

TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

GT60N321

High-Power Switching Applications

Fourth Generation IGBT

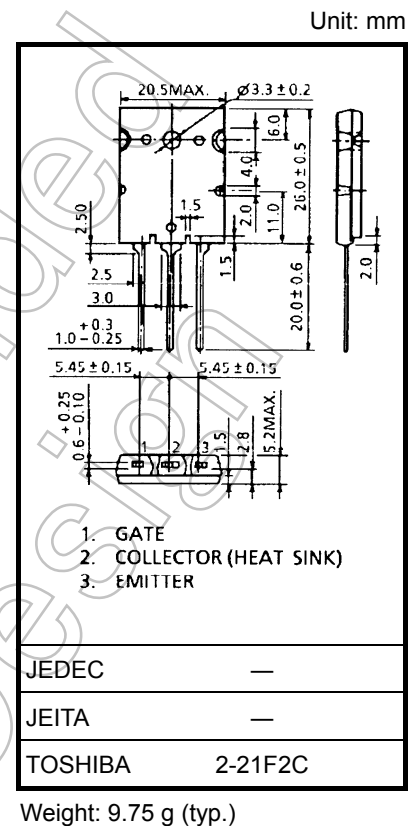
- FRD included between emitter and collector
- Enhancement mode type
- High speed IGBT : $t_f = 0.25 \mu s$ (typ.) ($I_C = 60 A$)
FRD : $t_{rr} = 0.8 \mu s$ (typ.) ($di/dt = -20 A/\mu s$)
- Low saturation voltage: $V_{CE(sat)} = 2.3 V$ (typ.) ($I_C = 60 A$)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		symbol	Rating	Unit
Collector-Emitter Voltage		V_{CES}	1000	V
Gate-Emitter Voltage		V_{GES}	± 25	V
Collector Current	DC	I_C	60	A
	1 ms	I_{CP}	120	
Emitter-Collector Forward Current	DC	I_{ECF}	15	A
	1 ms	I_{ECFP}	120	
Collector Power Dissipation ($T_c = 25^\circ\text{C}$)		P_C	170	W
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature		T_{stg}	-55 to 150	$^\circ\text{C}$
Screw Torque		—	0.8	N·m

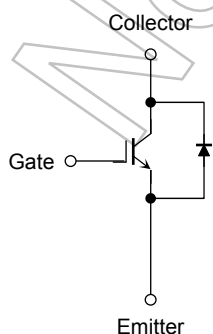
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

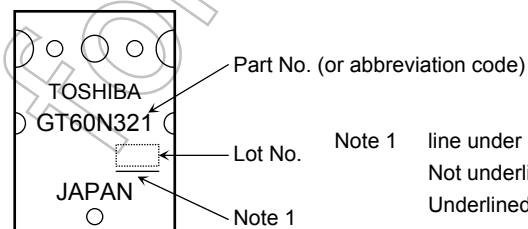


Weight: 9.75 g (typ.)

Equivalent Circuit



Marking

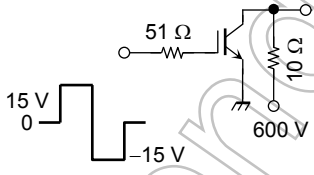


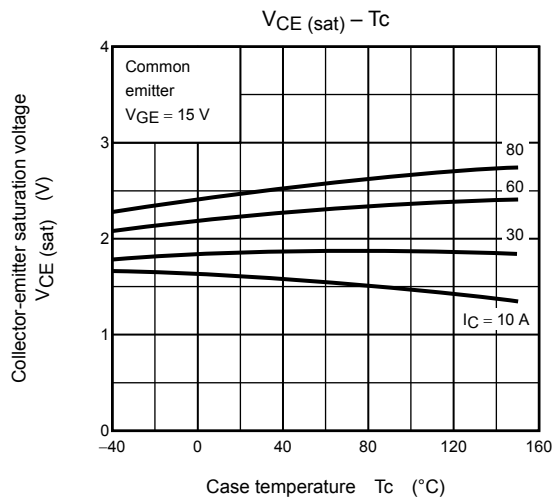
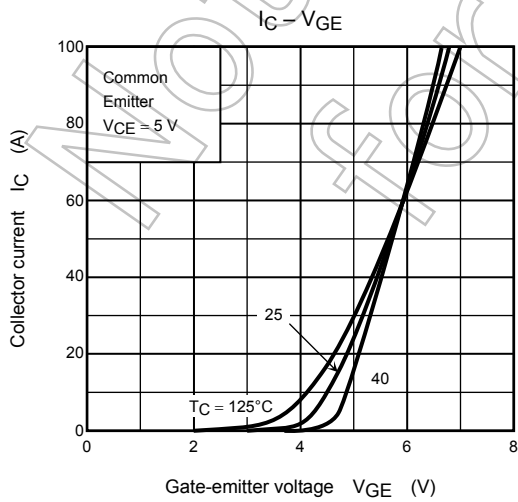
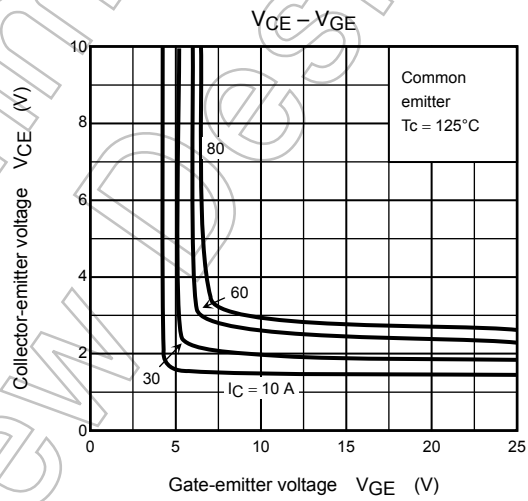
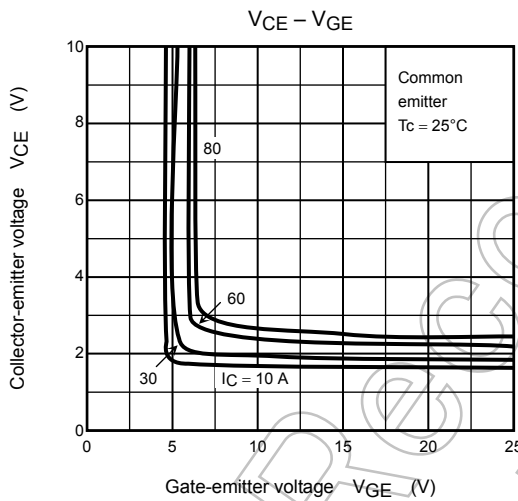
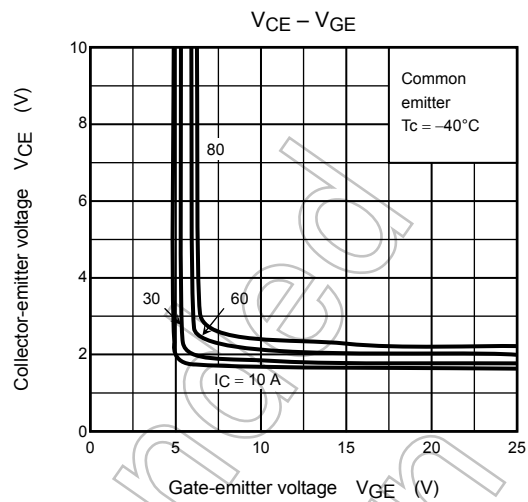
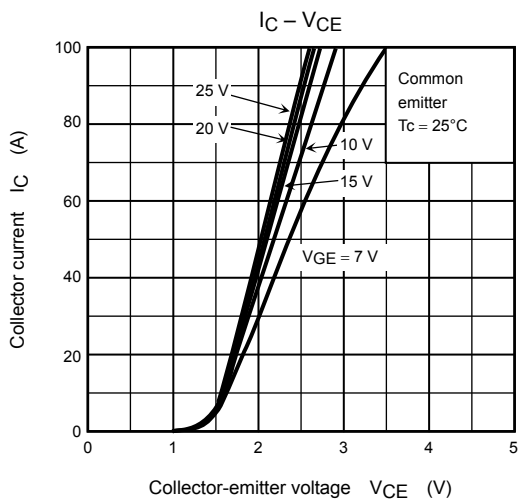
Note 1 line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

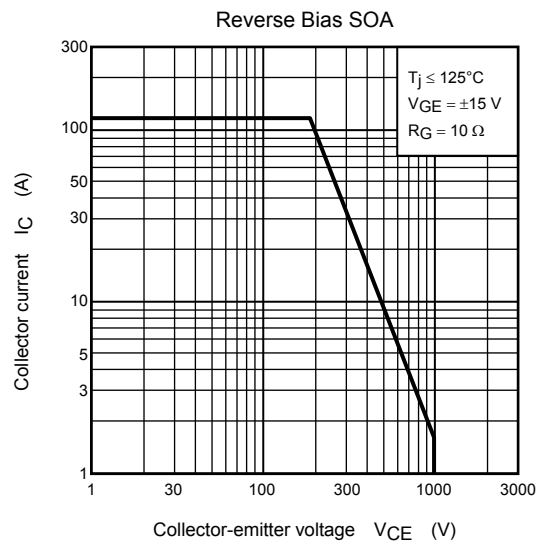
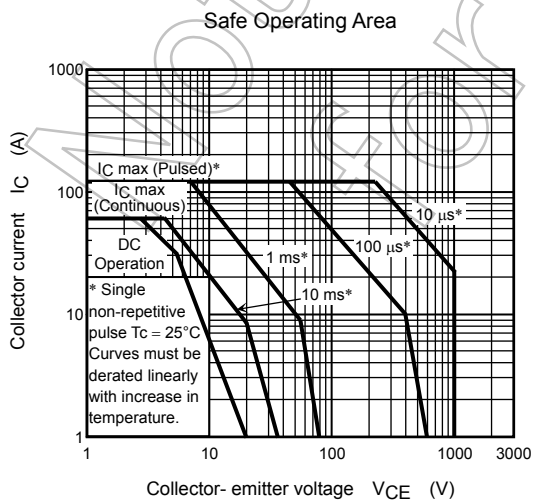
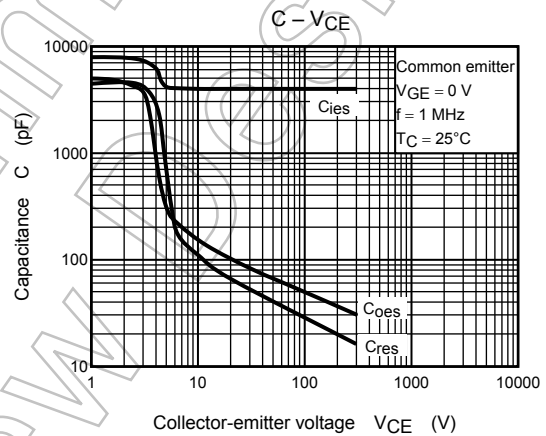
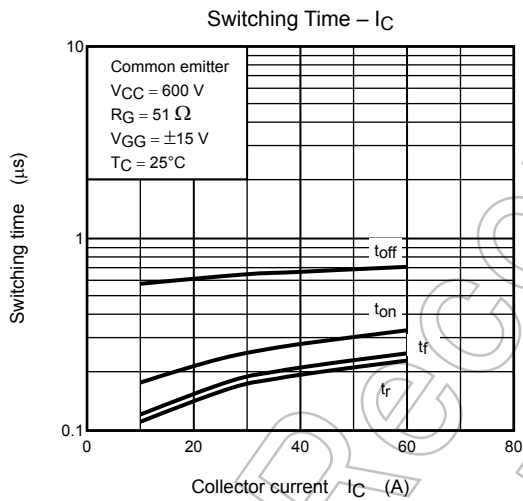
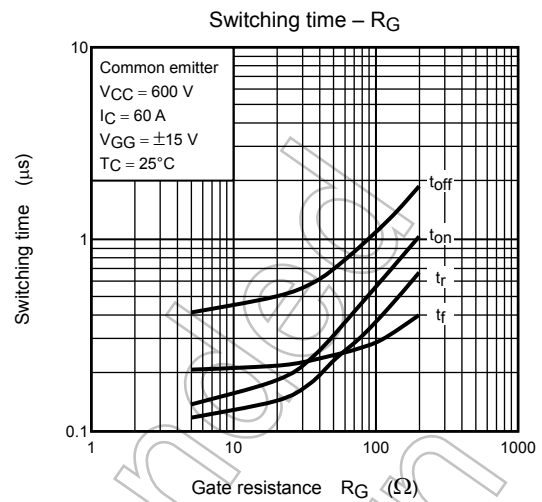
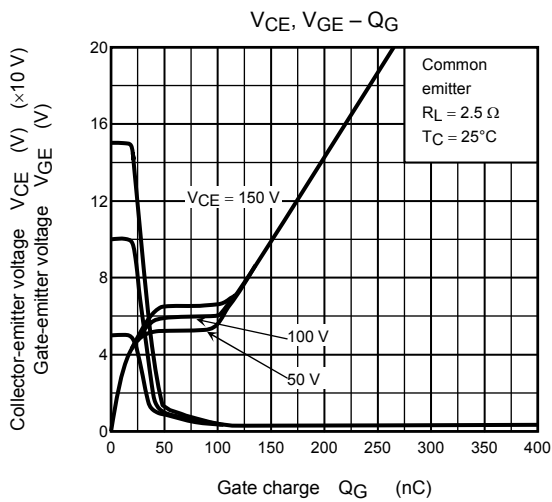
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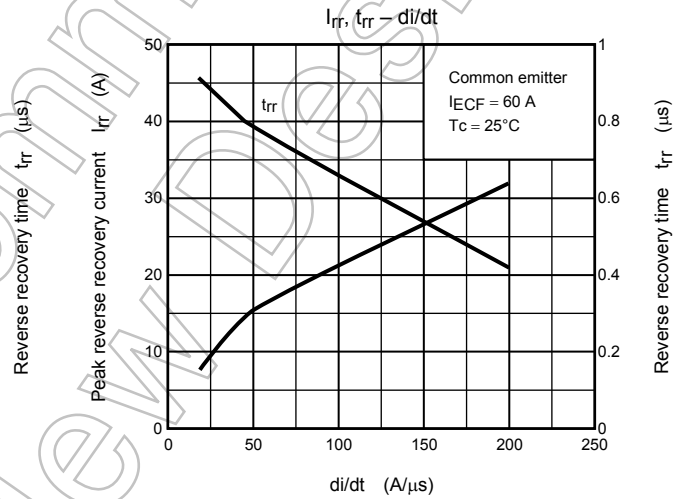
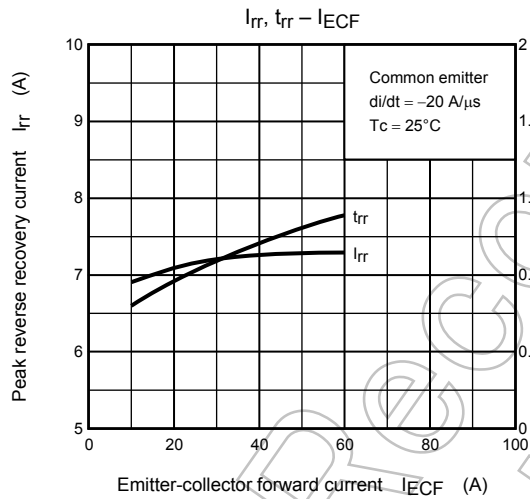
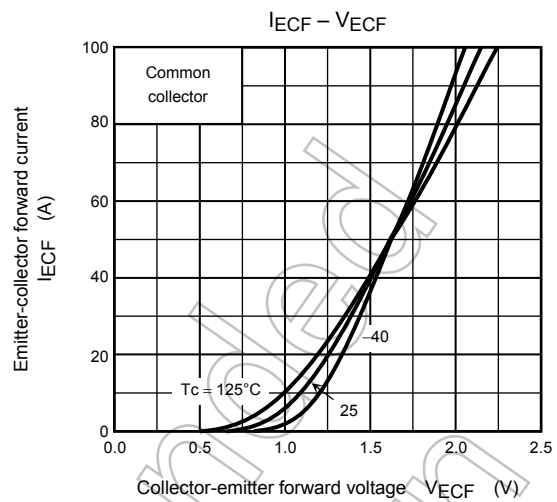
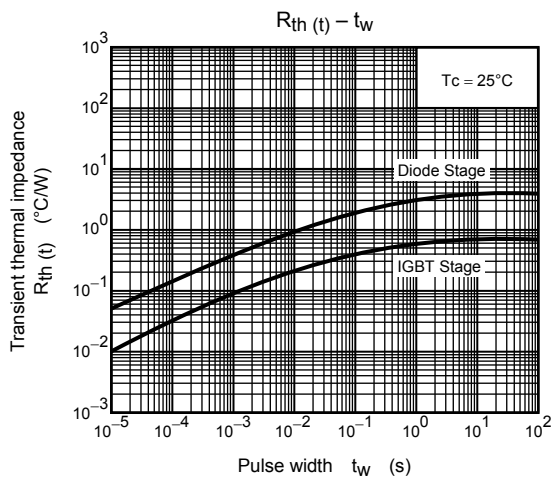
Start of commercial production
2000-03

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 1000 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE}(\text{OFF})$	$I_C = 60 \text{ mA}, V_{CE} = 5 \text{ V}$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE}(\text{sat}) (1)$	$I_C = 10 \text{ A}, V_{GE} = 15 \text{ V}$	—	1.6	2.3	V
Collector-Emitter Saturation Voltage		$V_{CE}(\text{sat}) (2)$	$I_C = 60 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.3	2.8	V
Input Capacitance		C_{ies}	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	4000	—	pF
Switching Time	Rise Time	t_r		—	0.23	—	μs
	Turn-on Time	t_{on}		—	0.33	—	
	Fall Time	t_f		—	0.25	0.40	
	Turn-off Time	t_{off}		—	0.70	—	
Emitter-Collector Forward Voltage		V_{ECF}	$I_{EC} = 15 \text{ A}, V_{GE} = 0$	—	1.2	1.9	V
Reverse Recovery Time		t_{rr}	$I_F = 15 \text{ A}, V_{GE} = 0, di/dt = -20 \text{ A}/\mu\text{s}$	—	0.8	2.5	μs
Thermal Resistance (IGBT)		$R_{th(j-c)}$	—	—	—	0.74	$^{\circ}\text{C}/\text{W}$
Thermal Resistance (Diode)		$R_{th(j-c)}$	—	—	—	4.0	$^{\circ}\text{C}/\text{W}$







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