

## Cryogenic Infrared Filter

### SMA Male to SMA Female

Infrared Filters protect sensitive quantum devices that operate below 1 K from high-energy photons that can cause unwanted heating or decoherence. In addition, they improve the thermalization of the center conductor in a coaxial line. A common application of IR Filters is in superconducting qubit devices where infrared radiation is suspected to generate quasi-particle excitations that reduce the coherence time of the qubit.

#### Features:

- Based on magnetically loaded dielectric absorber
- Capable of operation at 10 mK
- Housing Gold Plated OFHC Copper
- Impedance: 50  $\Omega$

#### Applications:

- Dilution refrigerators/Cryogenic devices
- Quantum Computing



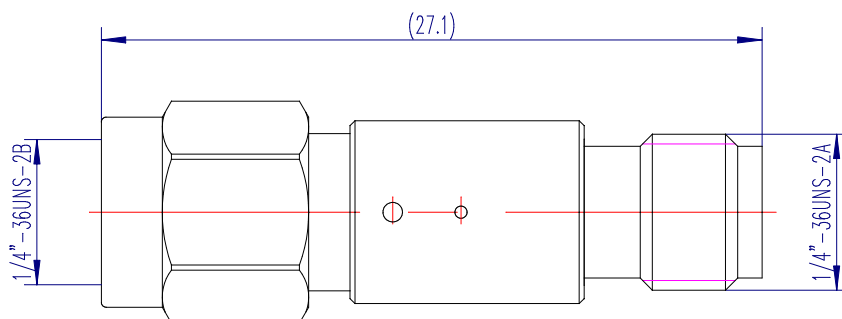
#### Electrical Characteristics:

| Model              | Parameter |                      |                   |             |
|--------------------|-----------|----------------------|-------------------|-------------|
|                    | Frequency | Insertion Loss (Typ) | Return Loss (Typ) | Impedance   |
| TL-CRYOIRHF01-2005 | DC-8GHz   | 20dB@5GHz            | -16dB             | 50 $\Omega$ |
| TL-CRYOIRHF01-2405 | DC-8GHz   | 24dB@5GHz            | -16dB             | 50 $\Omega$ |
| TL-CRYOIRHF01-4805 | DC-8GHz   | 48dB@5GHz            | -16dB             | 50 $\Omega$ |

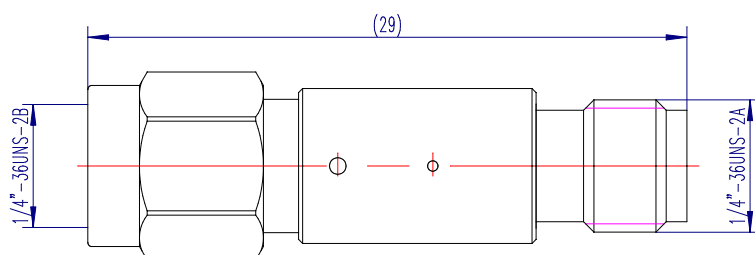
#### Envrionmental And Physical Characteristics:

| Description           | Parameter               | Units |
|-----------------------|-------------------------|-------|
| Operating Temperature | 10mK To +200            | °C    |
| Storage Temperature   | -55 to +200             | °C    |
| Packaging case        | Gold Plated OFHC Copper |       |
| Connector             | SMA Male to Female      |       |

**Outline Drawing: Unit:mm**



**TL-CRYOIRHF01-2405**



**TL-CRYOIRHF01-2005**

**Ordering Information:**

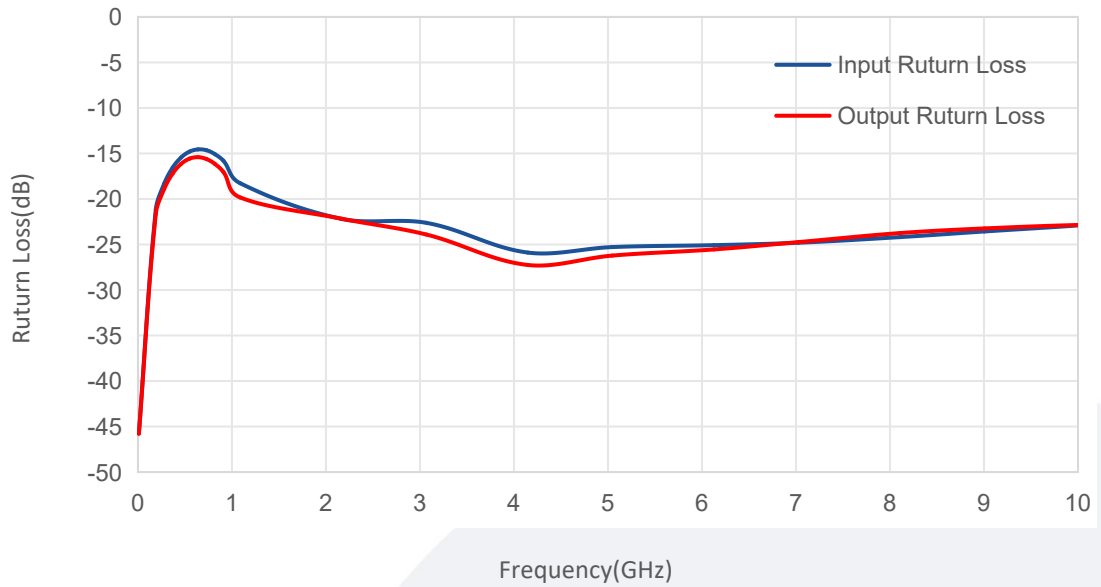
| Base Number        | Description                             | Revision |
|--------------------|-----------------------------------------|----------|
| TL-CRYOIRHF01-2005 | SMA Cryogenic Infrared Filter 20dB@5GHz | Rev.1.1  |
| TL-CRYOIRHF01-2405 | SMA Cryogenic Infrared Filter 24dB@5GHz | Rev.1.1  |
| TL-CRYOIRHF01-4805 | SMA Cryogenic Infrared Filter 48dB@5GHz | Rev.1.1  |

## Typical Performance Data:

**TL-CRYOIRHF01-2005**

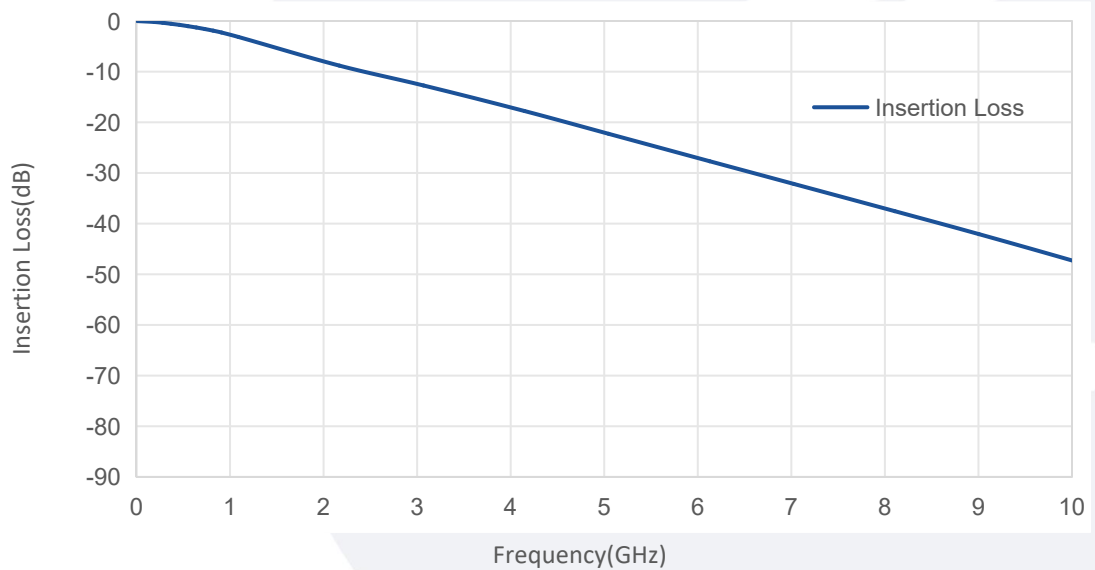
**298K:**

**Return Loss vs Frequency**



**298K:**

**Insertion Loss vs Frequency**



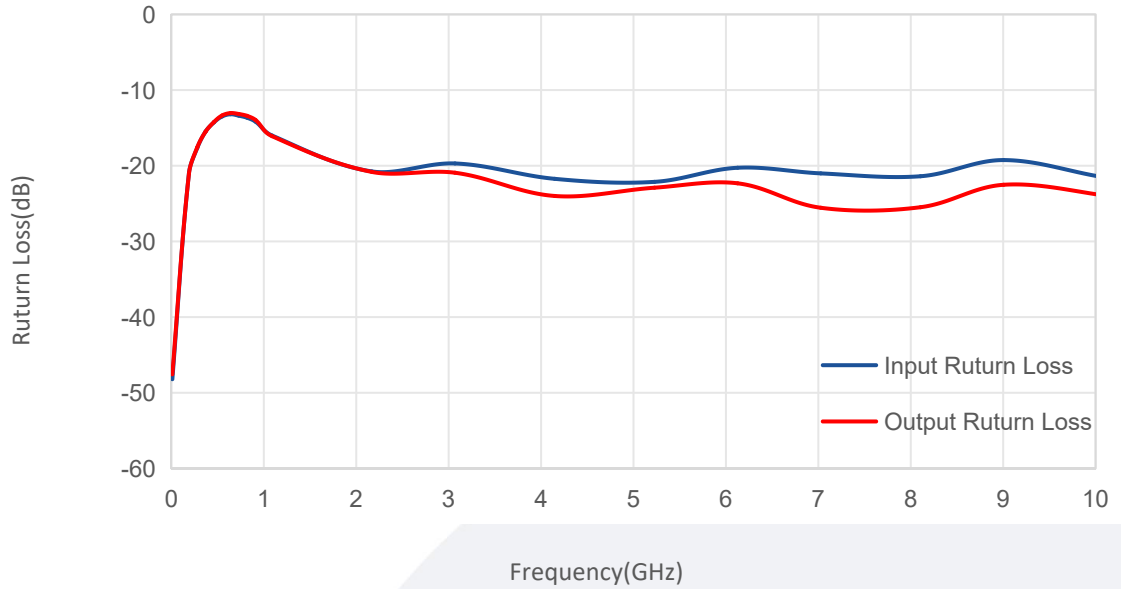
Note: Above data is for ref only, actual data may vary from unit to unit depending on operating environment and other factors like material lots etc.

## Typical Performance Data:

TL-CRYOIRHF01-2005

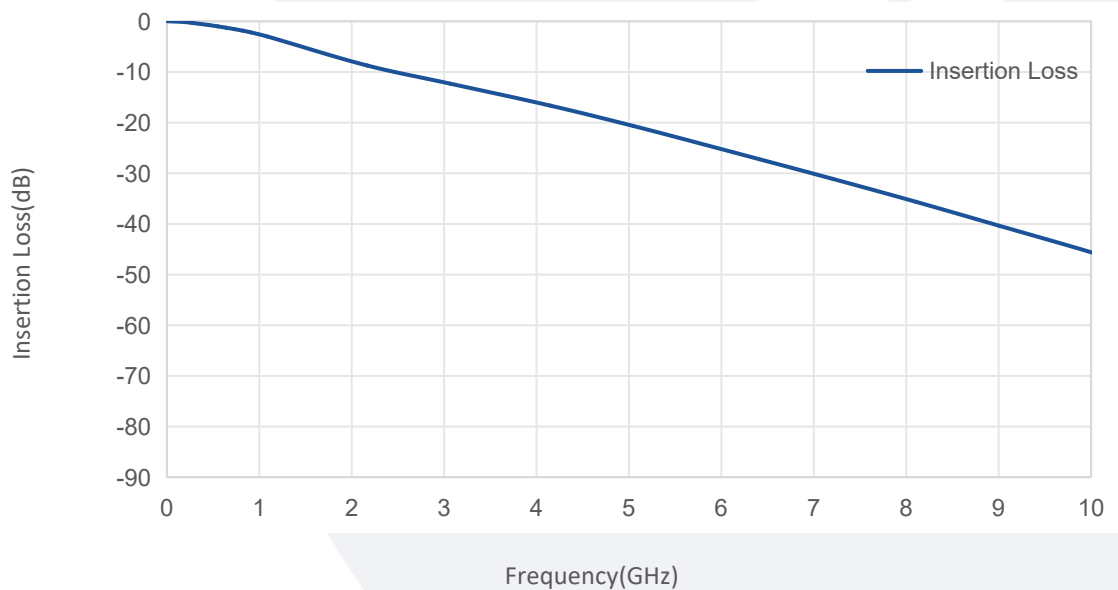
77K:

### Return Loss vs Frequency



77K:

### Insertion Loss vs Frequency



Note: Above data is for ref only, actual data may vary from unit to unit depending on operating environment and other factors like material lots etc.