



## MMIC SURFACE MOUNT

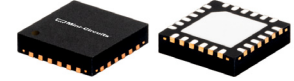
# Power Splitter/Combiner

## EP2K+

2 Way-0° 50Ω 5 to 20 GHz

### THE BIG DEAL

- Ultra-Wide bandwidth, 5 to 20 GHz
- High Power Handling, 2.5W as a splitter
- Low cost splitter for 5G Application
- Excellent amplitude unbalance, 0.1 dB typ.
- Good phase unbalance, 2 to 5° typ.
- High ESD level
- Small size, 4x4 mm
- Aqueous washable
- DC passing



Generic photo used for illustration purposes only

CASE STYLE: DG1847

#### +RoHS Compliant

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

### APPLICATIONS

- WIMAX
- ISM
- Instrumentation
- Radar
- WLAN
- Satellite communications
- LTE

### PRODUCT OVERVIEW

Mini-Circuits' EP2K+ is a MMIC splitter/combiner designed for wideband operation from 5 to 20 GHz. This model provides excellent power ratings in a tiny device package (4x4x1 mm), with up to 2.5W power handling (as a splitter) and up to 1.2A DC current handling. Manufactured using GaAs IPD technology, it provides a high level of ESD protection and excellent reliability.

### KEY FEATURES

Feature	Advantages
Wideband, 5 to 20 GHz	One power splitter can be used in many applications, saving component count. Also ideal for wideband applications such as military and instrumentation.
Excellent power handling 2.5W as a splitter at 25°C 1.7W internal dissipation as a combiner at 25°C	In power combiner applications, half the power is dissipated internally. EP2K+ is designed to handle 1.7W internal dissipation as a combiner allowing reliable operation without excessive temperature rise. Similar splitters implemented as Wilkinson splitters on PCB require big resistors and additional heat sinking. As a splitter, EP2K+ can handle up to 2.5W in a very small package.
DC Passing up to 1.2A	DC current passing is helpful in applications where both RF & DC need to pass through the DUT, such as antenna mounted hardware.
Small size 4 x 4mm QFN package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.





### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT 25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		20	GHz
Insertion Loss <sup>2</sup> above 3.0 dB	5 - 10	—	1.1	1.6	dB
	10 - 18	—	1.7	2.5	
	18 - 20	—	2.1	2.9	
Isolation	5 - 10	13	22	—	dB
	10 - 18	14	20	—	
	18 - 20	14	20	—	
Phase Unbalance	5 - 10	—	2.3	6.0	Degree
	10 - 18	—	3.7	8.0	
	18 - 20	—	4.2	9.0	
Amplitude Unbalance	5 - 10	—	0.1	0.3	dB
	10 - 18	—	0.1	0.5	
	18 - 20	—	0.1	0.5	
VSWR (Port S)	5 - 10	—	1.4	—	:1
	10 - 18	—	1.4	—	
	18 - 20	—	1.5	—	
VSWR (Port 1-2)	5 - 10	—	1.3	—	:1
	10 - 18	—	1.3	—	
	18 - 20	—	1.4	—	

1. Tested on Mini-Circuits Test Board TB-845-1+

2. Insertion Loss values are de-embedded from Test Board Loss; 0.5 dB at 5 GHz, 0.8 dB at 10 GHz, 1.3 dB at 18 GHz and 1.5 dB at 20 GHz

### MAXIMUM RATINGS

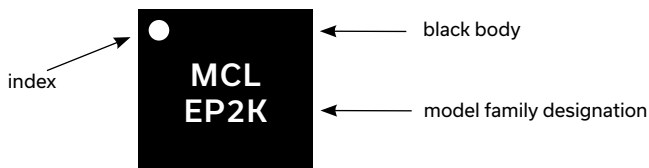
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Power Input (as a splitter)	2.5W max. at 25°C. Derate linearly to 1.25W at 85°C
Internal Dissipation	1.7W max. at 25°C. Derate linearly to 1.1W at 85°C
DC Current	1.2A max. at 25°C. Derate linearly to 0.6A at 85°C

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

### PAD CONNECTIONS

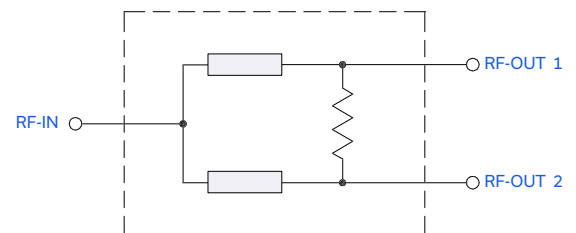
Function	Pad Number
SUM PORT	3
PORT 1	14
PORT 2	17
NOT USED, GROUND EXTERNALLY	1, 2, 4-13, 15-16, 18-24, Paddle

### PRODUCT MARKING



Marking may contain other features or characters for internal lot control

### SIMPLIFIED ELECTRICAL SCHEMATIC





ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

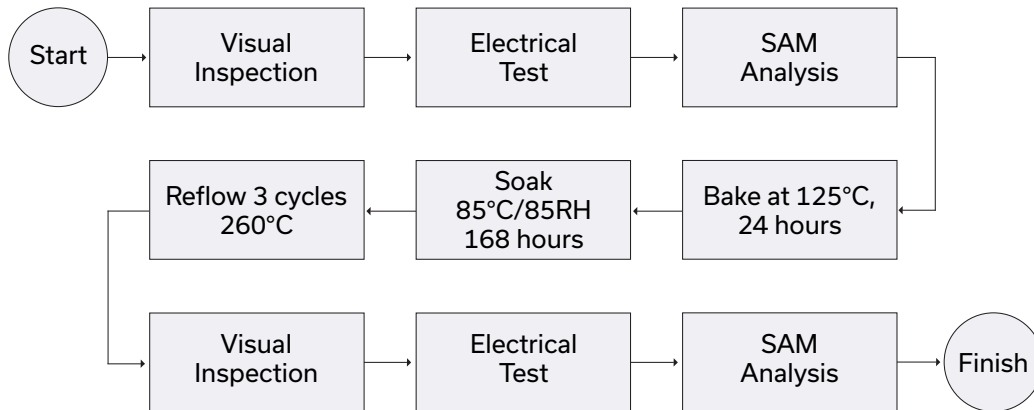
Performance Data	Data Table Swept Graphs S-Parameter (S3P Files) Data Set (.zip file)
Case Style	DG1847 Plastic package, exposed paddle; lead finish: Matte Tin
Tape & Reel Standard quantities available on reel	F68 7" reels with 20, 50, 100, 200, 500, 1000 devices 13" reels with 2000, 3000, 4000 devices
Suggested Layout for PCB Design	PL-472
Evaluation Board	TB-845-1+
Environmental Ratings	ENV82

### ESD RATING

Human Body Model (HBM): Class 2 (2000 to <4000 V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M3 (200 to <400 V) in accordance with ANSI/ESD STM 5.2 - 1999

### MSL TEST FLOW CHART



- 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-Circuit's 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)