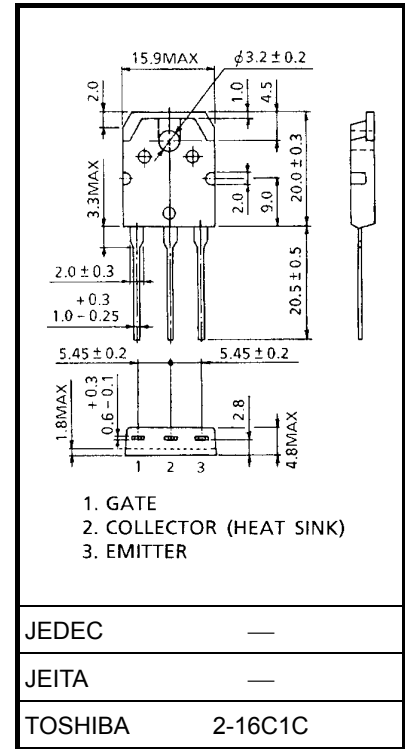


GT50N322A

Voltage Resonance Inverter Switching Application Fifth Generation IGBT

Unit: mm

- FRD included between emitter and collector
- Enhancement mode type
- High speed IGBT : $t_f = 0.10 \mu s$ (typ.) ($I_C = 60 A$)
FRD : $t_{rr} = 0.8 \mu s$ (typ.) ($di/dt = -20 A/\mu s$)
- Low saturation voltage: $V_{CE(sat)} = 2.2 V$ (typ.) ($I_C = 60 A$)



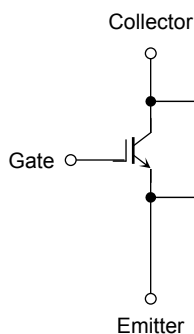
Weight: 4.6 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

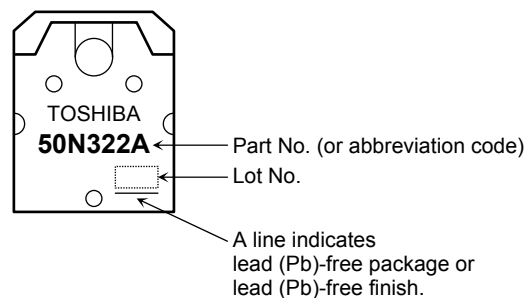
Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1000	V
Gate-emitter voltage		V_{GES}	± 25	V
Collector current	DC	I_C	50	A
	1ms	I_{CP}	120	
Diode forward current	DC	I_F	15	A
	1ms	I_{FP}	120	
Collector power dissipation (Tc = 25°C)		P_C	156	W
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-55 to 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. 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



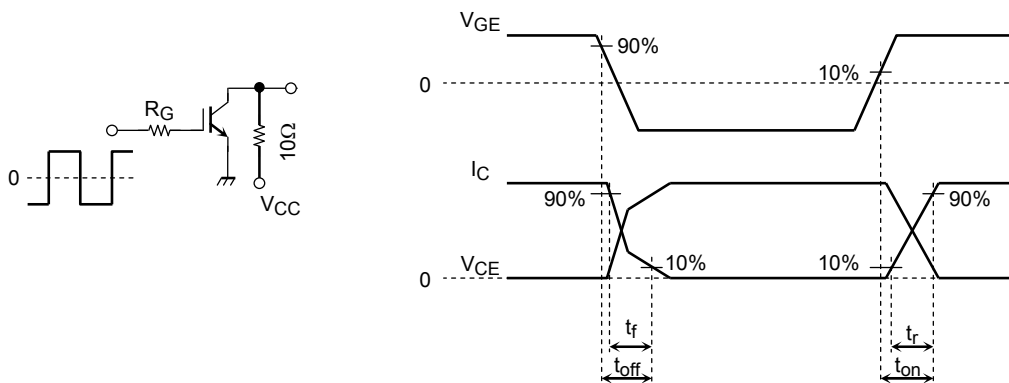
Marking

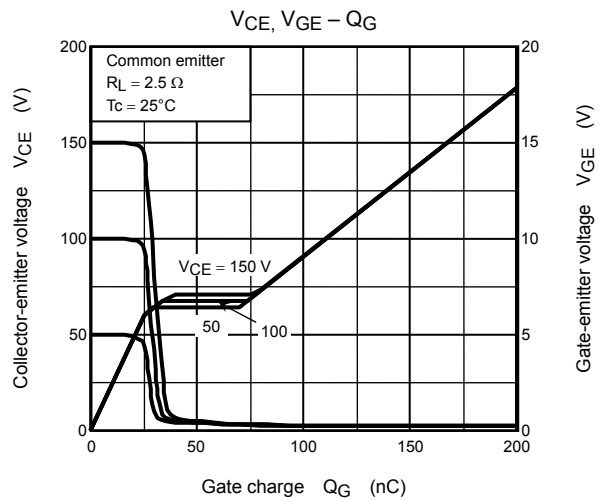
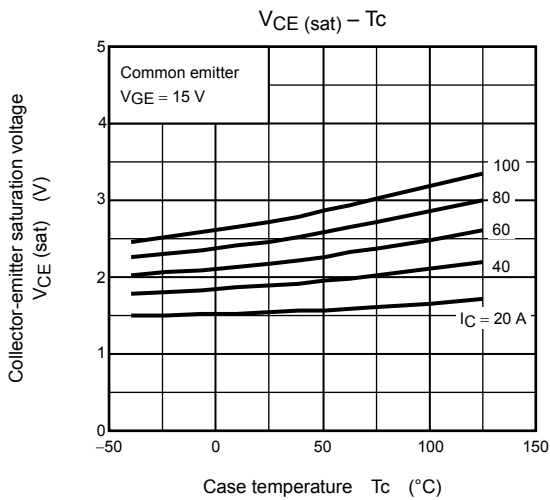
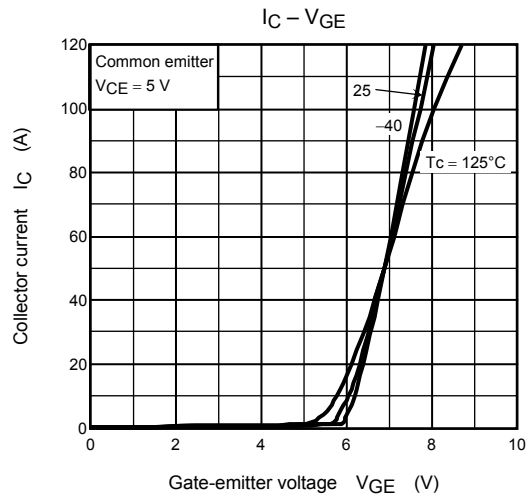
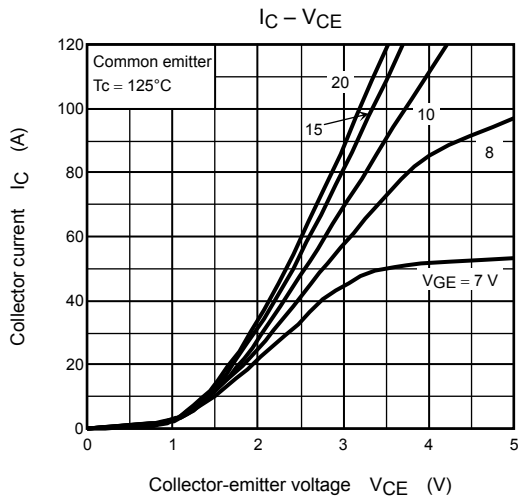
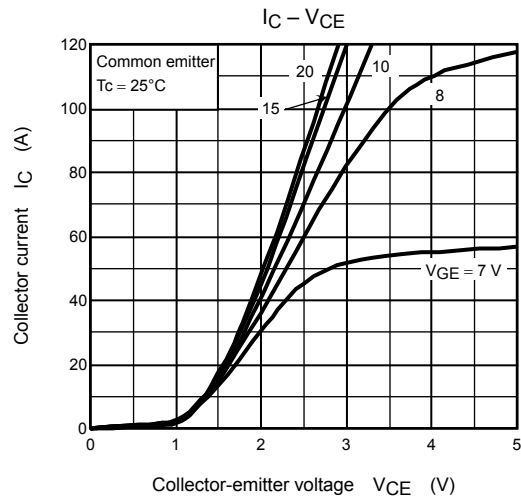
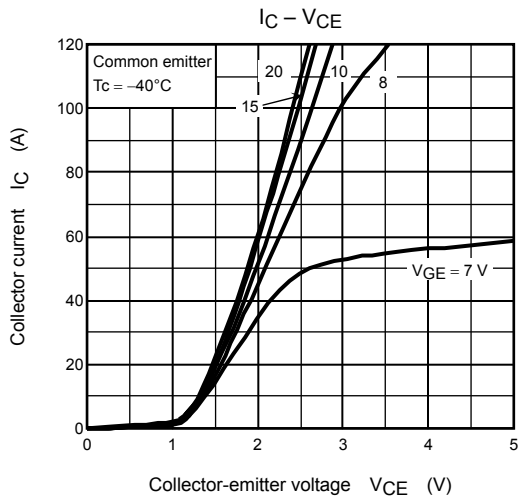


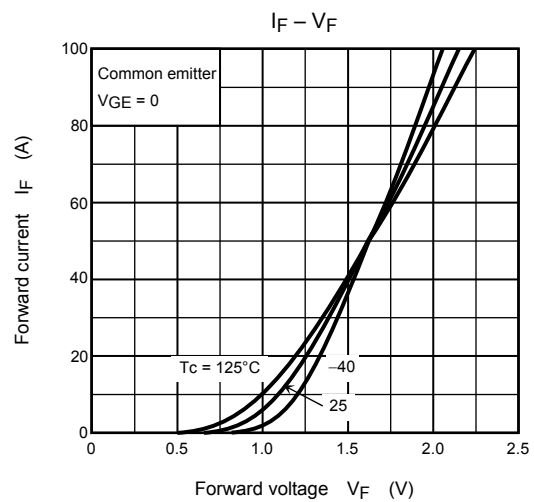
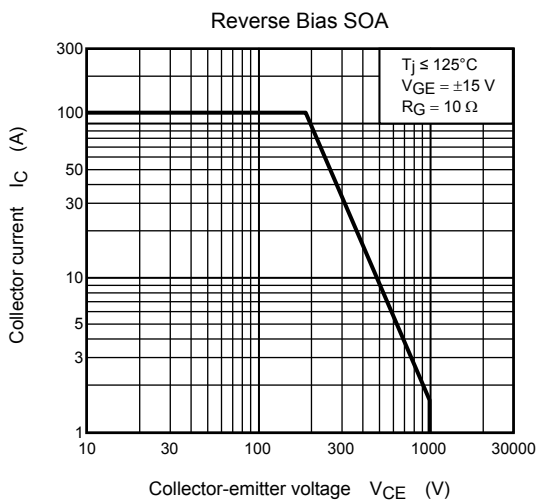
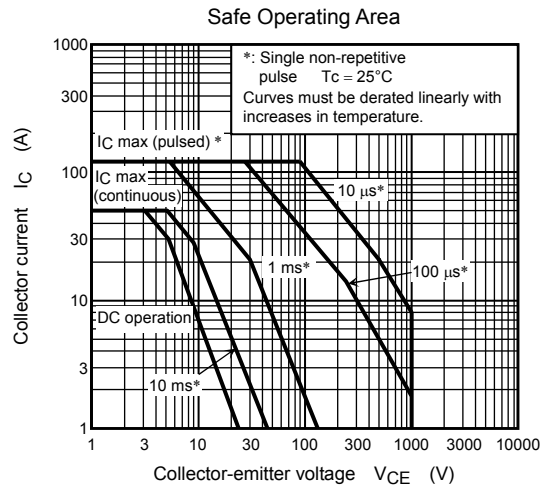
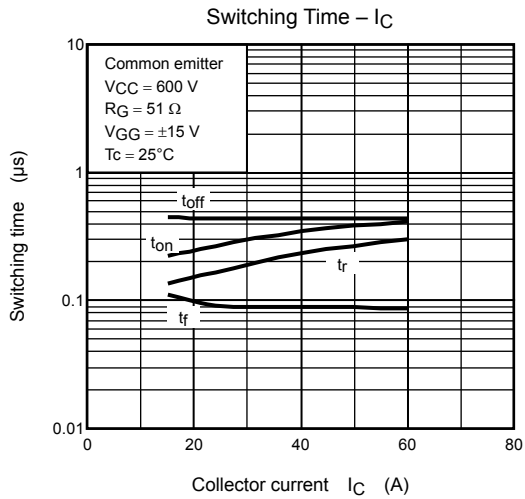
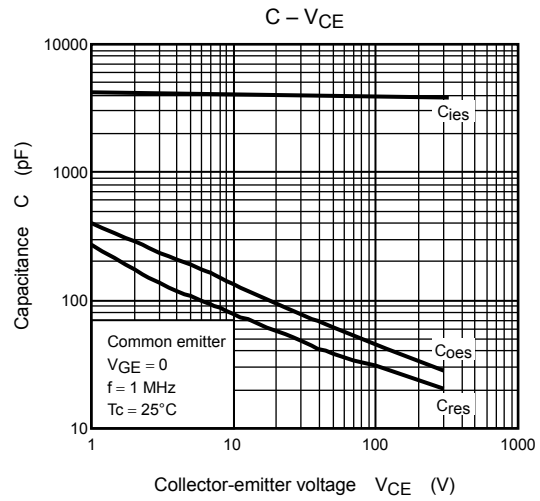
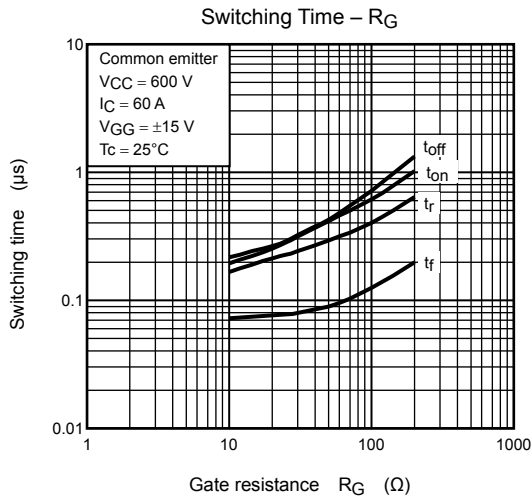
Electrical Characteristics (Ta = 25°C)

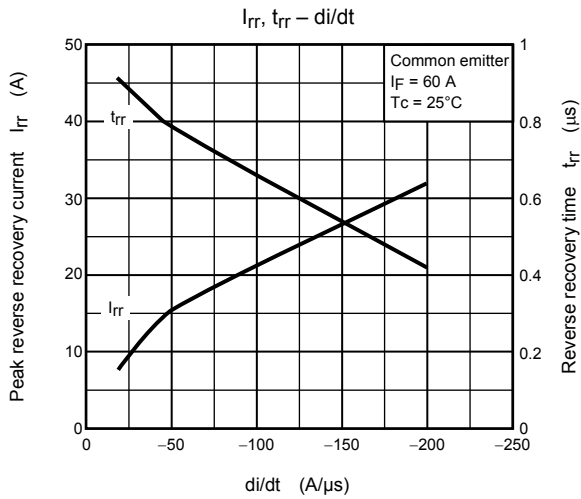
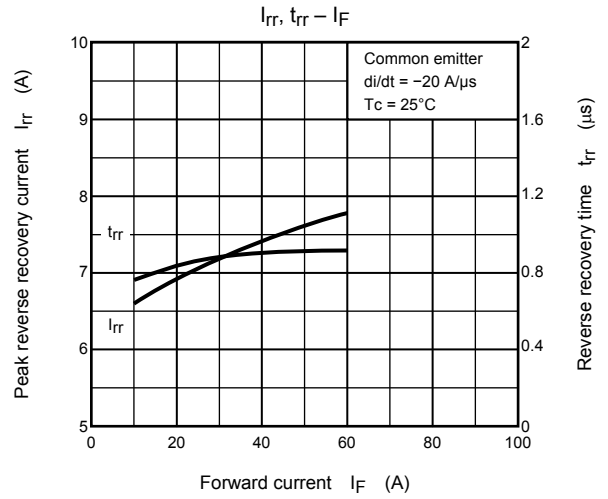
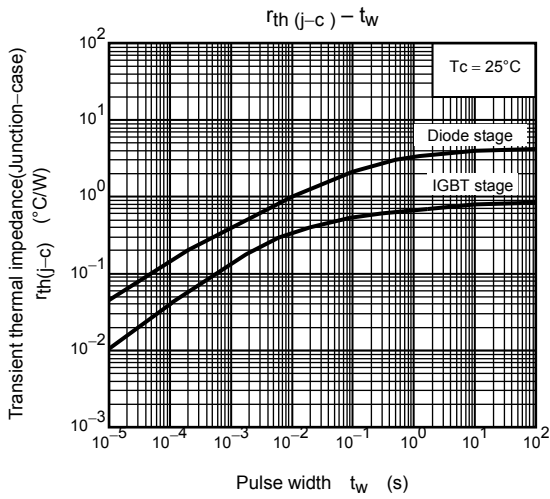
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 1000 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE (OFF)}$	$I_C = 60 \text{ mA}, V_{CE} = 5 \text{ V}$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 60 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.2	2.8	V
Input capacitance		C_{ies}	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	4000	—	pF
Switching time	Rise time	t_r	Resistive Load $V_{CC} = 600 \text{ V}, I_C = 60 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 51 \Omega$ (Note 1)	—	0.23	—	μs
	Turn-on time	t_{on}		—	0.33	—	
	Fall time	t_f		—	0.10	0.25	
	Turn-off time	t_{off}		—	0.70	—	
Diode forward voltage		V_F	$I_F = 15 \text{ A}, V_{GE} = 0$	—	1.2	1.9	V
Reverse recovery time		t_{rr}	$I_F = 15 \text{ A}, V_{GE} = 0, di/dt = -20 \text{ A}/\mu\text{s}$	—	0.8	—	μs
Thermal Resistance		$R_{th(j-c)}$	—	—	—	0.8	$^{\circ}\text{C}/\text{W}$
Thermal Resistance		$R_{th(j-c)}$	—	—	—	4.0	$^{\circ}\text{C}/\text{W}$

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









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20070701-EN

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