

5G Wireless Devices

Semiconductors

5G Connected Cars

Aerospace & Defense

Microwave & mmWave Test and Measurement



# **CUSTOMIZED SOLUTIONS**

We optimize Material & Design Technologies for 5G Connected Devices

to provide **Total Solutions** that give you your preferences:

Last Stop.





Your trusted partner for **5G** and **BEYOND-5G** 

# Microwave Precision Cable Ultra-miniaturized Coaxial Cable / Connector for SMT 1.5mm Minimum Bend Radius Cable (67GHz)

# Connectivity

- 01 Company
- 02 Business
- **03** Microwave Cable & Connector
- 04 MGroup
- 05 Antenna
- 06 60GHz soldering Antenna



## Antenna

- Installation Antennas for mobile carrier
- Antenna Modules
- Test Antennas



Your trusted partner for 5G and BEYOND-5G











We make your RF the BEST

# **™**Mission

"We design and manufacture high performance RF Interconnectors and Antenna. RF Designers and test engineers can leverage our products to make their RF performance best, on time."

# Core Capability

mmWave-oriented passive RF design

mmWave-optimized material fusion

ledo

Expertise in manufacturing and testing up to 110GHz





Selected as a recipient of 2021 Industrial Technology. Achievements' by NAEK



Selection of innovative companies under the supervision of the Financial Services Commission for 'innovative enterprises representative 1000.



CES' 2023 INNOVATION AWARDS



Sensorview is discovering and developing various key technologies to lead the mmWave(5G) market. We are actively applying for patents/designs/trademarks for technical protection.

Dom	estic	Ove	TOTAL	
registration	application	registration	TOTAL	
8	67	30	60	165



# **W**Certifications

ISO 14001 Environment



ISO 9001





# We make your RF the BEST **Business**

High Speed (6.25Gbps), Low Power-Consumption

High Gain + Gain-Flatness + Improved Isolation

(mW level), and Short Range (5-20mm).

# **SENSOR** VIEW **Industries**

SENSORVIEW delivers a total solution platform service by providing material and design technologies and a technology to technology fusion platform for smart 5G connected devices.

## **In-Building Coverage**



(617-960 / 1710-2690 / 3500 / 5800MHz) Perfectly Camouflaged Antenna (Complaint Free) Cost Reduction - 2 in 1 Concept



Indoor Cell coverage solution for For general service operator testing and Meets indoor requirements, which vary greatly because not all environment are

## 5G Laptop

**5G** 

Wireless

Various IT applications and

a large market potential.

**Device** 

TLIA® solution



Ultra compact Multi-Gang cable series that can carry a signal with low loss and near-zero EMI.

**Smart TV** 

60GHz Wireless Connector. High Speed (6.25Gbps), Low Power-Consumption (mW level),

60GHz Wireless Connector.

via Miniaturized Form Factor

and Short Range (5-20mm). High Gain + Gain-Flatness + Improved Isolation via Miniaturized Form Factor

**5G Smartphone** 

Flex-S ${\mathbb R}$  (multi-line cable) and TLIA ${\mathbb R}$  (Transmission Line Integrated Antenna) are made of low-loss materials and designed with patent-protected technologies. They are vital components in mmWave devices. FLEX-S® and TLIA® bring low-loss and high quality performance.





Third Party Products

## Ultra Wide Band

(Antenna + Information Sign)



coverage optimization. building cell coverage.

# **5G** Infrastructure

**Ultra Wideband Antennas** for in-building solutions. High-Gain antenna technologies.

## **5G Network**



Our patented design.
Gain+ delivers a higher gain
and wider beam steering range vs. conventional antennas.

## **In-Building Coverage**



Our patented design. Gain+ delivers a higher gain and wider beam steering range vs. conventional antennas.



Ultra compact Multi-Gang cable series that can carry a signal with low loss and near-zero EMI.

# Semiconductor

**SENSORVIEW's proprietary** solution.

Made possibly by innovation and patent ownership.

05







SENSORVIEW's miniature multiband antenna solution. Optimized for 5G AUT in test & measurement

- Minimizes chamber size
- Decreases expenditure
- Maximizes test performance



SENSORVIEW's high-quality, high-performance coaxial cable

- Low Insertion Loss
- Phase Stability vs. Temperature Insertion Loss Stability vs. Bending
- Phase Stability vs. Bending Low VSWR



Phase-Matched adapter that meet MIL STD 348. Manufactured in a wide range within / hetween series Matched adapter have the same nominal connector mating reference plane to reference plane length.



SENSORVIEW connectors are designed and manufactured to guarantee optimize end product performance/ We provide optimal transition for a low return loss. We can tailor connectors for specific equipment and

## Semiconductor **Test Equipment**



**EMI-Shielding Solution** Military Aircraft, and AESA Radars

## Missiles / Aircraft



Our unique braiding technology, "Zenild®" provides superior shielding effectiveness VS copper wire and offers significant weight savings. Silver Plated Fiber delivers over 60% weight savings VS copper wire at equal



Bendable\* Microwave Cable Wireless Connector. Minimum Bend Radius 1.5mm DC to 67GHz

Low-loss, EMI shielding MIL-STD compliant Outer Diameter 2mm

# Test & Measurement

**Compact OTA Testing Size** Reduction SENSORVIEW's **Proprietary Antenna** 



## mmWave OTA Solutions



**Network Analyzer** 

SENSORVIEW's high-quality, highperformance coaxial cable assembly.

- Low Insertion Loss Phase Stability vs. Temperature
- Insertion Loss Stability vs. Bending
- Phase Stability vs. Bending

Phase-Matched Adaptors that meet

Matched adaptors have the same

plane to reference plane length.

nominal connector mating reference

Low VSWR

MIL STD 348.

between series.



SENSORVIEW's high-quality, highperformance coaxial cable assembly.

SENSORVIEW's miniature multi-

Optimized for 5G AUT in test &

Maximizes test performance

band antenna solution.

Minimizes chamber size

Decreases expenditure

measurement.

- Low Insertion Loss
- Phase Stability vs. Temperature
- Insertion Loss Stability vs. Bending Phase Stability vs. Bending
- Low VSWR



Phase-Matched Adaptors that meet MIL STD 348.

Manufactured in a wide range within / between series.

Matched adaptors have the same nominal connector mating reference plane to reference plane length.

## **AESA Radar**



Car

Light- Weight,

**EMI- Shielded** 

Connected

**5G-Based Connected Car** 

High Efficiency, Masssive Antenna Arrays. Active Array Synthesis



Phase-Matched Adaptors that meet MIL STD 348.

Manufactured in a wide range within / between series.

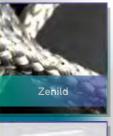
Matched adaptors have the same nominal connector mating reference plane to reference plane length.



SENSORVIEW connectors are designed and manufactured to guarantee optimize end product performance / We provide optimal transition for a low return loss.

We can tailor connectors for specific equipment and applications.

## **Autonomous Vehicles**



Our unique braiding technology, "Zenild<sup>®</sup>" provides superior shielding effectiveness VS copper wire and offers significant weight savings. Silver Plated Fiber Weights over 60% savings VS copper wire at equal volume Excellent.



Our patented antenna design, "Gain+" performs higher gain and wider beam steering range compare with the





# Microwave Cable & Connector W







Your trusted partner for 5G and BEYOND-5G

## 01. FlexStable®

Low Loss Microwave Cable **Excellent Flexibility Phase & Amplitude Stability** 

## 02. Flex Armor ™

**High Crush resistance Excellent Flexibility Phase & Ampilitude Stability** 

## 03, Zenild®

**Ultra Light Weight Material & Cable High Screen Effectiveness** 

## 04. FlexiBe®

Minimum Bend Radius Cable Assembly (MBR 1.5mm)

## 05. Micro Coaxial Cable

047 Type Flexible Cable (DC~110GHz)

## 06. Gannector®

**Magnetic Connector Solution Tool-Free & Quick Connector** 

## 07. End-Launch

Quick slide connector Bolt loss prevention

## 08. Connector & Adapter

**Color Coded RF adapters** Phase Match / Flange / Customized

# Microwave Cable & Connector

# FlexStable<sup>®</sup> **Microwave Cable**

SENSORVIEW FlexStable® microwave cable assembly series offer excellent performance providing various benefits to your specific needs.

Freq DC to 67GHz

We make your RF the BEST SENSORVIEW

Low-loss

VP (Velocity of propagation) 77 to 84% Phase-Stable (vs. bending)

**Phase-Matching** Under 1ps.



**SENSORVIEW** designs and produces the cable & connector solutions for microwave & milimeterwave systems by incorporating inhouse material technologies which guarantee excellent electrical performance versus flexure and temperature variation.

### Aeroflon® Dielectric

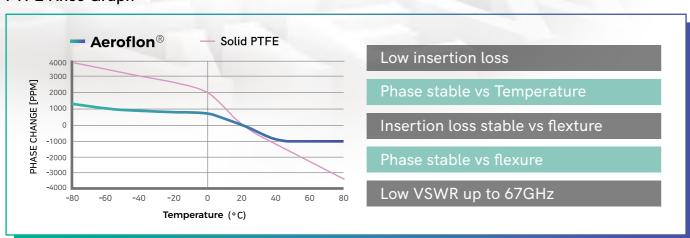
### For low loss and stable electrical performance

Sensorview has developed a new PTFE dielectric, named Aeroflon®, demonstrating Dk (dielectric constant) about 1.6~1.7 and Df (loss tangent) about 0.0001@10GHz, which enables to achieve much lower loss in property of Microwave & mmWave coaxicial cable compared to general PFTE cable.

Sensorview's Aeroflon® has a smaller "Knee" in its CTE (Coefficient of Thermal Expansion) profile around room temperature and remains the same even when exposed to extreme temperature, therefore, it is excellent to apply in harsh environment.



### PTFE Knee Graph



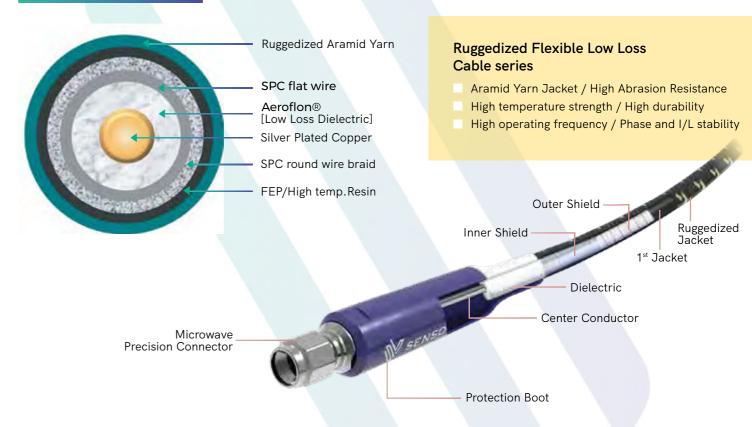
### Relative matching

Relative matching matches phase between two (which is one pair) or more cable assemblies which belongs to one another. Therefore, it is manufactured as sets with relative phase tolerance. Sensorview's default phase matching tolerance is  $\pm 0.3^{\circ}$ /GHz. (e.g. an 18GHz cable can be phase matched to  $\pm 5.4^{\circ}$ )

### Absolute matching

Absolute matching provides the matches in its assemblies to be at an absolute electrical length (Group delay). Any cable of a set can be replaced and manufactured in different location using any test equipment brand.

### **Structures**



### Typical Applications

- Bench-top testing
- High throughput RF production testing
- Portable analyzers
- Test rack systems
- Vector Network Analyzers
- Scalar Network Analyzers
- Antenna ranges
- Anechoic chambers

- Thermal vacuum chambers
- Nearfield scanners
- Wireless telecommunication module testing
- ElectroMagnetic Compliance Testing
- Automated Test Equipment
- High speed digital test
- 5G test and interconnection





# **FlexStable® Microwave Cable**

SENSORVIEW FlexStable® microwave cable assembly series offer excellent performance providing various benefits to your specific needs.

# The Immortal Knight of The Cable World



Available Connector:

Flexure Test (Tick-tock Test)

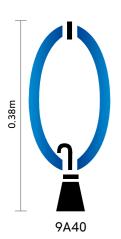
# **SUPER FLEXIBLE**

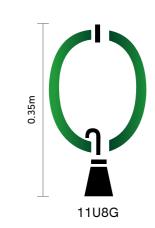
### **DUT** and condition

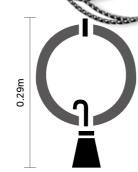
Tested cable: FlexStable(9A40), UltraRG(11U8G), Typical RG cable

### Test results

Test condition: 1meter, Weight 520gram, 25°C







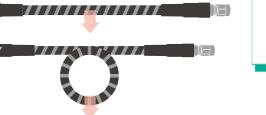
Typical RG Cable

More drooped the weights are, more flexible cable is. FlexStable shows the longest droop, which means it affects little force to connector and DUT, accordingly more stable and easy to use in a lab and bench, also convenient to install in a chamber.

# **PHASE STABILITY (VS. BENDING)**

During bend

'Insertion loss' and 'phase change' are measured under a bended condition using a 'Minimum Bend Radius' mandrel.







# DC ~ 8GHz Series

### Spec.

• Impedance (Nominal) : 50 ± 1 Ohm



- Velocity Propagation: 77% (Nominal)
- RF Leakage : -85dB
- Minimum Bend Radius [mm]: 25
- Phase Stability vs Flexture (Typical) : Max. 2° @ 8CHz
- ullet Loss Stability vs Flexture (Typical) :  $\pm\,0.05~\text{dB}$

Figure	Product	Center Conductor	Overall Outer Diameter [mm]	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[11111]		[ 6]	8GHz	8GHz
9	11A8G		5.8 ± 0.1	53	-50 ~ 135	-1.07	223
0	11S8G	Stranded	5.2 ± 0.1	49.9			
	11F8G	Stranded	4.9 ± 0.1	49.3	-50 ~ 125		190
0	11U8G		5.2 ± 0.1	53.3	-50 ~ 85		69
0	11A8GD	Solid	5.8 ± 0.1	54			
	11S8GD		5.2 ± 0.1	50.6	-50 ~ 135	-1.03	266

### Available Connector: SMA(ST, RA), N(ST, RA)

SMA Male Straight	SMA Female Straight	SMA Male Right Angle	N Male Straight	N Male Right Angle
15	C.M.	J.		

# DC ~ 18GHz Series

• Impedance (Nominal) : 50 ± 1 Ohm



- Velocity Propagation: 77% (Nominal, 13x26, 9S18G, 9F18GD) | 84% (Nominal, 23F18WD)
- RF Leakage : -100dB (13x26) | -85dB (9S18G, 9F18GD)
- Minimum Bend Radius [mm] : 30 (13x26) | 15 (9S18C) | 20 (9F18GD)
- Phase Stability vs Flexture (Typical): Max. 10° @ 18GHz (13x26, 9S18GD, 23F18WD) | Max. 18° @ 18GHz (9F18GD)
- Loss Stability vs Flexture (Typical) : ± 0.1 dB

Figure	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[mm]	-6, -	[°C]	18GHz	18GHz
0	13R26		9.7 ± 0.3	192	-55 ~ 135	-1.23	184
0	13A26		6.7 ± 0.1	81	-50 ~ 135		
	13\$26	Stranded	6.2 ± 0.1	73			
0	13F26		5.7 ± 0.1	56.2	-50 ~ 125		149
	9S18G		4.2 ± 0.1	34.4	-50 ~ 135	-1.75	130
	9F18GD	Solid	3.8 ± 0.1	33	-50 ~ 125	-1.72	155
	23F18WD		7.68 ± 0.1	130	-50 ~ 135	-0.75	377

### Available Connector: SMA(ST), N(ST), TNC(ST)



Spec.

# DC ~ 26.5GHz Series

### Spec.

• Impedance (Nominal) : 50 ± 1 Ohm



- Velocity Propagation: 77% (Nominal)
- RF Leakage : -100dB
- Minimum Bend Radius [mm]: 30
- Phase Stability vs Flexture (Typical) : Max. 10° @ 26.5GHz
- Loss Stability vs Flexture (Typical) :  $\pm 0.1 \text{ dB}$

Figure	Product	Center Conductor	r Diameter weight	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level	
		Туре	[mm]	-5/ -	[°C]	26.5GHz	26.5GHz
0	13R26		9.7 ± 0.3	192	-55 ~ 135	-1.55	
0	13A26		6.7 ± 0.1	81	-50 ~ 135		155
	13S26	Stranded	6.2 ± 0.1	73			
0	13F26		5.7 ± 0.1	56.2	-50 ~ 125		149
0	13R26D		9.7 ± 0.3	193			
0	13A26D	Solid	6.7 ± 0.1	82	-55 ~ 135		183
	13S26D		6.2 ± 0.1	74			
0	13F26D		5.7 ± 0.1	57.2	-55 ~ 125		151

### Available Connector: HFSMA(ST), 3.5mm(ST)



**SENSORVIEW** 







# DC ~ 33GHz Series

• Impedance (Nominal) : 50 ± 1 Ohm

Velocity Propagation: 77% (Nominal)

• RF Leakage : -100dB

• Minimum Bend Radius [mm]: 25

Phase Stability vs Flexture (Typical) : Max. 10° @ 33GHz

• Loss Stability vs Flexture (Typical) :  $\pm$  0.1 dB

Figure	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[mm]	.6/	[°C]	33GHz	33GHz
9	11R33		9.7 ± 0.3	172			
	11A33	Stranded	5.7 ± 0.1	59			121
0	11533		5.3 ± 0.1	53			
	11R33D		9.7 ± 0.3	173	-40 ~ 125	-2.03	
9	11A33D	Solid	5.7 ± 0.1	59.2			143
0	11S33D		5.3 ± 0.1	53.2			

Available Connector: HFSMA(ST)















# Microwave Cable & Connector



# DC ~ 40GHz Series

### Spec.

• Impedance (Nominal) : 50 ± 1 Ohm



- Velocity Propagation: 77% (Nominal)
- RF Leakage : -100dB
- Minimum Bend Radius [mm]: 25
- Phase Stability vs Flexture (Typical) : Max. 14° @ 40GHz
- ullet Loss Stability vs Flexture (Typical) :  $\pm$  0.1 dB

	Figure Pro	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
			Туре	[mm]	26/2		40GHz	40GHz
	0	9R40	Solid	8.4 ± 0.3	183		-2.60	102
	0	9A40		5.4 ± 0.1	49	-40 ~ 125		
•		9\$40		5.0 ± 0.1	44			

# DC ~ 50GHz Series

• Impedance (Nominal) : 50 ± 1 Ohm



Spec.

- Velocity Propagation: 77% (Nominal)
- RF Leakage : -100dB
- Minimum Bend Radius [mm]: 25
- Phase Stability vs Flexture (Typical) : Max. 15° @ 50GHz
- Loss Stability vs Flexture (Typical) : ±0.1 dB

Figure	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[mm]	-5, -	[°C]	50GHz	50GHz
0	7R50D	Solid	8.4 ± 0.3	173	40 . 125	2 97	00
0	7A50D	Solid	4.5 ± 0.1	34	-40 ~ 125	-3.87	88





Static Application

Available Connector: 2.4mm, 2.92mm(ST, SH)



Available Connector: 2.4mm(ST)









20



# DC ~ 67GHz Series

Spec.

• Impedance (Nominal) : 50 ± 1 Ohm



Velocity Propagation: 77% (Nominal, 5R67D, 5A67D)

• RF Leakage : -100dB (5R67D, 5A67D)

Minimum Bend Radius [mm] : 20 (5R67D, 5A67D)

• Phase Stability vs Flexture (Typical): Max. 19° @ 67GHz (5A67D) | Max. 14° @ 67GHz (5R67D)

• Loss Stability vs Flexture (Typical) : ± 0.1 dB

Figure	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[mm]	-8, -		67GHz	67GHz
2	5R67D	Solid	6.6 ± 0.3	63	-40 ~ 85	-6.32	64
9	5A67D		3.6 ± 0.1	25			



**Dynamic Application** 



Static Application

### Available Connector: 1.85mm(ST)



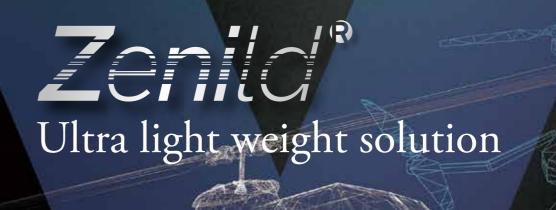








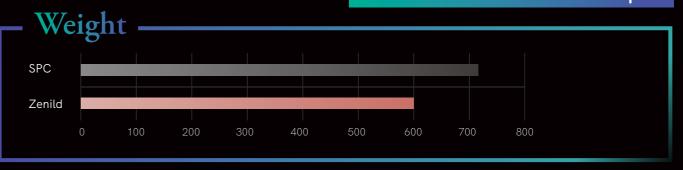




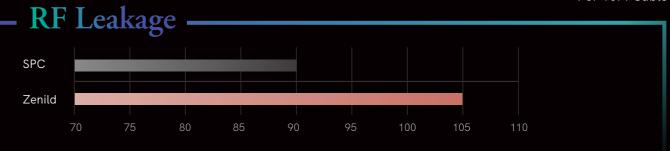
zenild®

Our unique braiding technology, "Zenild®" provides superior shielding effectiveness VS copper wire and offers significant weight savings. Silver Plated Fiber delivers over 60% weight savings VS copper wire at equal volumes.

## Zenild® vs Silver Plated Cooper



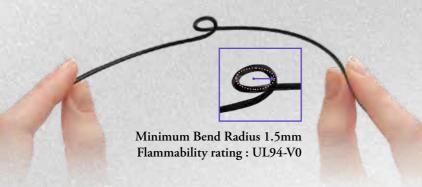
For 10M Cable





## **Bend Form to Function**

Minimum Bend Radius 1.5mm Cable Assembly



High Shielding Effectiveness using a Triple-Shielded Structure: -110dB(min)

Freq. DC to 67GHz Low-loss EMI shielding MIL-STD satisfactory

MBR 1.5mm Outer diameter 2mm

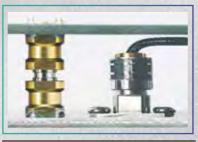
# O Angle Bends Directly Behind the Connector with a Small MBR





200mm<sup>2</sup>





MBR of 1.5mm
(Minimum Bend Radius 1.5mm)

Because there are no soldered sections on the connector, FlexiBe reduces attenuation by more than 50% than typical cables.

# Microwave Cable & Connector



# FlexiBe<sup>®</sup>

- Impedance (Nominal) : 50 ± 1 Ohm
- Velocity Propagation: 70% (Nominal)
- RF Leakage : -110dB
- Minimum Bend Radius [mm] : 1.5 (SFPS27D1) | 5.0 (SFPS24D1)
- Loss Stability vs Flexture (Typical): 0.1 dB

### Spec.

## **DC ~ 67GHz**



Figure	Product	Center ( Conductor Type	Overall Outer Diameter [mm]	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
						67GHz	67GHz
	FlexiBe 67	Solid	2 ± 0.1	12.6	-40 ~ 125	-11	27

### Spec.



## DC ~ 50GHz

Figure	Product	Center Conductor	Overall Outer Diameter	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре	[mm]		[ C]	50GHz	50GHz
10-1	FlexiBe 50	Solid	2.5 ± 0.1	19.4	-40 ~ 125	-6.7	52

## Available Connector: 1.85mm, 2.92mm, SMA









# **Micro Coaxial Cable**

Spec.

Impedance: 50 ± 2 Ohm



Velocity Propagation: 70% (Normal)

RF Leakage: -70dB

Minimum Bend Radius [mm]: 4.5

• Loss Stability vs Flexture (Typical): 0.1 dB

## **DC ~ 110GHz**

Figure	Product	vCenter Conductor	O VOI ditt O ditoi	Weight [g/m]	Temperature Range [°C]	Insertion Loss [dB/m]	Average Power Rating [Watt] @ 25°C at Sea Level
		Туре				110GHz	110GHz
-	FXPS29D1	Solid	1.42 ± 0.1	5.3	-40 ~ 85	16.7	15















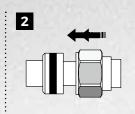
## Mating



### Hybrid Connector - Gannector®

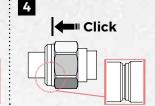
- Excellent contact resistance
- Tool-less (No torque wrench required)
- High frequency (up to 20GHz): S, X, Ku band
- Quick-Lock







Automatic Orientation



When pressed so that the black band is no longer visible, it will produce a "click" sound

### **HOW TO**



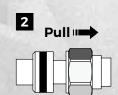






## **Unmating**



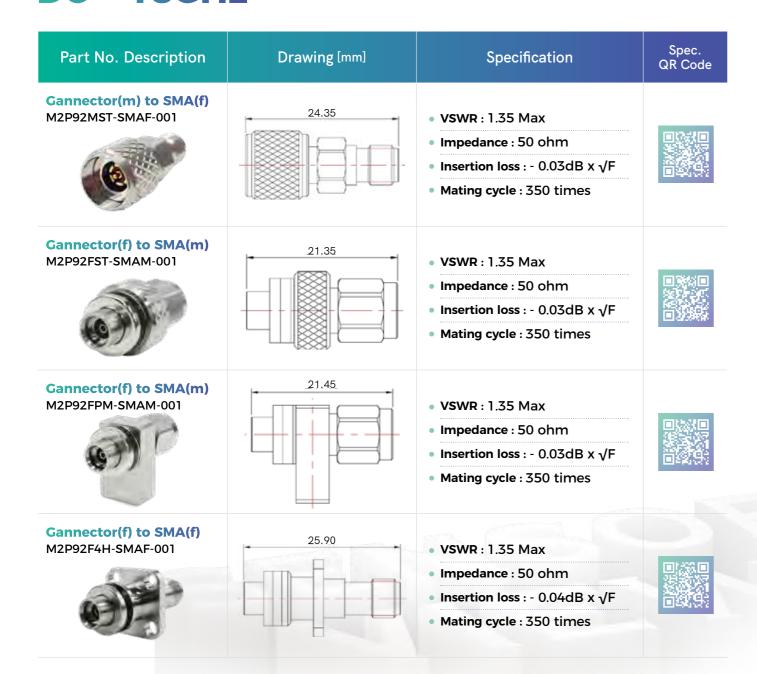




Improved Efficiency via Rapid Magnetic Connect and Disconnect.

## **GANNECTOR**

## **DC ~ 18GHz**



# **GANNECTOR**

## **DC ~ 18GHz**

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
Gannector(m) to N(f) M2P92MST-NF-001	33.75	<ul> <li>VSWR: 1.35 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.06dB x √F</li> <li>Mating cycle: 350 times</li> </ul>	
Gannector(f) to N(m) M2P92FST-NM-001	27.65	<ul> <li>VSWR: 1.35 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.06dB x √F</li> <li>Mating cycle: 350 times</li> </ul>	
Gannector(f) 2 Hole M2P92F2H-001	18.15 5.70 0.25.70 18.20 0.25.70	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 350 times</li> </ul>	
Gannector(f) 4 Hole M2P92F4H-002	18.15	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 350 times</li> </ul>	



Zero Bolt Loss

**EASY PCB Connection** 

PCB Damage Prevention & Leveling Spring

Easy soldering









Spring: A spring supports the block that holds the lower part of the PCB mounting component.

As such, a PCB is maintained in

As such, a PCB is maintained in a horizontal position when placed, preventing PCB and connector PIN damage.

Туре	РСВ	Part No.	Frequency	VSWR	Spec. QR Code
		CCA300PBZ001	(701)	1.5 Max.	
1.85mm	10Mil	CCA300PBZ002	67GHz	1.5 Max.	
8Mil		CCA500PBZ001 50GHz		1.5 Max.	
2.4mm	10Mil	CCA500PBZ004	30GHZ	1.5 Max.	
8Mil CCA700PBZ00		CCA700PBZ001	40GHz	1.4 Max.	
2.7211111	10Mil	CCA700PBZ005	40002	1.4 Max.	

# We make your RF the BEST Microwave Cable & Connector



# Microwave Cable & Collifecto

# Microwave Coaxial Connector & Adapter

**SENSORVIEW coaxial connectors & adapters** are designed and manufactured to guarantee optimized performance of the end products. We can provide the optimum transition for low return loss. Specially we can tailor connectors to specific equipment and application needs.



# **ADAPTER**

## DC ~ 67GHz - 1.85mm(V)

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
1.85mm(m) to 1.85mm(m) 1P85MST-1P85M-001	19.40	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.05dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
1.85mm(m) to 1.85mm(f) 1P85MST-1P85F-001	20.45	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.05dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
1.85mm(f) to 1.85mm(f) 1P85FST-1P85F-001	21.50	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.05dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
1.85mm(f) to 1.85mm(f) 1P85F4H-1P85F-001	21.50	<ul> <li>VSWR: 1.30 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.05dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	

# **ADAPTER**

## DC ~ 50GHz - 2.4mm

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
2.4mm(m) to 2.4mm(m) 2P4MST-2P4M-001	19.60	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.04dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.4mm(m) to 2.4mm(f) 2P4MST-2P4F-001	20.55	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.04dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.4mm(f) to 2.4mm(f) 2P4FST-2P4F-001	21.50	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.04dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.4mm(f) to 2.4mm(f) 2P4F4H-2P4F-001	19.30	<ul> <li>VSWR: 1.25 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.04dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	

# **ADAPTER**

## DC ~ 40GHz - 2.4mm to 2.92mm

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
2.4mm(m) to 2.92mm(m) 2P4MST-2P92M-001	20.50	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	10 (10 10 (10) 10 (10)
2.4mm(m) to 2.92mm(f) 2P4MST-2P92F-001	19.45	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.4mm(f) to 2.92mm(m) 2P4FST-2P92M-001	21.45	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.4mm(f) to 2.92mm(f) 2P4FST-2P92F-001	20.40	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	

# **ADAPTER**

## DC ~ 40GHz - 2.92mm(K)

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
2.92mm(m) to 2.92mm(m) 2P92MST-2P92M-001	21.40	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.92mm(m) to 2.92mm(f) 2P92MST-2P92F-001	20.35	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.92mm(f) to 2.92mm(f) 2P92FST-2P92F-001	19.30	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.92mm(f) to 2.92mm(f) 2P92F4H-2P92F-004	19.30	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.03dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	
2.92mm(f) to 2.92mm(f) 2P92FBH-2P92F-005	22.20	<ul> <li>VSWR: 1.15 Max</li> <li>Impedance: 50 ohm</li> <li>Insertion loss: - 0.04dB x √F</li> <li>Mating cycle: 500 times</li> </ul>	

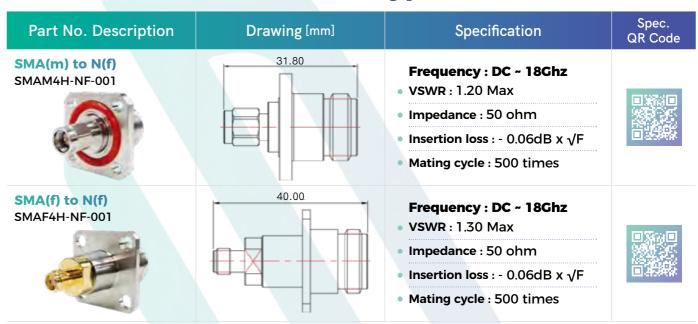
# **ADAPTER**

# DC ~ 18 / 26.5GHz - 3.5mm / SMA

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
3.5mm(f) to 3.5mm(f) 3P5FBH-3P5F-001	22.20	Frequency : DC ~ 26.5Ghz  • VSWR : 1.15 Max  • Impedance : 50 ohm  • Insertion loss : - 0.04dB x √F  • Mating cycle : 500 times	
SMA(m) to SMA(m) SMAMST-SMAM-001	21.40	Frequency : DC ~ 18Ghz  • VSWR : 1.15 Max  • Impedance : 50 ohm  • Insertion loss : - 0.03dB x √F  • Mating cycle : 500 times	
SMA(f) to SMA(f) SMAFST-SMAF-001	19.30	Frequency : DC ~ 18Ghz  • VSWR : 1.15 Max  • Impedance : 50 ohm  • Insertion loss : - 0.03dB x √F  • Mating cycle : 500 times	
SMA(f) to SMA(f) SMAF4H-SMAF-001	35.00	Frequency : DC ~ 18Ghz  • VSWR : 1.25 Max  • Impedance : 50 ohm  • Insertion loss : - 0.05dB x √F  • Mating cycle : 500 times	
SMA(f) to SMA(f) SMAFBH-SMAF-002	22.20	Frequency : DC ~ 26.5Ghz  • VSWR : 1.20 Max  • Impedance : 50 ohm  • Insertion loss : - 0.04dB x √F  • Mating cycle : 500 times	

# **ADAPTER**

## DC ~ 18GHz - SMA to N type



## DC ~ 18GHz - N type

Part No. Description	Drawing [mm]	Specification	Spec. QR Code
N(f) to N(f) NF4H-NF-001	38.00	Frequency: DC ~ 18Ghz • VSWR: 1.20 Max	
THE PARTY OF		• Impedance : 50 ohm	
S. Kima		• Insertion loss : - 0.06dB x √F	回路網絡
3		• Mating cycle : 500 times	
N(f) to N(f) NFBH-NF-002	38.00	Frequency : DC ~ 12.4Ghz  • VSWR : 1.20 Max  • Impedance : 50 ohm  • Insertion loss : - 0.06dB x √F  • Mating cycle : 500 times	
N(f) to N(f) NFBH-NF-003	44.30	Frequency: DC ~ 18Ghz  • VSWR: 1.20 Max  • Impedance: 50 ohm  • Insertion loss: - 0.07dB x √F  • Mating cycle: 500 times	



Communication equipment (small-cell and baseband station) manufacturers have difficulties in designing mmWave antenna module yet. For this reason, Qualcomm provides mmWave antenna modules, not chipset only.

### Where are Sensorview products?

MG210 is mounted on Qualcomm's mmWave Antenna module.

What is 5G Antenna module?

MG210 has low-loss, low EMI leakage traits with multi-gang micro interconnector.

Coaxial lines are combined into a connector with 50 ohm matched thoroughly. Slide-mating interface secures anti-rotation and anti-vibration stability.

> Main applications are CPE, Small cell, Laptop, IF signal transmission.



5G Antenna module for Small cell & base station

### **Features**

Space Efficiency:

Minimize footprint size by 2 ganged connector

Power Efficiency:

Low loss coaxial cable (DK < 2.0)

Mechanically Stability:

Strong resistance to X-Y-Z moving and vibration

Minimized Crosstalk:

Each contact is electrically/mechanically separated

Minimized RF Interference:

Full - enclosed mating by ground shell

### MG210 Products

Receptacle:

(P/N: MG210RE02)

Plug to plug cable assembly:

(P/N: MGC102XX)

Plug to Female SMAs cable assembly:

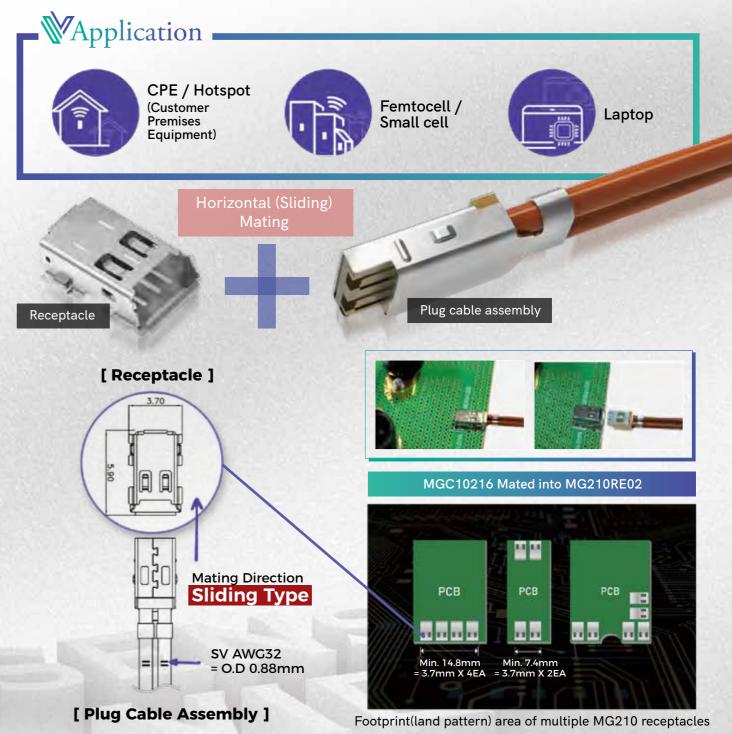
(P/N: TRA2PA5)

Plug to Male SMAs cable assembly:

(P/N: TRA2PA6)

Tweezer for Mating and unmating a plug:

(P/N:GJSZZA5)



	The second secon		
Specification		MG210	
Ports (RF Signal)		2ports ( can assemble with 1 port connector )	
Frequency		DC to 10GHz ( Can support up to 15GHz )	
Mating direction		Horizontal (Sliding)	
Size ( X,Y )	{ PCB pad }	3.7 x 5.9mm	
Size ( X,Y )	{ Top view }	3.7 x 5.9mm	30/98
Size ( Z )	{ Mate height }	2mm	TOV.
Cable	Diameter	0.88mm	30339
Insertion loss	( @10GHz/200mm )	-1.7dB	
VSWR	(DC to 10GHz)	Max 1.5	3
Crosstalk	(DC to 10GHz)	Typical < - 45dB	7



What is 5G M.2 card?

Laptop, CPE manufacturers need easy olug and play' card to realized 5G mmWave. For this reason, OEM of Global top fabless RF chip company manufactures M.2 cards by Global top fabless RF chip company's reference design.

Where is Sensorview products?

MG215M is listed on recommended components in Global top fabless RF chip company reference design.

MG215M has low-loss, low EMI leakage, dual-ports micro coaxial RF interconnector. Two Coaxial lines are in a connector with 50 ohm matched thoroughly. Vertical-mating interface secures anti-rotation and anti-vibration stability.

5G M.2 card for Laptop & CPE in applications are CPE, Laptop, M.2 Card RF or IF(Intermediate Frequency) transmission.

### **Features**

Footprint / Mating height:

Minimize footprint and mating height with dual-ports

**Power Efficiency :** Low loss coaxial cable (DK < 2.0)

Minimized Crosstalk:

Each contacts are electrically/mechanically separated

Minimized RF Interference:

Enclosure is fully shielded by ground shell

### MG215M Products

Receptacle:

(P/N: MG215MRE02)

Plug to plug cable assembly:

(P/N: MGC152XX)

Plug to Female SMAs cable assembly:

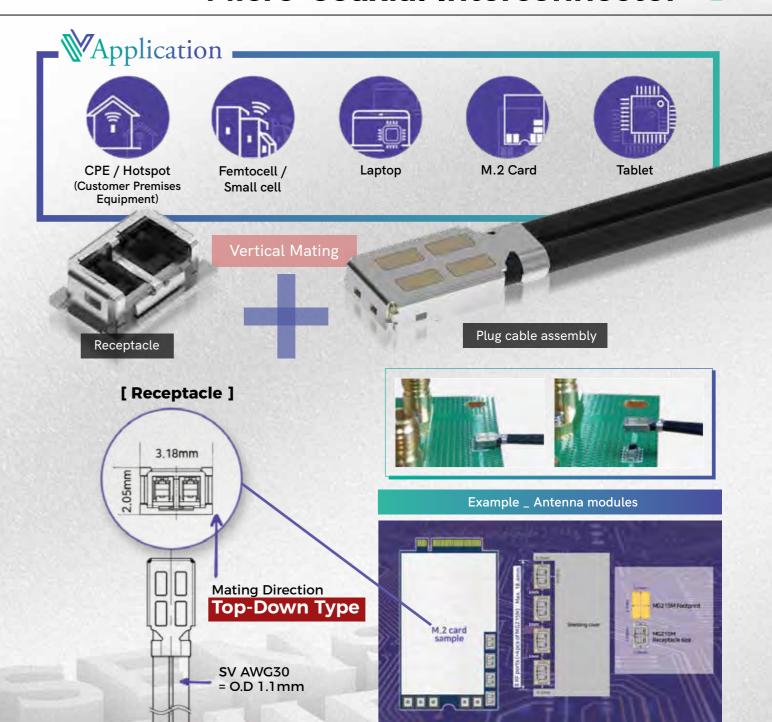
(P/N: TRA2P01)

Plug to Male SMAs cable assembly:

( P/N : TPA2PA3 )

Tweezer for Mating and unmating a plug:

(P/N:GJSZZA7)



Specification		MG215M	400
Ports ( RF Signal )		2ports ( can assemble with1port connector )	
Frequency		DC to 15GHz	3 3 9 1
Mating direction		Vertical ( Top-down )	
Size ( X,Y )	{ PCB pad }	3.1 x 2.0mm	
Size (X,Y)	{ Top view }	3.1 x 2.0mm	(1) E 100
Size (Z)	{ Mate height }	1.4mm	
Cable	Diameter	1.1mm	1182 174
Insertion loss	(@10GHz/200mm)	-1.35dB	will be to
VSWR	(DC to 15GHz)	Max 15	40
Crosstalk	(DC to 15GHz)	<-50dB	10

[ Plug Cable Assembly ]

Footprint(land pattern) area of multiple MG215M receptacles











# **SMFinder®**High-end mmWave Antenna

### Stable & Accurate Measurement

**SMFinder**® type antennas promise stable & accurate measurement for relative DUT performance.



Phase and Gain Adjustable

Light-Weight

High Reliable Performance 24 to 48GHz / 55 to 67 GHz

## **Products**

Figure	Product	Frequency [GHz]	Gain [dBi/dBic]	Polarization	Size [WxHxD]/[mm]	Connector Type
000	0015-01	24.0-29.5	10	Vertical & Horizontal	30(@) X 45	2.92mm
0	0015A	24.0-40.5	15	Vertical & Horizontal	35(@) X 80	2.4mm
SENSORVIEW	<b>0015B</b> (Type 1)	24.0-40.5	13	Vertical	17 X 17 X 25	2.92mm
SENSORVIEW	<b>0015B</b> (Type 2)	24.0-40.5	13	Vertical	17 X 18 X 33	2.92mm
2 4	0015C	24.0-48.5	15	Vertical & Horizontal	42 X 42 X 60	2.4mm
SENSORVIEW	0015D	24.0-48.5	15	Vertical	34 X 24 X 45	2.4mm
	0015E	24.0-40.5	15	Vertical & Horizontal	52(@) X 123	2.92mm

# COMPACT OTA TESTING

SMFinder series are highly efficient antennas for compact OTA testing.



### Circular Polarization Antenna

### **CP antenna for broadband**

- Mass-production available
- Lower cost
- (antenna, chamber box, absorber)

### Good performance of axial ratio

- Compact size (antenna, chamber box)
- Lighter than horn antennas

## **Products**

Figure	Product	Frequency [GHz]	Gain [dBi/dBic]	Polarization	Size [WxHxD]/[mm]	Connector Type
	0016	24.2-43.5	13	Circular	18 X 15 X 24	WR 28
	0016A	24.4-43.5	13	Circular	21 X 18 X 35	2.4mm
	0016B	24.2-48.5	14	Circular	18 X 20 X 41	2.4mm
	0016C	24.2-48.5	10.3	Circular	11 X 14 X 24	2.4mm
	0017	57-67	15	Circular	15(@) X 21	WR 15
	0013A	24.2-29.5	10	Circular	27 X 27 X 14	2.92mm
	0050	26.5-29.5 / 37.5-40.5	11/12	Circular	42 X 42 X 22	2.92mm
	0051	24-26.5 / 26.5-29.5 / 37.5-40.5	11/11/12	Circular	42 X 42 X 27	2.92mm
	0052	24-26.5 / 26.5-29.5 / 37.5-40.5 / 40.5-43.5	9/9/9/9.5	Circular	42 X 42 X 11	2.4mm



# **Broadband Performance** for Various Service



Description	Туре	Frequency [ GHz ] Gain [ dBi ]		Availability	
	SISO	0.698~0.96 / 1.71~2.69 / 3.4~3.7 / 5.8	3.0 / 4.0 / 4.0 / 4.0	Available now (Ceiling type)	
	MIMO	0.698~0.96 / 1.71~2.69 / 3.4~3.7 / 5.8	3.0 / 4.0 / 4.0 / 4.0	Available now	
UFO	SISO	0.698~0.96 / 1.71~2.69 / 3.4~3.7 / 5.8	3.0 / 4.0 / 4.0 / 4.0	Available now (Wall type / Side pigtail)	
	SISO	0.698~0.96 / 1.35~2.69 / 3.3~4.0	2.5 / 4.0 / 5.0	Available now (Ceiling / Pigtail type)	
	MIMO	0.698~0.96 / 1.35~1.55 / 1.71~2.69 / 3.3~4.0	4.0 / 4.0 / 4.0 / 5.0	Available now (Ceiling / Pigtail type)	

Sub-6GHz **In-Building** Solution

ransparent

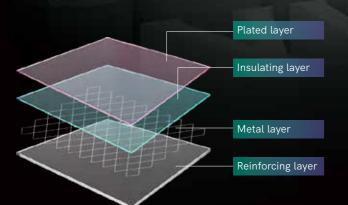
The Most Suitable Antenna Solution for In-Building Networks for the New Era

INNOVATION AWARDS

2023



**Antennas for** 



95% Transparency 'ESG' Low Plastic Usage Secured Performance

Description	Туре	Frequency [ GHz ] Gain [ dBi ]		Availability
	SISO	0.824~0.96 / 1.71~2.17 / 2.3~2.69 / 3.4~3.7	2.0 / 3.0 / 3.0 / 3.0	Available now
	МІМО	0.698~0.96 / 1.71~2.17 / 2.3~2.69 / 3.4~3.7	2.0 / 3.0 / 3.0 / 3.0	Available now
Transparent	SISO	0.617~0.96 / 1.71~2.69 / 3.4~3.7 / 5.8	2.0 / 3.0 / 3.0 / 3.0	Available now
n ansparent	МІМО	0.617~0.96 / 1.71~2.69 / 3.4~3.7 / 5.8	2.0 / 3.0 / 3.0 / 3.0	Available now
	SISO	1.71~2.69 / 3.4~3.7 / 5.8	3.0 / 3.0 / 3.0	Available now (for Window)
	МІМО	1.71~2.17 / 2.3~2.69 / 3.4~4.	3.0 / 3.0 / 3.0	Available now (for Window)



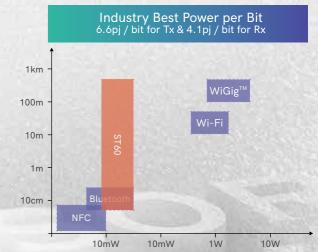
Replace physical-contacting cable and connector ommunicate in rotating 360degree

02. Fransmit / Receive 6.25Gbps without physical contact of connectors o wear-off conductor(or pin) of connector and cable

Transmit / Receive data and power with combination of commercialized

Provide ST60 antenna modules with interfaces of connector or SMT





without a Touch 5G Wireless Devices

Contactless

**Data transmission** 6Gbps, Total jitter 0.375UI. 5~20mm

Connectivity

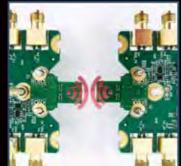
High Speed (6.25Gbps)

Energy Efficiency (mW) short distance (5~20mm) 60GHz

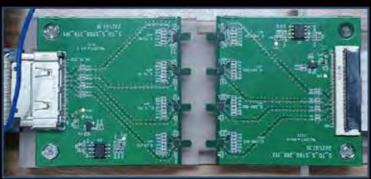
Pass the Baton

Wireless connector

# **High-Gain + Gain-Flatness** + Improved-Isolation with Miniaturized Form Factor







Side to side

Face to face

Side to side (Multi-link)

# **M**Application

### Factory Automation (e.g. OTA Testing & Flashing)



No cables to plug / unplug for reliability and higher manufacturing productivity.



LED tiles without physical connectors for detachability, form-factor, reliability.

### Industrial Equipment (e.g. Monitoring, Machine Vision)



Personal Electronics (e.g. Smartphone, Wearable)

Display (e.g. LED TV & Display Wall)



Contactless, freedom of movement, physical and electrical isolation, form-factor, reliability.



No connector wear & tear, water and dust proof, sleek design, foldable display.

SENSORVIEW W





Туре		Figure	Frequency [GHz]	Peak gain [dBi]	Substrate (FR4) (Layer/Thickness mm)
	Type 1	O	55 ~ 65	7.4	6L 1.2T
	Type 2		55 ~ 65	7.5	6L 1.2T
F2F	Dual		56 ~ 66	5.5	6L 1.2T
FZF	Vertical horn		55 ~ 65	7.8	4L 1T
	Slant horn		55 ~ 65	7.5	4L 1T
	<b>Multi-link</b>		55 ~ 65	7.4	6L 1.2T
<b>S2S</b>	<b>Multi-link</b>		55 ~ 65	6.5	6L 1.2T
	Type 1		55 ~ 65	4.1	6L 1.2T
	Type 2		56 ~ 66	4.9	6L 1.2T

Туре		Frequency [GHz]	Peak gain [dBi]	Substrate (FR4) (Layer/Thickness mm)	Feature
	SAM1	55 ~ 65	6dBi	6L 1.2T	Single No R/C No shield can
	SAM2	55 ~ 65	6dBi	6L 1.2T	Loopback + R/C
F2F	SAM3	55 ~ 65	5dBi	6L 1.2T	SAM2 + R/C + Shield can
	SAM4	56 ~ 66	8dBi	4L 1.2T (v1) 6L 1.2T (v2)	Horn + R/C
	SAM5	56 ~ 66	8dBi	6L 1.2T	Horn + R/C + Shield can
<b>S2S</b>	SAM1	55 ~ 65	6dBi	6L 1.2T	Single + R/C
	SAM2	55 ~ 65	6dBi	6L 1.2T	Single + R/C + Shield can

Feature	Module	Product	Max data	Max. Distance (mm)	
i catule	Size (mm)	Troduct	rate (Gbps)	Half duplex	Full duplex
Coaxial feed	16 x 17.5 x 1.2	S60PVS1A	5	25mm	X
Aperture coupling	16 x 17.5 x 1.2	S60PVS2A	5	25mm	X
Dual feeding patch	18.5 x 14 x 1.2	S60PVD1A	6.25	8mm	Not support
Horn	17 x 18.5 x 1	S60HVD1A	6.25	20mm	Not support
Horn	19 x 18.5 x 1.2	S60HVD2A	6.25	20mm	9mm
Coaxial feed	60.5 x 60.5 x 1.2	S60PVM1C	3	35mm	15mm
Dipole w / dielectric guide	53 x 50 x 1.2	S60PHM1A	2.83	32mm	On-going
Vivaldi	16 x 22 x 1.2	S60PHS1A	5	12mm	X
Quasi yagi	16 x 20 x 1.2	S60PHS2A	5	10mm	Х

Module Size (mm)	Product	Max data rate (Gbps) Max. Distar		ance (mm)
6.4 x 7.4	S60PVS3A	2.83 ~ 5.66	20 ~ 12	Verified
6.4 x 10	S60PVS4A	2.83 ~ 5.66	20 ~ 12	On-going
8 x 14	S60PVS4B	2.83 ~ 5.66	16 ~ 8	On-going
8 x 14	S60HVS1A	2.83 ~ 5.66	22 ~ 14	to be update
8 x 14	S60HVS1B	2.83 ~ 5.66	22 ~ 14	to be update
8 x 12	S60PHS3A	2.83 ~ 5.66	20 ~ 12	On-going
8 x 12	S60PHS3B	2.83 ~ 5.66	20 ~ 12	On-going

# "Our Upcoming Office Building, Approximately 11,570m<sup>2</sup>"

## Representative

#705, Samwhan Hipex A, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, 13493, Korea

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Your trusted partner for **5G** and **BEYOND-5G** 

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