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2N3773, 2N4348, 2N6259

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

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

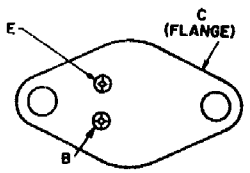
These types are hometaxial-base silicon n-p-n transistors intended for a wide variety of high-voltage high-current applications. Typical applications for these transistors include power-switching circuits, audio amplifiers, series- and shunt-regulator driver and output stages, dc-to-dc converters, inverters, 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**

TERMINAL DESIGNATIONS



JEDEC TO-3

MAXIMUM RATINGS, *Absolute-Maximum Values:*

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

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

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}	120 140 150	−1.5 −1.5 −1.5			– – –	2 – –	– – –	– 2 –	– – –	– – 0.2	mA
With base-emitter junction reverse-biased and T_C = 150°C	I_{CEX}	120 140 150	−1.5 −1.5 −1.5			– – –	10 – –	– – –	– 10 –	– – –	– – 4	mA
With base open	I_{CEO}	100 120				– –	20 –	– –	– 10	– –	– 2	mA
* Emitter-Cutoff Current	I_{EBO}		−7	0			5		5		2	mA
* DC Forward Current Transfer Ratio	h_{FE}	4 4 2 4 4		5[a] 8[a] 8[a] 10[a] 16[a]		15 10	60 –	– 15 – 5	60 – –	15 – 10	60 – –	
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 4 2 4		5[a] 8[a] 8[a] 10[a]		– –	2 – 3	– –	2.2 –	–	2 –	V
* Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$			5[a] 8[a] 10[a] 16[a]	0.5 0.8 1.25 3.2	–	1 2 – –	–	1.4 – 4 –	–	1 – 2.5 –	V
Second-Breakdown Collector Current With base forward-biased and 1-s nonrepetitive pulse	$I_{S/b}$[b]	80 100				1.5 –	–	1.5 –	–	2.5 –	–	A
Second-Breakdown Energy With base reverse-biased and L = 40 mH, R_{BE} = 100Ω	$E_{S/b}$[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)	$\lvert h_{fe} \rvert$	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 format JS-6 RDF-2.

[a]Pulsed; pulse duration = 300μs, rep. rate = 60 Hz.

[b]$I_{S/b}$ 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.

[c]$E_{S/b}$ is defined as the energy at which second breakdown occurs under specified reverse-bias conditions. $E_{S/b}$ = 1/2 L I^2 where L is a series load or leakage inductance and I is the peak collector current.