

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

***MAXIMUM RATINGS**

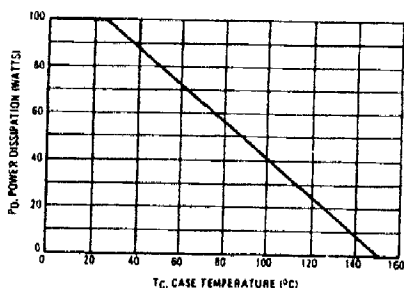
Rating	Symbol	2N5986 2N5989	2N5987	2N5988 2N5991	Unit
Collector-Base Voltage	V_{CB}	60	80	100	Vdc
Collector-Emitter Voltage	V_{CEO}	40	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0			Vdc
Collector Current - Continuous Peak	I_C	12 20			Adc
Base Current	I_B	4.0			Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ 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

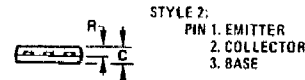
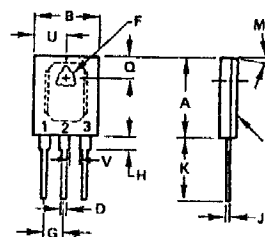
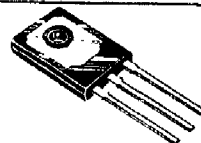
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.25	$^\circ\text{C/W}$

*Indicates JEDEC Registered Data

FIGURE 1 - POWER DERATING



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

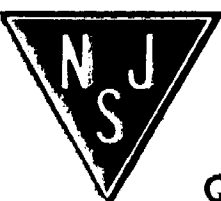


STYLE 2:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

NOTES:

- DIM "D" UNCONTROLLED IN ZONE "H"
- DIM "F" DIA THRU
- HEAT SINK CONTACT AREA (BOTTOM)
- 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		0.166 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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Quality Semi-Conductors

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

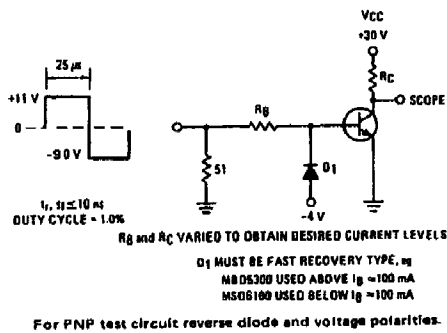


FIGURE 3 -- TURN-ON TIME

