GN6010A
Silicon N Channel IGBT

HITACHI

Mar. 1992

Application

High speed power switching

Features

- High speed switching
  t_f = 150 ns typ, 350 ns max
- Low on saturation voltage
  $V_{CE(sat)}$ = 4 V max
- Narrower $V_{GE(off)}$ voltage range
  $V_{GS(off)}$ = 3 to 5 V
- Built in gate protection diodes from electro–static damage
- Latch–free operation

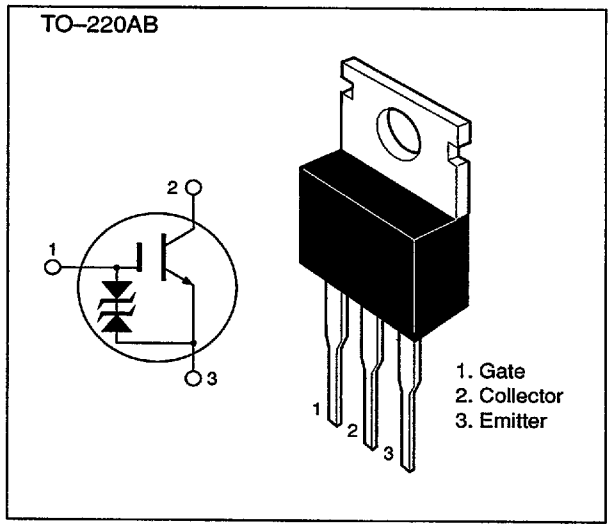

Table 1 Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CES}	600	V
Gate to emitter voltage	V_{GES}	±20	V
Collector current	I_C	10	A
Collector peak current	ic(peak)	20	A
Channel dissipation	P_C*	50	W
Channel temperature	T_j	150	°C
Storage temperature	Tstg	–55 to +150	°C

* Value at Tc = 25 °C

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Table 2 Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CES}$	600	—	—	V	I_C = 10 mA, V_{GE} = 0
Gate to emitter breakdown voltage	$V_{(BR)GES}$	±20	—	—	V	I_G = ±100 µA, V_{CE} = 0
Zero gate voltage collector current	I_{CES}	—	—	0.5	mA	V_{CE} = 480 V, V_{GE} = 0
Gate to emitter leak current	I_{GES}	—	—	±10	µA	V_{GE} = ±16 V, V_{CE} = 0
Gate to emitter cutoff current	$V_{GE(off)}$	3.0	—	5.0	V	I_C = 1 mA, V_{CE} = 10 V
Collector to emitter saturation voltage	$V_{CE(sat)}$1	—	2.0	3.0	V	I_C = 5 A, V_{GE} = 15 V
Collector to emitter saturation voltage	$V_{CE(sat)}$2	—	3.0	4.0	V	I_C = 10 A, V_{GE} = 15 V
Input capacitance	Cies	—	700	—	pF	V_{CE} = 10 V, V_{GE} = 0, f = 1 MHz
Switching time	t_r	—	50	300	ns	I_C = 10 A,
	t_{on}		70	350		R_L = 30 Ω,
	t_f		150	350		V_{GE} = ±15 V
	t_{off}		250	500		Rg = 50 Ω

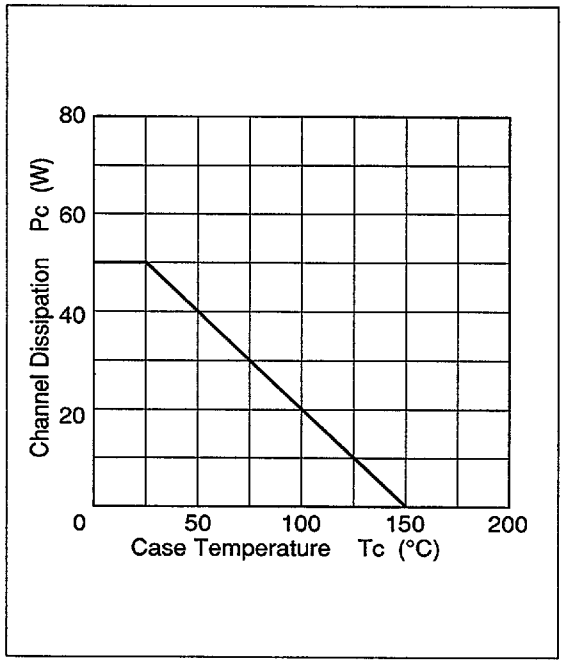

Figure 1 Power vs. Temperature Derating

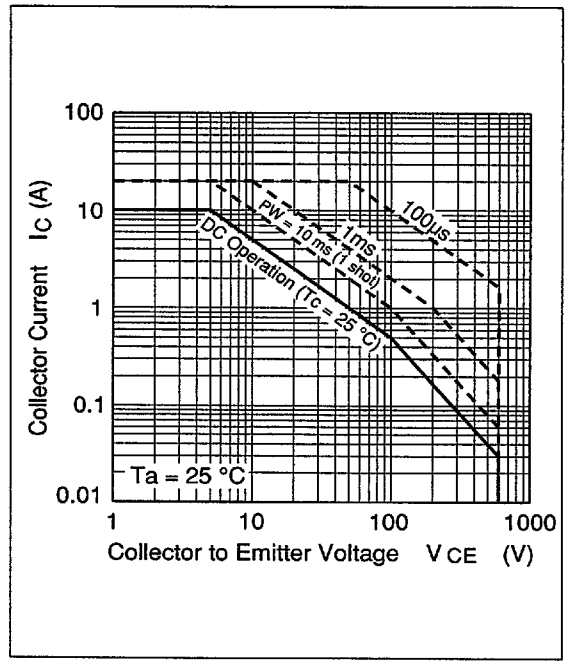

Figure 2 Maximam Safe Operation Area

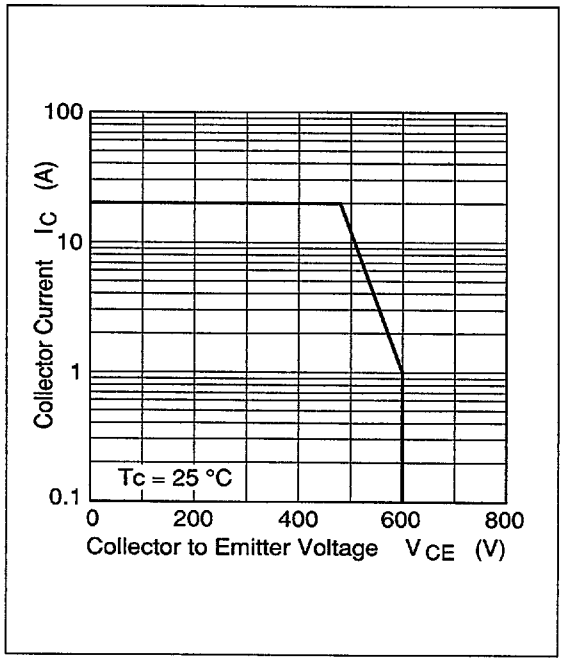

Figure 3 Reverse Bias SOA

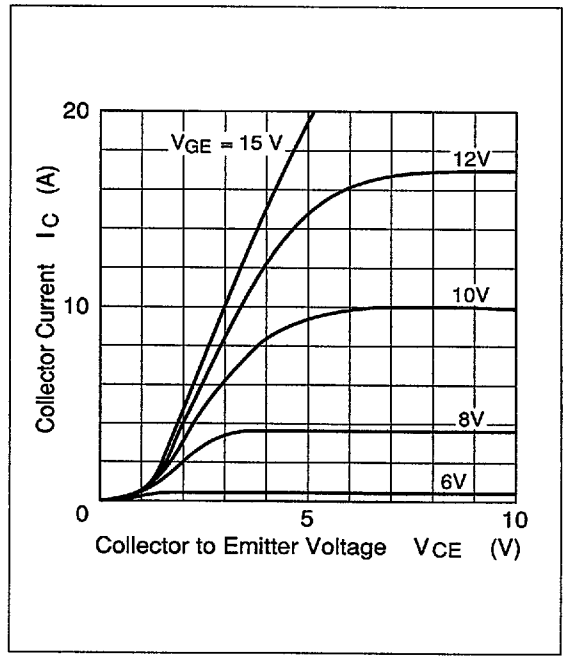

Figure 4 Typical Output Characteristics

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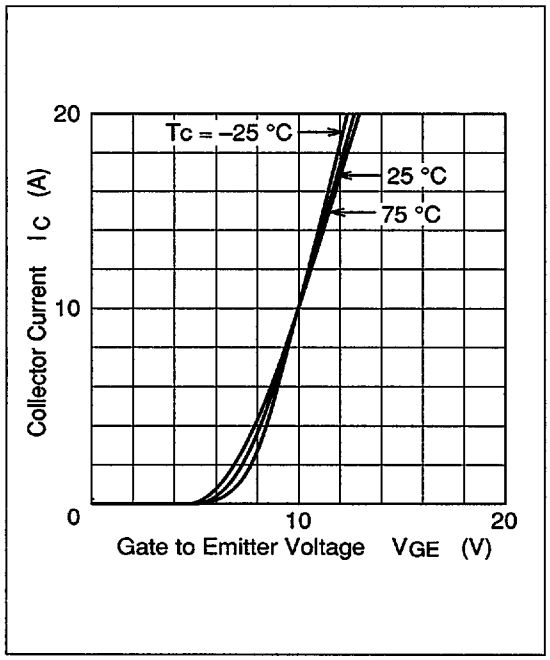


Figure 5 Typical Transfer Characteristics

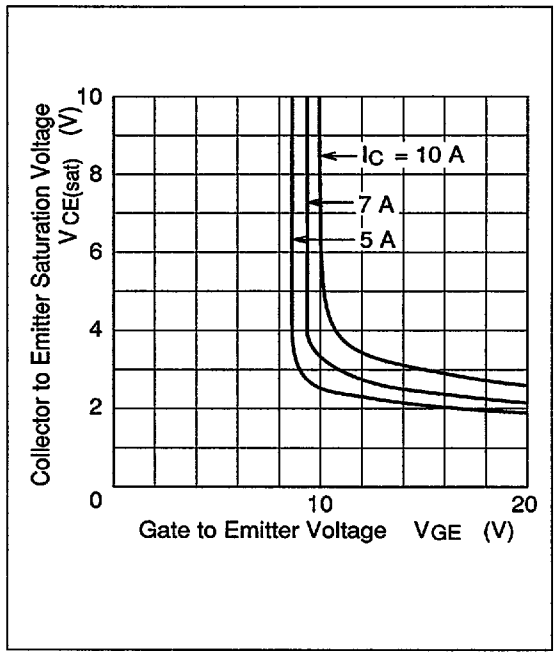


Figure 6 Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage

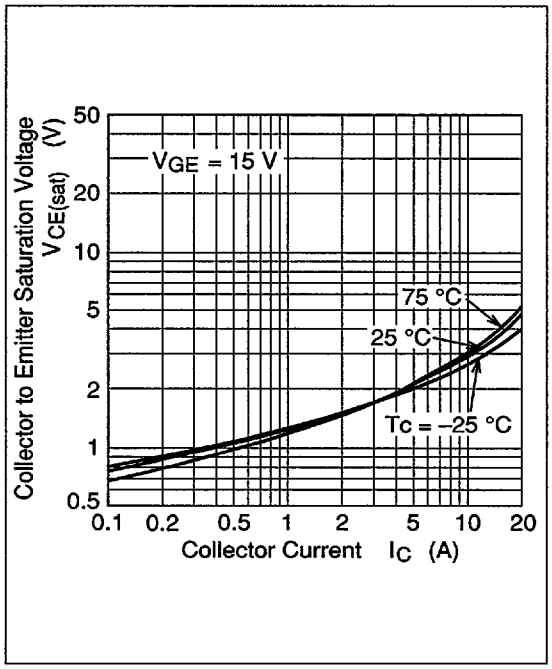


Figure 7 Collector to Emitter Saturation Voltage vs. Collector Current

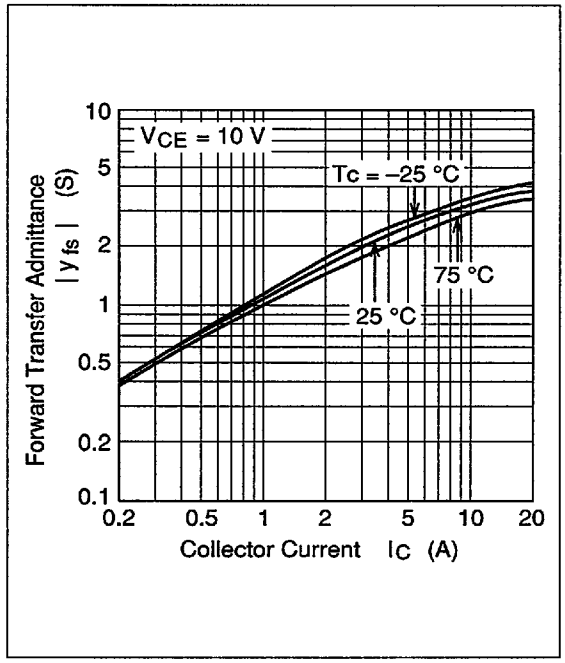


Figure 8 Forward Transfer Admittance vs. Collector Current

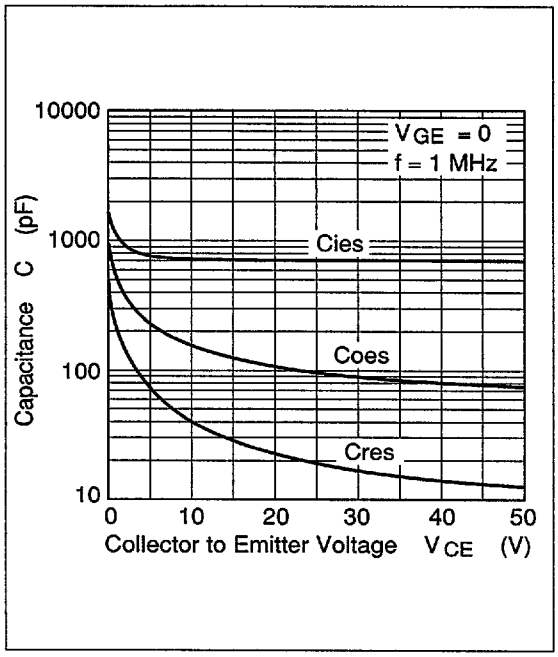


Figure 9 Typical Capacitance vs. Collector to Emitter Voltage

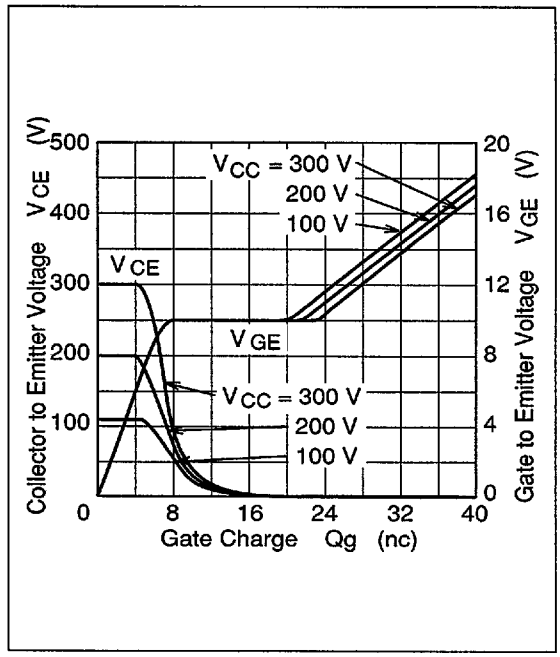


Figure 10 Dynamic Input Characteristics

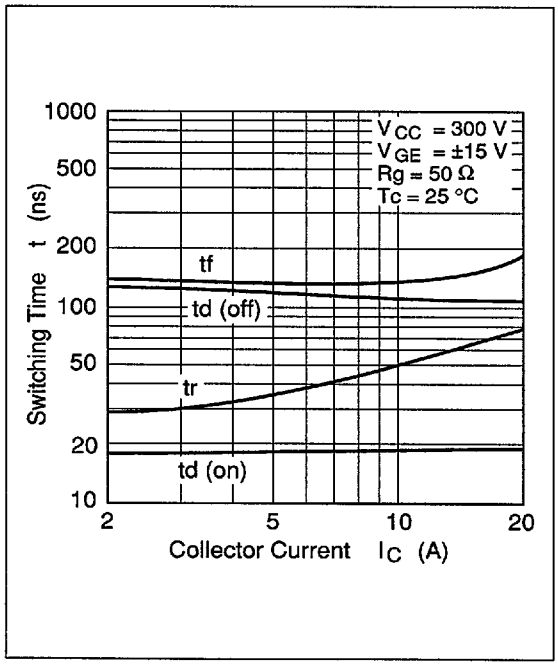


Figure 11 Switching Characteristics

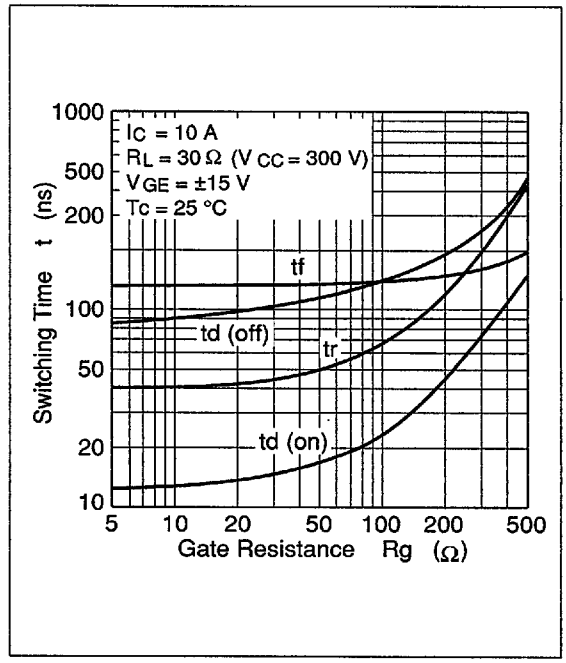


Figure 12 Switching Characteristics

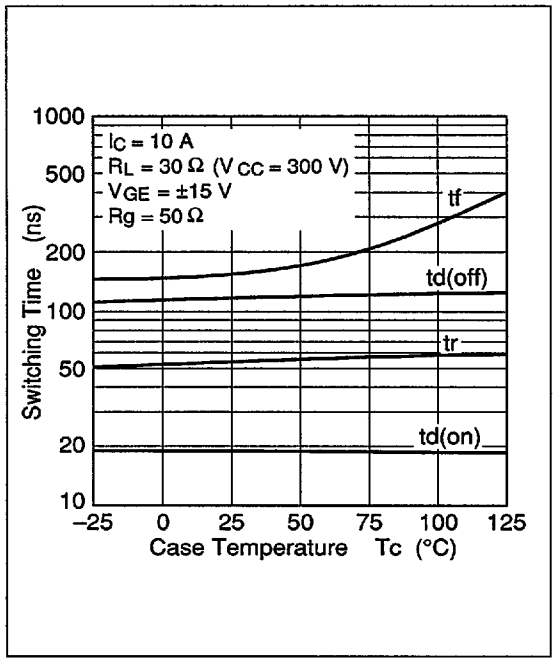


FIgure 13 Switching Characteristics

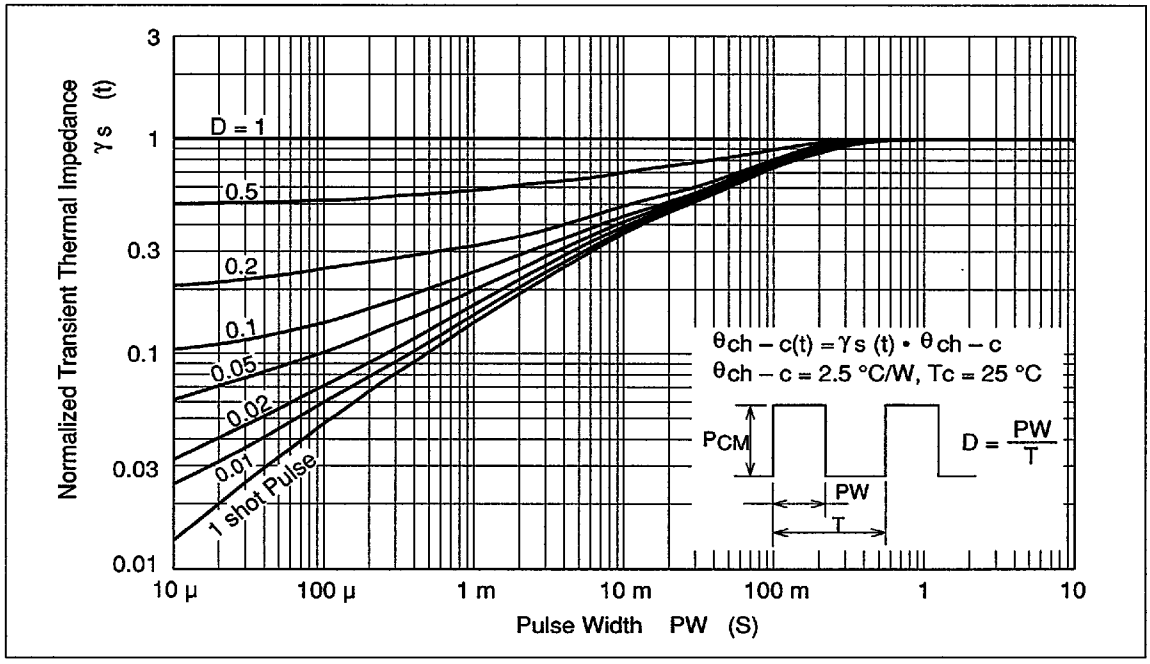
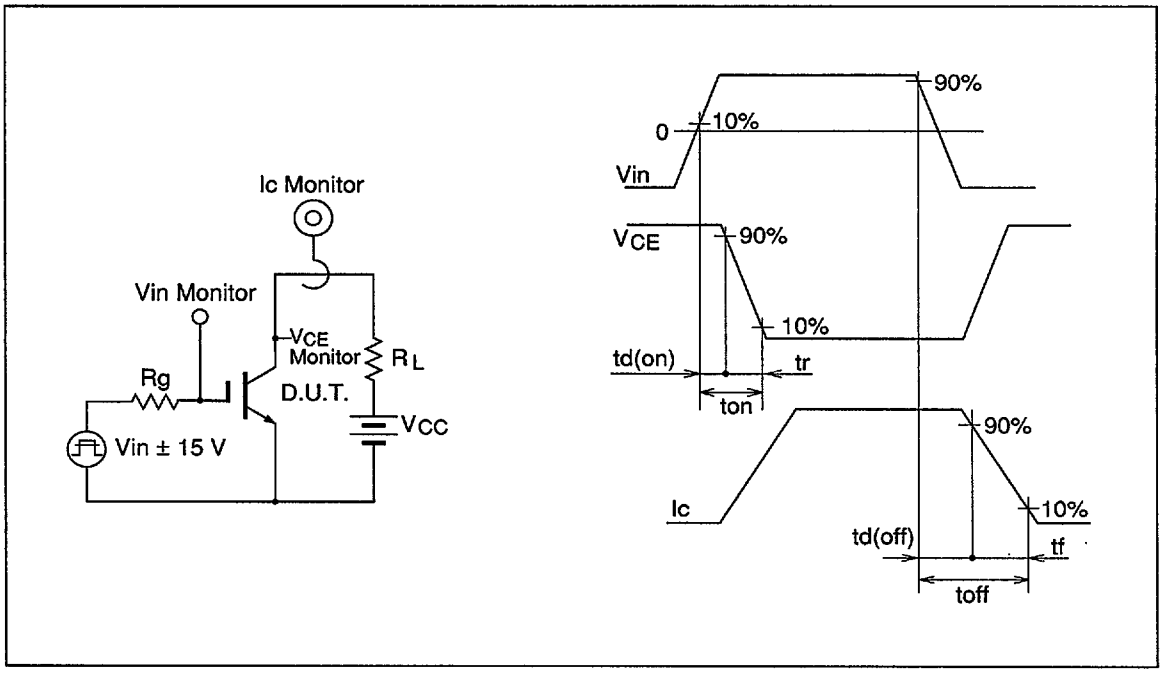


FIgure 14 Normalized Transient Thermal Impedance vs. Pulse Width

Switching Time Test Circuit and Waveforms



Package Dimensions

Unit : mm