TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

# GT20J101

## **High Power Switching Applications**

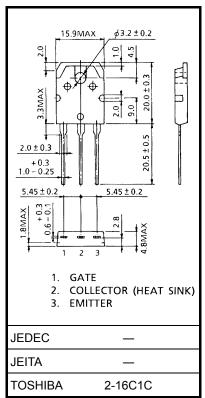
Unit: mm

- Third-generation IGBT
- Enhancement mode type
- High speed:  $t_f = 0.30 \mu s \text{ (max)}$
- Low saturation voltage: VCE (sat) = 2.7 V (max)

## **Absolute Maximum Ratings (Ta = 25°C)**

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	20	Α	
	1 ms	I <sub>CP</sub>	40		
Collector power dissipation		Pc	130	W	
$(Tc = 25^{\circ}C)$		FC	130		
Junction temperature		Tj	150	°C	
Storage temperature range		T <sub>stg</sub>	-55~150	°C	

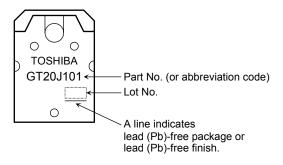
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e.



Weight: 4.6 g

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).

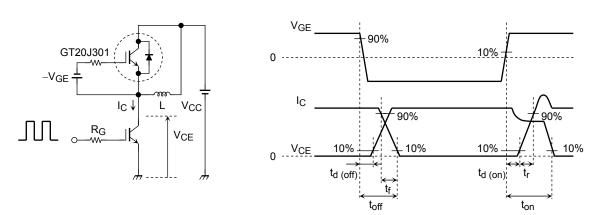
# Marking



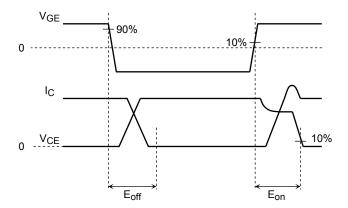
# **Electrical Characteristics (Ta = 25°C)**

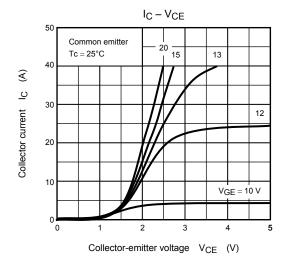
Characteristic		Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage curre	ent	I <sub>GES</sub>	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	_	_	±500	nA
Collector cut-off cu	rrent	I <sub>CES</sub>	V <sub>CE</sub> = 600 V, V <sub>GE</sub> = 0	_	_	1.0	mA
Gate-emitter cut-of	f voltage	V <sub>GE</sub> (OFF)	$I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$	5.0	_	8.0	٧
Collector-emitter sa	aturation voltage	V <sub>CE</sub> (sat)	$I_C = 20 \text{ A}, V_{GE} = 15 \text{ V}$	_	2.1	2.7	٧
Input capacitance		C <sub>ies</sub>	$V_{CE} = 20 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	_	1450		pF
Switching time	Rise time	t <sub>r</sub>	Inductive Load $V_{CC} = 300 \text{ V}, \text{ I}_{C} = 20 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, \text{ R}_{G} = 56 \Omega$	_	0.12		- μ <b>s</b>
	Turn-on time	t <sub>on</sub>		_	0.40	_	
	Fall time	t <sub>f</sub>		_	0.15	0.30	
	Turn-off time	t <sub>off</sub>	(Note1)	_	0.50	_	
Thermal resistance	)	R <sub>th (j-c)</sub>	_	_	—	0.96	°C/W

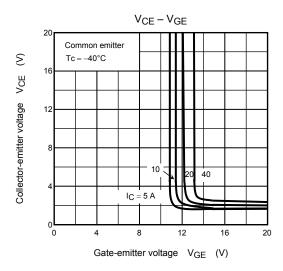
Note1: Switching time measurement circuit and input/output waveforms

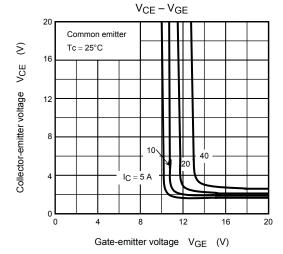


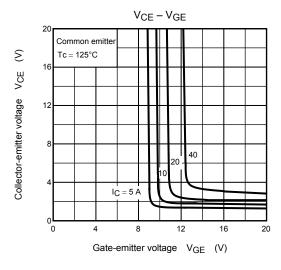
Note2: Switching loss measurement waveforms

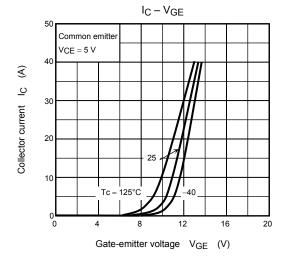


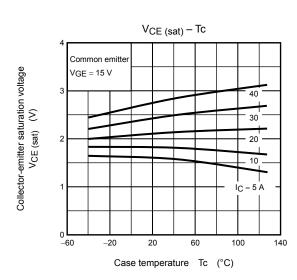




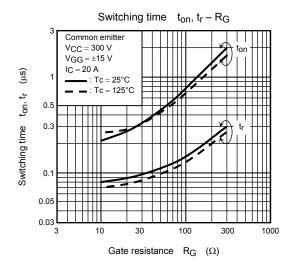


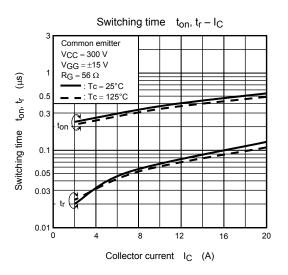


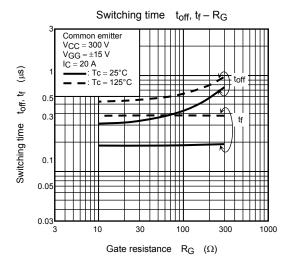


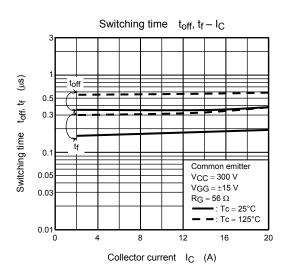


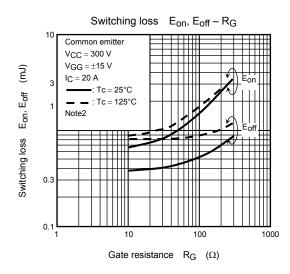
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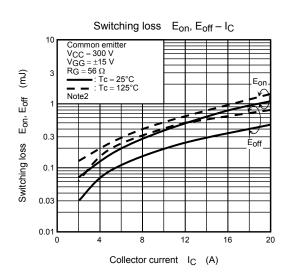


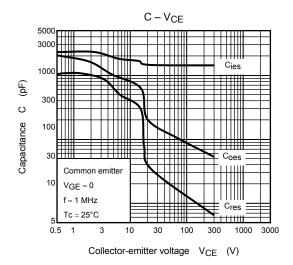


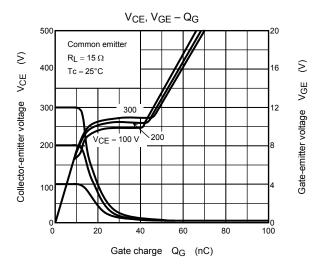


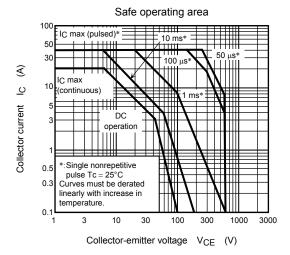


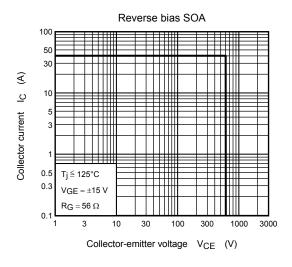


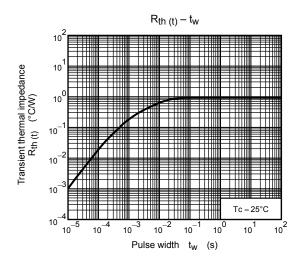












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