BENELEC
Professional Wireless Solutions

MOBILE PHONES / FIXED MOBILE BROADBAND / TELEMETRY DATA

CELLULAR & LOCATION TECHNOLOGIES

GSM | 3G | NEXT G | GPS | 4G | WIFI

AUSTRALIAN CELLULAR NETWORKS

NETWORK TYPE	BAND	CARRIER	NOTES
2G (2.5G) GSM + GPRS	900	TELSTRA / OPTUS / VODAFONE	STANDARD AUSTRALIAN 2G GSM FREQUENCY
	1800	TELSTRA / OPTUS / VODAFONE	SUPPLEMENTARY AUSTRALIAN 2G GSM FREQUENCY
3G (UMTS) WCDMA + HSDPA	850	TELSTRA / VODAPHONE	TELSTRA NEXTG & VODAPHONE USB MODEMS
	900	OPTUS / VODAPHONE	OPTUS & VODAPHONE RURAL 3G NETWORKS
	2100	TELSTRA / OPTUS / VODAFONE	STANDARD AUSTRALIAN 3G FREQUENCY
4G LTE	1800	TELSTRA / OPTUS	LTE-FDD
	2300	OPTUS	LTE-TDD DATA TERMINALS (SELECTED CITIES)

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MOBILE

BAND	3G 820 - 960 1710 - 2200	NEXT G 820 - 895	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	4G 690 - 960 1710 - 2700
PART #	02457	02459	024572	024574 ↳ Black 024574W ↳ White	024577 ↳ Black 024577W ↳ White	024576 ↳ Black 024576W ↳ White	024578 ↳ Black 024578W ↳ White	02471
IMAGE								
GAIN (dB)	3	8	3	3 / 7.5	3 / 7.5	3 / 7.5	3 / 7.5	3
SIZE (mm)	135	820	430	890	910	1100	1100	85
NOTES	GLASS MOUNT	STAINLESS STEEL	RUGGED	FIXED	REMOVABLE	FIXED	REMOVABLE	PANEL MOUNT
TERM.	3M LL195 SMA PLUG	5M LL195 FME SOCKET	5M LL195 FME SOCKET	5M RG58 FME SOCKET	5M LL195 FME SOCKET	5M LL195 FME SOCKET	5M LL195 FME SOCKET	5M LL195 SMA PLUG

BAND	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170
PART #	02461A	024576BW
IMAGE		
GAIN (dB)	3	3 / 7.5
SIZE (mm)	360	1040
NOTES	1" 14 TPI MAST MOUNT	1" 14 TPI MAST MOUNT
TERM.	N SOCKET	N SOCKET

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MARINE

3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2170
02462A	02462AH	02463A	02463AH
			
3	3 / 7.5	3	3 / 7.5
1800	1800	2400	2400
1" 14 TPI DECK MOUNT	1" 14 TPI DECK MOUNT	1" 14 TPI DECK MOUNT	1" 14 TPI DECK MOUNT
5M LL195 FME SOCKET	5M LL195 FME SOCKET	5M LL195 FME SOCKET	5M LL195 FME SOCKET

BASE (OMNI-DIRECTIONAL)

BAND	3G 820 - 2500	3G 820 - 960 1710 - 2170	3G 820 - 960 1710 - 2200	4G 690 - 960 1710 - 2700	4G 690 - 960 1710 - 2700	4G 690 - 960 1710 - 2700	4G 690 - 960 1710 - 2700
PART #	02452C	024581 ↳ 0.4m Lead 02458 → 3m 024582 → 5m	024576B ↳ Black 024576BW ↳ White	024562	024583 ↳ 0.4m Lead 024584 → 3m 024585 → 5m	024584X	02458XN
IMAGE	PATENT: 60629/99 					MIMO 	MIMO 
GAIN (dB)	0 - 3	3	3	3	3	3	3 X 3
SIZE (mm)	140	190	1040	38	190	190	190
NOTES	INDOOR CEILING MOUNT	INDOOR / OUTDOOR STUD MOUNT	OUTDOOR STUD MOUNT	PANEL MOUNT	INDOOR / OUTDOOR STUD MOUNT	INDOOR / OUTDOOR STUD MOUNT	INDOOR / OUTDOOR STUD MOUNT
TERM.	N SOCKET	SMA PLUG LL195 (0.4/3/5m)	N SOCKET	SMA PLUG 5M X LL195	SMA PLUG LL195 (0.4/3/5m)	2 X SMA PLUG	2 X N SOCKET

AVL

BAND	4G GPS 690 - 960 1710 - 2700	4G WIFI GPS 690 - 960 1710 - 2700	4G GPS 690 - 960 1710 - 2700	3G GPS 820 - 960 1710 - 2170
PART #	0294203 ↳ Black 0249203W ↳ White	0294205 ↳ Black 0294205W ↳ White	0294206	0294207 ↳ Glass Mount 0294208 ↳ Covert
IMAGE				
GAIN (dB)	3	3	3	3
NOTES	PANEL PUCK MOUNT, GP	PANEL PUCK MOUNT, GP	GLASS MOUNT, GP	GPI
TERM.	5M LL100 5M LL195 SMA PLUG	5M LL100 2 X 5M LL195 SMA PLUG	5M LL100 5M LL195 SMA PLUG	3M LL100 SMA PLUG

For AVL, various MIMO, WiFi & Fakra termination options are available.

RAIL

BAND	4G 690 - 960 1710 - 2700	4G GPS 690 - 960 1710 - 2700
PART #	02471R	0294206R
IMAGE		
GAIN (dB)	3	3
NOTES	LOW PROFILE	ACTIVE GPS LOW PROFILE
TERM.	N SOCKET	N SOCKET TNC SOCKET

BASE (DIRECTIONAL)

BAND	PART #	IMAGE	TYPE	GAIN	CONSTRUCTION	NOTES	TERM.
4G 700	02484E2		YAGI	14dBd	STAINLESS STEEL 15 ELEMENT	TILT ADJUST BRACKET	N SOCKET
NEXT G 850	02482		YAGI	9dBd	STAINLESS STEEL 6 ELEMENT	TILT ADJUST BRACKET	N SOCKET
NEXT G 850	02484		YAGI	14dBd	STAINLESS STEEL 15 ELEMENT	TILT ADJUST BRACKET	N SOCKET
NEXT G 850	02484E		YAGI	14dBd	ALUMINIUM 15 ELEMENT	TILT ADJUST BRACKET	N SOCKET
4G 700 - 2700	02485		LOG YAGI	9dBi	HYBRID	POLE / WALL MOUNT	N SOCKET
NEXT G 850 / GSM 900	02487		PARABOLIC GRID	21dBi	ALUMINIUM GRID, 1.8M	POLE MOUNT	N SOCKET
GSM 900	02482G		YAGI	9dBd	STAINLESS STEEL 6 ELEMENT	TILT ADJUST BRACKET	N SOCKET
GSM 900	02484G		YAGI	14dBd	STAINLESS STEEL 15 ELEMENT	TILT ADJUST BRACKET	N SOCKET
4G 1800	02484E3		YAGI	14dBd	ALUMINIUM 15 ELEMENT	TILT ADJUST BRACKET	N SOCKET
4G 700 - 2700	02492		PANEL	7dBi	PATCH	TILT ADJUST BRACKET	N SOCKET
4G 700 - 2700	02492M	MIMO 	PANEL	7dBi	PATCH	TILT ADJUST BRACKET	2 X N SOCKET

GPS

BAND	GPS 1575	GPS 1575	GPS 1575
PART #	0294101 ↳ *SMA Plug* 0294101F ↳ *Fakra Blue*	0294104 ↳ *SMA Plug* 0294104F ↳ *Fakra Blue*	0294105 ↳ *SMA Plug* 0294105D ↳ *TNC Plug*
IMAGE			
GAIN (dB)	28	28	28
NOTES	GLASS MOUNT	BRACKET, PANEL MOUNT	MAGNETIC
TERM.	5M LL100 *(SMA/Fakra)*	5M LL100 *(SMA/Fakra)*	5M LL100 *(SMA/TNC)*

M2M & DEVICE

BAND	NEXT G 850 / 1900	NEXT G 850 / 1900	NEXT G 850	NEXT G 850
PART #	02432S	02432SL	02434S	02434D
IMAGE				
GAIN (dB)	0	0	3	3
NOTES	1/4 WAVE	1/4 WAVE	1/2 WAVE, GPI	1/2 WAVE, GPI
TERM.	SMA PLUG	ANGLED SMA PLUG	SMA PLUG	TNC PLUG

dB gain reference is relative to ¼ wave on ground plane.

An antenna guide and an overview of MIMO technology can be found on the back page.

Detailed data sheets can be found on our website.

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CELLULAR ANTENNA ACCESSORIES

VEHICLE BRACKETS

02714S	Gutter Bracket - Fold Down - All S/S
02726S	Gutter Bracket - H/D - All S/S
02728	Mirror Bracket / Roof Bar - S/S
02728B	Mirror Bracket / Roof Bar - ZPS
027291	Mobile L Bracket - Lightweight S/S
02730	Bull Bar Bracket - Right Angle - S/S
02730B	Bull Bar Bracket - Right Angle - ZPS
027303	Adjustable Swivel "Lip" Mount
027313	Wrap Around Bull Bar Bracket (45mm)
027314	Wrap Around Bull Bar Bracket (50mm)
02732	Bull Bar Bracket - H/D - S/S
027321	Bull Bar Bracket (76mm) - H/D - S/S
02734	'Z' Trunk Groove Bracket - S/S
02734B	'Z' Trunk Groove Bracket - ZPS
027423	'Super Sucker' Magnetic Suction - 16mm Hole

BASE & MARINE BRACKETS

025222	Marine Mast Mount Bracket - S/S
027281	240mm (16mm hole) S/S Wall Mounting Bracket
02729	100mm S/S Wall Mounting Bracket
02735	Two Way Marine Deck Mount - H/D - Glass-Filled Nylon
02737	Two Way Marine Deck Mount - H/D - S/S

LOW LOSS CABLE ASSEMBLIES

101206	Coaxial Lead 3m x LL195 SMAp to Np (For EMP)
1012081	Coaxial Lead 5m x LL195 SMAp to Np (For EMP)
101209	Coaxial Lead 10m x LL400 Np to Np (For EMP)
1012093	Coaxial Lead 15m x LL400 Np to Np (For EMP)
101205	Coaxial Lead 6m x LL195 SMAp to Np
1012095	Coaxial Lead 12m x LL400 SMAp to Np
10120951	Coaxial Lead 15m x LL400 SMAp to Np
1012096	Coaxial Lead 20m x LL400 SMAp to Np

DEVICE PATCH LEADS

1013102	TS9 to SMAs 40cm x LL100 - Straight
1013102L	TS9 to SMAs 40cm x LL100 - Right Angled
1013104	CRC9 to SMAs 40cm x LL100
1013107	SSMB to SMAs 40cm x LL100
1013108	MS147 to SMAp 40cm x LL100

EMP PROTECTOR

176210	90v Gas Capsule DC-2500MHz Ns to Ns Bulk Head

02714S | 02726S | 02728 (S/S) 02728B (ZPS) | 027291

02730 (S/S) 02730B (ZPS) | 027303 | 027313 | 027314

02732 | 027321 | 02734 (S/S) 02734B (ZPS) | 027423

025222 | 027281 | 02729 | 02735

02737 | 101206 1012081 | 101209 1012093 | 101205 1012095

10120951 1012096 | 1013102 | 1013102L | 1013104

1013107 | 1013108 | 176210

Please refer to our website's cellular antenna section for a detailed modem vs patch lead cross reference.

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ANTENNA SELECTION GUIDE

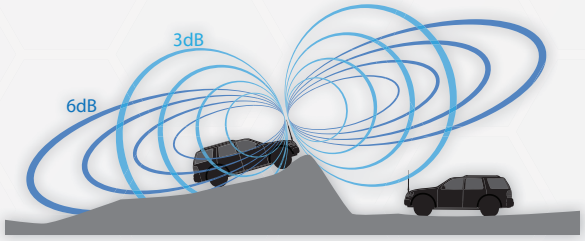
WHICH ANTENNA DO I NEED?

» Gain describes the shape of the radiation from an antenna.

» Use a higher gain antenna for better performance in open flat terrain.

» Use a lower gain antenna for better performance in rough mountainous terrain or city areas.

» We recommend the use of a lower gain antenna for the communications in vehicle convoy situations.



» Glass mount antennas are ideal for built up city areas where signal strength is higher.

» Hi-gain antennas are better suited for regional areas where long range is required.

» Fixed site directional antennas send all the signal in one direction - they need to be rotated and/or tilted until the strongest cell site signal is obtained during installation.

» Fixed site omni-directional antennas are ideal when reasonable signal is available in the area. This is an easier installation option.

MIMO TECHNOLOGY

MIMO technology utilises *Multiple Input and Multiple Output* antennas to maximise the signal link and data carrying capacity of the wireless system.

Typically, WiFi (802.11n) 2.4 / 5.8GHz systems or newer 4G LTE-A transceiver systems (eg, broadband wireless modems) have two antenna ports, and thus need a MIMO dual port antenna system to make use of this technology.

Should you use only one port, this will result in reduced data rates.

Benelec recommends using our MIMO range of antennas where two antenna ports are provided. Benelec can offer a range of both WiFi and 4G MIMO antennas to suit your application.

AVAILABLE FROM

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MOUNTING TIPS

» For better performance locate the antenna higher on the vehicle, or as high as possible in a fixed installation. Height always improved performance and range.

» Do not mount antennas close to each other. Min distance should be 70cm between UHF/Cellular antennas. The further apart the two antennas, the better the performance of each respective antenna.

» Do not mount antennas closer than 70cm to any metal vertical surface.

» Antennas must be mounted vertically, this is particularly important with higher gain antennas.

» Avoid affixing any object to the antenna as it could affect the performance of the communications system.

» Do not mount antennas operating on the same band, at the same horizontal level unless a switch selects them.

CABLE / CONNECTOR ADVICE

» Only use low loss cables for cellular installations as the cable quality is as important as the antenna. Benelec cables are designed to provide optimum performance.

» Do not crimp or damage cable during installation.

» Do not bend cable through an extreme radius.

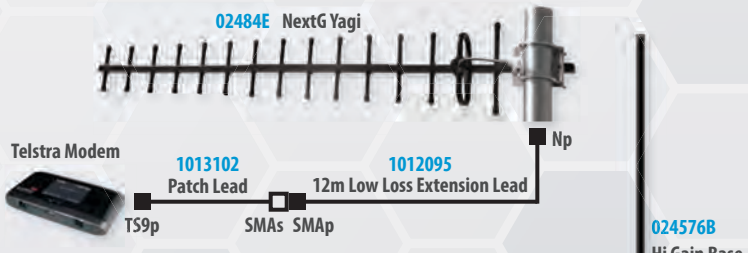
» Take care to tighten all fittings.

» Waterproof any exposed connectors.

N SOCKET	N PLUG	SMA SOCKET	SMA PLUG	FME SOCKET	FME PLUG
Ø15.5mm	Ø20mm	Ø6.1mm	Ø8mm	Ø8mm	Ø11mm

WIRING CONFIGURATIONS

» Patch leads are used to interface your device to an external antenna, or other devices.



» EMP protectors provide lightning protection for your modems and should be used in lightning prone areas.