Unit in mm

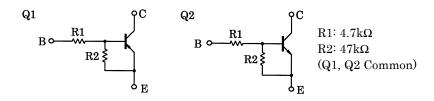
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) Silicon NPN Epitaxial Type (PCT Process)

# **RN4606**

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 <sub>CEO</sub>	-50	V
Emitter-base voltage	V <sub>EBO</sub>	-5	V
Collector current	IC	-100	mA

## 2.8 + 0.2 2.8 - 0.3 $1.9 \pm 0.2$ $2.9 \pm 0.2$ EMITTER 1 (E1) BASE 1 (B1) COLLECTOR 2 (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 <sub>CBO</sub>	50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	V
Emitter-base voltage	V <sub>EBO</sub>	5	٧
Collector current	IC	100	mA

Q1,	<b>Q2 Common</b>	<b>Absolute</b>	Maximum	Ratings	(Ta = 25°C)
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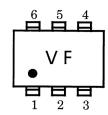
Characteristic	Symbol	Rating	Unit
Collector power dissipation	P <sub>C</sub> *	300	mW
Junction temperature	Tj	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

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.

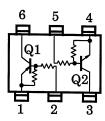
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

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#### Marking



# **Equivalent Circuit (Top View)**



<sup>\*</sup> Total rating

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

Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I <sub>CBO</sub>	_	V <sub>CB</sub> = −50V, I <sub>E</sub> = 0	_	_	-100	nA
Collector curent	I <sub>CEO</sub>	_	$V_{CE} = -50V, I_B = 0$	_	_	-500	ПА
Emitter cut-off current	I <sub>EBO</sub>	_	$V_{EB} = -5V, I_C = 0$	-0.074	_	-0.138	mA
DC current gain	h <sub>FE</sub>	_	$V_{CE} = -5V, I_{C} = -10mA$	80	_	_	_
Collector-emitter saturation voltage	V <sub>CE</sub> (sat)	_	$I_C = -5\text{mA}, I_B = -0.25\text{mA}$	_	-0.1	-0.3	V
Input voltage (ON)	V <sub>I (ON)</sub>	_	$V_{CE} = -0.2V$ , $I_{C} = -5mA$	-0.7	_	-1.3	V
Input voltage (OFF)	V <sub>I (OFF)</sub>	_	$V_{CE} = -5V, I_{C} = -0.1 \text{mA}$	-0.5	_	-0.8	V
Transition frequency	f <sub>T</sub>	_	V <sub>CE</sub> = −10V, I <sub>C</sub> = −5mA	_	200	_	MHz
Collector output capacitance	C <sub>ob</sub>	_	V <sub>CB</sub> = −10V, I <sub>E</sub> = 0	_	3	6	pF

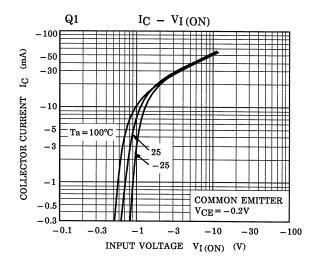
# Q2 Electrical Characteristics (Ta = 25°C)

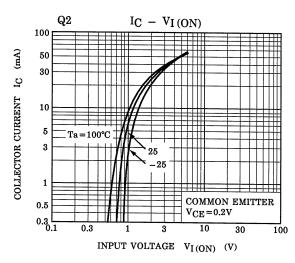
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I <sub>CBO</sub>	_	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0	_	_	100	nA
Collector current	I <sub>CEO</sub>	_	V <sub>CE</sub> = 50V, I <sub>B</sub> = 0	_	_	500	11/5
Emitter cut-off current	I <sub>EBO</sub>	_	$V_{EB} = 5V, I_{C} = 0$	0.074	_	0.138	mA
DC current gain	h <sub>FE</sub>	_	V <sub>CE</sub> = 5V, I <sub>C</sub> = 10mA	80	_	_	_
Collector-emitter saturation voltage	V <sub>CE</sub> (sat)	_	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA	_	0.1	0.3	V
Input voltage (ON)	V <sub>I (ON)</sub>	_	V <sub>CE</sub> = 0.2V, I <sub>C</sub> = 5mA	0.7	_	1.3	V
Input voltage (OFF)	V <sub>I (OFF)</sub>	_	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.1mA	0.5	_	0.8	V
Transition frequency	f <sub>T</sub>	_	V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA	_	250	_	MHz
Collector output capacitance	C <sub>ob</sub>	_	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1 MHz	_	3	6	pF

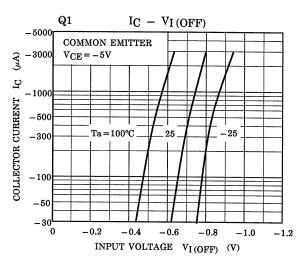
# Q1, Q2 Common Electrical Characteristics (Ta = 25°C)

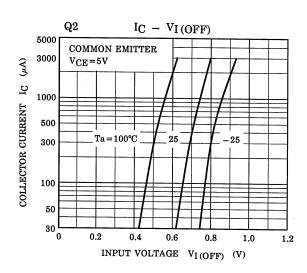
Characteristic	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Input resistor	R1	_	_	3.29	4.7	6.11	kΩ
Resistor ratio	R1/R2	_	_	0.09	0.1	0.11	_

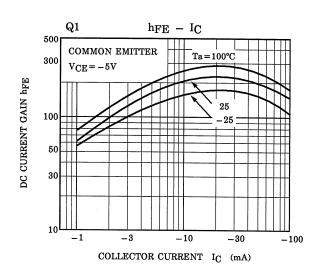
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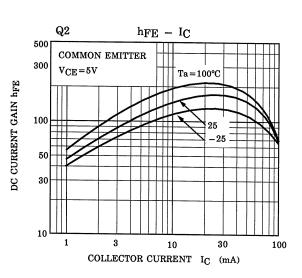












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20070701-EN GENERAL

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