

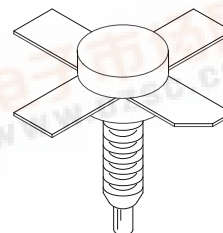
## The RF Line UHF Power Transistor

... designed primarily for wideband, large-signal output and driver amplifier stages to 1000 MHz.

- Designed for Class A Linear Power Amplifiers
- Specified 19 Volt, 1000 MHz Characteristics:  
Output Power — 14 Watts  
Power Gain — 8.0 dB, Small-Signal
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

**MRA1000-14L**

**8.0 dB, TO 1000 MHz  
14 WATTS BROADBAND  
UHF POWER TRANSISTOR**



**CASE 145D-02, STYLE 1  
(.380 SOE)**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	28	Vdc
Collector-Base Voltage	$V_{CBO}$	50	Vdc
Emitter-Base Voltage	$V_{EBO}$	3.5	Vdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	83 0.48	Watts $W/^\circ\text{C}$
Operating Junction Temperature	$T_J$	200	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case ( $T_C = 70^\circ\text{C}$ )	$R_{\theta JC}$	2.1	$^\circ\text{C/W}$

### ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C = 25\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	28	—	—	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 25\text{ mA}$ , $V_{BE} = 0$ )	$V_{(BR)CES}$	50	—	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 25\text{ mA}$ , $I_E = 0$ )	$V_{(BR)CBO}$	50	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 5.0\text{ mA}$ , $I_C = 0$ )	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 19\text{ V}$ , $I_E = 0$ )	$I_{CBO}$	—	—	20	mAdc

### ON CHARACTERISTICS

DC Current Gain ( $I_C = 1.0\text{ A}$ , $V_{CE} = 5.0\text{ V}$ )	$h_{FE}$	20	—	90	—
--	----------	----	---	----	---

(continued)

## ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

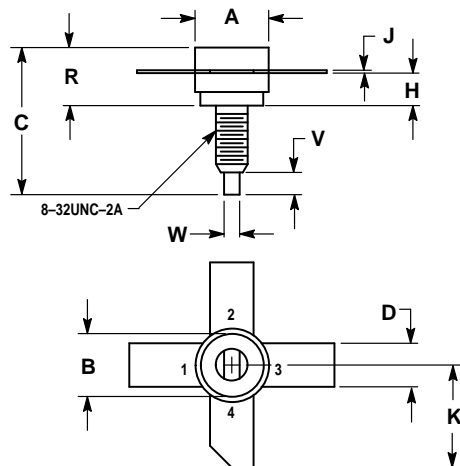
### DYNAMIC CHARACTERISTICS

Output Capacitance ( $V_{CB} = 24$ V, $I_E = 0$ , $f = 1.0$ MHz)	$C_{ob}$	—	—	40	pF
--	----------	---	---	----	----

### FUNCTIONAL TESTS

Common-Emitter Amplifier Small-Signal Gain ( $V_{CE} = 19$ V, $P_{in} = 1.0$ mW, $f = 1.0$ GHz, $I_C = 2.4$ A)	$G_{SS}$	8.0	—	—	dB
Load Mismatch ( $V_{CE} = 19$ V, $I_C = 2.4$ A, $P_{out} = 14$ W, $f = 1.0$ GHz, Load VSWR = $\infty:1$ , All Phase Angles)	$\psi$	No Degradation in Output Power			
Overdrive ( $V_{CE} = 19$ V, $I_C = 2.4$ A, $f = 1.0$ GHz) (No degradation)	$P_{inover}$	—	—	7.0	W
Output Power, 1.0 dB Compression Point ( $V_{CE} = 19$ V, $f = 1.0$ GHz, $I_C = 2.4$ A)	$P_{o1}$ dB	14	—	—	W

## PACKAGE DIMENSIONS




- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.320	0.385	9.28	9.77
B	0.320	0.330	8.13	8.38
C	0.700	0.778	17.78	19.76
D	0.220	0.230	5.59	5.84
H	0.160	0.170	4.07	4.31
J	0.003	0.006	0.08	0.15
K	0.490	0.520	12.45	13.20
R	0.248	0.275	6.30	7.23
V	0.100	0.130	2.54	3.30
W	0.055	0.065	1.40	1.65

- STYLE 1:  
PIN 1. EMITTER  
2. BASE  
3. EMITTER  
4. COLLECTOR

### CASE 145D-02 ISSUE A

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

#### How to reach us:

USA/EUROPE: Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609  
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298