



SANYO Semiconductors

## DATA SHEET

# 2SC6013

 — NPN Epitaxial Planar Silicon Transistor  
**DC / DC Converter Applications**

## Applications

- Relay drivers, lamp drivers, motor drivers, flash.

## Features

- Adoption of MBIT process.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Narrow hFE range.
- High allowable power dissipation.

## Specifications

### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		15	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		15	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		6	V
Collector Current	I <sub>C</sub>		6	A
Collector Current (Pulse)	I <sub>CP</sub>		9	A
Base Current	I <sub>B</sub>		600	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (250mm <sup>2</sup> ×0.8mm)	1.3	W
		T <sub>c</sub> =25°C	3.5	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =12V, I <sub>E</sub> =0A			0.1	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA	250		400	

Marking : QA

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**SANYO Electric Co., Ltd. Semiconductor Company**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

# 2SC6013

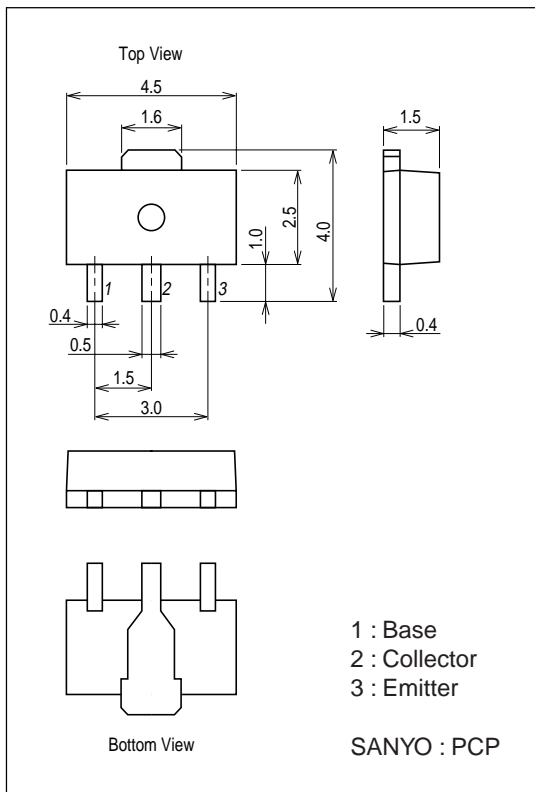
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	$f_T$	$V_{CE}=2V, I_C=500mA$		380		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		23		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1.5A, I_B=30mA$		90	135	mV
		$I_C=3A, I_B=60mA$		135	200	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1.5A, I_B=30mA$		0.85	1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0A$	15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	15			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0A$	6			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		30		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		190		ns
Fall Time	$t_f$	See specified Test Circuit.		15		ns

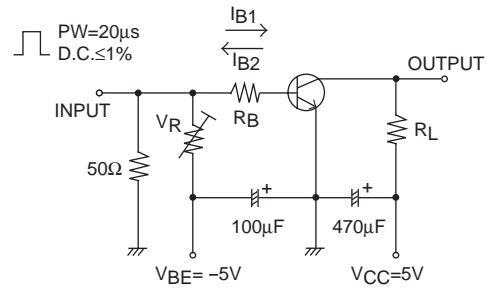
## Package Dimensions

unit : mm

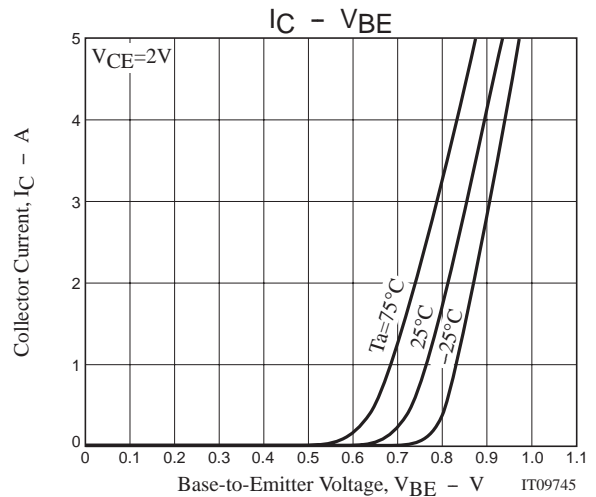
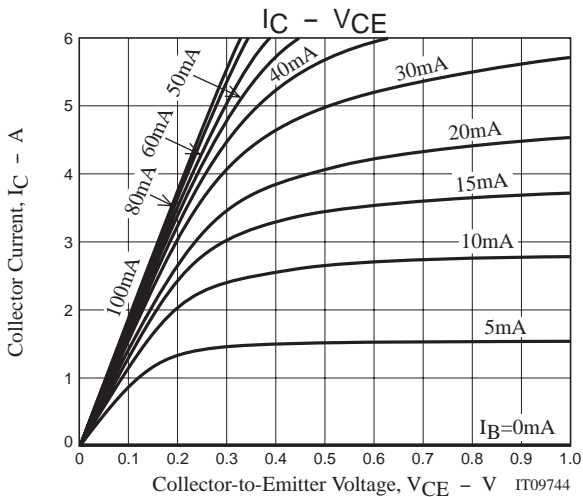
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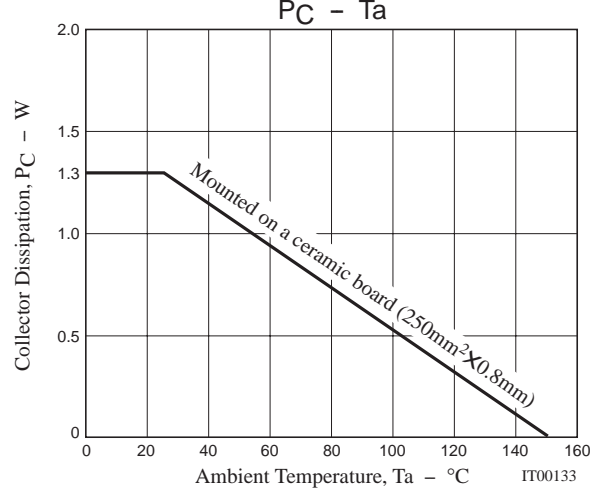
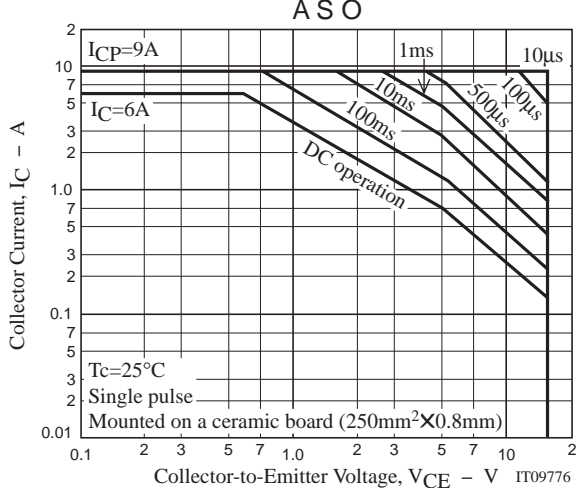
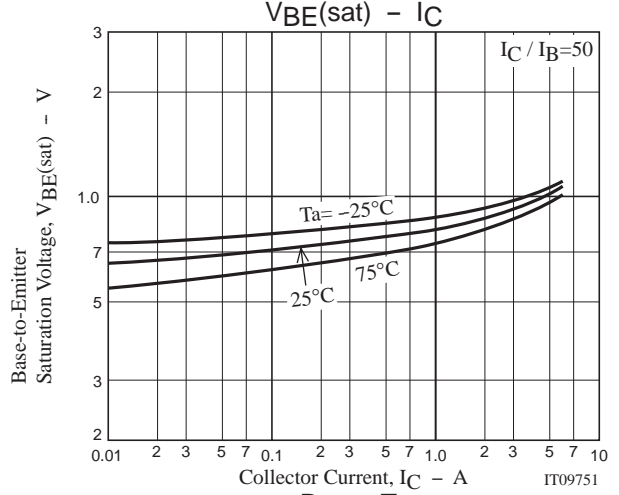
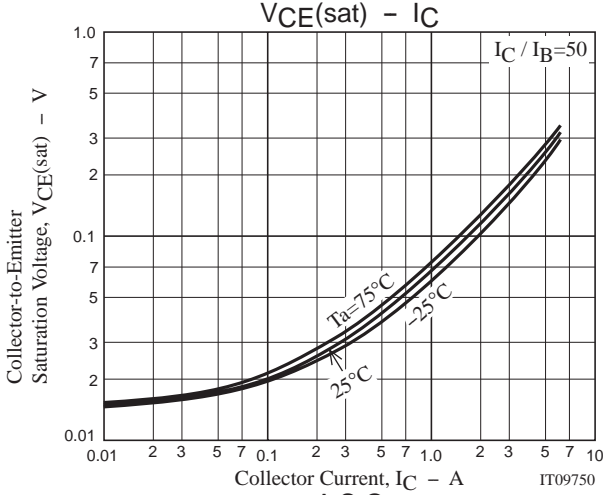
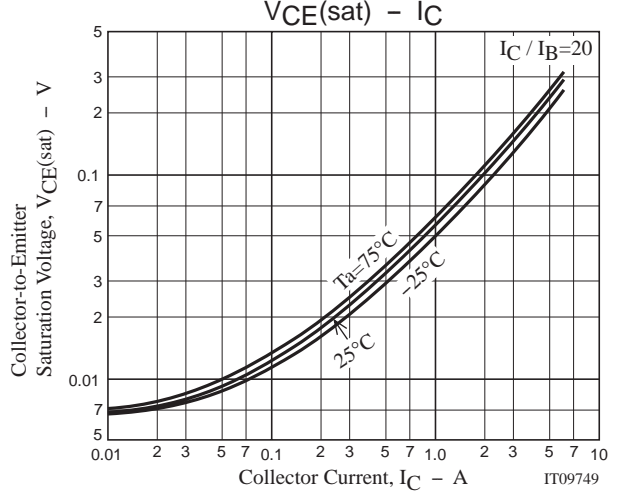
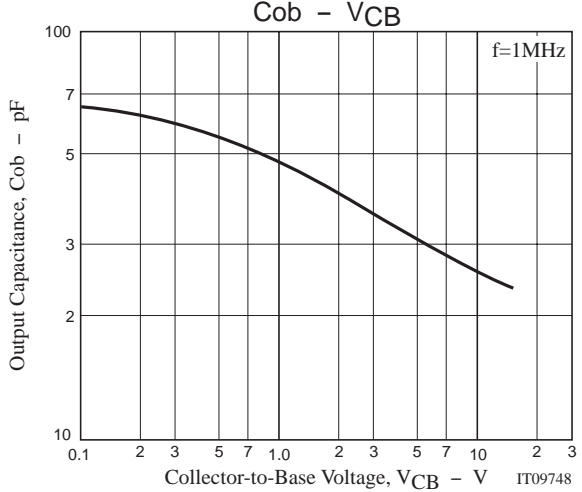
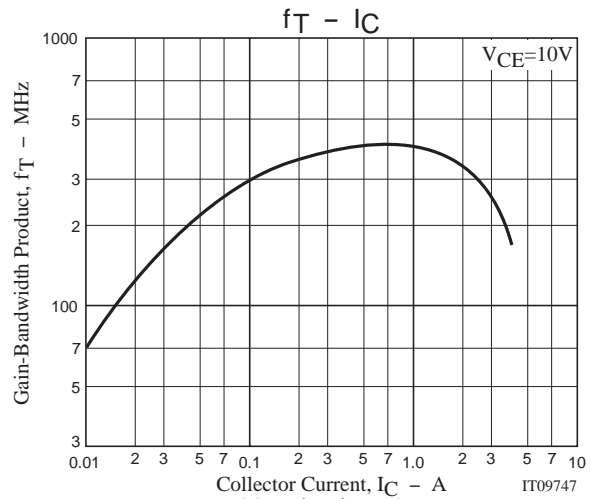
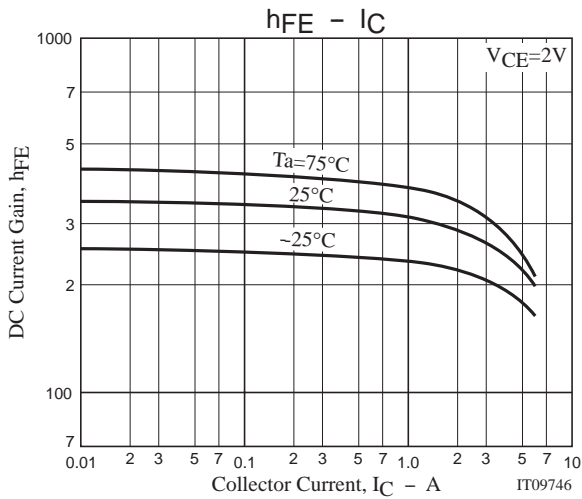
## Switching Time Test Circuit

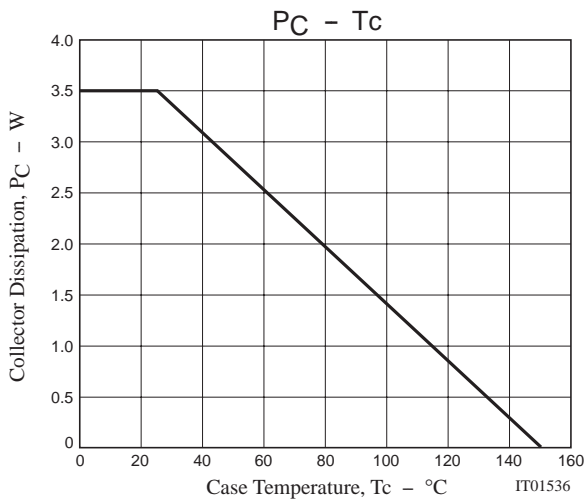


$$I_C = 20I_{B1} = -20I_{B2} = 1.5A$$



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