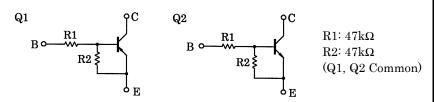
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) Silicon NPN Epitaxial Type (PCT Process)

RN4604

Switching, Inverter Circuit, Interface Circuit And Driver Circuit Applications

- Including two devices in SM6 (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}	-10	V
Collector current	I _C	-100	mA

Unit in mm 2.8 - 0.3 EMITTER 1 (E1) BASE 1 (B1) **COLLECTOR 2** 3. (C2)**EMITTER 2** (E2)BASE 2 (B2)SM6 COLLECTOR 1 (C1) **JEDEC** EIAJ **TOSHIBA** 2-3N1A

Weight: 0.015g

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}	10	V
Collector current	IC	100	mA

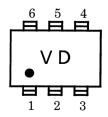
Q1, Q2 Common Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector power dissipation	P _C *	300	mW
Junction temperature	Tj	150	°C
Storage temperature range	T _{stg}	-55~150	°C

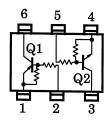
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Marking



Equivalent Circuit (Top View)



2007-11-01

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^{*} Total rating

Q1 Electrical Characteristics (Ta = 25°C)

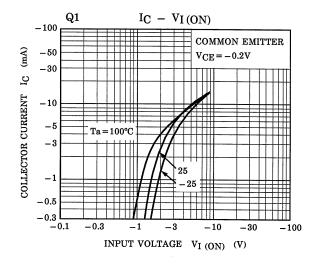
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	_	$V_{CB} = -50V, I_E = 0$	_	_	-100	nA
	I _{CEO}	_	$V_{CE} = -50V, I_B = 0$	_	_	-500	
Emitter cut-off current	I _{EBO}	_	$V_{EB} = -10V$, $I_C = 0$	-0.082	_	-0.15	mA
DC current gain	h _{FE}	_	$V_{CE} = -5V, I_{C} = -10mA$	80	_	_	_
Collector-emitter saturation voltage	V _{CE} (sat)	_	$I_C = -5\text{mA}, I_B = -0.25\text{mA}$	_	-0.1	-0.3	V
Input voltage (ON)	V _{I (ON)}	_	$V_{CE} = -0.2V$, $I_{C} = -5mA$	-1.5	_	-5.0	V
Input voltage (OFF)	V _{I (OFF)}	_	$V_{CE} = -5V, I_{C} = -0.1 \text{mA}$	-1.0	_	-1.5	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

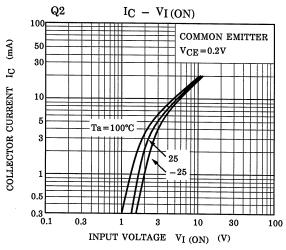
Q2 Electrical Characteristics (Ta = 25°C)

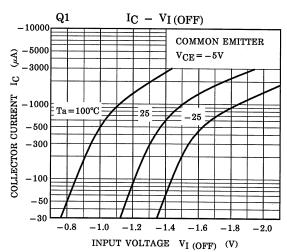
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	_	V _{CB} = 50V, I _E = 0	_	_	100	nA
	I _{CEO}	_	V _{CE} = 50V, I _B = 0	_	1	500	
Emitter cut-off current	I _{EBO}	_	V _{EB} = 10V, I _C = 0	0.082	_	0.15	mA
DC current gain	h _{FE}	_	V _{CE} = 5V, I _C = 10mA	80	_	_	_
Collector-emitter saturation voltage	V _{CE} (sat)	_	I _C = 5mA, I _B = 0.25mA	_	0.1	0.3	V
Input voltage (ON)	V _{I (ON)}	_	V _{CE} = 0.2V, I _C = 5mA	1.5	_	5.0	V
Input voltage (OFF)	V _{I (OFF)}	_	$V_{CE} = 5V, I_{C} = 0.1mA$	1.0	_	1.5	٧
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

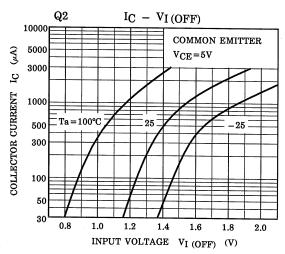
Q1, Q2 Common Electrical Characteristics (Ta = 25°C)

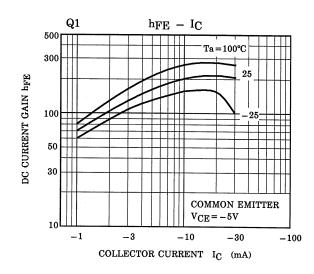
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Input resistor	R1	_	_	32.9	47	61.1	kΩ
Resistor ratio	R1/R2	_	_	0.9	1.0	1.1	_

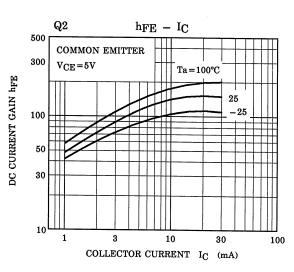












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20070701-EN GENERAL

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