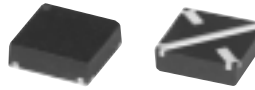


# MONOLITHIC AMPLIFIERS

50Ω

**BROADBAND** DC to 8 GHz

**NEW!**



LEE

low power, up to +10.9 dBm output

all specifications at 25°C

MODEL NO.	FREQ. GHz $f_c - f_u$	GAIN, dB Typical							MAXIMUM POWER (dBm)			DYNAMIC RANGE		VSWR (:1) Typ.				MAX. CURRENT RATING <sup>2</sup> I (mA)	DC OPERATING POWER <sup>3</sup> at Pin 3				THERMAL RESISTANCE <sup>4</sup> $\theta_{jc}$ Typ. °C/W	CASE STYLE Note B	CONNECTION	PRICE \$ Qty. (30)	
		over frequency, GHz							Output (1 dB Comp.) 2GHz $f_u$	Input (no dmg)	NF (dB) Typ.	IP3 (dBm) Typ.	DC-3		DC-3		Current (mA) Typ.		Device Volt. Max								
		0.1	1	2	4	5	8	10					Min.@ 2GHz	In GHz	Out GHz	3-f <sub>u</sub> **			3-f <sub>u</sub> **	Min	Max						
LEE-19	DC-8	12.1	12.0	12.1	12.0	11.6	10.6	9.0	9.6	10.2	11.3	15	6.5	24.5	1.5	1.2	1.4	1.8	55	40	3.6	3.2	4.0	322	FG873	cb	1.19
LEE-29	DC-8	15.5	15.4	15.4	14.9	14.1	12.5	10.6	13.3	10.9	11.3	15	5.5	25.5	1.4	1.3	1.3	1.6	55	40	3.6	3.2	4.0	334	FG873	cb	1.19
LEE-39	DC-8	21.9	21.4	20.8	18.3	16.6	13.5	10.5	18.5	10.4	11.3	13	4.5	23.4	1.3	1.4	1.3	1.6	55	35	3.5	3.1	3.9	321	FG873	cb	1.19

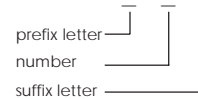
see suggested PCB layout PL-126 for LEE models

features

- frequency range, DC to 8 GHz useable to 10 GHz
- up to 17.3 dBm typ. output power
- excellent package for heat dissipation, exposed metal bottom
- flat output power to 10 GHz (LEE-19,-29,-39)

model identification

Model marking:  
 LEE-19 19  
 LEE-29 29  
 LEE-39 39  
 LEE-49 49  
 LEE-59 59  
<sup>1</sup>Prefix letter (optional) designates assembly location.  
 Suffix letters (optional) are for wafer identification.

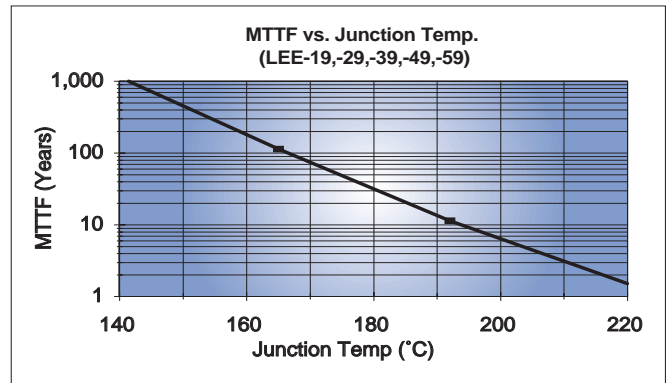


absolute maximum ratings

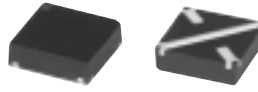
operating temperature: -45°C to 85°C  
 storage temperature: -65°C to 150°C

NOTES:

- ◆ Aqueous washable
- \*\*  $f_u$  is the upper frequency limit for each model as shown in the table.
- ⊕ Low frequency cutoff determined by external coupling capacitors.
- A. Environmental specifications and re-flow soldering information available in General Information Section.
- B. Units are non-hermetic unless otherwise noted. For details on case dimensions & finishes see "Case Styles & Outline Drawings".
- C. Prices and Specifications subject to change without notice.
- D. For Quality Control Procedures see Table of Contents, Section 0, "Mini-Circuits Guarantees Quality" article. For Environmental Specifications see Amplifier Selection Guide.
- 1. Model number designated by alphanumeric code marking.
- 2. Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.
- 3. Supply voltage must be connected to pin 3 through a bias connector in order to prevent damage. See "Biasing MMIC Amplifiers" in [Mini-circuits.com/application.html](http://Mini-circuits.com/application.html) Reliability predictions and normal operating conditions are applicable at current specified.
- 4. Thermal resistance  $\theta_{jc}$  is from hottest junction in device to mounting surface of leads.



## Surface Mount



LEE

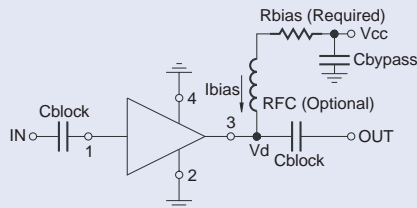
medium power, up to +17.3 dBm output

all specifications at 25°C

MODEL NO.	FREQ. GHz $f_l - f_u$	GAIN, dB Typical								MAXIMUM POWER (dBm)			DYNAMIC RANGE		VSWR (-1) Typ.				MAX. CURRENT RATING <sup>2</sup> I (mA)	DC OPERATING POWER <sup>3</sup> at Pin 3			THERMAL RESISTANCE <sup>4</sup> $\theta_{jc}$ Typ. °C/W	CASE STYLE Note B	CONNECTION	PRICE \$ Qty. (30)	
		over frequency, GHz								Output (1 dB Comp.) 2GHz	Input (no dmg) $I_u$	NF (dB) Typ.	IP3 (dBm) Typ.	In		Out		Current (mA)		Device Volt. Max							
		0.1	1	2	4	5	8	10	Min. @ 2GHz					DC-3 GHz	3-f <sub>u</sub> ** GHz	DC-3 GHz	3-f <sub>u</sub> ** GHz			Typ	Min	Max					
LEE-49	DC-5	14.0	13.9	14.3	14.0	13.1	7.8	—	12.0	16.4	10.8	15	5.5	33	1.6	1.2	1.4	1.4	85	65	4.9	4.5	5.3	229	FG873	cb	1.79
LEE-59	DC-5	20.6	20.3	19.7	15.8	13.8	7.6	—	17.8	17.3	11.7	13	4.5	33	1.5	1.5	1.5	1.6	85	65	4.8	4.3	5.2	244	FG873	cb	1.79

see suggested PCB layout PL-126 for LEE models

### typical biasing configuration



Test Board includes case, connectors, and components (in bold) soldered to PCB

### designers kits available

KIT No.	No. of Units in KIT	Description	Price \$ per KIT
K1-LEE	50	Kit includes 1 test board plus 10 of each: LEE-19,-29,-39,-49,-59	99.95

### R BIAS

"1%" Resistor Values (ohms) for Optimum Biasing of LEE Models

Vcc	LEE-19	LEE-29	LEE-39	LEE-49	LEE-59
7	88.7	88.7	107	34.8	35.7
8	113	113	133	48.7	49.9
9	137	137	162	63.4	64.9
10	162	162	191	78.7	80.6
11	187	187	221	95.3	95.3
12	215	215	249	110	110
13	237	237	280	127	127
14	261	261	309	140	143
15	287	287	340	158	158
16	309	316	365	174	174
17	332	340	392	191	191
18	357	365	422	205	205
19	383	392	453	221	221
20	412	412	475	232	237

### pin connections

PORT	cb
RF IN	1
RF OUT	3
DC	3
GND EXT.	2,4
DEMO BOARD	LEE-TB