

2SA1680

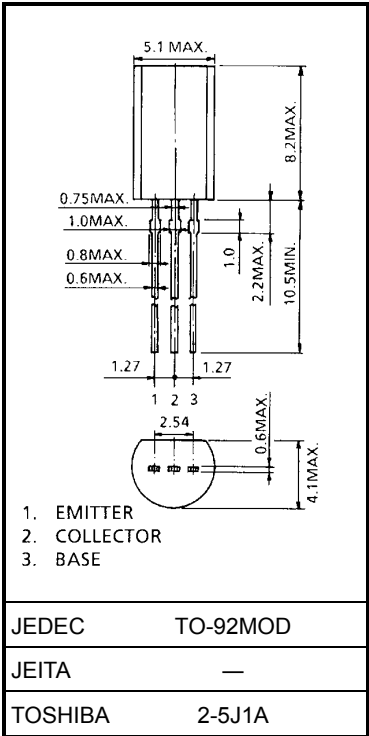
Power Amplifier Applications  
Power Switching Applications

Unit: mm

- Low collector-emitter saturation voltage:  $V_{CE(sat)} = -0.5\text{ V (max)}$   
( $I_C = -1\text{ A}$ )
- High collector power dissipation:  $P_C = 900\text{ mW (Ta = 25 °C)}$
- High-speed switching:  $t_{stg} = 300\text{ ns (typ.)}$
- Complementary to 2SC4408.

Absolute Maximum Ratings (Ta = 25°C)

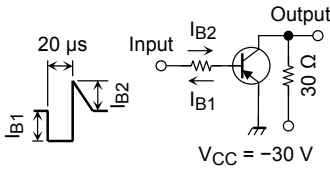
Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-60	V
Collector-emitter voltage	$V_{CEO}$	-50	V
Emitter-base voltage	$V_{EBO}$	-6	V
Collector current	$I_C$	-2	A
Base current	$I_B$	-0.2	A
Collector power dissipation	$P_C$	900	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°C



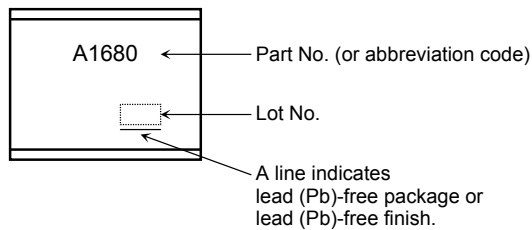
Weight: 0.36 g (typ.)

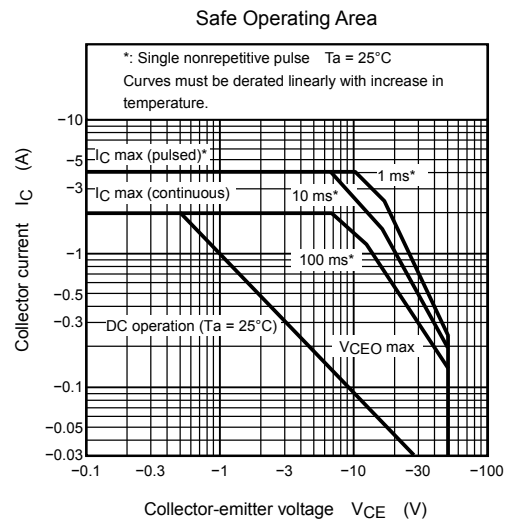
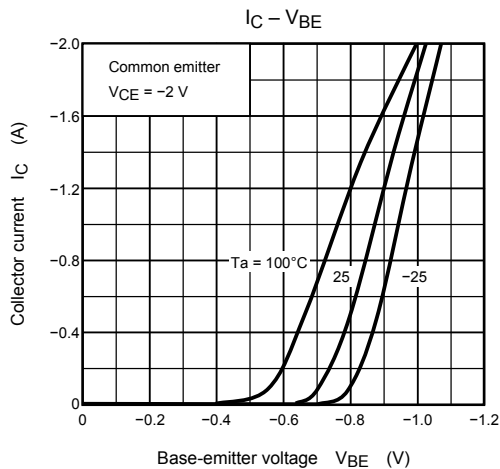
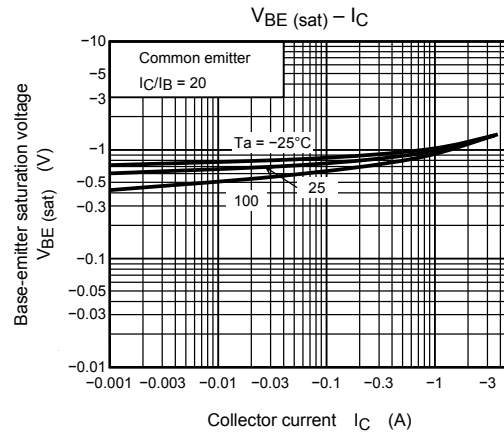
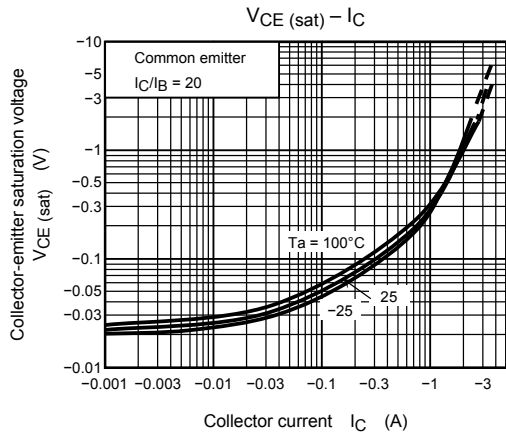
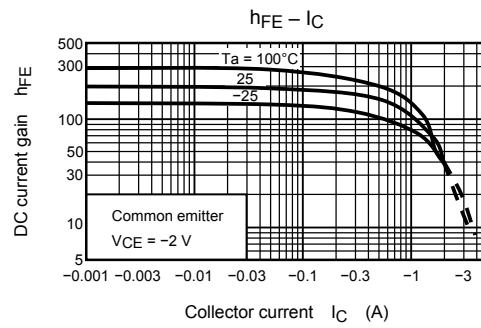
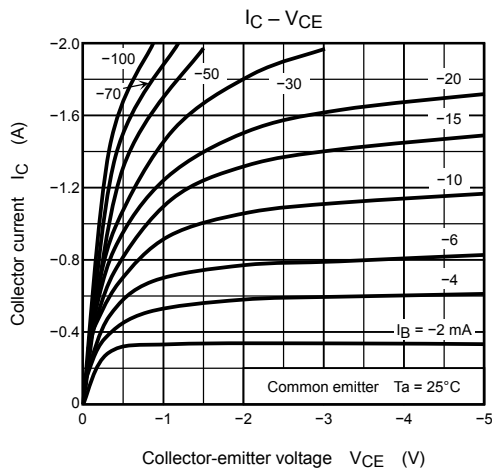
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.  
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = -60 \text{ V}, I_E = 0$	—	—	-1.0	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = -6 \text{ V}, I_C = 0$	—	—	-1.0	$\mu\text{A}$
Collector-emitter breakdown voltage		$V_{(BR) CEO}$	$I_C = -10 \text{ mA}, I_B = 0$	-50	—	—	V
DC current gain		$h_{FE} (1)$	$V_{CE} = -2 \text{ V}, I_C = -100 \text{ mA}$	120	—	400	
		$h_{FE} (2)$	$V_{CE} = -2 \text{ V}, I_C = -1.5 \text{ A}$	40	—	—	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = -1 \text{ A}, I_B = -0.05 \text{ A}$	—	—	-0.5	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = -1 \text{ A}, I_B = -0.05 \text{ A}$	—	—	-1.2	V
Transition frequency		$f_T$	$V_{CE} = -2 \text{ V}, I_C = -100 \text{ mA}$	—	100	—	MHz
Collector output capacitance		$C_{ob}$	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	23	—	pF
Switching time	Turn-on time	$t_{on}$	 <p><math>-I_{B1} = I_{B2} = 0.05 \text{ A}, \text{ duty cycle } \leq 1\%</math></p>	—	0.1	—	$\mu\text{s}$
	Storage time	$t_{stg}$		—	0.3	—	
	Fall time	$t_f$		—	0.1	—	

## Marking





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