

To our customers,

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## Old Company Name in Catalogs and Other Documents

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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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

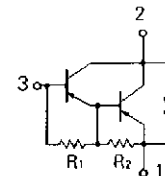
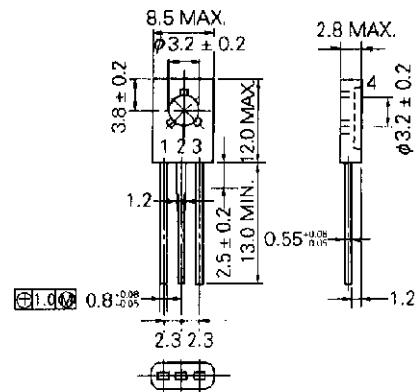
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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

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	$P_T (T_a = 25^\circ C)$	1.3	W
Total power dissipation	$P_T (T_c = 25^\circ C)$	12	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

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

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

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

$R_1 \cong 5.0$  k $\Omega$

$R_2 \cong 0.7$  k $\Omega$

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

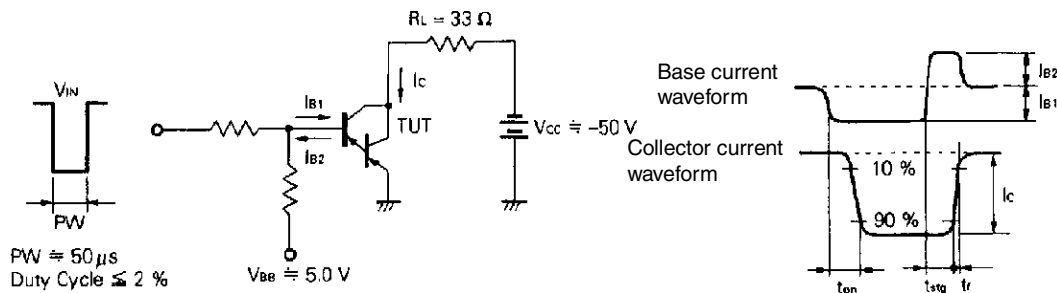
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CE0(SUS)}$	$I_C = -3.0\text{ A}$ , $I_B = -3.0\text{ mA}$ , $L = 1.0\text{ mH}$	-100			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = -100\text{ V}$ , $I_E = 0$			-10	$\mu\text{A}$
Collector cutoff current	$I_{CEO}$	$V_{CE} = -100\text{ V}$ , $R_{BE} = \infty$			-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

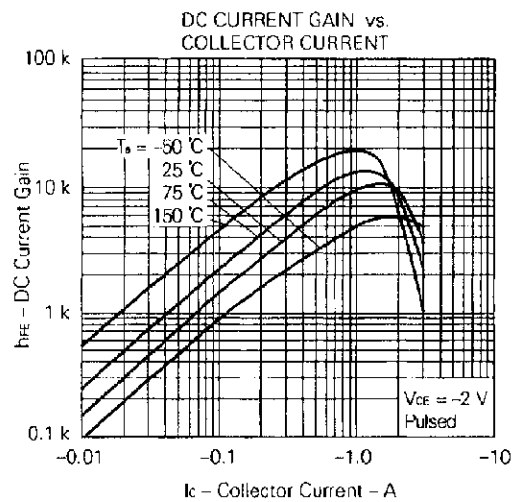
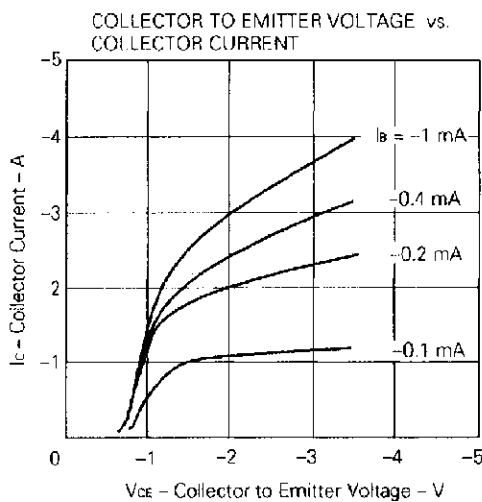
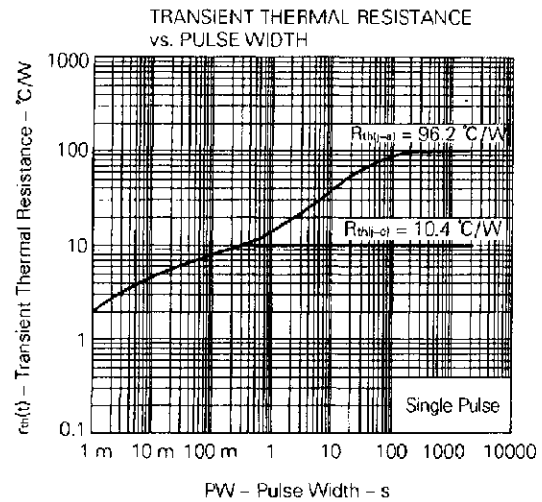
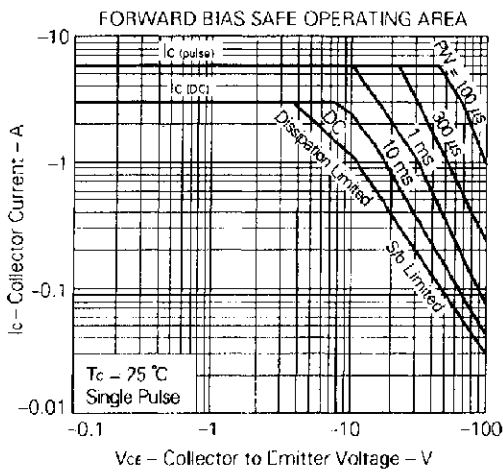
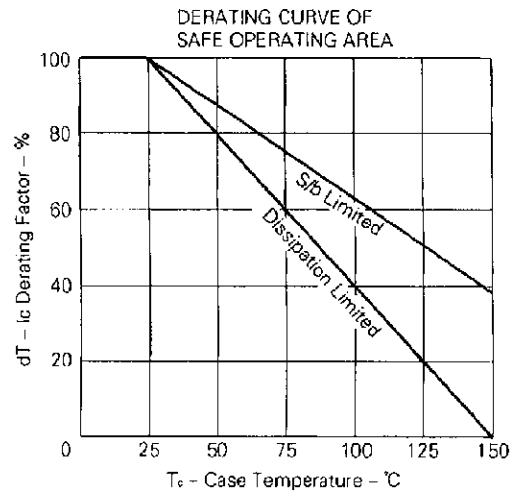
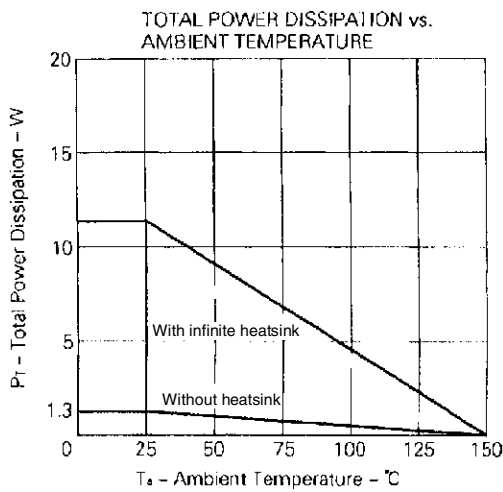
**$h_{FE}$  CLASSIFICATION**

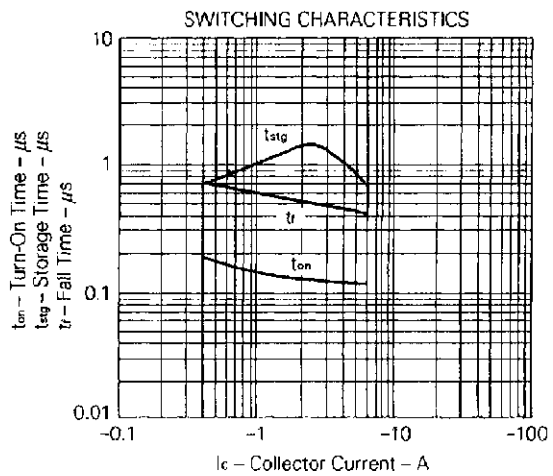
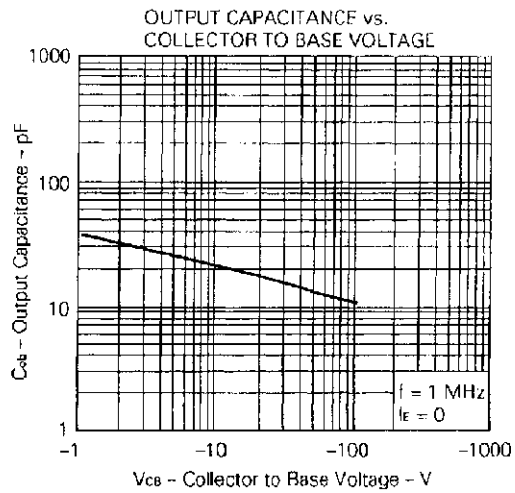
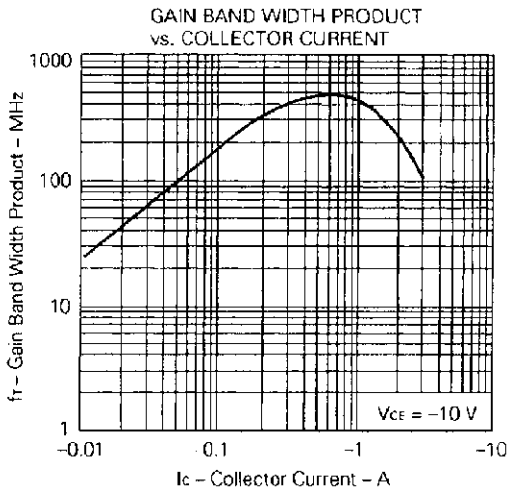
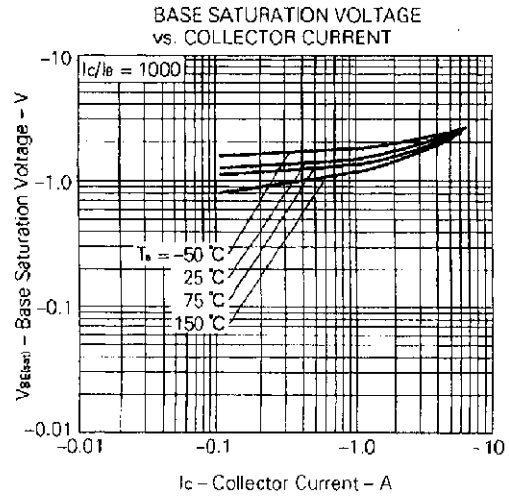
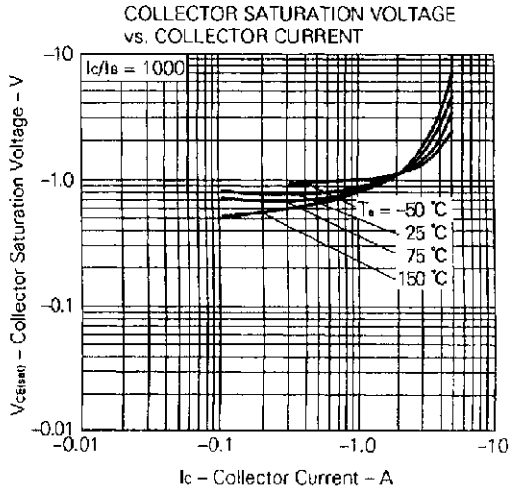
Marking	M	L	K
$h_{FE1}$	2,000 to 5,000	4,000 to 10,000	8,000 to 20,000

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



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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