

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

# 2SA1160

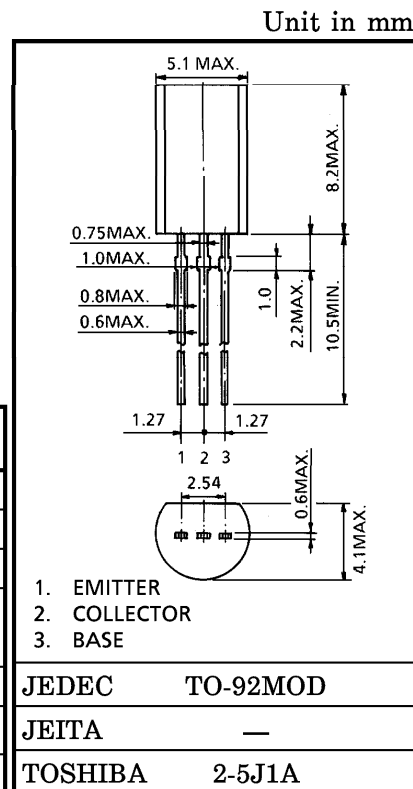
STROBE FLASH APPLICATIONS

MEDIUM POWER AMPLIFIER APPLICATIONS

- High DC Current Gain and Excellent  $h_{FE}$  Linearity  
 :  $h_{FE(1)} = 140 \sim 600$  ( $V_{CE} = -1V, I_C = -0.5A$ )  
 :  $h_{FE(2)} = 60$  (Min.), 120 (Typ.) ( $V_{CE} = -1V, I_C = -4A$ )
- Low Saturation Voltage  
 :  $V_{CE(sat)} = -0.5V$  (Max.) ( $I_C = -2A, I_B = -50mA$ )

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CB0}$	-20	V
Collector-Emitter Voltage	$V_{CEO}$	-10	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Collector Current	DC $I_C$	-2	A
	Pulsed (Note 1) $I_{CP}$	-4	
Base Current	$I_B$	-2	A
Collector Power Dissipation	$P_C$	900	mW
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ C$



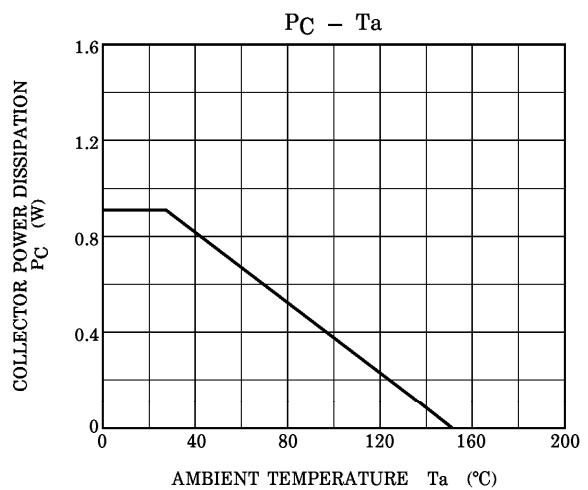
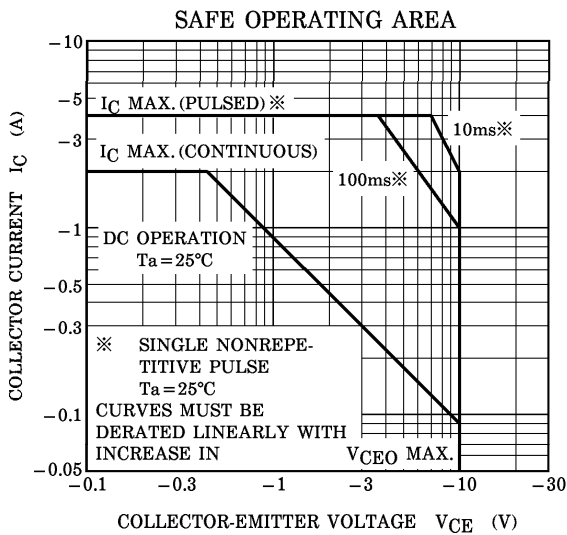
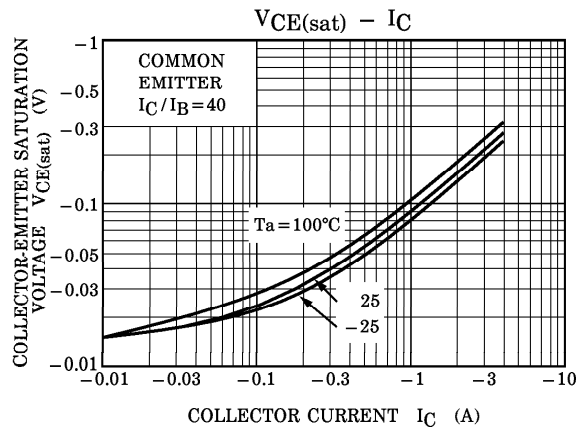
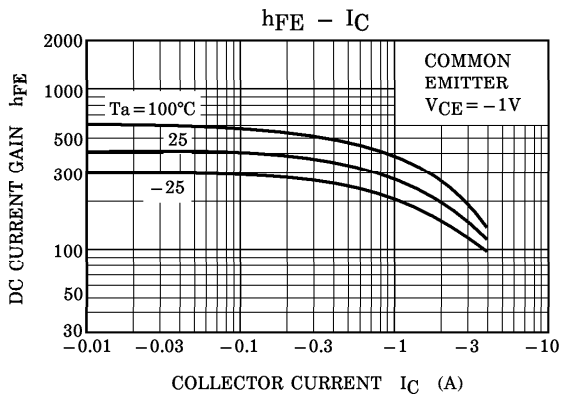
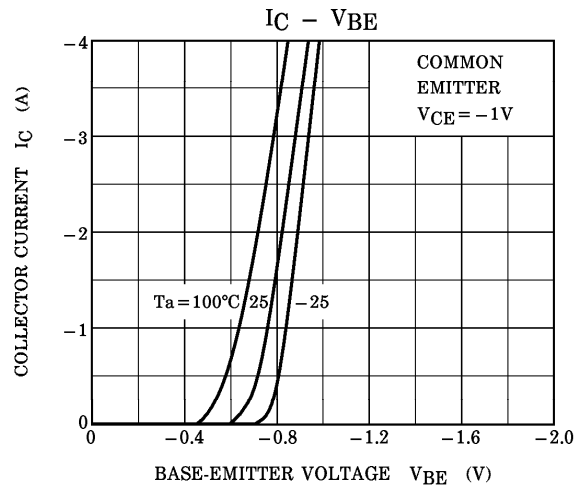
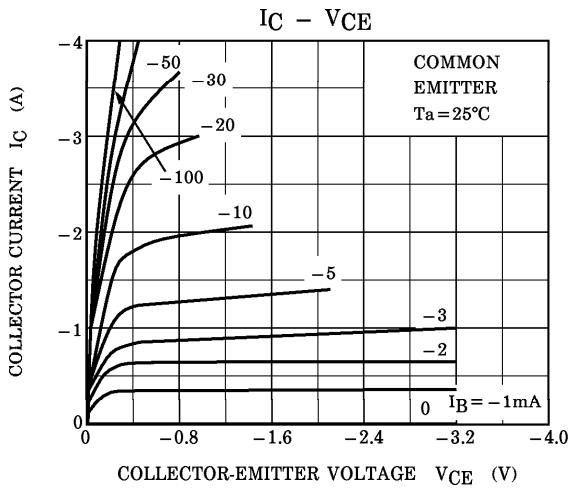
Weight : 0.36g (Typ.)

(Note 1) : Pulse Width = 10ms (Max.), Duty Cycle = 30% (Max.)

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CB0}$	$V_{CB} = -20V, I_E = 0$	—	—	-100	nA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = -6V, I_C = 0$	—	—	-100	nA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -10mA, I_B = 0$	-10	—	—	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -1mA, I_C = 0$	-6	—	—	V
DC Current Gain	$h_{FE(1)}$ (Note 2)	$V_{CE} = -1V, I_C = -0.5A$	140	—	600	
	$h_{FE(2)}$	$V_{CE} = -1V, I_C = -4A$	60	120	—	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -2A, I_B = -50mA$	—	-0.20	-0.50	V
Base-Emitter Voltage	$V_{BE}$	$V_{CE} = -1V, I_C = -2A$	—	-0.83	-1.5	V
Transition Frequency	$f_T$	$V_{CE} = -1V, I_C = -0.5A$	—	140	—	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	50	—	pF

(Note 2) :  $h_{FE(1)}$  Classification    A : 140~280,    B : 200~400,    C : 300~600



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