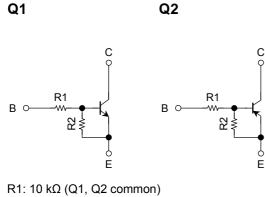
TOSHIBA Transistor Silicon NPN · PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN47A3

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

- Two devices are incorporated into an Ultra-Super-Mini (5 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.

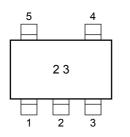
Equivalent Circuit and Bias Resistor Values

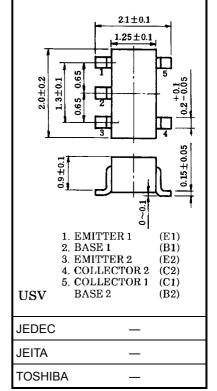


R2: 10 kΩ (Q1, Q2 common)

Q1: RN1102F Q2: RN2102F

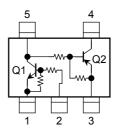
Marking





Weight: g (typ.)

Equivalent Circuit (top view)



Unit: mm

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	Ι _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	۱ _C	-100	mA

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

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

Note: Total rating

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

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	$V_{CB} = 50 \text{ V}, I_E = 0$			100	nA
	ICEO	$V_{CE} = 50 \text{ V}, I_B = 0$	_	_	500	
Emitter cut-off current	I _{EBO}	$V_{EB} = 10 \text{ V}, \text{ I}_{C} = 0$	0.38		0.71	mA
DC current gain	h _{FE}	$V_{CE} = 5 \text{ V}, \text{ I}_{C} = 10 \text{ mA}$	50	_	_	
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)}	$V_{CE} = 0.2 \text{ V}, I_{C} = 5 \text{ mA}$	1.2	_	2.4	V
Input voltage (OFF)	VI (OFF)	$V_{CE} = 5 \text{ V}, \text{ I}_{C} = 0.1 \text{ mA}$	1.0	_	1.5	V
Transition frequency	f _T	$V_{CE} = 10 \text{ V}, I_{C} = 5 \text{ mA}$		250	_	MHz
Collector output capacitance	C _{ob}	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$		3	6	pF
Input resistor	R1	—	7	10	13	kΩ
Resistor ratio	R1/R2	—	0.8	1.0	1.2	

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

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	$V_{CB} = -50 \text{ V}, \ I_E = 0$	_		-100	nA
	I _{CEO}	$V_{CE}=-50~V,~I_B=0$	_	_	-500	
Emitter cut-off current	I _{EBO}	$V_{EB} = -10 \text{ V}, \text{ I}_{C} = 0$	-0.38	_	-0.71	mA
DC current gain	h _{FE}	$V_{CE} = -5 \text{ V}, \text{ I}_{C} = -10 \text{ mA}$	50	_	_	
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	-1.2	_	-2.4	V
Input voltage (OFF)	V _{I (OFF)}	$V_{CE} = -5 \text{ V}, \text{ I}_{C} = -0.1 \text{ mA}$	-1.0	_	-1.5	V
Transition frequency	fT	$V_{CE} = -10 \text{ V}, \text{ I}_{C} = -5 \text{ mA}$	_	200	_	MHz
Collector output capacitance	C _{ob}	$V_{CB} = -10 \text{ V}, \text{ I}_{E} = 0, \text{ f} = 1 \text{ MHz}$	_	3	6	pF
Input resistor	R1	—	7	10	13	kΩ
Resistor ratio	R1/R2	—	0.8	1.0	1.2	

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