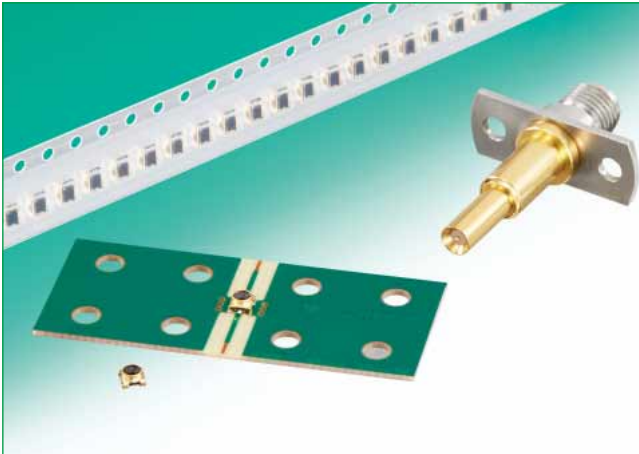


# Subminiature Coaxial Switch 1.35mm High, DC to 11GHz

## MS-156C Series



### Overview

Developed for inspection of high frequency circuits used in portable terminals. Verification of the circuit performance is accomplished by simply inserting the external plug in the board mounted receptacle. This action re-directs the circuit from normal condition to the plug side. Removing the plug restores circuit to its normal condition.

### Features

#### 1. Low insertion loss

- 0.15 dB MAX (DC to 2.5GHz)
- 0.2 dB MAX (2.5GHz to 6GHz)
- 0.4 dB MAX (6GHz to 11GHz)
- (NORMALLY CLOSED)

#### 2. Space-saving design

2.3mm x 2.3mm occupied board space.

#### 3. Low profile

1.35mm high above the board.

#### 4. Lightweight

0.014g. total weight

#### 5. Durability

100 mating/unmating cycles, with corresponding plug.

#### 6. Performs over a wide frequency range

Applicable frequencies range over a wide band, from DC to 11GHz.

#### 7. Board placement with automatic equipment

Packaged on tape-and-reel.

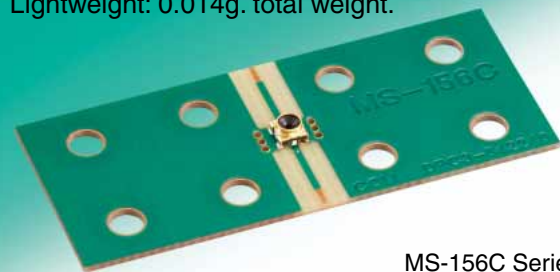
#### 8. Halogen Free, Beryllium free

Chlorine, and bromine are not used in the receptacles.

\*Definition according to IEC 61249-2-21.  
Br 900 ppm max., Cl 900 ppm max., and Br + Cl 1500 ppm max.

#### Space-saving design

Low profile: 1.35mm protrusion above the board.  
Lightweight: 0.014g. total weight.



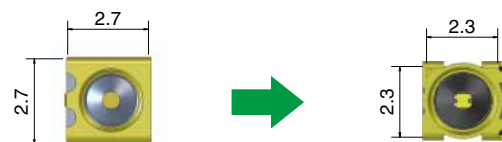
MS-156C Series

### Comparison with our conventional type

#### Conventional type

#### MS-156C3

##### ●Footprint



27% saving of space

##### ●Height



15% lower profile

##### ●Weight

0.025g → 0.014g

44% lighter weight

## Product Specifications

	Unmated	Mated with MS-156-HRMJ-3 plug
Operating temperature range	-40°C to +85°C	-40°C to +85°C
Rated power	2W	2W
Frequency range	DC to 11GHz	DC to 8GHz
V.S.W.R.	1.2 max.(DC to 2.5GHz) 1.3 max.(2.5GHz to 6.0GHz) 1.5 max.(6.0GHz to 11.0GHz)	1.4 max.(DC to 3.0GHz) 1.8 max.(3.0GHz to 8.0GHz)
Insertion loss	0.15dB max.(DC to 2.5GHz) 0.2dB max.(2.5GHz to 6.0GHz) 0.4dB max.(6.0GHz to 11.0GHz)	0.5dB max.(DC to 3.0GHz) 0.8dB max.(3.0GHz to 6.0GHz) 0.9dB max.(6.0GHz to 8.0GHz)
Isolation	20dB min.(DC to 3.0GHz) 15dB min.(3.0GHz to 6.0GHz) 12dB min.(6.0GHz to 11.0GHz)	

Item	Specification	Conditions
1.Contact resistance	100mΩ max.	100mA max.
2.Insulation resistance	1000MΩ min.	100V DC
3.Withstanding voltage	No flashover or insulation breakdown	100V AC / 1 minute
4.Vibration	No electrical discontinuity of 1μs or more	Frequency:10 to 55Hz, single amplitude of 0.75mm, 2 hours in each of the 3 axis.
5.Shock		Acceleration of 490m/s <sup>2</sup> , 6ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis, 18 times in total.
6.Temperature cycle	Contact resistance : 100mΩ max. Insulation resistance : 10MΩ min.	Temperature: -55°C → +5°C to +35°C → +85°C → +5°C to +35°C Time : 30 → 5 max. → 30 → 5 max. (Minutes) 50 cycles
7.High temperature exposure	Contact resistance : 100mΩ max. Insulation resistance : 10MΩ min.	96 hours at 85°C
8.Low temperature exposure	Contact resistance : 100mΩ max. Insulation resistance : 10MΩ min.	96 hours at -55°C
9.Humidity	Contact resistance : 100mΩ max. Insulation resistance : 10MΩ min.	96 hours at 40±2°C, and humidity of 90 to 95%
10. Durability (mating/un-mating, with corresponding plug)	Contact resistance : 100mΩ max.	100 cycles

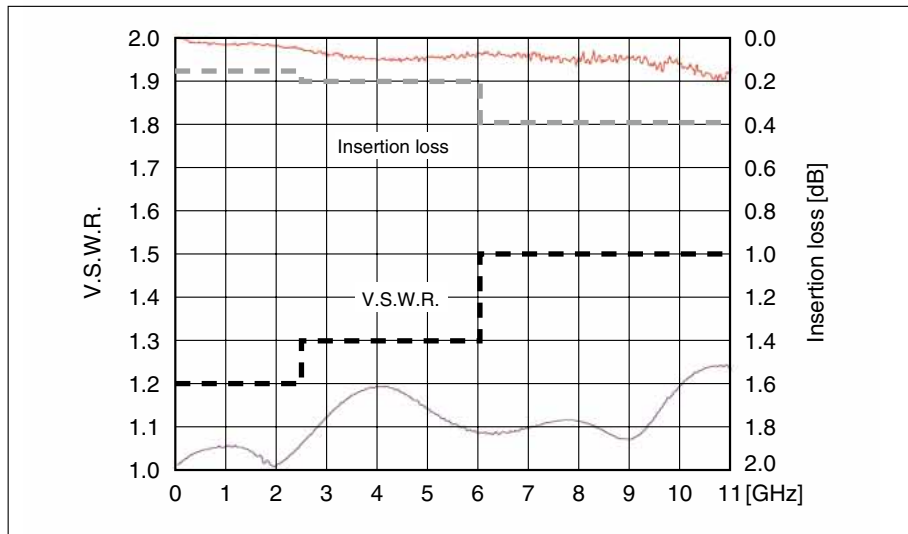
Note 1: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

## Materials / Finish

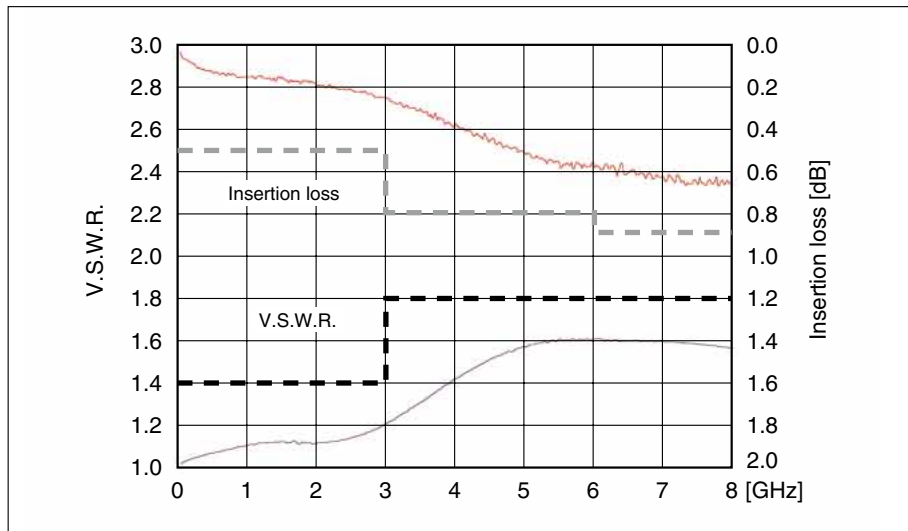
Part	Material	Finish	Remarks
Shell	Phosphor bronze	Gold plated	—————
Insulator	6T Nylon	—————	UL94HB
Common terminal	Cu-Ni-Si alloy	Selective gold plated	—————
Antenna terminal	Phosphor bronze	Selective gold plated	—————

◆ Typical Data

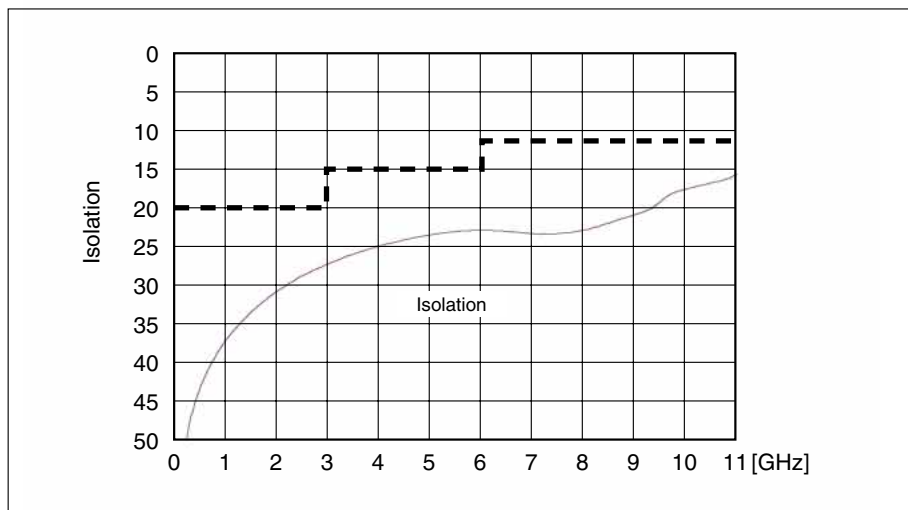
● NORMALLY CLOSED(N.C)



● NORMALLY OPEN(N.O)



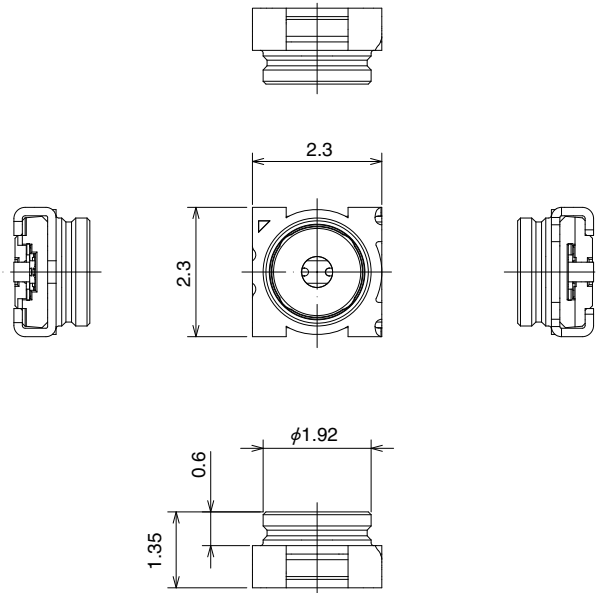
● ISOLATION



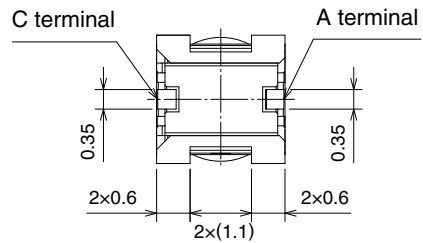
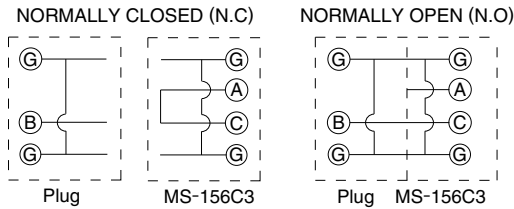
## ■ Receptacle



Part No.	HRS No.	Packing
MS-156C3	358-0346-0	10,000 pcs/reel
MS-156C3(20)	358-0346-0 20	2,000 pcs/reel



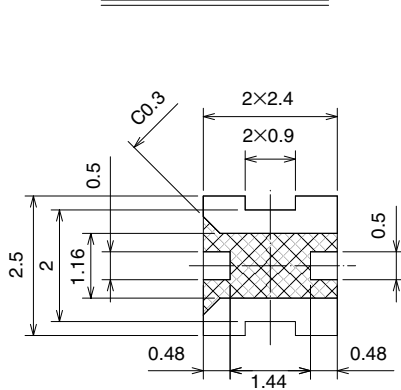
## ■ Circuit diagram



## ◆ PCB mounting pattern and metal mask dimensions

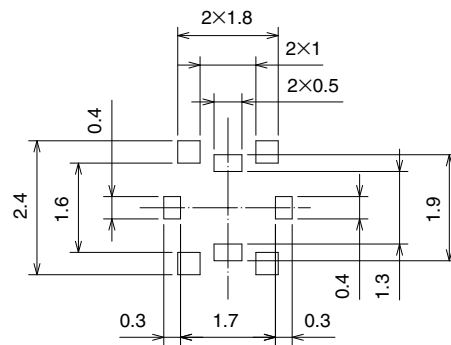
- \* Request drawing of the specific part for exact dimensions and tolerances.
- \* Specified dimensions must be followed to assure correct board placement and performance.

PCB mounting pattern




Metal mask dimensions

0.1 thick



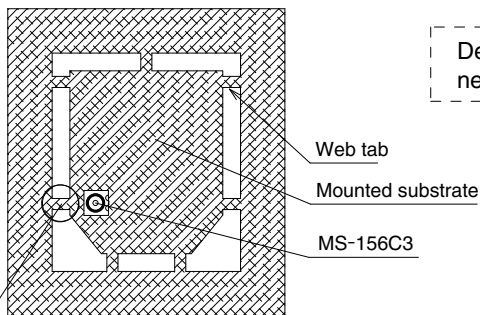
This area must be free of conductive traces and resist field.

## ◆ Precautions

1. Mounting this product using PCB patterns or metal mask dimensions other than the ones specified, may result in a product malfunction due to solder and/or flux wicking.
2. Cross-hatched area shown on the PCB mounting pattern must be free of any conductive traces. Placing conductive traces in this area may affect performance and will void product warranties. When the bottom surface of the product (i.e., the  shaded area of the specified land dimensions diagram on the previous page) has been processed with a substrate copper trace and resist processing, Hirose Electric will not be able to warrant the product.
3. Do not use hand soldering for mounting of MS-156C3. Doing so could result in solder and flux wicking to the contact areas.
4. Exercise caution as not to allow any debris to enter the board mounted MS-156C when cutting PCB.

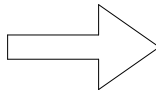
-Example of a PCB after mounting the MS-156C3-  
(Position relation between MS-156C3 and the web tab)

-Example of incorrect mounting-

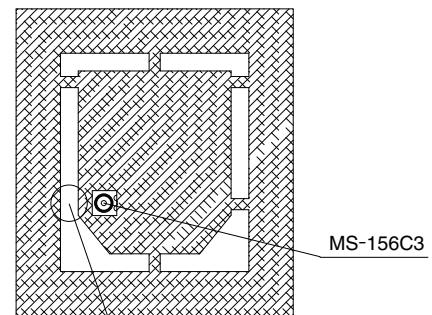


If the MS-156C3 is mounted too close to a web tab, there is a possibility that fine powder residue generated during depaneling could infiltrate the MS-156C3 switch and cause damage.

Design with no web tab near MS-156C3



-Recommended example-

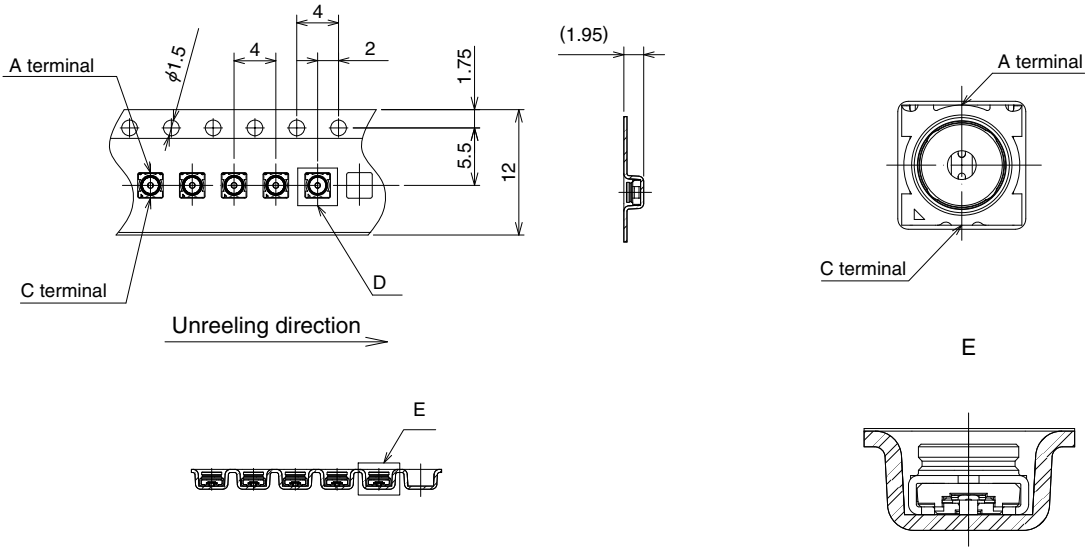


Optimal design with no web tab near the MS-156C3.

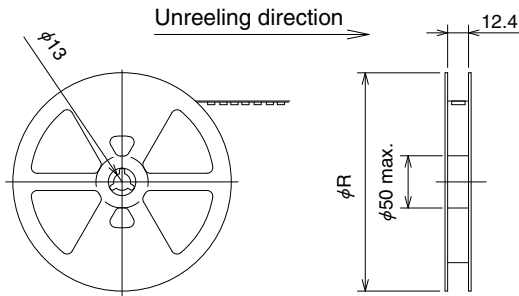
5. This product is intended for use only in testing the circuit. It cannot be used as an interface.
6. Please refrain from using the product in environments specifically affected by excessive vibration, shock, dust, high humidity, gases, very high temperatures and very low temperatures such as outdoor equipment. It might cause degradation or destruction of the product. Even if it endures during a short time, long time qualification is not guaranteed.
7. Plugs can be roughly classified to two types.
  - For mass production line automatic check (Press down type)
  - For manual check (With retentive lock) : Unable to be used at production line.
8. Do not use the washing process.
9. Please use a design in which the device housing does not exert pressure or force on the MS-156C in the event that the finished device is accidentally dropped.
10. Do not apply heat (heat gun or hot plate) over 260°C for more than 10 seconds. Exceeding this thermal limit could cause the resin to melt and cause deformation.
11. When automatic inspections are to be performed during the manufacturing operations, request the MS-156 plug connector manual for examples of implementation.

## ◆ Packing Specifications

### ● MS-156C3

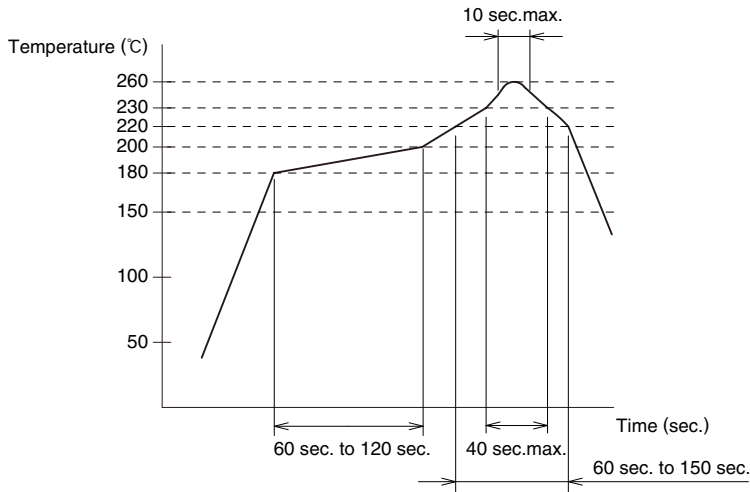


### ● Reel dimensions



Part No.	Reel Size	Packing
MS-156C3	R = $\phi 380$ mm	10,000 pcs/reel
MS-156C3(20)	R = $\phi 180$ mm	2,000 pcs/reel

## ◆ Recommended Temperature Profile



Using Lead-free Solder paste

①	Maximum temperature	: 260°C
②	Peak temperature time	: 10 sec. max.
③	230°C min.	: 40 sec. max.
④	220°C min.	: 60 sec. to 150 sec.
⑤	180°C to 200°C	: 60 sec. to 120 sec.
⑥	Metal mask thickness	: 0.1 mm
⑦	Reflow cycles	: 2 cycles

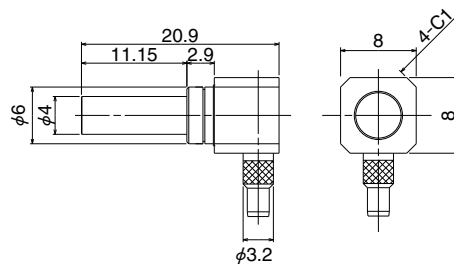
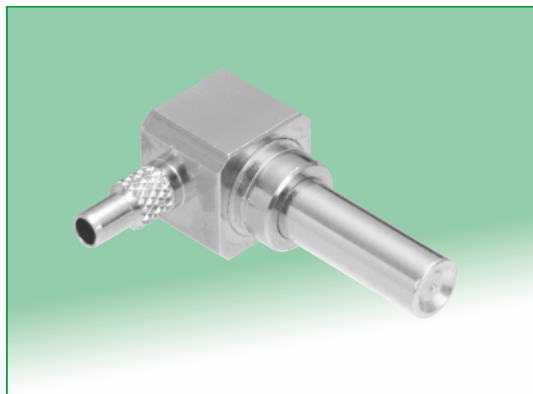
## ◆ MS-156C Series plugs and adapters

	<product name>	<Page>
<b>Cable harness type</b>		
<b>Press down, right angle type</b>	.....MS-156-C(LP)-1	8
※Needs a test fixture with a floating mechanism for installation.		
<b>Simplified lock, right angle type</b>	.....MS-156-088LP-H1	8
※For evaluation Cannot be used for automated inspection process.		
<b>For antenna type</b>	.....MS-156C-LP-068	8
※Cannot be used for circuit inspection.		
<b>SMA conversion Adapters</b>		
<b>Simplified lock type</b>	.....MS-156-HRMJ-H1	9
※For evaluation Cannot be used for automated inspection process.		
<b>Press down type</b>	.....MS-156-HRMJ-3	9
※Needs a test fixture with a floating mechanism for installation.		
<b>Right angle type</b>	.....MS-156LP-HRMJ-8	9
<b>Floating (self-pressing)</b>	.....MS-156-HRMJ-10	10
※Built-in, spring loaded push-down mechanism Stroke length controlled by fixture.		
	.....MS-156-HRMJ-12	10
	.....MS-156-HRMJ-29	10
<b>Adapter for plug inspection</b>		
<b>SMA Conversion Adapter</b>	.....MS-156R-HRMJ-1	11
<b>N Conversion Adapter</b>	.....MS-156R-NJ-1	11

When automatic inspections are to be performed during the manufacturing operations, request the instruction manual titled "MS-156 Plug Connector" which includes examples of actual use.

## Plugs

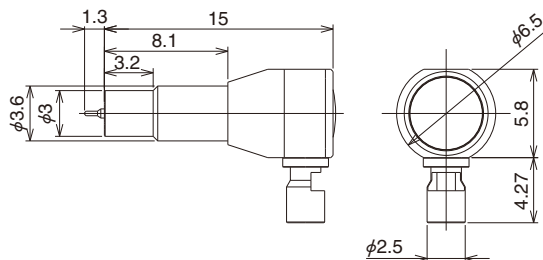
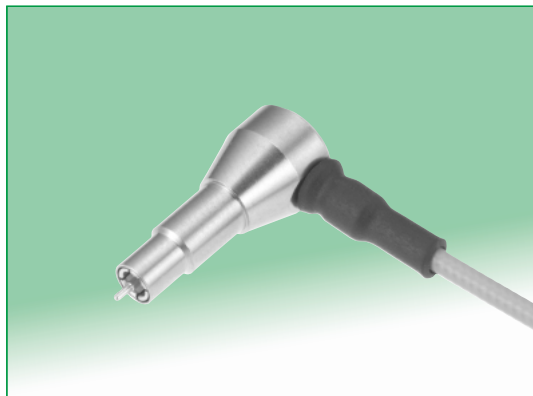
### ● Press down, right angle



Part No.	HRS No.	Durability
MS-156-C(LP)-1	358-0173-0	10,000 Times

Applicable cable: 1.5D-HQEW, 1.5D-QEW (Fujikura Ltd.)

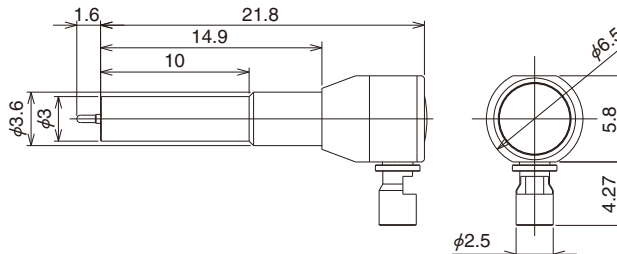
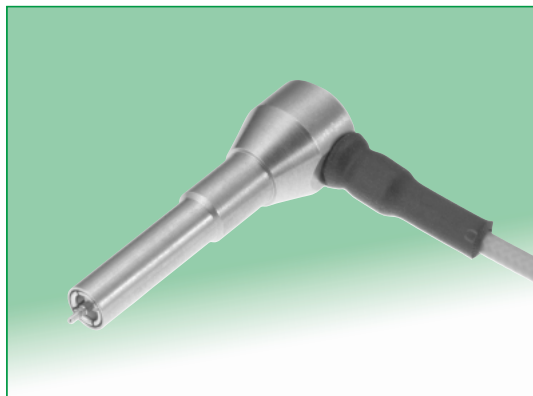
### ● Simplified lock, right angle, short



Part No.	HRS No.	Durability
MS-156-088LP-H1	358-0268-5	500 Times

Applicable cable: DFS111-UL1979 (Junkosha Ltd.)  
Please contact Hirose Sales Representative for cable length and cable end treatment.

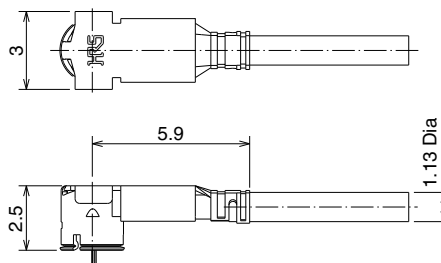
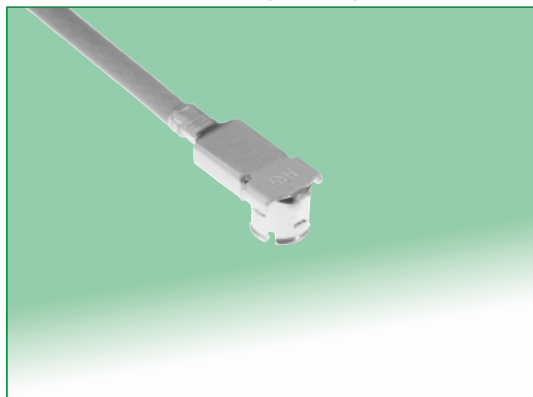
### ● Simplified lock, right angle, long



Part No.	HRS No.	Durability
MS-156-088LP-H2	358-0275-0	500 Times

Applicable cable: DFS111-UL1979 (Junkosha Ltd.)  
Please contact Hirose Sales Representative for cable length and cable end treatment.

### ● Simplified lock, right angle, for antenna



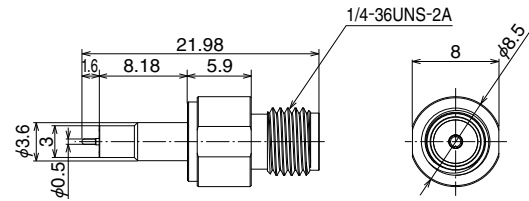
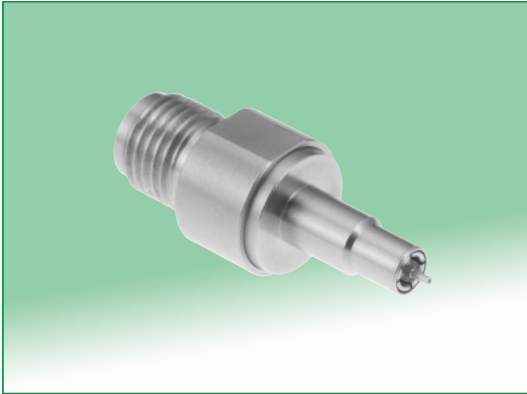
Part No.	HRS No.	Durability
MS-156C-LP-068	358-0276-3	30 Times

Applicable cable: RF-MF50161 (Nissei Electric Co., Ltd.)  
Please contact Hirose Sales Representative for cable length and cable end treatment.



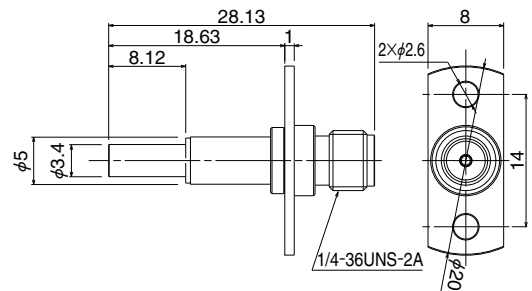
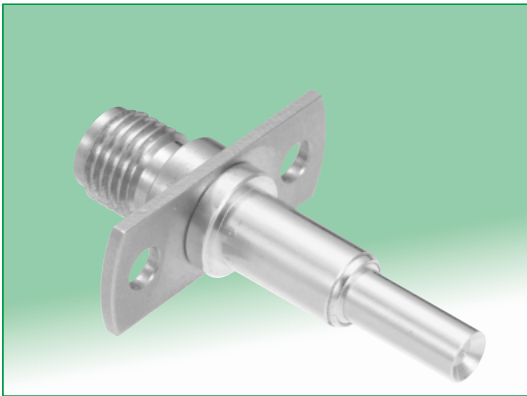
## ■ SMA Conversion Adapters

### ● Simplified lock



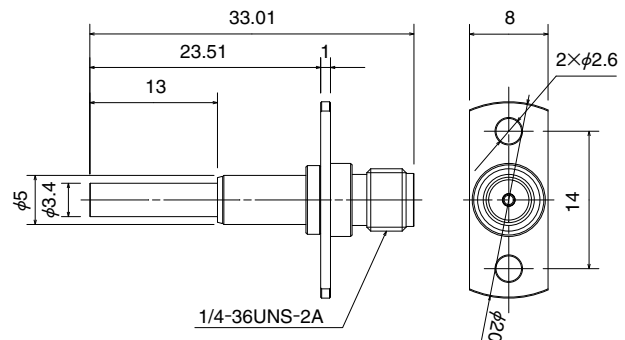
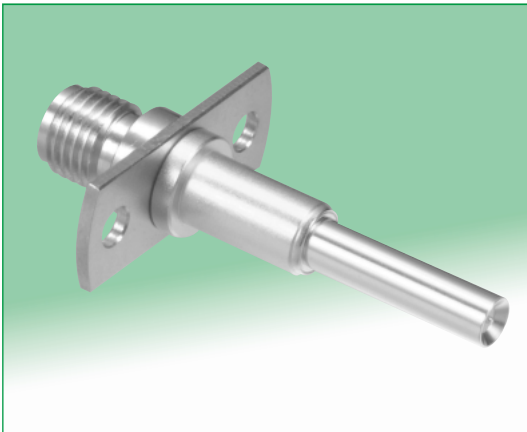
Part No.	HRS No.	Durability
MS-156-HRMJ-H1	358-0290-4	500 Times

### ● Press down, with flange, short



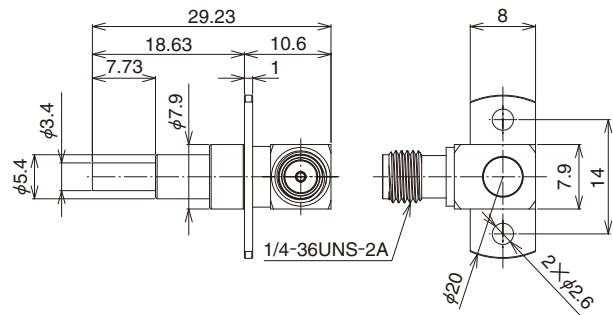
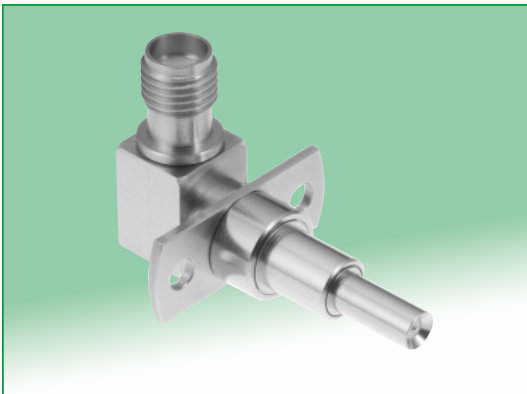
Part No.	HRS No.	Durability
MS-156-HRMJ-3	358-0171-5	10,000 Times

### ● Press down, with flange, long



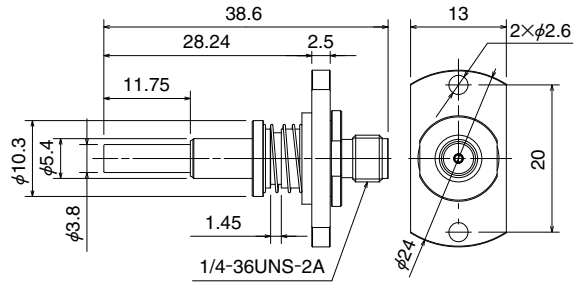
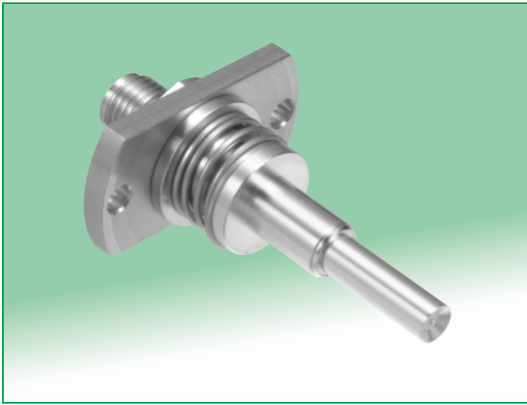
Part No.	HRS No.	Durability
MS-156-HRMJ-14	358-0198-1	10,000 Times

### ● Press down, with flange, right angle



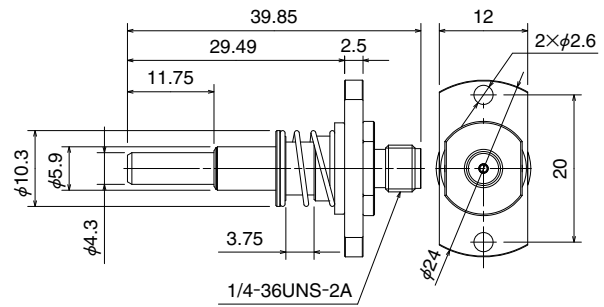
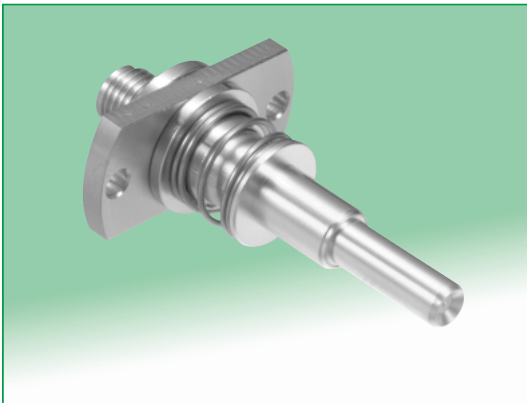
Part No.	HRS No.	Durability
MS-156LP-HRMJ-8	358-0289-5	100,000 Times

● Floating (Self-Pressing)



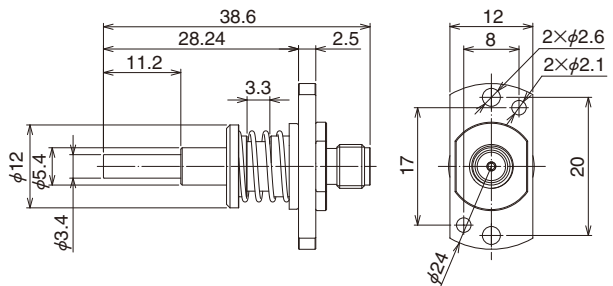
Part No.	HRS No.	Durability
MS-156-HRMJ-10	358-0194-0	10,000 Times

● Floating (Self-Pressing)



Part No.	HRS No.	Durability
MS-156-HRMJ-12	358-0196-6	10,000 Times

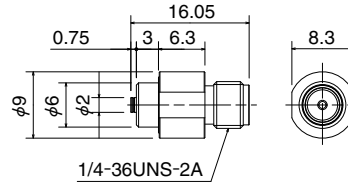
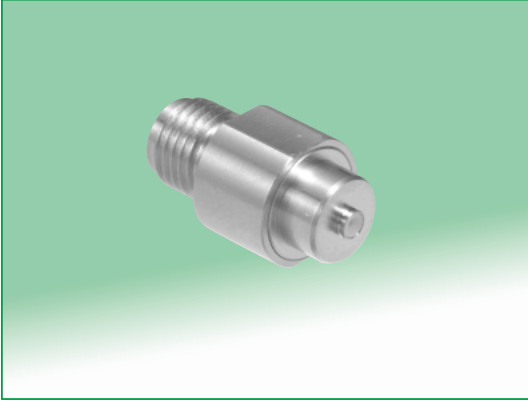
● Floating (Self-Pressing)



Part No.	HRS No.	Durability
MS-156-HRMJ-29	358-0295-8	200,000 Times

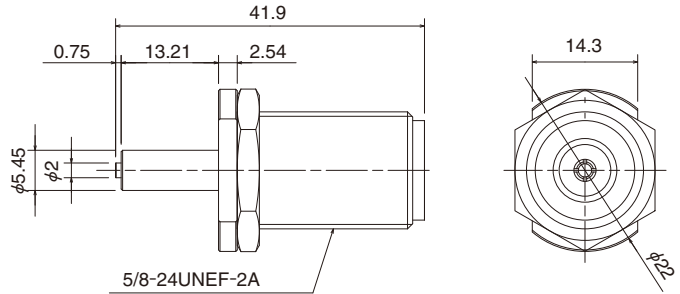
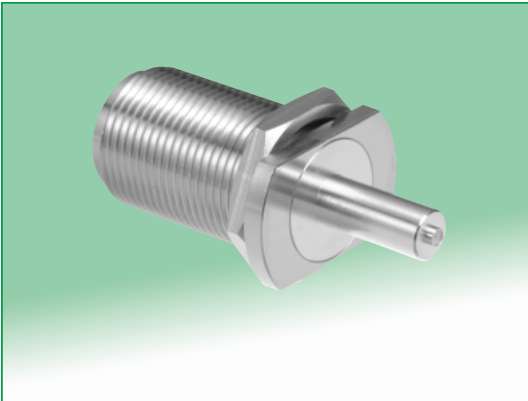
## ■ Adapter for plug inspection

### ● SMA Conversion Adapter



Part No.	HRS No.	Durability
MS-156R-HRMJ-1	358-0188-8	500 Times

### ● N Conversion Adapter



Part No.	HRS No.	Durability
MS-156R-NJ-1	358-0176-9	500 Times

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