

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

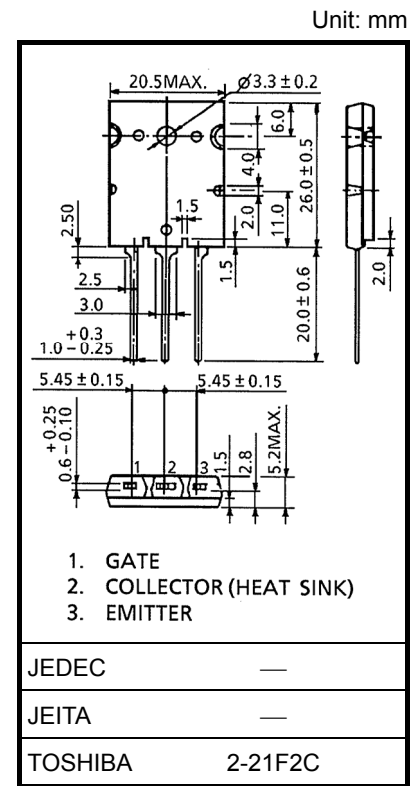
## GT50J322

### FOURTH GENERATION IGBT CURRENT RESONANCE INVERTER SWITCHING APPLICATIONS

- FRD included between emitter and collector
- Enhancement mode type
- High speed :  $t_f = 0.25\mu\text{s}$  (Typ.) ( $I_C = 50\text{A}$ )
- Low saturation voltage :  $V_{CE(sat)} = 2.1\text{V}$  (Typ.) ( $I_C = 50\text{A}$ )

### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	600	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	DC	$I_C$	50
	1ms	$I_{CP}$	100
Emitter-Collector Forward Current	DC	$I_F$	30
	1ms	$I_{FP}$	60
Collector Power Dissipation ( $T_c = 25^\circ\text{C}$ )	$P_C$	130	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ\text{C}$

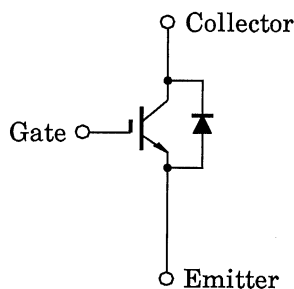


Weight: 9.75 g (typ.)

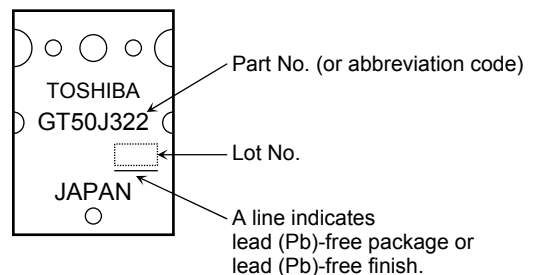
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

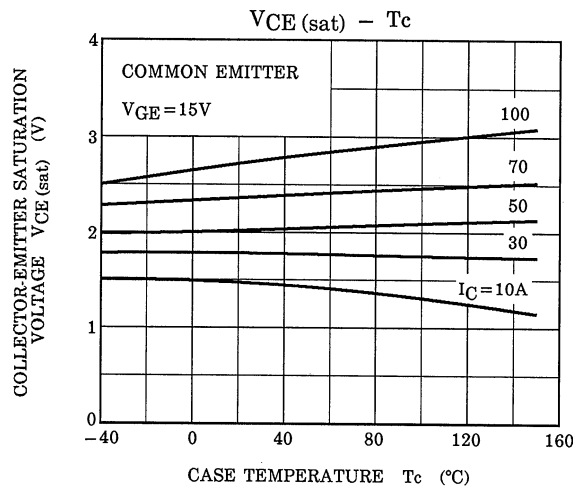
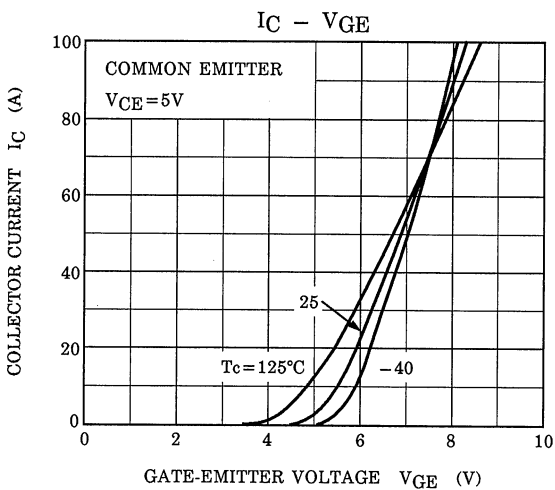
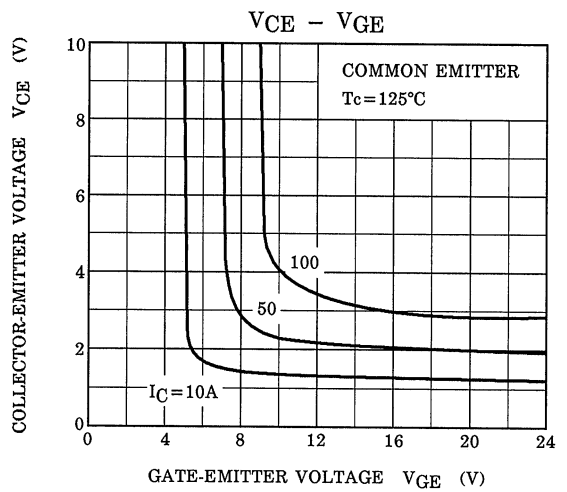
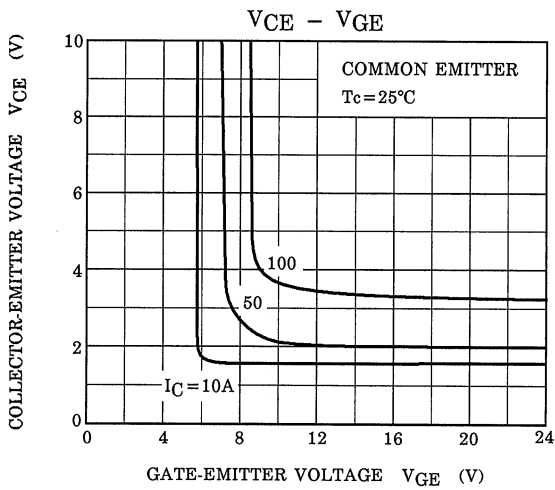
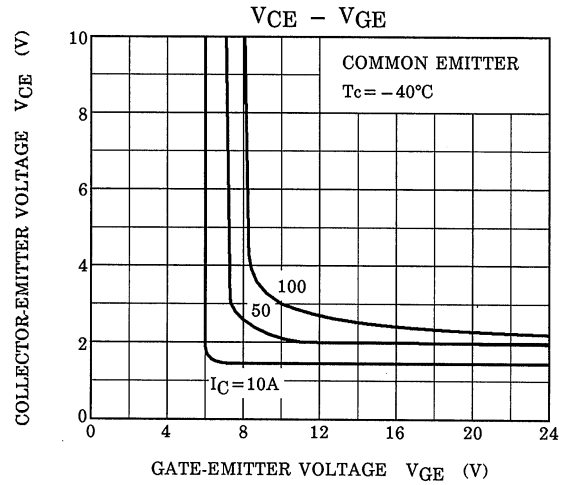
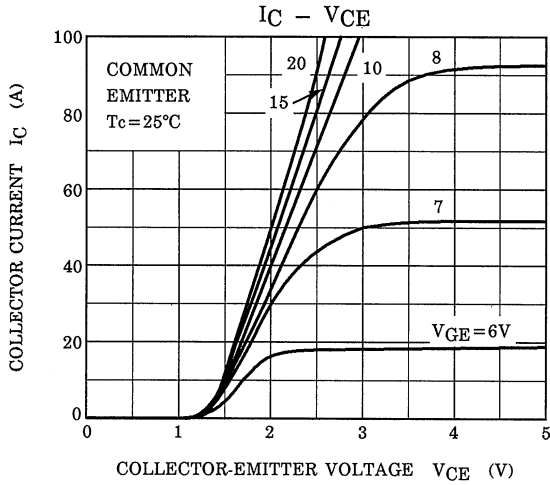


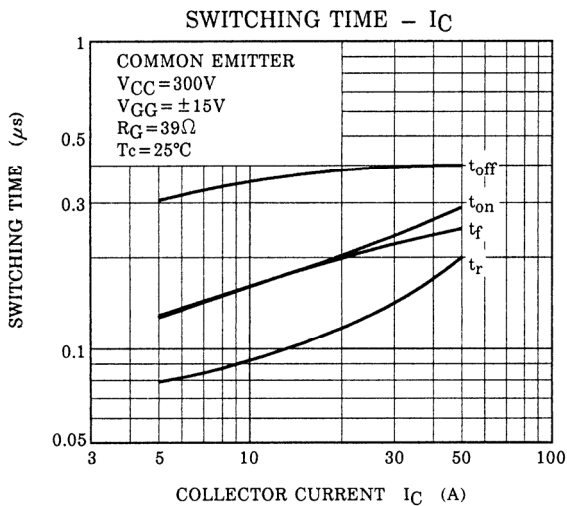
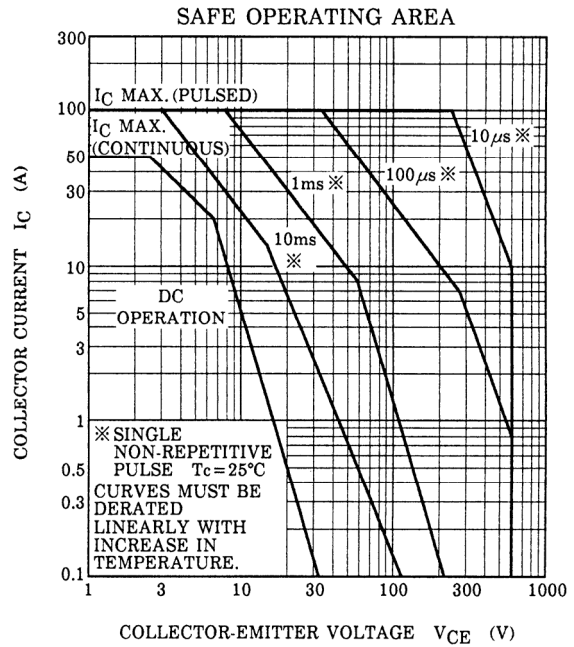
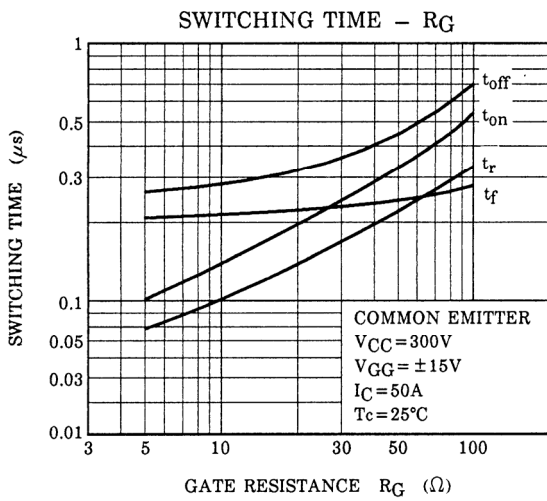
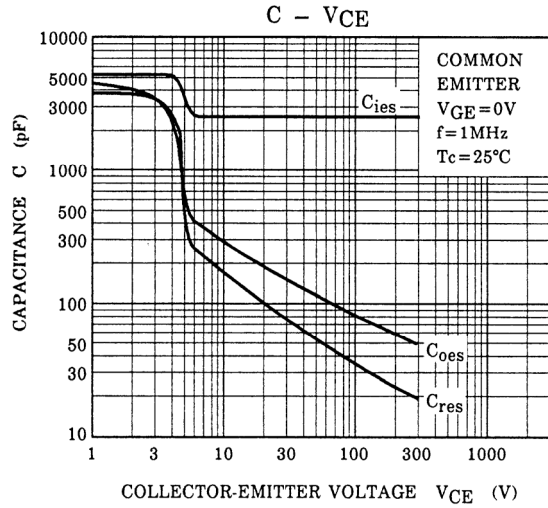
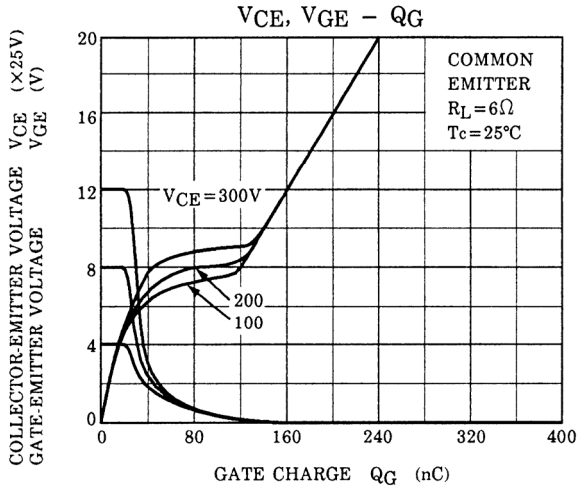
### MARKING

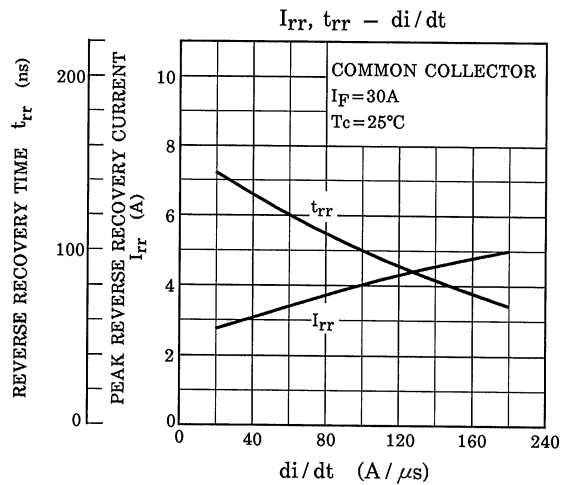
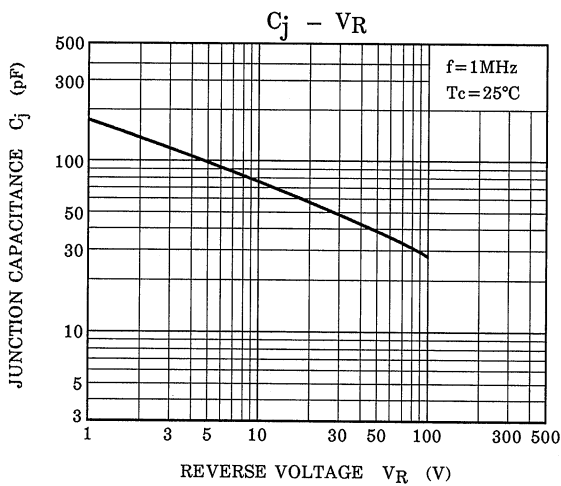
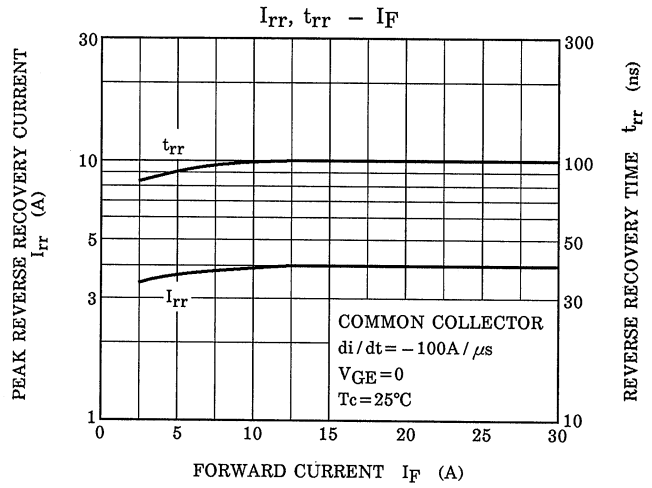
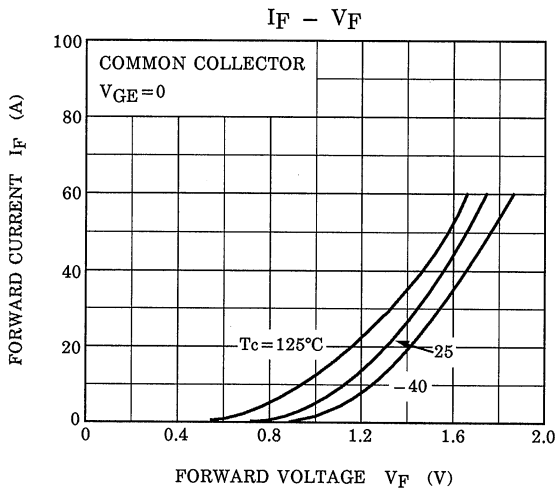
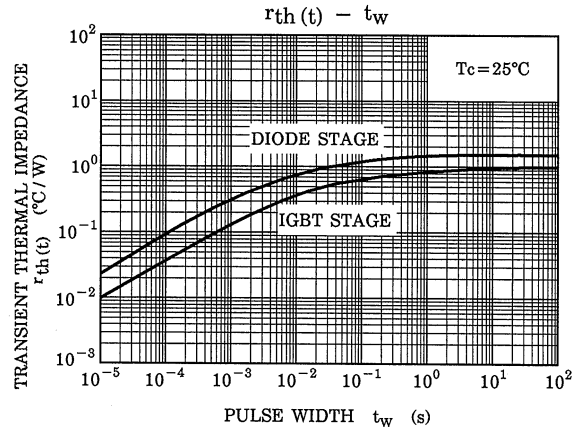
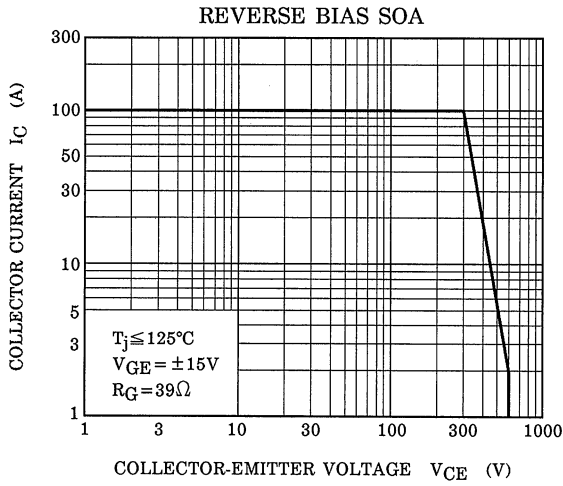


## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 600V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE(OFF)}$	$I_C = 50mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = 50A, V_{GE} = 15V$	—	2.1	2.8	V
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	2500	—	pF
Switching Time	Rise Time	$t_r$		—	0.20	—	μs
	Turn-on Time	$t_{on}$		—	0.30	—	
	Fall Time	$t_f$		—	0.25	0.40	
	Turn-off Time	$t_{off}$		—	0.40	—	
Forward Voltage		$V_F$	$I_F = 30A, V_{GE} = 0$	—	—	2.0	V
Reverse Recovery Time		$t_{rr}$	$I_F = 30A, V_{GE} = 0$ $di / dt = -100A / \mu s$	—	—	0.2	μs
Thermal Resistance		$R_{th(j-c)}$	IGBT	—	—	0.96	°C / W
Thermal Resistance		$R_{th(j-c)}$	Diode	—	—	1.56	°C / W







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