

# GT5G133

## Strobe Flash Applications

- Enhancement-mode
- Low gate drive voltage:  $V_{GE} = 2.5 \text{ V (min) (@}I_C = 130 \text{ A)}$
- Peak collector current:  $I_C = 130 \text{ A (max)}$
- Compact and Thin (TSO8-8) package

## Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-emitter voltage	$V_{CES}$	400	V
Gate-emitter voltage	DC	$V_{GES}$	$\pm 4$
	Pulse	$V_{GES}$	$\pm 5$
Collector current	Pulse (Note 1)	$I_{CP}$	130 A
Collector power dissipation ( $t = 10 \text{ s}$ )	(Note 2a)	$P_C (1)$	0.83 W
	(Note 2b)	$P_C (2)$	0.69 W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

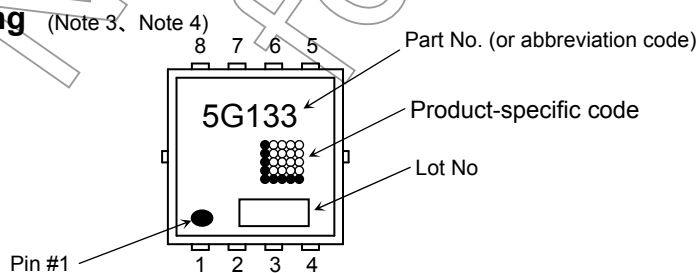
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

## Thermal Characteristics

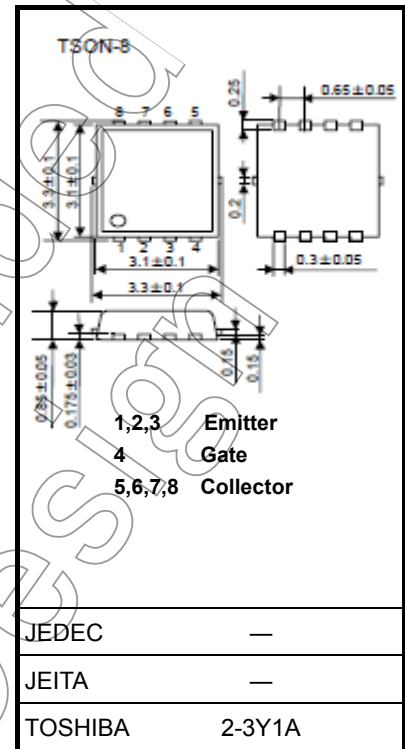
Characteristics	Symbol	Rating	Unit
Thermal resistance, junction to ambient ( $t = 10 \text{ s}$ ) (Note2a)	$R_{th(j-a)} (1)$	150	$^\circ\text{C/W}$
Thermal resistance, junction to ambient ( $t = 10 \text{ s}$ ) (Note2b)	$R_{th(j-a)} (2)$	180	$^\circ\text{C/W}$

## Marking



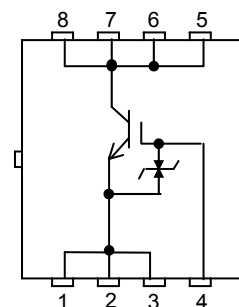
Note : For (Note 1) , (Note 2a) , (Note 2b) , (Note 3) and (Note 4) .

Unit: mm



Weight: 0.02 g (Typ.)

## Circuit Configuration



## Electrical Characteristics (Ta = 25°C)

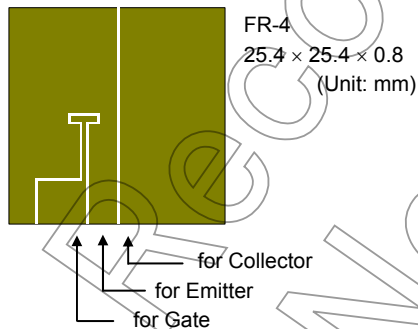
Characteristics		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 4 \text{ V}, V_{CE} = 0$	—	—	$\pm 10$	$\mu\text{A}$
Collector cut-off current		$I_{CES}$	$V_{CE} = 400 \text{ V}, V_{GE} = 0$	—	—	10	$\mu\text{A}$
Gate-emitter cut-off voltage		$V_{GE}(\text{OFF})$	$I_C = 1 \text{ mA}, V_{CE} = 5 \text{ V}$	0.55	—	1.05	V
Collector-emitter saturation voltage		$V_{CE}(\text{sat})$	$I_C = 130 \text{ A}, V_{GE} = 2.5 \text{ V}$	—	3.0	—	V
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	2480	—	pF
Switching time	Rise time	$t_r$		—	2.0	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	2.1	—	
	Fall time	$t_f$		—	1.5	—	
	Turn-off time	$t_{off}$		—	2.1	—	

### Note

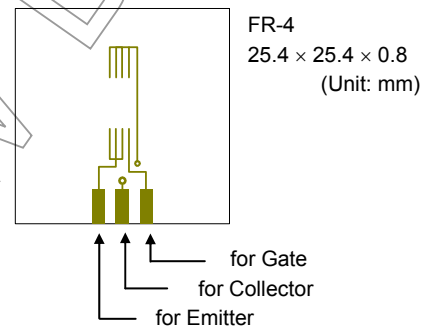
Note 1: Please use devices on condition that the junction temperature is below 150°C.

Repetitive rating: pulse width limited by maximum junction temperature.

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

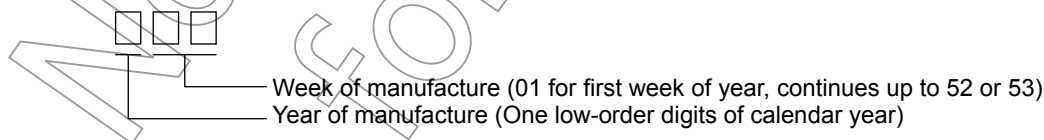


Note 2b : Device mounted on  
a glass-epoxy board (b)



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

\* Weekly code: (Three digits)



Note 4: 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 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

**Caution on handling**

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

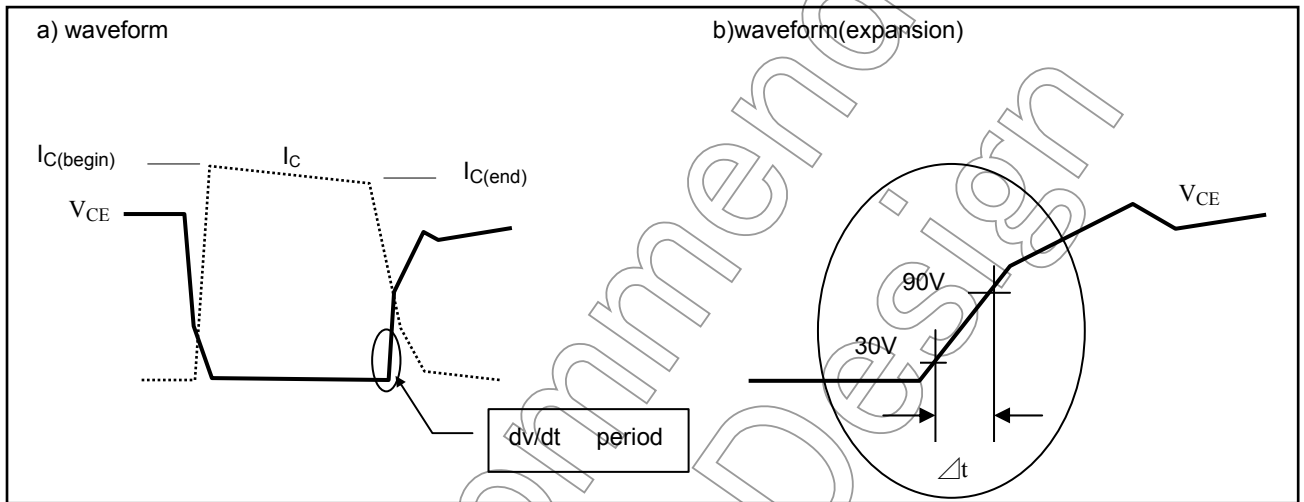
**Caution in design**

- You should be design dv/dt value is under 400V/μs below figure.1.

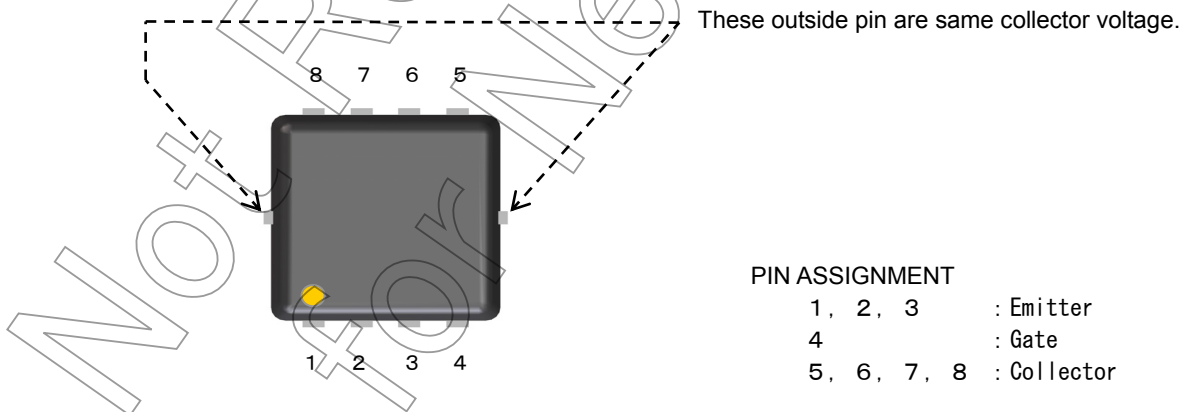
The slope of V<sub>CE</sub> from 30v to 90v (attached figure.1)

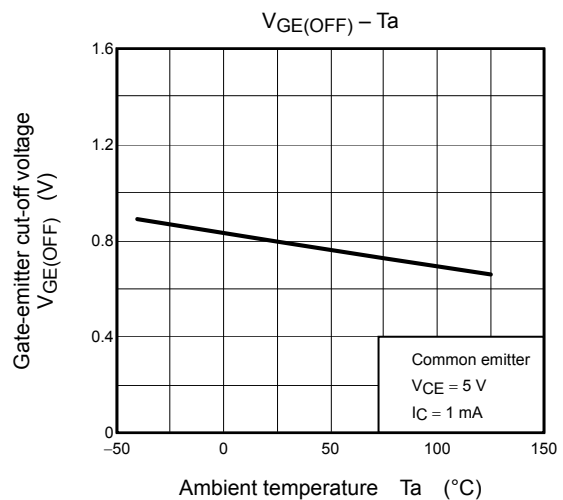
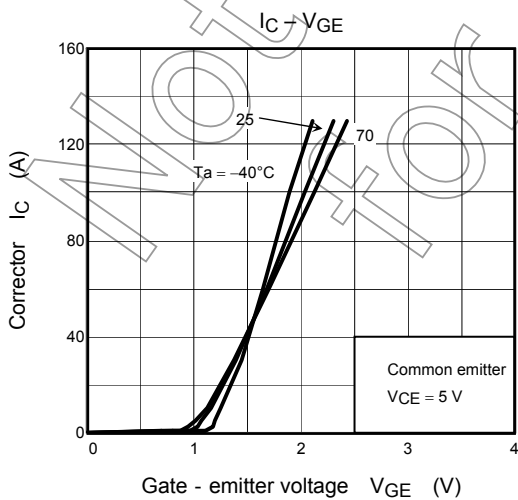
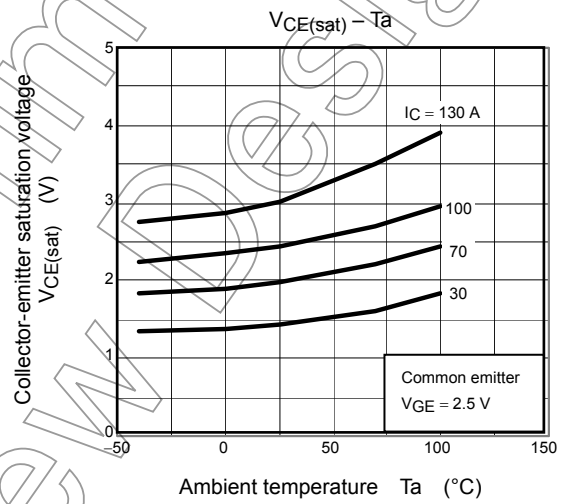
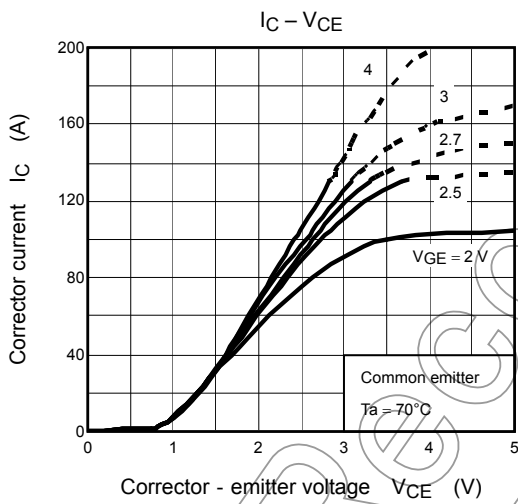
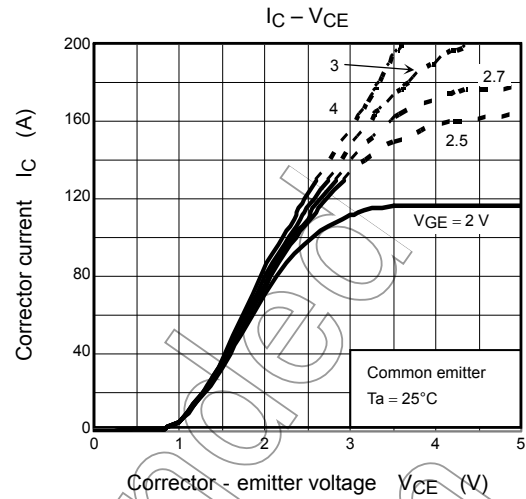
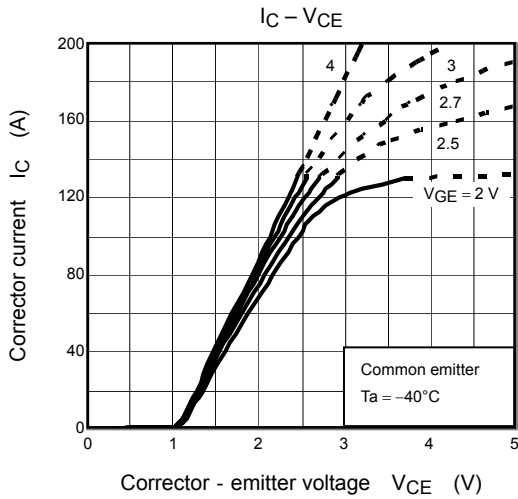
$$dv/dt = (90V-30V) / (\Delta t)$$

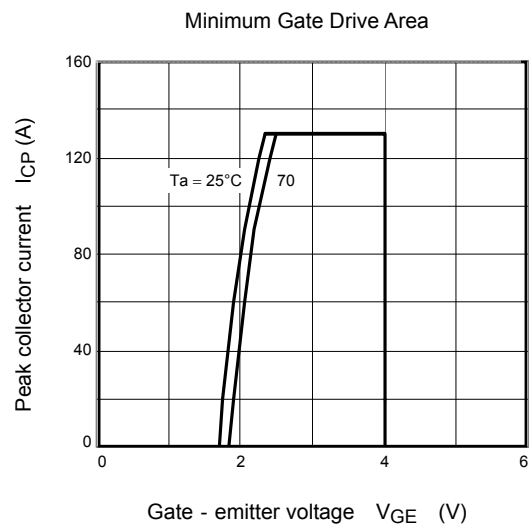
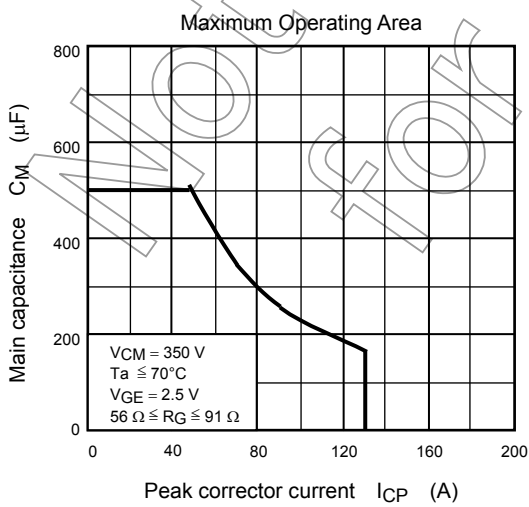
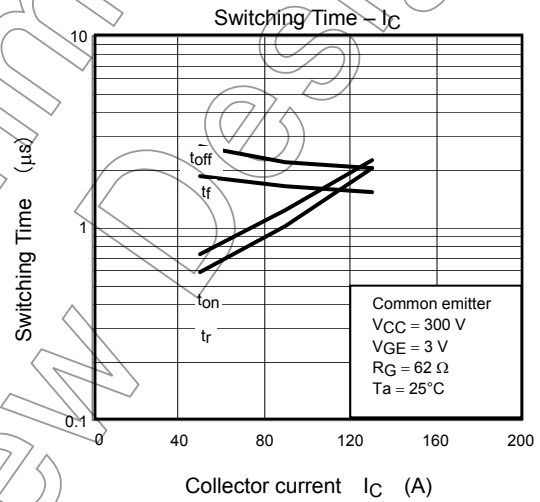
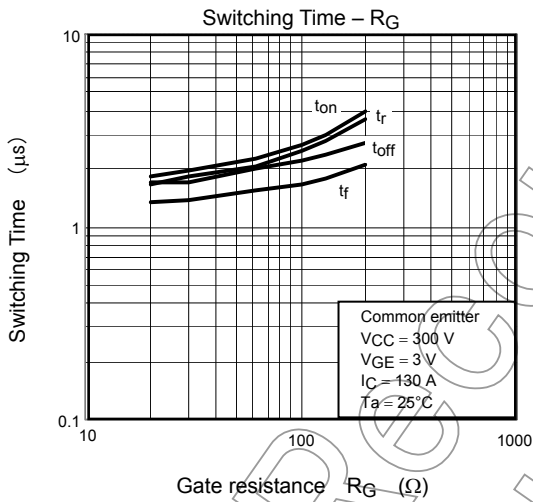
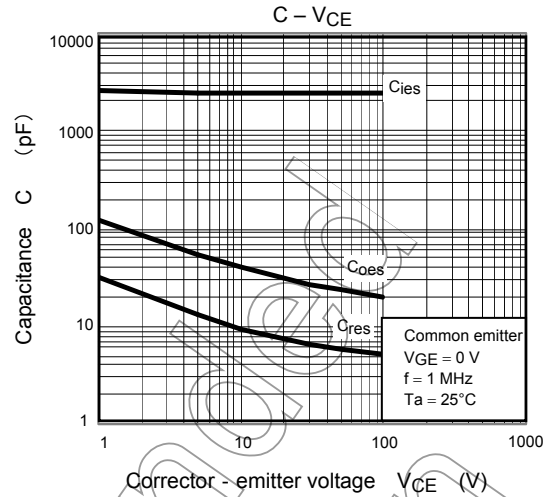
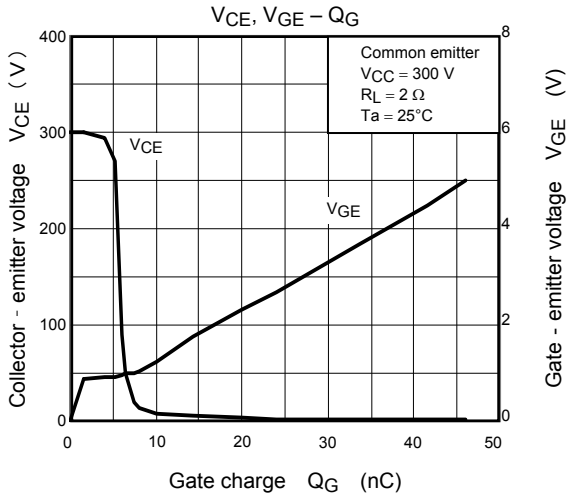
$$= 60V / \Delta t$$



- Outside pin  
Outside pin is same collector voltage.







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