



MMIC SURFACE MOUNT

# Power Splitter/Combiner

EP2K+

2 Way-0° 50Ω 5 to 20 GHz

Mini-Circuits

## THE BIG DEAL

- Ultra-Wide Bandwidth, 5 to 20 GHz
- High Power Handling, 2.5 W as a Splitter
- Low Cost Splitter for 5G Application
- Excellent Amplitude Unbalance, 0.1 dB Typ.
- Good Phase Unbalance, 2.3° to 4.2° 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 website for 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 2.5 W power handling (as a splitter) and up to 1.2 A 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 2.5 W as a Splitter at +25°C 1.7 W Internal Dissipation as a Combiner at +25°C	In power combiner applications, half the power is dissipated internally. EP2K+ is designed to handle 1.7 W 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 2.5 W in a very small package.
DC Passing Up to 1.2 A	DC current passing is helpful in applications where both RF & DC need to pass through the DUT, such as antenna mounted hardware.
Small Size, 4x4 mm QFN Package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

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ECO-012024  
EP2K+  
MCL NY  
250904



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## Power Splitter/Combiner

EP2K+

Mini-Circuits

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 10-18 18-20		1.1 1.7 2.1	1.6 2.5 2.9	dB
Isolation	5-10 10-18 18-20	13 14 14	22 20 20		dB
Phase Unbalance	5-10 10-18 18-20		2.3 3.7 4.2	6.0 8.0 9.0	Degree
Amplitude Unbalance	5-10 10-18 18-20		0.1 0.1 0.1	0.3 0.5 0.5	dB
VSWR (Port S)	5-10 10-18 18-20		1.4 1.4 1.5		:1
VSWR (Port 1-2)	5-10 10-18 18-20		1.3 1.3 1.4		:1

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

## ABSOLUTE MAXIMUM RATINGS

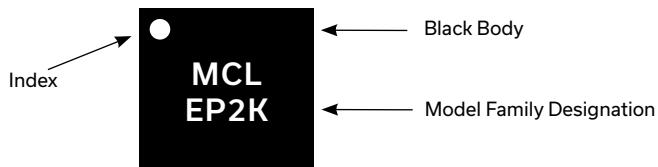
Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Power Input (as a Splitter)	2.5 W max. at +25°C Derate linearly to 1.25 W at +85°C
Internal Dissipation (as a Combiner)	1.7 W max. at +25°C Derate linearly to 1.1 W at +85°C
DC Current	1.2 A max. at +25°C Derate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

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

## PAD CONNECTIONS

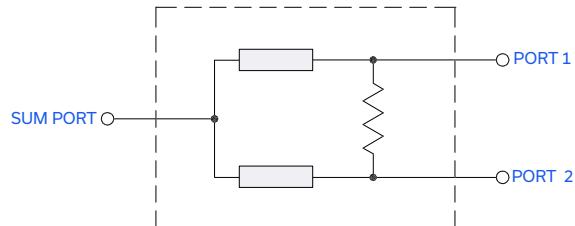
Function	Pad Number
SUM PORT	3
PORT 1	14
PORT 2	17
NOT USED, GROUND EXTERNALLY	1, 2, 4-13, 15-16, 18-24, Paddle

## PRODUCT MARKING



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

## SIMPLIFIED ELECTRICAL SCHEMATIC





ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. TO ACCESS

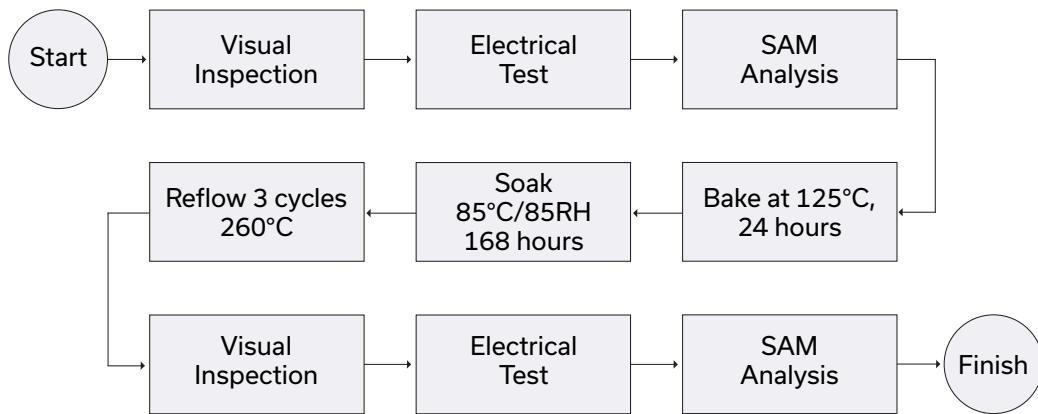
[CLICK HERE](#)

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	ENV08T1

**ESD RATING**

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

Machine Model (MM): Class M3 (200 V to &lt;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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)