



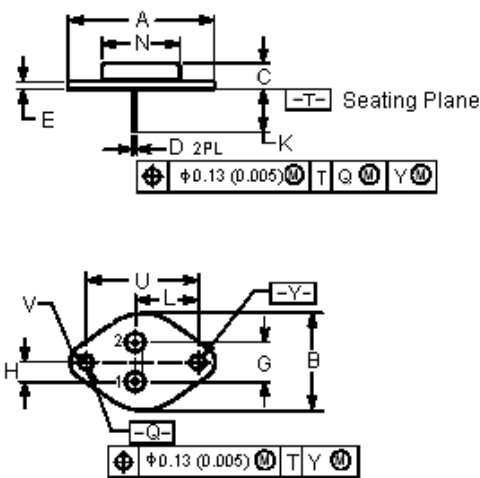
Complementary silicon power transistors.

The 2N3773 powerbase™ power transistors designed for high power audio, disk head positioners and other linear applications. These devices can also be used in power switching circuits such as relay or solenoid drivers. DC-DC converters or inverters.

**Features:**

- Pb-free packages.
- High safe operating area (100% tested) 150W at 100V.
- Completely characterized for linear operation.
- High DC current gain and low saturation voltage.  
 $h_{FE} = 15$  (minimum) at 8.0A, 4.0V.  
 $V_{CE(sat)} = 1.4V$  (maximum) at  $I_C = 8.0A$ ,  $I_B = 0.8A$ .
- For low distortion complementary designs.

(TO-3)

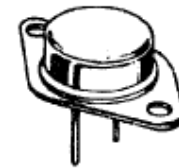


Style 1:  
 Pin 1. Base  
 2. Emitter  
 Collector (Case)

Dimensions	Minimum	Maximum
A	1.550 (39.37) Reference	
B	-	1.050 (26.67)
C	0.250 (6.35)	0.335 (8.51)
D	0.038 (0.97)	0.043 (1.09)
E	0.055 (1.40)	0.070 (1.77)
G	0.430 (10.92) BSC	
H	0.215 (5.46) BSC	
K	0.440 (11.18)	0.480 (12.19)
L	0.665 (16.89) BSC	
N	-	0.830 (21.08)
Q	0.151 (3.84)	0.165 (4.19)
U	1.187 (30.15) BSC	
V	0.131 (3.33)	0.188 (4.77)

Dimensions : Inches (Millimetres)

16A Complementary Power Transistors  
 140V, 150W



(TO-3)  
 Case 1-07

**Maximum Ratings** (Note 1)

Rating	Symbol	2N3772	Unit
Collector-Emitter Voltage	$V_{CEO}$	140	V dc
Collector-Emitter Voltage	$V_{CEX}$	160	
Collector-Base Voltage	$V_{CBO}$		
Emitter-Base Voltage	$V_{EBO}$	7	
Collector Current - Continuous - Peak (Note 2)	$I_C$	16 30	A dc
Base Current - Continuous - Peak (Note 2)	$I_B$	4 15	
Total Device Dissipation at $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	150 0.855	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Indicates JEDEC registered data.
2. Pulse test: pulse width =  $5\mu\text{s}$ , duty cycle  $\leq 10\%$ .

**Thermal Characteristics**

Characteristics	Symbol	Maximum	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.17	$^\circ\text{C}/\text{W}$

**Electrical Characteristics** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

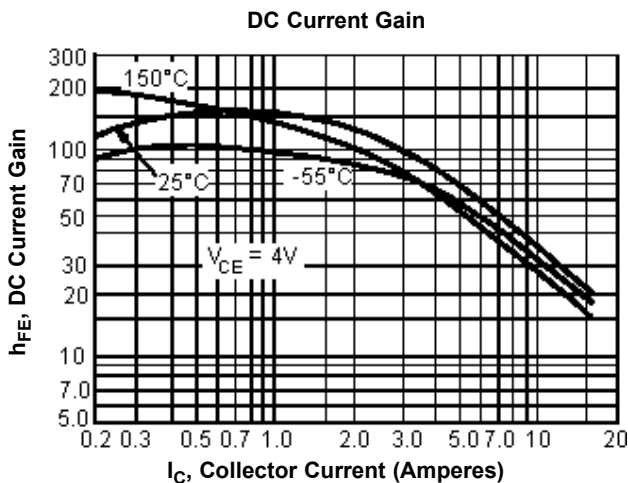
Characteristic	Symbol	Minimum	Maximum	Unit
<b>Off Characteristics</b> (Note 3)				
Collector-Emitter Breakdown Voltage (Note 4) ( $I_C = 0.2\text{ A dc}, I_B = 0$ )	$V_{EO(sus)}$	140	-	V dc
Collector-Emitter Sustaining Voltage (Note 4) ( $I_C = 0.1\text{ A dc}, V_{EB(off)} = 1.5\text{ Vdc}, R_{BE} = 100\Omega$ )	$V_{CEX(sus)}$	160	-	
Collector-Emitter Sustaining Voltage ( $I_C = 0.2\text{ A dc}, R_{BE} = 100\Omega$ )	$V_{CER(sus)}$	150	-	
Collector Cut off Current (Note 4) ( $V_{CE} = 120\text{ V dc}, I_B = 0$ )	$I_{CEO}$	-	10	mA dc
Collector Cut off Current (Note 4) ( $V_{CE} = 140\text{ V dc}, V_{EB(off)} = 1.5\text{ V dc}$ ) ( $V_{CE} = 140\text{ V dc}, V_{EB(off)} = 1.5\text{ V dc}, T_C = 150^\circ\text{C}$ )	$I_{CEX}$	-	2 10	

## Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

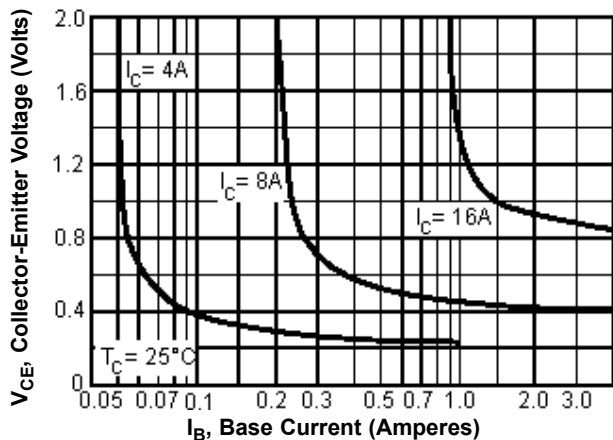
Characteristic	Symbol	Minimum	Maximum	Unit
Collector Cut off Current ( $V_{CB} = 140\text{V dc}$ , $I_E = 0$ )	$I_{CBO}$	-	2	mA dc
Emitter Cut off Current (Note 4) ( $V_{BE} = 7\text{Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	5	
<b>On Characteristic (Note 3)</b>				
DC Current Gain ( $I_C = 8\text{A dc}$ , $V_{CE} = 4\text{V dc}$ ) (Note 4) ( $I_C = 16\text{A dc}$ , $V_{CE} = 4\text{V dc}$ )	$h_{FE}$	15 5	60 -	-
Collector-Emitter Saturation Voltage ( $I_C = 8\text{A dc}$ , $I_B = 800\text{ mA dc}$ ) (Note 4) ( $I_C = 16\text{A dc}$ , $I_B = 3.2\text{A dc}$ )	$V_{CE(sat)}$	-	1.4 4	V dc
Base-Emitter On Voltage (Note 4) ( $I_C = 8\text{A dc}$ , $V_{CE} = 4\text{V dc}$ )	$V_{BE(on)}$	-	2.2	
<b>Dynamic Characteristics</b>				
Magnitude of Common-Emitter Small-Signal, Short-Circuit, Forward Current Transfer Ratio ( $I_C = 1\text{A}$ , $f = 50\text{kHz}$ )	$ h_{fe} $	4	-	-
Small-Signal Current Gain (Note 4) ( $I_C = 1\text{A dc}$ , $V_{CE} = 4\text{V dc}$ , $f = 1\text{ kHz}$ )	$h_{fe}$	40	-	-
<b>Second Breakdown Characteristics</b>				
Second Breakdown Collector Current with Base Forward Biased $t = 1\text{s}$ (non-repetitive), $V_{CE} = 100\text{V}$	$I_{S/b}$	1.5	-	A dc

3. Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

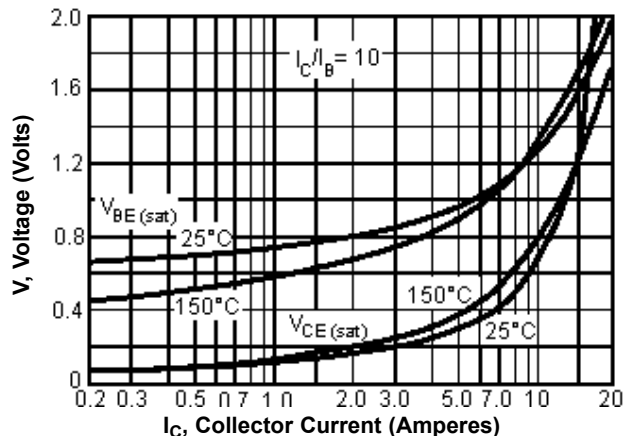
4. Indicates JEDEC Registered Data.



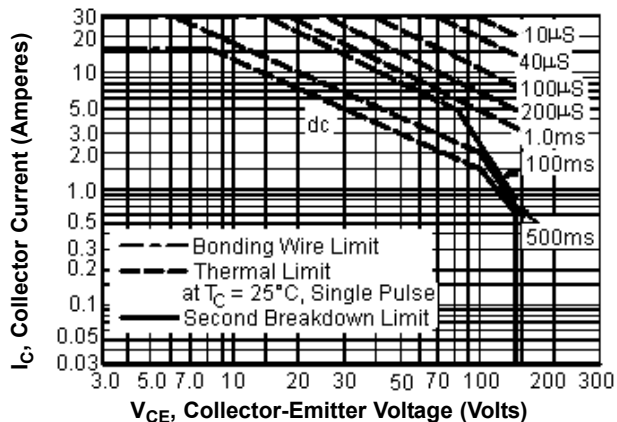
**Collector Saturation Region**



**"On" Voltage**



**Forward Bias Safe Operating Area**

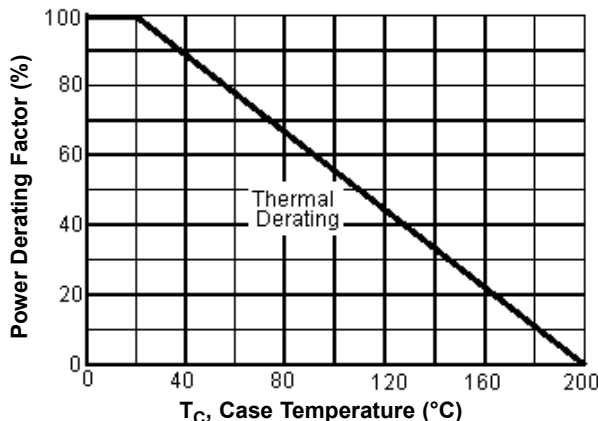


There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate. The data is based on  $T_{J(PK)} = 200^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} < 200^\circ\text{C}$ . At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

**Part Number Table**

Description	Part Number
Transistor, NPN, TO-3	2N3773

**Power Derating**



**Disclaimer** This data sheet and its contents (the "Information") belong to the Premier Farnell Group (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. SPC Multicomp is the registered trademark of the Group. © Premier Farnell plc 2008.