www.lscable.com

LS RF Feeder System

21st Fl. ASEM Tower, 159 Samsung-dong Gangnam-gu, Seoul 135-798 Korea

Tel. +82-2-2189-9114 E-mail. rf@lscable.com

LS Cable
Leading Solution

RF Feeder System

We are at the Heart of All Human Communication

Leading Solution

LG Cable, LG Industrial Systems and LG-Nikko Copper,
Gaon Cable, E1 and Yesco are starting with
a new name, Leading Solution, LS.

New Dream, New Start

To become a leader in the competitive global market, LG has been divided into three groups, electronics and chemicals for LG, energy and distribution for GS, Industrial electric · electronics and material for LS based on their business specialties.

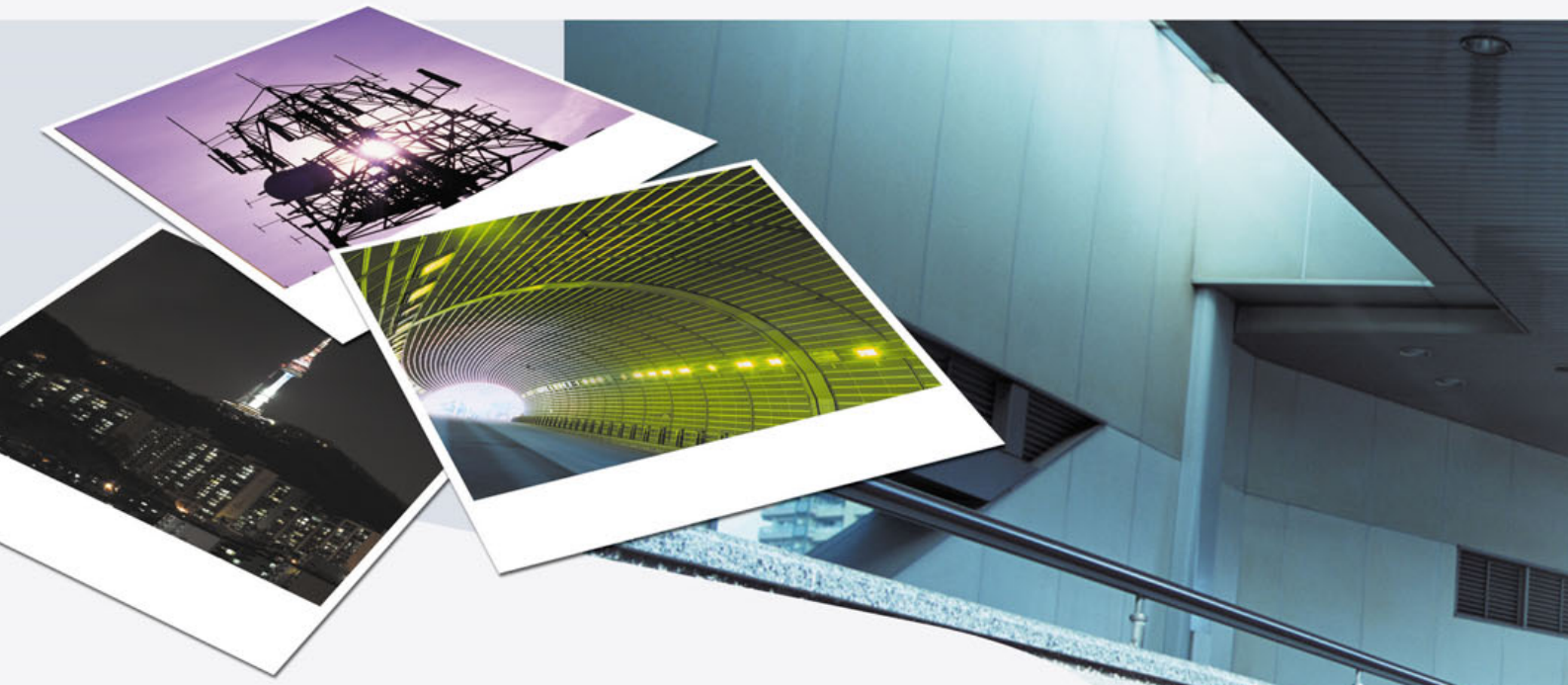
LS' main companies, such as LS cable, LS industrial systems, LS-Nikko copper, Gaon cable, E1 and Yesco, are ranked as No.1 in their respective industry. However, LS won't just sit back, satisfied with being the best in Korea. We will pave the way for becoming the world's best in industrial electric · electronics and material industry with the new CI, LS.

Your good partner LG Cable is making a fresh start as LS Cable

LS Cable is No. 1 cable maker in Korea and its business fields are telecommunication, electric power, components & materials and machinery. Also, LS Cable is creating new businesses particularly in component and materials industry. LS Cable makes its best to accomplish the vision, 'Your No.1 Creative Partner' and be one of the world leaders with high technology and best level of service.

RF Feeder System

for Wireless Base Station, Inbuilding System



LS Cable is a global designer of BTS feeder system and Indoor RF distributed antenna system, providing total-package solutions for wireless infrastructure.

LS Cable is preparing one-stop shopping package delivery system of BTS feeder system & indoor distribution system including indoor ant, radiating cables and passive component such as splitter and coupler.

Our RF Feeder System products have excellent electric characteristics such as low attenuation, low passive intermodulation (PIM), and guarantee fast and easy installation.

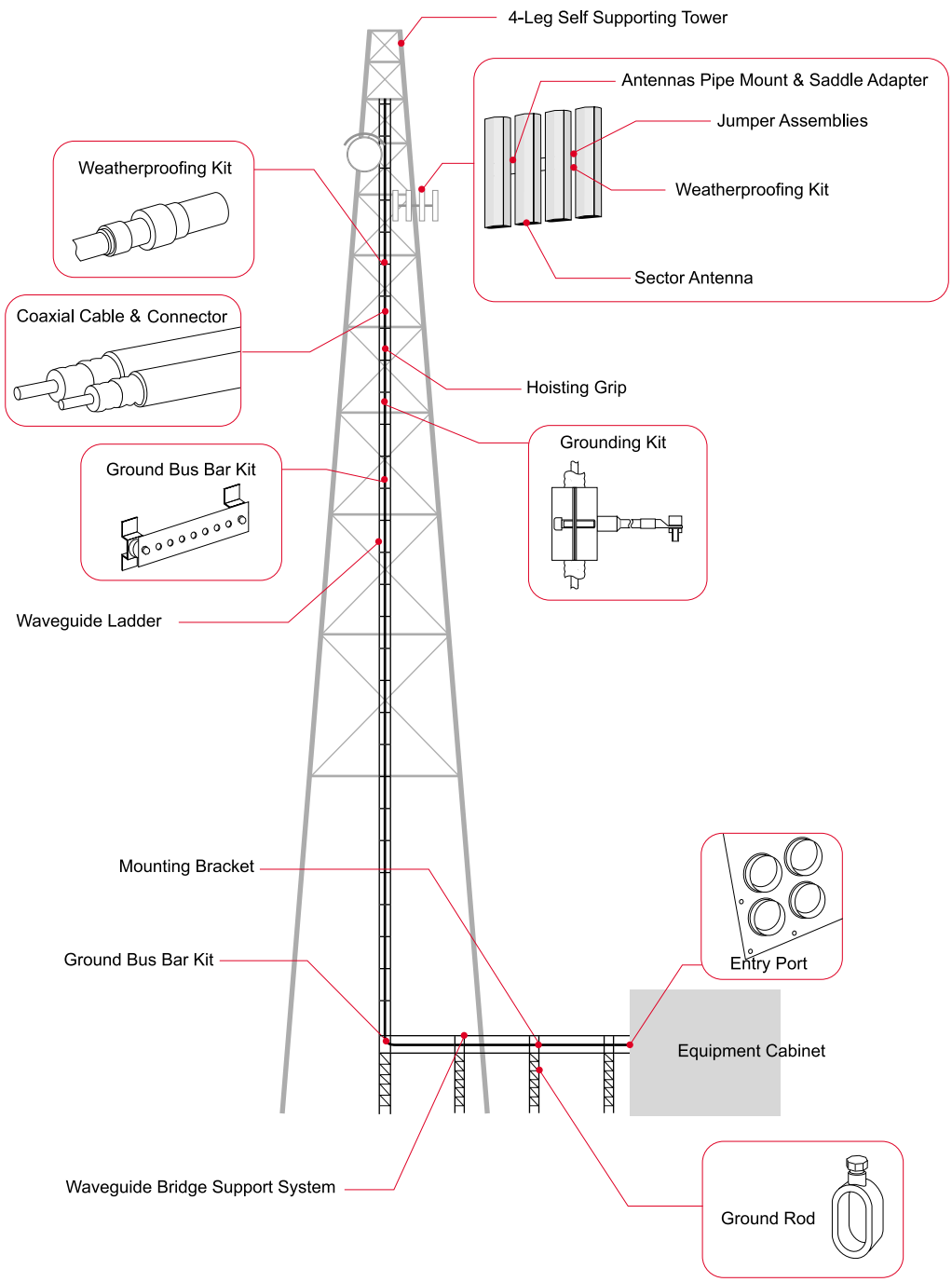
Our feeder cable series (LHF, HFC, and HFSC) have annular corrugations on the outer conductor which allows excellent flexibility for repeated bending and water prevention.

All cables feature abrasion resistant polyethylene jacket and also, as a jacket option, halogen free and flame retardant requirement which can be surely verified in our manufacturing site where is fully equipped for relevant international standards.

Contents

Application Guide
Self-Supporting Tower

Prior to beginning the design aspect of your system, it is important to have a general understanding of the applications which are common within the industry.



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

1/2″
LHF 12D / LHF-FR 12D

7/8″
LHF 22D / LHF-FR 22D

1-1/4″
LHF 33D / LHF-FR 33D

1 - 5/8″
LHF 42D / LHF-FR 42D

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 (㎜)	5.0	9.4	13.7	18.1
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (㎜)	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 (㎜)	14.0	24.9	36.0	46.5
Jacket Diameter	Standard Jacket (㎜)	16.0	27.9	39.0	50.0
	Halogen-Free / Flame-Retardant Jacket (㎜)	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 (㎜)		125	250	380	500
Recommended Operating Temperature	Standard Jacket (℃)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (℃)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (㎏/㎞)	244	501	915	1,068
	Halogen-Free / Flame-Retardant Jacket (㎏/㎞)	262	541	963	1,147
Flat Plate Crush Resistance (㎏/㎜)		2.0	1.8	2.4	1.6
Max. Pulling Force (㎏)		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 Ω/1,000m (Ω/1,000ft)	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 (mΩ·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℃) & Average Power Rating (at Ambient 40℃, Inner Conductor 100℃)

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℃

HFC Series
Flexible Foam Dielectric Feeder

1/2″
HFC 12D / HFC-FR 12D

7/8″
HFC 22D / HFC-FR 22D

1-1/4″
HFC 33D / HFC-FR 33D

1-5/8″
HFC 42D / HFC-FR 42D

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 (㎜)	4.8	9.0	13.1	17.1
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (㎜)	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 (㎜)	13.8	24.9	36.0	46.5
Jacket Diameter	Standard Jacket (㎜)	16.0	27.9	39.0	50.0
	Halogen-Free / Flame-Retardant Jacket (㎜)	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 (㎜)		125	250	380	510
Recommended Operating Temperature	Standard Jacket (℃)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (℃)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (㎏/㎞)	242	546	963	1,265
	Halogen-Free / Flame-Retardant Jacket (㎏/㎞)	260	590	1,014	1,358
Flat Plate Crush Resistance (㎏/㎜)		2.0	1.8	2.4	2.7
Max. Pulling Force (㎏)		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 Ω/1,000m (Ω/1,000ft)	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 (mΩ·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℃) & Average Power Rating (at Ambient 40℃, Inner Conductor 100℃)

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℃

HFSC Series

Super Flexible Foam Dielectric Feeder

1/4″
HFSC 6D / HFSC-FR 6D

3/8″
HFSC 10D / HFSC-FR 10D

1/2″
HFSC 12D / HFSC-FR 12D

7/8″
HFSC 22D / HFSC-FR 22D

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 (㎜)	1.9	2.8	3.6	9.5
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (㎜)	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 (㎜)	6.4	9.5	12.2	25.0
Jacket Diameter	Standard Jacket (㎜)	7.5	10.5	13.6	27.9
	Halogen-Free / Flame-Retardant Jacket (㎜)	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 (㎜)		25	25	32	125
Recommended Operating Temperature	Standard Jacket (℃)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (℃)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (㎏/㎞)	76	117	201	471
	Halogen-Free / Flame-Retardant Jacket (㎏/㎞)	80	123	211	494
Flat Plate Crush Resistance (㎏/㎜)		1.86	1.7	1.7	1.4
Max. Pulling Force (㎏)		68	60	65	102

Electrical Characteristics

		HFSC 6D (1/4″)	HFSC 10D (3/8″)	HFSC 12D (1/2″)	HFSC 22D (7/8″)
DC Resistance Ω/1,000m (Ω/1,000ft)	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 (MΩ·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℃) & Average Power Rating (at Ambient 40℃, Inner Conductor 100℃)

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℃

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 ㎲/㎝)

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 ㎲/㎝)

· IEC 332-1 : Flammability Test on Single Cables

· IEC 332-3C : Flammability Test on Cable Bundles

· IEEE 383 : Flammability Test on Cable Bundles

· ASTME 662 : Optical Density of Smoke (Smoke - Density < 150)

RFCL Series Cables Complying with;

· IEC 754-1 : Halogen Acid Gas Content (Chlorium < 0.5%)

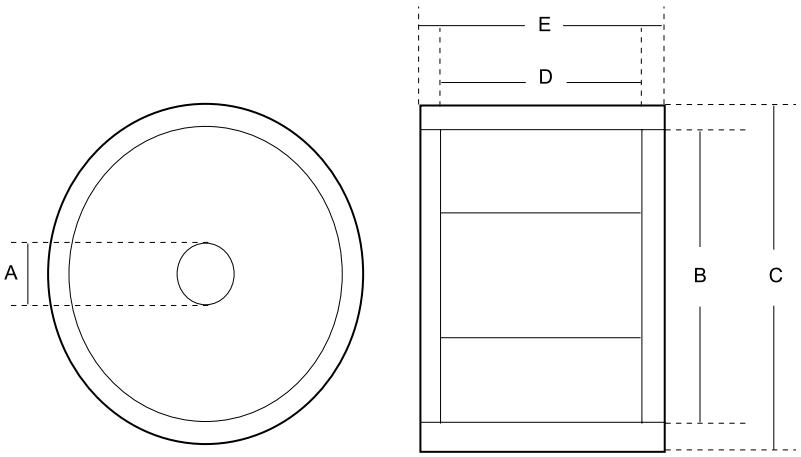
· IEC 754-2 : Degree of Acidity of Gas (pH-Value < 4.0, Conductivity < 100 ㎲/㎝)

· IEC 332-1 : FlammabilityTest on Single Cables

· ASTME 662 : Optical Density of Smoke (Smoke - Density < 150)

Model	Jacket	IEC 754-1	IEC 754-2	IEC 332-1	IEC 332-3C	IEEE 383	ASTM E662
LHF 12D 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	Halogen-Free Standard Black PE	○	○	–	–	–	–
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 RFCX-FR 33D RFCX-FR 42D	Halogen-Free Flame-Retardant Black Compound	○	○	○	○	○	○
RFCL-FR 22D RFCL-FR 33D RFCL-FR 42D	Halogen-Free Flame-Retardant Black Compound	○	○	○	–	–	○

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 HFC-FR 42D RFCX-FR 42D	500	110	2,100	2,190	1,020	1,200	685	5	10	10
1-1/4″	LHF-FR 33D HFC-FR 33D RFCX-FR 33D	500	110	1,700	1,790	750	900	367	6	13	13
7/8″	LHF-FR 22D HFC-FR 22D RFCX-FR 22D HFSC-FR 22D	500	110	1,250	1,320	650	750	181	12	25	25
1/2″	LHF-FR 12D HFC-FR 12D RFCX-FR 12D HFSC-FR 12D	500	75	850	910	428	500	62	44	100	100
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 impedence 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 fomulas can be used for converting among the "Returns Loss", "Reflection Coefficient" and "V.S.W.R."

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

Reflection Coefficient (Γ) $\frac{Z_L-1}{Z_L+1}$

R.L. (Return Loss) = - 20 log (| Γ |)

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

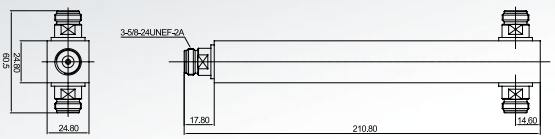
Coverage for Wireless Technologe

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

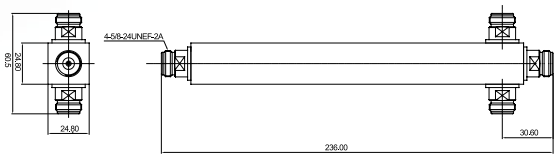
Technical Service Coverage

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

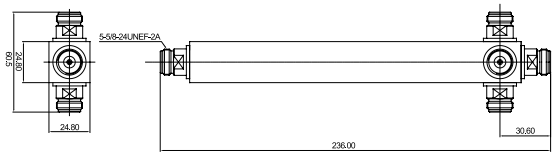
Passive Component
Wide Band Power Splitter (SPT-Xway-100-NF)



2 way



3 way



4 way

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.

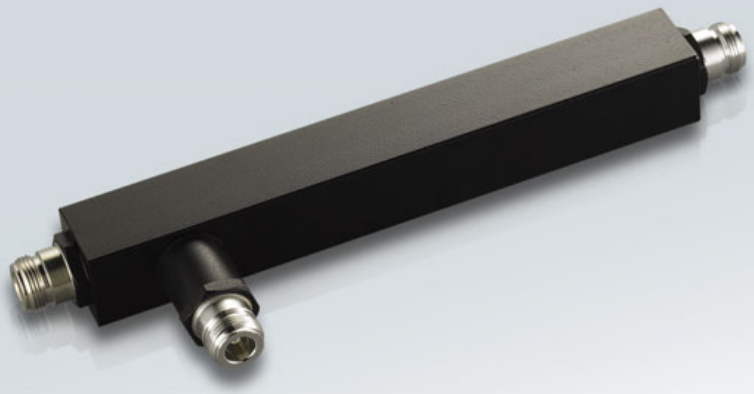
Electrical Characteristics

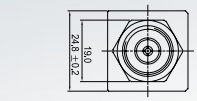
Frequency Range	800 ~ 2,500MHz		
For Conncecting Antennas	2 way	3way	4way
Insertion Loss	0.05 dB		
Impedance	50 Ω		
V.S.W.R	< 1.25	< 1.25	< 1.3
IMD	-150dBc		
Max. Power	100W (at 50℃ Ambient Temperature)		
Connector	N-Female (Other Connector Type is Available)		

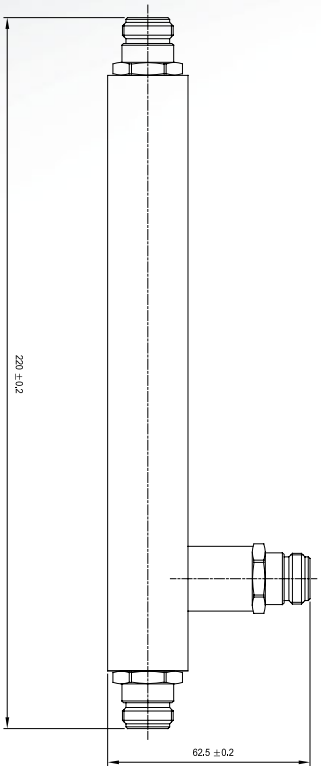
Mechanical Characteristics

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.

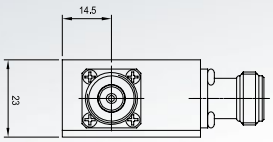
Electrical Characteristics

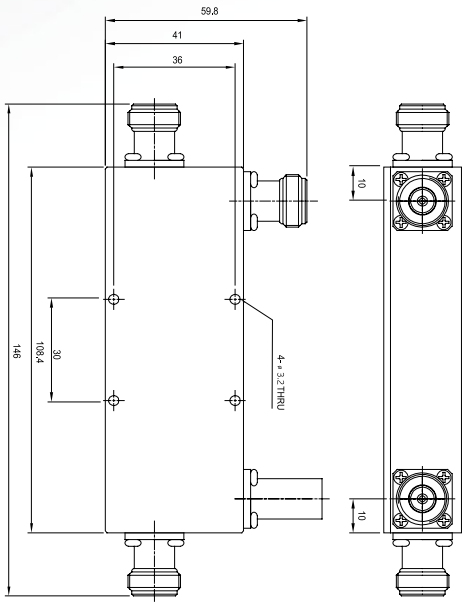
Frequency Range	800 ~ 2,500MHz		
Tap Loss Input ↔ P_1 Input ↔ P_2	 – 1.0dB – 7.0dB	 – 0.4dB – 10.4dB	 – 0.1dB – 15.1dB
For connecting... antennas	2		
Insertion Loss	< 0.05dB		
Impedance	50Ω		
V.S.W.R	< 1.5		
Intermodulation IM3 (2×43dBm carrier)	-150dBc		
Max. Power	100W (at 50℃ Ambient Temperature)		
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.

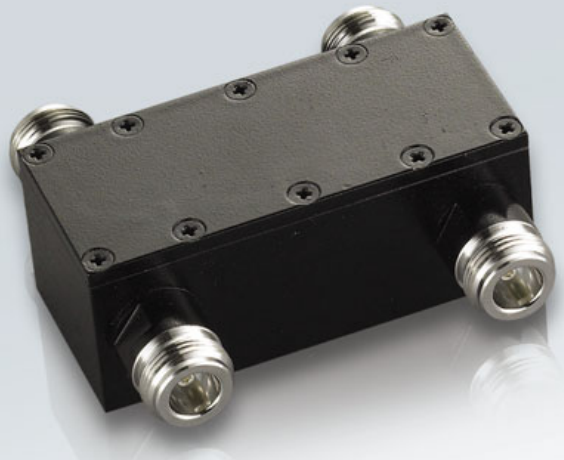
Electrical Characteristics

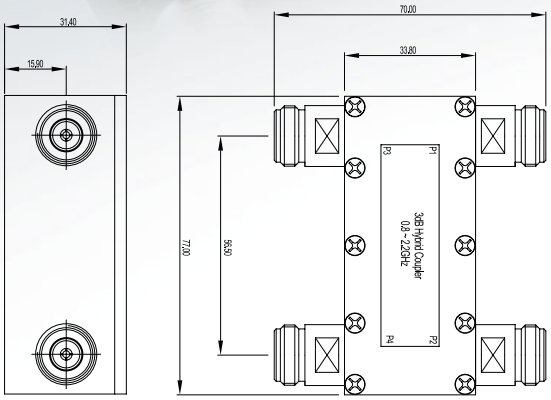
Frequency Range	800 ~ 2,500MHz					
Coupling Loss	6dB±0.8	8dB±1.0	10dB±1.0	15dB±1.0	20dB±1.0	30dB±1.0
Insertion Loss	1.5dB	1.1dB	0.7dB	0.4dB	0.2dB	0.2dB
Directivity	20dB					
Impedance	50Ω					
V.S.W.R	< 1.3					
IMD	-140dBc					
Max. Power	100W (at 50℃ Ambient Temperature)					
Connector	N-Female (Other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

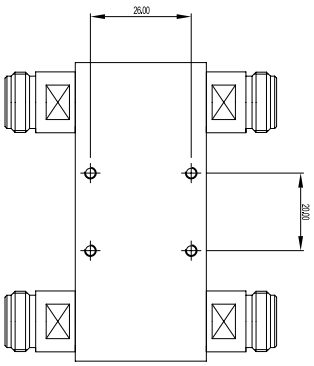
Mechanical Characteristics

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.

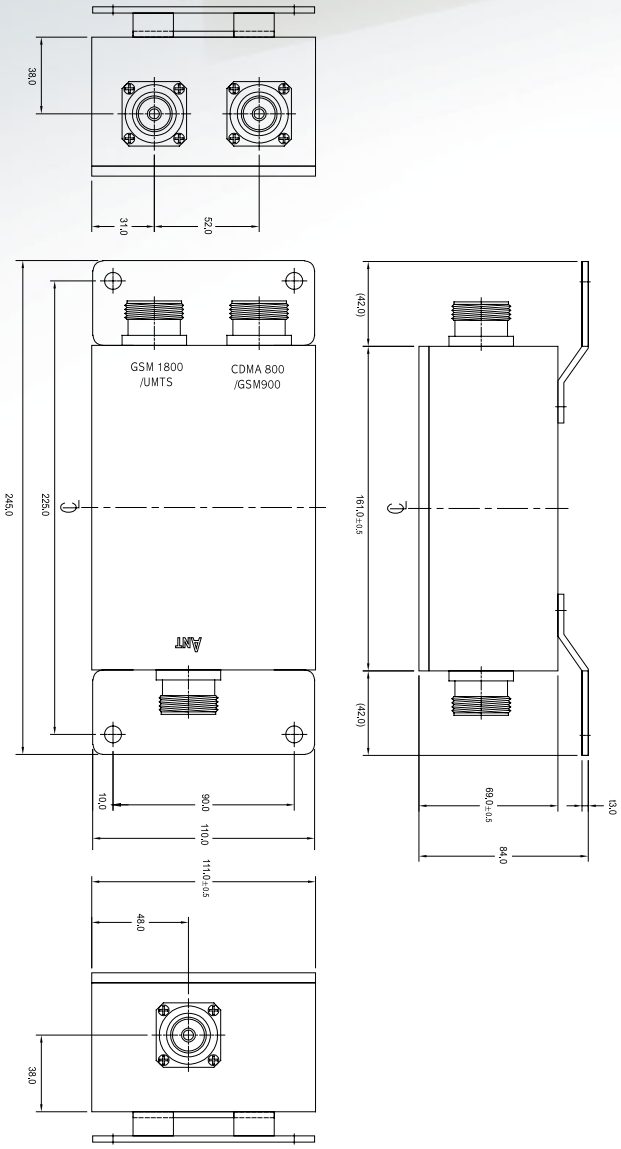
Electrical Characteristics

Frequency Range	800 ~ 2,200MHz
Coupling Loss	3dB ± 1.2
Directivity	20dB
Impedance	50Ω
V.S.W.R	< 1.2
IMD	-150dBc
Max. Power	300W (at 50℃ 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.

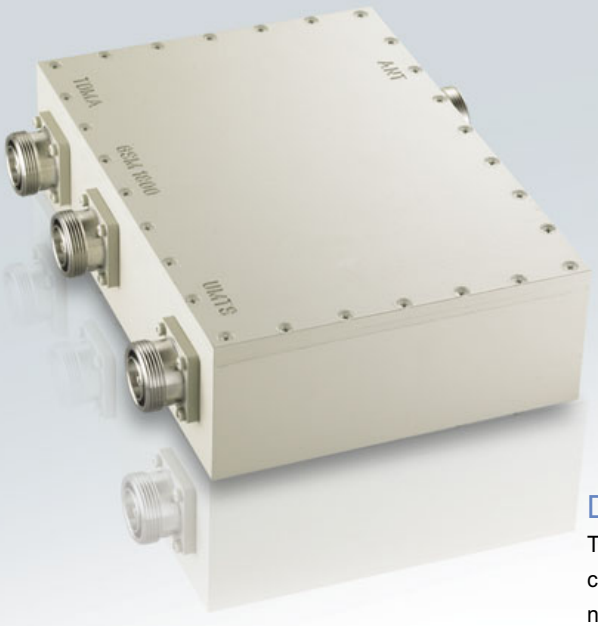
Electrical Characteristics

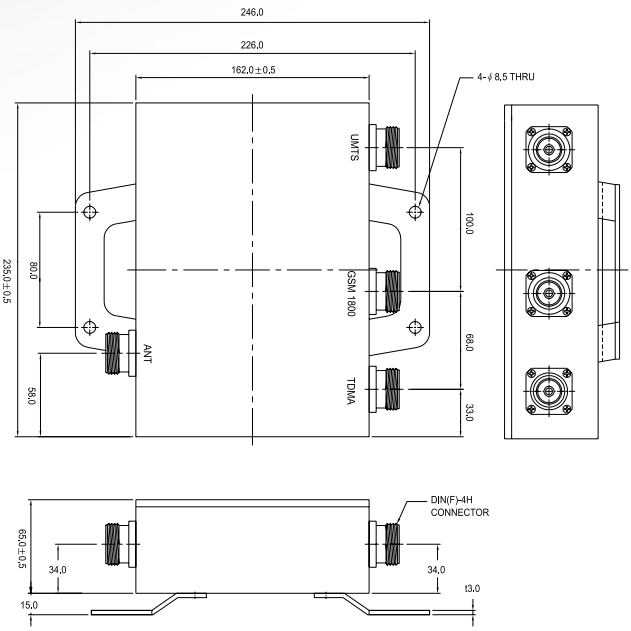
Pass Band	Band1	806 ~ 960MHz
	Band2	1,710 ~ 2,170MHz
Insertion Loss	Port1 ↔ Port3	0.15dB (806 ~ 960MHz)
	Port2 ↔ Port3	0.25dB (1,710 ~ 2,000MHz)
	Port2 ↔ Port3	0.35dB (2,000 ~ 2,170MHz)
Isolation	Port1 ↔ Port3	> 50dB (806 ~ 960MHz)
	Port2 ↔ Port3	> 50dB (1,710 ~ 2,000MHz)
	Port2 ↔ Port3	> 50dB (2,000 ~ 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℃ +60℃
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

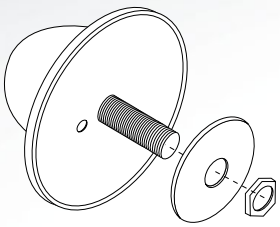
Pass Band	Band1	806 ~ 960MHz
	Band2	1,710 ~ 1,880MHz
	Band3	1,920 ~ 2,170MHz
Insertion Loss	Port1 ↔ Port4	< 0.2 dB (806 ~ 960MHz)
	Port2 ↔ Port4	< 0.3 dB (1,710 ~ 1,880MHz)
	Port3 ↔ Port4	< 0.2 dB (1,920 ~ 2,170MHz)
Isolation	Port1 ↔ Port2	> 50dB (806 ~ 960 / 1,710 ~ 1,880 MHz)
	Port1 ↔ Port3	> 50dB (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 ~ ,170MHz)
Impedance		50Ω
Input Power	Band1	< 240W
	Band2	< 240W
	Band3	< 240W
IMD		-150dBc
Temperature Range		-40℃ +60℃
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

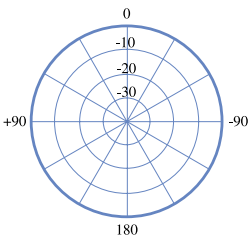


Description

The omni antennas provide dependable coverage along with sloutions 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. Futhemore, this omni antennas offer consistent patten 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.

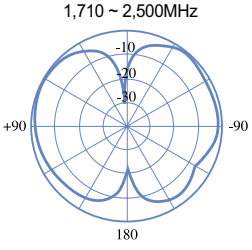
Radiation Pattern

1,710 ~ 2,500MHz



Horizontal Pattern

1,710 ~ 2,500MHz



Vertical Pattern

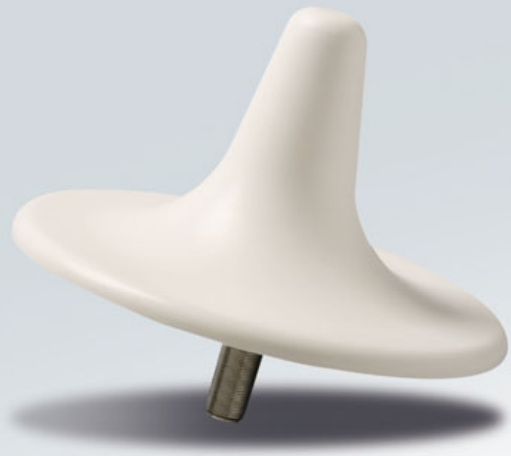
Electrical Characteristics

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

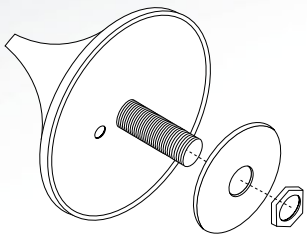
Mechanical Characteristics

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)



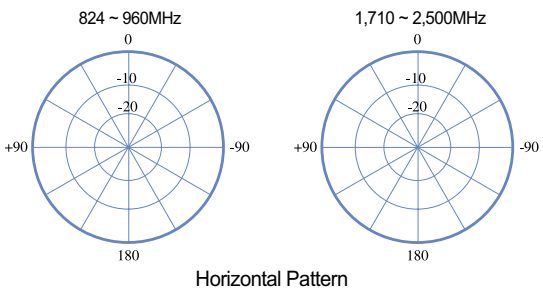
Installation



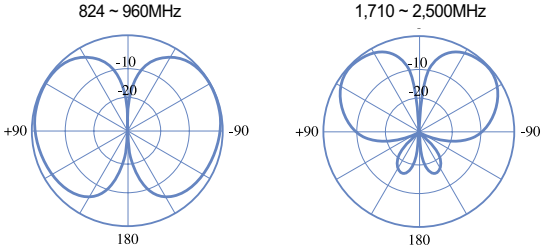
Description

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. Futhemore, this omni antennas offer consistent patten 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.

Radiation Pattern



Horizontal Pattern



Vertical Pattern

Electrical Characteristics

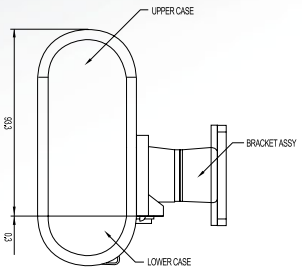
Frequency Range	824 ~ 960MHz	1,710 ~ 2,500MHz
Polarization	Vertical	
Gain	> 2dBi	> 3dBi
V.S.W.R	< 1.6	
Impedance	50 Ω	
Max. Power Rating	50 W	

Mechanical Characteristics

Dimension (Ø x 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)

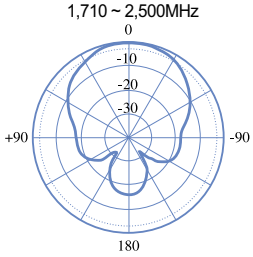
Indoor Antenna
Dual Band Patch Antenna (A-PAT-DUO-7)

Installation



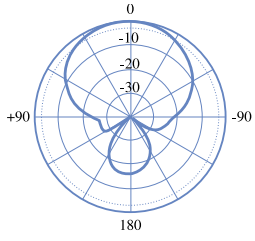
Radiation Pattern

1,710 ~ 2,500MHz



Horizontal Pattern

1,710 ~ 2,500MHz



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 cast as well as the losses associated with connector junctions. This dual band antennas support both existing and future wireless applications.

Electrical Characteristics

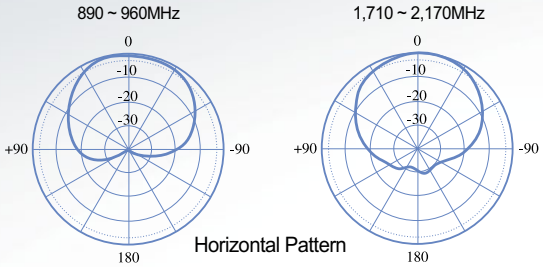
Frequency Range	1,710 ~ 2,400MHz	2,400 ~ 2,500MHz
Polarization	Vertical	
Gain	> 7dBi	
V.S.W.R	< 1.5	< 1.8
Vertical Beam Width	> 55	
Horizontal Beam Width	> 60	
Impedance	50 Ohm	
Max. Power Rating	100 W	
F/B Ratio	15	

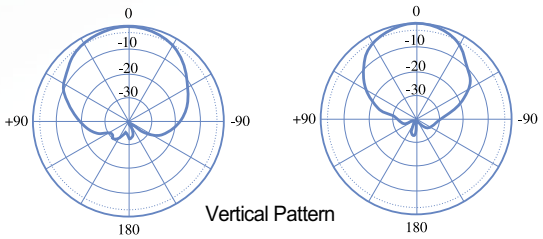
Mechanical Characteristics

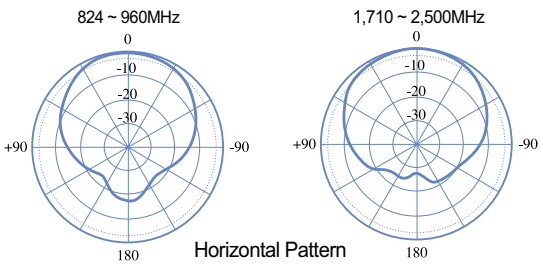
Size	108 x 118 x 50mm
Shipping Dimension	150 x 130 x 60mm
Weight	200g
Connector	1 x N-Female
Mounting	Wall
Radome (Color)	ASA (White)

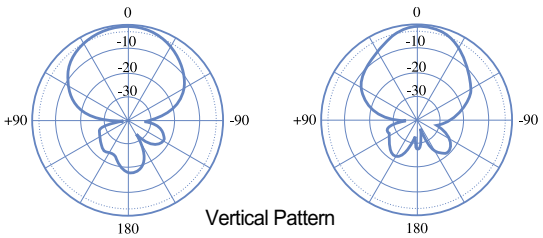
Indoor Antenna
Multi Band Patch Antenna (A-PAT-W69)

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 cast as well as the losses associated with connector junctions. This multi band patch antennas support both existing and future wireless applications.

Electrical Characteristics

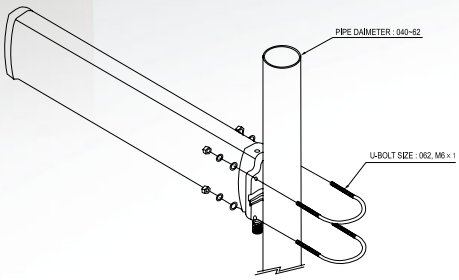
Frequency Range	890~960MHz	1,710~2,170MHz	824~960MHz	1,710~2,500MHz
Polarization	Vertical		Vertical	
Gain	> 6dBi	> 9dBi	> 6dBi	> 9dBi
V.S.W.R	< 1.5		< 1.8	
Horizontal Beam Width	> 80	> 65	> 80	> 45
Vertical Beam Width	> 65	> 50	> 90	> 60
Impedance	50 Ohm		50 Ohm	
Max. Power Rating	50W		50W	
F/B Ratio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

Mechanical Characteristics

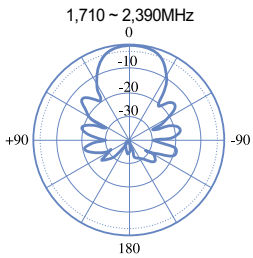
Size	180 x 210 x 42mm
Shipping Dimension	310 x 295 x 60mm
Weight	600g
Connector	1 x N-Female
Mounting	Wall
Radome (Color)	ASA (White)

Indoor Antenna
Wide Band Yagi Antenna (A-YG-W12)

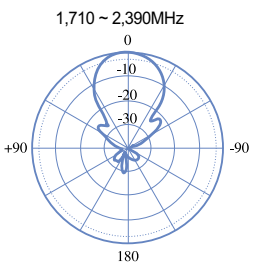
Installation



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 cast 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 x105 x 48mm
Shipping Dimension	500 x 145 x 88mm
Weight	1,250g
Connector	1 x N-Female
Mounting	Pole
Radome (Color)	ASA (White)

Radiating Cable

RFCX Series (Coupled Mode)

1/2″
RFCX 12D / RFCX-FR 12D

7/8″
RFCX 22D / RFCX-FR 22D

1-1/4″
RFCX 33D / RFCX-FR 33D

1-5/8″
RFCX 42D / RFCX-FR 42D

Construction

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

Mechanical Characteristics

		RFCX 12D (1/2″)	RFCX 22D (7/8″)	RFCX 33D (1-1/4″)	RFCX 42D (1-5/8″)
Min. Bending Radius (㎜)		125	250	380	510
Recommended Operating Temperature	Standard Jacket (℃)	-40 ~ +80	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (℃)	-30 ~ +80	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (㎏/㎞)	242	526	951	1,403
	Halogen-Free / Flame-Retardant Jacket (㎏/㎞)	260	595	1,014	1,496

Electrical Characteristics

		RFCX 12D (1/2″)	RFCX 22D (7/8″)	RFCX 33D (1-1/4″)	RFCX 42D (1-5/8″)
DC Resistance Ω/1,000m (Ω/1,000ft)	Inner Conductor	1.55 (0.47)	1.05 (0.32)	0.72 (0.22)	0.85 (0.26)
	Outer Conductor	2.50 (0.76)	1.30 (0.40)	0.60 (0.18)	0.50 (0.15)
Insulation Resistance (mΩ · ㎞)		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	87
Characteristic Impedance (Ω)		50 ± 2	50 ± 2	50 ± 2	50 ± 2

Attenuation and Coupling Loss (at 20℃)

Frequency (MHz)		RFCX 12D (1/2″)	RFCX 22D (7/8″)	RFCX 33D (1-1/4″)	RFCX 42D (1-5/8″)
Attenuation dB/1km	75	22.0	12.0	10.0	7.5
	150	31.0	16.0	13.0	17.0
	450	55.0	29.0	24.0	19.0
	800	75.0	41.0	34.0	28.0
	900	79.0	43.0	36.0	26.0
	1,800	118.0	67.0	59.0	43.0
	2,200	131.0	76.0	71.0	55.0
	2,400	140.0	80.0	76.0	60.0
Coupling Loss (dB) 50%/95%	90	63/74	59/69	58/68	60/72
	150	67/77	61/77	65/74	74/80
	450	71/83	70/80	68/78	69/80
	800	75/86	70/82	69/82	70/81
	900	74/85	69/79	70/81	71/82
	1,800	71/82	67/81	66/79	65/78
	2,200	73/84	69/80	67/80	66/78
	2,400	71/83	69/82	66/79	65/77

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

Radiating Cable

RFCL Series (Radiating Mode)

7/8″
RFCL 22D / RFCL-FR 22D

1-1/4″
RFCL 33D / RFCL-FR 33D

1-5/8″
RFCL 42D / RFCL-FR 42D

Construction

		RFCL 22D (7/8″)	RFCL 33D (1-1/4″)	RFCL 42D (1-5/8″)
Inner Conductor	Material / Construction	Smooth Copper Tube	Smooth Copper Tube	Corrugated Copper Tube
	Diameter (㎜)	9.0	13.0	17.1
Dielectric	Material / Construction	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
	Diameter (㎜)	23.3	33.0	43.5
Outer Conductor	Material / Construction	Overlapped Copper Foil with Punched Leaky Slots	Overlapped Copper Foil with Punched Leaky Slots	Overlapped Copper Foil with Punched Leaky Slots
	Diameter (㎜)	23.7	33.5	44.0
Jacket Diameter	Standard Jacket (㎜)	27.3	38.0	48.0
	Halogen-Free / Flame-Retardant Jacket (㎜)	28.7	39.0	49.0

Mechanical Characteristics

		RFCL 22D (7/8″)	RFCL 33D (1-1/4″)	RFCL 42D (1-5/8″)
Min. Bending Radius (㎜)		350	500	700
Recommended Operating Temperature	Standard Jacket (℃)	-40 ~ +80	-40 ~ +80	-40 ~ +80
	Halogen-Free / Flame-Retardant Jacket (℃)	-30 ~ +80	-30 ~ +80	-30 ~ +80
Nominal Weight	Standard Jacket (㎏/㎞)	591	790	995
	Halogen-Free / Flame-Retardant Jacket (㎏/㎞)	711	950	1,197

Electrical Characteristics

		RFCL 22D (7/8″)	RFCL 33D (1-1/4″)	RFCL 42D (1-5/8″)
DC Resistance Ω/1,000m (Ω/1,000ft)	Inner Conductor	1.05 (0.32)	0.72 (0.22)	0.85 (0.26)
	Outer Conductor	1.70 (0.52)	1.28 (0.39)	1.00 (0.30)
Insulation Resistance (mΩ · ㎞)		10,000	10,000	10,000
Dielectric Strength (for 1 Min.)		DC 6,000V	DC 9,000V	DC 11,000V
Velocity of Propagation (%)		88	87	87
Characteristic Impedance (Ω)		50 ± 2	50 ± 2	50 ± 2

Attenuation and Coupling Loss (at 20℃)

		Frequency (MHz)	RFCL 22D (7/8″)	RFCL 33D (1-1/4″)	RFCL 42D (1-5/8″)
RFCL M-Type	Attenuation dB/1km	75	11	7	6
		150	15	11	8
		450	30	20	15
		800	38	31	23
		900	40	34	25
	Coupling Loss (dB) 50%/95%	75	79/86	70/80	70/78
		150	77/83	76/85	70/78
		450	60/65	60/64	59/67
		800	63/68	62/71	54/64
		900	65/70	56/62	52/64
RFCL W-Type	Attenuation dB/1km	1700	54	50	46
		1900	57	54	48
		2100	60	58	52
		2300	65	62	59
		2500	72	70	67
	Coupling Loss (dB) 50%/95%	1700	63/68	56/61	58/63
		1900	64/69	62/67	56/61
		2100	64/69	64/69	60/65
		2300	65/70	60/65	58/63
		2500	65/70	60/65	60/65

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

Accessories

Connector

7/16 DIN Series

N Series

Adaptors

Cable Cutting Tool

Surge Arrestor

Jumper Cable

Dummy Load

Grounding Kit

Single Hanger Clamp Set

Double Hanger Clamp Set

Hoisting Grip

Weatherproofing Kit

Entry Port System

Cushion and Boot

Connector

7/16 DIN Series / N Series Connectors / Tool

Description

RF connector with 7/16 DIN & N interface is very typical type for communication systems. LS connectors are designed and produced to have features as below.

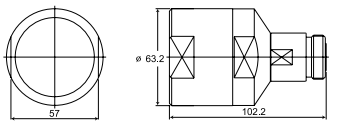
- Excellent V.S.W.R Performance
- Very Low Intermodulation
- Fast and Easy Installation
- Waterproof
- Environment Resistance Ensures Long Life and Consistent Performance

Products Overview

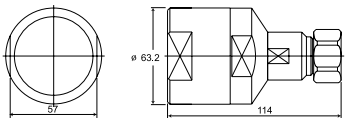
φ	Cable	Cable Description	N Connector		7/16 DIN Connector	
			Male	Female	Male	Female
1/4″	HFSC-FR 6D	Super Flex. 1/4″	CHFS 6NM	CHFS 6NF	CHFS 6DM	CHFS 6DF
			CHFS 6NMR	CHFS 6NFR	CHFS 6DMR	CHFS 6DFR
3/8″	HFSC-FR 10D	Super Flex. 3/8″	CHFS 10NM	CHFS 10NF	CHFS 10DM	CHFS 10DF
			CHFS 10NMR	CHFS 10NFR	CHFS 10DMR	CHFS 10DFR
1/2″	HFSC-FR 12D	Super Flex. 1/2″	CHFS 12NM	CHFS 12NF	CHFS 12DM	CHFS 12DF
			CHFS 12NMR	CHFS 12NFR	CHFS 12DMR	CHFS 12DFR
	HFC-FR 12D	Flex. 1/2″	CHF 12NM	CHF 12NF	CHF 12DM	CHF 12DF
	LHF-FR 12D		CLH 12NM	CLH 12NR	CLH 12DM	CLH 12DF
7/8″	HFSC-FR 22D	Super Flex. 7/8″	CHFS 22NM	CHFS 22NF	CHFS 22DM	CHF 22DF
	HFC-FR 22D	Flex. 7/8″	CHF 22NM	CHF 22NF	CHF 22DM	CHF 22DF
	LHF-FR 22D	Low Loss 7/8″	CLH 22NM	CLH 22NF	CLH 22DM	CLH 22DF
1-1/4″	HFC-FR 33D	Flex. 1-1/4″	CHF 33NM	CHF 33NF	CHF 33DM	CHF 33DF
	LHF-FR 33D		CLH 33NM	CLH 33NF	CLH 33DM	CLH 33DF
1-5/8″	HFC-FR 42D	Flex. 1-5/8″	CHF 42NM	CHF 42NF	CHF 42DM	CHF 42DF
	LHF-FR 42D	Low Loss 1-5/8″	CLH 42NM	CLH 42NF	CLH 42DM	CLH 42DF

* Other Designs are Available on Request

7/16 DIN Series



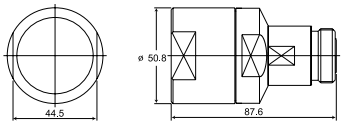
Din-Female for 1-5/8″



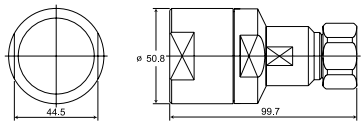
Din-Male for 1-5/8″

Connector Din Type for 1-5/8" LHF & HFC

Description	Length (mm)	Max.Dia (mm)	Weight (g)	Code	
				LHF	HFC
Din-Female for 1-5/8″	102.5	63	1,000	CLH 42DF	CHF 42DF
Din-Male for 1-5/8″	113.8	63	1,070	CLH 42DM	CHF 42DM



Din-Female for 1-1/4″



Din-Male for 1-1/4″

Connector Din Type for 1-1/4" LHF & HFC

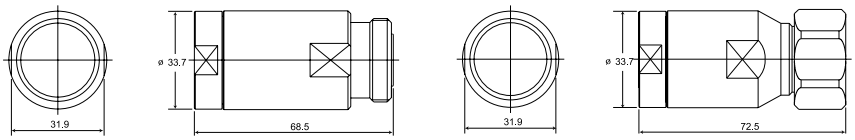
Description	Length (mm)	Max.Dia (mm)	Weight (g)	Code	
				LHF	HFC
Din-Female for 1-1/4″	89.1	50.8	560	CLH 33DF	CHF 33DF
Din-Male for 1-1/4″	101.4	50.8	560	CLH 33DM	CHF 33DM

Electrical Characteristics

Impendence		50 Ω
Frequency Range		(Max.) 7.5 GHz
V.S.W.R (Mating)	1 GHz (Straight / Right Angle)	1.08 / 1.12
	2 GHz (Straight / Right Angle)	1.10 / 1.15
Insertion Loss		(Max.) 0.2 dB @ 3 GHz
IMD		-155dBc
Dielectric Withstanding Voltage		4.0 kV rms, 50 Hz
Working Voltage		2.7 kV rms, 50 Hz
Insulation Resistance		10 GΩ
Contact Resistance	Inner Contact	0.4 mΩ
	Outer Contact	1.5 mΩ

Mechanical Characteristics

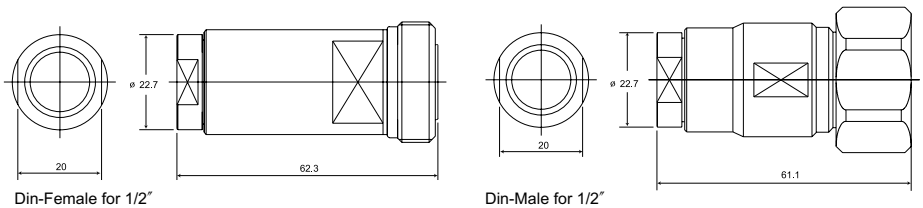
Coupling Nut Torque (Recommanded)	25 Nm ~ 30 Nm
Coupling Nut Retension Force	1,000 Nm
Contact Captivation	200 N
Durability (Mating)	500 Times



Din-Female for 7/8″ Din-Male for 7/8″

Connector Din Type for 7/8" LHF & HFC & HFSC

Description	Length (mm)	Max.Dia (mm)	Weight (g)	Code		
				LHF	HFC	HFSC
Din-Female for 7/8″	68.3	34	210	CLH 22DF	CHF 22DF	CHFS 22DF
Din-Male for 7/8″	72.5	34	230	CLH 22DM	CHF 22DM	CHFS 22DM



Din-Female for 1/2″ Din-Male for 1/2″

Connector Din Type for 1/2" LHF & HFC & HFSC

Description	Length (mm)	Max.Dia (mm)	Weight (g)	Code		
				LHF	HFC	HFSC
Din-Female for 1/2″	62.4	22.7	150	CLH 12DF	CHF 12DF	CHFS 12DF
Din-Male for 1/2″	60.2	22.7	183	CLH 12DM	CHF 12DM	CHFS 12DM

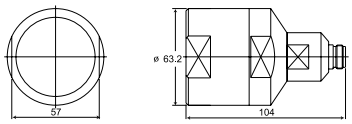
Environmental Characteristics

Temperature Range	-65℃ ~ +165℃ / -85℉ ~ +329℉
Corrosion (Salt Spray Test)	IEC-68-2-11-Ka
Vibration	CECC 22000 Part. 4.6.3
Waterproof	IP68

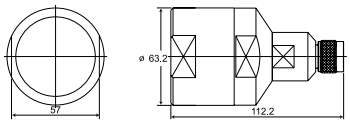
Material Characteristics

Bodies, Cap (Coupling Nut)		Brass / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
Back Nut		Brass / Nickel Plated
Pin	Male	Brass / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
	Female	Beryllium - Copper / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
Insulators		Plated PTEE (TEFLON)
Gasket		Silicon Rubber

N Series



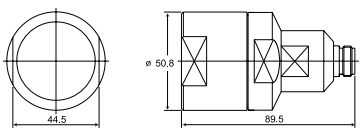
N-Female for 1-5/8″



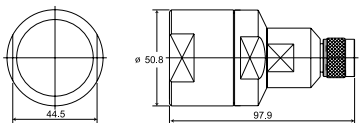
N-Male for 1-5/8″

Connector N Type for 1-5/8" LHF & HFC

Description	Length (mm)	Max. Dia (mm)	Weight (g)	Code	
				LHF	HFC
N-Female for 1-5/8″	107.3	63	1,000	CLH 42NF	CHF 42NF
N-Male for 1-5/8″	112.5	63	1,070	CLH 42NM	CHF 42NM



N-Female for 1-1/4″



N-Male for 1-1/4″

Connector N Type for 1-1/4" LHF & HFC

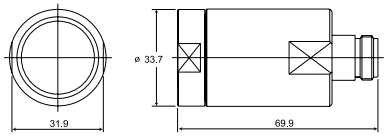
Description	Length (mm)	Max. Dia (mm)	Weight (g)	Code	
				LHF	HFC
N-Female for 1-1/4″	90.9	50.8	560	CLH 33NF	CHF 33NF
N-Male for 1-1/4″	99.1	50.8	560	CLH 33NM	CHF 33NM

Electrical Characteristics

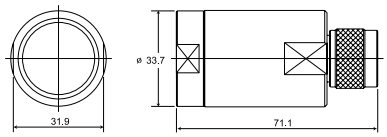
Impendence		50 Ω
Frequency Range		(Max.) 11 GHz
V.S.W.R (Mating)	1 GHz (Straight / Right Angle)	1.08 / 1.12
	2 GHz (Straight / Right Angle)	1.10 / 1.15
Insertion Loss		(Max.) 0.2 dB @ 3 GHz
IMD		-155dBc
Dielectric Withstanding Voltage		2.5 kV rms, 50 Hz
Working Voltage		1.0 kV rms, 50 Hz
Insulation Resistance		5,000 mΩ
Contact Resistance	Inner Contact	1.0 mΩ
	Outer Contact	1.0 mΩ

Mechanical Characteristics

Coupling Nut Torque (Recommanded)	0.68 Nm ~ 1.13 Nm
Coupling Nut Retension Force	450 Nm
Contact Captivation	28 N
Durability (Mating)	500 Times



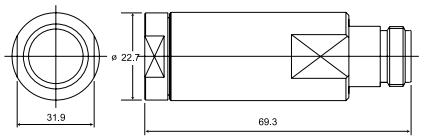
N-Female for 7/8″



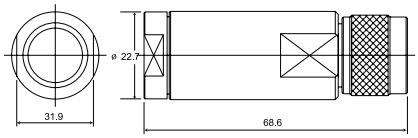
N-Male for 7/8″

Connector N Type for 7/8" LHF & HFC & HFSC

Description	Length (mm)	Max. Dia (mm)	Weight (g)	Code		
				LHF	HFC	HFSC
N-Female for 7/8″	70.4	34	215	CLH 22NF	CHF 22NF	CHFS 22NF
N-Male for 7/8″	71.9	34	215	CLH 22NF	CHF 22NM	CHFS 22NM



N-Female for 1/2″



N-Male for 1/2″

Connector N Type for 1/2" LHF & HFC & HFSC

Description	Length (mm)	Max. Dia (mm)	Weight (g)	Code		
				LHF	HFC	HFSC
N-Female for 1/2″	62.3	22.7	115	CLH 12NF	CHF 12NF	CHFS 12NF
N-Male for 1/2″	61.8	22.7	120	CLH 12NM	CHF 12NM	CHFS 12NM

Environmental Characteristics

Temperature Range	-65℃ ~ +165℃ / -85℉ ~ +329℉
Corrosion (Salt Spray Test)	IEC-68-2-11-Ka
Vibration	CECC 22000 Part. 4.6.3
Waterproof	IP68

Material Characteristics

Bodies, Cap (Coupling Nut)		Brass / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
Back Nut		Brass / Nickel Plated
Pin	Male	Brass / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
	Female	Beryllium - Copper / Silver Plated or Su Co (Alloy of Cu/ Sn/ Zn) Plated
Insulators		PTEE (TEFLON)
Gasket		Silicon Rubber

Adaptors

Description

RF Adaptor with Between Series & IN - Series is very typical type for communication systems.
LS Adaptors are designed and produced to have features as below.

- Excellent V.S.W.R Performance
- Very Low Intermodulation
- Fast and Easy Installation
- Waterproof
- Environment Resistance Ensures Long Life and Consistent Performance

Adaptor type & product code

<Between series>

Product code	Adaptor Type	Gender A	Gender B
AHF NM(F)DM(F)	N / 7/16DIN	Male (Female)	Male (Female)
AHF SM(F)NM(F)	SMA / N	Male (Female)	Male (Female)

<In- series>

Product code	Adaptor Type	Gender A	Gender B
AHF NM(F)NF(M)	N	Male (Female)	Male (Female)
AHF DM(F)DF(M)	7/16DIN	Male (Female)	Male (Female)
AHF SM(F)SF(M)	SMA	Male (Female)	Male (Female)

Electrical Characteristics

Impendence		50 Ω
Frequency Range		DC to 3 GHz
V.S.W.R (Max)		1.07:1(DC to 3 GHz)
Insertion (Max)		-0.1 dB
Intermodulation Distortion		≤-150dBc (2×43dBm carrier)
Insulation Resistance		≥5×10³3mΩ
Dielectric Withstanding	Voltage (at sea level)	2500V rms, 50 Hz
	Working Voltage (at sea level)	≤1000V rms, 50 Hz
Contact Resistance	Center Contact	≤1.0 mΩ
	Outer Contact	≤1.0 mΩ

Environmental Characteristics

Temperature Range	-65℃ ~ +165℃
Temperature Shock	MIL-STD202, Method107, Condition B
Moisture Resistance	MIL-STD202, Method106
Corrosion	Saltspray test acc. To MIL-STD-202 Method101D Condition B
Shock	MIL-STD-202, Method213. Condition I

Cable Cutting Tool

Description

Connector termination is one of the most important factors affecting RF transmission line operation. LS Cable offers cable cutting tools in sizes ranging from 1/2″ to 1 - 5/8″ which are desinged to cut the jacket and outer conductor in seconds.
These cutting tools make the accurate cuts of cables at top of currugation at exact distance required for easy connector attachment. It allows to give one more way to ensure consistent electrical performance for your application.

Features / Benefits

- Accurate Termination
- Easy Handling

Product Code

Code	Description	Cable Type
L-CT-12D	Cut Jacket & Outer Conductor	1/2″ Flex.
L-CT-12DS	Cut Jacket & Outer Conductor	1/2″ Super Flex.
L-CT-22D	Cut Jacket, Outer Conductor, Dielectric & Inner Conductor	7/8″ Flex.
L-CT-33D	Cut Jacket, Outer Conductor, Dielectric & Inner Conductor	1-1/4″ Flex.
L-CT-42D	Cut Jacket, Outer Conductor, Dielectric & Inner Conductor	1-5/8″ Flex.

Surge Arrestor (λ / 4 wave)

Description

LS Cable's surge arrestors provide excellent lightning protection and outstanding RF performance.
All designs have low return loss, low insertion loss and low intermodulation.
LS Cable offers λ / 4 wave shorting stubs with a full line of mounting adaptors and accessories.

Features / Benefits

- Outstanding RF Performance
- Complete Weatherproof
- Available with Type N or DIN Interface
- Maintenance Free Operation (λ / 4 Wave Shorting Stubs)

Product Code

Model	Code	Frequency Band(MHz)	Interface Type
λ/4 Wave	AT-NMNF-W	800 ~ 2,500	N-Male / N-Female
	AT-NMNF-01	800 ~ 900	N-Male / N-Female
	AT-NMNF-02	890 ~ 960	N-Male / N-Female
	AT-NMNF-03	1,700 ~ 1,900	N-Male / N-Female

Model	Code	Frequency Band(MHz)	Interface Type
λ/4 Wave	AT-DMDF-W	800 ~ 2,500	DIN-Male / Din-Female
	AT-DMDF-01	800 ~ 900	DIN-Male / Din-Female
	AT-DMDF-02	890 ~ 960	DIN-Male / Din-Female
	AT-DMDF-03	1,700 ~ 1,900	DIN-Male / Din-Male

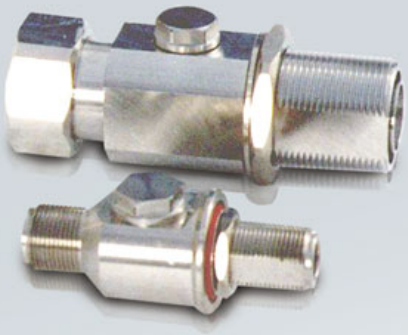
Electrical Characteristics

Model	λ/4 Wave Shorting Stub
Impedance (Nominal)	50Ω
V.S.W.R	< 1.1
Insertion Loss	<0.1 dB
IMD	-155dBc
Max.Impulse Spark-Over Voltage	>600V

Mechanical Characteristics

Model	λ/4 Wave Shorting Stub
Outer Conductor	Brass / Silver or SuCo Plated
Inner Conductor	BeCu (Female) / Silver or SuCo Plated
Other Metal Parts	Brass / Nickel Plated
Temperature Range	-40℃ ~ +100℃
Moisture Resistance	Waterproof

Surge Arrestor (Gas Tube)



Description

LS Cable's gas discharge tube type lightning arrestor is one of lightning strike protector that is used most widely with λ/4 shorting stub type lightning arrestor.
The biggest difference from others is that it adapts replaceable gas discharge tube between internal and outer conductor and it discharges electron pulse that occurred instantaneously at lightning strike to earth.

Features/Benefits

- Outstanding Broadband RF Performance (DC~2400MHz)
- DC Pass Capability
- High Tensional Internal Conductor Structure
- Complate Waterproof
- Available with Type N or 7/16 DIN Type

Product Code

Model	Code	Frequency Band(MHz)	Interface Type
Gas Tube	AG-NMNF-01	DC ~ 2,500	N Male / N Female
	AG-DMDF-02	DC ~ 2,500	DIN Male / Din Female

Electrical Characteristics

Model	Gas Tube
Impedance (Nominal)	50Ω
V.S.W.R	< 1.1
Insertion Loss	< 0.1 dB
Max.Impulse Spark-Over Voltage	> 600V

Mechanical Characteristics

Model	Gas Tube
Outer Conductor	Brass / Silver or SuCo Plated
Inner Conductor	BeCu (Female) / Silver or SuCo Plated
Other Metal Parts	Brass / Nickel Plated
Temperature Range	-40℃~ +100℃
Moisture Resistance	Waterproof

Jumper Cable

Description

LS Cable provides jumper cables which have outstanding electrical performance along with high durability for tight routing and superior environmental sealing for long life reliability.

LS jumper cables are offered in sizes of 3/8″ and 1/2″. Jumper cables are used in areas that require extremely small bending radius such as on the connection between main feeders and antennas or between main feeders and RF-equipments. LS jumper cables are designed and produced to have features as belows.

Features / Benefits

- High Pull-Off Strength
- Excellent V.S.W.R Performance
  - Typical V.S.W.R Over Cellular, PCS and 3 G-Band are 1.08
- Low and Stable Intermodulation
  - Typical IM3 Product Value with 40 dBm is -155 dBc Over the Cellular and PCS Band
- Complete Weatherproof

Cable Type (Min. Bending Radius)

- HFSC 10D : 25 mm
- HFSC 12D : 35 mm

Product Code

Description of Attached Connector	HFSC 10D		
	1M	2M	3M
7/16 Male to 7/16 Male	JHFS10-1-DMDM	JHFS10-2-DMDM	JHFS10-3-DMDM
7/16 Male to 7/16 Female	JHFS10-1-DMDF	JHFS10-2-DMDF	JHFS10-3-DMDF
7/16 Female to 7/16 Female	JHFS10-1-DFDF	JHFS10-2-DFDF	JHFS10-3-DFDF
N Male to 7/16 Male	JHFS10-1-NMDM	JHFS10-2-NMDM	JHFS10-3-NMDM
N Female to 7/16 Female	JHFS10-1-NMDM	JHFS10-2-NMDM	JHFS10-3-NMDM
N Male to 7/16 Female	JHFS10-1-NMDF	JHFS10-2-NMDF	JHFS10-3-NMDF
N Female to 7/16 Male	JHFS10-1-NFDM	JHFS10-2-NFDM	JHFS10-3-NFDM
N Male to N Male	JHFS10-1-NMNM	JHFS10-2-NMNM	JHFS10-3-NMNM
N Male to N Female	JHFS10-1-NMNF	JHFS10-2-NMNF	JHFS10-3-NMNF
N Female to N Male	JHFS10-1-NFNM	JHFS10-2-NFNM	JHFS10-3-NFNM

Description of Attached Connector	HFSC 12D		
	1M	2M	3M
7/16 Male to 7/16 Male	JHFS12-1-DMDM	JHFS12-2-DMDM	JHFS12-3-DMDM
7/16 Male to 7/16 Female	JHFS12-1-DMDF	JHFS12-2-DMDF	JHFS12-3-DMDF
7/16 Female to 7/16 Female	JHFS12-1-DFDF	JHFS12-2-DFDF	JHFS12-3-DFDF
N Male to 7/16 Male	JHFS12-1-NMDM	JHFS12-2-NMDM	JHFS12-3-NMDM
N Female to 7/16 Female	JHFS12-1-NMDM	JHFS12-2-NMDM	JHFS12-3-NMDM
N Male to 7/16 Female	JHFS12-1-NMDF	JHFS12-2-NMDF	JHFS12-3-NMDF
N Female to 7/16 Male	JHFS12-1-NFDM	JHFS12-2-NFDM	JHFS12-3-NFDM
N Male to N Male	JHFS12-1-NMNM	JHFS12-2-NMNM	JHFS12-3-NMNM
N Male to N Female	JHFS12-1-NMNF	JHFS12-2-NMNF	JHFS12-3-NMNF
N Female to N Male	JHFS12-1-NFNM	JHFS12-2-NFNM	JHFS12-3-NFNM

Dummy Load

Description

Dummy load is a means of termination microwave transmission line without much reflection.
It is performed by microwave power absorption.
Dummy load is used in “RFCL” or “RFCX” application to provide launch for the signal from the end of the cable.
All connector interfaces conform to MIL-C-39012.
V.S.W.R : 0~3GHz. Max 1.15.

Features / Benefits

- Outstanding RF Performance. Low V.S.W.R
- Available with Type N Interfaces

Product Code

Code	V. S. W. R	Connector Interface	Dummy Load Power Rating
L-DL-10-NM	〈 1.15	N-Male	10 Watt
L-DL-10-NF	〈 1.15	N-Female	
L-DL-20-NM	〈 1.15	N-Male	20 Watt
L-DL-20-NF	〈 1.15	N-Female	
L-DL-30-NM	〈 1.15	N-Male	30 Watt
L-DL-30-NF	〈 1.15	N-Female	
L-DL-50-NM	〈 1.15	N-Male	50Watt
L-DL-50-NF	〈 1.15	N-Female	

* Note : Other Designs are Available on Request

Grounding Kit

Clip-on Type

Description

The clip-on ground kits are an advanced coax grounding solution, providing the ultimate in ease-of-installation coupled with dependable protection of your coaxial cable system. The unique clip design and pre-formed strap allow the clip-on ground kits to be easily slipped over the outer conductor of the coax and firmly latched into place. The latch mechanism has been optimized to provide a secure fit maximizing performance by ensuring proper contact surface area and pressure. The innovative design of the clip-on ground kits greatly simplifies installation, minimizing installation time over traditional coiled and bolt-on grounding kits. This design also eliminates the danger of overtightening, reducing the chance of costly errors in the field. The clip-on ground kits are designed to comply with MIL-STD-188-124A, protecting coax from the damaging effects of lightning current in excess of 200 kA. Each kit includes a 6-gauge 7-strand copper ground lead with your choice of lead lengths and attached or unattached lugs. All buss bar attachment hardware is included along with required mastic and electric tape for weatherproofing each kit.

Characteristics

App.	Coax Protection	Mounts to	Coax Outer Conductor
Size	1/2″ to 1-5/8″ Coax	Material	Copper Strap
Feature	Easy-To-Install Clip Design	Incl.	Grounding Kit, Lug, Weatherproofing Kit
Design	One-Piece Style with Three Lead / Lug Options		

Product Code

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-GK-C12	Clip-on Ground Kit for 1/2″ Corrugated Coax. Includes 5′ (1.5 m) Lead with Unattached 3/8″ (10 mm) Two-Hole Lug *	Each	1.4 (0.6)
L-GK-C22	Clip-on Ground Kit for 7/8″ Corrugated Coax. Includes 5′ (1.5 m) Lead with Unattached 3/8″ (10 mm) Two-Hole Lug *	Each	1.4 (0.6)
L-GK-C33	Clip-on Ground Kit for 1-1/4″ Corrugated Coax. Includes 5′ (1.5 m) Lead with Unattached 3/8″ (10 mm) Two-Hole Lug *	Each	1.4 (0.6)
L-GK-C42	Clip-on Ground Kit for 1-5/8″ Corrugated Coax. Includes 5′ (1.5 m) Lead with Unattached 3/8″ (10 mm) Two-Hole Lug *	Each	1.5 (0.7)

* Note : 3/8″ (10 mm) two-hole lugs are universal to accommodate 3/4″ to 1″ (19 mm to 25 mm) spacing requirements.
Versions of these kits are available with 1/4″ (6 mm) two-hole lugs or with your choice of lug pre-attached.

Grounding Kit
Standard Type

Description

The standard ground kits facilitate easy installation with a pre-formed copper strap that eliminates the need for a coiling tool and prevents overtightening. These kits are designed to comply with MIL-STD-188-124A and have been verified by independent labs to protect coax from the damaging effects of lightning current in excess of 200 kA. Each kit includes a 5′ (1.5 m), 6-gauge 7-strand copper ground lead which can be trimmed to the exact length required for a neat and effective installation. Included in each kit is a two-hole 3/8″ (10 mm) universal lug, and all hardware necessary for attachment to the buss bar. The innovative two-hole universal lug features a unique slotted design which allows it to accommodate 3/4″ to 1′ (19 mm to 25 mm) buss bar hole spacings, ensuring a perfect fir in any ground system. The standard ground kits also include required mastic and electric tape for weatherproofing each kit.

Characteristics

App.	Coax Protection	Mounts to	Coax Outer Conductor
Size	1/2″ to 1-5/8″ Coax	Material	Copper or Aluminum Strap
Feature	Economical Protection	Incl.	Grounding Kit, Lug, Weatherproofing Kit
Design	Bolt - on Style with 5′ (1.5 m) Lead / Crimp Lug		

Product Code

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-GK-S12	Standard Ground Kit for 1/2″ Corrugated Coax	Each	1.4 (0.6)
L-GK-S22	Standard Ground Kit for 7/8″ Corrugated Coax	Each	1.4 (0.6)
L-GK-S33	Standard Ground Kit for 1-1/4″ Corrugated Coax	Each	1.4 (0.6)
L-GK-S42	Standard Ground Kit for 1-5/8″ Corrugated Coax	Each	1.5 (0.7)

Single Hanger Clamp Set

Description

This single hanger clamp set is a second generation hanger solution designed specially for BTS tower application.

Consist of Set

- Hanger clamp : UV and chemical resistances
- Hardware kits : 10mm 304 stainless steel hardware kit
- Angle adaptor : adaptor bracket, stainless 304

Product Code

Code	Description
L-MT-12SC1	Single Hanger Clamp Set for 1/2″ Corrugated Cable 1 Run
L-MT-12SC2	Single Hanger Clamp Set for 1/2″ Corrugated Cable 2 Runs
L-MT-12SC3	Single Hanger Clamp Set for 1/2″ Corrugated Cable 3 Runs
L-MT-22SC1	Single Hanger Clamp Set for 7/8″ Corrugated Cable 1 Run
L-MT-22SC2	Single Hanger Clamp Set for 7/8″ Corrugated Cable 2 Runs
L-MT-22SC3	Single Hanger Clamp Set for 7/8″ Corrugated Cable 3 Runs
L-MT-33SC1	Single Hanger Clamp Set for 1- 1/4″ Corrugated Cable 1 Run
L-MT-33SC2	Single Hanger Clamp Set for 1- 1/4″ Corrugated Cable 2 Runs
L-MT-33SC3	Single Hanger Clamp Set for 1-1/4″ Corrugated Cable 3 Runs
L-MT-42SC1	Single Hanger Clamp Set for 1- 5/8″ Corrugated Cable 1 Run
L-MT-42SC2	Single Hanger Clamp Set for 1- 5/8″ Corrugated Cable 2 Runs
L-MT-42SC3	Single Hanger Clamp Set for 1- 5/8″ Corrugated Cable 3 Runs

Single Hanger Clamp Set
for Small Tower (Max.50m)

Description

This single hanger clamp set for small tower which is shorter than 50m height is a second generation hanger solution designed specially for BTS tower application.

Consist of Set

- Hanger clamp : UV and chemical resistances
- Hardware kits : 10mm 304 stainless steel hardware kit
- Angle adaptor : adaptor bracket, stainless 304

Product Code

Code	Description
L-MT-12SC1L	Single Hanger Clamp for 1/2″ Corrugated Cable 1 Run Less 50m
L-MT-12SC2L	Single Hanger Clamp for 1/2″ Corrugated Cable 2 Runs Less 50m
L-MT-12SC3L	Single Hanger Clamp for 1/2″ Corrugated Cable 3 Runs Less 50m
L-MT-22SC1L	Single Hanger Clamp for 7/8″ Corrugated Cable 1 Run Less 50m
L-MT-22SC2L	Single Hanger Clamp for 7/8″ Corrugated Cable 2 Runs Less 50m
L-MT-22SC3L	Single Hanger Clamp for 7/8″ Corrugated Cable 3 Runs Less 50m
L-MT-33SC1L	Single Hanger Clamp for 1-1/4″ Corrugated Cable 1 Run Less 50m
L-MT-33SC2L	Single Hanger Clamp for 1-1/4″ Corrugated Cable 2 Runs Less 50m
L-MT-33SC3L	Single Hanger Clamp for 1-1/4″ Corrugated Cable 3 Runs Less 50m

* Note : Not available for 1-5/8″ corrugated cable

Double Hanger Clamp Set

Description

This double hanger clamp set is a second generation hanger solution designed specially for BTS tower application.

Consist of Set

- Hanger clamp : UV and chemical resistances
- Hardware kits : 10mm 304 stainless steel hardware kit
- Angle adaptor : adaptor bracket, stainless 304

Product Code

Code	Description
L-MT-12DC1	Double Hanger Clamp Set for 1/2″ Corrugated Cable 2 Runs
L-MT-12DC2	Double Hanger Clamp Set for 1/2″ Corrugated Cable 4 Runs
L-MT-12DC3	Double Hanger Clamp Set for 1/2″ Corrugated Cable 6 Runs
L-MT-22DC1	Double Hanger Clamp Set for 7/8″ Corrugated Cable 2 Runs
L-MT-22DC2	Double Hanger Clamp Set for 7/8″ Corrugated Cable 4 Runs
L-MT-22DC3	Double Hanger Clamp Set for 7/8″ Corrugated Cable 6 Runs
L-MT-33DC1	Double Hanger Clamp Set for 1-1/4″ Corrugated Cable 2 Runs
L-MT-33DC2	Double Hanger Clamp Set for 1-1/4″ Corrugated Cable 4 Runs
L-MT-33DC3	Double Hanger Clamp Set for 1-1/4″ Corrugated Cable 6 Runs
L-MT-42DC1	Double Hanger Clamp Set for 1-5/8″ Corrugated Cable 2 Runs
L-MT-42DC2	Double Hanger Clamp Set for 1-5/8″ Corrugated Cable 4 Runs
L-MT-42DC3	Double Hanger Clamp Set for 1-5/8″ Corrugated Cable 6 Runs

Double Hanger Clamp Set
for Small Tower (Max.50m)

Description

This double hanger clamp set for small tower which is shorter than 50m height is a second generation hanger solution designed specially for BTS tower application.

Consist of Set

- Hanger clamp : UV and chemical resistances
- Hardware kits : 10mm 304 stainless steel hardware kit
- Angle adaptor : adaptor bracket, stainless 304

Product Code

Code	Description
L-MT-12DC1L	Double Hanger Clamp Set for 1/2″ Corrugated Cable 2 Runs Less 50m
L-MT-12DC2L	Double Hanger Clamp Set for 1/2″ Corrugated Cable 4 Runs Less 50m
L-MT-12DC3L	Double Hanger Clamp Set for 1/2″ Corrugated Cable 6 Runs Less 50m
L-MT-22DC1L	Double Hanger Clamp Set for 7/8″ Corrugated Cable 2 Runs Less 50m
L-MT-33DC1L	Double Hanger Clamp Set for 1-1/4″ Corrugated Cable 2 Runs Less 50m

* Note : Not available for 7/8″ corrguated cable for more then 2 stacks
* Note : Not available for 1-1/4″ corrguated cable for more then 2 stacks
* Note : Not available for 1-5/8″ corrugated cable

Hoisting Grip

Lace-Up Hoisting Grip / Pre-Laced Hoisting Grip

Lace-Up Hoisting Grip

Pre-Laced Hoisting Grip

Description

Lace-up hoisting grips provide an effective means for hoisting coax and elliptical waveguide into position and can be utilized to provide additional support once in place. The lace-up design allows the hoisting grip to be attached even when the run has been connectorized and facilitates easy positioning at 200′ (61m) increments on long coax runs. Lace-up hoisting grips for coaxial cables include a self-locking clip and sealing tape to provide additional support both during and after installation.

Description

Pre-laced hoisting grips feature a closed-mesh design which simplifies installation over traditional split, lace-up style grips. The unique design allows the pre-laced hoisting grip to slip over an unterminated end of coax. The grip securely tightens when pulled, providing an effective means to hoist coax into position and to provide additional support for the coax once in place. Pre-laced hoisting grips for coaxial cables include a self-locking clip and sealing tape to provide additional support both during and after installation.

Characteristics

	Lace-Up Hoisting Grip	Pre-Laced Hoisting Grip
App.	Coax	Coax Support
Size	1/2″ to 1-5/8″	1/2″ to 1-5/8″
Feature	Lace-Up Installation at Ant Point On Coax	Pre-Laced to Simplify Installation
Design	Mesh Grip with Single Eye Support	Mesh Grip with Single Eye Support
Material	Tinned Broze	Tinned Bronze
Incl.	Grip, Self-Locking Clip, Tape	Grip, Self-Locking Clip, Tape

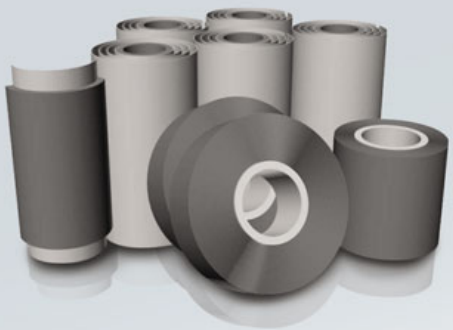
Product Code

	Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
Lace-Up Hoisting Grip	L-HG-12	Open Weave Hoisting Grip for 1/2″ Corrugated Coax	Each	0.3 (0.1)
	L-HG-22	Open Weave Hoisting Grip for 7/8″ Corrugated Coax	Each	0.6 (0.3)
	L-HG-33	Open Weave Hoisting Grip for 1-1/4″ Corrugated Coax	Each	0.6 (0.3)
	L-HG-42	Open Weave Hoisting Grip for 1-5/8″ Corrugated Coax	Each	1.3 (0.6)
Pre-Laced Hoisting Grip	L-HG-12L	Open Weave Hoisting Grip for 1/2″ Corrugated Coax	Each	0.4 (0.2)
	L-HG-22L	Open Weave Hoisting Grip for 7/8″ Corrugated Coax	Each	0.5 (0.2)
	L-HG-33L	Open Weave Hoisting Grip for 1-1/4″ Corrugated Coax	Each	0.5 (0.2)
	L-HG-42L	Open Weave Hoisting Grip for 1-5/8″ Corrugated Coax	Each	1.3 (0.6)

Weatherproofing Kit

Universal Weatherproofing Kit / 30M™ Cold Shrink™ Weatherproofing Kit

Universal Weatherproofing kit



Description

The universal weatherproofing kits include mastic and electrical tapes that are applied to provide a multi-layer, long-term environmental seal over multiple connections. The standard version (L-WK-U) includes five 3-3/4″ x 2′ (95mm x 0.6m) rolls of butyl mastic tape, two 3/4″ x 44′ (19mm x 13m) rolls of electrical tape, and one 2″ x 20′ (51mm x 6m) roll of electrical tape. The large version (L-WK-UL) includes five 3-3/4″ x 2′ (95mm x 0.6m) rolls of butyl mastic tape, three 3/4″ x 44′ (19mm x 13m) rolls of electrical tape, and three 2″ x 20′ (51mm x 6m) rolls of electrical tape.

Characteristics

App.	Coax Protection	Design	Tape Kit for Multi-Layer Wrap
Size	Two Versions	Material	Butyl and Winyl
Feature	Multi-Connection Protection	Incl.	See Text

Product Code

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-WK-U	Universal Weatherproofing Kit	Each	3.4 (1.5)

30M™ Cold Shrink™ Weatherproofing Kit

Description

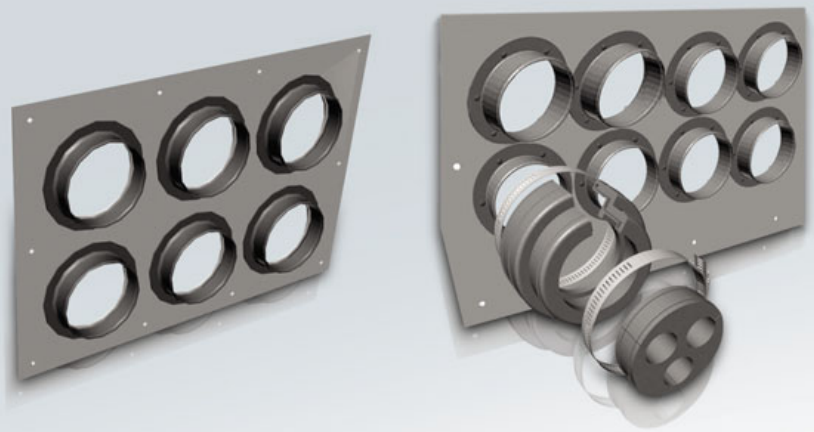
Avoid messy tapes and mastics with cold shrink™. This unique weatherproofing solution installs in less than three minutes, and eliminates difficult and time consuming taping processes. Because no speacial techniques are required, cold shrink™ can be installed perfectly by both new and experienced installers. To apply, position the kit over a connection, and unwind the spiral support. As the tube loses its support, it collapses over the connection to form a long term environmental seal. An universally designed spacer accommodates similar coax sizes with tolerance variances allowing these kits to be used on a variety of manufacturers coaxial cables regardless of your coax preference. Cold shrink™ kits are available to seal main feeder, jumper and antenna connections.

Product Code

Splices			Main Feeder to Jumper			Antenna Interfaces		
Coax Size Mated to Coax Size	Code	Wt. lbs (Wt. kg)	Coax Size Mated to Coax Size	Code	Wt. lbs (Wt. kg)	Coax Size Mated to Coax Size	Code	Wt. lbs (Wt. kg)
1/2″ to 1/2″	L-CS-U1212	0.2 (0.1)	7/8″ to 1/2″	L-CS-U1222	0.8 (0.4)	1/2″	L-CS-U1212	0.2 (0.1)
7/8″ to 7/8″	L-CS-U1222	0.8 (0.4)	1-1/4″ to 1/2″	L-CS-U1242	1.0 (0.5)	5/8″	L-CS-U1222	0.8 (0.4)
1-1/4″ to 1-1/4″	L-CS-U1242	1.0 (0.5)	1-1/4″ to 5/8″	L-CS-U1242	1.0 (0.5)	7/8″	L-CS-U1222	0.8 (0.4)
1-5/8″ to 1-5/8″	L-CS-U1242	1.0 (0.5)	1-5/8″ to 1/2″	L-CS-U12142	1.0 (0.5)			

Entry Port System

4″ (102mm) Feed-thru Entry Panel



Description

Aluminum feed-thru entry panels enable multiple coax runs to enter buildings and shelters. These rugged panels support the coax at the entry point and prevent moisture from entering the building. Each panel features 4″ (102mm) openings to accept boot assemblies. Each boot assembly must be fitted with a cushion to hold the coax in place. Feed-thru entry panels are offered with a broad selection of hole patterns and plate sizes to match your exact application. These entries can be used in both interior and exterior wall applications to create a neat and clean installation. Each feed-thru entry panel includes a set of wall attachment hardware, including #14 x 1-1/2″ (6mm x 38mm) stainless steel screws, finishing washers, and plastic anchors and is powder coated to ensure long term integrity and provide appealing aestheics. Sealing caps for all openings are also included. Boots and cushins, or boot assembly kits must be purchased separately to accommodate specific coax requirements.

Characteristics

App.	Entry Solutions	Mounts to	Walls
Size	19 Sizes	Material	Aluminum
Feature	Easy to Install Solution	Incl.	Port, Caps, Wall Hardware
Design	Entry Plates with Round Ports	Order Sep.	4″ (102mm) Boot Assemblies

Product Code

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-EP-220	Entry Panel, 1 Port, 1 x 1, Standard	Each	1.0 (0.5)
L-EP-574	Entry Panel, 1 Port, 1 x 1, Compact	Each	0.6 (0.3)
L-EP-1448	Entry Panel, 2 Port, 1 x 2	Each	2.3 (1.0)
L-EP-1635	Entry Panel, 3 Port, 1 x 3	Each	2.9 (1.3)
L-EP-575	Entry Panel, 4 Port, 1 x 4	Each	3.5 (1.6)
L-EP-1199	Entry Panel, 4 Port, 2 x 2, Standard	Each	4.2 (1.9)
L-EP-1650	Entry Panel, 4 Port, 2 x 2, Compact	Each	4.0 (1.8)
L-EP-1449	Entry Panel, 6 Port, 2 x 3	Each	6.1 (2.8)
L-EP-1477	Entry Panel, 6 Port, 1 x 6	Each	6.0 (2.7)
L-EP-576	Entry Panel, 8 Port, 2 x 4, Standard	Each	6.1 (2.8)

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-EP-1338	Entry Panel, 8 Port, 2 x 4, Large	Each	6.0 (2.7)
L-EP-1033	Entry Panel, 9 Port, 3 x 3	Each	7.1 (3.2)
L-EP-1297	Entry Panel, 10 Port, 2 x 5	Each	7.4 (3.4)
L-EP-1118	Entry Panel, 12 Port, 3 x 4, Standard	Each	8.5 (3.9)
L-EP-1334	Entry Panel, 12 Port, 3 x 4, Compact	Each	7.0 (3.2)
L-EP-1336	Entry Panel, 12 Port, 2 x 6	Each	9.2 (4.2)
L-EP-1447	Entry Panel, 16 Port, 4 x 4	Each	9.0 (4.1)
L-EP-1333	Entry Panel, 18 Port, 3 x 6	Each	13.0 (5.9)
L-EP-1861	Entry Panel, 20 Port, 4 x 5	Each	11.0 (5.0)
L-EP-1340	Entry Panel, 24 Port, 4 x 6	Each	15.8 (7.2)

* Note : 5″ (127mm) Feed-thru Entry Panels available with 1, 2, 3, 4, 6, 8, and 9 hole configurations.

Cushion and Boot

4″ (102mm) Boot Assembly Kit

Description

These innovative boot assembly kits feature a boot assembly and standard cushion insert in one convenient package. The unique boot assembly features a split, one-piece design which dramatically reduces installation time and difficulty. Boot assembly kits are designed to be fitted onto EP-series entry panels in wall/roof feed-thru applications.

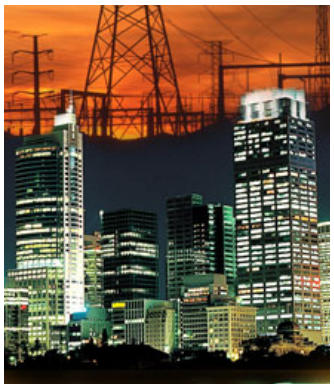
Characteristics

App.	Entry Solutions	Mounts to	4″ (102mm) Entry Panels
Size	Versions for Coax and Elliptical Waveguide	Material	EPDM Rubber
Feature	One-Piece Design Simplifies Installation	Incl.	Boot, Cushion, Two Hose Clames
Design	Compression Boot Kit for Aluminum Entry Panels	Order Sep.	4″ (102mm) Entry Panel

Product Code

Code	Description	Kit Qty.	Wt. lbs (Wt. kg)
L-BA-12-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 1/2″ Corrugated Coax	Each	1.6 (0.7)
L-BA-12-2A	Boot Assembly Kit, 4″ (102mm) w/2 Hole for 1/2″ Corrugated Coax	Each	1.6 (0.7)
L-BA-12-3A	Boot Assembly Kit, 4″ (102mm) w/3 Hole for 1/2″ Corrugated Coax	Each	1.6 (0.7)
L-BA-12-4A	Boot Assembly Kit, 4″ (102mm) w/4 Hole for 1/2″ Corrugated Coax	Each	1.6 (0.7)
L-BA-12-5A	Boot Assembly Kit, 4″ (102mm) w/5 Hole for 1/2″ Corrugated Coax	Each	1.6 (0.7)
L-BA-12F-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 1/2″ Flex Coax	Each	1.6 (0.7)
L-BA-12F-2A	Boot Assembly Kit, 4″ (102mm) w/2Hole for 1/2″ Flex Coax	Each	1.6 (0.7)
L-BA-12F-3A	Boot Assembly Kit, 4″ (102mm) w/3 Hole for 1/2″ Flex Coax	Each	1.6 (0.7)
L-BA-12F-4A	Boot Assembly Kit, 4″ (102mm) w/4 Hole for 1/2″ Flex Coax	Each	1.6 (0.7)
L-BA-16-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 5/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-16-2A	Boot Assembly Kit, 4″ (102mm) w/2 Hole for 5/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-16-3A	Boot Assembly Kit, 4″ (102mm) w/3 Hole for 5/8″ C orrugated Coax	Each	1.6 (0.7)
L-BA-16-4A	Boot Assembly Kit, 4″ (102mm) w/4 Hole for 5/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-22-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 7/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-22-2A	Boot Assembly Kit, 4″ (102mm) w/2 Hole for 7/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-22-3A	Boot Assembly Kit, 4″ (102mm) w/3 Hole for 7/8" Corrugated Coax	Each	1.6 (0.7)
L-BA-22-4A	Boot Assembly Kit, 4″ (102mm) w/4 Hole for 7/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-33-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 1-1/4″ Corrugated Coax	Each	1.6 (0.7)
L-BA-42-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 1-5/8″ Corrugated Coax	Each	1.6 (0.7)
L-BA-57-1A	Boot Assembly Kit, 4″ (102mm) w/1 Hole for 2-1/4″ Corrugated Coax	Each	1.6 (0.7)

Products & Systems of LS Cable



Power Transmission & Distribution System

Extra High Voltage Cable System
Overhead Transmission Line System
OPGW I Busduct System
Onshore & Offshore Cable System
Medium & Low Voltage Cable
Control & Instrumentation Cable

Telecommunication System

Optical Fiber
Optical Fiber Cable
RF Feeder Cable
LAN Cable
FTTH
HFC (Hybrid Fiber Coaxial Cable)

Electronic Components & Materials

Connector I Lead Frame I ACF I Antenna I Elastomer I
Copper Foil I FCCL I Heat Shrinkable Tube I
Ultracapacitor I Automotive Wire & Cable I
Electronic Wire & Cable I FA Cable I
High Frequency Coaxial Cable I
Micro Coaxial Cable I Magnet Wire I
Copper Wire Rod

Industrial Machinery

Tractor
Air Conditioning System
Injection Molding System
Military Defense Equipment

Global Network

LS International (Shanghai) : Head Office
#05 B-17th Fl. Global Trade Center, 36 Beisanhuan-Dong Rd
Dongcheng Dt. Beijing, China
Tel. +86-10-5825-6011 Fax. +86-10-5825-6015

Slovakia Office
222 Rybnicna 40, 831 07 Bratislava, Slovakia
Tel. +421-2-3359-5213 Fax. +421-2-3359-5214

Russia Office
Park Place Moscow 113/1 Leninsky Prospect E-711, Moscow 117198 Russia
Tel. +7-495-956-5814 Fax. +7-495-956-5811

Jordan Office
#307 4th Fl. Mid Town Plaza, Sweifieh-Subhi Al-Omari St.
P.O. Box 851885 Amman 11185 Jordan
Tel. +962-6-583-3357 Fax. +962- 6-583-3359

India Office
C-1, 3rd Fl. Community Centre (Opp. I.I.T Gate)
Safdarjung Development Area, New Delhi 110016 India
Tel. +91-11-4602-1657,1658 Fax. +91-11-4602-1659

Korea(HQ)

LS-VINA
So Dau Precint, Hong Bang Dt., Hai Phong, Vietnam
Tel. +84-31-540750 Fax. +84-31-540241

UAE Office
#502 Capricorn Tower, Sheikh Zayed Rd., Dubai, UAE, PO Box 113798
Tel. +971-4-332-9445 Fax. +971-4-332-9446

LS Cable Vietnam
Nhon Trach II-LocKhang IZ, Nhon Trach District, Dong Nai Province, Hochiminh, Vietnam
Tel. +84-61-356-9037 Fax. +84-61-356-9036

Singapore Office
300 Beach Road #25-07 The Concourse
Singapore 199555
Tel. +65-6342-9162~3 Fax. +65-6342-9164

LLSMW
Suite 7A, Menara Northam, 55 Jalan Sultan
Ahmad Shah, Penang 10050 Malaysia
Tel. +60-4-588-9609(34) Fax. +60-4-588-9607

Head Quarters
21st Fl. ASEM Tower, 159
Samsung-dong, Gangnam-gu
Seoul 135-798 Korea
Tel. +82-2-2189-9114

Anyang Plant
555 Hogye-dong, Dongan-gu
Anyang, Gyeonggi-do 431-831 Korea
Tel. +82-31-428-4114

Gumi Plant
190 Gongdan-dong, Gumi
Gyeongsangbuk-do 730-708 Korea
Tel. +82-54-469-7114

Indong Plant
643 Jinpyeong-dong, Gumi
Gyeongsangbuk-do 730-735 Korea
Tel. +82-54-469-7050

Jeongeup Plant
938 Jeongeup 3 Industrial Complex
Taegok-ri, Buk-myeon, Jeongeup
Jeollabuk-do 580-812 Korea
Tel. +82-63-530-4114

LS Cable (Tianjin)
East of Jing-Jin, Express Yixingbu Toll Gate Beichen, Tianjin, China
Tel. +86-22-2699-7618 Fax. +86-22-2699-7617

LS Air-Conditioning System (Shangdong)
Yu-Huangling Industrial Area, Xiazhuang, Chengyang District, Qingdao, China.
Tel. +86-532-8096-8888 Fax. +86-532-8096-5688

LS Electronic-Devices (Qingdao)
Yuhuangling Industrial Area, Xiazhuang, Chengyang District, Qingdao, China
Tel. +86-532-8096-2266 Fax. +86-532-8096-2288

Japan Office
E 16th Fl. Akasaka Twin Tower 17-22, 2-Chome Akasaka, Minato-Ku, Tokyo, Japan
Tel. +81-3-3582-9129 Fax. +81-3-3582-7363

LS Cable (Wuxi)
LS Industrial Park, Xin Mei Rd., New Dt. Wuxi 214028, China
Tel. +86-510-8811-9000 Fax. +86-510-8534-5341

LS Machinery (Wuxi)
LS Industrial Park, Xin Mei Rd., New Dt. Wuxi 214028, China
Tel. +86-510-8299-3888 Fax. +86-510-8299-3889

LS International (Shanghai) : Beijing Office
12th Fl. Huamin Empire Plaza, 726 West Yan'an Rd. , Shanghai 200050 China
Tel. +86-21-5237-3399, 8997 Fax. +86-21-5237-8996

LS Cable America, Inc.
920 Sylvan Avenue, Englewood Cliffs, NJ 07632, USA
Tel. +1-201-816-2253 Fax. +1-201-816-2984

Jeonju Plant
778 Jeonju 3 Industrial Complex
Yongnam-ri, Bongdong-eup
Wanju-gun, Jeollabuk-do
565-904 Korea
Tel. +82-63-279-5114

R&D Center
555 Hogye-dong, Dongan-gu
Anyang, Gyeonggi-do 431-831 Korea
Tel. +82-31-450-8114

● Branches
● Subsidiaries