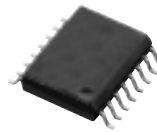


MONOLITHIC AMPLIFIERS

50&75Ω

High IP3 5 to 1000 MHz



HELA

All specifications at 25°C

KIT NO.	APPLICATION CIRCUIT	FREQ. (MHz) $f_L - f_U$	OHMS	GAIN ¹ (dB)				MAXIMUM POWER (dBm)			DYNAMIC RANGE		VSWR ² (:1) Typ.		DC POWER		THERMAL RESIS- TANCE ³ qj ^c °C/W	CASE STYLE Note B	CON- NEX- TION	PRICE \$ Qty. (1-9)
				Min.	Typ.	Max.	Typ. Flatness	Output (1 dB Comp.) Typ. Min.	Input (no damage)	NF (dB) Typ.	IP3 (dBm) Typ.	In	Out	Volt Typ.	Current (mA)					
HELA-10A	A	50 - 1000	75	10.0	12.0	13.0	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6	CM624	kl	19.95
HELA-10B	B	50 - 1000	50	10.0★	12.0	13.0	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6	CM624	kl	19.95
HELA-10C	C	5 - 450	75	9.3	11.4	12.5	±0.4	30	26	20	3.5	48	1.30	1.22	12	525	6	CM624	kl	19.95
HELA-10D	D	8 - 300	50	9.3	11.0	12.5	±0.4	30	26	20	3.5	48	1.20	1.20	12	525	6	CM624	kl	19.95

◆ Kit consists of HELA-10 plus transformers, see table below.

see suggested PCB layout PL-076 for HELA models

features

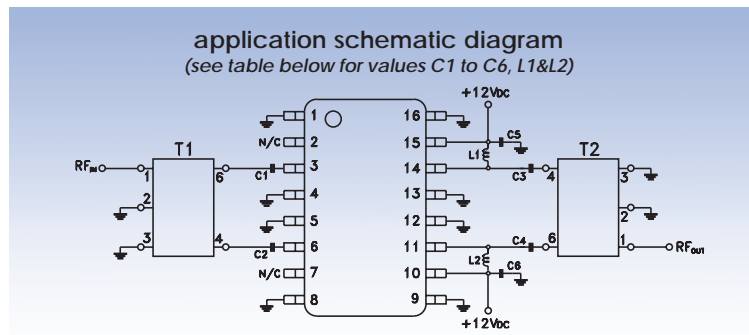
- very high IP3, 49 dBm typ at 150 MHz & 45 dBm typ at 800 MHz
- excellent flatness, ±0.4 dB typ.
- very high IP2, 88 dBm typ.
- low noise figure, 3.5 dB typ.

applications

- cellular
- instrumentation
- CATV

absolute maximum ratings

heat slug temperature: 110°C max.
storage temperature: -40°C to 150°
dc voltage: 13V
dc power: 7.15W



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 website.

NOTES:

- ◆ Aqueous washable
- † Open load is not recommended, potentially can cause damage. With no load, derate max input power by 20 dB.
- ★ 9.5 dB min., 800-1000 MHz.
- ⊛ Tested with recommended application schematic diagram.
- 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. Includes transformer losses at input & output.
- 2. HELA Series, VSWR for 75 ohm. For 50 ohm, VSWR increases from 1.2:1 at 1 GHz to 2.0:1 at 500 MHz. For MNA models, VSWR .75-2.5 GHz, MNA-7, 2.5-5.9 GHz.
- 3. Thermal resistance is from junction to heat slug, or mounting paddle.

pin connections

PORT	kl
RF IN	3,6
RF OUT	11,14
DC	10,15
GND EXT.	1,4,5,8,9,12,13,16
NOT USED	2,7



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

INTERNET <http://www.minicircuits.com>

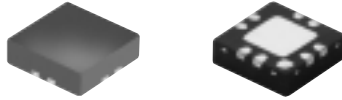
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

ISO 9001 CERTIFIED

Surface Mount 50Ω

High DIRECTIVITY 0.5 to 5.9 GHz

NEW!



MNA

All specifications at 25°C

MODEL NO.	FREQ. (GHz) $f_L - f_U$	DC VOLTS (V)	GAIN, dB Typical							MAXIMUM POWER (dBm)		DYNAMIC RANGE			VSWR ² (:1) Typ.	DIRECTIVITY (dB) (Isolation-Gain) Typ.	DC OPERATING CURRENT @ Pin 3 (mA)		THERMAL RESISTANCE ³ θ_{jc} Typ. °C/W	CASE STYLE Note B	CONNECTION	PRICE \$ Qty. (30)	
			over frequency, GHz							Output (1 dB Comp.) Typ. f_L f_U	NF (dB) Typ. at 1 GHz	IP3 (dBm) Typ. at 1 GHz	at 2 GHz	at 5.9 GHz			Typ.	Typ.					Max.
			0.5	1.0	1.5	2.0	2.5	Min. at 2 GHz	17.7														
MNA-2	0.5-2.5	5.0	10.6	12.8	12.8	12.3	11.9	10.3	17.7	14.9	5.4	26.5	28.0	1.5	1.6	20	76	95	DQ849	nt	1.90		
		2.8	9.6	11.5	11.2	10.7	10.2	—	12.9	12.4	5.4	23.2	24.2	1.5	1.6	20	60	—				78	
MNA-3	0.5-2.5	5.0	14.6	16.2	16.1	15.0	11.8	13.0	11.4	9.5	4.9	19.6	21.3	1.9	1.5	17	30	40	DQ849	nt	1.60		
		2.8	14.2	15.2	15.0	14.0	11.0	—	9.7	8.0	4.8	18.0	19.9	1.9	1.5	17	28	—				78	
MNA-4	0.5-2.5	5.0	15.6	16.6	16.4	15.8	13.3	14.0	19.0	17.0	4.8	28.4	29.0	1.5	1.7	20	75	90	DQ849	nt	1.90		
		2.8	14.3	14.6	14.5	14.1	11.7	—	13.4	13.7	4.8	23.9	24.9	1.5	1.7	20	67	—				78	
MNA-5	0.5-2.5	5.0	18.5	22.8	21.9	20.6	18.0	17.0	12.2	8.0	3.5	19.4	21.0	1.6	1.9	17	28	40	DQ849	nt	1.60		
		2.8	18.0	21.4	20.5	19.4	17.4	—	10.1	6.5	3.5	18.0	20.0	1.6	1.9	17	26	—				78	
MNA-6	0.5-2.5	5.0	19.4	23.5	23.6	23.0	20.2	21.5	18.0	15.8	2.9	27.1	28.0	1.5	1.6	17	72	95	DQ849	nt	2.25		
		2.8	18.6	21.5	21.2	21.0	19.0	—	14.1	13.2	2.9	23.4	25.0	1.5	1.9	17	65	—				78	
MNA-7	1.5-5.9	5.0	15.5	17.2	17.4	17.2	10.8	15.0	15.6	15.9	6.9	28.4	28.6	2.0	1.5	20	73	96	DQ849	nt	2.25		
		2.8	13.7	15.4	15.8	16.7	9.8	—	12.7	13.1	6.9	24.1	23.8	2.0	1.5	24	65	—				78	

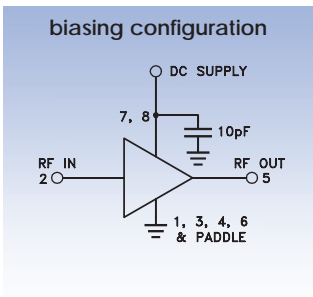
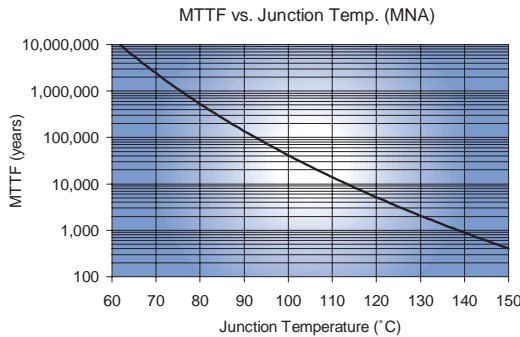
see suggested PCB layout PL-078 for MNA models

features

- 3V & 5V operation
- micro-miniature size .120"x.120"
- no external biasing circuit required
- high directivity, 20 dB typ.
- wide bandwidth, 0.5 to 5.9 GHz
- low noise figure, 2.9 dB typ. (MNA-6)
- output power, up to +19 dBm typ.
- excellent repeatability

applications

- buffer amplifier
- cellular
- communication satellite
- line of sight links
- defense



pin connections

PORT	nt
RF IN	2
RF OUT	5
DC	7,8^
GND EXT.	1,3,4,6 and bottom paddle
DEMO BOARD	TB-143

^ connected together externally

absolute maximum ratings

operating temperature: -40°C to 85°C

storage temperature: -55°C to 100°

dc voltage: 7V at pins 7&8; 10V at pins 2&5

power: 500mW

input power (no damage): 10 dBm

designers kit available

KIT No.	No. of Units in KIT	Description	Price \$ per KIT
K1-MNA	40	10 of each: MNA-2, -3, -5, -6	69.95
K2-MNA	60	10 of each: MNA-2, -3, -4, -5, -6, -7	99.95