

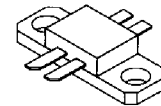
The RF Line NPN Silicon RF Power Transistor

Designed for 24 Volt UHF large-signal, common emitter, class-AB linear amplifier applications in industrial and commercial FM/AM equipment operating in the range 800-970 MHz.

- Specified 24 Volt, 900 MHz Characteristics
 - Output Power = 30 Watts
 - Minimum Gain = 10 dB @ 900 MHz, class-AB
 - Minimum Efficiency = 30% @ 900 MHz, 30 Watts (PEP)
 - Maximum Intermodulation Distortion -30 dBc @ 30 Watts (PEP)
- Characterized with Series Equivalent Large-Signal Parameters from 800 to 960 MHz
- Silicon Nitride Passivated
- 100% Tested for Load Mismatch Stress at all Phase Angles with 5:1 VSWR @ 26 Vdc, and Rated Output Power
- Gold Metalized, Emitter Ballasted for Long Life and Resistance to Metal-Migration
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

MRF897

**30 W, 900 MHz
RF POWER
TRANSISTOR
NPN SILICON**



CASE 395B-01,

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Emitter Voltage	V_{CES}	60	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector-Current — Continuous	I_C	4.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	105 0.60	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	30	33	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	60	80	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5 \text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	4.7	—	Vdc
Collector Cutoff Current ($V_{CE} = 30 \text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	—	—	10.0	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_{CE} = 1.0 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$)	h_{FE}	30	80	120	—
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DYNAMIC CHARACTERISTICS

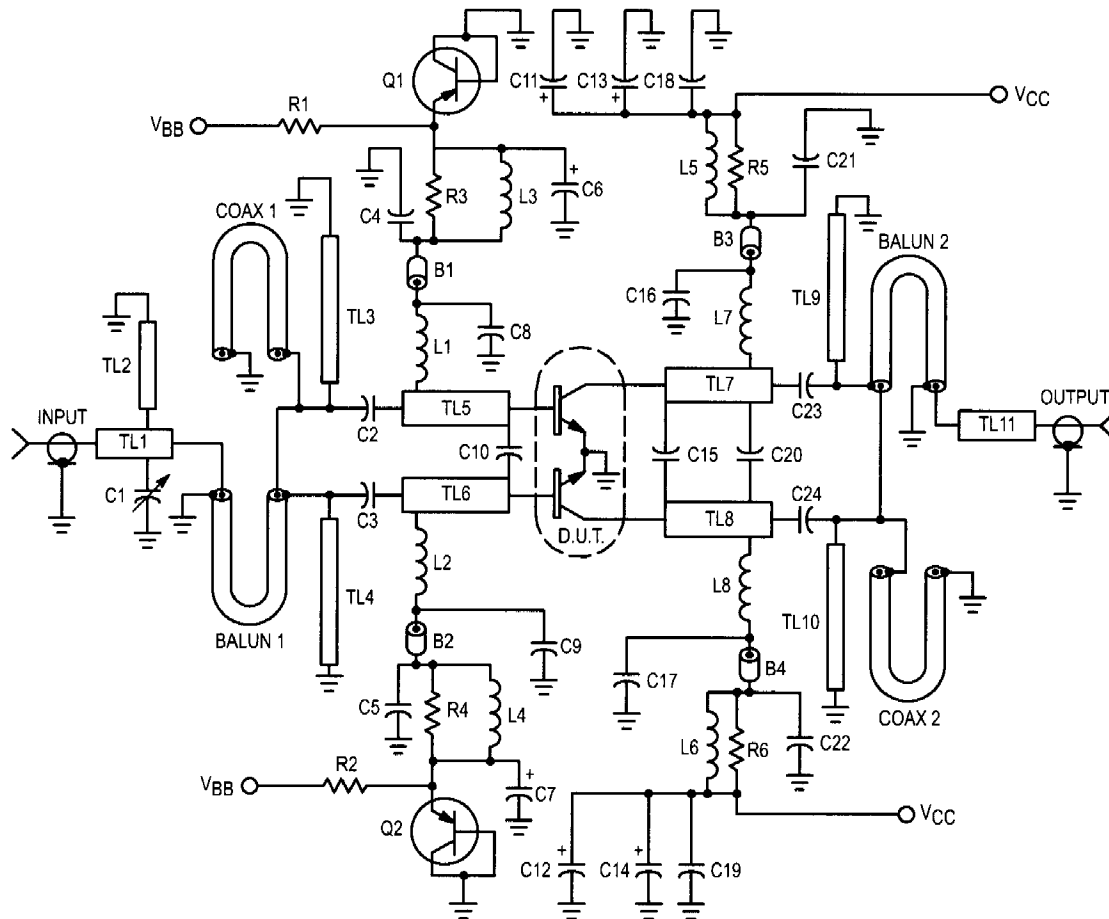
Output Capacitance ($V_{CB} = 24 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	14	21	28	pF
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(continued)



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

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL CHARACTERISTICS					
Common-Emitter Amplifier Power Gain ($V_{CC} = 24\text{ Vdc}$, $P_{Out} = 30\text{ Watts (PEP)}$, $I_{CQ} = 125\text{ mA}$, $f_1 = 900\text{ MHz}$, $f_2 = 900.1\text{ MHz}$)	G_{pe}	10.0	12.0	—	dB
Collector Efficiency ($V_{CC} = 24\text{ Vdc}$, $P_{Out} = 30\text{ Watts (PEP)}$, $I_{CQ} = 125\text{ mA}$, $f_1 = 900\text{ MHz}$, $f_2 = 900.1\text{ MHz}$)	η	35	38	—	%
Intermodulation Distortion ($V_{CC} = 24\text{ Vdc}$, $P_{Out} = 30\text{ Watts (PEP)}$, $I_{CQ} = 125\text{ mA}$, $f_1 = 900\text{ MHz}$, $f_2 = 900.1\text{ MHz}$)	IMD	—	-37	-30	dBc
Output Mismatch Stress ($V_{CC} = 26\text{ Vdc}$, $P_{Out} = 30\text{ Watts (PEP)}$, $I_{CQ} = 125\text{ mA}$, $f_1 = 900\text{ MHz}$, $f_2 = 900.1\text{ MHz}$, Load VSWR = 5:1 (all phase angles))	ψ	No Degradation in Output Power Before and After Test			



- B1, B2, B3, B4 — Ferrite Bead, Fair Rite #2743019447
- C1 — 0.8–8.0 pF Trimmer Capacitor, Johanson
- C2, C3, C23, C24 — 43 pF, 100 mil, ATC Chip Capacitor
- C4, C5, C18, C19, C21, C22 — 820 pF, 100 mil, Chip Capacitor, Kemet
- C6, C7, C11, C12 — 10 μF , Lytic Capacitor, Panasonic
- C8, C9, C16, C17 — 100 pF, 100 mil, Chip Capacitor, Murata Erie
- C10 — 13 pF, 50 mil, ATC Chip Capacitor
- C13, C14 — 250 μF Lytic Capacitor, Mallory
- C15 — 1.1 pF, 50 mil, ATC Chip Capacitor
- C20 — 6.8 pF, 100 mil, ATC Chip Capacitor
- L1, L2, L3, L4, L5, L6 — 5 Turns 20 AWG, IDIA 0.126" choke

- N1, N2 — Type N Flange Mount, Omni Spectra 3052–1648–10
- Q1 — Bias Transistor BD136 PNP
- R1, R12 — 39 Ohm, 2.0 W
- R3, R4, R5, R6 — 4.0 x 39 Ohm, 1/8 W, Chips in Parallel, Rohm 390-J
- TL1–TL11 — See Photomaster
- Balun1, Balun2, Coax 1, Coax 2 — 2.20" 50 Ohm, 0.088" o.d. semi-rigid coax, Micro Coax UT-85-M17
- Board — 1/32" Glass Teflon, Arlon GX-0300-55-22, $\epsilon_r = 2.55$

Figure 1. MRF897 Broadband Test Circuit