

TOSHIBA IGBT Module Silicon N Channel IGBT

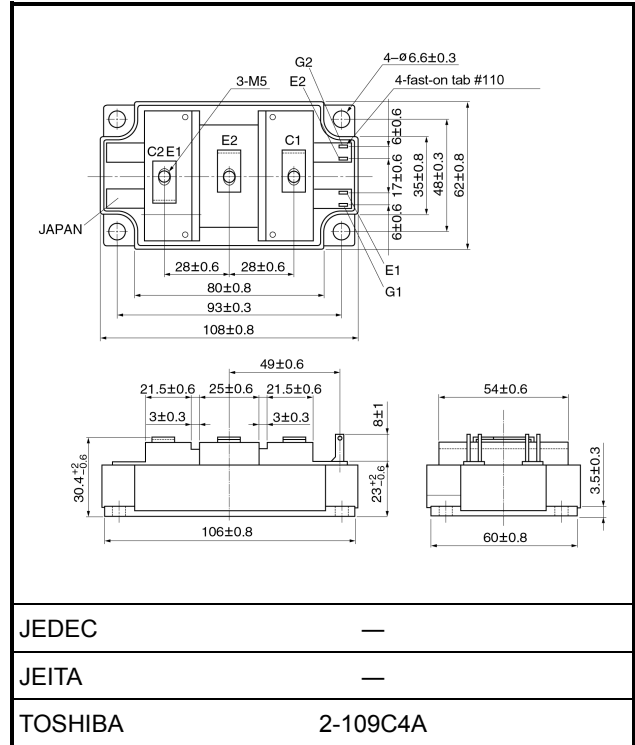
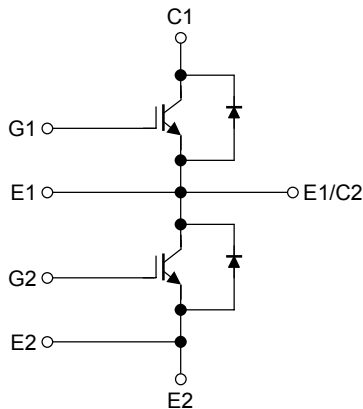
# MG300Q2YS61

High Power Switching Applications  
 Motor Control Applications

Unit: mm

- High input impedance
- High speed:  $t_f = 0.3 \mu s$  (max)  
 Inductive load
- Low saturation voltage:  $V_{CE(sat)} = 2.6 V$  (max)
- Enhancement-mode
- Includes a complete half bridge in one package.
- The electrodes are isolated from case.

## Equivalent Circuit



Weight: 430 g (typ.)

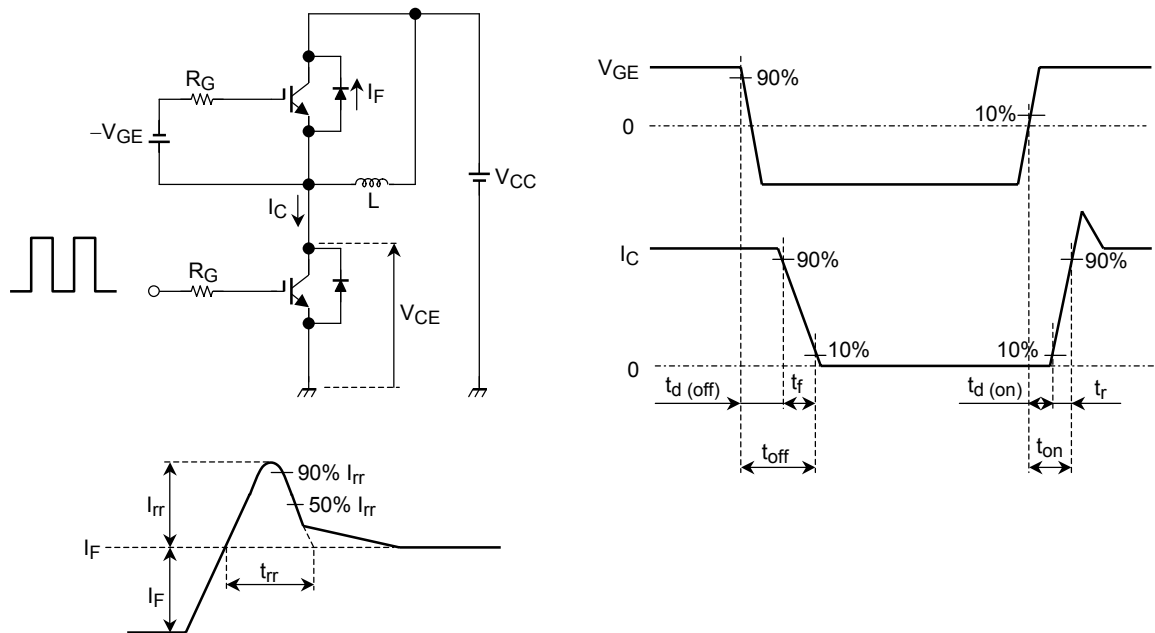
## Maximum Ratings (Tc = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	1200	V
Gate-emitter voltage		$V_{GES}$	±20	V
Collector current	DC (Tc = 80°C)	$I_C$	300	A
Forward current	DC (Tc = 80°C)	$I_F$	300	A
Collector power dissipation (Tc = 25°C)		$P_C$	2700	W
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-40 to 125	°C
Isolation voltage		$V_{isol}$	2500 (AC 1 minute)	Vrms
Screw torque	Terminal	—	3	N·m
	Mounting	—	3	N·m

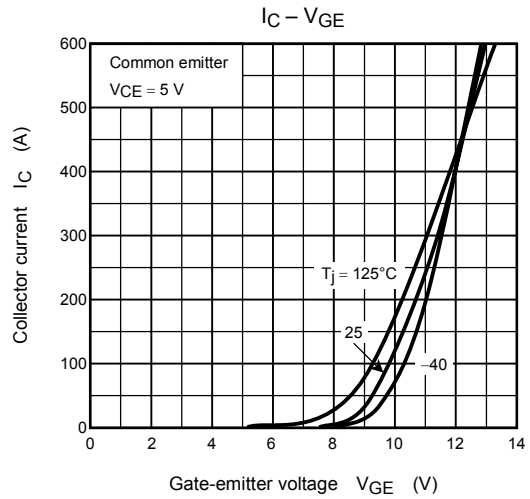
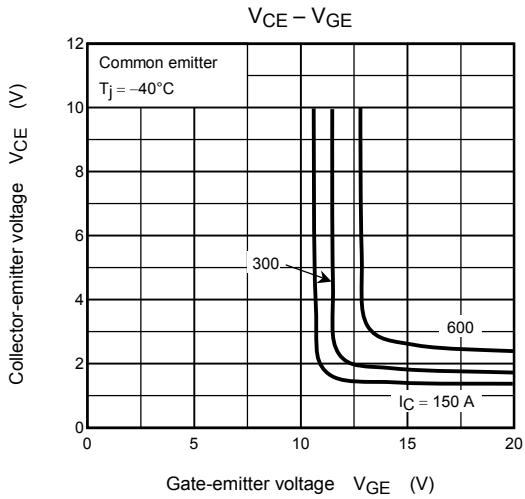
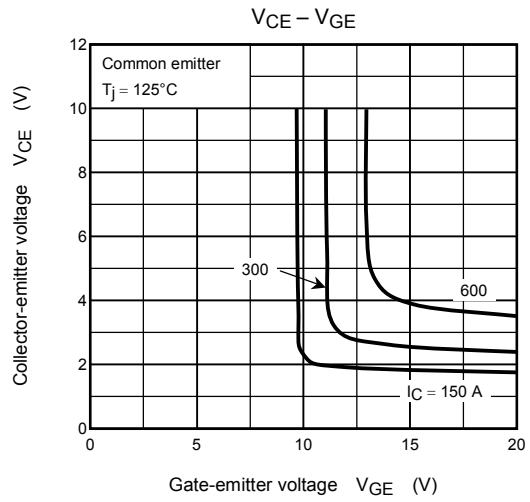
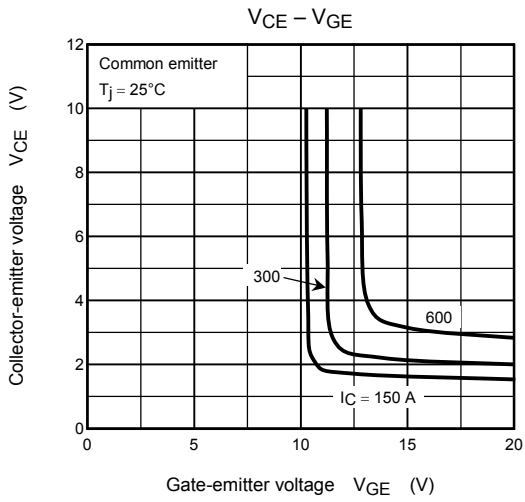
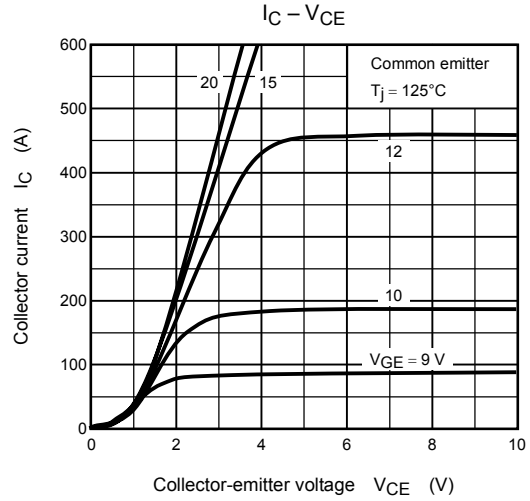
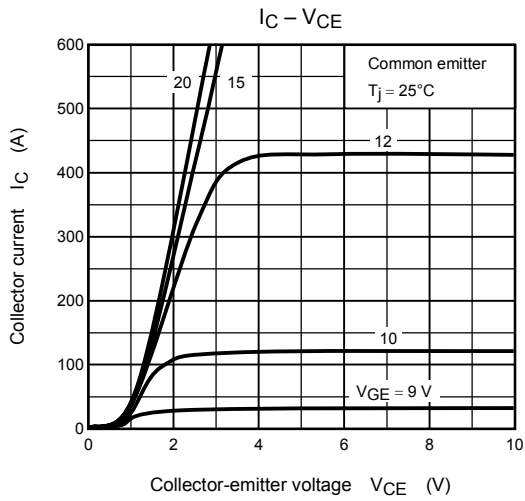
## Electrical Characteristics (Ta = 25°C)

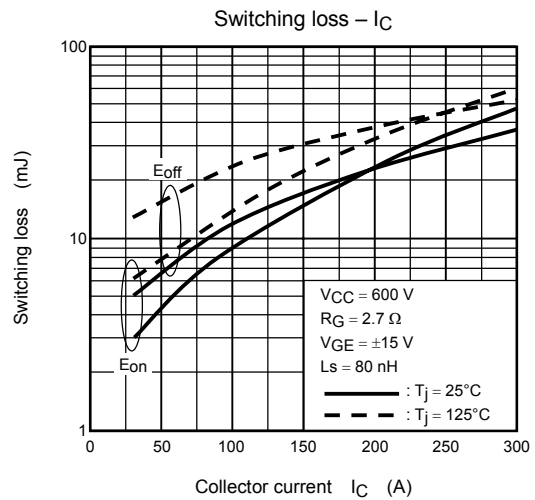
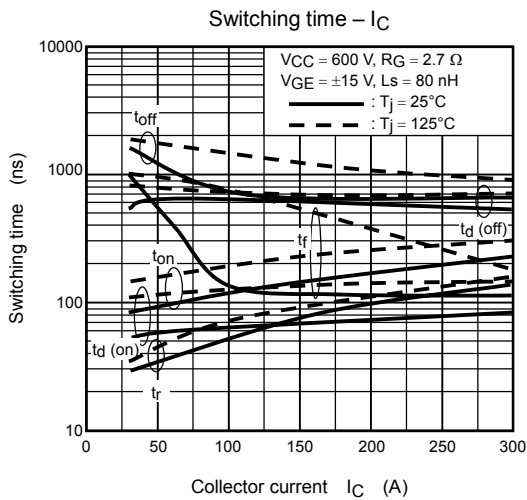
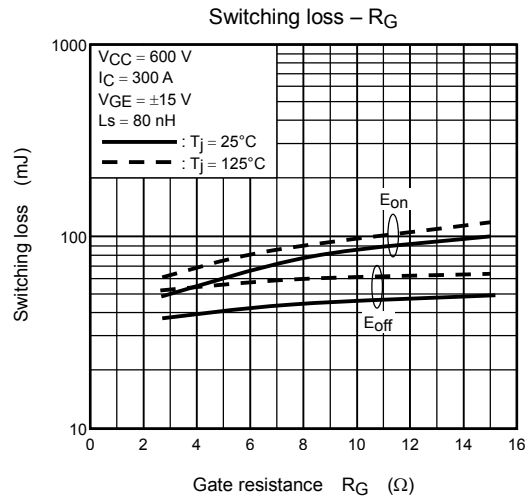
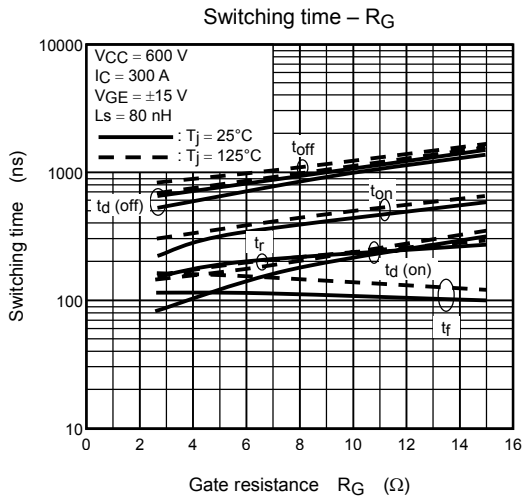
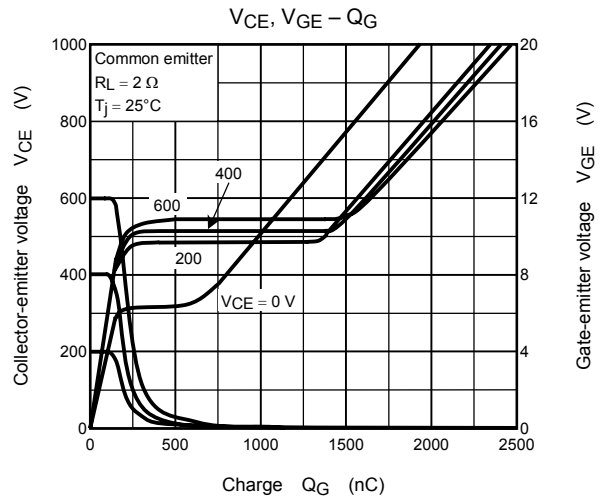
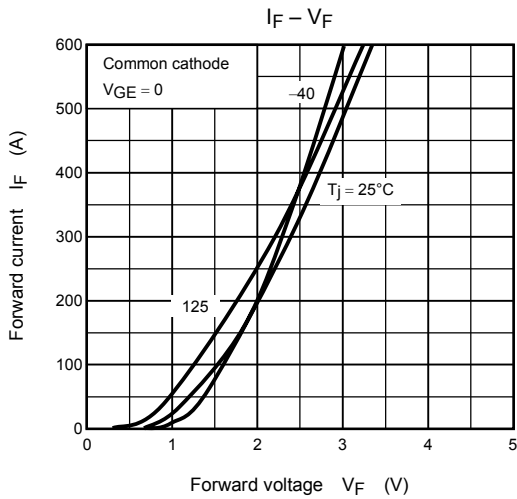
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0 \text{ V}$	—	—	$\pm 500$	nA	
Collector cut-off current		$I_{CES}$	$V_{CE} = 1200 \text{ V}, V_{GE} = 0 \text{ V}$	—	—	1	mA	
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 300 \text{ mA}, V_{CE} = 5 \text{ V}$	6.0	7.0	8.0	V	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 300 \text{ A}, V_{GE} = 15 \text{ V}$	$T_c = 25^\circ\text{C}$	—	2.1	2.6	V
				$T_c = 125^\circ\text{C}$	—	2.7	3.2	
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$	—	25000	—	pF	
Switching time	Turn-on delay time	$t_{d (on)}$	Inductive load $V_{CC} = 600 \text{ V}$ $I_C = 300 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$ $R_G = 2.7 \Omega$  (Note 1)	—	0.3	—	$\mu\text{s}$	
	Rise time	$t_r$		—	0.2	—		
	Turn-on time	$t_{on}$		—	0.5	—		
	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		$V_F$	$I_F = 300 \text{ A}, V_{GE} = 0 \text{ V}$	$T_c = 25^\circ\text{C}$	—	2.4	2.8	V
				$T_c = 125^\circ\text{C}$	—	2.2	—	
Reverse recovery time		$t_{rr}$	$I_F = 300 \text{ A}, V_{GE} = -15 \text{ V}, di/dt = 1500 \text{ A}/\mu\text{s}$	—	0.2	—	$\mu\text{s}$	
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	0.045	$^\circ\text{C}/\text{W}$	
			Diode stage	—	—	0.100		

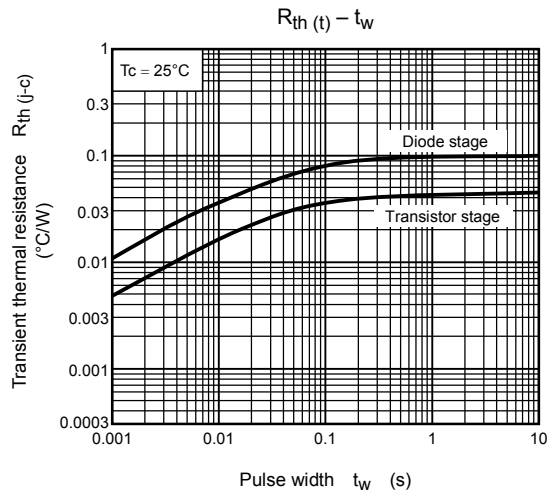
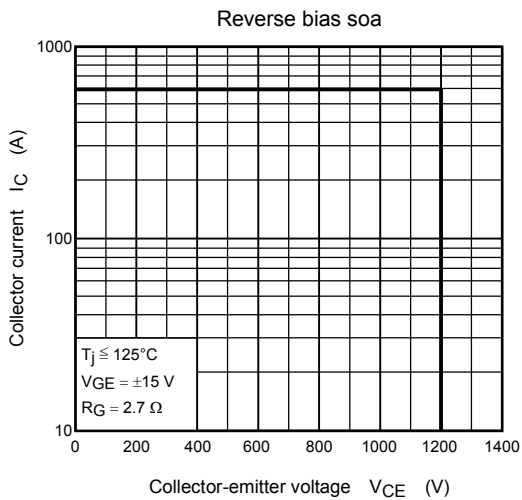
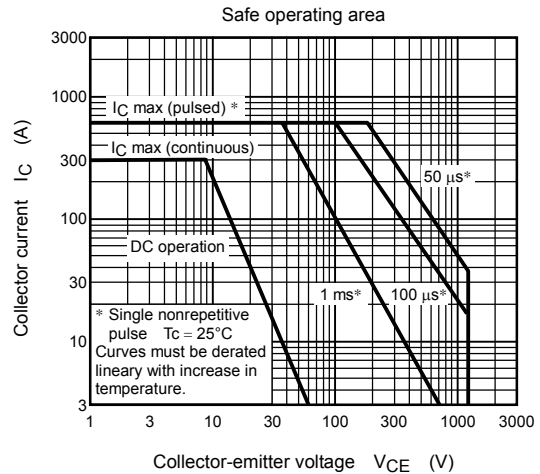
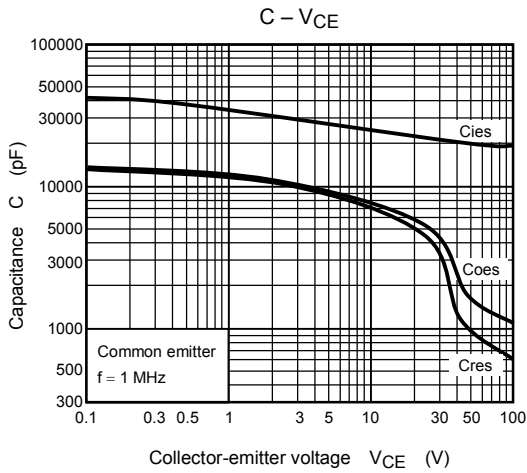
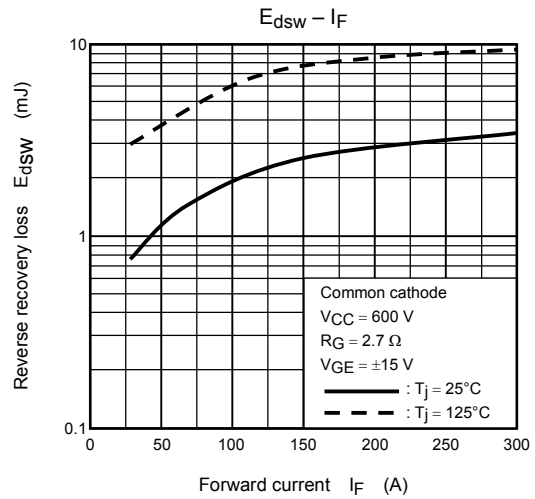
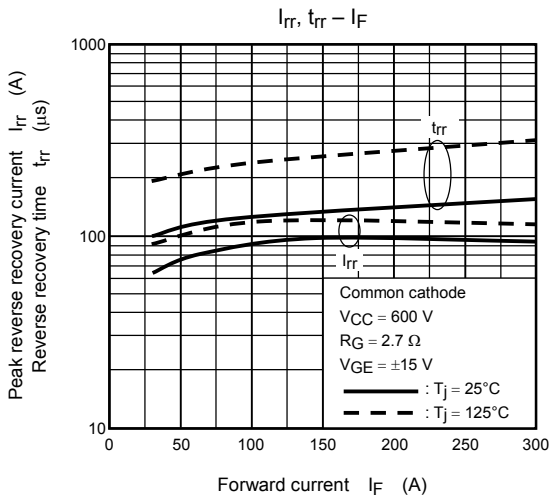
Note 1: Switching time and reverse recovery time test circuit and timing chart

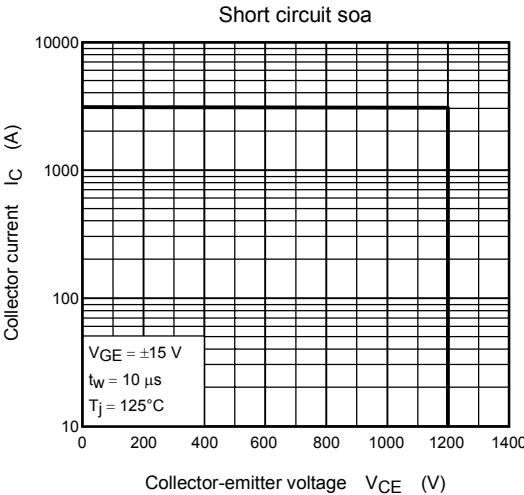












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