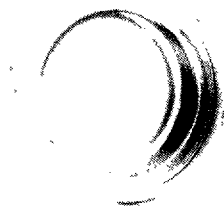


150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

2N6051, 2N6052,
2N6058, 2N6059



FEATURES

- Electrical specifications guaranteed at 25°C
- Guaranteed minimum DC current gain at full rated current
- Hermetically sealed

DESCRIPTION

The 2N6058, 2N6059 devices are three-terminal NPN Darlington Power Transistors. The 2N6051, 2N6052 devices are PNP Darlington Power Transistors. These devices are monolithic epitaxial base structures with built-in base to emitter shunt resistors. The devices are CVD glass passivated to increase reliability and provide reduced high-temperature reverse leakage current. Internal diode protection (D1) of the Darlington configuration is built into the structure to limit the device power dissipation during negative overshoot.

*MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Collector Emitter Voltage 2N6051, 2N6058 2N6052, 2N6059	V_{CEO}	80 100	Vdc
Collector Base Voltage 2N6051, 2N6058 2N6052, 2N6059	V_{CBO}	80 100	Vdc
Emitter Base Voltage	V_{EBO}	5	Vdc
Collector Current Continuous Peak	I_C	12 20	Adc
Base Current	I_B	0.2	Adc
Thermal Resistance	θ_{JC}	1.17	°C/Watt
Total Internal Power Dissipation (at $T_C = 25^\circ\text{C}$ *)	P_D	150	Watts
Operating Junction and Storage Temperature	T_J T_{STG}	-65 to +200	°C

*Indicates JEDEC Registered Data

(*) For operation above $T_C = 25^\circ\text{C}$, derate (at 0.857 W/°C

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DEVICE SELECTION GUIDE

DEVICE	VOLTAGE RATING	POLARITY
2N6058	80V	NPN
2N6059	100V	NPN
2N6051	80V	PNP
2N6052	100V	PNP

These Darlington devices are hermetically sealed steel TO-3 packages providing high reliability and low thermal resistance.

2N6051, 2N6052,
2N6058, 2N6059

150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

*ELECTRICAL CHARACTERISTICS

All parameters are guaranteed at $T_C = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Minimum	Maximum	Units
ON CHARACTERISTICS					
Collector Emitter Saturation Voltage ¹	$V_{CE(sat)}$	$I_C = 6 \text{ Adc}, I_B = 24 \text{ mAdc}$ $I_C = 12 \text{ Adc}, I_B = 120 \text{ mAdc}$		2.0 3.0	Vdc
Base Emitter Turn-on Voltage ¹	$V_{BE(on)}$	$I_C = 6 \text{ Adc}, V_{CE} = 3 \text{ Vdc}$		2.8	Vdc
Base Emitter Saturation ¹	$V_{BE(sat)}$	$I_C = 12 \text{ Adc}, I_B = 120 \text{ mAdc}$		4.0	Vdc
DC Current Gain ¹	h_{FE}	$I_C = 6 \text{ Adc}, V_{CE} = 3 \text{ Vdc}$ $I_C = 12 \text{ Adc}, V_{CE} = 3 \text{ Vdc}$	750 100	18,000	
OFF CHARACTERISTICS					
Collector Emitter Sustaining Voltage ¹ 2N6051, 2N6058 2N6052, 2N6059	$V_{CEO(sus)}$	$I_{CE} = 100 \text{ mAdc}, I_B = 0\text{A}$	80 100		Vdc
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5 \text{ Vdc}, I_C = 0\text{A}$		2.0	mAdc
Collector Cutoff Current 2N6051, 2N6058 2N6052, 2N6059	I_{CEO}	$V_{CE} = 40 \text{ Vdc}, I_B = 0\text{A}$ $V_{CE} = 50 \text{ Vdc}, I_B = 0\text{A}$		1.0 1.0	mAdc
Collector Cutoff Current	I_{CEX}	$V_{CE} = \text{Rated}, V_{BE(off)} = 1.5 \text{ Vdc}$ $V_{CE} = \text{Rated}, V_{BE(off)} = 1.5 \text{ Vdc},$ $T_C = 150^\circ\text{C}$		0.5 5.0	mAdc
DYNAMIC CHARACTERISTICS					
Output Capacitance	C_{ob}	$V_{CB} = 10 \text{ Vdc}, I_E = 0 \text{ Adc}$ $f = 0.1 \text{ MHz}$		500	pF
Small Signal Current Gain	h_{fe}	$I_C = 5 \text{ Adc}, V_{CE} = 3 \text{ Vdc}$ $f = 1 \text{ kHz}$	300		
Common Emitter Short Circuit Forward Transfer Ratio	$ h_{fe} $	$I_C = 5 \text{ Adc}, V_{CE} = 3 \text{ Vdc}$ $f = 1 \text{ MHz}$	4		

* Indicates JEDEC Registered Data

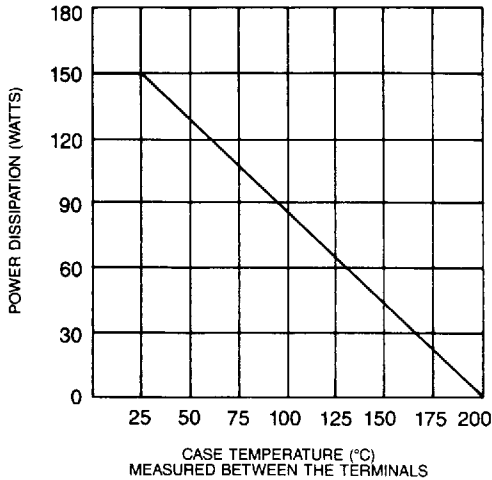
(1) Pulse tested with pulse width $\leq 300 \mu\text{s}$ and duty cycle $\leq 2.0\%$

150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

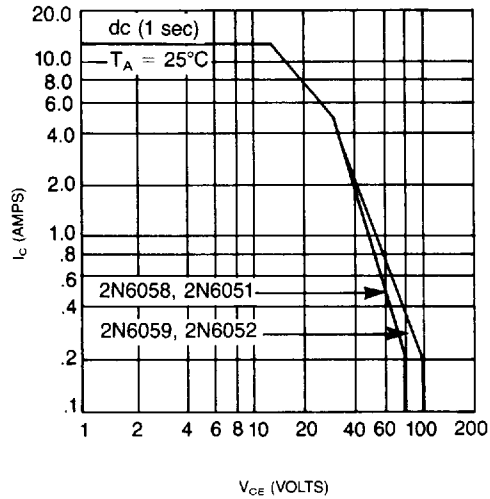
2N6051, 2N6052,
2N6058, 2N6059

OPERATIONAL DATA

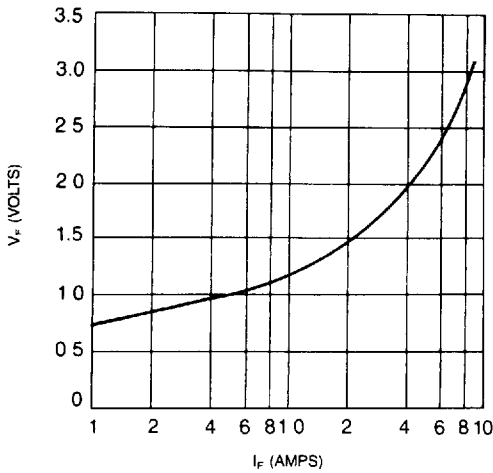
POWER DERATING



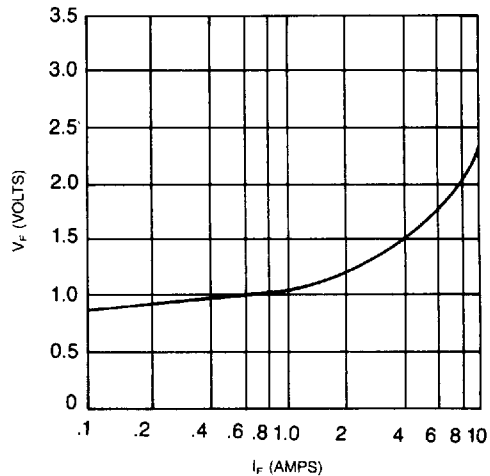
SAFE OPERATING AREA



FORWARD VOLTAGE OF D1 (2N6058, 2N6059)



FORWARD VOLTAGE OF D1 (2N6051, 2N6052)



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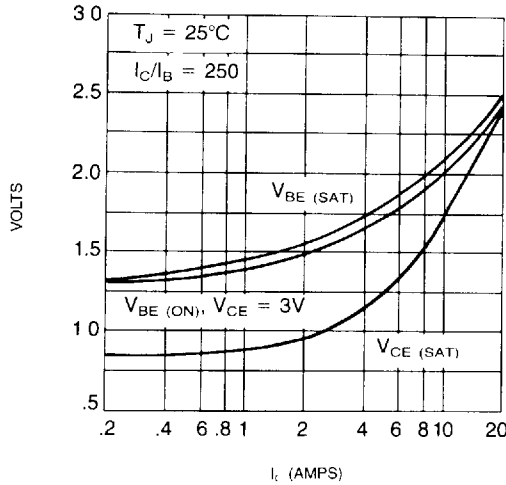
2N6051, 2N6052,
2N6058, 2N6059

150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

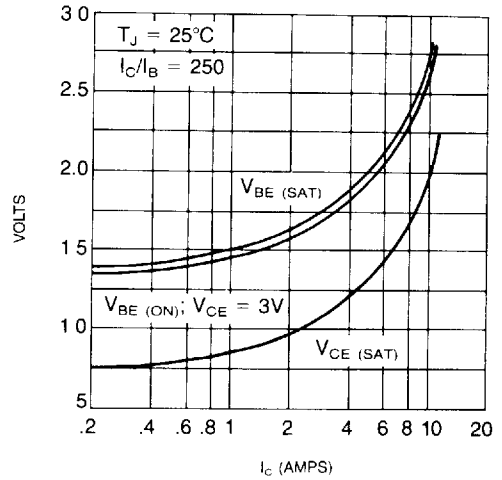
OPERATIONAL DATA

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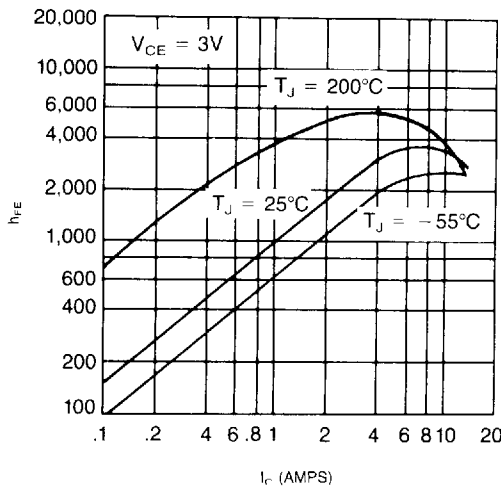
**ON VOLTAGE VS
COLLECTOR CURRENT
(2N6058, 2N6059)**



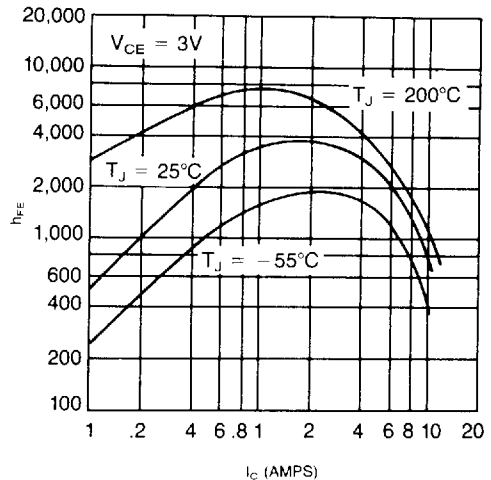
**ON VOLTAGE VS
COLLECTOR CURRENT
(2N6051, 2N6052)**



**DC COLLECTOR CURRENT GAIN
VS COLLECTOR CURRENT
(2N6058, 2N6059)**



**DC COLLECTOR CURRENT GAIN
VS COLLECTOR CURRENT
(2N6051, 2N6052)**

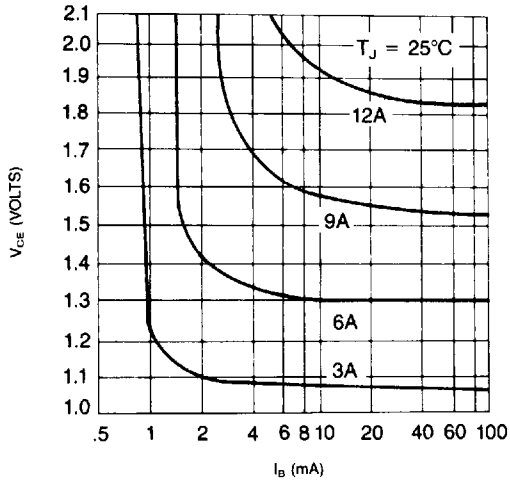


150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

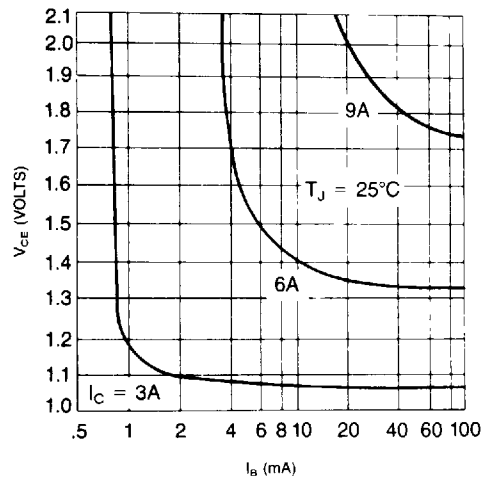
2N6051, 2N6052,
2N6058, 2N6059

OPERATIONAL DATA

**COLLECTOR SATURATION REGION
(2N6058, 2N6059)**



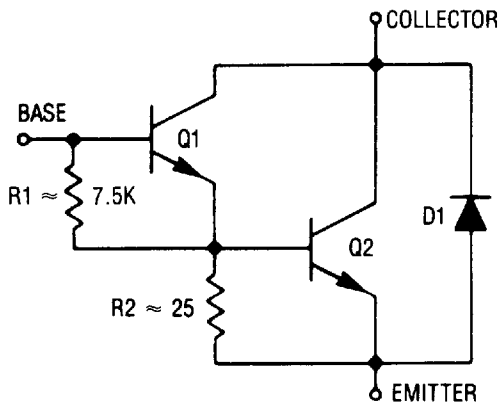
**COLLECTOR SATURATION REGION
(2N6051, 2N6052)**



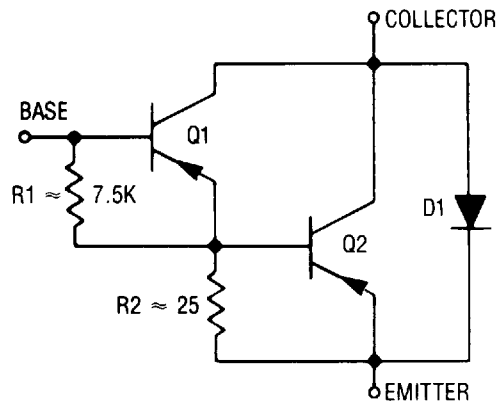
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BLOCK DIAGRAMS

NPN



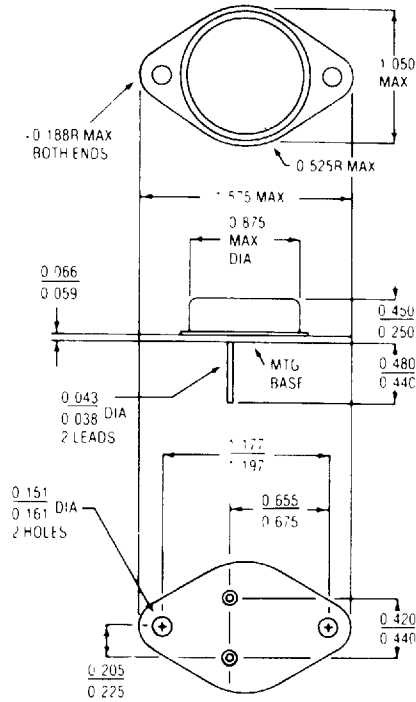
PNP



2N6051, 2N6052,
2N6058, 2N6059

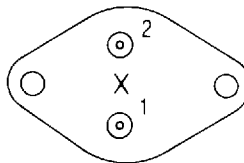
150 WATT (12 AMP CONTINUOUS, 20 AMP PEAK)

DEVICE OUTLINE



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Bottom View



- 1 - Base
- 2 - Emitter
- Case is Collector

NOTE: Case temperature measured at point X.
All dimensions are in inches.