

# MONOLITHIC AMPLIFIERS

50 Ω

Flat-Pack

## BROADBAND DC to 2 GHz



MAR



MAV

up to +17.5 dBm output

MODEL NO.	* FREQ. MHz		GAIN, dB Typical (at MHz)				MAXIMUM POWER, dBm		DYNAMIC RANGE		VSWR Typ. (:1)		ABSOLUTE MAXIMUM RATING <sup>7</sup> (25 °C)		DC OPERATING POWER at Pin 3		† THERMAL RESISTANCE <sup>6</sup>	CAPD DATA	Case Style	CONNECTION	Price \$	
	f <sub>L</sub>	f <sub>U</sub>	100	500	1000	2000	note 1 MIN.	Output (1 dB Comp.) Typ.	Input (no damage)	NF dB Typ.	IP3 dBm Typ.	In	Out	I (mA)	P (mW)	Current (mA)	Volt Typ.	θ <sub>jc</sub> °C/W		Note B	Qty. 30	
□ MAR-1	DC-1000		18.5	17.5	15.5	—	13.0	+1.5	+13	5.5	+14.0	1.3	1.3	40	200	17	5.00	105		VV105	cb	0.99
□ MAR-2	DC-2000		12.5	12.3	12.0	11.0	8.5	+4.5	+13	6.5	+17.0	1.3	1.4	60	325	25	5.00	95		VV105	cb	1.12
□ MAR-3	DC-2000		12.5	12.2	12.0	10.5	8.0	+10.0	+13	6.0	+23.0	1.5	1.7	70	400	35	5.00	105	(see YON on our website)	VV105	cb	1.19
□ MAR-4	DC-1000		8.3	8.2	8.0	—	7.0	+12.5	+13	6.5	+25.5	1.6	2.0	85	500	50	5.25	90		VV105	cb	1.29
□ MAR-6	DC-2000		20.0	18.5	16.0	11.0	9.0	+2.0	+13	3.0	+14.5	1.5	1.4	50	200	16	3.50	110		VV105	cb	1.16
□ MAR-7	DC-2000		13.5	13.1	12.5	11.0	8.5	+5.5	+13	5.0	+19.0	1.4	1.5	60	275	22	4.00	110		VV105	cb	1.31
□ MAR-8	DC-1000		32.5	28.0	22.5	—	19.0	+12.5	+13	3.3	+27.0	#	#	65	500	36	7.80	130		VV105	cb	1.27
□ MAV-11	50-1000		12.7	12.0	10.5	—	9.0	+17.5	+13	3.6	+30.0	1.5	1.7	80	550	60	5.50	115		BBB123	cb	1.57

TYPICAL BIASING CONFIGURATION AND REFLOW SOLDERING PROFILE  
SEE PREVIOUS PAGE

### features

- cascadable
- excellent repeatability
- wide bandwidth DC-2000 MHz
- unconditionally stable, except MAR-6, MAR-8
- low cost, MAR, MAV models
- low noise figure, 2.8 to 3.6 dB typ. MAR-6, MAR-8, MAV-11
- high output power, +17 dBm typ., MAV-11

### marking identification

Model	Alphanumeric Code	Color OR	Color Dot
MAR-1	A01		Brown
MAR-2	A02		Red
MAR-3	A03		Orange
MAR-4	A04		Yellow
MAR-6	A06		White
MAR-7	A07		Violet
MAR-8	A08		Blue
MAV-11	A		—

DESIGNERS KITS AVAILABLE  
SEE PAGES 16&17

### NSN GUIDE

MCL NO.	NSN
MAR-2	5962-01-417-4110
MAR-3	5962-01-339-2933
MAR-4	5962-01-414-8631
MAR-6	5962-01-416-1462
MAR-8	5998-01-360-6957
MAV-11	5998-01-360-6958

### pin connections

PORT	cb
RF IN	1
RF OUT	3
DC	3
CASE GND	2,4
NOT USED	—

### NOTES:

- Non-hermetic
- # Dash-8 models input and output impedances are not 50 ohms, see S-parameter data. Conditionally stable, source and load VSWR<3:1 required. Dash-6 models conditionally stable, source and load VSWR<5:1 required.
- \* Low frequency cutoff determined by external coupling capacitors.
- B. Connector types and case mounted options, case finishes are given in section 0, 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. Minimum gain at highest frequency. Full temperature range, except room temperature for Dash-4 models.
- 2. Model number designated by color dot or alphanumeric code marking.
- 3. Frequency at which output power, NF and IP3 are specified: 500MHz for MAR-1, MAR-6, MAV-11, 1000MHz for all other models.
- 4. Dash-6 models potentially unstable with very high VSWR terminations.
- 6. Thermal resistance θ<sub>jc</sub> is from hottest junction of the device to the mounting surface of the leads.
- 7. Permanent damage may occur if any of these limits are exceeded.

# MONOLITHIC AMPLIFIERS 50 & 75Ω

Surface Mount

## High IP3 5 to 1000 MHz



HELA

All specifications at 25°C

KIT NO.	APPLICATION CIRCUIT	FREQ. MHz f <sub>L</sub> - f <sub>H</sub>	OHMS	GAIN* dB				MAXIMUM POWER dBm			DYNAMIC RANGE		VSWR** Typ. (:1)		DC POWER		THERMAL RESISTANCE*** θ <sub>jc</sub> °C/W	CASE STYLE	CONNECTION	Price \$
				Min.	Typ.	Max.	Typ. Flatness	Output (1 dB Comp.) Typ.	Min.	Input† (no damage)	NF dB Typ.	IP3 dBm Typ.	In	Out	Volt (V)	Current (mA)				
NEW HELA-10A	A	50 - 1000	75	10 <sub>A</sub>	12	13	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6	CM624	kl	19.95
NEW HELA-10B	B	50 - 1000	50	10 <sub>B</sub>	12	13	±0.4	30	26	20	3.5	47	1.22	1.22	12	525	6	CM624	kl	19.95
NEW HELA-10C	C	5 - 450	75	9.3	11.4	12.5	±0.4	30	26	20	3.5	48	1.3	1.22	12	525	6	CM624	kl	19.95
NEW HELA-10D	D	8 - 300	50	9.3	11.0	12.5	±0.4	30	26	20	3.5	48	1.2	1.2	12	525	6	CM624	kl	19.95

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

### 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.

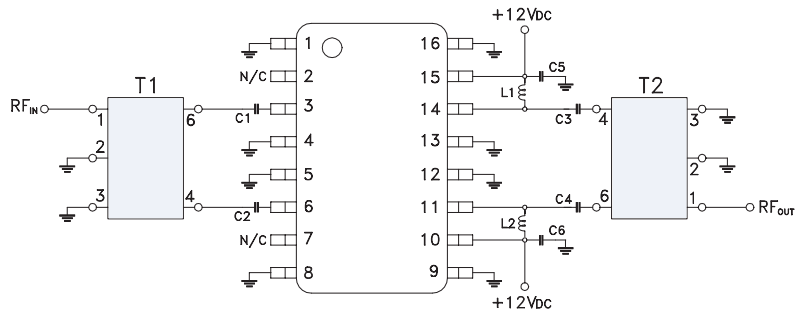
### applications

- cellular
- instrumentation
- CATV

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

### Application Schematic Diagram

(see table below for values C1 to C6, L1&L2)



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:

- \* Includes transformer losses at input & output.
- \*\* For 75 ohm. For 50 ohm, VSWR increases from 1.2:1 at 1 GHz to 2.0:1 at 500 MHz.
- \*\*\* Thermal resistance is from junction to heat slug.
- † 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.

### 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

000118

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