

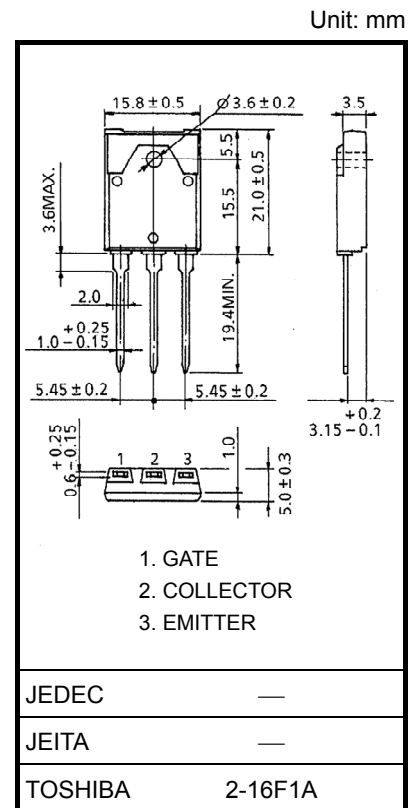
# GT35J321

Fourth-generation IGBT  
Current Resonance Inverter Switching Applications

- Enhancement mode
- High speed:  $t_f = 0.19 \mu s$  (typ.) ( $I_C = 50 A$ )
- Low saturation voltage:  $V_{CE(sat)} = 1.9 V$  (typ.) ( $I_C = 50 A$ )
- FRD included between emitter and collector
- Toshiba package name: TO-3P(N)IS

## 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
Collector current (DC)	@ Tc = 100°C	18	A
	@ Tc = 25°C	37	
Collector current (pulse)	$I_{CP}$	100	A
Diode forward current	DC	$I_F$	A
	Pulse	$I_{FP}$	
Collector power dissipation	@ Tc = 100°C	30	W
	@ Tc = 25°C	75	
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°C



Weight: 5.8 g (typ.)

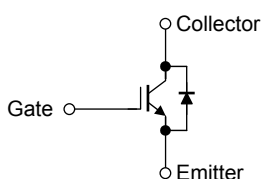
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

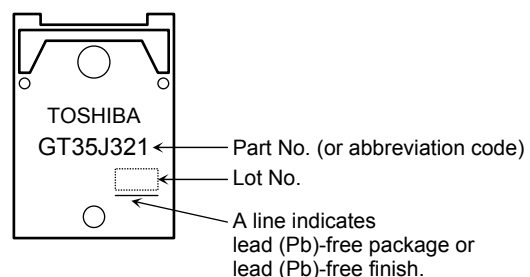
## Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance (IGBT)	$R_{th(j-c)}$	1.67	°C/W
Thermal resistance (diode)	$R_{th(j-c)}$	3.2	°C/W

## Equivalent Circuit



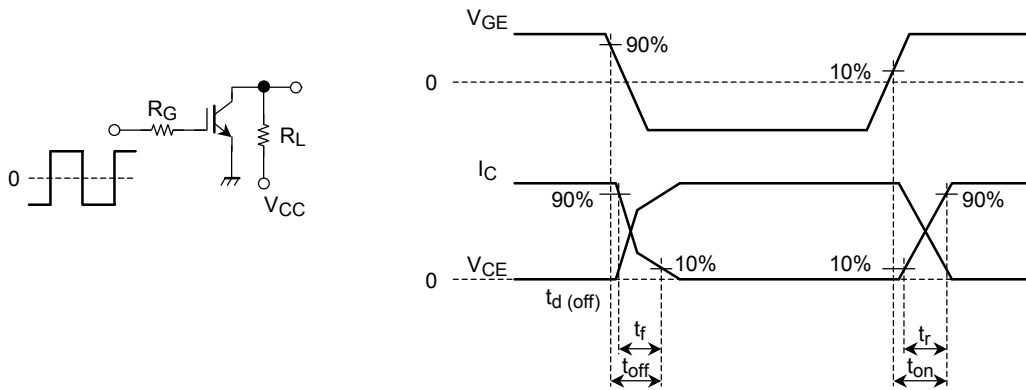
## Marking

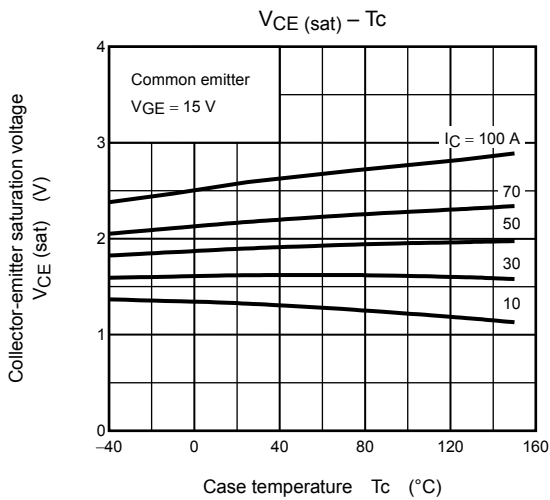
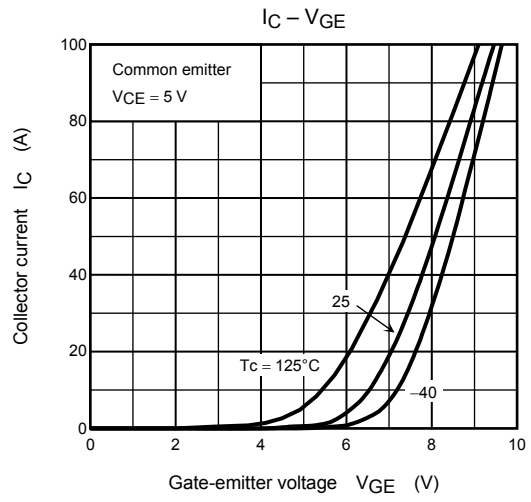
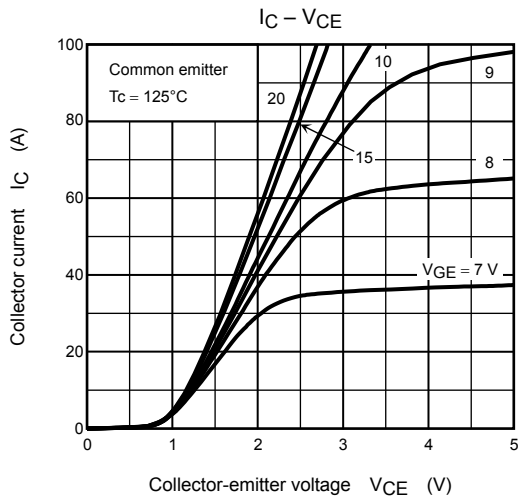
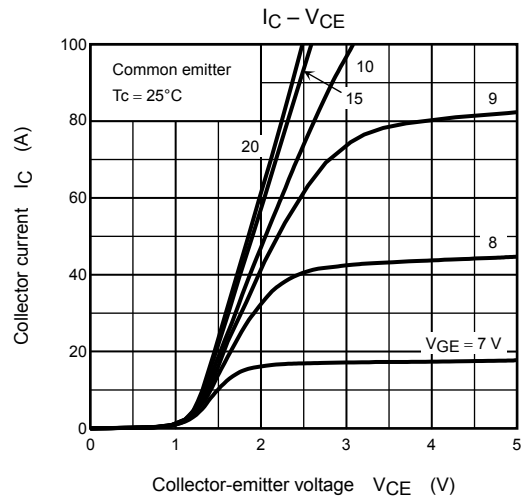
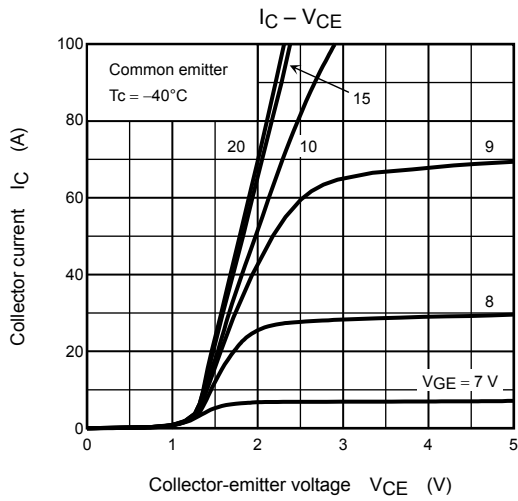


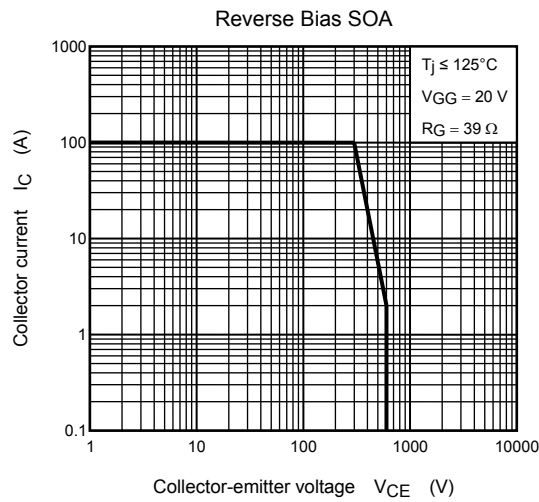
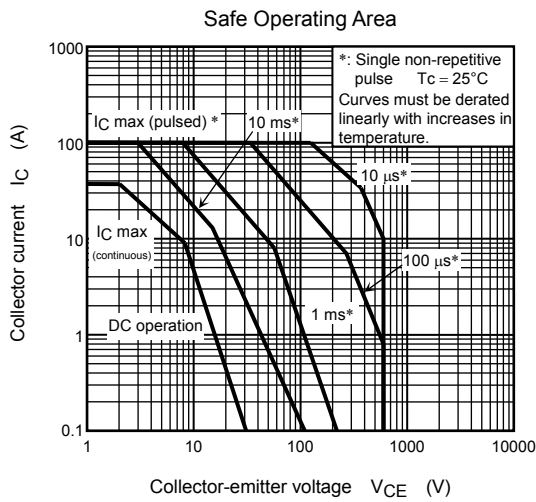
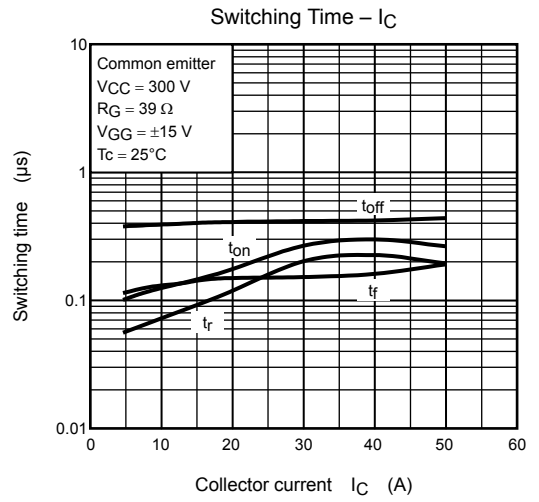
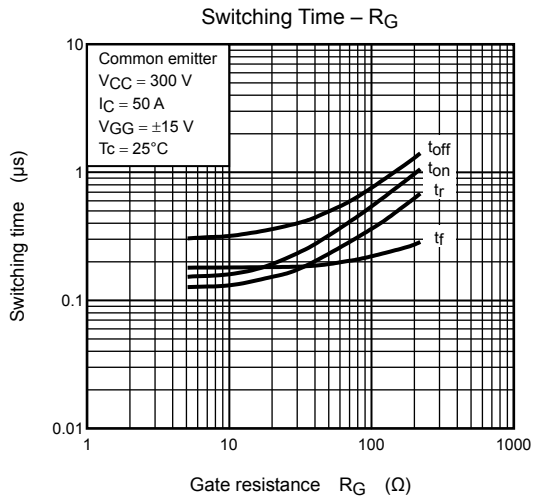
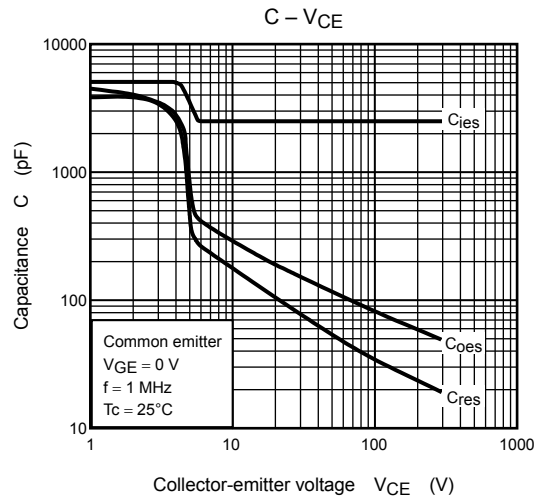
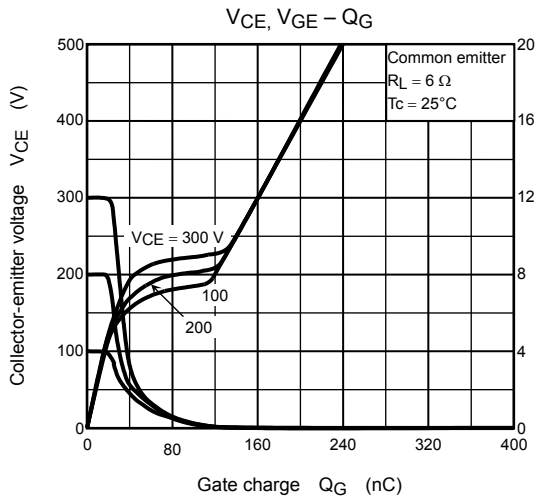
## Electrical Characteristics (Ta = 25°C)

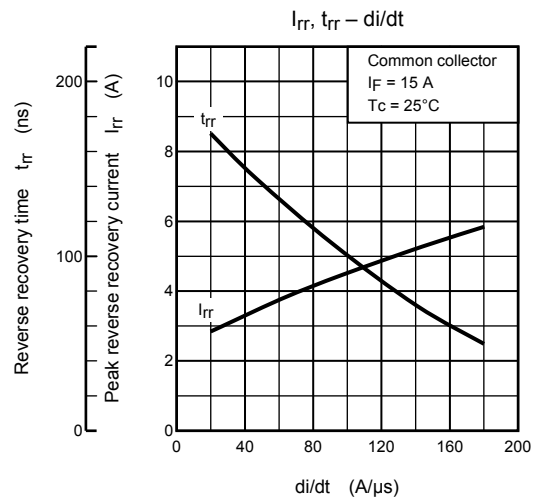
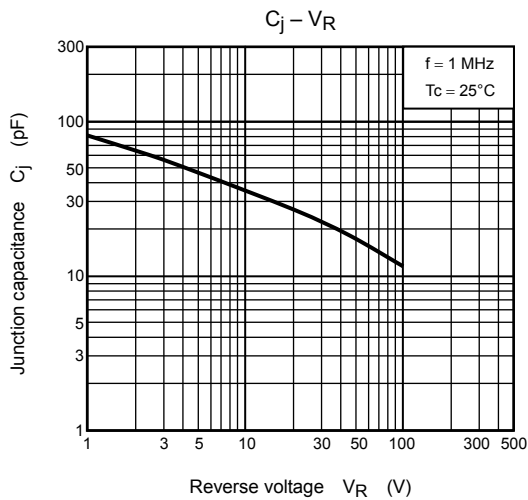
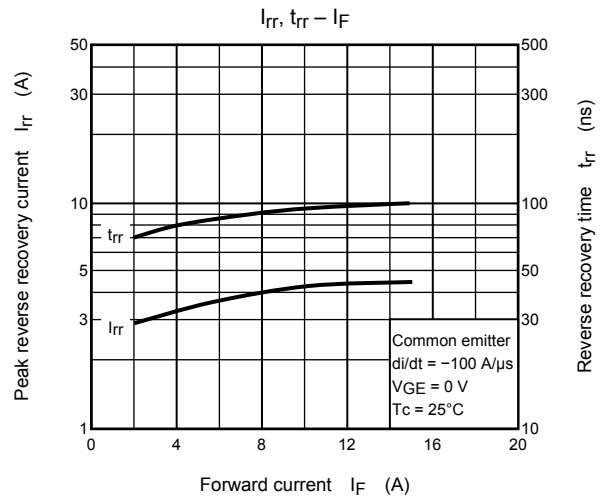
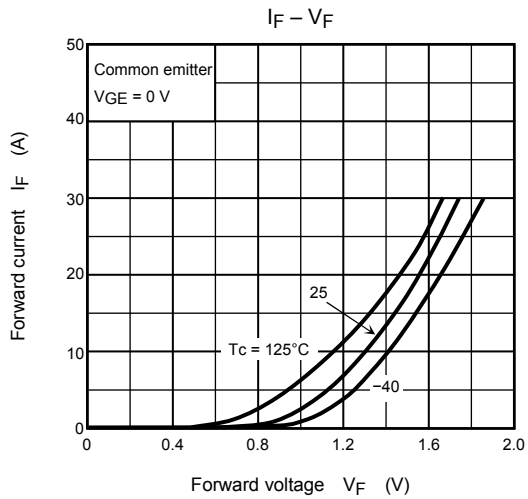
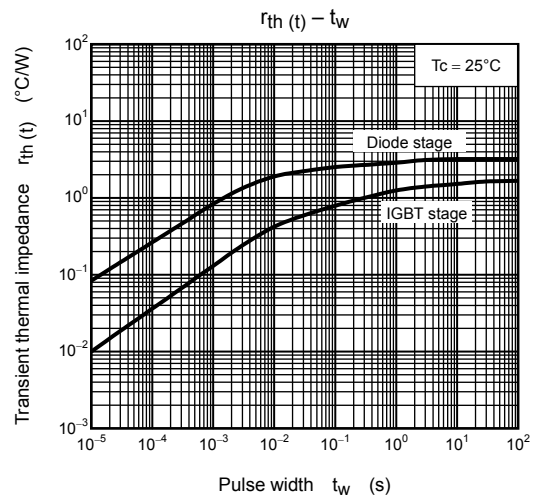
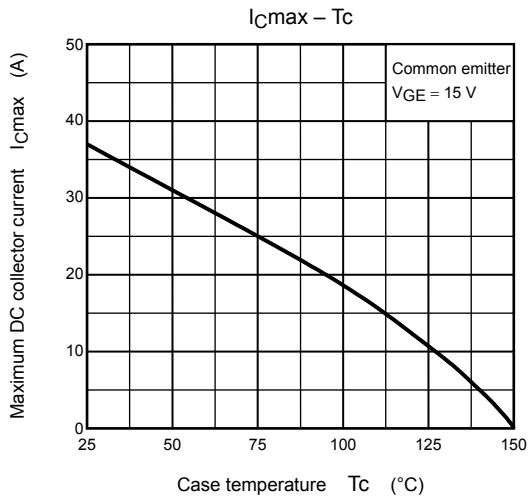
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 25\text{ V}, V_{CE} = 0\text{ V}$	—	—	$\pm 500$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 600\text{ V}, V_{GE} = 0\text{ V}$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE (OFF)}$	$I_C = 50\text{ mA}, V_{CE} = 5\text{ V}$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 50\text{ A}, V_{GE} = 15\text{ V}$	—	1.9	2.3	V
Input capacitance		$C_{ies}$	$V_{CE} = 10\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	—	2500	—	pF
Switching time	Rise time	$t_r$	Resistive Load $V_{CC} = 300\text{ V}, I_C = 50\text{ A}$ $V_{GG} = \pm 15\text{ V}, R_G = 39\ \Omega$  (Note 1)	—	0.24	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	0.33	—	
	Fall time	$t_f$		—	0.19	0.32	
	Turn-off time	$t_{off}$		—	0.51	—	
Diode forward voltage		$V_F$	$I_F = 15\text{ A}, V_{GE} = 0\text{ V}$	—	—	2.0	V
Reverse recovery time		$t_{rr}$	$I_F = 15\text{ A}, di/dt = -100\text{ A}/\mu\text{s}$	—	—	0.2	$\mu\text{s}$

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









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20070701-EN GENERAL

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