

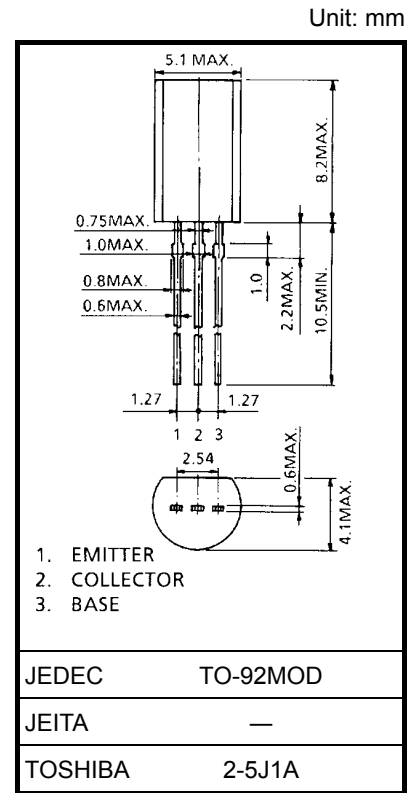
2SA1680

Power Amplifier Applications
 Power Switching Applications

- 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



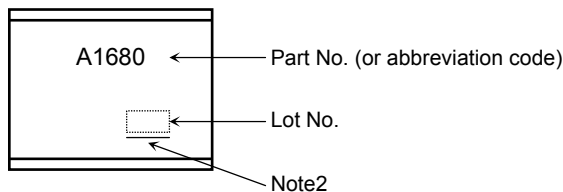
Weight: 0.36 g (typ.)

Note1: 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	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = -6\text{ V}, I_C = 0$	—	—	-1.0	μA
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>$I_{B1} = 0.05\text{ A}, I_{B2} = 0.05\text{ A}$ duty cycle $\leq 1\%$</p>	—	0.1	—	μs
	Storage time	t_{stg}		—	0.3	—	
	Fall time	t_f		—	0.1	—	

Marking

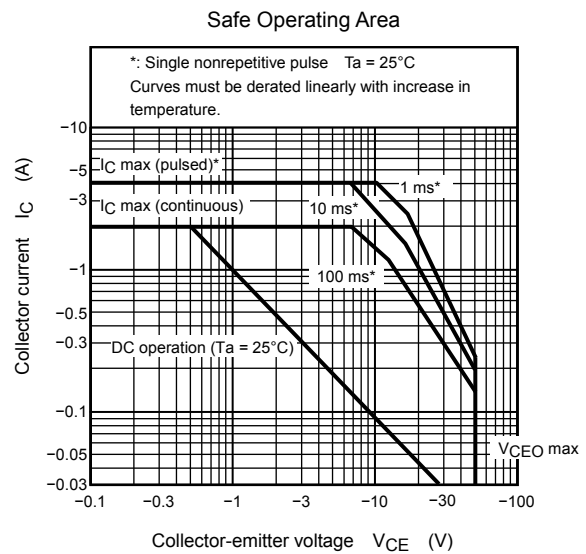
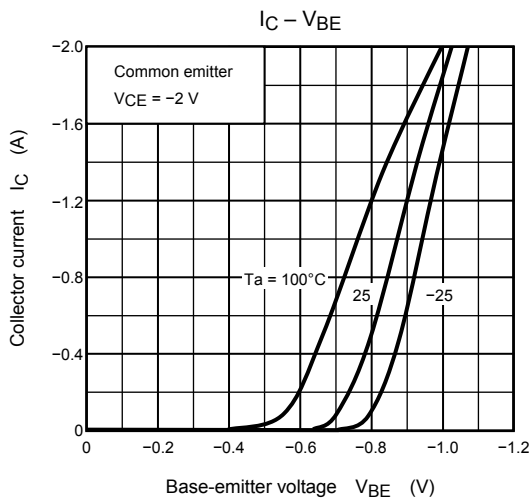
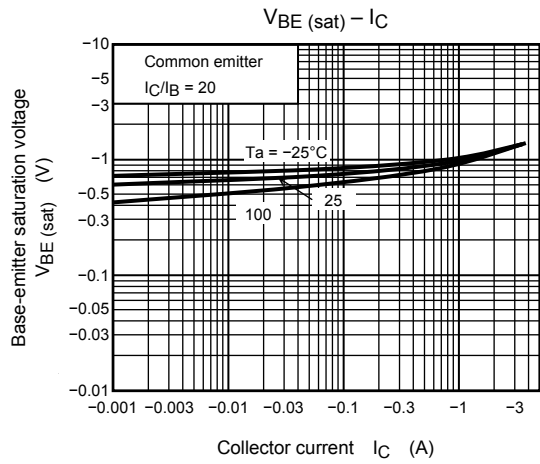
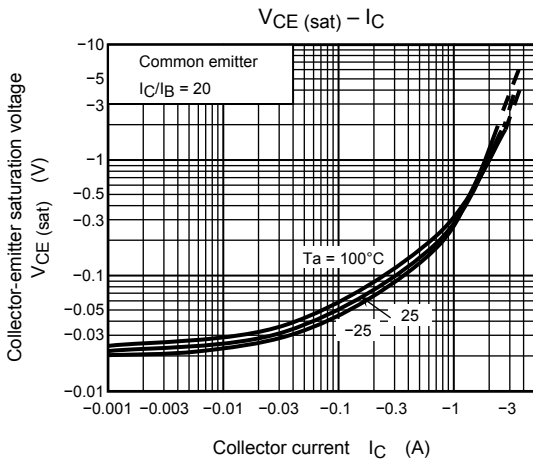
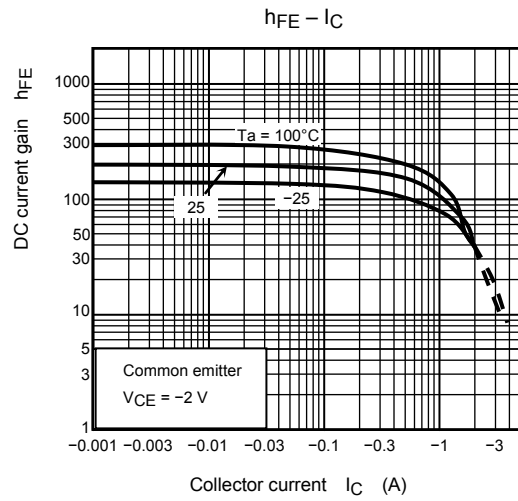
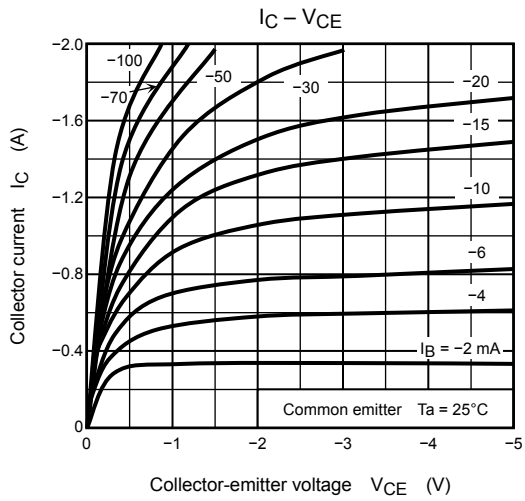


Note2: A line under a Lot No. identifies the indication of product Labels.

Not underlined: $[[Pb]]/INCLUDES > MCV$

Underlined: $[[G]]/RoHS COMPATIBLE$ or $[[G]]/RoHS [[Pb]]$

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



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