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

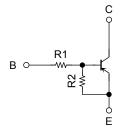
RN2101FS,RN2102FS,RN2103FS RN2104FS,RN2105FS,RN2106FS

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

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.

Complementary to RN1101FS~RN1106FS

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2101FS	4.7	4.7
RN2102FS	10	10
RN2103FS	22	22
RN2104FS	47	47
RN2105FS	2.2	47
RN2106FS	4.7	47//

			Unit: mm
	0.15±0.	05	
		>	0.2±0.05
// //	0.6±0.05±0.05	0.8±0.05 \$	3 1 0.1±0.05
$\langle \rangle$	+0.0204	10.05	
	f\$M	1.BASE 2.EMITTEI 3.COLLEC	
	75)		
/	JEDEC	_	
	JEITA	_	
	TOSHIBA	2-1E1 <i>A</i>	A

Weight: 0.0006 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Collector-base voltage	RN2101FS~2106FS	VCBO	-20	V	
Collector-emitter voltage	(11/2 1011 3 · 21001 3	∀ _{CE} Ø	-20	V	
Emitter-base voltage	RN2101FS~2104FS	Veno	-10	V	
Litilitier-base voltage	RN2105FS, 2106FS	V _{EBO}	-5		
Collector current		IC	-50	mA	
Collector power dissipation	RN210/1FS~2106FS	PC	50	mW	
Junction temperature	KN2 10 175 ~ 2 1001-3	Tj	150	°C	
Storage temperature range		T _{stg}	-55~150	°C	

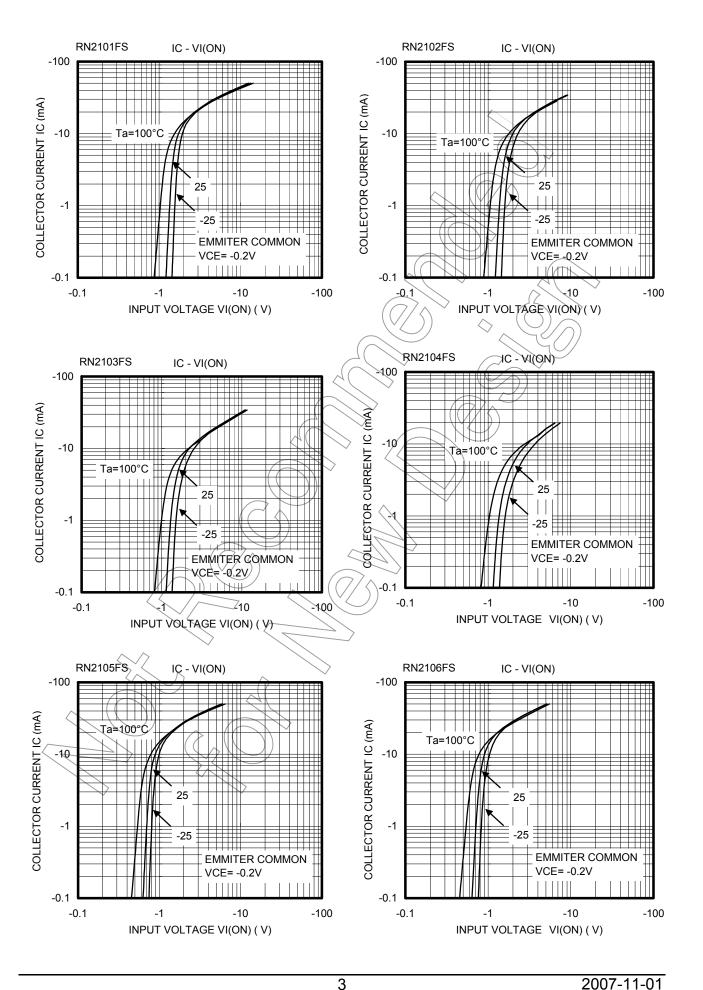
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

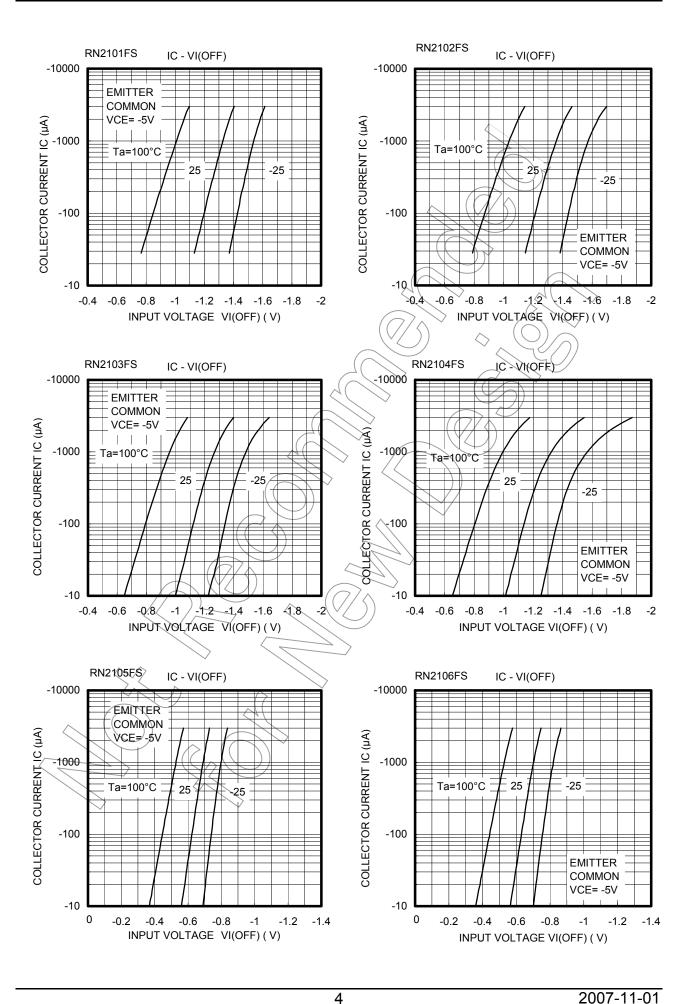
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

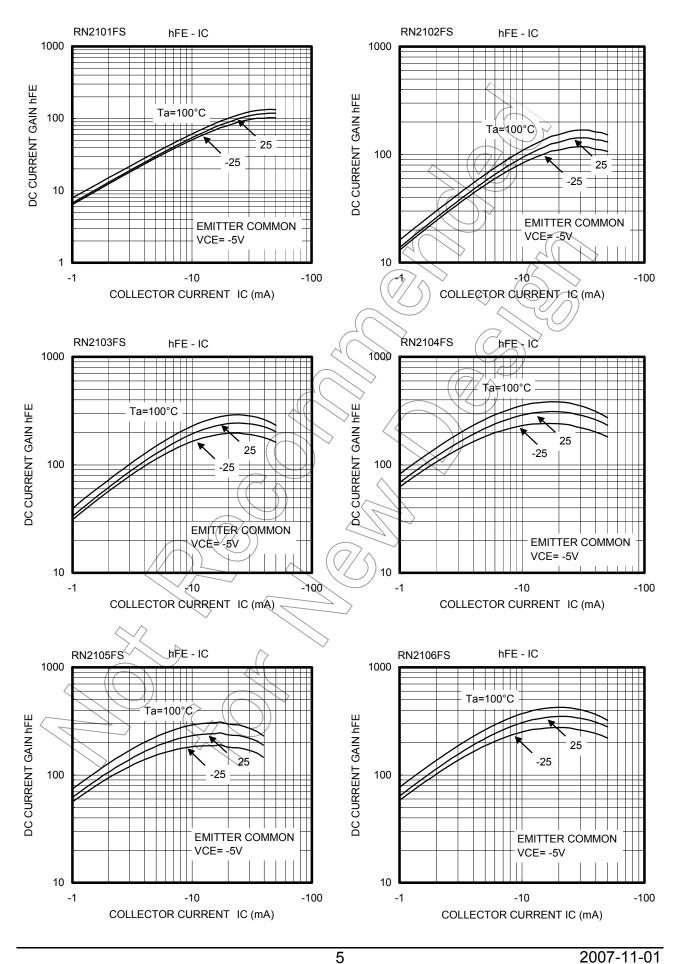


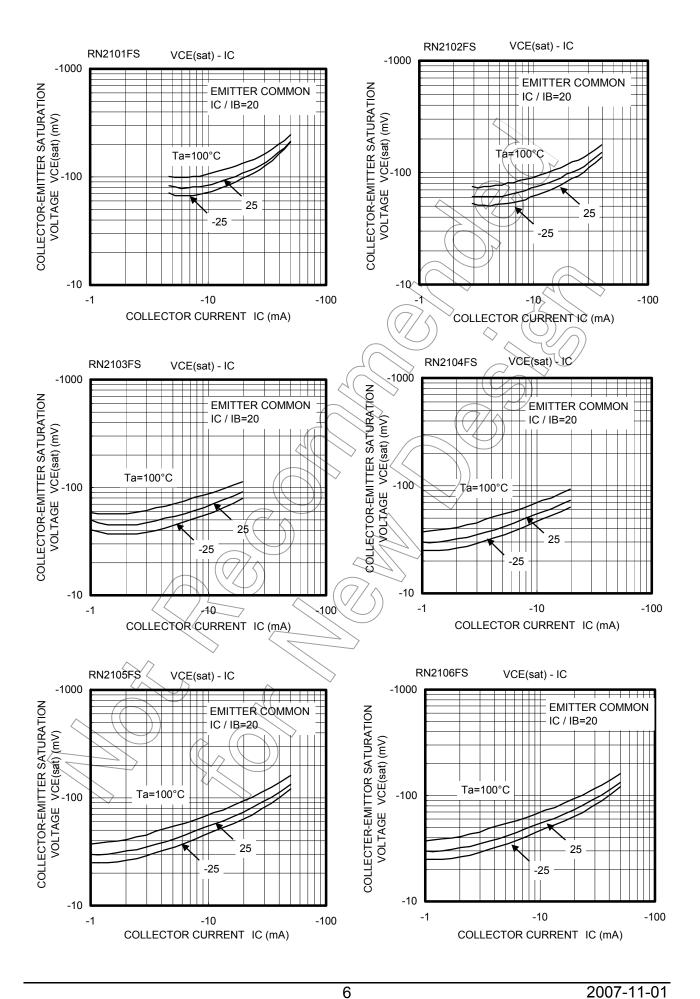
Electrical Characteristics (Ta = 25°C)

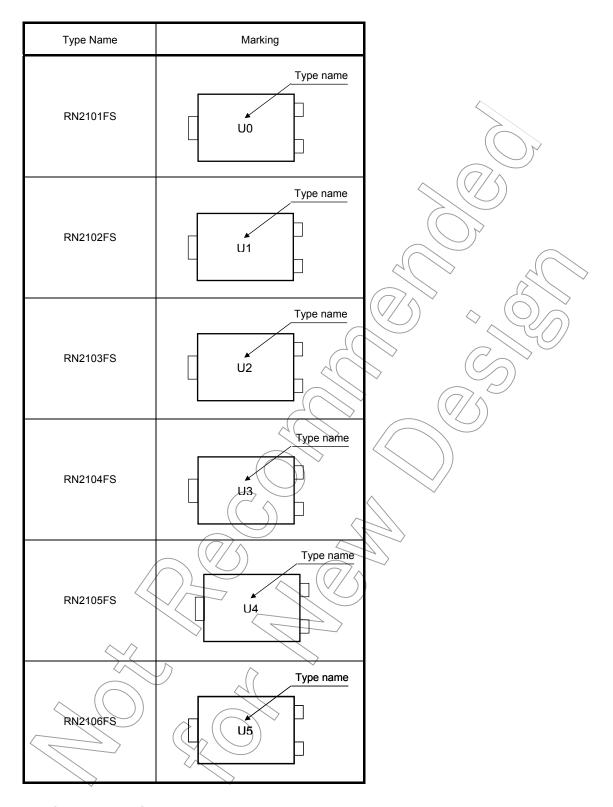
Charac	teristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	RN2101FS~2106FS	I _{CBO}	$V_{CB} = -20 \text{ V}, I_E = 0$	_	_	-100	- nA
	KN21011 3*21001 3	ICEO	$V_{CE} = -20 \text{ V}, I_B = 0$	_	_	-500	
Emitter cut-off current	RN2101FS	- l _{EBO}	$V_{EB} = -10 \text{ V}, I_{C} = 0$	-0.89	_	-1.33	
	RN2102FS			0.41	_	-0.63	mA
	RN2103FS			-0.18) >	-0.29	
	RN2104FS			0.088	_	-0.133	
	RN2105FS		$V_{EB} = -5 \text{ V, } I_{C} \le 0$	-0.085	_	-0.127	
	RN2106FS		VEB - 0 V, IC 20	-0.08	_	-0.121	
	RN2101FS		V _{CE} = -5 V I _Q = 10 mA	30	_	_	
	RN2102FS			60		_	
DC current gain	RN2103FS	h _{FE}		100	4	\searrow	
Do current gain	RN2104FS	''FE	Ic = 10 mA	120		> —	
	RN2105FS			120) —	
	RN2106FS			120		_	
Collector-emitter saturation voltage	RN2101FS~2106FS	V _{CE} (sat)	$I_{C} = -5 \text{ mA},$ $I_{B} = -0.25 \text{ mA}$	$(\widehat{\mathbb{R}})$	> –	-0.15	V
	RN2101FS		V _C E = -0.2 V, I _C = -5 mA	1.0	_	-2.0	V
	RN2102FS	V _I (ON)) –1.0	_	-2.2	
Input voltage (ON)	RN2103FS			-1.1	_	-2.7	
input voltage (ON)	RN2104FS			-1.2	_	-3.6	
	RN2105FS			-0.6	_	-1.1	
	RN2106FS			-0.6	_	-1.2	
Input voltage (OFF)	RN2101FS-2104F\$	V _{I (OFF)}	VCE = -5 V, IC = -0.1 mA	-0.8	_	-1.5	V
mpat voltage (OTT)	RN2105FS, 2106FS			-0.4	_	-0.8	v
Collector output capacitance	RN2101FS~2106FS	Cob	$V_{CB} = -10 \text{ V, I}_{E} = 0,$ f = 1 MHz		1.2	_	pF
Input resistor	RN2101FS	R1	_	3.76	4.7	5.64	· kΩ
	RN2102FS			8	10	12	
	RN2103FS			17.6	22	26.4	
	RN2104FS			37.6	47	56.4	
	RN2105F\$			1.76	2.2	2.64	
	RN2106FS			3.76	4.7	5.64	
	RN2101F8~2104FS			0.8	1.0	1.2	
Resistor ratio	RN2105FS	R1/R2	_	0.0376	0.0468	0.0562	
	RN2106FS			0.08	0.1	0.12	











Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

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