

TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

# GT20J101

## High Power Switching Applications

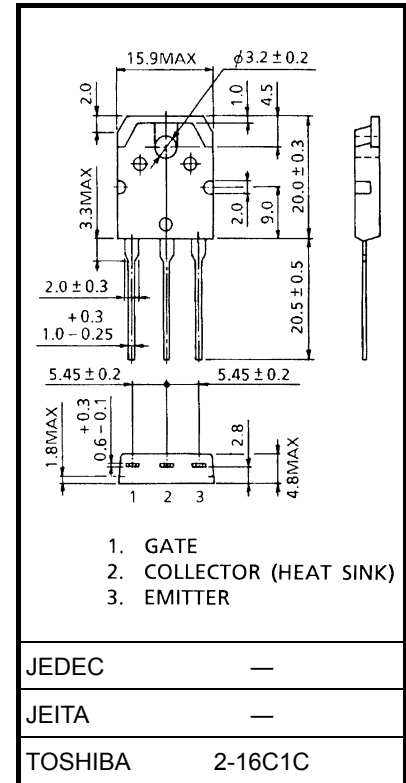
- Third-generation IGBT
- Enhancement mode type
- High speed:  $t_f = 0.30 \mu s$  (max)
- Low saturation voltage:  $V_{CE(sat)} = 2.7 V$  (max)

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

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	600	V
Gate-emitter voltage		$V_{GES}$	$\pm 20$	V
Collector current	DC	$I_C$	20	A
	1 ms	$I_{CP}$	40	
Collector power dissipation ( $T_c = 25^\circ C$ )		$P_C$	130	W
Junction temperature		$T_j$	150	$^\circ C$
Storage temperature range		$T_{stg}$	-55~150	$^\circ C$

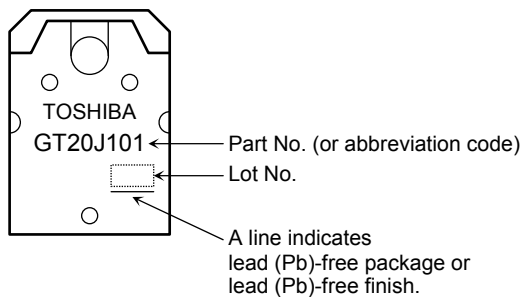
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Unit: mm



Weight: 4.6 g

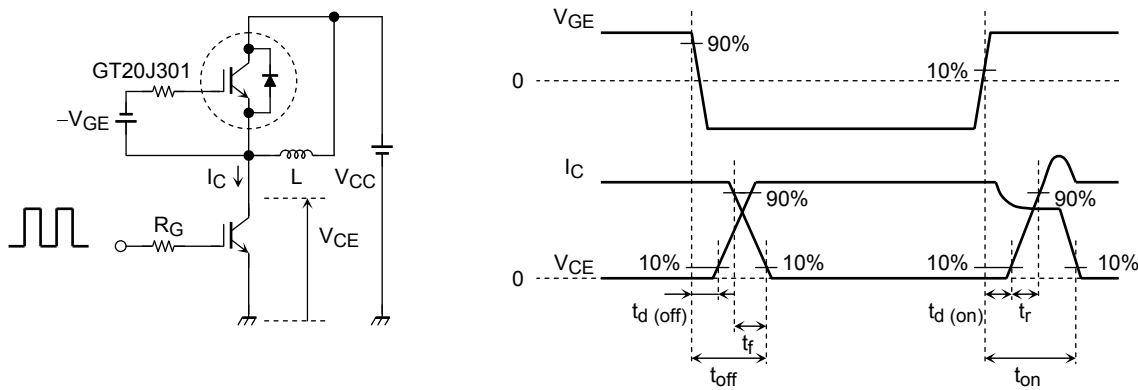
## Marking



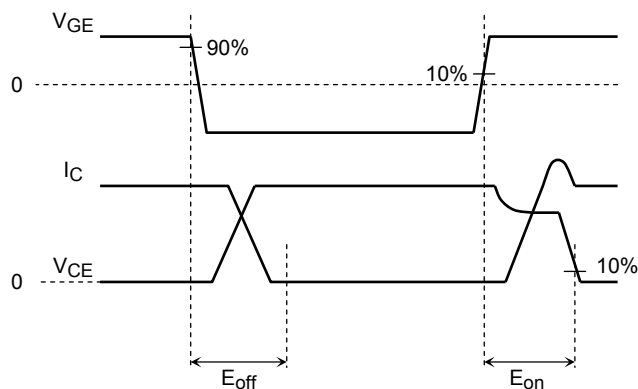
## Electrical Characteristics (Ta = 25°C)

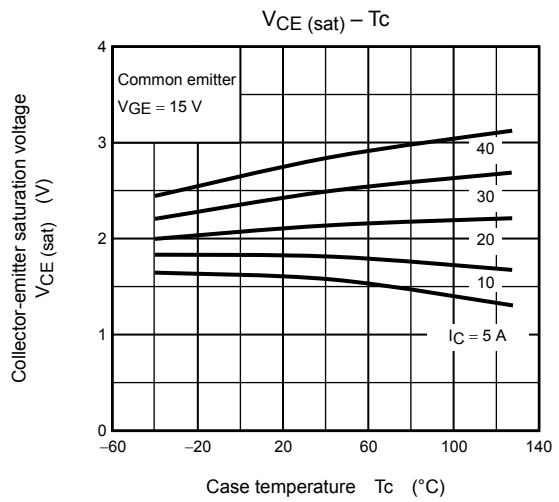
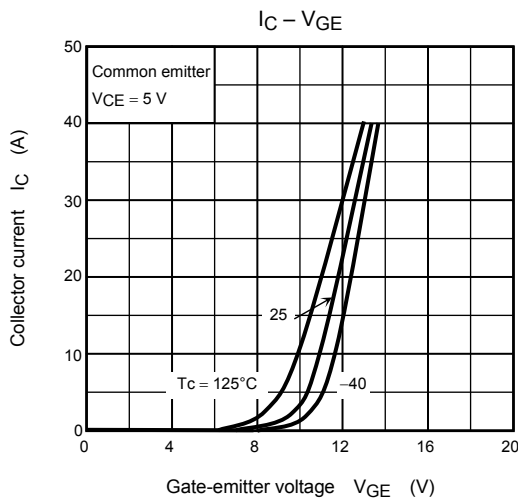
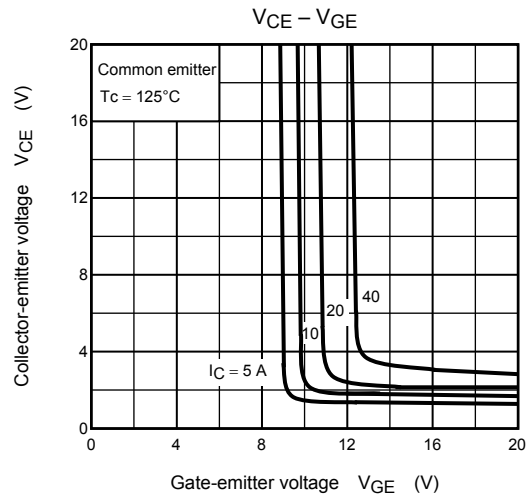
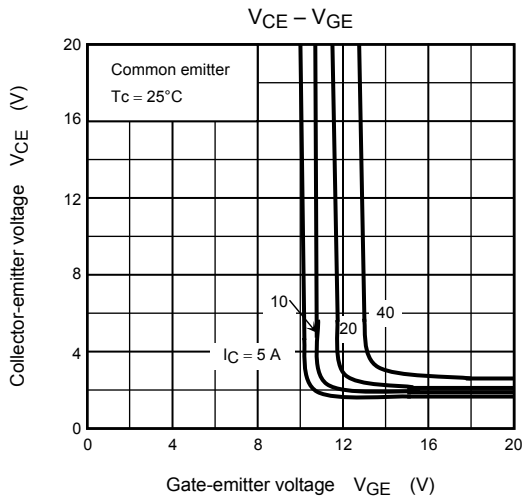
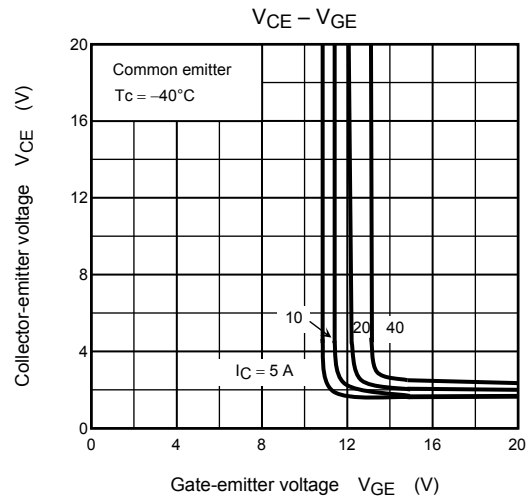
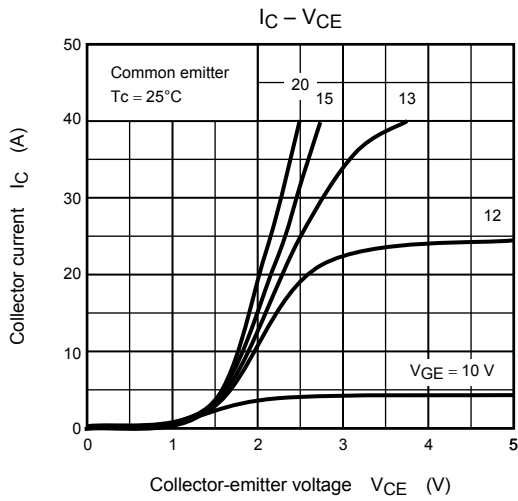
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	$I_{GES}$	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA	
Collector cut-off current	$I_{CES}$	$V_{CE} = 600\text{ V}, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage	$V_{GE(OFF)}$	$I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$	5.0	—	8.0	V	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 20\text{ A}, V_{GE} = 15\text{ V}$	—	2.1	2.7	V	
Input capacitance	$C_{ies}$	$V_{CE} = 20\text{ V}, V_{GE} = 0, f = 1\text{ MHz}$	—	1450	—	pF	
Switching time	Rise time	$t_r$	Inductive Load $V_{CC} = 300\text{ V}, I_C = 20\text{ A}$ $V_{GG} = \pm 15\text{ V}, R_G = 56\ \Omega$ (Note1)	—	0.12	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	0.40	—	
	Fall time	$t_f$		—	0.15	0.30	
	Turn-off time	$t_{off}$		—	0.50	—	
Thermal resistance	$R_{th(j-c)}$	—	—	—	0.96	$^{\circ}\text{C/W}$	

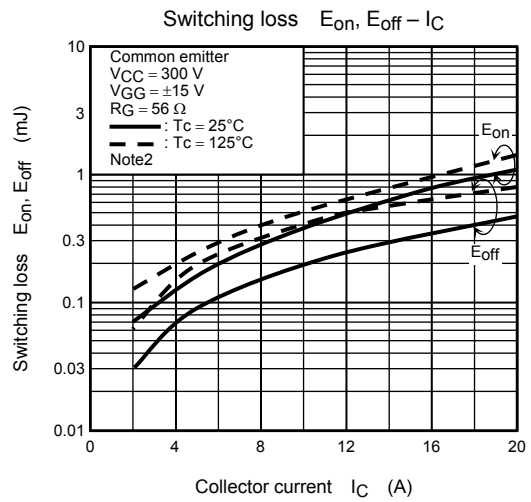
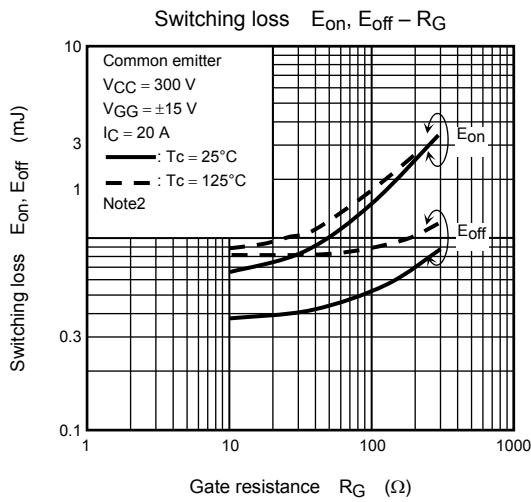
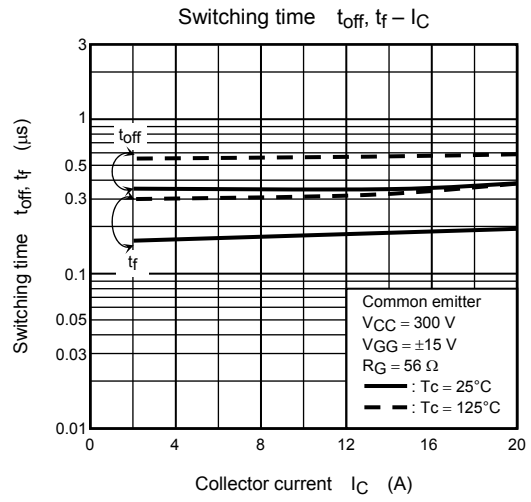
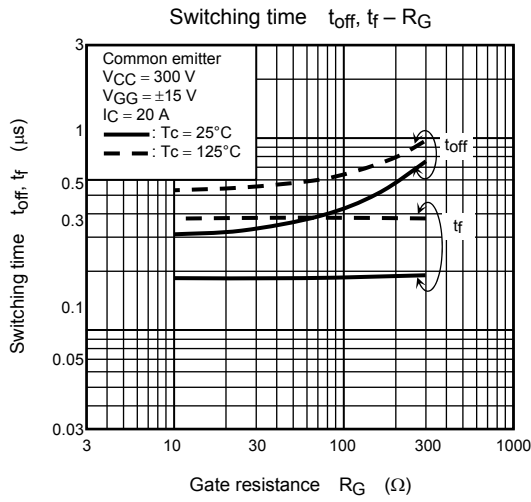
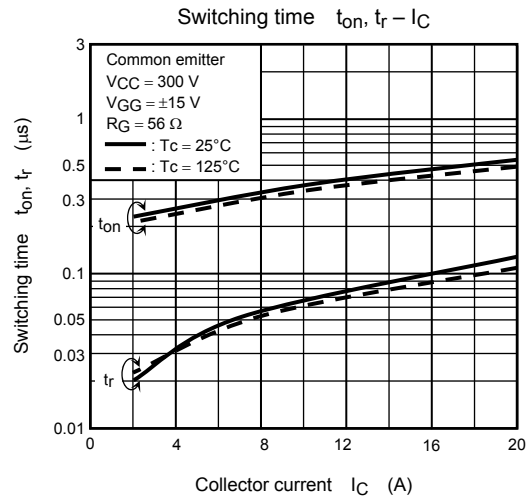
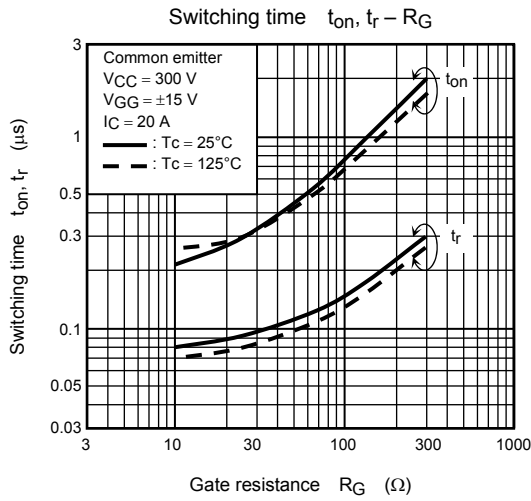
Note1: Switching time measurement circuit and input/output waveforms

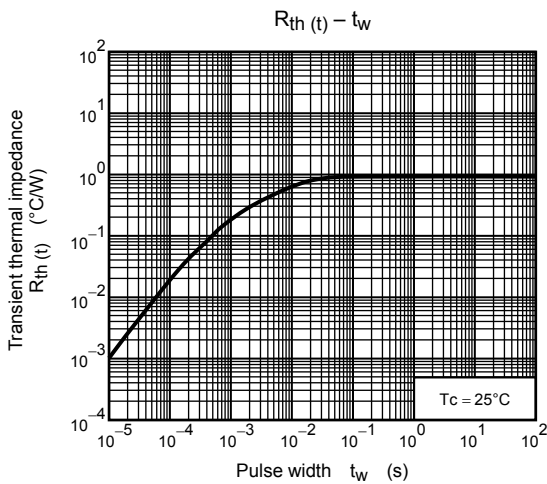
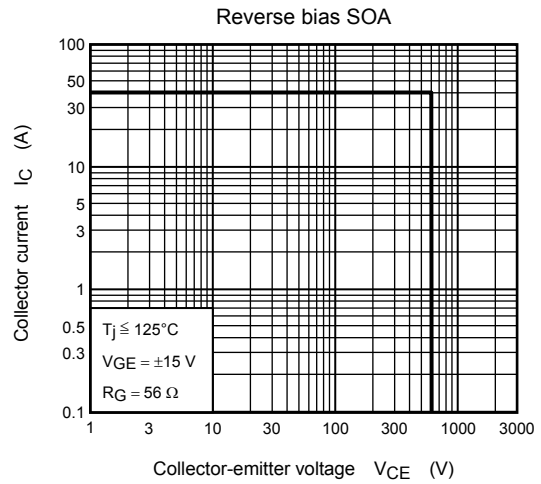
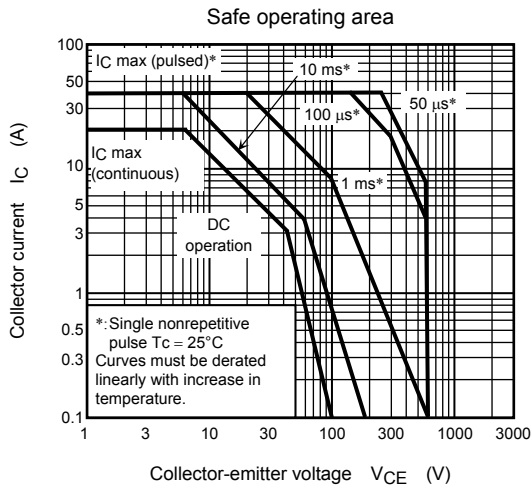
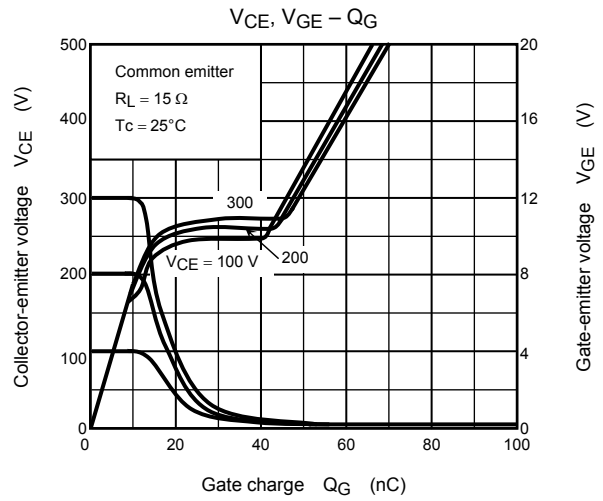
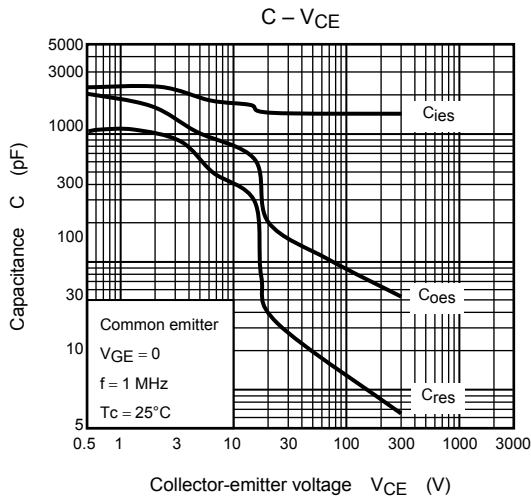


Note2: Switching loss measurement waveforms









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