

TOSHIBA GTR Module Silicon N Channel IGBT

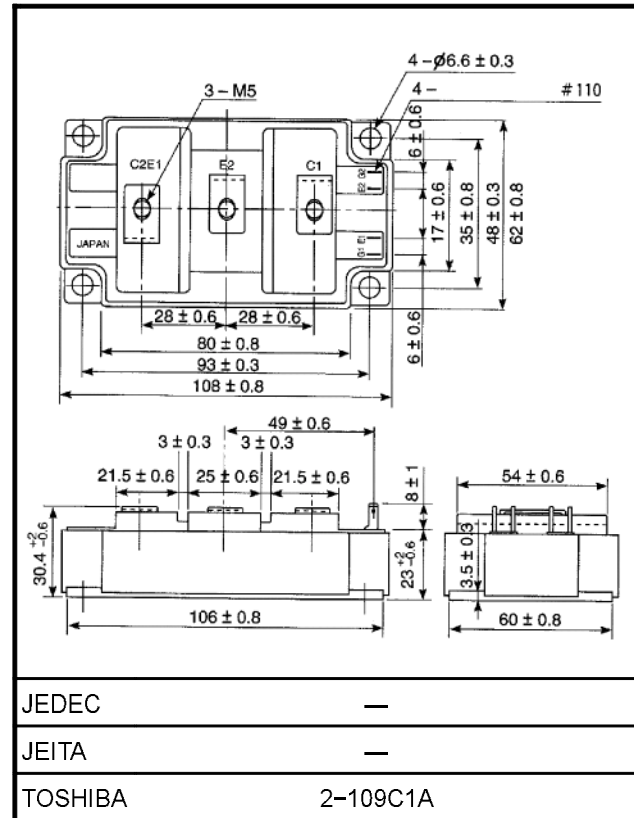
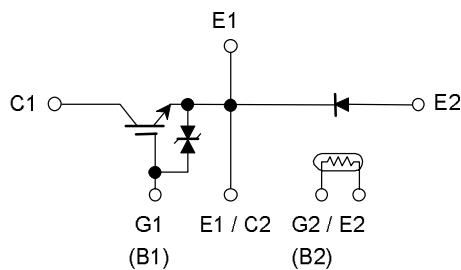
MG150Q1JS44

Unit in mm

High Power Switching Applications
Chopper Applications

- High input impedance
- High speed: $t_f = 0.4\mu s$ (max.)
 $t_{rr} = 0.45\mu s$ (max.)
- Low saturation voltage
: $V_{CE(sat)} = 4.0V$ (max.)
- Enhancement-mode
- The electrodes are isolated from case.

Equivalent Circuit

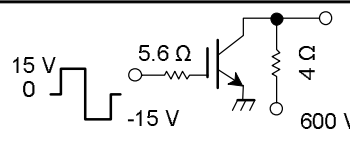
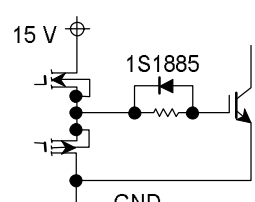


Weight: 430 g

Maximum Ratings ($T_a = 25^\circ C$)

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	150	A
	1ms	I_{CP}	300	
Forward current	DC	I_F	150	A
	1ms	I_{FM}	300	
Collector power dissipation ($T_c = 25^\circ C$)		P_C	1100	W
Junction temperature		T_j	150	$^\circ C$
Storage temperature range		T_{stg}	$-40 \sim 125$	$^\circ C$
Isolation voltage		V_{isol}	2500 (AC 1min.)	V
Screw torque (terminal / mounting)		—	3 / 3	N·m

Electrical Characteristics (Ta = 25°C)

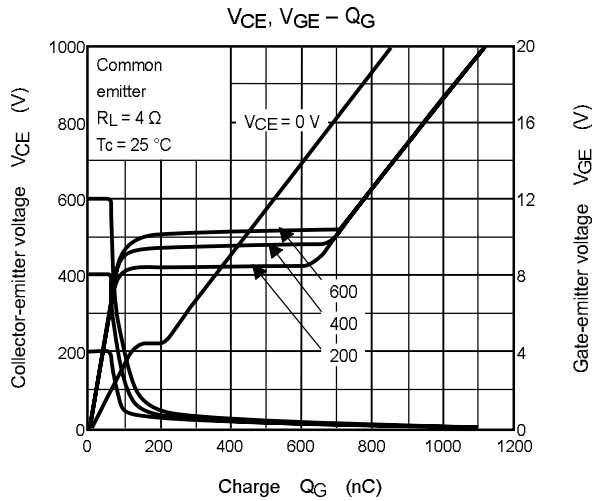
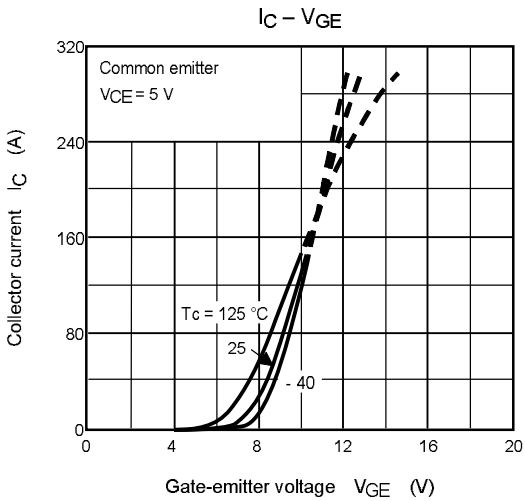
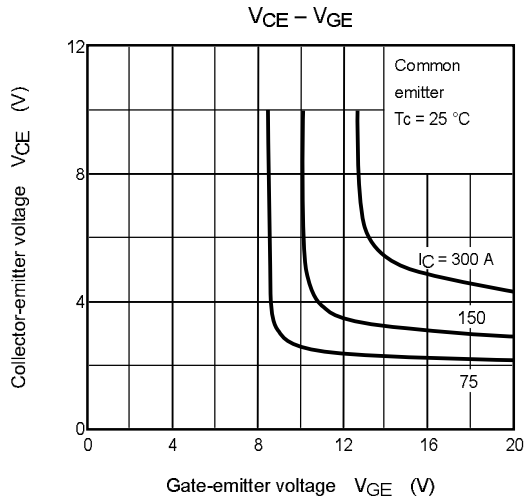
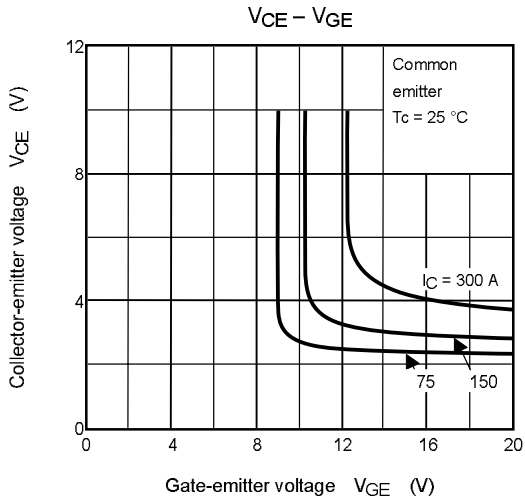
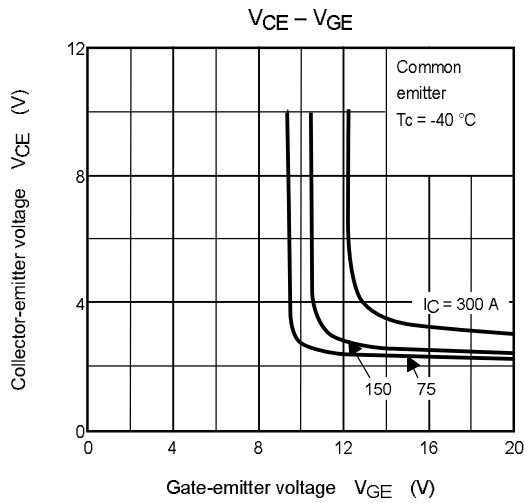
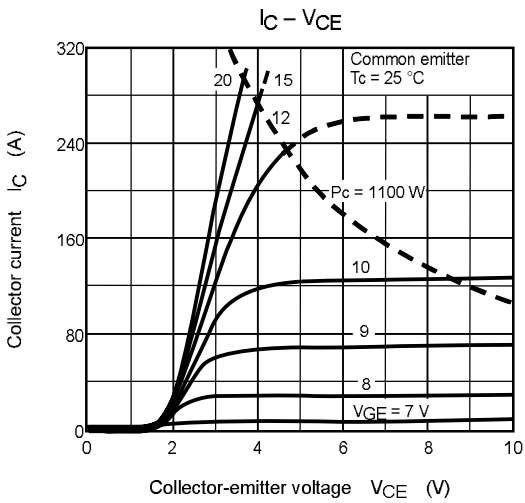
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 20	μA
Collector cut-off current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	2.0	mA
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 150mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 150A, V_{GE} = 15V$	2.78	3.2	4.0	V
Input capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	18000	—	pF
Switching time	Rise time	t_r		—	0.3	0.6	μs
	Turn-on time	t_{on}		—	0.4	0.8	
	Fall time	t_f		—	0.2	0.4	
	Turn-off time	t_{off}		—	0.8	1.4	
Forward voltage		V_F	$I_F = 150A, V_{GE} = 0$	1.7	2.0	3.0	V
Reverse recovery time		t_{rr}	$I_F = 150A, V_{GE} = -10V$ $di/dt = 200A/\mu s$	—	0.25	0.45	μs
Thermal resistance		$R_{th(j-c)}$	Transistor stage	—	—	0.11	$^{\circ}C/W$
			Diode stage	—	—	0.4	
Switching loss (Note 1)	Turn-on	E_{on}	Inductive load, $T_c = 125^{\circ}C$ $R_g = 5.1\Omega$ (Note 2) 	—	—	38	mJ
	Turn-off	E_{off}		—	—	32	

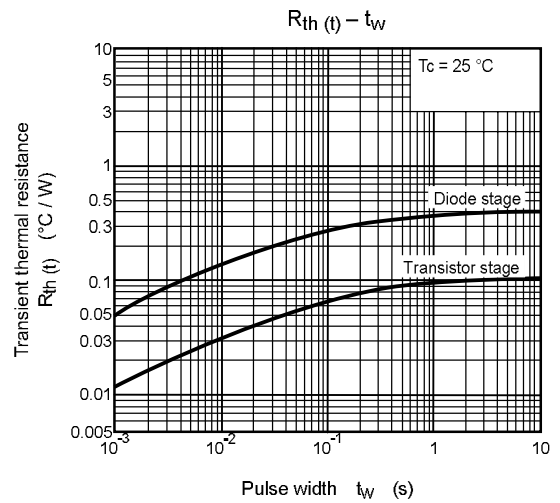
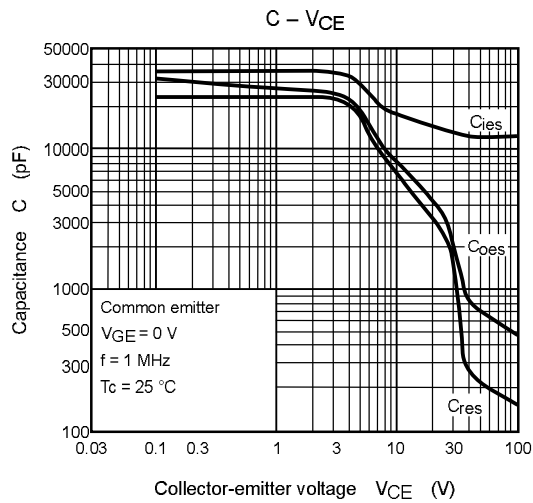
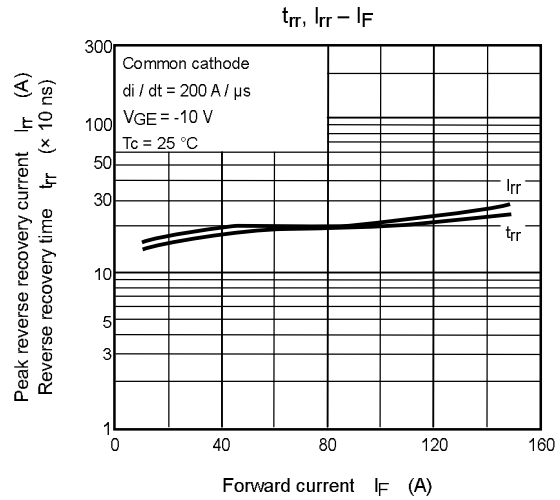
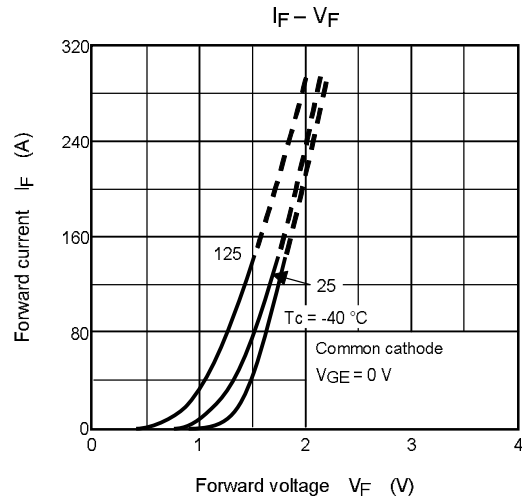
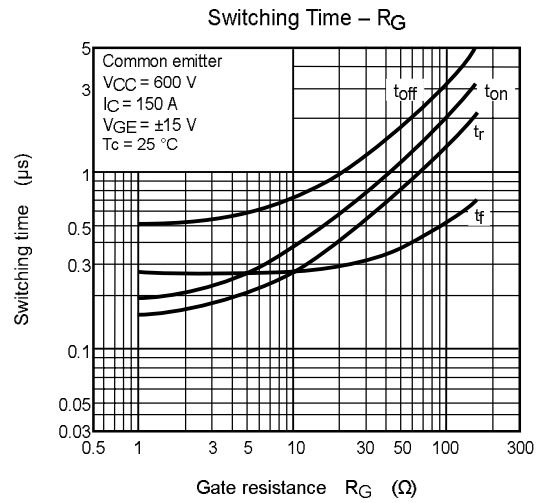
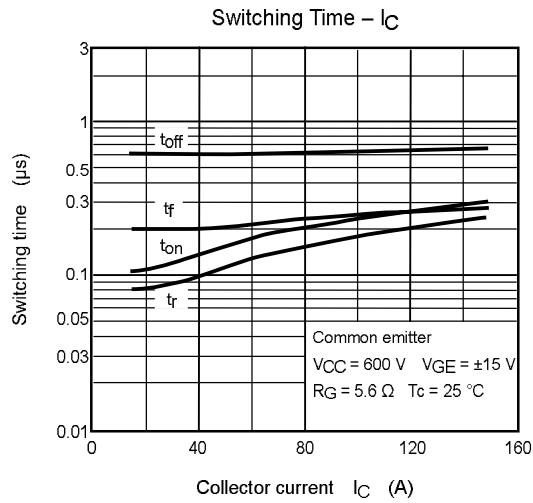
(Note 1) Switching loss (E_{on} , E_{off}) is guaranteed by controlling $V_{CE (sat)}$ and V_F .

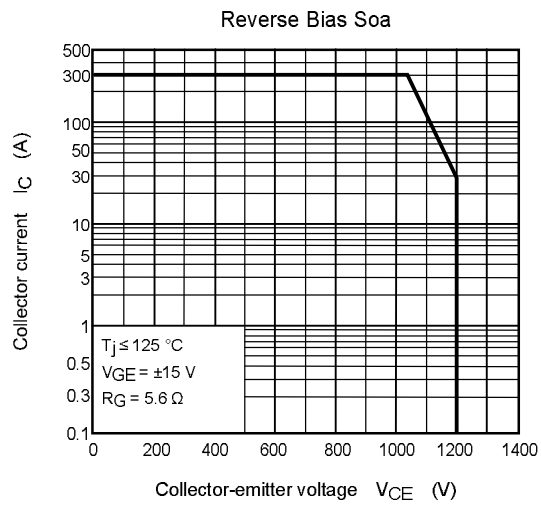
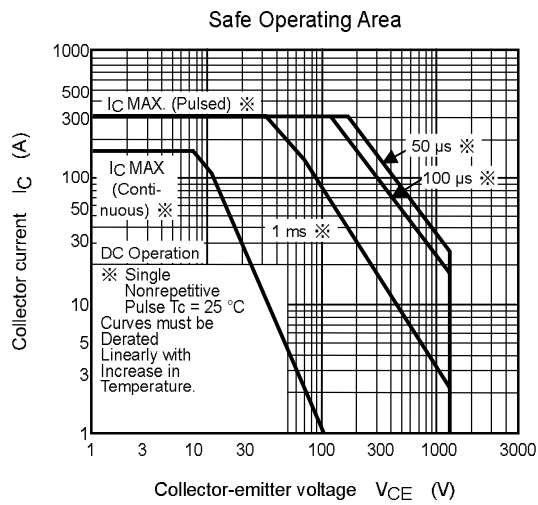
(Note 2) Drive output MOSFETs 2SK1112 (n-ch), 2SJ183 (p-ch)

Thermistor

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Zero power resistance	R25	$T_c = 25^{\circ}C$	—	5	—	k Ω
B value	B25 / 85	$T_c = 25^{\circ}C / T_c = 85^{\circ}C$	—	3860	—	K







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