

2N3773, 2N4348, 2N6259

Hometaxial-Base, High Current Silicon N-P-N Transistors

Rugged High-Voltage Devices for Applications in Industrial and Commercial Equipment

These RCA types are hometaxial-base silicon n-p-n transistors intended for a wide variety of high-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.

These devices employ the popular JEDEC TO-3 package; they differ in maximum ratings for voltage, current, and power.

Features:

- High dissipation capability —
120 W (2N4348), 150 W (2N3773), 250 W (2N6259)
- 5-A specification for h_{FE} , V_{BE} , & $V_{CE(sat)}$ (2N4348)
- 8-A specification for h_{FE} , V_{BE} , & $V_{CE(sat)}$ (2N3773, 2N6259)
- V_{CEX} —
140 V min (2N4348), 160 V min (2N3773)
170 V min (2N6259)
- Low saturation voltage with high beta

MAXIMUM RATINGS, Absolute-Maximum Values:

	2N4348	2N3773	2N6259	
* COLLECTOR-TO-BASE VOLTAGE	V _{CBO}	140	160	170
COLLECTOR-TO-EMITTER VOLTAGE:				
* With base open	V _{CEO}	120	140	150
With reverse bias (V _{BE}) of -1.5 V	V _{CEX}	140	160	170
* EMITTER-TO-BASE VOLTAGE	V _{EBO}	7	7	7
* COLLECTOR CURRENT:	I _C			
Continuous		10	16	16
Peak		30	30	30
* BASE CURRENT:	I _B			
Continuous		4	4	4
Peak		15	15	15
* TRANSISTOR DISSIPATION:	P _T			
At case temperatures up to 25°C		120	150	250
At case temperatures above 25°C		Derate linearly to 200°C		
* TEMPERATURE RANGE:				
Storage & Operating (Junction)		← -65 to +200 →		
* PIN TEMPERATURE (During Soldering):				
At distances ≥ 1/32 in. (0.8 mm) from case for 10 s max.		← 230 →		

* In accordance with JEDEC registration data format (JES-6, RDF-2).

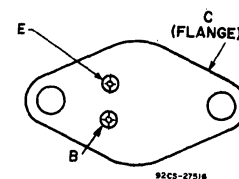
	2N4348	2N3773	2N6259	
V_{CBO}	140	160	170	V
V_{CEO}	120	140	150	V
V_{CEX}	140	160	170	V
V_{EBO}	7	7	7	V
I_C	10	16	16	A
I_B	4	4	4	A
P_T	120	150	250	W

Derate linearly to 200°C

— -65 to +200 — — °C

— 230 — — °C

TERMINAL DESIGNATIONS



JEDEC TO-3

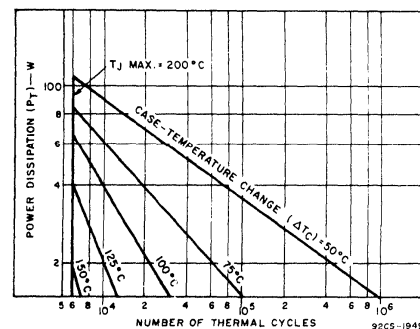


Fig. 2 - Thermal-cycle rating chart for 2N3773.

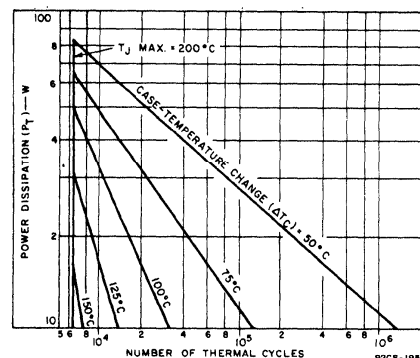


Fig. 3 - Thermal-cycle rating chart for 2N4348.

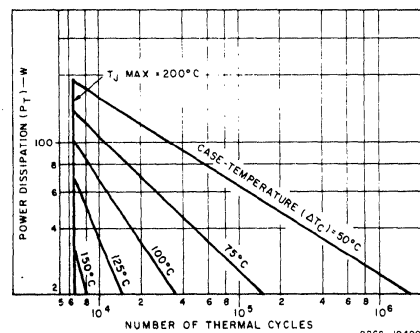


Fig. 4 - Thermal-cycle rating chart for 2N6259.

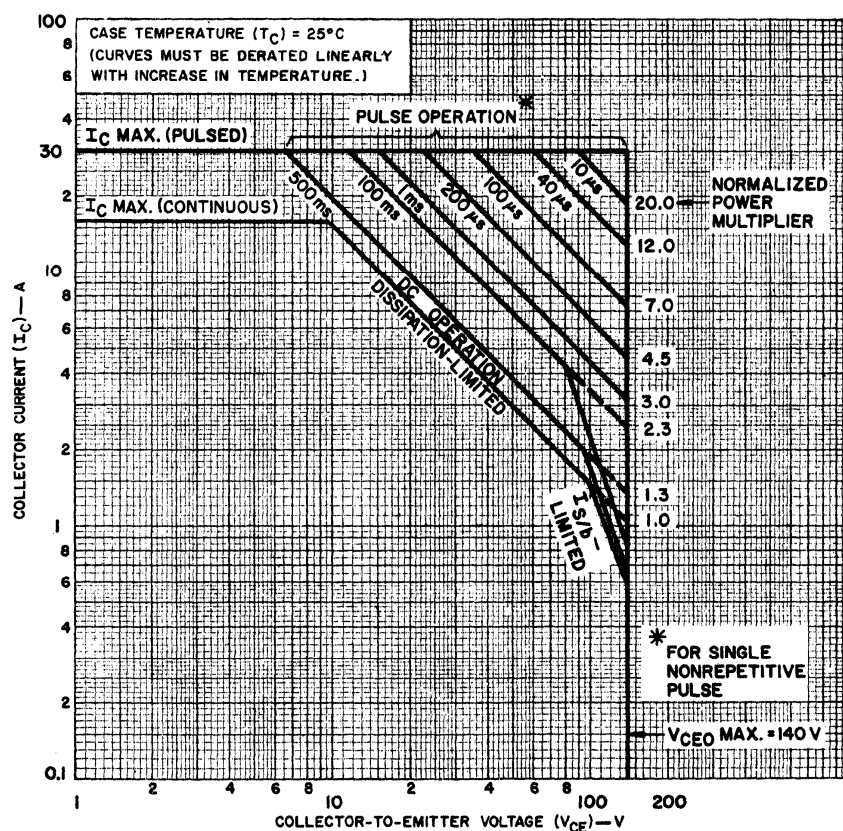


Fig. 1 - Maximum operating areas for 2N3773.

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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		
		VCE	VBE	IC	IB	Min.	Max.	Min.	Max.	Min.	Max.	
Collector-Cutoff Current: With emitter open, VCB=140 V	ICBO					—	—	—	2	—	—	mA
With base-emitter junction reverse-biased	ICEX	120 140 150	-1.5 -1.5 -1.5			— — —	2 — —	— — —	— 2 —	— — 0.2	—	mA
With base-emitter junction reverse-biased and TC = 150°C	ICEX	120 140 150	-1.5 -1.5 -1.5			— — —	10 — —	— — —	— 10 —	— — 4	—	mA
With base open	ICEO	100 120				— —	20 —	— —	— 10	— 2	—	mA
Emitter-Cutoff Current	IEBO		-7	0		—	5	—	5	—	2	mA
DC Forward Current Transfer Ratio	hFE	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 (RBE = 100Ω)	VCEX(sus)		-1.5	0.1		140	—	160	—	170	—	V
With external base-to emitter resistance (RBE) = 100Ω	VCER(sus)			0.2 ^a		140	—	150	—	160	—	V
With base open	VCEO(sus)			0.2 ^a	0	120	—	140	—	150	—	V
Base-to-Emitter Voltage	VBE	4		5 ^a		—	2	—	—	—	—	V
		4		8 ^a		—	—	2.2	—	—	—	V
		2		8 ^a		—	—	—	—	2	—	V
		4		10 ^a		—	3	—	—	—	—	V
Collector-to-Emitter Saturation Voltage	VCE(sat)			5 ^a	0.5	—	1	—	—	—	—	V
				8 ^a	0.8	—	—	1.4	—	1	—	V
				10 ^a	1.25	—	2	—	—	—	—	V
				16 ^a	3.2	—	—	4	—	2.5	—	V
Second-Breakdown Collector Current With base forward-biased and 1-s nonrepetitive pulse	IS/b ^b	80 100				1.5 —	— 1.5	— —	— 2.5	—	—	A
Second-Breakdown Energy With base reverse-biased and L = 40 mH, RBE = 100Ω	ES/b ^c		-1.5	2.5		0.125	—	0.125	—	0.125	—	J
Magnitude of Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 50 kHz)	hfe	4		1		4	—	4	—	4	—	
Common-Emitter, Small- Signal, Short-Circuit, Forward Current Transfer Ratio (f = 1 kHz)	hfe	4		1		40	—	40	—	40	—	
Thermal Resistance Junction-to-Case	RθJC					—	1.46	—	1.17	—	0.7	°C/W

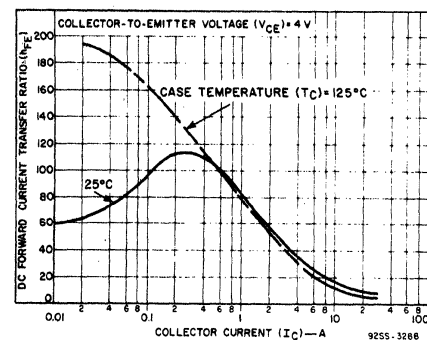
^a In accordance with JEDEC registration data format JS-6 RDF-2.^b Pulsed; pulse duration = 300 μ s, rep. rate = 60 Hz.^c $I_{S/bb}$ is defined as the current at which second breakdown occurs at a specified collector voltage with the emitter base junction forward-biased for transistor operation in the active region.^d $E_{S/bb}$ is defined as the energy at which second breakdown occurs under specified reverse-bias conditions. $E_{S/bb} = 1/2LI^2$ where L is a series load or leakage inductance and I is the peak collector current.

Fig. 5 - Typical dc beta characteristics for 2N3773.

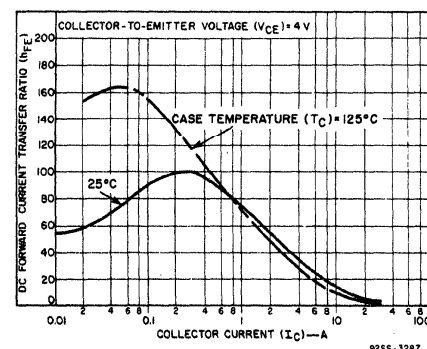


Fig. 6 - Typical dc beta characteristics for 2N4348.

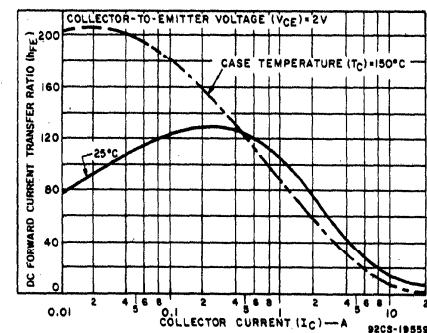


Fig. 7 - Typical dc beta characteristics for 2N6259.

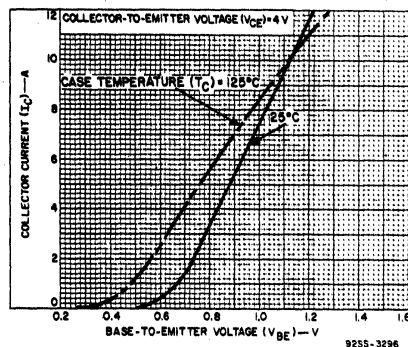


Fig. 8 - Typical transfer characteristics for 2N3773.

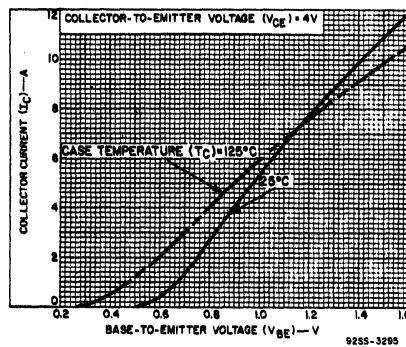


Fig. 9 - Typical transfer characteristics for 2N4348.

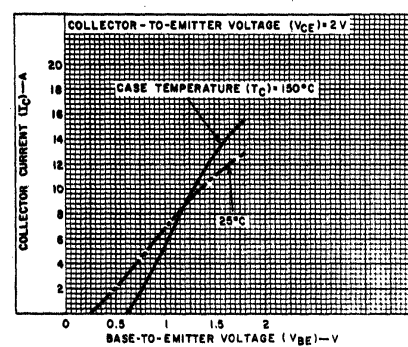


Fig. 10 - Typical transfer characteristics for 2N6259.

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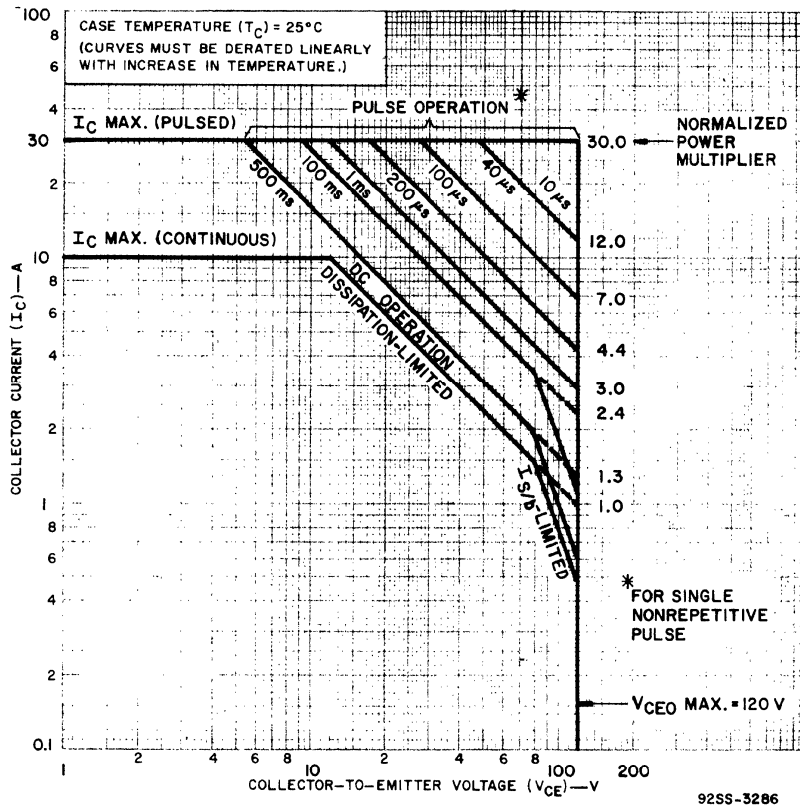


Fig. 11 - Maximum operating areas for 2N4348.

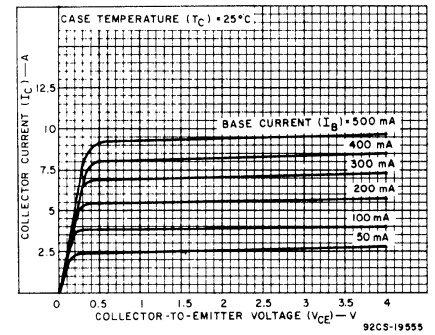


Fig. 12 - Typical output characteristics for 2N3773.

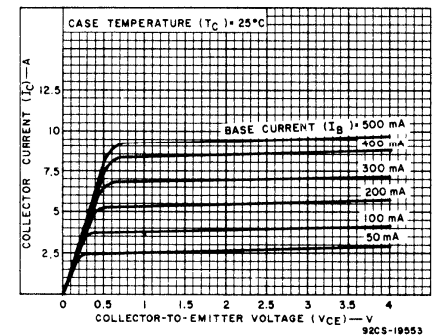


Fig. 13 - Typical output characteristics for 2N4348.

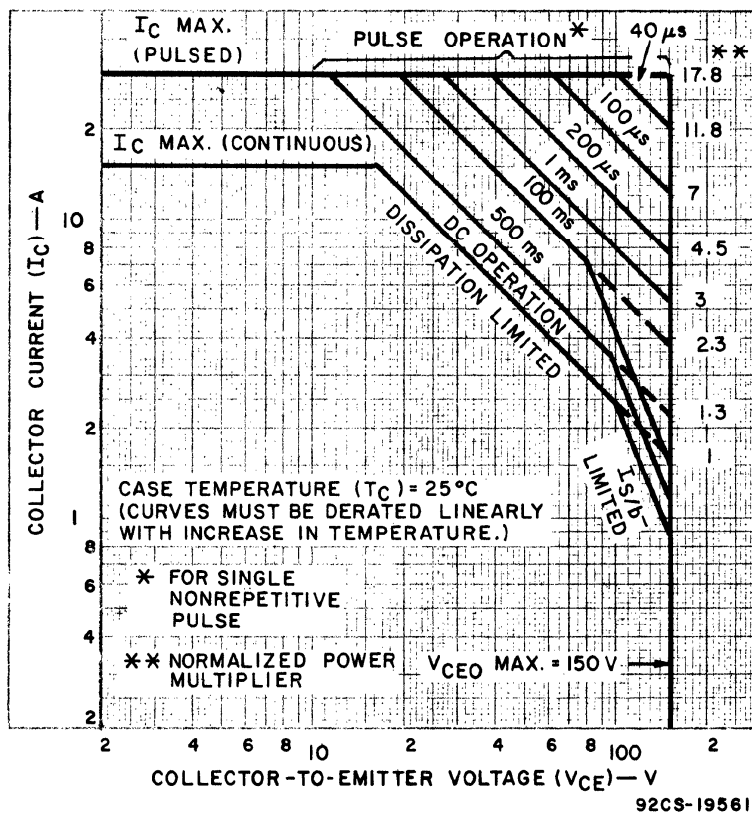


Fig. 14 - Maximum operating areas for 2N6259.

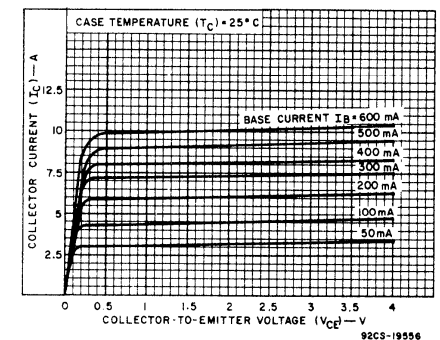


Fig. 15 - Typical output characteristics for 2N6259.

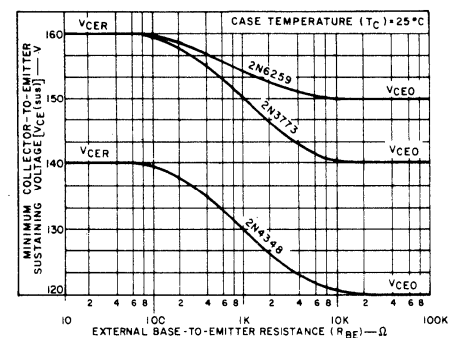


Fig. 16 - Sustaining voltage as a function of base-to-emitter resistance for all types.

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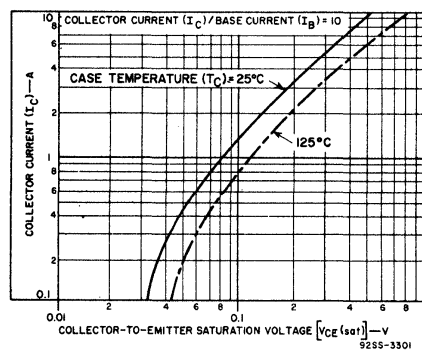


Fig. 17 - Typical saturation-voltage characteristics for 2N3773.

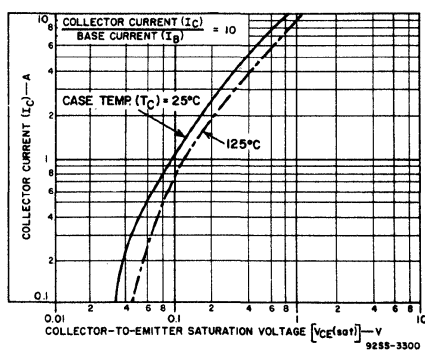


Fig. 18 - Typical saturation-voltage characteristics for 2N4348.

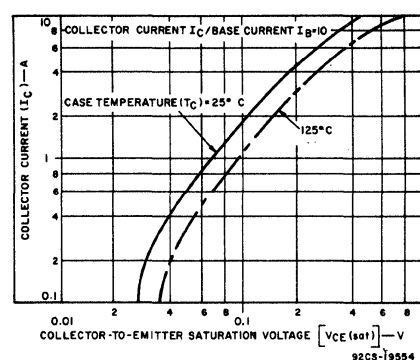


Fig. 19 - Typical saturation-voltage characteristics for 2N6259.

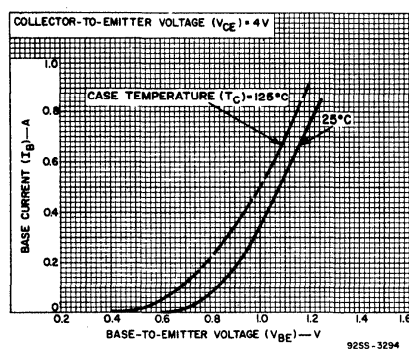


Fig. 20 - Typical input characteristics for 2N3773.

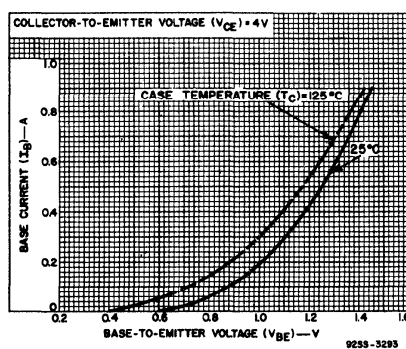


Fig. 21 - Typical input characteristics for 2N4348.

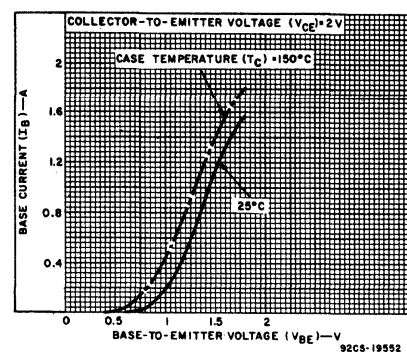


Fig. 22 - Typical input characteristics for 2N6259.