2N4130 NPN (SILICON)

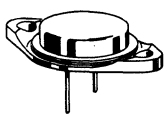
The RF Line

NPN SILICON RF POWER TRANSISTOR

. . . designed primarily for use in large-signal output amplifier stages. Intended for use in industrial communications equipment operating to 100 MHz. High breakdown voltages allow a high percentage of up-modulation in AM circuits operated at 28 volts.

- Balanced Emitter Construction
- Power Output – P_{out} = 50 W @ 70 MHz
- Collector-Base Voltage – 80 Vdc
- Case Common to Emitter

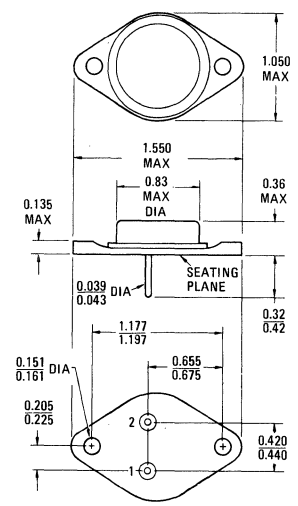
50 W - 70 MHz
RF POWER TRANSISTOR
NPN SILICON



*MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	65	Vdc
Collector-Base Voltage	V_{CBO}	80	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current – Continuous	I_C	10	Adc
Base Current – Continuous	I_B	2.0	Adc
Total Device Dissipation @ $T_C = 25^oC$ Derate above 25^oC	P_D	120 0.8	Watts $W/^oC$
Operating Junction Temperature	T_J	+175	^oC
Storage Temperature Range	T_{stg}	-65 to +200	^oC

*Indicates JEDEC Registered Data



To convert inches to millimeters multiply by 25.4

PIN 1. BASE
2. COLLECTOR
Emitter connected to case

CASE 1

***ELECTRICAL CHARACTERISTICS** (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (I_C = 50 mAdc, I_B = 0)	$V_{CEO(sus)}$	65	–	–	Vdc
Collector-Emitter Sustaining Voltage (I_C = 50 mAdc, R_{BE} = 0)	$V_{CES(sus)}$	80	–	–	Vdc
Collector Cutoff Current	I_{CEV}				mAdc
(V_{CE} = 75 Vdc, V_{BE} = -1.5 Vdc)		–	–	0.2	
(V_{CE} = 50 Vdc, V_{BE} = -1.5 Vdc, T_C = 150°C)		–	–	1.0	
Collector Cutoff Current (V_{CB} = 80 Vdc, I_E = 0)	I_{CBO}	–	–	0.02	mAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	–	–	1.0	mAdc
ON CHARACTERISTICS					
DC Current Gain(1)	h_{FE}				–
(I_C = 2.0 Adc, V_{CE} = 5.0 Vdc)		10	–	60	
(I_C = 10 Adc, V_{CE} = 5.0 Vdc)		10	–	–	
Collector-Emitter Saturation Voltage(1) (I_C = 10 Adc, I_B = 2.0 Adc)	$V_{CE(sat)}$	–	–	2.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain–Bandwidth Product(2) (I_C = 2.0 Adc, V_{CE} = 10 Vdc, f = 50 MHz)	f_T	125	–	–	MHz
Output Capacitance (V_{CB} = 28 Vdc, I_E = 0, f = 0.13 MHz)	C_{ob}	–	125	200	pF
FUNCTIONAL TEST (Figure 1)					
Power Input (Figure 1) (P_{out} = 50 W, R_S = 50 Ohms, V_{CE} = 28 Vdc, f = 70 MHz)	P_{in}	–	–	8.0	Watts
Collector Efficiency (P_{out} = 50 W, R_S = 50 Ohms, V_{CE} = 28 Vdc, f = 70 MHz)	η	50	–	–	%

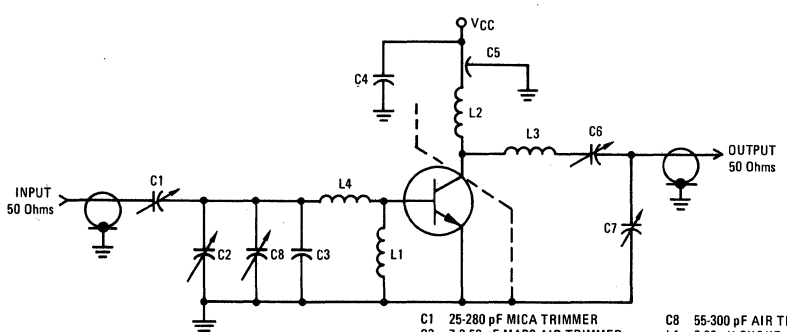
*Indicates JEDEC Registered Data

Notes:

(1) Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle = 1.0%.

(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

FIGURE 1 – 70 MHz POWER GAIN TEST CIRCUIT



C1	25-280 pF MICA TRIMMER	C8	55-300 pF AIR TRIMMER
C2	7.0-50 pF MAPC AIR TRIMMER	L1	0.22 μH CHOKE
C3	200 pF MICA CAPACITOR	L2	0.1 μH CHOKE
C4	0.005 μF CERAMIC CAPACITOR	L3	2 TURNS, #14 AWG, 1" DIA., 1/4" LONG
C5	1500 pF FEEDTHRU CAPACITOR	L4	3/4" LONG, 1/4" WIDE, 0.3" THICK COPPER STRAP
C6,C7	24-200 pF MICA TRIMMER		