

## COMPLEMENTARY SILICON POWER TRANSISTORS

The 2N3773 and 2N6609 are power base power transistors designed for high power audio, disk head positioners, linear amplifiers, switching regulators, solenoid drivers, and dc to dc converters or inverters.

### FEATURES:

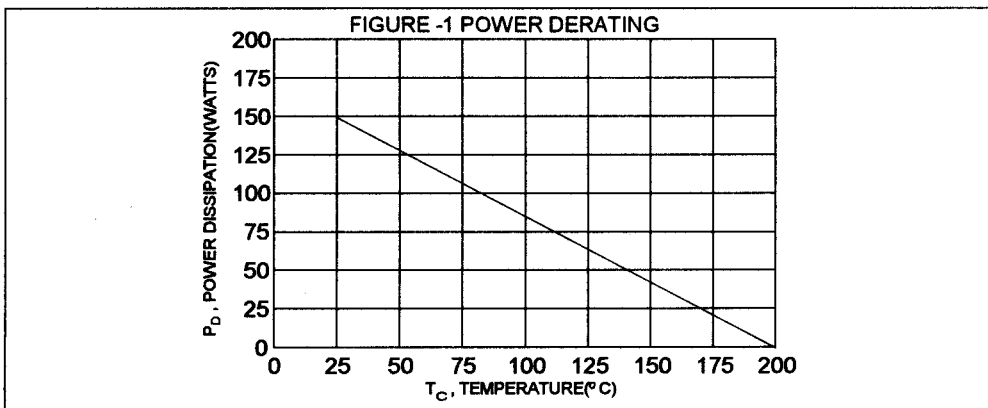
- \* High Power Dissipation  
 $P_D = 150 \text{ W (} T_C = 25^\circ\text{C)}$
- \* High DC Current Gain and Low Saturation Voltage  
 $hFE = 15-60 @ I_C = 8 \text{ A, } V_{CE} = 4 \text{ V}$   
 $V_{CE(SAT)} = 1.4 \text{ V (Max.) @ } I_C = 8 \text{ A, } I_B = 0.8 \text{ A}$

### MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO(SUS)}$	140	V
Collector-Emitter Voltage	$V_{CEX}$	160	V
Collector-Base Voltage	$V_{CBO}$	160	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current-Continuous Peak (1)	$I_C$ $I_{CM}$	16 30	A
Base Current-Continuous Peak (1)	$I_B$ $I_{BM}$	4.0 15	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	150 0.857	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +200	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

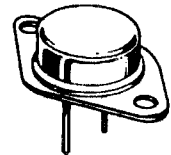
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.17	$^\circ\text{C/W}$



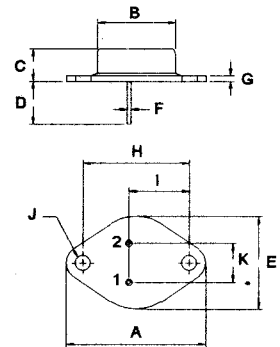
(1) Pulse Test: Pulse width = 5 ms , Duty Cycle < 10%

NPN	PNP
2N3773	2N6609

16 AMPERE  
COMPLEMENTARY SILICON  
POWER TRANSISTORS  
140 VOLTS  
150 WATTS



TO-3



PIN 1. BASE  
2. EMITTER  
COLLECTOR (CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

**ELECTRICAL CHARACTERISTICS** (  $T_c = 25^\circ\text{C}$  unless otherwise noted )

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

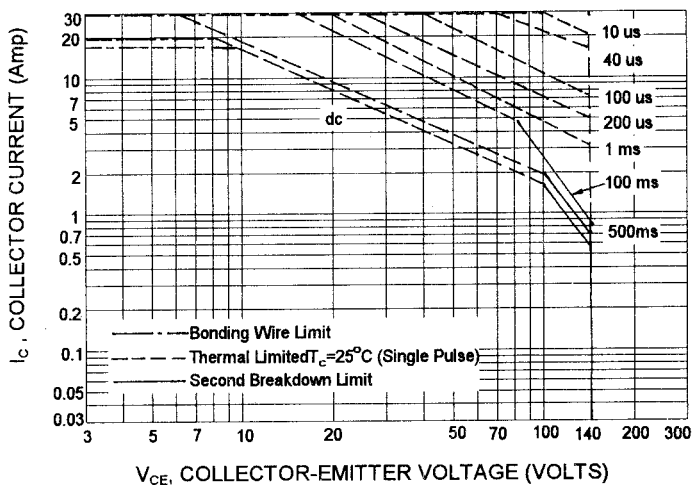
Collector - Emitter Sustaining Voltage (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ )	$V_{CE(SUS)}$	140		V
Collector Cutoff Current ( $V_{CE} = 120\text{ V}$ , $I_B = 0$ )	$I_{CEO}$		10	mA
Collector Cutoff Current ( $V_{CE} = 140\text{ V}$ , $V_{BE(OFF)} = 1.5\text{ V}$ )	$I_{CEX}$		2.0	mA
Collector Cutoff Current ( $V_{CB} = 140\text{ V}$ , $I_E = 0$ )	$I_{CBO}$		2.0	mA
Emitter Cutoff Current ( $V_{EB} = 7.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		5.0	mA

**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 8.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ ) ( $I_C = 16\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	hFE	15 5.0	60	
Collector - Emitter Saturation Voltage ( $I_C = 8.0\text{ A}$ , $I_B = 800\text{ mA}$ ) ( $I_C = 16\text{ A}$ , $I_B = 3.2\text{ A}$ )	$V_{CE(sat)}$		1.4 4.0	V
Base - Emitter On Voltage ( $I_C = 8.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$V_{BE(ON)}$		2.2	V

\* Pulse Test: Pulse width = 300 us , Duty Cycle = 2.0%

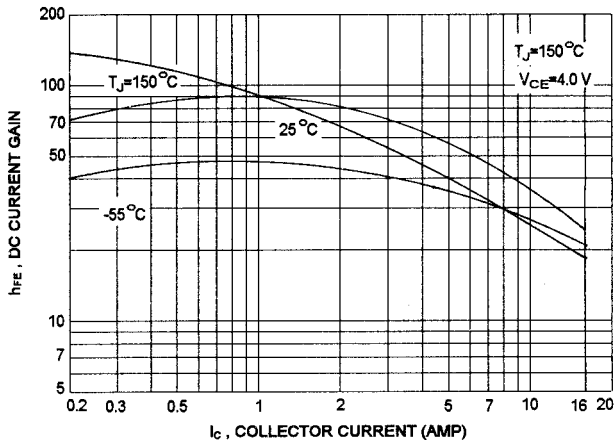
**ACTIVE-REGION SAFE OPERATING AREA (SOA)**



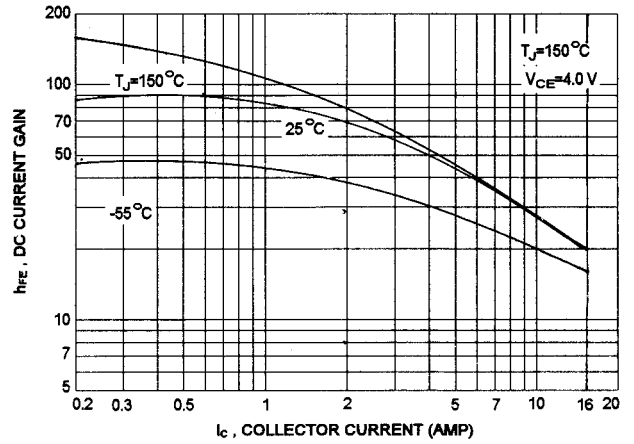
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base 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  $T_{J(PK)} \leq 200^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

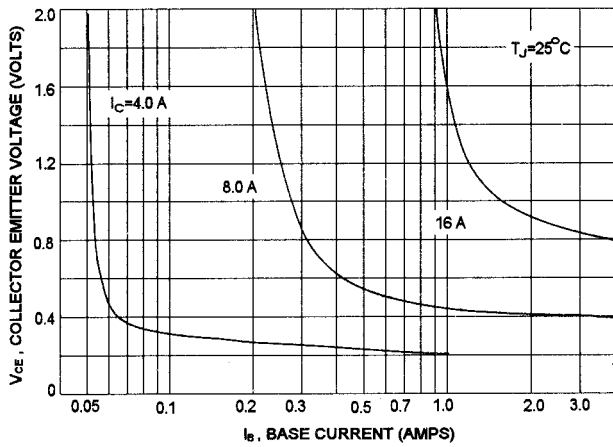
NPN 2N3773  
DC CURRENT GAIN



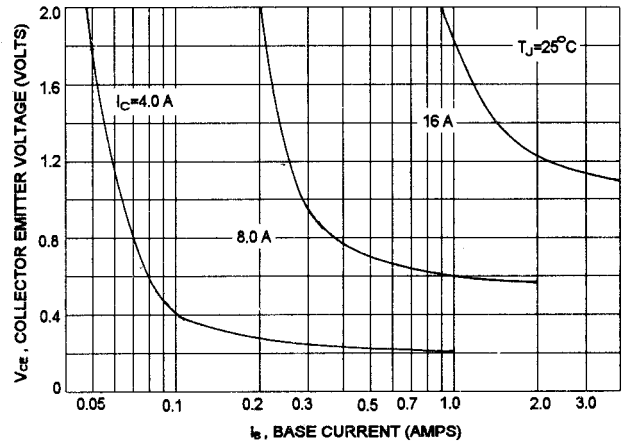
PNP MJ6609  
DC CURRENT GAIN



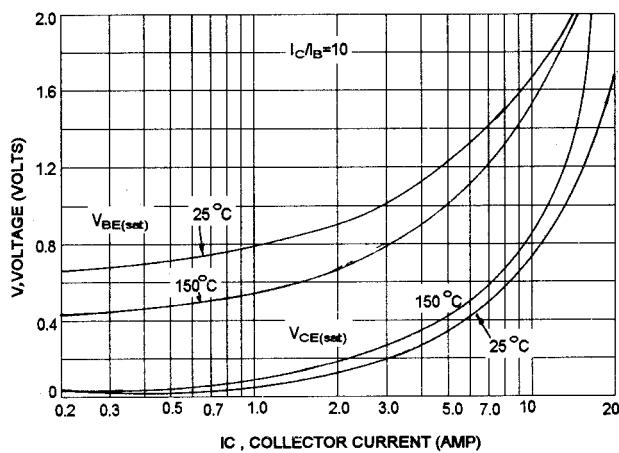
COLLECTOR SATURATION REGION



COLLECTOR SATURATION REGION



"ON" VOLTAGES



"ON" VOLTAGES

