

**2N5641**

**The RF Line**

**NPN SILICON RF POWER TRANSISTOR**

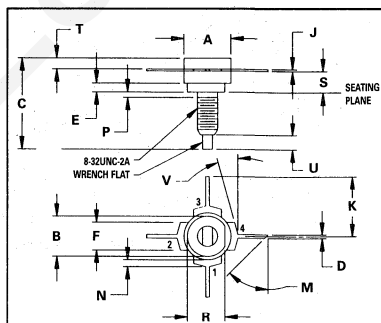
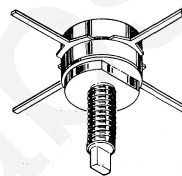
... designed primarily for wideband large-signal amplifier stages in the 125-175 MHz frequency range.

- Specified 28 Volt, 175 MHz Characteristics –  
 Output Power = 7.0 Watts  
 Minimum Gain = 8.4 dB  
 Efficiency = 60%
- Characterized from 125 to 175 MHz
- Includes Series Equivalent Impedances



Island Labs

**7.0 W – 175 MHz**  
**RF POWER**  
**TRANSISTOR**  
**NPN SILICON**



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

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

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	0.790
D	0.64	0.89	0.025	0.035
E	1.78	—	0.070	—
F	5.46	5.97	0.215	0.235
J	0.08	0.18	0.003	0.007
K	12.45	—	0.490	—
M	45° NOM		45° NOM	
N	1.27	1.52	0.050	0.060
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
V	10°	20°	10°	20°

**CASE 144B-05**

**\*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	$I_C$	1.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 86	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** ( $T_C = 25^\circ\text{C}$  unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (Note 1) ( $I_C = 200 \text{ mA dc}, I_B = 0$ )	$V_{(BR)CEO}$	35	—	—	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 200 \text{ mA dc}, V_{BE} = 0$ )	$V_{(BR)CES}$	65	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 5.0 \text{ mA dc}, I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 30 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	—	1.0	mA dc
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 100 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	5.0	—	—	—
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance ( $V_{CB} = 30 \text{ Vdc}, I_E = 0, f = 0.1$ to $1.0 \text{ MHz}$ )	$C_{ob}$	—	8.5	15	pF
<b>FUNCTIONAL TEST</b>					
Common-Emitter Amplifier Power Gain (Figure 1) ( $P_{out} = 7.0 \text{ Watts}, V_{CE} = 28 \text{ Vdc}, f = 175 \text{ MHz}$ )	$G_{pE}$	8.4	12.5	—	dB
Collector Efficiency (Figure 1) ( $P_{out} = 7.0 \text{ Watts}, V_{CE} = 28 \text{ Vdc}, f = 175 \text{ MHz}$ )	$\eta$	60	—	—	%

Note 1: Pulsed through 25 mH inductor.

\*Indicates JEDEC Registered Data.

FIGURE 1 — 175 MHz TEST CIRCUIT SCHEMATIC

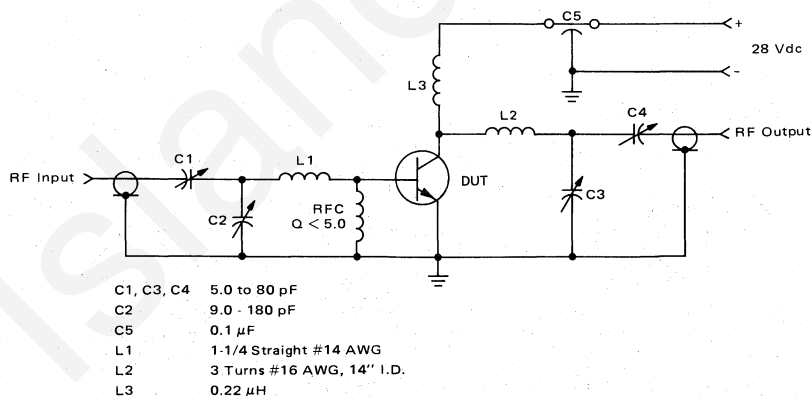


FIGURE 2 – OUTPUT POWER versus FREQUENCY

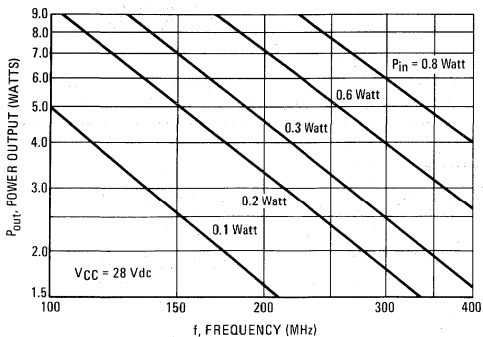


FIGURE 3 – OUTPUT POWER versus FREQUENCY

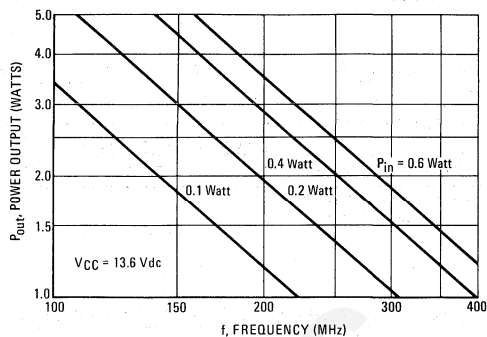
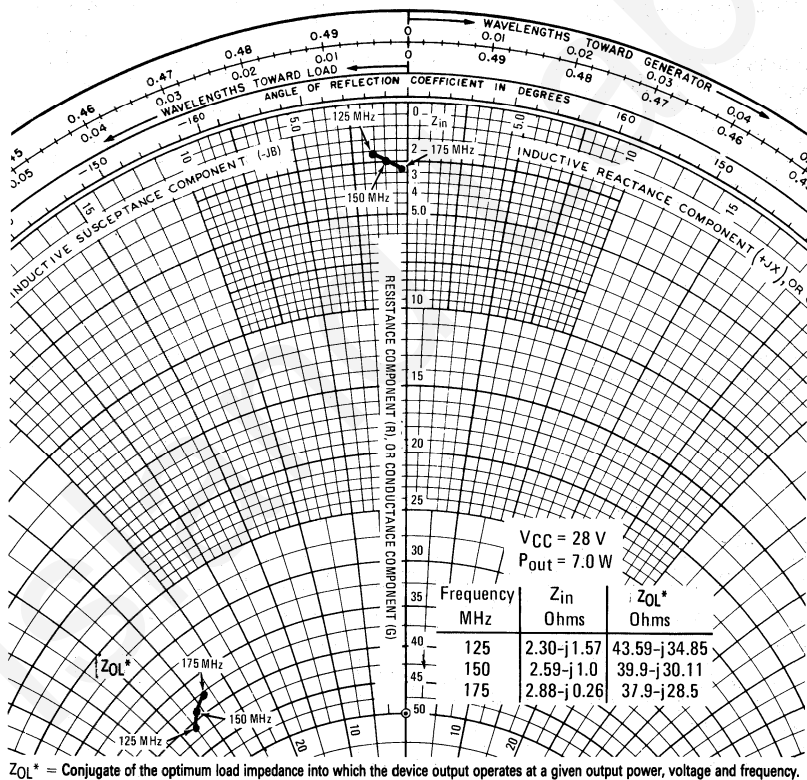


FIGURE 4 – SERIES EQUIVALENT IMPEDANCE



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