

**MOTOROLA**  
**SEMICONDUCTOR**  
**TECHNICAL DATA**

T-33-09  
**2N5642**

**The RF Line**

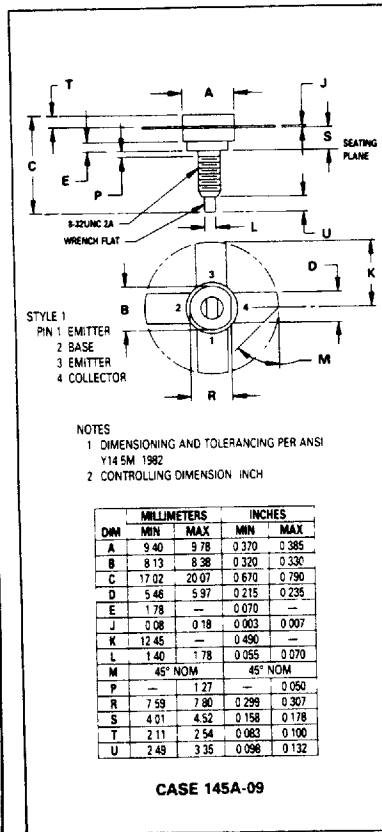
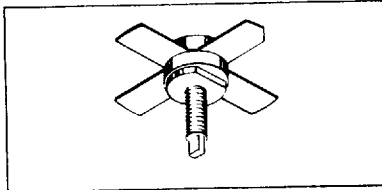
**NPN SILICON RF POWER TRANSISTOR**

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

- Specified 28 Volt, 175 MHz Characteristics –  
 Output Power = 20 Watts  
 Minimum Gain = 8.2 dB  
 Efficiency = 60%
- Characterized from 125 to 175 MHz
- Includes Series Equivalent Impedances

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

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**\*MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector Emitter Voltage	V <sub>CEO</sub>	35	Vdc
Collector Base Voltage	V <sub>CB</sub>	65	Vdc
Emitter Base Voltage	V <sub>EB</sub>	4.0	Vdc
Collector Current – Continuous	I <sub>C</sub>	3.0	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	30 171	Watts mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to +200	°C

\*Indicates JEDEC Registered Data

\*ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector Emitter Breakdown Voltage (Note 1) (I <sub>C</sub> = 200 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	35	-	-	Vdc
Collector Emitter Breakdown Voltage (I <sub>C</sub> = 200 mA, V <sub>BE</sub> = 0)	V <sub>(BR)CES</sub>	65	-	-	Vdc
Emitter Base Breakdown Voltage (I <sub>E</sub> = 10 mA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	40	-	-	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	-	-	1.0	mA
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 200 mA, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	5.0	-	-	-
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0, f = 0.1 to 1.0 MHz)	C <sub>ob</sub>	-	22	35	pF
<b>FUNCTIONAL TEST</b>					
Common Emitter Amplifier Power Gain (Figure 1) (P <sub>out</sub> = 20 Watts, V <sub>CE</sub> = 28 Vdc, f = 175 MHz)	G <sub>PE</sub>	8.2	10.2	-	dB
Collector Efficiency (Figure 1) (P <sub>out</sub> = 20 Watts, V <sub>CE</sub> = 28 Vdc, f = 175 MHz)	η	60	-	-	%

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

FIGURE 1 - 175 MHz TEST CIRCUIT SCHEMATIC

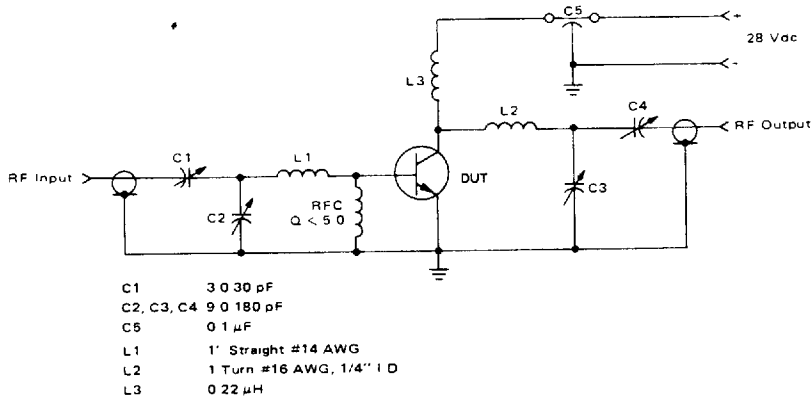


FIGURE 2 - OUTPUT POWER versus FREQUENCY

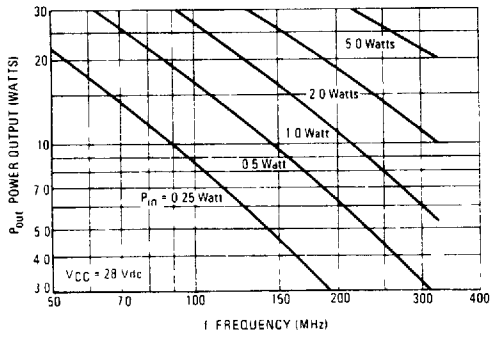
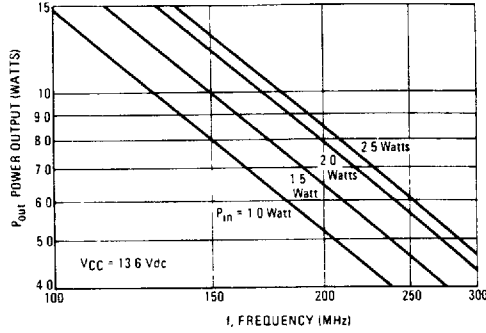


FIGURE 3 - OUTPUT POWER versus FREQUENCY



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FIGURE 4 - SERIES EQUIVALENT IMPEDANCE

