

TOSHIBA Transistor Silicon NPN·PNP Epitaxial Type
(PCT process) (Bias Resistor built-in Transistor)

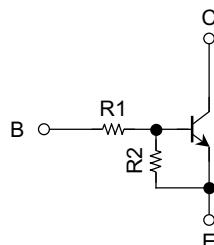
R N 4 9 8 1 F E

Switching, Inverter Circuit, Interface Circuit and
Driver Circuit Applications.

- Two devices are incorporated into an Extreme-Super-Mini (6 pin) package.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.

Equivalent Circuit and Bias Resistor Values

Q1

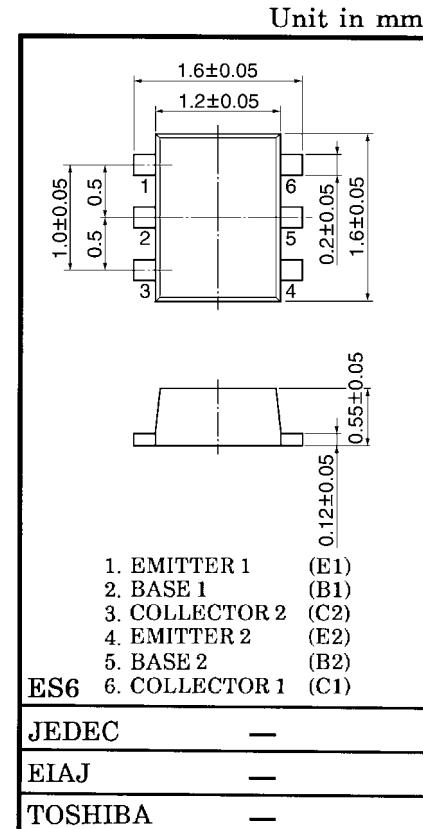
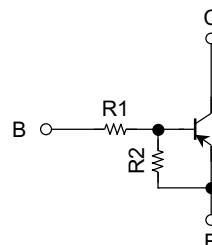


R1: 4.7 kΩ

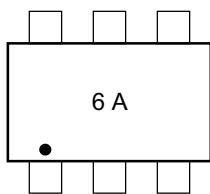
R2: 4.7 kΩ

(Q1, Q2 common)

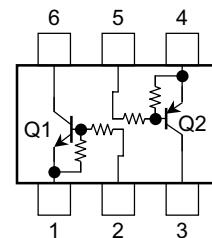
Q2



Marking



Equivalent Circuit (top view)



000707EA1

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Maximum Ratings (Ta = 25°C) (Q1)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	10	V
Collector current	I_C	100	mA

Maximum Ratings (Ta = 25°C) (Q2)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-10	V
Collector current	I_C	-100	mA

Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

Characteristics	Symbol	Rating	Unit
Collector power dissipation	P_C (Note)	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

Note: Total rating

Electrical Characteristics (Ta = 25°C) (Q1)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I _{CBO}	V _{CB} = 50 V, I _E = 0	—	—	100	nA
	I _{CEO}	V _{CE} = 50 V, I _B = 0	—	—	500	
Emitter cut-off current	I _{EBO}	V _{EB} = 10 V, I _C = 0	0.82	—	1.52	mA
DC current gain	h _{FE}	V _{CE} = 5 V, I _C = 10 mA	30	—	—	
Collector-emitter saturation voltage	V _{CE} (sat)	I _C = 5 mA, I _B = 0.25 mA	—	0.1	0.3	V
Input voltage (ON)	V _I (ON)	V _{CE} = 0.2 V, I _C = 5 mA	1.1	—	2.0	V
Input voltage (OFF)	V _I (OFF)	V _{CE} = 5 V, I _C = 0.1 mA	1.0	—	1.5	V
Transition frequency	f _T	V _{CE} = 10 V, I _C = 5 mA	—	250	—	MHz
Collector output capacitance	C _{ob}	V _{CB} = 10 V, I _E = 0, f = 1 MHz	—	3	6	pF

Electrical Characteristics (Ta = 25°C) (Q2)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I _{CBO}	V _{CB} = -50 V, I _E = 0	—	—	-100	nA
	I _{CEO}	V _{CE} = -50 V, I _B = 0	—	—	-500	
Emitter cut-off current	I _{EBO}	V _{EB} = -10 V, I _C = 0	-0.82	—	-1.52	mA
DC current gain	h _{FE}	V _{CE} = -5 V, I _C = -10 mA	30	—	—	
Collector-emitter saturation voltage	V _{CE} (sat)	I _C = -5 mA, I _B = -0.25 mA	—	-0.1	-0.3	V
Input voltage (ON)	V _I (ON)	V _{CE} = -0.2 V, I _C = -5 mA	-1.1	—	-2.0	V
Input voltage (OFF)	V _I (OFF)	V _{CE} = -5 V, I _C = -0.1 mA	-1.0	—	-1.5	V
Transition frequency	f _T	V _{CE} = -10 V, I _C = -5 mA	—	200	—	MHz
Collector output capacitance	C _{ob}	V _{CB} = -10 V, I _E = 0, f = 1 MHz	—	3	6	pF

Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Input resistor	R ₁	—	3.29	4.7	6.11	kΩ
Resistor ratio	R ₁ /R ₂	—	0.9	1.0	1.1	