

Crossband Coupler

MBC Series

The MBC-2-5 Crossband Coupler allows WLAN services to be added to indoor cellular distributed coverage systems.

- Radiating cable systems
- In-building distributed antenna systems (DAS)
- Broadband



2G/3G - WLAN Crossband Coupler MBC-2-5

SPECIFICATIONS	MBC-2-5
Application	Indoor
Frequency Range, MHz	800 - 1000 / 1700 - 2200, 2400 - 2500
Number of Input Ports	2
Number of Output Ports	1
Connectors	N
Input Connector Type	N female
Output Connector Type	N female
Impedance, Ohm	50
Insertion Loss, dB	< 0.3 (800-1000 MHz), < 1.5 (1700-2200 MHz), < 1.7 (2400-2500 MHz)
Isolation, dB	> 50
Return Loss - Input Port, dB	> 15
Input Power per Port, W	< 100 (800-1000/1700-2200 MHz), < 50 (2400-2500 MHz)
Temperature Range, °C (°F)	-40 to +65 (-40 to 149)
Height (Less Connectors), mm (in)	151 (5.95), excluding connectors
Width (Less Connectors), mm (in)	86 (3.39)
Length (Less Connectors), mm (in)	19 (0.75)
Mounts in 19" (483mm) EIA Rack	No
Weight, kg (lb)	0.8 (1.76)
Intermodulation (IM3)	< -130 dBc at 2 x 20 dBm inputs
Environmental Class	Indoor

Directional Coupler

DC*-380/520 Series

This directional coupler series is designed to decouple a defined part of the RF signal off the main through line. It allows to provide side branches of a wireless system with the required signal strength. It covers 380-520 MHz. Indoor and outdoor versions are available.

- Low Loss.
- Low Profile.
- Flat Response.
- Indoor and outdoor version available.



30 dB Directional Coupler

SPECIFICATIONS (ALL MODELS)

Number of Input Ports	1
Number of Output Ports	2
Impedance, Ohm	50
Directivity, dB	> 20
Total Input Power, W	< 200
Insertion Loss, dB	< 3.5 (through line)
VSWR (50 Ohm)	< 1.25
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	20.5 (0.80)
Width (Less Connectors), mm (in)	50 (1.96)
Length (Less Connectors), mm (in)	158 (6.22)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	DC3-380/520	DC3E-380/520	DC6-380/520	DC6E-380/520
Product Type	3dB Directional Coupler	3dB Directional Coupler	6dB Directional Coupler	6dB Directional Coupler
Application	Indoor	Outdoor	Indoor	Outdoor
Coupling Value, dB	3	3	6	6
Weight, kg (lb)	0.38 (0.83)	0.74 (1.6)	0.38 (0.83)	0.74 (1.6)
Environmental Class		IP 66		IP 66
Input Connector Type	N female	N female	N female	N female
Output Connector Type	N female	N female	N female	N female
SPECIFICATIONS	DC10-380/520	DC10E-380/520	DC15-380/520	DC15E-380/520
Product Type	10dB Directional Coupler	10dB Directional Coupler	15dB Directional Coupler	15dB Directional Coupler
Application	Indoor	Outdoor	Indoor	Outdoor
Coupling Value, dB	10	10	15	15
Weight, kg (lb)	0.38 (0.83)	0.74 (1.6)	0.38 (0.83)	0.74 (1.6)
Environmental Class		IP 66		IP 66
Input Connector Type	N female	N female	N female	N female
Output Connector Type	N female	N female	N female	N female
SPECIFICATIONS	DC20-380/520	DC20E-380/520	DC30-380/520	DC30E-380/520
Product Type	20dB Directional Coupler	20dB Directional Coupler	30dB Directional Coupler	30dB Directional Coupler
Application	Indoor	Outdoor	Indoor	Outdoor
Coupling Value, dB	20	20	30	30
Weight, kg (lb)	0.38 (0.83)	0.74 (1.6)	0.38 (0.83)	0.74 (1.6)
Environmental Class		IP 66		IP 66
Input Connector Type	N female	N female	N female	N female
Output Connector Type	N female	N female	N female	N female

Directional Coupler

DC*-800/2500 Series

This directional coupler series is designed to decouple a defined part of the RF signal off the main through line. It allows to provide side branches of a wireless system with the required signal strength. It covers 800-2500 MHz. Indoor and outdoor versions are available.

- Low Loss.
- Low Profile.
- Flat Response.
- Indoor and outdoor version available.



10dB Directional Coupler

SPECIFICATIONS (ALL MODELS)

Number of Input Ports	1
Number of Output Ports	2
Impedance, Ohm	50
Directivity, dB	> 18
Total Input Power, W	< 200
Insertion Loss, dB	< 3.5 (through line)
VSWR (50 Ohm)	< 1.3
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	19 (0.75)
Width (Less Connectors), mm (in)	57 (2.24)
Length (Less Connectors), mm (in)	85.5 (3.37)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	DC3-800/2500	DC3E-800/2500	DC6-800/2500	DC6E-800/2500
Product Type	3dB Directional Coupler	3dB Directional Coupler	6dB Directional Coupler	6dB Directional Coupler
Application	Indoor	Outdoor	Indoor	Outdoor
Coupling Value, dB	3	3	6	6
Weight, kg (lb)	0.30 (0.66)	0.55 (1.2)	0.30 (0.66)	0.55 (1.2)
Environmental Class		IP 66		IP 66
Input Connector Type	N female	N female	N female	N female
Output Connector Type	N female	N female	N female	N female
SPECIFICATIONS	DC10-800/2500	DC10E-800/2500	DC15-800/2500	DC15E-800/2500
Product Type	10dB Directional Coupler	10dB Directional Coupler	15dB Directional Coupler	15dB Directional Coupler
Application	Indoor	Outdoor	Indoor	Outdoor
Coupling Value, dB	10	10	15	15
Weight, kg (lb)	0.30 (0.66)	0.55 (1.2)	0.30 (0.66)	0.55 (1.2)
Environmental Class		IP 66		IP 66
Input Connector Type	N female	N female	N female	N female
Output Connector Type	N female	N female	N female	N female

Directional Coupler

DC*-380/2500 Series

This directional coupler is designed to allow two signals to be combined and equally shared into the output ports.

- Ultra Wideband.
- 18dB Isolation over the whole band



3dB Directional Coupler

SPECIFICATIONS (ALL MODELS)

Number of Input Ports	2
Number of Output Ports	2
Impedance, Ohm	50
Insertion Loss, dB	< 3.3 ±0.7
Temperature Range, °C (°F)	-10 to 50 (14 to 122)
Height (Less Connectors), mm (in)	47 (1.85)
Width (Less Connectors), mm (in)	250 (9.84)
Length (Less Connectors), mm (in)	136 (5.35)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	DC3-380/2500	DC3-380/2500-N
Product Type	3dB Directional Coupler	3dB Directional Coupler
Application	Indoor	Indoor
Weight, kg (lb)	2.6 (5.7)	2.6 (5.7)
Input Connector Type	7-16 female	N female
Output Connector Type	7-16 female	N female

SCPD*-380/520 Series

This splitter series is designed to divide an incoming RF signal equally into 2, 3, 4 and 8 output ports. It covers 380-520 MHz. Indoor and outdoor versions are available.

- Low Loss.
- Low Profile.
- Flat Response.
- Indoor and outdoor version available.



2 Way Power Divider

SPECIFICATIONS (ALL MODELS)

Number of Input Ports	1
Connectors	N
Input Connector Type	N female
Output Connector Type	N female
VSWR (50 Ohm)	< 1.3
Input Power (Splitter mode), W	< 100
Impedance, Ohm	50
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	20 (0.80)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	SCPD2-380/520	SCPD2E-380/520	SCPD3-380/520	SCPD3E-380/520
Product Type	2 Way Power Divider	2 Way Power Divider	3 Way Power Divider	3 Way Power Divider
Application	Indoor	Outdoor	Indoor	Outdoor
Number of Output Ports	2	2	3	3
Insertion Loss, dB	< 3.5	< 3.5	< 5.8	< 5.8
Isolation, dB	> 18	> 18	> 18	> 18
Inserts, Mounting Connectors, mm (in)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)
Width (Less Connectors), mm (in)	41 (1.61)	41 (1.61)	41 (1.61)	41 (1.61)
Length (Less Connectors), mm (in)	123 (4.84)	123 (4.84)	123 (4.84)	123 (4.84)
Weight, kg (lb)	0.26 (0.57)	0.51 (1.1)	0.28 (0.6)	0.55 (1.2)
Environmental Class		IP 66		IP 66
SPECIFICATIONS	SCPD4-380/520	SCPD4E-380/520		
Product Type	4 Way Power Divider	4 Way Power Divider		
Application	Indoor	Outdoor		
Number of Output Ports	4	4		
Insertion Loss, dB	< 6.5	< 6.5		
Isolation, dB	> 18	> 18		
Inserts, Mounting Connectors, mm (in)	4@ 5.1mm, 117.2 x 111.2mm (4@0.2in, 4.6 x 4.4)	4@ 5.1mm, 117.2 x 111.2mm (4@0.2in, 4.6 x 4.4)		
Width (Less Connectors), mm (in)	124 (4.9)	124 (4.9)		
Length (Less Connectors), mm (in)	118 (4.65)	118 (4.65)		
Weight, kg (lb)	0.78 (1.7)	1.50 (3.3)		
Environmental Class		IP 66		

SCPD*-800/2500 Series

This splitter series is designed to divide an incoming RF signal equally into 2, 3, 4 and 8 output ports. It covers 800-2500 MHz. Indoor and outdoor versions are available.

- Low Loss.
- Low Profile.
- Flat Response.
- Indoor and outdoor version available.



3 Way Power Divider

SPECIFICATIONS (ALL MODELS)

Number of Input Ports	1
Connectors	N
Input Connector Type	N female
Output Connector Type	N female
VSWR (50 Ohm)	< 1.3
Input Power (Splitter mode), W	< 100
Impedance, Ohm	50
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	20 (0.80)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	SCPD2-800/2500	SCPD2E-800/2500	SCPD3-800/2500	SCPD3E-800/2500
Product Type	2 Way Power Divider	2 Way Power Divider	3 Way Power Divider	3 Way Power Divider
Application	Indoor	Outdoor	Indoor	Outdoor
Number of Output Ports	2	2	3	3
Insertion Loss, dB	< 3.5	< 3.5	< 5.5	< 5.5
Isolation, dB	> 20	> 20	> 20	> 20
Inserts, Mounting Connectors, mm (in)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)	4@5.1mm, 115.9 x 34.4mm (4@0.2in, 4.6 x 1.35)
Width (Less Connectors), mm (in)	41 (1.61)	41 (1.61)	41 (1.61)	41 (1.61)
Length (Less Connectors), mm (in)	123 (4.84)	123 (4.84)	123 (4.84)	123 (4.84)
Weight, kg (lb)	0.26 (0.57)	0.51 (1.1)	0.28 (0.6)	0.55 (1.2)
Environmental Class		IP 66		IP 66

SPECIFICATIONS	SCPD4-800/2500	SCPD4E-800/2500
Product Type	4 Way Power Divider	4 Way Power Divider
Application	Indoor	Outdoor
Number of Output Ports	4	4
Insertion Loss, dB	< 7	< 7
Isolation, dB	> 20	> 20
Inserts, Mounting Connectors, mm (in)	4@ 5.1mm, 117.2 x 111.2mm (4@0.2in, 4.6 x 4.4)	4@ 5.1mm, 117.2 x 111.2mm (4@0.2in, 4.6 x 4.4)
Width (Less Connectors), mm (in)	124 (4.9)	124 (4.9)
Length (Less Connectors), mm (in)	118 (4.65)	118 (4.65)
Weight, kg (lb)	0.65 (1.43)	1.3 (2.9)
Environmental Class		IP 66

UWBS* Series

Ultra Wide Band Splitters (UWBS) are used in the distribution of in-building or tunnel communication. The 70 - 2500 MHz bandwidth passes VHF, UHF, CDMA, GSM, UMTS and WLAN communications bands, allowing a single network to provide multiple services.

- Ultra wide band.
- Low Loss.
- Low Profile.
- Flat Response.



2 Way Ultra Wideband Power Divider

SPECIFICATIONS (ALL MODELS)	
Number of Input Ports	1
Connectors	N
Input Connector Type	N female
Output Connector Type	N female
Input Power (Splitter mode), W	< 100
Impedance, Ohm	50
Temperature Range, °C (°F)	-10 to +60 (14 to 140)
Height (Less Connectors), mm (in)	24 (0.94)
Mounts in 19" (483mm) EIA Rack	No

SPECIFICATIONS	UWBS-3-70/2500	UWBS-6-70/2400
Product Type	2 Way Ultra Wideband Power Divider	4 Way Ultra Wideband Power Divider
Application	Outdoor, Indoor	Outdoor, Indoor
Number of Output Ports	2	4
Insertion Loss, dB	< 3.8 at 70-1000 MHz, < 4.0 at 1000-2000 MHz, < 4.4 at 2000-2400 MHz, < 4.6 at 2400-2500 MHz	< 7.2 at 70-1000 MHz, < 7.6 at 1000-2000 MHz, < 7.8 at 2000-2400 MHz
Isolation, dB	> 7.5 at 70-150 MHz, > 13.5 at 150-2500 MHz	> 6.0 at 70-150 MHz, > 14.0 at 150-2400 MHz (Isolation between non adjacent ports: > 14.0 at 70-150 MHz, > 20.0 at 150-2400 MHz)
Return Loss - Output Port, dB	> 11.0 at 70-150 MHz, > 13.5 at 150-2500 MHz	> 8.0 at 70-150 MHz, > 12.0 at 150-2400 MHz
Return Loss - Input Port, dB	> 14.0 at 70-2400 MHz, > 11.0 at 2400-2500 MHz	> 14.0 at 70 - 150 MHz, > 12.0 at 150 - 2400 MHz
Width (Less Connectors), mm (in)	150 (5.9)	308 (12.13)
Length (Less Connectors), mm (in)	390 (15.35)	404 (15.39)
Weight, kg (lb)	1.7 (3.75)	4.2 (9.2)
Environmental Class	IP 66	IP 66

WINS Passive System Components

Combining Network

Whenever more than one BTS has to be connected into RF distribution system there is a need for a combining network.

This can be as simple as a crossband coupler for a two BTS system with bi-directional ports, each working on a different frequency band.

This can also be a complex system combining many services spread over a number of frequency bands, all switched onto the same RF distribution network.

The performance of these combining networks strongly influences the transmission quality of the entire WINS system in both directions, up link and down link, as there are for example: intermodulation products, frequency band separation, and up/down link separation. RFS has the knowledge and many years of experience in developing and producing this equipment.

RFS offer equipment for combining of one service per frequency band as well as of multi services per band, and multi band applications.

Larger complex combining networks are often customized equipment, developed or adapted to the special requirements of special applications.

RFS also offers standardized combiner modules in 19" rack technology that are suitable for many in-building and tunnel applications. One module generally features separated Rx and Tx ports for each of 4 BTS links combining them to one common port. One module serves one frequency band. Combiner modules are developed for all common mobile bands worldwide including:

- TETRA 380 MHz
- CDMA 800 MHz
- GSM 900 MHz
- GSM 1800 MHz
- PCS 1900 MHz
- UMTS 2100 MHz

Each combiner module can also be equipped with an additional RF port interface to link fiber optic converters.

A 19" multi-port module can combine up to four frequency bands providing two or four common bi-directional RF ports for distribution.

Multi-channel combining system

MCC* Series

The MCC series of multi-channel combiners allow the co-siting of a number of BTS' onto the one in-building or tunnel communication system. It is available in a modular system to maximize flexibility. These 19" modules are available in the TETRA, CDMA800, GSM900 and UMTS bands. Each combiner module can also be equipped with an additional RF port interface to link fiber optic converters.

- Modular System for Plug and Play.
- 4 high power input ports per band.
- Separate TX and RX ports to BTS.
- 1 common RF port to distribution network.
- Additional RF interface for fiber optic converters.
- Modules available for TETRA, CDMA800, GSM900, GSM1800, and UMTS.



Multi Carrier Combiner

SPECIFICATIONS (ALL MODELS)

Product Type	Multi Carrier Combiner
Application	Indoor
Number of Input Ports	4 x Tx, 4 x Rx
Number of Output Ports	1
Connectors	7-16
Input Connector Type	7-16 female
Output Connector Type	7-16 female
Impedance, Ohm	50
Return Loss - Output Port, dB	> 15
Return Loss - Input Port, dB	> 17
Input Power per Port, W	< 50
Temperature Range, °C (°F)	-10 to +50 (14 to 122)
Height (Less Connectors), mm (in)	4RU, 178 (7.0)
Width (Less Connectors), mm (in)	483 (19.0)
Length (Less Connectors), mm (in)	510 (20.08)
Mounts in 19" (483mm) EIA Rack	Yes
Weight, kg (lb)	24.0 (53.0)

SPECIFICATIONS	MCC-4T4R-TETRA380	MCC-4T4R-CDMA800	MCC-4T4R-GSM900	MCC-4T4R-GSM1800
Frequency Range, MHz	380 - 395	820 - 886	890 - 960	1710 - 1880
Isolation, dB	> 30 (DL-DL), > 20 (UL-DL), > 70 (DL-UL), > 80 (between bands)	> 30 (DL-DL), > 20 (UL-DL), > 70 (DL-UL), > 80 (between bands)	> 30 (DL-DL), > 20 (UL-DL), > 70 (DL-UL), > 80 (between bands)	> 30 (DL-DL), > 20 (UL-DL), > 70 (DL-UL), > 80 (between bands)

SPECIFICATIONS	MCC-4T4R-UMTS2100
Frequency Range, MHz	1920 - 2170
Isolation, dB	> 30 (DL-DL), > 20 (UL-DL), > 70 (DL-UL), > 80 (between bands)

Multi service combiner

MSC* series

This high isolation, low loss Point of Interface unit combines 3x4 duplex ports of GSM 900, GSM 1800, and UMTS into 4 output ports.

- Wideband.
- Low insertion loss.
- High isolation.
- All duplex ports.
- Compact size.



Multi Service Combiner

SPECIFICATIONS (ALL MODELS)

Product Type	Multi Service Combiner
Application	Indoor
Number of Input Ports	12
Number of Output Ports	4
Connectors	7-16
Input Connector Type	7-16 female
Output Connector Type	7-16 female
Impedance, Ohm	50
Return Loss - Output Port, dB	> 17.0 at GSM 900, > 15.0 at GSM 1800, > 14.0 at UMTS
Return Loss - Input Port, dB	> 16.0 (GSM 900 and 1800, UMTS)
Input Power per Port, W	< 50
Temperature Range, °C (°F)	-10 to +50 (14 to 122)
Height (Less Connectors), mm (in)	8RU, 356 (14.0)
Width (Less Connectors), mm (in)	483 (19.0)
Length (Less Connectors), mm (in)	320 (12.6)
Mounts in 19" (483mm) EIA Rack	Yes
Weight, kg (lb)	32 (71)

SPECIFICATIONS

MSC-4G-4D-4W-1

Frequency Range, MHz	870 - 2170
Isolation, dB	See Note

Isolation Note: >18.0 GSM 900 to GSM 900 ports, >20.0 GSM 1800 to GSM 1800 ports, >18.0 UMTS to UMTS ports; > 18.0 any common ports in GSM 900 band, > 20.0 any common ports in GSM 1800 band, > 18.0 any common ports in UMTS band; > 80.0 GSM 900 to GSM 1800 ports in GSM 900 band, > 48.0 GSM 900 to GSM 1800 ports in GSM 1800 band, > 80.0 GSM 900 to UMTS ports in GSM 900 band, > 48.0 GSM 900 to UMTS ports in UMTS band, > 60.0 GSM 1800 to UMTS ports in GSM 1800 band, > 70.0 GSM 1800 to UMTS ports in UMTS band

Multi-channel combining system

BBC-*/*-380/2500 Series

This broadband multi operator combiner allows the co-siting of a number of remote RF units (I-RFU series) into an in-building communication system. It distributes the combined signals into 4 output ports. All ports are broadband from TETRA to WLAN.

- Ultra Wideband.
- Low insertion loss.
- Low Passive Intermodulation.
- All ports broadband from TETRA to WLAN.



Broadband Coupler

SPECIFICATIONS	BBC-4/4-380/2500	BBC-4/4-380/2500-SMA-N	BBC-2/2-380/2500
Application	Indoor	Indoor	Indoor
Frequency Range, MHz	380 - 2500	380 - 2500	380 - 2500
Number of Input Ports	4	4	2
Number of Output Ports	4	4	2
Connectors	7-16	SMA, N	7-16
Input Connector Type	7-16 female	SMA female	7-16 female
Output Connector Type	7-16 female	N female	7-16 female
Impedance, Ohm	50	50	50
Insertion Loss, dB	< 7.2 ±1.6	< 7.2 ±1.6	< 3.6 ±0.8
Isolation, dB	> 15 (> 20 typical) between all ports	> 15 (> 20 typical) between all ports	> 15 (> 20 typical) between all ports
Return Loss - Output Port, dB	> 13.0 (> 18.0 typical)	> 13.0 (> 18.0 typical)	> 14.0 (> 18.0 typical)
Return Loss - Input Port, dB	> 13.0 (> 18.0 typical)	> 13.0 (> 18.0 typical)	> 14.0 (> 18.0 typical)
Input Power per Port, W	< 50	< 50	< 100
Temperature Range, °C (°F)	-10 to +50 (14 to 122)	-10 to +50 (14 to 122)	-10 to +50 (14 to 122)
Height (Less Connectors), mm (in)	4RU, 178 (7.0)	4RU, 178 (7.0)	2RU, 88 (3.5)
Width (Less Connectors), mm (in)	483 (19.0)	483 (19.0)	483 (19.0)
Length (Less Connectors), mm (in)	320 (12.6)	320 (12.6)	320 (12.6)
Mounts in 19" (483mm) EIA Rack	Yes	Yes	Yes
Weight, kg (lb)	17.0 (37.4)	17.0 (37.4)	7.0 (15.4)
Intermodulation (IM3)	< -140 dBc at 2 x 43 dBm in TETRA, CDMA, GSM 900 Rx bands, < -140 dBc at 2 x 38 dBm in GSM 1800, UMTS Rx bands		< -140 dBc at 2 x 43 dBm in TETRA, CDMA, GSM 900 Rx bands, < -140 dBc at 2 x 38 dBm in GSM 1800, UMTS Rx bands
Environmental Class	Indoor	Indoor	Indoor
SPECIFICATIONS	BBC-2/2-380/2500-SMA-N	BBC-2/2-380/2500-N-N	
Application	Indoor	Indoor	
Frequency Range, MHz	380 - 2500	380 - 2500	
Number of Input Ports	2	2	
Number of Output Ports	2	2	
Connectors	SMA, N	N	
Input Connector Type	SMA female	N female	
Output Connector Type	N female	N female	
Impedance, Ohm	50	50	
Insertion Loss, dB	< 3.6 ±0.8	< 3.6 ±0.8	
Isolation, dB	> 15 (> 20 typical) between all ports	> 15 (> 20 typical) between all ports	
Return Loss - Output Port, dB	> 14.0 (> 18.0 typical)	> 14.0 (> 18.0 typical)	
Return Loss - Input Port, dB	> 14.0 (> 18.0 typical)	> 14.0 (> 18.0 typical)	
Input Power per Port, W	< 100	< 100	
Temperature Range, °C (°F)	-10 to +50 (14 to 122)	-10 to +50 (14 to 122)	
Height (Less Connectors), mm (in)	2RU, 88 (3.5)	2RU, 88 (3.5)	
Width (Less Connectors), mm (in)	483 (19.0)	483 (19.0)	
Length (Less Connectors), mm (in)	320 (12.6)	320 (12.6)	
Mounts in 19" (483mm) EIA Rack	Yes	Yes	
Weight, kg (lb)	7.0 (15.4)	7.0 (15.4)	
Intermodulation (IM3)			
Environmental Class	Indoor	Indoor	

WINS Passive System Components

820-1880 MHz

Dual Band Diplexer

DBC* Series

This dual band diplexer is used to combine a GSM900 and a GSM1800 BTS onto the one RF network. It is also available with 7-16 sockets.

- Flat Response.
- Low Loss.
- Compact size.



Dual Band Diplexer

SPECIFICATIONS	DBC-2N
Application	Indoor
Frequency Range, MHz	820 - 1880
Number of Input Ports	2
Number of Output Ports	1
Connectors	N
Input Connector Type	N female
Output Connector Type	N female
Impedance, Ohm	50
Insertion Loss, dB	< 0.3
Isolation, dB	> 45 (CDMA 800/GSM 900), > 55 (GSM 1800)
Return Loss - Output Port, dB	> 15 (CDMA 800), > 20 (GSM 900 and 1800)
Return Loss - Input Port, dB	> 15 (CDMA 800), > 20 (GSM 900 and 1800)
Input Power per Port, W	< 250
Temperature Range, °C (°F)	-30 to +60 (-22 to 140)
Height (Less Connectors), mm (in)	41 (1.61)
Width (Less Connectors), mm (in)	155 (6.1)
Length (Less Connectors), mm (in)	200 (7.87)
Mounts in 19" (483mm) EIA Rack	No
Weight, kg (lb)	2.0 (4.2)

WINS Passive System Components

1710-2170 MHz

Branchline Coupler

BLC* Series

This wideband branchline coupler is designed to combine 2 signals to a common port or to split an incoming signal equally to 2 output ports.

- Wide band.
- High Power.
- Compact Size.
- Low Loss.



Branchline Coupler

SPECIFICATIONS	BLC19-1700/2200
Application	Outdoor, Indoor
Frequency Range, MHz	1710 - 2170
Number of Input Ports	2
Number of Output Ports	2
Connectors	7-16
Input Connector Type	7-16 female
Output Connector Type	7-16 female
Impedance, Ohm	50
Insertion Loss, dB	< 4
Isolation, dB	> 20
Return Loss - Output Port, dB	> 20
Return Loss - Input Port, dB	> 20
Total Input Power, W	< 200
Temperature Range, °C (°F)	-30 to +60 (-22 to 140)
Height (Less Connectors), mm (in)	35 (1.38)
Width (Less Connectors), mm (in)	134 (5.28)
Length (Less Connectors), mm (in)	105 (4.13)
Mounts in 19" (483mm) EIA Rack	No
Weight, kg (lb)	1.2 (2.6)
Environmental Class	IP 66

DC Block

DC Block* Series

DC Blocks are used to prevent the flow of direct current and low frequency current surges along the inner and outer conductors of a transmission line, while permitting the unimpeded flow of RF signals. Applications include the blocking of current surges in subway and train tunnels.



DC Block

SPECIFICATIONS	DC-BLOCK-4-NMF	DC-BLOCK-4-NFF	DC-BLOCK-4-7MF
Application	Outdoor	Outdoor	Outdoor
Frequency Range, MHz	160 - 2500	160 - 2500	160 - 2500
Number of Input Ports	1	1	1
Number of Output Ports	1	1	1
Connectors	N	N	7-16
Input Connector Type	N male	N female	7-16 male
Output Connector Type	N female	N female	7-16 female
Impedance, Ohm	50	50	50
Insertion Loss, dB	< 0.1	< 0.1	< 0.1
VSWR (50 Ohm)	<1.17 (160-300 MHz), <1.10 (300-2500 MHz)	<1.17 (160-300 MHz), <1.10 (300-2500 MHz)	<1.17 (160-300 MHz), <1.10 (300-2500 MHz)
Total Input Power, W	<500	<500	<500
Max. RF Peak Power, W	<1,000	<1,000	<1,000
Max. RF Peak Voltage, kV	4	4	4
Temperature Range, °C (°F)	-40 to +85 (-40 to 185)	-40 to +85 (-40 to 185)	-40 to +85 (-40 to 185)
Weight, kg (lb)	0.46 (1.0)	0.46 (1.0)	0.46 (1.0)
Intermodulation (IM3)	< -150 dBc typ.	< -150 dBc typ.	< -150 dBc typ.
Environmental Class	IP 66	IP 66	IP 66
SPECIFICATIONS	DC-BLOCK-4-7FF	DC-BLOCK-15-NMF	DC-BLOCK-15-NFF
Application	Outdoor	Outdoor	Outdoor
Frequency Range, MHz	160 - 2500	180 - 2500	180 - 2500
Number of Input Ports	1	1	1
Number of Output Ports	1	1	1
Connectors	7-16	N	N
Input Connector Type	7-16 female	N male	N female
Output Connector Type	7-16 female	N female	N female
Impedance, Ohm	50	50	50
Insertion Loss, dB	< 0.1	< 0.5	< 0.5
VSWR (50 Ohm)	<1.17 (160-300 MHz), <1.10 (300-2500 MHz)	<1.38 (180-380 MHz), <1.22 (380-2500 MHz)	<1.38 (180-380 MHz), <1.22 (380-2500 MHz)
Total Input Power, W	<500	<80	<80
Max. RF Peak Power, W	<1,000	<250	<250
Max. RF Peak Voltage, kV	4	15	15
Temperature Range, °C (°F)	-40 to +85 (-40 to 185)	-40 to +85 (-40 to 185)	-40 to +85 (-40 to 185)
Weight, kg (lb)	0.46 (1.0)	0.66 (1.45)	0.66 (1.45)
Intermodulation (IM3)	< -150 dBc typ.	< -150 dBc typ.	< -150 dBc typ.
Environmental Class	IP 66	IP 66	IP 66
SPECIFICATIONS	DC-BLOCK-15-7MF	DC-BLOCK-15-7FF	
Application	Outdoor	Outdoor	
Frequency Range, MHz	180 - 2500	180 - 2500	
Number of Input Ports	1	1	
Number of Output Ports	1	1	
Connectors	7-16	7-16	
Input Connector Type	7-16 male	7-16 female	
Output Connector Type	7-16 female	7-16 female	
Impedance, Ohm	50	50	
Insertion Loss, dB	< 0.5	< 0.5	
VSWR (50 Ohm)	<1.38 (180-380 MHz), <1.22 (380-2500 MHz)	<1.38 (180-380 MHz), <1.22 (380-2500 MHz)	
Total Input Power, W	<80	<80	
Max. RF Peak Power, W	<250	<250	
Max. RF Peak Voltage, kV	15	15	
Temperature Range, °C (°F)	-40 to +85 (-40 to 185)	-40 to +85 (-40 to 185)	
Weight, kg (lb)	0.66 (1.45)	0.66 (1.45)	
Intermodulation (IM3)	< -150 dBc typ.	< -150 dBc typ.	
Environmental Class	IP 66	IP 66	

Indoor Omnidirectional Antenna

I-ATO* Series

This omnidirectional antenna is specifically designed for broadband in-building distributed antenna systems for 2G, 3G and WLAN (WiFi)

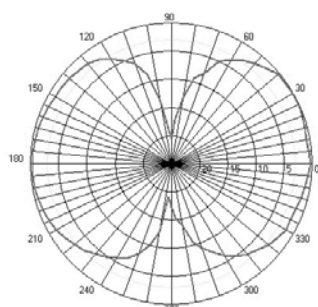
The off-white radome blends easily into most building aesthetics.

The unit is suitable for either wall or ceiling mountings

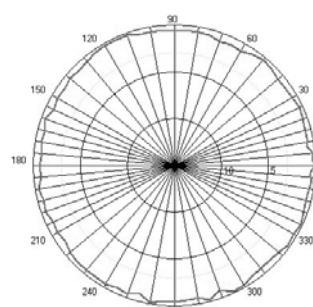
- Input power 50 watts maximum.
- Full wide band 800-2500 MHz.
- Aesthetically designed, compact and light weight.



Indoor Omnidirectional Antenna



Vertical Pattern



Horizontal Pattern

ELECTRICAL SPECIFICATIONS

Application	Indoor
Number of Input Ports	1
Impedance, Ohm	50
VSWR (50 Ohm)	< 1.5
Total Input Power, W	< 50
Gain, dBi (dBd)	Nominal 3.0 (0.9)
Polarization	Vertical
Horizontal Beamwidth, deg	360
Vertical Beamwidth, deg	Nominal 90

MECHANICAL SPECIFICATIONS

Radiating Element Material	Brass
Radome Material	ABS
Radome Color	White
Mounting Hardware included	Ceiling Mount
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	90 (3.54)
Length (Less Connectors), mm (in)	180 (7.09)
Weight, kg (lb)	0.25 (0.55)
Environmental Class	Indoor

ORDERING INFORMATION

Model Number	Frequency Range, MHz	Connectors	Input Connector Type
I-ATO2-800/2500	806 - 960, 1710 - 2500	N	N female

Indoor Panel Antenna

I-ATP* Series

Specifically designed for broadband in-building distributed antenna systems for 2G, 3G and WLAN (WiFi)

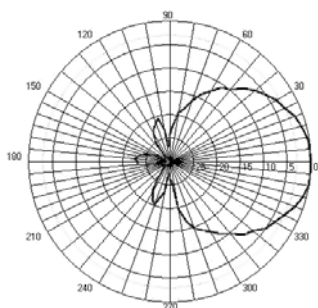
The off-white radome blends easily into most building aesthetics.

This unit is suitable for wall mounting.

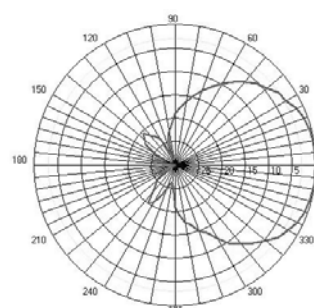
- Input power 50 watts maximum.
- Full wide band 800-2500 MHz.
- Aesthetically designed, compact and light weight.



Indoor Panel Antenna



Vertical Pattern



Horizontal Pattern

ELECTRICAL SPECIFICATIONS

Application	Indoor
Number of Input Ports	1
Impedance, Ohm	50
VSWR (50 Ohm)	< 1.5
Total Input Power, W	< 50
Gain, dBi (dBd)	Nominal 7.0 (4.9)
Polarization	Vertical
Horizontal Beamwidth, deg	70
Vertical Beamwidth, deg	Nominal 50

MECHANICAL SPECIFICATIONS

Connector Cable, mm (in)	390 (15.35)
Radiating Element Material	Silver-gilt brass
Radome Material	ABS
Radome Color	White
Mounting Hardware included	Wall bracket, screws
Temperature Range, °C (°F)	0 to +60 (32 to 140)
Height (Less Connectors), mm (in)	44 (1.73)
Width (Less Connectors), mm (in)	180 (7.09)
Length (Less Connectors), mm (in)	210 (8.27)
Weight, kg (lb)	0.6 (1.32)
Environmental Class	Indoor

ORDERING INFORMATION

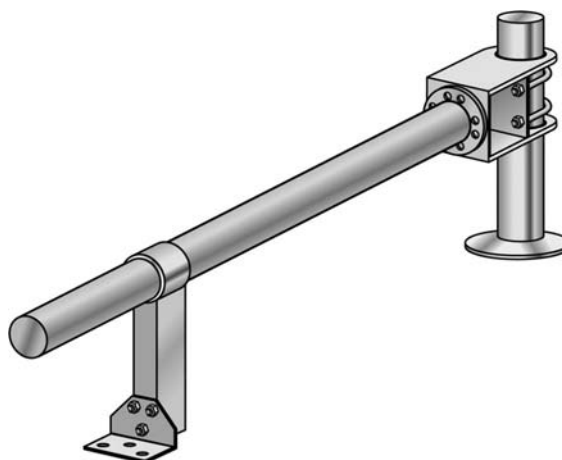
Model Number	Frequency Range, MHz	Connectors	Input Connector Type
I-ATP2-800/2500	806 - 960, 1710 - 2500	N	N female

Tunnel Helical Antenna

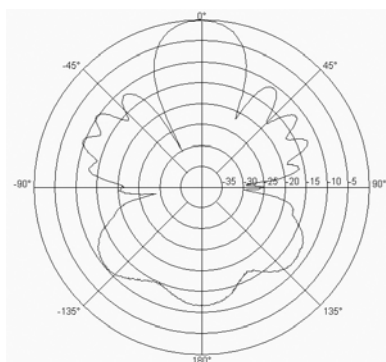
T-ASD* series

This helical antenna is specifically designed for tunnel coverage applications. Its robust construction is suitable for environments with high train speeds of up to 350 km/h (217 mph).

- For CDMA 800, GSM 900 and GSM-R.
- For heavy duty environment.
- For high speed train applications.



Tunnel Helical Antenna



Horizontal & Vertical Pattern

ELECTRICAL SPECIFICATIONS

Application	Outdoor
Number of Input Ports	1
Impedance, Ohm	50
VSWR (50 Ohm)	< 1.5
Total Input Power, W	< 400
Gain, dBi (dBd)	> 8.0 (5.9)
Polarization	Circular
Horizontal Beamwidth, deg	32
Vertical Beamwidth, deg	32

MECHANICAL SPECIFICATIONS

Connector Cable, mm (in)	300 (11.8)
Radiating Element Material	Copper
Radome Material	Fiberglass
Radome Color	White
Mounting Hardware included	Wall mounting for heavy duty
Temperature Range, °C (°F)	-30 to +60 (-22 to 140)
Height (Less Connectors), mm (in)	510 (20.1)
Width (Less Connectors), mm (in)	120 (4.7)
Length (Less Connectors), mm (in)	1859 (73.2)
Weight, kg (lb)	7.8 (17.2)
Environmental Class	IP 66

ORDERING INFORMATION

Model Number	Frequency Range, MHz	Connectors	Input Connector Type
T-ASD1-824/960	824 - 960	7-16	7-16 female