

# DARLINGTON POWER TRANSISTOR 2SA1720

### 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.

#### FEATURES

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

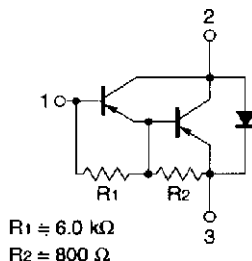
#### ORDERING INFORMATION

Part No.	Package
2SA1720	Isolated TO-220

#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V <sub>CB0</sub>		-100	V
Collector to emitter voltage	V <sub>CEO</sub>		-100	V
Emitter to base voltage	V <sub>EBO</sub>		-8.0	V
Collector current (DC)	I <sub>C(DC)</sub>		-10, +3.0	A
Collector current (pulse)	I <sub>C(pulse)</sub>	PW ≤ 10 ms, duty cycle ≤ 50%	±20	A
Base current (DC)	I <sub>B(DC)</sub>		-1.0	A
Total power dissipation	P <sub>T</sub>	T <sub>C</sub> = 25°C	25	W
		T <sub>A</sub> = 25°C	2.0	W
Junction temperature	T <sub>J</sub>		150	°C
Storage temperature	T <sub>stg</sub>		-55 to +150	°C

#### EQUIVALENT CIRCUIT



1. Base
2. Collector
3. Emitter

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

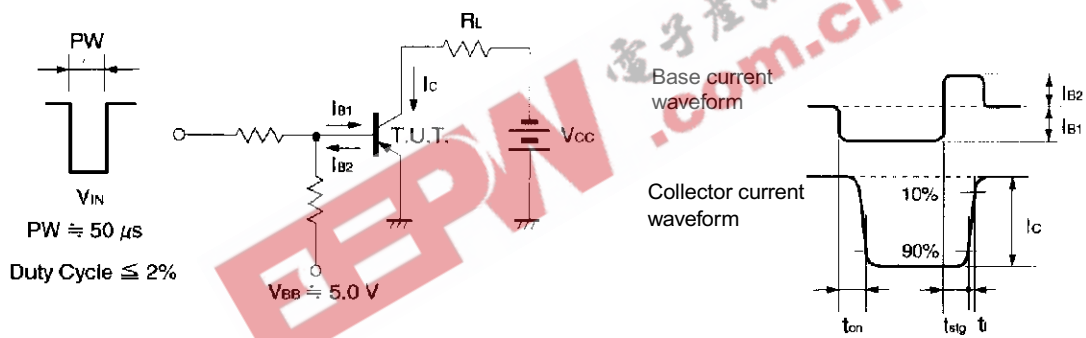
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -100 V, I <sub>E</sub> = 0 A			-10	μA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> = -2.0 V, I <sub>C</sub> = -5.0 A <sup>Note</sup>	4,000		20,000	
DC current gain	h <sub>FE2</sub>	V <sub>CE</sub> = -2.0 V, I <sub>C</sub> = -10 A <sup>Note</sup>	500			
Collector saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -5.0 mA <sup>Note</sup>		-0.9	-1.5	V
Base saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -5.0 mA <sup>Note</sup>		-1.5	-2.0	V
Gain bandwidth product	f <sub>T</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -5.0 A		100		MHz
Turn-on time	t <sub>on</sub>	I <sub>C</sub> = -5.0 A, R <sub>L</sub> = 10 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = -5 mA, V <sub>CC</sub> ≅ -50 V Refer to the switching time (t <sub>on</sub> , t <sub>stg</sub> , t <sub>f</sub> ) test circuit.		0.2		μs
Storage time	t <sub>stg</sub>			1.5		μs
Fall time	t <sub>f</sub>			0.7		μs

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

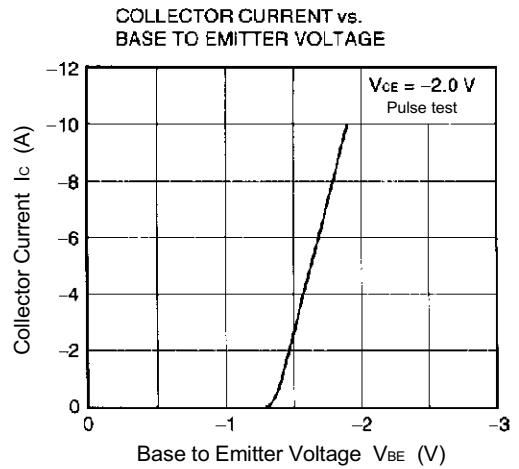
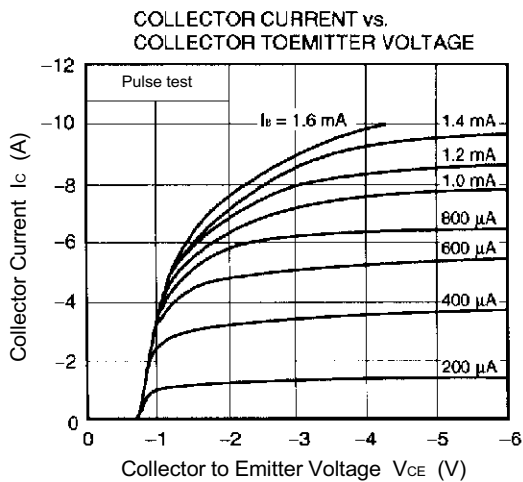
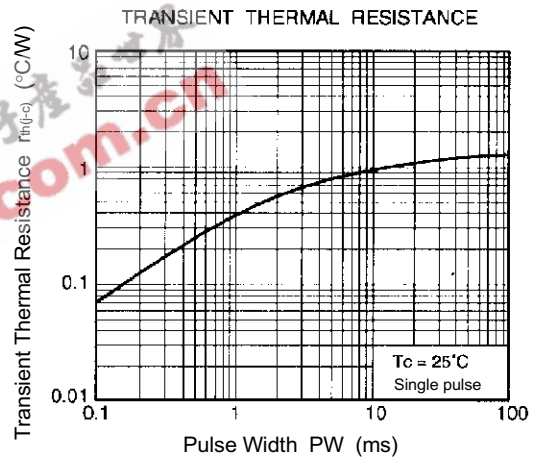
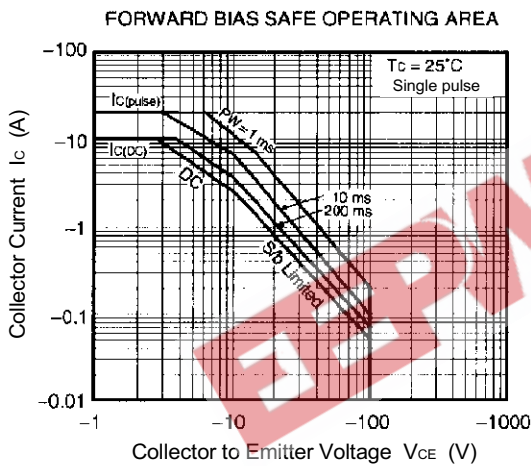
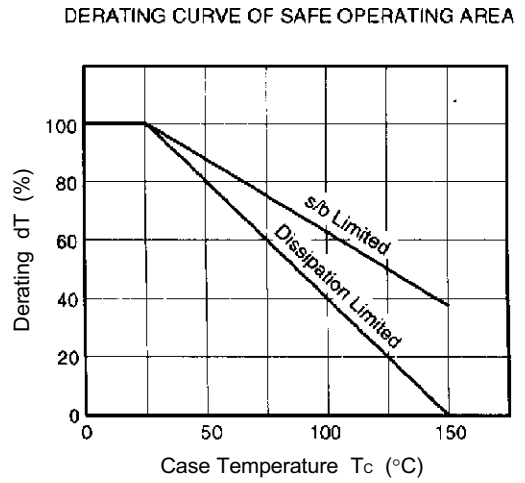
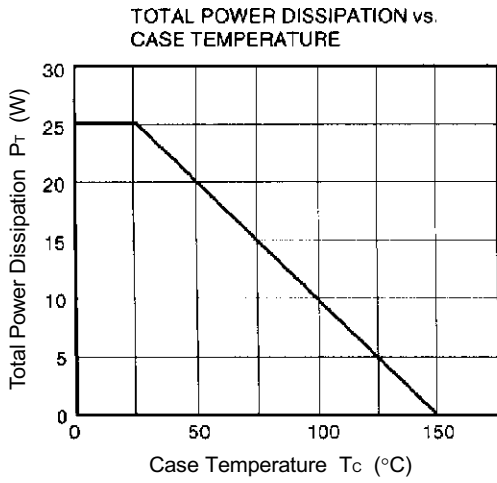
**h<sub>FE</sub> CLASSIFICATION**

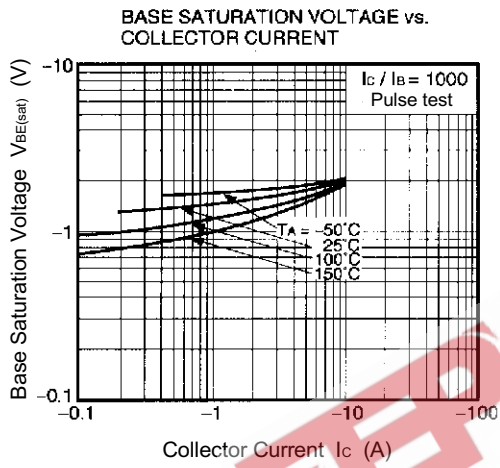
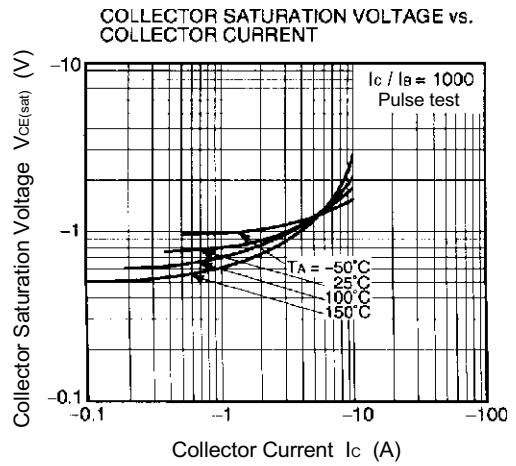
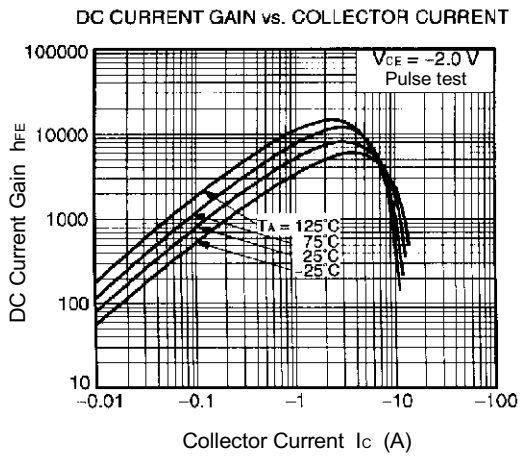
Marking	L	K
h <sub>FE1</sub>	4,000 to 10,000	8,000 to 20,000

**SWITCHING TIME (t<sub>on</sub>, t<sub>stg</sub>, t<sub>f</sub>) TEST CIRCUIT**



TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

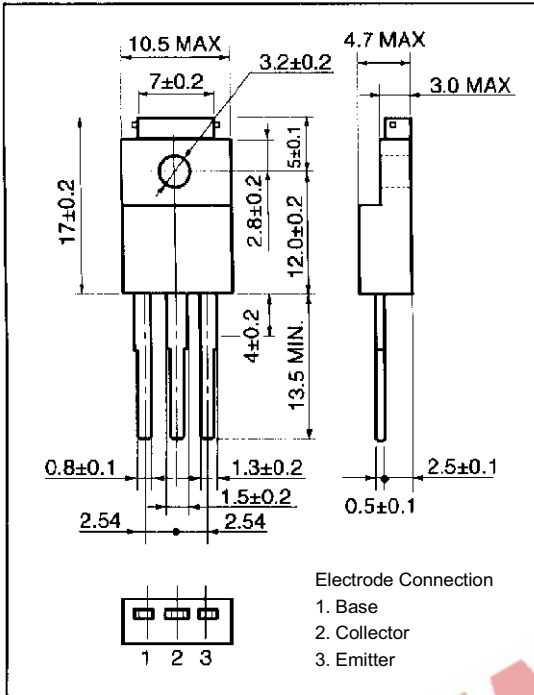




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PACKAGE DRAWING (UNIT: mm)

Isolated TO-220 (MP-45)



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