

Surface Mount

Monolithic Amplifiers

LEE+ SERIES
LEE SERIES

50Ω, Broadband, DC to 8 GHz

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(+))
- protected by US Patent, 6,943,629

Applications

- cellular
- PCS
- communication receivers & transmitters
- satellite communication, military



CASE STYLE : FG873

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

See our web site for RoHS Compliance methodologies and qualifications.

Electrical Specifications @ 25°C

MODEL NO.	FREQ. [▲] (GHz)	GAIN, dB Typical								MAXIMUM POWER, dBm			DYNAMIC RANGE		VSWR (:1) Typ.				MAXIMUM CURRENT RATING ³	DC OPERATING POWER @Pin 3 (note 4)				THERMAL RESISTANCE	PRICE \$
		over frequency, GHz								Min. Output (1dB Comp.) 2 GHz	Input (no dmg.) f _u	NF dB Typ.	IP3 dBm Typ.	In DC-3 GHz	3-f _u GHz	Out DC-3 GHz	3-f _u GHz	I mA	Current (mA)	Device Volt				θ _J , typ. °C/W	Qty. (25)
		0.1	1	2	4	5	8	10	Min. @ 2GHz											Typ	Min	Max			
		Low Power																							
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	1.19
LEE-29(+)	DC-8	15.5	15.4	15.4	14.9	14.1	12.5	10.6	13.3	10.6	10.0	15	5.5	25.5	1.4	1.3	1.3	1.6	55	40	3.6	3.2	4.0	334	1.19
LEE-39(+)	DC-8	21.9	21.4	20.8	18.3	16.6	13.5	10.5	18.5	10.4	8.8	13	4.5	23.4	1.3	1.4	1.3	1.6	55	35	3.5	3.1	3.9	321	1.19
Medium Power																									
LEE-49(+)	DC-5	14.0	13.9	14.3	14.0	13.1	7.8	—	12.0	15.8	9.7	15	5.5	33	1.6	1.2	1.4	1.4	85	65	4.9	4.5	5.3	229	1.79
LEE-59(+)	DC-5	20.6	20.3	19.7	15.8	13.8	7.6	—	17.8	16.3	10.3	13	4.5	33	1.5	1.5	1.5	1.6	85	65	4.8	4.3	5.2	244	1.79

▲ Low frequency cutoff determined by external coupling capacitors.

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

4. Supply voltage must be connected to pin 3 through a bias resistor in order to prevent damage. See "Biasing MMIC Amplifiers" in minicircuits.com/application.html. Reliability predictions are applicable at specified current & normal operating conditions.

f_U is the upper frequency limit for each model as shown in the table.

Maximum Ratings

Operating Temperature -45°C to 85°C

Storage Temperature -65°C to 150°C

Pin Configuration

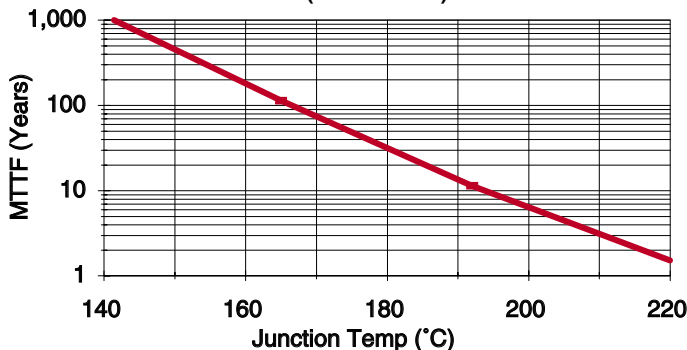
RF IN	1
RF OUT	3
DC	3
GROUND	2,4

Model Identification

Model	Marking [†]
LEE-19(+)	19
LEE-29(+)	29
LEE-39(+)	39
LEE-49(+)	49

[†] Prefix letter (optional) designates assembly location.
Suffix letters (optional) are for wafer identification.

MTTF vs. Junction Temp.
(LEE SERIES)



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

REV. F
M105218
LEE-19 ED-10757/1
LEE-29 ED-10757/2
LEE-39 ED-10757/3
LEE-49 ED-10757/4
LEE-59 ED-10757/5
RS/YB/LC
060515
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INTERNET <http://www.minicircuits.com>

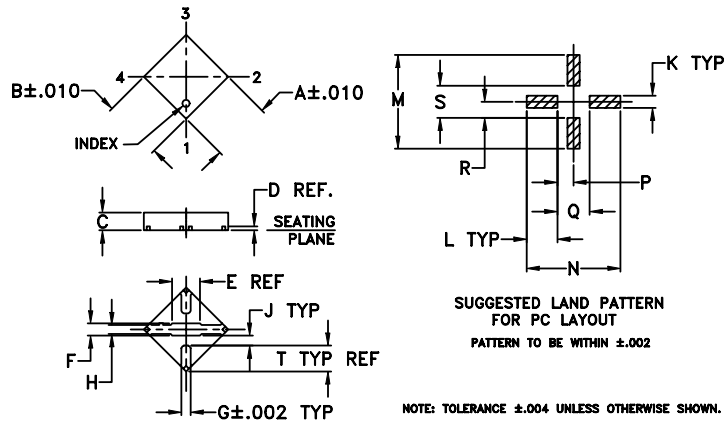
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

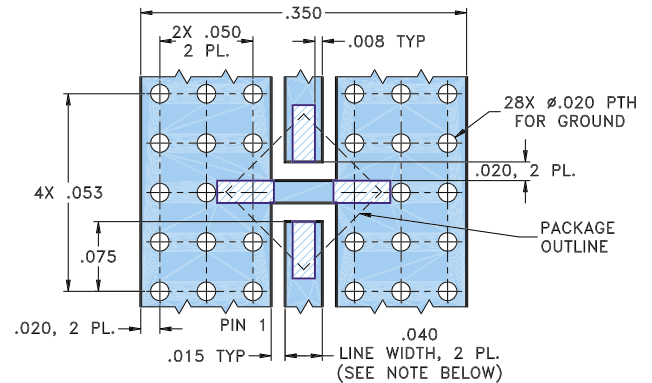
Mini-Circuits ISO 9001 & ISO 14001 Certified



Outline Drawing



Demo Board MCL P/N: LEE-TB Suggested PCB Layout (PL-126)



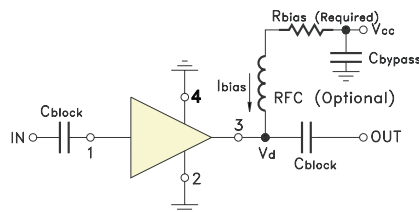
- NOTE:**
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	
0.11	0.11	0.03	0.00	0.07	0.02	0.01	0.01	0.01	
3.00	3.00	0.89	0.20	1.78	0.61	0.43	0.46	0.46	
K	L	M	N	P	Q	R	S	T	wt
0.02	0.06	0.18	0.18	0.03	0.06	0.03	0.06	0.05	grams
0.61	1.55	4.72	4.72	0.81	1.63	0.81	1.63	1.27	20.0

Typical Biasing Configuration



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

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