

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

GT10J312,GT10J312(SM)

Unit: mm

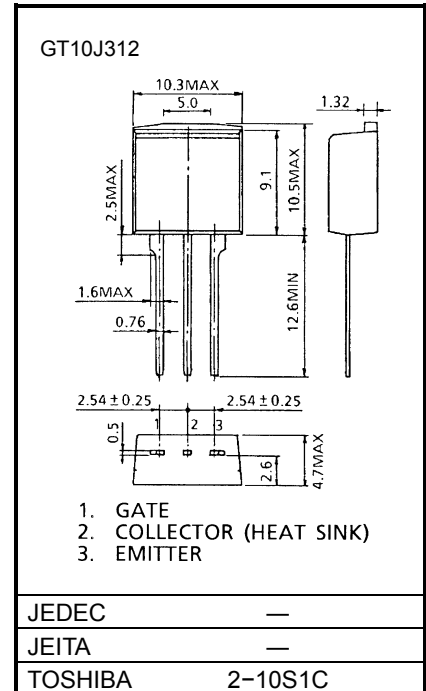
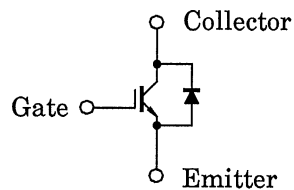
HIGH POWER SWITCHING APPLICATIONS
MOTOR CONTROL APPLICATIONS

- The 3rd Generation
- Enhancement-Mode
- High Speed : $t_f = 0.30\mu s$ (Max.)
- Low Saturation Voltage : $V_{CE(sat)} = 2.7V$ (Max.)
- FRD included between Emitter and Collector.

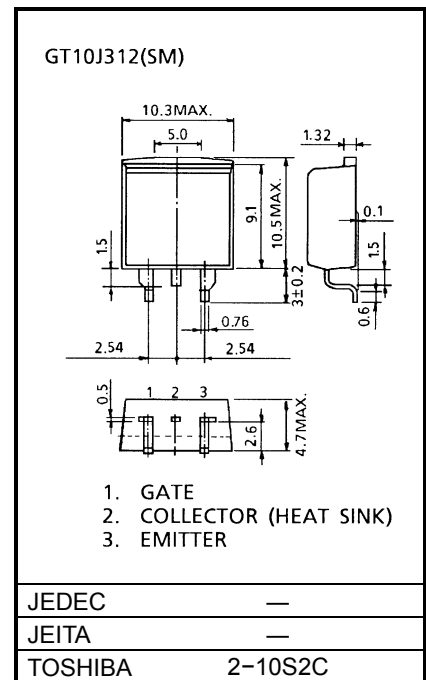
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	600	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C	10	A
	1ms	I_{CP}	20	A
Emitter-Collector Forward Current	DC	I_F	10	A
	1ms	I_{FM}	20	A
Collector Power Dissipation (Tc = 25°C)		P_C	60	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C

EQUIVALENT CIRCUIT



Weight: 1.5g

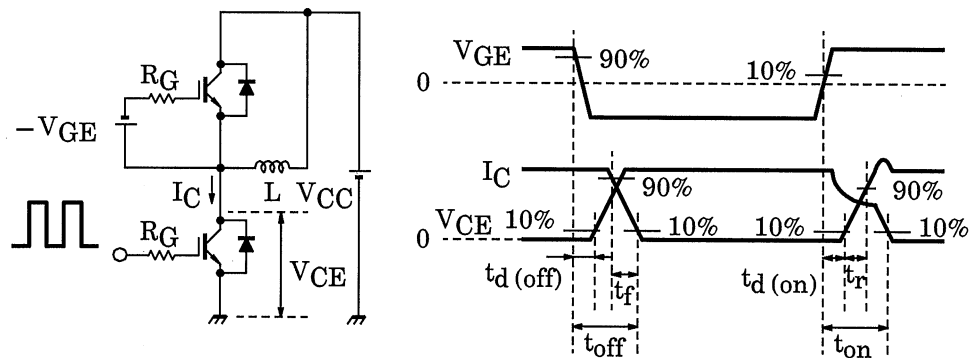


Weight: 1.4g

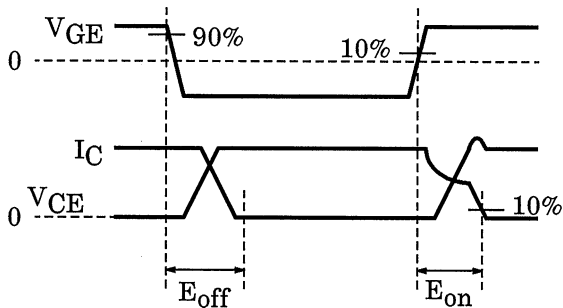
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

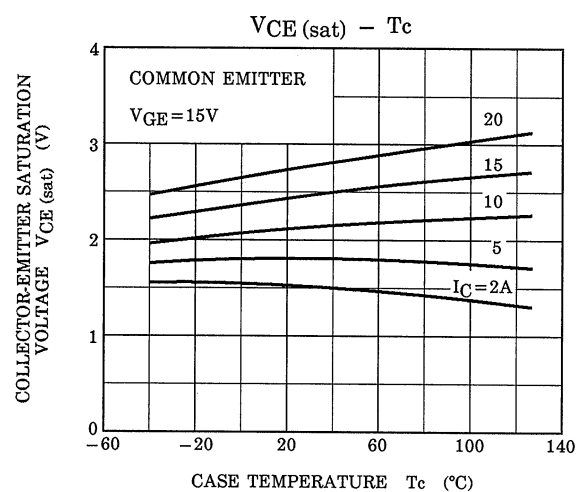
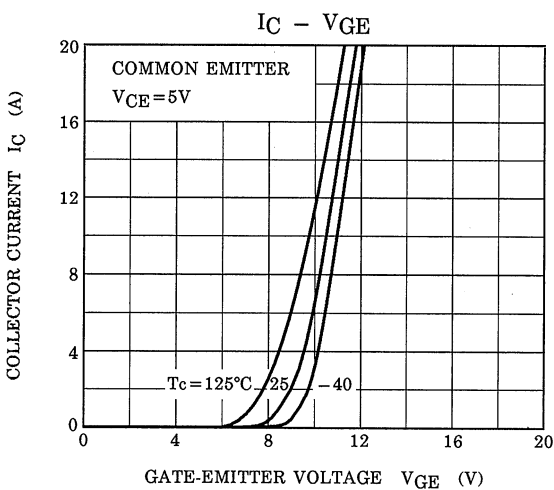
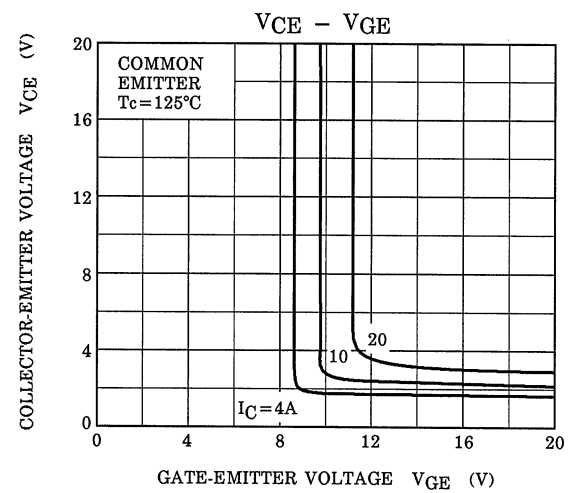
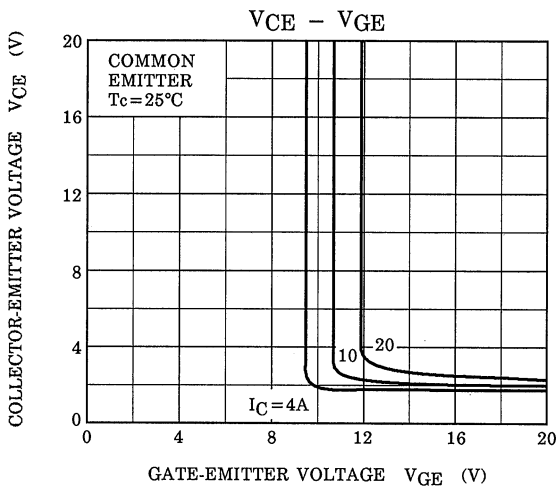
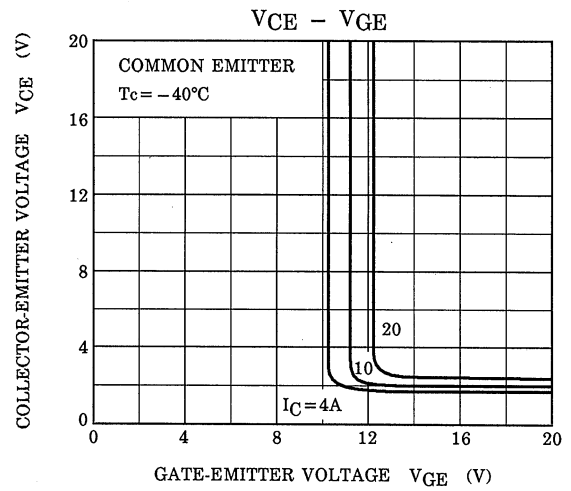
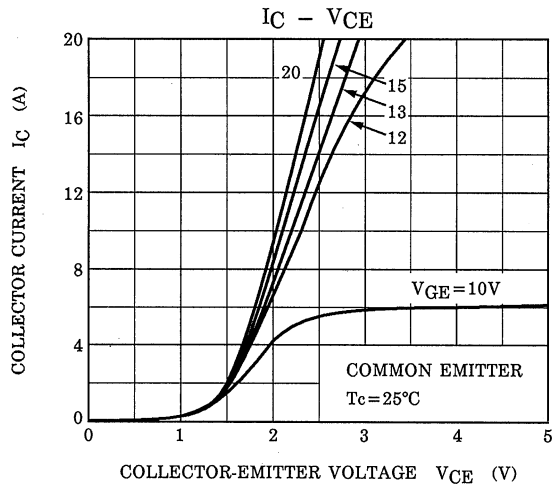
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-Off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE (OFF)}$	$I_C = 1mA, V_{CE} = 5V$	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 10A, V_{GE} = 15V$	—	2.1	2.7	V
Input Capacitance		C_{ies}	$V_{CE} = 20V, V_{GE} = 0, f = 1MHz$	—	720	—	pF
Switching Time	Rise Time	t_r	Inductive Load $V_{CC} = 300V, I_C = 10A$ $V_{GG} = \pm 15V, R_G = 100\Omega$ (Note 1)	—	0.12	—	μs
	Turn-On Time	t_{on}		—	0.40	—	
	Fall Time	t_f		—	0.15	0.30	
	Turn-Off Time	t_{off}		—	0.40	—	
Peak Forward Voltage		V_F	$I_F = 10A, V_{GE} = 0$	—	—	2.0	V
Reverse Recovery Time		t_{rr}	$I_F = 10A, di/dt = -100A/\mu s$	—	—	200	ns
Thermal Resistance (IGBT)		$R_{th (j-c)}$	—	—	—	2.08	$^{\circ}C/W$
Thermal Resistance (Diode)		$R_{th (j-c)}$	—	—	—	3.76	$^{\circ}C/W$

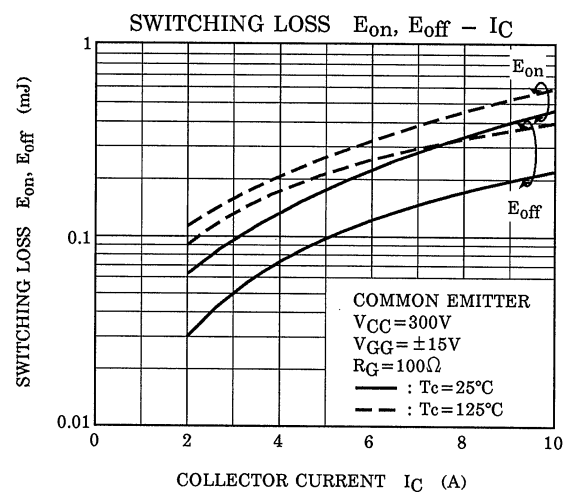
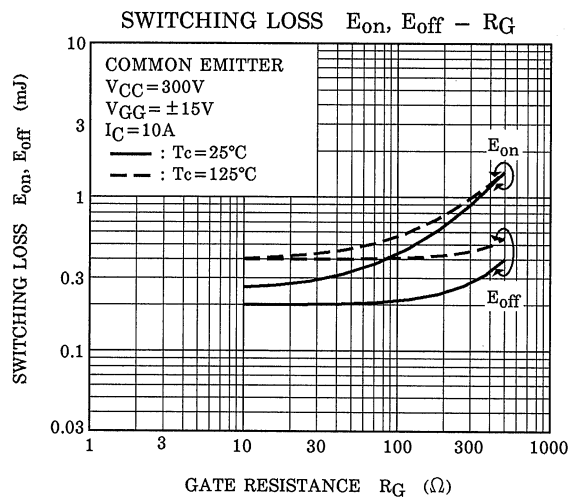
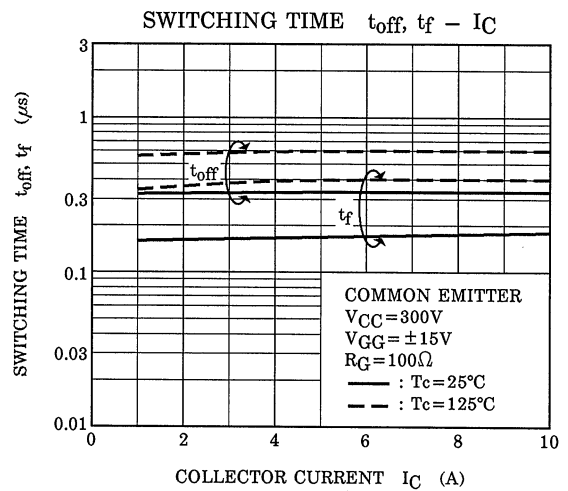
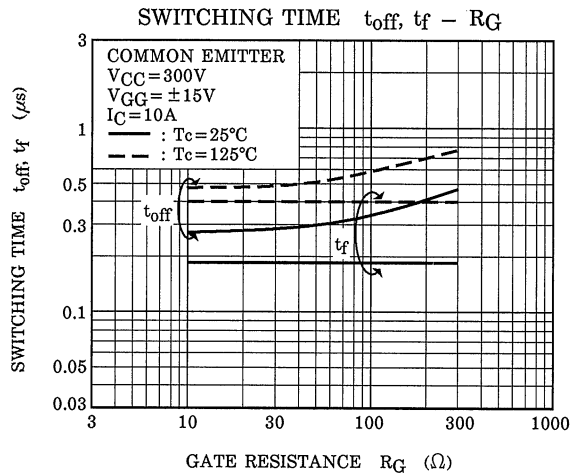
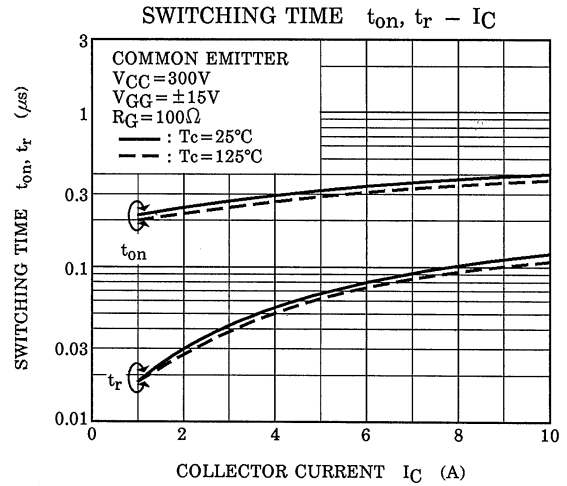
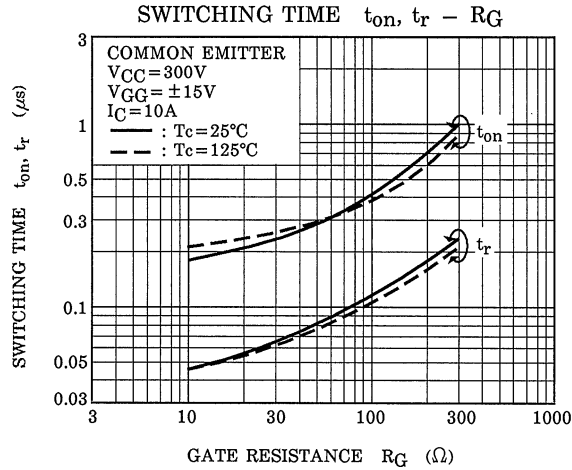
Note 1: Switching time measurement circuit and input / output waveforms

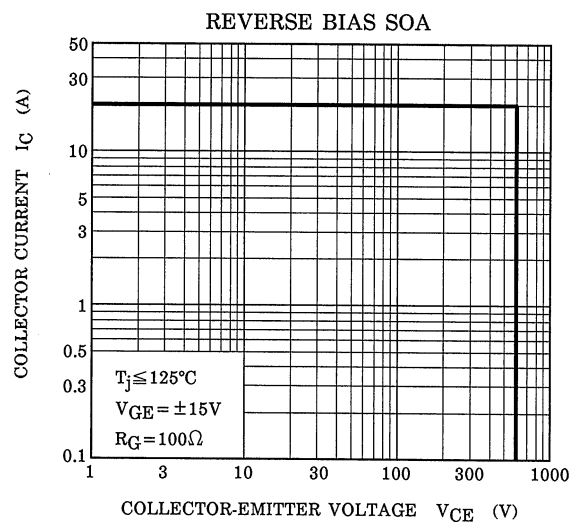
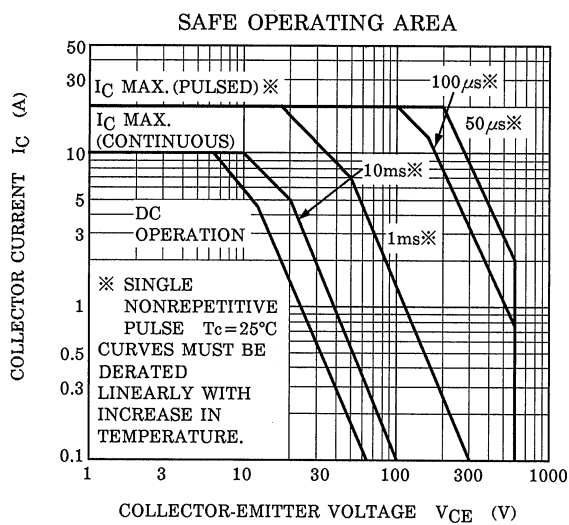
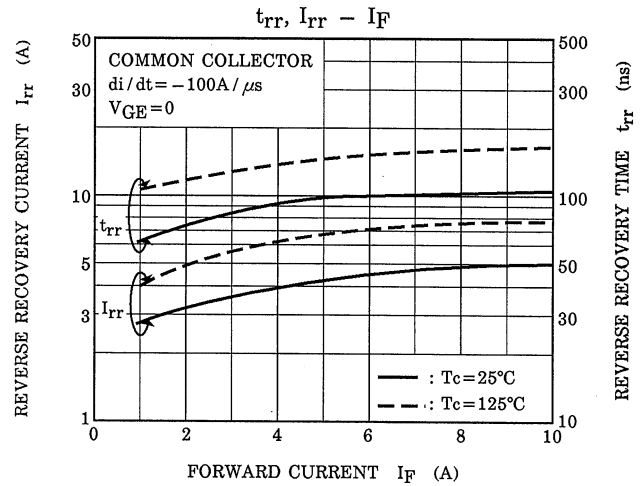
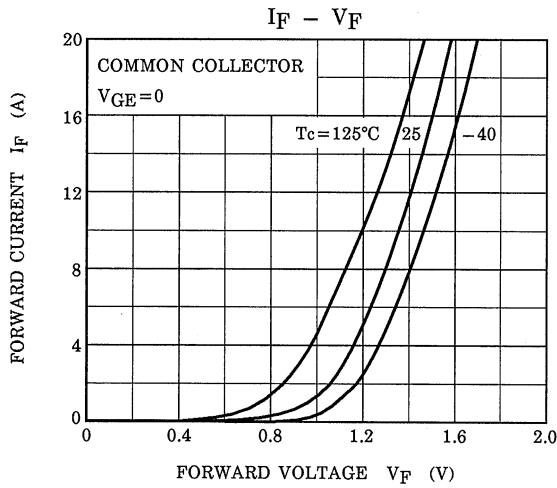
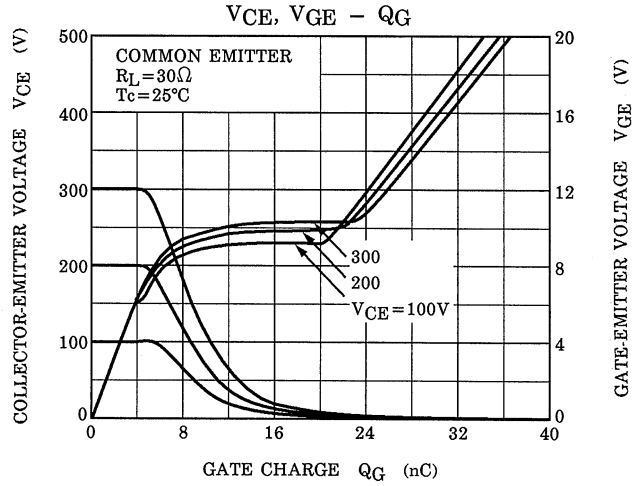
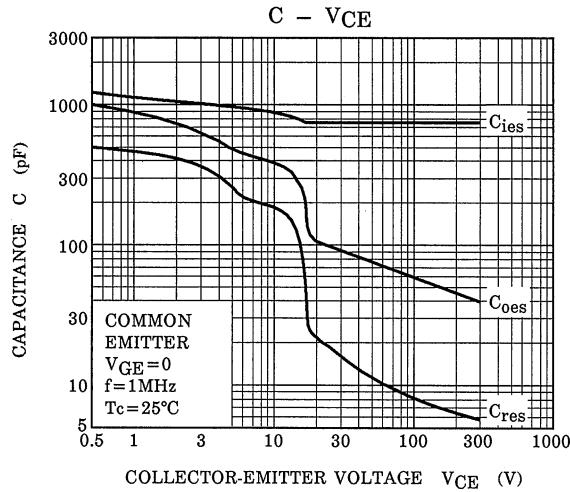


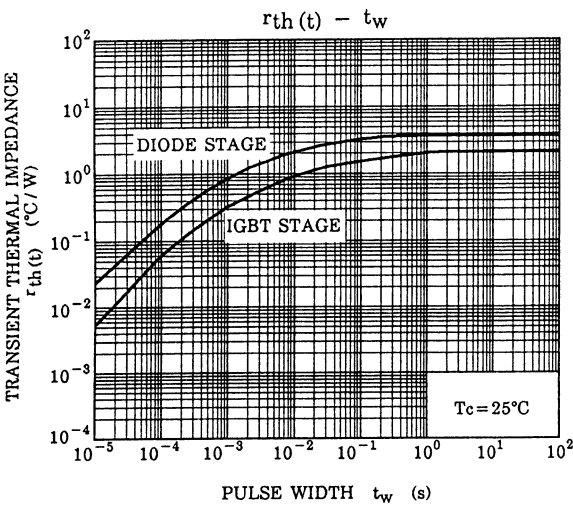
Switching loss measurement waveforms











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