

**DATA SHEET**

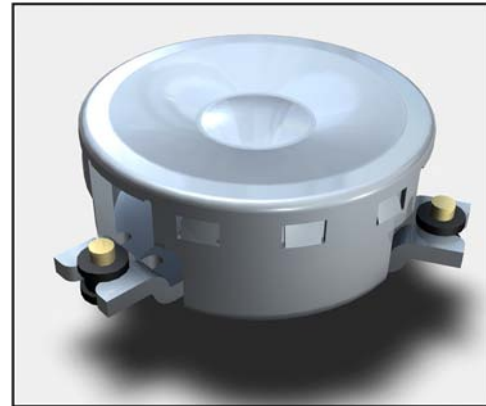
# MAFR-000653-000001: 2110-2170 MHz Single Junction Robust Lead Circulator

## Applications

- TD-LTE
- Wireless infrastructure

## Features

- BeO free
- Operating frequency range: 2110 MHz to 2170 MHz
- Insertion loss: 0.25 dB
- Isolation: 25 dB
- Return loss: 25 dB
- Small, surface mount package
- Shipped 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.

## Description

The MAFR-000653-000001 is a single-junction circulator designed for wireless infrastructure applications. It operates over the frequency range of 2110 MHz to 2170 MHz. Insertion loss is less than 0.25 dB over an operating temperature range of  $-40^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$ .

The MAFR-000653-000001 comes in an industry-standard surface mount package and is designed for automated SMT placement.

A block diagram of the MAFR-000653-000001 is shown in Figure 1. The absolute maximum ratings of the MAFR-000653-000001 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 recommended PCB footprint. Tape and reel dimensions are provided in Figure 3.

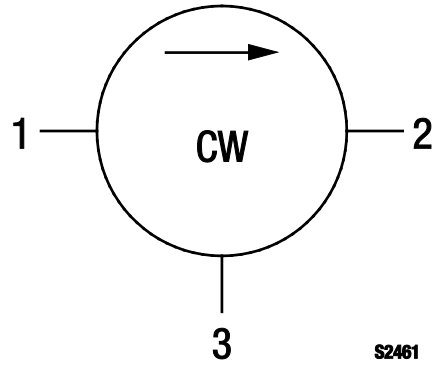


Figure 1. MAFR-000653-000001 Block Diagram

Table 1. MAFR-000653-000001 Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Average power	P <sub>AVR</sub>		140	W
Peak power	P <sub>PEAK</sub>		500	W
Operating temperature	T <sub>OP</sub>	-40	+90	°C
Storage temperature	T <sub>ST</sub>	-40	+125	°C

**Note:** 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. MAFR-000653-000001 Electrical Specifications (Note 1)  
(T<sub>OP</sub> = -40 °C to +90 °C)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Frequency range	f		2110		2170	MHz
Impedance				50		Ω
Insertion loss	IL			0.20	0.25	dB
Isolation	I <sub>SO</sub>		20	25		dB
Return loss	RL		20	25		dB
3 <sup>rd</sup> Order Intermodulation Distortion (Note 2)	IMD3	2 x 5 W CW tones, 5 MHz spacing		-76	-74	dBc

**Note 1:** Performance is guaranteed only under the conditions listed in this Table.

**Note 2:** See Skyworks Application Note, *Intermodulation Distortion Measurements of Ferrites*, document number 201537 for further details.

Table 3. MAFR-000653-000001 Plating

Section	Material	Plating
Leads	Bronze	Gold
Housing	Steel	Silver

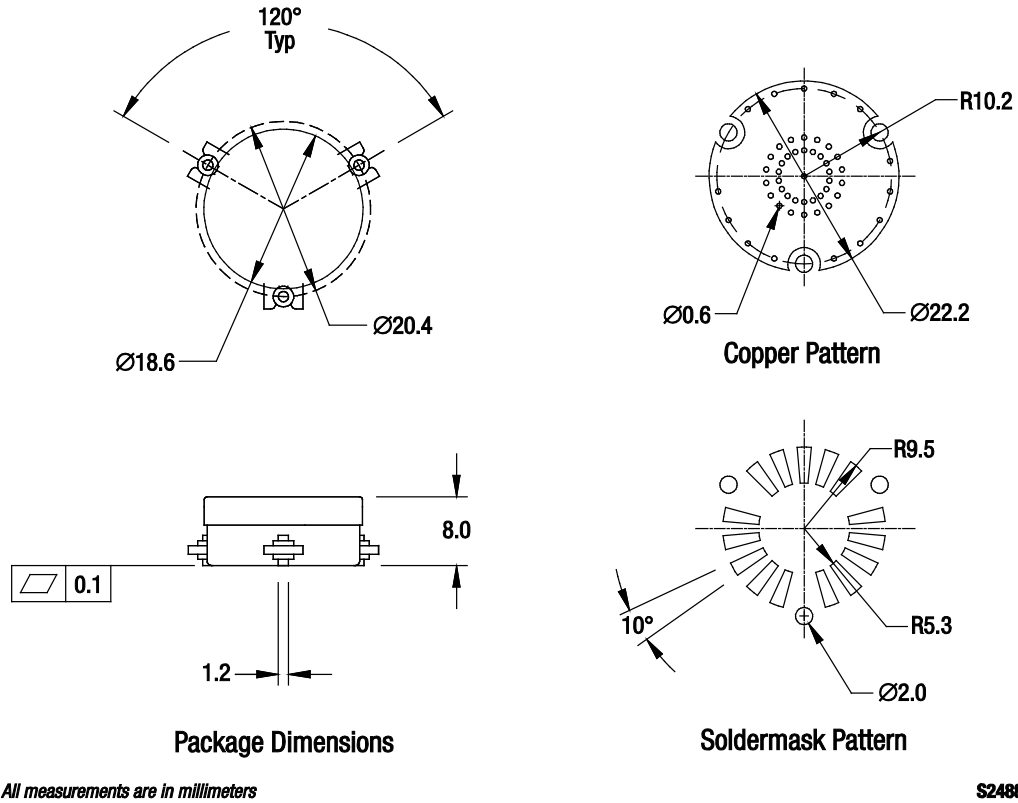
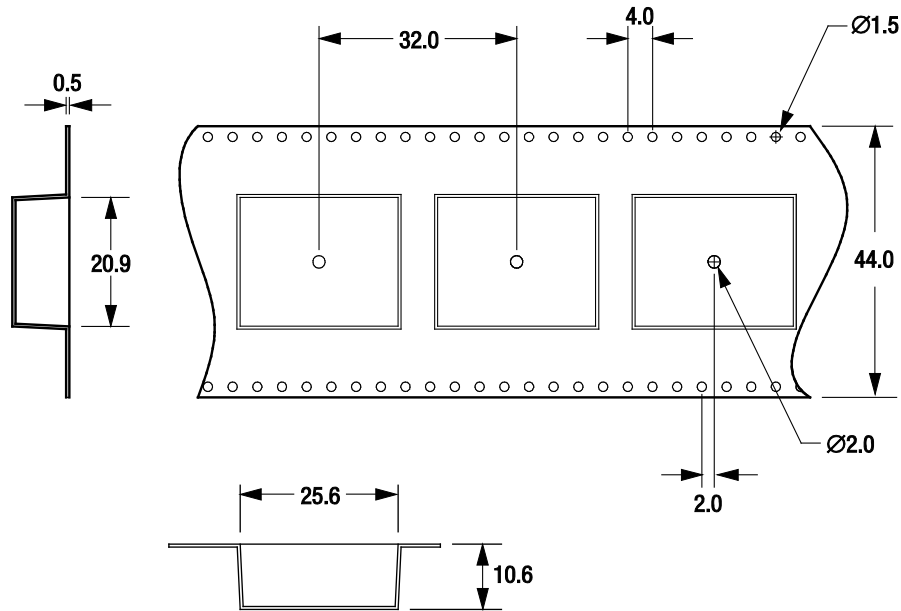


Figure 2. MAFR-000653-000001 Package Dimensions



- Notes:**
1. Carrier tape: black conductive polycarbonate or polystyrene.
  2. All measurements are in millimeters.

S2490

Figure 3. MAFR-000653-000001 Tape and Reel Dimensions

**Ordering Information**

Model Name	Manufacturing Part Number	Evaluation Board Part Number
MAFR-000653-000001 Single Junction Lead Circulator	MAFR-000653-000001	MAFX-000020-RL00FR

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