

The RF Line

NPN SILICON RF POWER TRANSISTOR

... designed primarily for application as a high-power linear amplifier from 1.5 to 30 MHz, in single sideband mobile, marine and base station equipment.

- Low-Cost, Common-Emitter TO-220AB Package
- Specified 28 Volt, 30 MHz Performance —
Output Power = 40 W (PEP)
Power Gain = 15 dB Min
Efficiency = 40% Min
- Intermodulation Distortion @ 40 W (PEP) —
IMD = -30 dB (Max)
- 30:1 VSWR Load Mismatch Capability at Rated Output Power and Supply Voltage

MAXIMUM RATINGS

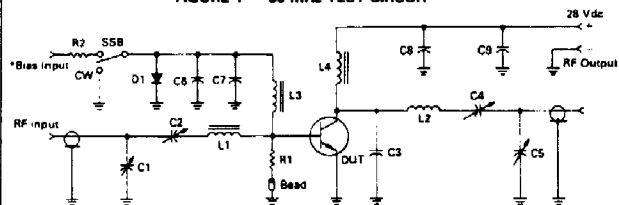
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEQ}	35	Vdc
Collector-Base Voltage	V _{CBQ}	65	Vdc
Emitter-Base Voltage	V _{EBQ}	4.0	Vdc
Collector Current — Continuous	I _C	3.0	A dc
Withstand Current (t = 5.0 s)	—	6.0	A dc
Total Device Dissipation @ T _C = 25°C (1) Derate above 25°C	P _D	87.5 0.5	Watts W/°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance Junction to Case	R _{θJC}	2.0	°C/W

(1) This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.

FIGURE 1 — 30 MHz TEST CIRCUIT



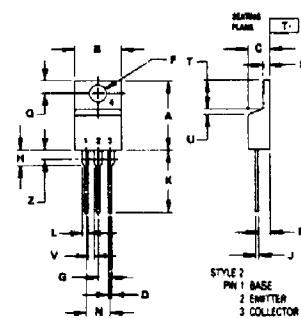
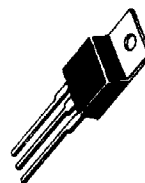
- C1, C2 — Arco 46S 190-780 pF
- C3 — 150 pF ELMENCO**
- C4, C5 — Arco 42B 90-400 pF
- C6, C7 — 0.001 μF Disc Ceramics
- C7 — 500 μF 3.0 Vdc Electrolytic
- C8 — 50 μF 50 Vdc Electrolytic
- R1 — 10 Ω, 1.0 Watt Resistor
- R2 — 5.0 Ω, 5.0 Watt Resistor
- L1 — 0.15 μH Molded Choke
- L2 — 7 Turns #18 AWG Enameled Close Wound 1.2" ID
- L3 — 10 μH Molded Choke
- L4 — 1.9 μH Molded Choke
- One Bead — #58-590-65 3B (Ferroxcube or equiv)
- D1 — 1N4997

*Adjust Bias (Base) Voltage for I_{CQ} = 40 mA with no RF applied
**Type MCM01 010 or UNELCO 3 HS 0006

MRF486

40 W (PEP) — 30 MHz

RF POWER TRANSISTOR
NPN SILICON



- NOTES
1. DIMENSIONING AND TOLERANCING PER ANS. Y14.5M 1982
 2. CONTROLLING DIMENSION: INCH
 3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED

MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN
A	14.48	17.25	0.570
B	6.86	10.29	0.270
C	4.07	4.82	0.160
D	0.84	0.88	0.033
F	3.61	3.73	0.142
G	2.52	2.66	0.099
H	3.92	3.95	0.154
J	0.26	0.56	0.010
K	12.70	14.27	0.500
L	1.15	1.30	0.045
N	4.83	5.20	0.190
O	2.54	3.25	0.100
R	2.04	2.70	0.080
S	1.15	1.30	0.045
T	3.97	4.47	0.156
U	0.50	1.27	0.020
V	1.15	—	0.045
Z	—	2.61	—

CASE 221A-04
TO-220AB



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

MRF486

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mA dc}, I_B = 0$)	$V_{(BR)CEO}$	35	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mA dc}, V_{BE} = 0$)	$V_{(BR)CES}$	65	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 50 \text{ mA dc}, I_E = 0$)	$V_{(BR)CBO}$	65	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5.0 \text{ mA dc}, I_C = 0$)	$V_{(BR)EBO}$	40	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 28 \text{ Vdc}, V_{BE} = 0, T_C = 25^\circ\text{C}$)	I_{CES}	—	—	10	mA dc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 2.0 \text{ A dc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	10	40	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 27 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{ob}	—	130	200	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CC} = 28 \text{ Vdc}, P_{out} = 40 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 40 \text{ mA dc}$)	G_{PE}	15	17.5	—	dB
Collector Efficiency ($V_{CC} = 28 \text{ Vdc}, P_{out} = 40 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 40 \text{ mA dc}$)	η	40	45	—	%
Intermodulation Distortion (1) ($V_{CC} = 28 \text{ Vdc}, P_{out} = 40 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 40 \text{ mA dc}$)	$IMD(d_3)$	—	-35	-30	dB

(1) TO MIL-STD-1311 Version A, Test Method 2204B, Two Tone, Reference Each Tone

