

# High IP3 Monolithic Amplifier

# HELA-10+

Broadband, 50&75 ohms 5 to 1000 MHz



### Maximum Ratings

Heat Slug Temperature	110°C
Storage Temperature	-40°C to +125°C
DC Voltage	+13V
DC Power	7.15W

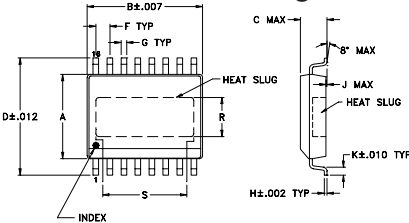
### Pin Connections

RF IN 1,2	3,6
RF OUT 1,2	14,11
DC	10,15
GROUND	1,4,5,8,9,12,13,16
NO CONNECTION	2,7*

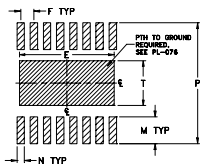
\*Adding bias resistors may improve IP3, IP2.  
See Application Notes:  
Enhanced linearity in the HELA-10 Power Amplifier (AN60-009)

High IP3, wideband, balanced linear amplifier  
HELA-10 (AN60-0033)

### Outline Drawing



### PCB Land Pattern

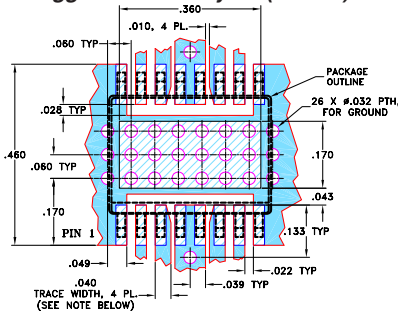


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J
.295	.405	.098	.406	.360	.050	.016	.008	.004
7.49	10.29	2.49	10.31	9.14	1.27	0.41	0.20	0.10
K	L	M	N	P	R	S	T	wt
.032	--	.102	.028	.460	.13	.34	.170	grams
0.81	--	2.59	0.71	11.68	3.30	8.64	4.32	0.67

### Demo Board MCL P/N: TB-16,-17,-30,-45 Suggested PCB Layout (PL-076)



NOTE: 1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS 0.087" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

### Features

- excellent flatness, ±0.4 dB typ.
- very high IP3, 49 dBm typ. at 150 MHz & 45 dBm typ. at 800 MHz
- very high IP2, 88 dBm typ.
- low noise figure, 3.5 dB typ.
- aqueous washable

### Applications

- Cellular
- Catv
- Instrumentation

CASE STYLE: CM624

Model	Price	Qty.
HELA-10+	\$15.95	(1-24)
HELA Kit (see table below)	\$19.95	(1-9)

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

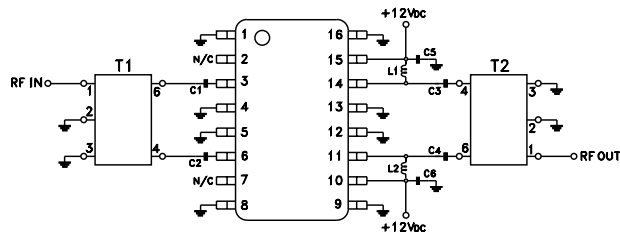
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

### Electrical Specifications at 25°C

KIT <sup>1</sup> NO.	FREQ. (MHz)	OHMS	GAIN <sup>2</sup> (dB)				MAXIMUM POWER (dBm)			DYNAMIC RANGE		VSWR <sup>4</sup> (:1)		DC POWER		THERMAL RESISTANCE <sup>5</sup> θjc °C/W
			Min.	Typ.	Max.	Typ. Flatness	Output (1 dB Compr.)	Min.	Typ.	Input <sup>3</sup> (no damage)	NF (dB)	IP3 (dBm)	IN	OUT	Volt (V)	
HELA-10A+	50-1000	75	9.5	12	13	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6
HELA-10B+	50-1000	50	9.5	12	13	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6
HELA-10C+	5-450	75	9.3	11.4	12.5	±0.4	30	26	20	3.5	48	1.3	1.22	12	525	6
HELA-10D+	8-300	50	9.3	11	12.5	±0.4	30	26	20	3.5	48	1.2	1.2	12	525	6

1. Kit consists of HELA-10 plus transformers, see table below.
2. Includes transformer losses at input & output.
3. Open load is not recommended, potentially can cause damage. With no load, derate max. input power by 20 dB.
4. For 75 ohm. For 50 ohm, VSWR increases from 1.2:1 at 1 GHz to 2.0:1 at 50MHz.
5. Thermal resistance is from junction to heat slug. (mounting paddle).

### Application Schematic Diagram



APPLICATION CIRCUIT	T1	T2	C1 TO C6	L1, L2	PCB LAYOUT	EVALUATION BOARD
A	ADTL1-18-75	ADTL1-18-75	0.01µF	0.75µH	B14-TB-30	TB-16
B	ADTL1-12	ADTL1-12	0.01µF	0.75µH	B14-TB-17	TB-17
C	ADT1-1WT	ADTL1-4-75	0.039µF	3.3µH	B14-TB-16	TB-30
D	ADT1.5-1	ADT1.5-1	0.039µF	3.3µH	B14-TB-17	TB-45

### Assembly Guideline

Reflow solder the slug to the ground plane; PC board layouts for 75 ohm (B14-TB-16), (B14-TB-30), and for 50 ohm (B14-TB-17) are available upon request. Please contact Applications Department or consult our web site.

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For detailed performance specs & shopping online see web site

IF/RF MICROWAVE COMPONENTS

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).

REV. M  
M131858  
HELA-10+  
A ED-6636T  
B ED-6636T  
C ED-7157/1  
D ED-7491/2  
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