

Westinghouse



NPN Silicon Power Transistors 2N3773 Westinghouse Type 1561

For Switching, Amplifier and Regulator Applications
 16 Amperes 150 Watts
 Gain Rated at 8 Amperes



Application

These general purpose, NPN single diffused transistors are especially suited for switching, regulator, and amplifier applications.

Listed in this data sheet are seven transistors including the 2N3773 having $V_{CEO(sus)}$ voltages which range from 40V through 160V. Devices with voltages other than the 140V $V_{CEO(sus)}$ of the 2N3773 can be chosen for meeting specific circuit requirements. Burn-in and other similar type conditioning can be performed on this type transistor to provide units capable of meeting high reliability specifications.

Features

- No forward bias secondary breakdown to 100 volts
- High reverse bias S.O.A. for inductive loads
- Low thermal resistance
- Hermetically sealed TO-3 type package
- 150 watt dissipation
- 100% Power tested
- JEDEC-type 2N3773 carries the Westinghouse Lifetime Guarantee
- Gain rated at 8 amperes

Westinghouse Lifetime Guarantee

Westinghouse warrants to the original purchaser that it will correct any defects in workmanship, by repair or replacement f.o.b. factory, for any silicon power semiconductor bearing this symbol during the life of the equipment in which it is originally installed, provided said device is used within manufacturer's published ratings and applied in accordance with good engineering practice. The foregoing warranty is exclusive and in lieu of all other warranties of quality whether written, oral, or implied (including any warranty of merchantability or fitness for purpose) Westinghouse shall not be liable for any consequential damages.

Voltage Matrix 1561

$T_c = 25^\circ C$

| Symbol | Test Conditions | 1561-0408 | 1561-0608 | 1561-0808 | 1561-1008 | 1561-1208 | 2N3773 | 1561-1608 | Units |
|---------------------------------|--|-----------|-----------|-----------|-----------|-----------|--------|-----------|-------|
| $V_{CEO(sus)}$ (see Fig. 11) | Base Open $L = 1 H$ $I_c = 200 mA$ | 40 | 60 | 80 | 100 | 120 | 140 | 160 | Volts |

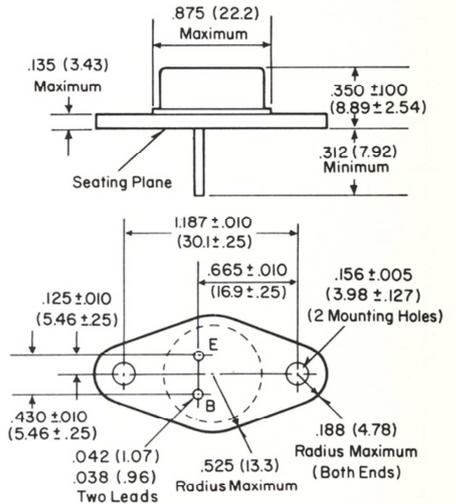
Maximum Ratings and Characteristics

$T_c = 25^\circ C$ unless specified

| Symbol | 2N3773 | 1561-XX08 Types | Units |
|--|-------------|---------------------|--------------|
| Operating and storage temperature | *-65 to 200 | -65 to 200 | $^\circ C$ |
| Collector-emitter sustaining voltage | *140 | 40 to 160 | Volts |
| Collector-base voltage | *160 | $V_{CEO(sus)} + 10$ | Volts |
| Emitter-base voltage | *7 | 7 | Volts |
| Collector-emitter voltage $V_{BE} = -1.5V$. | *160 | 40 to 160 | Volts |
| Continuous collector current | *16 | 20 | Amperes |
| Continuous base current | *4 | 5 | Amperes |
| Linear power derating factor from $T_c = 25^\circ C$ | *.855 | .855 | $W/^\circ C$ |
| Thermal resistance | 1.17 | 1.17 | $^\circ C/W$ |
| Power dissipation | *150 | 150 | Watts |
| Power dissipation $T_c = 100^\circ C$ | 86 | 86 | Watts |

* JEDEC Registered Parameters

Dimensions in Inches (and Millimeters)



Case is TO-3

Approx. Weight: .58 Oz. (16.5 Gms.)

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Electrical Specifications

T_c = 25°C unless specified

| Test | Symbol | Test Conditions | 2N3773 | | All 1561-XX08 | | Units |
|---|----------------------|---|--------|------|---------------|------|-------|
| | | | Min. | Max. | Min. | Max. | |
| D.C. Current Gain ① | h _{FE} | V _{CE} = 4V I _C = 8A | *15 | *60 | 15 | 60 | |
| Collector Cutoff Current | I _{CEV} | V _{CE} = Rated V _{CEO(sus)} V _{BE} = -1.5V | | *2 | | 2 | mA |
| Collector Cutoff Current | *I _{CEV} | T _C = 150°C V _{CE} = 140V V _{BE} = -1.5V | | *10 | | | mA |
| Collector Cutoff Current | I _{CEV} | V _{CE} = Rated V _{CEO(sus)} minus 10 volts V _{BE} = -1.5V | | | | 10 | mA |
| Collector Cutoff Current | I _{CEO} | V _{CE} = Rated V _{CEO(sus)} minus 10 volts Base open | | | | 10 | mA |
| Collector Cutoff Current | I _{CEO} | V _{CE} = 120 Base open | | *2 | | | mA |
| Collector Cutoff Current | I _{CBO} | V _{CB} = Rate V _{CEO(sus)} Emitter open | | 5 | | 5 | mA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} = 7V | | *5 | | 5 | mA |
| Collector-Emitter Saturation Voltage ① | V _{CE(sat)} | I _C = 8A I _B = 0.8A | | *1.4 | | 1.4 | V |
| Base-Emitter Saturation Voltage ① | V _{BE(sat)} | I _C = 8A I _B = 0.8A | | | | 2 | V |
| Base to Emitter Voltage ① | V _{BE} | I _C = 8A V _{CE} = 4V | | *2.2 | | | V |
| Rise Time (See Fig. 11) | t _r | V _{CC} = 30V I _C = 8A | 2 | 5 | 2 | 5 | μsec. |
| Storage Time | t _s | I _{son} = I _s off = 0.8A | 0.5 | 2 | 0.5 | 2 | μsec. |
| Fall Time | t _f | R _L = 3.75 ohms | 3 | 5 | 3 | 5 | μsec. |
| Safe Operating Area Forward Biased Thru 100V V _{CEO(sus)} | SOA FWD | V _{CE} = 60V 1 sec. non-rep. T _C = 25°C | | | | 1.95 | A |
| Safe Operating Area Forward Biased Above 100V V _{CEO(sus)} | SOA FWD | V _{CE} = 100V 1 sec. non-rep. T _C = 25°C | | 1.5 | | | A |
| Safe Operating Area Rev. Bias | SOA REV. | Unclamped inductance L = 1 mH V _{BB} = -6V R _B = 20 ohms I _C = 15A | 112 | | 112 | | mJ |
| A.C. Current Gain | h _{re} | V _{CE} = 4V I _C = 1A f = 1 KHz | *40 | | 40 | | |
| Gain-Bandwidth | f _T | V _{CE} = 4V I _C = 1A f = 50 KHz | *.2 | 1.5 | .2 | 1.5 | MHz |
| Output Capacitance | C _{ob} | V _{CB} = 10V I _E = 0 f = 1 MHz | | 600 | | 600 | pF |

* JEDEC Registered Parameters

① Pulse Test 300 Micro-sec. 2% Duty Cycle

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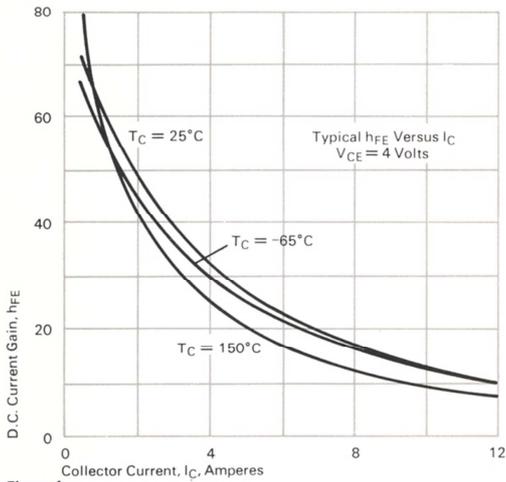


Figure 1

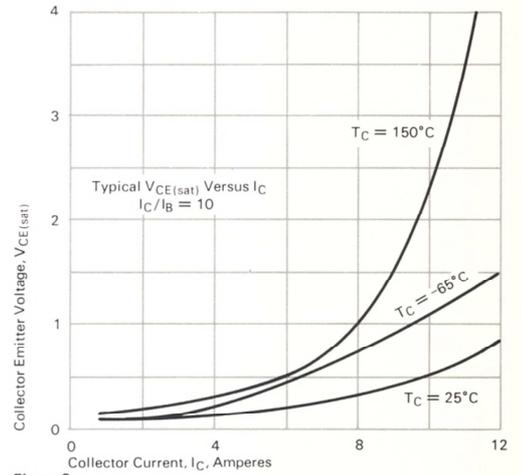


Figure 2

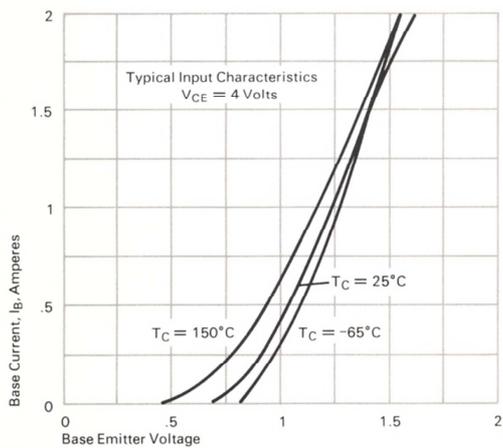


Figure 3

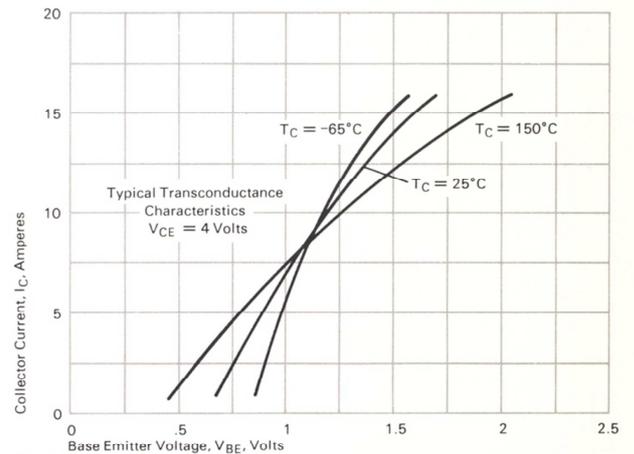


Figure 4

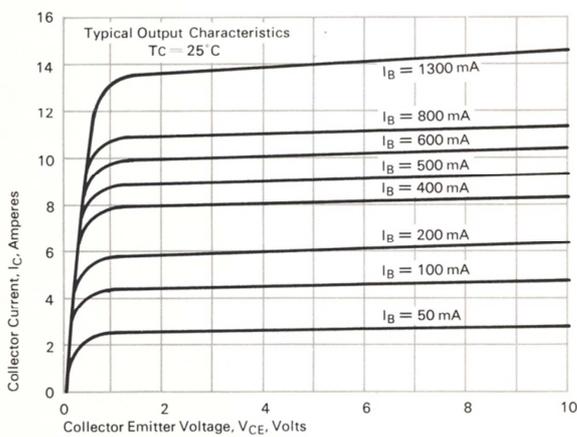


Figure 5

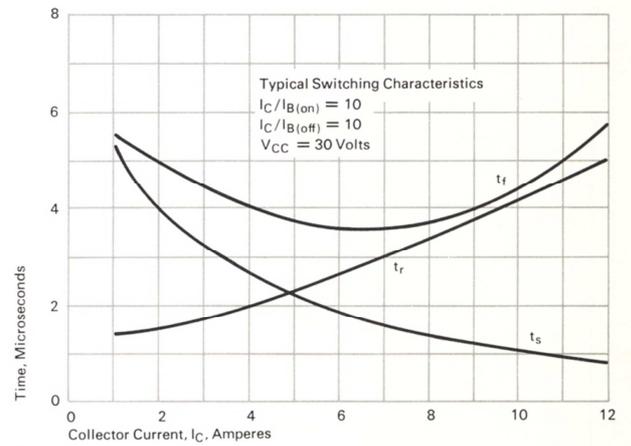


Figure 6

NPN Silicon Power Transistors 2N3773 Westinghouse Type 1561

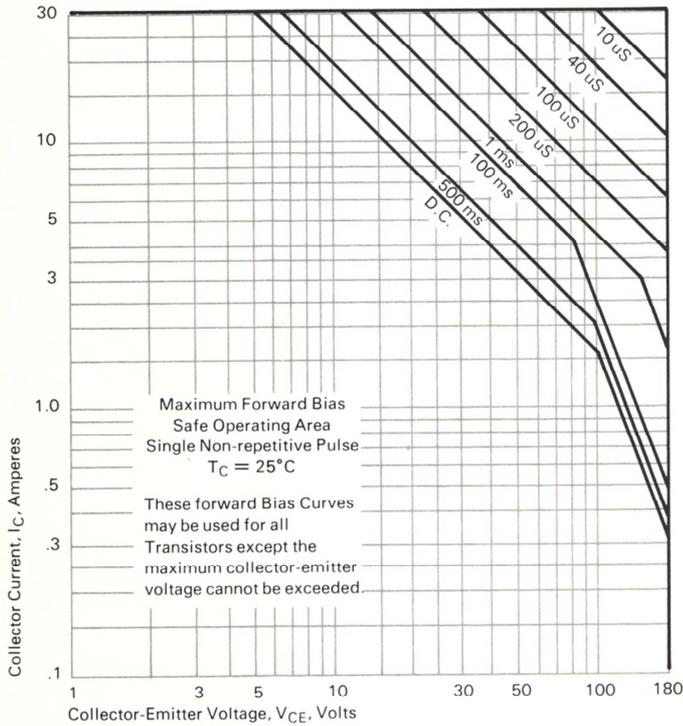


Figure 7

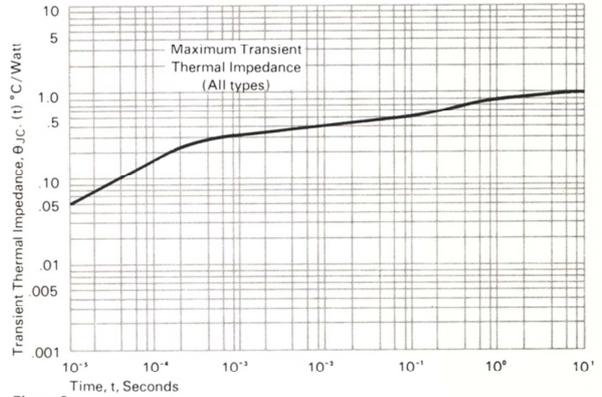


Figure 8

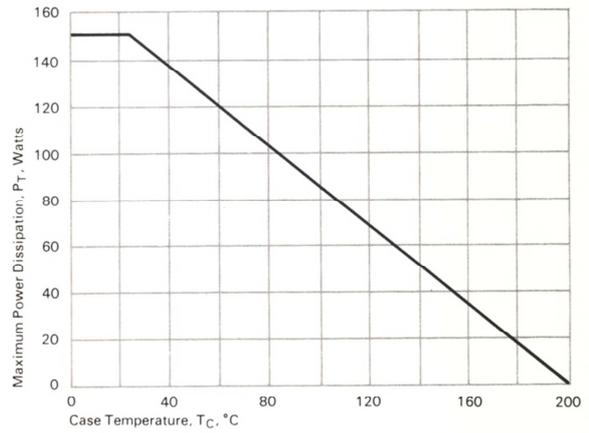


Figure 9

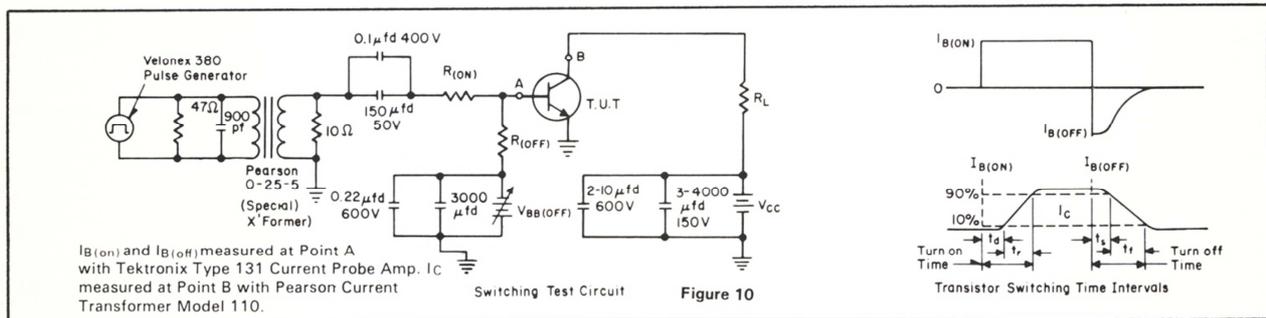


Figure 10

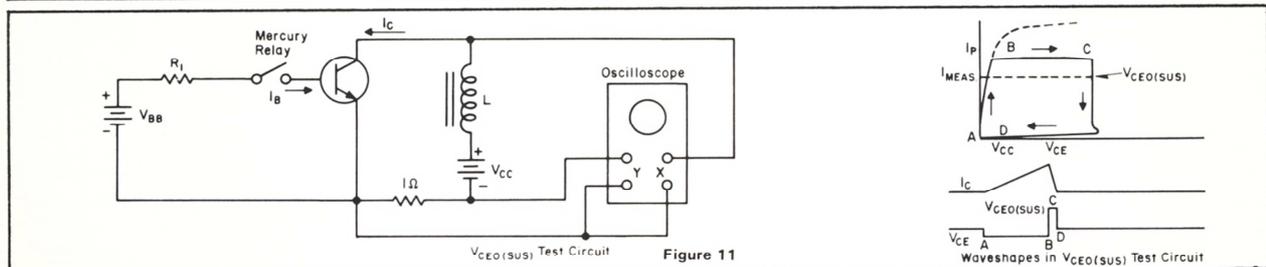


Figure 11