

**PLASTIC MEDIUM-POWER
COMPLEMENTARY SILICON TRANSISTORS**

...designed for general-purpose amplifier and low speed switching applications

FEATURES:

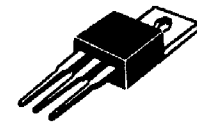
- * Collector-Emitter Sustaining Voltage-
 $V_{CE(sus)}$ = 60 V (Min) - TIP110, TIP115
= 80 V (Min) - TIP111, TIP116
= 100 V (Min) - TIP112, TIP117
- * Collector-Emitter Saturation Voltage
 $V_{CE(sat)}$ = 2.5 V (Max.) @ $I_C = 2.0 A$
- * Monolithic Construction with Built-in Base-Emitter Shunt Resistor

NPN	PNP
TIP110	TIP115
TIP111	TIP116
TIP112	TIP117

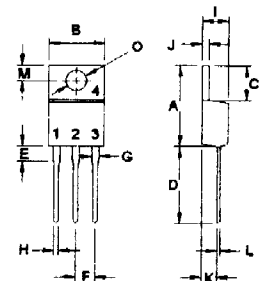
**2.0 AMPERE
DARLINGTON
COMPLEMENTARY SILICON
POWER TRANSISTORS**
60-100 VOLTS
50 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	TIP110 TIP115	TIP111 TIP116	TIP112 TIP117	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	100	V
Collector-Base Voltage	V_{CBO}	60	80	100	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	2.0 4.0			A
Base Current	I_B	50			mA
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	50 0.4			W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150			$^\circ C$



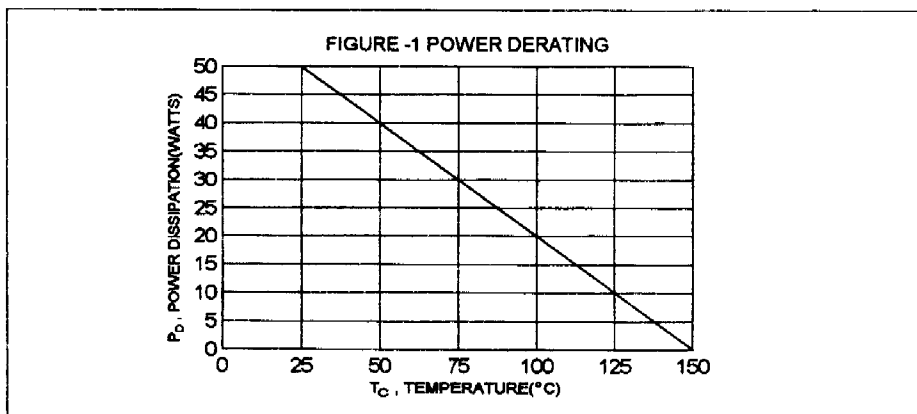
TO-220



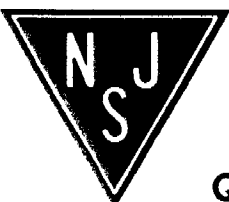
PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.5	$^\circ C/W$



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.96
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90



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Quality Semi-Conductors

TIP110, TIP111, TIP112 NPN / TIP115, TIP116, TIP117 PNP

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector - Emitter Sustaining Voltage (1) ($I_C = 30\text{ mA}$, $I_B = 0$)	TIP110, TIP115 TIP111, TIP116 TIP112, TIP117	$V_{CE(sus)}$	60 80 100	V
Collector Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 40\text{ V}$, $I_B = 0$) ($V_{CE} = 50\text{ V}$, $I_B = 0$)	TIP110, TIP115 TIP111, TIP116 TIP112, TIP117	I_{CEO}		2.0 2.0 2.0
Collector Cutoff Current ($V_{CB} = 60\text{ V}$, $I_E = 0$) ($V_{CB} = 80\text{ V}$, $I_E = 0$) ($V_{CB} = 100\text{ V}$, $I_E = 0$)	TIP110, TIP115 TIP111, TIP116 TIP112, TIP117	I_{CBO}		1.0 1.0 1.0
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)		I_{EBO}		2.0

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 1.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 2.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	h_{FE}	1000 500		
Collector-Emitter Saturation Voltage ($I_C = 2.0\text{ A}$, $I_B = 8.0\text{ mA}$)	$V_{CE(sat)}$		2.5	V
Base-Emitter On Voltage ($I_C = 2.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	$V_{BE(on)}$		2.8	V

DYNAMIC CHARACTERISTICS

Small-Signal Current Gain ($I_C = 0.75\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	h_{fe}	25		
Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 0.1\text{ MHz}$)	TIP110, TIP111, TIP112 TIP115, TIP116, TIP117	C_{ob}	250 150	pF

(1) Pulse Test: Pulse width = 300 us , Duty Cycle \leq 2.0%

