

# GT60J323

## Current Resonance Inverter Switching Application

- Enhancement mode type
- High speed :  $t_f = 0.16 \mu s$  (typ.) ( $I_C = 60A$ )
- Low saturation voltage:  $V_{CE(sat)} = 1.9 V$  (typ.) ( $I_C = 60A$ )
- FRD included between emitter and collector
- Fourth generation IGBT
- TO-3P(LH) (Toshiba package name)

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

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	600	V
Gate-emitter voltage		$V_{GES}$	$\pm 25$	V
Continuous collector current	@ $T_c = 100^\circ\text{C}$	$I_C$	33	A
	@ $T_c = 25^\circ\text{C}$		60	
Pulsed collector current		$I_{CP}$	120	A
Diode forward current	DC	$I_F$	30	A
	Pulsed	$I_{FP}$	120	
Collector power dissipation	@ $T_c = 100^\circ\text{C}$	$P_C$	68	W
	@ $T_c = 25^\circ\text{C}$		170	
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^\circ\text{C}$

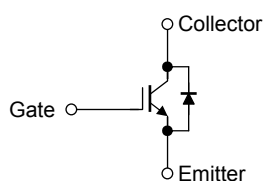
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

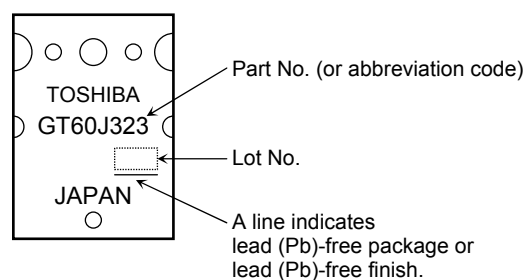
## Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance (IGBT)	$R_{th(j-c)}$	0.74	°C/W
Thermal resistance (diode)	$R_{th(j-c)}$	1.56	°C/W

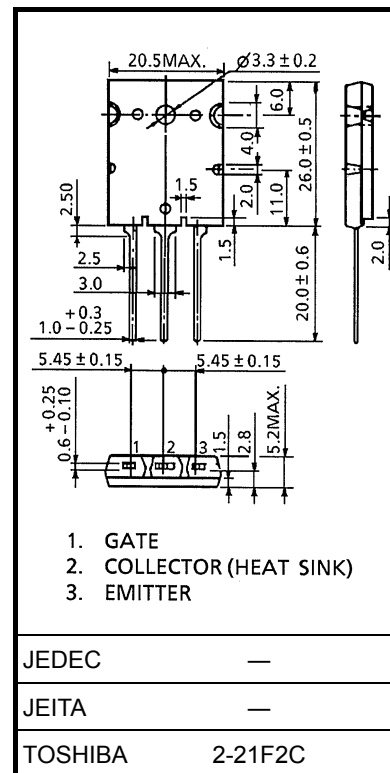
### Equivalent Circuit



## Marking



Unit: mm

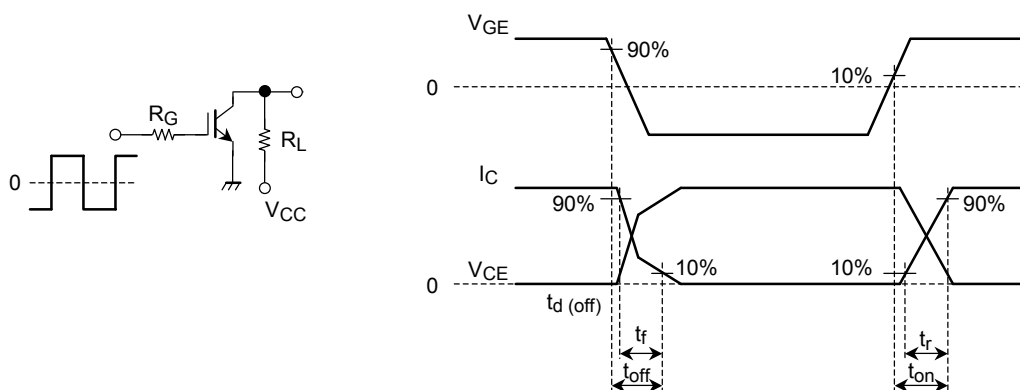


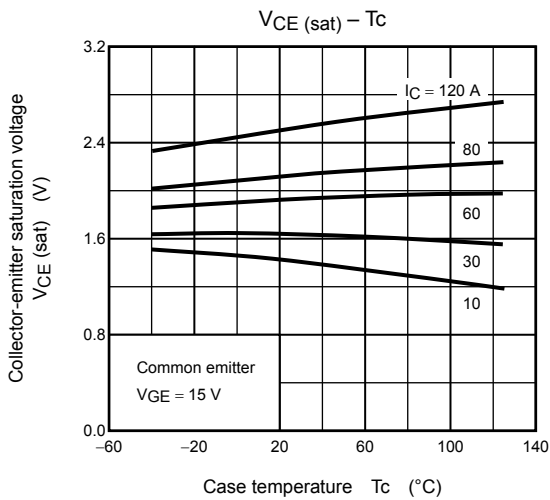
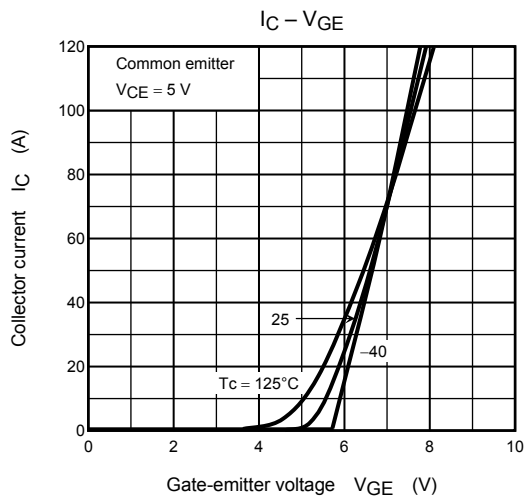
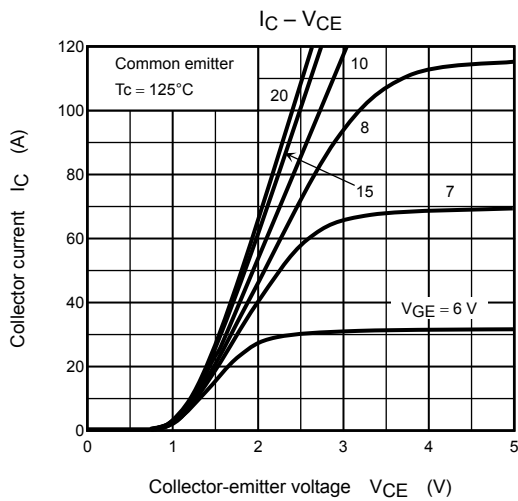
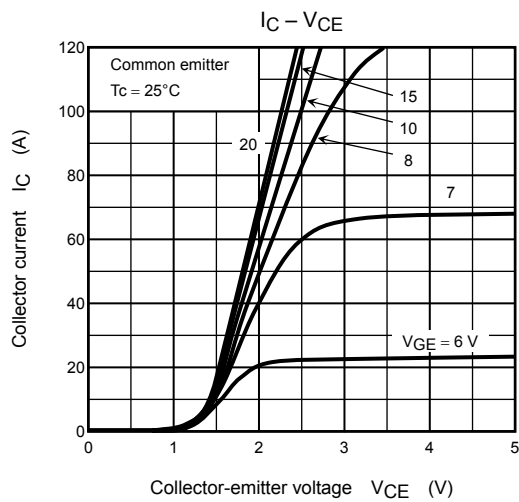
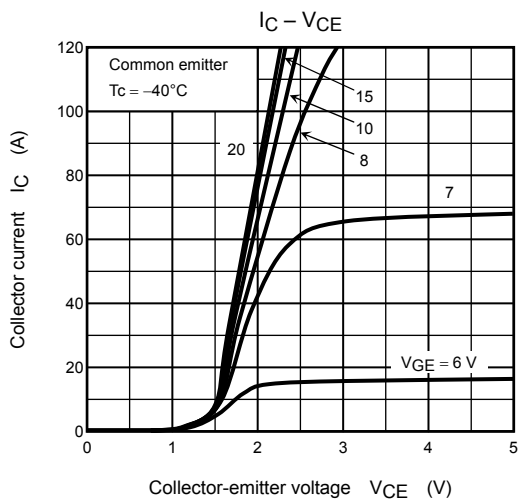
Weight: 9.75 g (typ.)

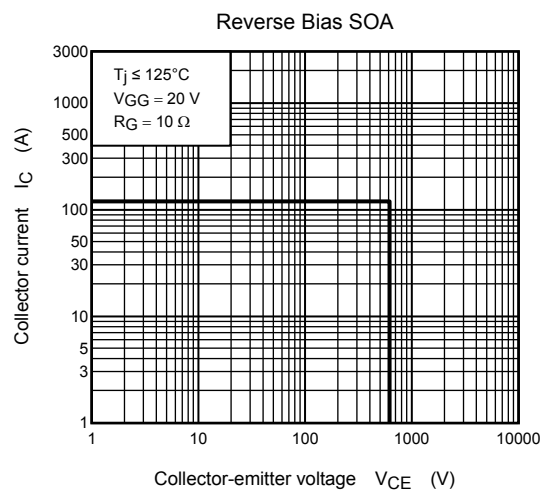
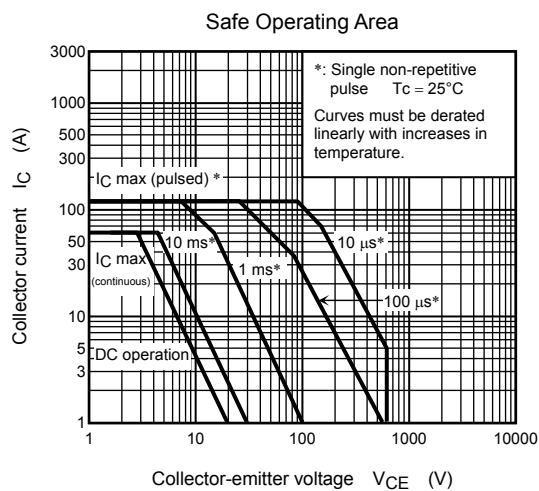
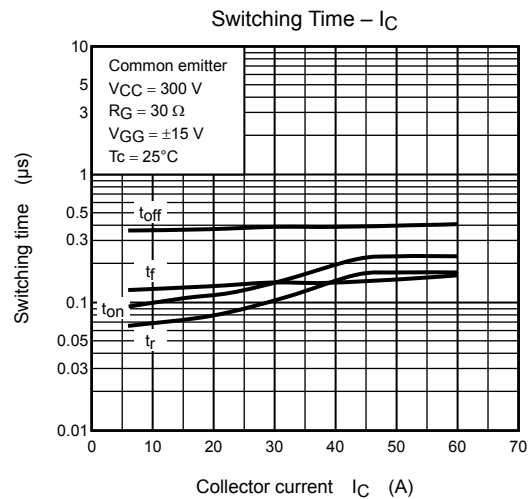
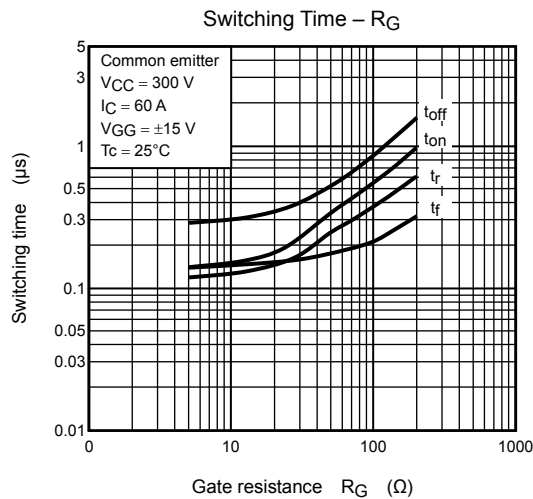
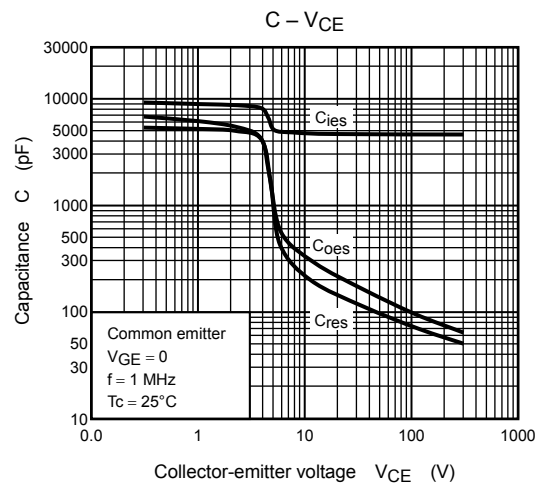
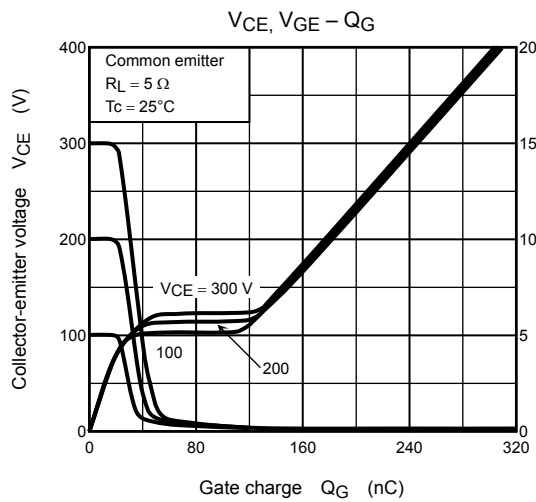
## Electrical Characteristics (Ta = 25°C)

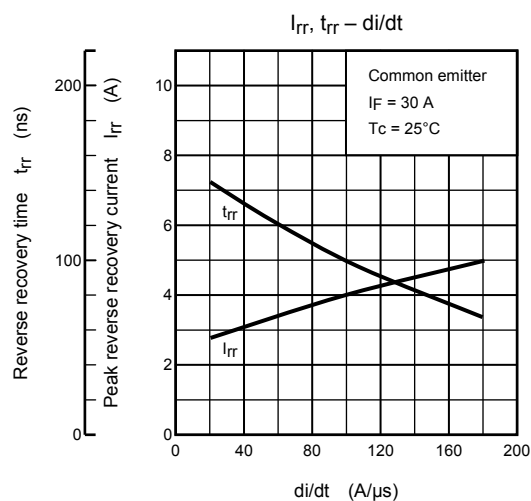
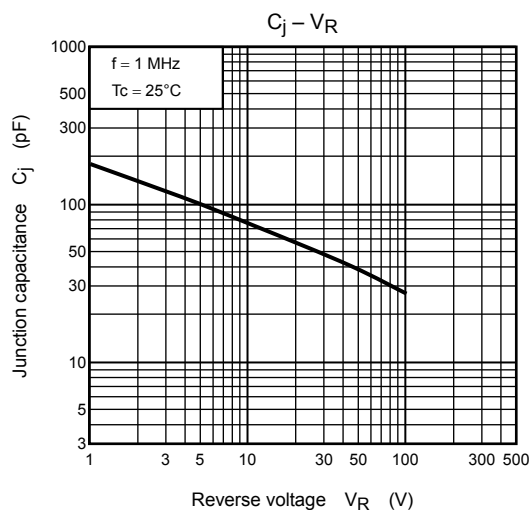
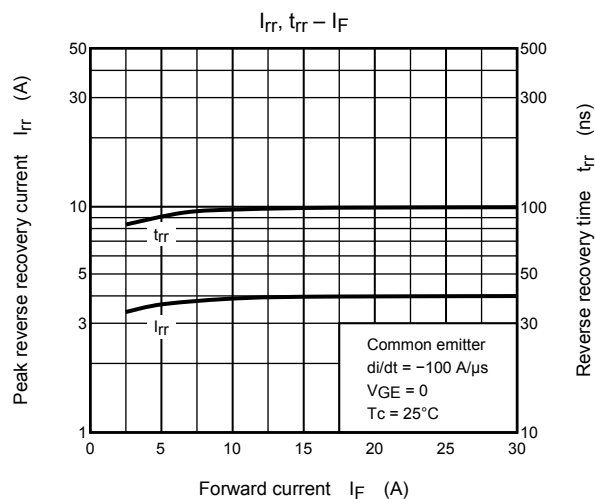
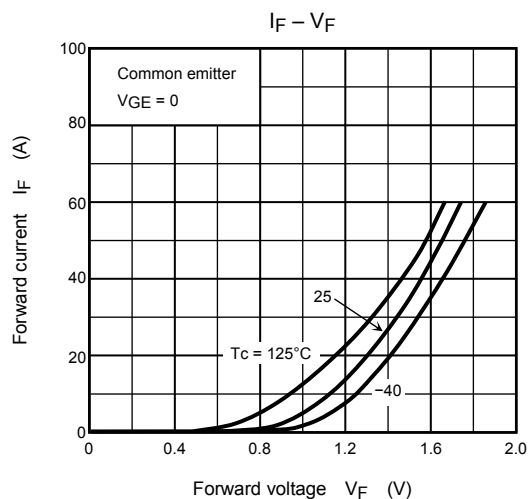
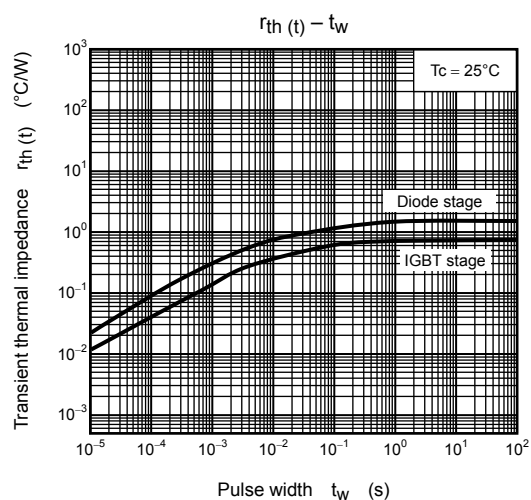
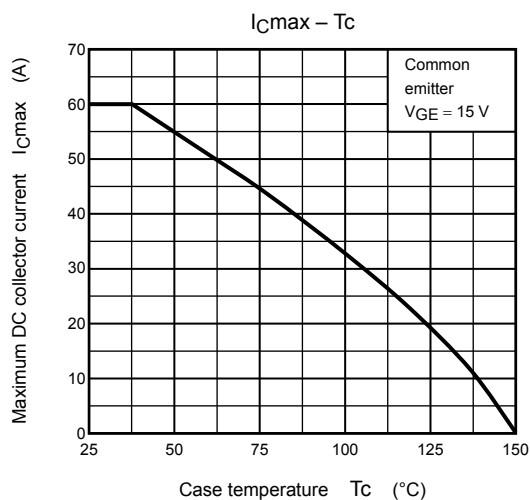
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 600 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE}(\text{OFF})$	$I_C = 60 \text{ mA}, V_{CE} = 5 \text{ V}$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE}(\text{sat})$	$I_C = 60 \text{ A}, V_{GE} = 15 \text{ V}$	—	1.9	2.5	V
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	4800	—	pF
Switching time	Rise time	$t_r$	Resistive Load $V_{CC} = 300 \text{ V}, I_C = 60 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 30 \Omega$ (Note 1)	—	0.17	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	0.23	—	
	Fall time	$t_f$		—	0.16	0.26	
	Turn-off time	$t_{off}$		—	0.41	—	
Diode forward voltage		$V_F$	$I_F = 30 \text{ A}, V_{GE} = 0$	—	1.4	2.0	V
Reverse recovery time		$t_{rr}$	$I_F = 30 \text{ A}, di/dt = -100 \text{ A}/\mu\text{s}$	—	0.1	0.2	$\mu\text{s}$

Note 1: Switching time measurement circuit and input/output waveforms









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