

# 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)

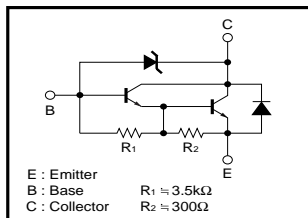
Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	60±10	V
Collector-emitter voltage	V <sub>CE0</sub>	60±10	V
Emitter-base voltage	V <sub>EB0</sub>	6	V
Collector current	I <sub>c</sub>	2	A (DC)
		3 *1	A (Pulse)
Collector power dissipation	P <sub>c</sub>	0.5	W
		2 *2	W
		1	W
		10	W (Tc=25°C)
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-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 1cm<sup>2</sup> 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)

**2SD2212**

ROHM : MPT3  
EIAJ : SC-62

(1) Base(Gate)  
(2) Collector(Drain)  
(3) Emitter(Source)

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**2SD2143**

ROHM : CPT3  
EIAJ : SC-63

(1) Base(Gate)  
(2) Collector(Drain)  
(3) Emitter(Source)

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**2SD1866**

ROHM : ATV

(1) Emitter  
(2) Collector  
(3) Base

Taping specifications

Transistors

●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	$\mu A$	$V_{CE}=40V$
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

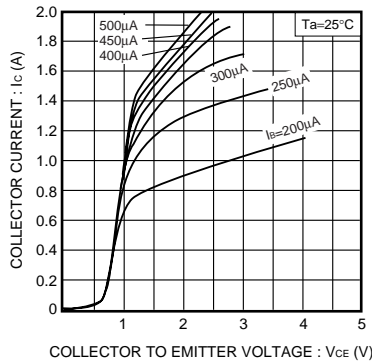


Fig.1 Grounded emitter output characteristics ( I )

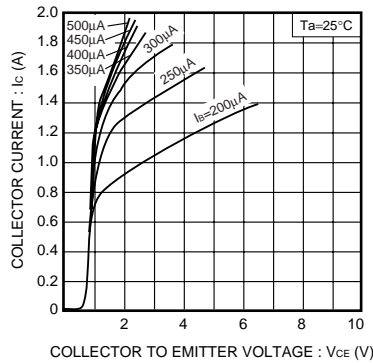


Fig.2 Grounded emitter output characteristics ( II )

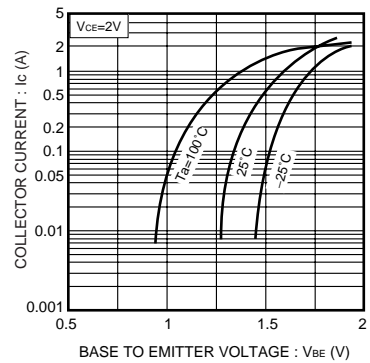


Fig.3 Grounded emitter propagation characteristics

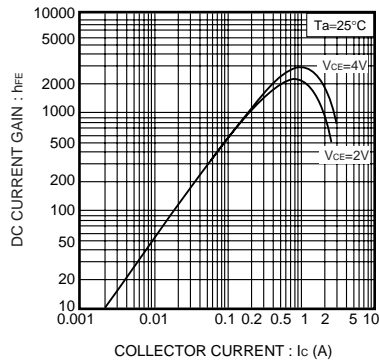


Fig.4 DC current gain vs. collector current ( I )

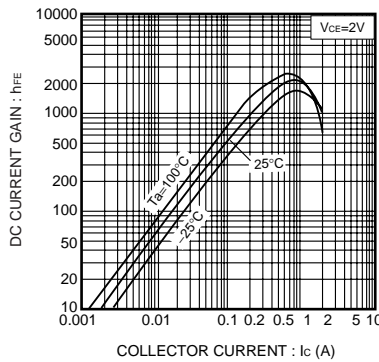


Fig.5 DC current gain vs. collector current ( II )

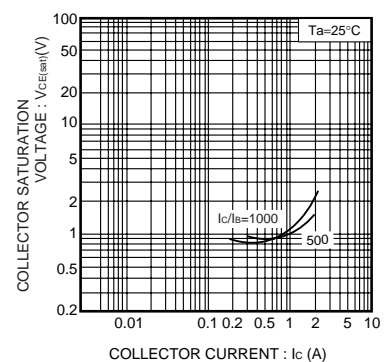


Fig.6 Collector-emitter saturation voltage vs. collector current

Transistors

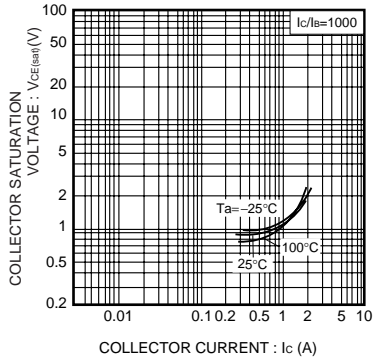


Fig.7 Collector-emitter saturation voltage vs. collector current

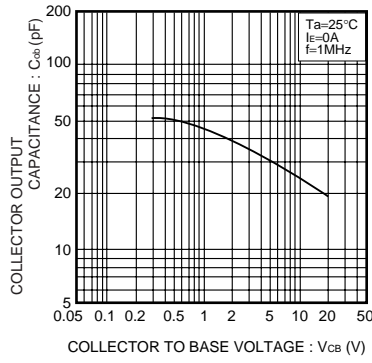


Fig.8 Collector output capacitance vs. collector-base voltage

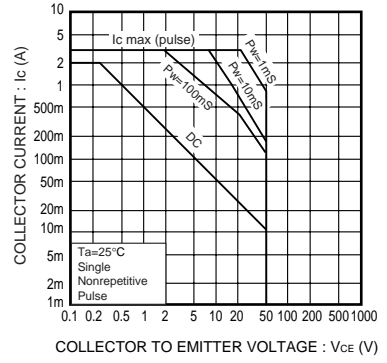


Fig.9 Safe operating area (A. S. O) 2SD2212 (MPT)

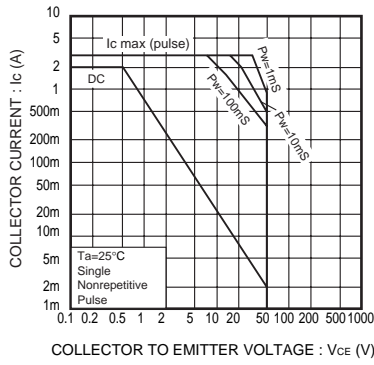


Fig.10 Safe operating area (A. S. O) 2SD2143 (CPT)

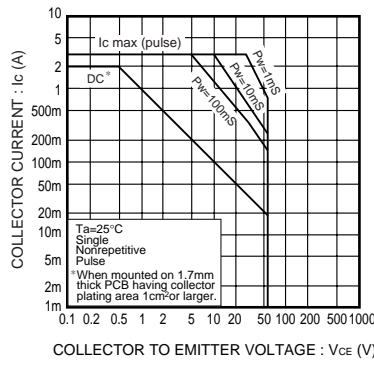


Fig.11 Safe operating area (A. S. O) 2SD1866 (ATV)

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