

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

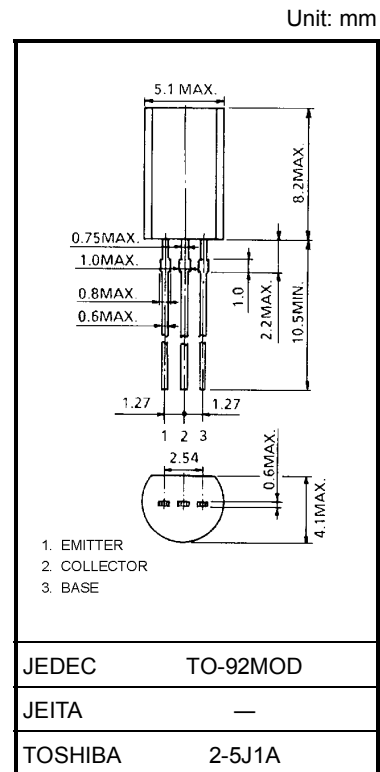
# 2SA1013

Color TV Vertical Deflection Output Applications  
Power Switching Applications

- High voltage:  $V_{CEO} = -160$  V
- Large continuous collector current capability
- Recommended for vertical deflection output & sound output applications for line-operated TV.
- Complementary to 2SC2383.

### Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-160	V
Collector-emitter voltage	$V_{CEO}$	-160	V
Emitter-base voltage	$V_{EBO}$	-6	V
Collector current	$I_C$	-1	A
Base current	$I_B$	-0.5	A
Collector power dissipation	$P_C$	900	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$



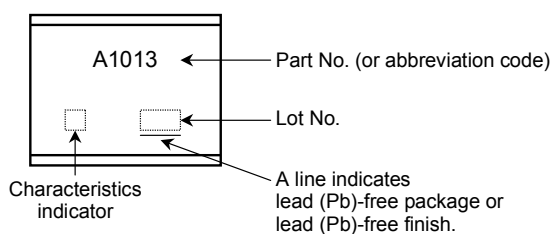
Weight: 0.36 g (typ.)

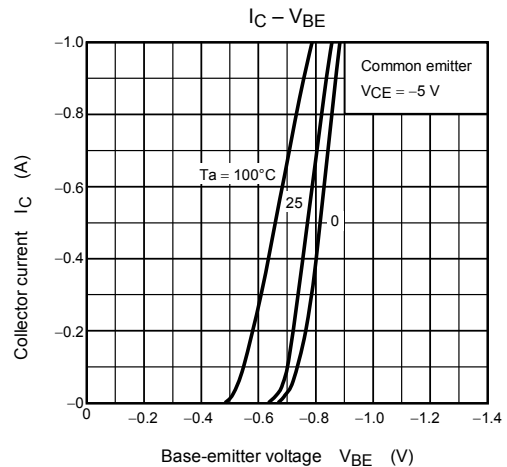
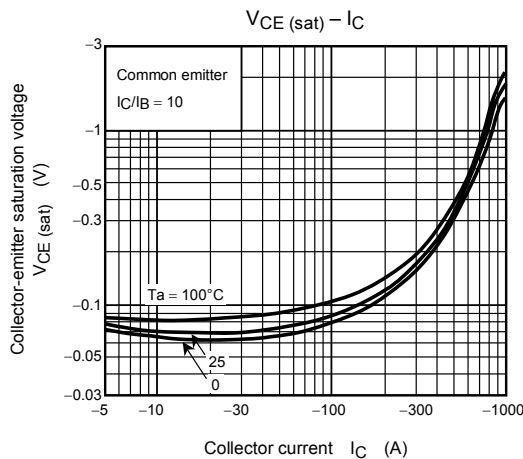
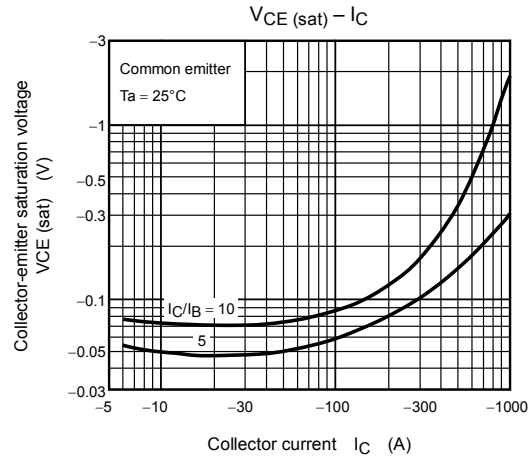
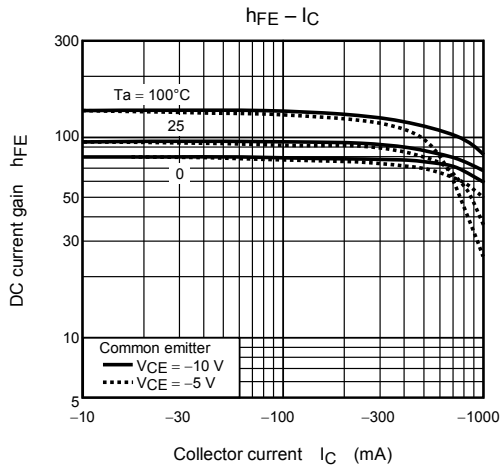
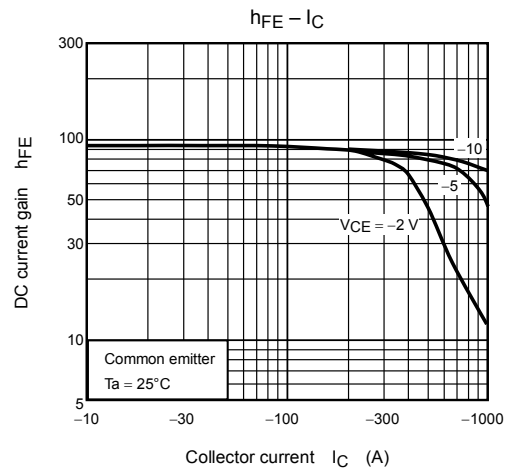
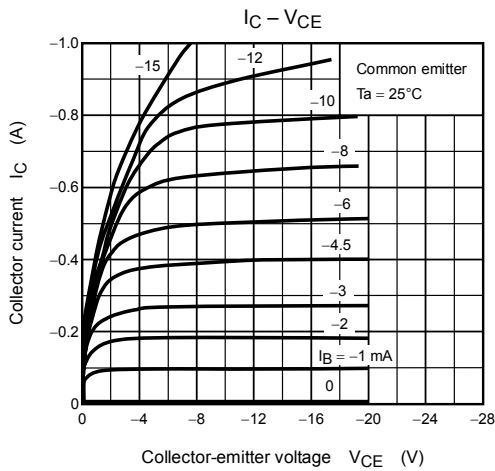
### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

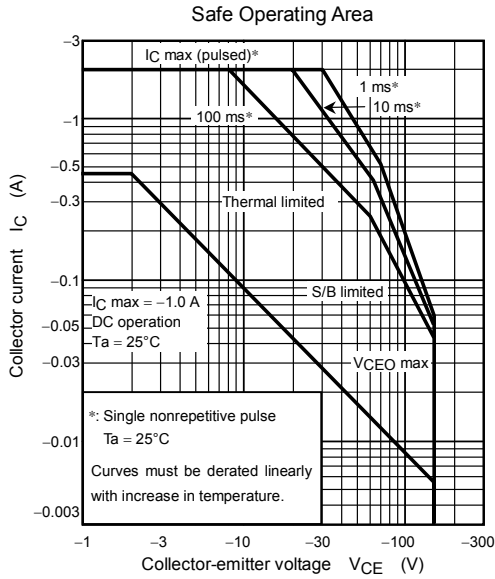
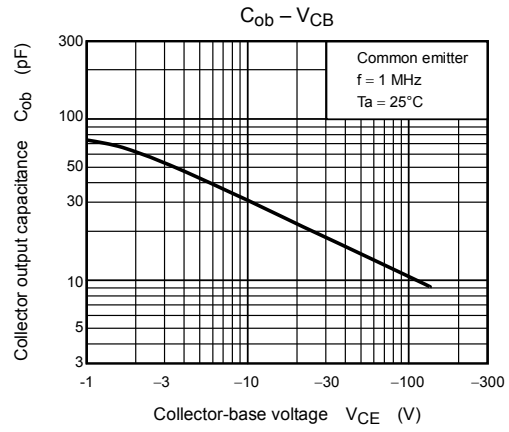
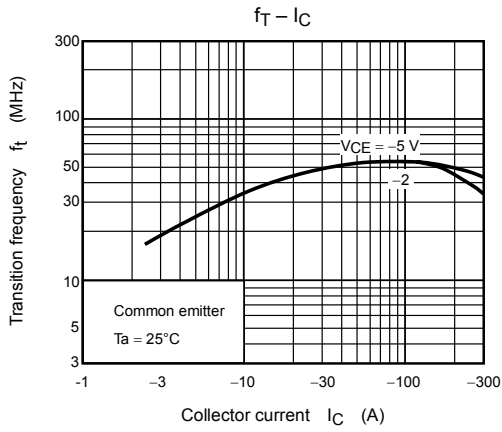
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -150$ V, $I_E = 0$	—	—	-1.0	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -6$ V, $I_C = 0$	—	—	-1.0	$\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10$ mA, $I_B = 0$	-160	—	—	V
DC current gain	$h_{FE}$ (Note)	$V_{CE} = -5$ V, $I_C = -200$ mA	60	—	200	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -500$ mA, $I_B = -50$ mA	—	—	-1.5	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -5$ V, $I_C = -5$ mA	-0.45	—	-0.75	V
Transition frequency	$f_T$	$V_{CE} = -5$ V, $I_C = -200$ mA	15	50	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10$ V, $I_E = 0$ , $f = 1$ MHz	—	—	35	pF

Note:  $h_{FE}$  classification R: 60 to 120, O: 100 to 200

### Marking







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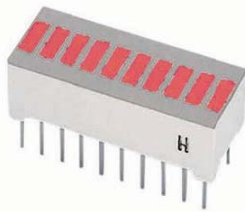


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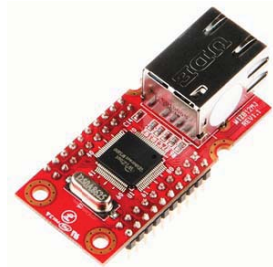
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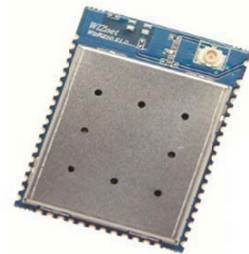
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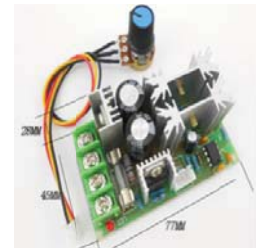
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