

# Medium Power Transistor

## (Motor, Relay drive) (60±10V, 2A)

2SD2143 / 2SD1866

### ●Features

- 1) Built-in zener diode between collector and base.
- 2) Strong protection against reverse surges due to "L" loads.
- 3) Built-in resistor between base and emitter.
- 4) Built-in damper diode.

### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	60±10	V
Collector-emitter voltage	V <sub>CEO</sub>	60±10	V
Emitter-base voltage	V <sub>EB0</sub>	6	V
Collector current	I <sub>c</sub>	2	A (DC)
		3 *1	A (Pulse)
Collector power dissipation	P <sub>c</sub>	1	W
		10	W (T <sub>c</sub> =25°C)
		1 *2	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

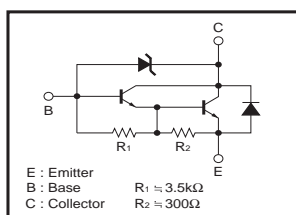
\*1 Single pulse Pw=100ms

\*2 Printed circuit board 1.7mm thick, collector plating 1cm<sup>2</sup> or larger.

### ●Packaging specifications and h<sub>FE</sub>

Type	2SD2143	2SD1866
Package	CPT3	ATV
h <sub>FE</sub>	1k to 10k	1k to 10k
Marking	-	-
Code	TL	TV2
Basic ordering unit (pieces)	2500	2500

### ●Inner circuit

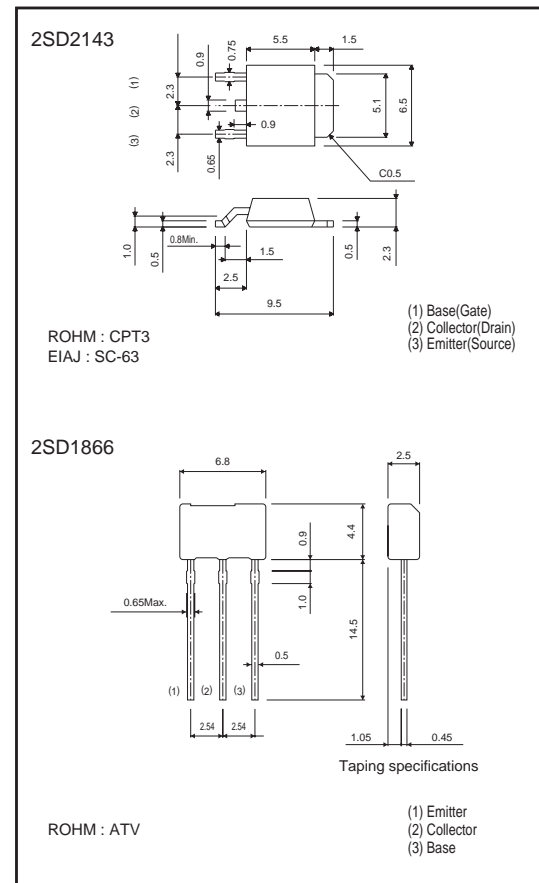


### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	50	-	70	V	I <sub>c</sub> =50μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	50	-	70	V	I <sub>c</sub> =5mA
Collector cutoff current	I <sub>cBO</sub>	-	-	1.0	μA	V <sub>CB</sub> =40V
Emitter cutoff current	I <sub>EB0</sub>	-	-	3	mA	V <sub>EB</sub> =5V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	-	1.5	V	I <sub>c</sub> /I <sub>B</sub> =1A/1mA
DC current transfer ratio	h <sub>FE</sub>	1000	-	10000	-	V <sub>CE</sub> =2V, I <sub>c</sub> =1A
Transition frequency	f <sub>r</sub>	-	80	-	MHz	V <sub>CE</sub> =5V, I <sub>E</sub> =-0.1A, f=30MHz
Output capacitance	C <sub>ob</sub>	-	25	-	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz

\* Measured using pulse current.

### ●Dimensions (Unit : mm)



●Electrical characteristics curves

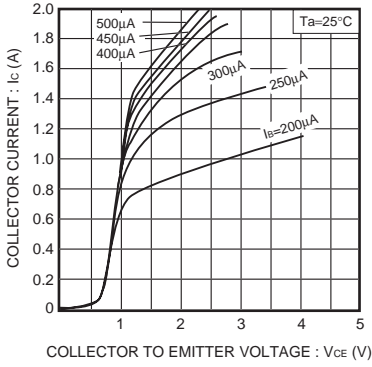


Fig.1 Grounded emitter output characteristics ( I )

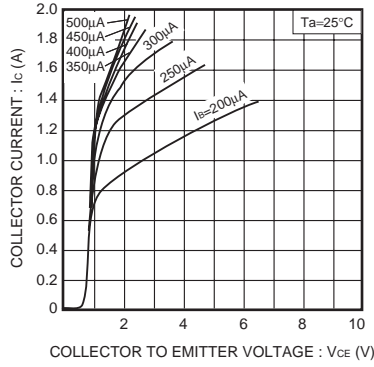


Fig.2 Grounded emitter output characteristics ( II )

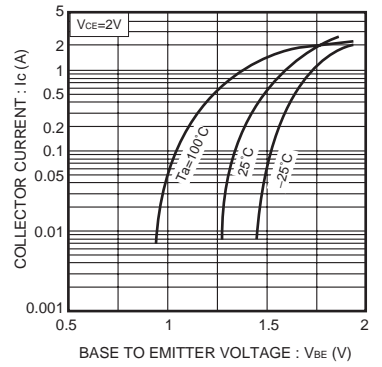


Fig.3 Grounded emitter propagation characteristics

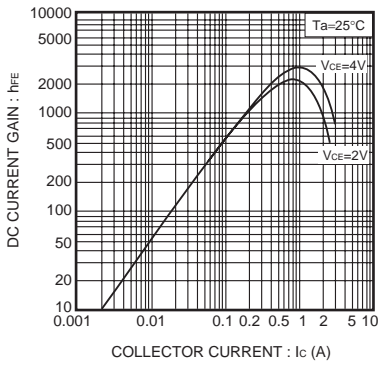


Fig.4 DC current gain vs. collector current ( I )

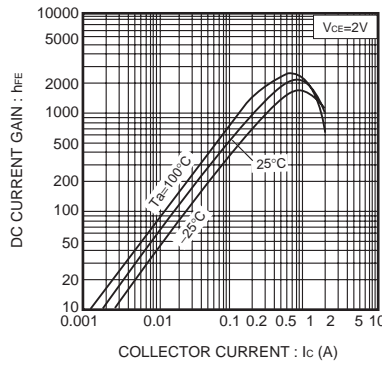


Fig.5 DC current gain vs. collector current ( II )

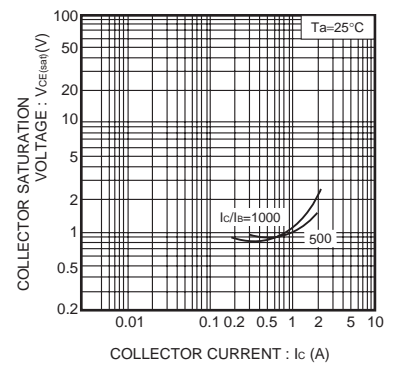


Fig.6 Collector-emitter saturation voltage vs. collector current

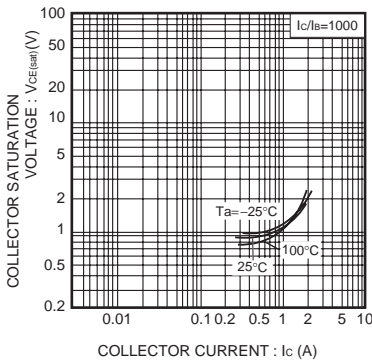


Fig.7 Collector-emitter saturation voltage vs. collector current

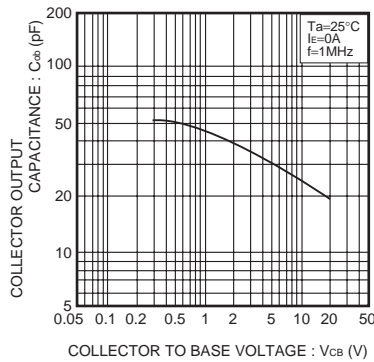


Fig.8 Collector output capacitance vs. collector-base voltage

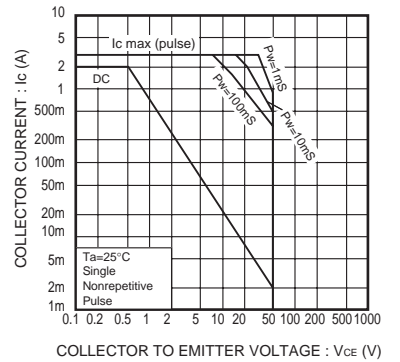


Fig.9 Safe operating area (A. S. O) 2SD2143 (CPT)

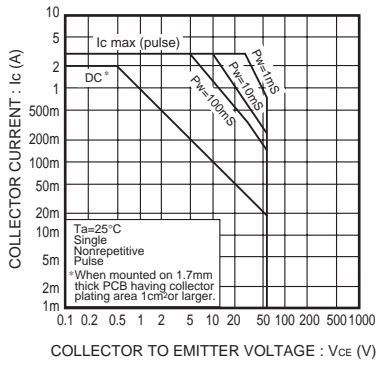


Fig.10 Safe operating area (A. S. O)  
2SD1866 (ATV)

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