



# MULTI FUNCTION MIMO ANTENNA

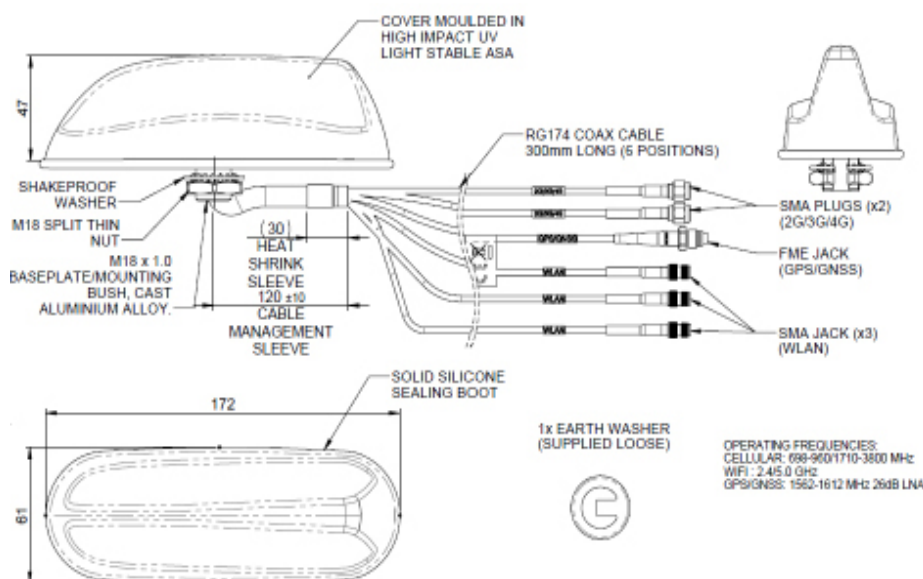
## MIMO LTE/GPS/WIFI ANTENNA

The Multi Function has a compact OEM style shark fin housing that contains 2x2 MiMo antenna function for 4G/3G/2G and an active antenna for

GPS/GLONASS/Galileo/Beidou with 26dB gain LNA. In order to maximise functionality versions of the Multi Function Antenna are available that add either 2x2 MiMo or 3x3 MiMo antenna functionality for 2.4/5.8GHz WiFi.

The shark fin style design provides multiple antenna functions while remaining discreet and is suitable for public safety (overt/covert), industrial and transport applications where a cost effective, efficient and robust antenna is essential. Requiring only a single hole mounting, the SHK[G] reduces vehicle damage, installation time & cost and visual impact whilst protecting a vehicle's resale value.

### Technical Drawing



# MULTI FUNCTION MIMO ANTENNA

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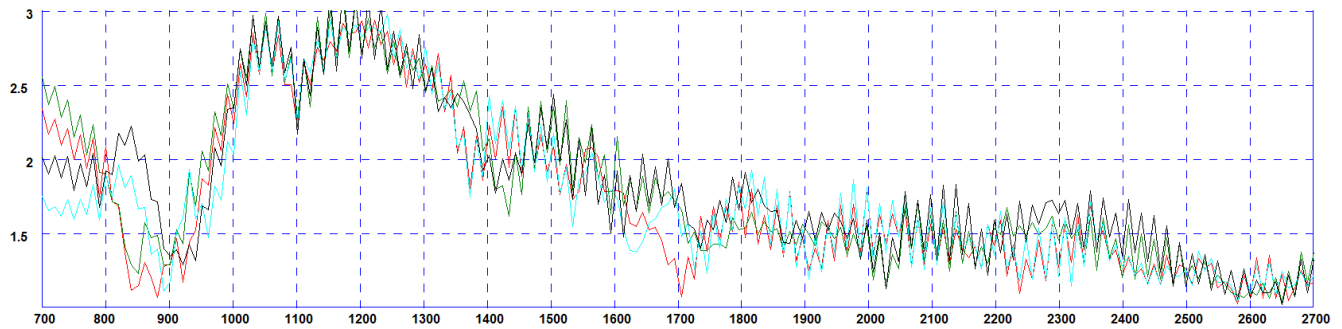
Part Number			
	2332157-1	2332157-2	2332157-3 2332157-4
Electrical Data			
Frequency Range (MHz)	698-960 / 1710-2170 / 2500-3800 (2G,3G,4G)		
	-	1562-1612 (GPS/GNSS/Galileo/Beidou)	
	-	2300-2500, 4900-6000 (WLAN)	
Peak Gain: (Excluding cable loss)	Elements 2&3	2dBi (598-960MHz), 5dBi (1710-3800MHz)	
	Elements 4,5,6	-	4dBi (2.4GHz), 6dBi (5.8GHz)
Isolation with 5m CS29	Cellular >12dBi, WiFi >20dB		
Typical efficiency w/o cable loss	elements 2&3: >50%		
Correlation co-efficient	Elements 2&3: <0.2		
Polarisation	Vertical (Element 6 is Horizontal)		
Pattern	Omni Directional		
Impedance	50Ω		
Max Input Power (W)	25		
GPS /GNSS Data			
Frequency Range (MHz)	-	1562-1612	
VSWR	-	<2:1 ± 4MHz	
Gain: LNA	-	26dB	
Polarisation	-	Righth Hand Circular	
Operating Voltage	-	3-5V DC (fed via Coax)	
Current	-	Typical <20mA	
Mechanical Data			
Dimensions (mm)	Height	50 (2.2")	
	Length	170 (6.77")	
	Width	60 (2.4")	
Operating Temp (°C)	-40 to +80°C (-40 to 176°F)		
Material	ASA, EPDM, Aluminium Alloy Black		
Approx Weight (g)	260		
Ingress protection	IP 66		
Mounting Data			
Fixing	Panel Mount, 19mm hole size		
Cable Data			
Cable Type all feeds	RG174 (UN ECE 118.01 Compliant)		
Dimensions	2.8mm x 300mm (0.11" x 12")		
Termination	GPS/GNSS: FME Socket, 4G: 2x SMA plug, WiFi: 2 or 3x SMA socket		

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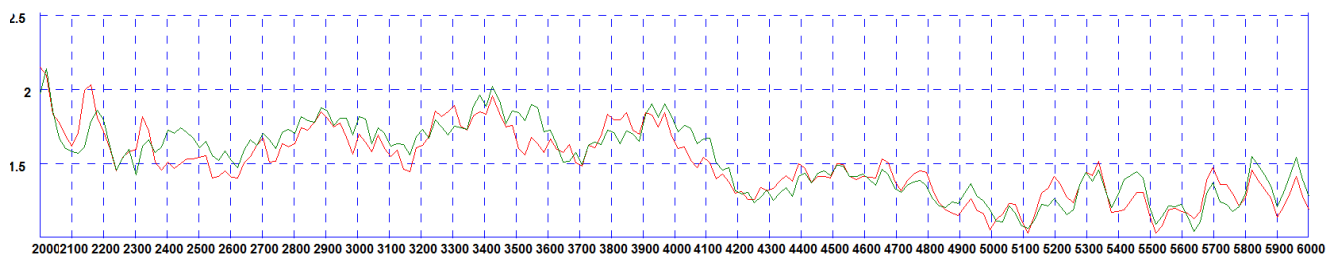
## VSWR

Typical VSWR - 2G/3G/4G Elements 2&3\*



\*VSWR measured with no whip and 5m (16') of CS29 cable Black & Blue = no ground plane Green and Red = 600x 600mm (2'x2') ground plane

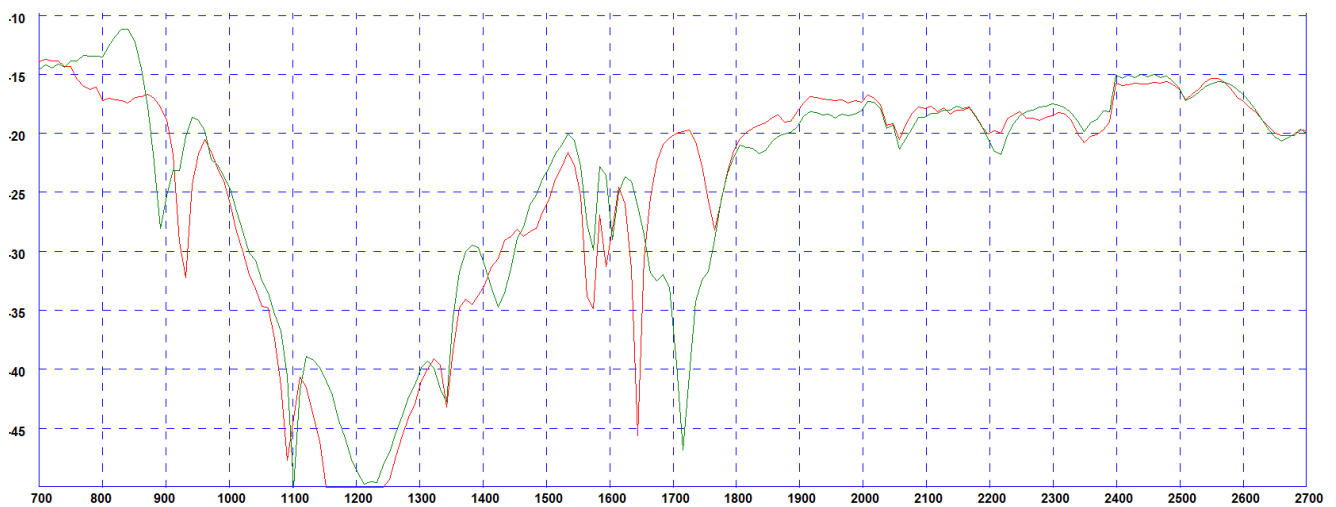
Typical VSWR - WiFi Elements 4&5\*



\*VSWR measured with no whip and 5m (16') of CS32 cable

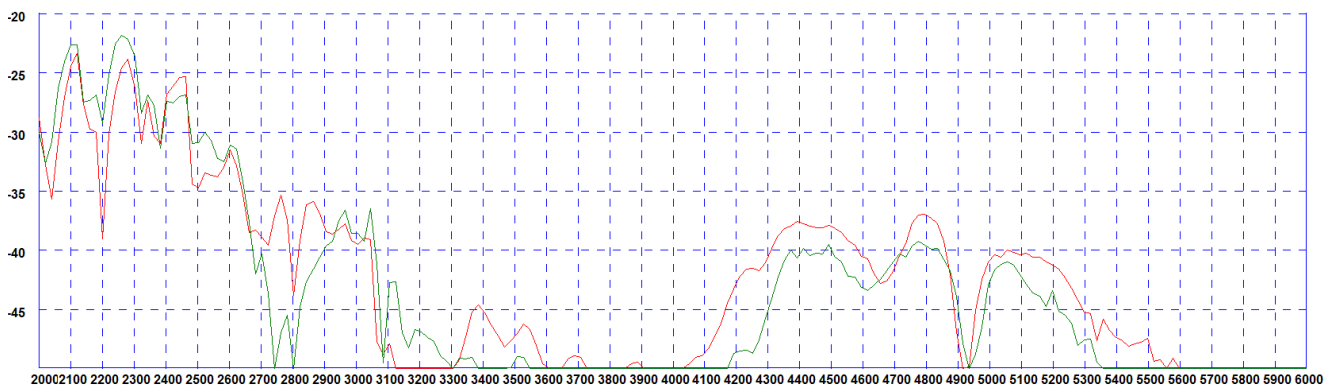
## Isolation

Typical Isolation - Cellular Elements 2&3\*



\*Isolation measured with no whip and 5m (16') of CS29 cable Green Plot = 600x600mm (2' X2') ground plane Red Plot = no ground plane

Typical Isolation - WiFi Elements 4&5\*

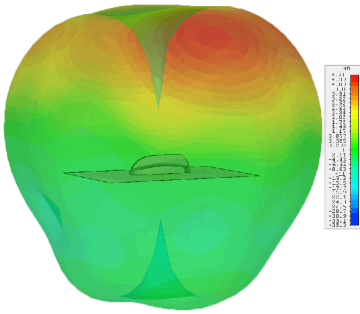


\*Isolation measured with no whip and 5m (16') of CS29 cable Red Plot = 600x600mm (2' X2') ground plane Green Plot = no ground plane

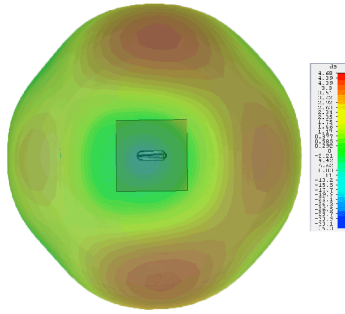
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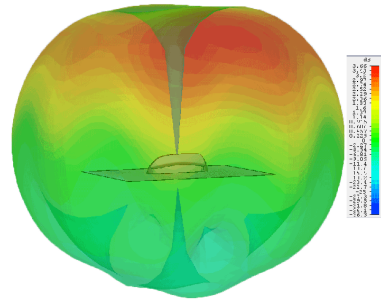
3D Gain Plot Side (700MHz)



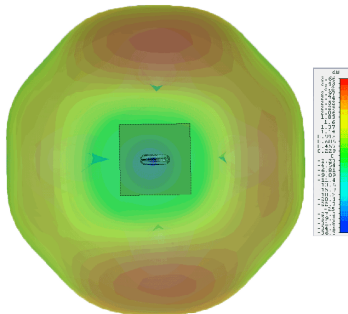
3D Gain Plot Top (700MHz)



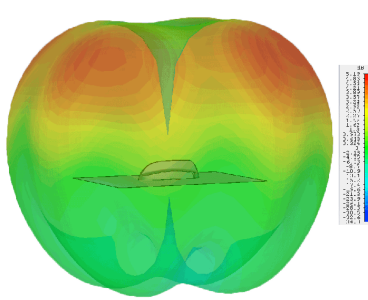
3D Gain Plot Side (800MHz)



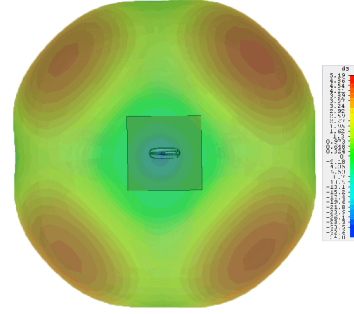
3D Gain Plot Top (800MHz)



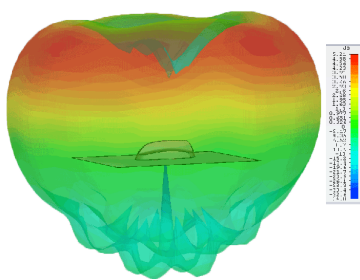
3D Gain Plot Side (900MHz)



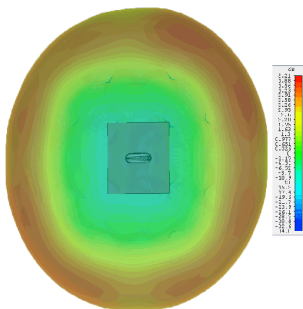
3D Gain Plot Top (900MHz)



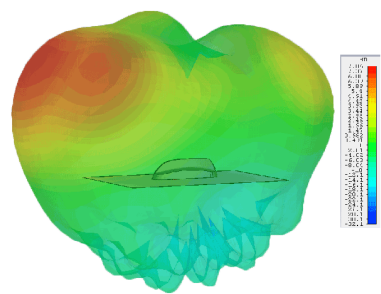
3D Gain Plot Side (1800MHz)



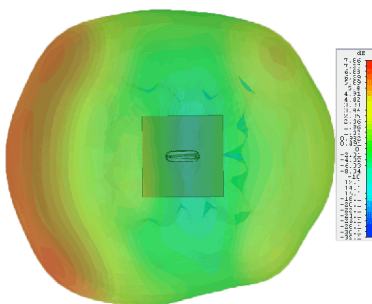
3D Gain Plot Top (1800MHz)



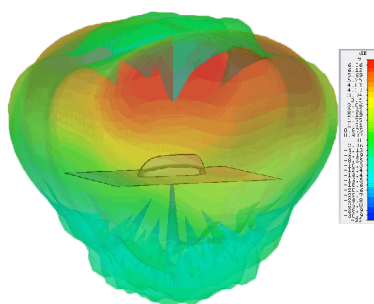
3D Gain Plot Side (2100MHz)



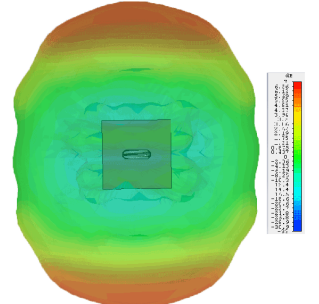
3D Gain Plot Top (2100MHz)



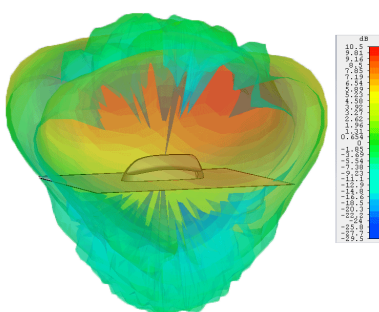
3D Gain Plot Side (2600MHz)



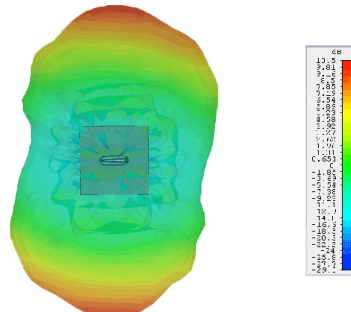
3D Gain Plot Top (2600MHz)



3D Gain Plot Side (3600MHz)



3D Gain Plot Top (3600MHz)

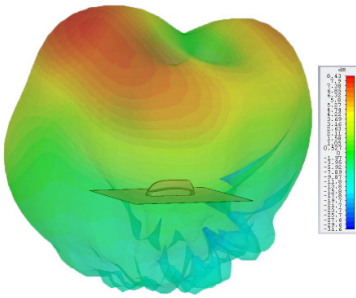


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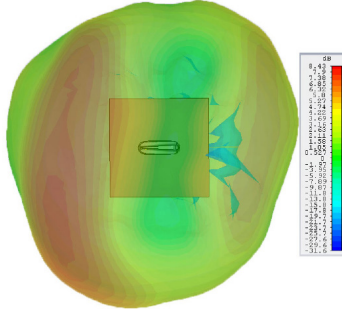
## MIMO LTE/GPS/WIFI ANTENNA

### Typical 3D Radiation Patterns - Wifi Elements 4&5

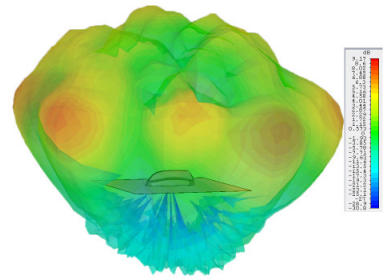
3D Gain Plot Side (2.4GHz)



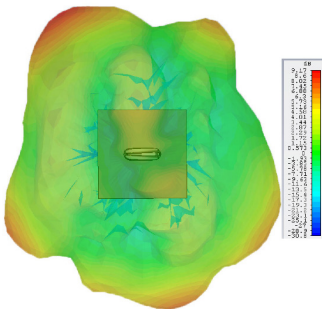
3D Gain Plot Top (2.4GHz)



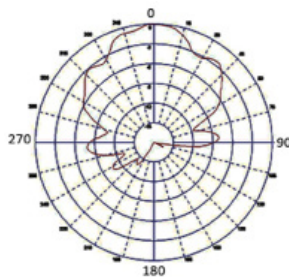
3D Gain Plot Side (5.4GHz)



3D Gain Plot Top (5.4GHz)

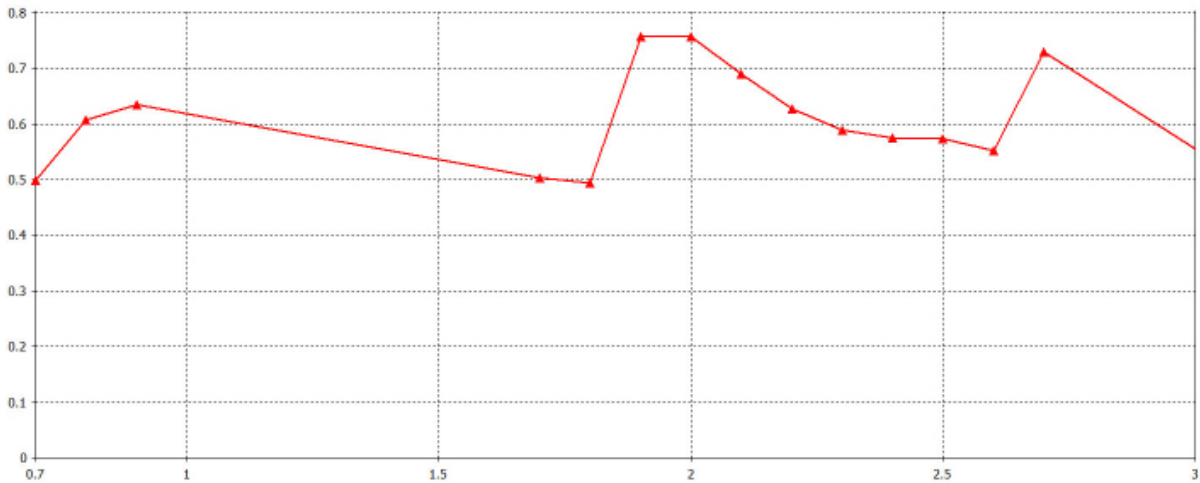


### Typical Radiation Patterns - GPS/GNSS Element 1 Element 3: Typical E Plane Pattern



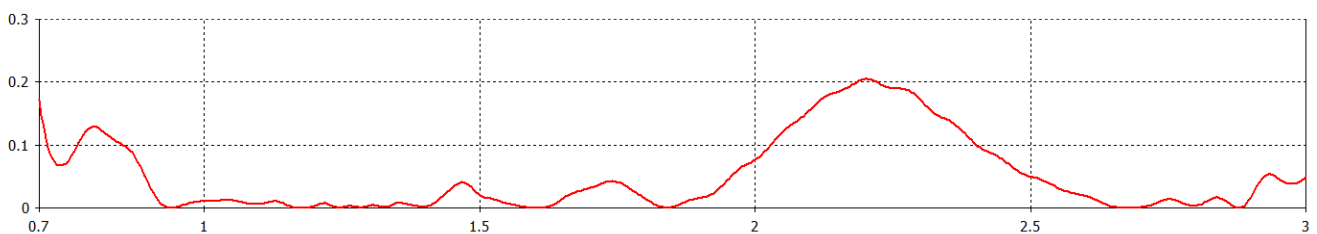
\*3D radiation patterns simulated in CST Microwave Studio on a 600x600mm (2' X2') ground plane with both elements fed together.

### Typical Total Efficiency Typical Total Efficiency - Cellular Elements 2&3\*



\* Efficient simulated in free space with no whip and no ground plane and no cable.

### Typical Correlation Co-efficient Typical Correlation Co-efficient- Cellular Elements 2&3\*



\*Correlation co-efficient simulated in free space with no whip, no additional cable and no ground plane