



Technical
Publication
WT5510/11
Issue 1
February 1981

High Power Transistor Types WT5510 and WT5511

- 45kW Switched Power
- 100 Amperes Continuous
- 450 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

		WT5510	WT5511
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 10V 100A 150A 50A 0.85kW 150°C	550V 450V

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 $t_{f(1)}$ $R_{TH(J-C)}$	at $V_{CEV}, V_{EB} = 1.0V$ at V_{EBO} at $0.5A, R_{BE} = 10\Omega$ at $I_C = 100A, I_B = \left(\frac{100 \times 1.5}{h_{FE}}\right) A$ at $V_{CE} = 2.0V, I_C = 100A$ resistive load $I_C = 100A$ $I_B = \pm \left(\frac{100 \times 1.5}{h_{FE}}\right) A, V_{CE} = 200V, V_{EB} = 5V$ clamped inductive load $I_C = 100A, I_B = \pm \left(\frac{100 \times 1.5}{h_{FE}}\right) A$ $V_{CE} = V_{CER(SUS)}, V_{EB} = 5V \text{ max.}$	10mA max. 100mA max. 400V min. 450V min. 1.0V max. 1.5V max. 7 min. 4µs max. 5µs max. 3µs max. 1.5µs max. 0.15°C/W
---	---	--

WT5510/11

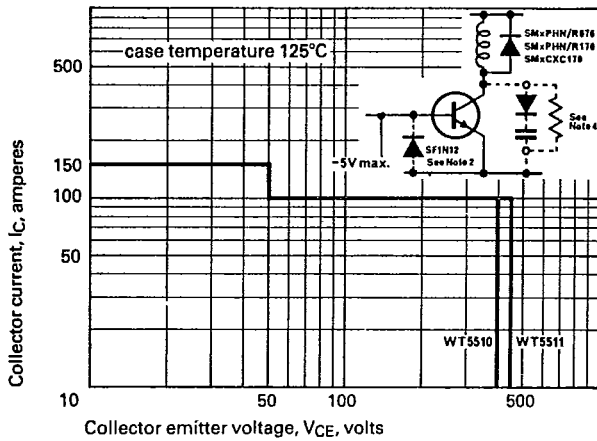


Figure 1 Max. Forward and Reverse Bias Switching Periphery

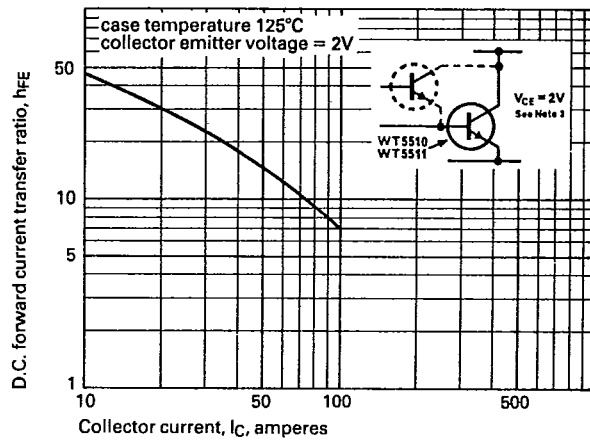


Figure 2 Min. D.C. Forward Current Transfer Ratio v. Collector Current

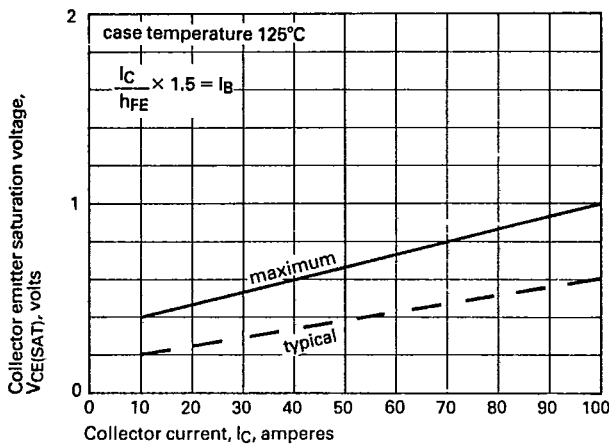


Figure 3 Collector to Emitter Saturation Voltage Characteristics

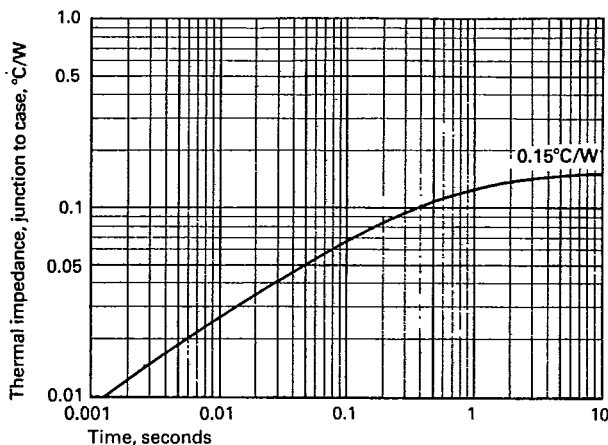


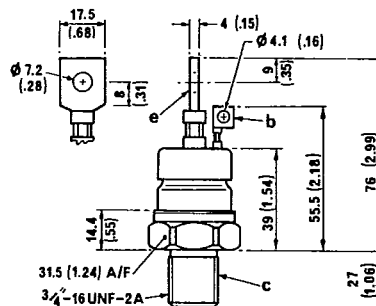
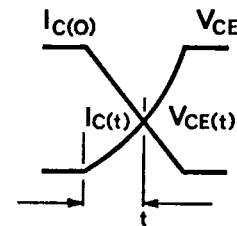
Figure 4 Transient Thermal Impedance, Junction to Case

NOTES

- All data is given at a design junction temperature of 125°C.
- 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.
- A 2V V_{CE} d.c. forward current transfer ratio curve enables drive operation in the Darlington mode to be considered.
- 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).

Let $I_{C(0)} = 150A$
 $V_{CE(t)} = 50V$
 $I_{C(t)} = 100A$
 $t = \text{time for } I_C \text{ to fall to } 100A$
 and V_{CE} to rise to 50V
 $= 2.0\mu s \text{ (max.)}$
 $C = \left(\frac{I_{C(0)} - I_{C(t)}}{2V_{CE(t)}} \right) t$
 $= 1.0\mu F$



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.

WESTCODE SEMICONDUCTORS

0-02 Fair Lawn Avenue, Fair Lawn, New Jersey 07410
 Telephone: (201) 791-3020 • Telex: 130389

HAWKER SIDDELEY

Westinghouse Brake and Signal Co. Ltd.