

TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

GT15J321

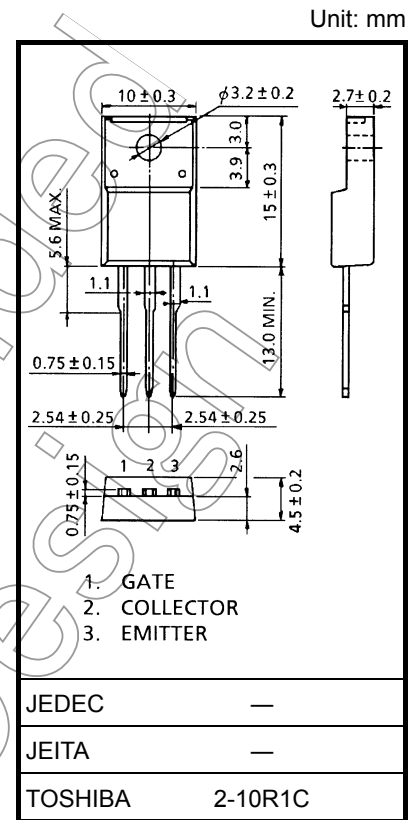
High Power Switching Applications

Fast Switching Applications

- Fourth-generation IGBT
- Fast switching (FS)
- Enhancement mode type
- High speed: $t_f = 0.03 \mu s$ (typ.)
- Low saturation Voltage: $V_{CE(sat)} = 1.90 V$ (typ.)
- FRD included between emitter and collector

Absolute Maximum Ratings ($T_a = 25^\circ C$)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	15	A
	1 ms	I_{CP}	30	
Emitter-collector forward current	DC	I_F	15	A
	1 ms	I_{FM}	30	
Collector power dissipation ($T_c = 25^\circ C$)		P_C	30	W
Junction temperature		T_j	150	$^\circ C$
Storage temperature range		T_{stg}	$-55 \sim 150$	$^\circ C$

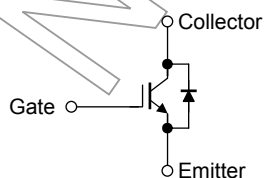


Weight: 1.7 g

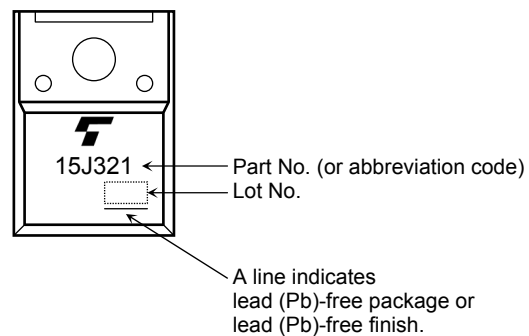
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Equivalent Circuit



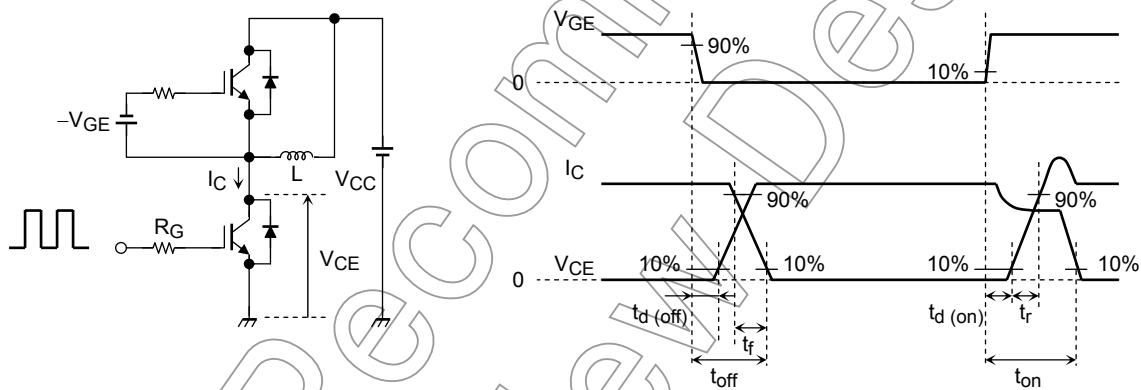
Marking



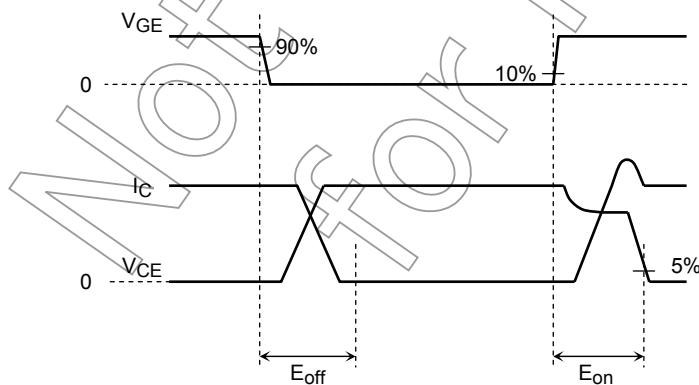
Electrical Characteristics (Ta = 25°C)

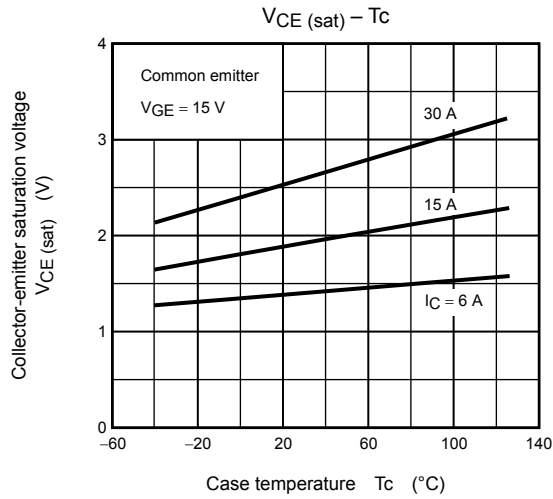
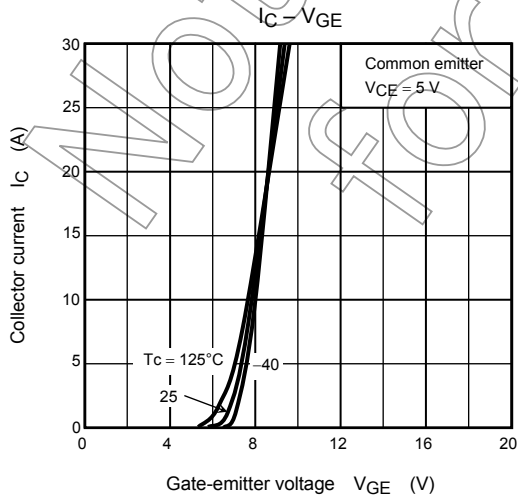
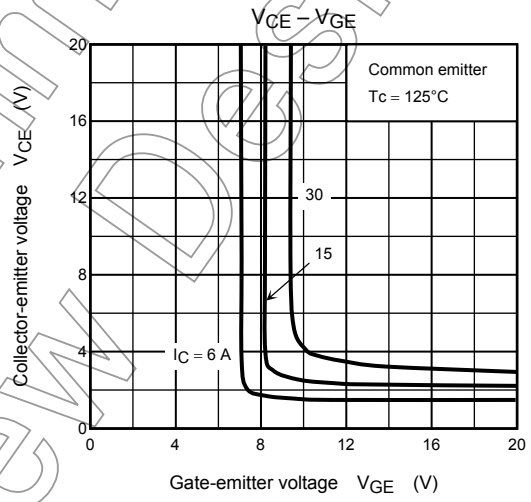
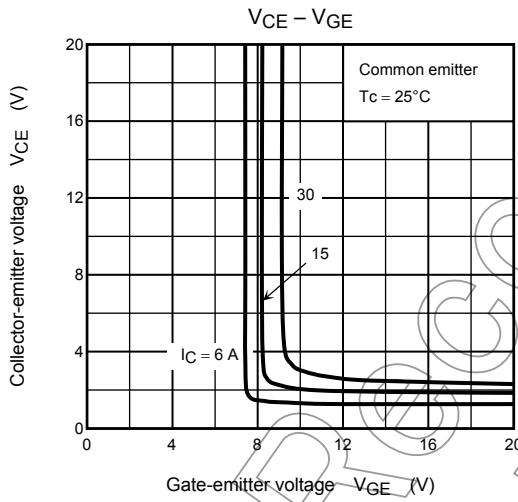
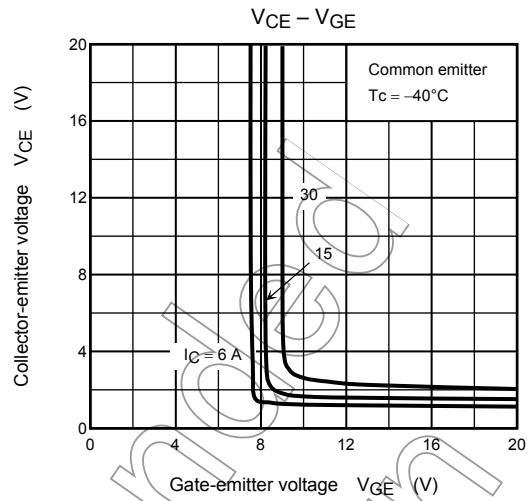
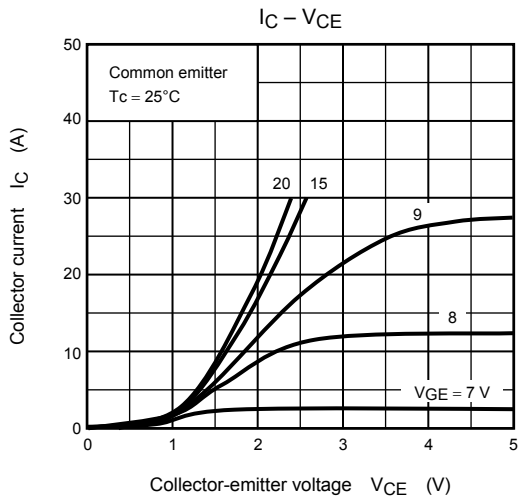
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 600 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE}(\text{OFF})$	$I_C = 1.5 \text{ mA}, V_{CE} = 5 \text{ V}$	3.5	—	6.5	V
Collector-emitter saturation voltage		$V_{CE}(\text{sat})$	$I_C = 15 \text{ A}, V_{GE} = 15 \text{ V}$	—	1.90	2.45	V
Input capacitance		C_{ies}	$V_{CE} = 20 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	2300	—	pF
Switching time	Rise time	t_r	Inductive Load $V_{CC} = 300 \text{ V}, I_C = 15 \text{ A}$ $V_{GG} = 15 \text{ V}, R_G = 43 \Omega$ (Note 1)	—	0.04	—	μs
	Turn-on time	t_{on}		—	0.17	—	
	Fall time	t_f		—	0.03	0.15	
	Turn-off time	t_{off}		—	0.34	—	
Peak forward voltage		V_F	$I_F = 15 \text{ A}, V_{GE} = 0$	—	—	2.0	V
Reverse recovery time		t_{rr}	$I_F = 15 \text{ A}, di/dt = -100 \text{ A}/\mu\text{s}$	—	—	200	ns
Thermal resistance (IGBT)		$R_{th(j-c)}$		—	—	4.16	°C/W
Thermal resistance (Diode)		$R_{th(j-c)}$		—	—	4.63	°C/W

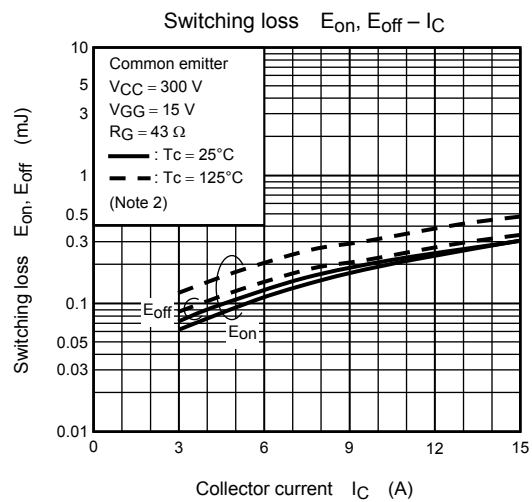
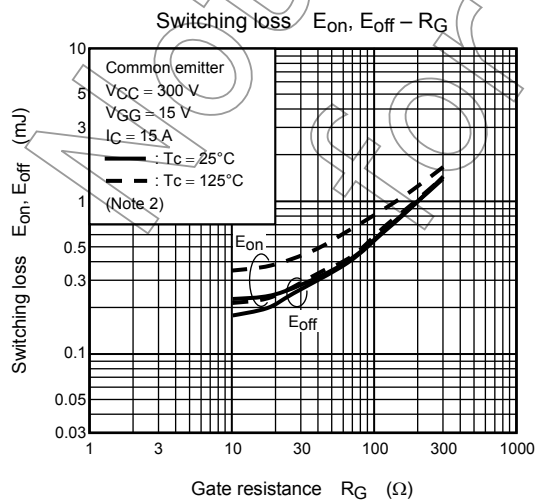
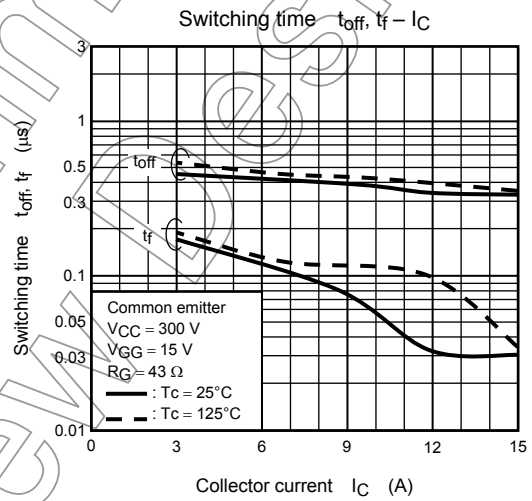
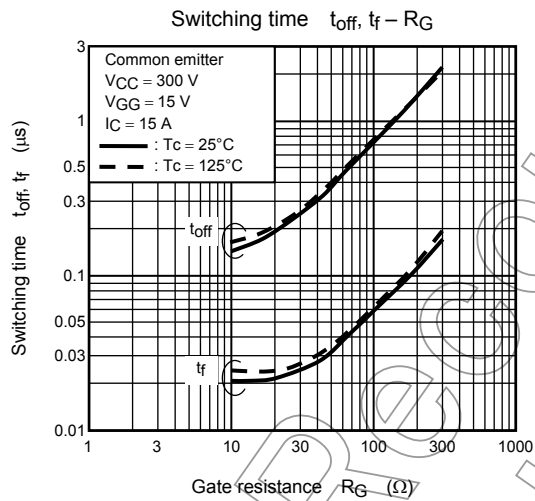
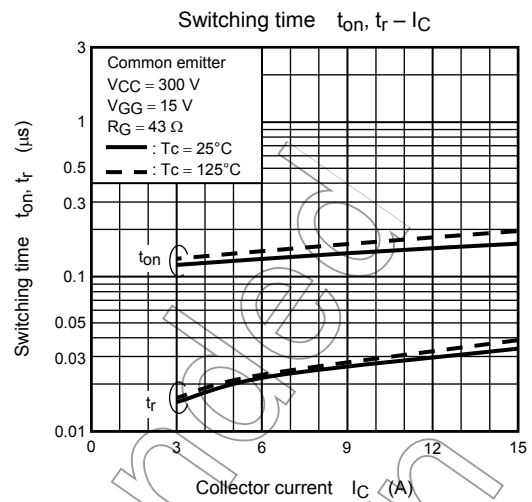
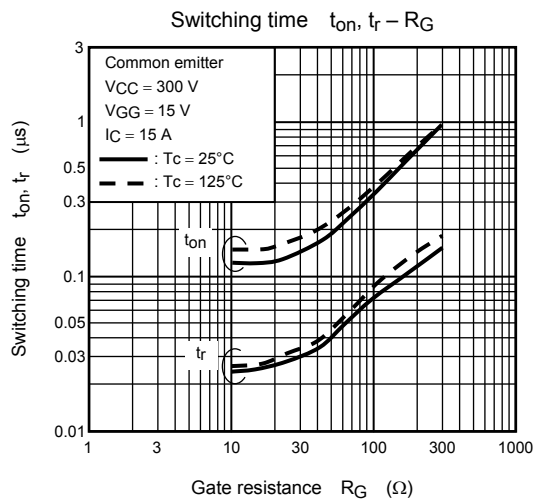
Note 1: Switching time measurement circuit and input/output waveforms

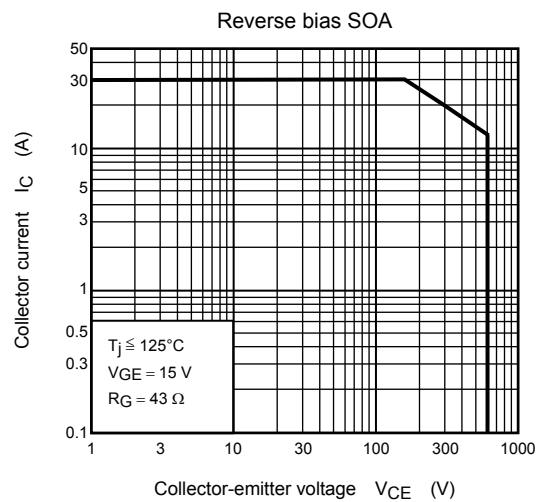
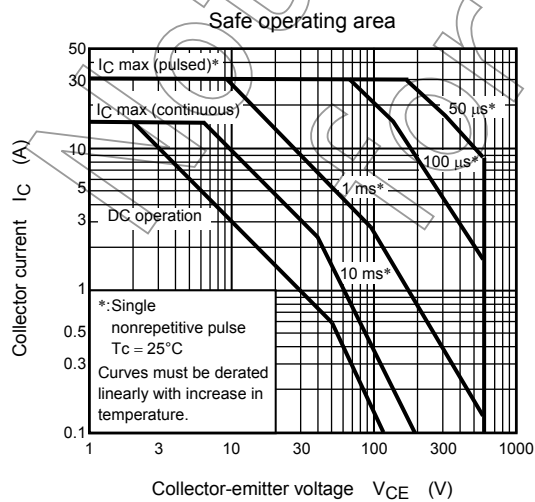
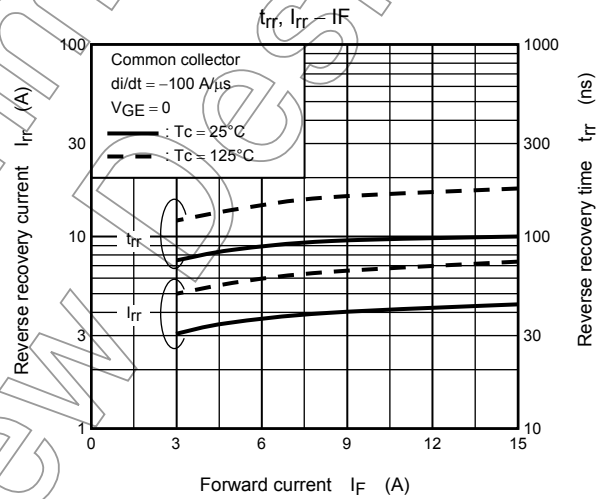
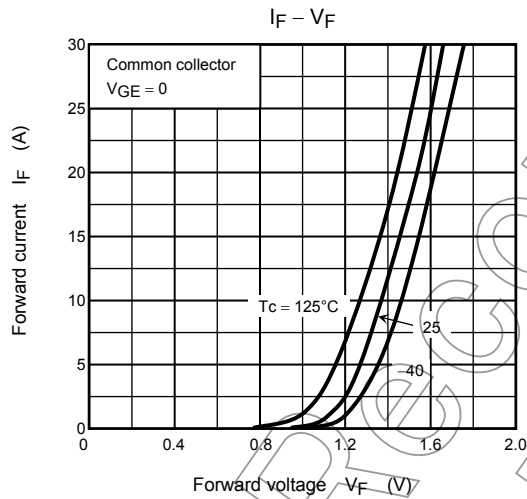
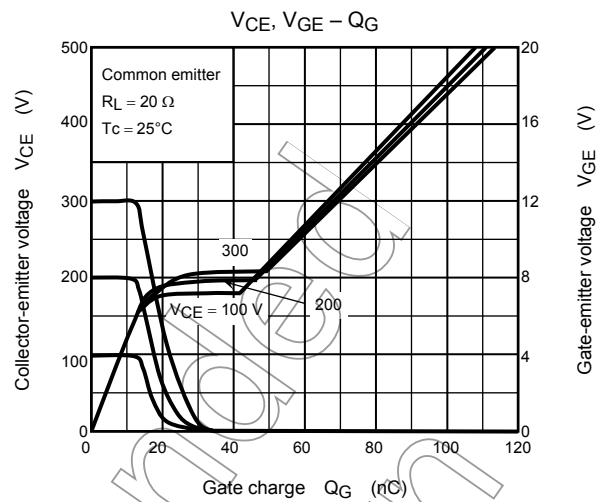
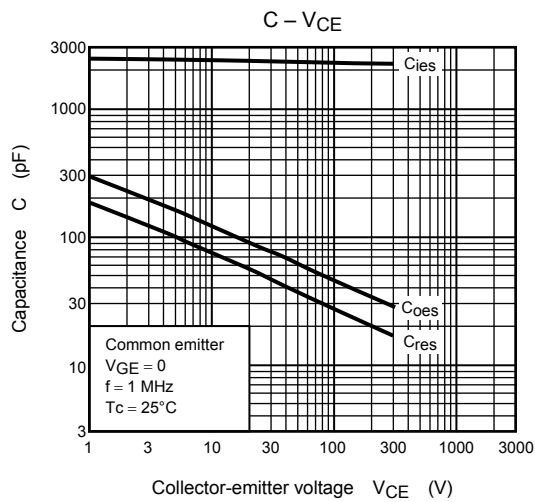


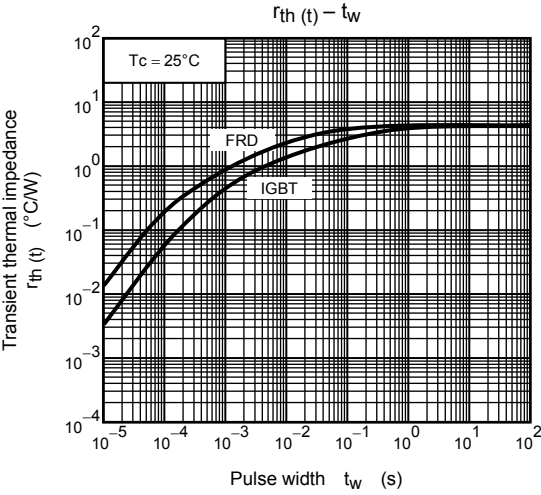
Note 2: Switching loss measurement waveforms











Not Recommended
for New Design

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