TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

# GT50J322

#### FOURTH GENERATION IGBT

CURRENT RESONANCE INVERTER SWITCHING APPLICATIONS

• FRD included between emitter and collector

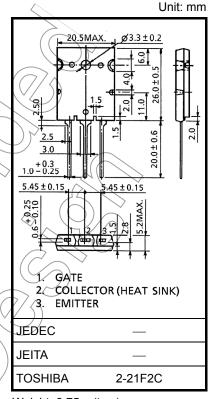
• Enhancement mode type

• High speed :  $t_f = 0.25 \mu s$  (Typ.) (I<sub>C</sub> = 50A)

• Low saturation voltage  $: V_{CE (sat)} = 2.1V (Typ.) (I_{C} = 50A)$ 

### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

				$\langle - \rangle$	
CHARACTERISTIC		SYMBOL	RATING	UNIT	
Collector-Emitter Voltage		V <sub>CES</sub>	600	V	
Gate-Emitter Voltage		V <sub>GES</sub>	±20	v	
Collector Current	DC	IC	50	A	
	1ms	I <sub>CP</sub>	100		
Emitter-Collector Foward Current	DC	l <sub>F</sub>	30	A	
	1ms	IFP	60		
Collector Power Dissipation (Tc = 25°C)		PC	130	W	
Junction Temperature		(Tj \	150 〈	∕ °C	
Storage Temperature Range		T <sub>stg</sub>	-55~150	∑%¢	

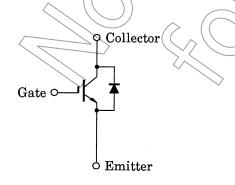


Weight: 9.75 g (typ.)

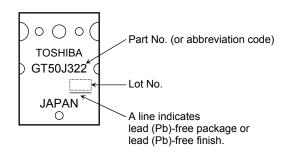
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

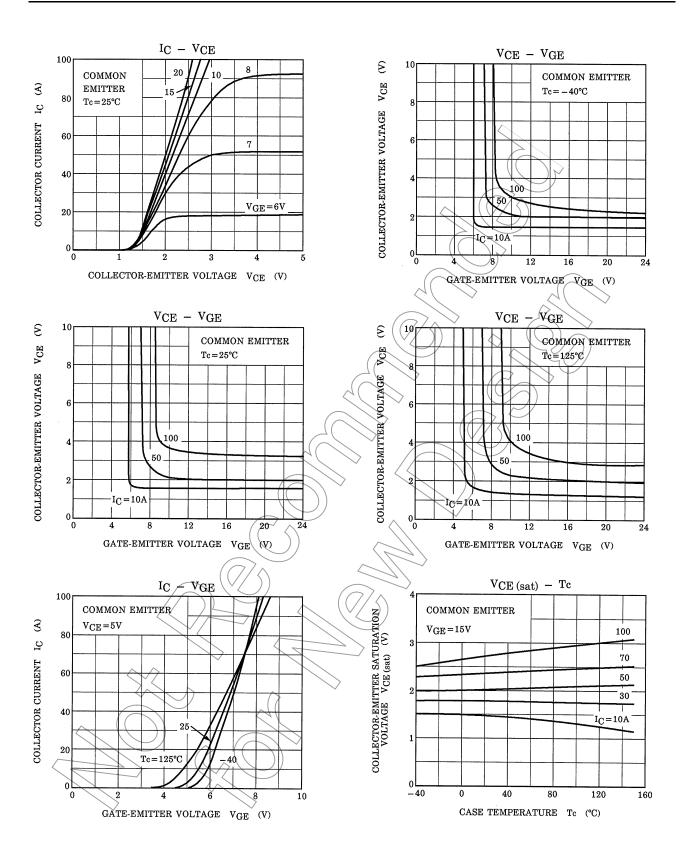


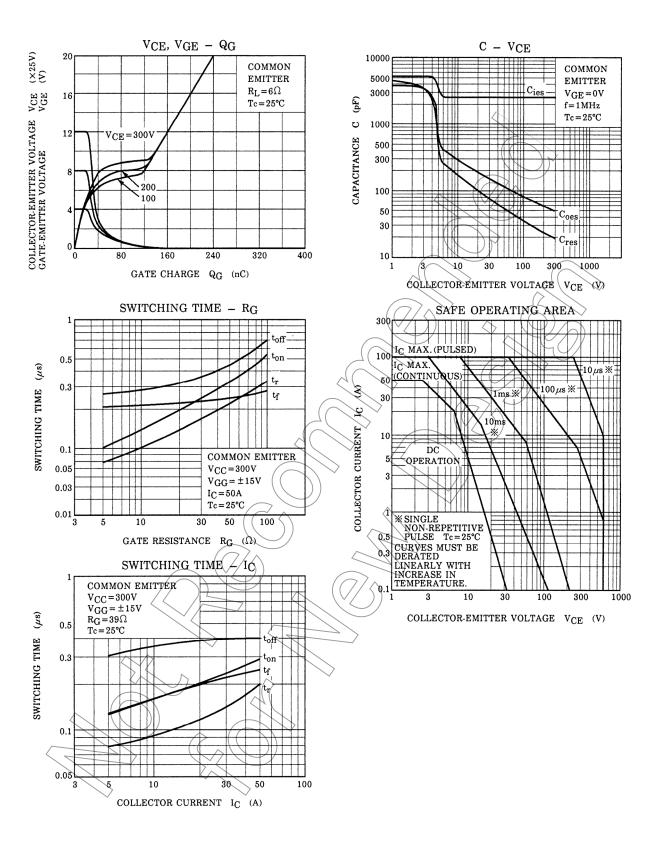
#### **MARKING**

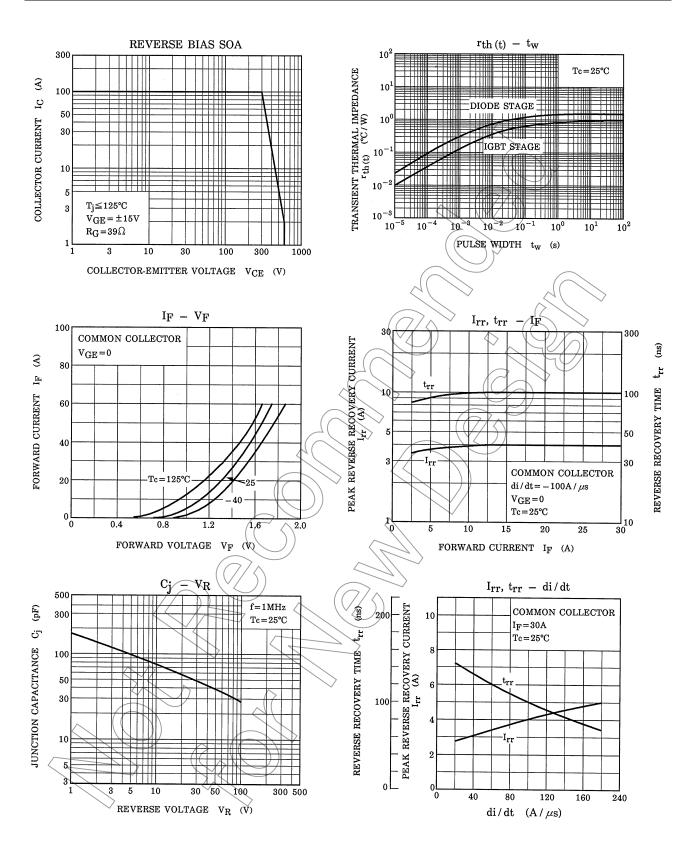


## **ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARA	CTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Curr	ent	I <sub>GES</sub>	V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0	_	_	±500	nA
Collector Cut-off C	urrent	I <sub>CES</sub>	V <sub>CE</sub> = 600V, V <sub>GE</sub> = 0	_	_	1.0	mA
Gate-Emitter Cut-	off Voltage	V <sub>GE</sub> (OFF)	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V	3.0	_	6.0	V
Collector-Emitter S	Saturation Voltage	V <sub>CE</sub> (sat)	I <sub>C</sub> = 50A, V <sub>GE</sub> = 15V		2.1	2.8	V
Input Capacitance		C <sub>ies</sub>	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz		2500	1	pF
Switching Time	Rise Time	t <sub>r</sub>	15V 0 1 2 39Ω 1 300V	$\stackrel{>}{>}$	0.20	_	
	Turn-on Time	t <sub>on</sub>		) <del>)</del> 0.	0.30	_	μs
	Fall Time	t <sub>f</sub>			0.25	0.40	
	Turn-off Time	t <sub>off</sub>		_	0.40	_	
Forward Voltage	·	V <sub>F</sub>	I <sub>F</sub> = 30A, V <sub>GE</sub> = 0	_		2.0	V
Reverse Recovery	Time	t <sub>rr</sub>	I <sub>F</sub> = 30A, V <sub>GE</sub> = 0 di / dt = -100A/µs	- (		0.2	μs
Thermal Resistance	е	R <sub>th (j-c)</sub>	IGBT (//)	-((		0.96	°C / W
Thermal Resistance		R <sub>th (j−c)</sub>	Diode	( <del>-</del>	4	1.56	°C / W









#### **RESTRICTIONS ON PRODUCT USE**

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