

**2N4427**

**The RF Line**

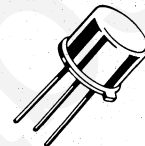
**NPN SILICON HIGH FREQUENCY TRANSISTOR**

... designed for amplifier, frequency multiplier, or oscillator applications in military and industrial equipment. Suitable for use as output driver or pre-driver stages in VHF and UHF equipment.

- Specified 175 MHz, 12 Vdc Characteristics –  
 Output Power = 1.0 Watt  
 Minimum Gain = 10 dB  
 Efficiency = 50%



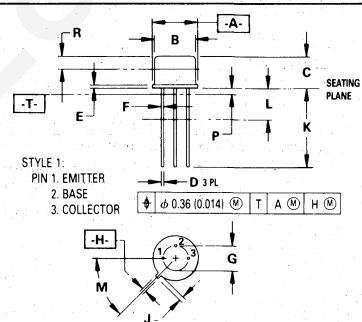
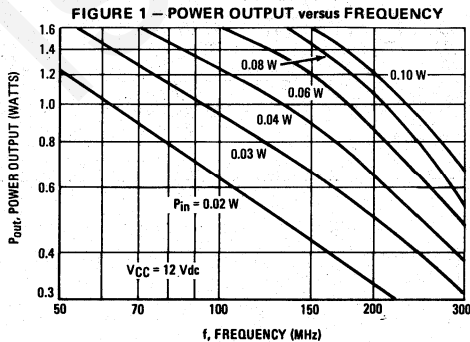
Island Labs



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
*Collector-Emitter Voltage	$V_{CE0}$	20	Vdc
*Collector-Base Voltage	$V_{CB}$	40	Vdc
*Emitter-Base Voltage	$V_{EB}$	2.0	Vdc
*Collector Current – Continuous	$I_C$	400	mAdc
*Base Current – Continuous	$I_B$	400	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 5.71	Watt mW/ $^\circ\text{C}$
*Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	3.5 20	Watts mW/ $^\circ\text{C}$
*Storage Temperature Range	$T_{stg}$	-65 to + 200	$^\circ\text{C}$

\*Indicates JEDEC Registered Data



- NOTES:
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  - CONTROLLING DIMENSION: INCH.
  - DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
  - DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
  - DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.51	9.39	0.335	0.370
B	7.75	8.50	0.305	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	1.04	0.009	0.041
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	19.05	0.500	0.750
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
P	—	1.27	—	0.050
R	2.54	—	0.100	—

**CASE 79-04**  
**TO-205AD**  
**(TO-39)**

# 2N4427

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
*Collector-Emitter Sustaining Voltage ( $I_C = 5.0 \text{ mA}$ , $I_B = 0$ )	$V_{CE0(sus)}$	20	—	Vdc
*Collector-Emitter Sustaining Voltage ( $I_C = 5.0 \text{ mA}$ , $R_{BE} = 10 \text{ ohms}$ )	$V_{CER(sus)}$	40	—	Vdc
*Collector Cutoff Current ( $V_{CE} = 12 \text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	—	0.02	mA
*Collector Cutoff Current ( $V_{CE} = 40 \text{ Vdc}$ , $V_{BE} = -1.5 \text{ Vdc}$ ) ( $V_{CE} = 12 \text{ Vdc}$ , $V_{BE} = -1.5 \text{ Vdc}$ , $T_C = +150^\circ\text{C}$ )	$I_{CEV}$	—	0.1 5.0	mA
*Emitter Cutoff Current ( $V_{EB} = 2.0 \text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	0.1	mA
<b>ON CHARACTERISTICS</b>				
*DC Current Gain ( $I_C = 100 \text{ mA}$ , $V_{CE} = 5.0 \text{ Vdc}$ ) ( $I_C = 360 \text{ mA}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	10 5.0	200 —	—
*Collector-Emitter Saturation Voltage ( $I_C = 100 \text{ mA}$ , $I_B = 20 \text{ mA}$ )	$V_{CE(sat)}$	—	0.5	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
*Current-Gain – Bandwidth Product ( $I_C = 50 \text{ mA}$ , $V_{CE} = 15 \text{ Vdc}$ , $f = 200 \text{ MHz}$ )	$f_T$	500	—	MHz
*Output Capacitance ( $V_{CB} = 12 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	4.0	pF
<b>FUNCTIONAL TEST</b>				
*Power Input (Figure 2) ( $P_{out} = 1.0 \text{ W}$ , $V_{CC} = 12 \text{ Vdc}$ , $f = 175 \text{ MHz}$ )	$P_{in}$	—	100	mW
Common-Emitter Amplifier Power Gain ( $P_{in} = 100 \text{ mW}$ , $V_{CC} = 12 \text{ Vdc}$ , $f = 175 \text{ MHz}$ )	$G_{pe}$	10	—	dB
*Collector Efficiency (Figure 2) ( $P_{out} = 1.0 \text{ W}$ , $V_{CC} = 12 \text{ Vdc}$ , $f = 175 \text{ MHz}$ )	$\eta$	50	—	%

\*Indicates JEDEC Registered Data

FIGURE 2 – 175 MHz RF AMPLIFIER CIRCUIT FOR POWER-OUTPUT TEST

