



Mini-Circuits

BULKHEAD

# Adapter

24FPM-24F+

50Ω DC to 50 GHz 2.4 mm-Female to 2.4 mm-Female

## THE BIG DEAL

- Ultra-Wideband, DC-50 GHz
- Flat Response
- Low Insertion Loss, 0.11 dB
- Excellent VSWR, 1.04:1

## APPLICATIONS

- 5G mmW,
- KA/KU band
- Satellite Communications



Generic photo used for illustration purposes only

|            |                      |
|------------|----------------------|
| Model No.  | 24FPM-24F+           |
| Case Style | DJ3008               |
| Connectors | 2.4 mm-F to 2.4 mm-F |

### +RoHS Compliant

The +Suffix identifies RoHS Compliance.  
See our website for methodologies and qualifications

## PRODUCT OVERVIEW

Mini-Circuits' 24FPM-24F+ is a wideband bulkhead adapter supporting a wide range of applications from DC to 50 GHz. This model provides excellent VSWR, low insertion loss, and flat response versus frequency. The 24FPM-24F+ features passivated stainless steel construction and measures only 0.77" in length.

## KEY FEATURES

| Features                                             | Advantages                                                                                                            |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Wideband, DC to 50 GHz                               | Wide frequency range provides application flexibility and makes this model ideal for broadband and multi-band use.    |
| Excellent VSWR, 1.04:1                               | Provides good matching for 50Ω systems and minimizes signal reflections across wide frequency range.                  |
| Low insertion loss, 0.11 dB                          | Provides excellent signal power transmission from input to output.                                                    |
| Passivated stainless steel construction              | Stands up to wear and tear in demanding environments and provides excellent reliability.                              |
| Very wide operating temperature range, -55 to +100°C | Withstands extreme operating conditions and is suitable for use near high power componentry where heat rise is common |





## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter       | Condition (GHz) | Min. | Typ. | Max. | Units |
|-----------------|-----------------|------|------|------|-------|
| Frequency Range | —               | DC   | —    | 50   | GHz   |
| Insertion Loss  | DC-10           | —    | 0.05 | 0.2  | dB    |
|                 | 10-20           | —    | 0.08 | 0.2  |       |
|                 | 20-40           | —    | 0.11 | 0.2  |       |
|                 | 40-50           | —    | 0.13 | 0.25 |       |
| VSWR            | DC-10           | —    | 1.01 | 1.2  | :1    |
|                 | 10-20           | —    | 1.01 | 1.2  |       |
|                 | 20-40           | —    | 1.04 | 1.2  |       |
|                 | 40-50           | —    | 1.04 | 1.2  |       |

## ABSOLUTE MAXIMUM RATINGS

| Parameter             | Ratings         |
|-----------------------|-----------------|
| Operating Temperature | -55°C to +100°C |
| Storage Temperature   | -55°C to +100°C |

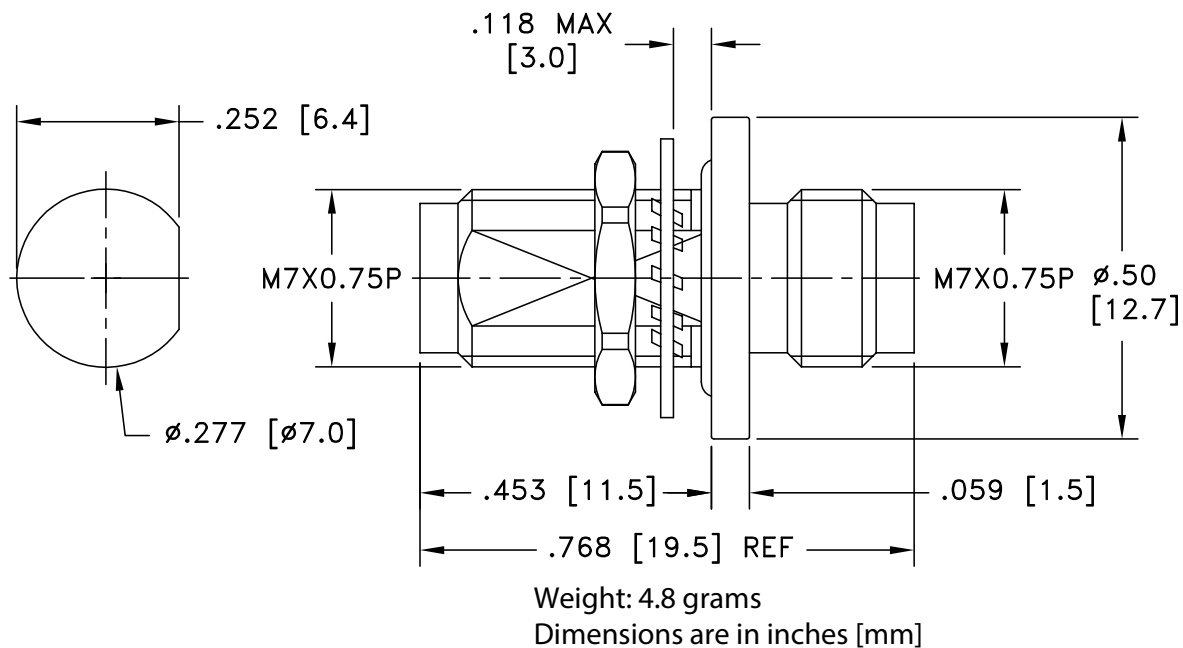
Permanent damage may occur if any of these limits are exceeded.



## COAXIAL CONNECTIONS

|             |          |
|-------------|----------|
| Connector 1 | 2.4 mm-F |
| Connector 2 | 2.4 mm-F |

## OUTLINE DRAWING

OUTLINE DIMENSIONS (Inches  
mm)

| A     | B     | C  | D     | E  | wt    |
|-------|-------|----|-------|----|-------|
| 0.362 | 0.276 | -- | 0.720 | -- | grams |
| 9.20  | 7.00  | -- | 18.30 | -- | 5.0   |



BULKHEAD

# Adapter

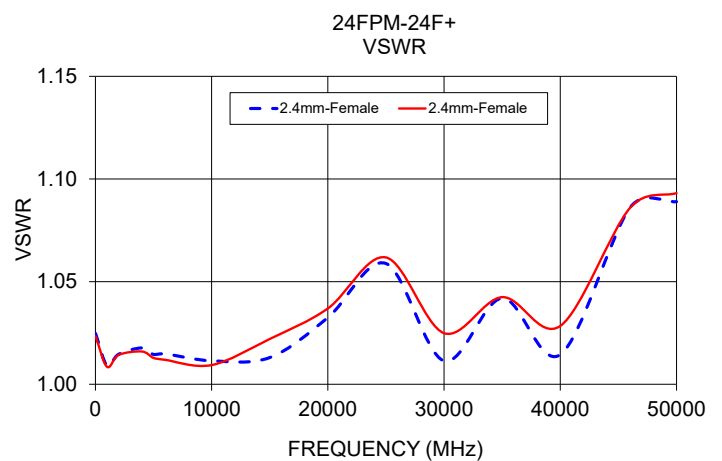
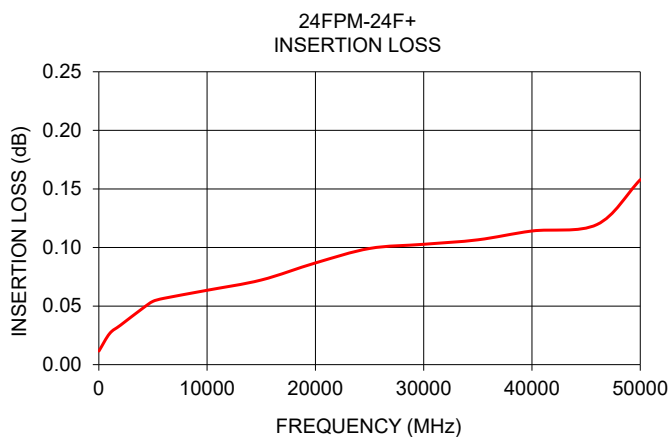
24FPM-24F+

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50Ω DC to 50 GHz 2.4 mm-Female to 2.4 mm-Female

## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | VSWR<br>(:1)  |             |
|--------------------|------------------------|---------------|-------------|
|                    |                        | 2.4 mm-Female | 2.4 mm-Male |
| 10                 | 0.01                   | 1.02          | 1.02        |
| 100                | 0.01                   | 1.00          | 1.00        |
| 500                | 0.02                   | 1.01          | 1.01        |
| 2000               | 0.03                   | 1.01          | 1.01        |
| 4000               | 0.05                   | 1.02          | 1.02        |
| 6000               | 0.06                   | 1.01          | 1.01        |
| 10000              | 0.06                   | 1.01          | 1.01        |
| 15000              | 0.07                   | 1.01          | 1.02        |
| 20000              | 0.09                   | 1.03          | 1.04        |
| 25000              | 0.10                   | 1.06          | 1.06        |
| 30000              | 0.10                   | 1.01          | 1.02        |
| 35000              | 0.11                   | 1.04          | 1.04        |
| 40000              | 0.11                   | 1.01          | 1.03        |
| 46000              | 0.12                   | 1.09          | 1.09        |
| 50000              | 0.16                   | 1.09          | 1.09        |



### NOTES

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



## Typical Performance Data

| FREQ. | INSERTION LOSS |       |         | 2.4mm-Female 1<br>VSWR |       |         | 2.4mm-Female 2<br>VSWR |       |         |
|-------|----------------|-------|---------|------------------------|-------|---------|------------------------|-------|---------|
| (MHz) | (dB)           |       |         | (:1)                   |       |         | (:1)                   |       |         |
|       | @-55°C         | @25°C | @+100°C | @-55°C                 | @25°C | @+100°C | @-55°C                 | @25°C | @+100°C |
| 10    | 0.01           | 0.01  | 0.01    | 1.02                   | 1.02  | 1.02    | 1.02                   | 1.02  | 1.02    |
| 100   | 0.01           | 0.01  | 0.01    | 1.00                   | 1.00  | 1.00    | 1.00                   | 1.00  | 1.00    |
| 500   | 0.02           | 0.02  | 0.02    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.01  | 1.01    |
| 1000  | 0.02           | 0.03  | 0.03    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.01  | 1.01    |
| 2000  | 0.03           | 0.03  | 0.03    | 1.01                   | 1.01  | 1.02    | 1.01                   | 1.01  | 1.02    |
| 3000  | 0.04           | 0.04  | 0.04    | 1.02                   | 1.02  | 1.02    | 1.02                   | 1.02  | 1.02    |
| 4000  | 0.05           | 0.05  | 0.05    | 1.02                   | 1.02  | 1.02    | 1.02                   | 1.02  | 1.02    |
| 5000  | 0.05           | 0.05  | 0.05    | 1.01                   | 1.01  | 1.02    | 1.01                   | 1.01  | 1.01    |
| 6000  | 0.05           | 0.06  | 0.06    | 1.01                   | 1.01  | 1.02    | 1.01                   | 1.01  | 1.01    |
| 7000  | 0.06           | 0.06  | 0.06    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.01  | 1.01    |
| 8000  | 0.06           | 0.06  | 0.06    | 1.00                   | 1.00  | 1.00    | 1.01                   | 1.00  | 1.00    |
| 9000  | 0.06           | 0.06  | 0.06    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.01  | 1.00    |
| 10000 | 0.06           | 0.06  | 0.06    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.01  | 1.01    |
| 11000 | 0.07           | 0.07  | 0.07    | 1.01                   | 1.01  | 1.01    | 1.01                   | 1.02  | 1.01    |
| 12000 | 0.07           | 0.07  | 0.07    | 1.02                   | 1.02  | 1.02    | 1.01                   | 1.02  | 1.02    |
| 13000 | 0.07           | 0.07  | 0.07    | 1.02                   | 1.02  | 1.02    | 1.02                   | 1.02  | 1.02    |
| 14000 | 0.07           | 0.07  | 0.07    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.02  | 1.02    |
| 15000 | 0.07           | 0.07  | 0.07    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.02  | 1.02    |
| 16000 | 0.07           | 0.07  | 0.07    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.02  | 1.02    |
| 17000 | 0.07           | 0.08  | 0.07    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.02  | 1.02    |
| 18000 | 0.08           | 0.08  | 0.08    | 1.03                   | 1.02  | 1.02    | 1.02                   | 1.03  | 1.03    |
| 19000 | 0.08           | 0.08  | 0.08    | 1.03                   | 1.02  | 1.03    | 1.02                   | 1.03  | 1.03    |
| 20000 | 0.08           | 0.09  | 0.08    | 1.04                   | 1.03  | 1.04    | 1.03                   | 1.04  | 1.04    |
| 21000 | 0.08           | 0.09  | 0.09    | 1.05                   | 1.04  | 1.05    | 1.04                   | 1.05  | 1.05    |
| 22000 | 0.08           | 0.09  | 0.09    | 1.05                   | 1.05  | 1.05    | 1.05                   | 1.05  | 1.06    |
| 23000 | 0.09           | 0.09  | 0.09    | 1.05                   | 1.05  | 1.06    | 1.05                   | 1.06  | 1.06    |
| 24000 | 0.09           | 0.10  | 0.10    | 1.06                   | 1.06  | 1.06    | 1.06                   | 1.06  | 1.06    |
| 25000 | 0.09           | 0.10  | 0.10    | 1.06                   | 1.06  | 1.06    | 1.06                   | 1.06  | 1.06    |
| 26000 | 0.09           | 0.10  | 0.09    | 1.06                   | 1.06  | 1.06    | 1.06                   | 1.06  | 1.06    |
| 27000 | 0.09           | 0.10  | 0.09    | 1.06                   | 1.05  | 1.05    | 1.05                   | 1.05  | 1.05    |
| 28000 | 0.09           | 0.10  | 0.10    | 1.05                   | 1.04  | 1.04    | 1.04                   | 1.04  | 1.04    |
| 29000 | 0.09           | 0.10  | 0.09    | 1.04                   | 1.02  | 1.03    | 1.03                   | 1.03  | 1.03    |
| 30000 | 0.09           | 0.10  | 0.10    | 1.03                   | 1.01  | 1.01    | 1.02                   | 1.02  | 1.02    |
| 31000 | 0.10           | 0.11  | 0.10    | 1.02                   | 1.01  | 1.00    | 1.00                   | 1.02  | 1.02    |
| 32000 | 0.09           | 0.10  | 0.10    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.03  | 1.02    |
| 33000 | 0.10           | 0.11  | 0.10    | 1.03                   | 1.03  | 1.02    | 1.03                   | 1.03  | 1.03    |
| 34000 | 0.10           | 0.11  | 0.10    | 1.04                   | 1.04  | 1.04    | 1.04                   | 1.04  | 1.04    |
| 35000 | 0.10           | 0.11  | 0.10    | 1.04                   | 1.04  | 1.04    | 1.04                   | 1.04  | 1.04    |
| 36000 | 0.10           | 0.11  | 0.10    | 1.04                   | 1.04  | 1.04    | 1.04                   | 1.04  | 1.04    |
| 37000 | 0.10           | 0.11  | 0.10    | 1.04                   | 1.04  | 1.04    | 1.04                   | 1.04  | 1.04    |
| 38000 | 0.10           | 0.11  | 0.11    | 1.03                   | 1.04  | 1.03    | 1.04                   | 1.03  | 1.03    |
| 39000 | 0.09           | 0.11  | 0.10    | 1.03                   | 1.03  | 1.02    | 1.02                   | 1.03  | 1.03    |
| 40000 | 0.10           | 0.11  | 0.11    | 1.02                   | 1.01  | 1.01    | 1.01                   | 1.03  | 1.03    |
| 42000 | 0.10           | 0.11  | 0.11    | 1.03                   | 1.02  | 1.03    | 1.02                   | 1.03  | 1.03    |
| 44000 | 0.11           | 0.13  | 0.12    | 1.05                   | 1.05  | 1.05    | 1.04                   | 1.05  | 1.05    |
| 46000 | 0.10           | 0.12  | 0.11    | 1.09                   | 1.09  | 1.08    | 1.08                   | 1.09  | 1.09    |
| 48000 | 0.10           | 0.12  | 0.11    | 1.09                   | 1.08  | 1.08    | 1.08                   | 1.09  | 1.08    |
| 49000 | 0.12           | 0.14  | 0.12    | 1.09                   | 1.08  | 1.07    | 1.09                   | 1.09  | 1.08    |
| 50000 | 0.14           | 0.16  | 0.14    | 1.10                   | 1.09  | 1.09    | 1.09                   | 1.09  | 1.08    |



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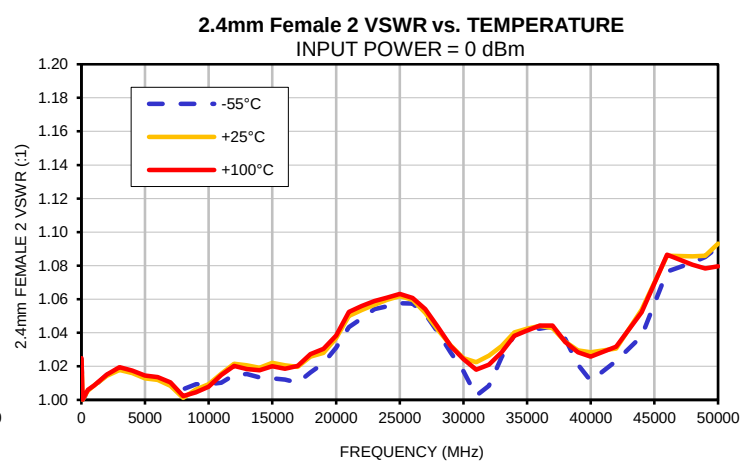
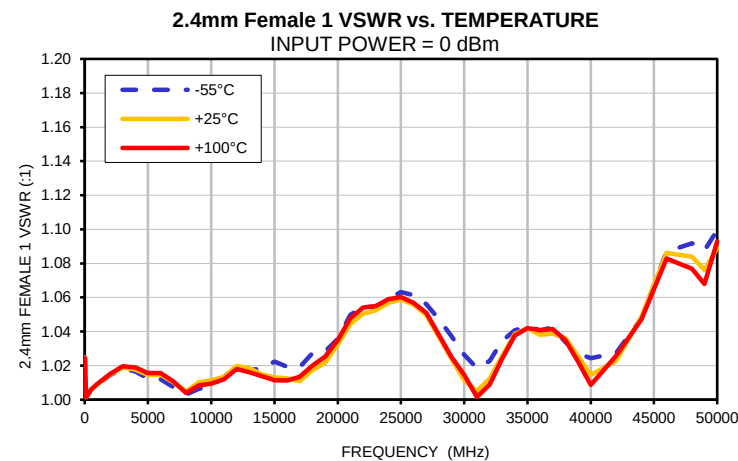
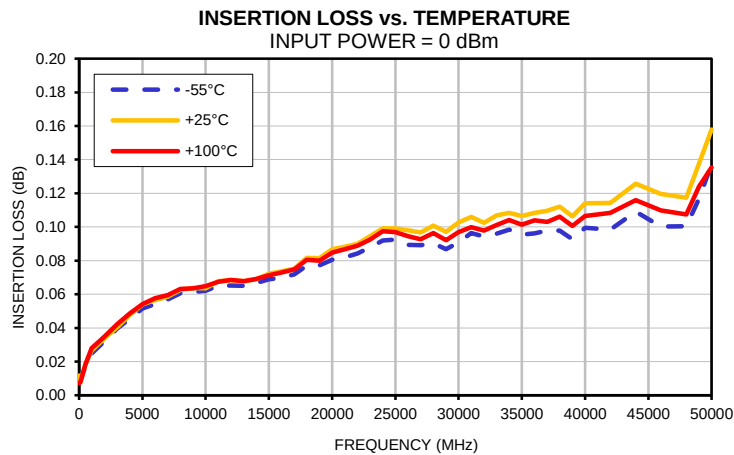


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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. OR  
24FPM-24F+  
1/30/2020  
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Typical Performance Curves

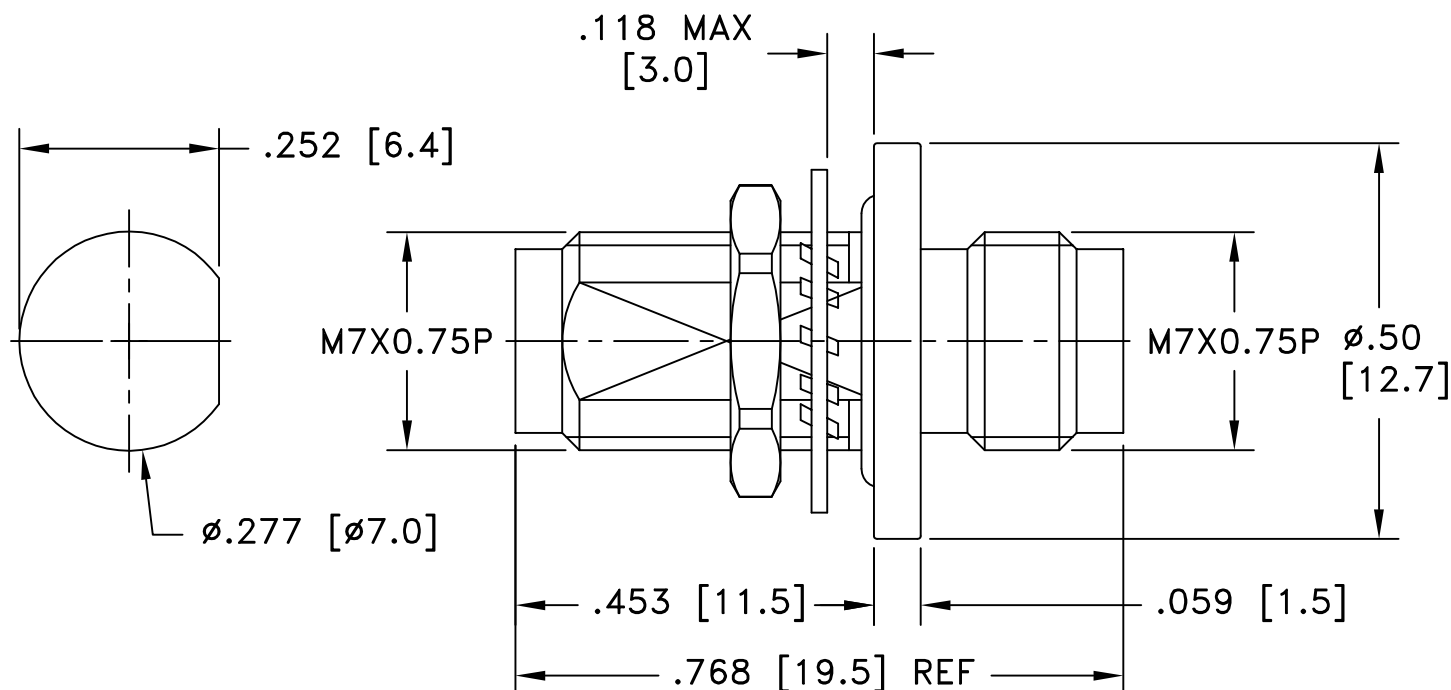


# Case Style

## Outline Dimensions

# DJ

## DJ3008



Weight: 4.8 grams

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm$  .03; 3 Pl.  $\pm$  .015

### Notes:

1. Case material: Stainless Steel.
2. Finish: Passivation.

**Mini-Circuits®**  
ISO 9001 ISO 14001 CERTIFIED

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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification         | Test/Inspection Condition                              | Reference/Spec                                                      |
|-----------------------|--------------------------------------------------------|---------------------------------------------------------------------|
| Operating Temperature | -55° to 100° C or -55° to 85° C<br>Ambient Environment | Individual Model Data Sheet                                         |
| Storage Temperature   | -55° to 100° C<br>Ambient Environment                  | Individual Model Data Sheet                                         |
| Thermal Shock         | -55° to 100°C, 5 cycles                                | MIL-STD-202, Method 107, conditionB-3,except over -<br>55° to 100°C |
| Connector Durability  | 500 mating/unmating cycles                             | MIL-PRF-39012E, PARAGRAPH 4.6.12                                    |