

Surface Mount

# Dual Matched MMIC Amplifier

DC-2.2 GHz

## Product Features

- Two matched 50-ohm amplifiers in one package
- InGaP HBT IF and RF amplifier
- Frequency range DC to 2.2 GHz
- High gain, 20.5 dB typ. at 0.1 GHz
- Very good flatness response at 50-1000 MHz
- Up to +18 dBm typ. output power at 0.1 GHz
- High IP3, +35 dBm at 0.1 GHz
- Low noise figure, 3.5 dB typ.
- Low thermal resistance
- Transient protected
- Useable as balanced and push pull amplifier
- Protected by US Patent 6,943,629



## MERA-556+

CASE STYLE: DL1020  
PRICE: \$3.40 ea. QTY. (25)

**+ RoHS compliant in accordance with EU Directive (2002/95/EC)**

*The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.*

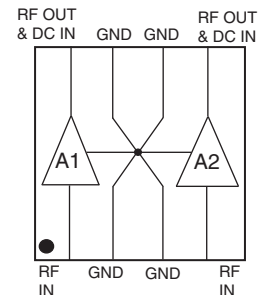
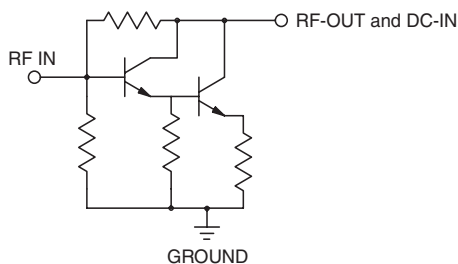
## Typical Applications

- Cellular
- CATV
- UHF/VHF communications
- Receivers & transmitters
- FTTH

## General Description

MERA-556+ is a dual matched wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in a 6.0 x 4.9 mm MCLP plastic package. MERA-556+ uses Darlington configuration and is fabricated using InGaP HBT technology. Expected MTBF at 85°C case temperature is 420 years for the entire device (A1 and A2).

## simplified schematic (each of A1, A2) and pin description



Function	Pin Number	Description
RF IN, A1	1	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN, A1	8	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit".
RF IN, A2	4	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN, A2	5	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit".
GND	2,3,6,7 & paddle	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

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ISO 9001 ISO 14001 AS 9100 CERTIFIED

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IF/RF MICROWAVE COMPONENTS

For detailed performance specs & shopping online see web site

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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).

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**Electrical Specifications at 25°C and 65mA, unless noted**

(Specifications (other than Matching) are for each of the two matched amplifiers in the package)

Parameter	Min.	Typ.	Max.	Units
Frequency Range*	DC		2.2	GHz
Gain				
	f=0.1 GHz	20.5		
	f=1 GHz	20.2		
	f=2 GHz	16	19	dB
	f=3 GHz		16.7	
	f=4 GHz		13	
Input Return Loss	f=DC to 2.2 GHz	21		dB
Output Return Loss	f=DC to 2.2 GHz	15.5		dB
Output Power @ 1 dB compression				
	f=0.1 GHz	18		
	f=1 GHz	16.5	17.6	dBm
	f=2 GHz		16.6	
Output IP3				
	f=0.1 GHz	35		
	f=0.5 GHz	35.5		dBm
	f=1 GHz	34		
Noise Figure	f=DC to 4 GHz	3.5		dB
Matching between A1, A2 <sup>2</sup>				
Amplitude Unbalance	f=DC to 2.2 GHz	0.1	0.3	dB
	f=2.2 to 4 GHz	0.1		
Phase Unbalance	f=DC to 2.2 GHz	0.6		deg.
	f=2.2 to 4 GHz	1.5		
Recommended Device Operating Current		65		mA
Device Operating Voltage	4.2	4.9	5.5	V
Device Voltage Variation vs. Temperature at 65 mA		-3.2		mV/°C
Device Voltage Variation vs. Current at 25°C		6.9		mV/mA
Thermal Resistance, junction-to-case <sup>1</sup> , A1 or A2		133		°C/W

\*Guaranteed specification DC-2.2 GHz. Low frequency cut off determined by external coupling capacitors.

**Absolute Maximum Ratings**

Parameter	Ratings
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
Operating Current	120mA
Power Dissipation	650mW
Input Power	13dBm

Note: Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.

<sup>1</sup>Case is defined as ground paddle. See application note AN-60-032 for adequate heat sinking of paddle.

<sup>2</sup>For test method, see application note AN-60-032.

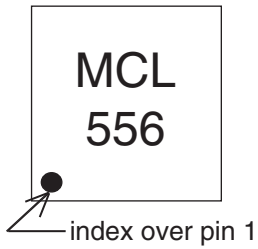


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**Product Marking**



**Additional Detailed Technical Information**

Additional information is available on our web site. To access this information enter the model number on our web site home page.

**Performance data, graphs, s-parameter data set (.zip file)**

**Case Style: DL1020**

Plastic package, exposed paddle, lead finish: tin/silver/nickel

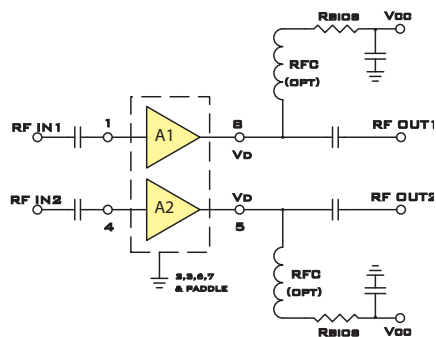
**Tape & Reel: F68**

**Suggested Layout for PCB Design: PL-164**

**Evaluation Board: TB-293+**

**Environmental Ratings: ENV08T2**

**Recommended Application Circuit**



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**ESD Rating**

Human Body Model (HBM): Class 1B (500 v to < 1000 v) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (< 100 v) in accordance with ESD STM 5.2-1999

**MSL Rating**

Moisture Sensitivity: MSL1 in accordance with IPC/JEDECJ-STD-020C

No.	Test Required	Condition	Standard	Quantity
1	Visual Inspection	Low Power Microscope Magnification 40x	MIP-IN-0003 (MCT spec)	114 units
2	Electrical Test	Room Temperature	SCD (MCL spec)	114 units
3	SAM Analysis	Less than 10% growth in term of delamination	J-Std-020C (Jedec Standard)	114 units
4	Moisture Sensitivity Level 1	Bake at 125°C for 24 hours Soak at 85°C/85%RH for 168 hours Reflow 3 cycles at 250°C peak	J-Std-020C (Jedec Standard)	114 units

**MSL Test Flow Chart**

