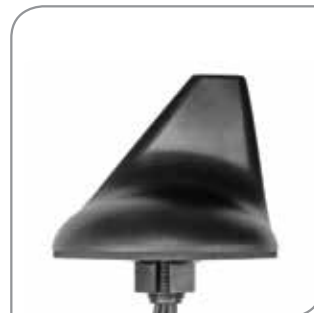


# **PulseLARSEN** *Antennas*

**Multi-band Antennas for Vehicle,  
IoT and M2M Applications**



**YOUR INTRODUCTION TO PULSELARSEN MULTI-BAND ANTENNAS.**

Want to learn more? Visit our website at [pulselarsenantennas.com](http://pulselarsenantennas.com)

## PULSELARSEN MULTI-BAND ANTENNAS

Whether your need is for antennas for police, utility trucks, ambulances, agricultural or recreational vehicles, public transportation or remote monitoring and control PulseLarsen has your multi-band solution. For over 50 years we have produced vehicular/outdoor ruggedized antennas. Our expertise covers 3G/4G(LTE), WiFi, GPS(GNSS), ISM, and other Technologies.

For precise navigation our solutions cover all satellite navigation types including GPS, GLONASS, Beidou/

### MULTI-BAND ANTENNA SUMMARY



Compass, and Galileo. Plus we have products that combine navigation with data transmission for complete telematics requirements. Our navigation antennas are designed for use in trucking, commercial fleets, utility, public safety, search and rescue, GPS and mapping markets.

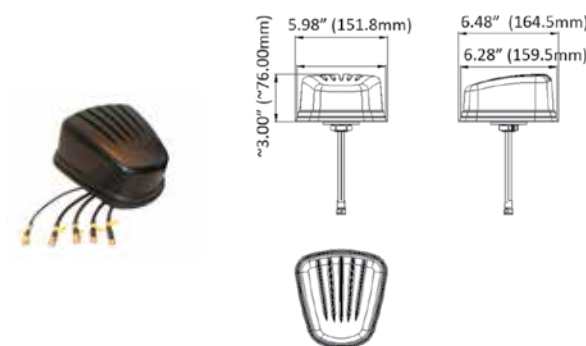
For utility applications we offer extensive ruggedized, tamper-proof and aesthetically pleasing solutions. Our offering includes antennas with lowest profile, steel mounting studs with steel nuts, UV-Rated plastics and other features to keep idle hands from tampering with the antenna.

		Panther	Jaguar	Armadillo	Razorback (Spring 2017)	FIN	DISC
		<ul style="list-style-type: none"> <li>• Best Performance</li> <li>• Low Cost</li> <li>• Best Gain, Efficiency, VSWR, and Port-to-Port Isolation</li> </ul>	<ul style="list-style-type: none"> <li>• Low profile</li> <li>• Good Performance</li> <li>• Various Install Methods</li> </ul>	<ul style="list-style-type: none"> <li>• Low Profile</li> <li>• Good Performance</li> <li>• Tamper-proof steel stud 'Narrowest Package'</li> </ul>	<ul style="list-style-type: none"> <li>• Best Performance</li> <li>• Narrow Profile,</li> <li>• Tamper-proof steel stud</li> </ul>	<ul style="list-style-type: none"> <li>• Best Performance</li> <li>• Aesthetically pleasing</li> </ul>	<ul style="list-style-type: none"> <li>• Good Performance.</li> <li>ISM Options</li> </ul>
No. of Ports	Baseline Configuration						
6	LTE - (2x) WiFi -Dual Band (3x) GPS -full GNSS (1x)	✓					
5	LTE - (2x) WiFi -Dual Band (2x) GPS -full GNSS (1x)	✓	✓		✓		
4	LTE - (2x) WiFi -Dual Band (1x) GPS -full GNSS (1x)	✓	✓	✓	✓		
3	LTE - (2x) GPS -full GNSS (1x) or LTE (1x) WiFi-Dual Band (1x) GPS-full GNSS (1x)	✓	✓	✓	✓	✓	✓
2	3G - or ISM - (1x) GPS -Full GNSS (1x) or LTE (1x) GPS-full GNSS (1x) or LTE (2x)			✓	✓	✓	✓
Color Options		Black, White	Black	Black, White	Black	Black, White	Black
Ideal Placement		Either: On Ground Plane; or On Non-Metal Surface	Either: On Non-Metal Surface; or On Ground Plane if base used.	On Ground Plane	Either: On Ground Plane ; or On Non-Metal Surface	On Ground Plane	Either: On Ground Plane ; or On Non-Metal Surface
Package Available Mounting		Direct Mount Stud (Magnetic Mount available)	Adhesive Mount (Magnetic Mount and Fixed Mount Adapters available)	Direct Mount Stud (Magnetic Mount versions available)	Direct Mount Stud (Magnetic Mount versions available)	Direct Mount Stud	Direct Mount Stud (Magnetic Mount Versions Available)

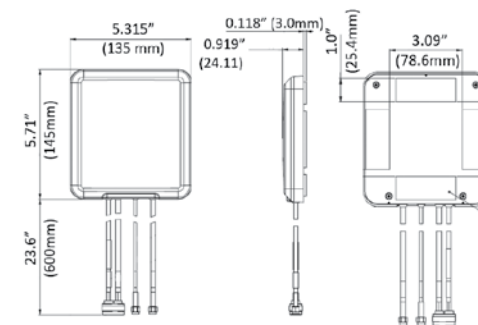
On Ground Plane: Best if installed on metal vehicle roof, metal utility box, or other metal structure.  
On Non-Metal: Best if installed on fiberglass, plastic, or other non-metallic surface.  
Contact factory if any concerns about installation methods.



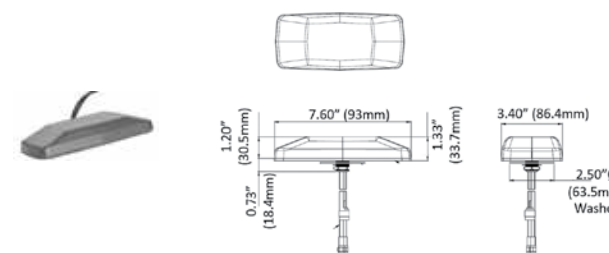
### PANTHER FAMILY



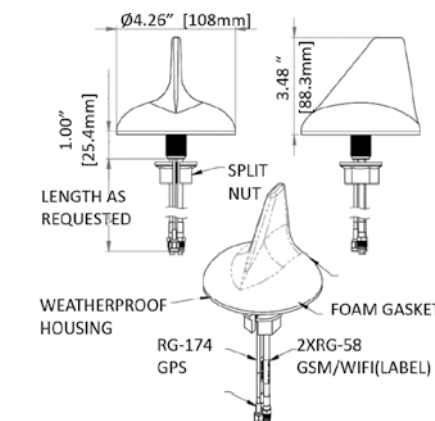
### JAGUAR FAMILY



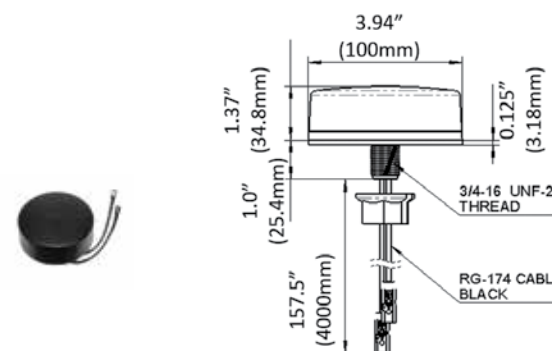
### ARMADILLO FAMILY



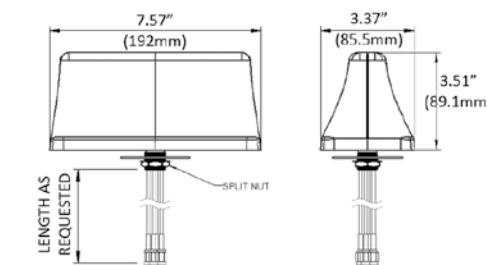
### FIN FAMILY



### DISC FAMILY



### RAZORBACK FAMILY COMING SOON!



- PANTHER - GPSMBXXX**
- SHARK FIN - GPSDMXXX**
- PUCK - W4165XXX**



Every effort is made to assure the integrity and long life of each Pulse product. In the unfortunate event a problem does occur, you will find us ready to make it right!

Duration of warranty is one year from date of purchase.

Pulse will repair or replace without charge any Larsen antenna product which fails for any reason during the warranty period. Pulse is not responsible for any incidental or consequential damages due to failure of the antenna under this warranty or any implied warranty. This exclusion may not apply to all areas of the USA or Canada.



PANTHER (PAN, GPSMB)							PANTHER (PAN, GPSMB)								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS					ENVIRONMENTAL SPECS			
			Frequency (MHz)	VSWR *	Peak Gain*** (dBi, Average)	Isolation* (dB)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
PAN62311DM (Black radome) PAN62312DM (White)	6	LTE 1	698-960/ 1695-2700/ 2900-3600	< 1.5	4 @698-2170MHz	-15	L: 164.5 (6.48") x W: 151.9 (5.98") x H: 76 (3.0")	Direct mount, 7/8" (22mm) threaded through-hole	RG 58	17ft / 5180mm	SMA(m)	Black or White	-40C to +85C (MIL-STD 810G)	ABS/PC UV stable, UL-94HB	IP67
		LTE 2			5 @2170-3600MHz				RG 58		SMA(m)				
		WLAN 1	2400-2500/ 4900-5925	< 1.5	4.5 @ 2.4GHz, 5 @ 5GHz	-40			RG 58		RP-SMA(m)				
		WLAN 2							RG 58		RP-SMA(m)				
		WLAN 3							RG 58		RP-SMA(m)				
GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.5dB, DC power: 3-5V		RG 174	SMA(m)									
GPSMB501 (Black radome) GPSMB502 (White)	5	LTE 1	698-960/ 1695- 2700/2900-3600	< 1.5	4 @698-2170MHz	-15	L: 164.48 (6.48) W:151.85 (5.98) H: 76 (3)	Direct mount, 7/8" (22mm) threaded through-hole	RG 58	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C (MIL-STD 810G)	ABS/PC UV stable, UL-94HB	IP67
		LTE 2			5 @2170-3600MHz				RG 58		SMA(m)				
		WLAN 1	2400-2500/ 4900-5925	< 1.4	4.5 @ 2.4GHz, 5 @ 5GHz	-40			RG 58		RP-SMA(m)				
		WLAN 2							RG 58		RP-SMA(m)				
		GNSS							1559-1607		< 2				
GPSMB401 (Black) GPSMB402 (White)	4	LTE 1	698-960/ 1695- 2700/2900-3600	< 1.5	4 @698-2170MHz	-15	L: 164.48 (6.48) W:151.85 (5.98) H: 76 (3)	Direct mount, 7/8" (22mm) threaded through-hole	RG 58	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C (MIL-STD 810G)	ABS/PC UV stable, UL-94HB	IP67
		LTE 2			5 @2170-3600MHz				RG 58		SMA(m)				
		WLAN	2400-2500/ 4900- 5925	< 1.4	4.5 @ 2.4GHz, 5 @ 5GHz	N/A			RG 58		RP-SMA(m)				
		GNSS							1559-1607		< 2				
GPSMB301 (Black) GPSMB302 (White)	3	LTE 1	698-960/ 1695- 2700/2900-3600	< 1.5	6 @698-2170MHz	-15	L: 164.48 (6.48) W:151.85 (5.98) H: 76 (3)	Direct mount, 7/8" (22mm) threaded through-hole	RG 58	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C (MIL-STD 810G)	ABS/PC UV stable, UL-94HB	IP67
		LTE 2			5.5 @2170-3600MHz				RG 58		SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.5dB, DC power: 3-5V				RG 174		SMA(m)				
GPSMBMM	Magnetic Mount Bracket						Magnetic Mount Bracket								
GPSDM (FIN FAMILY:SKF)							GPSDM (FIN FAMILY: SKF)								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS					ENVIRONMENTAL SPECS			
			Frequency (MHz)	VSWR *	Peak Gain ** (dBi, Average)	Isolation* (dB, Min.)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
GPSDM700/ 5800GGT (Black) GPSDMW 700/5800GGT (White)	3	LTE	698-960/ 1710-2700	< 2.5	4.4 @698-960MHz, 6.5 @1710-2690MHz	-10	Dia.: 108 (4.26) H: 88.3 (3.48)	Direct mount, 3/4" (19.3mm) threaded through-hole	RG 58	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C (MIL-STD 810G)	UV stable, UL-94	IP67
		WLAN	2400-2485/ 5150- 5875	< 2	3 @ 2.4GHz, 5 @ 5GHz	-10 (vs LTE)			RG 58		RP-SMA(m)				
		GPS	1575.42	< 2	LNA gain:28dB, NF: < 1.3dB, DC power: 3.3-5V				RG 174		SMA(m)				
GPSDM700/ 5900GG	2	LTE	698-960/ 1710-2700	< 2.5	4.4 @698-960MHz, 6.5 @1710-2690MHz	-10	Dia.: 108 (4.26) H: 88.3 (3.48)	Direct mount, 3/4" (19.3mm) threaded through-hole	RG 58	17ft/ 5180mm	SMA(m)	Black (White available)	-40C to +85C (MIL-STD 810G)	UV stable, UL-94	IP67
		GPS	1575.42	< 2	LNA gain:28dB, NF: < 1.3dB, DC power: 3.3-5V				RG 174		SMA(m)				
W4165 (DISC FAMILY: DSC)							W4165 (DISC: DSC)								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS					ENVIRONMENTAL SPECS			
			Frequency (MHz)	VSWR*	Peak Gain*** (dBi, Average)	Isolation* (dB, Min.)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
W4165	2	GSM/UMTS or ISM	824-960/ 1710-2170	< 2	2 @824-960, 2 @1710- 2170MHz	-10	Dia.: 100 (3.94) H: 34.8 (1.37)	Direct mount, 3/4" (19mm) Thread hole	RG 58	13.2ft/ 4000mm	SMA(m)	Black	-40C to +85C	UV stable, UL-94	IP67
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG 174		SMA(m)				
W4165MM	2	GSM/UMTS or ISM	824-960/ 1710-2170	< 2	3 @824-960, 4.5 @ 1710-2170MHz	-10	Dia.: 100 (3.94) H: 34.8 (1.37)	Magnetic Mount	RG 58	13.2ft/ 4000mm	SMA(m)	Black	-40C to +85C	UV stable, UL-94	IP67
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG 174		SMA(m)				

\* Measured with a default cable length in free space. \*\* Measured with 6inch cable with 40" GP.  
\*\*\* Measured with 4" cable with 24" GP. Attenuation of cable assembly with 17' RG58 is 4.6dB @2.7GHz and 7.3dB @6GHz.

- Frequency detail of GNSS: 1561.098MHz±2.046/ 1575.42MHz±1.023/ 1602.5625MHz±4  
- Please contact sales for options of customized cable type, cable length, and connector type.

ARMADILLO (ARM)							ARMADILLO (ARM)								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS				ENVIRONMENTAL SPECS				
			Frequency (MHz)	VSWR *	Peak Gain ** (dBi, Average)	Isolation* (dB)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
ARM4211DM (Black) ARM4212DM (White)	4	LTE 1	698-2700	< 2.5	1.5 @698-960MHz	-10	L: 193 (7.6) W: 87 (3.4) H: 33 (1.32)	Direct mount, 3/4" (19mm) threaded through-hole	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz				LMR195		SMA(m)				
		WLAN	2400-2500/ 5150-5900	< 2	3 @ 2.4GHz, 5 @ 5GHz	-10 (vs LTE)			LMR195		RP-SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG174		SMA(m)				
ARM3201DM (Black) ARM3202DM (White)	3	LTE 1	698-2700	< 2.5	1.5 @698-960MHz	-10	L: 193 (7.6) W: 87 (3.4) H: 33 (1.32)	Direct mount, 3/4" (19mm) threaded through-hole	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz				LMR195		SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG174		SMA(m)				
ARM4211MM (Black, Magnet Mount) ARM4212MM (White, Magnet Mount)	4	LTE 1	698-2700	< 2.5	1.5 @698-960MHz	-10	L: 193 (7.6) W: 87 (3.4) H: 33 (1.32)	Magnetic mount	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz				LMR195		SMA(m)				
		WLAN	2400-2500/ 5150-5900	< 2	3 @ 2.4GHz, 5 @ 5GHz	-10 (vs LTE)			LMR195		RP-SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG174		SMA(m)				
ARM4211AM (Black, Adhesive Mount) ARM4212AM (White, Adhesive Mount)	4	LTE 1	698-2700	< 2.5+	1 @698-960MHz	-15+	L: 193 (7.6) W: 87 (3.4) H: 33 (1.32)	Adhesive mount	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			3.5 @1710-2690MHz*				LMR195		SMA(m)				
		WLAN	2400-2500/ 5150-5900	< 2+	3 @ 2.4GHz, 5 @ 5GHz*	-10 (vs LTE)*			LMR195		RP-SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG174		SMA(m)				
JAGUAR (JAG)							JAGUAR (JAG)								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS				ENVIRONMENTAL SPECS				
			Frequency (MHz)	VSWR *	Peak Gain (dBi, Average)	Isolation* (dB, Min.)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
GPSLPMB401	4	LTE 1	698-960/ 1710-2690	< 2.5+	4.4 @698-960MHz*	-10*	L: 145 (5.7) W:135 (5.3) H: 25 (0.98)	Adhesive mount	LMR195	9.84ft/ 3000mm	SMA(m)	Black	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			5.4 @1710-2690MHz*				LMR195		SMA(m)				
		WLAN	2400-2500/ 5150-5900	< 3+	3 @ 2.4GHz, 5 @ 5GHz*	-10 (vs LTE)*			LMR195		RP-SMA(m)				
		GNSS	1559-1607	< 2+	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V*				LMR100		SMA(m)				
GPSLPMB401MM	4	LTE 1	698-960/ 1710-2690	< 2.5 **	7 @698-960MHz**	-8**	L: 145 (5.7) W:135 (5.3) H-MM: 25 (1)	Adhesive or Magnetic mount with 'LPMB-4BracketMM' bracket	LMR195	9.84ft/ 3000mm	SMA(m)	Black	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			8 @1710-2690MHz**				LMR195		SMA(m)				
		WLAN	2400-2500/ 5150-5900	< 3**	4.5 @ 2.4GHz, 5.5 @ 5GHz**	-10 (vs LTE)**			LMR195		RP-SMA(m)				
		GNSS	1559-1607	< 2**	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V**				LMR100		SMA(m)				
LPMB401	4	LTE 1	698-960/ 1710-2690	< 2.5+	4.4 @698-960MHz*	-10*	L: 145 (5.7) W:135 (5.3) H: 25 (0.98)	Adhesive mount	LMR195	9.84ft/ 3000mm	SMA(m)	Black	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			5.4 @1710-2690MHz*				LMR195		SMA(m)				
		WLAN 1	2400-2500/ 5150-5900	< 3+	3 @ 2.4GHz*	-15*			LMR100		RP-SMA(m)				
		WLAN 2	5 @ 5GHz*	LMR100	RP-SMA(m)										
RAZORBACK (RAZ) • COMING SOON!							RAZORBACK (RAZ) • COMING SOON!								
Model Part Number	Numbers of Cables	Application	ELECTRICAL SPECS				MECHANICAL SPECS				ENVIRONMENTAL SPECS				
			Frequency (MHz)	VSWR *	Peak Gain ** (dBi, Average)	Isolation* (dB, Min.)	Dimension mm (inch)	Mounting Method	Cable Type	Cable Length (ft/ mm)	Connector	Radome color	Operating Temp.	Radome	Weather Resistance
RAZ5221DM (Black) RAZ5222DM (White)	5	LTE 1	644-2700	< 2.5	3 @698-960MHz	-10	L: 194 (7.6) W: 87 (3.4) H: 92 (3.6)	Direct mount, 7/8" (22mm) threaded through-hole	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz				LMR195		SMA(m)				
		WLAN 1	2400-2500/ 5150-5900	< 2	6 @ 2.4GHz	-15			LMR195		RP-SMA(m)				
		WLAN 2	8.5 @ 5GHz	LMR195	RP-SMA(m)										
			GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V		RG174	SMA(m)						
RAZ4211DM (Black) RAZ4212DM (White)	4	LTE 1	644-2700	< 2.5	3 @698-960MHz	-10	L: 194 (7.6) W: 87 (3.4) H: 92 (3.6)	Direct mount, 3/4" (19mm) threaded through-hole	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz				LMR195		SMA(m)				
RAZ3201DM (Black) RAZ3202DM (White)	3	LTE 1	644-2700	< 2.5	“3 @698-960MHz	-10	L: 194 (7.6) W: 87 (3.4) H: 92 (3.6)	Direct mount, 3/4" (19mm) threaded through-hole	LMR195	17ft/ 5180mm	SMA(m)	Black or White	-40C to +85C	UV stable, UL-94	IP67
		LTE 2			4.5 @1710-2690MHz”				LMR195		SMA(m)				
		GNSS	1559-1607	< 2	LNA gain:30dB, NF: < 2.4dB, DC power: 3.3-5V				RG174		SMA(m)				

\* Measured with a default cable length in free space. + Measured without Ground Plane (GP). \*\*Measured with 1" bracket and 40" GP.  
\*\* Measured with 6" cable with 40" GP. Attenuation of cable assembly with 17' LMR195 is 3.8dB @2.7GHz and 5.8dB @6GHz.

- Frequency detail of GNSS: 1561.098MHz±2.046/ 1575.42MHz±1.023/ 1602.5625MHz±4  
- Please contact sales for options of customized cable length and connector type.

## MANUFACTURING CAPABILITIES - AVAILABLE TRADITIONAL TECHNOLOGIES

- Stamping
- Plastic injection molding
- Heatstaking
- Welding (Spot, USW, Induction)
- Plasma Treatment
- Flexible Printed Circuit
- PAD printing, Painting
- In-House Ceramic Process
- Any Cable Assemblies
- Any Connector Mounts
- SMD Process
- Automatic Cable Stripping
- Epoxy resins and Glue deposition
- Plastic Dipping
- RF Testing
- Any Connector Mounts
- Auto Packaging and Labeling

## PROTOTYPING ABILITIES WORLDWIDE (AMERICAS, EMEA, ASIA)

3D printing plastic parts, FR4 or Stamping parts using LPKF machines, CNC, Plastisol Dipping techniques, Lathes, Milling machines...

## TESTING SERVICES - TESTING CAPABILITIES FOR PRODUCT QUALIFICATION AND DESIGN VALIDATION

### ELECTRICAL

- S-Parameters using VNA up to 14GHz
- Impedance
- Insertion Losses
- Isolation
- Portable VNA for on-site Tuning with customers
- 3D radiation Patterns using Worldwide anechoic chambers Satimo/ETS)
- 3D RF simulation tools (CST, Optenni, Ibwave, AWR)
- WiFi Throughout testing using IXIA Chariot
- Expertise in advance RF behaviours with/without body

### MECHANICAL

- Ability to use Solidworks, Catia VS, Pro E, ProgeCAD
- 3D fitting and rendering
- Mechanical Shock
- Solderability
- Tensile Strength
- Pull Force
- Torque testing
- Surface Profilometer

### ENVIRONMENTAL

- ESD environment for Production &/or Design
- Humidity (to 90% RH)
- Moisture Resistance
- Thermal Shock
- Thermal Cycling with/without salt mist
- Aging
- Vibrations

NOTE: Full EMC Standards Compliance Testing in Germany for any vehicle size (Truck, Car, Tractor, Escalator, Agricultural machines and IoT).

\*\*\*\*\*

CHANGES / CONDITIONS: Continual research and development make it necessary for Pulse to reserve the right to make exceptions to or changes in policies, specifications and prices without notice.

\*\*\*\*\*

## CONTACT US TODAY!



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Connect with us on twitter: **PulseLarsen1**



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