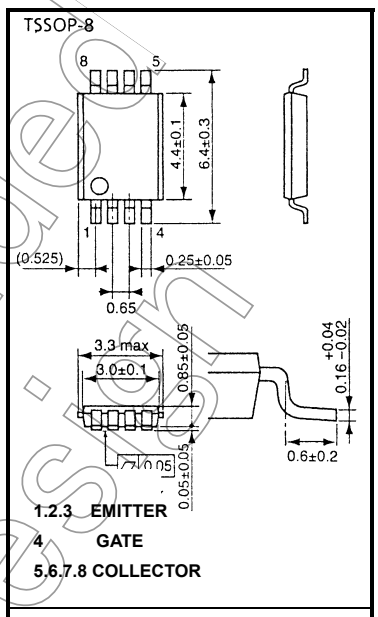
TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

GT8G133

Strobe Flash Applications

- Compact and Thin (TSSOP-8) package
- Enhancement-mode
- 4-V gate drive voltage: V_{GE} = 4.0 V (min) (@I_C = 150 A)
- Peak collector current: I_C = 150 A (max)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3R1G

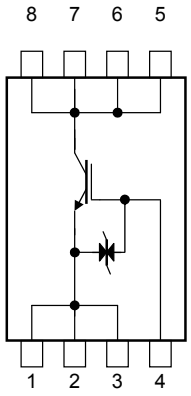
Weight: 0.035 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	400	V
Gate-emitter voltage	DC	V_{GES}	± 6	V
	Pulse	V_{GES}	± 8	
Collector current	Pulse (Note 1)	I_{CP}	150	A
Collector power dissipation (t = 10 s)	(Note 2a)	P_C (1)	1.1	W
	(Note 2b)	P_C (2)	0.6	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).

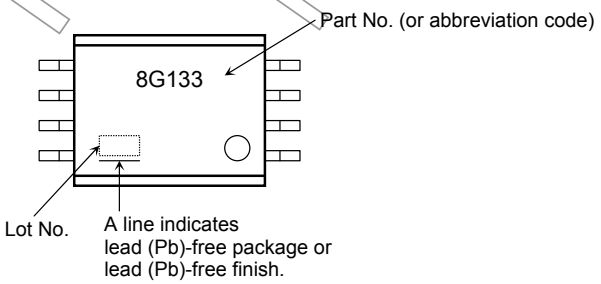
Circuit Configuration



Thermal Characteristics

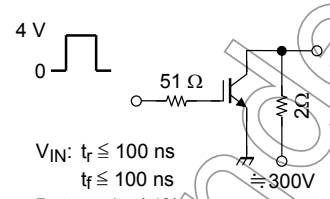
Characteristics	Symbol	Rating	Unit
Thermal resistance , junction to ambient (t = 10 s) (Note2a)	$R_{th\ (j\text{-}a)}$ (1)	114	°C/W
Thermal resistance , junction to ambient (t = 10 s) (Note2b)	$R_{th\ (j\text{-}a)}$ (2)	208	°C/W

Marking (Note 3)



Note : For (Note 1) , (Note 2a) , (Note 2b) and (Note 3) , Please refer to the next page.

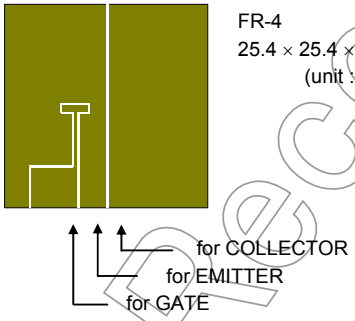
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 6$ V, $V_{CE} = 0$	—	—	± 10	μA
Collector cut-off current		I_{CES}	$V_{CE} = 400$ V, $V_{GE} = 0$	—	—	10	μA
Gate-emitter cut-off voltage		$V_{GE\ (OFF)}$	$I_C = 1$ mA, $V_{CE} = 5$ V	0.7	1.05	1.4	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	$I_C = 150$ A, $V_{GE} = 4$ V	—	2.9	—	V
Input capacitance		C_{ies}	$V_{CE} = 10$ V, $V_{GE} = 0$, f = 1 MHz	—	2500	—	pF
Switching time	Rise time	t_r		—	1.6	—	μs
	Turn-on time	t_{on}		—	1.7	—	
	Fall time	t_f		—	1.7	—	
	Turn-off time	t_{off}		—	2.0	—	

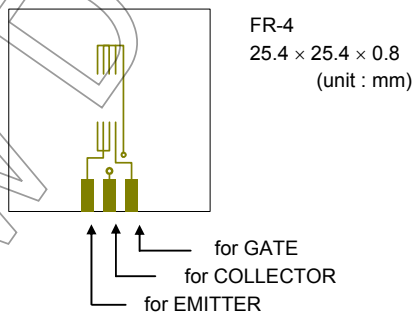
Note

Note 1: Please use devices on condition that the junction temperature is below 150°C.
Repetitive rating: pulse width limited by maximum junction temperature.

Note 2a : Device mounted on a glass-epoxy board (a)

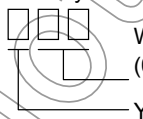


Note 2b : Device mounted on a glass-epoxy board (b)



Note 3: ○ on lower right of the marking indicates Pin 1.

※ Weekly code: (Three digits)



Week of manufacture
(01 for first week of year, continues up to 52 or 53)

Year of manufacture
(One low-order digits of calendar year)

※ Pb-Free Finish (Only a coating lead terminal) :
It is marking about an underline to a week of manufacture mark.

Caution on handling

This device is MOS gate type. Therefore , please care of a protection from ESD in your handling .

Caution in design

You should be design dV/dt value is below 400 V/μs when IGBT turn off.

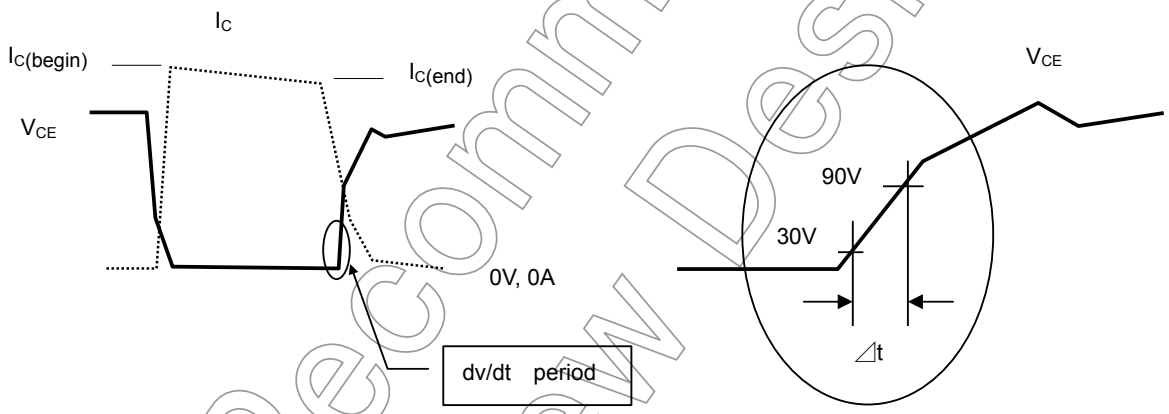
●definition of dv/dt

The slope of vce from 30v to 90v (attached figure.1)

$dv/dt = (90V-30V) / (\Delta t)$

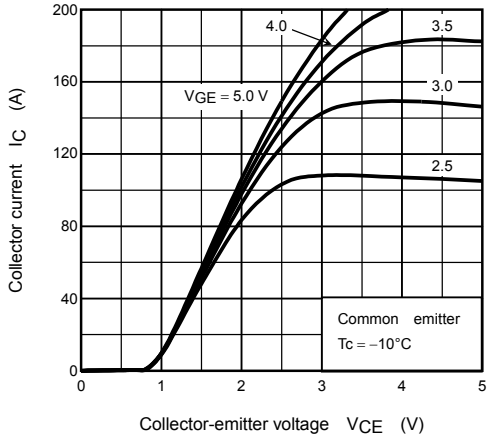
$= 60V / \Delta t$

●waveform

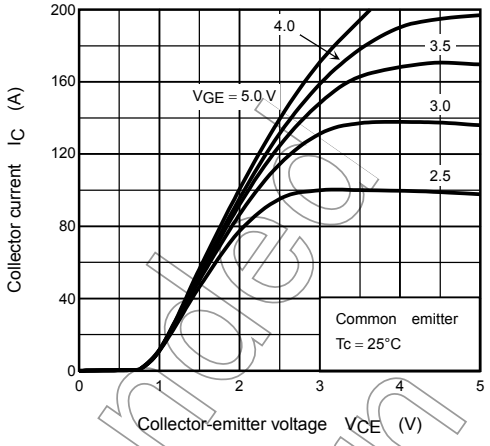


●waveform (expansion)

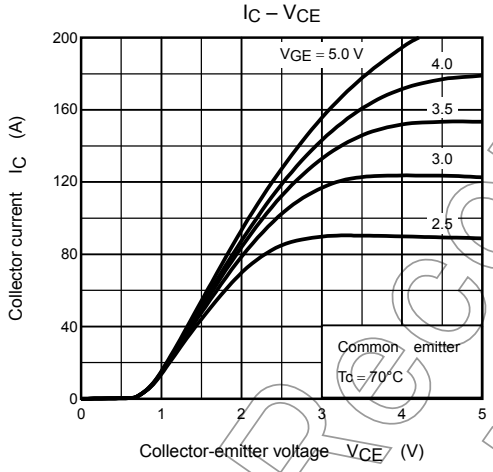
$I_C - V_{CE}$



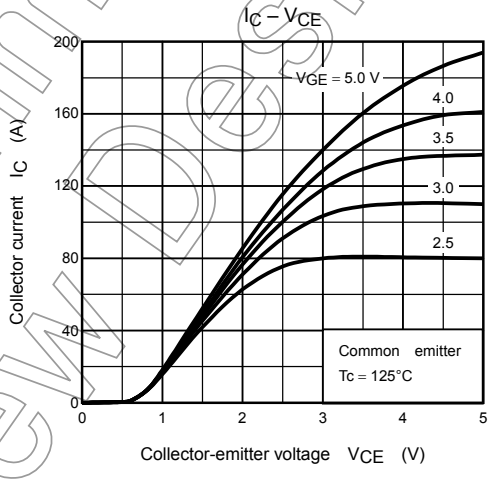
$I_C - V_{CE}$



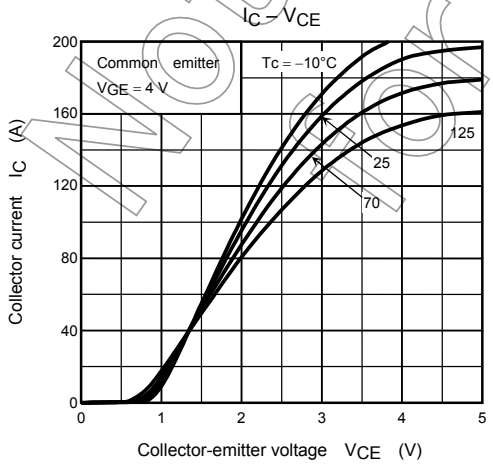
$I_C - V_{CE}$



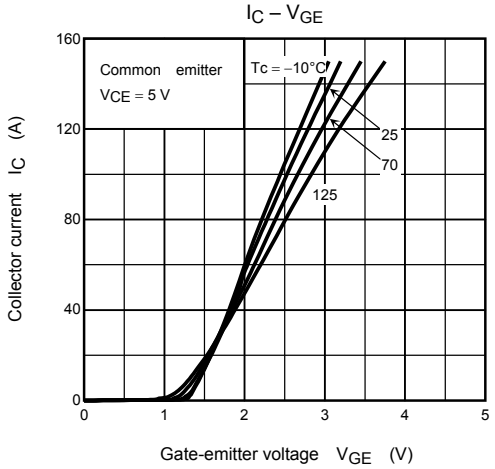
$I_C - V_{CE}$



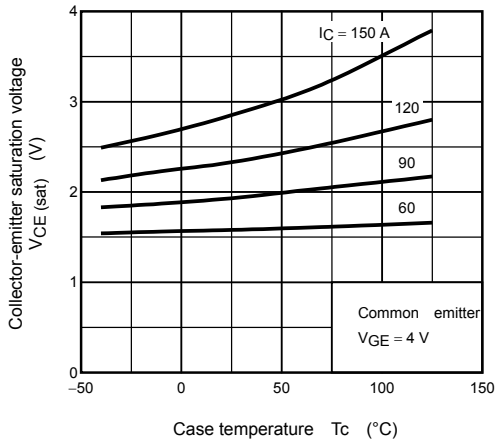
$I_C - V_{CE}$



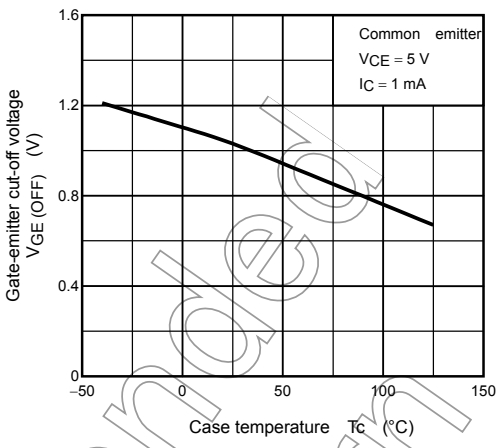
$I_C - V_{GE}$



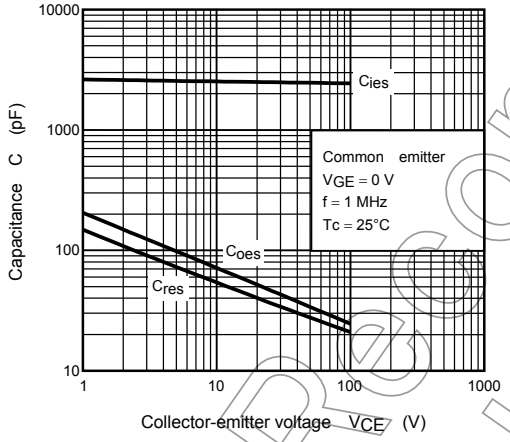
$V_{CE\ (sat)} - T_C$



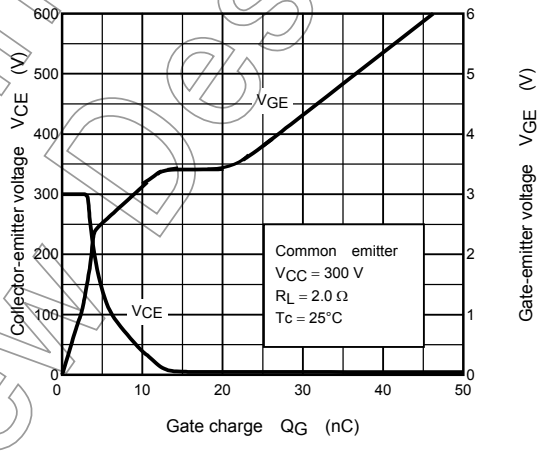
$V_{GE(OFF)} - T_C$



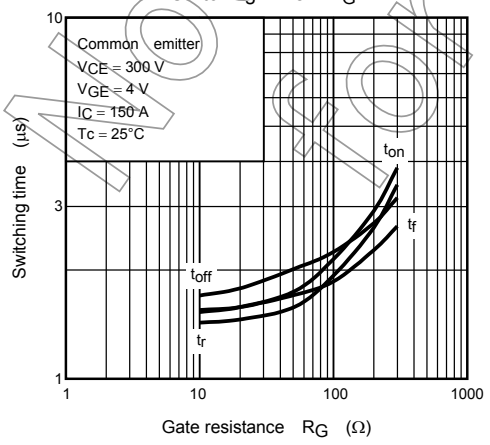
$C - V_{CE}$



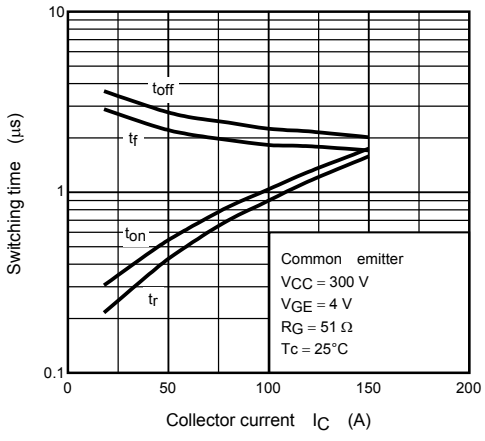
$V_{CE}, V_{GE} - Q_G$



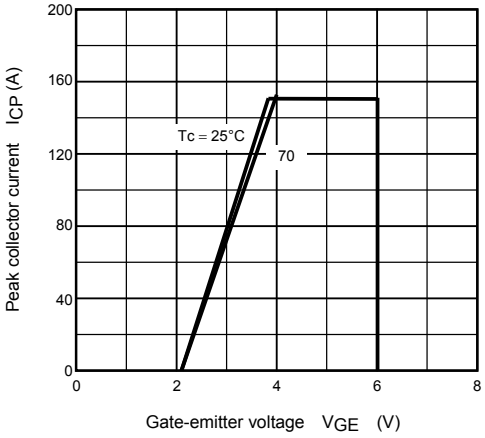
Switching Time – R_G



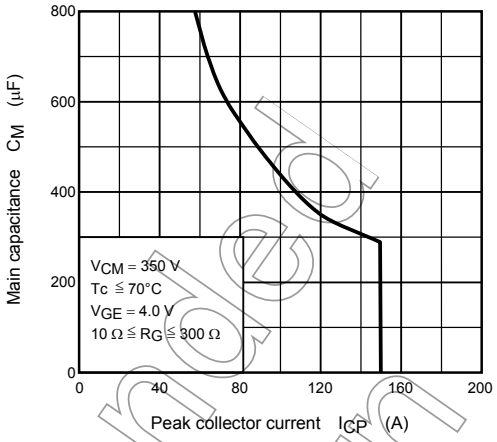
Switching Time – I_C



Minimum Gate Drive Area



Maximum Operating Area



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