

Medium Power Transistor (Motor, Relay drive) (60±10V, 2A) 2SD2212 / 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)

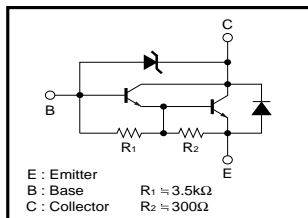
Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CB0}	60±10	V
Collector-emitter voltage	V _{CE0}	60±10	V
Emitter-base voltage	V _{EB0}	6	V
Collector current	I _c	2	A (DC)
		3 *1	A (Pulse)
Collector power dissipation	P _c	0.5	W
		2 *2	W
		1	W
		10	W (Tc=25°C)
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

*1 Single pulse Pw=100ms
 *2 When mounted on a 40×40×0.7mm ceramic board.
 *3 Printed circuit board 1.7mm thick, collector plating 1cm² or larger.

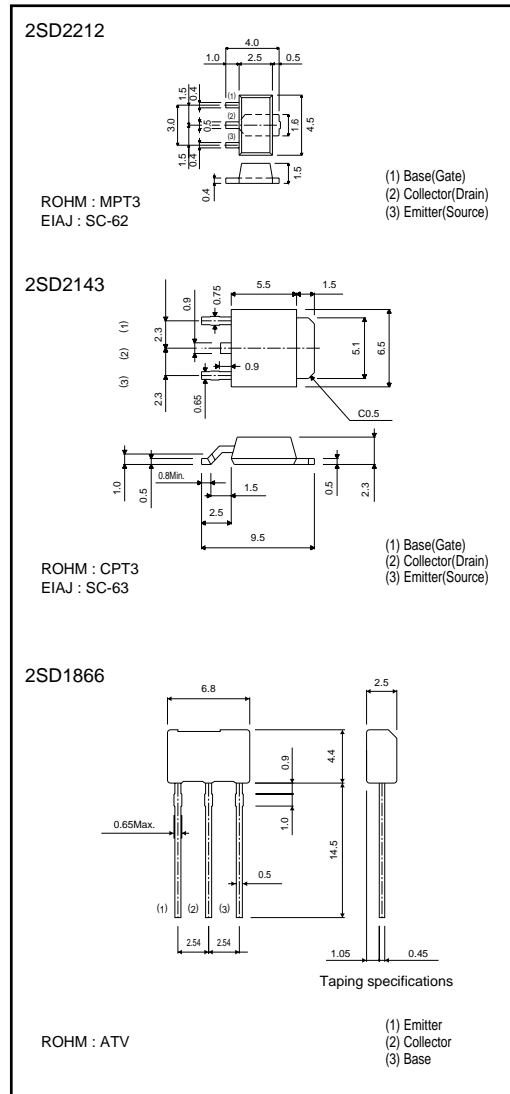
●Packaging specifications and hFE

Type	2SD2212	2SD2143	2SD1866
Package	MPT3	CPT3	ATV
hFE	1k to 10k	1k to 10k	1k to 10k
Marking	DR	-	-
Code	T100	TL	TV2
Basic ordering unit (pieces)	1000	2500	2500

●Equivalent circuit



●External dimensions (Unit : mm)



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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	—	70	V	$I_C=50\mu A$
Collector-emitter breakdown voltage	BV_{CEO}	50	—	70	V	$I_C=5mA$
Collector cutoff current	I_{CBO}	—	—	1.0	μA	$V_{CE}=40V$
Emitter cutoff current	I_{EBO}	—	—	3	mA	$V_{EB}=5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	$I_C/I_B=1A/1mA$ *
DC current transfer ratio	h_{FE}	1000	—	10000	—	$V_{CE}=2V, I_C=1A$
Transition frequency	f_t	—	80	—	MHz	$V_{CE}=5V, I_E=-0.1A, f=30MHz$
Output capacitance	C_{ob}	—	25	—	pF	$V_{CB}=10V, I_E=0A, f=1MHz$

* Measured using pulse current.

●Electrical characteristics curves

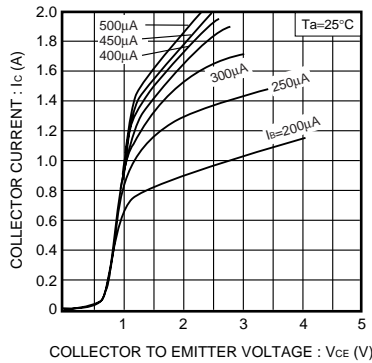


Fig.1 Grounded emitter output characteristics (I)

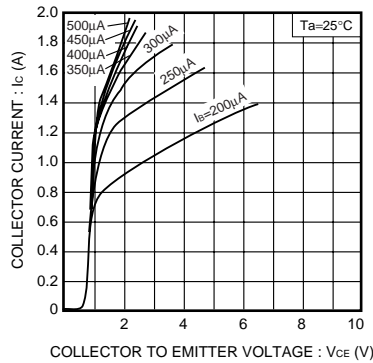


Fig.2 Grounded emitter output characteristics (II)

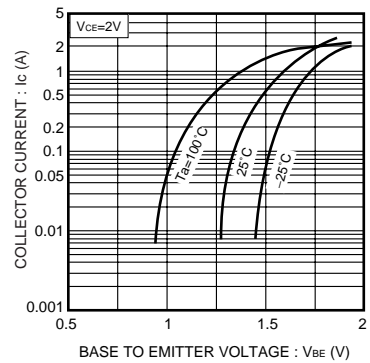


Fig.3 Grounded emitter propagation characteristics

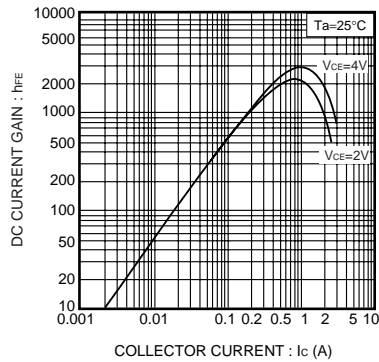


Fig.4 DC current gain vs. collector current (I)

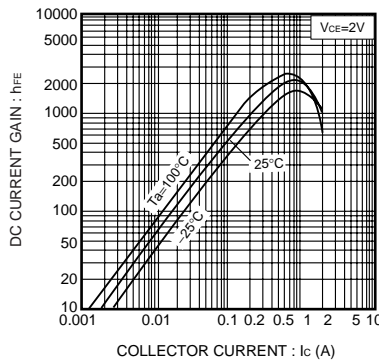


Fig.5 DC current gain vs. collector current (II)

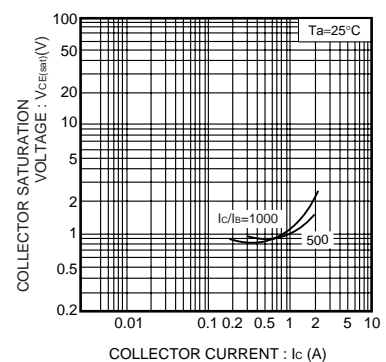


Fig.6 Collector-emitter saturation voltage vs. collector current

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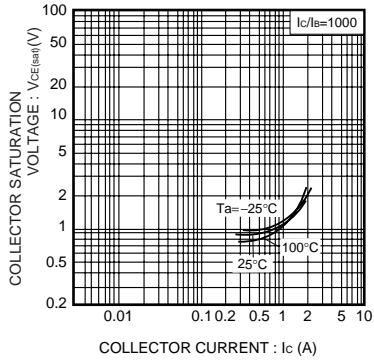


Fig.7 Collector-emitter saturation voltage vs. collector current

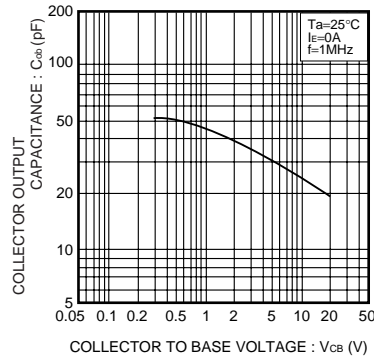


Fig.8 Collector output capacitance vs. collector-base voltage

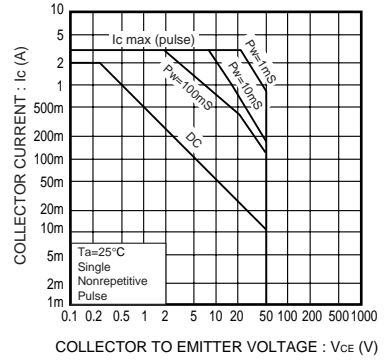


Fig.9 Safe operating area (A. S. O) 2SD2212 (MPT)

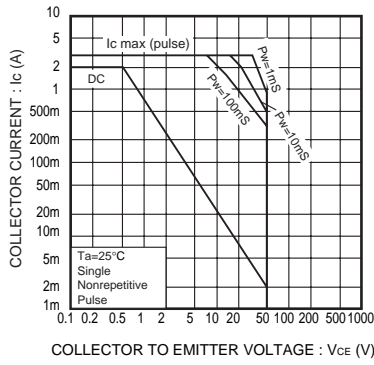


Fig.10 Safe operating area (A. S. O) 2SD2143 (CPT)

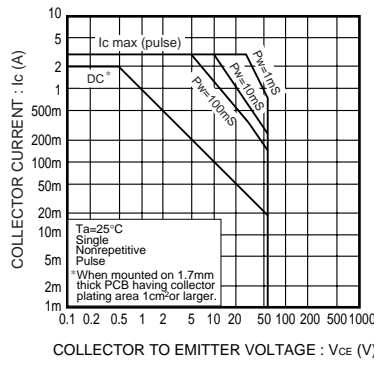


Fig.11 Safe operating area (A. S. O) 2SD1866 (ATV)

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