

GPS World

ANTENNA SURVEY

2014

After choosing the most appropriate receiver for your application from the Receiver Survey in the January issue of *GPS World*, you may need an antenna, too. We have collected key specifications for 417 antennas from 33 manufacturers.

We publish the Antenna Survey each year in our February issue. To recommend improvements or to be listed in the survey next year, please email gpsworld@gpsworld.com.



SPONSORED BY



FOOTNOTES

¹ User environment and applications:

- A = aviation
- D = defense
- E = meteorology
- G = survey/GIS
- L = land
- M = marine
- N = navigation
- O = other
- P = other position reporting
- R = real-time DGPS reference
- S = space
- T = timing
- V = vehicle/vessel tracking

² GPS L1 frequency 1575.42 MHz
GPS L2 frequency 1227.60 MHz

³ A single voltage standing wave ratio (VSWR) figure indicates a combined antenna and amplifier.

⁴ Noise figure is expressed in maximum decibels.

⁵ L/D = lightning/diode.

ABBREVIATIONS

- cm: centimeter
- dB: decibel
- ∅: diameter
- ft: foot
- g: force of gravity
- g: gram
- Hz: hertz
- in: inch
- kg: kilogram
- lb: pound
- m: meter
- mA: milliamper
- max: maximum
- MHz: megahertz
- min: minimum
- mm: millimeter
- na: not applicable
- nr: no response
- qty: quantity
- RHCP: right-hand circular polarization
- typ: typical



Selecting the Right GNSS Antenna



GORDON RYLEY
Antenna/Smart Antennas
Product Manager

We recently met with Gordon Ryley of NovAtel to provide additional information on how to select the ideal GNSS antenna for your application.

Where do you start?

The antenna you choose must match your receiver's capabilities and specifications. Since the antenna behaves both as a spatial and a

frequency filter, it will have significant impact on the performance of the GNSS receiver. Your application will also help determine form factor and antenna performance.

What GNSS constellations and signals do I want to receive?

Active GNSS constellations include GPS, GLONASS, and BeiDou. Galileo and QZSS will soon grow to full operation. Position correction services, known as Space Based Augmentation Services (SBAS), transmit on geostationary satellites in orbit around the earth.

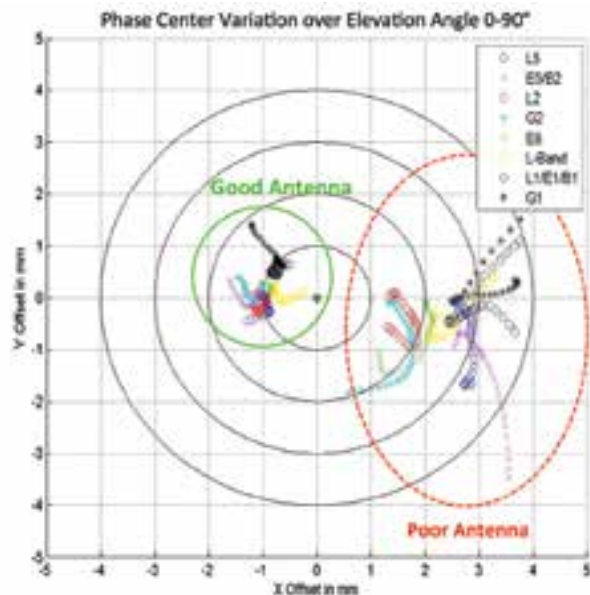
Each of the constellations and SBAS have their own signal frequencies and bandwidths. Some of these frequencies are shared (e.g. GPS L1, WAAS (SBAS), Galileo E1). Choose an antenna that covers the signal frequencies transmitted by the constellation and bandwidth supported by your GNSS receiver. Multiple frequency antennas are used to help correct for ionospheric errors in Real Time Kinematic (RTK) applications.

The signal bandwidth of your antenna is important as many GNSS receivers take advantage of the full signal power transmitted. NovAtel's GNSS receivers utilize a patented Pulse Aperture Correlator technology (PAC) which uses a wider signal bandwidth to mitigate position errors caused by multipath and can support precision carrier phase RTK algorithms with centimetre accuracy. Many basic GNSS receivers only look at the constellations coarse acquisition (C/A) code and only require a narrow bandwidth of a few MHz and as such are restricted to positional accuracies of a few metres.

What amount of antenna gain do I need?

Gain is a key performance indicator of a GNSS antenna. A minimum gain is required to achieve a minimum C/N_0 (carrier-to-noise ratio) to track the GNSS satellites. The antenna gain is directly related to the overall C/N_0 of the navigation GNSS receivers. Hence, antenna gain helps define the tracking ability of the system.

GNSS receiver manufacturers will typically specify the expected RF input level required for optimum performance. This level is important to avoid under-driving (causing poor C/N_0) or overdriving (causing limiting or distortion) the front end of the receiver. Nearly all receivers have automatic gain



Plot of Good and Poor Antenna Phase Centre Variation over Elevation Angle

control, but there is only so much dynamic range in the system and the antenna gain, including cable losses, needs to be considered carefully.

Why is element gain so important?

The element gain defines how efficient the antenna element is at receiving the signals. In any signal chain, you are only as good as the weakest link, so an antenna with low element gain might be compensated by an increased low noise amplifier gain, but the signal to noise ratio or C/N_0 is degraded.

How important is antenna beamwidth and gain roll-off?

Very important. Gain roll-off is a factor of beamwidth and specifies how much the gain changes over the elevation angle of the antenna. From the antenna's point of view the satellites rise from the horizon towards zenith and fall back to the horizon. The variation in gain between zenith (directly overhead) and the horizon is known as the gain roll-off.

Different antenna technologies have different gain roll-off characteristics. Patch antennas can track down to low elevation angles such as 10 degrees. Most choke ring antennas will typically not receive signals below 30 degrees with the exception of NovAtel's GNSS-750 which can track down to and below the horizon.

What is Noise Figure?

Noise figure directly impacts the C/N_0 of the GNSS receiver. The lower the overall noise figure the better the C/N_0 and tracking capability.

The noise figure is the difference between the signal-to-

	Desirable Feature																			
	Low Profile	Ultra-low PCO/PCV	Low PCO/PCV	High Vibration	Rugged	Single Frequency	Multi Constellation	Multi Frequency (RTK)	L-band frequency (Correction Services)	Narrow Bandwidth	Weatherproof	Corrosion Resistant	High Multipath Suppression	Pole Mount	Magnetic/Surface Mount	TSO/FAA Certification	Extended Temperature Range	Small Form-factor/Lightweight	High Altitude Operation	
Survey		•			•		•	•			•		•	•						
GIS			•		•		•	•			•							•		
Reference Station		•			•		•	•			•	•	•	•			•		•	
Aviation/Aerial Survey	•		•	•			•	•			•					•	•		•	
Marine							•	•	•		•	•	•	•						
Construction/Mining	•		•	•	•		•	•			•	•	•	•	•					
Precision Agriculture			•	•			•	•	•		•		•		•					
Vehicle Tracking	•										•				•					
Dock Operations				•	•		•	•			•	•	•	•	•					
Unmanned Aircraft	•		•	•			•	•			•					•	•	•	•	
Unmanned Vehicle			•	•			•	•			•		•		•					
Timing						•				•	•	•		•						

noise ratio at the input and output of the component and identifies how much additional noise is being added into the signal through the system or its individual components such as the low noise amplifier. Good antennas will have a noise figure less than 3dB.

Why should I be concerned about multipath rejection?

Positioning errors are caused by multipath, which are multiple reflections of the GNSS signal off of nearby or far objects.

Multipath degrades the positioning accuracy and should be suppressed. For optimum multipath rejection, an antenna should be mounted as close to the horizontal surface as possible and away from reflecting objects including water, antenna masts, air conditioners, ventilation shafts, etc.

Choke ring antennas offer high multipath rejection due to their unique concentric ring design that block out multipath signal reflections to the antenna element.

The Axial Ratio also defines the antenna's ability to reject multipath-generated replicas of the original GPS signal. A good GNSS antenna provides a low axial ratio not only at each of the GNSS frequencies, but also over all elevations angles of the satellites in view. NovAtel's GPS-700 series of antennas maintains an axial ratio as low as 3dB at azimuth or horizon.

What is phase center stability and why is it important?

The phase center of the antenna is the point where the signals transmitted from satellites are collected. When your receiver reports a location fix, that location is essentially the phase centre of the antenna.

If you are specifying an antenna for use with geodetic survey or a reference station application, phase center offset (PCO) and phase centre stability or variation (PCV) are important. The electrical phase center of any antenna will vary with the position of the transmitting signal it is receiving by as much as a few millimetres. As GNSS satellites move across the sky, the electrical phase center of the signal received will typically move with the satellite position unless the antenna has been carefully designed to minimize PCO/PCV.

The Phase Center Offset with respect to the antenna reference point (ARP) is the difference between the mechanical center of antenna rotation and electrical phase center location. The PCO is also frequency dependent which means that there can be a different offset for each signal frequency. The Phase Center Variation identifies how much the phase center moves with respect to the satellite elevation angles.

Many users can accept accuracies of less than a metre so these small phase

center variations cause a negligible amount of position error. But if you require high precision, RTK receivers can achieve position accuracies of 2-4 cm and a few millimetres of phase center error translates to a 10-15% error in reported position. For RTK survey applications, geodetic grade antennas such as NovAtel's GPS-700 series and Antcom G8 series offer superior PCO/PCV performance. For reference station applications a NovAtel GNSS-750 antenna is ideal.

How does my application affect my antenna choice?

Depending upon the application, the antenna may have to meet certain environmental, mechanical, and operational requirements. GNSS antennas used for aviation applications should ideally be TSO/FAA certified and be rugged enough to handle extreme temperatures and vibration profiles such as the NovAtel Compact GNSS Antenna line and the Antcom G3/G5/G8 product lines. Survey rover antennas, like the GPS-700 series Pinwheel models, should be able to survive rough handling and pole drop. The table above highlights some of the important desirable features needed for a GNSS antenna based upon the user's application.

Please go to www.novatel.com/products/gnss-antennas to learn more.

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y/N) / Type	L/D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration	
AeroAntenna Technology, Inc. www.aeroantenna.com	AT1675-7 L1 / L2 GPS & GLONASS	2007	G	7.25 x 3.20in	1.36lb	1590 ± 25 & 1238 ± 21.5 MHz	≤2.0:1	3 dB Max @ Boresight	38 dB	RHCP	2.4 dB Max	+4.25 to +15 VDC	70 mA	-40 to +85	nr	Y	Y	TNC Female	None	Pole Mount	nr	Amplifier	
	AT1675-8 GPS / GLONASS L1 -BEIDOU B3 / B1	2009	A	4.70 x 3.00 x .75in	8oz	1268± 12 MHz & 1590± 125MHz	≤2.0:1	as above	42 dB	RHCP	2.5 dB Max	+4.5-+15 VDC	70 mA	-55 to +85	nr	Y	Y	TNC / SMA Female	None	Roof Mount	nr	Amplifier	
	AT1675-17 GPS / GNSS ANTENNA	2000	AG	4.70 x 3.0 x .75in	8oz	1590 ± 25 & 1238 ± 21.5 MHz	≤2.0:1	as above	26 & 40 dB	RHCP	2.5 dB Max	+5 to +15 VDC	28, 55 and 75 mA	-55 to +85	nr	Y	Y	TNC OR SMA Female	None	Roof Mount	nr	Amplifier	
	AT1675-19, GPS / GLONASS L1	2010	LD	2.20 x .57in	75g	1565-1607 MHz	≤2.0:1	as above	26 db	RHCP	2.5 dB Max	+2.5 -+5.5 VDC	60 mA	-40 TO +85	nr	Y	Y	SMA Female	None	Roof Mount	nr	Amplifier	
	AT1675-32 GPS / GNSS ANTENNA	2009	LG	5.75 x 2.46in	1.00lb	1570±45 & 1164-1260 MHz	≤2.0:1	as above	26 and 39 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	40 & 65 mA	-55 to +85	nr	Y	Y	TNC Female	None	Roof Mount	nr	Amplifier	
	AT1675-80 (TSO) GPS / GNSS / L-BAND ANTENNA	2008	AG	4.70 x 3.0 x .92in	10oz	1570 ±45 & 1238 ±21.5 MHz	≤1.5:1	as above	43 dB	RHCP	2.6 dB Max	+5 to +15 VDC	70 mA	-55 to +85	nr	Y	Y	TNC Female	None	Roof Mount	nr	Amplifier	
	AT1675-116	2010	LG	3.5 x .84in	200g	1551 -1615 MHz	≤2.0:1	as above	43 dB	RHCP	2.5 dB Max	+4.5 -+18 VDC	65 mA	-55 TO +85	nr	Y	Y	TNC Female	None	Roof Mount	nr	Amplifier	
	AT1675-120 GPS / GNSS CHOKE RING	2009	LG	14 x 13in	11.00lb	1570±45 & 1164-1260 MHz	≤2.0:1	as above	26 and 39 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	40 & 65 mA	-55 to +85	nr	Y	Y	TNC Female	None	Pole Mount	nr	Amplifier	
	AT1675-180	2011	A	4.31 x 1.46 x 5.55		1565-1607 MHz & 1217-1260 MHz	≤2.0:1	as above	26 dB	RHCP	2.5 dB Max	+2.5 TO +5.5 vdc	38 mA	-50 to +70	nr	Y	Y	SMA Female	None	Pole Mount	nr	Amplifier	
AT1675-182 GPS / GNSS ANTENNA	2009	LG	5.75 x 2.46in	1.00lb	1570±45 & 1164-1260 MHz	≤2.0:1	as above	26 and 39 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	40 & 65 mA	-55 to +85	nr	Y	Y	TNC Female	None	Roof Mount	nr	Amplifier		
Allis Communications Co., Ltd. www.alliswireless.com	GCRTB	2003	NV	100 x 39mm	as above	1575.42 / 824-960 / 1850-1990 MHz	2.0:1	3 dB max	27	nr	1.5 dB typ	2.7V / 6V	13mA max	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-10Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	GPS: RG174 / 5m Cellular: RG58 / 5m	Thread Permanent Mount		GPS / Cellular	
	LC751	2013	N	13" 225mm; Base: 55" 39.7mm	19.5g; Base: 75.5g	680MHz - 960MHz / 1710MHz - 2170MHz	2.0:1	NC	680-800MHz: 1.29dBi 824-960MHz: -0.36dBi 1710-1990MHz: 0.21dBi 1920-2170MHz: 2.83dBi		Omni - direction / Linear	na	nr	nr	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-15Hz each axis	Y / rubber sealed	N / N	SMAR / P Plug	RG174 / 2m	Magnetic base		LTE, AMPS / GSM, DCS / PCS, WCDMA / UMTS / HSDPA
	CMIDM	2013	MN	75mm Dia. * 15.8mm	75g Max. (without cable)	1621 ± 3 MHz	1.5:1	3 dB Max. @ 0°	4dBic		omni at 0 in + / - 90°	na	nr	nr	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-16Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m	Magnetic base		Iridium only
	CMIGM	2013	MN	75mm Dia. * 15.8mm	75g Max.	Iridium: 1621 ± 3 MHz GPS: 1575.42± 3 MHz	GPS: 1.5 Max.	Iridium: 3 dB Max. @ 0°	GPS: 28 dB Typical		omni at 0 in + / - 90°	1.8 dB Typical	DC 2.7 V to 6.0V	12 ± 5.5 mA	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-17Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m	Magnetic base		Iridium + GPS
	GCRGI	2013	MN	100mm Dia. x 67mm	280g Max.	Iridium: 1621 ± 3 MHz GPS: 1575.42± 3 MHz	GPS: 1.5 Max.	Iridium: 3 dB Max. @ 0°	GPS: 28 dB Typical		omni at 0 in + / - 90°	1.8 dB Typical	DC 2.7 V to 6.0V	12 ± 5.5 mA	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-18Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 for GPS / 3m RG58 for Iridium / 3m	Thread Permanent Mount		Iridium + GPS
	MPIDM	2013	M	48 x 40 x 13 mm	42g Max.	1621 ± 3 MHz	1.5:1	3 dB Max. @ 0°	4dBic		omni at 0 in + / - 90°	na	nr	nr	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-19Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m RG316 / 3m	Magnetic base		Iridium only
	AM460	2013	MNOV	139mm Dia. x 60mm	<1.1kg	GPS: 1575.42 ± 3 MHz Iridium: 1616-1626MHz C:696-960MHz, 1710-2170MHz W: 2.4-2.5GHz, 4.7-5.9GHz	GPS: 1.5 Max. Iridium: 2.0 Max Cellular: -2.15dBi VSWR(2-2.48GHz): VSWR<3.0, VSWR(5-6GHz): VSWR<3.0	GPS / Iridium: 3dB typical / RHCP	GPS: 27dB Typical		C / WiFi: Omni-direction / Linear	GPS: 1.8dB Typical	GPS: DC 2.7V to 6.0V	8.5±4.5mA	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-20Hz each axis	stainless bottom	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 5m	Thread Permanent Mount		GPS / LTE / 2G / 3G WIFI (Tenative)
	IMP99	2013	MN	100mm Dia. x 67mm	280g Max	GPS: 1575.42 ± 3 MHz C: 824-960MHz, 1710-2170MHz W: 2.4-2.5GHz, 4.7GHz-5.9GHz	GPS: 1.5 max. C: VSWR<2.0 WiFi: VSWR<2.0	GPS: 3dB typical / RHCP	824-960MHz: -1.2 dBi 1710-1880MHz: -1.2 dBi 1850-1990MHz: -1.48 dBi 1920-2170MHz: -1.3 dBi 2.4-2.5GHz: -2.7 dBi 4.7-5.0GHz: -3.6 dBi 5-5.4GHz: -2.8 dBi 5.4-5.9GHz: -3.7 dBi		C / WiFi: Omni-direction / Linear	na	GPS: DC5.0V	50mA	-40°C-85°C	Sine Sweep, 1G(0-P), 10-150-21Hz each axis	Y / rubber sealed	N / N	GPS: USB A Type C: Option WiFi: Option	GPS: USB Cable O.D. 3.5±0.2mm C: Option WiFi: Option	Thread Permanent Mount		GPS NEMA + WIFI / GSM
	X830D	2013	N	36 x 36 x 13.9mm	35g max.	1559-1615MHz	1.5 max.	3dB max. at 1680MHz	GPS, Galileo - 27dBic @ 2.7VDC 36dBic @ 6VDC BDS - 26dBic @ 2.7VDC 35dBic @ 6VDC GLONASS - 23dBic @ 2.7VDC 30dBic @ 6VDC		omni at 0 in + / - 90°	1.5 dB typ	2.7 to 6 V	9.5±4.5mA	-40°C-86°C	Sine Sweep, 1G(0-P), 10-150-22Hz each axis	Y / rubber sealed	N / N	SMA	RG174 / 5m	Magnetic base		GPS / GLONASS / BDS / Galileo
X830B	2013	N	36 x 36 x 13.9mm	35g max.	1575.42MHz	1.5 max.	3dB max. at 1575MHz	GPS - 27dBic @ 2.7VDC 36dBic @ 6VDC		4dBic min. at 0°	1.5 dB typ	2.7 to 6 V	9.5±4.5mA	-40°C-86°C	Sine Sweep, 1G(0-P), 10-150-22Hz each axis	Y / rubber sealed	N / N	SMA	RG174 / 5m	Magnetic base		GPS Only	
Antcom, Inc. www.antcom.com	2DG1215A-MNT-3	2013	LGMOV	22 x 63mm Ø	113 g	1575.4 ± 15 MHz 1227.6± 15 MHz	≤2.0:1	2 dB typ	L1: 33 dB typ L2: 35 dB typ	RHCP	3 dB typ	2.5 - 24 V DC	<50 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole back mount, flush magnetic	Inquire	nr	
	G3Ant-2A196MNS-4	2012	LGMOV	19 x 63mm Ø	184 g	1575.4 ± 12 MHz 1609.0± 7 MHz 1542.0± 14 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3 dB typ	2.5 - 24 V DC	<40 mA typ	-55 to +85	>30 G's	Y/nr	YY	SMA Male	7.7 m/RG-316	4-hole back mount, flush magnetic	Inquire	nr	
	3GOXX16A4-XTR-1-2	2013	ALGMV	18 x 89mm Ø	184 g	1575.4 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	2.2 dB typ	2.5 - 24 V DC	<30 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole, surface	Inquire	nr	
	3GOXX16A4-XTR-1-1	2013	ALGMV	19 x 89mm Ø	191 g	1575.4 ± 12 MHz 1227.6 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole, surface	Inquire	nr	
	3GOXX16A4-XTR-1-4	2013	ALGMV	27 x 89mm Ø	340 g	1575.4 ± 17 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1176.4 ± 12 MHz, 1542.5 ± 14 MHz	≤2.0:1	3.5 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole, surface	Inquire	nr	
	42G1215A-XT-1	2013	ALGMV	119 x 76 x 18mm (ARINC 743A)	198 g	1575.4 ± 12 MHz, 1227.6 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole, surface	Inquire	nr	
	G5Ant-42AT1	2009	ALGMV	119 x 76 x 23mm (ARINC 743A)	227 g	1575.4 ± 16 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1542.5 ± 14 MHz	≤2.0:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y/nr	YY	TNC	na	4-hole, surface	Inquire	nr	
This row intentionally left blank																							
Exelis, Inc. Antenna Products & Technologies www.exelisin.com/antennas	N100-3-1 4-Element CRPA	2003	D	7 x 7 x 2in	3lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	TNC (female)	na	12 thru holes	nr	nr	
	N100-6-1 4-Element, 7 output Polarimetric CRPA	2007	D	7 x 7 x 2in	3lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	TNC (female)	na	12 thru holes	nr	nr	

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y / N) / Type	L / D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration	
	N79-3-1 7-Element CRPA	2002	D	2 x 14.12in Ø	8lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	SMA	30in	24 thru holes	nr	nr	
	N104-1-1 5-Element CRPA	2002	D	2 x 14.12in Ø	8lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	SMA	na	24 thru holes	nr	nr	
	N105-1-1 3-Element CRPA	2002	D	Triangular 8 x 8.7 x 2in	3lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	SMA (female)	na	12 thru holes	nr	nr	
	C146-13-2 FRPA	1992	D	1.5in x 5.25in Ø	<1lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Fixed & rotary wing	Y / nr	na	TNC (female)	na	6 thru holes	nr	nr	
	C146-10-1 FRPA	1989	G	1.5in x 5in Ø	<1lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	Ground use plus fixed and rotary wing	Y / nr	na	SMA (female)	na	12 thru holes	nr	nr	
	C146-22-1 FRPA	2005	G	1.5in x 5in Ø	<1lb	L1, L2	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	as above	Y / nr	na	SMA (female)	na	12 thru holes	nr	nr	
	C146-24-1 FRPA	2008	G	1.5in x 5in Ø	<1lb	L1, L2; Glonass, Galileo	1.5:1	Variable w / elevat.	na	Hemispheric	na	na	na	Military spec.	as above	Y / nr	na	SMA (female)	na	12 thru holes	nr	nr	
	N103-3-1	2006	A	3.9 x 1.0in	1lb	L1, L2	2.0:1	Variable w / elevat.	na	Hemispheric	na	na	na	as above	Fixed & rotary wing	Y / nr	na	TNC (female)	na	4 thru holes on a contoured 6.18in R mounting surface	nr	nr	
N103-3-2	2006	A	3.9 x 1.0in	1lb	L1, L2	2.0:1	Variable w / elevat.	na	Hemispheric	na	na	na	as above	Fixed & rotary wing	Y / nr	na	TNC (female)	na	as above	nr	nr		
Rtech Radio Frequency System Corporation www.rtech.com.tw	FA02	4 / 20 / 2010	ALMNV	52.5 x 36.5 x 11.65mm	20g	1575.42MHz / L1	2	<= 5	29	RHCP	0.65	2.5-3.3	5	-40 to +85	na	Y / IP65	N	SMA / MCX / MMCX	various length available	magnetic / sticker	price will be quoted by qty.		
GPS Source, Inc. www.gpssource.com	L1A	2006	DELMNOTV	3.445 x 3.445 x .649in	3.2oz	1575.42 k 5MHz	2.01	nr	3 dB / 35dB	Hemispheric	1.0dB	3-16 VDC	20 mA max	-40 to +85	Sine 10-500 Hz 5G XYZ, Shock 30G	Y / Water Proof	DC ground	SMA, TNC, BNC, N	na	10-32 4-Hole 2.3in	\$175	GPS	
	L1P	2006	as above	3.445 x 3.445 x .649in	2.7oz	1575.42 k 10MHz	2.01	nr	3 dB	Hemispheric	na	na	na	-40 to +85	as above	Y / Water Proof	DC ground	SMA, TNC, BNC, N	na	10-32 4-Hole 2.3in	\$50	GPS	
	L1L2-2GP	2010	ADELMNOTV	2.6 x .94in	6.4oz	1575.5 k 10MHz 1227.6 k 10MHz	2.01	nr	3 dB	Hemispheric	na	na	na	-54 to +71	as above	Y / Water Proof	DC ground	SMA, TNC, N	na	6-32 4-Hole 2.3in	\$510	GPS	
	L1L2-2GA	2010	ADELMNOTV	2.6 x .94in	6.4oz	1575.5 k 10MHz 1227.6 k 10MHz	2.01	nr	L1 3 dB / 33 dB L2 6.7dB / 33 dB		Hemispheric	na	3-10 VDC	50 mA max	-54 to +71	as above	Y / Water Proof	DC ground	SMA, TNC, N	na	6-32 4-Hole 2.3in	\$600	GPS
	L1L2-RA-1	2011	ADELMNOTV	3 x 2.27in	6.3oz	1575.42 k 15MHz 127.6 k 15MHz	2.0:1	2dB max	L1 3dB / 26 dB L2 3dB / 26dB		Hemispheric	2.8dB	2.5 - 10 VDC	30 mA max	-54 to +71	as above	Y / Water Proof	DC ground	SMA	na	Magnet or 10-32 1-hole and 6-32 3-hole	\$600	GPS
	L1L2-RA-2	2011	ADELMNOTV	3.4 x 2.2in	6.7oz	1575.42 k 15MHz 1227.6 k 15MHz	2.0:1	2dB max	L1 3dB / 26 dB L2 3dB / 26dB		Hemispheric	2.8dB	2.5 - 10 VDC	30 mA max	-54 to +71	as above	Y / Water Proof	DC ground	SMA, TNC, N	na	6-32 4-hole	\$600	GPS
	L1L2-S2GRA-1	2011	ADELMNOTV	2.7in	6.4oz	1575.42 k 15MHz 1227.6 k 15MHz	2.0:1	2dB max	L1 3dB / 30 dB L2 3dB / 30dB		Hemispheric	3dB	3.3 - 10 VDC	35 mA max	-54 to +71	as above	Y / Water Proof	DC ground	SMA	na	Magnet or 10-32 1-hole and 6-32 3-hole	\$600	GPS
	GNSS-3GA	2014		3.5 x .97in	9.6oz	1584 +/- 26MHz 1215 +/- 25MHz	2.0:1	2.8dB max	L1 3dB / 30 dB		Hemispheric	3dB	3.3 - 10 VDC	35 mA max	-54 to +71	as above	Y / Water Proof	DC ground	SMA, TNC, N	na	6-32 4-Hole or 10-32 4-Hole	\$1,100	GNSS
Gutec AB www.gutec.se	GNSSA200	2010	G	85 x 166mm Ø	250g	GPS L1, GPS L2, GLONASS L1, GLONASS L2	0.084	<3 dB	6 dB / 30 dB	Hemispheric	1.5 dB	3.5-15 VDC	10 mA	-40 to +85	Sine10-200 Hz 1 G XYZ, Shock 10 G	Y / ventilated body (Gore vent), hermetic connector	na	TNC	na	5 / 8in UNC	995	Y	
Hemisphere GNSS www.hemispheregnss.com	A21	2009	ADEGLMNV	70 x 130mm	380g	1525 - 1610MHz			30 dB	RHCP	2.0, typ	3 - 12VDC	20 - 30mA typ	/ - 40 to +70	EP455	Y / IP69K	N / N	TNC	5 metre typ	Magnetic, screw	call	L1 GPS / L1 GLONASS / L-Band	
	A22	2009	ADEGLMNV	70 x 130mm	380g	1525 - 1610MHz			30 dB	RHCP	2.0, typ	3 - 12VDC	20 - 30mA typ	/ - 40 to +70	EP455	Y / IP69K	N / N	N	5 metre typ	Magnetic, screw	call	L1 GPS / L1 GLONASS / L-Band	
	A31	2011	DEGLMNV	104 x 145mm	734g	283.5 - 325kHz, 1525 - 1610MHz			30 dB	RHCP	2.0, typ	5 - 12VDC	50 - 60mA typ	/ - 30 to +70	EP455	Y / IP69K	N / N	TNC	5 metre typ	Magnetic, screw	call	L1 GPS / L1 GLONASS / L-Band / Beacon	
	A42	2011	DEGLMNV	70 x 130mm	380g	1165 - 1278MHz, 1525 - 1613MHz			30 dB	RHCP	2.0, typ	3 - 12VDC	35mA typ	/ - 40 to +70	EP455	Y / IP69K	N / N	TNC	5 metre typ	Magnetic, screw	call	L1 / L2 / L5 GPS / L1 / L2 GLONASS / B1 / B2 / B3 Beidou / Galileo / QZSS / SBAS / L-Band	
	A43	2012	DEGLMNV	104 x 145mm	730g	283.5 - 325kHz, 1165 - 1278MHz, 1525 - 1613MHz			28 dB	RHCP	2.0, typ	5 - 12VDC	50 - 60mA typ	/ - 40 to +70	EP455	Y / IP69K	N / N	TNC	5 metre typ	Magnetic, screw	call	L1 / L2 / L5 GPS / L1 / L2 GLONASS / B1 / B2 / B3 Beidou / Galileo / QZSS / SBAS / L-Band	
	A52	2010	DEGLMNV	76 x 185mm	778g	1165 - 1278MHz, 1525 - 1613MHz			30 dB	RHCP	2.0, typ	3 - 12VDC	30 - 45mA typ	/ - 40 to +70	EP455	Y / IP69K	N / N	TNC	5 metre typ	Magnetic, screw	call	L1 / L2 / L5 GPS / L1 / L2 GLONASS / B1 / B2 / B3 Beidou / Galileo / QZSS / SBAS / L-Band	
Hirschmann Car Communication GmbH www.hirschmann-car.com	GPS 916 V FLEX	2010	LMNOPV	81 x 45 x 42mm / 3.19 x 1.77 x 1.65in	ca. 110g	GPS L1 frequency 1575.42 MHz; GSM 850 / 900 / 1800 / 1900 / UMTS	na	na	GPS: typ. 26 dB CELL: typ. 0 dB	RHCP	< 1.9 ± 0.3 dB (50 Ohm)	2.7 - 5.1 VDC (fergespeist, remotely fed)	max. 30 mA	-30 ~ +80°C / -22 ~ +176 °F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 918 V FLEX	2010	LMNOPV	81 x 45 x 42mm / 3.19 x 1.77 x 1.65in	ca. 150g	GPS L1 frequency 1575.42 MHz; GSM 850 / 900 / 1800 / 1900 / UMTS; AMFM	na	na	GPS: typ. 26 dB CELL: typ. 0 dB	RHCP	< 1.9 ± 0.3 dB (50 Ohm)	2.7 - 5.1 VDC (fergespeist, remotely fed)	max. 30 mA	-30 ~ +80°C / -22 ~ +176 °F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 2400 Cellular	2010	LMNOPV	81 x 45 x 42mm / 3.19 x 1.77 x 1.65in	255g / 8.99oz	GPS L1 frequency 1575.42 MHz; GSM 850 / 900 / 1800 / 1900 / UMTS; WLAN / BLUETOOTH	na	na	GPS: typ. 26 dB CELL: typ. 0 dB WLAN: typ. 0 dB	RHCP	< 1.9 ± 0.3 dB	2.7 - 5.1 VDC (fergespeist / remotely fed)	max. 30 mA	-40 ~ +80°C / -40 ~ +176 °F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 400 V FLEX	2010	LMNOPV	81 x 45 x 42mm / 3.19 x 1.77 x 1.65in	ca. 137g / 4.8oz	GPS L1 frequency 1575.42 MHz; TETRA	na	na	GPS: typ. 26 dB TETRA: typ. 0 dB	RHCP	< 1.9 ± 0.3 dB (50 Ohm)	2.7 - 5.1 VDC (fergespeist, remotely fed)	max. 30 mA	-40 ~ +80°C / -40 ~ +176 °F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 940 V FLEX	2010	LMNOPV	81 x 45 x 42mm / 3.19 x 1.77 x 1.65in	ca. 137g / 4.8oz	GPS L1 frequency 1575.42 MHz; GSM 900 / 1800 / 1900 / UMTS; TETRA	na	na	GPS: typ. 26 dB CELL: typ. 0 dB TETRA: typ. 0 dB	RHCP	< 1.9 ± 0.3 dB	2.7 - 5.1 VDC (fergespeist, remotely fed)	max. 30 mA	-40 ~ +80°C / -40 ~ +176 °F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 10 P	2010	LMNOPV	34 x 38 x 12.8mm	70g	GPS L1 frequency 1575.42 MHz;	na	na	GPS: typ. 28 dB	RHCP	≤ 1.4 dB typ.	2.7 V - 5.5 VDC	13 mA max. @ 5 VDC	-40° C - +80° C	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Adhesive mount	on request		
	GPS 11 S	2012	LMNOPV	63 x 63 x 19mm / 2.5 x 2.5 x 0.75in	150g / 5.3oz	GPS L1 frequency 1575.42 MHz;	na	na	GPS: typ. 29 dB	RHCP	typ. 1.4 dB	2.7 V - 5.5 VDC	≤ 13 mA at 5V ± 0.5 V (typ. 10 mA)	-40°C to +80°C / -40°F to +176°F	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request		
	GPS 7 M	2010	LMNOPV	39 x 39 x 14mm	ca. 65g	GPS L1 frequency 1575.42 MHz;	na	na	GPS: typ. 28 dB	RHCP	typ. 1.4 dB	3 V - 5.5 V	< 25 mA @ 5 V ± 0.1 V	-40° C to +80° C	IEC 68-2-6	IP66 (acc. DIN 60529)	na	on request	RG 174	Magnet mount	on request		
	GPS 9 M	2012	LMNOPV	38 x 34 x 15.5mm	70g	GPS L1 frequency 1575.42 MHz;	na	na	GPS: typ. 28 dB	RHCP	typ. 1.4 dB	2.7 V - 5.5 VDC	≤ 13 mA @ 5 V ± 0.5 V (typ. 10 mA)	-40° C - +80° C	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Magnet mount	on request		

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y/N) / Type	L/D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
	GPS 925	2010	LMNOPV	95 x 57 x 69mm	ca. 327g	GPS L1 frequency 1575.42 MHz; GSM 900 / 1800 / 1900	na	na	GPS: typ. 26 dB CELL: typ. 3 dBi	RHCP	< 2.5 dB	3.0 – 5.5 VDC ferngespeist von GPS Receiver durch HF-Kabel remote fed by GPS receiver through signal cable	max. ≤ 25 mA, typ. 20 mA	-40 – +85°C	IEC 68-2-6	IP66 (acc. IEC 60529)	na	on request	RG 174	Screw mount	on request	
Impact Power, Inc. www.impactpwr.com	GCRTB	2003	NV	100 x 39mm	as above	1575.42 / 824-960 / 1850-1990 MHz	2.0:1	3 dB max	27	nr	1.5 dB typ	2.7V / 6V	13mA max	-40°C-85°C	Sine Sweep,1G(0-P),10-150-10Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	GPS: RG174 / 5m Cellular: RG58 / 5m	Thread Permanent Mount		GPS / Cellular
	LC751	2013	N	13" 225mm; Base: 55" 39.7mm	19.5g; Base: 75.5g	680MHz – 960MHz / 1710MHz – 2170MHz	2.0:1	NC	680-800MHz: 1.29dBi 824-960MHz: -0.36dBi 1710-1990MHz: 0.21dBi 1920-2170MHz: 2.83dBi	Omni – direction / Linear	na	nr	nr	-40°C-85°C	Sine Sweep,1G(0-P),10-150-15Hz each axis	Y / rubber sealed	N / N	SMAR / P Plug	RG174 / 2m	Magnetic base		LTE, AMPS / GSM, DCS / PCS,WCDMA / UMTS / HSDPA
	CMIDM	2013	MN	75mm Dia. * 15.8mm	75g Max. (without cable)	1621 ± 3 MHz	1.5:1	3 dB Max. @ 0°	4dBic	omni at θ in + / - 90°	na	nr	nr	-40°C-85°C	Sine Sweep,1G(0-P),10-150-16Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m	Magnetic base		Iridium only
	CMIGM	2013	MN	75mm Dia. * 15.8mm	75g Max.	Iridium: 1621 ± 3 MHz GPS: 1575.42± 3 MHz	GPS: 1.5 Max.	Iridium: 3 dB Max. @ 0°	GPS: 28 dB Typical	omni at θ in + / - 90°	1.8 dB Typical	DC 2.7 V to 6.0V	12 ± 5.5 mA	-40°C-85°C	Sine Sweep,1G(0-P),10-150-17Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m	Magnetic base		Iridium + GPS
	GCRGI	2013	MN	100 Dia. x 67mm	280g Max.	Iridium: 1621 ± 3 MHz GPS: 1575.42± 3 MHz	GPS: 1.5 Max.	Iridium: 3 dB Max. @ 0°	GPS: 28 dB Typical	omni at θ in + / - 90°	1.8 dB Typical	DC 2.7 V to 6.0V	12 ± 5.5 mA	-40°C-85°C	Sine Sweep,1G(0-P),10-150-18Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 for GPS / 3m RG58 for Iridium / 3m	Thread Permanent Mount		Iridium + GPS
	MPIDM	2013	M	48 x 40 x 13mm	42g Max.	1621 ± 3 MHz	1.5:1	3 dB Max. @ 0°	4dBic	omni at θ in + / - 90°	na	nr	nr	-40°C-85°C	Sine Sweep,1G(0-P),10-150-19Hz each axis	Y / rubber sealed	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 3m RG316 / 3m	Magnetic base		Iridium only
	AM460	2013	MNOV	139 Dia. x 60mm	<1.1kg	GPS: 1575.42 ± 3 MHz Iridium: 1616-1626MHz C:696-960MHz, 1710-2170MHz W: 2.4-2.5GHz, 4.7-5.9GHz	GPS: 1.5 Max. Iridium: 2.0 Max Cellular: -2.15dBi VSWR(2-2.48GHz): VSWR<3.0, VSWR (5-6GHz): VSWR <3.0	GPS / Iridium: 3dB typical / RHCP	GPS: 27dB Typical	C / WiFi: Omni-direction / Linear	GPS: 1.8dB Typical	GPS: DC 2.7V to 6.0V	8.5±4.5mA	-40°C-85°C	Sine Sweep,1G(0-P),10-150-20Hz each axis	stainless bottom	N / N	BNC, TNC, SMA, SMB, MCX, SMC, MMCX, FAKRA	RG174 / 5m	Thread Permanent Mount		GPS / LTE / 2G / 3G WiFi (Tenative)
	IMPP9	2013	MN	100 Dia. x 67mm	280g Max	GPS: 1575.42 ± 3 MHz C: 824-960MHz, 1710-2170MHz W: 2.4-2.5GHz, 4.7GHz-5.9GHz	GPS: 1.5 max. C: VSWR<2.0 WiFi: VSWR<2.0	GPS: 3dB typical / RHCP	824-960MHz: -1.2 dBi 1710-1880MHz: -1.2 dBi 1850-1990MHz: -1.48 dBi 1920-2170MHz: -1.3 dBi 2.4-2.5GHz: -2.7 dBi 4.7-5.0GHz: -3.6 dBi 5-5.4GHz: -2.8 dBi 5.4-5.9GHz: -3.7 dBi	C / WiFi: Omni-direction / Linear	na	GPS: DC5.0V	50mA	-40°C-85°C	Sine Sweep,1G(0-P),10-150-21Hz each axis	Y / rubber sealed	N / N	GPS: USB A Type C: Option WiFi: Option	GPS: USB Cable O.D. 3.5±0.2mm C: Option WiFi: Option	Thread Permanent Mount		GPS NEMA + WiFi / GSM
	X830D	2013	N	36 x 36 x 13.9mm	35g max.	1559-1615MHz	1.5 max.	3dB max. at 1580MHz	GPS, Galileo – 27dBic @ 2.7VDC 36dBic @ 6VDC BDS – 26dBic @ 2.7VDC 35dBic @ 6VDC GLONASS – 23dBic @ 2.7VDC 30dBic @ 6VDC	omni at θ in + / - 90°	1.5 dB typ	2.7 to 6 V	9.5±4.5mA	-40°C-86°C	Sine Sweep,1G(0-P),10-150-22Hz each axis	Y / rubber sealed	N / N	SMA	RG174 / 5m	Magnetic base		GPS / GLONASS / BDS / Galileo
X830B	2013	N	36 x 36 x 13.9mm	35g max.	1575.42MHz	1.5 max.	3dB max. at 1575MHz	GPS – 27dBic @ 2.7VDC 36dBic @ 6VDC	4dBic min. at 0°	1.5 dB typ	2.7 to 6 V	9.5±4.5mA	-40°C-86°C	Sine Sweep,1G(0-P),10-150-22Hz each axis	Y / rubber sealed	N / N	SMA	RG174 / 5m	Magnetic base		GPS Only	
Inventeksys www.inventeksys.com	ACTPAT154-01-IP	2007	GLMNV	15 x 15 x 4mm	0.01oz	1578.00 +/- 2.0 MHz	1.5	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	63	Active Patch	\$9.75		
	ACTPAT184-01-IP	2007	GLMNV	18 x 18 x 4mm	0.01oz	1578.00 +/- 2.0 MHz	1.5	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	63	Active Patch	\$9.75		
	ACTPAT182-025-IP	2008	GLMNV	18 x 18 x 2mm	0.01oz	1578.00 +/- 2.0 MHz	1.5	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	25	Active Patch	\$9.75		
	ACTPAT182-01-IP	2008	GLMNV	18 x 18 x 2mm	0.01oz	1578.00 +/- 2.0 MHz	1.5	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	63	Active Patch	\$9.75		
	ACTPAT182-07-IP	2008	GLMNV	18 x 18 x 2mm	0.01oz	1578.00 +/- 2.0 MHz	1.5	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	165	Active Patch	\$9.75		
	ACTPAT254-01-IP	2008	GLMNV	25 x 25 x 4mm	0.01oz	1581.00 +/- 2.0 MHz	2	2 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +85	NR	N	U.FL	25	Active Patch	\$9.75		
	ANTDOM-05-01-WPM	2008	ADGLMNV	45 x 14.5mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +90	NR	Y	SMA	5000	Active Dome	\$12.75		
	ANTDOM-10-MCX-WPM	2008	ADGLMNV	45 x 14.5mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +90	NR	Y	MCX	10000	Active Dome	\$13.27		
	ANTDOM-10-MCX-WPMT	2008	ADGLMNV	45 x 14.5mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +90	NR	Y	MCX	10000	Active Dome	\$13.27		
	ANTDOM-05-MMCX-WPM	2008	ADGLMNV	45 x 14.5mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.4	2.7-5.4 V	10	-40 to +90	NR	Y	MMCX	5000	Active Dome	\$13.27		
	ANTBULK-02-SMB-RG316	2009	ADGLMNV	47 x 15.2mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.5	3.0- 5.4 V	10	-40 to +90	NR	Y	SMB	200	Bulkhead	\$14.75		
	ANTBULK-05-SMA	2009	ADGLMNV	47 x 15.2mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.5	3.0- 5.4 V	10	-40 to +90	NR	Y	SMA	5000	Bulkhead	\$13.27		
	ANTBULK-05-SMA-RG316	2009	ADGLMNV	47 x 15.2mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.5	3.0- 5.4 V	10	-40 to +90	NR	Y	SMA	5000	Bulkhead	\$13.27		
PAT152				15.2 x 15.2mm	0.01oz	1575.42 MHz	2	1.0 dB Typical	26 to 35 dB	RHCP	1.4	3.0- 5.4 V	10	-40 to +85	NR	N	None	0			\$5.00	
JAVAD GNSS www.javad.com	GrAnt-G3T	2011	EGLMNOPRTV	140 x 140 x 62mm	520g	1559-1610 MHz, 1164-1253 MHz	1.5:1 / 2.0:1	3 dB	5 / L1 32+3 dB L2 32+2 dB	as above	L1 2.2 dB L2 1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / N	TNC	RG58 / 3 m	Threaded 5 / 8-11; 1in-14; 4 holes	nr	GPS & GLONASS & GALILEO; opt. Snow Coner; opt. N connector
	RingAnt-G3T	2011	EGLMNOPRTV	Ø 326 x 88mm	2.7kg	1559-1610 MHz, 1164-1253 MHz	1.5:1 / 2.0:1	3 dB	5 / L1 32+3 dB L2 32+2 dB	as above	L1 2.2 dB L2 1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / N	TNC	RG58 / 3 m	as above	nr	as above
	AirAnt-G3T	2008	ADNVPO	120 x 74 x 44.5mm	320g	1565-1610 MHz, 1165-1253 MHz	1.5:1 / 2.0:1	3 dB	4 / 30 ± 3 dB	Omnidirectional, hemispherical	L1 2.5 dB; L2 2.0 dB	4.7-12 V DC	85 mA @ 5 V	-45 to +85	nr	Y / nr	Y / Y	TNC	RG58 / 3 m	4 holes	nr	GPS & GLONASS & GALILEO
	GrAnt-G3T	2008	GDLMrVTPO	140 x 140 x 62mm	515g	as above	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / Y	TNC	RG58 / 3 m	Threaded 5 / 8-11; 1in-14; 4 holes	nr	GPS & GLONASS & GALILEO; opt. Snow Coner; opt. N connector
	GrAnt-G3	2008	as above	140 x 140 x 62mm	450g	1565-1610 MHz	1.5:1 / 2.0:1	3 dB	5 / 32± 2 dB	as above	1.7 dB	3-15 V DC	25 mA @ 5 V	-45 to +85	nr	Y / nr	Y / Y	TNC	RG58 / 3 m	as above	nr	GPS & GLONASS & GALILEO; opt. Snow Coner
	RingAnt-G3T	2008	GDLMrVPO	Ø 326 x 88mm	2.7kg	1565-1610 MHz, 1165-1253 MHz	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / Y	TNC	RG58 / 3 m	as above	nr	as above
	RingAnt-DM	2008	as above	Ø 380 x 138mm	4.4kg	1565-1610 MHz, 1165-1300 MHz	1.5:1 / 2.0:1	3 dB	6 / 32 ± 2 dB	as above	L1 2.2 dB; L2 1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / N	N-Type	RG58 / 3 m	Threaded 5 / 8-11	nr	as above
	GyrAnt	2008	GDLMrVTPO	140 x 140 x 62mm	570g	1565-1610 MHz, 1165-1253 MHz	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	Antenna 3-15 V DC IMU 9-35 V DC	Antenna 45 mA @ 5 V IMU 100 mA @ 9 V	-45 to +85	nr	Y / nr	Y / Y	TNC; M12	RG58 / 3 m, M12 Connector	Threaded 5 / 8-11; 1in-14; 4 holes	nr	Combined Antenna with IMU
	TriAnt	2008	as above	128 x 128 x 54mm	425g	as above	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	3-15 V DC	45 mA @ 5 V	-45 to +85	nr	Y / nr	Y / Y	TNC	RG58 / 3 m	Threaded 1in-14; 3 hole	nr	GPS & GLONASS & GALILEO
	TyrAnt-G2T	2008	as above	140 x 140 x 62mm	600g	as above	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	9-35 V DC	170 mA @ 9 V	-45 to +85	nr	Y / nr	Y / Y	M12	M12 Connector	Threaded 5 / 8-11; 1in-14; 4 holes	nr	Smart Antenna, integrated with Receiver TR-G2T
TyrAnt-G3	2008	as above	140 x 140 x 62mm	600g	1565-1610 MHz	1.5:1 / 2.0:1	3 dB	5 / 32 ± 2 dB	as above	1.7 dB	9-35 V DC	130 mA @ 9 V	-45 to +85	nr	Y / nr	Y / Y	M12	M12 Connector	as above	nr	Smart Antenna, integrated with Receiver TR-G3	

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y/N) / Type	L/D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
Leica Geosystems AG www.leica-geosystems.com	AS05	2009	DGLMNRV	62 x 170mm Ø	0.44kg	1565.5-1611.5 MHz	<2.0:1	na	- / 27 dB typ	Omni-Directional	<2 dB	4.5-18 V DC	35 mA max	-40 to +70	MIL-STD-810F method 514.5-cat.24	Y / IP68	N / N	TNC female	na	5 / 8 Threaded	nr	GPS & GLONASS, SBAS
	AS10	2009	DGLMNRV	62 x 170mm Ø	0.44kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 29 dB typ	Omni-Directional	<2 dB	4.5-18 V DC	35 mA max	-40 to +70	MIL-STD-810F method 514.5-cat.24	Y / IP68	N / N	TNC female	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS
	AR25	2008	EGLMNRST	200 x 380mm Ø	7.6kg	1513.5-1623.5 MHz, 1152.0-1312.0 MHz	<1.5:1	na	- / 40 dB + / - 3dB typ	Omni-Directional	<1.2 dB	3.3-12 V DC	100 mA typ	-55 to +85	MIL-STD-810F / ISO9022-36-05	Y / IP67	N / N	N female with TNC adapter supplied	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS
	AR20	2012	EGLMNRST	163 x 320mm Ø	5.9kg	1525.0-1612.0 MHz, 1164.0-1301.0 MHz	na	na	- / 29 dB + / - 3dB typ	Omni-Directional	<2.0 dB	3.3-12 V DC	60 mA typ	-55 to +85	MIL-STD-810F / ISO9022-36-05	Y / IP67	N / N	N female with TNC adapter supplied	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS
	AR10	2010	EGLMNRST	136 x 240mm Ø	1.12kg	1525.0-1612.0 MHz, 1164.0-1301.0 MHz	<2.0:1	<1.4db at zenith	- / 29 dB + / - 3dB typ	Omni-Directional	<1.8 dB	3.3-12 V DC	40 mA typ	-40 to +70	MIL-STD-810F / ISO9022-36-05	Y / IP67	N / N	TNC female	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS
	GS08plus	2012	DGLMNRV	71 x 186mm Ø	0.70kg	1558.4-1616.0 MHz, 1215.6-1259.7 MHz	<2.0:1	na	- / 37 dB typ	Omni-Directional	<3 dB	na	na	-40 to +65	MIL-STD-810F / ISO9022-36-05	Y / IP68	Y / Y	8-pin LEMO-1 / Bluetooth	na	5 / 8 Threaded	nr	GPS & GLONASS, SBAS
	GS14	2012	DGLMNRV	90 x 190mm Ø	0.93kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 27 dB typ	Omni-Directional	<2 dB	na	na	-40 to +65	MIL-STD-810F method 514.5-cat.24	Y / IP68	Y / Y	8-pin LEMO-1 / Bluetooth	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS
	GS12	2010	DGLMNRV	89 x 186mm Ø	0.95kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 27 dB typ	Omni-Directional	<2 dB	na	na	-40 to +65	MIL-STD-810F method 514.5-cat.24	Y / IP68	Y / Y	8-pin LEMO-1 / Bluetooth	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS
	GS15	2009	DGLMNRV	198 x 196mm Ø	1.34kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 27 dB typ	Omni-Directional	<2 dB	na	na	-40 to +65	MIL-STD-810F method 514.5-cat.24	Y / IP68	Y / Y	2 * 8-pin LEMO-1 / UART / Bluetooth	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS
	GG03	2012	DGLMNRV	71 x 186mm Ø	0.7kg	1558.4-1616.0 MHz, 1215.6-1259.7 MHz	<2.0:1	na	- / 37 dB typ	Omni-Directional	<3 dB	na	na	-40 to +65	MIL-STD-810F / ISO9022-36-05	Y / IP68	Y / Y	8-pin LEMO-1 / Bluetooth	na	5 / 8 Threaded	nr	GPS & GLONASS, SBAS
IG60	2012	DGLMNRV	130 x 197mm Ø	1.45kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 27 dB typ	Omni-Directional	<2 dB	4.5-18 V DC	50 mA max	-40 to +65	MIL810F, Fig. 514.5C-3	Y / IP67	Y / Y	8-pin LEMO-1 / Bluetooth / USB Host / QN Female / TNC Female / UART	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS	
CGA60	2014	DGLMNRV	62 x 170mm Ø	0.44kg	1552.0-1609.0 MHz, 1165.0-1255.0 MHz	<2.0:1	na	- / 29 dB typ	Omni-Directional	<2 dB	4.5-18 V DC	35 mA max	-40 to +70	MIL-STD-810F method 514.5-cat.24	Y / IP68	N / N	TNC female	na	5 / 8 Threaded	nr	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS	
Maxtena, Inc. www.maxtena.com	M1621HCT-SMA (Iridium / GPS)	2010	DLMNOV	48 x 18mm	9g	1575MHz / 1621MHz	<2	1.0db	1.5db passive					-40 - +85C				SMA / TNC other		SMA / TNS / Embedded		
	M1516HCT-SMA (GPS / GLONASS)	2010	DLMNOV	48 x 18mm	9g	1575MHz / 1602MHz	<2	1.0db	1.0 db passive					-40 - +85C				SMA / TNC other		SMA / TNS / Embedded		
	M1227HCT-A-SMA (L1 / L2 Active)	2010	ADEGLMNOVO	50 x 30mm	12g	1227MHz / 1575MHz		1.0db	2.5db passive / 27db Active		1 db	3.0-5.0V	50mA max	-40 - +85C				SMA / TNC other		SMA / TNS / Embedded		
	MEA1516 (GPS / GLONASS)	2009	DLMNOV	44 x 35mm	110g	1575MHz / 1602MHz	1.5:1		5db passive / 32db active		1.5db max	2.5V-5.0V	11mA max	-40 - +85C				SMA / TNC / MMCX / other	5m	Magnet, adhesive		
	M1575HCT-TMG-SMA (Timing)	2011	DLMNOV	50 x 30mm	12g	1575MHz		1.0db	3.5db passive / 23db active		1db	3.0-6.0V	50mA max	-40 - +85C				SMA / TNC other		SMA / TNS / Embedded		
	M1575HCT-P-SMA (Passive GPS L1)	2011	DLMNOV	48 x 18mm	9g	1575MHz	1.5max	0.5db	2.5db passive					-40 - +85C				SMA / TNC other		SMA / TNS / Embedded		
M1575HCT-22P	2012	DLMNOV	22 x 13mm	2g	1575MHz	1.5max	0.5db	0db passive														
Microwave Photonic Systems www.b2bphotronics.com	OFW-3478, Fiber Optic Antenna Link, Multidrop	2002	DELMOT	6" Diameter	500g	L1, L2	1.5:1		35 dB	Omni-Directional	<2 dB	+5V to +18V DC	<50 mA	-40 to +85	Random & Sinusoidal Certified	Yes, MIL-STD-810F		TNC Female	Up To 10 KM	Multiple	12,000.00	Fiber Optic Antenna Link
Mobile Mark www.mobilemark.com	IW-1575	1998	NV	In-vcl 2 in sq. x 0.75 H	0.4lb	1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft RG-174	Glass mount	\$41.00 List Price	GPS only
	SM-1575	1999	NV	0.75 H x 2in Ø	0.4lb	1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	EN 61373, IEEE 1478, MIL-810G, TIA-329.2C	IPx5	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft RG-58 220 band	Surface mount	\$67.20 List Price	GPS only
	MAG-1575	2000	NV	0.5 x 1.75 x 2in	0.4lb	1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	IPx5	N / N	Choice of connectors	10 ft RG-174	Magnet mount	\$38.70 List Price	GPS only
	SM-220 / 1575	2000	NV	Overall 8.5in H 1 H x 2.6in Ø	0.5lb	220-224 MHz & 1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS, Unity (220 band)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft RG-58 UHF	Surface mount	\$115.50 List Price	220 MHz band
	SM-450 / 1575	2000	NV	Overall H 9in 1in H x 2.625in Ø;	0.5lb	450-470 MHz (UHF) & 1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS, Unity (UHF)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft RG-174; 15 ft RG-58 UHF	Surface mount	\$115.50 List Price	VHF
	SM-837 / 1575	2000	NV	0.75 H x 4.5in Ø	0.5lb	806-870 MHz & 1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS, Unity (Cell)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	EN 61373, IEEE 1478, MIL-810G, TIA-329.2C	IPx5	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft RG-58 SMR	Surface mount	\$115.50 List Price	SMR Trunking
	MGO-U15 series	2001	NV	Overall 3.5in H 1 H x 2.625in Ø;	0.4lb	as above	2.0:1	3 db max	5 dBi GPS, Unity (Cell, GSM / CDMA)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft dual RG-174	Magnet mount	\$115.50 List Price	Cell & GSM / CDMA
	MM3-U15 series	2001	NV	2in Ø, whip 3.25in in-vcl 2 x 3.25in	0.4lb	824-894 MHz (Cell); 1850-1990 MHz (GPRS / 1 x RTT)	2.0:1	3 db max	5 dBi GPS, 3 dB (Cell & GSM / CDMA)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft RG-58 Cell & GSM / CDMA	Glass mount	\$105.40 List Price	Cell & GSM / CDMA
SM3-837 / 1575	2001	NV	Overall 14.5in H 1in H x 2.625in Ø;	0.5lb	806-870 MHz (SMR) & 1575 MHz	2.0:1	3 db max	5 dBi GPS	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	na	na	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft RG-58 Cell	Surface mount	\$115.50 List Price	SMR Trunking	
SM-U15 series	2001	NV	0.75 H x 4.5in Ø	0.5lb	824-894 MHz (Cell) 1850-1990 MHz (GSM / CDMA) & 1575 MHz (GPS)	2.0:1	3 db max	5 dBi GPS, Unity (Cell, GSM / CDMA)	Hemispheric	2 dB max, 1.7 dB typ	2.7 to 5 VDC; GPS	20 mA max, 10 mA typ	-40 to +85	EN 61373, IEEE 1478, MIL-810G, TIA-329.2C	IPx5	N / N	Choice of connectors	15 ft RG-174 GPS; 15 ft separate RF-195 comm#1 & #2	Surface mount	\$126.00 List Price	Cell & GSM / CDMA	
NavCom Technology, Inc. www.navcomtech.com	ANT-3001R	2009	D G L M N	5.75 x 2.46in	1.1lb	1570 ± 45 & 1164-1260 MHz	≤2.0:1	3 dB Max @ Boresight	39 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	65 mA	-55C TO +85C	nr	Y	Y	TNC Female	Antenna Cable / 12ft	Pole Mount	nr	nr
	ANT-3001A	2009	D G L M N	5.75 x 2.46in	1.1lb	1570 ± 45 & 1164-1260 MHz	≤2.0:1	3 dB Max @ Boresight	39 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	65 mA	-55C TO +85C	nr	Y	Y	TNC Female	Antenna Cable / 12ft	Fuselage / Vehicle Flush Mount (FAA Certified)	nr	nr
	ANT-3001BR	2009	R	14.82 x 13.83in	10.5lb.	1570 ± 45 & 1164-1260 MHz	≤2.0:1	3 dB Max @ Boresight	38 dB	RHCP	2.6 dB Max	+4.2 +15 VDC	65 mA	-55C TO +85C	nr	Y	Y	TNC Female	Antenna Cable / 12ft	Roof Mount	nr	nr
NAVIS, Inc. www.navis.ru/en	434854.011 Aviation Antenna	2009	A	119.4 x 73.6 x 107mm	310g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	< 1.5	3	30 typ.	RHCP, hemispherical radiation pattern, 5° to 175°	<3.5	9.6 to 14.4 V	75 mA	-55 to +70°C	1) 5 to 500 Hz: 5 g 2) 5 to 2k Hz: 10 g 3) 20 ms, 7k Hz: 12 g	Y / IP67	Y	TNC	N	Screw surface mount, includes mounting hardware	\$640.00	Aviation grade active antenna
	A101P Aviation antenna (ARINC 743A)	2009	A	119.4 x 73.6 x 59mm	180g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	< 1.7	3	na	RHCP, hemispherical radiation pattern, 5° to 175°	na	na	na	-55 to +85°C	1) 5 to 2k Hz: 10 g 2) 20 ms, 7k Hz: 8 g 4) 5 to 15 ms 3kHz: 12 g 5) 15 ms, 18kHz: 15 g	Y / IP67	Y	TNC	N	Screw surface mount, includes mounting hardware	\$254.00	Aviation passive antenna
	B102 Magnet mount antenna	2011	N	35.6 x 47 x 15.8mm	120g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	< 2.5	3	28 typ.	RHCP, hemispherical radiation pattern, 5° to 175°	2	2.5 to 5.5 V	25 mA	-40 to +55°C	1) 6hr, 1 to 80 Hz: 5 g 2) 2 to 4 ms, 12k Hz: 15 g	Y / IP67	N	SMA / TNC	RG174 / 3 m or 5 m	Magnetic Mount	\$45.00	Magnet mount active antenna

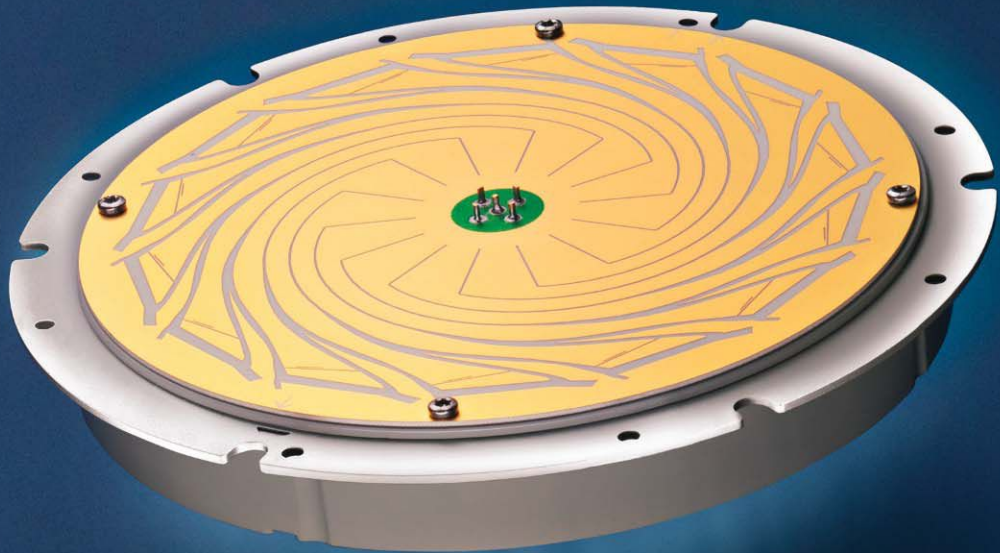
Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y/N) / Type	L/D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
	B104 Precision GPS GLONASS Antenna	2012	G	21 x 63mm Ø	200g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	<2		23	RHCP, hemispherical radiation pattern, 5° to 175°	<3.5				Y / IP67			RG174 / 3 m or 5 m	Magnetic Mount	\$89.00	Magnet mount active antenna	
	G102 Precision GPS GLONASS L1 / L2 Antenna	2012	G	48 x 140mm Ø	500g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz 1217 to 1238 (GPS / GLONASS L2)	<2		25.0±2.5	RHCP, hemispherical radiation pattern, 5° to 175°	3	2.75 to 5.00 V	30 mA	-50 to +70°C		Y / IP67		ERC.00.250 NTL	N		\$297.00	
	DS101 Marine Antenna GLONASS / GPS / DGNSS	2011	M	211 x 160mm Ø	1000g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz 283.5 to 325.0 KHz	<2	3	30 typ.	RHCP, hemispherical radiation pattern, 5° to 175°	3.5	10.9 to 12.1 V	95 mA	-40 to +55°C		Y / IP67		TNC	N	Pole mount, includes mounting hardware	\$590.00	Marine / External grade active antenna
	M102 Marine / Timing Antenna	2011	M, T	168H x 74mm Ø	280g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	<2	<3	40	RHCP, hemispherical radiation pattern, 5° to 175°	3.5	5 to 11 V	45 mA	-50 to +50°C	1) 5 to 300 Hz: 5 g 2) 5 to 10 ms: 15 g 3) 1 to 5 ms: 100 g	Y / IP67	Y	TNC	N	Pole mount, includes mounting hardware	\$299.00	Marine / External grade active antenna
	M103 Marine / Timing Antenna	2013	N, M, T	58H x 74mm Ø	200g	1570 to 1610 MHz (GPS / GLONASS L1) / 40MHz	<2	<3	40	RHCP, hemispherical radiation pattern, 5° to 175°	3.5	5 to 11 V	45 mA	-50 to +50°C	1) 5 to 300 Hz: 5 g 2) 5 to 10 ms: 15 g 3) 1 to 5 ms: 100 g	Y / IP67	Y	TNC	N	Pole mount, includes mounting hardware	\$259.00	Marine / External grade active antenna
NovAtel, Inc. www.novatel.ca	GPS-703-GGG	2009	DGLMNOPRV	69 x 185mm Ø	500g	1580.5 ± 28.5 MHz, 1210.0 ± 45 MHz,	≤2.0:1	3 dB max	L1: 5 dBic / 29 dB typ L2: 3 dBic / 29 dB typ L5: 3 dBic / 29 dB typ	RHCP	2.0 dB typ	4.5 - 18 V DC	36 mA typ	-40 to +85	MIL-STD-810F method 514.5 ASAE EP455 Section 5.15.2 Level 1	Y / Waterproof to IPX7	Y / Y	TNC	na	Threaded	Inquire	nr
	GPS-702-GGL	2007	DGLMNOPRV	69 x 185mm Ø	500g	1588.5 ± 23 MHz, 1236.0 ± 18.3 MHz, 1545 ± 20 MHz	≤2.0:1	3 dB max	L1: 5 dBic / 29 dB typ L2: 2 dBic / 29 dB typ L: 5 dBic / 29 dB typ	RHCP	2.5 dB typ	4.5 - 18 V DC	35 mA typ	-40 to +85	MIL-STD-202F method 214 SAEJ1211 section 4.7	Y / Waterproof to IPX7	Y / Y	TNC	na	Threaded	Inquire	nr
	GPS-702-GG	2006	DGLMNOPRV	69 x 185mm Ø	500g	1588.5 ± 23 MHz, 1236.0 ± 18.3 MHz	≤2.0:1	3 dB max	L1: 5 dBic / 29 dB typ L2: 2 dBic / 29 dB typ	RHCP	2.5 dB typ	4.5 - 18 V DC	35 mA typ	-40 to +85	MIL-STD-202F method 214	Y / Waterproof to IPX7	Y / Y	TNC, N	na	Threaded	Inquire	nr
	GPS-702L	2005	DGLMNOPRV	69 x 185mm Ø	500g	1575.4 ± 20 MHz, 1227.6 ± 20 MHz, 1543 ± 20 MHz	≤2.0:1	3 dB max	L1: 5 dBic / 27 dB typ L2: 1.5 dBic / 27 dB typ L: 5 dBic / 27 dB typ	RHCP	2.5 dB typ	4.5 - 18 V DC	35 mA typ	-40 to +85	MIL-STD-810F method 514.5 ASAE EP455 Section 5.15.2 Level 1	Y / Waterproof to IPX7	Y / Y	TNC	na	Threaded	Inquire	nr
	GPS-701-GGL	2007	DGLMNOPRV	69 x 185mm Ø	500g	1588.5 ± 23 MHz, 1545 ± 20 MHz	≤2.0:1	3 dB max	L1, L: 5 dBic / 29 dB typ	RHCP	2.5 dB typ	4.5 - 18 V DC	35 mA typ	-40 to +85	MIL-STD-202F method 214 SAEJ1211 section 4.7	Y / Waterproof to IPX7	Y / Y	TNC	na	Threaded	Inquire	nr
	GPS-701-GG	2006	DGLMNOPRV	69 x 185mm Ø	500g	1575.4 -10 / +36 MHz	≤2.0:1	3 dB max	L1, L: 5 dBic / 29 dB typ	RHCP	2.5 dB typ	4.5 - 18 V DC	35 mA typ	-40 to +85	MIL-STD-202F method 214 SAEJ1211 section 4.7	Y / Waterproof to IPX7	Y / Y	TNC	na	Threaded	Inquire	nr
	GPS-704X	2006	DGLMNOPRV	69 x 185mm Ø	468g	1.15GHz -1.65 GHz	≤2.0:1	3 dB max	L1, L: +6 dBic, L2, L5: +2 dBic	RHCP	nr	nr	Passive	-40 to +85	nr	Y / nr	Y / Y	TNC	na	Threaded	Inquire	nr
	Pinwheel OEM	2013	DGLMNOPRV	30 x 143mm Ø	120g	1588.5 ± 23 MHz, 1236.0 ± 18.3 MHz, 1545 ± 20 MHz	≤2.0:1	3 dB max	L1: 3 dBic / 23 dB typ L2: 2 dBic / 23 dB typ L: 3 dBic / 23 dB typ	RHCP	2.0 dB typ	5 V DC	35 mA typ	-40 to +85	MIL-STD-202F SAEJ1211 Section 4.7	N	Y / Y	R / A MMCX	na	Screw Flange	Inquire	Required
	ANT-26C1GA-TBW-N	2006	ALGMV	18 x 66mm Ø	113g	1575.4 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	2.4 dB typ	2.5 - 24 V DC	<30 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole back mount, surface	Inquire	nr
	ANT-26C1GA-MTB	2013	LGMVOV	22 x 63mm Ø	113g	1575.4 ± 15 MHz 1227.6± 15 MHz	≤2.0:1	2 dB typ	L1: 33 dB typ L2: 35 dB typ	RHCP	3 dB typ	2.5 - 24 V DC	<50 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole back mount, flush magnetic	Inquire	nr
	ANT-26C1GOA-196MNSB	2012	LGMVOV	19 x 63mm Ø	184g	1575.4 ± 12 MHz 1609.0± 7 MHz 1542.0± 14 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3 dB typ	2.5 - 24 V DC	<40 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	SMA Male	7.7 m / RG-316	4-hole back mount, flush magnetic	Inquire	nr
	ANT-2GNSSA-TW	2009	ALGMV	26 x 66mm Ø	255g	1575.4 ± 17 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1176.4 ± 12 MHz, 1542.5 ± 14 MHz	≤2.0:1	3.0 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole back mount, surface	Inquire	nr
	3GOXX16A4-XTR-1-2-CERT (replaces ANT-35C1GA-TW-N)	2013	ALGMV	18 x 89mm Ø	184g	1575.4 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	2.2 dB typ	2.5 - 24 V DC	<30 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	3GOXX16A4-XTR-1-1-CERT (replaces ANT-35C2GA-TW)	2013	ALGMV	19 x 89mm Ø	191g	1575.4 ± 12 MHz, 1227.6 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	3GOXX16A4-XTR-1-4-CERT (replaces ANT-3GNSSA-TW)	2013	ALGMV	27 x 89mm Ø	340g	1575.4 ± 17 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1176.4 ± 12 MHz, 1542.5 ± 14 MHz	≤2.0:1	3.5 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42G1215A-XTR-1-CERT (replaces ANT-A72GA-TW-N)	2013	ALGMV	119 x 76 x 18mm (ARINC 743A)	198g	1575.4 ± 12 MHz, 1227.6 ± 12 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42GO16A4-XTR-1-CERT (replaces ANT-A71GLA4-TW)	2013	ALGMV	119 x 76 x 20mm (ARINC 743A)	191g	1525-1595 MHz, 1602-1626 MHz	≤1.5:1	2 dB typ	40 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<39 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42GOXX16A4-XTR-1-2-CERT (replaces ANT-42GNSSA-TW)	2013	ALGMV	119 x 76 x 26mm (ARINC 743A)	272g	1575.4 ± 17 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1176.4 ± 12 MHz, 1542.5 ± 14 MHz	≤2.0:1	3.5 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42G1215A-XTR-1-2-CERT (replaces ANT-A72GLA-TW-N)	2013	ALGMV	119 x 76 x 20mm (ARINC 743A)	191g	1575.4 ± 13 MHz, 1227.6 ± 13 MHz, 1542.5 ± 17.5 MHz	≤1.5:1	2 dB typ	33 dB typ	RHCP	1.9 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42G1215A-XTR-1-3-CERT (replaces ANT-A72GLA4-TW-N)	2013	ALGMV	119 x 76 x 20mm (ARINC 743A)	191g	1575.4 ± 13 MHz, 1227.6 ± 13 MHz, 1542.5 ± 17.5 MHz	≤1.5:1	2 dB typ	40 dB typ	RHCP	1.9 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr
	42GOXX16A4-XTR-1-1-CERT (replaces ANT-A72GOLA-TW)	2013	ALGMV	119 x 76 x 23mm (ARINC 743A)	227g	1575.4 ± 16 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1542.5 ± 14 MHz	≤2.0:1	2 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	4-hole, surface	Inquire	nr

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y / N) / Type	L / D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
	ANT-72GNSSA-TW	2009	G L R	100 x 180mm Ø	848g	1575.4 ± 17 MHz, 1609 ± 7 MHz, 1227.6 ± 12 MHz, 1252.5 ± 7.5 MHz, 1542.5 ± 14 MHz	≤2.0:1	3.0 dB typ	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	Threaded	Inquire	nr
	ANT-C2GA-NW-N	2006	G L R	223 x 308mm Ø	4.1kg	1575.4 ± 13 MHz, 1227.6 ± 13 MHz	≤1.5:1	nr	33 dB typ	RHCP	3.0 dB typ	2.5 - 24 V DC	<35 mA typ	-55 to +85	>30 G's	Y / nr	Y / Y	TNC	na	Threaded	Inquire	nr
	GNSS-750	2008	G L R	380 x 200mm Ø	7.6kg	1568.5 ± 55 MHz, 1232 ± 80 MHz	≤1.5:1	2 dB @ zenith	5 dBic / 43 dB typ	RHCP	2.0 dB typ	3.3-12 V DC	100 mA typ	-55 to +85	ISO 9022-3 Method 36	Y / MIL-STD-810F, IEC-60529	Y / Y	N-Type with TNC adaptor supplied	na	Threaded	Inquire	nr
OriginGPS LTD. www.origingps.com	ORG9805	2012	LMNTV	49mm x 39mm x 15mm	106g including cable and connector	1575 / 20MHz	1.5 :1	2.0 (max)	4dBic (min) / 27dB (typ)	Hemispheric, RHCP	1.5 (max)	3 - 5V	8.5 (typ)	-40°C to +85°C	Sine sweep 5 - 55 - 5 Hz, 1 octave/min	Y / IP66	N	SMA plug	RG-174 / 5m	Magnetic base	Contact Distributor	GPS Active Antenna
	ORG9802	2011	LMNTV	13.4mm x 13.4mm x 6.5mm	4g / 6.3g including 150mm cable and connector	1575 / 10MHz	1.5 :1	2.5 (max)	-1dBic / NA	Hemispheric, RHCP	NA, Passive Antenna	NA, Passive Antenna	NA, Passive Antenna	-40°C to +85°C	NA	N	N	Hirose W.FL / I-pex MHFIII plug	AWG36 / 43mm or 150mm	NA	Contact Distributor	GPS Passive Antenna
	ORG12-4T	2011	LMNTV	12mm x 12mm x 4mm	3.4g	1575 / 10MHz	1.5 :1	3.0 (max)	-1.3dBic / NA	Hemispheric, RHCP	NA, Passive Element	NA, Passive Element	NA, Passive Element	-40°C to +85°C	Sine sweep 5 - 55 - 5 Hz, 1 octave/min	N	N	N	NA	Manual Soldering	Contact Distributor	GPS Antenna Element
	ORG18-4T	2012	LMNTV	18mm x 18mm x 4mm	6.5g	1573 / 20MHz	1.5 :1	3.0 (max)	0.3dBic / NA	Hemispheric, RHCP	NA, Passive Element	NA, Passive Element	NA, Passive Element	-40°C to +85°C	Sine sweep 5 - 55 - 5 Hz, 1 octave/min	N	N	N	NA	Manual Soldering	Contact Distributor	GPS Antenna Element
	ORG25-4T	2012	LMNTV	25mm x 25mm x 4mm	9.5g	1580 / 25MHz	1.5 :1	3.0 (max)	5dBic / NA	Hemispheric, RHCP	NA, Passive Element	NA, Passive Element	NA, Passive Element	-40°C to +85°C	Sine sweep 5 - 55 - 5 Hz, 1 octave/min	N	N	N	NA	Manual Soldering	Contact Distributor	GPS Antenna Element
	Low Profile Hornet (ORG1400)	2010	LMNTV	17mm x 17mm x 3.2mm	2.2g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	2 - 5.5V	10 (low power tracking)	-40°C to +85°C	NA	N	N	N	NA	SMD LGA22	Contact Distributor	GPS Receiver Module With Integrated Antenna
	Micro Hornet (ORG1410)	2012	DLMNTV	10mm x 10mm x 5.8mm	2.5g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	1.8V or 2 - 5.5V	8 (low power tracking)	-40°C to +85°C	NA	N	N	N	NA	SMD LGA10	Contact Distributor	GPS Receiver Module With Integrated Antenna
	Hornet (ORG1415)	2010	LMNTV	17mm x 17mm x 4.8mm	3.5g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	2 - 5.5V	10 (low power tracking)	-40°C to +85°C	NA	N	N	N	NA	SMD LGA22	Contact Distributor	GPS Receiver Module With Integrated Antenna
	AB1 Hornet (ORG1415-AB1)	2011	ELMNTV	18 mm x 20mm x 5.6mm	4.2g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	2 - 5.5V	10 (low power tracking)	-40°C to +85°C	NA	N	N	5 position hole array	NA	Through Hole	Contact Distributor	GPS Receiver Module With Integrated Antenna
	Ultra Sensitive Hornet (ORG1418)	2010	LMNTV	18mm x 18mm x 4.8mm	4.8g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	1.8V or 2 - 5.5V	10 (low power tracking)	-40°C to +85°C	NA	N	N	N	NA	SMD LGA22	Contact Distributor	GPS Receiver Module With Integrated Antenna
	Snap-In Snap-Out Hornet (ORG4402)	2011	ELMNTV	18.5mm x 28mm x 7mm	11g	GPS L1, SBAS (WAAS, EGNOS), QZSS	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	2 - 6V	10 (low power tracking)	-40°C to +85°C	NA	N	N	10 position ZIF connector	NA	FPC cable	Contact Distributor	GPS Receiver Module With Integrated Antenna
	Multi Hornet (ORG1218)	2013	LMNTV	17mm x 17mm x 6mm	8g	GPS L1, GLONASS L1, SBAS (WAAS, EGNOS), QZSS, Galileo and Beidou Ready	NA, Integrated Receiver	NA, Integrated Receiver	NA / Integrated Receiver	Hemispheric, RHCP	NA, Integrated Receiver	3 - 3.6V	40 (full power tracking)	-40°C to +85°C	NA	N	N	N	NA	SMD LGA22	Contact Distributor	GNSS Receiver Module With Integrated Antenna
Panasonic http://pewa.panasonic.com/lighting/gps	CCA32ST01	1999	T	90.0 D x 98.4mm H	200g	1575.42 +/- 1.023 MHz	1.5 typical 2.5 maximum	3dB typical 6dB maximum	38dB typical 30dB minimum	RHCP	1.8dB typical 2.1dB maximum	5V +/- 0.5V	20mA typical 27mA maximum	-40 to +85 C	Sine Sweep, 1G, 33 to 50 Hz each axis	Y	N	TNC	nr	Pole mount	Contact Panasonic	Antenna
	CCA32ST02	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	TNC	>>	>>	>>	>>
	CCA32ST03	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	N	>>	>>	>>	>>
	CCA32ST04	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	N	>>	>>	>>	>>
	CCA32ST05	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	TNC	>>	>>	>>	>>
	CCA32ST12	1999	T	90.0 D x 98.4mm H	200g	1575.42 +/- 1.023 MHz	1.5 typical 2.5 maximum	3dB typical 6dB maximum	38dB typical 30dB minimum	RHCP	1.8dB typical 2.1dB maximum	5V +/- 0.5V	20mA typical 27mA maximum	-40 to +85 C	Sine Sweep, 1G, 33 to 50 Hz each axis	Y	Y	TNC	nr	Pole mount	Contact Panasonic	Antenna
	CCA32ST13	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	N	>>	>>	>>	>>
	CCA32ST14	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	N	>>	>>	>>	>>
	CCA32ST15	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	TNC	>>	>>	>>	>>
	CCA32ST16	1999	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	TNC	>>	>>	>>	>>
	CCA32NT21	2010	T	90.0 D x 98.4mm H	200g	1575.42 +/- 1.023 MHz	1.5 typical 2.5 maximum	3dB typical 6dB maximum	34dB typical 27dB minimum	RHCP	4dB typical 5dB maximum	5V +/- 0.5V	23mA typical 30mA maximum	-40 to +85 C	Sine Sweep, 1G, 33 to 50 Hz each axis	Y	N	TNC	nr	Pole mount	Contact Panasonic	Enhanced Filter Antenna
	CCA32NT24	2010	T	Same as above >>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	>>	N	>>	>>	>>	>>
Parsec Technologies, Inc. www.parsec-t.com	PTA1.5-9 - Antenna	13-Dec	ALMNOPTV	9 x 9 x 0.8mm	.5g	1560MHz-1610MHz	1.5:1	3.0dB max	0.9dB max- No LNA	LP	No LNA	na	na	na	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5-17 - Antenna	13-Dec	ALMNOPTV	16.25 x 6 x 0.8mm	.5g	1560MHz-1610MHz	1.5:1	3dB max	2.1dB max No LNA	LP	No LNA	na	na	na	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5-22 - Antenna	13-Dec	ALMNOPTV	21 x 10 x 0.8mm	.5g	1560MHz-1610MHz	1.5:1	3dB max	0.9dB max No LNA	LP	No LNA	na	na	na	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5-V - Antenna	13-Dec	ALMNOPTV	14.25 x 6 x 0.8mm	.5g	1560MHz-1610MHz	1.5:1	3dB max	2.1dB max No LNA	LP	No LNA	na	na	na	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5M-9 - Active Antenna	13-Dec	ALMNOPTV	9 x 9 x 1.3mm	1.5g	1560MHz-1610MHz	1.5:1	3dB max	15dB	LP	1.25dB	1.8-6v	4mA-50mA	0-85	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5M-17 - Active Antenna	13-Dec	ALMNOPTV	16.25 x 10 x 1.3mm	1.5g	1560MHz-1610MHz	1.5:1	3dB max	15dB	LP	1.25dB	1.8-6v	4mA-50mA	0-85	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5M-22 - Active Antenna	13-Dec	ALMNOPTV	21 x 10 x 1.3mm	1.5g	1560MHz-1610MHz	1.5:1	3dB max	15dB	LP	1.25dB	1.8-6v	4mA-50mA	0-85	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5x2M-22 - Active Antenna	13-Dec	ALMNOPTV	21 x 10 x 1.3mm	2.0g	1560MHz-1610MHz	1.5:1	3dB max	30dB	LP	1.50dB	1.8-6v	4mA-50mA	0-85	na	na	na	na	na	SMT	call	GPS / GNSS
	PTA1.5M-V - Active Antenna	13-Dec	ALMNOPTV	14.25 x 6 x 1.3mm	1.5g	1560MHz-1610MHz	1.5:1	3dB max	15dB	LP	1.25dB	1.8-6v	4mA-50mA	0-85	na	na	na	na	na	SMT	call	GPS / GNSS
PCTEL www.antenna.com	GPS-L1L2-28MAG	2011	D,L,O,V	2.75 D x 0.98in H	6.6oz	GPS L1 / 10MHz, GPS L2 / 10MHz	<2.0:1	2 dB typ	3 dBic / 30 dB typ	RHCP	2.5 dB	2.5-5.5 VDC	37mA typ, 50mA (max)	-40 to +85	Mil Std 810F, Method 514.5, Procedure II, Category 5	Y	nr	SMA F	na	Magnetic < 20lb pull force	425	
	1273FW	2002	A,D,L,O,V	3.4 H x 2.2in W	3.6oz	GPS L1 / 10MHz	1.5:1	nr	4.5 dBic / 35 dB	RHCP	2.5 dB	4.5-5.5 VDC	40mA Nominal	-40 to +85	nr	Y	nr	TNC F	na	Surface mount four hole pattern	320	
	1210FW	2002	A,D,L,O,V	2.7 OD x 0.75in D	3oz	GPS L1 / 10MHz	1.9:1	nr	4.5 dBic / 26 dB	RHCP	2.5 dB	5-28 VDC through connector	25 mA typ., 40 mA max @ 26.5 dB / 40 mA typ., 60 mA Max @ 40 dB	-40 to +85	nr	Y	nr	TNC F	na	Through-hole 5 / 8-18UNC-2A thread	385.5	
	3226MSMA	2004	V	2.5 OD x 0.5in D	25g	GPS L1	1.8:1	nr	3.5 dBic / 26 dB	RHCP	1.8 dB	3 - 13.5 V	20 mA nominal; <30 mA @ -40°C to +85°C	-40 to +85	nr	nr	nr	SMA M, options available	RG174 / 17 ft	Through-hole for 1-inch diameter	111.78	
	3235MSMA	2004	V	2.5 OD x 0.5in D	25g	GPS L1	1.8:1	nr	3.5 dBic / 34 dB	RHCP	1.8 dB	3 - 13.5 V	20 mA nominal; <30 mA @ -40°C to +85°C	-40 to +85	nr	nr	nr	SMA M, options available	RG174 / 17 ft	Through-hole for 1-inch diameter	111.78	

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y / N) / Type	L / D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration		
	AGPS35HPMMSMA																							
	GPS35MMSMA-NC																							
	GPSHPMIMO																							
	GPSHPM-SM-SM																							
	PCTMDL	2009	L,O,P,V	5.1 x 4.95 x 1.7in	31.9oz	GPS L1, 806-960MHz, 1710-2170MHz, 2.3-2.6GHz	<2.0:1	nr	3.5 dBic / 27 dB, 2.8dBi-3.3dBi (Cell), 3.9dBi (Wi-Fi)	RHCP	1.6 dB	3-5.5 VDC	20 mA typ	-40 to +85	nr	Y	nr	SMA, SMA, SMA (options available)	RG174 / 17 ft (GPS), RG-58 / U / 17 ft (Cell & Wi-Fi)	Through-hole	132.25			
	PCTMDL-RCVR	2010	L,O,P,V	5.1 x 4.95 x 1.7in	31.9oz	GPS L1, 806-960MHz, 1710-2170MHz, 2.3-2.6GHz	<2.0:1	nr	na Integrated Receiver, 2.8dBi-3.3dBi (Cell), 3.9dBi (Wi-Fi)	RHCP	1.6 dB	3-5.5 VDC	20 mA typ	-40 to +85	nr	Y	nr	USB, SMA, SMA (options available)	USB Cable / 17 ft (GPS), RG-58 / U / 17 ft (Cell & Wi-Fi)	Through-hole	228.85			
	GPSGL-TMG-SPI-40NCB	2010	O, P, T	5.0 H x 3.2in D	0.75lb	GPS L1 / 10MHz, GLONASS 1602-1615MHz	1.5:1	nr	3 dBic typ / 30 dB	RHCP	2.5 dB	3.3-9 VDC	40 mA	-40 to +85	nr	Y	EN61000-4-5 Level 4	N Female	na	Mounting Options to pipes 1"-1.45"	333.5			
	GPSL1-TMG-SPI-40NCB	2010	O, P, T	5.0 H x 3.2in D	0.75lb	GPS L1 / 10MHz	1.5:2	nr	3 dBic typ / 30 dB	RHCP	2.5 dB	3.3-9 VDC	40 mA	-40 to +85	nr	Y	EN61000-4-5 Level 5	N Female	na	Mounting Options to pipes 1"-1.45"	298			
	GPS-TMG-HR-26NCM	2010	O, P, T	5.0 H x 3.2in D	0.6lb	GPS L1 / 10MHz	1.5:1	nr	3.5 dBic / 26.5 dB	RHCP	4.0 dB	3.3-12 VDC	40 mA	-40 to +85	nr	Y	nr	N Female	na	Mounting Options to pipes 1"-1.45"	242			
	3978D-DH-W	2009	O, P, T	2.36 D x 1.73in H	0.11lb	GPS L1 / 10MHz	1.5:1	nr	3 dBic / 40 dB	RHCP	0.5 dB	2.7-5.5 VDC	15mA @ 5.5VDC	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	TNC Female	na	3 / 4" through-hole or bracket mount	73.75			
3971D	2009	D,O,P,T,V	2.36 D x 0.83in H	0.11lb	GPS L1 / 10MHz	1.5:1	nr	3 dBic / 28 dB	RHCP	0.8 dB	2.7-5 VDC	8mA @ 3.3 VDC	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	TNC Female	na	3 / 4" through-hole or bracket mount	59.35				
1357D	2009	D,L,O,P,V	0.63 x 0.63 x 0.23in	0.21oz	GPS L1 / 10MHz	<2.0:1	nr	0.5 dBic / 28 dB	RHCP	1.5 dB	2.7-5 VDC	9 mA @ 3.3V	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	N	nr	H.FL (U.FL & W.FL available)	CO-6FFH-SB / 6 Inches	Embedded	31.85				
3961D	2009	D,L,O,P,V	1.85 D x 0.32in H	0.56oz	GPS L1 / 10MHz	1.5:1	nr	3 dBic / 28 dB	RHCP	0.5 dB	2.7-5 VDC	7.5mA @ 3.3 VDC	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	N	nr	MCXR / A (others available)	RG174 / 15CM	Embedded	39.65				
3910D	2009	D,L,M,P,V	1.77 x 2.01 x 0.47in	0.26lb	GPS L1 / 10MHz	1.5:1	nr	3 dBic / 28 dB	RHCP	0.5 dB	2.7-5 VDC	8 mA	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	SMA M, options available	RG174 / 3M	Magnetic (5lb lift-off) or screw mount	47.5				
3947D	2009	O,P,V	5.2 x 2.3 x 0.3in	nr	GPS L1, 824-960MHz, 1710-2200MHz, 2.4-2.5GHz	1.5:1	nr	nr / 27 dB, 2dBi (Cell / Wi-Fi)	RHCP	1.5 dB	3-5 VDC	9 mA @ 3.5V	-40 to +85	nr	N	nr	SMA M / SMA M (options available)	RG174 / 3M	Covert, VHB Tape	52.2				
8117D	2011	D,L,M,P,V	1.77 x 2.01 x 0.47in	0.26lb	GPS L1, GLONASS L1 / 1568-1618MHz	1.5:1	nr	3 dBic / 28 dB	RHCP	1.5 dB	2.5-5 VDC	9 mA @ 3.3V	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	SMA M, options available	RG174 / 3M	Magnetic (5lb lift-off) or screw mount	55.3				
9211D	2009	D,L,M,P,V	1.77 x 2.01 x 0.47in	0.26lb	Indium, 1616-1626.5MHz	<2.0:1	nr	4 dBic / Passive	RHCP	na	nr	nr	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	SMA M, options available	RG174 / 2M	Magnetic (5lb lift-off) or screw mount	55				
5012D-U	2009	L,O,P,V	1.77 x 2.01 x 0.47in	0.26lb	GPS L1 / 10MHz	1.5:1	nr	3 dBic / na integrated receiver	RHCP	nr	5 V	85 mA (max)	-40 to +85	3 axis, sweep=15 min 10-200 Hz log sweep:3G	Y	nr	USB (RS232 Options Available)	USB Cable / 3M	Magnetic (5lb lift-off) or screw mount	90.65				
5072D-RD15	2009	L,O,P,V	2.36 D x 0.8in H	0.23lb	GPS L1 / 10MHz	1.5:1	nr	3 dBic / na integrated receiver	RHCP	nr	8-18 VDC	nr	-40 to +85	nr	Y	nr	RS232 DB15 (RS232 DB9 & DB25 options available)	USB Cable / 5M	Through-hole	194.92				
GPS-TMG-RCVR232	2008	O, P, T	5.0 H x 3.2in D	0.6lb	GPS L1 / 10MHz	1.5:1	nr	4 dBic / na Integrated Receiver	RHCP	nr	8-12 V	nr	-40 to +85	nr	Y	nr	8-pin Circular Connector conforming IEC 60130-9.v3.0	na	Mounting Options to pipes 1"-1.45"	549.5				
Pulse / Larsen www.pulseelectronics.com	GPSDM700 / 5800LTE Tri-Band Roof Mount	2013	V	3.5 H x 4.16 Dia	nr	698-960 / 1710-2170 / 2300-2700 / 2400-2485 / 5150-5850 / 1575.42 MHz	2:1 or better	nr	3 dBi / 6 dBi / 5 dBic / 26 ± 2 dB (LNA)	Linear Vertical	nr	3 or 5 V DC	25	-40 to +85	nr	Y	nr	SMA / SMA / SMA Male (GPS)	17' RG-58 / 17' RG-58 / 17' RG-174 (GPS)	Direct feed 3 / 4-in hole	\$112.50	nr		
	GPSGM800 / 2710 Tri-Band Glass Mount	2012	V	2 x 4 x 0.3	5.4oz	824-960 / 1710-2170 / 1575.42 MHz	2.5:1 / 1.5:1	nr	2 dBi / 4 dBi / 5 dBic / 26 ± 2 dB (LNA)	Linear Vertical Omni	1.5 maz	3 or 5 V DC	25	-40 to +85	nr	Y	nr	FME / SMA Male (GPS)	16 ft, 4 in RG174 / 16 ft, 4 in RG174	Adhesive Tape	\$36	nr		
	GPS NMO Mount (black)	2001	V	1.3 x 2.9 in Ø	nr	1575.4 MHz	>2:1	3 Max	5 dBic / 28 ± 2 dB (LNA)	RHCP	2	5 V DC	20	-30 to +80	nr	Y	nr	na	nr	NMO mount	\$87	nr		
	GPS / UHF Dual Band	2000	V	base 2 x 2.3 x 0.7 in elliptical whip 6 1 / 4 in	nr	406-512 / 1575.42 MHz	2.0:1	nr	2.14 dBi / 5 dBic / 26 ± 2 dB (LNA)	RHCP / Vertical	2	5 V DC	nr	-30 to +80	nr	Y	nr	SMA / SMA, SMA / SMB	16.4 ft RG174	Direct feed 5 / 8 in hole with die cut	\$120.00	nr		
	GPS / VHF Dual Band	2008	V	base 2 x 2.3 x 0.7 in elliptical whip 22 in	nr	136-174 / 1575.42 MHz	2.0:1	nr	2.14 dBi / 5 dBic / 26 ± 2 dB (LNA)	RHCP / Vertical	2	5 V DC	nr	-30 to +80	nr	Y	nr	SMA / SMB	16.4 ft RG174	Direct feed 5 / 8 in hole with die cut	\$120.00	nr		
	GPS / 800 Dual Band	2008	V	base 2 x 2.3 x 0.7 in elliptical whip 10.25 in	nr	806-896 / 1575.42 MHz	2.0:1	nr	5 dBic / 5 dBic / 26 ± 2 dB (LNA)	RHCP / Vertical	2	5 V DC	nr	-30 to +80	nr	Y	nr	FME / SMA, SMA / SMA	16.4 ft RG174	Direct feed 5 / 8 in hole with die cut	\$126.00	nr		
	GPSDM Direct Mount	2001	V	0.7 x 2.5 in Ø	nr	1575.4 MHz	2.0:1	nr	5 dBic / 28 ± 2 dB (LNA)	RHCP	nr	5 V DC	nr	-30 to +80	nr	Y	nr	MCX, MMCX, SMB, SMA	17 ft RG174	Bolt requiring 5 / 8-in hole with die cut	\$68.25	nr		
	GPS Single Band Mag Mount	2001	V	1.7 x 1.5 x 0.5 in	nr	1575.4 MHz	>2:1	nr	5 dBic / 26 ± 2 dB (LNA)	RHCP	2	5 V DC	20 Max	-30 to +80	nr	Y	nr	MCX, SMB, SMA, BNC, No Conn	17 ft RG174	Magnetic	\$48.00	nr		
	NMOHFGPS Roof Mount GPS with NMOHF High Frequency Mount	2010	V	4.5 x 2 x 0.5	nr	1574.4-1576.4 plus antenna frequency (any NMO mount antenna will work on the NMOHF side)	dependent on NMO mount antenna	nr	GPS: 5 dBic / 26 ± 2 dB (LNA) NMOHF mount: dependent on antenna	GPS: RHCP NMOHF: Dependent on antenna	2	3-5 V DC	25	-40 to +85	nr	Y	nr	No Conn, FME / No Conn, SMA / SMA, FME / SMA	GPS: 16.4 ft RG-174 NMOHF: 16.4 ft RG-58	Direct feed 3 / 4-in hole	\$115.00	nr		
GPSSB Stealth Blade Multiband	2012	V	5.4 x 1.5 x 0.6	4.7oz	806-960 / 1710-2170 / 1575.4	2.5:1 / 2.5:1 / 2.0:1	nr	5 dBi / d dBi / 5 dBic / 26 ± 2 dB	Linear Vertical / Linear Vertical / RHCP	1.5	3 or 5 V DC	nr	-40 to +85	nr	Y	nr	FME Female / SMA Male (GPS)	16.4 ft RG-174 / 16.4 ft RG-174	Adhesive Tape	\$50.00				
Raytheon UK Ltd www.raytheon.co.uk	GAS-1	1998	NDAMOP	CRPA=350mm ø AE=220x60x330mm	CRPA 3.8Kg, AE 4kg	GPS L1 / GPS L2	nr	nr	7-40dB	nr	nr	nr	nr	nr	nr	nr	nr	TNC	nr	nr	nr	nr		
	Navshield	2005	NDAMOP	CRPA=350mm ø AE=220x60x330mm	CRPA 3.4Kg, AE 4.5kg	GPS L1 / GPS L2	nr	nr	7-40dB	nr	nr	nr	nr	nr	nr	nr	nr	nr	TNC	nr	nr	nr	nr	
	Landshield Analogue	2011	LMNDOPTV	115 ø x 50mm		GPS L1	nr	nr	7-28dB	nr	nr	nr	nr	nr	nr	nr	nr	SMA	nr	nr	nr	nr	nr	
	Landshield Digital	2011	LMNDOPTVA	115 ø x 50mm		GPS L1	nr	nr	7-38dB	nr	nr	nr	nr	nr	nr	nr	nr	nr	SMA	nr	nr	nr	nr	nr
	SAS	2009	DAMNOP	150 x 110 x 80mm		GPS L1 / GPS L2	nr	nr	7-38dB	nr	nr	nr	nr	nr	nr	nr	nr	nr	TNC	nr	nr	nr	nr	nr
Rojone www.rojone.com	MaxiNav	2000	DGLMV	110 x 18mm	150g	157.5 ± 5 MHz	<1.5:1	3 dB	6 / 36 dB	Omni-Directional	1.2 dB	3-30 V DC	25 mA	-40 to +60c	na	Y / IP68	DC ground	N preferred but all available	As applicable	Magnetic / Pole / Screw	nr	nr		
	GPSA9-wide	2004	DLMnV	115 x 30mm	220g	1535-1576 MHz DGPS-GPS	<1.5:1	3 dB	6 / 50 dB	Omni-Directional	<0.7 dB	5-30 V DC	80 mA	-40 to +60c	na	Y / IP68	DC ground	N preferred but all available	As applicable	as above	nr	nr		
	L1 / L2	2004	DR	200 x 30mm	480g	1535-1576 / 1220-1230MHz	<1.5:1	3 dB	6 / 50 dB	Omni-Directional	<0.7 dB	5-30 V DC	80 mA	-40 to +60c	na	Y / IP68	DC ground	N preferred but all available	As applicable	Pole / Screw	nr	nr		
Sarantel www.sarantel.com	SL1251 / SL1252 (GeoHelix)	2012	ADLNPVSM	23.2x10x10mm	7g	1575.42 MHz ± 2	2.0:1 typ	<1.5 dB	-3 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	N	nr	Surface Mount	nr	Internal or external	Inquire	nr		
	SL1206 (GeoHelix-S)	2003	ADLNPVSM	44 x 14.6 x 12mm	8.4g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	+25 dBic nom.	RHCP cardioid	1.2 dB typ	3.3 V DC	13 mA	-40 to +85	Full report available	N	nr	Surface Mount	nr	Internal or external	Inquire	nr		
	SL1204 (GeoHelix-M)	2008	ADLNPVSM	34 x 12.4 x 13.3mm	7g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	+18 dBic nom.	RHCP cardioid	0.8dB typ	3.0 V DC	3.4 mA	-40 to +85	Full report available	N	nr	Surface Mount	nr	Internal or external	Inquire	nr		
	SL1203A (Rugged Passive antenna)	2009	ADLNPVSM	31 x 19(15) x 19(15) mm	14g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	-2.8 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	Y	nr	SMA male	nr	External	Inquire	nr		
	SL1203C (Rugged Passive antenna)	2010	ADLNPVSM	31.5 x 19(15) x 19(15)mm	14g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	-2.8 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	Y	nr	SMA male	nr	External	Inquire	nr		

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y / N) / Type	L / D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
	SL1203D (Rugged Passive antenna)	2010	ADLNPVSM	31.4 x 15 x 15mm	14g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	-2.8 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	Y	nr	SMA male	nr	External	Inquire	nr
	SL1350 (lbs Pro GeoHelix)	2012	ADLNPVSM	12 x 7.5 x 7.5mm	3g	1575.42 MHz ± 3 + 2.4GHz	2.0:1 typ	<1.5 dB	-5.0 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	N	nr	Surface Mount	nr	Internal	Inquire	nr
	SL1203B (Rugged Passive antenna)	2011	ADLNPVSM	29.1 x 15 x 15mm	14g	1575.42 MHz ± 2	2.0:1 typ	<2 dB	-2.8 dBic w / o gnd pln	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	Y	nr	SMA male	nr	External	Inquire	nr
	SL1258 (GeoHelix Rugged Active Antenna)	2012	ADLNPVSM	35 x 17 (14.7) x 17(14.7)mm	23g	1575.42 MHz ± 2	2.0:1 typ	<1.5dB	+9dBic nom.	RHCP cardioid	1.8dB typ	2.85 V DC	7 mA	-40 to +85	Full report available	Y	nr	SMA male	nr	External	Inquire	nr
	SL1350E (lbs Pro GeoHelix Evaluation Kit)	2012	ADLNPVSM	60 x 60 x 18mm	33.7g	1575.42 MHz ± 2	2.0:1 typ	<1.5 dB	-4 dBic	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	N	nr	SMA male	nr	External	\$35	nr
	SL1350E2 (lbs Pro GeoHelix + 2.4GHz Evaluation Kit)	2012	ADLNPVSM	60 x 60 x 18mm	33.7g	1575.42 MHz ± 2 + 2.4GHz	2.0:1 typ	<1.5 dB	-4 dBic	RHCP cardioid	nr	nr	nr	-40 to +85	Full report available	N	nr	SMA male	nr	External	\$40	nr
Spectra Precision www.spectraprecision.com www.ashtech.com	ASH-661 (L1 / L2 / L5 GNSS Antenna)	2010	GLMNORT	ø 190.5 x 73.15mm ø 7.50 x 2.88in	0.53kg 1.12lb	L1 / L2 / L5 GPS L1 / L2 GLONASS GALILEO E1 / E5a	<2.0:1	3 dB max at BORESIGHT	38 dB ± 2 dB	nr	2.5 dB max	+4.2 to +15 VDC	nr	-40 to +70	DO-160D	nr	N / N	TNC (f) coaxial conn. -50 ohms	nr	5 / 8-11 UNC-2B	nr	nr
	ASH-660 (L1 GNSS Antenna)	2010	GLMNORT	ø 190.5 x 73.15mm ø 7.50 x 2.88in	0.45kg 1lb	L1 GPS L1 GLONASS	<2.0:1	3 dB max at BORESIGHT	38 dB ± 2 dB	nr	2.5 dB max	+4.2 to +15 VDC	nr	-40 to +70	DO-160D	nr	N / N	TNC (f) coaxial conn. -50 ohms	nr	5 / 8-11 UNC-2B	nr	nr
	GNSS Machine / Marine Antenna	2009	GLMNORT	ø143 x 38.8 (+9.6)mm ø5.755 x 1.53 (+0.38)in	0.45kg 1lb	L1 / L2 GPS L1 / L2 GLONASS L-Band	<2.0:1	3 dB max	38 dB ± 2 dB	nr	2.6 dB max	+4.2 to +15 VDC	60 mA	-55 to +85	DO-160D ENV CAT: E1-ABB[CLMY] XSFDFSZAAACPH[A3][2A]CA	nr	N / N	TNC (f) coaxial conn. -50 ohms	nr	8X Ø.213 THRU 82° C'SINK x Ø.365	nr	nr
	GNSS Choke Ring Antenna	2009	GLOR	ø 376 x 351.2mm ø14.82 x 13.83in	4.7kg 10.5lb	L1 / L2 / L5 GPS L1 / L2 GLONASS GALILEO E1 / E5a L-Band	<2.0:1	3 dB max at BORESIGHT	39 dB ± 2 dB	nr	2.6 dB max	+4.2 to +15 VDC	65 mA	-55 to +85	DO-160D ENV CAT: E1-ABB[CLMY] XSFDFSZAAACPH[A3][2A]CA	nr	N / N	TNC (f) coaxial conn. -50 ohms	nr	1-14 UNS-2B THREAD 3X 3 / 8-16UNC-2B INSERTS ON A.B.C. Ø12.70	nr	nr
	GPS L1 Aircraft Antenna	1997	ANOPRSTL	3.44 x 2.19 x 1.27in	F	L1 GPS	≤2.0:1	3 dB max at bore sight	38 dB ± 2 dB	Hor. ≥-7.5 dBic, 5° ≥-4.5 dBic, 10° ≥ -3 dBic, 15° or above ≥ -2 dBic	2.5 dB max	+5 to +18VDC	50 mA	-55°C to +85°C	nr	nr	N / N	TNC (f) coaxial conn. -50 ohms	nr	4x Mounting Screws, 6-32UNC-2A x .75	nr	nr
Surrey Satellite Technology Ltd. www.sstl.co.uk	SGR Patch Antenna ASY-00741-04	2000	S	45 x 50 x 20mm	50g	1574.5 - 1576.5MHz	<2:1		24dB	RHCP	2.5dB	2.7 - 5 VDC	24mA typ	/ - 35 to +60	> 10 grms	N / outgassing allowance	N / N	SMA	2 metre K02252D	4 Screw	-	-
Synergy Systems, LLC www.synergy-gps.com	ART-10S	2006	N	2.36 x 1.49in	1 lb	1575.42MHz / 2 MHz min	2 dB	3 dB	28 dB		1.5 dB	2.5 to 5.5 Vdc	12 mA	-30°C to +85°C		Y		TNC	up to 150 feet	3 / 4 inch pipe	\$41.50	
	SSA-5	2011	N D V	3.40 D x 1.2in H	10.3oz	1575.42 MHz	1.5 max	3 dB	28 dB		2.0 dB	3.0 Vdc to 6.0 Vdc	11 mA typ; 13 mA max	-40°C to +85°C			IEC 61373 (1999)	TNC	bulkhead	1-14 Marine Mnt; or bulkhead	\$127.50 - \$144.50	
Tallysman www.tallysman.com	TW1421 / TW4421- GPS L1+ GLONASS G1, Dual Feed, Patch Antenna	2012	ADLNOPTV	35 D x 7.25mm	30g	GPS L1+GLONASS L1 / 1574 to 1606 MHz	<1.5:1	< 3.5	4.5 dBic / 28 dB	Hemispherical	1.25	2.5 to 16	15	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	N	15 KV ESD Protection	SMA Male, MCX, MMCX, SMB, MCX right angle, H.F.L., U.F.L., SMA right angle, SSMA	1.5mm dia. CO-6F-FH-SB cable / custom	Screw or adhesive	Contact distributor or Tallysman	Custom Tuning available
	TW2410 / TW2405 - GPS L1+ GLONASS G1, Dual Feed Antenna	2010	ADLNOPTV	50 D x 7.8mm	100g	GPS L1+GLONASS L1 / 1574 to 1606 MHz	<1.5:1	< 3	4 dBic / 28 dB	Hemispherical	1	2.5 to 16	10	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	N	15 KV ESD Protection	MMCX, MCX, SMB, SMC, SMA, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, SMA on bulkhead, H.F.L.	1.5mm dia. CO-6F-FH-SB cable / custom	Screw or adhesive	Contact distributor or Tallysman	Custom Tuning available
	TW3040 - GPS L1, High Gain, Thru-hole Mount, Single Feed Antenna	2012	DGLMNOPTV	66.5 D x 21mm	150g	1575 Mhz +/- 10 Mhz	<1.5:1	4	4 dBic / 40 dB	Hemispherical	1	2.5 to 16	10	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW2710 - GPS + GLONASS + Galileo + BeiDou, Magnet / Screw Mount, Dual Feed Antenna	2013	ADLNOPTV	57 D x 15mm	150g	1557 to 1606 MHz	<1.5:1	< 2	4.75 dBic / 28 dB	Hemispherical	< 1	2.5 to 16	15	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	MMCX, MCX, SMB, SMC, SMA, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, SMA on bulkhead, H.F.L.	RG174 / Custom	Magnet or screw mount	Contact distributor or Tallysman	Custom labelling available
	TW3010 - GPS L1, Thru-hole Mount, Single Feed Antenna	2012	DGLMNOPTV	66.5 D x 21mm	150g	1575 Mhz +/- 10 Mhz	<1.5:1	4	4 dBic / 30 dB	Hemispherical	na	2.5 to 16	10	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW3400 - GPS L1+ GLONASS, Thru-hole Mount Antenna - Low Profile	2010	DGLMNOPTV	66.5 D x 21mm	150g	1574 to 1606 Mhz	<1.5:1	1	4.25 dBic / 28 dB	Hemispherical	1	2.5 to 16	10	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW3440 - GPS L1+ GLONASS, Timing Antenna	2012	DGLMNOPTV	66.5 D x 21mm	150g	1574 to 1606 Mhz	<1.5:1	1	4.25 dBic / 40 dB	Hemispherical	1	2.5 to 16	10	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW3710 - GPS + GLONASS + Galileo + BeiDou, Thru-hole mount, Dual Feed Antenna	2013	DGLMNOPTV	66.5 D x 21mm	150g	1557 to 1606 MHz	<1.5:1	<2	4.75 dBic / 28 dB	Hemispherical	1	2.5 to 16	15	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW3870 - GPS L1 / L2 + GLONASS G1 / G2 Twin Dual Feed Antenna	2013	DGLMNOPTV	66.5 x 21mm	185g	1213 to 1261 MHz + 1570 to 1614 MHz	<1.5:1	<2	4.5 dBic + 3dBic / 35 dB	Hemispherical	2	2.5 to 16	25	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	TNC female or N Type on bottom of base, or MMCX, MCX, SMB, SMC, SMA, SMB, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, H.F.L.	RG174 / Custom	3 / 4 inch (19mm) thru-hole with option L-bracket or mast mount	Contact distributor or Tallysman	Conical or low profile radome in White or Grey
	TW2600 - Indium Certified Magnet / Screw Mount, Dual Feed Antenna	2011	DMNV	57 D x 15mm	150g	1616 to 1626.5 MHz	<1.5:1	< 3	4.25 dBic / --	Hemispherical	1 (GPS)	na	na	-40 to +85	3g (3 axis, 15min, 10 to 200Hz sweep)	Y / IP67	15 KV ESD Protection	MMCX, MCX, SMB, SMC, SMA, U.F.L., SMA Right Angle, Waterproof SMA, SSMA, Reverse Polarity SMA, SMA on bulkhead, H.F.L.	RG174 / Custom	Magnet or screw mount	Contact distributor or Tallysman	Custom labelling available

Manufacturer	Model	Introduction Date	User Environment	Size: Length x Width x Height	Weight	Frequency / Bandwidth ²	VSWR ³	Axial Ratio (dB)	Gain / Gain with Amplifier (dB)	Pattern	Noise Figure (dB) ⁴	Amplifier DC Voltage	Amplifier Current (mA)	Operating Temperature (°C)	Vibration	Environmentally Sealed (Y / N) / Type	L / D ⁵	Connectors	Cable Type / Length	Mounting Configuration	List Price in U.S. Dollars	Integration
Topcon Positioning Systems, Inc. www.topconpositioning.com	PL-S1	2012	GL	14.2 x 14.2 x 5.4cm w / o GP, Ø 20.0 x 5.4cm w GP	.430kg	1586.5 ± 25MHz 1236 ± 20 MHz L-Band 1535 ± 10 MHz	≤ 2.0:1	2	4.5 / 33	Symmetrical	1.5	3-18	55 (typ)	-50C to +85C	IEC 60068-2-34, Test Fd IEC 60068-2-6, Test Fc	Y / IP67	Y / Y	TNC	RG-58 / Variable Length	5 / 8-11 UNC-2B Threaded	Contact distributor	< 1cm centering
	PG-S1	2012	GLR	14.2 x 14.2 x 5.4cm w / o GP, Ø 20.0 x 5.4cm w GP	.430kg w / o GP, 0.615kg w / GP	1586.5 ± 25MHz 1236 ± 20 MHz L-Band 1535 ± 10 MHz	≤ 2.0:1	2	4.5 / 33	Symmetrical	1.5	3-18	55 (typ)	-50C to +85C	IEC 60068-2-34, Test Fd IEC 60068-2-6, Test Fc	Y / IP67	Y / Y	TNC	RG-58 / Variable Length	5 / 8-11 UNC-2B Threaded	Contact distributor	<1mm, microcentered antenna
	MG-A8	2012	MN	Diameter 8.9cm Height w / o adapter 10.2cm w / adapter 20.5cm	0.280kg w / o adapter	Upper band 1520 - 1590 MHz Lower Band 1215 - 1260 MHz	≤ 2.0:1	2	5.5 / 35	Symmetrical	1.5	3-15	60(typ)	-40C to +70C	-	Y / IP67	Y / Y	TNC	Variable	5 / 8-11 Threaded	Contact distributor	na
	CR-G5	2011	GLR	Ø 30.8 x 15.25cm (w / o dome)	4.8kg (w / o dome)	L1 1565 + / - 50MHz (typ) L2 1230 + / - 80MHz (typ)	≤ 2.0:1	2	5 / 30	Symmetrical	1.5	3-12	100	-50C to +85C	MIL-STD-810G	Y / IP67	Y / Y	N	RG-58 / Variable Length	Threaded	Contact distributor	na
	PN-A5	2011	GLR	Ø 41.5 x 29.2cm (dome included)	7.1kg (dome included)	L1 1565 + / - 50MHz (typ) L2 1230 + / - 80MHz (typ)	≤ 1.5:1	2	5 / 48	Symmetrical	1.5	3-12	100	-50C to +85C	MIL-STD-810G	Y / IP67	Y / Y	N	RG-58 / Variable Length	Threaded	Contact distributor	na
	G3-A1	2005	GLR	14.2 x 14.2 x 5.4cm w / o GP, Ø 20.0 x 5.4cm w GP	.515kg w / o GP, .685kg w / GP	1590 ± 30 MHz / 1240 ± 25 MHz / 1176.5 ± 12.5 MHz	<1.5:1	2	5 / 30	Symmetrical	1.5	3-15	30	-40C to +65C	MIL-STD-810F	Y / IP65	Y / Y	TNC	RG-58 / Variable Length	Threaded	Contact distributor	na
	PG-A5	2005	GL	14.2 x 14.2 x 5.4cm	.380kg	1586.5 ± 25 MHz	≤ 2.0:1	2	6.5 / 30	Symmetrical	1.8	3-18	30	-40C to +55C	MIL-STD-810F	Y / IP65	Y / Y	TNC	RG-58 / Variable Length	5 / 8-11 UNC-2B Threaded	Contact distributor	na
Trimble www.trimble.com	Magnetic Mount 3 V Antenna, MCX, SMA connectors	2001	LNPVY	37.4 x 34 x 12.9mm	25g (without cable) cable length 5m	1575 MHz	2.0 max	4 dB @ 90°	27 dBi ±3 dBi typ temp	Upper hemispherical	1.8 (+25°C) / 2.3(+85°C)	3 V DC	20 max	-40 to +85	as above	Y / waterproof JISD0203 S2	nr	SMB, SMA	1.5DS-QEHV / 5 m	Magnetic mount	OEM pricing; inquire	nr
	Magnetic Mount 5V Antenna, SMB, SMA connectors	2001	LNPVY	37.4 x 34 x 12.9mm	25g (without cable) cable length 5m	1575 MHz	2.0 max	4 dB @ 90°	27 dBi ±3 dBi typ temp	Upper hemispherical	1.8 (+25°C) / 2.3(+85°C)	5 V DC	30 max	-40 to +85	as above	Y / waterproof JISD0203 S2	nr	MCX, SMA	1.5DS-QEHV / 5 m	Magnetic mount	OEM pricing; inquire	nr
	Unpackaged Embedded 3.V	2001	LNPVY	22 x 21 x 7.5mm	20g (cable length 85mm)	1575 MHz	2.0 max	4d B @ 90°	27 dBi ±3 dBi typ temp	Upper hemispherical	1.5 (+25°C) / 2.0(+85°C)	3 V DC	13 max	-40 to +85	as above	nr	nr	H.FL	0.8 D / 8 cm	Mounting holes	OEM pricing; inquire	nr
	Bulkhead	2001	LNPVY	64.5 x 40mm	150g	1575 MHz	2.0 max	4d B @ 90°	27 dBi ±3 dBi typ temp	Upper hemispherical	1.8 (+25°C) / 2.3(+85°C)	5 V or 3 V	35 max	-40 to +86	as above	nr	nr	TNC	na	Threaded	OEM pricing; inquire	nr
	GPS / GLONASS Magnetic Mount 3 V Antenna, MCX, SMA connectors	2011	LNPVY	37.4 x 34 x 12.9mm	25g (without cable) cable length 5 m	1575 to 1615 MHz	2.0 max	4 dB @ 90°	30 dBi typ	Upper hemispherical	2.0 typ	3 V DC	8 typ	-40 to +85	as above	Y / waterproof JISD0203 S2	nr	SMB, SMA	1.5DS-QEHV / 5 m	Magnetic mount	OEM pricing; inquire	nr
	GPS / GLONASS Bulkhead	2011	LNPVY	64.5 x 40mm	150g	1575 to 1615 MHz	2.0 max	4d B @ 90°	30 dBi typ	Upper hemispherical	2.0 typ	5 V or 3 V	6.5 typ @ 3V 13 typ @ 3V	-40 to +86	as above	nr	nr	TNC	na	Threaded	OEM pricing; inquire	nr
	Trimble A3	2005	DGLMnV	16 x 6.2cm	0.39kg	1575 MHz	2.0 max	nr	42 dB	Upper hemispherical	nr	2.95-11.5 V DC	nr	-50° to +85°	MIL-STD-810-F	as above	nr	TNC-type	Any with up to 10 dB loss	Tripod, tribrach	Contact Distributor	nr
	Zephyr 2 Antenna	2006	DGLMnV	34.3 x 7.6cm	0.60kg	L1 / L2 / L5 / G1 / G2 / E1 / E5ab / E6	2.0 max	2 dB @ Zenith	50 dB ±2.0	Upper hemispherical	2.0 dB	3.3-20 V DC	125	-40° to +70°	as above	as above	nr	TNC female	Any with up to 10 dB loss	Tripod, tribrach, pole	Contact Distributor	nr
Zephyr 2 Rugged	2008	DGLMnV	25.4 x 11.1cm	1.8kg	L1 / L2 / L5 / G1 / G2 / OmniSTAR / E1 / E2 / E5ab / E6 / SBAS	2.0 max	2 dB @ Zenith	50 dB ±2.0	Upper hemispherical	2.0 dB	3.3-20 V DC	125	-40° to +70°	Designed for extreme shock and vibration installations. Bouyant	+ / - 5 psi sealing. Rain and spray per IEC 60945	nr	TNC female	Any with up to 10 dB loss	Rugged 4 point mount to pole, or 5 / 8in thread to pole	Contact Distributor	nr	
u-blox AG www.u-blox.com	PAM-7Q GPS antenna module	2014	DMNTV	22.0 x 22.0 x 8.0mm	9gg	GPS / QZSS L1 C / A SBAS: WAAS, EGNOS, MSAS	na, Integrated Receiver	na, Integrated Receiver	na, Integrated Receiver	Hemispherical, RHCP	na, Integrated Receiver	2.7V...3.6V		-40C...+85C		N		8-pin contact header	NA	Pin contact	contact u-blox	GPS receiver modules with integrated patch antenna
	CAM-M8Q GNSS antenna module	2014	DMNTV	9.6 x 14.0 x 1.95mm	5g	GPS / QZSS L1 C / A, GLONASS L10F, BeiDou B1 SBAS L1 C / A: WAAS, EGNOS, MSAS Galileo-ready E1B / C (ext. Flash required)	na, Integrated Receiver	na, Integrated Receiver	na, Integrated Receiver	Hemispherical, Linear pol.	na, Integrated Receiver	2.7V...3.6V		-40C...+85C		N		31 contact LGA	NA	SMD	contact u-blox	Extremely sensitive module with integrated chip antenna. Concurrent reception of GPS with GLONASS or BeiDou.
	ANN-MS	2003	LMNVT	48 x 40 x 13mm	42ggg (without gcable) <105gg (with gcable)	GPS L1, 10 MHz	2.0 max	3 dB typ	4 dB / 27 dB	nr	1.8 dB typ	2.7 - 6.0V	Typ. 8.5 mA, + / - 4.5 mA	-40 to +80	Sine sweep 1 G (o-p) 10-150-10 Hz ea axis	Y / rubber sealed	N / N	Choice: SMA, SMB, MCX, FAKRA	RG-174, 5 m	Magnetic	contact u-blox	nr
Wang Electro-Opto Corporation www.weo.com	GNSS-D060-L-P0900	2011	LNVT	60ø x 15mm	180g	1150 - 1620 MHz	<2.0:1	<4dB	4dBi typ	RHCP	2 dB typ	3-5 VDC	na	-30 to +60	MIL-STD-810F	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands; thin and conformal
	GNSS-D060-L-P0900-LNA	2011	LNVT	60ø x 15mm	182g	1150 - 1620 MHz	<2.0:1	<4dB	4dBi / 20dBi typ	RHCP	2 / 2.5 dB typ	3-5 VDC	4 mA	-30 to +60	MIL-STD-810F	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands; thin and conformal
	GNSS-D060-L-P0500	2011	LNVT	60ø x 15mm	180g	1150 - 1620 MHz	<2.0:1	<4dB	4dBi typ	RHCP	2 dB typ	3-5 VDC	na	-30 to +60	MIL-STD-810F	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands; thin and conformal
	GNSS-D060-L-P0100	2011	LNVT	60ø x 15mm	180g	1150 - 1620 MHz	<2.0:1	<4dB	4dBi typ	RHCP	2 dB typ	3-5 VDC	na	-30 to +60	MIL-STD-810F	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands; thin and conformal
	GNSS-D060-L-P0100-LNA	2011	LNVT	60ø x 15mm	182g	1150 - 1620 MHz	<2.0:1	<4dB	4dBi / 20dBi typ	RHCP	2 / 2.5 dB typ	3-5 VDC	4 mA	-30 to +60	MIL-STD-810F	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands; thin and conformal
	GNSS-D115-L-P0100	2011	DGLNVT	115ø x 30mm	250g	1100 - 2000 MHz	<2.0:1	<3 dB	5dBi typ	RHCP	1.7 dB typ	na	na	-45 to +70	MIL-STD-810F, DO-160E	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery	Cover all GNSS bands and some cell bands; thin and conformal
	GNSS-D115-L-P0010	2011	DLNVT	115ø x 30mm	250g	1100 - 2000 MHz	<2.0:1	<3 dB	5dBi typ	RHCP	1.7 dB typ	na	na	-45 to +70	MIL-STD-810F, DO-160E	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery schedule	Cover all GNSS bands and some cell bands; thin and conformal
	GNSS-D115-L-P0010-LNA	2011	DLNVT	115ø x 30mm	252g	1100 - 2000 MHz	<2.0:1	<3 dB	5dBi / 21-43dBi typ	RHCP	1.7 / 2 dB typ	3-5 VDC	4-20 mA	-45 to +70	MIL-STD-810F, DO-160E	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery schedule	Cover all GNSS bands and some cell bands; thin and conformal
	GNSS-D200-L-P0010	2011	DGLNVT	200ø x 30mm	360g	1100 - 2000 MHz	<2.0:1	<3 dB	5dBi typ	RHCP	1.5 dB typ	na	na	-45 to +70	MIL-STD-810F, DO-160E	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery schedule	Cover all GNSS bands and some cell bands; thin and conformal
	GNSS-D200-L-P0010-LSQ	2012	DGLNVT	200ø x 30mm	362g	1100 - 2000 MHz	<2.0:1	<3 dB	5dBi typ	RHCP	1.5 dB typ	na	na	-45 to +70	MIL-STD-810F, DO-160E	Y / Rubber Sealed	N / N	SMA / other available	na	Side or bottom feed	Low cost; inquiry with quantity and delivery schedule	Cover all GNSS bands and some cell bands; LightSquared compatible



Possibly the greatest saucer shaped technology since Roswell.

Aperture coupled slotted array. Sounds alien, but it is the technology behind NovAtel's legendary Pinwheel™ antenna which is now available as an OEM module. With superior multipath rejection and a highly stable phase center, the Pinwheel OEM provides choke ring antenna like performance at a fraction of the size and cost. Best of all, only you will know it is from NovAtel. Success has a secret ingredient. Discover more at novatel.com/antennas



Integrate success into your

