

# Medium Power Transistor

## (Motor, Relay drive) ( $60 \pm 10\text{V}$ , 2A)

**2SD2143**

### ●Features

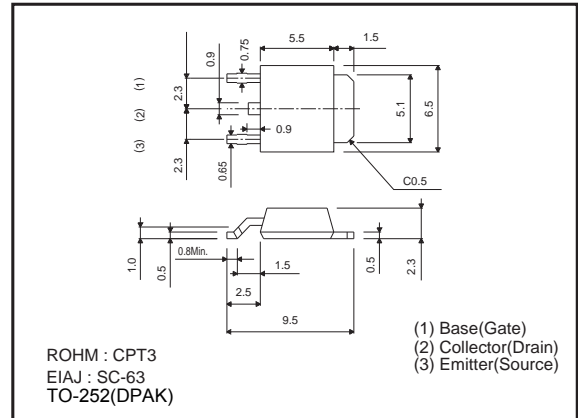
- 1) Built-in zener diode between collector and base.
- 2) Strong protection against reverse surges due to "L" loads.
- 3) Built-in resistor between base and emitter.
- 4) Built-in damper diode.

### ●Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	$60 \pm 10$	V
Collector-emitter voltage	$V_{CE0}$	$60 \pm 10$	V
Emitter-base voltage	$V_{EB0}$	6	V
Collector current	$I_C$	2	A (DC)
		3 *1	A (Pulse)
Collector power dissipation	$P_C$	1	W
		10	W ( $T_C=25^\circ\text{C}$ )
Junction temperature	$T_J$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	$-55$ to $+150$	$^\circ\text{C}$

 \*1 Single pulse  $P_W=100\text{ms}$ 

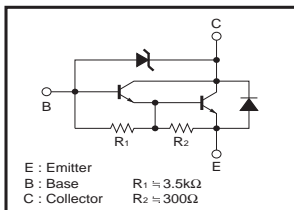
### ●Dimensions (Unit : mm)



### ●Packaging specifications and $h_{FE}$

Type	2SD2143
Package	CPT3
$h_{FE}$	1k to 10k
Marking	—
Code	TL
Basic ordering unit (pieces)	2500

### ●Inner circuit



### ●Electrical characteristics ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	50	—	70	V	$I_C=50\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CE0}$	50	—	70	V	$I_C=5\text{mA}$
Collector cutoff current	$I_{CBO}$	—	—	1.0	$\mu\text{A}$	$V_{CB}=40\text{V}$
Emitter cutoff current	$I_{EBO}$	—	—	3	mA	$V_{EB}=5\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	$I_C/I_E=1\text{A}/1\text{mA}$ *
DC current transfer ratio	$h_{FE}$	1000	—	10000	—	$V_{CE}=2\text{V}$ , $I_C=1\text{A}$
Transition frequency	$f_T$	—	80	—	MHz	$V_{CE}=5\text{V}$ , $I_E=-0.1\text{A}$ , $f=30\text{MHz}$
Output capacitance	$C_{ob}$	—	25	—	pF	$V_{CB}=10\text{V}$ , $I_E=0\text{A}$ , $f=1\text{MHz}$

\* Measured using pulse current.

# ●Electrical characteristics curves

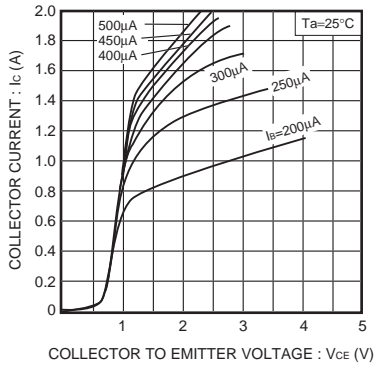


Fig.1 Grounded emitter output characteristics ( I )

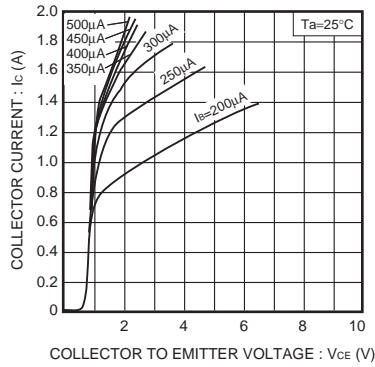


Fig.2 Grounded emitter output characteristics ( II )

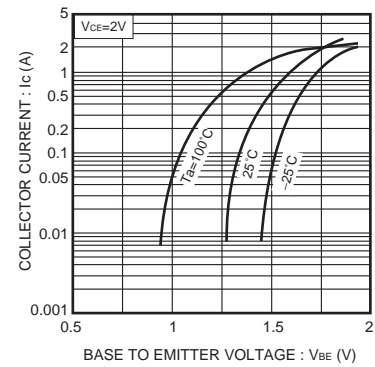


Fig.3 Grounded emitter propagation characteristics

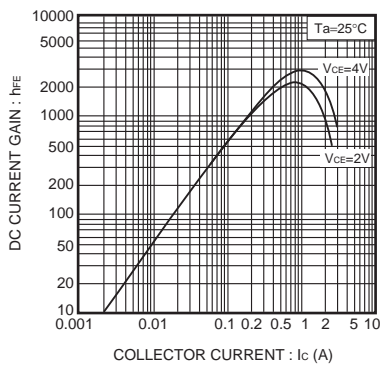


Fig.4 DC current gain vs. collector current ( I )

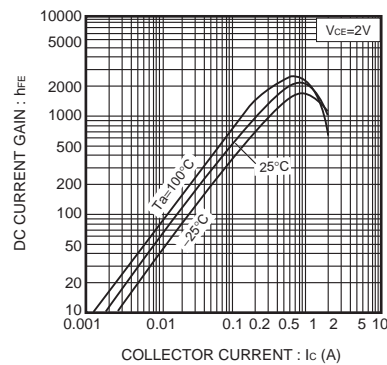


Fig.5 DC current gain vs. collector current ( II )

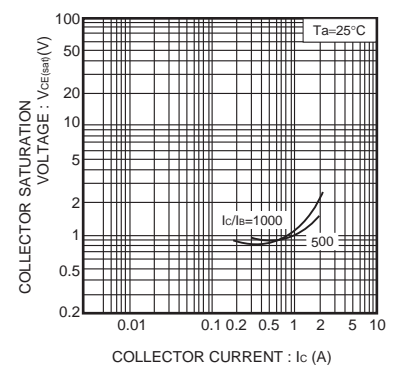


Fig.6 Collector-emitter saturation voltage vs. collector current

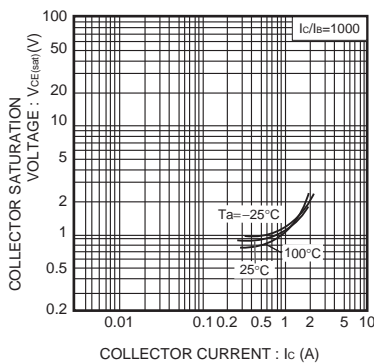


Fig.7 Collector-emitter saturation voltage vs. collector current

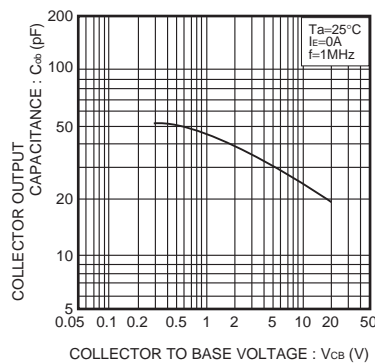


Fig.8 Collector output capacitance vs. collector-base voltage

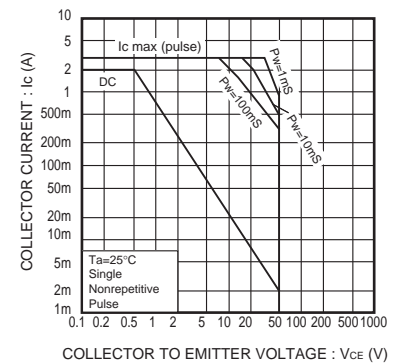


Fig.9 Safe operating area (A. S. O) 2SD2143 (CPT)

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