SUSPENDED SUBSTRATE STRIPLINE COAXIAL

# High Pass Filter

# ZHSS-V29G+

50Ω 29 to 50 GHz 2.4mm Female

## KEY FEATURES

- Insertion Loss, 1 dB Typ.
- High Rejection, 80 dB Typ.
- Wide Passband up to 50 GHz

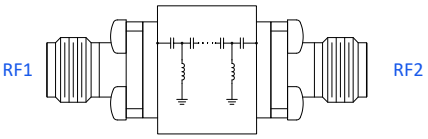


*Generic photo used for illustration purposes only*

## APPLICATIONS

- 5G Applications
- Cellular Backhaul
- Elint

## FUNCTIONAL DIAGRAM




## PRODUCT OVERVIEW

Mini-Circuits' Suspended Substrate Stripline filters offer low insertion loss combined with wide stopband, good power handling & temperature stability, small form factor with rugged build ideal for harsh operating environments making them an excellent choice for wideband instruments and systems like ECM, ECCM, ELINT and ultrabroadband receivers. Low pass, high pass, band pass, diplexer and multiplexer designs can be realized with this technology with passband, stopband up to 50GHz and stopband width greater than 6x cutoff frequency.

## ELECTRICAL SPECIFICATIONS AT +25°C

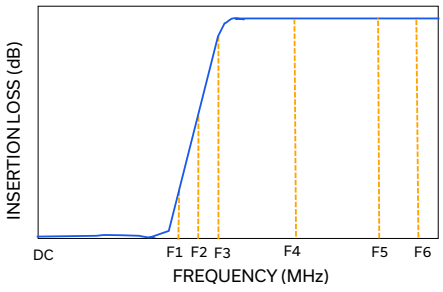
| Parameter | | F# | Frequency (GHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|
| Passband | Insertion Loss | F4-F5 | 29 - 48 | — | 1 | 2 | dB |
| | | F5-F6 | 48 - 50 | — | 1.5 | — | |
| | Return Loss | F4-F6 | 29 - 50 | — | 9.5 | — | dB |
| Stopband | Rejection | DC-F1 | DC - 18.5 | 60 | 80 | — | dB |
| | | F1-F2 | 18.5 - 21 | 40 | 60 | — | |
| | | F2-F3 | 21 - 22.5 | 20 | 40 | — | |

## ABSOLUTE MAXIMUM RATINGS[1]

| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +100°C |
| Input Power[2] | 1 W @ 25°C |

1. Permanent damage may occur if any of these limits are exceeded.
2. Power rating applies only to signals within the passband.

## TYPICAL FREQUENCY RESPONSE



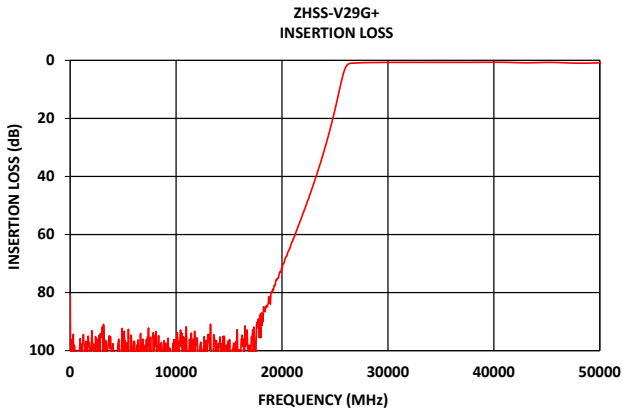

REV. OR
ECO-031162
EDU5276
ZHSS-V29G+
MCINU
260909

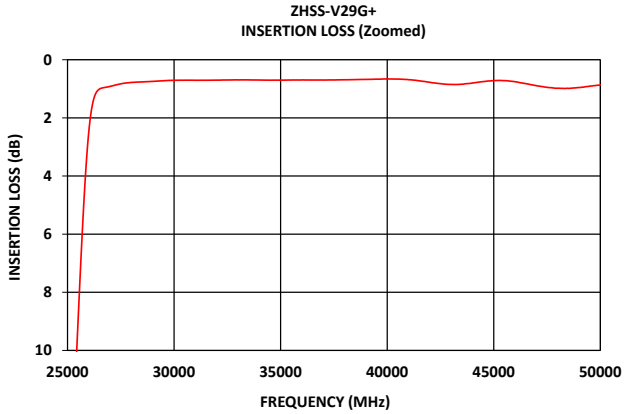
# High Pass Filter

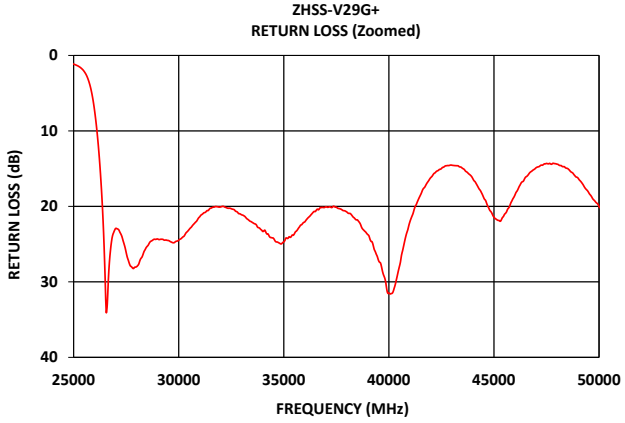
# ZHSS-V29G+

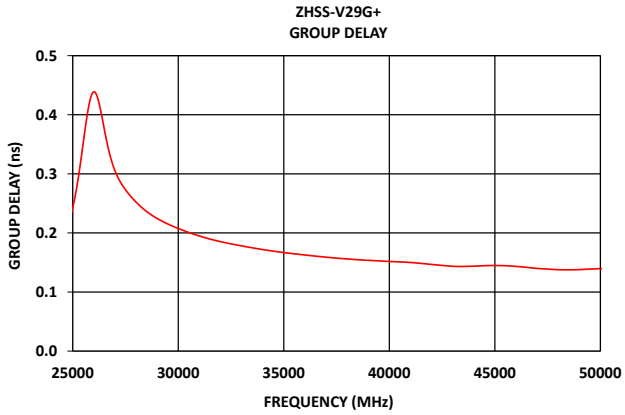
50Ω 29 to 50 GHz 2.4mm Female

## TYPICAL PERFORMANCE GRAPHS AT +25°C



# High Pass Filter

# ZHSS-V29G+

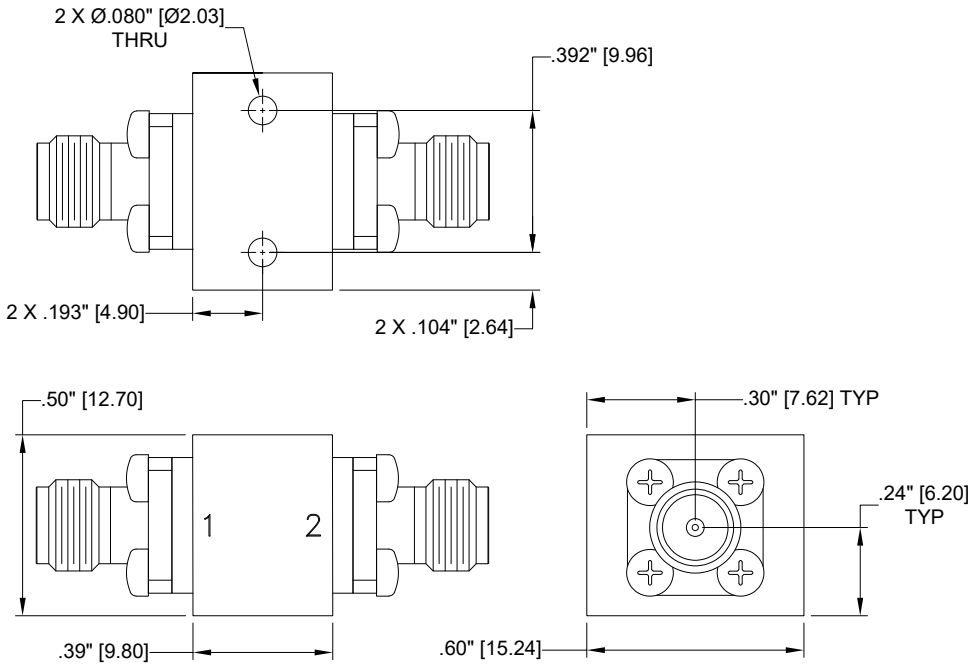
50Ω 29 to 50 GHz 2.4mm Female

## CONNECTOR DESCRIPTION

| Function | Connector |
|---|---|
| RF1[3] | 2.4mm Female |
| RF2[3] | 2.4mm Female |

3. This filter is bi-directional, RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

## CASE STYLE DRAWING




Unit Weight: 25 Grams.
Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.06[1.5]; 3 Pl. ± 0.015[0.38]

## PRODUCT MARKING*: ZHSS-V29G+

*Marking may contain other features or characters for internal lot control.

# High Pass Filter

## ZHSS-V29G+

50Ω 29 to 50 GHz 2.4mm Female

**ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD** CLICK HERE

| | |
|---|---|
| **Performance Data & Graphs** | Data<br>Graphs<br>S-Parameter (S2P Files) Data Set (.zip file) |
| **Case Style** | BCK3906 |
| **RoHS Status** | Compliant |
| **Environmental Ratings** | ENV001 |

NOTES

A. 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.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
C. 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

Suspended substrate stripline

# Coaxial High Pass Filter ZHSS-V29G+

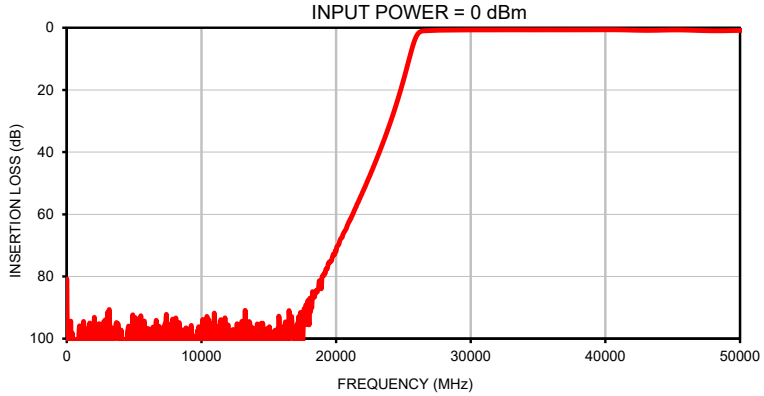
*Typical Performance Data*

| FREQ. | Insertion Loss | Input Return Loss | Output Return Loss |
|---|---|---|---|
| (MHz) | (dB) | (dB) | (dB) |
| 10 | 80.81 | 0.00 | 0.00 |
| 20 | 89.14 | 0.00 | 0.00 |
| 40 | 106.78 | 0.00 | 0.00 |
| 100 | 118.73 | 0.00 | 0.00 |
| 150 | 120.71 | 0.00 | 0.00 |
| 200 | 96.59 | 0.00 | 0.00 |
| 250 | 101.17 | 0.00 | 0.00 |
| 400 | 98.13 | 0.00 | 0.00 |
| 500 | 107.64 | 0.00 | 0.00 |
| 800 | 102.08 | 0.00 | 0.00 |
| 900 | 99.17 | 0.00 | 0.00 |
| 1000 | 103.16 | 0.00 | 0.00 |
| 1500 | 96.86 | 0.00 | 0.00 |
| 2000 | 99.23 | 0.00 | 0.00 |
| 2500 | 95.88 | 0.00 | 0.01 |
| 3000 | 94.57 | 0.01 | 0.01 |
| 3500 | 102.06 | 0.02 | 0.02 |
| 4000 | 100.63 | 0.03 | 0.03 |
| 4500 | 98.41 | 0.05 | 0.05 |
| 5000 | 98.38 | 0.06 | 0.07 |
| 5500 | 92.63 | 0.08 | 0.09 |
| 10000 | 108.35 | 0.34 | 0.33 |
| 14000 | 97.55 | 0.60 | 0.59 |
| 16000 | 100.18 | 0.63 | 0.64 |
| 18500 | 84.64 | 0.36 | 0.43 |
| 20000 | 71.93 | 0.12 | 0.17 |
| 21000 | 62.19 | 0.04 | 0.04 |
| 22500 | 47.66 | 0.16 | 0.07 |
| 23000 | 42.38 | 0.27 | 0.16 |
| 23500 | 36.81 | 0.42 | 0.29 |
| 24000 | 30.83 | 0.59 | 0.47 |
| 24750 | 20.73 | 0.97 | 0.88 |
| 25900 | 3.35 | 5.55 | 5.66 |
| 27000 | 0.92 | 22.91 | 21.36 |
| 29000 | 0.75 | 24.32 | 25.56 |
| 30000 | 0.71 | 24.48 | 21.36 |
| 31000 | 0.71 | 21.38 | 19.05 |
| 32000 | 0.70 | 20.07 | 21.35 |
| 33000 | 0.69 | 21.12 | 26.55 |
| 34000 | 0.70 | 23.33 | 26.78 |
| 35000 | 0.70 | 24.70 | 25.66 |
| 36000 | 0.70 | 22.05 | 24.94 |
| 36500 | 0.70 | 20.69 | 24.23 |
| 37000 | 0.70 | 20.04 | 23.72 |
| 40000 | 0.66 | 31.45 | 30.73 |
| 41000 | 0.69 | 22.04 | 23.02 |
| 41500 | 0.72 | 18.51 | 19.27 |
| 42000 | 0.78 | 16.16 | 16.87 |
| 42100 | 0.79 | 15.81 | 16.44 |
| 43000 | 0.85 | 14.55 | 14.88 |
| 43700 | 0.83 | 15.42 | 15.34 |
| 45000 | 0.72 | 21.43 | 17.96 |
| 45500 | 0.72 | 21.06 | 17.98 |
| 46000 | 0.76 | 18.48 | 17.00 |
| 46500 | 0.82 | 16.14 | 16.00 |
| 47000 | 0.89 | 14.89 | 15.51 |
| 47500 | 0.95 | 14.31 | 15.48 |
| 48000 | 0.98 | 14.40 | 15.90 |
| 49000 | 0.96 | 16.25 | 16.94 |
| 50000 | 0.87 | 20.02 | 16.00 |

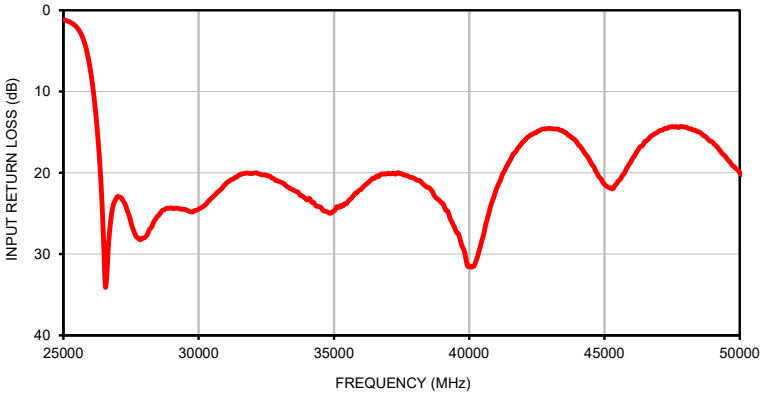
| FREQ. | Group Delay |
|---|---|
| (MHz) | (ns) |
| 29000 | 0.22 |
| 29100 | 0.22 |
| 29200 | 0.22 |
| 29300 | 0.22 |
| 29400 | 0.22 |
| 29500 | 0.22 |
| 29600 | 0.21 |
| 29700 | 0.21 |
| 30000 | 0.21 |
| 30100 | 0.21 |
| 30200 | 0.20 |
| 30400 | 0.20 |
| 30600 | 0.20 |
| 30800 | 0.20 |
| 31000 | 0.19 |
| 31200 | 0.19 |
| 31400 | 0.19 |
| 31600 | 0.19 |
| 31800 | 0.19 |
| 32000 | 0.19 |
| 32200 | 0.18 |
| 32400 | 0.18 |
| 32600 | 0.18 |
| 32800 | 0.18 |
| 33000 | 0.18 |
| 34000 | 0.17 |
| 34500 | 0.17 |
| 35000 | 0.17 |
| 35500 | 0.16 |
| 36000 | 0.16 |
| 36500 | 0.16 |
| 37000 | 0.16 |
| 37500 | 0.16 |
| 38000 | 0.16 |
| 38500 | 0.15 |
| 39000 | 0.15 |
| 39500 | 0.15 |
| 40000 | 0.15 |
| 40500 | 0.15 |
| 41000 | 0.15 |
| 41500 | 0.15 |
| 42000 | 0.15 |
| 42500 | 0.15 |
| 43000 | 0.14 |
| 43500 | 0.14 |
| 44000 | 0.14 |
| 44500 | 0.14 |
| 45000 | 0.14 |
| 45500 | 0.14 |
| 45800 | 0.14 |
| 46000 | 0.14 |
| 46200 | 0.14 |
| 46400 | 0.14 |
| 46600 | 0.14 |
| 46800 | 0.14 |
| 47000 | 0.14 |
| 47500 | 0.14 |
| 48000 | 0.14 |
| 49000 | 0.14 |
| 50000 | 0.14 |

*Typical Performance Curves*

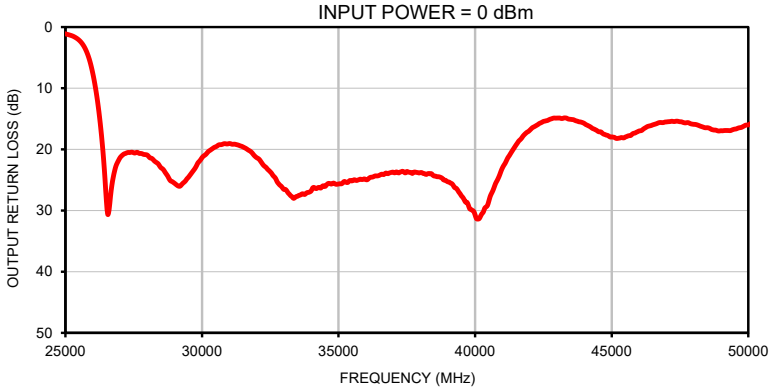
**INSERTION LOSS**
INPUT POWER = 0 dBm



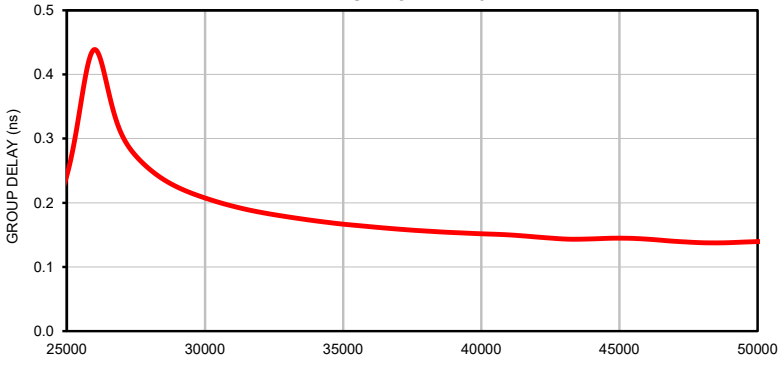

**INPUT RETURN LOSS**
INPUT POWER = 0 dBm




**OUTPUT RETURN LOSS**
INPUT POWER = 0 dBm

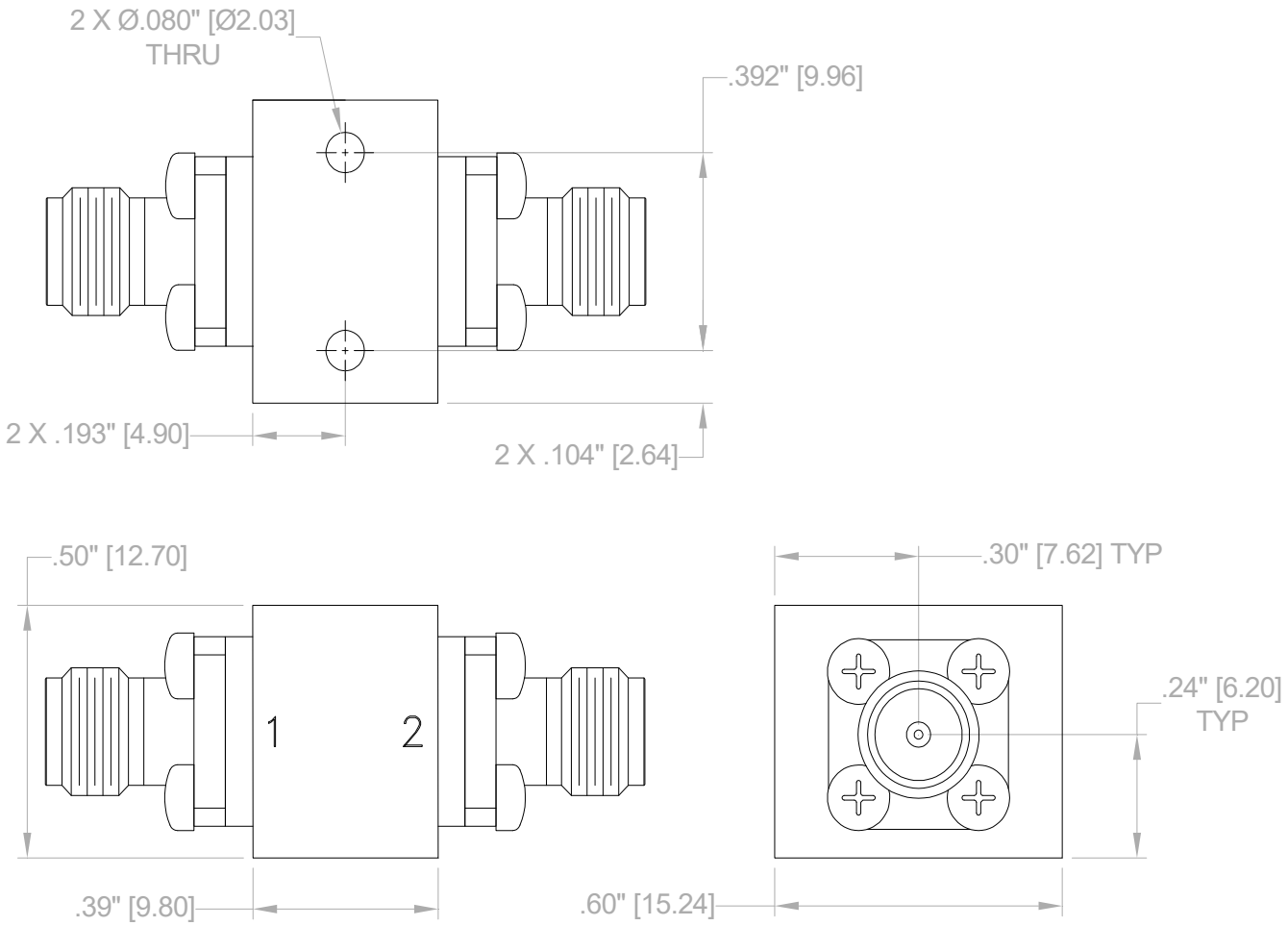



**GROUP DELAY**
INPUT POWER = 0 dBm



# Case Style BCK

## Outline Dimensions BCK3906




**Dimensions are in inches [mm]. Tolerances: 2 Pl. ± 0.06 [1.5]; 3 Pl. ± 0.015 [0.38].**

**Notes:**

1. Case material: Brass.
2. Case Finish: Powder coating.
3. Unit Weight: 25 grams.
4. Refer to the individual model data sheet for the type of connectors available.


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# Environmental Specifications ENV001

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 | -40° to 85° C<br>Ambient Temperature | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |


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