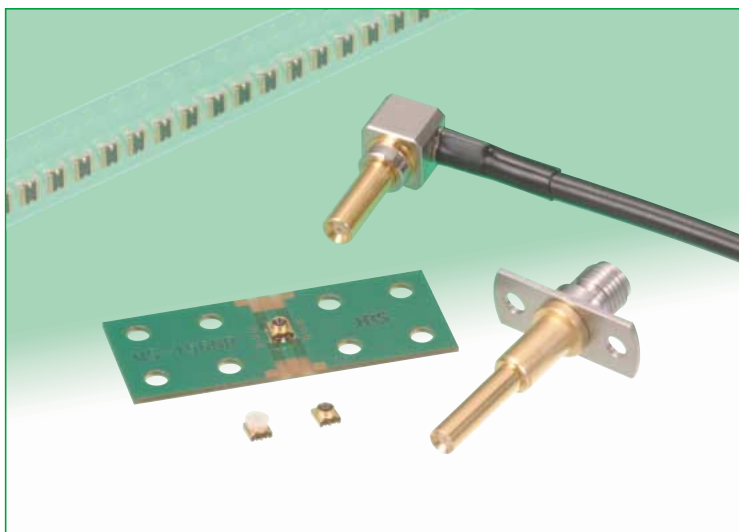




# Subminiature Coaxial Switch 1.6 mm High, DC to 6 GHz

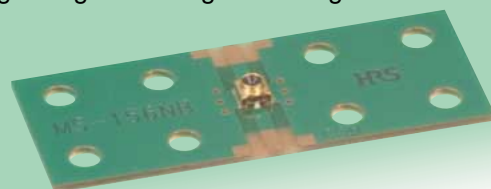
## MS-156NB Series



### 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.

**Space-saving design**  
Low profile -1.6 mm protrusion above the board.  
**Lightweight** -0.025 g. total weight.

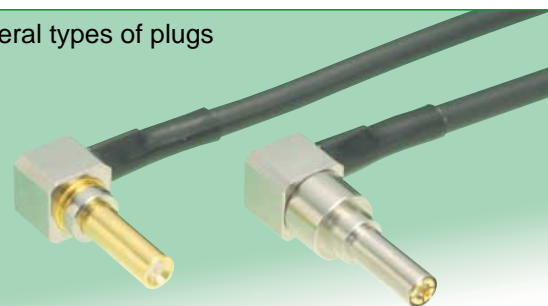


MS-156NB

### Features

- 1. Low insertion loss**  
0.1 dB typical at 6 GHz (not mated with the plug).
- 2. Space-saving design**  
2.7 mm x 2.7 mm occupied board space.
- 3. Low profile**  
1.6 mm protrusion above the board.
- 4. Lightweight**  
0.025 g. total weight (without vacuum cap).
- 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 6 GHz.
- 7. Board placement with automatic equipment**  
Packaged on tape-and-reel. Also available with a vacuum pick-up cap over each switch.
- 8. RoHS compliant**  
All components and materials comply with the requirements of the EU Directive 2002/95/EC.

### Several types of plugs



### Several types of SMA conversion adapters



### Adapter for plug inspection



### Applications

Portable terminals, ETC, notebook computers (Bluetooth), wireless LAN, POS terminals, GPS terminals, PDA, and any small devices requiring verification of antenna/circuit performance.

## ■Product Specifications

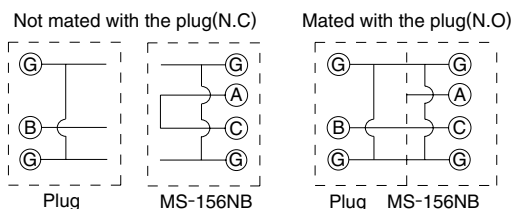
	Not mated with the plug	Mated (MS-156-HRMJ-3)
Operating temperature range	-40°C to +85°C	-40°C to +85°C
Rated power	2W	2W
Frequency range	DC to 6GHz	DC to 6GHz
Insertion loss	0.1 dB max. (DC to 3.0GHz) 0.15 dB max. (3.0GHz to 6.0GHz)	0.5 dB max. (DC to 3.0GHz) 1.2 dB max. (3.0GHz to 6.0GHz)
Isolation	20 dB max. (DC to 2.0GHz) 15 dB max. (2.0GHz to 4.0GHz) 13 dB max. (4.0GHz to 6.0GHz)	
V.S.W.R	1.2 max. (DC to 2.5GHz) 1.3 max. (2.5GHz to 6.0GHz)	1.4 max. (DC to 3.0GHz) 1.8 max. (3.0GHz to 6.0GHz)

Item	Specification	Conditions
1. Contact resistance	100 mΩ max.	100 mA max.
2. Insulation resistance	1000 MΩ min.	100 V DC
3. Withstanding voltage	No flashover or insulation breakdown	100 V AC / 1 minute
4. Vibration	No electrical discontinuity of 1 μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 axis.
5. Shock		Acceleration of 490 m/s <sup>2</sup> , 6 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis
6. Thermal shock	Contact resistance: 100 mΩ max. Insulation resistance: 10 MΩ min.	Temperature: -55°C → +5°C to +35°C → +85°C → +5°C to +35°C Time: 30 → 2 to 3 → 30 → 2 to 3 (Minutes) 100 cycles
7. Durability (mating/un-mating, with corresponding plug)	Contact resistance: 100 mΩ max.	100 cycles

## ■Materials

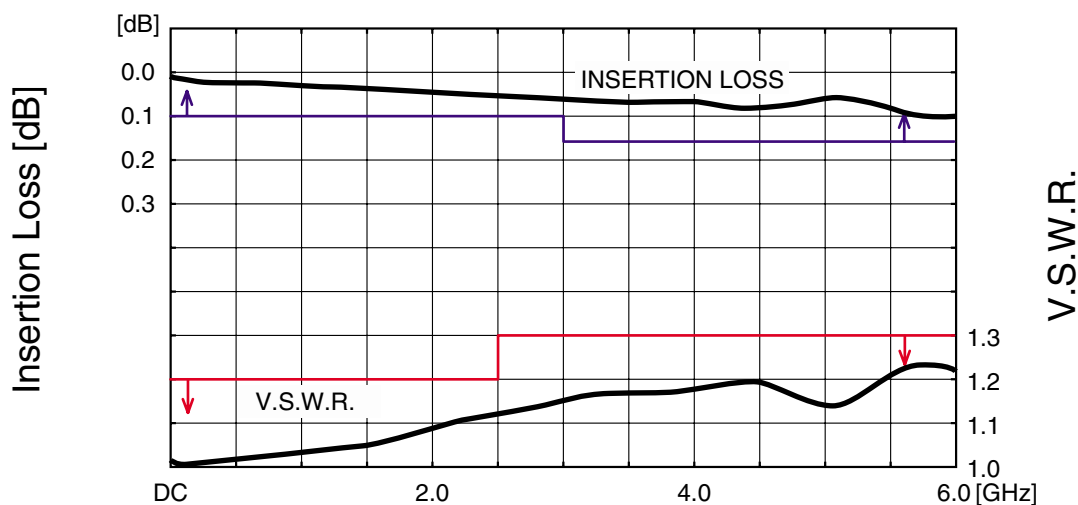
Part	Material	Finish	Remarks
Shell	Phosphor bronze	Gold plated	—
Insulator	9T Nylon	—	UL94V-0
Common terminal	Beryllium copper	Selective gold plated (Nickel barrier)	—
Antenna terminal	Phosphor bronze	Selective gold plated (Nickel barrier)	—

## ◆Circuit diagram

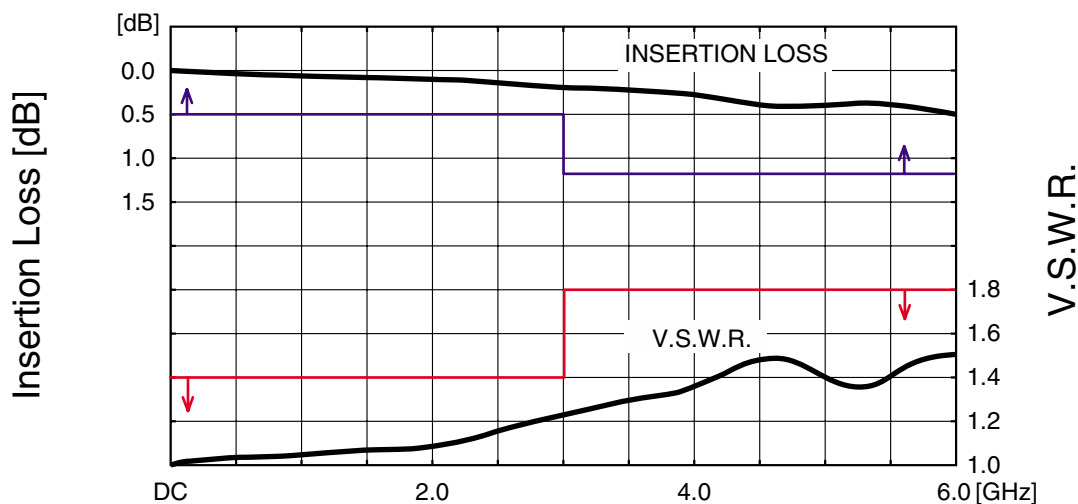


## ◆ Typical Data

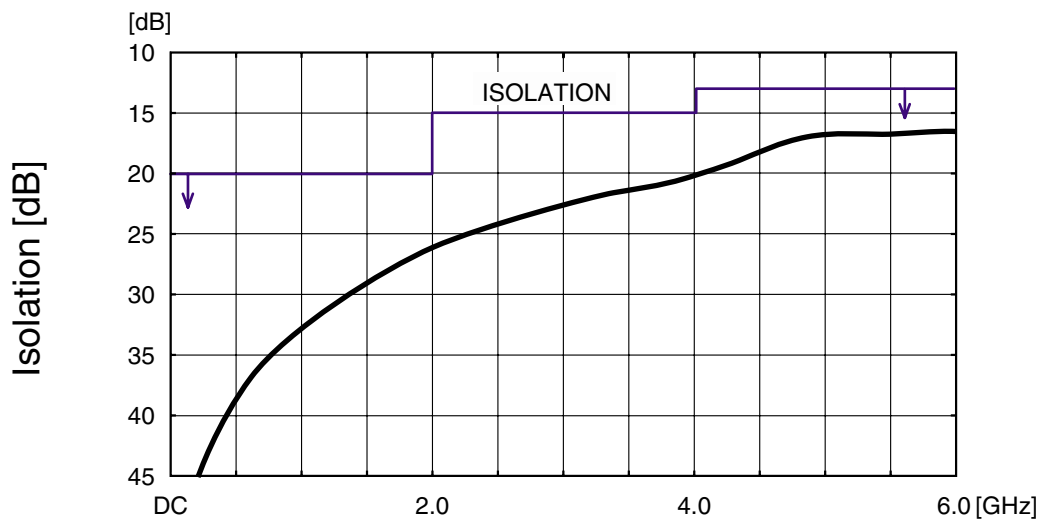
### ● NORMALLY CLOSED(N.C)~(Not mated with the plug)



### ● OPEN(N.O)~(Mated with the plug)

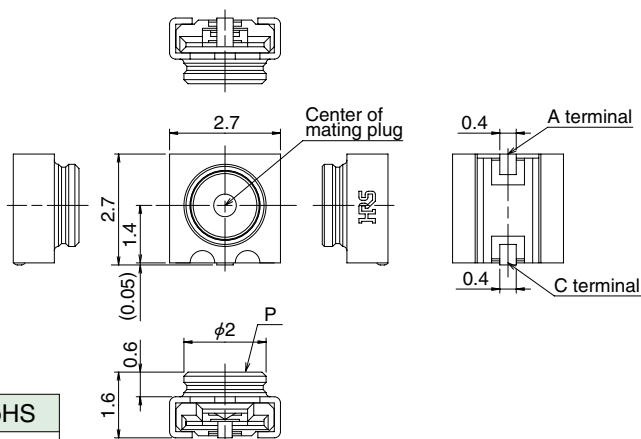


### ● ISOLATION



## ■ Receptacle

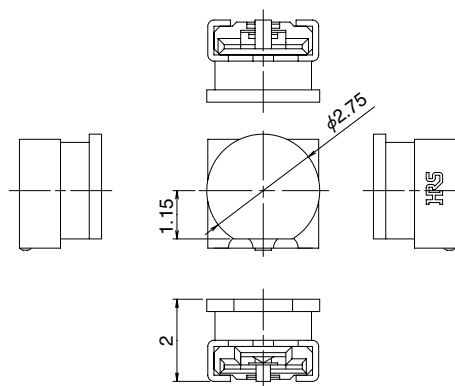
### ● Without vacuum pick-up cap



\* Lead coplanarity within 0.1mm

Part Number	CL No.	Packaging	RoHS
MS-156NB	358-0206-8	2,000 pieces/reel	YES
MS-156NB(01)	358-0206-8-01	100 pieces/bag	

### ● With vacuum pick-up cap



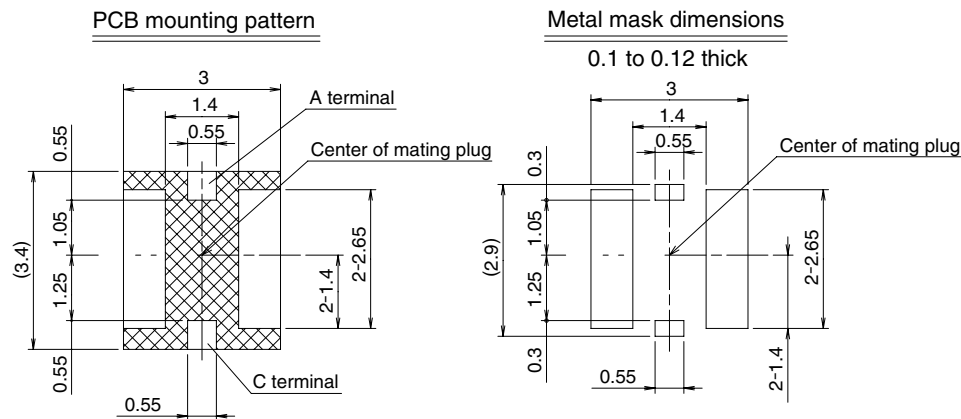
Note: Vacuum pick-up cap flat can be oriented in any direction. Orientation will not affect placement of the switch on the board.

Part Number	CL No.	Packaging	RoHS
MS-156NB(02)	358-0206-8-02	1,500 pieces/reel	YES

## ◆ 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.

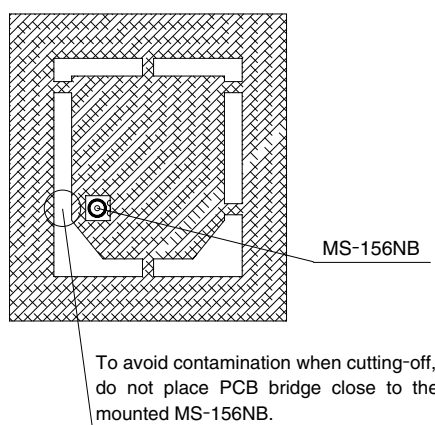


⊞ This area must be free of conductive traces and resist field.

## ◆Precautions

1. This product is intended to be used for circuit inspection only. Consult us if any other application is considered.
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-156NB.  
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-156NB when cutting PCB.

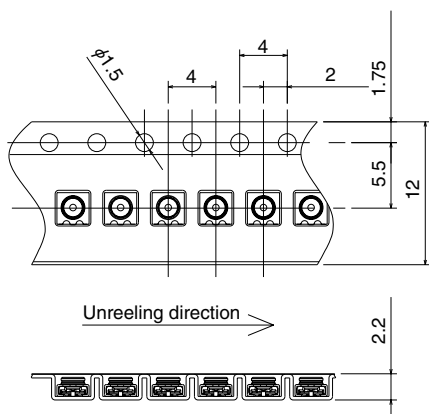
Recommended Mounting of MS-156NB coaxial switch  
on the PCB during the manufacturing process



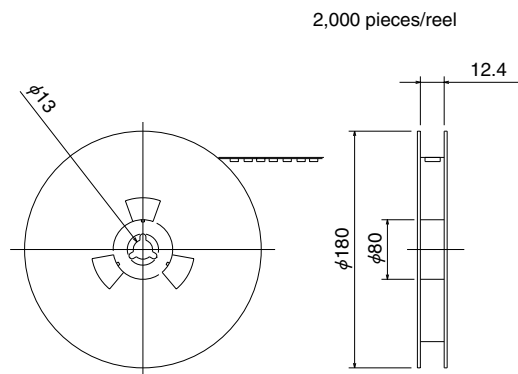
5. Do not use the washing process.
6. Please refrain from using the product in environments specifically affected by excessive vibration, shock, dust, high humidity, gases, very high temperatures and very low temperatures such as outdoor equipment. It might cause degradation or destruction of the product. Even if it endures during a short time, long time qualification is not guaranteed.
7. For use of this product, be sure to put contact area of plug on position P(P4 full view) perpendicularly.
8. 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.
9. When automatic inspections are to be performed during the manufacturing operations, request the MS-156 plug connector manual for examples of implementation.

## ◆ Packaging Specifications

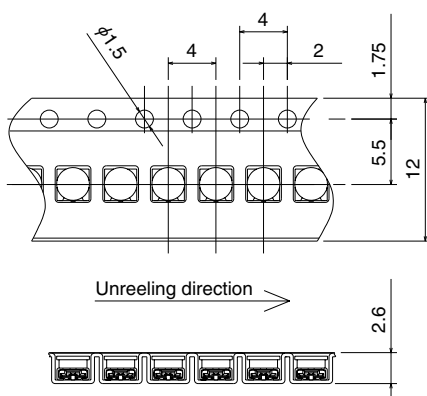
### ● MS-156NB (Without vacuum cap)



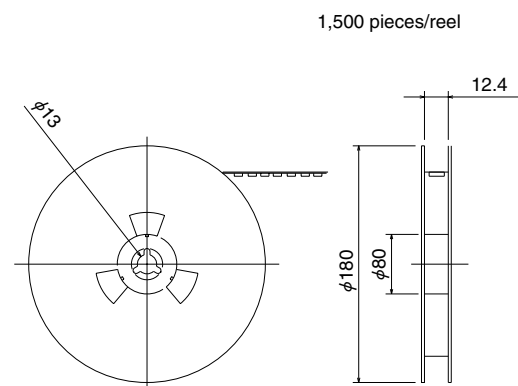
### ● Reel dimensions



### ● MS-156NB(02) (With vacuum cap)

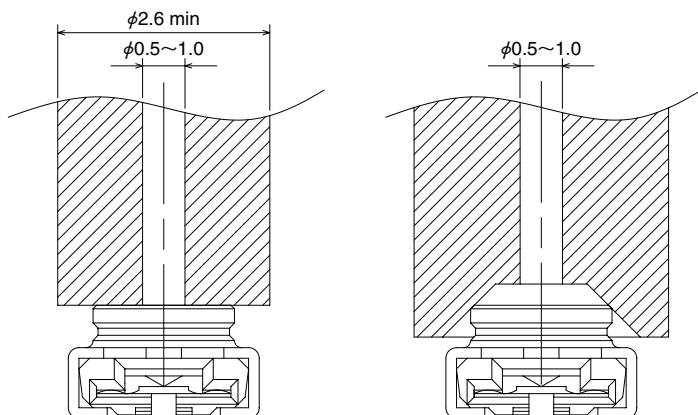


### ● Reel dimensions

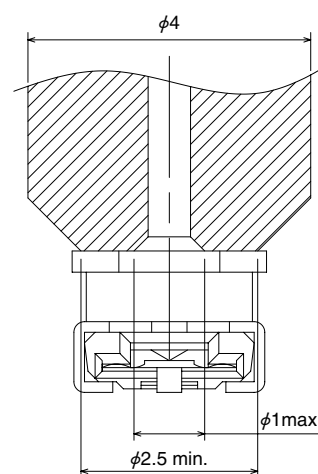


## ◆ Recommended Nozzle Dimensions

### ● Without vacuum pick-up cap

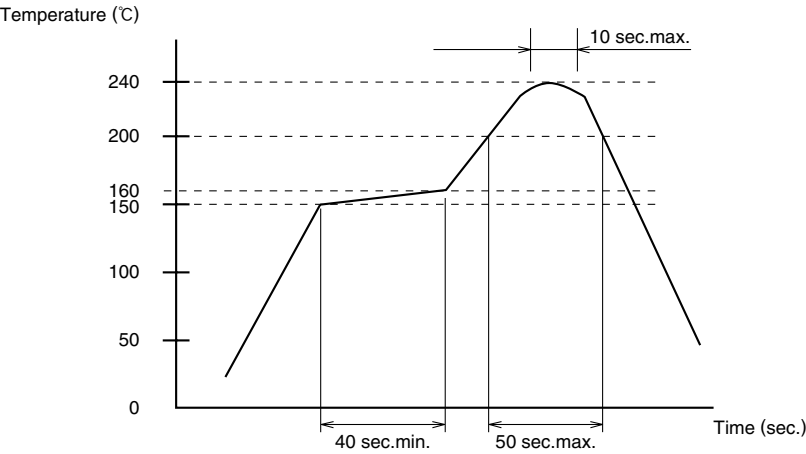


### ● With vacuum pick-up cap



\* Depending on the placement equipment, the use of a special nozzle might be required.

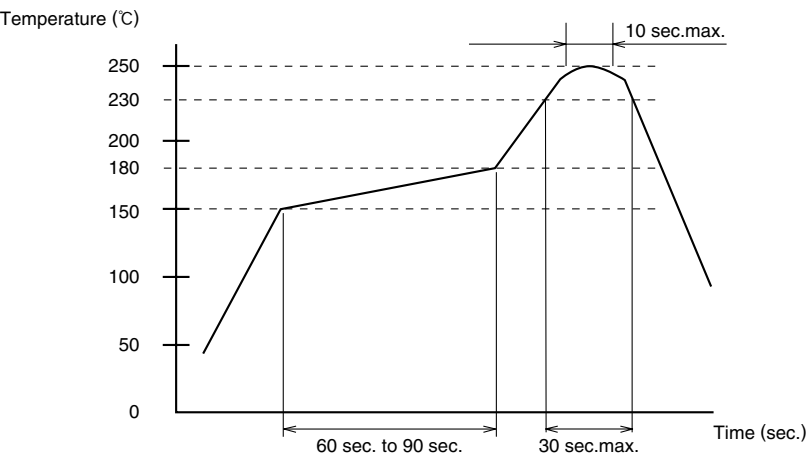
◆ Recommended Temperature Profile



Using Typical Solder Paste

① Maximum temperature	: 240°C
② Peak temperature	: 220°C to 235°C
③ Peak temperature time	: 10 sec. max.
④ 200°C min.	: 50 sec. max.
⑤ 150°C to 160°C	: 40 sec. min.

Metal mask thickness : 0.1 to 0.12 mm  
Reflow cycles : 2 cycles



Using Lead-free Solder paste

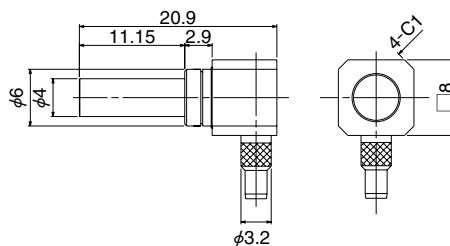
① Maximum temperature	: 250°C
② Peak temperature	: 240°C to 250°C
③ Peak temperature time	: 10 sec. max.
④ 230°C min.	: 30 sec. max.
⑤ 150°C to 180°C	: 60 sec. to 90 sec.

Metal mask thickness : 0.1 to 0.12 mm  
Reflow cycles : 2 cycles

\* Max. temperature 260°C for 10 sec. max. for heat gun or heat plate.

## ■Plugs

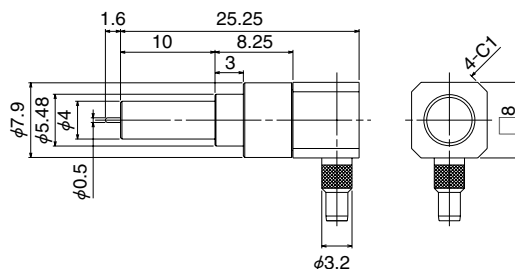
### ●Press down, right angle



Part Number	CL No.	Durability	RoHS
MS-156-C(LP)-1	358-0173-0	10,000 Times	YES

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

### ●Simplified lock, right angle

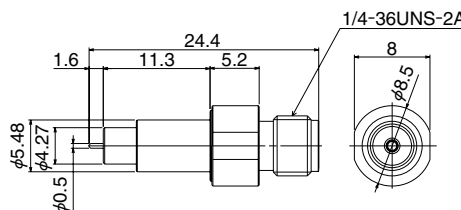


Part Number	CL No.	Durability	RoHS
MS-156-C(LP)-2	358-0174-3	500 Times	YES

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

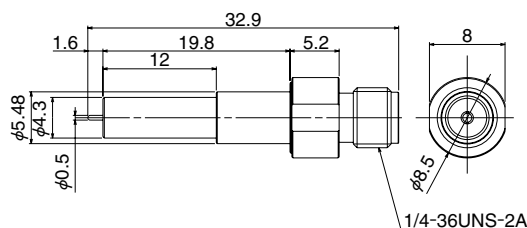
## ■SMA Conversion Adapters

### ●Simplified lock, straight, short



Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-2	358-0170-2	500 Times	YES

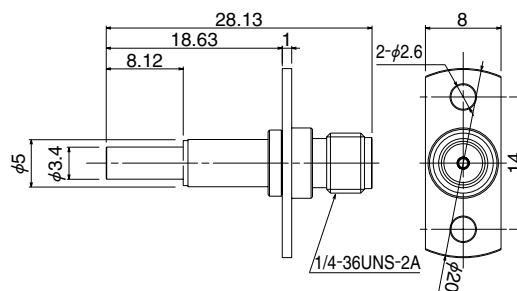
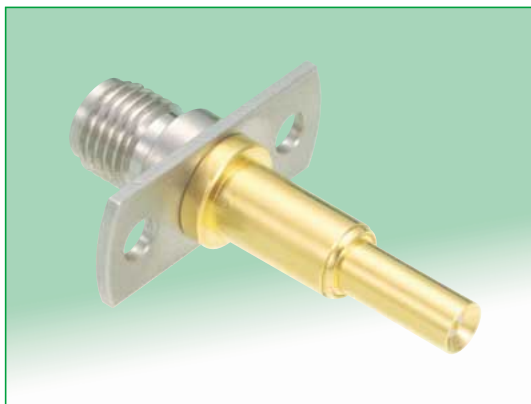
### ●Simplified lock, straight, long



Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-5	358-0177-1	500 Times	YES

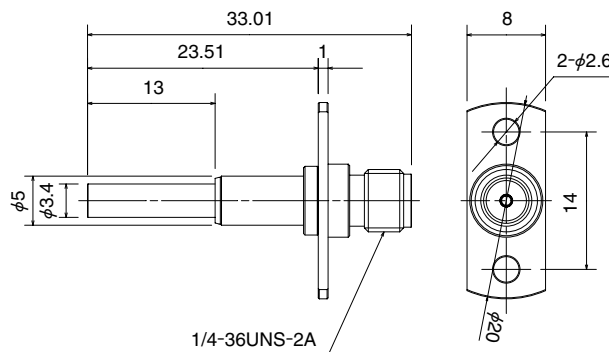
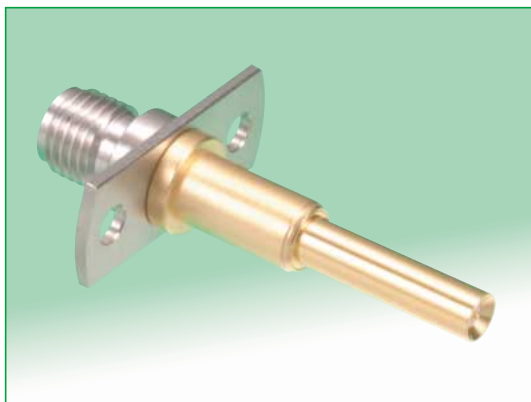


●Press down, with flange, short



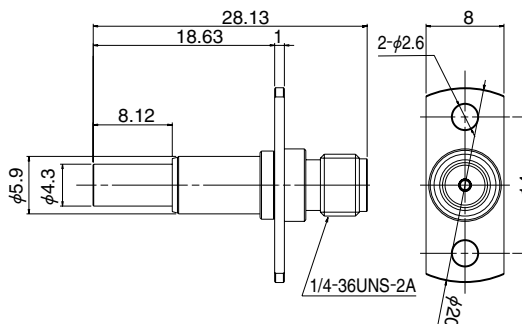
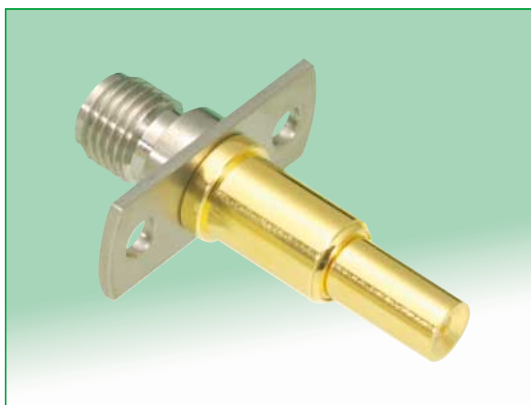
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-3	358-0171-5	10,000 Times	YES

●Press down, with flange, long



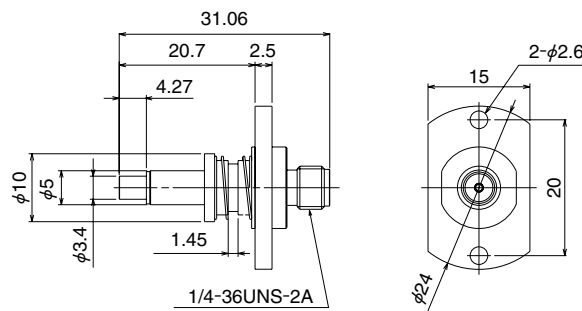
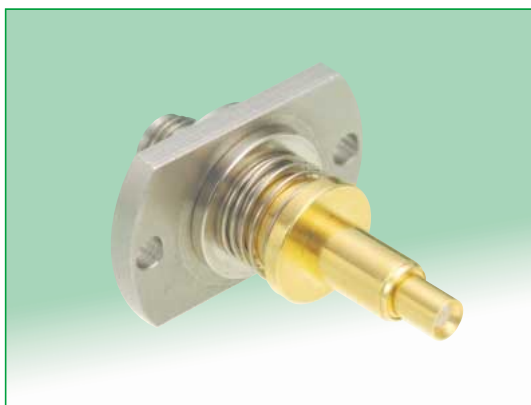
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-14	358-0198-1	10,000 Times	YES

●Press down, with flange  
(Increased self alignment)



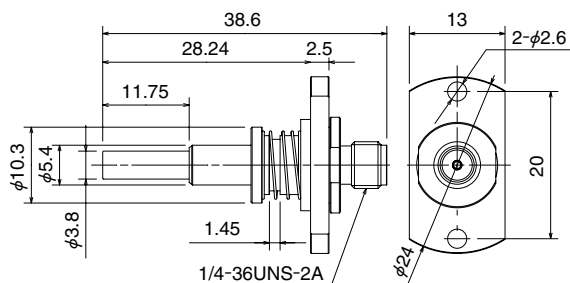
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-6	358-0181-9	10,000 Times	YES

●Floating



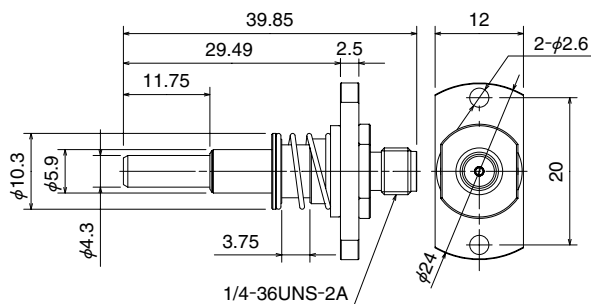
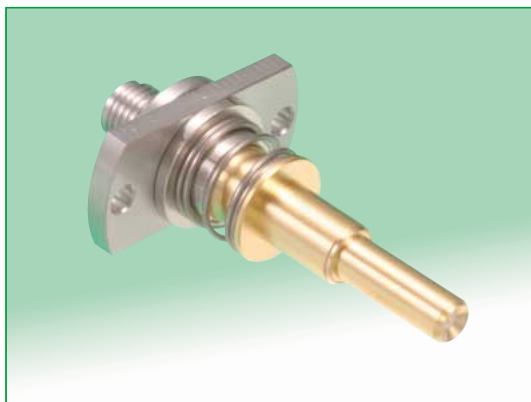
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-9	358-0180-6	10,000 Times	YES

### ●Floating (Self-Pressing)



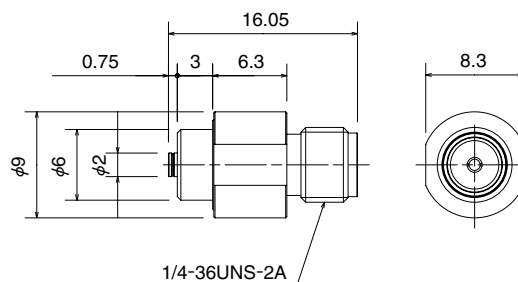
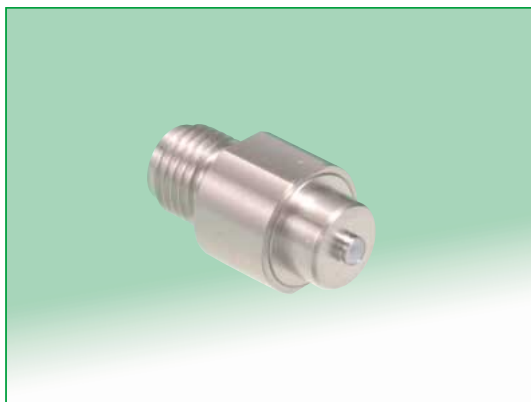
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-10	358-0194-0	10,000 Times	YES

### ●Floating (Self-Pressing)



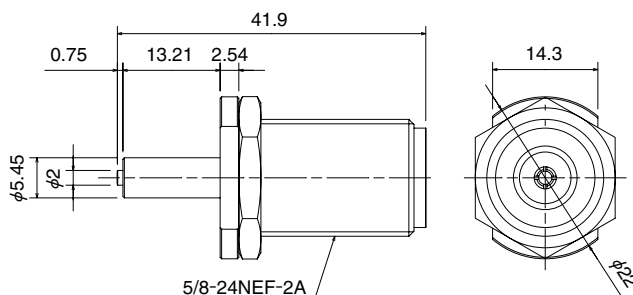
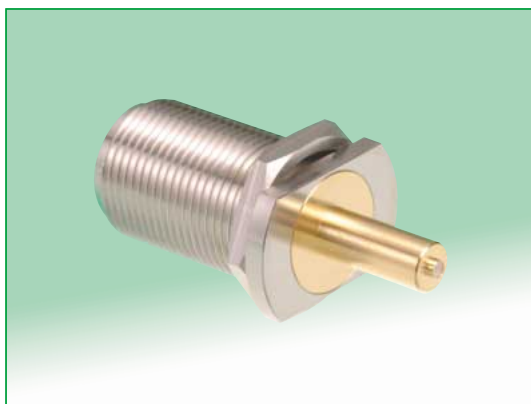
Part Number	CL No.	Durability	RoHS
MS-156-HRMJ-12	358-0196-6	10,000 Times	YES

### ●Adapter for plug inspection



Part Number	CL No.	Durability	RoHS
MS-156R-HRMJ-1	358-0188-8	500 Times	YES

### ●Adapter for plug inspection



Part Number	CL No.	Durability	RoHS
MS-156R-NJ-1	358-0176-9	500 Times	YES

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