

PNP
2N5986, 2N5987
2N5988
NPN
2N5989, 2N5991

**HIGH POWER PLASTIC
COMPLEMENTARY SILICON POWER TRANSISTORS**

... designed for use in general-purpose amplifier and switching circuits.

- Collector-Base Voltage – $V_{CB0} = 60 \text{ Vdc} - 2N5986, 2N5989$
= 80 Vdc – 2N5987
= 100 Vdc – 2N5988, 2N5991
- Collector-Emitter Voltage – $V_{CEO} = 40 \text{ Vdc} - 2N5986, 2N5989$
= 60 Vdc – 2N5987
= 80 Vdc – 2N5988, 2N5991
- DC Current Gain –
 $h_{FE} = 20-120 @ I_C = 6.0 \text{ Adc}$
= 7.0 (Min) @ $I_C = 12 \text{ Adc}$
- Collector-Emitter Saturation Voltage –
 $V_{CE(sat)} = 0.7 \text{ Vdc (Max) @ } I_C = 6.0 \text{ Adc}$

***MAXIMUM RATINGS**

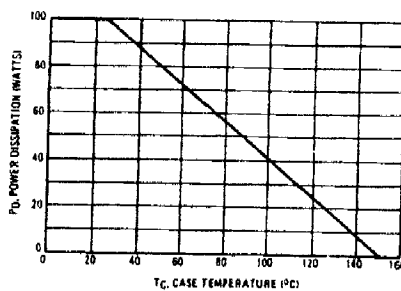
Rating	Symbol	2N5986 2N5989	2N5987	2N5988 2N5991	Unit
Collector-Base Voltage	V_{CB}	60	80	100	Vdc
Collector-Emitter Voltage	V_{CEO}	40	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0			Vdc
Collector Current – Continuous Peak	I_C	12 20			A dc
Base Current	I_B	4.0			A dc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	100 0.8			Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS

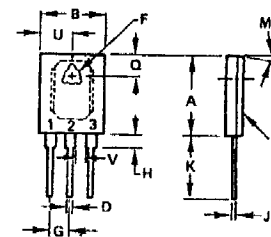
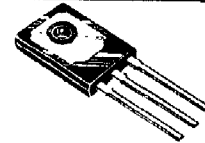
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.25	$^\circ\text{C/W}$

*Indicates JEDEC Registered Data

FIGURE 1 – POWER DERATING



**12 AMPERE
POWER TRANSISTORS
COMPLEMENTARY SILICON
40, 60, 80 VOLTS
100 WATTS**



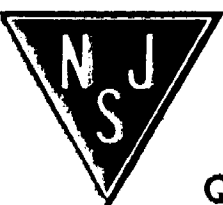
STYLE 2:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

NOTES:

1. DIM "D" UNCONTROLLED IN ZONE "H"
2. DIM "F" DIA THRU
3. HEAT SINK CONTACT AREA (BOTTOM)
4. LEADS WITHIN 0.005" RAD OF TRUE POSITION (TP) AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	16.13	16.38	0.635	0.645
B	12.57	12.83	0.495	0.505
C	3.18	3.43	0.125	0.135
D	1.09	1.24	0.043	0.049
F	3.51	3.76	0.138	0.148
G	4.22 BSC 0.165 BSC			
H	2.67	2.92	0.105	0.115
J	0.813	0.864	0.032	0.034
K	15.11	16.38	0.595	0.645
M	90 TYP 90 TYP			
Q	4.70	4.95	0.185	0.195
R	1.91	2.16	0.076	0.085
U	6.22	6.48	0.245	0.255
V	2.03	-	0.080	-

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2N5986, 2N5987, 2N5988 PNP / 2N5989, 2N5991 NPN

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (I _C = 0.2 Adc, I _B = 0)	V _{CE(sus)}	40 60 80	—	Vdc
Collector Cutoff Current (V _{CE} = 20 Vdc, I _B = 0) (V _{CE} = 30 Vdc, I _B = 0) (V _{CE} = 40 Vdc, I _B = 0)	I _{CEO}	— — —	2.0 2.0 2.0	mA _{dc}
Collector Cutoff Current (V _{CE} = 60 Vdc, V _{BE(off)} = 1.5 Vdc) (V _{CE} = 80 Vdc, V _{BE(off)} = 1.5 Vdc) (V _{CE} = 100 Vdc, V _{BE(off)} = 1.5 Vdc) (V _{CE} = 40 Vdc, V _{BE(off)} = 1.5 Vdc, T _C = 125°C) (V _{CE} = 60 Vdc, V _{BE(off)} = 1.5 Vdc, T _C = 125°C) (V _{CE} = 80 Vdc, V _{BE(off)} = 1.5 Vdc, T _C = 125°C)	I _{CEx}	— — — — — —	200 200 200 2.0 2.0 2.0	μA _{dc} mA _{dc}
Emitter Cutoff Current (V _{BE} = 5.0 Vdc, I _C = 0)	I _{EBO}	—	1.0	mA _{dc}
ON CHARACTERISTICS				
DC Current Gain (I _C = 1.5 Adc, V _{CE} = 2.0 Vdc) (I _C = 6.0 Adc, V _{CE} = 2.0 Vdc) (I _C = 12 Adc, V _{CE} = 2.0 Vdc)	h _{FE}	40 20 7.0	— 120 —	—
Collector-Emitter Saturation Voltage (I _C = 6.0 Adc, I _B = 0.6 Adc) (I _C = 12 Adc, I _B = 1.8 Adc)	V _{CE(sat)}	— —	0.6 1.7	Vdc
Base-Emitter Saturation Voltage (I _C = 12 Adc, I _B = 1.8 Adc)	V _{BE(sat)}	—	2.5	Vdc
Base-Emitter On Voltage (I _C = 6.0 Adc, V _{CE} = 2.0 Vdc)	V _{BE(on)}	—	1.4	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain — Bandwidth Product (I _C = 0.5 Adc, V _{CE} = 10 Vdc, f _{test} = 1.0 MHz)	f _T	2.0	—	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{ob}	— —	500 300	pF
Small-Signal Current Gain (I _C = 2.0 Adc, V _{CE} = 4.0 Vdc, f = 1.0 kHz)	h _{fe}	20	—	—

*Indicates JEDEC Registered Data.

(1) f_T = |h_{fe}| @ f_{test}

FIGURE 2 — SWITCHING TIMES TEST CIRCUIT

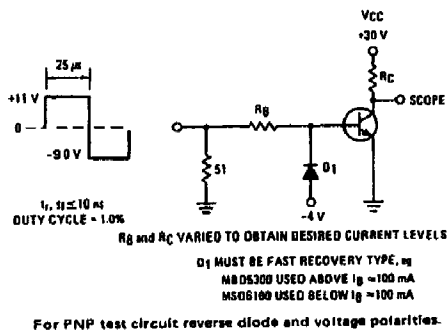


FIGURE 3 — TURN-ON TIME

