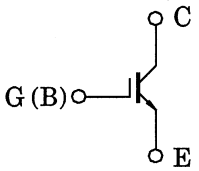
TOSHIBA IGBT Module Silicon N Channel IGBT

MG100J1BS11

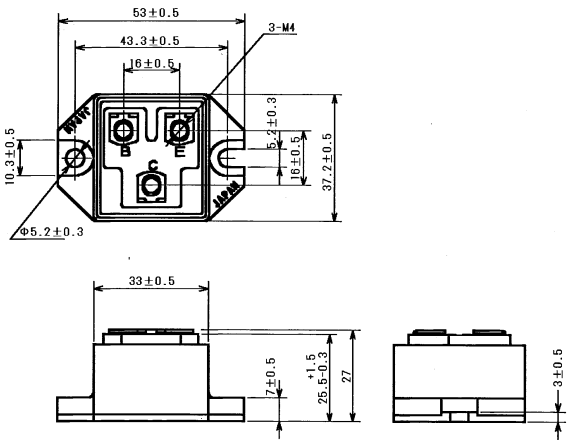
High Power Switching Applications
Motor Control Applications

- Enhancement-mode
- The electrodes are isolated from case.

Equivalent Circuit



Unit: mm

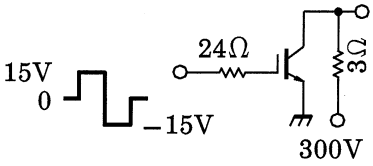


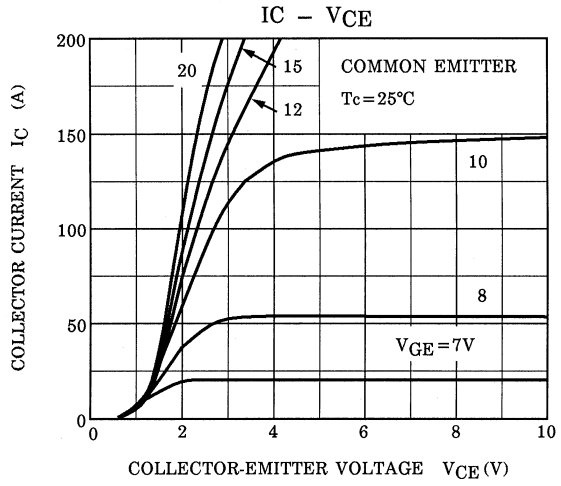
JEDEC	—
JEITA	—
TOSHIBA	2-33F2A

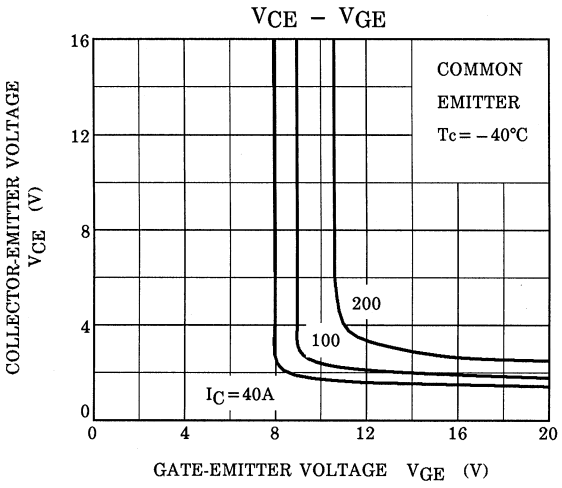
Maximum Ratings (Ta = 25°C)

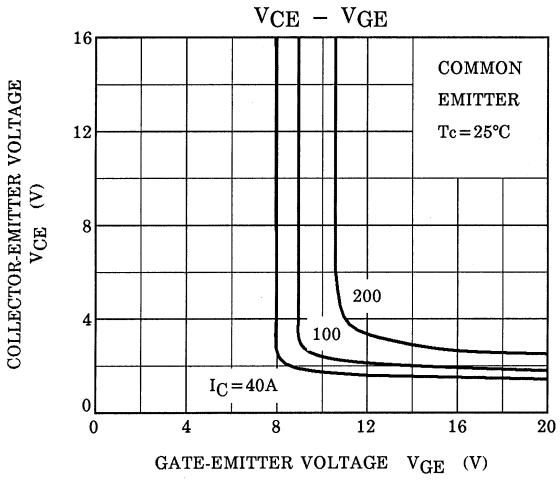
Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	100	A
	1ms	I_{CP}	200	
Collector power dissipation (Tc = 25°C)		P_C	300	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−40 to 125	°C
Isolation voltage		V_{Isol}	2500 (AC 1 Minute)	V
Screw torque (Terminal / mounting)		—	2 / 3	N m

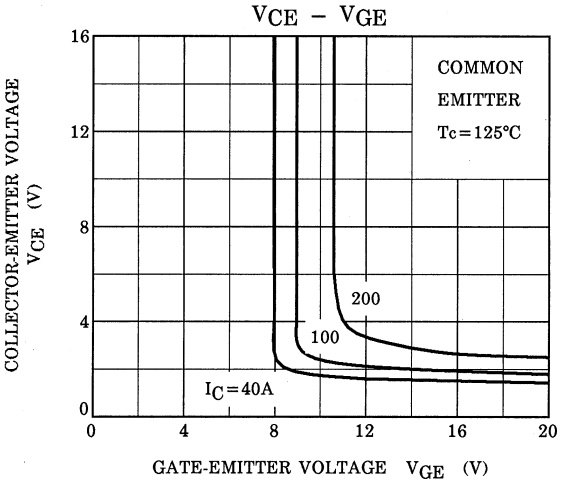
Electrical Characteristics (Ta = 25°C)

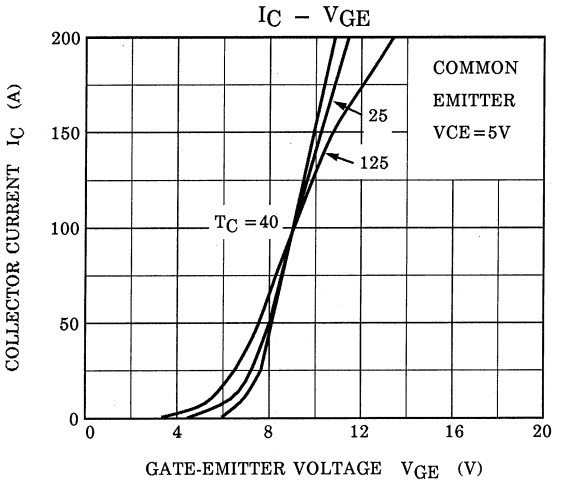
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20V, V_{CE} = 0	—	—	±500	nA
Collector cut-off current		I_{CES}	V_{CE} = 600V, V_{GE} = 0	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE(off)}$	V_{CE} = 5V, I_C = 100mA	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V	—	2.3	2.7	V
Input capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	—	8200	—	pF
Switching time	Rise time	t_r		—	0.3	0.8	μs
	Turn-on time	t_{on}		—	0.4	1.0	
	Fall time	t_f		—	0.6	1.0	
	Turn-off time	t_{off}		—	1.0	1.6	
Thermal resistance		$R_{th(j-c)}$	—	—	—	0.41	°C / W

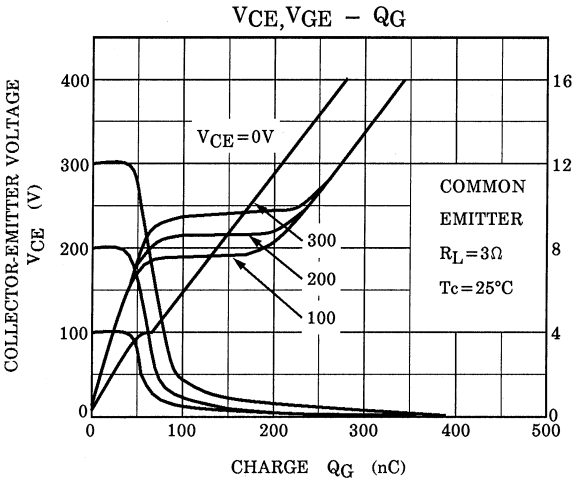

IC – VCE
COMMON EMITTER
Tc=25°C
20
15
12
10
8
VGE=7V
COLLECTOR CURRENT IC (A)
COLLECTOR-EMITTER VOLTAGE VCE (V)


VCE – VGE
COMMON
EMITTER
Tc=–40°C
200
100
IC=40A
COLLECTOR-EMITTER VOLTAGE VCE (V)
GATE-EMITTER VOLTAGE VGE (V)

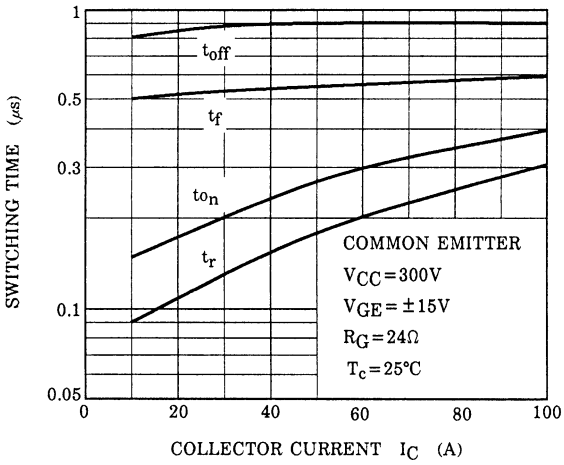

VCE – VGE
COMMON
EMITTER
Tc=25°C
200
100
IC=40A
COLLECTOR-EMITTER VOLTAGE VCE (V)
GATE-EMITTER VOLTAGE VGE (V)


VCE – VGE
COMMON
EMITTER
Tc=125°C
200
100
IC=40A
COLLECTOR-EMITTER VOLTAGE VCE (V)
GATE-EMITTER VOLTAGE VGE (V)

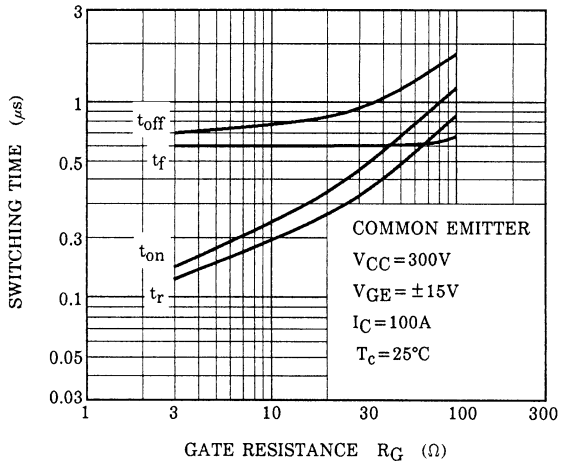

IC – VGE
COMMON
EMITTER
VCE=5V
25
125
TC=40
COLLECTOR CURRENT IC (A)
GATE-EMITTER VOLTAGE VGE (V)


VCE,VGE – QG
VCE=0V
COMMON
EMITTER
RL=3Ω
Tc=25°C
300
200
100
COLLECTOR-EMITTER VOLTAGE VCE (V)
CHARGE QG (nC)

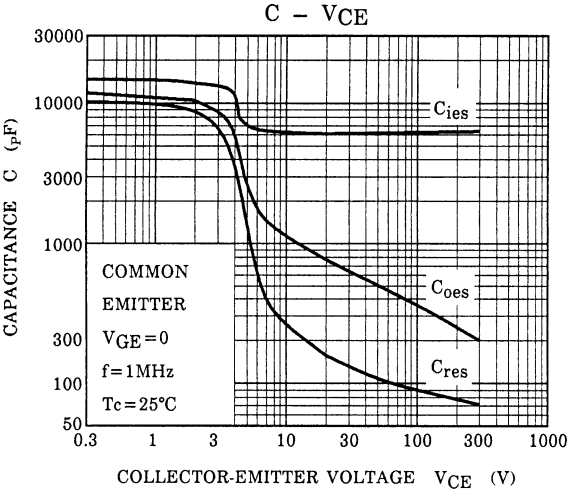
SWITCHING TIME – I_C



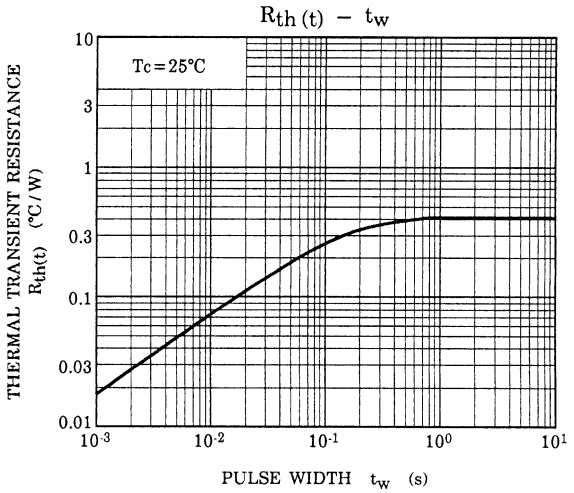
SWITCHING TIME – R_G



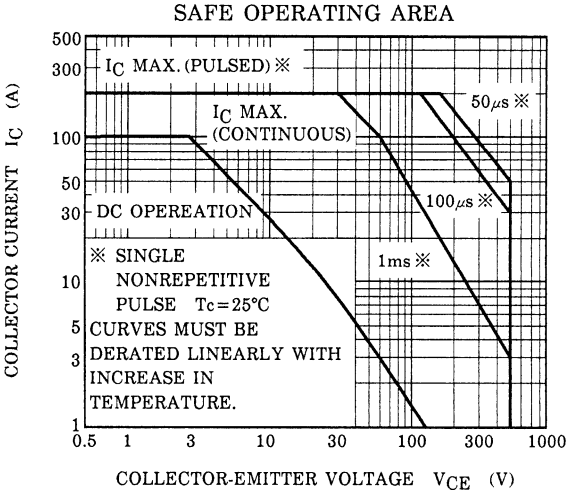
C – V_{CE}



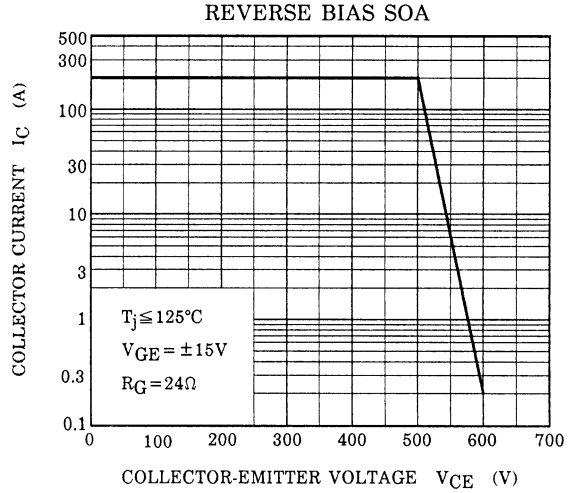
R_{th} (t) – t_w



SAFE OPERATING AREA



REVERSE BIAS SOA



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