

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

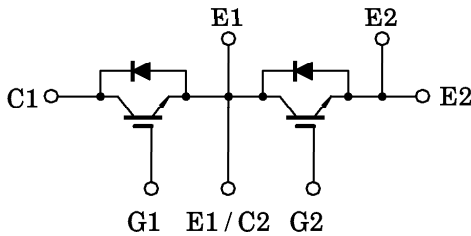
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HIGH POWER SWITCHING APPLICATIONS

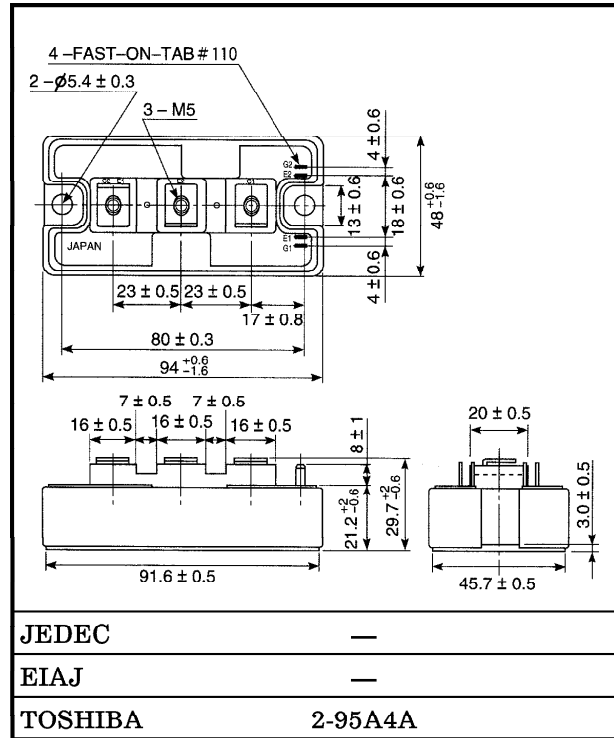
MOTOR CONTROL APPLICATIONS

- High Input Impedance
- High Speed : $t_f = 0.3 \mu s$ (Max.)
@Inductive Load
- Low Saturation Voltage
: $V_{CE(sat)} = 3.6V$ (Max.)
- Enhancement-Mode
- Includes a Complete Half Bridge in One Package.
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Unit in mm



Weight : 255g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	±20	V
Collector Current	DC	I_C (25°C / 80°C)	200 / 150
	1ms	I_{CP} (25°C / 80°C)	400 / 300
Forward Current	DC	I_F	150
	1ms	I_{FM}	300
Collector Power Dissipation (Tc = 25°C)	P_C	1250	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-40~125	°C
Isolation Voltage	V_{Isol}	2500 (AC 1 minute)	V
Screw Torque (Terminal / Mounting)	—	3 / 3	N·m

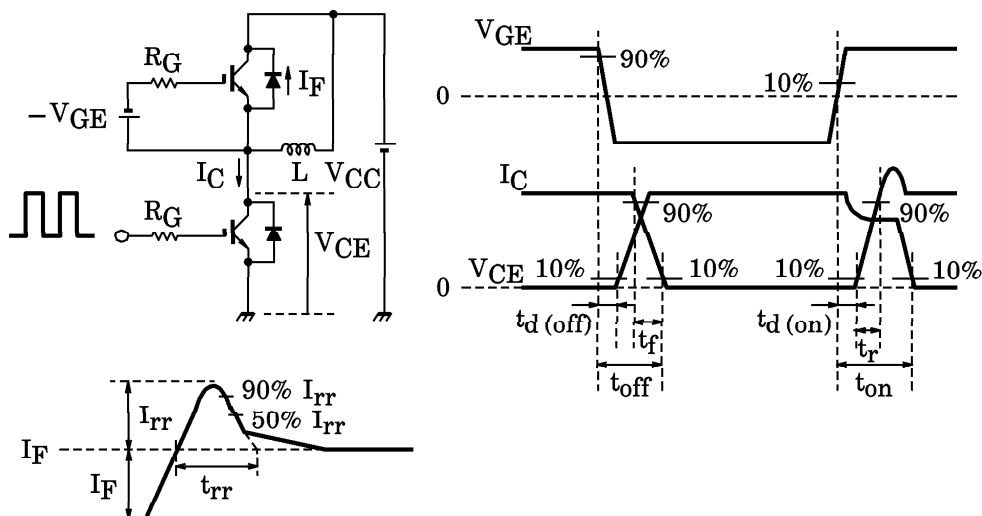
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

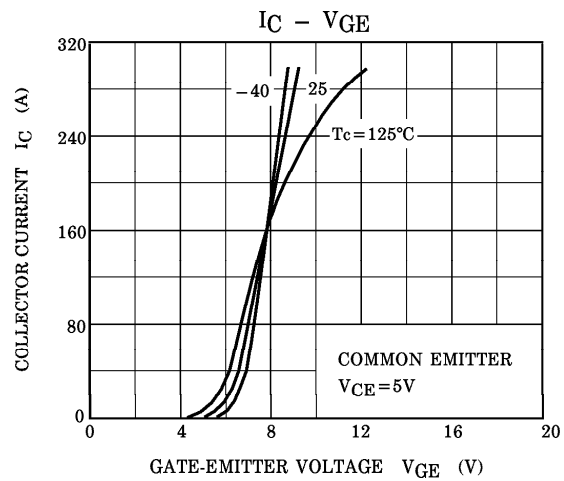
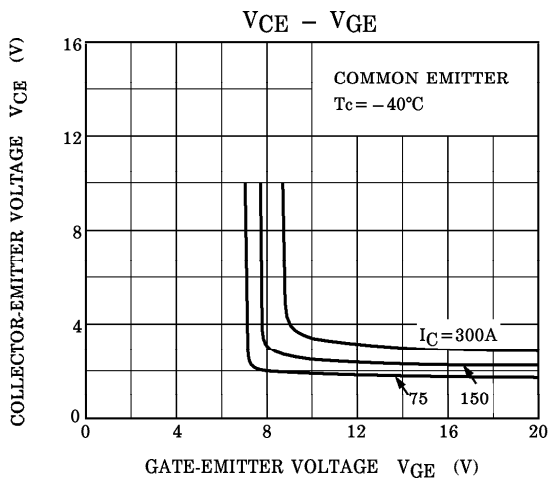
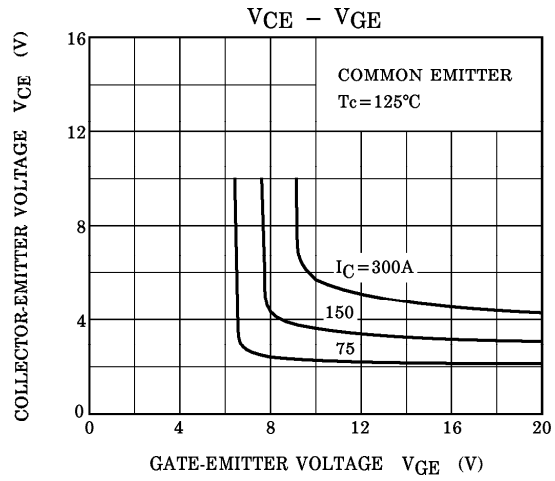
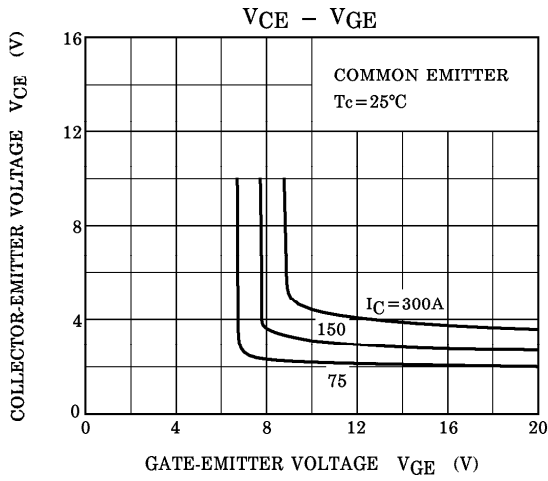
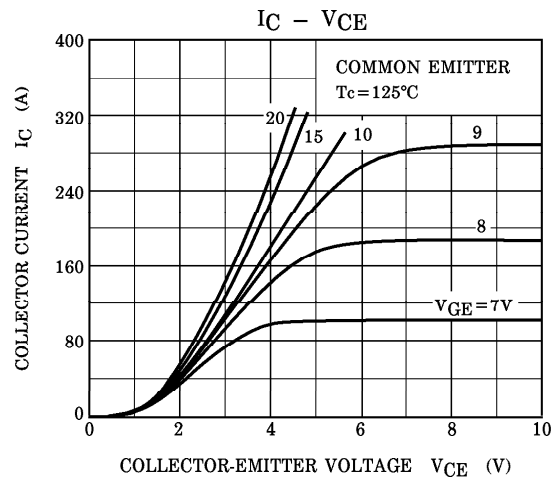
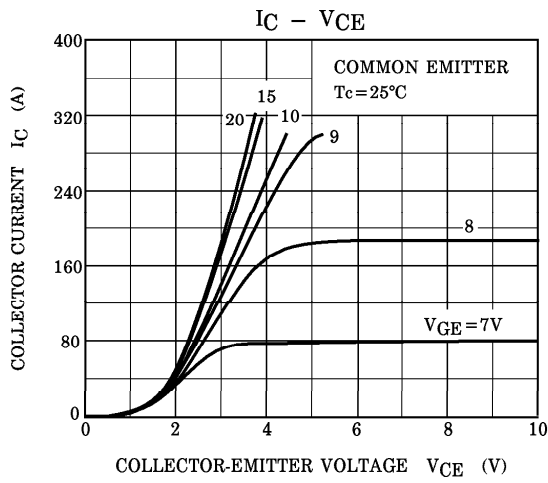
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	2.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE} (off)$	$I_C = 150mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 150A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6
				$T_j = 125^\circ C$	—	3.1	4.0
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	18.0	—	nF
Switching Time	Turn-on Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 600V$ $I_C = 150A$ $V_{GE} = \pm 15V$ $R_G = 5.6\Omega$ (Note 1)	—	0.05	—	μs
	Rise Time	t_r		—	0.05	—	
	Turn-on Time	t_{on}		—	0.2	—	
	Turn-off Delay Time	$t_d (off)$		—	0.5	—	
	Fall Time	t_f		—	0.1	0.3	
	Turn-off Time	t_{off}		—	0.6	—	
Forward Voltage		V_F	$I_F = 150A, V_{GE} = 0$	—	2.4	3.5	V
Reverse Recovery Time		t_{rr}	$I_F = 150A, V_{GE} = -10V$ $di / dt = 700A / \mu s$ (Note 1)	—	0.1	0.25	μs
Thermal Resistance		$R_{th} (j-c)$	Transistor Stage	—	—	0.1	$^\circ C / W$
			Diode Stage	—	—	0.32	

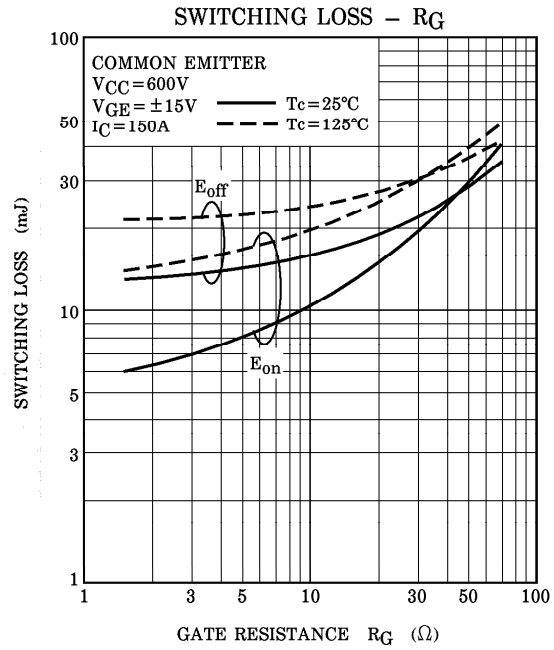
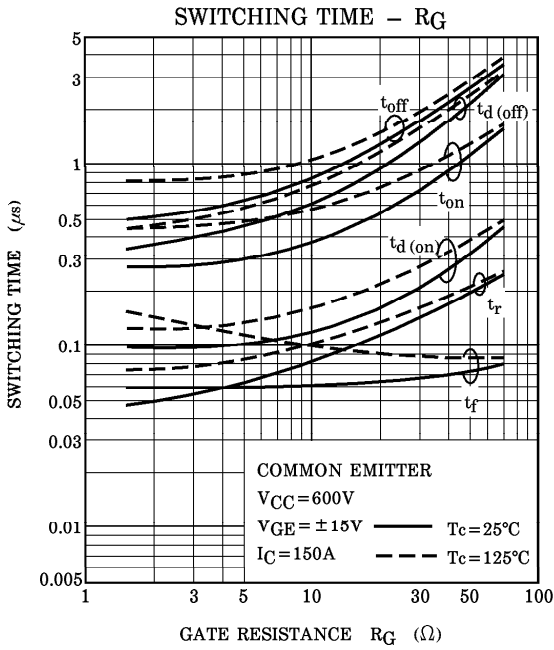
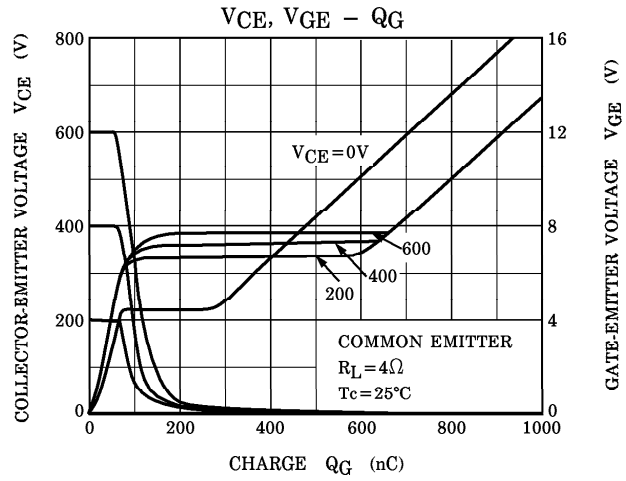
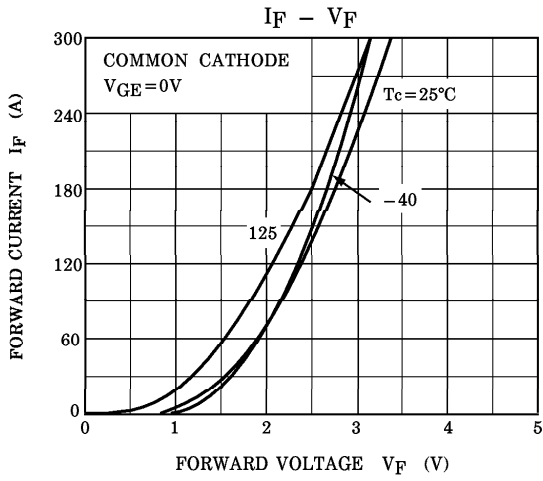
Note 1 : Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



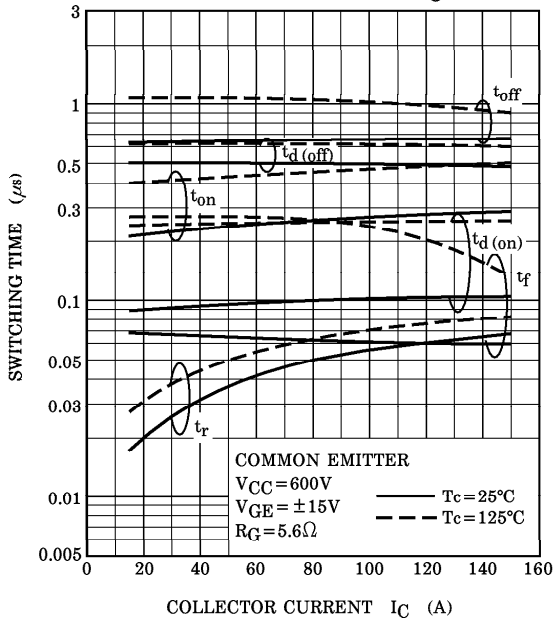
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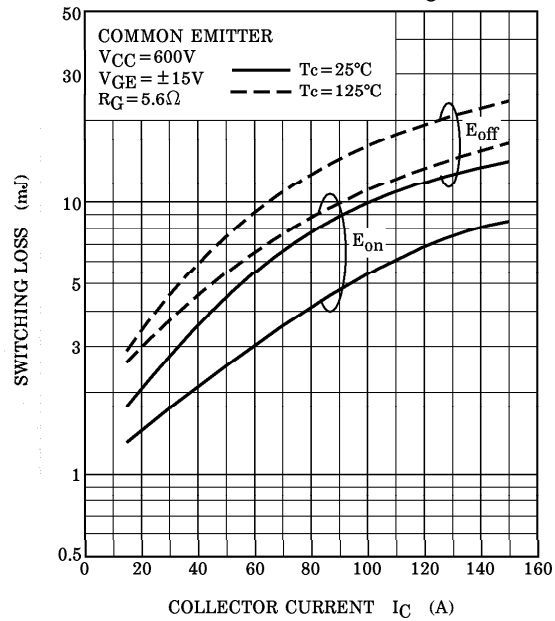




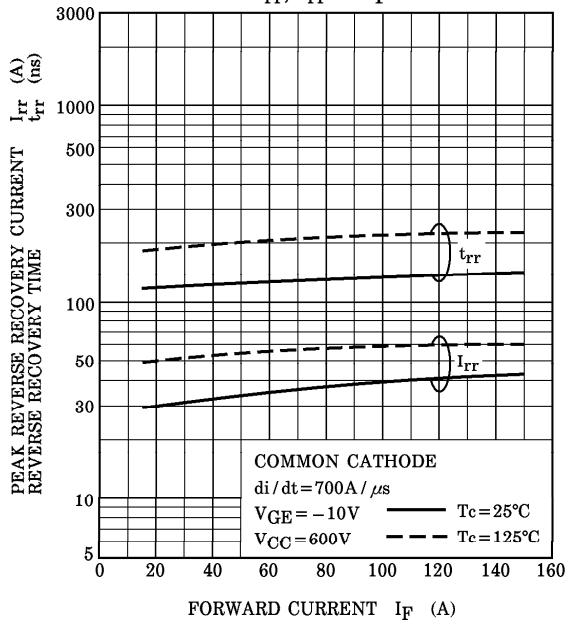
SWITCHING TIME - I_C



SWITCHING LOSS - I_C



I_{rr}, t_{rr} - I_F



E_{dsw} - I_F

