TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

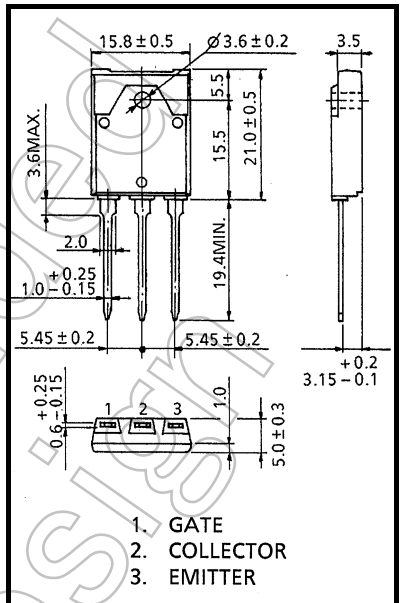
GT30J322

FOURTH-GENERATION IGBT

CURRENT RESONANCE INVERTER SWITCHING APPLICATIONS

- FRD included between emitter and collector
- Enhancement mode type
- High speed : t_f = 0.25μs (Typ.) (I_C = 50A)
- Low saturation voltage : $V_{CE\ (sat)}$ = 2.1V (Typ.) (I_C = 50A)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-16F1A

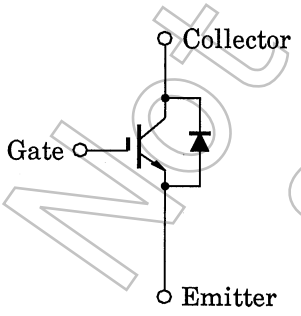
Weight: 5.8 g (typ.)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

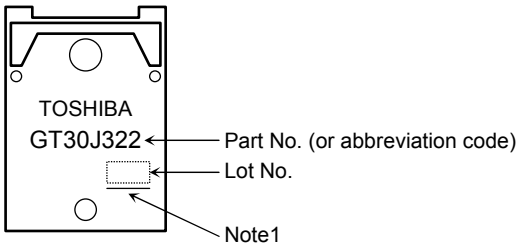
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector−Emitter Voltage		V_{CES}	600	V
Gate−Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C	30	A
	1ms	I_{CP}	100	
Emitter−Collector Forward Current	DC	I_F	30	A
	1ms	I_{FP}	60	
Collector Power Dissipation (Tc = 25°C)		P_C	75	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		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



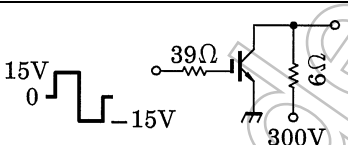
Note1: A line under a Lot No. identifies the indication of product Labels.
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.
The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Start of commercial production
1998-11

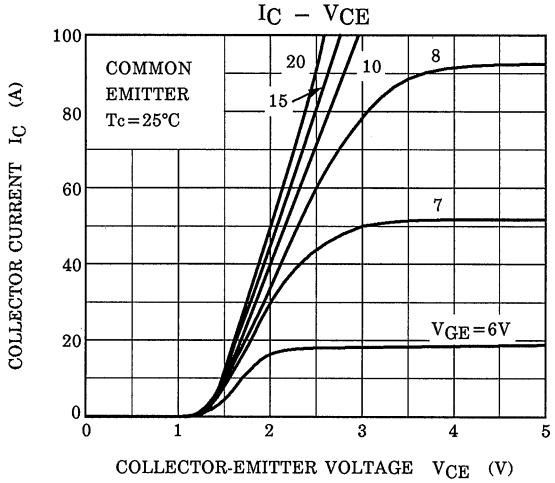
Not Recommended for New Design

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

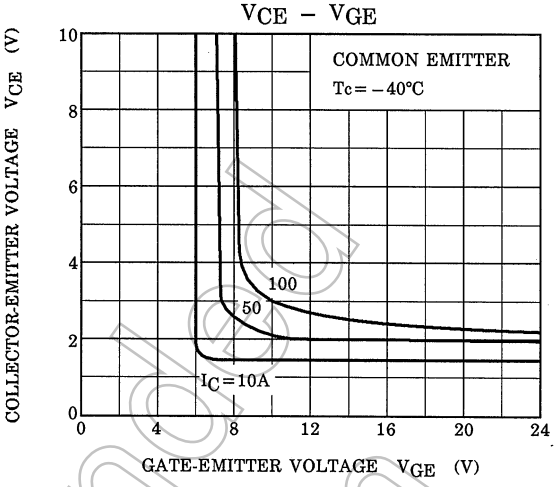
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		I_{GES}	V_{GE} = ±20V, V_{CE} = 0	—	—	±500	nA
Collector Cut−Off Current		I_{CES}	V_{CE} = 600V, V_{GE} = 0	—	—	1.0	mA
Gate−Emitter Cut−Off Voltage		$V_{GE\ (OFF)}$	I_C = 50mA, V_{CE} = 5V	3.0	—	6.0	V
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 50A, V_{GE} = 15V	—	2.1	2.8	V
Input Capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	—	2500	—	pF
Switching Time	Rise Time	t_r		—	0.20	—	µs
	Turn−On Time	t_{on}		—	0.30	—	
	Fall Time	t_f		—	0.25	0.40	
	Turn−Off Time	t_{off}		—	0.40	—	
Peak Forward Voltage		V_F	I_F = 30A, V_{GE} = 0	—	—	2.0	V
Reverse Recovery Time		t_{rr}	I_F = 30A, V_{GE} = 0 di / dt = −100A / µs	—	—	0.2	µs
Thermal Resistance (IGBT)		$R_{th\ (j-c)}$		—	—	1.67	°C / W
Thermal Resistance (Diode)		$R_{th\ (j-c)}$		—	—	2.27	°C / W

Not Recommended for New Design

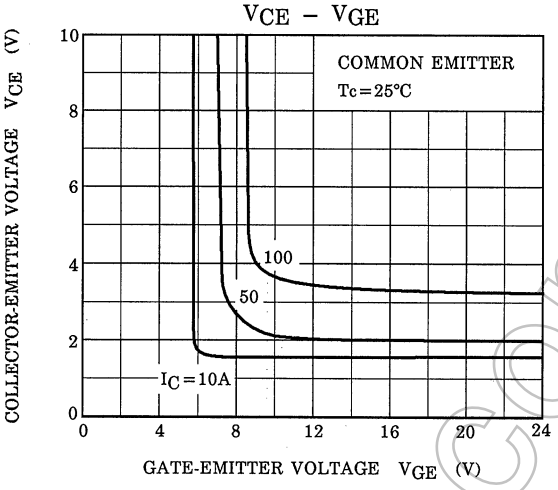
I_C – V_{CE}



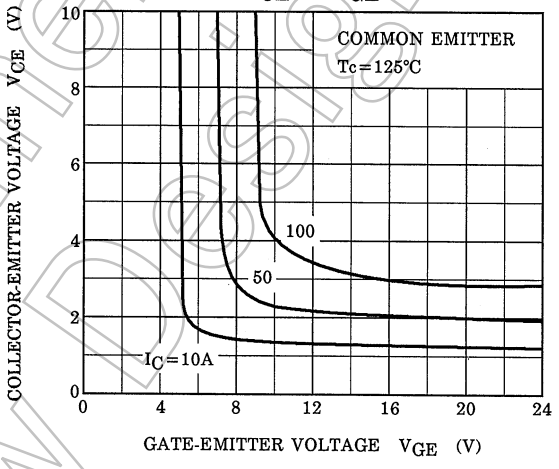
V_{CE} – V_{GE}



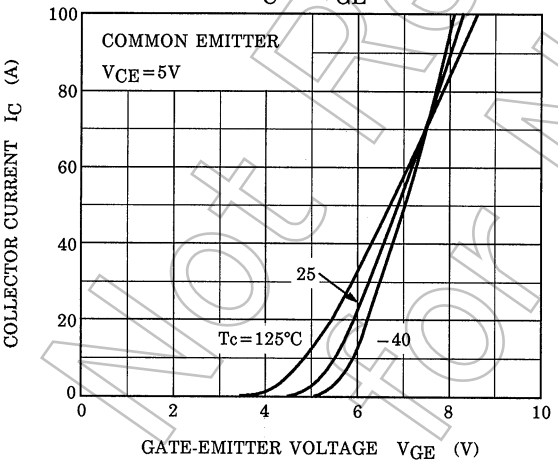
V_{CE} – V_{GE}



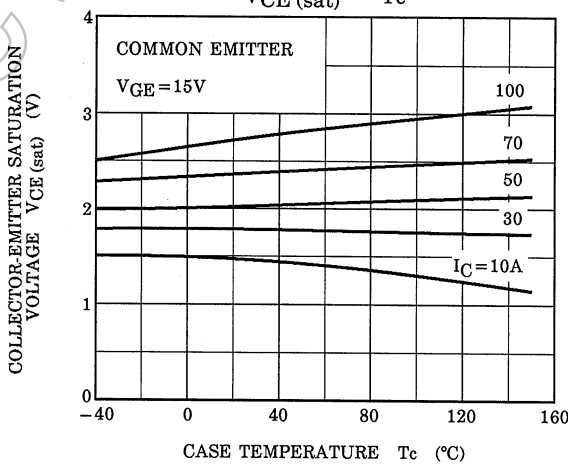
V_{CE} – V_{GE}



I_C – V_{GE}

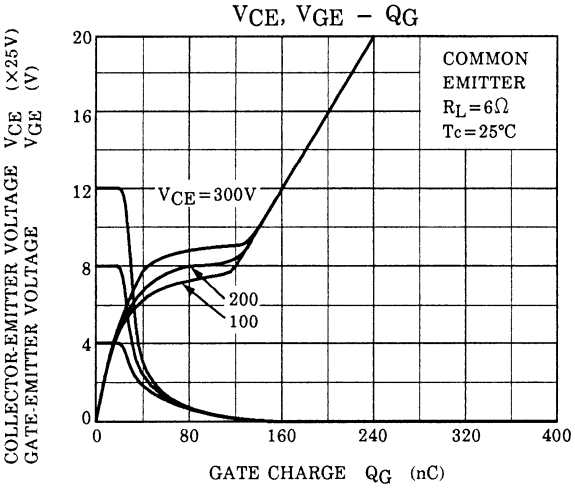


$V_{CE\,(sat)}$ – Tc

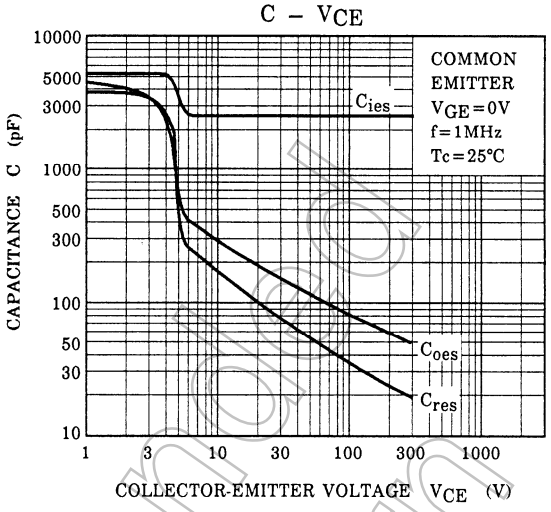


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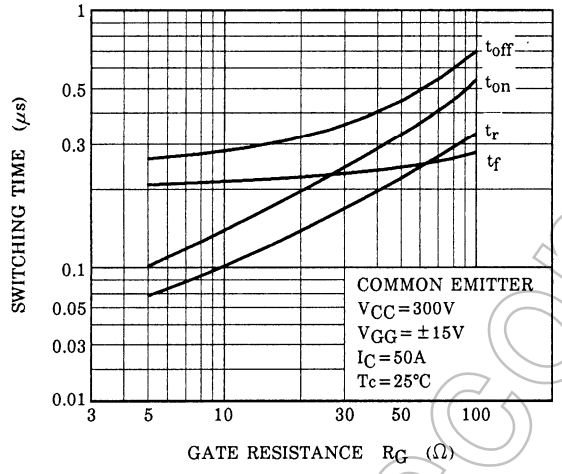
V_{CE}, V_{GE} – Q_G



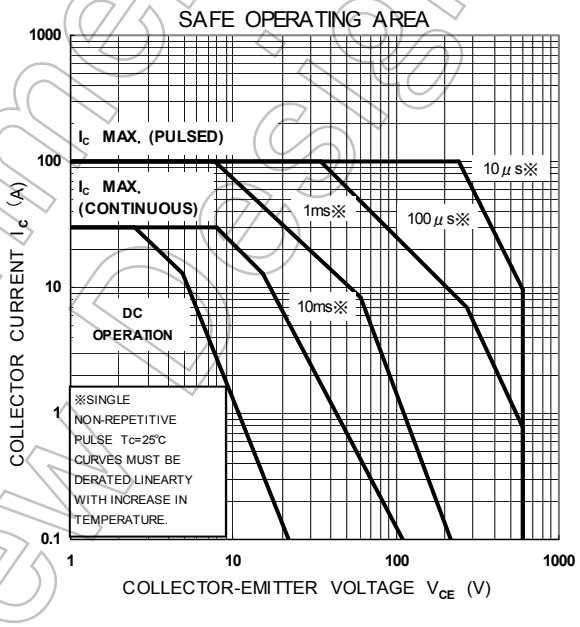
C – V_{CE}



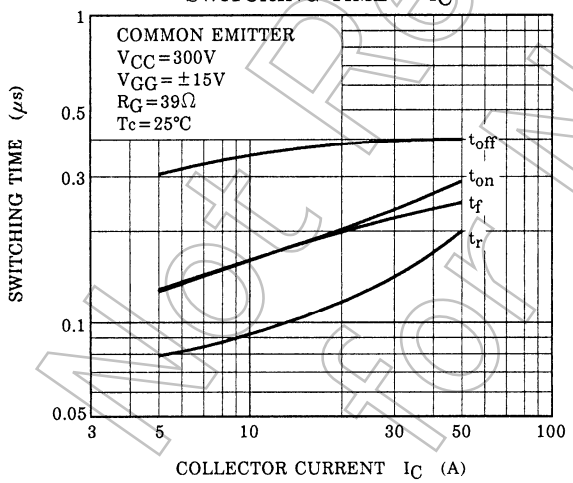
SWITCHING TIME – R_G



SAFE OPERATING AREA

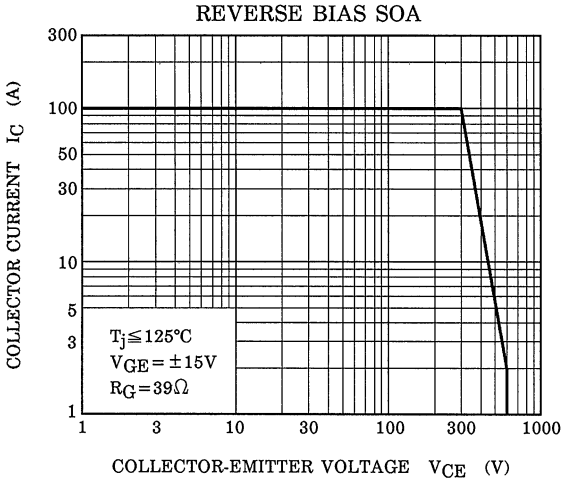


SWITCHING TIME – I_C

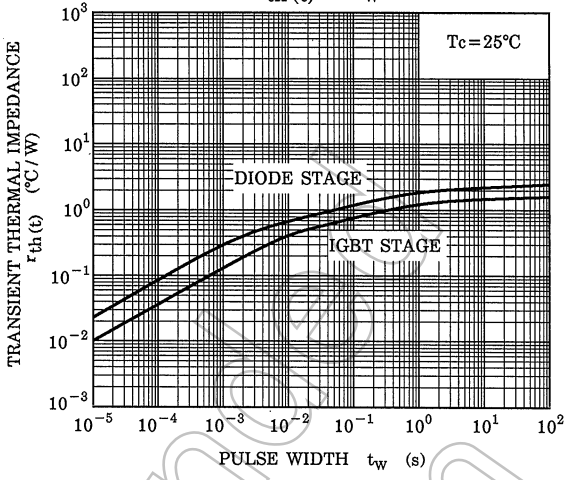


We Recommend for New Design

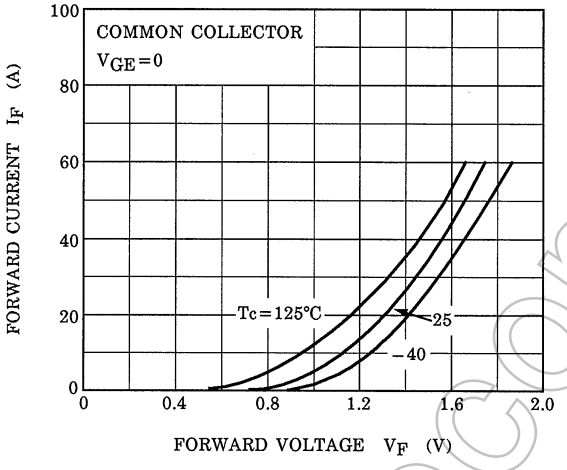
REVERSE BIAS SOA



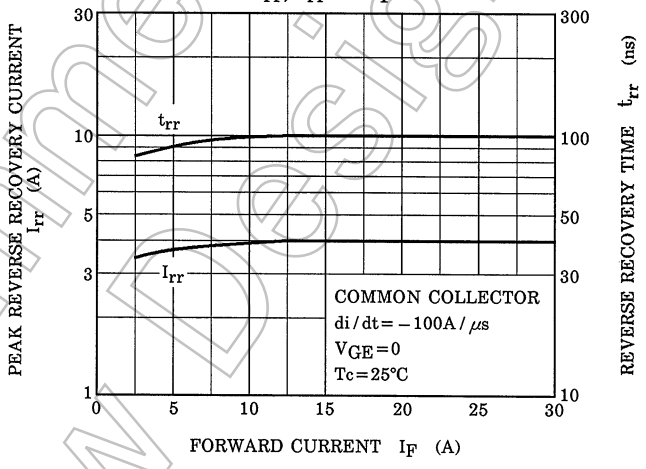
$r_{th}(t) - t_w$



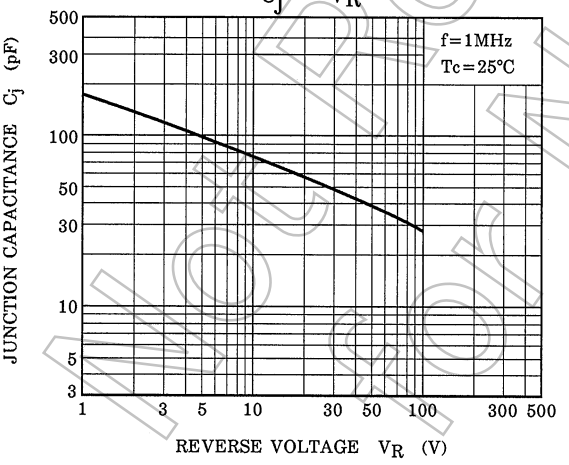
$I_F - V_F$



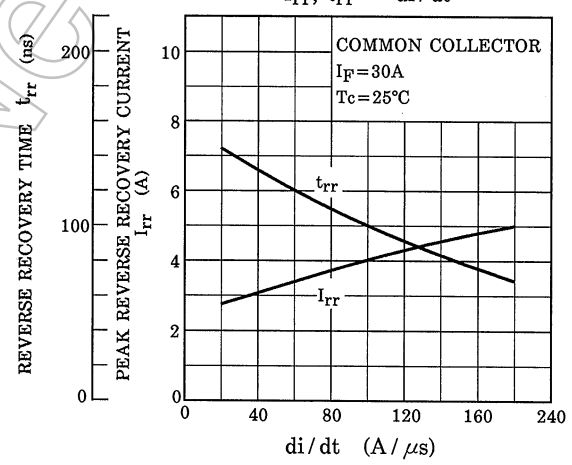
$I_{rr}, t_{rr} - I_F$



$C_j - V_R$



$I_{rr}, t_{rr} - di/dt$



Not Recommended for New Design

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