

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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DARLINGTON POWER TRANSISTOR
2SD2163

NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION)
FOR LOW-FREQUENCY POWER AMPLIFIERS AND
LOW-SPEED HIGH-CURRENT SWITCHING

The 2SD2163 is a mold power transistor developed for low-speed high-current switching. This transistor is ideal for direct driving from the IC output of devices such as pulse motor drivers and relay drivers of PC terminals.

FEATURES

- Mold package that does not require an insulating board or insulation bushing
- High DC current gain due to Darlington connection
 $h_{FE} = 1,000$ MIN. (@ $I_C = 10$ A)
- Low collector saturation voltage:
 $V_{CE(sat)} = 1.5$ V MAX. (@ $I_C = 10$ A)

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

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	150	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	A
Collector current (pulse)	$I_{C(pulse)^*}$	± 20	A
Base current (DC)	$I_{B(DC)}$	1.0	A
Total power dissipation	P_T ($T_c = 25^\circ\text{C}$)	30	W
Total power dissipation	P_T ($T_a = 25^\circ\text{C}$)	2.0	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 100$ V, $I_E = 0$			10	μA
DC current gain	h_{FE}^{**}	$V_{CE} = 2.0$ V, $I_C = 10$ A	1,000	6,000	30,000	
Collector saturation voltage	$V_{CE(sat)}^{**}$	$I_C = 10$ A, $I_B = 25$ mA		1.1	1.5	V
Base saturation voltage	$V_{BE(sat)}^{**}$	$I_C = 10$ A, $I_B = 25$ mA		1.8	2.0	V
Turn-on time	t_{on}	$I_C = 10$ A, $I_{B1} = -I_{B2} = 25$ mA		1.0		μs
Storage time	t_{stg}	$R_L = 5.0$ Ω , $V_{CC} \cong 50$ V		5.0		μs
Fall time	t_f	Refer to the test circuit.		2.0		μs

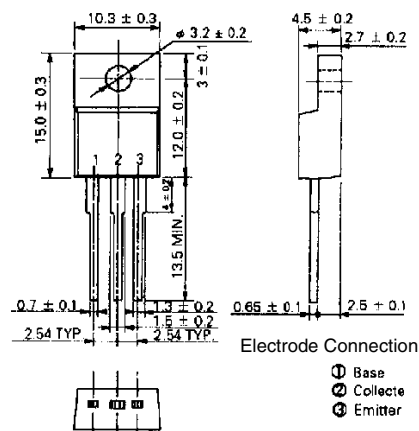
** Pulse test $PW \leq 350$ μs , duty cycle $\leq 2\%$

h_{FE} CLASSIFICATION

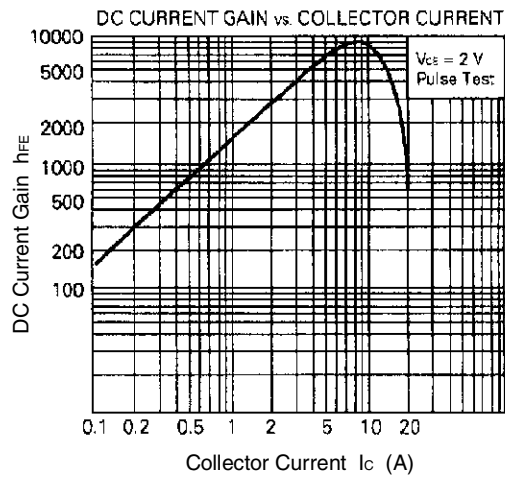
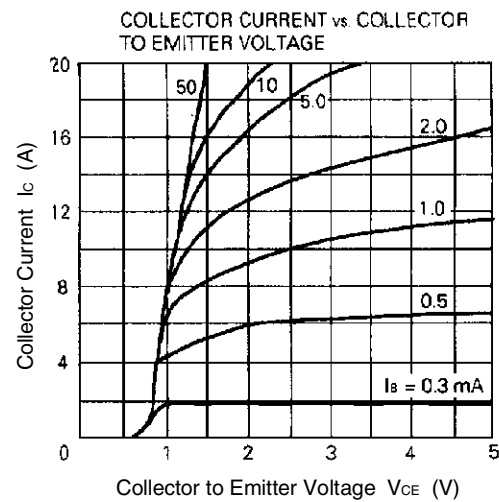
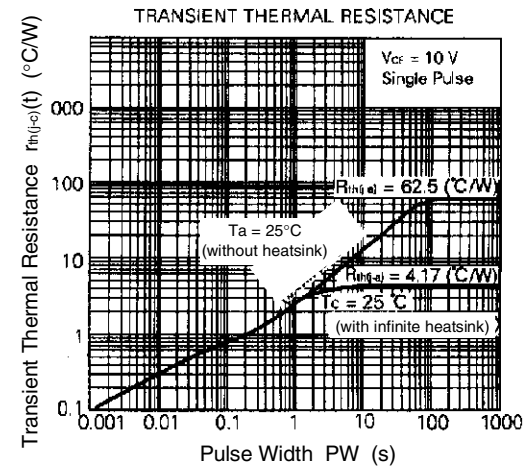
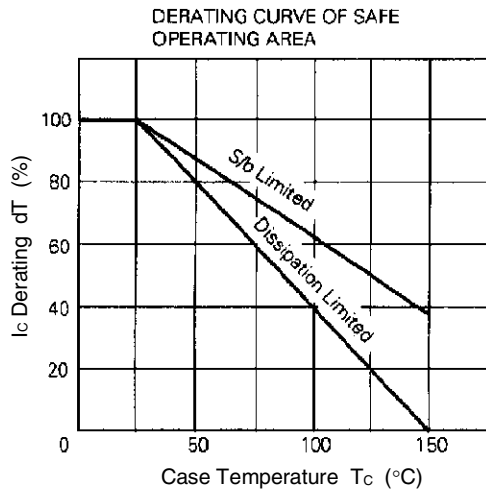
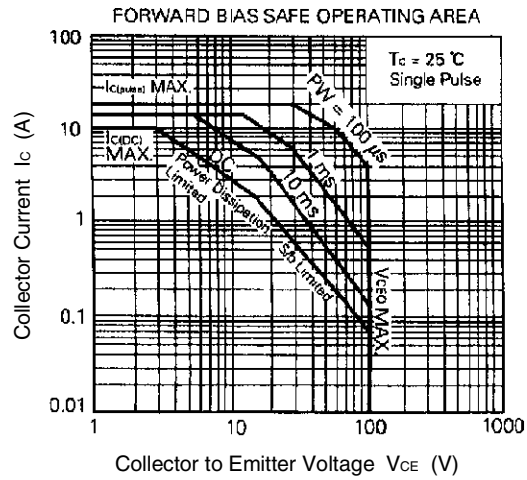
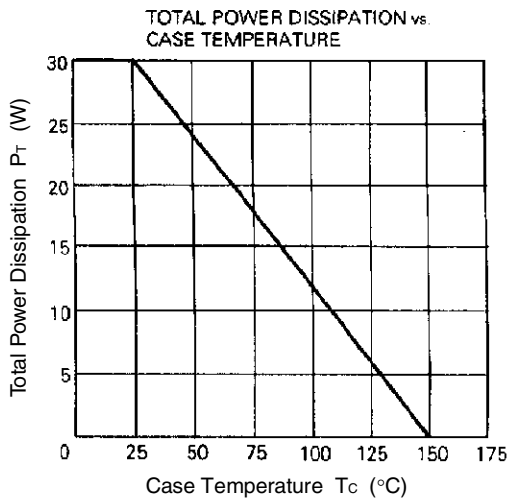
Marking	M	L	K	J
h_{FE}	1,000 to 3,000	2,000 to 5,000	4,000 to 10,000	8,000 to 30,000

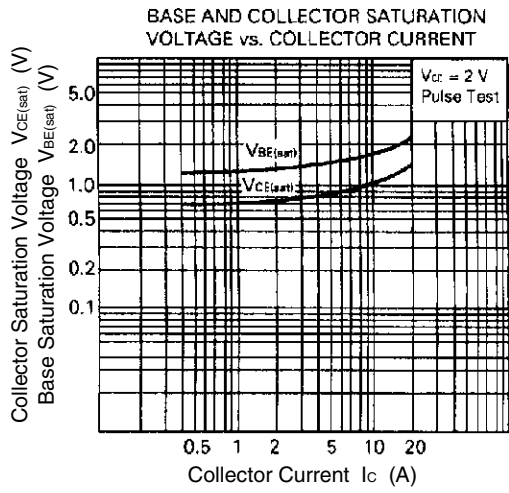
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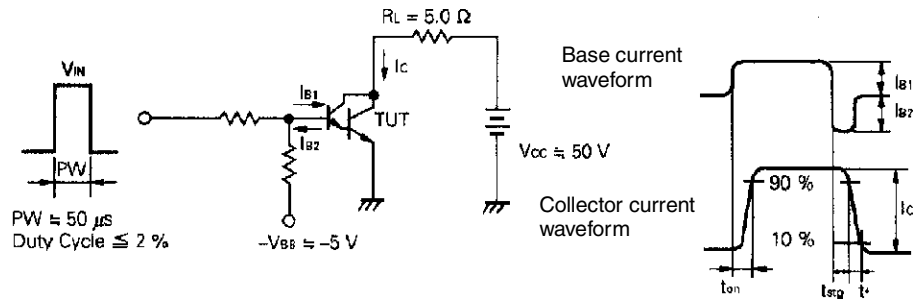


TYPICAL CHARACTERISTICS (Ta = 25°C)





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



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