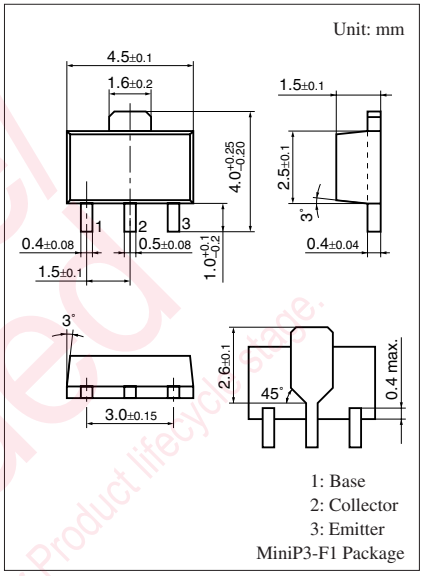
2SD1511

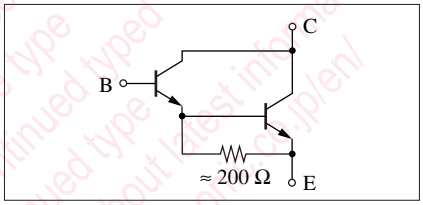
Silicon NPN epitaxial planar type darlington

For low-frequency output amplification



Marking Symbol: P

Internal Connection



■ Features

- Forward current transfer ratio h_{FE} is designed high, which is appropriate to the driver circuit of motors and printer hammer: $h_{FE} = 4000$ to 20000.
- A shunt resistor is omitted from the driver.
- Mini power type package, allowing downsizing of the equipment and automatic insertion through the tape packing and the magazine packing.

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	100	V
Collector-emitter voltage (Base open)	V_{CEO}	80	V
Emitter-base voltage (Collector open)	V_{EBO}	5	V
Collector current	I_C	1	A
Peak collector current	I_{CP}	1.5	A
Collector power dissipation *	P_C	1	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	–55 to +150	°C

Note) *: Printed circuit board: Copper foil area of 1 cm² or more, and the board thickness of 1.7 mm for the collector portion

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	$I_C = 100$ µA, $I_E = 0$	100			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 1$ mA, $I_B = 0$	80			V
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, $I_C = 1$ A	4000		40000	—
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_C = 1$ A, $I_B = 1$ mA			1.8	V
Base-emitter saturation voltage *1	$V_{BE(sat)}$	$I_C = 1$ A, $I_B = 1$ mA			2.2	V
Transition frequency	f_T	$V_{CB} = 10$ V, $I_E = -50$ mA, f = 200 MHz		150		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	S
h_{FE}	4000 to 10000	8000 to 20000	16000 to 40000

Maintenance/Discontinued
Maintenance/Discontinued includes following four Product lifecycle stage.
Planned maintenance type
maintenance type
Planned discontinued type
discontinued type
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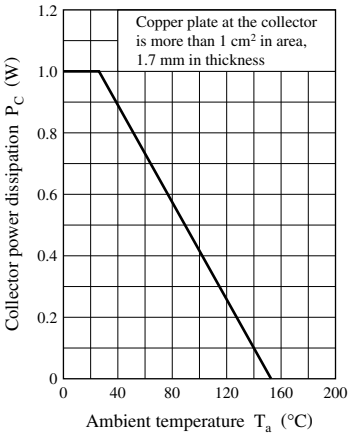
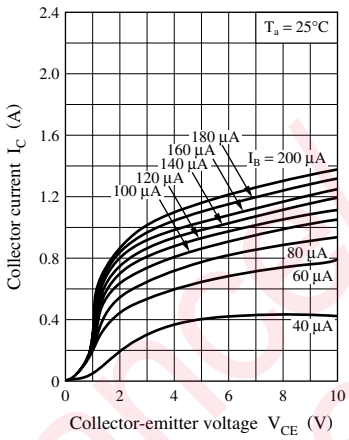
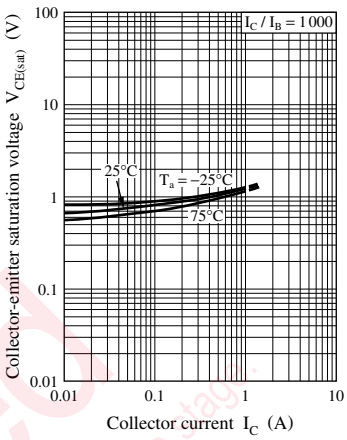
P_C — T_a



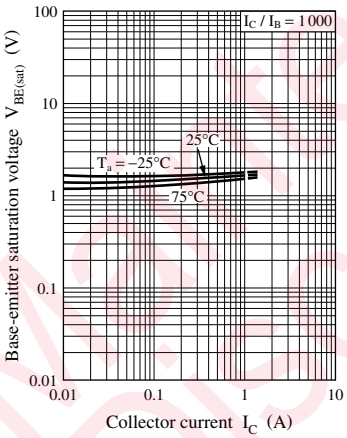
I_C — V_{CE}



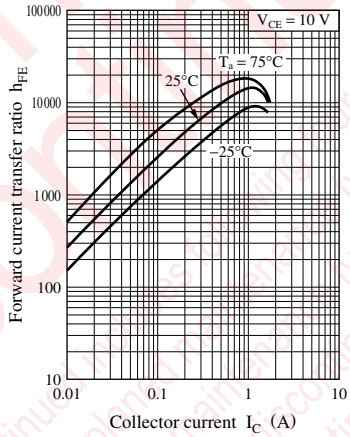
$V_{CE(sat)}$ — I_C



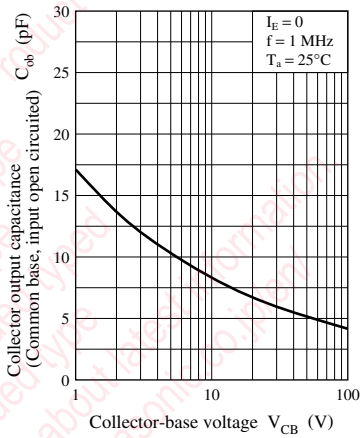
$V_{BE(sat)}$ — I_C



h_{FE} — I_C



C_{ob} — V_{CB}



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