

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

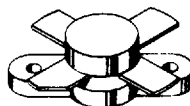
T-33-07

MRF433**The RF Line****SILICON RF POWER TRANSISTORS**

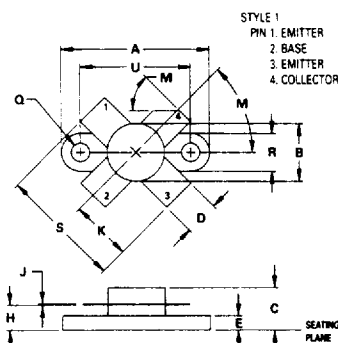
... designed primarily for application as complementary symmetry amplifiers in linear amplifiers from 2.0 to 30 MHz.

- Specified 12.5 Volt, 30 MHz Characteristics –
Output Power = 12.5 W (PEP)
Minimum Gain = 20 dB
Efficiency = 50%
- Intermodulation Distortion @ 12.5 W (PEP) –
IMD = -30 dB (Max)

12.5 W (PEP) – 30 MHz

**RF POWER
TRANSISTOR****NPN SILICON****MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	18	Vdc
Collector-Base Voltage	V_{CBO}	36	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current – Continuous	I_C	2.5	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	20 114	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

**NOTES**

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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.39	25.14	0.960	0.990
B	9.40	9.90	0.370	0.390
C	5.82	7.13	0.229	0.281
D	5.47	5.96	0.215	0.235
E	2.15	2.66	0.085	0.105
H	3.81	4.57	0.150	0.180
J	0.11	0.15	0.004	0.006
K	10.04	10.28	0.395	0.405
M	40°	50°	40°	50°
Q	2.88	3.30	0.113	0.130
R	6.23	6.47	0.245	0.255
S	20.07	20.57	0.790	0.810
U	18.29	18.54	0.720	0.730

CASE 211-07

MRF433

MOTOROLA SC (XSTRS/R F)

46E D

6367254 0094663 8 MOT6

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

T-33-07

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 20\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 2.0\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 15\text{ Vdc}$, $V_{BE} = 0$, $T_C = 55^\circ\text{C}$)	I_{CES}	—	—	8.0	mA
Collector Cutoff Current ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	0.5	mA

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.5\text{ A}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	15	—	—	—
---	----------	----	---	---	---

DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	70	120	pF
---	----------	---	----	-----	----

FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ⁽¹⁾ ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 12.5\text{ W (PEP)}$, $I_{CQ} = 100\text{ mA}$, $f = 30.30.001\text{ MHz}$)	G_{pe}	20	—	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 12.5\text{ W (PEP)}$, $f = 30.30.001\text{ MHz}$)	$\eta(1)$ $\eta(2)$	45 40	50 45	—	%
Intermodulation Distortion ⁽³⁾ ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 12.5\text{ W (PEP)}$, $I_{CQ} = 100\text{ mA}$, $f = 30.30.001\text{ MHz}$)	IMD	—	—	-30	dB
Series Equivalent Input Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 12.5\text{ W (PEP)}$, $I_{CQ} = 100\text{ mA}$, $f = 30.30.001\text{ MHz}$)	Z_{in}	—	$2.50 - j2.20$	—	Ohms
Series Equivalent Output Impedance ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 12.5\text{ W (PEP)}$, $I_{CQ} = 100\text{ mA}$, $f = 30.30.001\text{ MHz}$)	Z_{out}	—	$4.80 - j3.00$	—	Ohms

(1) Class AB

(2) Class A

(3) To Mil-Std-1311 Version A, Test Method 2204B, Two Tone, Reference each Tone

FIGURE 1 — 30 MHz TEST CIRCUIT SCHEMATIC

