TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

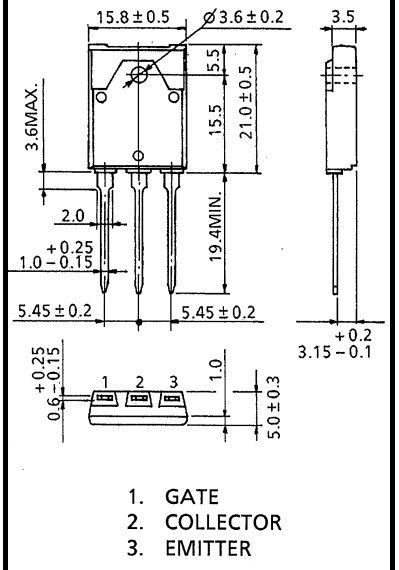
GT30J122

4TH GENERATION IGBT

CURRENT RESONANCE INVERTER SWITCHING APPLICATIONS

- Enhancement mode type
- High speed: t_f = 0.25μs (Typ.) (I_C = 50A)
- Low saturation voltage: VCE (sat) = 2.1V (Typ.) (IC = 50A)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-16F1A

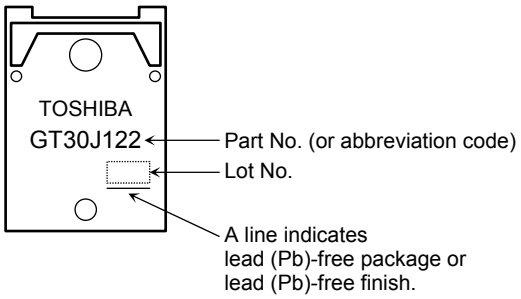
Weight: 5.8 g (typ.)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

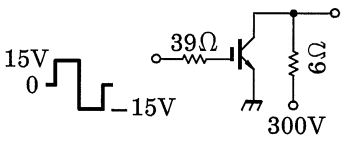
Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	30	A
	1 ms	I_{CP}	100	
Collector power dissipation (Tc = 25°C)		P_C	75	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

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).

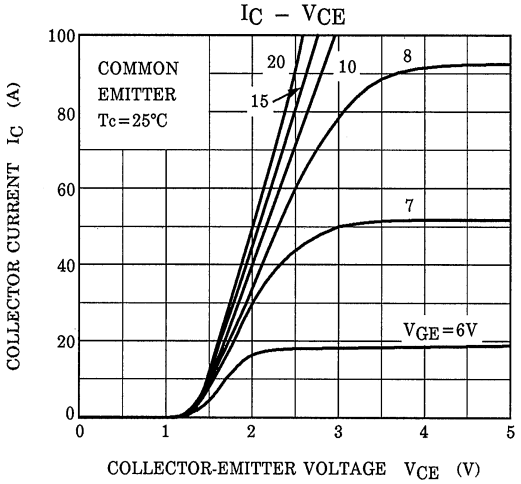
MARKING



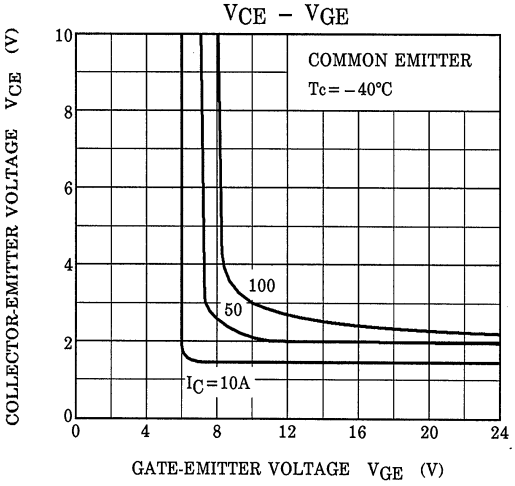
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20 V, V_{CE} = 0	—	—	±500	nA
Collector cut-off current		I_{CES}	V_{CE} = 600 V, V_{GE} = 0	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE\ (OFF)}$	I_C = 50 mA, V_{CE} = 5 V	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 50 A, V_{GE} = 15 V	—	2.1	2.8	V
Input capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1 MHz	—	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	—	
Thermal resistance (IGBT)		$R_{th\ (j-c)}$	—	—	—	1.67	°C/W

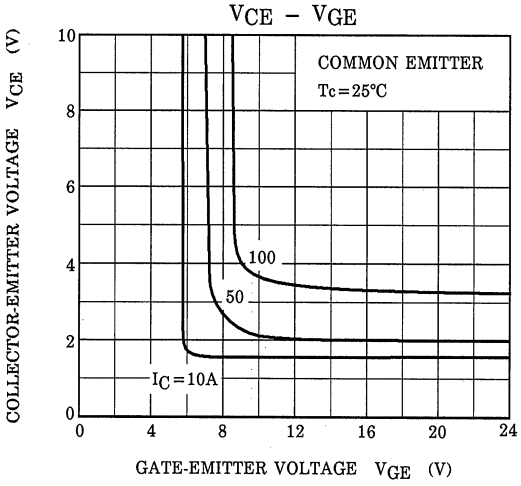
I_C – V_{CE}



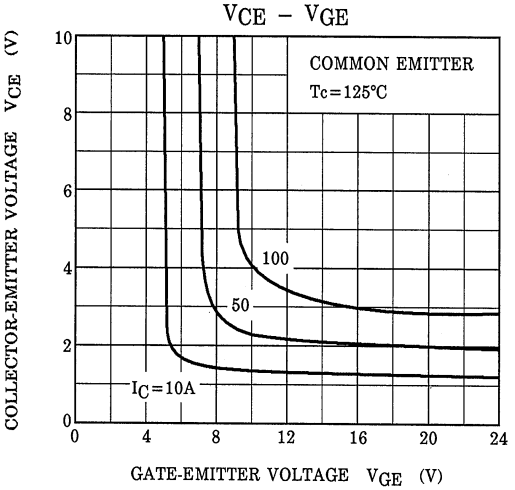
V_{CE} – V_{GE}



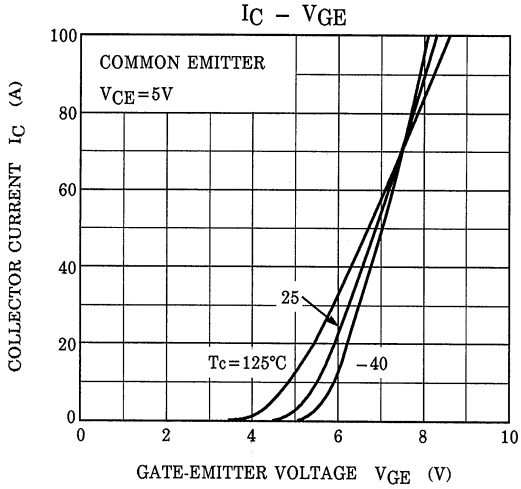
V_{CE} – V_{GE}



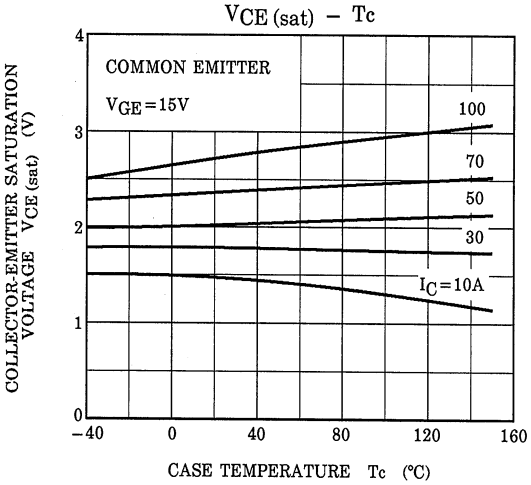
V_{CE} – V_{GE}



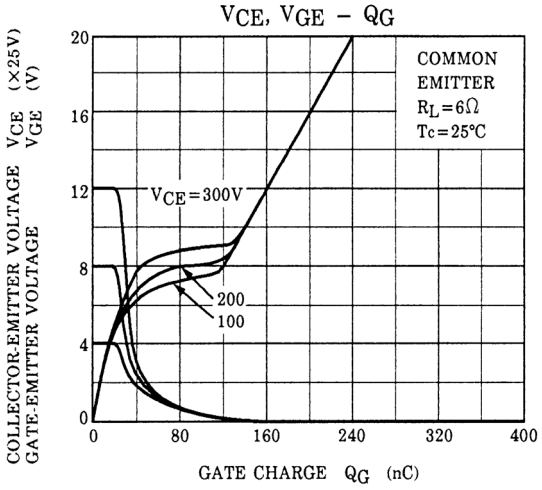
I_C – V_{GE}



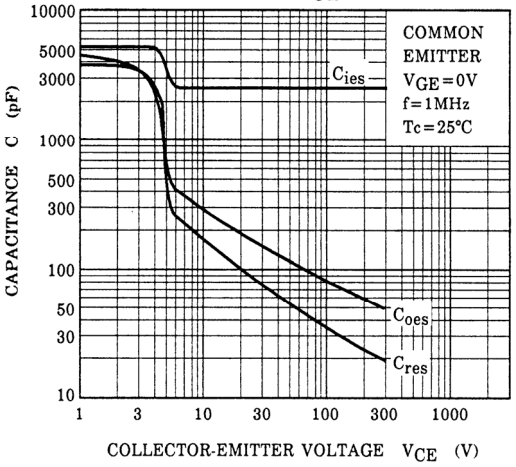
$V_{CE\,(sat)}$ – Tc



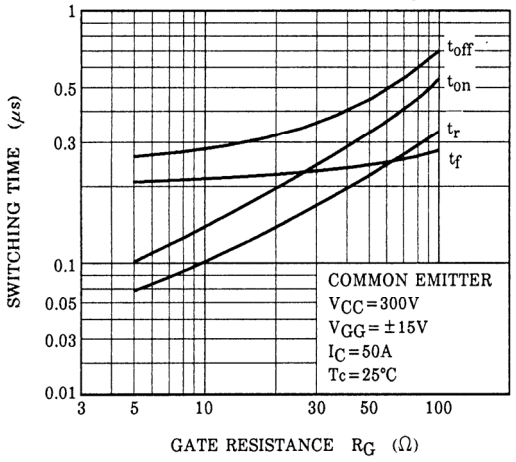
V_{CE}, V_{GE} – Q_G



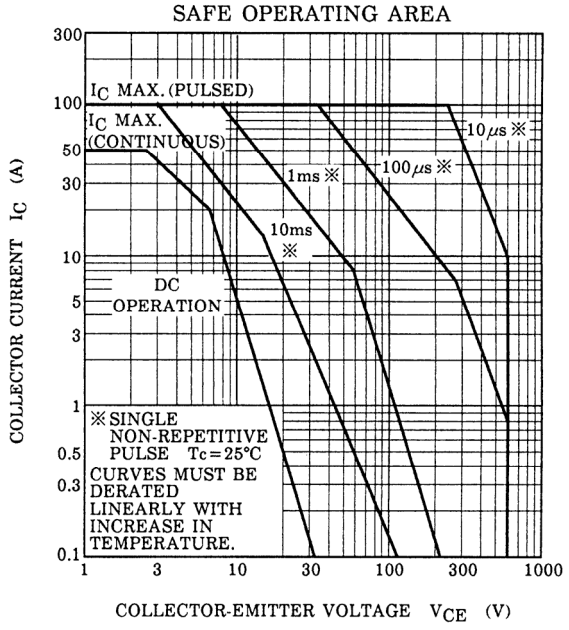
C – V_{CE}



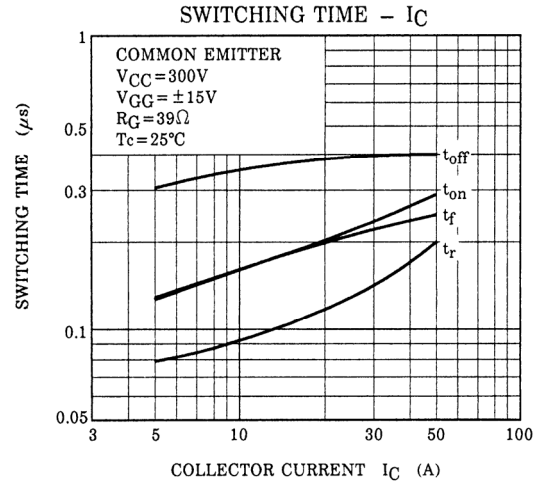
SWITCHING TIME – R_G

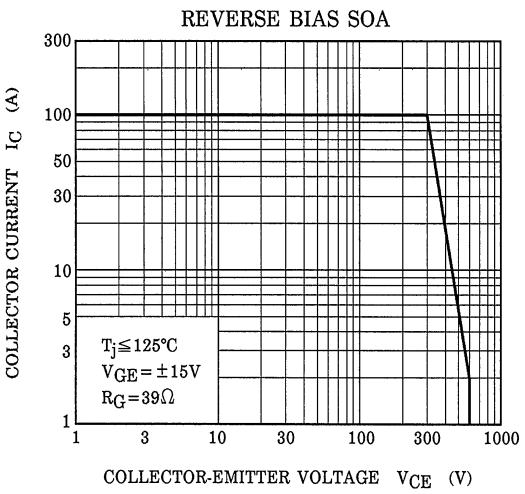


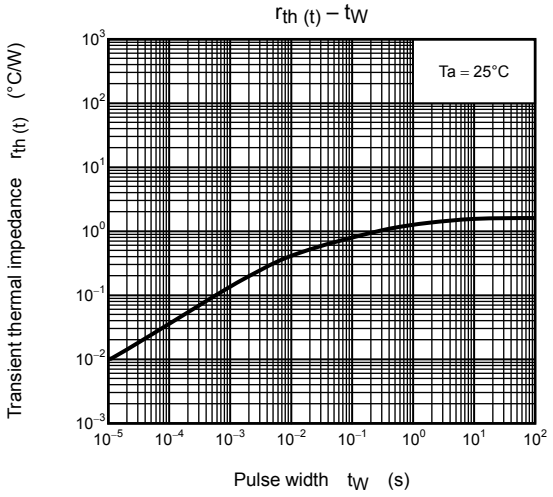
SAFE OPERATING AREA



SWITCHING TIME – I_C




REVERSE BIAS SOA
COLLECTOR CURRENT I_C (A)
300
100
50
30
10
5
3
1
$T_j \leqq 125°C$
$V_{GE} = \pm 15V$
$R_G = 39\Omega$
1
3
10
30
100
300
1000
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


$r_{th\ (t)} - t_W$
Transient thermal impedance $r_{th\ (t)}$ (°C/W)
10^3
10^2
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
Ta = 25°C
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
10^0
10^1
10^2
Pulse width t_W (s)

RESTRICTIONS ON PRODUCT USE

20070701-EN

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