



MOTOROLA
Semiconductors

BOX 20912 • PHOENIX ARIZONA 85036

2N5643

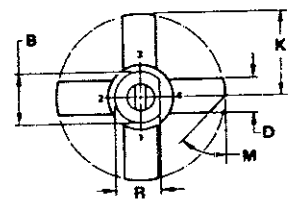
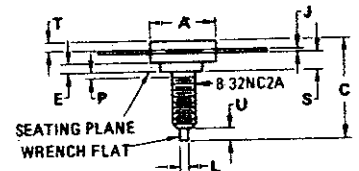
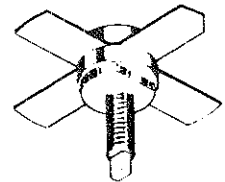
The RF Line

NPN SILICON RF POWER TRANSISTOR

Designed primarily for wideband large-signal amplifier stages in the 125-175 MHz frequency range

- Specified 28 Volt, 175 MHz Characteristics –
Output Power = 40 Watts
Minimum Gain = 7.6 dB
Efficiency = 60%
- Characterized from 125 to 175 MHz
- Includes Series Equivalent Impedances

40 W – 175 MHz
RF POWER
TRANSISTOR
NPN SILICON



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	9.78	0.370	0.385
B	8.13	8.38	0.320	0.330
C	17.02	20.07	0.670	0.780
D	5.46	5.97	0.215	0.235
E	1.78	—	0.070	—
J	0.08	0.18	0.003	0.007
K	12.45	—	0.490	—
L	1.40	1.78	0.055	0.070
M	45° NOM		45° NOM	
P	—	1.27	—	0.050
R	7.59	7.80	0.299	0.307
S	4.01	4.52	0.158	0.178
T	2.11	2.54	0.083	0.100
U	2.49	3.35	0.098	0.132

145A-09

***MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	35	Vdc
Collector-Base Voltage	V _{CB}	65	Vdc
Emitter-Base Voltage	V _{EB}	4.0	Vdc
Collector Current – Continuous	I _C	5.0	Adc
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	60 342	Watts mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200	°C

*Indicates JEDEC Registered Data

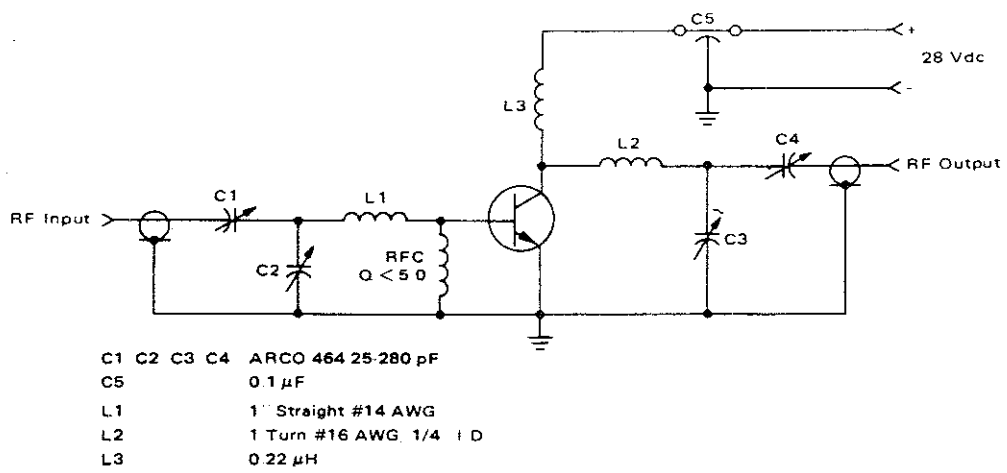
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***ELECTRICAL CHARACTERISTICS** ($T_C = 25^{\circ}C$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (Note 1) ($I_C = 200 \text{ mA dc}, I_B = 0$)	BV_{CEO}	35	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 200 \text{ mA dc}, V_{BE} = 0$)	BV_{CES}	65	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \text{ mA dc}, I_C = 0$)	BV_{EBO}	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 30 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	—	1.0	mA dc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 500 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	5.0	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 30 \text{ Vdc}, I_E = 0, f = 0.1 \text{ to } 1.0 \text{ MHz}$)	C_{ob}	—	45	65	pF
FUNCTIONAL TEST					
Common-Emitter Amplifier Power Gain (Figure 1) ($P_{out} = 40 \text{ Watts}, V_{CE} = 28 \text{ Vdc}, f = 175 \text{ MHz}$)	G_{pE}	7.6	8.1	—	dB
Collector Efficiency (Figure 1) ($P_{out} = 40 \text{ Watts}, V_{CE} = 28 \text{ Vdc}, f = 175 \text{ MHz}$)	η	60	—	—	%

Note 1: Pulsed through 25 mH inductor
 *Indicates JEDEC Registered Data

FIGURE 1 — 175 MHz TEST CIRCUIT SCHEMATIC



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FIGURE 2 – OUTPUT POWER versus FREQUENCY

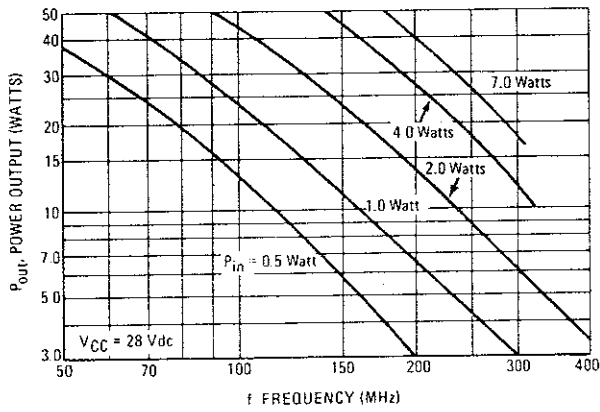


FIGURE 3 – OUTPUT POWER versus FREQUENCY

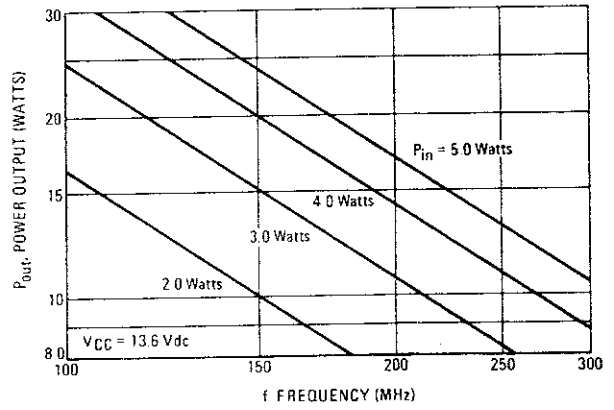
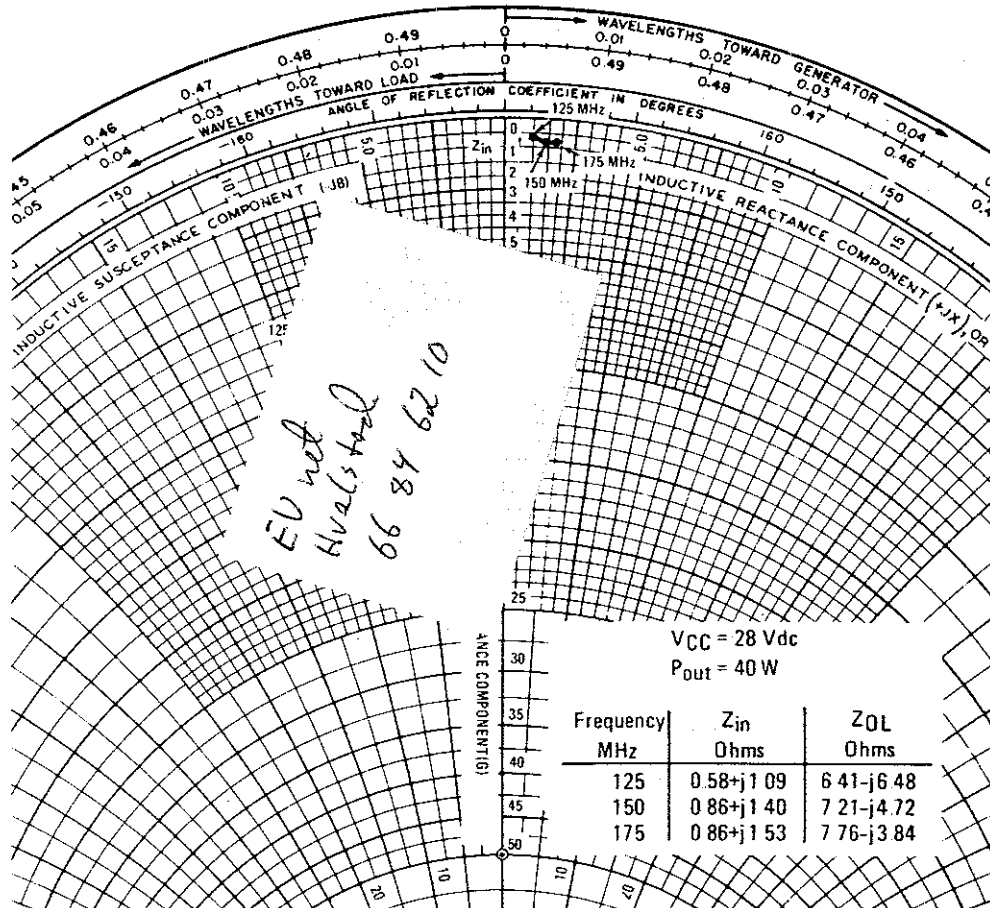


FIGURE 4 – SERIES EQUIVALENT IMPEDANCE



MOTOROLA Semiconductor Products Inc.