

2N3773, 2N4348, 2N6259

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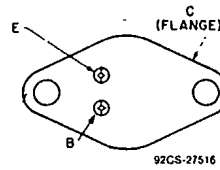
## High-Voltage, High-Current Power Transistors

Broadly Applicable Devices for  
Industrial and Commercial Use

**Features:**

- High dissipation capability —  
120 W (2N4348), 150 W (2N3773), 250 W (2N6259)
- 5-A specification for  $h_{FE}$ ,  $V_{BE}$ , and  $V_{CE}(sat)$  (2N4348)
- 8-A specification for  $h_{FE}$ ,  $V_{BE}$ , and  $V_{CE}(sat)$  (2N3773, 2N6259)

**TERMINAL DESIGNATIONS**



JEDEC TO-204AA/TO-3

The RCA-2N3773, 2N4348, and 2N6259 are silicon n-p-n transistors intended for a wide variety of medium-voltage, high-current applications. Typical applications for these transistors include power-switching circuits, audio amplifiers, series and shunt-regulator driver and output stages, dc-to-dc converters, inverters, and solenoid (hammer)/relay driver service.

This device employs the popular JEDEC TO-204AA/TO-3 package.

**MAXIMUM RATINGS, Absolute-Maximum Values:**

	2N4348	2N3773	2N6259	
*COLLECTOR-TO-BASE VOLTAGE, $V_{CBO}$	140	160	170	V
*COLLECTOR-EMITTER VOLTAGE, $V_{CEX}$	140	160	170	V
*COLLECTOR-EMITTER VOLTAGE, $V_{CEO}$	120	140	150	V
*EMITTER-BASE VOLTAGE, $V_{EBO}$	7	7	7	V
*COLLECTOR CURRENT				
DC, $I_C$	10	16	16	A
Peak, $I_{CM}$	30	30	30	A
*BASE CURRENT				
DC, $I_B$	4	4	4	A
Peak, $I_{BM}$	15	15	15	A
*COLLECTOR POWER DISSIPATION, $P_T$ ( $T_c = 25^\circ\text{C}$ )	120	150	250	W
Derate Linearly above $25^\circ\text{C}$	0.686	0.857	1.43	W/ $^\circ\text{C}$
*JUNCTION TEMPERATURE, $T_j$	200			$^\circ\text{C}$
*STORAGE TEMPERATURE, $T_{sig}$	-65 to +200			$^\circ\text{C}$

\*In accordance with JEDEC registration data.

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ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C Unless Otherwise Specified

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS						UNITS
		VOLTAGE V dc		CURRENT A dc		2N4348		2N3773		2N6259		
		V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.	Min.	Max.	Min.	Max.	
Collector-Cutoff Current: With emitter open, V <sub>CB</sub> = 140 V	I <sub>CBO</sub>					-	-	-	2	-	-	mA
With base-emitter junction reverse-biased	I <sub>CEX</sub>	120	-1.5			-	2	-	-	-	-	mA
		140	-1.5			-	-	-	2	-	-	mA
		150	-1.5			-	-	-	-	-	0.2	mA
With base-emitter junction reverse-biased and T <sub>C</sub> = 150°C	I <sub>CEX</sub>	120	-1.5			-	10	-	-	-	-	mA
		140	-1.5			-	-	-	10	-	-	mA
		150	-1.5			-	-	-	-	-	4	mA
With base open	I <sub>CEO</sub>	100				-	200	-	-	-	-	mA
		120				-	-	-	10	-	2	mA
Emitter-Cutoff Current	I <sub>EBO</sub>		-7	0		-	5	-	5	-	2	mA
DC Forward Current Transfer Ratio	h <sub>FE</sub>	4		5 <sup>a</sup>		15	60	-	-	-	-	
		4		8 <sup>a</sup>		-	-	15	60	-	-	
		2		8 <sup>a</sup>		-	-	-	-	15	60	
		4		10 <sup>a</sup>		10	-	-	-	-	-	
Collector-to-Emitter Sustaining Voltage:** With base-emitter junction reverse-biased (R <sub>BE</sub> = 100Ω)	V <sub>CEX(sus)</sub>	4		5 <sup>a</sup>		140	-	160	-	170	-	V
		4		8 <sup>a</sup>		-	-	-	-	-	-	
		2		8 <sup>a</sup>		-	-	-	-	-	-	
		4		10 <sup>a</sup>		-	-	5	-	10	-	
With external base-to-emitter resistance (R <sub>BE</sub> ) = 100Ω	V <sub>CER(sus)</sub>	4		5 <sup>a</sup>		140	-	150	-	160	-	V
		4		8 <sup>a</sup>		-	-	-	-	-	-	
		4		10 <sup>a</sup>		-	-	-	-	-	-	
With base open	V <sub>CEO(sus)</sub>			0.2 <sup>a</sup>	0	120	-	140	-	150	-	V
Base-to-Emitter Voltage	V <sub>BE</sub>	4		5 <sup>a</sup>		-	2	-	-	-	-	V
		4		8 <sup>a</sup>		-	-	-	2.2	-	-	
		2		8 <sup>a</sup>		-	-	-	-	-	2	
		4		10 <sup>a</sup>		-	3	-	-	-	-	
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	4		5 <sup>a</sup>	0.5	-	1	-	-	-	-	V
		4		8 <sup>a</sup>	0.8	-	-	-	1.4	-	1	
		2		10 <sup>a</sup>	1.25	-	2	-	-	-	-	
		4		16 <sup>a</sup>	3.2	-	-	-	4	-	2.5	
Second-Breakdown Collector Current With base forward-biased and 1-s nonrepetitive pulse	I <sub>S/b</sub>	80				1.5	-	-	-	-	-	A
		100				-	-	1.5	-	2.5	-	
Magnitude of Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 50 kHz)	h <sub>fe</sub>	4		1		4	-	4	-	4	-	
Common-Emitter, Small- Signal, Short-Circuit, Forward Current Transfer Ratio (f = 1 kHz)	h <sub>fe</sub>	4		1		40	-	40	-	40	-	
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>					-	1.46	-	1.17	-	0.7	°C/W

\*In accordance with JEDEC registration data.

\*\*The sustaining voltages V<sub>CEX(sus)</sub> and V<sub>CEO(sus)</sub> MUST NOT be measured on a curve tracer.

<sup>a</sup>Pulsed; pulse duration = 300μs, rep. rate = 60 Hz, duty factor ≤ 2%.

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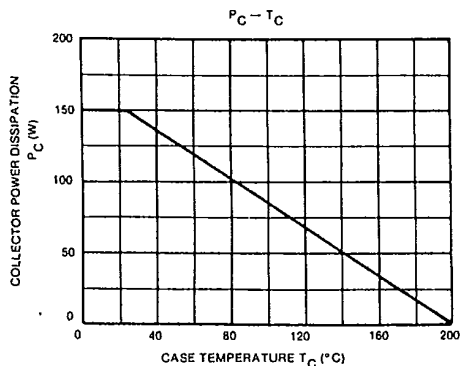


Fig. 1 — Dissipation derating curve for all types.

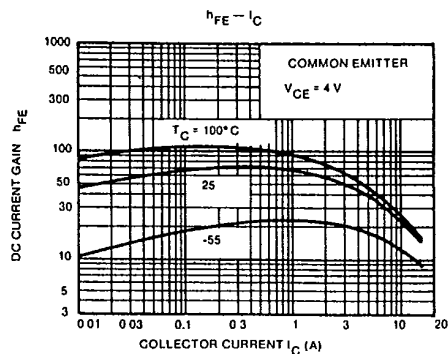


Fig. 2 — Typical dc-beta characteristics for all types.

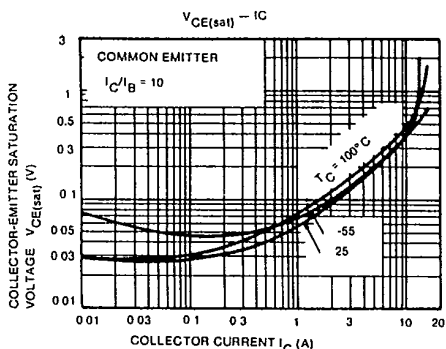


Fig. 3 — Typical collector-to-emitter saturation voltage characteristics for all types.

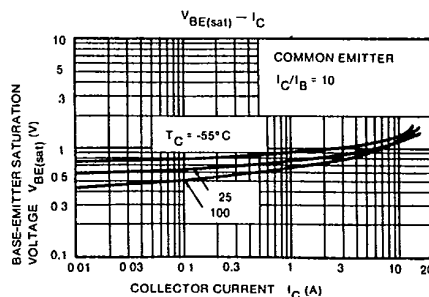


Fig. 4 — Typical base-to-emitter saturation voltage as a function of collector current for all types.

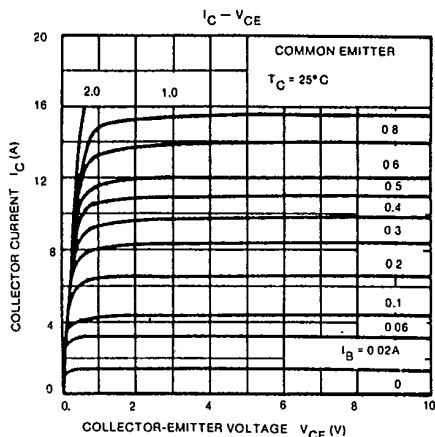


Fig. 5 — Typical output characteristics for all types.

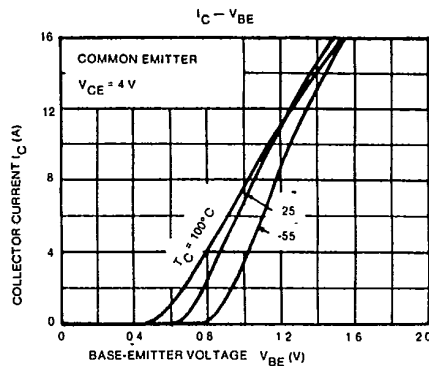


Fig. 6 — Typical transfer characteristics for 2N3773 and 2N4348.