

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:

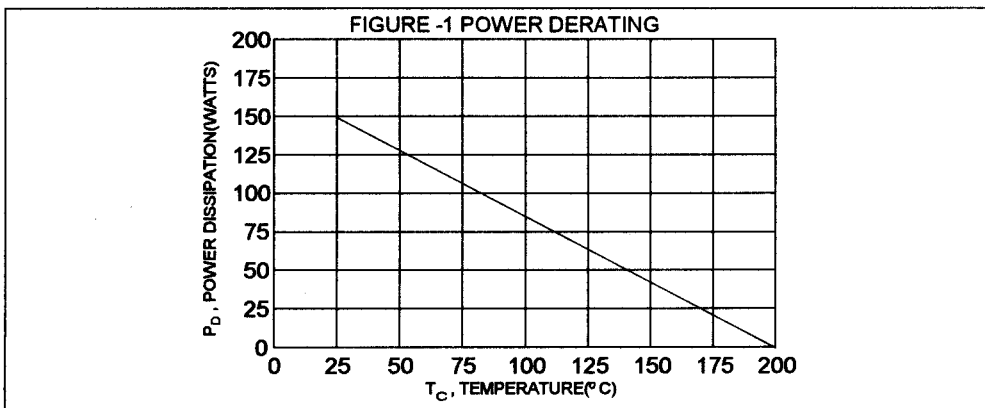
- * High Power Dissipation
 $P_D = 150 \text{ W (} T_C = 25^\circ\text{C)}$
- * High DC Current Gain and Low Saturation Voltage
 $h_{FE} = 15-60 @ I_C = 8 \text{ A, } V_{CE} = 4 \text{ V}$
 $V_{CE(SAT)} = 1.4 \text{ V (Max.) @ } I_C = 8 \text{ A, } I_B = 0.8 \text{ A}$

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°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

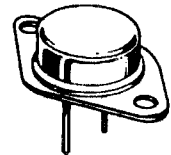
| Characteristic | Symbol | Max | Unit |
|-------------------------------------|-----------------|------|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 1.17 | $^\circ\text{C/W}$ |



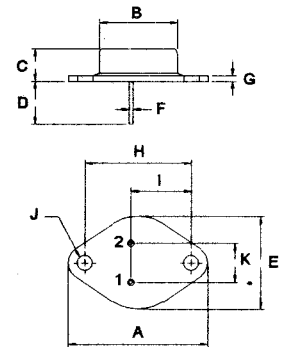
(1) Pulse Test: Pulse width = 5 ms, Duty Cycle < 10%

| 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 |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

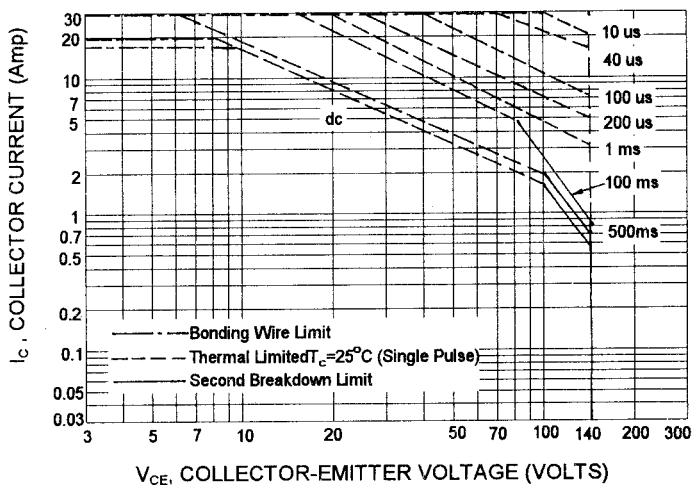
| | | | | |
|--|---------------|-----|-----|----|
| Collector - Emitter Sustaining Voltage (1) ($I_C = 200\text{ mA}$, $I_B = 0$) | $V_{CE(SUS)}$ | 140 | | V |
| Collector Cutoff Current ($V_{CE} = 120\text{ V}$, $I_B = 0$) | I_{CEO} | | 10 | mA |
| Collector Cutoff Current ($V_{CE} = 140\text{ V}$, $V_{BE(OFF)} = 1.5\text{ V}$) | 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%

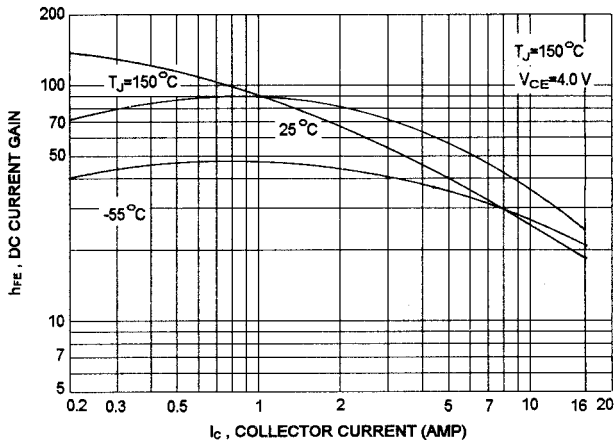
ACTIVE-REGION SAFE OPERATING AREA (SOA)



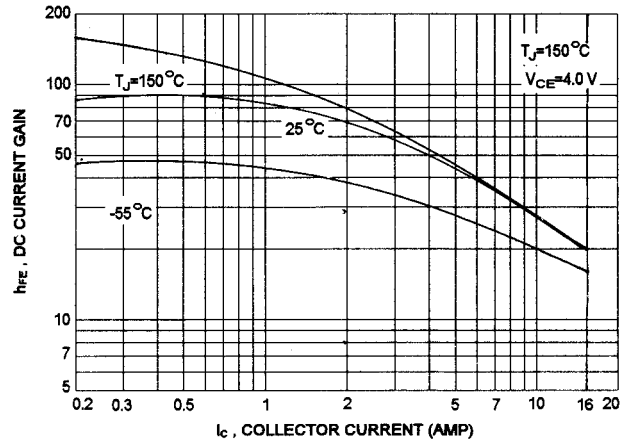
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

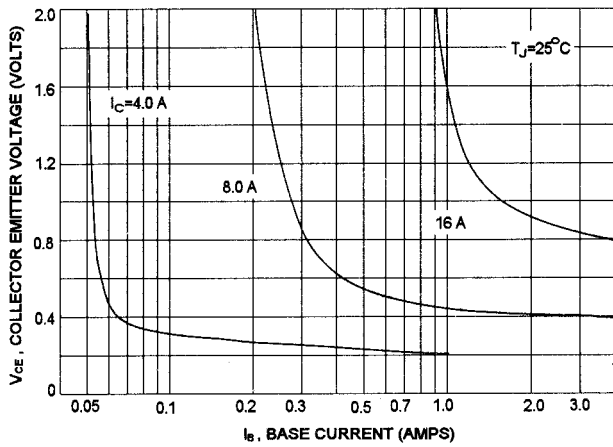
NPN 2N3773
DC CURRENT GAIN



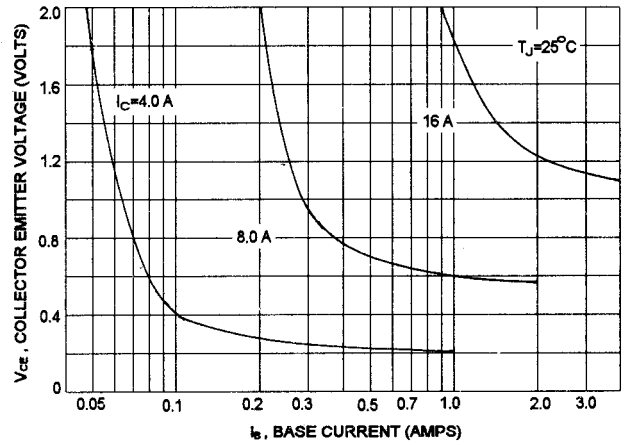
PNP MJ6609
DC CURRENT GAIN



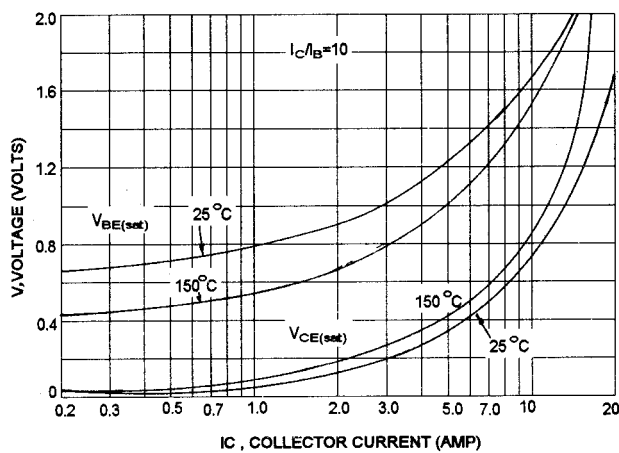
COLLECTOR SATURATION REGION



COLLECTOR SATURATION REGION



"ON" VOLTAGES



"ON" VOLTAGES

