

The background of the page features a photograph of two communication towers. The tower on the right is tall and has a complex lattice structure with various antennas and equipment mounted at the top. The tower on the left is shorter and also has a lattice structure with antennas. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The text is overlaid on the left side of the image.

Transmission Line System

LHF Series(Low Loss Flexible Foam Dielectric Feeder)

HFC Series(Flexible Foam Dielectric Feeder)

HFSC Series(Super Flexible Foam Dielectric Feeder)

Jacket Option

Packing Information

Conversion Table

LHF Series

Low Loss Flexible Foam Dielectric Feeder



Construction

		LHF 12D (1/2")	LHF 22D (7/8")	LHF 33D (1-1/4")	LHF 42D (1-5/8")
Inner Conductor	Material / Construction	Copper-Clad Aluminum Wire	Smooth Copper Tube	Smooth Copper Tube	Helically Corrugated Copper Tube
	Diameter (mm)	5.0	9.4	13.7	18.1
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (mm)	12.5	22.1	32.5	42.5
Outer Conductor	Material / Construction	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube
	Diameter (mm)	14.0	24.9	36.0	46.5
Jacket Diameter	Standard Jacket (mm)	16.0	27.9	39.0	50.0
	Halogen-Free / Flame-Retardant Jacket (mm)	16.0	27.9	39.0	50.0

Mechanical Characteristics

		LHF 12D (1/2")	LHF 22D (7/8")	LHF 33D (1-1/4")	LHF 42D (1-5/8")
Min. Bending Radius (mm)		125	250	380	500
Recommended Operating Temperature	Standard Jacket (°C)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (°C)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (kg/km)	244	501	915	1,068
	Halogen-Free / Flame-Retardant Jacket (kg/km)	262	541	963	1,147
Flat Plate Crush Resistance (kg/mm)		2.0	1.8	2.4	1.6
Max. Pulling Force (kg)		113	147	260	181

Electrical Characteristics

		LHF 42D (1-5/8")	LHF 22D (7/8")	LHF 33D (1-1/4")	LHF 42D (1-5/8")
DC Resistance $\Omega/1,000\text{m}$ ($\Omega/1,000\text{ft}$)	Inner Conductor	1.6 (0.5)	1.4 (0.4)	0.9 (0.2)	1.4 (0.4)
	Outer Conductor	1.9 (0.6)	1.1 (0.3)	0.5 (0.2)	0.6 (0.2)
Insulation Resistance ($\text{m}\Omega \cdot \text{km}$)		10,000	10,000	10,000	10,000
Dielectric Strength (for 1 Min.)		DC 4,000V	DC 6,000V	DC 10,000V	DC 11,000V
Velocity of Propagation (%)		89	89	89	89
Peak Power Rating (kW)		40	91	200	302
Max. Operating Frequency (GHz)		8.8	4.9	3.3	2.5
Characteristic Impedance (Ω)		50 ± 1	50 ± 1	50 ± 1	50 ± 1
Return Loss (Typical Value) (dB)		28	28	28	28

Attenuation (at 20°C) & Average Power Rating (at Ambient 40°C, Inner Conductor 100°C)

Frequency (MHz)		LHF 12D (1/2")	LHF 22D (7/8")	LHF 33D (1-1/4")	LHF 42D (1-5/8")
Attenuation dB/100m (dB/100ft)	30	1.11 (0.34)	0.59 (0.18)	0.42 (0.13)	0.33 (0.10)
	100	2.06 (0.63)	1.13 (0.34)	0.79 (0.24)	0.64 (0.20)
	150	2.54 (0.77)	1.40 (0.43)	0.98 (0.30)	0.80 (0.24)
	450	4.51 (1.37)	2.52 (0.77)	1.77 (0.54)	1.48 (0.45)
	824	6.17 (1.88)	3.51 (1.07)	2.49 (0.76)	2.11 (0.64)
	894	6.42 (1.96)	3.67 (1.12)	2.61 (0.80)	2.20 (0.67)
	960	6.69 (2.04)	3.82 (1.16)	2.72 (0.83)	2.31 (0.70)
	1,000	6.84 (2.08)	3.92 (1.19)	2.79 (0.85)	2.38 (0.73)
	1,700	9.13 (2.78)	5.29 (1.61)	3.81 (1.16)	3.28 (1.00)
	1,800	9.41 (2.87)	5.47 (1.67)	3.94 (1.20)	3.40 (1.04)
	2,000	10.20 (3.10)	5.81 (1.77)	4.21 (1.28)	3.63 (1.11)
	2,400	11.00 (3.34)	6.46 (1.97)	4.37 (1.33)	4.05 (1.23)
	3,000	12.80 (3.89)	7.37 (2.25)	5.16 (1.57)	-
	3,500	13.70 (4.18)	8.08 (2.46)	-	-
	4,000	15.00 (4.58)	8.75 (2.67)	-	-
	5,000	16.90 (5.15)	9.99 (3.04)	-	-
Average Power Rating (kW)	30	6.81	17.75	22.96	35.22
	100	3.67	9.27	12.20	18.16
	150	2.98	7.48	9.84	14.53
	450	1.68	4.16	5.45	7.85
	824	1.22	2.98	3.87	5.51
	894	1.18	2.85	3.69	5.28
	960	1.13	2.74	3.54	5.03
	1,000	1.10	2.67	3.46	4.88
	1,700	0.83	1.98	2.53	3.54
	1,800	0.80	1.91	2.45	3.42
	2,000	0.74	1.80	2.29	3.20
	2,400	0.69	1.62	2.21	2.85
	3,000	0.59	1.42	1.87	-
	3,500	0.55	1.30	-	-
	4,000	0.50	1.20	-	-
	5,000	0.45	1.05	-	-

* Standard Conditions : V.S.W.R 1.0 ; Ambient Temperature 20°C

HFC Series

Flexible Foam Dielectric Feeder



Construction

		HFC 12D (1/2")	HFC 22D (7/8")	HFC 33D (1-1/4")	HFC 42D (1-5/8")
Inner Conductor	Material / Construction	Copper-Clad Aluminum Wire	Smooth Copper Tube	Smooth Copper Tube	Helically Corrugated Copper Tube
	Diameter (mm)	4.8	9.0	13.1	17.1
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (mm)	12.0	22.1	32.4	42.5
Outer Conductor	Material / Construction	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube	Annularly Corrugated Copper Tube
	Diameter (mm)	13.8	24.9	36.0	46.5
Jacket Diameter	Standard Jacket (mm)	16.0	27.9	39.0	50.0
	Halogen-Free / Flame-Retardant Jacket (mm)	16.0	27.9	39.0	50.0

Mechanical Characteristics

		HFC 12D (1/2")	HFC 22D (7/8")	HFC 33D (1-1/4")	HFC 42D (1-5/8")
Min. Bending Radius (mm)		125	250	380	510
Recommended Operating Temperature	Standard Jacket (°C)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (°C)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (kg/km)	242	546	963	1,265
	Halogen-Free / Flame-Retardant Jacket (kg/km)	260	590	1,014	1,358
Flat Plate Crush Resistance (kg/mm)		2.0	1.8	2.4	2.7
Max. Pulling Force (kg)		113	147	260	250

Electrical Characteristics

		HFC 12D (1/2")	HFC 22D (7/8")	HFC 33D (1-1/4")	HFC 42D (1-5/8")
DC Resistance $\Omega/1,000\text{m}$ ($\Omega/1,000\text{ft}$)	Inner Conductor	1.55 (0.47)	1.05 (0.32)	0.72 (0.22)	0.85 (0.26)
	Outer Conductor	1.9 (0.58)	1.05 (0.32)	0.45 (0.14)	0.36 (0.11)
Insulation Resistance ($\text{m}\Omega \cdot \text{km}$)		10,000	10,000	10,000	10,000
Dielectric Strength (for 1 Min.)		DC 4,000V	DC 6,000V	DC 9,000V	DC 11,000V
Velocity of Propagation (%)		88	88	88	88
Peak Power Rating (kW)		40	91	205	315
Max. Operating Frequency (GHz)		8.8	5	3.3	2.5
Characteristic Impedance (Ω)		50 ± 1	50 ± 1	50 ± 1	50 ± 1
Return Loss (Typical Value) (dB)		28	28	28	28

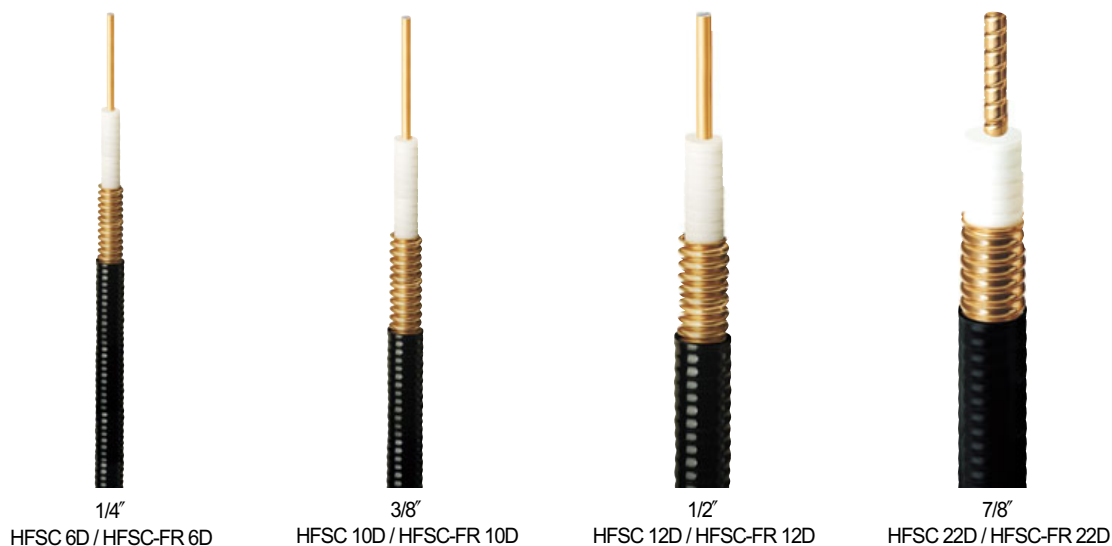
Attenuation (at 20°C) & Average Power Rating (at Ambient 40°C, Inner Conductor 100°C)

Frequency (MHz)		HFC 12D (1/2")	HFC 22D (7/8")	HFC 33D (1-1/4")	HFC 42D (1-5/8")
Attenuation dB/100m (dB/100ft)	30	1.17 (0.36)	0.64 (0.20)	0.44 (0.13)	0.36 (0.11)
	100	2.17 (0.66)	1.19 (0.36)	0.83 (0.25)	0.67 (0.20)
	150	2.67 (0.81)	1.47 (0.45)	1.03 (0.31)	0.84 (0.26)
	450	4.75 (1.45)	2.65 (0.81)	1.86 (0.57)	1.53 (0.47)
	824	6.49 (1.98)	3.68 (1.12)	2.62 (0.80)	2.17 (0.66)
	890	6.76 (2.05)	3.85 (1.18)	2.75 (0.84)	2.27 (0.69)
	960	7.04 (2.15)	4.01 (1.22)	2.86 (0.87)	2.38 (0.73)
	1,000	7.20 (2.19)	4.10 (1.25)	2.94 (0.90)	2.43 (0.74)
	1,700	9.61 (2.93)	5.54 (1.69)	4.01 (1.22)	3.35 (1.02)
	1,800	9.91 (3.02)	5.73 (1.75)	4.15 (1.26)	3.47 (1.06)
	2,000	10.70 (3.26)	6.09 (1.86)	4.43 (1.35)	3.71 (1.13)
	2,300	11.54 (3.52)	6.63 (2.02)	4.60 (1.40)	4.07 (1.24)
	3,000	13.44 (4.10)	7.81 (2.38)	5.43 (1.66)	–
	3,400	14.44 (4.40)	8.52 (2.59)	–	–
	4,000	15.81 (4.82)	9.42 (2.87)	–	–
	5,000	17.77 (5.42)	10.84 (3.30)	–	–
Average Power Rating (kW)	30	6.26	14.18	22.12	30.52
	100	3.43	7.63	11.73	16.40
	150	2.79	6.17	9.45	13.08
	450	1.56	3.43	5.23	6.95
	824	1.15	2.46	3.72	4.80
	890	1.10	2.35	3.54	4.62
	960	1.07	2.26	3.40	4.43
	1,000	1.04	2.20	3.31	4.31
	1,700	0.78	1.63	2.43	3.13
	1,800	0.75	1.53	2.35	2.98
	2,000	0.70	1.49	2.20	2.76
	2,300	0.65	1.36	1.50	2.51
	3,000	0.56	1.16	1.80	–
	3,400	0.52	1.06	–	–
	4,000	0.48	0.96	–	–
	5,000	0.43	0.83	–	–

* Standard Conditions : V.S.W.R 1.0 ; Ambient Temperature 20°C

HFSC Series

Super Flexible Foam Dielectric Feeder



Construction

		HFSC 6D (1/4")	HFSC 10D (3/8")	HFSC 12D (1/2")	HFSC 22D (7/8")
Inner Conductor	Material / Construction	Copper-Clad Aluminum Wire	Copper-Clad Aluminum Wire	Copper-Clad Aluminum Wire	Helically Corrugated Copper Tube
	Diameter (mm)	1.9	2.8	3.6	9.5
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (mm)	4.7	7.2	8.9	22.1
Outer Conductor	Material / Construction	Helically Corrugated Copper Tube	Helically Corrugated Copper Tube	Helically Corrugated Copper Tube	Annularly Corrugated Copper Tube
	Diameter (mm)	6.4	9.5	12.2	25.0
Jacket Diameter	Standard Jacket (mm)	7.5	10.5	13.6	27.9
	Halogen-Free / Flame-Retardant Jacket (mm)	8.0	10.8	13.6	27.9

Mechanical Characteristics

		HFSC 6D (1/4")	HFSC 10D (3/8")	HFSC 12D (1/2")	HFSC 22D (7/8")
Min. Bending Radius (mm)		25	25	32	125
Recommended Operating Temperature	Standard Jacket (°C)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (°C)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (kg/km)	76	117	201	471
	Halogen-Free / Flame-Retardant Jacket (kg/km)	80	123	211	494
Flat Plate Crush Resistance (kg/mm)		1.86	1.7	1.7	1.4
Max. Pulling Force (kg)		68	60	65	102

Electrical Characteristics

		HFSC 6D (1/4")	HFSC 10D (3/8")	HFSC 12D (1/2")	HFSC 22D (7/8")
DC Resistance $\Omega/1,000\text{m}$ ($\Omega/1,000\text{ft}$)	Inner Conductor	9.80 (2.99)	4.20 (1.28)	2.85 (0.87)	2.80 (0.26)
	Outer Conductor	6.50 (1.98)	5.00 (1.52)	3.25 (0.99)	1.20 (0.11)
Insulation Resistance ($\text{M}\Omega \cdot \text{km}$)		10,000	10,000	10,000	10,000
Dielectric Strength (for 1 Min.)		DC 1,600V	DC 2,300V	DC 2,500V	DC 6,000V
Velocity of Propagation (%)		81	81	81	88
Peak Power Rating (kW)		6.4	13.2	15.6	90
Max. Operating Frequency (GHz)		20.4	13.0	10.0	5.0
Characteristic Impedance (Ω)		50 ± 1	50 ± 1	50 ± 1	50 ± 1
Return Loss (Typical Value) (dB)		28	28	28	28

Attenuation (at 20°C) & Average Power Rating (at Ambient 40°C, Inner Conductor 100°C)

Frequency (MHz)		HFSC 6D (1/4")	HFSC 10D (3/8")	HFSC 12D (1/2")	HFSC 22D (7/8")
Attenuation dB/100m (dB/100ft)	30	3.15 (0.96)	2.28 (0.69)	1.80 (0.55)	0.70 (0.21)
	100	5.82 (1.77)	4.22 (1.29)	3.33 (1.01)	1.29 (0.39)
	150	7.17 (2.19)	5.20 (1.58)	4.10 (1.25)	1.61 (0.49)
	450	12.70 (3.87)	9.22 (2.81)	7.29 (2.22)	2.85 (0.87)
	824	17.60 (5.36)	12.70 (3.87)	10.10 (3.08)	3.97 (1.21)
	894	18.40 (5.61)	13.30 (4.05)	10.50 (3.20)	4.12 (1.26)
	960	19.10 (5.82)	13.80 (4.21)	11.00 (3.35)	4.32 (1.32)
	1,000	19.50 (5.94)	14.10 (4.30)	11.20 (3.41)	4.42 (1.35)
	1,700	26.10 (7.96)	18.80 (5.73)	15.00 (4.57)	5.95 (1.81)
	1,800	26.90 (8.20)	19.40 (5.91)	15.50 (4.72)	6.13 (1.87)
	2,000	28.50 (8.69)	20.60 (6.28)	16.40 (5.00)	6.52 (1.99)
	2,400	31.60 (9.63)	22.80 (6.95)	18.20 (5.55)	7.13 (2.17)
	3,000	35.80 (10.91)	25.80 (7.86)	20.70 (6.31)	8.27 (2.52)
	4,000	42.20 (12.86)	30.40 (9.27)	24.40 (7.44)	9.80 (2.99)
	6,000	53.40 (16.28)	38.40 (11.70)	31.00 (9.45)	-
	10,000	72.60 (22.13)	52.10 (15.90)	42.30 (12.90)	-
14,000	89.40 (27.25)	-	-	-	
16,000	97.20 (29.63)	-	-	-	
Average Power Rating (kW)	30	2.10	3.46	4.80	15.30
	100	1.14	1.87	2.59	8.24
	150	0.92	1.52	2.10	6.67
	450	0.52	0.86	1.18	3.74
	824	0.38	0.62	0.86	2.69
	894	0.36	0.60	0.82	2.57
	960	0.35	0.57	0.79	2.48
	1,000	0.34	0.56	0.77	2.42
	1,700	0.25	0.42	0.58	1.80
	1,800	0.25	0.41	0.56	1.74
	2,000	0.23	0.38	0.53	1.64
	2,400	0.21	0.35	0.47	1.48
	3,000	0.19	0.31	0.42	1.30
	4,000	0.16	0.26	0.35	1.10
	6,000	0.12	0.21	0.28	-
	10,000	0.19	0.15	0.20	-
14,000	0.07	-	-	-	
16,000	0.07	-	-	-	

* Standard Conditions : V.S.W.R 1.0 ; Ambient Temperature 20°C

Jacket Option

Standard Jacket

LHF & HFC & HFSC & RFCX & RFCL Series Cables Complying with;

- IEC 754-1 : Halogen Acid Gas Content (Chlorium < 0.5%)
- IEC 754-2 : Degree of Acidity of Gas (pH-Value < 4.0, Conductivity < 100 $\mu\text{S}/\text{cm}$)

Flame Retardant Jacket

LHF & HFC & HFSC & RFCX Series Cables Complying with;

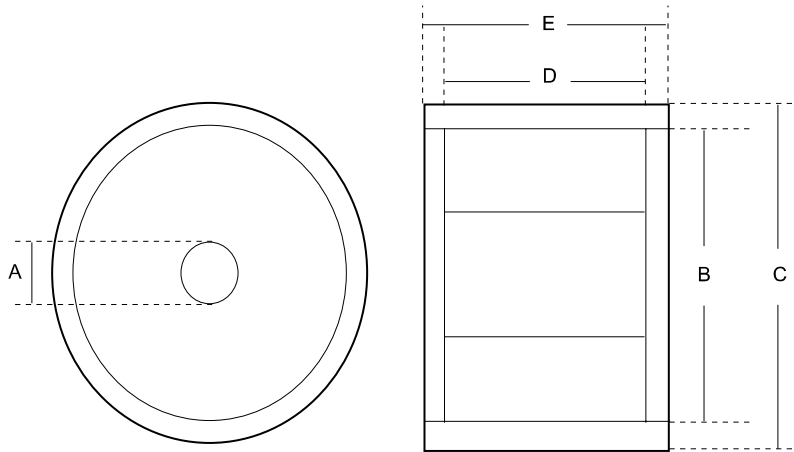
- IEC 754-1 : Halogen Acid Gas Content (Chlorium < 0.5%)
- IEC 754-2 : Degree of Acidity of Gas (pH-Value < 4.0, Conductivity < 100 $\mu\text{S}/\text{cm}$)
- IEC 332-1 : Flammability Test on Single Cables
- IEC 332-3C : Flammability Test on Cable Bundles
- IEEE 383 : Flammability Test on Cable Bundles
- ASTM E 662 : Optical Density of Smoke (Smoke - Density < 150)

RFCL Series Cables Complying with;

- IEC 754-1 : Halogen Acid Gas Content (Chlorium < 0.5%)
- IEC 754-2 : Degree of Acidity of Gas (pH-Value < 4.0, Conductivity < 100 $\mu\text{S}/\text{cm}$)
- IEC 332-1 : Flammability Test on Single Cables
- ASTM E 662 : Optical Density of Smoke (Smoke - Density < 150)

Model	Jacket	IEC 754-1	IEC 754-2	IEC 332-1	IEC 332-3C	IEEE 383	ASTME 662
LHF 12D	Halogen-Free Standard Black PE	○	○	-	-	-	-
LHF 22D							
LHF 33D							
LHF 42D							
HFC 12D							
HFC 22D							
HFC 33D							
HFC 42D							
HFSC 12D							
RFCX 12D							
RFCX 22D							
RFCX 33D							
RFCX 42D							
RFCL 22D							
RFCL 33D							
RFCL 42D							
LHF-FR 12D							
LHF-FR 22D							
LHF-FR 33D							
LHF-FR 42D							
HFC-FR 12D							
HFC-FR 22D							
HFC-FR 33D							
HFC-FR 42D							
HFSC-FR 12D							
RFCX-FR 12D							
RFCX-FR 22D							
RFCL-FR 22D	Halogen-Free Flame-Retardant Black Compound	○	○	○	-	-	○
RFCL-FR 33D							
RFCL-FR 42D							

Packing Information



Size	Model	Standard (m)	Drum Type					Drum Weight (kg)	Quantity of Drums Per Container		
			A	B	C	D	E		20 ft	40 ft	40 ft HQ
1-5/8"	LHF-FR 42D	500	110	2,100	2,190	1,020	1,200	685	5	10	10
	HFC-FR 42D										
	RFCX-FR 42D										
1-1/4"	LHF-FR 33D	500	110	1,700	1,790	750	900	367	6	13	13
	HFC-FR 33D										
	RFCX-FR 33D										
7/8"	LHF-FR 22D	500	110	1,250	1,320	650	750	181	12	25	25
	HFC-FR 22D										
	RFCX-FR 22D										
	HFSC-FR 22D										
1/2"	LHF-FR 12D	500	75	850	910	428	500	62	44	100	100
	HFC-FR 12D										
	RFCX-FR 12D										
	HFSC-FR 12D										
3/8"	HFSC-FR 10D	500	75	790	850	428	500	55	52	110	110
1/4"	HFSC-FR 6D	500	75	790	850	428	500	55	52	110	110

Conversion Table

The reflection coefficient sums up the effects of all the impedance variations within the cable and its end at a certain frequency.

“Return Loss” or “V.S.W.R” is usually used instead of reflection coefficient.

The following formulas can be used for converting among the “Return Loss”, “Reflection Coefficient” and “V.S.W.R.”

$$V.S.W.R = \frac{1 + \Gamma}{1 - \Gamma}$$

$$\text{Reflection Coefficient } (\Gamma) = \frac{R.L. - 1}{R.L. + 1}$$

$$R.L. (\text{Return Loss}) = -20 \log (|\Gamma|)$$

V.S.W.R	Return Loss (dB)	Reflection Coefficient (%)	V.S.W.R	Return Loss (dB)	Reflection Coefficient (%)	V.S.W.R	Return Loss (dB)	Reflection Coefficient (%)
1.010	46.06	0.512	1.053	31.80	2.570	1.138	23.80	6.457
1.011	45.60	0.525	1.055	31.40	2.692	1.141	23.60	6.607
1.012	44.80	0.575	1.058	31.00	2.818	1.145	23.40	6.761
1.012	44.20	0.616	1.059	30.80	2.884	1.149	23.20	6.918
1.013	44.00	0.631	1.060	30.71	2.910	1.150	23.13	6.980
1.013	43.60	0.660	1.064	30.20	3.090	1.156	22.80	7.244
1.014	43.00	0.707	1.065	30.00	3.162	1.160	22.60	7.413
1.015	42.80	0.724	1.068	29.60	3.311	1.164	22.40	7.586
1.016	42.40	0.776	1.070	29.40	3.338	1.168	22.20	7.762
1.017	41.60	0.832	1.072	29.20	3.467	1.170	22.12	7.830
1.018	41.20	0.871	1.074	29.00	3.548	1.173	22.00	7.943
1.019	40.60	0.933	1.075	28.80	3.631	1.177	21.80	8.128
1.020	40.08	0.990	1.077	28.40	3.715	1.180	21.66	8.260
1.021	39.80	1.023	1.080	28.30	3.85	1.181	21.60	8.318
1.022	39.40	1.072	1.083	28.00	3.981	1.186	21.40	8.511
1.023	39.00	1.122	1.085	27.80	4.074	1.190	21.23	8.680
1.024	38.60	1.175	1.087	26.70	4.196	1.200	20.83	9.090
1.025	38.20	1.230	1.089	27.40	4.266	1.210	20.08	9.910
1.026	37.60	1.288	1.090	27.32	4.310	1.230	19.73	10.310
1.029	37.00	1.413	1.091	27.20	4.365	1.240	19.40	10.710
1.030	36.59	1.480	1.094	27.00	4.467	1.250	19.08	11.110
1.031	36.40	1.514	1.096	26.80	4.571	1.260	18.48	11.500
1.032	36.00	1.585	1.098	26.60	4.677	1.270	18.49	11.890
1.035	35.40	1.698	1.101	26.40	4.786	1.280	18.22	12.280
1.036	35.00	1.778	1.106	26.00	5.012	1.290	17.95	12.660
1.037	34.80	1.820	1.108	25.80	5.129	1.300	17.69	13.040
1.040	34.19	1.950	1.111	25.60	5.248	1.310	17.45	13.420
1.042	33.80	2.042	1.114	25.40	5.370	1.330	16.98	14.160
1.043	33.60	2.089	1.116	25.20	5.495	1.350	16.54	14.890
1.044	33.40	2.138	1.119	25.00	5.563	1.360	16.33	15.250
1.045	33.20	2.188	1.122	24.80	5.754	1.370	16.13	15.610
1.046	33.00	2.239	1.125	24.60	5.888	1.380	15.94	15.970
1.049	32.40	2.339	1.130	24.29	6.100	1.390	15.75	16.320
1.050	32.20	2.255	1.135	24.00	6.310	1.400	15.60	16.600

In-Building Solution

Indoor Products

Passive Component

Wide Band Power Splitter

Wide Band Power Tapper

Directional Coupler

3dB Hybrid Coupler

Combiner

Dual Band Combiner

Triple Band Combiner

Indoor Antenna

Dual Band Omni Antenna

Multi Band Omni Antenna

Dual Band Patch Antenna

Multi Band Patch Antenna

Wide Band Yagi Antenna

Radiating Cable

RFCX Series

RFCL Series

Indoor Products

Applications

High Rise Buildings / Hotel / Shopping Center / Airport / Tunnels / Metros / Campus Area

Coverage for Wireless Technologe

TETRA 380 / TETRA 450 / TETRA 800 / CDMA 800 / GSM 900 / GSM / DCS 1800 / PCS 1900
W-CDMA 2100 / Wimax / WLAN

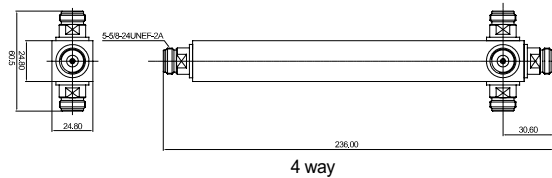
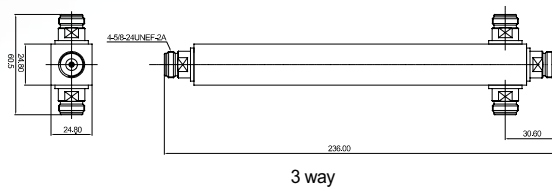
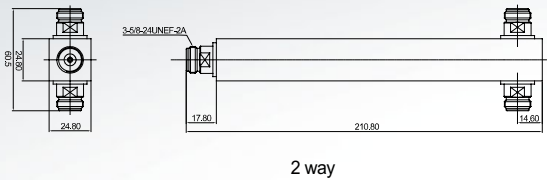
Technical Service Coverage

Site Survey / System Design / Installation (also subcontractor to local Companies) / Training
Supervision / Commissioning / Acceptance Tests



Passive Component

Wide Band Power Splitter (SPT-Xway-100-NF)



Description

This specification details the requirements for wide band power splitter for mobile networks. It is designed to divide an incoming RF signal into certain output port. It covers wide band 800 to 2,500MHz. Indoor and outdoor versions are available.

Electrical Characteristics

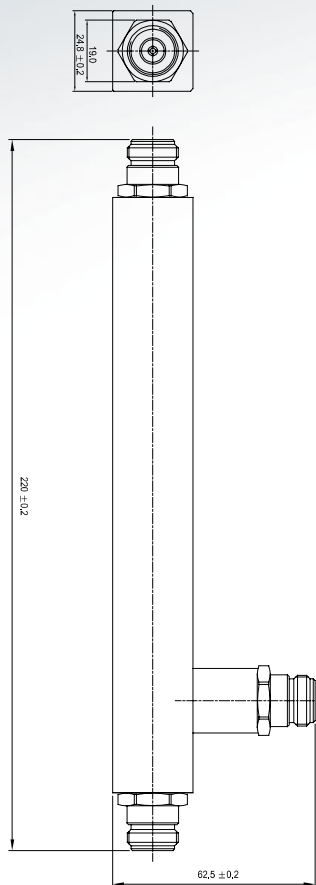
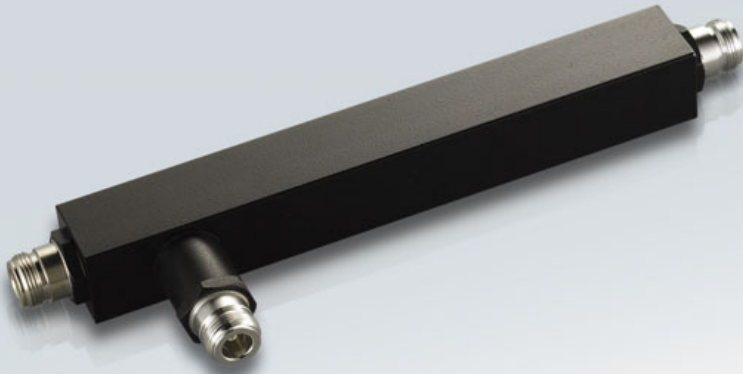
Frequency Range	800 ~ 2,500MHz		
For Connecting Antennas	2 way	3way	4way
Insertion Loss	0.05 dB		
Impedance	50 Ω		
V.S.W.R	< 1.25	< 1.25	< 1.3
IMD	-150dBc		
Max. Power	100W (at 50°C Ambient Temperature)		
Connector	N-Female (Other Connector Type is Available)		

Mechanical Characteristics

Weight	Approx. 0.6kg
Size	210 x 60 x 25 mm

Passive Component

Wide Band Power Tapper(TAP-XdB-100-NF)



Description

This specification details the requirements for wide band power tapper for mobile networks. It is designed to divide an incoming RF signal into certain output port. It covers wide band 800 to 2,500MHz. Indoor and outdoor versions are available.

Electrical Characteristics

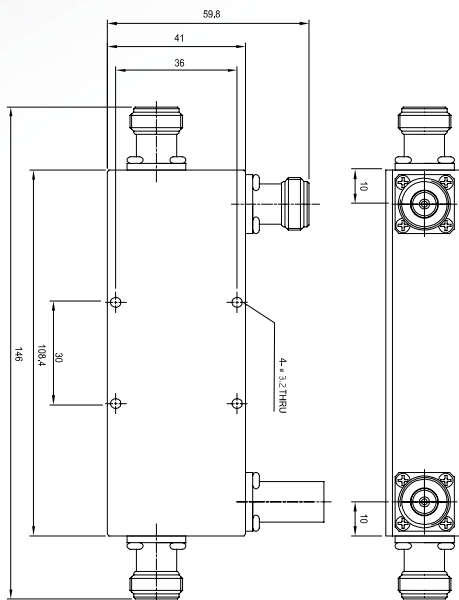
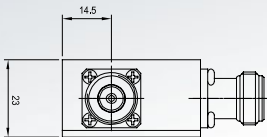
Frequency Range	800 ~ 2,500MHz		
Tap Loss			
Input ↔ P ₁	- 1.0dB	- 0.4dB	- 0.1dB
Input ↔ P ₂	- 7.0dB	- 10.4dB	- 15.1dB
For connecting... antennas	2		
Insertion Loss	< 0.05dB		
Impedance	50Ω		
V.S.W.R	< 1.5		
Intermodulation IM3 (2×43dBm carrier)	-150dBc		
Max. Power	100W (at 50°C Ambient Temperature)		
Connector	N-Female		
Weight	approx. 0.5kg		
Profile Cross-Section	25 x 25mm		
Packing Size	267 x 95 x 111mm		
Max. Size	244/64/25mm		

Mechanical Characteristics

Weight	Approx. 0.45 kg
Size	220 x 62.5 x 24.8 mm

Passive Component

Directional Coupler (CPL-100-XX-NF)



Description

This specification details the requirements for wide band coupler for mobile networks. It is designed to decouple defined part of the RF signal from the main through line. It covers 800 to 2,500MHz.

Electrical Characteristics

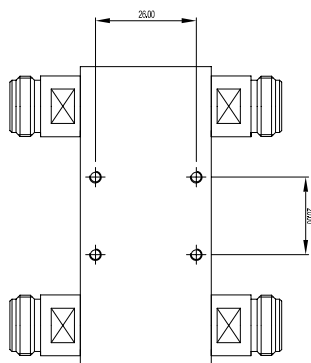
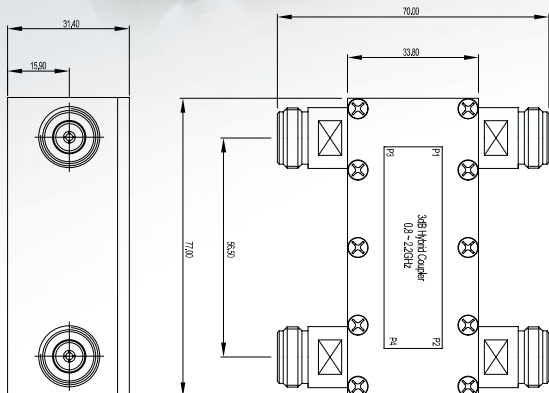
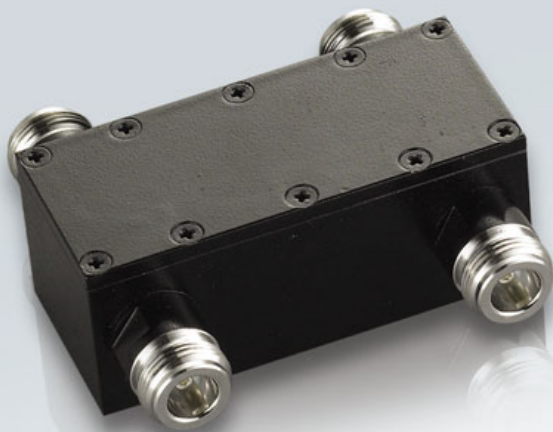
Frequency Range	800 ~ 2,500MHz					
Coupling Loss	6dB±0.8	8dB±1.0	10dB±1.0	15dB±1.0	20dB±1.0	30dB±1.0
Insertion Loss	1.5dB	1.1dB	0.7dB	0.4dB	0.2dB	0.2dB
Directivity	20dB					
Impedance	50Ω					
V.S.W.R	< 1.3					
IMD	-140dBc					
Max. Power	100W (at 50°C Ambient Temperature)					
Connector	N-Female (Other Connector Type is Available)					

Mechanical Characteristics

Weight	Approx. 0.5 kg
Size	146 x 59.8 x 23 mm

Passive Component

3dB Hybrid Coupler (CPL-100-3-NF)



Description

This specification details the requirements for 3dB hybrid coupler for mobile networks. It supports indoor application in 800 to 2,200MHz. The wide frequency range allows use with multiband antennas, radiating cable systems and wireless base stations.

Electrical Characteristics

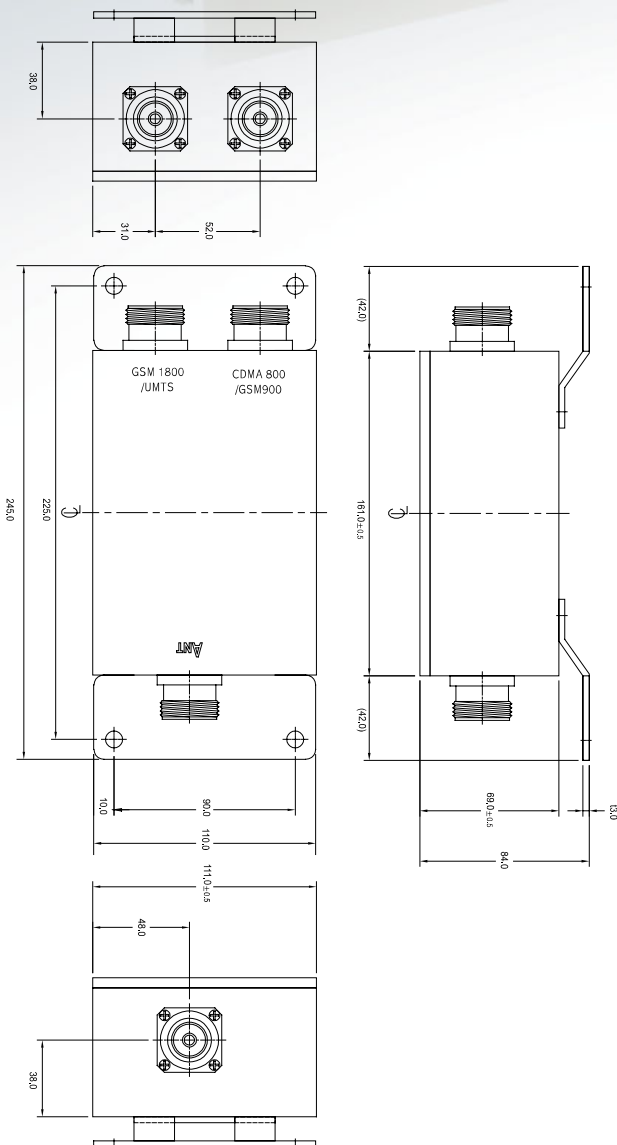
Frequency Range	800 ~ 2,200MHz
Coupling Loss	3dB \pm 1.2
Directivity	20dB
Impedance	50 Ω
V.S.W.R	< 1.2
IMD	-150dBc
Max. Power	300W (at 50°C Ambient Temperature)
Connector	N-Female (Other Connector Type is Available)

Mechanical Characteristics

Weight	Approx. 0.5kg
Size	77 x 70 x 31.4 mm

Combiner

Dual Band Combiner (COM-DUO-W-DF)



Description

This specification details the requirements for dual band combiner for mobile networks.

It allows the co-siting of a number of remote RF unit into an in-building communication system. It distributes the combined signal into 2 output ports.

All ports are broad band from GSM to UMTS.

Electrical Characteristics

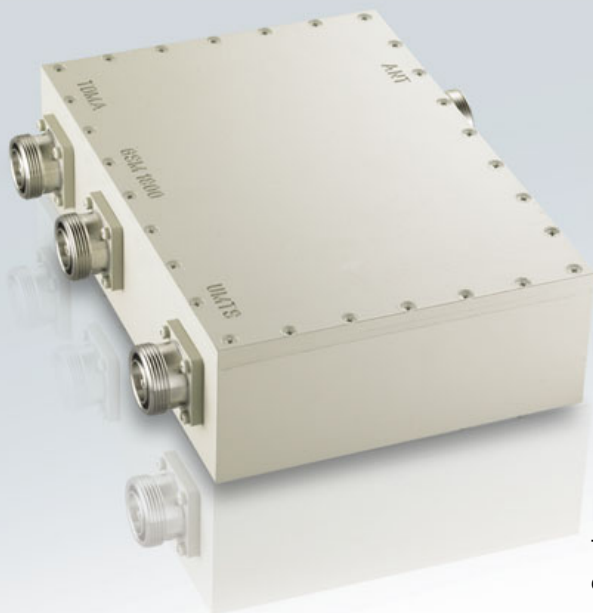
Pass Band	Band1	806 ~ 960MHz
	Band2	1,710 ~ 2,170MHz
Insertion Loss	Port1 ↔ Port3	0.15dB (806 ~ 960MHz)
	Port2 ↔ Port3	0.25dB (1,710 ~ 2,000MHz)
	Port2 ↔ Port3	0.35dB (2,000 ~ 2,170MHz)
Isolation	Port1 ↔ Port3	> 50dB (806 ~ 960MHz)
	Port2 ↔ Port3	> 50dB (1,710 ~ 2,000MHz)
	Port2 ↔ Port3	> 50dB (2,000 ~ 2,170MHz)
V.S.W.R	< 1.2 (806 ~ 960 / 1,710 ~ 2,170 MHz)	
Impedance	50Ω	
Input Power	Band1	< 250W
	Band2	< 200W
IMD	-150dBc	
Temperature Range	-55°C +60°C	
Connector	7/16DIN-Female	
Application	Indoor or Outdoor (IP 66)	
Wall Mounting	With 4 Screws (Max. 8mm Diameter)	

Mechanical Characteristics

Weight	1.6kg
Size	245 x 111 x 69mm

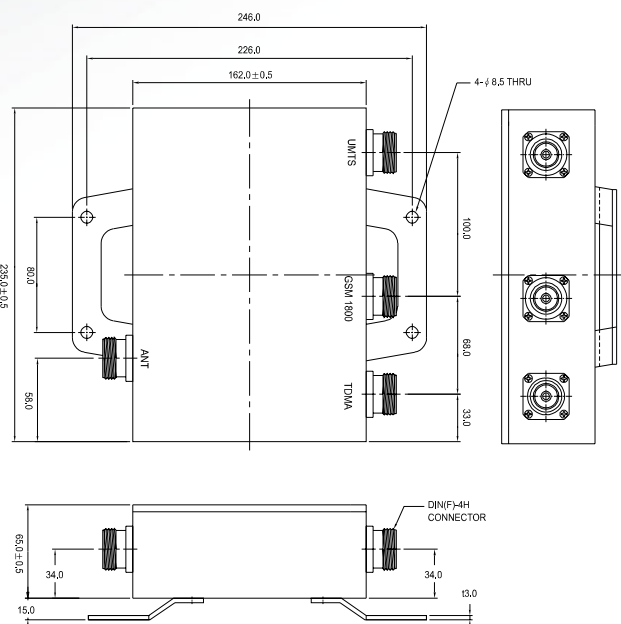
Combiner

Triple Band Combiner (COM-TRI-W-DF)



Description

This specification details the requirements for triple band combiner for mobile networks. It allows the co-siting of a number of remote RF unit into an in-building communication system. It distributes the combined signal into 3 output ports. All ports are broad band from GSM to UMTS.



Electrical Characteristics

Pass Band	Band1	806 ~ 960MHz
	Band2	1,710 ~ 1,880MHz
	Band3	1,920 ~ 2,170MHz
Insertion Loss	Port1 ↔ Port4	< 0.2 dB (806 ~ 960MHz)
	Port2 ↔ Port4	< 0.3 dB (1,710 ~ 1,880MHz)
	Port3 ↔ Port4	< 0.2 dB (1,920 ~ 2,170MHz)
Isolation	Port1 ↔ Port2	> 50dB (806 ~ 960 / 1,710 ~ 1,880 MHz)
	Port1 ↔ Port3	> 50dB (806 ~ 960 / 1,920 ~ 2,170 MHz)
	Port2 ↔ Port3	> 50dB (1,710 ~ 1,880MHz / 1,920 ~ 2,170MHz)
V.S.W.R	< 1.2 dB (806 ~ 960 / 1,710 ~ 1,880 / 1,920 ~ 2,170MHz)	
Impedance	50Ω	
Input Power	Band1	< 240W
	Band2	< 240W
	Band3	< 240W
IMD	-150dBc	
Temperature Range	-40°C +60°C	
Connector	7/16DIN-Female	
Application	Indoor or Outdoor (IP 66)	
Wall Mounting	With 4 Screws (Max. 8mm Diameter)	

Mechanical Characteristics

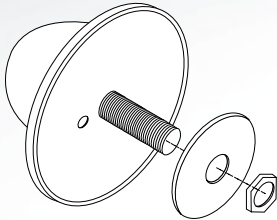
Weight	4.2kg
Size	246 x 235 x 65mm

Indoor Antenna

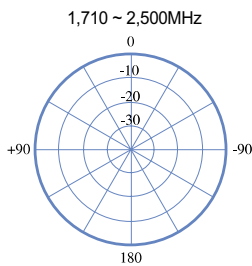
Dual Band Omni Antenna (A-OMN-DUO-2)



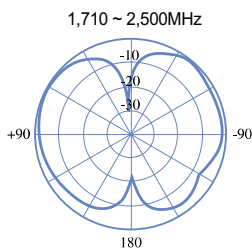
Installation



Radiation Pattern



Horizontal Pattern



Vertical Pattern

Description

The omni antennas provide dependable coverage along with solutions to many cost and reliability issues faced in wireless network deployments. These GSM band antennas maintain a pleasing low-profile design attractive enough for the more demanding aesthetic requirements of in-building applications. Furthermore, these omni antennas offer consistent pattern and V.S.W.R performance across the entire frequency band, and are available for GSM band. LS Cable can provide a complete solution to your internal wireless coverage needs.

Electrical Characteristics

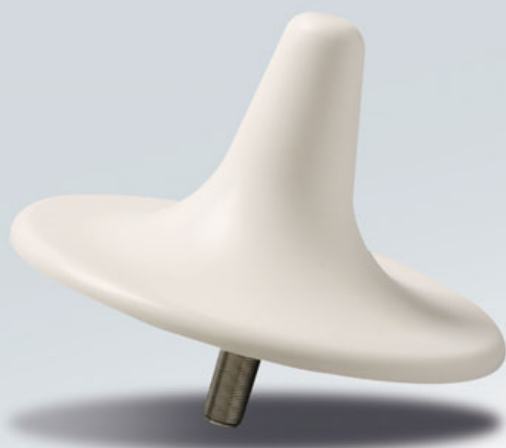
Frequency Range	1,710 ~ 2,500MHz
Polarization	Vertical
Gain	> 2dBi
V.S.W.R	< 1.5
Impedance	50 Ω
Max. Power Rating	100 W

Mechanical Characteristics

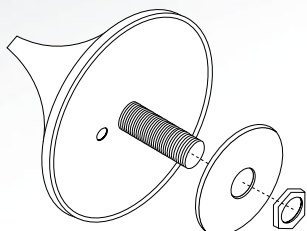
Dimension (Ø x H)	Ø 114 x 53mm
Shipping Dimension	120 x 120 x 95mm
Weight (excl. Brackets)	210g
Connector	1 x N-Female
Mounting	Ceiling
Radome (Color)	ASA (White)

Indoor Antenna

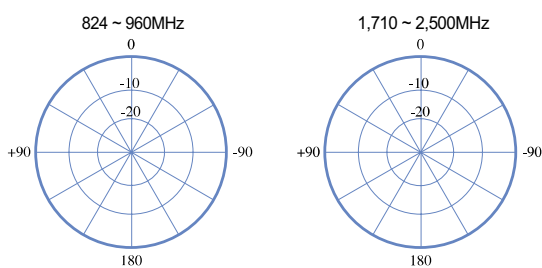
Multi Band Omni Antenna (A-OMN-W23)



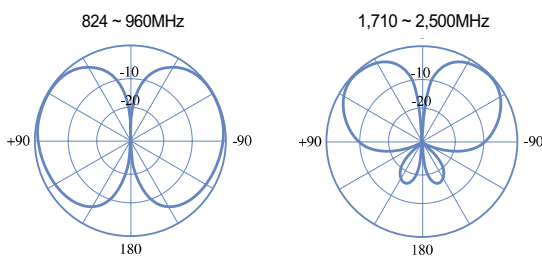
Installation



Radiation Pattern



Horizontal Pattern



Vertical Pattern

Description

The omni antennas provide dependable coverage along with solutions to many cost and reliability issues faced in wireless network deployments. These multi band antennas maintain a pleasing low-profile design attractive enough for the more demanding aesthetic requirements of in-building applications. Furthermore, this omni antennas offer consistent pattern and V.S.W.R performance across the entire frequency band, and are available for multi band. LS Cable can provide a complete solution to your internal wireless coverage needs.

Electrical Characteristics

Frequency Range	824 ~ 960MHz	1,710 ~ 2,500MHz
Polarization	Vertical	
Gain	> 2dBi	> 3dBi
V.S.W.R	< 1.6	
Impedance	50 Ω	
Max. Power Rating	50 W	

Mechanical Characteristics

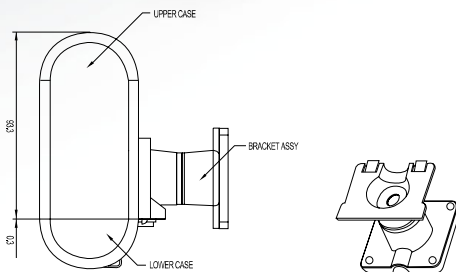
Dimension (Øx H)	Ø 184 x 105mm
Shipping Dimension	190 x 190 x 154mm
Weight (excl. Brackets)	270g
Connector	1 x N-Female
Mounting	Ceiling
Radome (Color)	ASA (White)

Indoor Antenna

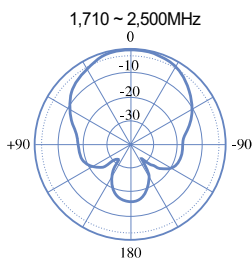
Dual Band Patch Antenna (A-PAT-DUO-7)



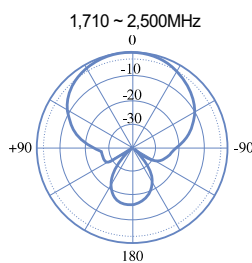
Installation



Radiation Pattern



Horizontal Pattern



Vertical Pattern

Description

LS Cable's dual band antennas are also ideally suited for parking garages, airports, shopping malls, department store and other difficult coverage areas. Designed for simple installation and minimal visual impact. An integral low-loss coaxial cable pigtail eliminates connectors, reducing overall system cost as well as the losses associated with connector junctions. This dual band antennas support both existing and future wireless applications.

Electrical Characteristics

Frequency Range	1,710 ~ 2,400MHz	2,400 ~ 2,500MHz
Polarization	Vertical	
Gain	> 7dBi	
V.S.W.R	< 1.5	< 1.8
Vertical Beam Width	> 55	
Horizontal Beam Width	> 60	
Impedance	50 Ohm	
Max. Power Rating	100 W	
F/B Ratio	15	

Mechanical Characteristics

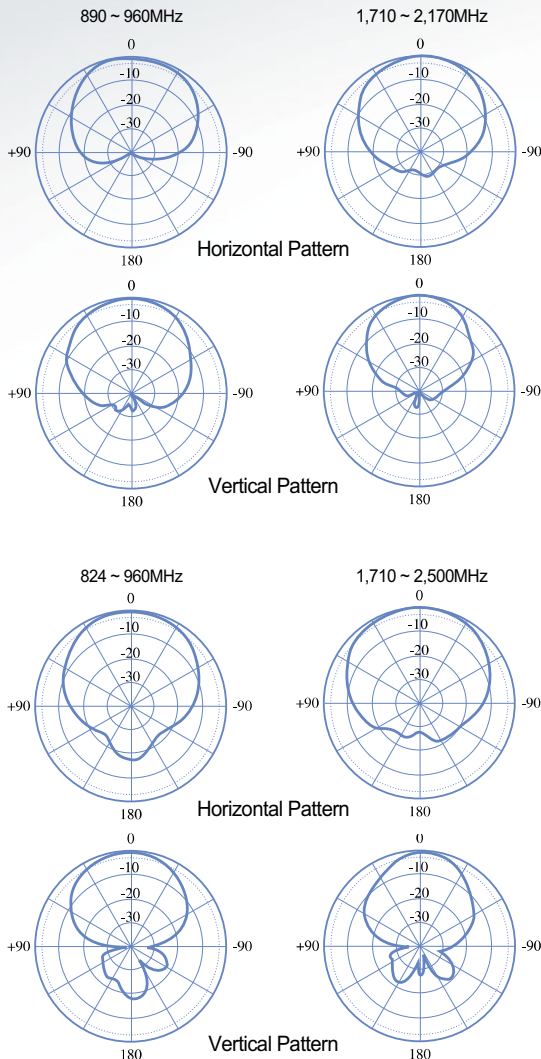
Size	108 x 118 x 50mm
Shipping Dimension	150 x 130 x 60mm
Weight	200g
Connector	1 x N-Female
Mounting	Wall
Radome (Color)	ASA (White)

Indoor Antenna

Multi Band Patch Antenna (A-PAT-W69)



Radiation Pattern



Description

LS Cable's multi band patch antennas are uniquely effective and positive solution to enhancing your in-building wireless system. Airports, shopping malls, department store and other difficult coverage areas. Designed for simple installation and minimal visual impact. An integral low-loss coaxial cable pigtail eliminates connectors, reducing overall system cost as well as the losses associated with connector junctions. This multi band patch antennas support both existing and future wireless applications.

Electrical Characteristics

Frequency Range	890~960MHz	1,710~2,170MHz	824~960MHz	1,710~2,500MHz
Polarization	Vertical		Vertical	
Gain	> 6dBi	> 9dBi	> 6dBi	> 9dBi
V.S.W.R	< 1.5		< 1.8	
Horizontal Beam Width	> 80	> 65	> 80	> 45
Vertical Beam Width	> 65	> 50	> 90	> 60
Impedance	50 Ohm		50 Ohm	
Max. Power Rating	50W		50W	
F/B Ratio	15		15	

Mechanical Characteristics

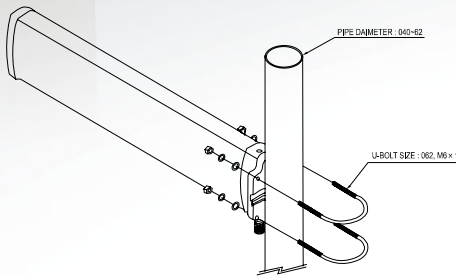
Size	180 x 210 x 42mm
Shipping Dimension	310 x 295 x 60mm
Weight	600g
Connector	1 x N-Female
Mounting	Wall
Radome (Color)	ASA (White)

Indoor Antenna

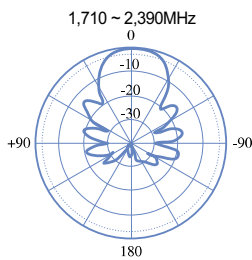
Wide Band Yagi Antenna (A-YG-W12)



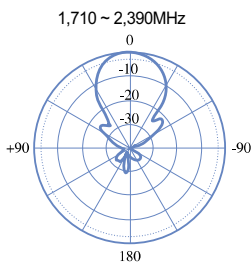
Installation



Radiation Pattern



Horizontal Pattern



Vertical Pattern

Description

LS Cable's wide band yagi antennas are uniquely effective and positive solution to enhancing your in-building wireless system. Airports, shopping malls, department store and other difficult coverage areas. Designed for simple installation and minimal visual impact. An integral low-loss coaxial cable pigtail eliminates connectors, reducing overall system cost as well as the losses associated with connector junctions. This wide band yagi antennas support both existing and future wireless applications.

Electrical Characteristics

Frequency Range	1,710 ~ 2,390MHz
Polarization	Vertical
Gain	12
V.S.W.R	< 1.5
Vertical Beam Width	> 28
Horizontal Beam Width	> 28
Impedance	50 Ohm
Max. Power Rating	100 W
F/B Ratio	15

Mechanical Characteristics

Size	450 x 105 x 48mm
Shipping Dimension	500 x 145 x 88mm
Weight	1,250g
Connector	1 x N-Female
Mounting	Pole
Radome (Color)	ASA (White)