2N3773, 2N4348, 2N6259

File Number **526**

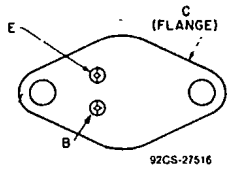
High-Voltage, High-Current Power Transistors

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°C)	120	150	250	W
Derate Linearly above 25°C	0.686	0.857	1.43	W/°C
*JUNCTION TEMPERATURE, T_j	200			°C
*STORAGE TEMPERATURE, T_{stg}	-65 to +200			°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_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	Min.	Max.	
*Collector-Cutoff Current: With emitter open, V_{CB}=140 V	I_{CBO}					–	–	–	2	–	–	mA
With base-emitter junction reverse-biased	I_{CEX}	120	−1.5			–	2	–	–	–	–	mA
		140	−1.5			–	–	–	2	–	–	
		150	−1.5			–	–	–	–	–	0.2	
With base-emitter junction reverse-biased and T_C = 150°C	I_{CEX}	120	−1.5			–	10	–	–	–	–	mA
		140	−1.5			–	–	–	10	–	–	
		150	−1.5			–	–	–	–	–	4	
With base open	I_{CEO}	100				–	200	–	–	–	–	mA
		120				–	–	–	10	–	2	
*Emitter-Cutoff Current	I_{EBO}		−7	0		–	5	–	5	–	2	mA
*DC Forward Current Transfer Ratio	h_{FE}	4		5[a]		15	60	–	–	–	–	
		4		8[a]		–	–	15	60	–	–	
		2		8[a]		–	–	–	–	15	60	
		4		10[a]		10	–	–	–	–	–	
		4		16[a]		–	–	5	–	10	–	
Collector-to-Emitter Sustaining Voltage:** With base-emitter junction reverse-biased (R_{BE} = 100Ω)	V_{CEX}(sus)		−1.5	0.1		140	–	160	–	170	–	V
With external base-to-emitter resistance (R_{BE}) = 100Ω	V_{CER}(sus)			0.2[a]		140	–	150	–	160	–	V
*With base open	V_{CEO}(sus)			0.2[a]	0	120	–	140	–	150	–	V
*Base-to-Emitter Voltage	V_{BE}	4		5[a]		–	2	–	–	–	–	V
		4		8[a]		–	–	–	2.2	–	–	
		2		8[a]		–	–	–	–	–	2	
		4		10[a]		–	3	–	–	–	–	
*Collector-to-Emitter Saturation Voltage	V_{CE}(sat)			5[a]	0.5	–	1	–	–	–	–	V
				8[a]	0.8	–	–	–	1.4	–	1	
				10[a]	1.25	–	2	–	–	–	–	
				16[a]	3.2	–	–	–	4	–	2.5	
Second-Breakdown Collector Current With base forward-biased and 1-s nonrepetitive pulse	$I_{S/b}$	80				1.5	–	–	–	–	–	A
		100				–	–	1.5	–	2.5	–	
*Magnitude of Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 50 kHz)	$\lvert h_{fe} \rvert$	4		1		4	–	4	–	4	–	
*Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 1 kHz)	h_{fe}	4		1		40	–	40	–	40	–	
Thermal Resistance Junction-to-Case	$R_{\theta JC}$					–	1.46	–	1.17	–	0.7	°C/W

*In accordance with JEDEC registration data.
**The sustaining voltages V_{CEX}(sus) and V_{CEO}(sus) MUST NOT be measured on a curve tracer.
[a]Pulsed; pulse duration = 300μs, rep. rate = 60 Hz, duty factor ≤ 2.%.

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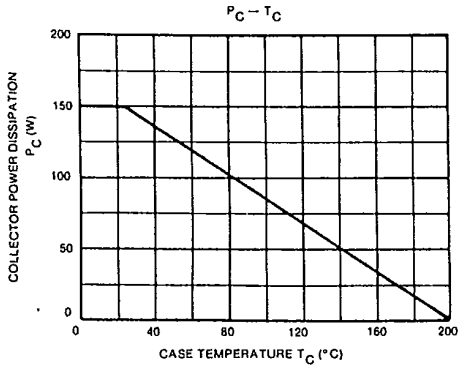

Fig. 1 — Dissipation derating curve for all types.

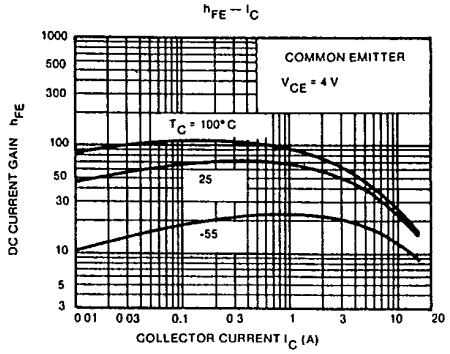

Fig. 2 — Typical dc-beta characteristics for all types.

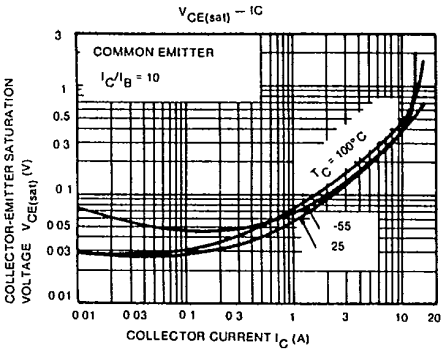

Fig. 3 — Typical collector-to-emitter saturation voltage characteristics for all types.

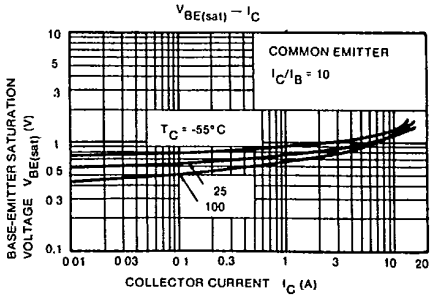

Fig. 4 — Typical base-to-emitter saturation voltage as a function of collector current for all types.

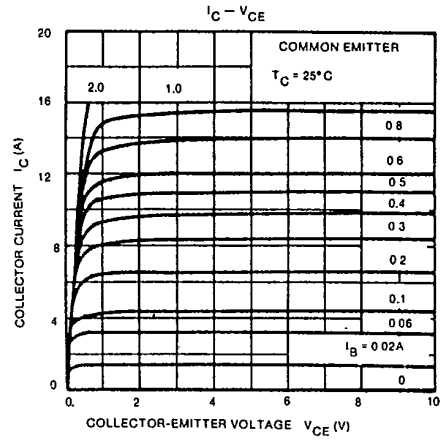

Fig. 5 — Typical output characteristics for all types.

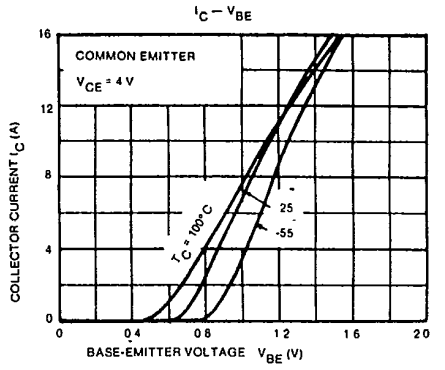

Fig. 6 — Typical transfer characteristics for 2N3773 and 2N4348.