

DATA SHEET

# SKYFR-001709: 3600 to 3800 MHz Single-Junction Robust Lead Circulator

## Applications

- Wireless infrastructure
- Power amplifiers

## Features

- Small surface-mount package
- Operating frequency range: 3600 MHz to 3800 MHz
- BeO free
- RoHS compliant
- Parts delivered on tape and reel



Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.

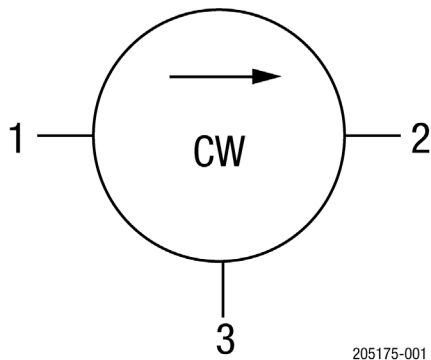
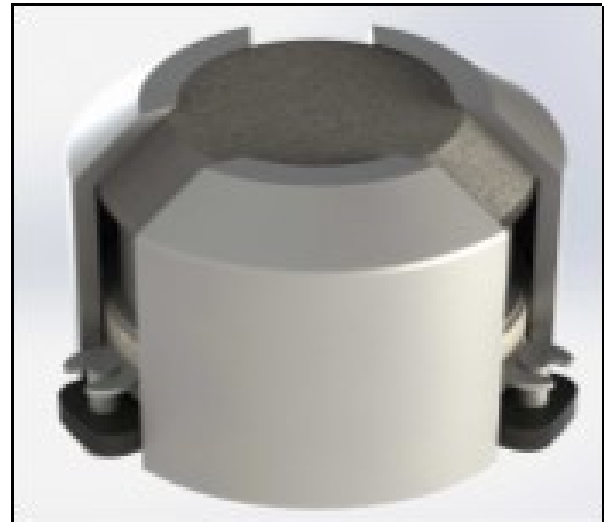


Figure 1. SKYFR-001709 Block Diagram

## Description

The SKYFR-001709 is a single-junction, surface-mount circulator designed for wireless infrastructure and power-amplifier applications. It operates over the frequency range of 3600 MHz to 3800 MHz with an operating temperature range of -40 °C to +105 °C.

The SKYFR-001709 comes in an industry-standard surface-mount package and is designed for automated SMT placement.

A block diagram of the SKYFR-001709 is shown in Figure 1.

For tape and reel information, refer to the *Tape and Reel Guidelines for Isolators and Circulators* Application Note.

## Electrical and Mechanical Specifications

The absolute maximum ratings of the SKYFR-001709 are provided in Table 1. Electrical specifications are provided in Table 2.

Plating information is shown in Table 3. Figure 2 shows the package dimensions and PCB footprint information.

**Table 1. SKYFR-001709 Absolute Maximum Ratings<sup>1</sup>**

Parameter	Symbol	Minimum	Maximum	Units
Average power (forward and reverse)	P <sub>AVG</sub>		20	W
Peak power	P <sub>PK</sub>		160	W
Operating temperature	T <sub>OP</sub>	-40	+105	°C
Storage temperature	T <sub>STOR</sub>	-65	+155	°C

<sup>1</sup> Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

**Table 2. SKYFR-001709 Electrical Specifications<sup>1,2</sup>**

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Frequency range	f		3600		3800	MHz
Impedance				50		Ω
Input impedance, real		@ 3600 MHz	46	52	55	Ω
Input impedance, imaginary		@ 3600 MHz	-6j		3j	jΩ
Input impedance, real		@ 3700 MHz	46	49.5	54	Ω
Input impedance, imaginary		@ 3700 MHz	-4.5j		3j	jΩ
Input impedance, real		@ 3800 MHz	46	48	54	Ω
Input impedance, imaginary		@ 3800 MHz	-2j		5.5j	jΩ
Insertion loss	IL	25 °C			0.19	dB
Insertion loss	IL	-40 °C to +105 °C			0.23	dB
Isolation	ISO		21			dB
Isolation	ISO	3400 MHz to 4000 MHz	16			dB
Return loss	RL		22			dB
Intermodulation distortion <sup>3</sup>	IMD	2 x 5 W CW tones, 5 MHz spacing	60			dBc
Group delay					2.0	ns
2nd harmonic			10			dBc
3rd harmonic			5			dBc
Out-of-band resonance point		Resonance point away 3400 MHz to 4000 MHz	3400		4000	MHz

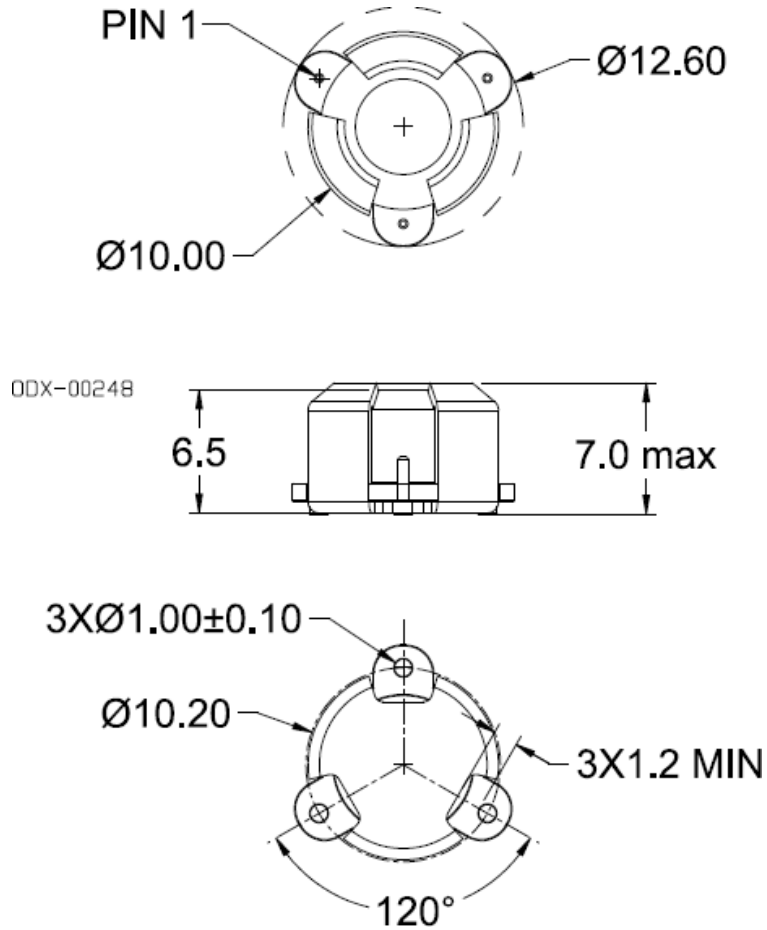
<sup>1</sup> Performance is guaranteed under the conditions listed in this table and over the operating temperature range.

<sup>2</sup> Performance will not degrade by > 10% (Insertion loss > 20%) with an operating temperature of up to 130 °C.

<sup>3</sup> See Skyworks Application Note, *Intermodulation Distortion Measurements of Ferrites*, document number 201537 for further details.

**Table 3. SKYFR-001709 Plating Specification**

Section	Base Material	Plating
Pins	Brass	Silver
Housing	Steel	Silver



**Notes:**

1. All dimensions in millimeters.
2. Tolerance:  $\pm 0.2 \text{ mm}$  unless otherwise specified.
3. Coplanarity specification:  $0.1 \text{ mm}$  maximum.
4. Model number, lot code, and port designation are printed on the top side of device.

**Figure 2. SKYFR-001709 Package Dimensions and PCB Footprint**

## Ordering Information

Part Number	Product Description	Evaluation Board Part Number
SKYFR-001709	3600 to 3800 MHz Single-Junction Robust Lead Circulator	TFX-00294-01/PCB-00263

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