

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

The 2SA1714 is a high-speed darlington power transistor. This transistor is ideal for high-precision control such as PWM control for pulse motors or brushless motor of OA and FA equipment.

#### FEATURES

- High DC current amplifiers due to darlington connection
- Large current capacitance and low  $V_{CE(sat)}$
- TO-126 power transistor with high power dissipation
- Complementary transistor with 2SC4342

#### QUALITY GRADES

- Standard

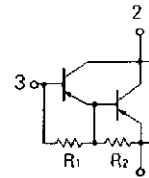
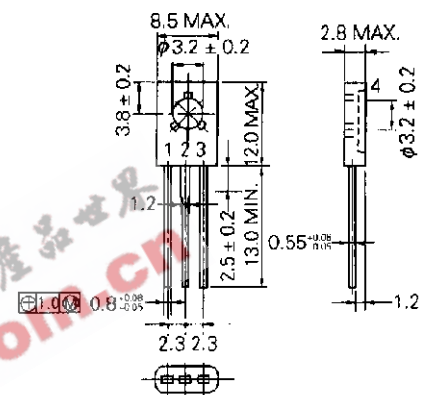
Please refer to "Quality Grades on NEC Semiconductor Devices" (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

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

Parameter	Symbol	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)	$I_{C(DC)}$	$\mp 3.0$	A
Collector current (pulse)	$I_{C(pulse)^*}$	$\mp 6.0$	A
Base current (DC)	$I_{B(DC)}$	-0.3	A
Total power dissipation	$P_T$ ( $T_a = 25^\circ\text{C}$ )	1.3	W
Total power dissipation	$P_T$ ( $T_c = 25^\circ\text{C}$ )	12	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10$  ms, duty cycle  $\leq 50\%$

#### PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Emitter
2. Collector
3. Base
4. Fin (collector)

$$R_1 \approx 5.0 \text{ k}\Omega$$

$$R_2 \approx 0.7 \text{ k}\Omega$$

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**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

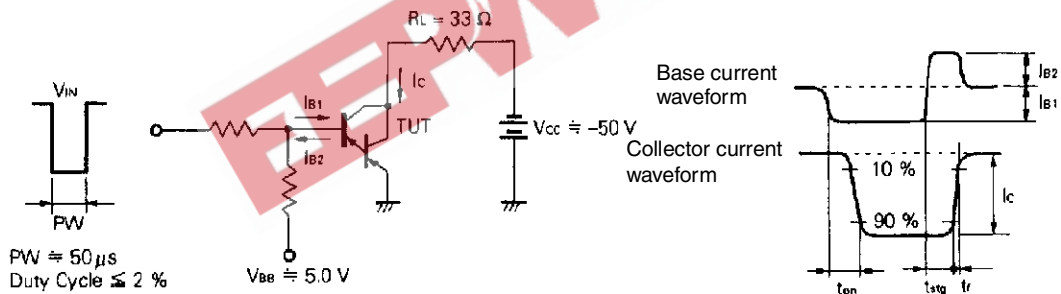
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CEO(SUS)}$	$I_C = -3.0\text{ A}$ , $I_B = -3.0\text{ mA}$ , $L = 1.0\text{ mH}$	-100			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = -100\text{ V}$ , $I_E = 0$			-10	$\mu\text{A}$
Collector cutoff current	$I_{CEO}$	$V_{CE} = -100\text{ V}$ , $R_{BE} = \infty$			-10	$\mu\text{A}$
DC current gain	$h_{FE1}^{**}$	$V_{CE} = -2.0\text{ V}$ , $I_C = -1.5\text{ A}$	2,000		20,000	-
DC current gain	$h_{FE2}^{**}$	$V_{CE} = -2.0\text{ V}$ , $I_C = -3.0\text{ A}$	1,000			-
Collector saturation voltage	$V_{CE(sat)}^{**}$	$I_C = -1.5\text{ A}$ , $I_B = -1.5\text{ mA}$		-0.9	-1.2	V
Base saturation voltage	$V_{BE(sat)}^{**}$	$I_C = -1.5\text{ A}$ , $I_B = -1.5\text{ mA}$		-1.5	-2.0	V
Turn-on time	$t_{on}$	$I_C = -1.5\text{ A}$ , $I_{B1} = -I_{B2} = -1.5\text{ mA}$ , $R_L = 33\ \Omega$ , $V_{CC} \cong -50\text{ V}$ Refer to the test circuit.		0.15		$\mu\text{s}$
Storage time	$t_{stg}$			1.2		$\mu\text{s}$
Fall time	$t_f$			0.6		$\mu\text{s}$

\*\* Pulse test PW  $\leq 350\ \mu\text{s}$ , duty cycle  $\leq 2\%$ /pulsed

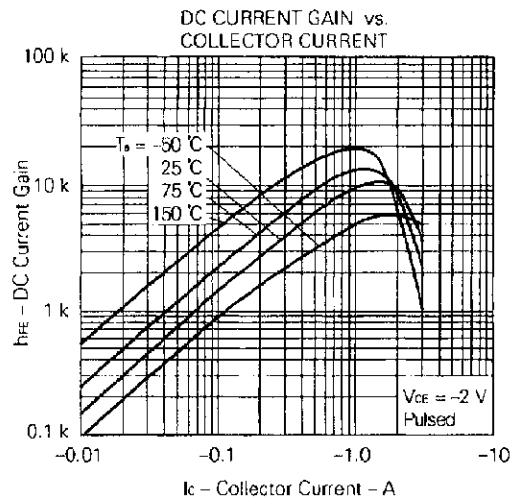
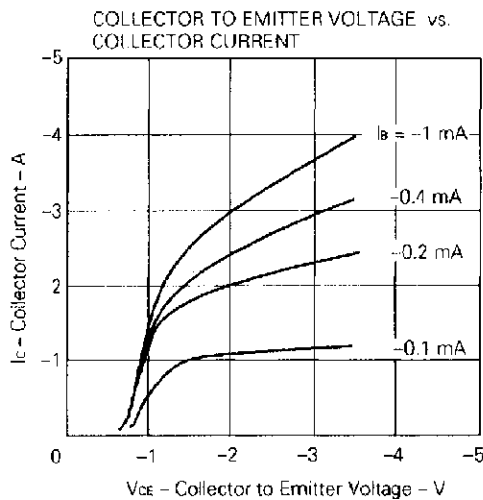
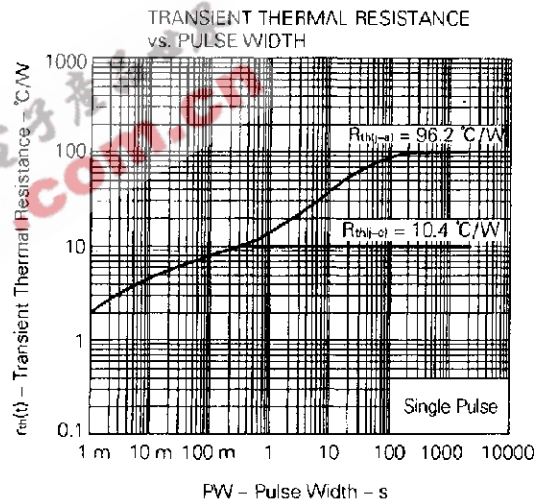
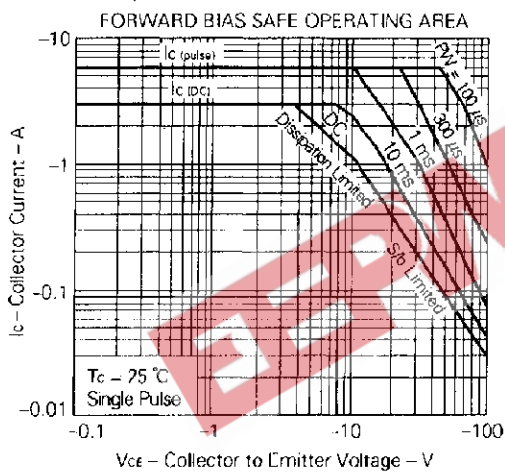
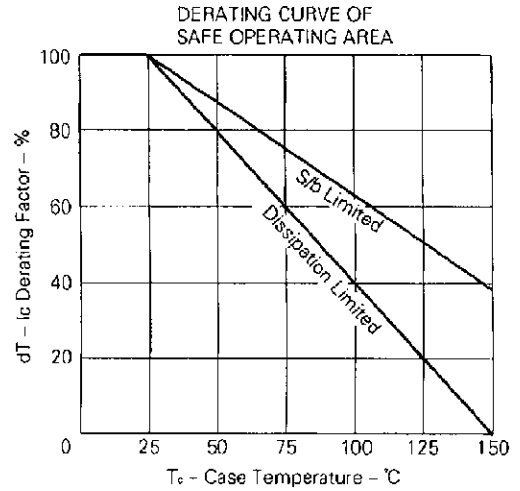
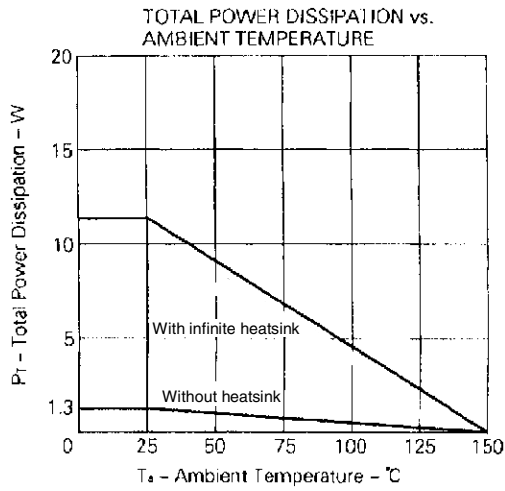
**hFE CLASSIFICATION**

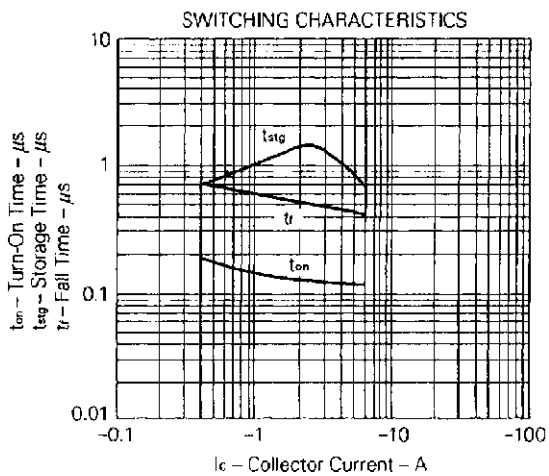
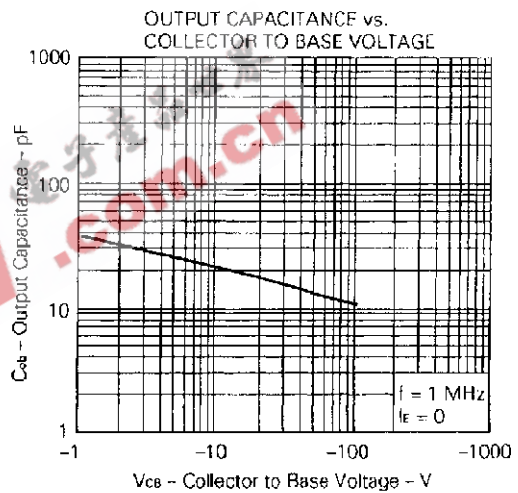
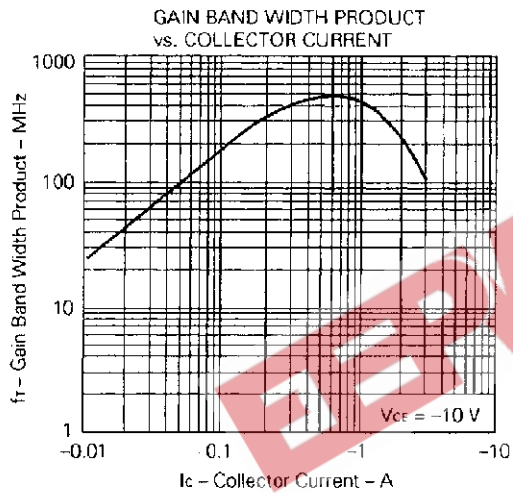
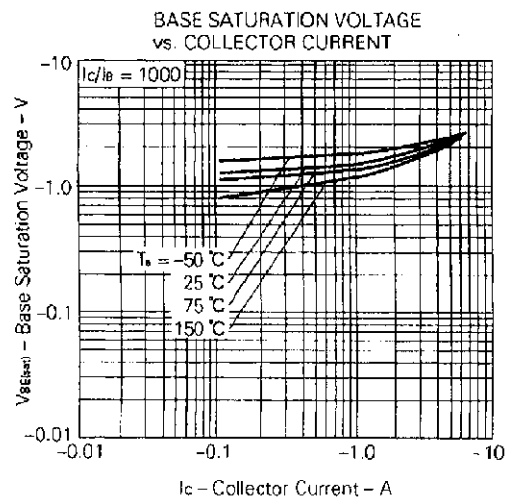
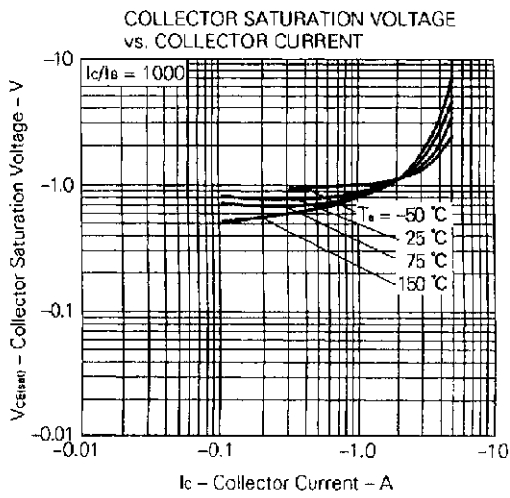
Marking	M	L	K
$h_{FE1}$	2,000 to 5,000	4,000 to 10,000	8,000 to 20,000

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



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]



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