

Cables

75Ω Coaxial Cables

Technical Note

Many types of video coax. What're the differences and how select?

In brief, there are three of essential factors: 1) center conductor, 2) insulation, and 3) shield. Each factor has its advantage and disadvantage as described below:

- 1) Center Conductor: two types existing, "Solid" and "Stranded". Stranded conductor is more flexible and therefore the best choice for mobile and stage use.
- 2) Insulation: includes "Solid", "Foamed", and "Highly-foamed" types. Foamed and highly-foamed insulation would perform better attenuation, compared to the solid type thus they are often selected for hi-def video. However, since foamed and high-foamed insulation contain the air physically, they are weak to external pressure. You should pay attention to where and how the cables are installed.
- 3) Shield: we have "Braided" and "Braided with aluminum foil" type. Braided shields include single, double, or triple layers as well as bare copper or tinned copper. Braided with aluminum foil offers perfect screening, but they are not suitable for repeated bending and mobile applications due to the foil's lack of strength. In that case, it's better to choose "Braided".

Braided Shield



Double-Layer Braided Shield



Braided Shield with Aluminum Foil



What is Propagation Delay?

Propagation delay refers to the time required for a signal to be transmitted from one end of connection to another. In the case of cable transmission, this greatly depends on the materials and construction of the actual cable, and large differences in delay can cause transmission errors if they exceed the receiver delay tolerance.

The following table shows the differences in coaxial cable propagation delay time relative to the insulation type.

Propagation Delay Caused by Coaxial Cable Insulation (reference)

Insulation	Propagation Delay
Solid PE	5.0 ns/m
Foamed PE	4.2 ns/m
Highly-Foamed PE	3.7 ns/m

■ Typical Transmission Distance as per SMPTE Standard

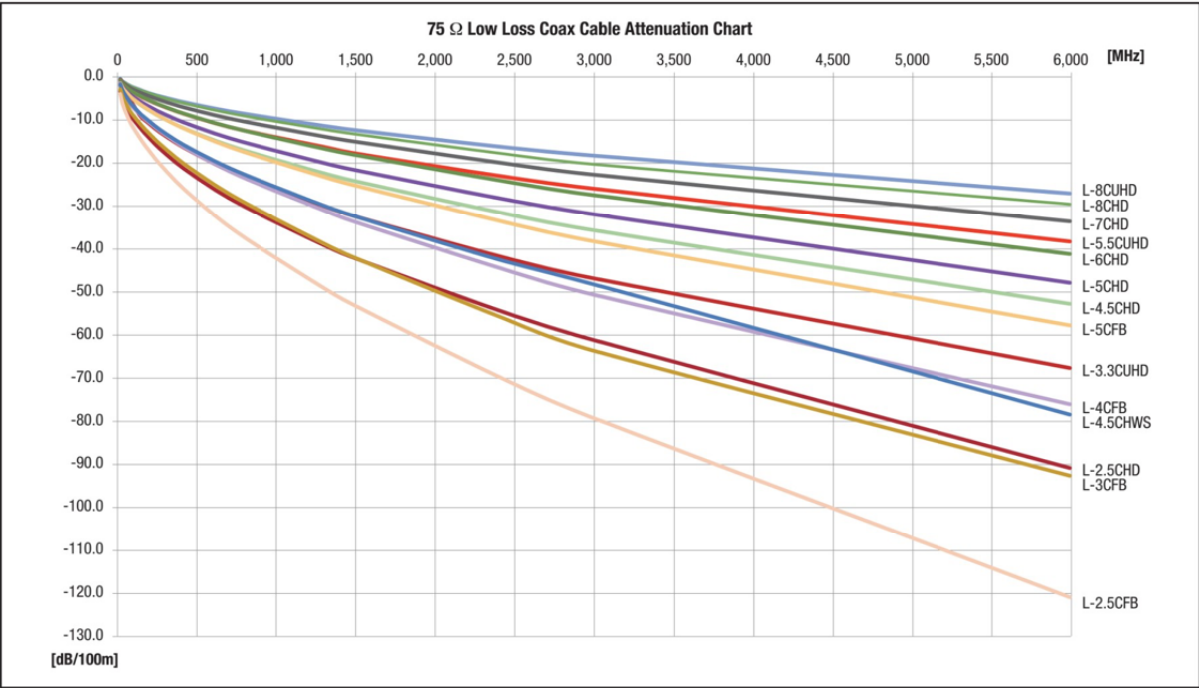
SMPTE	ST 259				ST 344	ST 292	ST 424	ST 2082-1
Designation	SD-SDI				540 Mbps-SDI	HD-SDI	3G-SDI	12G-SDI
Video Format	NTSC	PAL	525/625 (4:3)	525/625 (16:9)	525/625 (4:3) p60	2K 1080i	2K 1080p	4K UHD
Bit Rate	143 Mb/s	177 Mb/s	270 Mb/s	360 Mb/s	540 Mb/s	1.5 Gb/s	3 Gb/s	12 Gb/s
Clock	143 MHz	177 MHz	270 MHz	360 MHz	540 MHz	1.485 GHz	2.97 GHz	11.88 GHz
Cable Loss @ 1/2 Clock	30 dB @ 72 MHz	30 dB @ 88 MHz	30 dB @ 135 MHz	30 dB @ 180 MHz	30 dB @ 270 MHz	20 dB @ 750 MHz	30 dB @ 1.5 GHz	40 dB @ 6 GHz
Model	m	m	m	m	m	m	m	m
L-2.5CFB	265	242	199	172	139	54	55	32
L-2.5CHD	314	287	237	206	168	66	69	43
L-2.5CHLT	314	287	237	206	168	66	69	43
L-3CFB	344	314	257	222	179	68	69	42
L-3.3CUHD	461	422	306	265	215	85	90	58
L-4CFB	422	314	315	272	220	84	86	52
L-4CHD	447	410	337	294	238	93	98	61
L-5CFB	563	513	420	364	294	112	114	68
L-4.5CHD	551	504	415	361	293	115	119	74
L-5CHD	614	562	464	403	327	128	133	82
L-6CHD	766	700	575	499	403	154	158	95
L-5.5CUHD	769	697	566	491	400	155	161	102
L-7CHD	902	824	678	589	476	184	188	116
L-8CHD	1034	937	769	681	545	208	212	131
L-8CUHD	1034	937	789	681	555	219	227	143
L-2.5CHWS	275	247	198	171	138	53	54	32
V4-2.5CHW	288	258	208	178	144	56	57	34
L-3CFW	319	288	230	197	158	60	60	35
L-4.5CHWS	447	405	322	280	225	87	90	50
L-5CFW	535	483	384	333	267	103	105	56

The above values are based on SMPTE standards and will vary depending on receiving equipment.
Our criteria: Cable attenuation value does not exceed SMPTE cable loss at 1/2 clock frequency.
See page 67 for the cable nominal attenuation.

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75Ω Coax Cable Nominal Attenuation

Frequency		dB/100m											
		10MHz	30MHz	SMPTE 259M Composite NTSC	ITU-R BT.601 Composite PAL	SMPTE 259M Composite 4:2:2	SMPTE 259M Composite 4:2:2 16x9	SMPTE 344M 540Mb/s SDI	SMPTE 292M HD-SDI	1.3GHz	SMPTE ST 424 3G-SDI	3GHz	SMPTE ST 2082-1 12G-SDI
Model													
75Ω	L-1.5C2VS/V*-1.5C	8.7	15.2	23.8	26.4	32.9	38.1	47.1	80.5	108.6	117.5	173.4	—
	L-2.5CFB	4.8	7.6	11.3	12.4	15.1	17.4	21.5	37.0	50.0	54.1	80.2	121.8
	L-2.5CHD/L-2.5CHLT	4.1	6.5	9.5	10.4	12.6	14.5	17.8	30.2	40.0	43.1	62.0	91.7
	L-2.5CHWS	4.0	7.0	10.9	12.1	15.1	17.5	21.7	37.4	50.5	54.7	81.0	121.9
	V4-2.5CHW	3.8	6.7	10.4	11.6	14.4	16.8	20.7	35.7	48.3	52.3	77.4	115.9
	L-3C2V/L-3C2W	4.1	7.2	11.3	12.5	15.7	18.3	22.8	40.0	54.9	59.7	90.5	—
	L-3C2VS/V*-3C	4.5	7.9	12.4	13.7	17.2	20.0	24.8	43.2	58.9	63.9	96.0	—
	L-3CFB/V*-3CFB	3.7	5.9	8.7	9.5	11.7	13.5	16.7	29.1	39.6	43.0	64.5	93.5
	L-3CFW/V*-3CFW	3.4	5.9	9.4	10.4	13.0	15.2	18.9	33.1	45.4	49.4	74.8	114.2
	L-3.3CUHD	2.8	4.4	6.5	7.1	9.8	11.3	13.9	23.4	30.9	33.3	47.7	68.5
	L-4CFB	3.0	4.8	7.1	7.8	9.5	11.0	13.6	23.6	31.9	34.6	51.5	76.9
	V*-4CFB	3.0	4.9	7.2	7.9	9.7	11.2	13.9	24.3	33.2	36.0	54.3	83.8
	L-4CHD	2.9	4.6	6.7	7.3	8.9	10.2	12.6	21.3	28.4	30.6	44.3	65.1
	L-4.5CHD	2.3	3.7	5.4	6.0	7.2	8.3	10.2	17.4	23.2	25.1	36.5	53.6
	L-4.5CHWS	2.5	4.3	6.7	7.4	9.3	10.7	13.3	22.8	30.8	33.3	49.1	79.3
	L-5C2V/L-5C2W	2.5	4.5	7.1	7.9	9.9	11.6	14.4	25.7	35.6	38.9	59.9	94.8
	L-5C2VS/V*-5C	2.9	5.1	8.1	9.0	11.3	13.2	16.5	29.3	40.8	44.4	68.3	108.0
	L-5CFB/V*-5CFB	2.2	3.6	5.3	5.8	7.1	8.2	10.2	17.7	24.1	26.1	39.1	58.6
	L-5CFW/V*-5CFW	2.1	3.6	5.6	6.2	7.8	9.0	11.2	19.4	26.2	28.4	42.2	70.5
	L-5CHD	2.1	3.3	4.9	5.3	6.5	7.4	9.1	15.6	20.8	22.5	32.8	48.7
	L-5.5CUHD	1.6	2.6	3.9	4.3	5.3	6.1	7.5	12.9	17.1	18.6	26.8	39.1
	L-6CHD	1.7	2.7	3.9	4.3	5.2	6.0	7.4	12.9	17.5	19.0	28.3	42.0
	L-7CFB	1.6	2.5	3.8	4.2	5.1	6.0	7.5	13.4	18.8	20.5	32.0	53.6
	L-7CHD	1.4	2.3	3.3	3.6	4.4	5.1	6.3	10.9	14.7	15.9	23.5	34.4
	L-8CHD	1.2	2.0	2.9	3.2	3.9	4.4	5.5	9.6	13.0	14.1	21.1	30.4
	L-8CUHD	1.2	2.0	2.9	3.2	3.8	4.4	5.4	9.1	12.2	13.2	19.1	27.9
	LV-61S	3.8	6.6	10.4	11.6	14.5	16.9	20.9	36.6	49.9	54.2	81.7	126.0
	LV-77S	2.9	5.2	8.1	9.0	11.3	13.1	16.3	28.6	—	—	—	—



Cables

75Ω Coaxial Cables

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Analog to digital. HD to UHD. Canare 75 ohm coaxial cable series expands the range of choices for any kind of video formats.

■ Ultra Coax 12G-SDI

Type	Model	Sales units	Nom. O.D.	Weight	Inner cond			Insulation	Outer conductors		Inner cond. resist.	Outer cond. resist.	Static capacity	Characteristic impedance	Attenuation
					Comp.	O.D.	O.D.		Foil	Braid comp. (coverage)					
		m	mm	kg/100m	(AWG) Q'ty/mm	mm	mm			mm/ends/carriers	Ω/km	Ω/km	pF/m	Ω	dB/100m (6 GHz)
	 L-3.3CUHD	100 200	5.5	4.1	(21) 1/0.75A	0.75	3.3		Cu	0.12TA/8/16 (92%)	41.4	14.9	55	75	68.5
	 L-5.5CUHD	100 200 500 1000	7.7	7.1	(16) 1/1.35A	1.35	5.55		Cu	0.12TA/8/24 (91%)	12.8	10.3	52	75	39.1
	 L-8CUHD	100 200 500 1000	11.1	14.1	(13) 1/2.00A	2.00	8.26		Cu	0.16TA/8/24 (90%)	5.8	6.3	52	75	27.9

Jacket colors: black and others

Jacket: PVC Dielectric strength: 1000V AC/min.

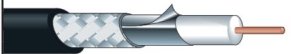
L-CUHD Series

- Specially designed for 12G-SDI
- The max. transmission distance of 4K UHD over L-5.5CUHD single link able to reach 100 m or longer*.
- *Depending on receiving equipment.
- As handy as conventional coaxial cables.
- Copper foil and high-density tinned copper braided shielding.
- Highly-foamed multi-layer PE insulation

Note 1: Designed for fixed installation, please avoid repeated bending or external pressure.

Note 2: Cable strippers (TS100 series) cannot be used for L-5.5CUHD and L-8CUHD.

■ Super Coax

Type	Model	Sales units	Nom. O.D.	Weight	Inner cond			Insulation	Outer conductors		Inner cond. resist.	Outer cond. resist.	Static capacity	Characteristic impedance	Attenuation
					Comp.	O.D.	O.D.		Foil	Braid comp. (coverage)					
		m	mm	kg/100m	(AWG) Q'ty/mm	mm	mm			mm/ends/carriers	Ω/km	Ω/km	pF/m	Ω	dB/100m (1.5 GHz)
	 L-2.5CHD	100 200	4.2	2.6	(23) 1/0.59A	0.59	2.59		AL	0.12TA/7/16 (95%)	66.9	16.9	53	75	43.1
	 L-4CHD		6.1	5.2	(20) 1/0.82A	0.82	3.68		AL	0.14TA/8/16 (95%)	36.4	11.4	53	75	30.6
	 L-4.5CHD		7.0	6.2	(18) 1/1.02A	1.02	4.57		AL	0.14TA/6/24 (91%)	23.3	9.9	53	75	25.1
	 L-5CHD		7.7	7.4	(17) 1/1.20A	1.20	4.9		AL	0.14TA/7/24 (93%)	16.1	8.2	53	75	22.5
	 L-6CHD		8.9	9.0	(16) 1/1.40A	1.40	6.1		AL	0.14TA/8/24 (92%)	11.8	7.7	53	75	19.0
	 L-7CHD		10.2	13.0	(14) 1/1.80A	1.80	7.3		AL	0.16TA/8/24 (92%)	7.1	6.1	53	75	15.9
	 L-8CHD		11.1	13.5	(12) 1/2.00A	2.00	8.2		AL	0.16TA/8/24 (89%)	5.8	6.3	53	75	14.1
Jacket colors: black and others															
	L-2.5CHLT	100 200	4.2	1.8	(23) 1/0.59A	0.59	2.59		AL	0.14TCCA/6/16 (95%)	66.9	21.5	53	75	43.1
Jacket colors: black and others															

Jacket: PVC Dielectric strength: 1000V AC/min.

L-CHD Series

- Best suited to 3G-SDI/HD-SDI transmission.
- Highly-foamed PE insulation allows further improvement in the attenuation characteristics.
- Multi-layer insulation in which to each layer is given a different foaming ratio is used to increase strength.
- High-density tinned copper braided shield with aluminum foil brings excellent shielding.
- Solid conductor

Note 1: Designed for fixed installation, please avoid repeated bending or external pressure.

Note 2: L-2.5CHLT has less connection strength with the connector BCP-B25HD compared with L-2.5CHD.

Note 3: Availability for Cable Stripper TS100 Series:

OK: L-2.5CHD and L-2.5CHLT, N/A: others

L-2.5CHLT

- Ideal for an O.B. van installation.
- Tinned copper-clad aluminum (CCA) braided shield brings an advantage in weight-saving.
- 30% lighter than L-2.5CHD, yet the same attenuation.
- Space-saving slim design: O.D. 4.2 mm
- High-density braided shield with aluminum foil
- Highly-foamed PE insulation
- Solid conductor

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Mobile Coax

Type	Model	Sales units	Nom. O.D.	Weight	Inner cond		Insulation	Outer conductors		Inner cond. resist.	Outer cond. resist.	Static capacity	Characteristic impedance	Attenuation
		m	mm	kg/100m	Comp.	O.D.	O.D.	Braid comp. (coverage)	mm/ends/carriers	Ω/100m	Ω/100m	pF/m	Ω	dB/100m (750 MHz)
 Jacket colors: black and others	L-2.5CHWS	100 200	4.2	3.2	(24) 7/0.20A	0.6	2.6	0.10TA/8/16 (95%) 0.10TA/9/16 (94%)		8.5	1.0	53	75	37.4
	L-4.5CHWS	100 200	7.2	6.6	(20) 7/0.34A	1.02	4.57	0.10A/8/24 (93%) 0.10A/9/24 (95%)		3.3	0.8	53	75	22.8
 Jacket colors: black and others	L-3CFW	100 200	5.8	5.1	(22) 1/0.65A	0.65	3.1	0.12A/5/24 (94%) 0.12A/6/24 (94%)		5.5	0.7	55	75	33.1
	L-5CFW	100 1000	7.7	8.1	(18) 1/1.05A	1.05	5.0	0.12A/7/24 (93%) 0.12A/9/24 (96%)		2.1	0.5	55	75	19.4

Jacket: PVC Dielectric strength: 1000V AC/min.

L-CHWS Series

- Suited to mobile HD application
- High-density double braided shield
- Flexible stranded center conductor
- Highly-foamed PE insulation

L-CFW Series

- Suited to mobile HD application
- High-density double braided shield
- Solid center conductor
- Foamed PE insulation

Note: Cable strippers (TS100 series) cannot be used.

Low Loss Coax

Type	Model	Sales units	Nom. O.D	Weight	Inner cond		Insulation	Outer conductors		Inner cond. resist.	Outer cond. resist.	Static capacity	Characteristic impedance	Attenuation
		m	mm	kg/100m	Comp.	O.D.	O.D.	Foil	Braid comp. (coverage)	Ω/100m	Ω/100m	pF/m	Ω	dB/100m (750 MHz)
					(AWG) Q*ty/mm	mm	mm		mm/ends/ carriers					
 Jacket colors for L-2.5CFB: black L-3CFB: black and others L-4CFB: black and others L-5CFB: black and others L-7CFB: black	L-2.5CFB	100 200	4.0	2.4	(25) 1/0.50A	0.50	2.4	AL	0.12TA/6/16 (92%)	9.3	2.0	55	75	37.0
	L-3CFB		5.5	4.0	(22) 1/0.65A	0.65	3.1	AL	0.14TA/6/16 (91%)	5.5	1.6	55	75	29.1
	L-4CFB		6.1	4.9	(20) 1/0.80A	0.80	3.7	AL	0.14TA/8/16 (93%)	3.6	1.1	55	75	23.6
	L-5CFB		7.7	7.3	(18) 1/1.05A	1.05	5.0	AL	0.14TA/7/24 (93%)	2.1	0.8	55	75	17.7
	L-7CFB		10.2	13.0	(15) 1/1.50A	1.50	7.3	AL	0.18TA/8/24 (95%)	1.0	0.5	55	75	13.4

Jacket: PVC Dielectric strength: 1000V AC/min.

L-CFB Series

- Suited to HD video signals
- High-density tinned copper braided shield with aluminum foil
- Solid center conductor
- Foamed PE insulation

Note: Designed for fixed installation, please avoid repeated bending or external pressure.

Technical Trend

Fiber-Optic Systems

Connectors

Cables

Panels & Patchbays

Multichannel Systems

Cable Assemblies