Microwave & RF Coaxial Cable Assemblies

Edition 2014(S)

Be compatible with world class microwave cables

GigaLane is certified according to ISO 9001, ISO 14001, AS 9100

GigaLane

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Be compatible with world class microwave cables

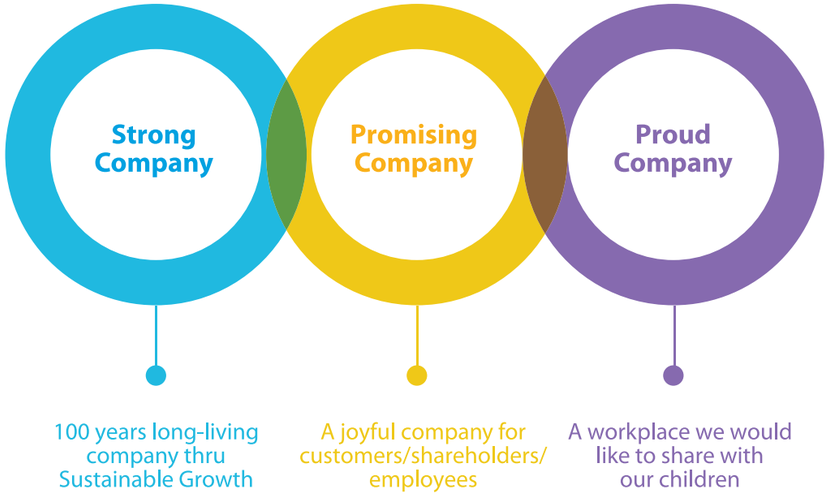
GigaLane is a company specialized in high performance RF connector, cable and assembly which is applicable to state-of-the-art technology for military, aerospace and mobile communications. GigaLane performs all activities from original design to production based on its R&D skills and technology.

The RF products of GigaLane comply with all military standards in design, production, quality assurance etc.

GigaLane looks forward to growing together with our customers by enhancing customer satisfaction through speedy supplying customized products that meet both requirements of high quality and fair price.

GigaLane is always at your service.

Vision



Quality Certificates

AS 9100	ISO 9001	ISO 14001

GigaLane is developing RF low loss cable and hermetically sealed RF cable for aircrafts in accordance with quality standards ISO 9001, 14001 and AS 9100. GigaLane strives to provide our customers with the best product quality, service and support for customer's satisfaction.

Qualified Test

Component test

Group		Test	Group
1	Shape & material	Material	A
		Finish	A
		Dissimilar metals	A
		Configuration and features	A
		Marking	A
		Mating	A
		Workmanship	A
		Permeability of nonmagnetic materials	B
		Coupling	B
	Retension force		B
	Insulation resistance		B
2	Center conductor force		B
	Salt fog		C
3	VSWR		C
	Durability		C
4	DWV		C
	Vibration		C
	Shock		C
	Thermal shock		C
	Humidity		C
	Cable tension		C
	Corona level		C
	RF high potential withstanding voltage		C
	Connector retention		C
5	RF leakage		c
6	Insertion loss		C
7	Contact resistance		C

Assembly performance test

No	Test	Standard
1	Weight	Drawing
2	Frequency	Customer requirement
3	VSWR	Customer requirement
4	Insertion loss	Customer requirement
5	Insulation R	MIL-T-81490A
6	Voltage withstanding	MIL-T-81490A
7	Impedance	MIL-DTL-87104B

Assembly environmental test

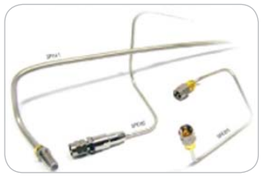
No	Test	Standard
1	Minimum bend R	MIL-T-81490A
2	IL stability	MIL-T-81490A
3	VSWR stability	MIL-T-81490A
4	Flexure	MIL-T-81490A
5	Impact	MIL-T-81490A
6	Thermal shock	MIL-STD-202G, 107, C-1
7	Humidity	MIL-STD-810E, Method 507
8	Salt fog	MIL-STD-810E, Method 509
9	Vibration	MIL-STD-202G, Method 204
10	Chemical R	MIL-T-81490A, MIL-DTL-87104B
11	Sand & Dust	MIL-T-81490A, MIL-DTL-87104B
12	RFI	MIL-STD-1344

Bulk cable performance test

No	Test	Standard
1	Dimension	Drawing
2	Voltage	MIL-T-81490A
3	Impedance	MIL-T-81490A
4	Minimum BR	MIL-T-81490A
5	Flexure	MIL-T-81490A
6	Impact	MIL-T-81490A
7	Thermal shock	MIL-T-81490A
8	Humidity	MIL-T-81490A
9	VSWR	MIL-T-81490A
10	Insertion loss	MIL-T-81490A
11	RFI	MIL-STD-1344
12	Vapor seal	KS C 0226

GigaLane
Microwave Cable
GL

GigaLane was established in 2001, specializing in design, development and production of RF & microwave connectors, cable assemblies, RF modules and subsystems up to 60GHz based on its qualified R&D faculties.

Introduction

GigaLane is a sole and largest supplier for mobile RF connector assembly in Korea and is now expanding to manufacture a variety of RF connector/cables for Military, Aerospace and Network.

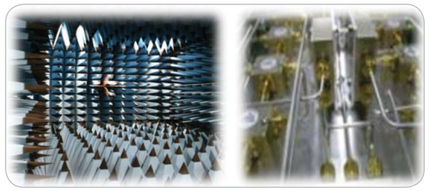
GigaLane operates a high-performancemicrowave cable production line in Korea, designs and assembles all manufacturing equipments with its own technology.

GiaLane's quality system ensures that we meet our customer's requirements in product quality, performance and delivery.
In 2010, GigaLane was selected by KAI(Korea Aerospace Industries) as a supplier of light weight airborne cable assemblies for Helicopter, Trainer, UAV.

The GL & GUL coaxial cables are designed to fit DC~40GHz frequency range. GigaLane cables are known for their competitiveness in performance, durability and cost-effectiveness.

Applications

Wireless Telecommunications



Enables supplying a variety of cable diameter and insertion loss

- GL100
- GL140 / GL140s
- GL200 / GL200s
- GL340s
- Enables customizing cable color when for large orders

Military - Ground Vehicle & Radar

All cable assemblies in compliance with Military standards

- Long life time
- Composite cable assembly
- RF + Harness cable assembly
- Military certification
- Optimized for field application

Test & Measurement

Cable assembly for high-durability test

- Low loss
- High flexibility
- Phase / Insertion loss stability
- High temperature
- Low VSWR connector & assembly
- Armored cable
- Customized length

Military - Aircraft

Specific design for airframe

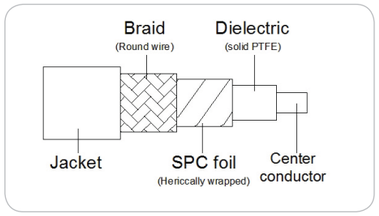
- Meet the stringent specification
- Requirements of military aircraft
- Hermetically sealed (vapor sealed)
- Crushproof design
- Anti rotation connector

Gigalane Overview GL

Structure & Feature

Coaxial cable mainly consists of center conductor, dielectric, shield layer, and jacket. The dielectric constant of low-loss cable is as low as 1.4~1.7 ; and it is the special feature that RF insertion loss can be drastically minimized.

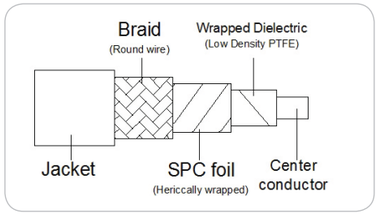
General Type



Dielectric : full density PTFE
VP : 70%
RG405, RG-402, SF141 etc.

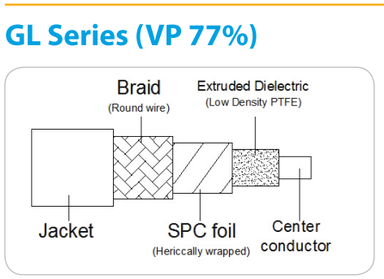
Overview

GUL Series (VP 83%)



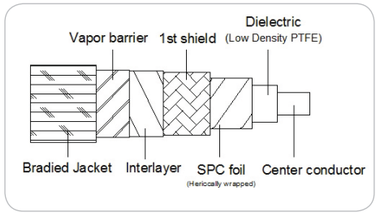
Dielectric : low density taped PTFE
Dielectric constant : 1.45 nominal
VP : 83% nominal
Low insertion loss (70% nominal)
GUL100, GUL140, GUL180, GUL310 etc.
Jacket : FEP or PUR

GL Series (VP 77%)



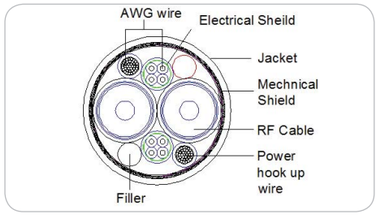
Dielectric : low density extruded PTFE
Dielectric constant : 1.7 nominal
VP : 77% nominal
Low insertion loss (90% nominal)
GL100, GL140, GL200, GL340 etc.
Jacket : FEP or PUR

Airborne



VP : 77 ~ 83% nominal
Durable vapor sealing
Light weight
GLA210, GULA320 etc.

Composite

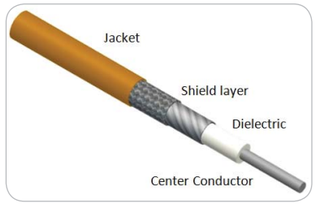


Customizable

Cable Specification (GL)

Cable Structure & Material

Center conductor : silver plated copper (solid / stranded)
Dielectric core : low density PTFE (extruded)
Outer conductor : silver plated copper
Jacket : extruded FEP



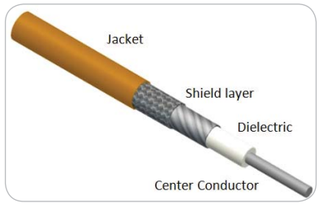
	GL100	GL140s	GL200	GL200s	GL200sC01	GL340s
Physical & Environmental Specifications						
Center conductor [mm]	0.54	19/0.2	1.39	19 / 0.3	19 / 0.3	19/0.48
Out diameter [mm]	3.0	4.2	5.7	5.7	6.1	8.7
Minimum bend radius [mm]	12.5	19.05	29.2	29.2	29.2	52
Weight [g/m]	30	42	70	70	70	135
Temperature range	-55~135℃	-55~135℃	-55~135℃	-55~135℃	-40~100℃	-55~135℃
Electrical Specifications						
Impedance	50Ω	50Ω	50Ω	50Ω	50Ω	50Ω
Velocity of propagation	77% nom.	77% nom.	77% nom.	77% nom.	77% nom.	77% nom.
Dielectric constant	1.7	1.7	1.7	1.7	1.7	1.7
RF leakage	-100dB	-100dB	-100dB	-100dB	-100dB	-100dB
Time delay [ns/m]	4.35	4.35	4.35	4.35	4.35	4.35
Capacitance [pF/m]	86	86	85	85	85	86
Phase stability vs. flexure [@18GHz max.]	4°	4°	5°	4°	4°	3° [@6GHz max.]
IL stability vs. flexure [dB @minimum BR]	±0.3	±0.3	±0.3	±0.3	±0.3	±0.3
Phase stability vs. temp. [deg/GHz/m] (-40~80℃)	< 2°	< 2°	< 2°	< 2°	< 2°	< 2°
Attenuation [dB/m]						
1 GHz	0.55	0.33	0.22	0.23	0.23	0.14
3 GHz	0.97	0.58	0.40	0.41	0.41	0.26
6 GHz	1.39	0.84	0.58	0.59	0.59	0.38
10 GHz	1.83	1.12	0.78	0.82	0.82	-
12 GHz	2.01	1.24	0.87	0.91	0.91	-
18 GHz	2.51	1.58	1.10	1.15	1.15	-
26.5 GHz	-	1.94	1.39	1.41	1.41	-
40 GHz	-	2.48	-	-	-	-
Power Handling [W] @ + 25 ℃ (Sea level)						
1 GHz	370	620	1040	982	600	1874
2 GHz	262	440	735	694	400	1326
6 GHz	152	254	424	401	240	766
12 GHz	107	180	300	283	160	-
18 GHz	88	147	245	231	140	-
40 GHz	-	99	-	-	-	-

* The subscript 's' stands for stranded center conductor (higher flexibility)
* Refer page 12,13 for compatible connector

Cable Specification (GUL)

Cable Structure & Material

Center conductor : silver plated copper (solid / stranded)
Dielectric core : ultra low density PTFE (taped)
Outer conductor : silver plated copper
Jacket : extruded FEP



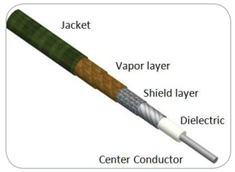
	GUL140	GUL180	GUL310
Physical & Environmental Specifications			
Center conductor [mm]	0.9	1.29	2.35
Out diameter [mm]	3.6	6	7.8
Minimum bend radius [mm]	25.4	25.4	48.5
Weight [g/m]	33	51	115
Temperature range	-55~165℃	-55~165℃	-55~165℃
Electrical Specifications			
Impedance	50Ω	50Ω	50Ω
Velocity of propagation	85% nom.	84% nom.	84% nom.
Dielectric constant	1.4	1.4	1.4
RF leakage	-100dB	-100dB	-100dB
Time delay [ns/m]	3.95	3.95	3.95
Capacitance [pF/m]	78	78	78
Phase stability vs. flexure [@18GHz max.]	3°	3°	3°
IL stability vs. flexure [dB @minimum BR]	±0.1	±0.1	±0.1
Phase stability vs. temp. [deg/GHz/m] (-40~80℃)	< 2°	< 2°	< 2°
Attenuation [dB/m]			
1 GHz	0.38	0.24	0.14
3 GHz	0.65	0.43	0.25
6 GHz	0.93	0.74	0.45
10 GHz	1.21	0.84	0.51
12 GHz	1.34	0.93	0.57
18 GHz	1.66	1.18	0.73
26.5 GHz	-	1.48	-
40 GHz	-	-	-
Power Handling [W] @ + 25 ℃ (sea level)			
1 GHz	300	1015	1998
2 GHz	200	718	1413
6 GHz	100	414	816
12 GHz	70	293	577
18 GHz	55	239	471
40 GHz	-	-	-

* The subscript 's' stands for stranded center conductor (higher flexibility)
* Refer page 12, 13 for compatible connector

Cable Specification (GLA&GULA)

Cable Structure & Material

Center conductor : silver plated copper (solid / stranded)
Dielectric core : low density PTFE
Outer conductor : silver plated copper
Vapor layer : high temperature tape
Jacket : Nomex & Kevlar



	GLA210	GULA320
Physical & Environmental Specifications		
Out diameter [mm]	5.9	8
Minimum bend radius [mm]	29.2	44
Weight [g/m]	60	95
Temperature range	-55 ~ +200 ℃	-55 ~ +200 ℃
Chemical resistance	In accordance with 'MIL-T-81490' and 'MIL-DTL-87104'	
Flexure	In accordance with 'MIL-T-81490' and 'MIL-DTL-87104'	
Salt fog	In accordance with 'MIL-T-81490' and 'MIL-DTL-87104'	
Humidity	In accordance with 'MIL-T-81490' and 'MIL-DTL-87104'	
Abrasion resistance	In accordance with 'MIL-T-81490' and 'MIL-DTL-87104'	
Cable tensile strength	75 lbs.(34.02 kg) minimum	
Vapor leakage	He 1 x 10^{-5} cc/sec/ft 'MIL-T-81490'	
Vibration	In accordance with 'MIL-T-81490'	
Impact shock	In accordance with 'MIL-T-81490'	
Electrical Specifications		
Frequency range	DC to 18 GHz	DC to 18 GHz
Impedance	50Ω	50Ω
Velocity of propagation	77% nom.	84% nom.
VSWR (max)	1.35 : 1	1.35 : 1
Cable assembly Insertion loss(max)	1.30 dB/m @ 18 GHz	0.8 dB/m @ 18 GHz
Maximum operation voltage	1000 Volts	2000 Volts
RF leakage	-100 dB	-100 dB
Insertion loss stability	In accordance with 'MIL-T-81490'	
VSWR stability	In accordance with 'MIL-T-81490'	

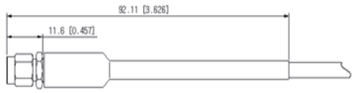
* Enables supplying cable assembly only for airborne application
* Enables connecting anti rotation connector and it can eliminate safety wire
* Applied airborne : Helicopter, Trainer, UAV etc.

Connector Drawings

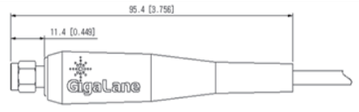
For Microwave and Commercial

More various connectors are available.
SMA, N, TNC, BNC type are in compliance with MIL-PRF-39012

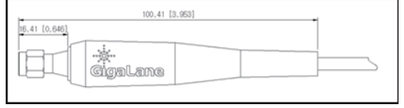
Cable	Part Name
GL140sB02	SMS114
Straight SMA Plug	



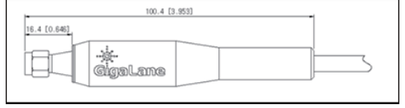
Cable	Part Name
GL140sB02	SMS114
Straight SMA Plug	



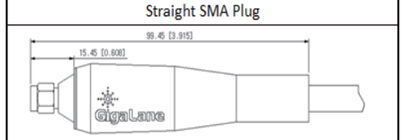
Cable	Part Name
GL140sD	SMS115
GL140sE	KMS116
Straight SMA Plug, Straight K(2.92mm) Plug	



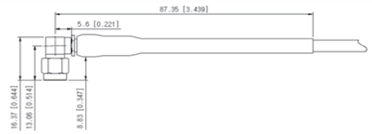
Cable	Part Name
GL200C, GL200sC	SMS111
GL200D, GL200sD	SMS112
Straight SMA Plug	



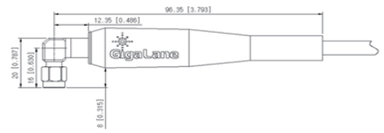
Cable	Part Name
GUL310C	SMS120
Straight SMA Plug	



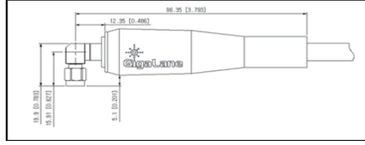
Cable	Part Name
GL140sB02	SMR114
Right Angle SMA Plug	



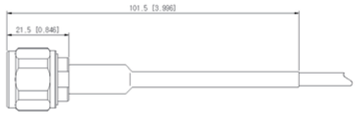
Cable	Part Name
GL200C, GL200sC	SMR111
Right Angle SMA Plug	



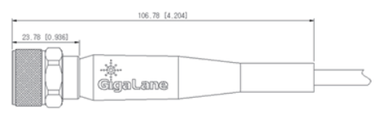
Cable	Part Name
GUL310C	SMR120
Right Angle SMA Plug	



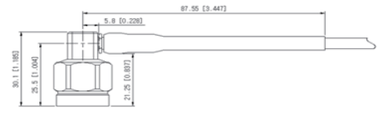
Cable	Part Name
GL140sB02	SMS114
Straight N Plug	



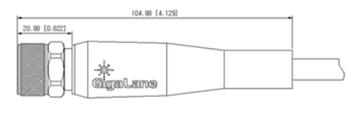
Cable	Part Name
GL200C, GL200sC	NMS111
Straight N Plug	



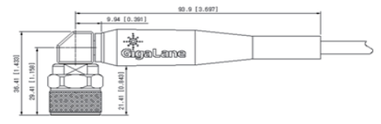
Cable	Part Name
GL140sB02	NMR114
Right Angle N Plug	



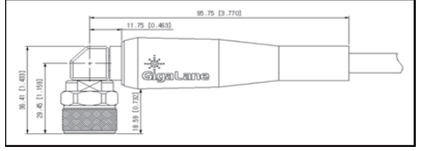
Cable	Part Name
GUL310C	NMS120
Straight N Plug	



Cable	Part Name
GL200C, GL200sC	NMR111
Right Angle N Plug	



Cable	Part Name
GUL310C	NMR120
Right Angle N Plug	

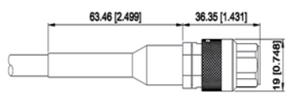


Connector Drawings

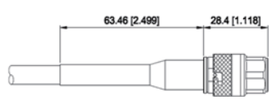
For Aircraft

All connectors are designed to meet the aircraft requirement and in compliance with MIL-PRF-39012 & MIL-T-81490.
Enables designing customized connector according to airframe structure.
Field replaceable connector available.
Anti rotation connector can eliminate safety wire

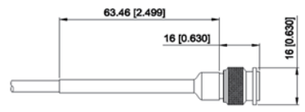
Cable	Part Name
GLA210	TAMS402M
Anti-Rotation Straight TNCA PLUG	
Hermetically Sealed	



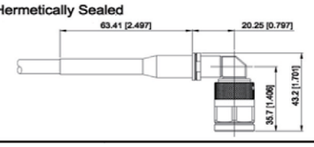
Cable	Part Name
GULA320	TAMS403M
Anti-Rotation Straight TNCA PLUG	
Hermetically Sealed	



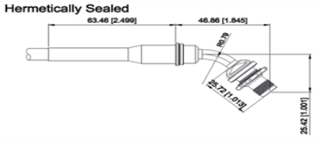
Cable	Part Name
GLA210	TMS401M
Straight TNC PLUG	



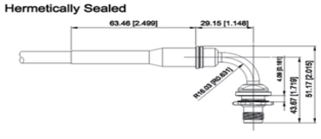
Cable	Part Name
GULA320	NAMRA401M
Anti-Rotation Right Angle SELFLOCKING N PLUG	
Hermetically Sealed	



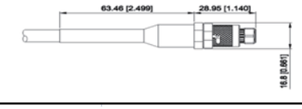
Cable	Part Name
GULA320	TAFRA401M
Bulk Head Right Angle 45° TNCA JACK	
Hermetically Sealed	



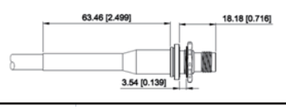
Cable	Part Name
GULA320	TAFRA402M
Bulk Head Right Angle 90° TNCA JACK	
Hermetically Sealed	



Cable	Part Name
GULA320	SMS401M
Anti-Rotation Straight SELFLOCKING SMA PLUG	
Hermetically Sealed	



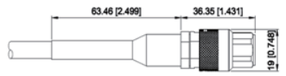
Cable	Part Name
GULA320	TAFS401M
Bulk Head TNCA JACK	
Hermetically Sealed	



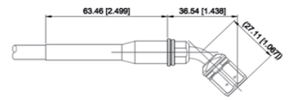
Connector Drawings

For Aircraft

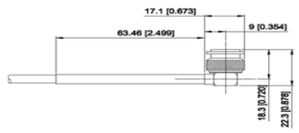
Cable	Part Name
GULA320	TAMS401M
Anti-Rotation Straight TNCA PLUG	
Hermetically Sealed	



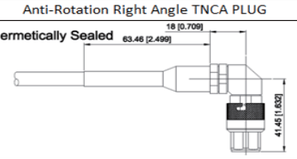
Cable	Part Name
GULA320	TMR402M
Right Angle 45˚ TNCA PLUG	
Hermetically Sealed	



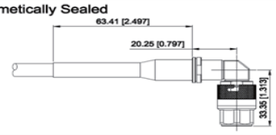
Cable	Part Name
GLA210	TMR401M
Right Angle TNC PLUG	



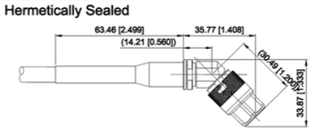
Cable	Part Name
GULA320	TAMRA401M
Anti-Rotation Right Angle TNCA PLUG	
Hermetically Sealed	



Cable	Part Name
GULA320	TAMRA402M
Anti-Rotation Right Angle TNCA PLUG	
Hermetically Sealed	

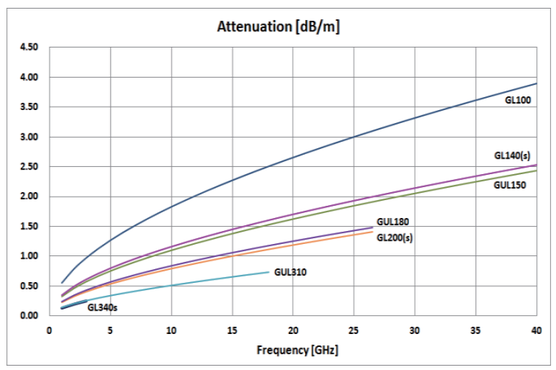


Cable	Part Name
GLUA320	TAMRA403M
Anti-Rotation Right Angle 45˚ TNCA PLUG	
Hermetically Sealed	



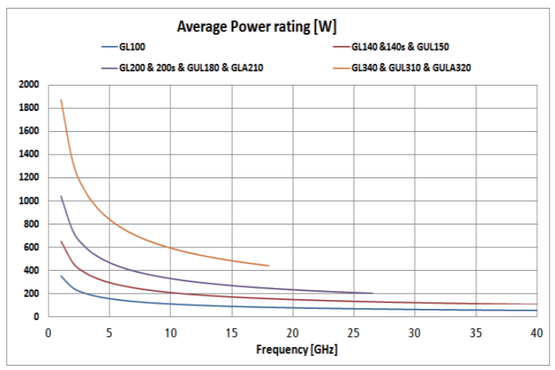
Technical Information

Typical Insertion Loss



* See the page 9, 10 for exact insertion loss value

Average Power Ratings

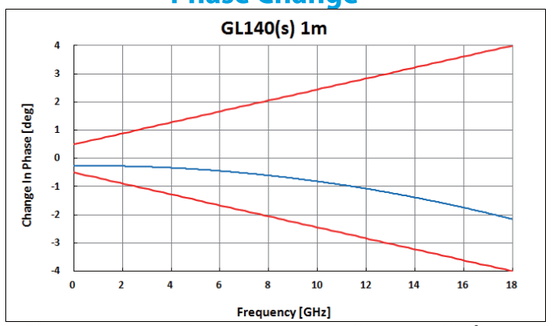


* Power rating at sea level

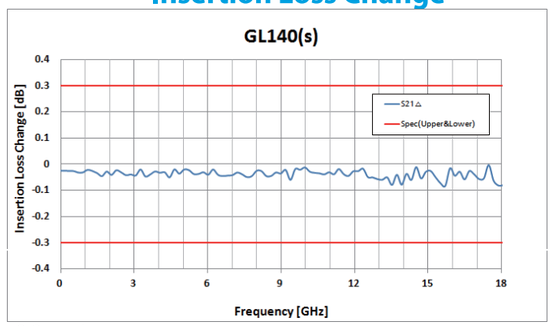
Technical Information

Insertion & Phase Stability with Flexure

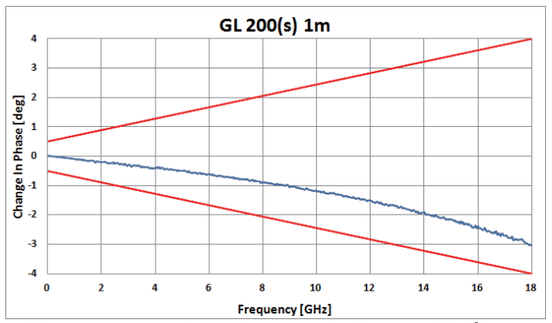
Phase Change

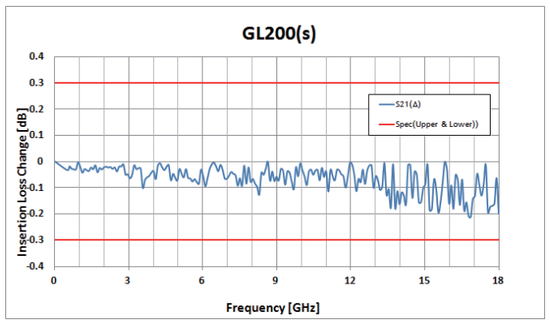


Insertion Loss Change

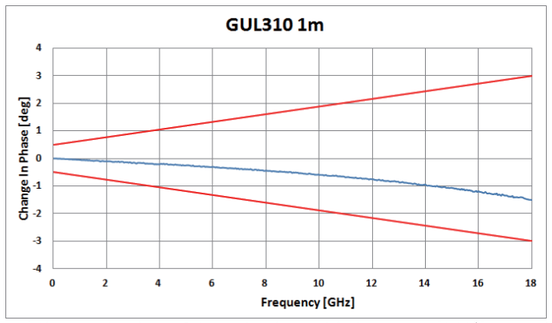


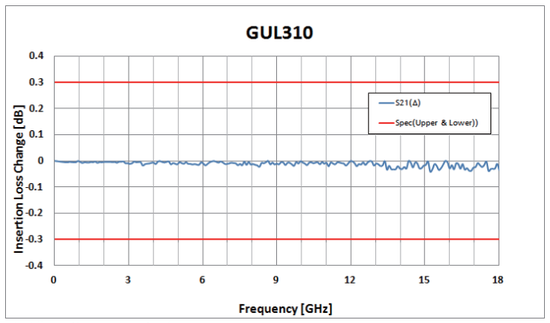
*Changes in phase & insertion loss with One wrap [360˚] around a 0.8" radius mandrel



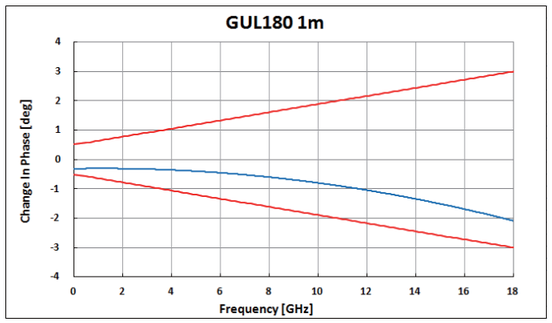


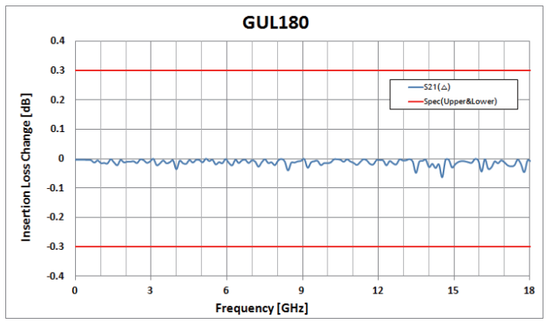
*Changes in phase & insertion loss with One wrap [360˚] around a 1.2" radius mandrel





*Changes in phase & insertion loss with One wrap [360˚] around a 2.0" radius mandrel



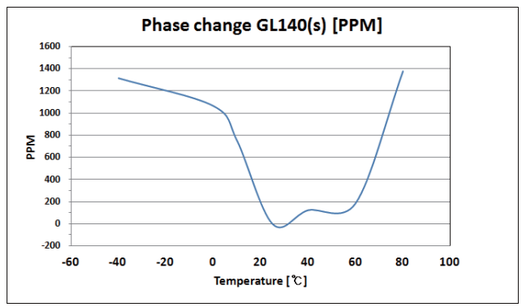


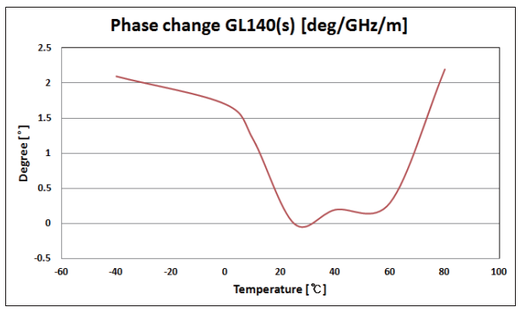
*Changes in phase & insertion loss with One wrap [360˚] around a 1.0" radius mandrel

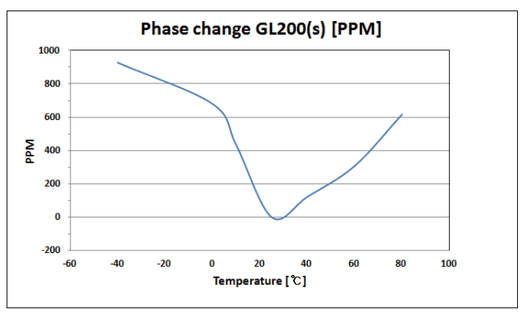
GigaLane

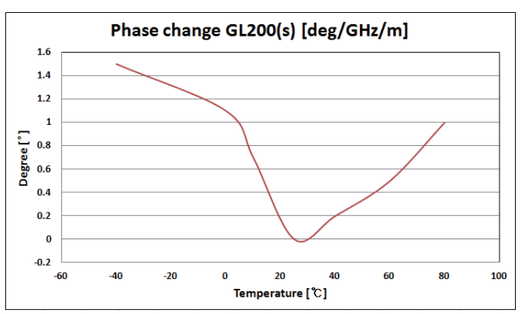
Technical Information

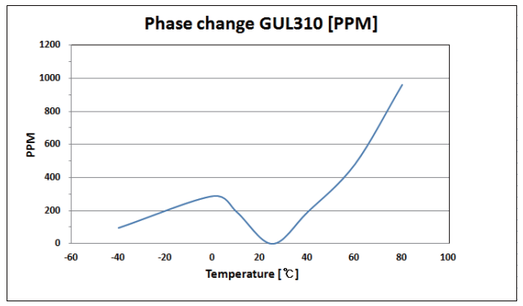
Insertion & Phase Stability with Temperature

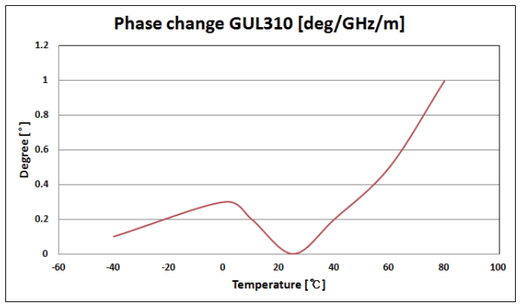


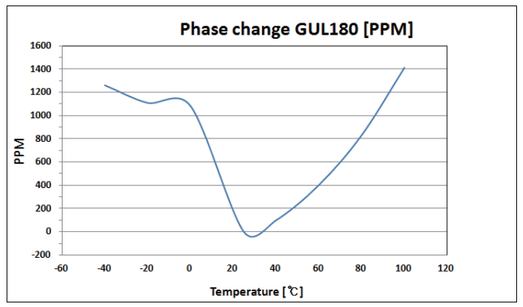


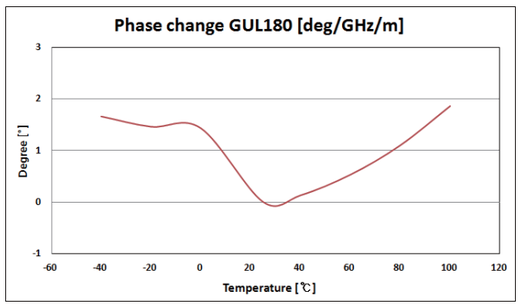








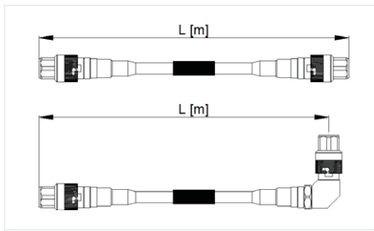




* Contact us if you need specific cable phase stability graph

Part Numbering System

Specifying Assembly Length



Guranteed Length Tolerance	
0.3M~2M (1ft ~ 6ft)	±5mm(±0.2 in.)
2.5M (6ft ~ 16ft)	±10mm (±0.4 in.)
5~10M (16ft ~ 33ft)	±20mm (±0.8 in.)
> 10M (33ft)	Consult

Cable Part Number Designation

G L 200 s C O1 A
① ② ③ ④ ⑤ ⑥ ⑦

1st	2nd		3rd		4th		5th		6th		7th	
Company Name	Code	Dielctric	Code	Cable Diameter (≒inch x 1000)	Code	Center Conductor	Code	Frequency (GHz)	Code	Option 1	Code	Option 2	Code
Gigalane	G	Extruded	L	100	100	Solid	-	3	A	Jacket - Orange, FEP	-	Unarmor	-
		Wrapping	UL	140	140	Stranded	s	6	B	Jacket - Black, PUR	01	Armor	A
				200	200			18	C	Jacket - Gray, HFPE	02		
				340	340			26.5	D	Jacket - Black, FEP	03		
				180	180			40	E	Jacket - Gray, FEP	04		
				310	310			50	F				
								67	G				
								110	H				

Standard — Option

Cable and Connector Selection

Cable selection		Standard Connector selection					max. VSWR		
		SMA type		N type		K type	Connector		
P/N	Frequency	Straight	R/A	Straight	R/A	Straight	ST to ST	ST to R/A	R/A to R/A
GL140sB02	6 GHz	SMS114	SMR114	NMS114	NMR114	-	1.15	1.2	1.25
GL140sC	18 GHz	SMS122	-	-	-	-	1.25	-	-
GL140sD	26.5 GHz	SMS115	-	-	-	-	1.25	-	-
GL140sE	40 GHz	-	-	-	-	KMS116	1.35	-	-
GL200C	18 GHz	SMS111	SMR111	NMS111 NFS111(Female)	NMR111	-	1.25	1.35	1.45
GL200D	26.5 GHz	SMS112	-	-	-	-	1.25	-	-
GL200sC	18 GHz	SMS111	SMR111	NMS111 NFS111(Female)	NMR111	-	1.25	1.35	1.45
GL200sD	26.5 GHz	SMS112	-	-	-	-	1.25	-	-
GL340B	6 GHz	SMS117	-	-	-	-	1.23	-	-
GUL180C	18 GHz	SMS119	SMR119	NMS119	NMR119	-	1.25	1.35	1.45
GUL310C	18 GHz	SMS120	SMR120	NMS120	NMR120	-	1.25	1.35	1.45

*All connectors are male(Plug) type *Typical insertion loss of one connector
-Straight connector : 0.03 X √f with f in GHz
-Right angle connector : 0.07 X √f with f in GHz

SMS111-GL200C-SMS111-1M
Connector ① Cable ② Connector ① Length ③

① **Select connector** : SMS111 (18GHz SMA Male Straight)
② **Select cable** : GL200C (18GHz Low loss cable)
③ **Select cable length** : 1M (1meter)

**At any time, to respond to the needs of our customers,
GigaLane is always on your side.**

언제든 고객의 요구에 응답할 수 있도록
기가레인은 항상 고객의 곁에 있습니다.

HQ (Hwa-seong)

HQ (MEMS FAB)

CNC (Hwa-seong)

Factory (Asan)

Factory (Yantai, China)

New Building
(Dong-tan, Korea)

Business Sites