TOSHIBA Transistor Silicon PNP Epitaxial Type

2SA2059

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

- High DC current gain: $h_{FE} = 200 \text{ to } 500 \text{ (IC} = -0.5 \text{ A)}$
- Low collector-emitter saturation voltage: $V_{CE (sat)} = -0.19 \text{ V (max)}$
- High-speed switching: $t_f = 40 \text{ ns (typ.)}$

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Collector-base voltage		V _{CBO}	-20	V	
Collector-emitter voltage		V _{CEO}	-20	V	
Emitter-base voltage		V _{EBO}	-7	V	
Collector current	DC	IC	-3.0	A	
	Pulse	I _{CP}	-5.0		
Base current		Ι _Β	-300	mA	
Collector power dissipation	DC	PC	1.0	W	
	t = 10 s	(Note)	2.5		
Junction temperature		Tj	150	°C	
Storage temperature range		T _{stg}	−55 to 150	°C	

Note: Mounted on FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm^2)

Unit: mm 4.6MAX. 1.6MAX. 1.6MAX. 1.6MAX. 1.7MAX. 0.4±0.05 1.7MAX. 0.4±0.05 1.7MAX. 0.4±0.05 1.5±0.1 1.5±0.1 1. Base 2. Collector (heat sink) 3. Emitter JEDEC — JEITA SC-62 TOSHIBA 2-5K1A

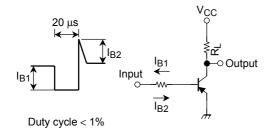
Weight: 0.05 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit	
Collector cut-off current		I _{CBO}	V _{CB} = -20 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 mA, I _B = 0	-20	_	_	V	
DC current gain		h _{FE} (1)	$V_{CE} = -2 \text{ V}, I_{C} = -0.5 \text{ A}$	200	_	500		
		h _{FE} (2)	V _{CE} = -2 V, I _C = -1.6 A	100	_	_		
Collector-emitter saturation voltage		V _{CE (sat)}	I _C = -1.6 A, I _B = -53 mA	_	_	-0.19	V	
Base-emitter saturation voltage		V _{BE (sat)}	I _C = −1.6 A, I _B = −53 mA	_	_	-1.10	V	
Collector output capacitance		C _{ob}	V _{CB} = −10 V, I _E = 0, f = 1 MHz	_	28	_	pF	
Switching time	Rise time	t _r	See Figure 1 circuit diagram.	_	70	_	ns	
	Storage time	t _{stg}	$V_{CC} \approx -12 \text{ V}, R_L = 7.5 \Omega$	_	150	_		
	Fall time	t _f	-I _{B1} = I _{B2} = -53.3 mA	_	40	_		

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Marking



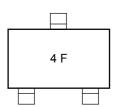
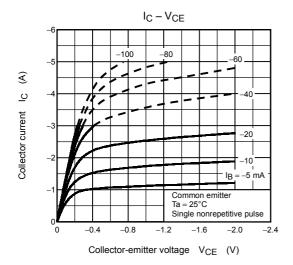
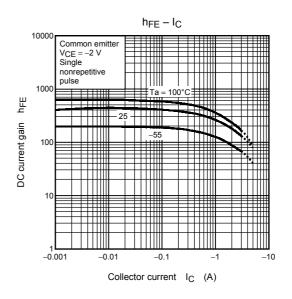
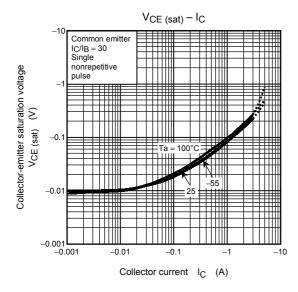
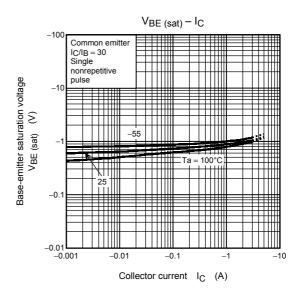


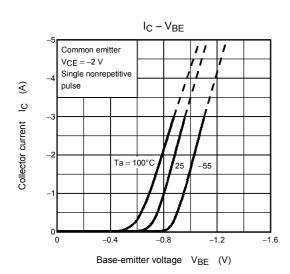
Figure 1 Switching Time Test Circuit & Timing Chart



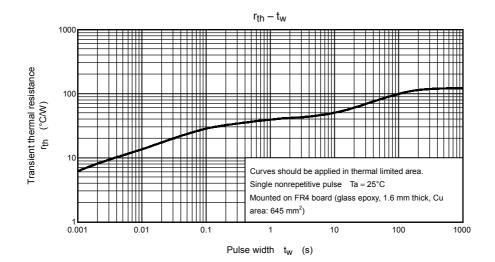


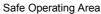


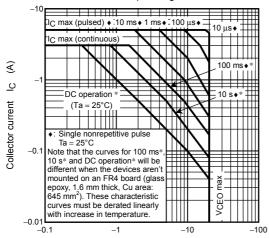




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Collector-emitter voltage V_{CE} (V)

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