Timing Antenna with Receiver (top); bottom view (inset)

Features

- Integrated GPS antenna and receiver in one rugged housing
- Quadrifiliar helix element for optimal coverage and multipath rejection
- Embedded low noise amplifier with preselector and interstage filter for minimizing interference
- Low power consumption (500 mW typical)
- Input voltage 8-12 V
- Lighting Protection Compliance per EN61000-4-5 Level 4

Antenna Specifications

Frequency Band	Antenna Gain	Polarization
1575.42 +/- 10 MHz	4 dBic (Quadrifiliar Helix)	Right hand circular (RHCP)

Receiver Specifications

General	Update Rate	Accuracy
L1 (1575.42 MHz) frequency, C/A code,12-channel, continuous tracking receiver	NMEA@ 1 Hz	Horizontal: <3 m (50%), <8 m (90%) Altitude: <10 m (50%), <16 m (90%) PPS (static): ± 50 nanoseconds

Acquisition (Autonomous Operation)	Sensitivity	PPS	Protocols	Interface
Reacquisition: 2 sec typical Hot start: 9 sec typical Warm Start: 36 sec typical Cold Start: 39 sec typical Out of the Box: 41 sec typical	Tracking: -150 dBm Acquisition: -142 dBm	Once per second TTL-level pulse (RS232 only) Differential pulse (RS422 only)	NMEA 0183 v3.0 Bi-directional NMEA messages Messages selectable by NMEA commands Selection stored in flash memory	RS232 or RS422 options

Mechanical Specifications

Antenna Dimensions	Shipping Dimensions	Antenna Weight	Shipping Weight	Radome Color	Connector
5.0” H x 3.2” D (126 H x 81 mm)	7.5” L x 4.4” W x 3.8” D (190 L x 112 x 96 mm)	0.6 lbs (0.3 kg)	1.9 lbs (0.9 kg)	White	8-pin circular connector conforming IEC 60130-9.v3.0

Environmental Specifications

Operating Temperature	Humidity	Ingress Protection
- 40˚C to + 85˚C	95%	IP67

Model Numbers

All mounting options fit pipes of 1”-1.45” (25 mm-37 mm) maximum diameter.

RS232 Interface Models	RS422 Interface Models	Description
GPS-TMG-RCVR232	GPS-TMG-RCVR422	Timing antenna (does not include mounting hardware).
GPS-TMG-RCVR232NLM	GPS-TMG-RCVR422NLM	Timing antenna includes L-bracket mount (GPS-TMG-LMNT)
GPS-TMG-RCVR232NCB	GPS-TMG-RCVR422NCB	Timing antenna includes heavy duty mount (GPS-TMG-HDMNT)

12700 Series, Airborne Antennas

The 12700 series antennas are robust, rigorously tested and environmentally sealed units suitable for a wide variety of GPS applications, including vehicle tracking, marine and airborne navigation.

These antennas have been tested to five DO-160 environmental test requirements, including:

- Altitude. RTCA/DO-160E, Section 4.6.1, Category F2
- Temperature and Temperature Variation Test. RTCA/DO-160E, Sections 4 and 5, Categories F2 and A
- Humidity. RTCA/DO-160D, Section 6. Category C-External Humidity Environment.
- Mechanical Shock RTCA/DO-160E, Section 7.0, Category B, Operational
- Vibration Test. RTCA/DO-160E, Section 8.0, Curves C, L, M, and Y

They feature a sealed o-ring that protects them against severe environmental conditions for reliable, long-lasting performance. Their radome is constructed of high grade polymer resin for UV and abrasion resistance. They will resist all de-icing fluids, jet fuels, and standard cleaning solvents.

12700 Series

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Grounding Protection	RF Input
1575.42 +/-10 MHz (GPS L1)	+4.5 dBiC nominal at zenith	50 ohms	< 1.5:1	Right hand circular	DC grounded	TNC female

Mechanical Specifications

Antenna Dimensions	Antenna Weight	Radome Color
3.4” H x 2.2” W	3.6 oz. nominal	White

Environmental Specifications

Temperature Range	Humidity
-40˚C to +85˚C	95%

Mounting

Model	Options
1270FW	Surface mount four hole pattern
1271FW	Surface mount four hole pattern
1273FW	Surface mount four hole pattern

PCTEL

Low Noise Amplifier Specifications

Frequency Band (MHz): 1575.42 +/-10 MHz (GPS L1)
Amplifier Gain: 26 dB (Part #1270FW) Passive (Part #1271FW) 35 dB (Part #1273FW)
Nominal Impedance: 50 ohms
Output VSWR: < 2.0:1
Noise Figure: 2.5 dB nominal
DC Voltage: 4.5 to 9 VDC
DC Current: ≤ 40 mA
Polarization: Right hand circular
Filtering: Dual filter

12100 Series, Airborne Puck Antennas

12100 Series

The 12100 series antennas are robust, rigorously tested and environmentally sealed units suitable for a wide variety of GPS applications. They are ideal for vehicle tracking, marine or airborne navigation installations requiring maximum security and durability.

These antennas have been tested to DO-160 environmental test requirements and are designed to meet Arinc 743 specifications. They feature dual o-ring seals that protect them against severe environmental conditions for reliable, long-lasting performance. Their radome is constructed of high grade polymer resin for UV and abrasion resistance. They will resist all de-icing fluids, jet fuels, and standard cleaning solvents.

The antennas in this series are hard mounted through a unique single hole feed structure and include gaskets to prevent air and water leaks. They are available in passive form (no amplifier) or in a variety of active amplified gain configurations.

Low Noise Amplifier Specifications

Frequency Band (MHz): 1575.42 +/-10 MHz (GPS L1)
Amplifier Gain: 26 dB (Part #1210FW) 40 dB (Part #1213FW)
Nominal Impedance: 50 ohms
Output VSWR: 2.0:1 maximum
Maximum Noise Figure: 2.5 dB maximum
DC Voltage: 5 to 9 VDC through connector
DC Current: 25 mA typical ≤ 40 mA
Filtering: Dual ceramic filters

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization	Grounding Protection	RF Input
1575.42 +/-10 MHz (GPS L1)	+4.5 dBiC nominal at zenith	50 ohms	< 1.9:1	Right hand circular	DC grounded	TNC female

Mechanical Specifications

Antenna Dimensions	Antenna Weight	Radome Color	NATO Stock Number
2.7” OD x 0.75” D	3 oz. nominal	White	5820 99 147 2772 (for 1213FW only)

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C	95%

Mounting

Model	Options
1210FW	Through hole 5/8-18UNC-2A thread
1213FW	Through hole 5/8-18UNC-2A thread

Precision Performance WAAS Antenna

Specifically designed to meet the demanding standards necessary for worldwide WAAS aviation operations, model 2225NW features both advanced spiral technology and a self-complementary element structure.

The antenna's low multipath error design has the lowest phase error of all antenna element designs. The spiral minimizes manufacturing errors and its self-complementary currents act to center antenna phase. The large cavity design (1/5 lambda) allows for similar, choke slot-like (radiation pattern), roll off at the horizon and a superior front-to-back ratio.

2225NW

Antenna Element Electrical Specifications

Frequency Band	Antenna Gain	Nominal Impedance	VSWR	Polarization
1575.42 MHz (L1 band)	>-3 dBic @ El=90° (zenith); ≥ -9.0 dBic @ El=5° (L1)	50 ohms	< 2.0:1 @ +/-10 MHz	Right hand circular
1227.60 MHz (L2 band)	>-3 dBic @ El=90° (zenith); ≥ -5.0 dBic @ El=5° (L2)	50 ohms	< 2.0:1 @ +/-10 MHz	Right hand circular
1176.45 MHz (L5 band)	>-3 dBic @ El=90° (zenith); ≥ -9.0 dBic @ El=5° (L5)	50 ohms	< 2.0:1 @ +/-10 MHz	Right hand circular

Elevation Boresight	Elevation HPBW	Azimuth HPBW	Axial Ratio
90° above horizon	66° (L1 band) 90° (L2 band) 103° (L5 band)	Omnidirectional	8 dB (max) elevation from 5° to 45° 4 dB (max) elevation above 45°

Mechanical Specifications

Antenna Dimensions	Antenna Weight	Radome Color	Connectors
24.5" H x 12.8" OD (61.27 x 32.5 cm)	30 lbs (13.6 kg)	White	**RF Side:** TYpe N, Female, Flonge-mount **DC Side:**TYpe N, Male, Cable-terminated

Environmental Specifications

Temperature Range	Wind Operational
-58°F to 158°F	0-100 mph

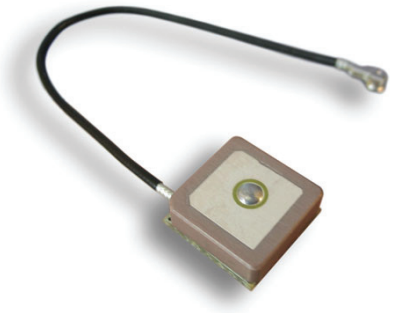
Mounting

Model	Options
2225NW	Interface to PELCO mount*

*PELCO mount not included

Low Noise Amplifier Specifications

Frequency Band (MHz): 1575.42 MHz (L1 band) 1227.60 MHz (L2 band) 1176.45 MHz (L5 band)
Amplifier Gain: 48 +/3 dB
VSWR: < 1.5:1 +/-10 MHz
Maximum Noise Figure: 2.0 dB
DC Voltage: 24 V
DC Current: ≤ 200 mA @ 24 V
Bandwidth: -1 dB +/-10 MHz (L1, L2, L5) -80 dB +/-50 MHz (L1, L2, L5)
Bandpass Ripple: 1.5 dB +/-10 MHz (L1, L2, L5)
Group Delay Ripple: 3 ns @ L1 +/-10 MHz 4 ns @ L2 +/-10 MHz 4 ns @ L5 +/-10 MHz
1 dB Compression Point: ≥ 10 dBm



1357D 13 mm Compact Embedded GPS Antenna

The Compact 1357D Embedded GPS antenna is ideal for GPS enabled ruggedized PDAs, laptops and portable GPS Handhelds. The 1357D antenna features a compact ceramic patch element, ESD circuit protection, a low noise amplifier and a SAW filter, enabling the 1357D to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock in an extremely small form factor.

Features

- Ultra compact form factor
- 15 KV ESD circuit protection
- 2.7 to 5 V operation
- Ideal for embedded applications

RF/Electrical Specifications

Center Frequency	Gain	Polarization	Current Draw
1575.42 MHz ±10 MHz	0.5 dBic	Right Hand Circular	9 mA @ 3.3V 15 mA @ 5V

Low Noise Amplifier Specifications

Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 1.5 dB (typical)
Voltage: 2.7 - 5 V
Out-of-band Rejection: +/- 15 MHz: 5dB +/- 20 MHz: 10 dB +/- 30 MHz: 32 dB +/- 40 MHz: 40 dB

Mechanical Specifications

Antenna Dimensions	Weight	Shock	Vibration
.63” x .63” x .23” (16 x 16 x 5.8 mm)	.21 oz (5.9 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

Cable	Connector
6” (15 cm) CO-6F.FH-SB cable (1.5 mm diameter)	H.FL

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

1857D 18 mm Compact Embedded GPS Antenna

The Compact 1857D Embedded GPS antenna is ideal for GPS enabled ruggedized PDAs, laptops and portable GPS Handhelds. The 1857D antenna features a custom tuned frequency ceramic patch element, ESD circuit protection, a two stage low noise amplifier and a SAW filter, enabling the 1857D to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock in a very small form factor.

Features

- Very compact form factor
- 15 KV ESD circuit protection
- 2.7 to 5 Volt operation
- Ideal for embedded applications

RF/Electrical Specifications

Center Frequency	Gain	Polarization	Current Draw
1575.42MHz ±10 MHz	1 dBic	Right Hand Circular	9 mA @ 3.3V 15 mA @ 5V

Mechanical Specifications

Antenna Dimensions	Weight	Shock	Vibration
.71" x .71" x .28" (18 x 18 x 7 mm)	.28 oz (8 g)	Vertical axis 50G, Other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

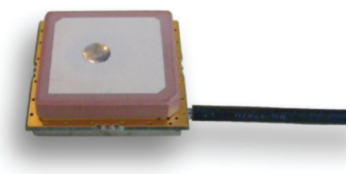
Cable	Connector
6" (15 cm) RG174	Right angle MCX

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

Low Noise Amplifier Specifications

Nominal Impedance: 50 Ohm
VSWR: 1.5:1 max (at connector)
Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 1.5 dB (typical)
Voltage: 2.7 - 5 VDC
Out-of-band Rejection: +/- 15 MHz: 5 dB +/- 20 MHz: 10 dB +/- 30 MHz: 32 dB +/- 40 MHz: 40 dB



3951D Low Noise GPS Embedded Antenna, NGP

The 3951D Embedded GPS Antenna has one of the industry's lowest noise figures. It features a tuned custom ceramic patch element that minimizes detuning effects caused by adjacent objects. It also features ESD circuit protection, an innovative LNA (low noise amplifier) and a high rejection SAW filter which enable a consistent, clear signal while minimizing loss-of-lock even when GPS conditions are less than ideal.

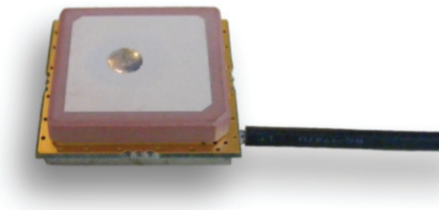
Features

- 15 KV ESD circuit protection
- Low noise figure: 0.5 dB LNA
- Excellent out-of-band signal rejection
- Ideal for embedded applications

Low Noise Amplifier Specifications

Nominal Impedance: 50 Ohm
VSWR: 1.5:1 max (at connector)
Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 0.5 dB (typical)
Voltage: 2.7 - 5.0 VDC

Out-of-band Filter Rejection Chart



RF/Electrical Specifications

Center Frequency	Gain	Polarization	Current Draw
1575.42MHz ±10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	7.5 mA @ 3.3VDC (typical)

Mechanical Specifications

Antenna Dimensions	Weight	Shock	Vibration
1.1" x 1.1" x .3" (28.4 x 28.3 x 7.7 mm)	.56 oz (16 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10 – 200 Hz log sweep: 3G

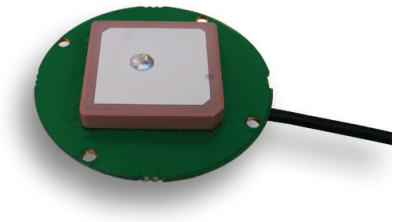
Cable	Connector
6" (15 cm) RG174	MCX right angle

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

3961D Low Noise GPS Embedded Antenna

The 3961D Embedded GPS Antenna has one of the industry's lowest noise figures. It features a tuned custom ceramic patch element that minimizes detuning effects caused by adjacent objects. It also features ESD circuit protection, an innovative LNA (low noise amplifier) and a high rejection SAW filter which enable these antennas to provide a consistent, clear signal while minimizing loss-of-lock even when GPS conditions are less than ideal. The 3961D comes with a 45.2 mm diameter mini ground plane.



Features

- Comes with internal ground plane
- 15 KV ESD circuit protection
- Low noise figure: 0.5 dB
- Excellent out-of-band signal rejection
- Ideal for embedded applications

RF/Electrical Specifications

Center Frequency	Gain	Polarization	Current Draw
1575.42MHz ±10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	7.5 mA @ 3.3VDC (typical)

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
1.85" x 0.32" (47 x 8 mm)	.56 oz (16 g)	Vertical axis 50G Other axes 30G	3 axis, sweep = 15 min 10 - 200 Hz log sweep: 3G

Cable	Connector
6" (15 cm) RG174	MCX right angle

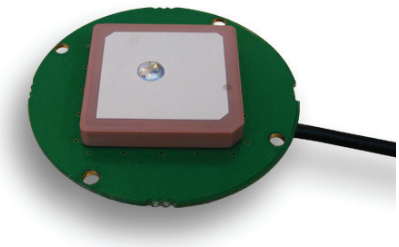
Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

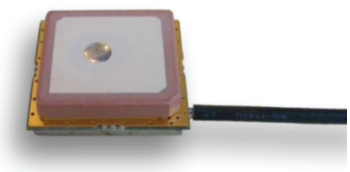
Low Noise Amplifier Specifications

Nominal Impedance: 50 Ohm
VSWR: 1.5:1 max (at connector)
Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 0.5 dB (typical)
Voltage: 2.7 - 5 VDC

Out-of-band Filter Rejection Chart



3957D Value Embedded GPS Antenna, NGP



The 3957D GPS antenna is ideal for ruggedized handheld GPS devices, mobile asset tracking equipment and GPS timing applications. This antenna features a custom designed ceramic patch element, a two-stage low noise amplifier and a SAW filter, enabling it to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock. The 3957D comes in a compact square package.

Features

- 2.7 - 5 V operation
- 15 KV ESD circuit protection
- Ideal for embedded applications

Low Noise Amplifier Specifications

Nominal Impedance: 50 Ohm
VSWR: 1.5:1 max (at connector)
Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 1.5 dB (typical)
Voltage: 2.7 - 5 VDC
Out-of-band Rejection: +/- 15 MHz: 5 dB +/- 20 MHz: 10 dB +/- 30 MHz: 32 dB +/- 40 MHz: 40 dB

RF/Electrical Specifications

Center Frequency	Gain (typical)	Polarization	Current Draw
1575.42MHz ±10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	9 mA @ 3.3V 15 mA @ 5V

Mechanical Specifications

Antenna Dimensions	Weight	Shock	Vibration
1.2” x 1.1” x 0.3” (29.5 x 28.4 x 8 mm)	.56 oz (16 g)	Vertical axis 50G Other axes 30G	3 axis, sweep = 15 min 10 - 200 Hz log sweep: 3G

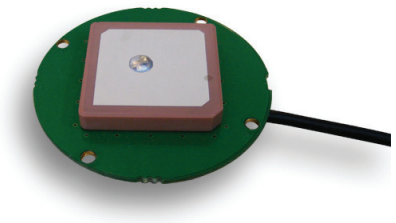
Cable	Connector
6” (15 cm) RG174	Right angle MCX

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

3967D Value Embedded GPS Antenna

The 3967D GPS antenna is ideal for ruggedized handheld GPS devices, mobile asset tracking equipment and GPS timing applications. The 3967D features a custom designed ceramic patch element, a two-stage low noise amplifier and a SAW filter, providing great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock. The 3967D comes with a 1.85" mini-ground plane.



Features

- 2.7 - 5 V operation
- 15 KV ESD circuit protection
- Comes with internal ground plane
- Ideal for embedded applications

RF/Electrical Specifications

Center Frequency	Gain (typical)	Polarization	Current Draw
1575.42MHz ±10 MHz	3 dBic @ 90° -2 dBic @ 20°	Right Hand Circular	9 mA @ 3.3V 15 mA @ 5V

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight	Shock	Vibration
1.85" x 0.32" (47 x 8 mm)	.56 oz (16 g)	Vertical axis 50G Other axes 30G	3 axis, sweep = 15 min 10 - 200 Hz log sweep: 3G

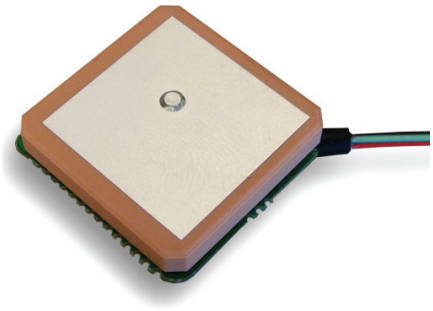
Cable	Connector
6" (15 cm) RG174	Right angle MCX

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating	95% max (non condensing)

Low Noise Amplifier Specifications

Nominal Impedance: 50 Ohm
VSWR: 1.5:1 max (at connector)
Nominal Gain: @ 3.3VDC: 28 dB @ 5VDC: 30 dB
Noise Figure: 1.5 dB
Voltage: 2.7 - 5.0 VDC
Out-of-band Rejection: +/- 15 MHz: 5 dB +/- 20 MHz: 10 dB +/- 30 MHz: 32 dB +/- 40 MHz: 40 dB



5012D-CE Embedded High Sensitivity Tracking & Timing GPS Receiver + Antenna

The 5012D-CE Embedded GPS Receiver + Antenna incorporates a highly sensitive 16-channel, very quick time to fix GPS Receiver as well as a high performance active/filtered GPS antenna. It features the STMicroelectronics STA8058 Teseo™ high performance GPS Engine with embedded flash memory, an LNA, SAW filter, as well as a precisely tuned ceramic patch element for maximum GPS signal reception. The 5012D-CE High Sensitivity GPS Receiver + Antenna is ideal for embedded applications and comes with CMOS flying leads.

Features

- Integrated GPS receiver + antenna (active)
- Very High Sensitivity:-159dBm tracking
- Quick Time to Fix: 39 sec cold start
- 16 channel ST Teseo™ GPS Engine
- Flash memory: upload embedded GPS Firmware, settings & history
- Standard NMEA 0183; GPS output
- 1PPS output: 50n second accuracy
- WAAS and EGNOS supported
- Low current: 80 mA typ., 3.3V operation
- Compact form factor: 25.76 mm square
- Ideal for embedded applications
- RoHS compliant

GPS Receiver Performance

Frequency: L1, 1575.42 MHz
Channels: 16 channels parallel
Sensitivity: Acquisition: -146dBm Tracking: -159dBm
Accuracy: 2m (autonomous) <1 metre (SBAS)
Time to First Fix: Cold start: 39 sec Warm start: 34sec Hot start: 2.5 sec Reacquisition <1 sec
Serial Protocol: Output: NMEA 0183 Baud Rate: 4800 bps (default), user configurable up to 115kbps Update Rate: 1Hz NMEA Message: GGA, VTG, GSA, GSV, RMC
Wiring Information: Red: VCC Black: Ground White: Tx Green: Rx

Antenna Response Specifications

Center Frequency	Nominal Gain	Polarization	Out-of-Band Rejection
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2.0 dBic @ 20°	Right Hand Circular	+15 MHz: 10 dB/- 15 MHz: 30dB +20 MHz: 20 dB/- 20 MHz: 30dB +40 MHz: 40 dB/- 40 MHz: 40dB

Antenna Electrical Specifications

Voltage	Current Draw
3.3V ±10% (CMOS version)	85 mA max (CMOS version)

Mechanical/Environmental Specifications

Antenna Dimensions	Weight	Mounting	Shock
1.0” x 1.0” x .33” (25.76 x 25.76 x 8.4 mm)	14 g (0.49 oz)	Adhesive (not included)	Vertical axis 50G, other axes 30G

Vibration	Interface	Temperature Range	Humidity
3 axis, sweep = 15 min; 10-200 Hz log sweep: 3G	CMOS, 10cm 4 x 26AWG	-40°C to +85°C operating (-45°C to +85°C storage)	95% max (non-condensing)

5012D-U Smart GPS Antenna with Integrated Receiver

The 5012D-U GPS Receiver + Antenna incorporates a highly sensitive 16-channel, very quick time-to-fix GPS Receiver, and a high performance active/filtered GPS antenna. It features high performance GPS Engine with embedded flash memory, a Low Noise Amplifier, SAW filter, as well as a precision tuned ceramic patch element for maximum GPS signal reception. The 5012D-U High Sensitivity GPS Receiver + Antenna is housed in a compact, rugged weatherproof magnet or screw mount enclosure.

Features

- Highly Sensitive: -159dBm tracking
- Quick Time to Fix: 39 sec cold start
- 16 channel GPS Engine
- Standard NMEA 0183 GPS output
- WAAS and EGNOS supported
- Low power & standby modes
- Weatherproof industrial grade enclosure

Antenna Response Specifications

Center Frequency	Nominal Gain	Polarization	Out-of-Band Rejection
1575.42 MHz ± 10 MHz	3 dBic @ 90° -2.0 dBic @ 20°	Right Hand Circular	+15 MHz: 10 dB/- 15 MHz:30dB +20 MHz: 20 dB/- 20 MHz:30dB +40 MHz: 40 dB/- 40 MHz:40dB

Antenna Electrical Specifications

Voltage	Current Draw
5 volts USB comm interface	85 mA max

Mechanical Specifications

Antenna Dimensions	Weight	Mounting
2.05" x 2.32" x .53" (52.1 x 58.9 x 13.6 mm)	.26 lbs (120 g)	Magnetic (5 lb lift-off) or Screw mount (M2.5 pre-threaded)

Shock	Vibration	Cable Length	Interface
Vertical axis 50G, other axes 30G	3 axis, sweep tt= 15 min; 10 – 200 Hz log sweep: 3G	9.8'(3 meters) highly flexible USB cable	USB

Environmental Specifications

Temperature Range	Weather Proof
-40°C to +85°C operating	IP67

GPS Performance

Frequency: L1: 1575.42 MHz
Channels: 16 channels parallel
Sensitivity: Acquisition: -146dBm Tracking: -159dBm
Accuracy: 2 m (autonomous) <1 metre (SBAS)
Time to First Fix: Cold start: 39 sec Warm start: 34sec Hot start: 2.5 sec Reacquisition <1 sec
Serial Protocol: Output: NMEA 0183 Baud Rate: 4800 bps (default), user configuration up to 115kbps Update Rate: 1Hz NMEA Message: GGA, VTG, GSA, GSV, RMC

5012D-RD9

RD9 (left) and RD15 (right) Connectors

RD25 Connector

GPS Receiver + Antenna with Digital Interface RS232 Terminations

The 5012D-RD Series GPS Receiver + Antenna incorporate a 16-channel high sensitivity receiver with fast, first time to GPS fix. This, coupled with position information maintained over power cycles, provides immediate and accurate position reporting. All models in the 5012D-RD series all come with a CMOS to RS232 adapter cable connected by two, 4-pin DIN connectors for ease in installation.

Features

- Plug and Play GPS tracking
- Simple Interface to Data-Ready Radios
- NMEA RMC message output
- Maintains position over power cycles
- RS232 (TTL interface option)
- Magnetic and screw hole mount
- Rugged weatherproof IP67 housing

RF/Electrical Specifications

Frequency Range	Polarization	Voltage
1575.42 MHz	Right Hand Circular	8 to 18 VDC

Mechanical Specifications

Antenna Dimensions	Weight *	Mounting
2.1” x 2.3” x .07” (52.1 x 58.9 x 16.6 mm)	4.2 oz (120 g)	Magnetic (5 lb lift-off) or Screw mount (M2.5 pre-threaded)

Environmental Specifications

Temperature Range	Humidity
-40˚C to +85˚C operating (-45˚C to +85˚C storage)	95% max (non-condensing)

Interface/Connector

Model	Interface/Connector Description
5012D-RD9	RS232/DB9 Male with 3 meter cable
5012D-RD15	RS232/DB15 Male with 3 meter cable
5012D-RD25	RS232/DB25 Male with 3 meter cable

* Does not include adapter cable

GPS Performance

Frequency:
L1, 1575.42 MHz

Channels:
16 channels parallel

Sensitivity:
Acquisition: -146dBm
Tracking: -159dBm

Accuracy:
2m (autonomous)
<1 metre (SBAS)

Time to First Fix:
Cold start: 39 sec
Warm start: 34sec
Hot start: 2.5 sec
Reacquisition <1 sec

Serial Protocol:
Output: NMEA 0183
Baud Rate: 4800 bps (default), user configurable up to 115kbps
Update Rate: 1Hz
NMEA Message: GGA, VTG, GSA, GSV, RMC

GPS Receiver + Antenna Permanent Mount with Digital Interface RS232 Terminations

The 5072D-RD Series GPS Receiver + Antenna incorporates a 16-channel high sensitivity receiver with fast, first time to GPS fix. This, coupled with position information maintained over power cycles, provides immediate and accurate position reporting. All models in the 5072D-RD series all come with a CMOS to RS232 adapter cable connected by two, 4-pin DIN connectors for ease in installation. The 5072D-RD Series is designed for permanent mounted installations requiring a 3/4" thru-hole.

5072D

RD9 (left) and RD15 (right) Connectors

RD25 Connector

Features

- Plug and Play GPS tracking
- Simple Interface to Data-Ready Radios
- NMEA RMC message output
- Maintains position over power cycles
- RS232 (TTL interface option)
- Thru-hole mount for permanent installations
- Rugged weatherproof IP67 housing

RF/Electrical Specifications

Frequency Range	Nominal Gain	Polarization	Voltage
1575.42 MHz	3 dBic @ 90° -2.0 dBic @ 20°	Right Hand Circular	8 to 18 VDC

Mechanical Specifications

Antenna Dimensions (diameter x height)	Weight *	Housing	Mounting
2.36" x .83" (60 x 21 mm)	.23 lbs (104 g)	GE Lexan EXL9330	¾" thru-hole

Environmental Specifications

Temperature Range	Humidity
-40°C to +85°C operating (-45°C to +85°C storage)	95% max (non-condensing)

Interface/Connector

Model	Interface/Connector Description
5072D-RD9	RS232/DB9 Male with 5 meter cable
5072D-RD15	RS232/DB15 Male with 5 meter cable
5072D-RD25	RS232/DB25 Male with 5 meter cable

* Does not include adapter cable

GPS Performance

Frequency:
L1, 1575.42 MHz

Channels:
16 channels parallel

Sensitivity:
Acquisition: -146dBm
Tracking: -159dBm

Accuracy:
2m (autonomous)
<1 metre (SBAS)

Time to First Fix:
Cold start: 39 sec
Warm start: 34sec
Hot start: 2.5 sec
Reacquisition <1 sec

Serial Protocol:
Output: NMEA 0183
Baud Rate: 4800 bps (default),
user configurable up to 115kbps
Update Rate: 1Hz
NMEA Message: GGA, VTG, GSA, GSV, RMC

Low Profile Multi-Band Antenna With GPS Antenna + Receiver

The Medallion™ PCTMDL-RCVR Multi-Band Antenna with GPS Antenna + Receiver features an attractive modern design in a rugged low profile housing. This antenna offers multi-band coverage of GSM 850, GSM 900, GSM 1800, GSM 1900, 3G, WiFi/WiMAX frequencies, coupled with GPS + Receiver capability for outstanding value and flexibility.

Features

- No tune, multi-band coverage: GSM 850, GSM 900, GSM 1800, GSM 1900, 3G and WiFi/WiMAX frequencies, coupled with GPS Antenna + Receiver Capabilities
- Stylish low profile housing provides “omnidirectional” trouble-free installation while complementing most vehicular aesthetic requirements
- Metal 3/4-inch stud mount with slotted jam nut provides single cable exit for easier installation and/or antenna replacement
- IP56 compliant design with custom over molded gasket provides added protection against water or dust ingress under severe environmental conditions
- WAAS and EGNOS supported (GPS)

Electrical Specifications - GPS Antenna + Receiver

Frequency Band: 1575.42 MHz (GPS L1)
GPS Antenna Gain: 3 dBic @ 90° -2.0 dBic @ 20°
Polarization: Right Hand Circular
Current Draw: 85 mA (max)
Channels: 16 Channels Parallel
Sensitivity: Acquisition: -146dBm Tracking: -159dBm
Accuracy: 2 m (autonomous) <1 metre (SBAS)
Time to First Fix: Cold start: 39 sec Warm start: 34sec Hot start: 2.5 sec Reacquisition <1 sec
Serial Protocol: Output: NMEA 0183 Baud Rate: 4800 bps (default), user configuration up to 115kbps Update Rate: 1Hz NMEA Message: GGA, VTG, GSA, GSV, RMC

Electrical Specifications - RF Antennas

Model PCTMDL-RCVR	Operating Frequencies	Polarization	Nominal Impedance	Gain (Typical)	VSWR	Max. Power
Voice/Data RF Element	806-960 MHz/ 1710-2170 MHz	Vertical, linear	50 ohms	2.8dBi (806-960 MHz) / 3.3dBi (1710-2170 MHz)	< 2.0:1	20 Watts
Broadband Wireless RF Element	2.3 GHz - 2.6 GHz	Vertical, linear	50 ohms	3.9dBi	< 2.0:1	10 Watts

Mechanical Specifications

Housing Material	Dimensions	Coax (3)	Connectors
UV resistant, Black ABS	5.1” x 4.95” x 1.7” (129.6 x 125.8 x 43.1 mm)	17 feet RG-58/U (GSM lead) 17 feet RG-58/U (WiFi/WiMAX lead) 17 feet USB Cable (GPS lead)	2 x SMA Plug (Male) USB (GPS)

Environmental Specifications

Operating / Storage temperature	Weight	Humidity	Fluid Shower
-40°C to +85°C	1.96 lbs 31.9 oz	95%	Water, salt, mist, windshield wiper fluid, detergent with wax: no degradation

9211D Iridium™ Magnet Mount Passive Antenna

The 9211D is a high performance passive 1616 to 1626.5 MHz, RHCP antenna, specifically designed to operate with the Iridium™ Satellite communication system. It features a precisely tuned custom ceramic patch antenna element and a matching network. The 9211D antenna is enclosed in a rugged, fully weatherproof housing that allows the Iridium Satellite SBD modem to be mounted away from the elements, yet fully meeting Iridium's radiated power requirements. Its top cover (radome) is composed of high-grade GE plastic and the zinc base is equipped with both screw holes and magnets for ease of installation. The antenna comes standard with 6.6' (2 meters) of high quality Shikoku coaxial cable and an SMA male connector.

Features

- Ideal for Iridium™ Satellite Short Data Service applications
- Weather proof housing
- Magnet or screw mount
- RoHS compliant

Antenna Response Specifications

Frequency Range	Gain	Polarization	Axial Ratio	VSWR
1616 MHz to 1626.5 MHz	4 dBic @ Zenith (max)	Right Hand Circular	3 dB @ Zenith (max)	<2.0:1

Mechanical Specifications

Antenna Dimensions	Antenna Weight	Shock	Vibration
2.1" x 2.3" x .54" (52.1 x 58.9 x 13.6 mm)	.26 lbs (120 g)	Vertical axis 50G, other axes 30G	3 axis, sweep = 15 min 10-200 Hz log sweep: 3G

Cable	Cable Loss	Connector	Mounting Method
6.6' (2 meters) highly-flexible 174 sized cable	1.3 dB/m typical	SMA male	Magnetic (5 lb lift-off force) or permanent (pre-threaded for 3 x M2.5 screws)

Environmental Specifications

Temperature Range	Humidity	Weatherproof
-40°C to +85°C operating	95% max (non condensing)	IP67