

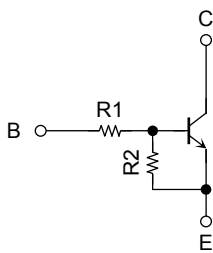
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1107FS, RN1108FS, RN1109FS

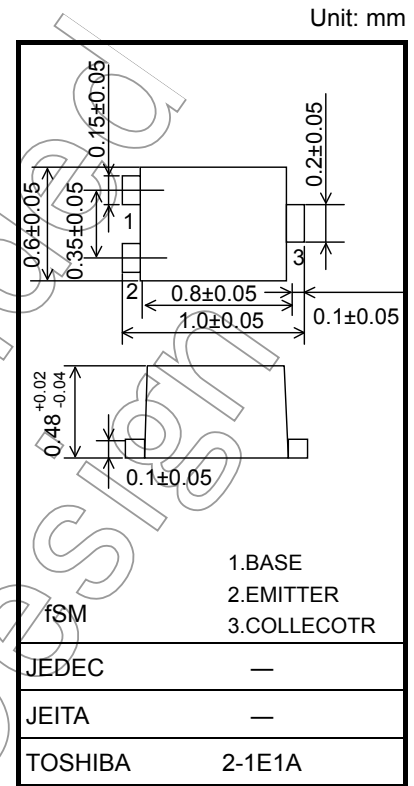
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- 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 RN2107FS~RN2109FS

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1107FS	10	47
RN1108FS	22	47
RN1109FS	47	22



Weight: 0.0006 g (typ.)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	6	V
		7	
		15	
Collector current	I_C	50	mA
Collector power dissipation	P_C	50	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

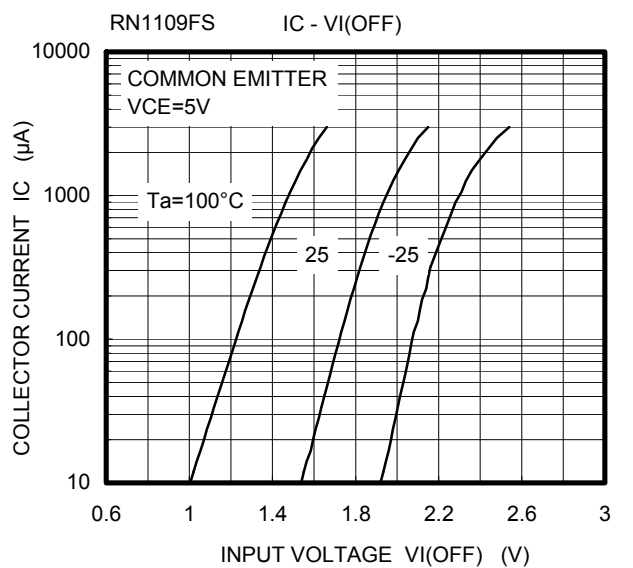
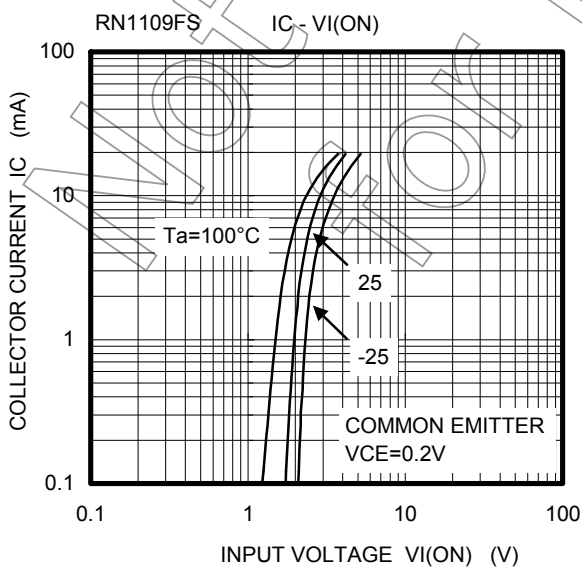
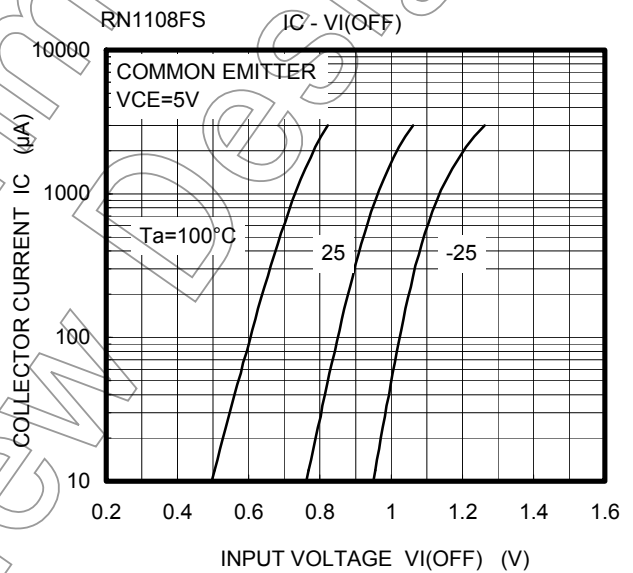
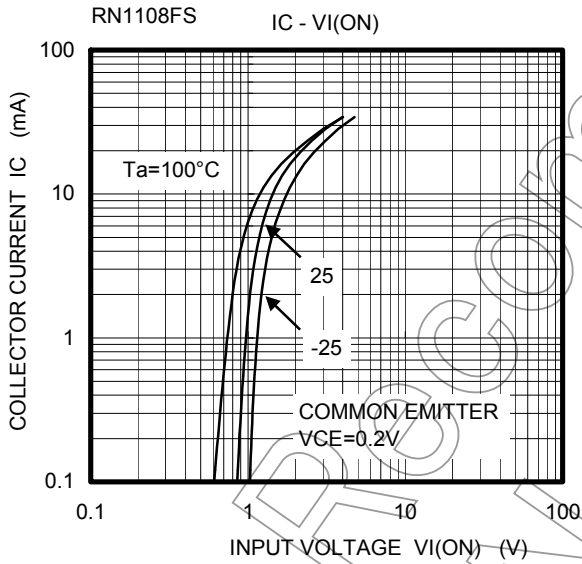
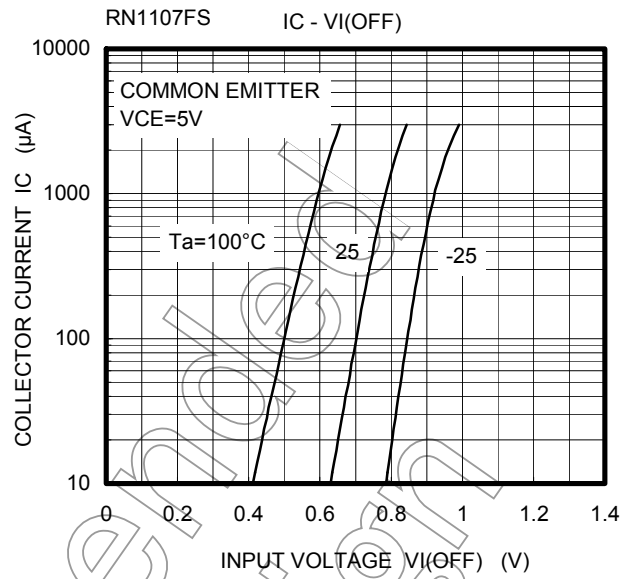
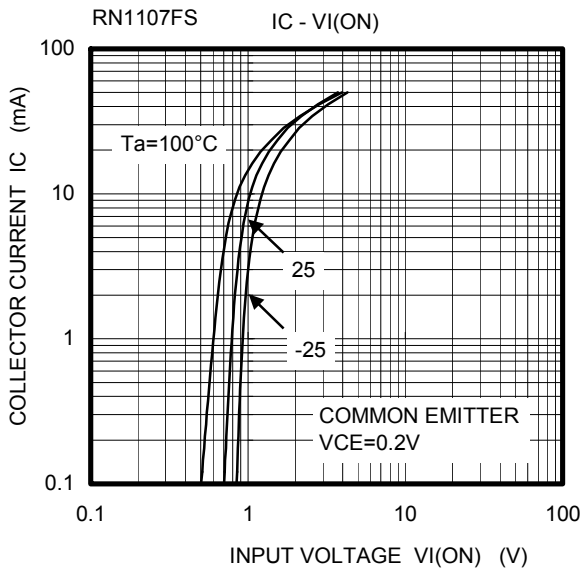
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

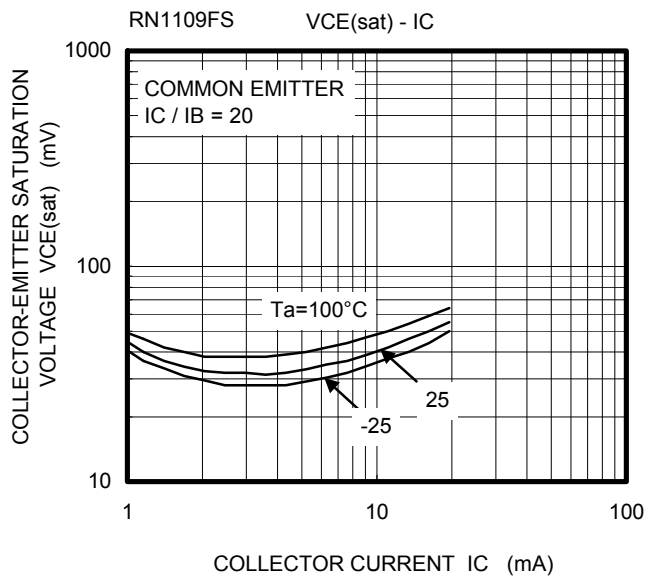
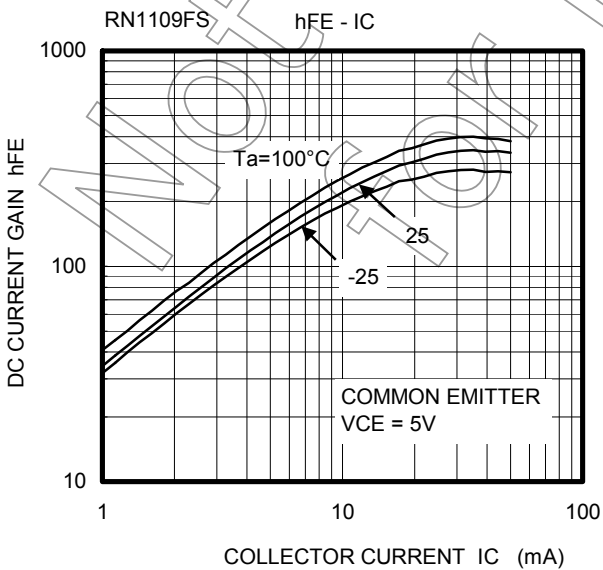
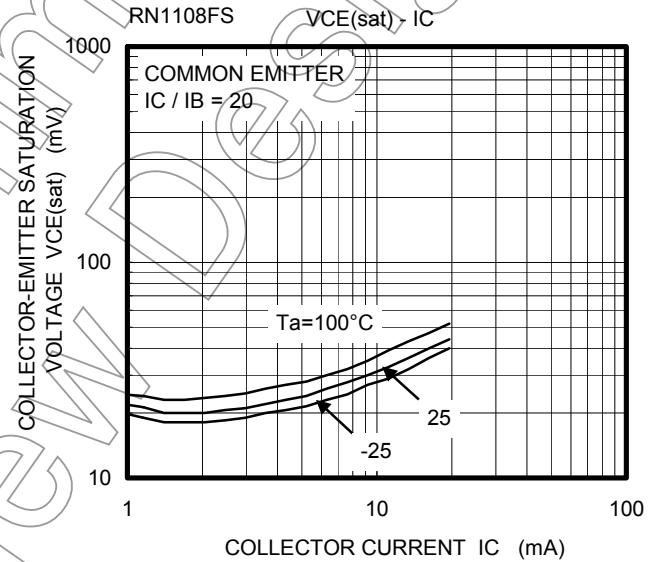
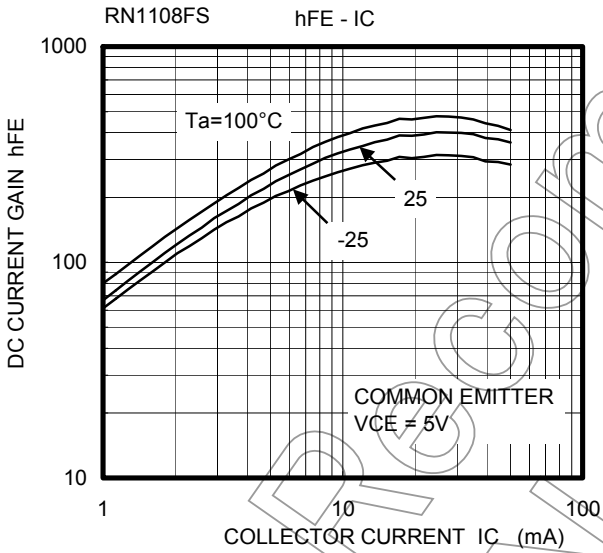
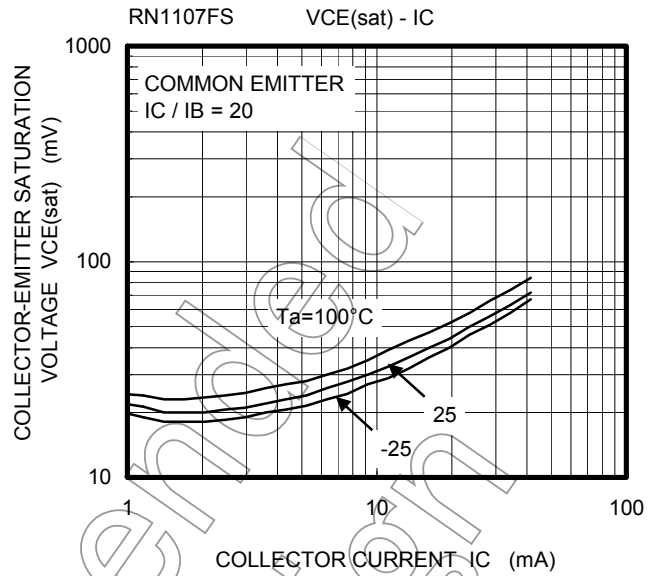
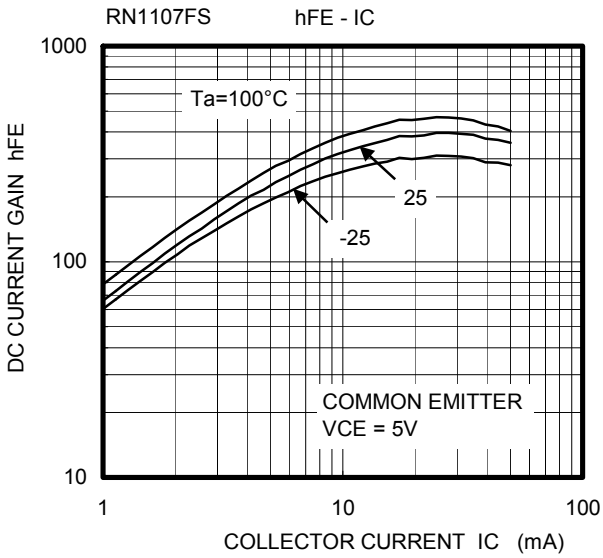
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

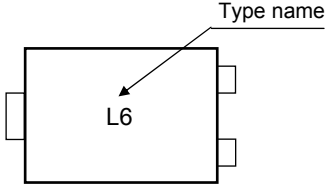
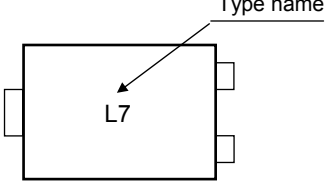
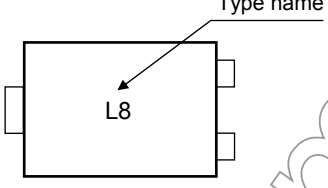
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1107FS~1109FS	I_{CBO}	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	100	nA
		I_{CEO}	$V_{CE} = 20\text{ V}, I_B = 0$	—	—	500	
Emitter cut-off current	RN1107FS	I_{EBO}	$V_{EB} = 6\text{ V}, I_C = 0$	0.088	—	0.131	mA
	RN1108FS			0.085	—	0.126	
	RN1109FS			0.182	—	0.271	
DC current gain	RN1107FS	h_{FE}	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	120	—	—	
	RN1108FS			120	—	—	
	RN1109FS			100	—	—	
Collector-emitter saturation voltage	RN1107FS~1109FS	$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	—	0.15	V
Input voltage (ON)	RN1107FS	$V_I(ON)$	$V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$	0.7	—	1.5	V
	RN1108FS			0.8	—	2.2	
	RN1109FS			1.6	—	5.0	
Input voltage (OFF)	RN1107FS	$V_I(OFF)$	$V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$	0.5	—	1.0	V
	RN1108FS			0.6	—	1.1	
	RN1109FS			1.3	—	2.6	
Collector output capacitance	RN1107FS~1109FS	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN1107FS	R1	—	8	10	12	k Ω
	RN1108FS			17.6	22	26.4	
	RN1109FS			37.6	47	56.4	
Resistor ratio	RN1107FS	R1/R2	—	0.17	0.213	0.255	
	RN1108FS			0.374	0.468	0.562	
	RN1109FS			1.71	2.14	2.56	

Not Ready for New





Type Name	Marking
RN1107FS	
RN1108FS	
RN1109FS	

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.

Not Recommended for New Design

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