

TOSHIBA Transistor Silicon NPN Triple Diffused Type

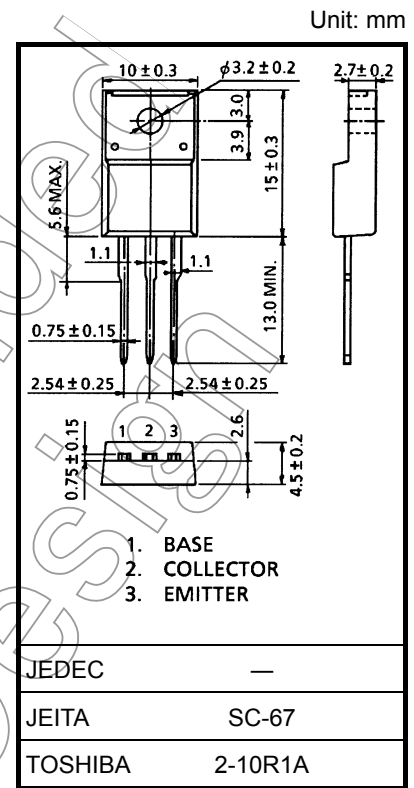
# 2SC5439

Switching Regulator Applications  
 High-Voltage Switching Applications  
 DC-DC Converter Applications  
 Inverter Lighting Applications

- Excellent switching times:  $t_r = 0.2 \mu s$  (typ.),  $t_f = 0.15 \mu s$  (typ.)
- High collector breakdown voltage:  $V_{CEO} = 450 V$

### Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	1000	V
Collector-emitter voltage		$V_{CEO}$	450	V
Emitter-base voltage		$V_{EBO}$	9	V
Collector current	DC	$I_C$	8	A
	Pulse	$I_{CP}$	16	
Base current		$I_B$	1	A
Collector power dissipation	Ta = 25°C	$P_C$	2.0	W
	Tc = 25°C		30	
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-55 to 150	°C



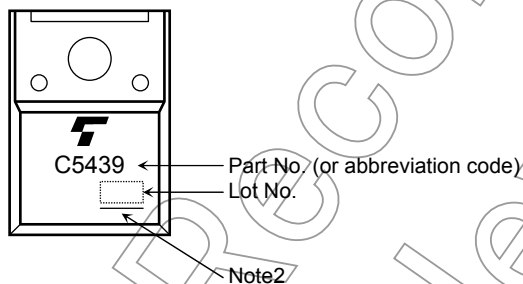
Weight: 1.7 g (typ.)

Note1: 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).

## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 1000\text{ V}, I_E = 0$	—	—	100	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	10	$\mu\text{A}$
Collector-base breakdown voltage		$V_{(BR)CBO}$	$I_C = 1\text{ mA}, I_E = 0$	1000	—	—	V
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	450	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	10	—	—	
		$h_{FE(2)}$	$V_{CE} = 5\text{ V}, I_C = 1\text{ A}$	14	—	34	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 3.2\text{ A}, I_B = 0.64\text{ A}$	—	—	1.0	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 3.2\text{ A}, I_B = 0.64\text{ A}$	—	—	1.5	V
Switching time	Turn-on time	$t_{on}$	<p><math>I_{B1} = 0.64\text{ A}, I_{B2} = 1.28\text{ A}</math> duty cycle <math>\leq 1\%</math></p>	—	0.2	—	$\mu\text{s}$
	Storage time	$t_{stg}$		—	2.0	3.5	
	Fall time	$t_f$		—	0.15	—	

## Marking

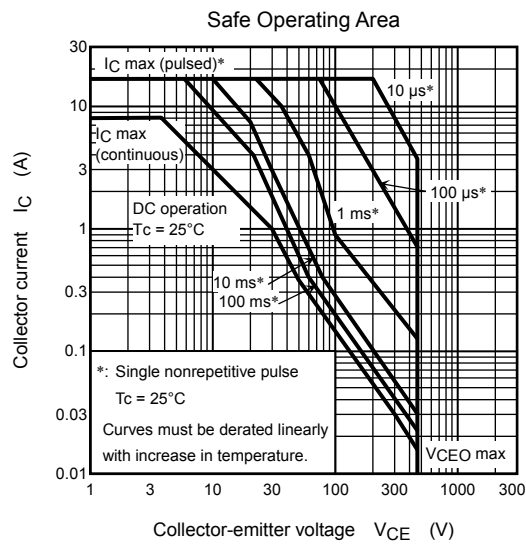
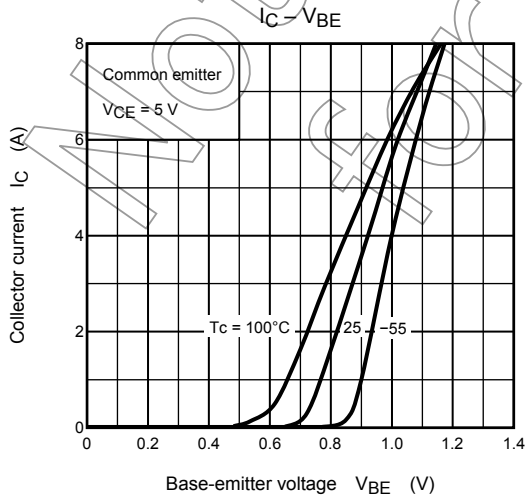
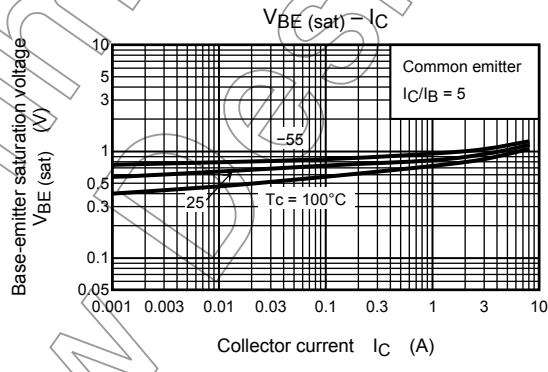
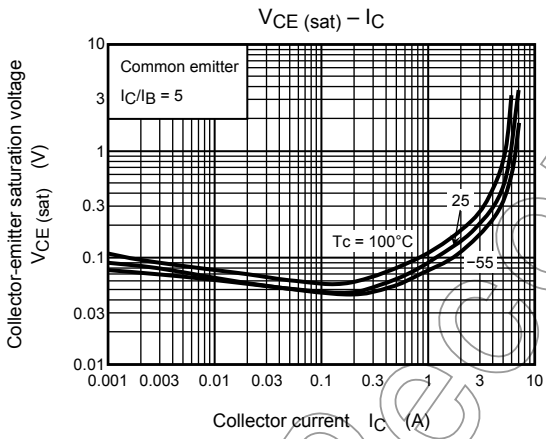
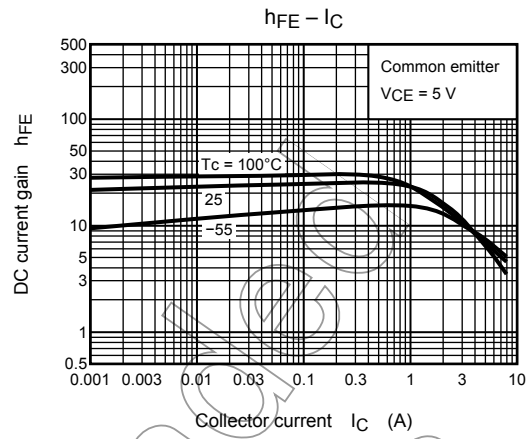
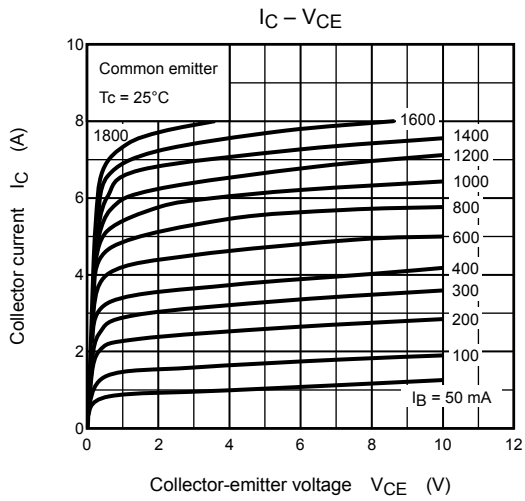


Note2: A line under a Lot No. identifies the indication of product Labels.

Not underlined:  $[[Pb]]/INCLUDES > MCV$

Underlined:  $[[G]]/RoHS COMPATIBLE$  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.



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