

# Meander® Collinear Solutions



## About RFI Technology Solutions

RFI is a global technology solutions company, specialising in wireless coverage. RFI has one of the largest, most innovative and experienced wireless solutions teams with dedicated engineers, product managers, deployment engineers, logistics, distribution and R&D staff.

Our network of international sales offices means that all customers get the attention and advice they require, providing local support on a global scale.

RFI develops, manufactures and distributes world-class, high performance, wireless products including; antenna systems, rebroadcast & monitoring equipment, power systems and cabling and connectors. RFI is recognised as a market leader in wireless products and offers the best products backed with outstanding technical support.

RFI is continually strengthening its technology solutions portfolio, including the recent acquisition of Maxon Australia, allowing us to offer industry leading M2M solutions.

### AWARD WINNING MANUFACTURING

RFI is proud to be an award winning manufacturer with wireless coverage products that perform on a global stage. RFI Technology solutions are manufactured in Australia and exported to 80+ countries. RFI operates manufacturing sites in Victoria and South Australia, both with a proud history in quality, safety and environmental performance. Our two sites include Australia's largest antenna manufacturing facility, producing world class Antenna and Multicoupling Systems for both Domestic and International Markets and the only Australian manufacturing site producing frequency translating repeater systems.

### LEADING-EDGE TECHNOLOGY

RFI utilises leading RF design and drafting modeling packages. Our world-class testing environment has an extensive suite of test equipment and custom automated testing.

### **RFI Meander® Antenna Solutions**

The Meander<sup>®</sup> family is a complete and extensive antenna offering covering 130-930MHz, with exceptional bandwidth capability in an extremely light-weight and low profile package. These antennas are an extremely versatile replacement for any antenna range available in the market.

#### PERFORMANCE

RFI's patented Meander<sup>®</sup> antennas tick the box in every area for performance, providing wide, full band coverage, high power rating, and exceptional PIP and low PIM performance. Purchasing a Meander<sup>®</sup> antenna ensures a highly reliable, cost effective, light-weight solution for everything from multi-carrier environments in mission-critical applications to typical telemetry and SCADA applications.

#### **MEANDER® TECHNOLOGY**

Using RFI's patented Meander<sup>®</sup> PCB technology, the meander elements have been printed on a single continuous sided PCB. By removing all the joints and variations typified in the construction of standard high gain collinears, many benefits ensue including; ultra low PIM, high PIP rating, pattern repeatability, weight reduction, and exceptional reliability.

### FEATURES INCLUDE:

- High power capability
- -150 PIM rated, with outstanding PIM stability
- 25kW PIP rating
- 0dBd 9dBd options
- Excellent bandwidth characteristics, with full band coverage
- Exceptional pattern stability
- Superior manufacturing
- Extremely light weight
- Direct grounding for better stability and reduction of static precipitation

USA Patent No. 6,909,403, European Patent No. 1411588, Aust Patent No. 2003255049. Chinese Patent No. ZL200310100548.5 and Indian Patent No. 254674.



### **Product Applications**

### SOUTH EAST ASIA POLICE NETWORK - PUBLIC SAFETY RADIO DESIGN & UPGRADE

RFI provided equipment and design assistance for a whole of country digital upgrade and geographic expansion to a 180+ site public safety network based in South East Asia. Many of the install sites were high density RF sites, necessitating PIM conscious design considerations to ensure reliable service.

With low PIM requirements in mind, the design team utilised RFI's extensive range of -150dBc PIM rated VHF Meander<sup>®</sup> series collinears in the design, providing a complete and cost effective solution meeting specific site coverage requirements.

The VHF Meander<sup>®</sup> series in particular offers a lightweight, wideband VHF antenna with -150dBc low PIM and 25kW PIP ratings, packaged in a low profile radome, with benefits including reduced wind and tower loading over that of a traditional dipole array in a high power cost effective package.

RFI provided a low PIM solution including antennas and multicoupling, combined with an array of support services including site frequency evaluation, intermodulation studies, client training and interference mitigation services, all of which facilitated in the delivery of an efficient and highly robust radio network.

### TAIWAN MARITIME SAFETY COMMUNICATION SYSTEM

Taiwan's major maritime first responders implemented a nationwide maritime safety communications network across 3 stages providing coverage of the complete region.

RFI worked with one of the country's major systems integrators to implement a system which minimised potential interference and maximised longevity and performance within this critical communications network.

RFI's Meander<sup>®</sup> series antennas were chosen for their low PIM performance, light weight and wide bandwidth capability packaged in a compact size.

A successful and cost effective project was delivered and all expectations in performance met, with a low noise, high performance network delivered on time.







### **VHF Meander® Collinear Antennas**

The VHF Meander<sup>®</sup> is a unique product, offering market leading performance in a cost effective solution. With characteristics such as high power, large bandwidth and low PIM performance, the VHF Meander offers a solution to a diverse range of requirements.

- PIM rated, individually tested
- PIP rated to endure rigorous multi-carrier environments
- Large bandwidth
- Exceptional 400W continuous power rating
- Lightweight and highly durable
- Rugged build
- High reliability, and versatility



COL51 SERIES (130-174MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>5 Models covering 130-174MHz in 10MHz bands.</li> <li>Unity gain.</li> <li>Exceptional beamwidth over full band.</li> <li>Useful for close in coverage, telemetry and control station systems.</li> </ul>		
COL53 SERIES (130-174MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>5 Models covering 130-174MHz in 10 MHz bands.</li> <li>4dBd gain.</li> <li>Medium gain, with great coverage characteristics, including strong null fill.</li> <li>Useful for a good mix of gain and close in coverage, including local VHF coverage in multi-carrier environments.</li> </ul>		
COL54 SERIES (145-174MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>4 Models covering 145-174MHz in 10MHz bands.</li> <li>6 dBd gain.</li> <li>High gain, with great coverage characteristics and strong main lobe.</li> <li>Useful for long range coverage in multi-carrier combined systems.</li> </ul>		

### **ELECTRICAL SPECIFICATIONS**

Model	Gain dBi (dBd)	Frequency	Bandwidth	E Plane °	Power W	Passive IM 3rd order dBc*	Peak Instantaneous Power kW
COL51-140		130 - 140		100			
COL51-150		140 - 150		106			
COL51-160	2.1 (0)	150 - 160		92			
COL51-166		156 - 166		75			
COL51-174		162 - 174		82			
COL53-140	6.1 (4)	130 - 140		24	400 150		
COL53-150		140 - 150	Full band			400 -150	05
COL53-160		150 - 160	Full Darid		400		20
COL53-166		156 - 166					
COL53-174		162 - 174					
COL54-155	0.1.(0)	145 - 155					
COL54-160		150 - 160					
COL54-166	ō.ī (b)	156 - 166		17			
COL54-174		162 - 174					

#### **MECHANICAL SPECIFICATIONS**

Model	Construction	Length mm	Project Area cm <sup>2</sup>	Weight	Wind Gust	Shipping Weight	Shipping Dimensions	
COL51-140		2300	1705				Ø100 x 2500mm	
COL51-150		2100	1588				Ø100 x 2300mm	
COL51-160		2200	1683	11		13	Q100 x 2400mm	
COL51-166		2200	1636				Ø100 X 24001111	
COL51-174		2100	1597		- 040		Ø100 x 2300mm	
COL53-140	76mm Composite fibreglass sky	5500	4870	19	>240	22	Ø100 x 5700mm	
COL53-150	blue radome &	5200	4600	18		21 3 21	21	Ø100 x 5400mm
COL53-160	Ecofilm plated	5000	4460	18			21	Ø100 x 5200mm
COL53-166	aluminium mount	4800	4342	17 20		20	<b>Q</b> 100 × 5000mm	
COL53-174	lube	4800	4218	17		20	Ø100 X 500011111	
COL54-155		6500	5906	23	217	26		
COL54-160		6500	5810	21		24	Ø100 x 6700mm	
COL54-166		6500	5640	2	>240	23		
COL54-174		6000	5420	19		22	Ø100 x 6200mm	



### **UHF Meander® Collinear Antennas**

The UHF Meander<sup>®</sup> is the most popular of the Meander range, offering a lightweight cost effective solution; it is adaptive and versatile with a large range of both gain and band offerings.

- PIM rated, individually tested
- PIP rated to endure rigorous multi-carrier environments
- Exceptional Bandwidth
- Comprehensive range, covering UHF band, gain and coverage options.
- Exceptional 250W continuous power rating
- Lightweight, high durability
- High reliability



COL41 SERIES (380-520MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>5 Models covering 380-520MHz, in 20MHz bands.</li> <li>Unity gain.</li> <li>Exceptional beamwidth over full band.</li> <li>Useful for close in coverage, telemetry and control station systems.</li> </ul>		
COL43 SERIES (380-520MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>6 Models covering 380-520MHz in 20MHz bands.</li> <li>4dBd gain.</li> <li>Medium gain, with great coverage characteristics, including strong null fill.</li> <li>Useful for a good mix of gain and close in coverage.</li> <li>Including localised multi-carrier environments. LMR, critical systems, telemetry, transport.</li> </ul>		
COL45 SERIES (350-520MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>7 models, and the most comprehensive and versatile of the Meander<sup>®</sup> series.</li> <li>Covering 350-520MHz in 20MHz bands.</li> <li>7 dBd gain.</li> <li>High gain, with great coverage characteristics, and strong main lobe.</li> <li>Useful for medium to long range coverage.</li> <li>Uses include multi-carrier combined systems in LMR, critical systems, public safety, telemetry, mining, and transport.</li> </ul>		
COL410 SERIES (145-174MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>6 Models covering 380-520, in 20MHz bands.</li> <li>9 dBd gain.</li> <li>High gain, with great coverage characteristics and strong main lobe.</li> <li>Useful for long range coverage in multi-carrier combined systems. Including multi-carrier combined systems in LMR, critical systems and public safety.</li> </ul>		

#### **ELECTRICAL SPECIFICATIONS**

Model	Gain dBi (dBd)	Frequency	Bandwidth	E Plane °	Power W	Passive IM 3rd order dBc*	Peak Instantaneous Power kW
COL41-58		380 - 400		109			
COL41-65	2.1 (0)	400 - 420		96			
COL41-70		450 - 470		71			
COL41-71		470 - 490		69			
COL41-72		490 - 520		57			
COL43-400		380 - 400					
COL43-420		400 - 420					
COL43-430	71(5)	410 - 430		01			
COL43-470	1.1 (5)	450 - 470		21			
COL43-490		470 - 490			250 -150		
COL43-520		490 - 520					
COL45-370		350 - 370	Full Pand			25	
COL45-400		380 - 400	i uli Dallu			-130	20
COL45-420		400 - 420		12.5			
COL45-430	9.1 (7)	410 - 430					
COL45-470		450 - 470					
COL45-490		470 - 490					
COL45-520		490 - 520					
COL410-400		380 - 400					
COL410-420		400 - 420					
COL410-430	11 1 (0)	410 - 430		7			
COL410-470	11.1 (9)	450 - 470		1			
COL410-490		470 - 490					
COL410-520		490 - 520					

### **MECHANICAL SPECIFICATIONS**

Model	Construction	Length mm	Projected Area cm <sup>2</sup>	Weight	Wind Gust	Shipping Weight	Shipping Dimensions
COL41-58							
COL41-65							
COL41-70		1100	437	2.1		4	Ø70 x 1300mm
COL41-71							
COL41-72							
COL43-400		2170	980	2.0	>240		
COL43-420		2035	916	2.9		4	Ø70 x 2300mm
COL43-430	38mm Composite fibreglass sky	1970	871				
COL43-470	blue radome &	1860	810	2.7			Ø70 x 2200mm
COL43-490	Ecofilm plated aluminium mount	1794	770			3.5	
COL43-520		1735	736	2.6			
COL45-370	lube	3665	1625	3	214	5.5	Ø70 x 3700mm
COL45-400		3360	1516		232		Ø70 x 3600mm
COL45-420		3100	1399			5	Ø70 x 3300mm
COL45-430		3045	1372				Ø70 x 3200mm
COL45-470		2810	1265				Ø70 x 3000mm
COL45-490		2720	1224	2.5		4.5	Ø70 x 2900mm
COL45-520		2615	1176				Ø70 x 2800mm
COL410-400		6210	4765	11.5	>240	25.5	Ø115 x 6400mm
COL410-420	fibreglass sky	5900	4570	11		25	Ø115 x 6200mm
COL410-430	blue radome &	5820	4474	11		24	Ø115 x 6000mm
COL410-470	Ecofilm plated	5390	4144	10.5		23	Ø115 x 5600mm
COL410-490	aluminium mount tube	5200	3969	10		22	Ø115 x 5400mm
COL410-520	ເພນະ	4940	3774	10		21.5	Ø115 x 5200mm

**Note:** For further detail on specific model numbers please refer to model specific PDS at **rfiwireless.com.au** \* 2 x 20W, 3rd order PIM test performed on each item produced, to give -150dBc PIM rating

### **800MHz Meander® Collinear Antennas**

The 800MHz Meander<sup>®</sup> offers exceptional bandwidth, over a great range of gain variants. The low PIM performance allows for applications for everything from control stations to public safety and even LTE.

- PIM rated, individually tested
- PIP rated to endure rigorous multi-carrier environments
- Exceptional bandwidth
- Comprehensive range, covering 800MHz band, gain and coverage options
- Includes ISM900 band coverage
- Exceptional 250W continuous power rating
- Lightweight, high durability
- High reliability



COL81 SERIES (746-930MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>3 models covering 746-930MHz in full bands.</li> <li>Unity gain.</li> <li>Exceptional beamwidth over full band.</li> <li>Useful for close in coverage, telemetry and control station systems.</li> </ul>		
COL84 SERIES (746-930MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>3 models covering 746-930MHz in full bands.</li> <li>5 dBd gain.</li> <li>Medium gain, with great coverage characteristics.</li> <li>Useful for a good mix of gain and close in coverage.</li> <li>Including localised multi-carrier environments, LMR, critical systems, telemetry, and transport.</li> </ul>		
COL85 SERIES (746-930MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>3 models covering 746-930MHz in full bands.</li> <li>7 dBd gain.</li> <li>Great coverage characteristics, with strong main lobe, and good null fill.</li> <li>Useful for medium to long range coverage.</li> <li>Uses include multi-carrier combined systems in LMR, critical systems, public safety, telemetry, mining, transport.</li> </ul>		
COL811 SERIES (746-930MHz)	Typical VSWR Response	Typical E-Plane
<ul> <li>4 models covering 746-930MHz in full bands.</li> <li>9 dBd gain.</li> <li>High gain, with great coverage characteristics, and strong main lobe.</li> <li>Useful for long range, large area coverage in multi-carrier combined systems.</li> <li>Including multi-carrier combined systems in LMR, critical systems, public safety and telemetry.</li> </ul>		

#### Note: For further detail on specific model numbers please refer to model specific PDS at rfiwireless.com.au

\* 2 x 20W, 3rd order PIM test performed on each item produced, to give -150dBc PIM rating

### **ELECTRICAL SPECIFICATIONS**

Model	Gain dBi (dBd)	Frequency	Bandwidth	E Plane °	Power W	Passive IM 3rd order dBc*	Peak Instantaneous Power kW
COL81-806		746 - 806					
COL81-870	2.1 (0)	806 - 870		67			
COL81-930		850 - 930					
COL84-806		746 - 806		16	16 250 -150 13		
COL84-870	7.1 (5)	806 - 870					
COL84-930		850 - 930				-150	25
COL85-806	9.1 (7)	746 - 806	Full Band	13			
COL85-870		806 - 870					
COL85-930		850 - 930					
COL811-806	11.1 (0)	746 - 806		_			
COL811-824		796 - 824					
COL811-870	11.1 (9)	806 - 870		ſ			
COL811-930		850 - 930					

#### **MECHANICAL SPECIFICATIONS**

Model	Construction	Length mm	Project Area cm <sup>2</sup>	Weight	Wind Gust	Shipping Weight	Shipping Dimensions
COL81-806					2.2		
COL81-870		1100	437	2.2		4	Ø70 x 1300mm
COL81-930							
COL84-806		1716	726				
COL84-870	38mm Composite	1633	680	3		5	Ø70 x 2000mm
COL84-930	fibreglass sky blue radome &	1567	647		>240		
COL85-806	500 x Ø48.5mm	1960	844	2.1		4.1	Ø70 x 2100mm
COL85-870	aluminium mount	1860	785				Ø70 x 2000mm
COL85-930	tube	1780	736				Ø70 x 2000mm
COL811-806		3610	1629	11.5			Ø70 x 3800mm
COL811-824	-	3520	1599	11		E	Ø70 x 3700mm
COL811-870		3390	1512	11		3	Ø70 x 3500mm
COL811-930		3200	1428	10			Ø70 x 3400mm



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