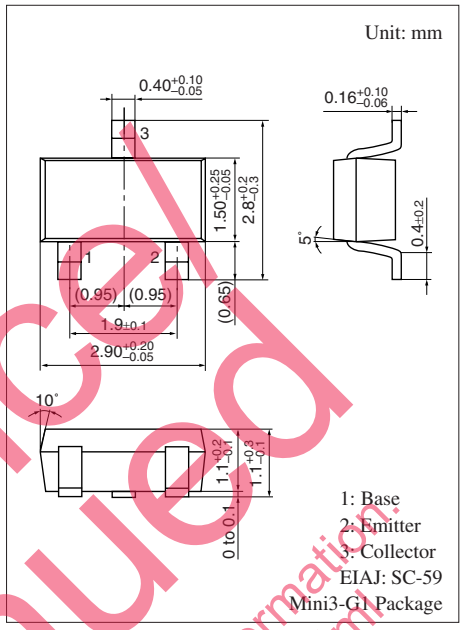
2SD1478, 2SD1478A

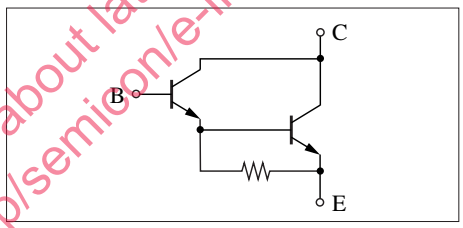
Silicon NPN epitaxial planar type darlington

For low-frequency amplification



Marking Symbol:
- 2SD1478: 2N
- 2SD1478A: 2O

Internal Connection



■ Features

- Forward current transfer ratio h_{FE} is designed high, which is appropriate to the driver circuit of motors and printer hammer
- A shunt resistor is omitted from the driver.

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter		Symbol	Rating	Unit
Collector-base voltage (Emitter open)	2SD1478	V_{CBO}	30	V
	2SD1478A		60	
Collector-emitter voltage (Base open)	2SD1478	V_{CEO}	25	V
	2SD1478A		50	
Emitter-base voltage (Collector open)		V_{EBO}	5	V
Collector current		I_C	500	mA
Peak collector current		I_{CP}	750	mA
Collector power dissipation		P_C	200	mW
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

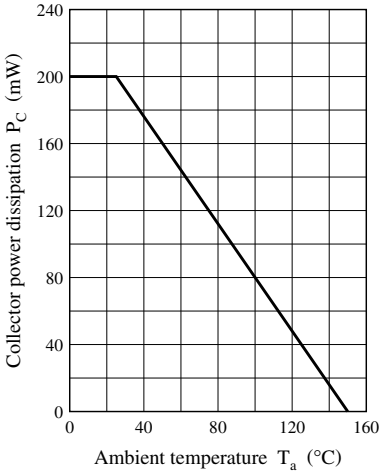
■ Electrical Characteristics $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	2SD1478	V_{CBO}	I_C = 100 µA, I_E = 0	30			V
	2SD1478A			60			
Collector-emitter voltage (Base open)	2SD1478	V_{CEO}	I_C = 1 mA, I_B = 0	25			V
	2SD1478A			50			
Emitter-base voltage (Collector open)		V_{EBO}	I_E = 100 µA, I_C = 0	5			V
Collector-base cutoff current (Emitter open)		I_{CBO}	V_{CB} = 25 V, I_E = 0			100	nA
Emitter-base cutoff current (Collector open)		I_{EBO}	V_{EB} = 4 V, I_C = 0			100	nA
Forward current transfer ratio *1, 2		h_{FE}	V_{CE} = 10 V, I_C = 500 mA	4000		20000	—
Collector-emitter saturation voltage *1		$V_{CE(sat)}$	I_C = 500 mA, I_B = 0.5 mA			2.5	V
Base-emitter saturation voltage *1		$V_{BE(sat)}$	I_C = 500 mA, I_B = 0.5 mA			3.0	V
Transition frequency		f_T	V_{CB} = 10 V, I_E = −50 mA, f = 200 MHz		200		MHz

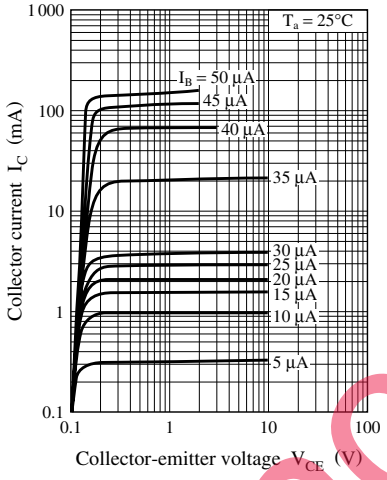
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. *1: Pulse measurement
*2: Rank classification

Rank	Q	R
h_{FE}	4000 to 10000	8000 to 20000

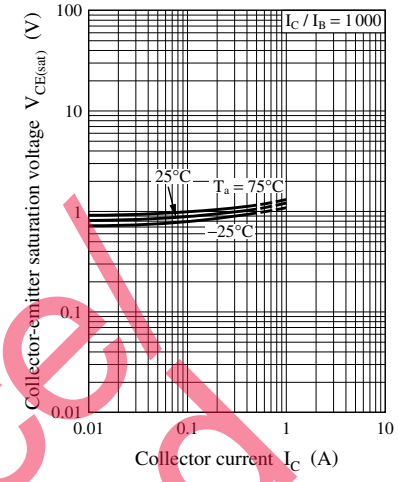
P_C — T_a



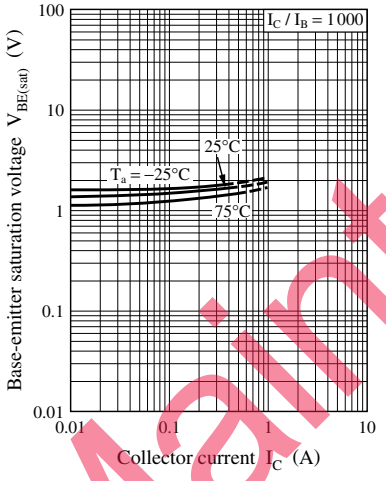
I_C — V_{CE}



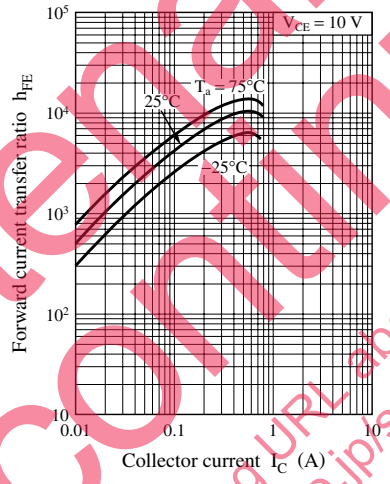
$V_{CE(sat)}$ — I_C



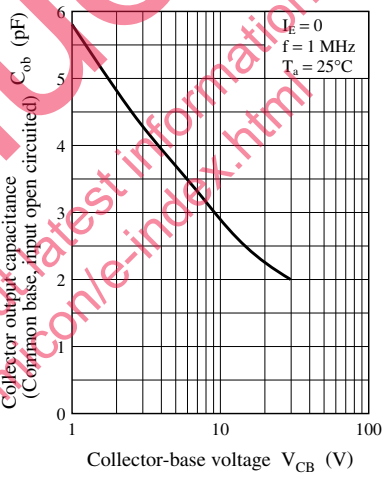
$V_{BE(sat)}$ — I_C



h_{FE} — I_C



C_{ob} — V_{CB}



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