

SPECIFICATION

Part No.	:	MA208.A.AB.001
Product Name	:	GPS/GALILEO and LTE/GSM/UMTS (4G/3G/2G 700Mhz to 960MHz/1710MHz to 2200MHz) Combination Antenna
Description	:	Adhesive Mount IP67 Antenna GPS: 3M RG-174 SMA(M) Cellular: 3M CFD-200 SMA(M) 1.8~5.5V/30dB 200.5*66.5*9mm

RoHS Compliant



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1. Introduction

The Stream MA.208 GPS/GALILEO/LTE Cellular antenna is a low profile, heavyduty, fully IP67 waterproof external M2M antenna for use by RF professionals in telematics, transportation and remote monitoring applications. The Stream is unique in the market as it combines the highest possible efficiency and peak gain for GPS/GALILEO and all cellular bands in 4G/3G/2G in a low profile compact format for mounting via high quality first tier automotive approved 3M adhesive foam.

The patent pending design incorporates internally a custom Taoglas 35mm patch antenna on an extended integral ground-plane to deliver more than 3.5dBiC gain. A front-end SAW filter dramatically reduces radiated spurious emissions. The extended ground-plane used with an innovative internal cellular PIFA also enables the unique wide-band 4G/3G/2G response to deliver the highest performance possible, at 3 meters cable length. Nothing else out there comes close in terms of consistency of efficiency and peak gain at all cellular bands, with an awesome 70%+ at the LTE 700MHz band, again including 3 meters of cable loss. High antenna efficiencies are absolutely critical in today's 3G and 4G systems to achieving targeted data-speeds and coverage.

All this is done while still maintaining 20dB isolation between antennas. The Stream uses high-shielded PTFE dielectric ultra low-loss cables that maintain low attenuation at all frequency bands, and high noise rejection, with an average loss of only 0.3dB per meter (0.1dB per foot), compared to 0.7dB for RG58 and 1.2dB for RG174. Because of this, the Stream maximizes chances of passing PTCRB and network approvals first time. The Stream works best when attached to plastic or glass, but can also be used on metal if some foam spacing is added.

The Stream comes packaged with a separate 3M first tier automotive approved adhesive which can be attached to either the bottom of the top of the product, for easy mounting directly on glass, or on plastic.



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1.1. System Configuration

This antenna specification covers the LTE/GSM/UMTS Full band for 700MHz~960MHz, 1710MHz~2170MHz and GPS (L1 Band).





2. Specification

Performance Specifications			
Items	GPS/GALILEO Antenna	Cellular Antenna	
	High performance GPS/GALILEO	LTE – 700MHz	
	35*35*4mm ceramic patch	CDMA: 824-896 MHz	
Features	antenna with two stage high	GSM: 880-960 MHz	
reatures	gain LNA	DCS: 1710-1880 MHz	
	1575.42 +/- 1.023MHz	PCS: 1850-1990 MHz	
		3G: 1920-2170MHz	
		Average:3.03dBi at 700-	
		960MHz	
Gain	3.5dBic typ @ Zenith	-4.34dBi at 1710 – 2170MHz	
		Peak: 2.16dBi at 700 – 960MHz	
		0.42dBi at 1710 - 2170MHz	
Polarization	RHCP	Linear	
		3.3 Max. at 700- 960MHz	
VSWR		3.6 Max. at 1710- 1850MHz	
		2.2 Max. at 1880-2170MHz	
Impedance	50Ω	50Ω	
		≧68% @ 700MHz,	
		≧72% @ 750MHz,	
		≧66% @ 824MHz,	
		≧56% @ 890MHz,	
		≧61% @ 880MHz,	
Efficiency		≧53% @ 960MHz,	
		≧37% @1710MHz,	
		≧51% @1880MHz,	
		≧55% @1990MHz,	
		≧54% @2110MHz,	
		≧45% @2170MHz	



MECHANICAL			
Cable / Connector	3m RG-174 Cable SMA(M) connector Fully Customizable	CFD-200 with SMA(M) Fully customizable	
Housing	UV resistant PVC		
Adhesive Mount	3M 1600SB(197.5*63.5*1.2mm)		
Protection Class	IP-67		
ENVIRONMENTAL			
Operation Temperature	-40°C to +85°C		
Storage Temperature	-40°C to +85°C		
Relative Humidity	20% to 95%		
Weight per unit	0.1	8kg	

*note: specifications may be subject to change



Band Number LTE / LTE-Advanced / WCDMA / HSPA / HSPA + / TD-SCDMA Uplink Downlink Covered 1 UU: 1820 to 1980 DL: 2110 to 2170 ✓ 2 UU: 1850 to 1910 DL: 1930 to 1990 ✓ 3 UL: 1710 to 1785 DL: 1805 to 1880 ✓ 4 UL: 1710 to 1785 DL: 2110 to 2155 ✓ 5 UL: 820 to 820 DL: 2620 to 2590 × 8 UL: 820 to 2570 DL:2620 to 2590 × 9 UL: 1749.9 to 1784.9 DL: 1844.9 to 1879.9 ✓ 11 UL: 1279.1 to 1447.9 DL: 749.746 ✓ 12 UL: 699 to 716 DL: 729 to 746 ✓ 13 UL: 777 to 787 DL: 745 to 768 ✓ 14 UL: 880 to 945 DL: 875 to 768 ✓ 19 UL: 801 to 830 DL: 860 to 875 (LET only) ✓ 19 UL: 815 to 830 DL: 310 to 2200 ✓ 20 UL: 1447.9 to 1462.9 DL: 1495.9 to 1510.9 ✓ 21 UL: 1447.9 to 1462.9	LTE BANDS				
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25 UL: 1850 to 1915 DL: 1930 to 1995 ✓ 26 UL: 814 to 849 DL: 859 to 894 ✓ 27 UL: 807 to 824 DL: 852 to 869 (LTE only) ✓ 28 UL: 703 to 748 DL: 758 to 803 (LTE only) ✓ 29 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) ✓ 30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) ✓ 31 UL: 452.5 to 457.5 DL: 462.5 to 467.5 (LTE only) × 32 UL: - DL: 1452 - 1496 ✓ 35 Image: State of the state of	23	UL:2000 to 2020	DL: 2180 to 2200 (LTE only)	√	
26 UL: 814 to 849 DL: 859 to 894 ✓ 27 UL: 807 to 824 DL: 852 to 869 (LTE only) ✓ 28 UL: 703 to 748 DL: 758 to 803 (LTE only) ✓ 29 UL: - DL: 717 to 728 (LTE only) ✓ 30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) ✓ 31 UL: 452.5 to 457.5 DL: 462.5 to 467.5 (LTE only) × 32 UL: - DL: 1452 - 1496 ✓ 35 ISSO ISSO to 1910 ✓ 38 2570 to 2620 × 39 ISSO to 2300 to 2400 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 ISSO to 1900 X	24	UL:1625.5 to 1660.5	DL: 1525 to 1559 (LTE only)	✓	
27 UL: 807 to 824 DL: 852 to 869 (LTE only) ✓ 28 UL: 703 to 748 DL: 758 to 803 (LTE only) ✓ 29 UL: - DL: 717 to 728 (LTE only) ✓ 30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) ✓ 31 UL: 452.5 to 457.5 DL: 462.5 to 467.5 (LTE only) × 32 UL: - DL: 1452 - 1496 ✓ 35 Image: State S	25	UL: 1850 to 1915	DL: 1930 to 1995	√	
28 UL: 703 to 748 DL: 758 to 803 (LTE only) ✓ 29 UL: - DL: 717 to 728 (LTE only) ✓ 30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) ✓ 31 UL: 452.5 to 457.5 DL: 1452 - 1496 ✓ 35 UL: - DL: 1452 - 1496 ✓ 38 2570 to 2620 × 39 1880 to 1920 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	26	UL: 814 to 849	DL: 859 to 894	\checkmark	
29 UL: - DL: 717 to 728 (LTE only) ✓ 30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) X 31 UL: 452.5 to 457.5 DL: 462.5 to 467.5 (LTE only) X 32 UL: - DL: 1452 - 1496 ✓ 35	27	UL: 807 to 824	DL: 852 to 869 (LTE only)	\checkmark	
30 UL: 2305 to 2315 DL: 2350 to 2360 (LTE only) × 31 UL: 452.5 to 457.5 DL: 462.5 to 467.5 (LTE only) × 32 UL: - DL: 1452 - 1496 ✓ 38 2570 to 2620 × 39 1880 to 1920 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	28	UL: 703 to 748	DL: 758 to 803 (LTE only)	\checkmark	
31UL: 452.5 to 457.5DL: 462.5 to 467.5 (LTE only)X32UL: -DL: 1452 - 1496 \checkmark 35 -1850 ± 1910 \checkmark 38 -2570 ± 2620 X39 -1880 ± 1920 \checkmark 40 -2300 ± 2400 \checkmark 41 -2496 ± 2690 X42 -3400 ± 3600 X	29	UL: -	DL: 717 to 728 (LTE only)	\checkmark	
32UL: -DL: 1452 - 1496 \checkmark 35 $1850 to 1910$ \checkmark 38 $2570 to 2620$ x 39 $1880 to 1920$ \checkmark 40 $2300 to 2400$ \checkmark 41 $2496 to 2690$ x 42 $3400 to 3600$ x	30	UL: 2305 to 2315	DL: 2350 to 2360 (LTE only)	×	
35 1850 to 1910 ✓ 38 2570 to 2620 × 39 1880 to 1920 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	31	UL: 452.5 to 457.5	DL: 462.5 to 467.5 (LTE only)	×	
38 2570 to 2620 × 39 1880 to 1920 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	32	UL: -	DL: 1452 - 1496	\checkmark	
39 1880 to 1920 ✓ 40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	35	1850 t	o 1910	\checkmark	
40 2300 to 2400 ✓ 41 2496 to 2690 × 42 3400 to 3600 ×	38			×	
41 2496 to 2690 X 42 3400 to 3600 X	39			\checkmark	
42 3400 to 3600 ×	40	2300 t			
	41	2496 t	o 2690	×	
	42	3400 t	o 3600	×	
43 3600 to 3800	43	3600 t	o 3800	×	

*Covered bands represent an efficiency greater than 20%



3. Antenna Characteristics

3.1. Axial Ratio

3.1.1. With IPEX Cable



3.1.2. 3M CFD-200 Cable



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3.2. Radiation Patterns





XZ Plane

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3.3. **VSWR**



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3.4. Efficiency



3.5. Average Gain



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3.6. Peak Gain



3.7. LNA

Frequency Range	1575.42+/-1.023Mhz
Output Impedance	50 Ohm
Output Power at 1dB Compression Point	-35dBm typ.
Output VSWR	2.0 Max.

Supply Voltage	Gain(Typ)	Noise Figure(Typ)	Power Consumption (Typ.)
1.8V	27.0dB	2.2dB	5.5mA
3.0V	32.9dB	2.3dB	12.5mA
5.5V	33.8dB	2.5dB	15.0mA



3.8. LNA Noise Figure at 3.0V



3.9. LNA Gain and Output of VSWR at 3.0V





3.10. GPS/GALILEO Antenna Specifications (Through Antenna, LNA and Cable Assembly)

Frequency Range	1575.42+/-1.023Mhz
Gain at 3.0V	32.5dBic @ Zenith
Output Impedance	50 Ohm
Output VSWR	2.0 Max.

3.11. 20dB min isolation to GPS/GALILEO LNA input and LTE/ GSM/ UMTS ANTENNA





4. Drawing



	Name	14-1-2-1	C	OTV
	Name	Material	Finish	QTY
1	Housing Top	ABS	Black	1
2	Housing Bottom	ABS	Black	1
3	Double Sided Adhesive Foam	3M 1600SB	Green Liner	1
4	Clear Label	PET	Black	1
5	Heat Shrink Tube	PE	Black	1
6	Heat Shrink Tube	PE	Black	1
7	GPS Label	Coated Paper	Orange	1
8	2G/3G/4G Label	Coated Paper	White	1
9	White Label (48x30)	PET	White	1
10	Barcode Label (25x9)	PET	White	1
	Name	Spec	Finish	QTY
W	Cable Type	RG174	Black	1
WW	Cable Type	CFD-200	Black	1
ΧХ	Connector Type	SMA(M)ST	Au Plated	1
YY	Connector Type	SMA(M)ST	Au Plated	1



4.1. Separate Adhesive Pad



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5. SPQ Packing



(740x370x300mm)



6. Packaging



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