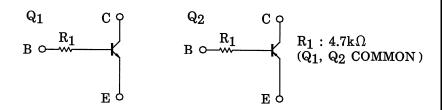
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) Silicon PNP Epitaxial Type (PCT Process)

RN4990

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process

Equivalent Circuit and Bias Resister Values



Q1 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	IC	100	mA

Unit: mm 2.1 ± 0.1 1.25 ± 0.1 0~0.1 EMITTER 1 (E1) (B1) BASE 1 **COLLECTOR 2** (C2) **EMITTER 2** (E2) BASE 2 (B2) US₆ **COLLECTOR 1** (C1) **JEDEC** JEITA TOSHIBA 2-2J1A

Weight: 6.8 mg (typ.)

Q2 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V _{CBO}	-50	V
Collector-emitter voltage	V _{CEO}	-50	V
Emitter-base voltage	V _{EBO}	-5	V
Collector current	IC	-100	mA

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

Characteristic	Symbol	Rating	Unit
Collector power dissipation	P _C *	200	mW
Junction temperature	Tj	150	°C
Storage temperature range	T _{stg}	-55~150	°C

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.

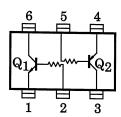
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

* : Total rating

Marking



Equivalent Circuit (Top View)



Q1 Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	_	V _{CB} = 50V, I _E = 0	_	_	100	mA
Emitter cut-off current	I _{EBO}	_	V _{EB} = 10V, I _C = 0	_	_	100	mA
DC current gain	h _{FE}	_	V _{CE} = 5V, I _C = 1mA	120	_	700	_
Collector-emitter saturation voltage	V _{CE} (sat)	_	I _C = 5mA, I _B = 0.25mA	_	0.1	0.3	V
Transition frequency	f _T	_	V _{CE} = 10V, I _C = 5mA	_	250	_	MHz
Collector output capacitance	C _{ob}	_	V _{CB} = 10V, I _E = 0, f = 1 MHz	_	3	6	pF

Q2 Electrical Characteristics (Ta = 25°C)

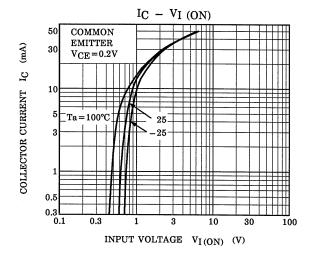
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	_	$V_{CB} = -50V, I_{E} = 0$	_	_	-100	mA
Emitter cut-off current	I _{EBO}	_	$V_{EB} = -5V$, $I_C = 0$	_	_	-100	mA
DC current gain	h _{FE}	_	$V_{CE} = -5V, I_{C} = -1mA$	120	_	400	_
Collector-emitter saturation voltage	V _{CE} (sat)	_	I _C = -5mA, I _B = -0.25mA	_	-0.1	-0.3	V
Transition frequency	f _T	_	V _{CE} = −10V, I _C = −5mA	_	200	_	MHz
Collector output capacitance	C _{ob}	_	V _{CB} = -10V, I _E = 0, f = 1MHz	_	3	6	pF

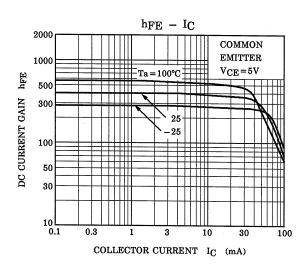
Q1, Q2 Common Electrical Characteristics (Ta = 25°C)

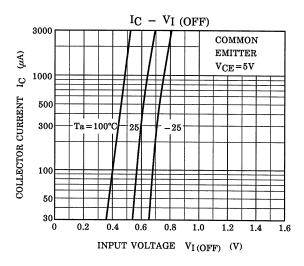
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Input resistor	R1	_	I	3.29	4.7	6.11	kΩ

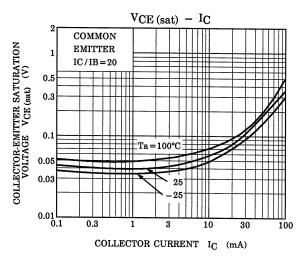
3

 Q_1

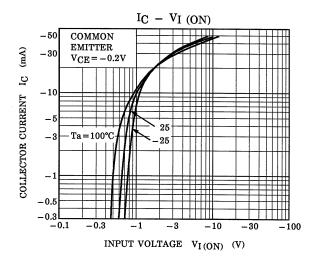


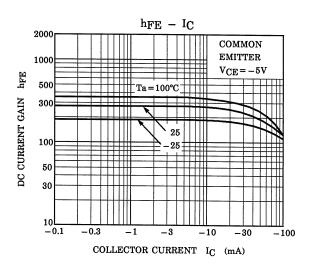


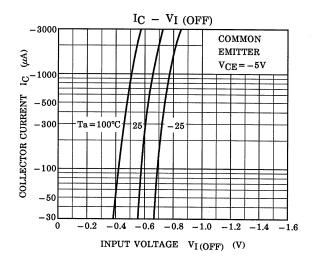


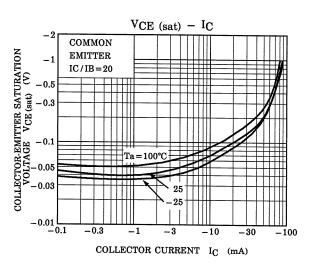


 Q_2









5

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