

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

# 2SD1160

SWITCHING APPLICATIONS

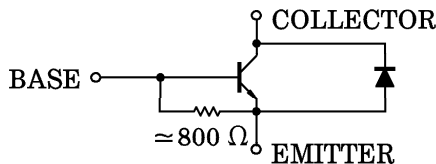
SUITABLE FOR MOTOR DRIVE APPLICATIONS

- High DC Current Gain
- Low Saturation Voltage : 0.6 V MAX. @
- Built-in Free Wheel Diode

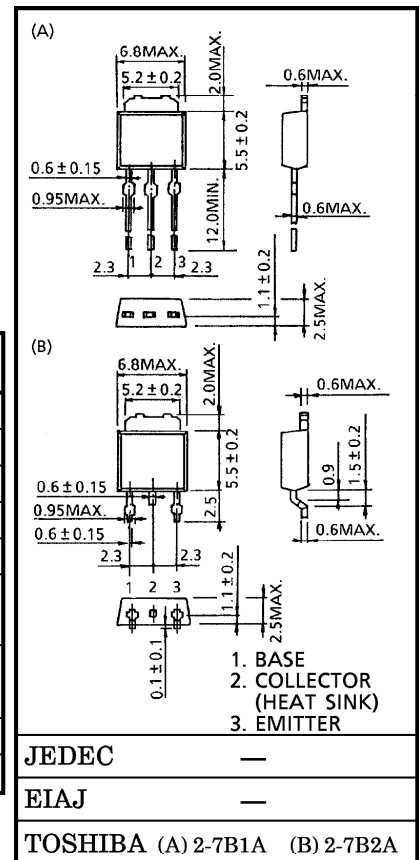
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V <sub>CB0</sub>	50	V
Collector-Emitter Voltage		V <sub>CE0</sub>	20	V
Emitter-Base Voltage		V <sub>EB0</sub>	6	V
Collector Current	DC	I <sub>C</sub>	2	A
	Pulse	I <sub>CP</sub>	4	A
Diode Forward Surge Current (t = 1 s)		I <sub>FP</sub>	1	A
Collector Power Dissipation	Ta = 25°C	P <sub>C</sub>	1.0	W
	Tc = 25°C		10	
Junction Temperature		T <sub>j</sub>	150	°C
Storage Temperature Range		T <sub>stg</sub>	-55~150	°C

EQUIVALENT CIRCUIT



Unit in mm



Weight : 0.36 g

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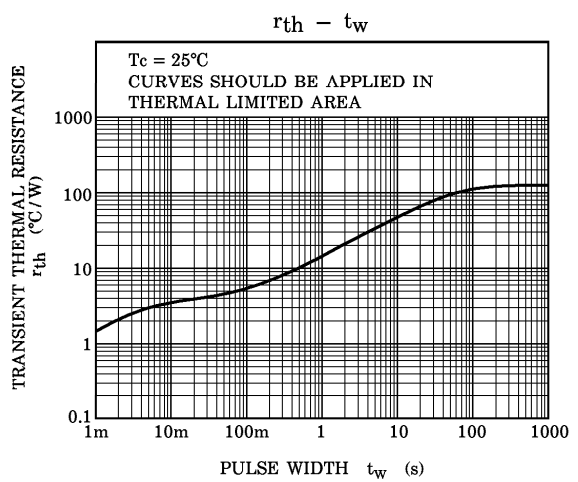
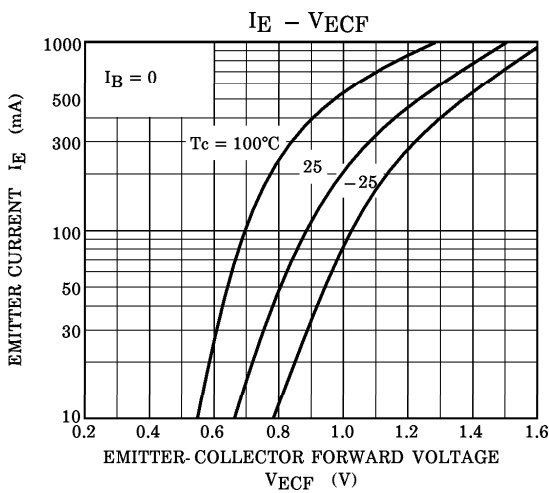
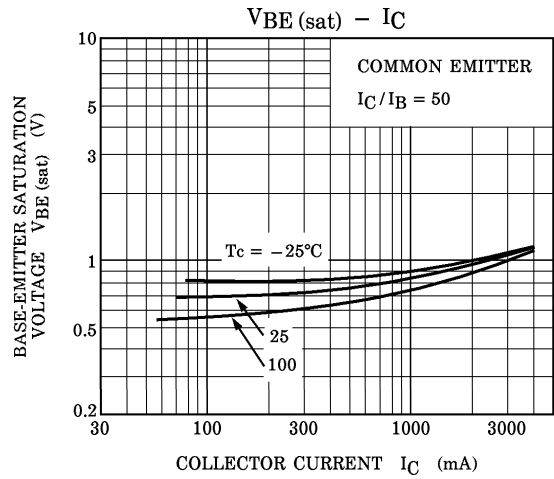
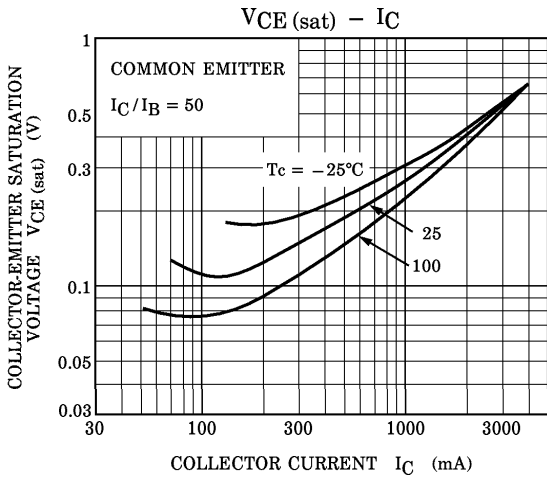
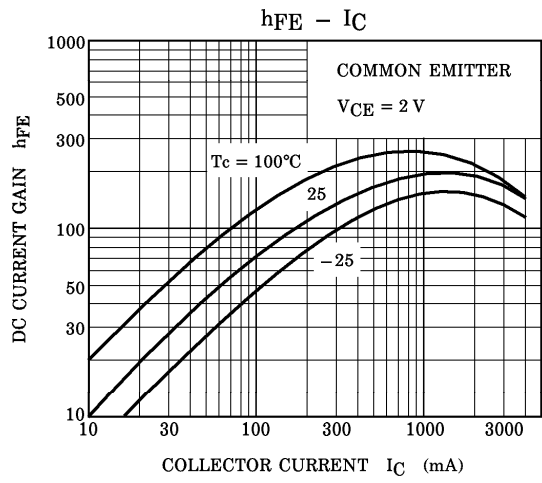
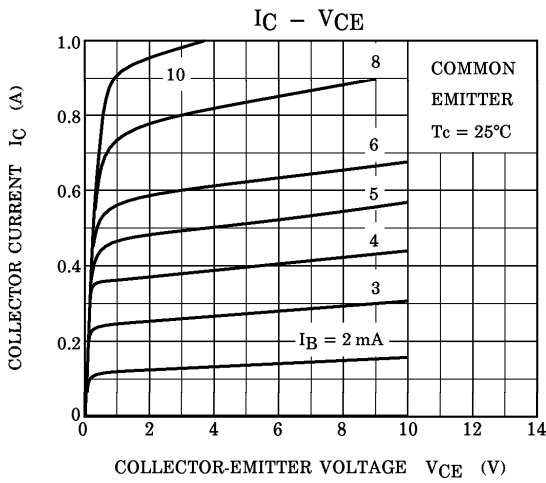
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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0$	—	—	1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$	2.5	6.25	15	mA
Collector-Emitter Sustaining Voltage	$V_{CEO}(\text{SUS})$	$I_C = 20\text{ mA}, L = 40\text{ mH}$	20	—	—	V
DC Current Gain	$h_{FE}(1)$ (Note)	$V_{CE} = 2\text{ V}, I_C = 1\text{ A}$	100	—	300	
DC Current Gain	$h_{FE}(2)$	$V_{CE} = 2\text{ V}, I_C = 2\text{ A}$	60	—	—	
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 2\text{ A}, I_B = 40\text{ mA}$	—	0.4	0.6	V
Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C = 2\text{ A}, I_B = 40\text{ mA}$	—	—	1.5	V
Diode Forward Voltage	$V_{ECF}$	$I_E = 1\text{ A}, I_B = 0$	—	—	2.0	V

Note 1 : According to the value of  $h_{FE}(1)$ , 2SD1160 is classified as follows.

CLASSIFICATION	MIN.	MAX.
2SD1160-O	100	200
2SD1160-Y	150	300



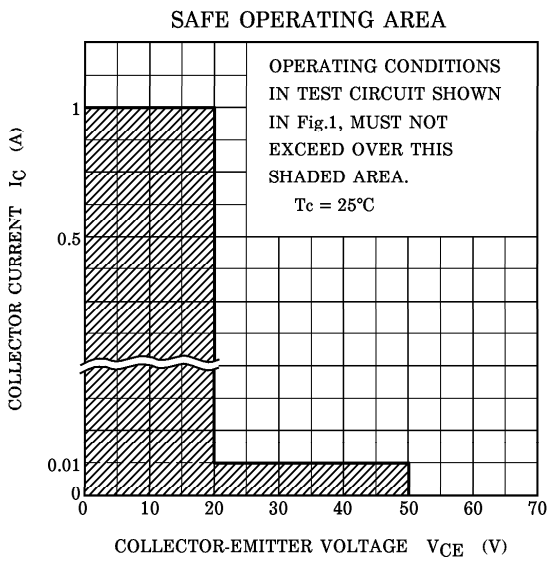


Fig.1 SAFE OPERATING AREA TEST CIRCUIT

