Unit: mm

TOSHIBA Transistor Silicon PNP Epitaxial Type

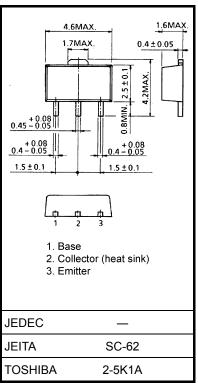
2SA2060

High-Speed Switching Applications DC-DC Converter Applications Strobe Applications

- High DC current gain: $h_{FE} = 200$ to 500 ($I_C = -0.3$ A)
- Low collector-emitter saturation voltage: V_{CE} (sat) = −0.2 V (max)
- High-speed switching: t_f = 90 ns (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Collector-base voltage		V _{CBO}	-50	V	
Collector-emitter voltage		V _{CEO}	-50	V	
Emitter-base voltage		V _{EBO}	-7	V	
Collector current	DC	IC	-2.0	Α	
	Pulse	I _{CP}	-3.5		
Base current		ΙΒ	-200	mA	
Collector power dissipation	t = 10 s	PC	2.5	W	
	DC	(Note 1)	1.0		
Junction temperature		Tj	150	°C	
Storage temperature range		T _{stg}	−55 to 150	°C	



Weight: 0.05 g (typ.)

- Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm²)
- Note 2: 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.

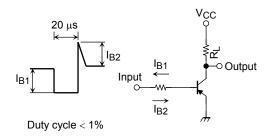
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit	
Collector cut-off current		I _{CBO}	V _{CB} = -50 V, I _E = 0	_	_	-100	nA	
Emitter cut-off current		I _{EBO}	V _{EB} = -7 V, I _C = 0	_	_	-100	nA	
Collector-emitter breakdown voltage		V (BR) CEO	$I_C = -10 \text{ mA}, I_B = 0$	-50	_	_	٧	
DC current gain		h _{FE} (1)	V _{CE} = -2 V, I _C = -0.3 A	200	_	500		
		h _{FE} (2)	V _{CE} = -2 V, I _C = -1.0 A	100	_	_		
Collector-emitter saturation voltage		V _{CE (sat)}	I _C = -1.0 A, I _B = -0.033 A	_	_	-0.2	V	
Base-emitter saturation voltage		V _{BE (sat)}	I _C = -1.0 A, I _B = -0.033 A	_	_	-1.1	V	
Collector output capacitance		C _{ob}	V _{CB} = −10 V, I _E = 0, f = 1 MHz	_	20	_	pF	
Switching time	Rise time	t _r	See Figure 1 circuit diagram.	_	60	_	ns	
	Storage time	t _{stg}	$V_{\rm CC} \approx -30 \text{ V}, R_{\rm L} = 30 \Omega$	_	250	_		
	Fall time	t _f	I _{B1} = 33 mA,I _{B2} = 33 mA	_	90	_		

Marking



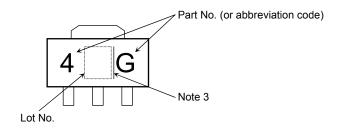


Figure 1 Switching Time Test Circuit & Timing Chart

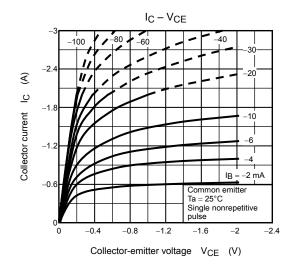
Note 3: A line to the right of a Lot No. identifies the indication of product Labels.

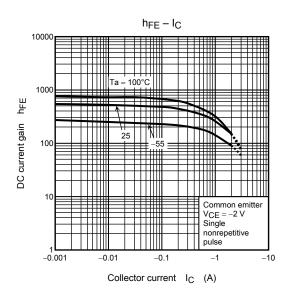
Without a line: [[Pb]]/INCLUDES > MCV

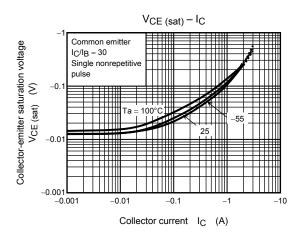
With a line: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

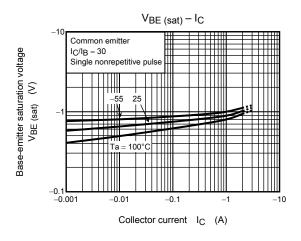
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

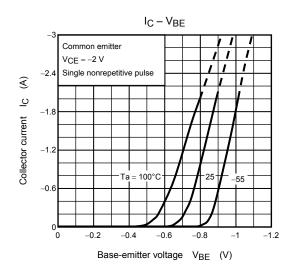
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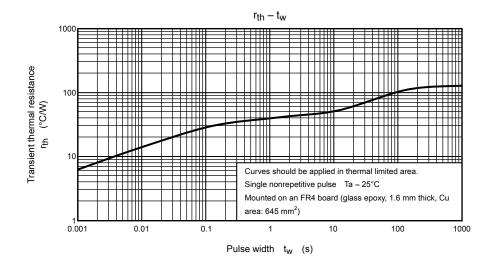


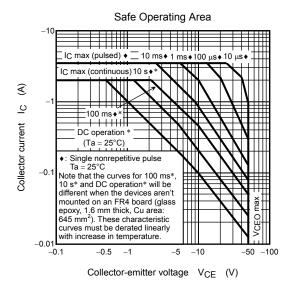












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