

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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PNP SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR HIGH-SPEED SWITCHING

The 2SA1720 is a high-speed Darlington power transistor.

This transistor is ideal for high-precision control such as PWM control for pulse motors or brushless motors in OA and FA equipment.

ORDERING INFORMATION

Part No.	Package
2SA1720	Isolated TO-220

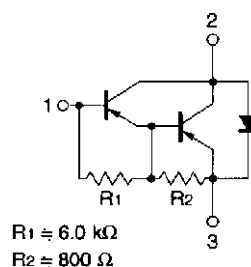
FEATURES

- Mold package that does not require an insulating board or insulation bushing
- On-chip C-to-E reverse diode
- Fast switching speed

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		-100	V
Collector to emitter voltage	V_{CEO}		-100	V
Emitter to base voltage	V_{EBO}		-8.0	V
Collector current (DC)	$I_{C(DC)}$		-10, +3.0	A
Collector current (pulse)	$I_{C(pulse)}$	$PW \leq 10 \text{ ms}$, duty cycle $\leq 50\%$	± 20	A
Base current (DC)	$I_{B(DC)}$		-1.0	A
Total power dissipation	P_T	$T_C = 25^\circ\text{C}$	25	W
		$T_A = 25^\circ\text{C}$	2.0	W
Junction temperature	T_j		150	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

EQUIVALENT CIRCUIT



1. Base
2. Collector
3. Emitter

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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

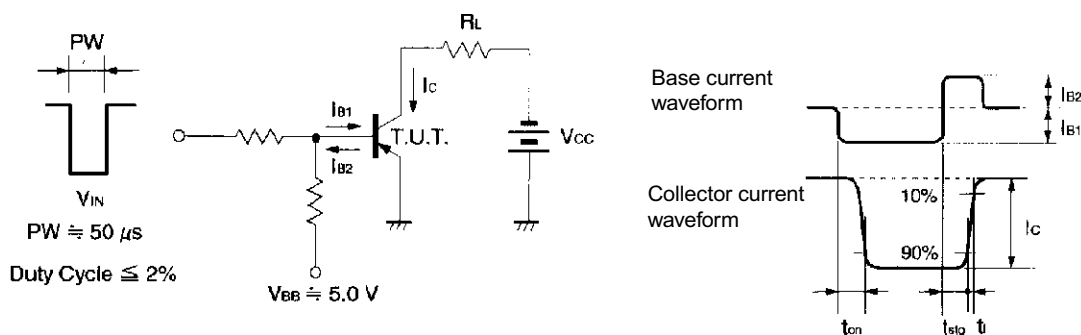
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -100 V, I _E = 0 A			-10	μA
DC current gain	h _{FE1}	V _{CE} = -2.0 V, I _C = -5.0 A ^{Note}	4,000		20,000	
DC current gain	h _{FE2}	V _{CE} = -2.0 V, I _C = -10 A ^{Note}	500			
Collector saturation voltage	V _{CE(sat)}	I _C = -5.0 A, I _B = -5.0 mA ^{Note}		-0.9	-1.5	V
Base saturation voltage	V _{BE(sat)}	I _C = -5.0 A, I _B = -5.0 mA ^{Note}		-1.5	-2.0	V
Gain bandwidth product	f _T	V _{CE} = -5.0 V, I _C = -5.0 A		100		MHz
Turn-on time	t _{on}	I _C = -5.0 A, R _L = 10 Ω, I _{B1} = -I _{B2} = -5 mA, V _{CC} ≅ -50 V Refer to the switching time (t _{on} , t _{stg} , t _f) test circuit.		0.2		μs
Storage time	t _{stg}			1.5		μs
Fall time	t _f			0.7		μs

Note Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

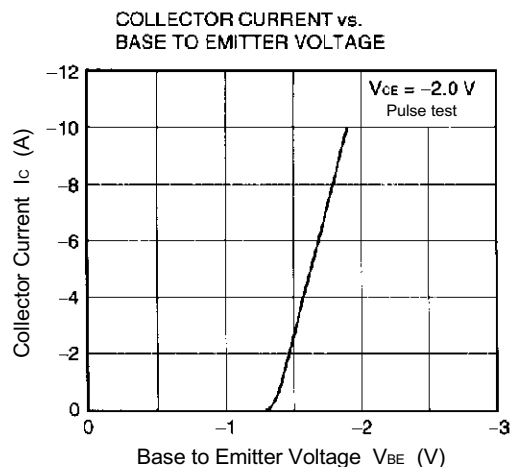
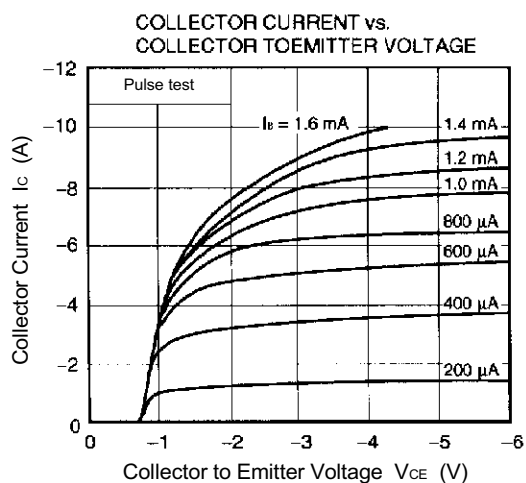
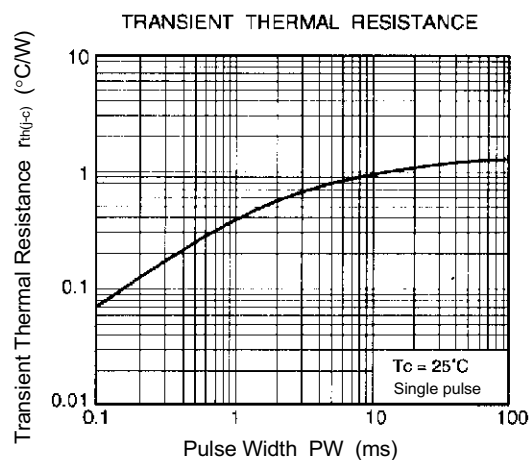
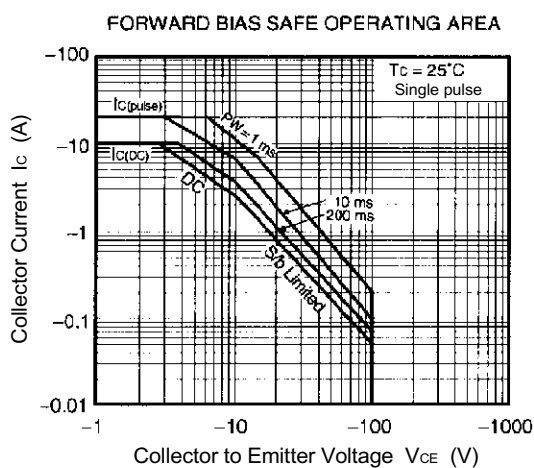
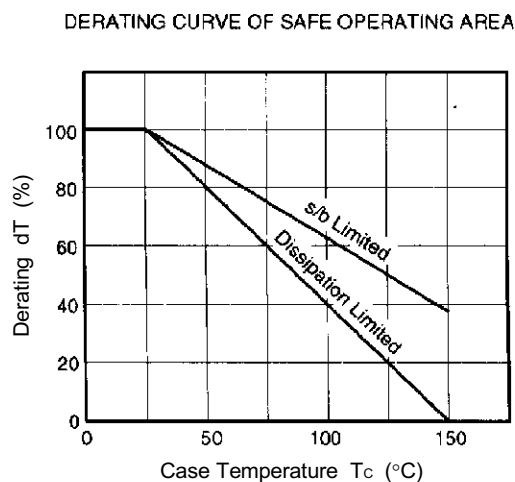
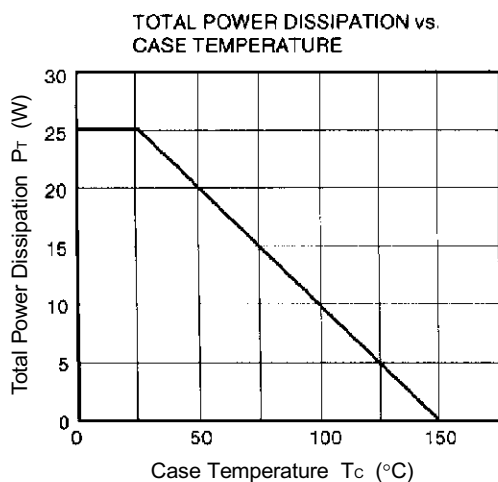
h_{FE} CLASSIFICATION

Marking	L	K
h _{FE1}	4,000 to 10,000	8,000 to 20,000

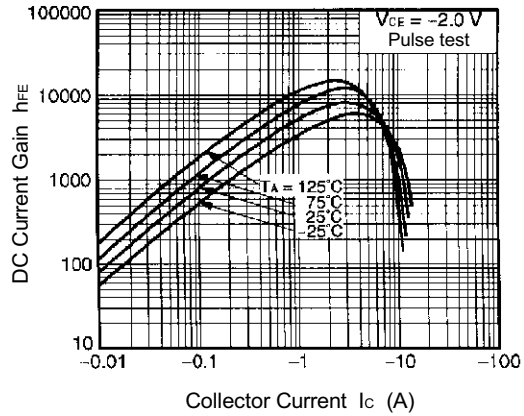
SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT



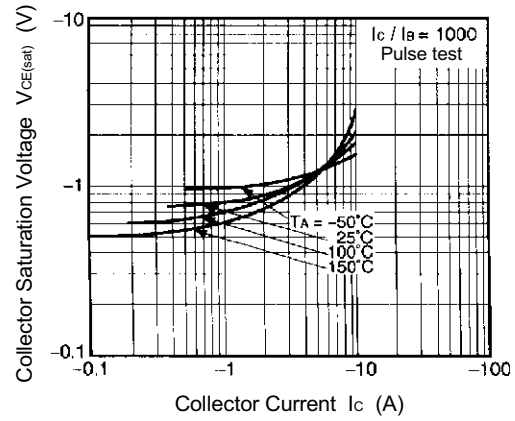
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



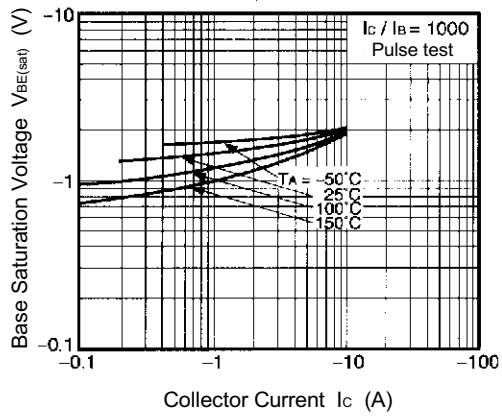
DC CURRENT GAIN vs. COLLECTOR CURRENT



COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT

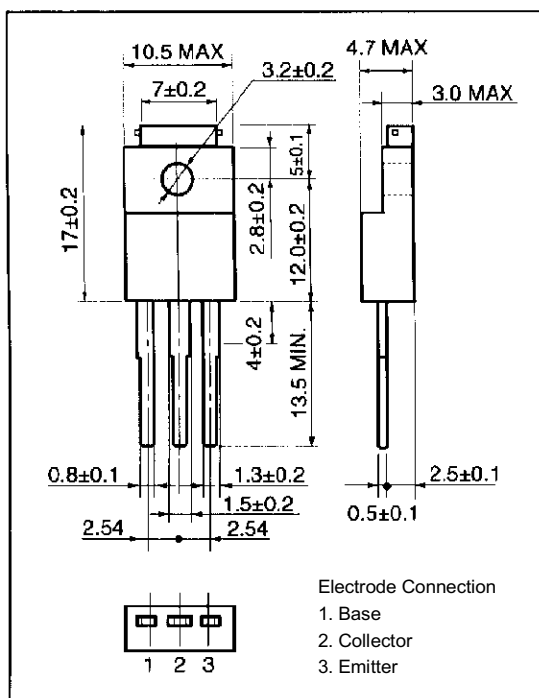


BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



PACKAGE DRAWING (UNIT: mm)

Isolated TO-220 (MP-45)



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