

TOSHIBA Insulated Gate Bipolar Transistor
Silicon N Channel IGBT

GT15Q102

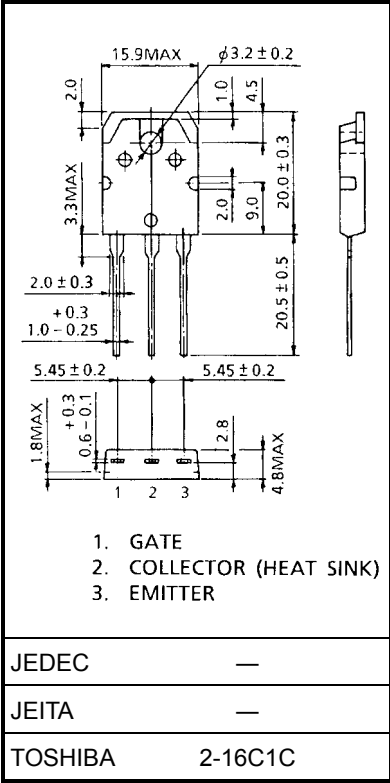
High Power Switching Applications

- The 3rd Generation
- Enhancement-Mode
- High Speed: $t_f = 0.32 \mu s$ (max)
- Low Saturation Voltage: $V_{CE(sat)} = 2.7 V$ (max)

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	15	A
	1 ms	I_{CP}	30	
Collector power dissipation (Tc = 25°C)		P_C	170	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-55~150	°C

Unit: mm

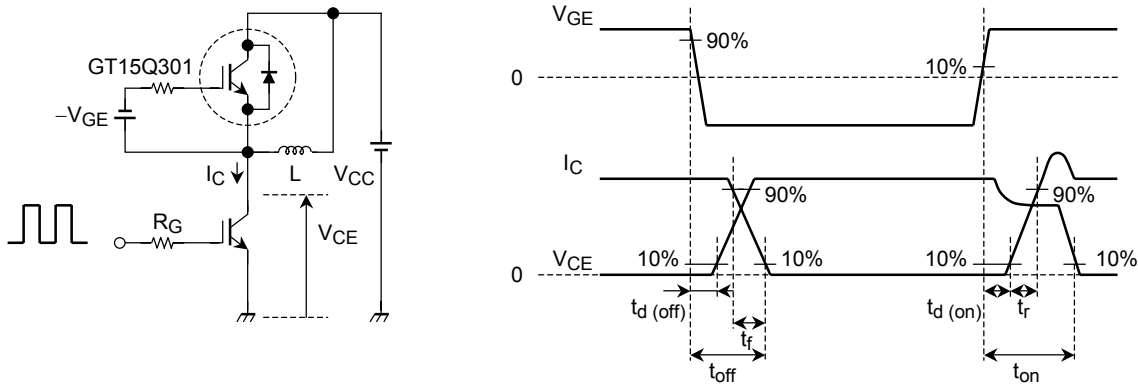


Weight: 4.6 g

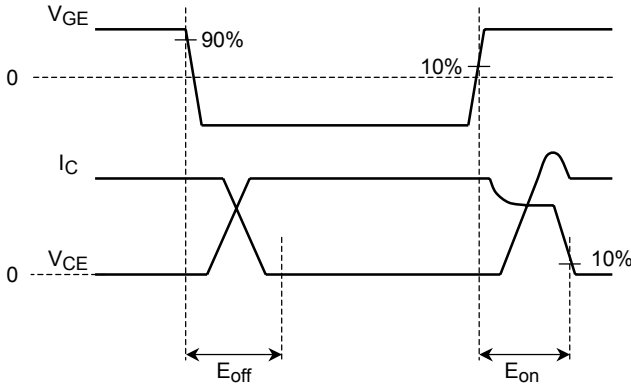
Electrical Characteristics (Ta = 25°C)

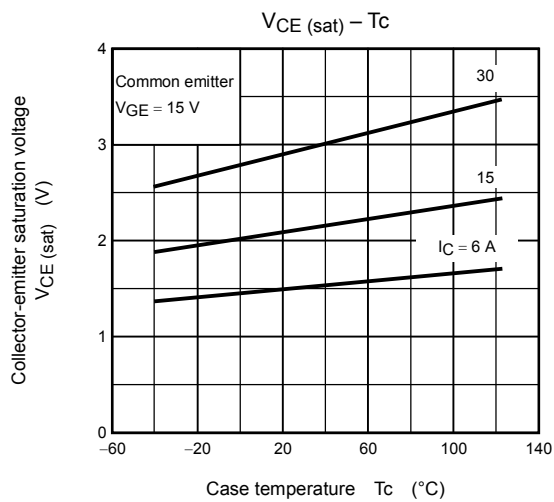
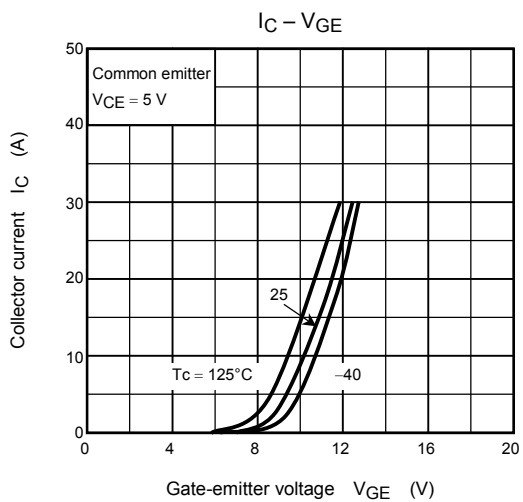
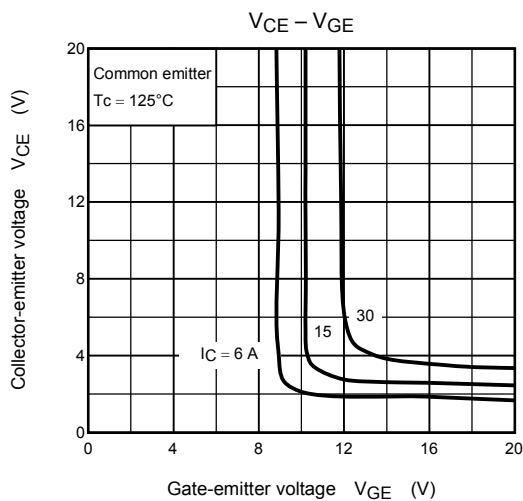
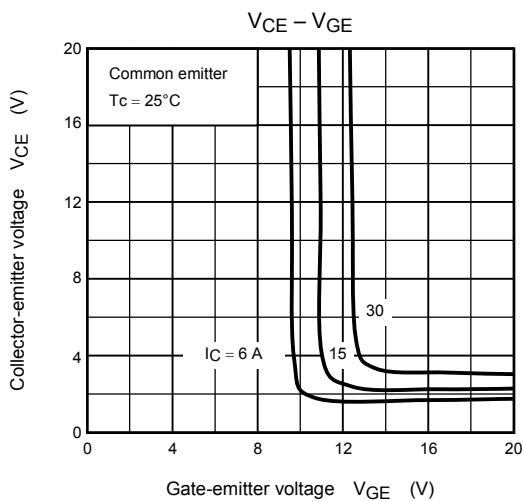
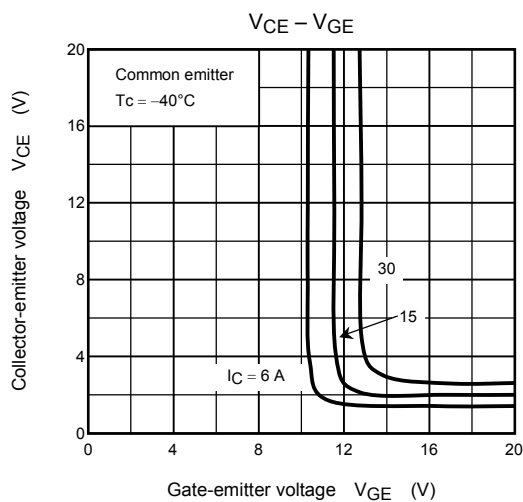
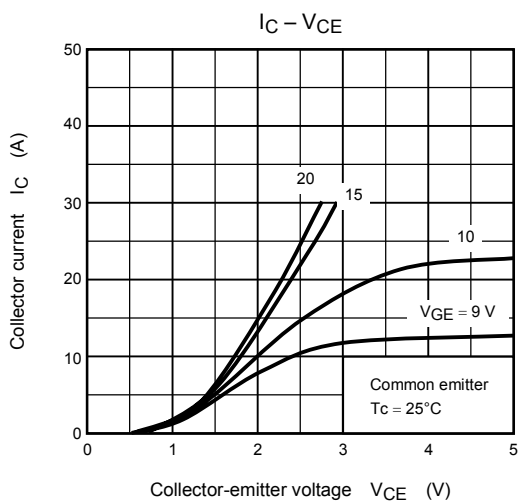
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE}(\text{OFF})$	$I_C = 1.5 \text{ mA}, V_{CE} = 5 \text{ V}$	4.0	—	7.0	V
Collector-emitter saturation voltage		$V_{CE}(\text{sat})$	$I_C = 15 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.1	2.7	V
Input capacitance		C_{ies}	$V_{CE} = 50 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	850	—	pF
Switching time	Rise time	t_r	Inductive Load $V_{CC} = 600 \text{ V}, I_C = 15 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 56 \Omega$ (Note1)	—	0.05	—	μs
	Turn-on time	t_{on}		—	0.12	—	
	Fall time	t_f		—	0.16	0.32	
	Turn-off time	t_{off}		—	0.56	—	
Thermal resistance		$R_{th(j-c)}$	—	—	—	0.74	$^{\circ}\text{C/W}$

Note1: Switching time measurement circuit and input/output waveforms

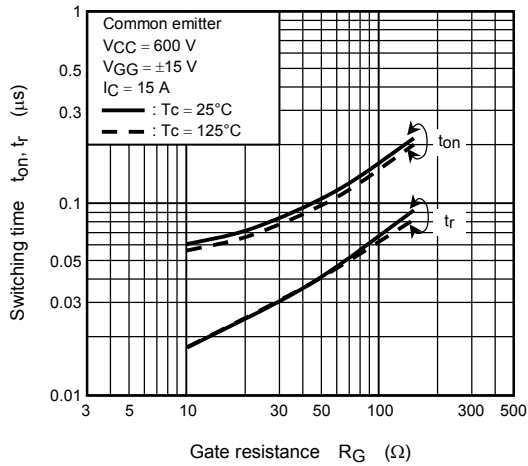


Note2: Switching loss measurement waveforms

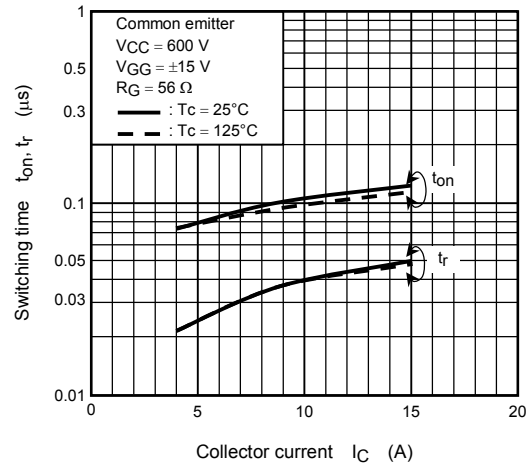




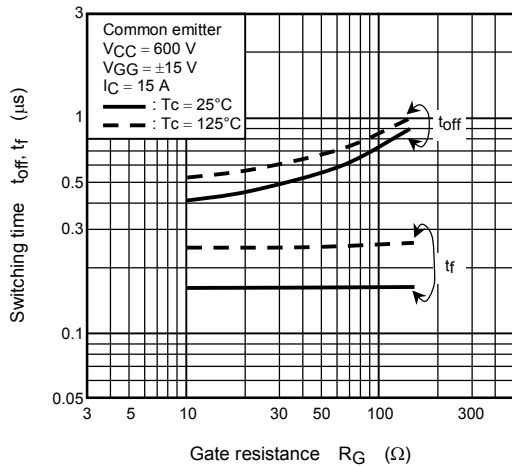
Switching time $t_{on}, t_r - R_G$



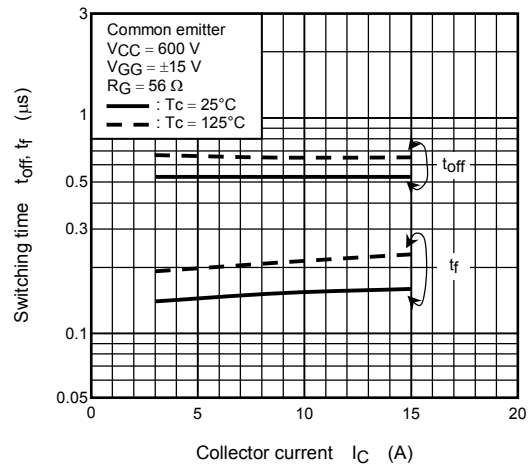
Switching time $t_{on}, t_r - I_C$



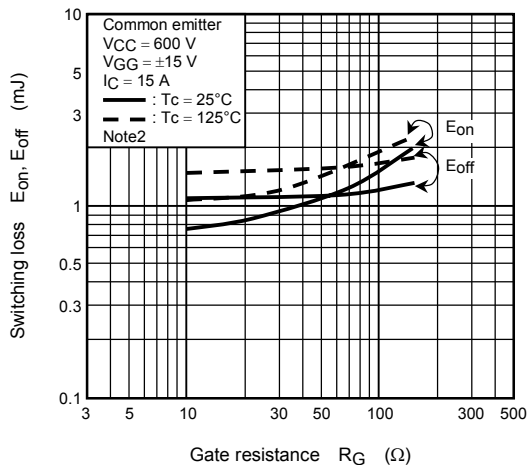
Switching time $t_{off}, t_f - R_G$



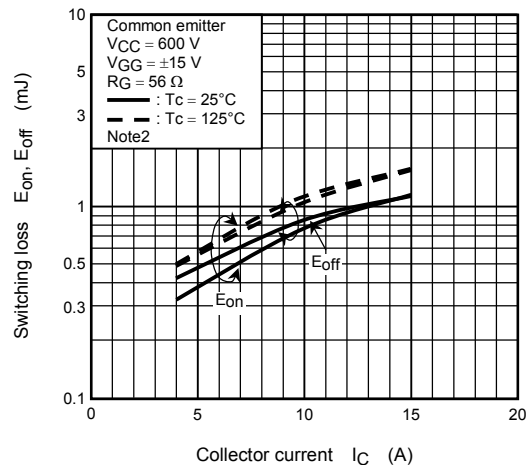
Switching time $t_{off}, t_f - I_C$

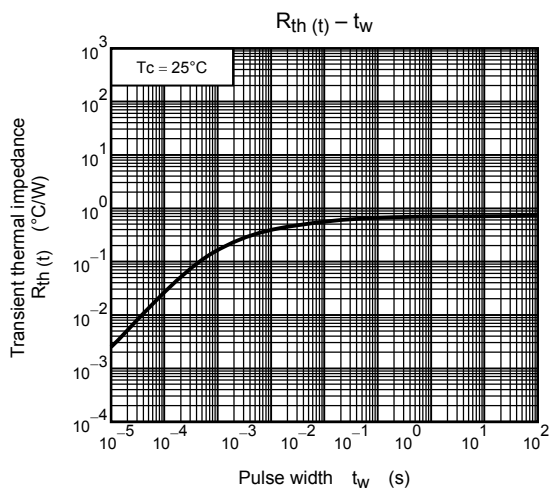
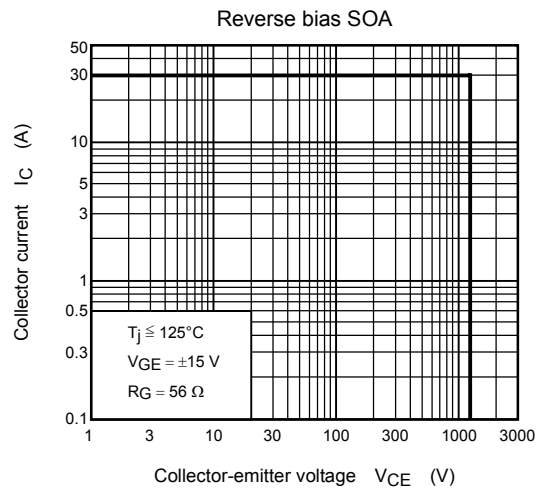
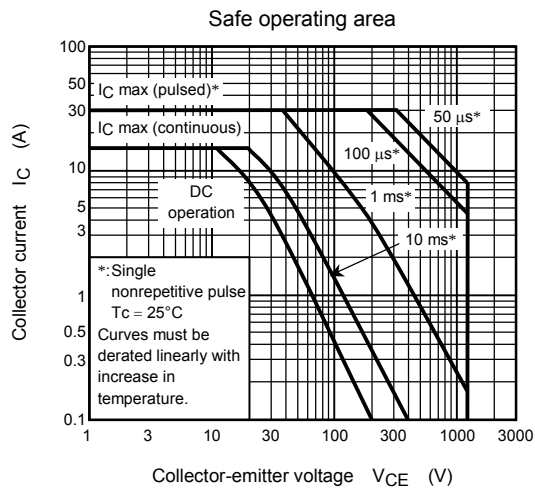
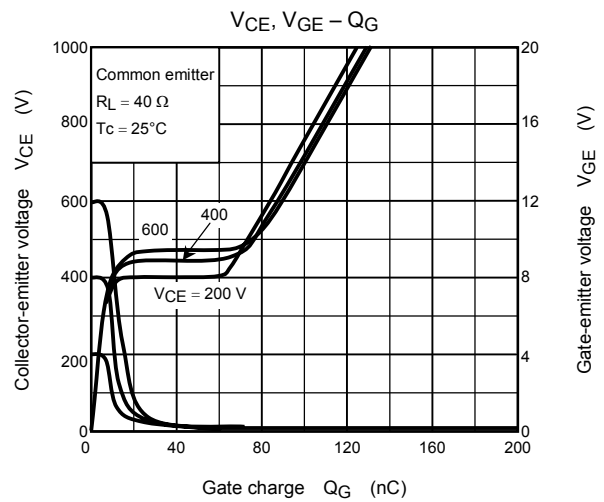
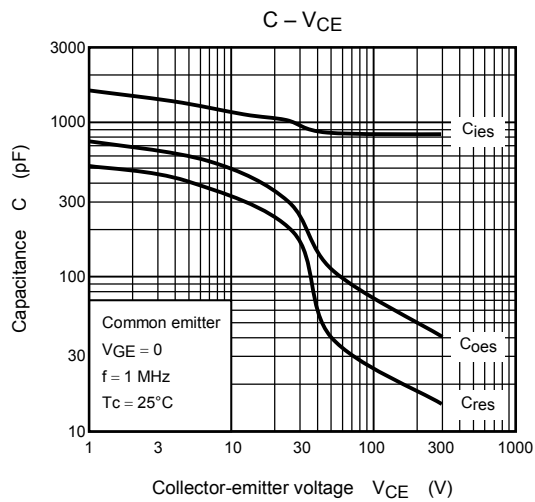


Switching loss $E_{on}, E_{off} - R_G$



Switching loss $E_{on}, E_{off} - I_C$





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