

TOSHIBA IGBT Module Silicon N Channel IGBT

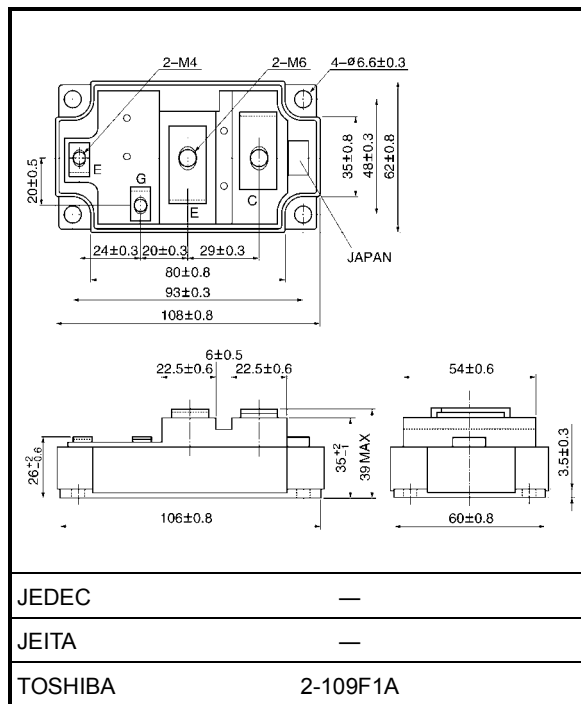
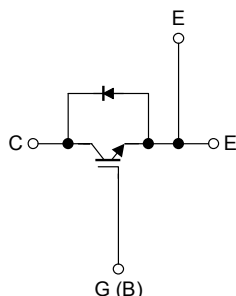
MG400Q1US65H

High Power & High Speed Switching Applications

Unit: mm

- High input impedance
- Enhancement mode
- The electrodes are isolated from case.

Equivalent Circuit



Weight: 465 g (typ.)

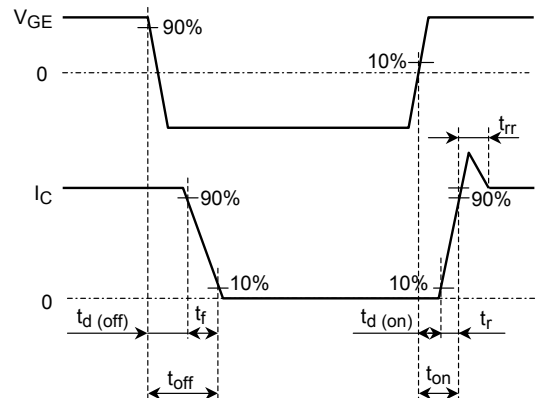
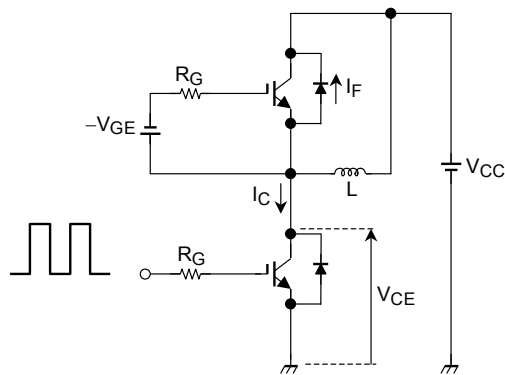
Maximum Ratings (Ta = 25°C)

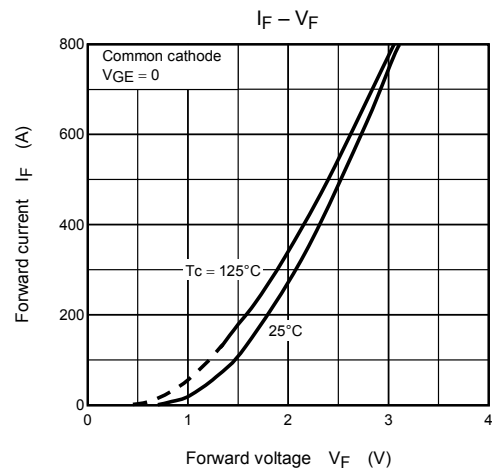
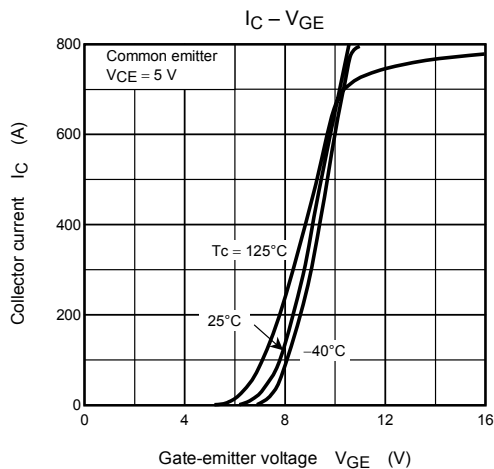
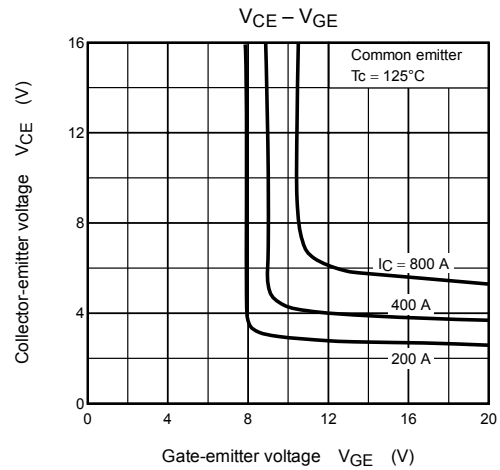
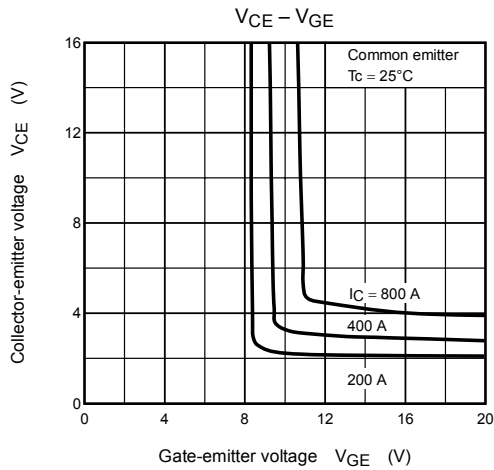
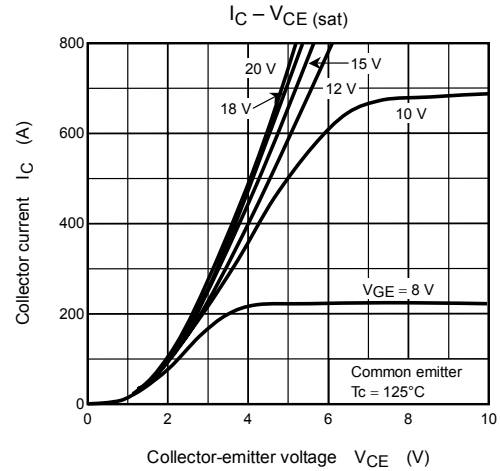
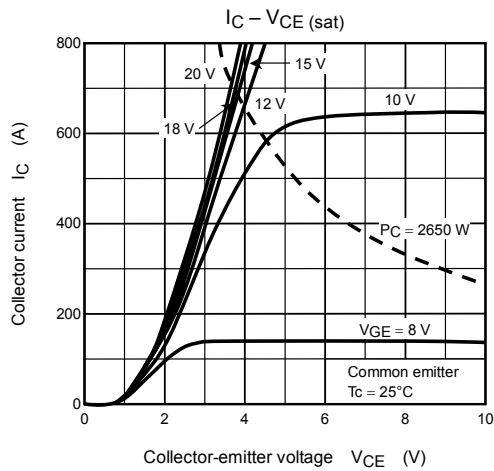
Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	400	A
	1 ms	I_{CP}	800	
Forward current	DC	I_F	400	A
	1 ms	I_{FM}	800	
Collector power dissipation (Tc = 25°C)		P_C	2650	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-40 to 125	°C
Isolation voltage		V_{Isol}	2500 (AC 1 minute)	V
Screw torque	Terminal	—	3	N·m
	Mounting	—	3	

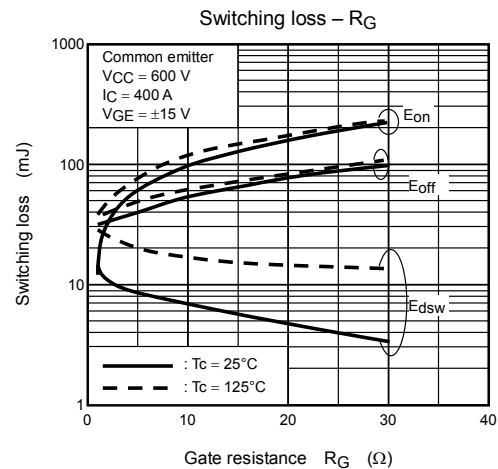
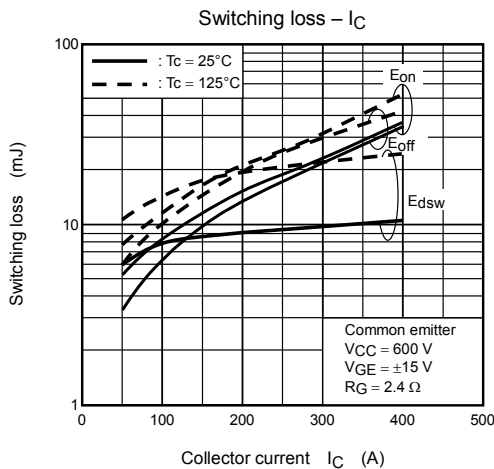
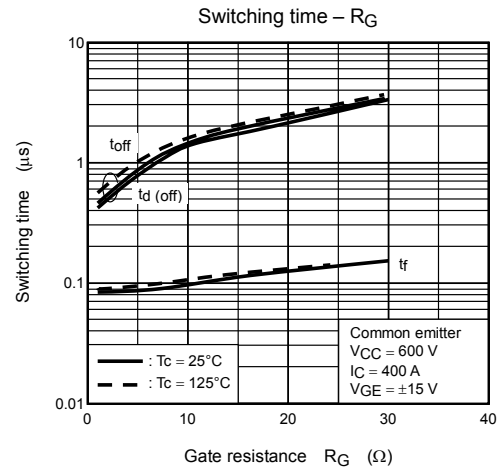
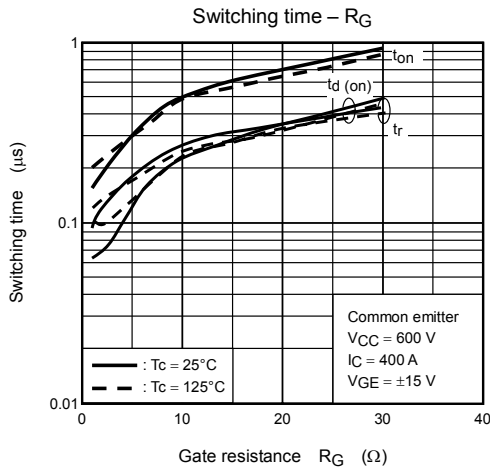
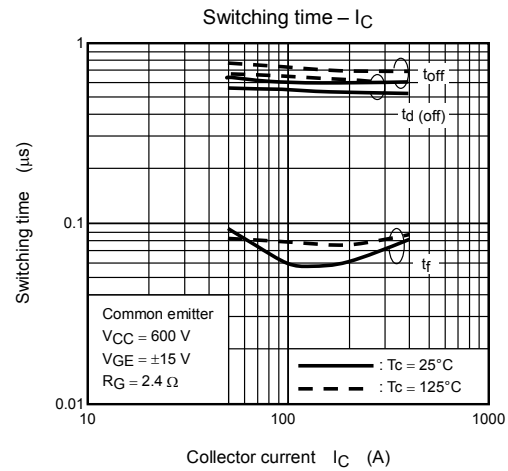
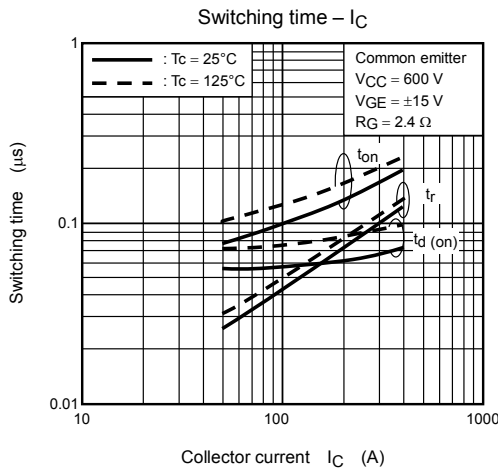
Electrical Characteristics (Ta = 25°C)

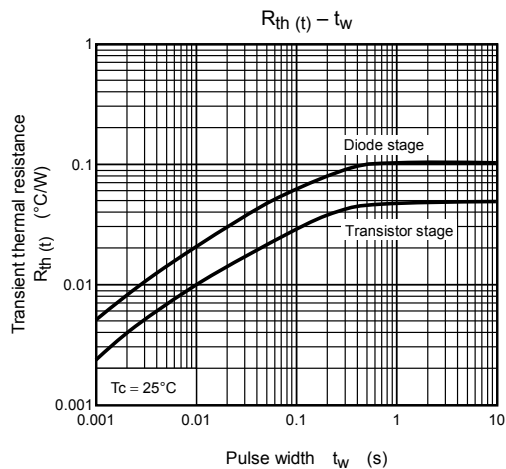
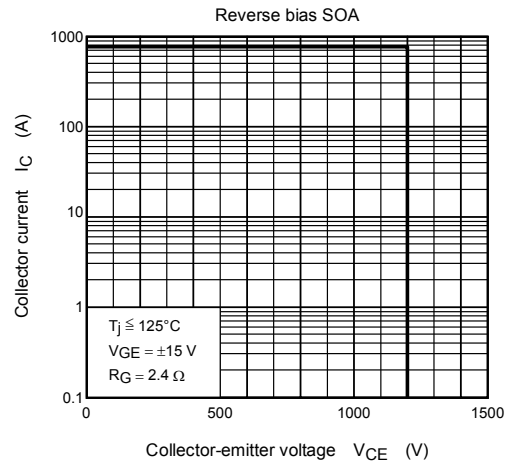
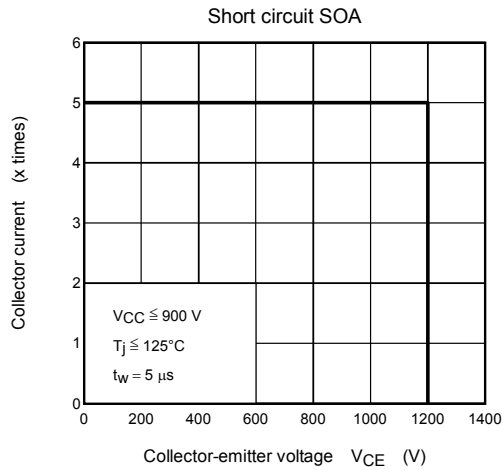
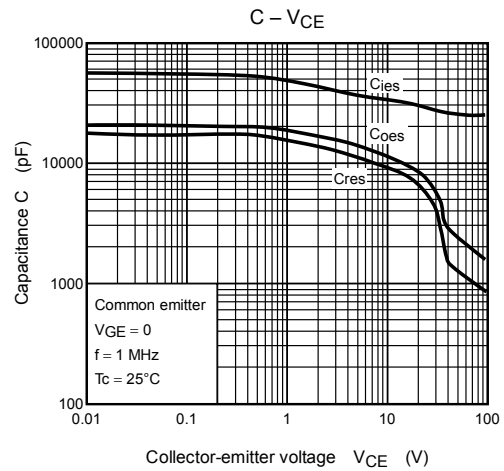
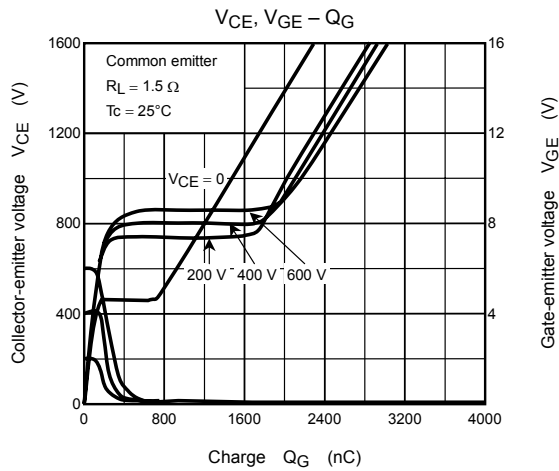
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	4.0	mA
Gate-emitter cut-off voltage		$V_{GE} \text{ (off)}$	$I_C = 400 \text{ mA}, V_{CE} = 5 \text{ V}$	4.0	—	7.0	V
Collector-emitter saturation voltage		$V_{CE} \text{ (sat)}$	$I_C = 400 \text{ A}, V_{GE} = 15 \text{ V}$	$T_C = 25^\circ\text{C}$	—	3.0	V
				$T_C = 125^\circ\text{C}$	—	3.6	
Input capacitance		C_{ies}	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	34000	—	pF
Switching time	Turn-on delay time	$t_d \text{ (on)}$	Inductive load $V_{CC} = 600 \text{ V}, I_C = 400 \text{ A}$ $V_{GE} = \pm 15 \text{ V}, R_G = 2.4 \Omega$	—	0.05	—	μs
	Rise time	t_r		—	0.05	—	
	Turn-on time	t_{on}		—	0.10	—	
	Turn-off delay time	$t_d \text{ (off)}$		—	0.55	—	
	Fall time	t_f		—	0.05	0.15	
	Turn-off time	t_{off}		—	0.60	—	
Forward voltage		V_F	$I_F = 400 \text{ A}, V_{GE} = 0$	—	2.4	3.5	V
Reverse recovery time		t_{rr}	$I_F = 400 \text{ A}, V_{GE} = -10 \text{ V}$	—	0.25	—	μs
Thermal resistance		$R_{th} \text{ (j-c)}$	Transistor stage	—	—	0.047	$^\circ\text{C/W}$
			Diode stage	—	—	0.1	
Switching loss	Turn-on	E_{on}	Inductive load $V_{CC} = 600 \text{ V}, I_C = 400 \text{ A}$ $V_{GE} = \pm 15 \text{ V}, R_G = 2.4 \Omega$ $T_C = 125^\circ\text{C}$	—	40	—	mJ
	Turn-off	E_{off}		—	40	—	

Note: Switching time measurement circuit and input/output waveforms









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