



Technical
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High Power Transistor Types WT5503 to WT5506

- 50kW Switched Power
- 100 Amperes Continuous
- 500 Volts Sustaining Voltage

These transistors are designed for switching into clamped inductive loads (see Figure 1), for such applications as:

Choppers
Inverters
A.C. Machines (Speed Regulation)

utilising the transistors with Pulse Width Modulation or Multi-Step systems for frequency and/or voltage control.

Maximum ratings

		WT 5503	WT 5504	WT 5505	WT 5506
V_{CEV} $V_{CER(SUS)}$ V_{EBO} $I_{C(CONT)}$ $I_{C(PEAK)}$ $I_{B(CONT)}$ P_{tot} T_j	$R_{BE} = 10\Omega$ $25^\circ C T_C$	500V 400V	550V 450V	600V 500V 10V 100A 150A 50A 0.85kW 150°C	450V 350V

Limit electrical characteristics at $T_j 125^\circ C$

I_{CEV} I_{EBO} $V_{CER(SUS)}$ $V_{CE(SAT)}$ $V_{BE(SAT)}$ h_{FE} t_{on} t_s t_f $t_{(1)}$ $R_{TH(J-C)}$	<p>at $V_{CEV}, V_{EB} = 1.0V$ at V_{EBO} at $0.5A, R_{BE} = 10\Omega$</p> <p>at $I_C = 50A, I_B = \left(\frac{50 \times 1.5}{h_{FE}}\right) A$</p> <p>at $V_{CE} = 2.0V, I_C = 50A$ resistive load $I_C = 50A$ $I_B = \pm \left(\frac{50 \times 1.5}{h_{FE}}\right) A, V_{CE} = 200V, V_{EB} = 5V$</p> <p>clamped inductive load $I_C = 50A, I_B = \pm \left(\frac{50 \times 1.5}{h_{FE}}\right) A$ $V_{CE} = V_{CER(SUS)}, V_{EB} = 5V \text{ max.}$</p>	<p>10mA max. 100mA max.</p> <p>400V min. 450V min. 500V min. 350V min.</p> <p>1.0V max.</p> <p>1.5V max.</p> <p>12 min. 10 min. 8 min. 10 min.</p> <p>2μs max. 5μs max. 1.5μs max.</p> <p>0.8μs max.</p> <p>0.15°C/W</p>
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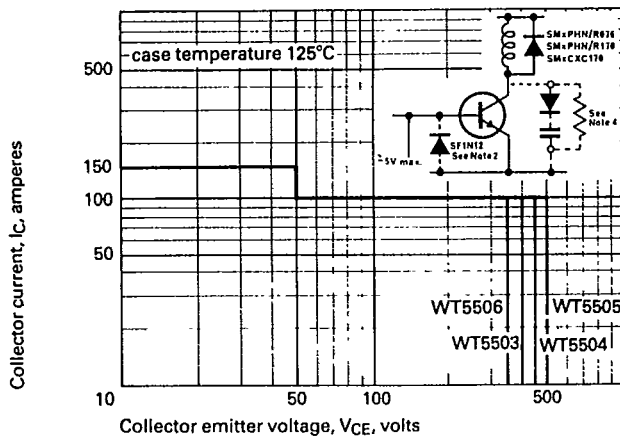


Figure 1 Max. Forward and Reverse Bias Switching Periphery

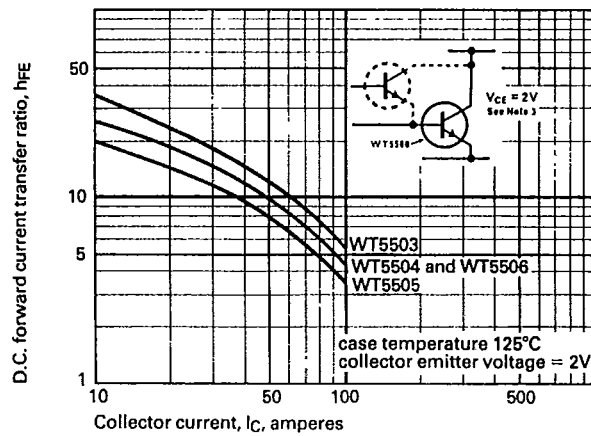


Figure 2 Min. D.C. Forward Current Transfer Ratio v. Collector Current

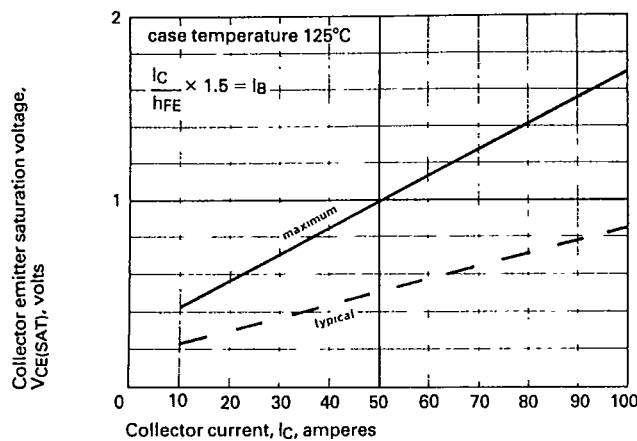


Figure 3 Collector to Emitter Saturation Voltage Characteristics

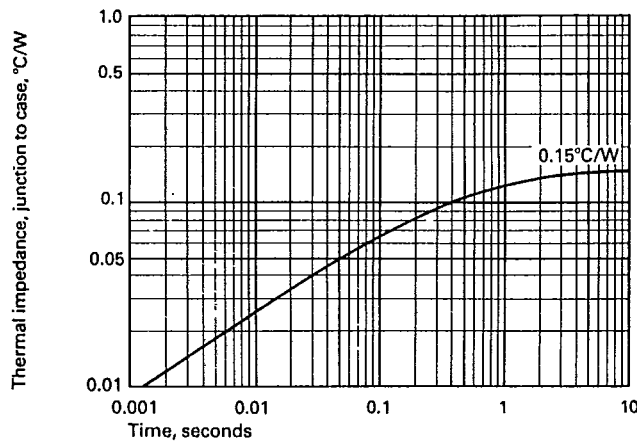


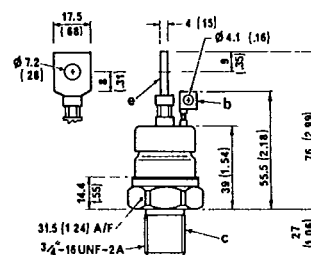
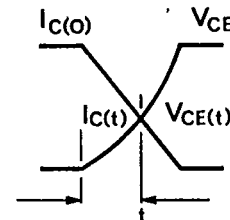
Figure 4 Transient Thermal Impedance, Junction to Case

NOTES

1. All data is given at a design junction temperature of 125°C.
2. I_{CEV} at V_{CEV} with V_{EB} 1.0V permits the use of a forward biased diode to maintain reverse bias on the emitter base junction during off-state operation, and to clamp the emitter base junction during clamped inductive load turn-off.
3. A 2V V_{CE} d.c. forward current transfer ratio curve enables drive operation in the Darlington mode to be considered.
4. The forward and reverse bias switching periphery indicates that clamped inductive load continuous current operation is permissible at rated sustaining voltage and rated continuous collector current. For operation utilising the peak current rating, load line tailoring is required.

Example: Turn-off Snubber Network, from clamped inductive load (Diode, Capacitor, Resistor Discharge).

$$\begin{aligned} \text{Let } I_{C(0)} &= 150A \\ V_{CE(t)} &= 50V \\ I_{CE(t)} &= 100A \\ t &= \text{time for } I_C \text{ to fall to } 100A \\ &\quad \text{and } V_{CE} \text{ to rise to } 50V \\ &= 1.5\mu s \text{ (max.)} \\ C &= \left(\frac{I_{C(0)} - I_{CE(t)}}{2V_{CE(t)}} \right) t \\ &= 0.75\mu F \end{aligned}$$



Mounting torque
2.5 – 2.77 KgM
threads not to be lubricated
Weight: 255 grams

dimensions in mm (inches)

In the interest of product improvement, Westcode reserves the right to change specifications at any time without notice.

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