



Product Catalogue

Telstra Lanes Antenna Guide

PANORAMA  ANTENNAS

Over 70 Years of Experience

Panorama Antennas is a privately owned family business, now in its third generation, and is a leading designer and manufacturer of antennas for wireless communication. Established in London in 1947, Panorama started life as a manufacturer of consumer products and buoyed by huge demand in 1952, began manufacturing TV components and antennas. With the transistor radio trend of the 1960s, Panorama's expert knowledge swiftly led us into the manufacturing of communication antennas.

Throughout the 70s and 80s, Panorama evolved to become the first specialized communication antenna manufacturer in the UK, developing a range of cellular antennas to coincide with the launch of the mobile phone network in Britain. 1990 was a year of huge change as Panorama found itself revolutionizing cellular glass mount antenna technology, filing a patent application for the first ever solid state coupling circuit. Through creating a new benchmark for quality in the production of components and leading technology development, Panorama has grown side by side with the cellular telecommunications industry.

Today Panorama produces antennas for the world's leading communication companies and has grown to include over 80 staff in 8 international sales offices, as well as operating 3 fully owned subsidiaries, one of which is based in Brisbane to support our customers across Australia/ New Zealand. Manufacturing, design and development are located in London less than a mile from the original factory. Our network of international sales representatives means that all customers get the attention and advice they require, providing local support on a global scale.

Antennas For Next Generation

Panorama's constant cutting-edge research ensures that our antennas meet the demands of the very latest public safety communications technology. Trusted by thousands of professionals the world over, our antennas are depended on to provide critical communications in even the most challenging conditions.

With over 70 years' experience in delivering world-class antenna products, Panorama's current product range reflects our unparalleled expertise in providing high-quality performance antennas.



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Ready for Telstra Lanes

Panorama Antennas is the leading antenna supplier to public safety and transportation organisations in the USA, Europe, Australia/ New Zealand and beyond. Our success is built on understanding the evolving needs of these sectors, which is driven by the ever increasing demand for complex communication systems in vehicles, whilst at the same time, the need to reduce installation costs and improve vehicle residual value at end of service life. Panorama's products have already been extensively proven in providing voice and data communications for Government and Commercial projects globally. The GPSD MiMo Sharkee® antenna has been adopted by many public safety and enterprise users. It has a rugged OEM style shark fin housing, with single hole mounting, internal antennas for GPS/GNSS, 2x2 MiMo for 4G/5G with fallback capability, 2x2 MiMo dual band WiFi antennas and a mobile radio antenna can also be fitted.

Telstra LANES® Emergency and LANES® Enterprise services provide prioritised access to the Telstra 4G/LTE commercial network across various frequency bands, for mission and business critical data services.

The antenna is a critical part of a Telstra LANES® vehicle installation in order to achieve the optimum 4G broadband performance. A key feature of LTE is that it uses MiMo (Multiple Input, Multiple Output) technology to enable a high speed broadband connection. The current requirement is for a 2x2 system, which uses two antennas at the client terminal, but with the introduction of LTE Advanced Pro, a 4x4 MiMo antenna is required. MiMo functionality leverages on multi-path signal propagation to utilise multiple signal paths which increases the channel capacity, as shown in the image above for a 2x2 system. A MiMo system requires the antennas to have a defined level of isolation and a low correlation factor, which Panorama provides in its' "all in one" solutions.

Panorama has a complete range of MiMo multi-function antenna solutions, which are easy to install and provide pre-defined MiMo performance. Our latest development, the '4x4 MiMo Dome' supports new generation LTE Advanced Pro devices to deliver downloads speeds of up to 1.2Gbps. Panorama continues to develop new products for LTE 4G/ 5G to ensure that we are at the front in being able to offer high performance, cost effective solutions for Emergency and Enterprise users.

‘Plug and Play’

Panorama’s antennas are designed to give guaranteed performance straight out of the box with minimum configuration. Our ‘Sharkee®’, ‘MiMo Sharkee®’ and ‘Great White’ are multi-function low profile antennas that provide the antenna requirements for Telstra Lanes, within a compact housing using a single mounting hole, and includes:



- 2x2 or 4x4 MiMo for 4G/3G/2G (700-3800MHz)
- 2x2, 3x3 or 4x4 MiMo for dual band WiFi (2.4GHz/5GHz)
- 1 x GPS/GNSS antenna with 26dB gain low noise amplifier (LNA)

The installer does not need to understand the complexities of MiMo antenna configuration, as it is a simple one hole mounting, that can be quickly installed and connected to a 4G terminal with pre-terminated low loss “plug and play” coaxial cables.

The ‘Sharkee®’, the ‘MiMo Sharkee®’ and the ‘Great White’ antennas are in use by many US public safety agencies and has been selected as the preferred antenna choice by several industry router OEM’s.

The ‘Great White’ antenna has been recognized by:
2014 FCS Gerald David Award for Innovation in Business Radio
2016 International Critical Communication Awards - Best Evolution to Future Broadband (Finalist).



Global User Case Studies

Network Redundancy and FirstNet

FirstNet, the U.S public safety broadband network for critical communications, is coming soon, making connectivity a necessity, not a luxury. After the Mesa Fire and Medical Department in Arizona experienced a 17-hour commercial network outage that put their operation at risk, they were forced to look at their options for broadband redundancy. With this issue at hand, the LGMQM4-7-38-24-58 proved to be the ideal antenna solution to move towards. The premier low profile MiMo antenna contains up to nine isolated antenna elements; four ultra-wideband LTE elements, four dual band WiFi elements covering 2.4/4.9-6.00GHz and a higher performance GPS/GNSS antenna with an integrated 26dB gain LNA, making it fully reliable across two networks and shows the potential of secure failover connectivity for the future of FirstNet.



Bedfordshire & Hertfordshire Police Mobile

Bedfordshire & Hertfordshire Police were looking to develop technology to allow officers to spend more time on the road and tracking criminals. The force's cars were equipped with rugged tablet computers to process paperwork while in the field. In order to provide a data link for the tablets, each car was fitted with a 4G mobile router and LGMM-7-27-24-58 that provided the router with 2 x MiMo 4G/3G/2G (700-2700MHz), 2x MiMo WiFi to create an operational hotspot around the car, and GPS to provide location services.

As the antenna required the drilling of just one hole to install, it proved to be a fast and easy process, while also preserving the resale value of the force's high-spec cars.



MiMo Vehicle Antennas

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MiMo



'4x4 MiMo Dome'

Designed for use with LTE Advance Pro
 Low Profile Rugged Housing
 Up to 9 functions in one

Accessories



Magnetic Mount
SAB-225

The LGMQM4 antenna has been developed for use with new generation LTE Advance Pro routers which require a 4x4 MiMo antenna system. In addition, the antenna can incorporate 2x2, 3x3, or 4x4 MiMo antennas for dual band WiFi, as well as a high performance GPS/GNSS antenna with 26dB gain LNA.

The antenna does not require a conductive ground plane, so can be fitted on a metal or plastic roof and still maintain the same high level of performance.

Available Colors:

- Black
- White

Variants

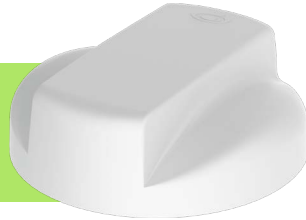
	GNSS	MiMo LTE (4x4)	MiMo WiFi (2x2)	MiMo WiFi (3x3)	MiMo WiFi (4x4)
LGMM4-7-38	●	●			
LGMDM4-7-38-24-58	●	●	●		
LGMTM4-7-38-24-58	●	●		●	
LGMQM4-7-38-24-58	●	●			●

Standard Data

Electrical Data		
Function	Cellular, LTE, 4G/3G/2G	WiFi
Frequency (MHz)	698-3800 MHz	2.4 / 4.9 - 6GHz
Peak Gain: Isotropic	2dBi (698-960MHz) 5dBi (1710-3800MHz)	4dBi (2.4GHz) 6dBi (5.8GHz)
Correlation Coefficient	<0.3	
Max. Input Power (w)	10	
Mechanical Data		
Dimensions (Diameter X Height)	170mm (6.7") x 48mm (1.9")	
Mounting type	Panel mount M18 Bush	
Material	ASA & diecast aluminium	
Ingress Protection	IP69K	

'Great White'

- 2x2 MiMo Wideband LTE/cellular elements
- Optional integrated GPS/GNSS
- Up to 4x4 MiMo 2.4/5GHz WiFi
- Magnetic mount available



The Panorama LGMM and LPMM low profile MiMo antenna range has been designed to support the new generation of vehicular LTE routers.

The antenna enclosure contains up to seven isolated high performance antenna elements; two ultra-wideband elements covering 698-2700MHz supporting MiMo/diversity at cellular/LTE frequencies, up to four optional dual band elements covering 2.4 & 4.9-6GHz supporting MiMo/function for WiFi. The LGMM[B] range also contains a GPS/GNSS antenna with an integrated 26dB gain LNA with high performance filtering.

Ground Plane Independent

This antenna does not require a ground plane, and maintains a high level of performance when mounted on a non-metallic surface.

Accessories



Magnetic Mount
SAB-225

Available Colors:

- Black
- White

Standard Data

Electrical Data		
Frequency Range (MHz)	698-960, 1700-2700 (Cellular) 2400, 4900-6000 (WiFi), 1562-1612 (GPS/GNSS)	
Peak Gain: Isotropic	2.3dBi (698-960), 5dBi (1700-2700), 2dBi (2400/4900-6000)	
Typical VSWR	< 2.5:1 (Cellular) < 2:1 (WiFi)	
Mechanical Data		
Dimensions (mm)	Height	62 (2.4" in)
	Diameter	176 (6.7" in)
Material	ASA & diecast aluminium	
Mounting type	Panel Mount M18 Bush	
Ingress Protection	IP66 (EN 60529:1992)	

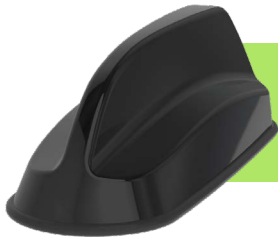
Variants

	GPS/GNSS	MiMo LTE (2x2)	MiMo WiFi (2x2)	MiMo WiFi (3x3)	MiMo WiFi (4x4)
LPMM-7-27		●			
LPMM-7-27-24-58		●	●		
LGMM-7-27	●	●			
LGMM-7-27-24-58	●	●	●		
LGMTM-7-27-24-58	●	●		●	
LGMQM-7-27-24-58	●	●			●

5G version will be available during 2019

MiMo Vehicle Antennas

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'MiMo Sharkee®'

2x2 MiMo Cellular/LTE
 Optional GPS/GNSS & 2x2 or 3x3 WiFi sharkfin housing
 A single antenna means faster installation and decommission
 Mounting boss for optional airwave antenna

Trials & Drive Testing
 A magnetic mount adaptor is available to allow temporary installation for evaluation or drive testing.

The SHKG range offers 2x2 MiMo 698-960/1710-3800MHz with active GPS/GLONASS (26dB LNA) and optional 2x2 or 3x3 MiMo WiFi 2.4/5.0GHz.

Requiring only a single hole fixing, the SHKG reduces vehicle damage, visual impact and cost of installation, whilst protecting vehicle resale value.



Accessories

Magnetic Mount SAB-225

Available Colors:

- Black
- White

Variants

	GPS/GNSS	MiMo LTE (2x2)	MiMo WiFi (2x2)	MiMo WiFi (3x3)
SHK-7-27		●		
SHKG-7-27	●	●		
SHKG-7-27-24-58	●	●	●	
SHKG-7-27-T24-58	●	●		●

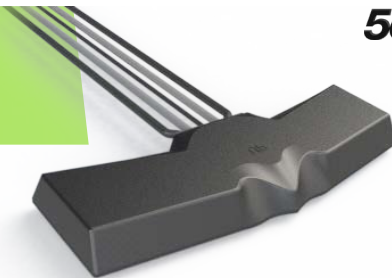
Standard Data

Part No.	SHKG	
Frequency Range (MHz)	698-960, 1700-3800 (2 x Cellular) 2300-2500, 4900-6000 (2 or 3 x WiFi - optional) 1562-1612 (GPS/GNSS)	
Operational Bands	GPS/GNSS, 5G/4G/3G/2G, WiFi	
Max. Input Power	50 watts	
Mechanical Data		
Dimensions (mm)	Height	50 (1.97")
	Length	170 (6.69")
	Width	60 (2.36")
Material	ASA & diecast aluminium	
Mounting type	Panel mount M18 Bush	
Ingress Protection	IP66 (EN60529:1992)	



'The Bat'

Mount on or under dashboard
MiMo 5G/4G/3G/2G functionality
Optional SiSo or 2x2 MiMo WiFi
GPS/GNSS 26dB LNA



The BATG antenna series is an ideal solution for vehicles when an external antenna cannot be fitted.

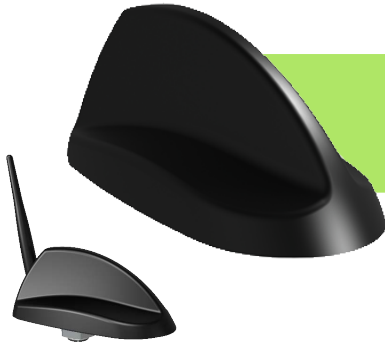
The antenna offers 2x2 MiMo function for 5G/4G/ with fallback to 3G/2G and either a single or 2x2 MiMo dual band WiFi antenna(s). It also features a GPS/GNSS antenna with 26dB gain LNA.

The antenna can be fitted onto any non-conductive surface; typical locations would be on a windscreen or on/under dashboard. It is fitted with 3m length low loss coaxial cables, available pre-terminated with either sma or FAKRA type connectors. The antenna moulding and cables are flame retardant and meet requirements of UN ECE 118.01.

Variants	MiMo LTE	GPS/GNSS	WiFi	MiMo WiFi
BATM-7-38	●			
BATGM-7-38	●	●		
BATGM-7-38-24-58	●	●	●	
BATGM2-7-38-24-58	●	●		●

Standard Data

Electrical Data			
Function	Cellular, LTE, 5G/4G/3G/2G	WiFi	GPS/GNSS
Frequency Range (MHz)	698-960, 1710-3800	2.4/5.0GHz	1562-1612MHz
Peak gain: Isotropic	2dBi (698-960MHz) 3dBi (1710-2170MHz) 5dBi (2500-3800MHz)	4dBi (2.4GHz) 5dBi (5.0GHz)	26dB (LNA)
Pattern	Omni-directional		
Max input power (W)	20		
Mechanical Data			
Dimensions (Height X Width X Length)	16.5mm (0.65") X 77mm (3") X 214mm (8.4")		
Material	ASA		
	Adhesive pad		
Cable Data			
Type	CS29 (Cell), CS32 (WiFi), FR RG174 (GNSS)		
Length (m)	3 (10")		



'Sharkee'®

All 4G, 3G & 2G cellular bands
 Integrated GNSS and 2.4/4.9-6GHz WiFi
 Optional external whips available

The 'Sharkee'® provides antenna functions for multiple technologies within one antenna housing. Trusted by public safety organisations, utilities and transportation companies all over the world, the 'Sharkee'® sets the industry standard in functionality.

The 'Sharkee'® offers three internal antenna systems, GNSS, 4G/3G/2G cellular, dual-band WiFi as well as an optional external whip.

Requiring only a single hole fixing, the 'Sharkee'® reduces vehicle damage, visual impact and cost of installation, whilst protecting vehicle resale value.

Optional Whip Mounting

The 'Sharkee' features a whip mounting boss that allows the attachment of a VHF/UHF whip for voice communications.



Standard Data

Electrical Data				
Function	Cellular, LTE, 4G/3G/2G	WiFi	GPS/GNSS	Whip
Frequency Range (MHz)	698-2700	2400 4900-6000	1562-1612	dependent on selected whip
Peak gain: Isotropic	1dBi	2dBi	26dB	-
Termination	SMA Male	SMA Female	FME Female	FME Male
Pattern	Omni-directional			
Max. Input Power (W)	25 (Internal Elements), 60 (External Whip)			
Mechanical Data				
Dimensions (Length X Width X Height)	120mm (4.72") x 58mm (2.3") x 50mm (2")			
Material	Impact resistant UV light stabilised ABS			
Operating Temperature	-40° / +80°C (-40° / 176°F)			
Ingress Protection	IP66 (EN 60529:1992)			



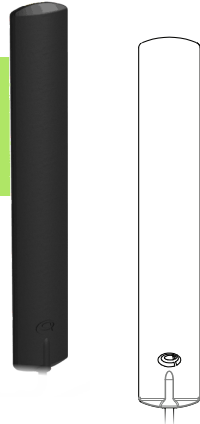
Covert Internal Multi-Band

Multi-Band internal antenna
Simple adhesive pad fitment
Can be fitted on glass or plastic panel

The EF-BC3G-26 antenna is a low cost single 4G/3G/2G product that can be fitted on any non-conductive surface.

It is typically fitted on a window and with correct spacing, a pair can be installed to provide a covert 2x2 MiMo antenna system.

The antenna covers the full range 700-2700MHz to support 4G with fallback to 3G/2G when required and is supplied with a 3m cable with a sma plug fitted. It is constructed from ASA plastic, with an automotive grade adhesive pad, so is suitable for internal installation or semi-exposed locations.



Variants

	LTE	MMo LTE (2x2)
EF-BC3G-26-3SP	●	
EF-IN2307		●

Standard Data

Electrical Data		
Frequency (MHz)		698-2700
Peak Gain: Isotropic		2dBi
Max Input Power (W)		25
Mechanical Data		
Dimensions (mm)	Height	131 (5.2")
	Width	21.7 (0.9")
Material		ASA
Mounting Type		Automotive grade adhesive pad
Cable Data		
Type		RG174
Length (m)		3 (10')
Diameter (mm)		3 (0.1")
Connector		SMA Plug (TS-9 With EF-IN2307)



Low Profile Cellular

- Compact and robust
- Cost effective solution
- Multi-band operation

The LPB series is a multi-band antenna, in a 82mm (3.22”) high impact radome, designed to perform in any environment it offers excellent performance across the frequency range 617-960/1710-6000MHz which includes 4G/5G as well as all global cellular bands, making it an extremely versatile product.

It features an integral low loss coaxial cable, available in various lengths/connector configuration. The antenna is ideal for a SiSo requirement, or a pair can be used, with correct spacing to provide MiMo function.

Variants (others upon request)

Part No.	Termination	Cable Length
LPB-6-60-05SP	SMA Male	0.5m (1.6')
LPB-6-60-2SP	SMA Male	2m (6.6')
LPB-6-60-5SP	SMA Male	5m (16.4')

Standard Data

Electrical Data		
Frequency (MHz)	617-960 / 1710-6000	
Peak Gain: Isotropic	3dBi (617-960), 4dBi (1710-2700), 8dBi (3400-3800), 9dBi (4900-6000)	
Pattern	Omnidirectional	
Mechanical Data		
Dimensions (mm)	Height	82 (3.2')
	Width	48 (1.9')
Material	High-impact UV stable ABS	
Mounting Type	Panel Mount CS29	

Ultra Low Profile MiMo WiFi

Ultra Low Profile
Up to 4 x 4 MiMo Dual Band WiFi
Optional GPS/GNSS Active Antenna

The LP[G]M[X]-24-58 range has been designed to provide MiMo WiFi operation in an ultra low profile package. The compact, robust, low-profile housing contains up to four antenna elements with effective isolation and low correlation covering 2.4-2.5/4.9-6GHz.

The antenna is designed to be panel mounted on vehicles or devices and can be fitted on a conductive or non-conductive panel. Supplied with integrated flame retardant CS32 cables (Compliant to UNECE 118.01 and EN45545-2) and a halogen free flame retardant radome (white version), the antenna is suitable for many environments and applications.

Available Colors:

- Black
- White



Variants

	GPS/ GNSS	MiMo 2x2 WiFi	MiMo 3x3 WiFi	MiMo 4x4 WiFi
LPM2-24-58		●		
LPM3-24-50			●	
LPM4-24-58				●
LGM2-24-50	●	●		
LGM3-24-58	●			
LGM4-24-58	●			●

Standard Data

Electrical Data	
Function	Dual Band WiFi
Frequency Range (MHz)	2.4GHz / 4.9GHz-6GHz / GPS/GNSS (Optional)
Peak Gain: Isotropic (Individual Elements)	4dBi
Pattern	Omni-directional
Max Input Power (W)	10W
Mechanical Data	
Dimensions (Height x Diameter)	30mm (1.18") x 115mm (4.52")
Material	Geloy HRA 222F
Mounting Type	Panel Mount M18 Bush
Cable Type	CS32
Termination	Reverse polarity SMA Male



MiMo Cellular

Supports MiMo across 4G, 3G & 2G
Two wideband elements with gain
Durable housing for indoor or outdoor use
Suitable for mast, wall & desk mounting

The WMMG-7-27 is ideal for use with client devices that require effective MiMo and diversity support for 2G, 3G and 4G networks. The WMMG-7-27 antenna is a wide beam width, medium gain, 2x2 MiMo antenna which incorporates two separately fed wideband, cross polarised elements in a rugged, weather resistant housing. It can be wall, mast or desk mounted using the included mounting hardware. Supplied with integral ultra-low loss twinned coaxial cable, the WMMG-7-27 eliminates exposed connector joints and simplifies cable management for easy, cost effective installation.

Optional Extension Cables

Additional extension cable assemblies available for the following lengths; 5m (17'), 10m (33'), 15m (50')

Variants

Part No.	Termination	Cable Length
WMMG-7-27-5SP	2 x SMA Male	5m (17')
WMMG-7-27-03NJ	2 x N Female	0.3m (1')

Standard Data

Electrical Data		
Frequency Range (MHz)	698-960, 1710-2700	
Peak Gain (excluding cable loss)	2dBi (698-960), 5dBi (1710-2170), 4dBi (2200-2700)	
Typical VSWR	< 2:1	
Pattern	Hybrid	
Correlation coefficient (all bands)	< 0.2	
Element isolation	> 20dB	
Mechanical Data		
Dimensions (mm)	Height	186 (7.3")
	Width	155 (6.1")
	Depth	75 (2.9")
Material	U.V. stable, impact resistant ASA	
Mounting Type	Wall mount / mast mount / desk mount	
Cable Data		
Type	2 x CS29 Coax	
Length (m)	5 (17')	

High Gain MiMo Cellular

Supports 2x2 MiMo operation for 5G/4G with fallback to 3G/2G
Cross polarised high gain elements
Rugged housing for external/internal use
Mast, wall or desk top mounting

The WMM8G-7-38 is ideal for use with client devices that require effective MiMo and diversity support for 2G, 3G, 4G and 5G networks. The WMM8G-7-38 is a wide beam width, high gain, directional 2x2 MiMo antenna. Incorporating two separately fed wideband, cross polarised elements in a rugged weather resistant housing, it is typically wall mounted and supplied with integrated ultra-low loss twinned coaxial cables for use with a fixed client device in an office, mobile control centre and in rural areas where signal strength is an issue.



Optional Extension Cables

Additional extension cable assemblies available for the following lengths; 5m (17'), 10m (33'), 15m (50')

Variants

Part No.	Termination	Cable Length
WMM8G-7-38-5SP	2 x SMA Male	5m (17')
WMM8G-7-38-03NJ	2 x N Female	0.3m (1')

Standard Data

Frequency Range (MHz)	698-960, 1710-3800	
Peak Gain (excl. cable loss)	6dBi (698-960), 9dBi (1710-2170), 6dBi (2396-3800)	
Radiation pattern	Directional	
Correlation co-efficient (all bands)	< 0.05	
Max input power	20 watts	
Mechanical Data		
Dimensions (mm)	Height	230 (9")
	Width	180 (7.1")
	Depth	94 (3.7")
Material	U.V. stable, impact resistant ASA	
Cable Data		
Type	2 x CS29 Coax	
Length (m)	5 (17')	
Termination	2 x SMA male	

Cables

CS23 Type for VHF-UHF

Cable Data	
Impedance	50Ω
Attenuation (per 10m)	2.5 dB @ 400 MHz, 4 dB @ 1GHz, 5.8 dB @ 2GHz
Outer Diameter (mm)	5 (0.2" in)

CS29 Type - for 4G LTE

Cable Data	
Impedance	50Ω
Attenuation (per 10m)	3dB @ 400MHz, 5dB @ 1GHz, 7.5dB @ 2GHz
Outer Diameter (mm)	5 (0.2" in)
Shielding Effectiveness	785dB (According to IEC 61196)

CS32 Type - for WiFi

Cable Data	
Impedance	50Ω
Attenuation (per 10m)	2.5dB @ 400 MHz, 4dB @ 1 GHz, 5.8dB @ 2GHz, 11dB @ 6GHz
Outer Diameter (mm)	10.29 (0.4" in)

C240 Type - for longer cables

Cable Data	
Impedance	50Ω
Attenuation (per 10m)	2.3dB @ 1GHz, 3.8 dB @ 2GHz
Outer Diameter (mm)	6 (0.2" in)

Important Waiver Information

All information and data in this catalogue is intended to provide an indication of the performance of our products under particular circumstances and none of it implies a guarantee of performance or fitness for any particular purpose.


We strongly encourage our customers to conduct their own tests in order to establish the appropriate product for any particular application.

All products should only be installed by a properly qualified installer familiar with appropriate local laws and regulations. We advise our customers to consult and comply with the appropriate Panorama Antennas installation instructions.

All specifications and product information in this catalogue are subject to change without notice.

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Panorama produces a wide range of tried and trusted antennas for Public Safety applications, for both mission critical voice and data. Our emphasis is on excellent performance combined with robust & resilient design for reliable long service operation.

PANORAMA  ANTENNAS

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