

TOSHIBA IGBT Module Silicon N Channel IGBT

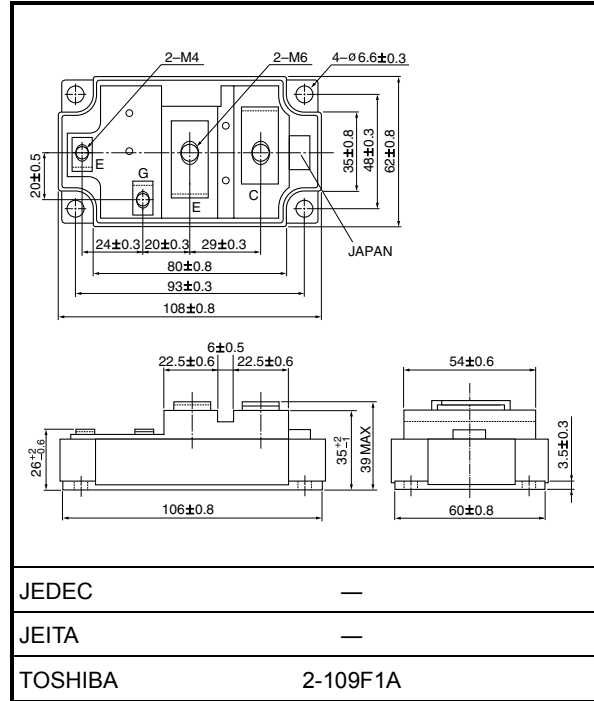
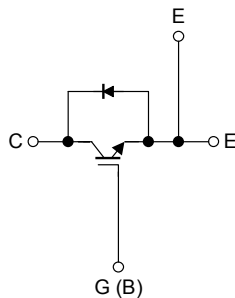
MG400Q1US65H

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.)

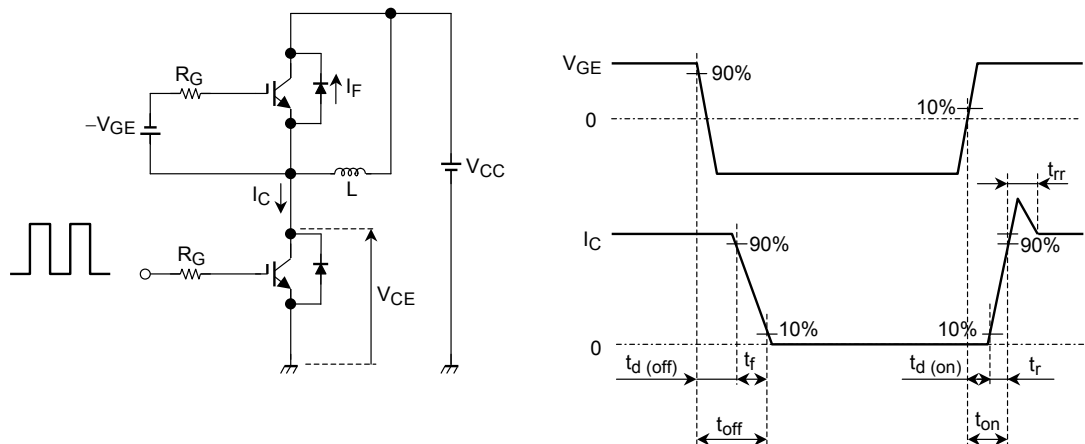
Maximum Ratings (Ta = 25°C)

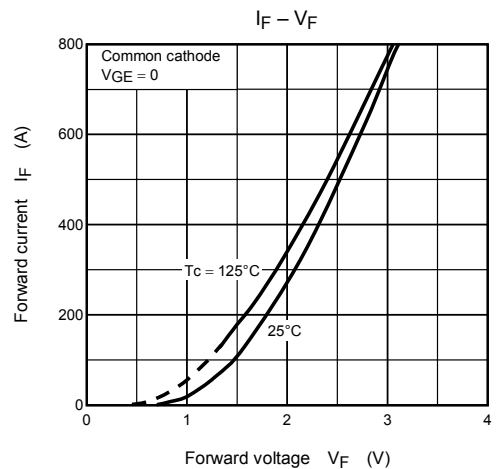
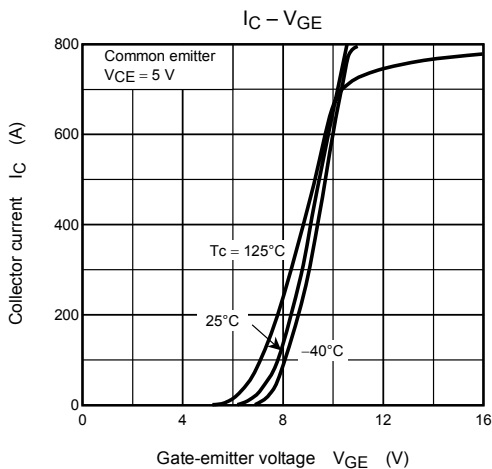
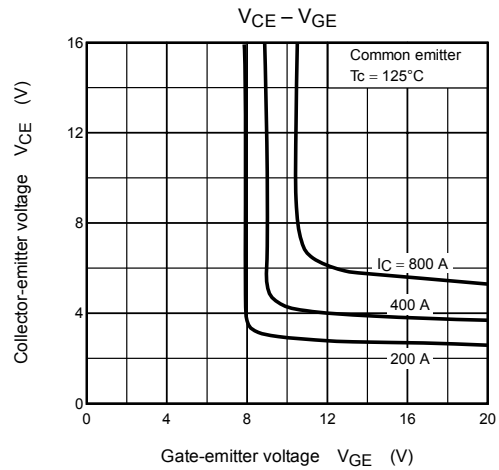
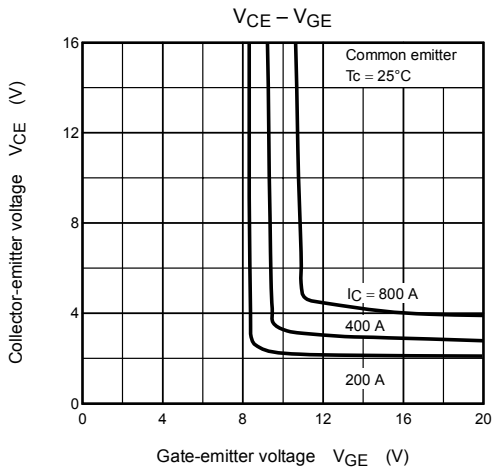
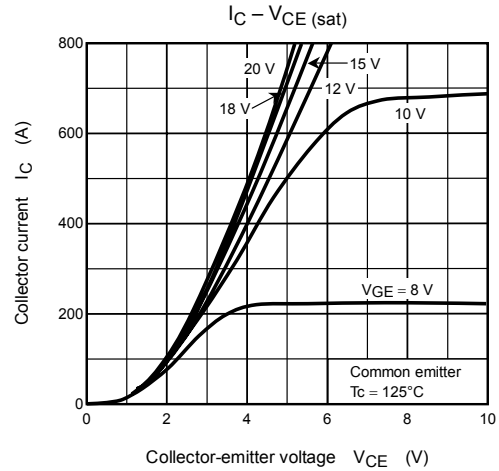
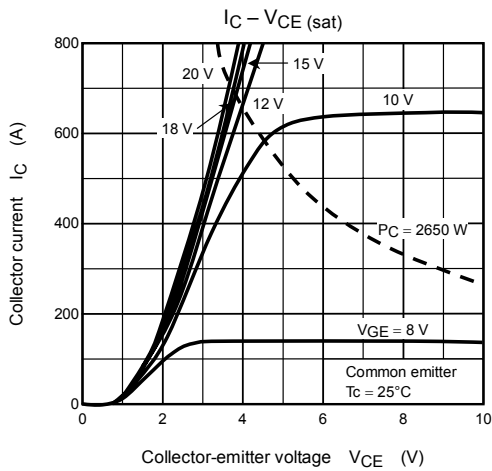
Characteristics	Symbol	Rating	Unit	
Collector-emitter voltage	V_{CES}	1200	V	
Gate-emitter voltage	V_{GES}	±20	V	
Collector current	DC	I_C	400	A
	1 ms	I_{CP}	800	
Forward current	DC	I_F	400	A
	1 ms	I_{FM}	800	
Collector power dissipation (Tc = 25°C)	P_C	2650	W	
Junction temperature	T_j	150	°C	
Storage 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	

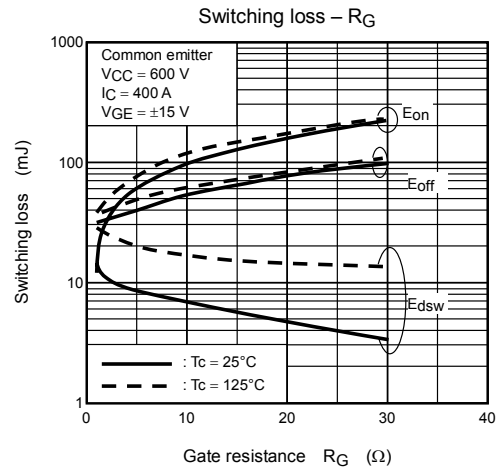
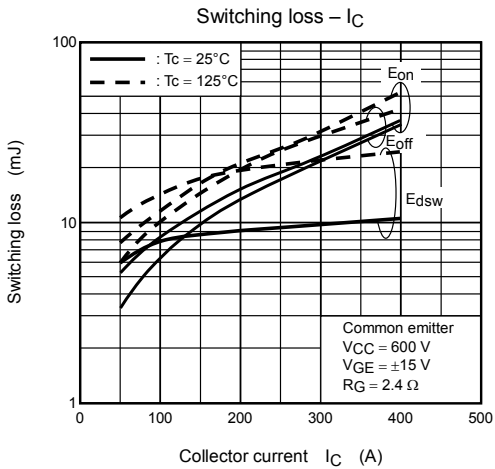
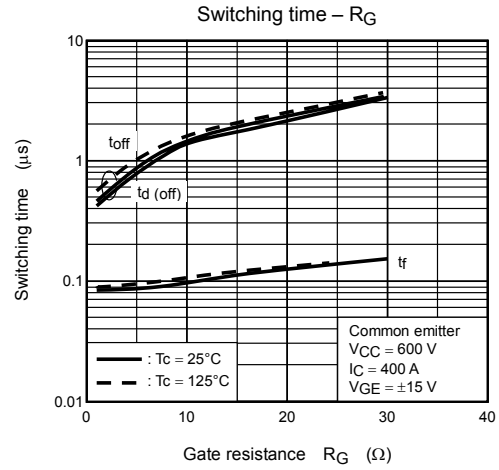
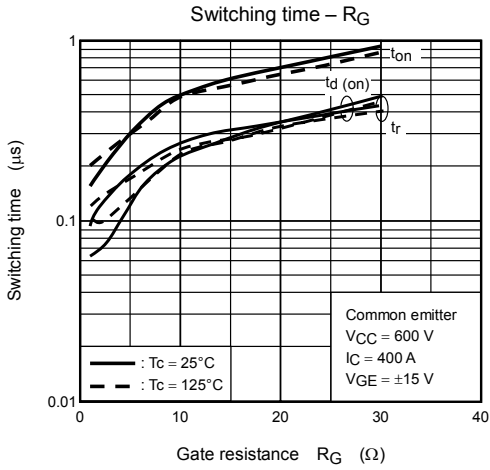
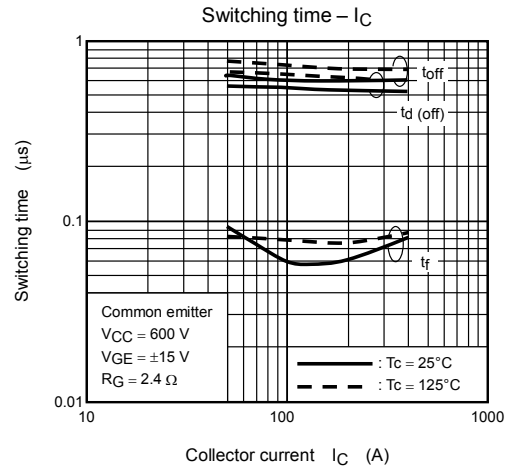
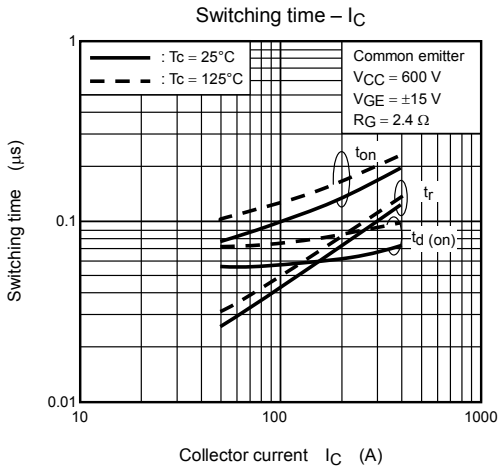
Electrical Characteristics (Ta = 25°C)

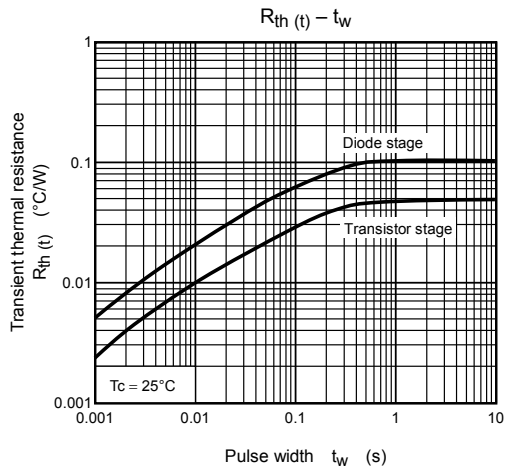
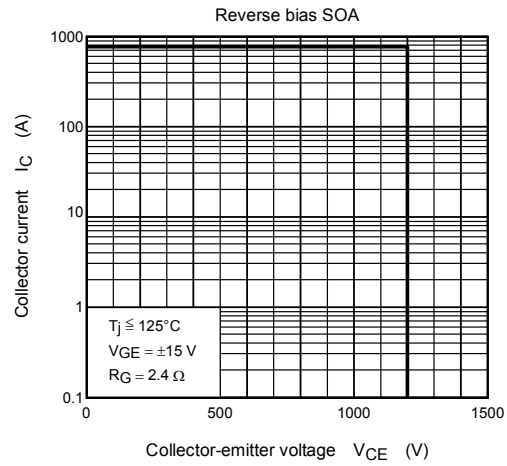
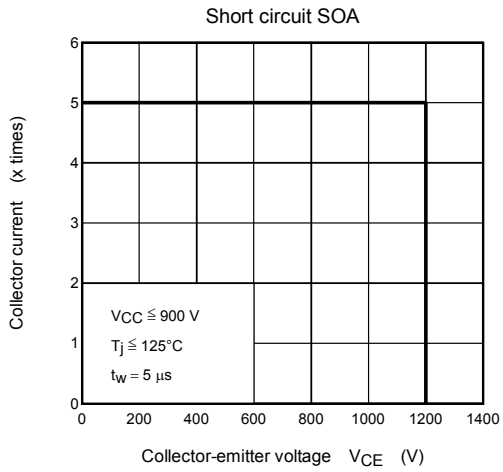
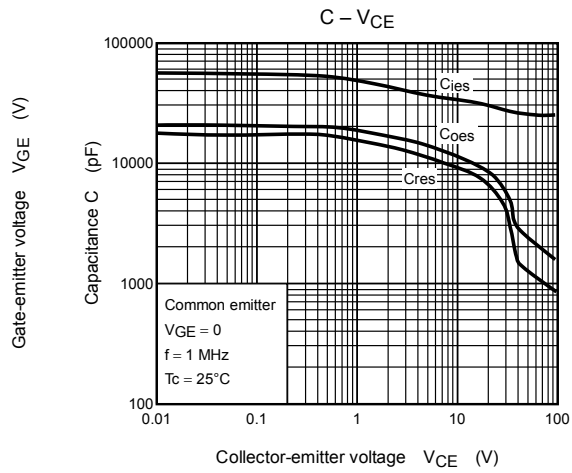
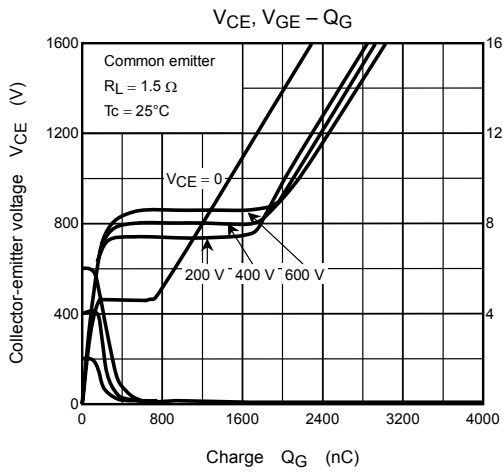
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current		I_{GES}	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	± 500	nA	
Collector cut-off current		I_{CES}	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	4.0	mA	
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 400\text{ mA}, V_{CE} = 5\text{ V}$	4.0	—	7.0	V	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 400\text{ A}, V_{GE} = 15\text{ V}$	$T_c = 25^\circ\text{C}$	—	3.0	4.0	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	$t_d (on)$	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	$t_d (off)$		—	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		$R_{th (j-c)}$	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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