

## CSE-SGAM-ccc-SGFB

### SMA Bulkhead Jack to SMA Plug Cable Assembly

The CSE-SGAM-ccc-SGFB cable assembly provides an SMA bulkhead jack (female socket) to SMA plug (male pin) connection with the option of 12 in., 24 in., or 36 in. lengths of RG-316/U coaxial cable.

Operating from 0 Hz to 12.4 GHz, the CSE-SGAM-ccc-SGFB cable assembly combines superior performance, compact size, and a convenient threaded mating interface to provide a reliable, easy-to-use cable assembly. Additionally, all Linx coaxial cables and connectors meet RoHS lead free standards and are tested to meet requirements for corrosion resistance, vibration, mechanical and thermal shock.



#### Features

- 0 to 12.4 GHz operation
- SMA jack (female socket)
  - Gold plated brass washer and 1/4”-36UNS hex nut provided
- SMA plug (male pin)
  - Gold plated brass
- RG-316/U 50 Ω coaxial cable

#### Applications

- LPWA
- Cellular IoT – LTE-M (Cat-M1), NB-IoT
- Cellular – 5G/4G LTE/3G/2G
- PC, LAN
- ISM – Bluetooth®, ZigBee®
- GNSS – GPS, Galileo, GLONASS, BeiDou, QZSS
- Automotive, Industrial, Commercial, Enterprise

**Table 1. Electrical Specifications**

Parameter	Value		
	CSE-SGAM-305-SGFB	CSE-SGAM-610-SGFB	CSE-SGAM-914-SGFB
Insertion Loss (dB max)	2.1	2.8	3.7
VSWR (max)	1.8	1.7	1.7
Impedance	50 Ω		
Insulation Resistance	3000 MΩ min.		

#### Ordering Information

Part Number	Description
<b>CSE-SGAM-305-SGFB</b>	SMA bulkhead jack (female socket) to SMA plug (male pin) on 305.0 mm (12.0 in) of RG-316/U coaxial cable
<b>CSE-SGAM-610-SGFB</b>	SMA bulkhead jack (female socket) to SMA plug (male pin) on 610.0 mm (24.0 in) of RG-316/U coaxial cable
<b>CSE-SGAM-914-SGFB</b>	SMA bulkhead jack (female socket) to SMA plug (male pin) on 914.0 mm (36.0 in) of RG-316/U coaxial cable

Available from Linx Technologies and select distributors and representatives.

Product Dimensions

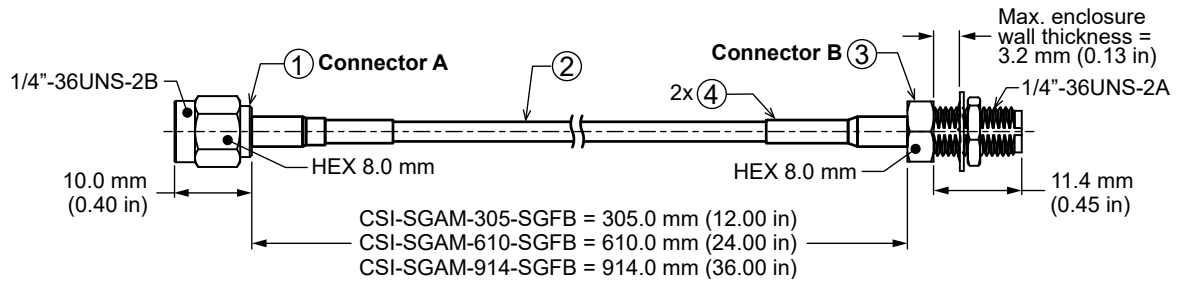


Figure 1. Product Dimensions for the CSE-SGAM-ccc-SGFB Cable Assembly

Table 2. Cable Assembly Components

Item #	Description	Material	Finish
1	Connector, SMA plug (male pin)	Brass	Gold
2	RG-316/U coaxial cable	RG-316/U	Black
3	Connector, SMA bulkhead jack (female socket) with hex nut and washer	Brass	Gold
4	Heat Shrink Tubing	PTFE	Black

Table 3. Cable Assembly Mechanical Specifications

Parameter	Connector A SMA plug (male pin)	Connector B SMA bulkhead jack (female socket)
Fastening Type	1/4"-36 UNS-2B threaded coupling	1/4"-36 UNS-2A threaded coupling
Recommended Torque	0.9 N m (8.0 in lbs)	0.9 N m (8.0 in lbs)
Coupling Nut Retention	60 lbs. min.	60 lbs. min.
Connector Durability	500 cycles min.	500 cycles min.
Weight	CSE-SGAM-305-SGFB = 11.6 g (0.41 oz) CSE-SGAM-610-SGFB = 16.1 g (0.57 oz) CSE-SGAM-914-SGFB = 20.5 g (0.72 oz)	

Recommended Mounting

Figure 2 shows the recommended mounting hole dimensions for the SMA connector (bulkhead) end of the cable assembly. Hex nut torque should not exceed 10.0 in/lbs max or damage may occur to threads. Maximum enclosure wall thickness = 3.2 mm (0.13 in)

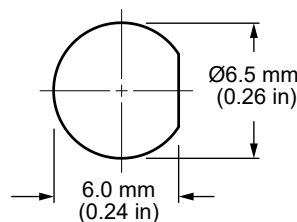


Figure 2. Recommended Mounting Hole Dimensions for the CSE-SGAM-ccc-SGFB Cable Assembly

Coaxial Cable Specifications

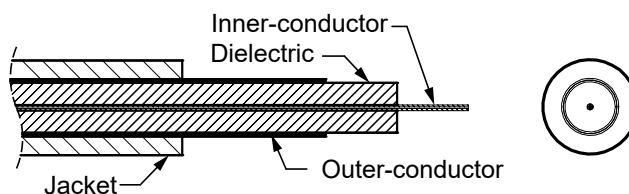


Figure 3. Coaxial Cable Cutaway Diagram

Table 4. Coaxial Cable Material Specifications for RG-316/U

Parameter	Material	Dimensions
Inner-Conductor	Silver-coated Copper plated steel, 7 strand, 0.175 mm/conductor	Ø0.53 mm (0.020 in)
Dielectric	PTFE	Ø1.53 mm (0.06 in)
Outer-Conductor	Silver plated copper braid, Coverage 92.3%	Ø1.71 mm (0.067 in)
Jacket	FEP	Ø2.53 mm (0.100 in)

Table 5. Coaxial Cable Electrical and Physical Specifications for RG-316/U

Parameter	Value					
Rated Temp Voltage	105 °C 30 V					
Conductor Resistance	302 Ω/km 20 °C					
Insulation Resistance	3000 M Ω·km min.					
Dielectric Strength	AC 1000 V/Minute					
Spark Test	5 kV					
Insulation	Unaged	Tensile Strength	2500 psi min. (1.76 kg/mm <sup>2</sup> )			
		Elongation	200% min.			
	Aged	Tensile Strength	Unaged min. 75% (168 hrs x 232 °C)			
		Elongation	Unaged min. 75% (168 hrs x 232 °C)			
Jacket	Unaged	Tensile Strength	2500 psi min. (1.76 kg/mm <sup>2</sup> )			
		Elongation	200% min.			
	Aged	Tensile Strength	Unaged min. 75% (168 hrs x 232 °C)			
		Elongation	Unaged min. 75% (168 hrs x 232 °C)			
Nominal Impedance	50 ± 3 Ω					
Nominal Capacitance	95.8 ± 3 pF/m					
Nominal Velocity of Propagation	69.5%					
VSWR (0 to 6 GHz)	≤ 1.3					
Attenuation (dB/1M)	1 MHz 10.2	100 MHz 34.1	1.8 GHz 180.0	2.4 GHz 206	5.2 GHz 315	6.0 GHz 5.20
Minimum Inside Bend radius	4.0 mm (0.16 in)					

Insertion Loss

Figure 4 shows the Insertion Loss for the CSE-SGAM-ccc-SGFB cable assembly. Insertion loss is the loss of signal power (gain) resulting from the insertion of a device in a transmission line.

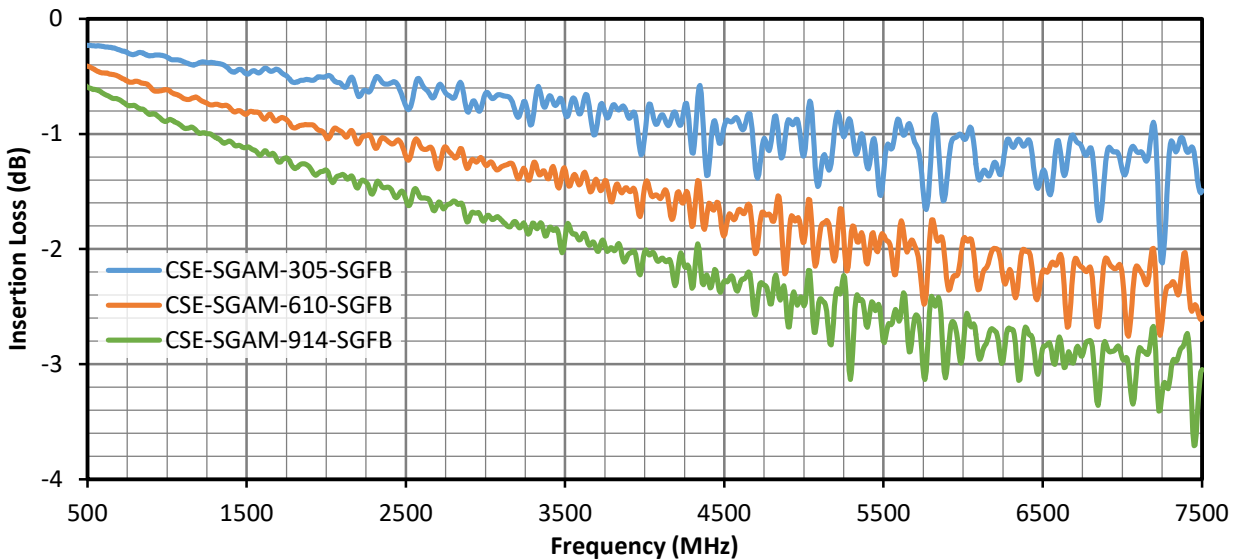


Figure 4. Insertion Loss for the CSE-SGAM-ccc-SGFB Cable Assembly

VSWR

Figure 5 provides the voltage standing wave ratio (VSWR) across the cable assembly’s bandwidth for the CSE-SGAM-ccc-SGFB cable assembly. VSWR describes how efficiently power is transmitted through the cable assembly. A lower VSWR value indicates better performance at a given frequency.

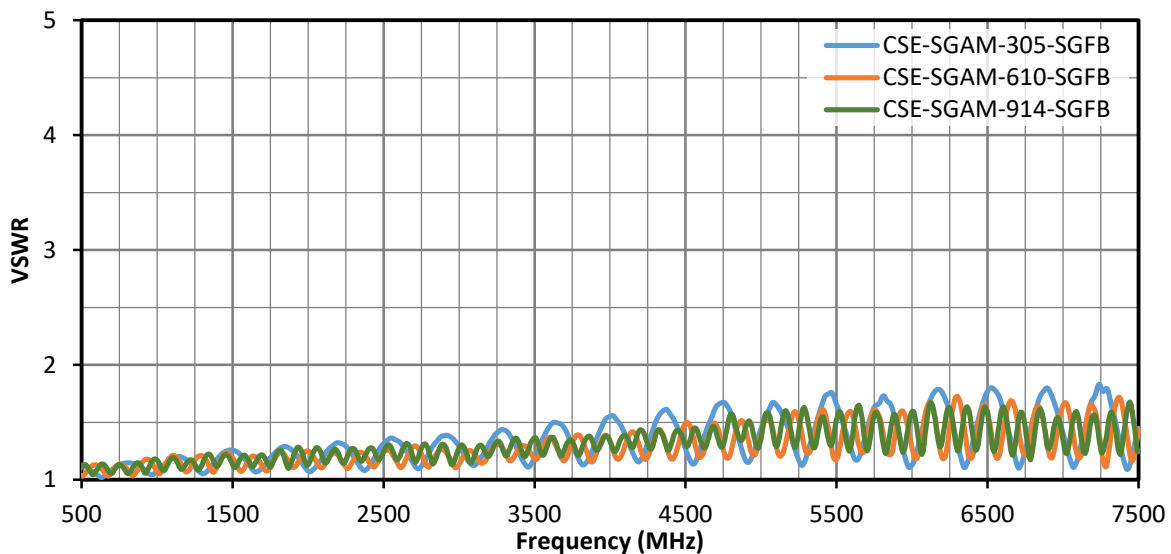


Figure 5. VSWR for the CSE-SGAM-ccc-SGFB Cable Assembly

Packaging Information

The CSE-SGAM-ccc-SGFB cable assembly is packaged in a clear plastic bag, in quantities of 50. Distribution channels may offer alternative packaging options.

### Cable Assembly Definitions and Useful Formulas

VSWR - Voltage Standing Wave Ratio. VSWR is a unitless ratio that describes how efficiently power is transmitted through the cable assembly. A lower VSWR value indicates better performance at a given frequency. VSWR is easily derived from Return Loss.

$$VSWR = \frac{10^{\left[\frac{\text{Return Loss}}{20}\right]} + 1}{10^{\left[\frac{\text{Return Loss}}{20}\right]} - 1}$$

Insertion Loss - The loss of signal power (gain) resulting from the insertion of a device in a transmission line. Insertion loss can be derived from the power transmitted to the load before the insertion of the component  $P_T$  and the power transmitted to the load after the insertion of the component  $P_R$ .

$$\text{Insertion Loss (dB)} = 10 \log_{10} \frac{P_T}{P_R}$$

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