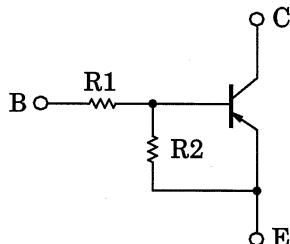


TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

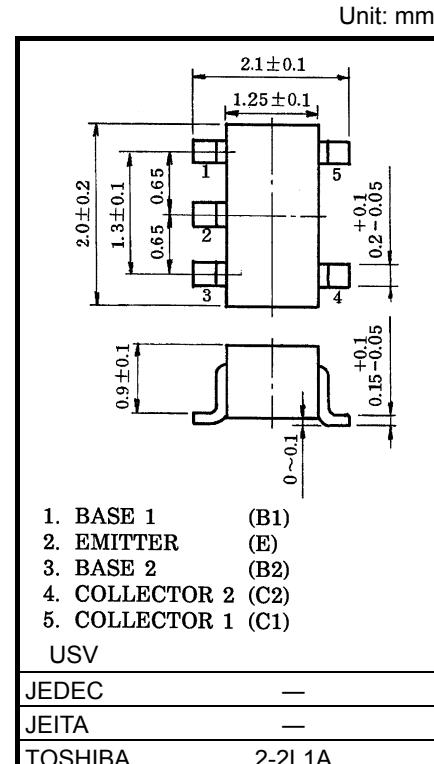
**RN2707, RN2708, RN2709**

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

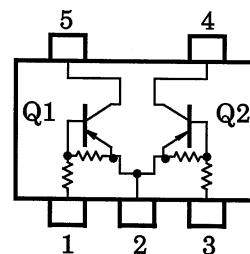
- Including two devices in USV (ultra super mini type with 5 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1707 to RN1709

**Equivalent Circuit and Bias Resistor Values**

Type No.	R1 (kΩ)	R2 (kΩ)
RN2707	10	47
RN2708	22	47
RN2709	47	22

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	RN2707 to 2709	V <sub>CBO</sub>	-50
Collector-emitter voltage		V <sub>CEO</sub>	-50
Emitter-base voltage	V <sub>EBO</sub>	-6	V
		-7	
		-15	
Collector current	RN2707 to 2709	I <sub>C</sub>	-100
Collector power dissipation		P <sub>C</sub> *	200
Junction temperature		T <sub>j</sub>	150
Storage temperature range		T <sub>stg</sub>	-55 to 150

**Equivalent Circuit (top view)**

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.).

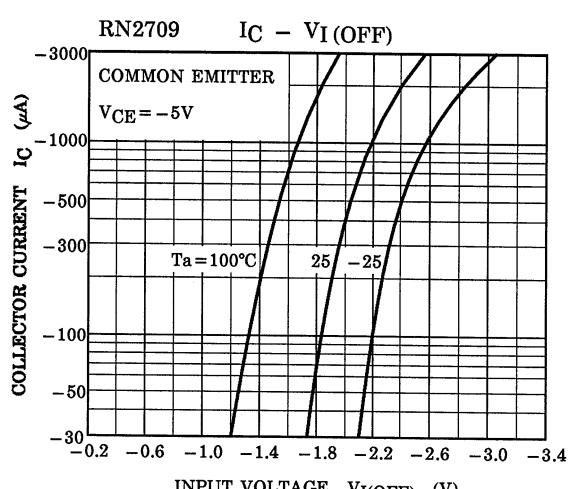
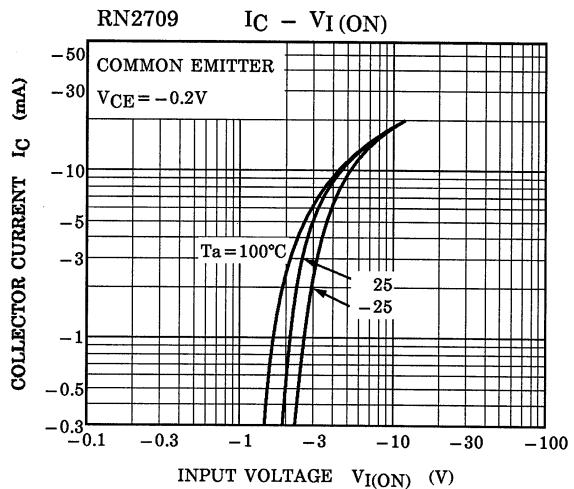
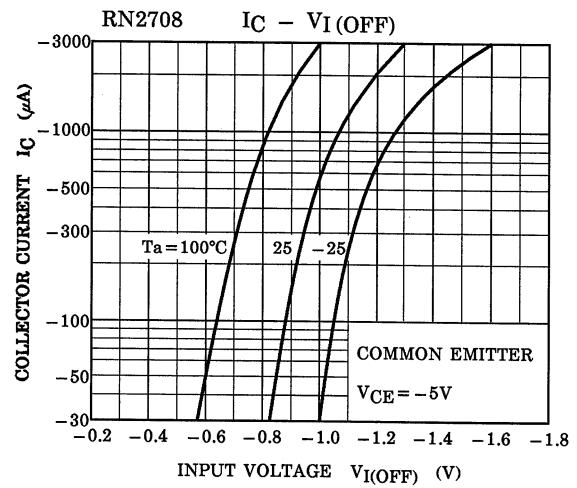
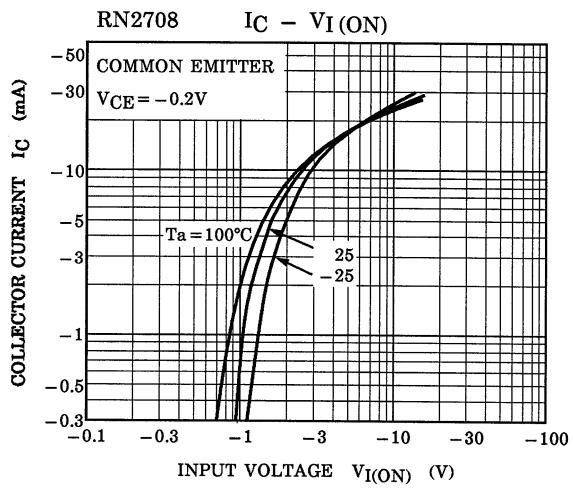
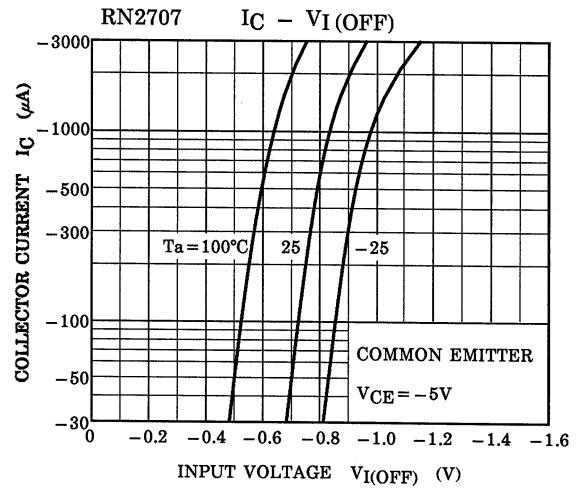
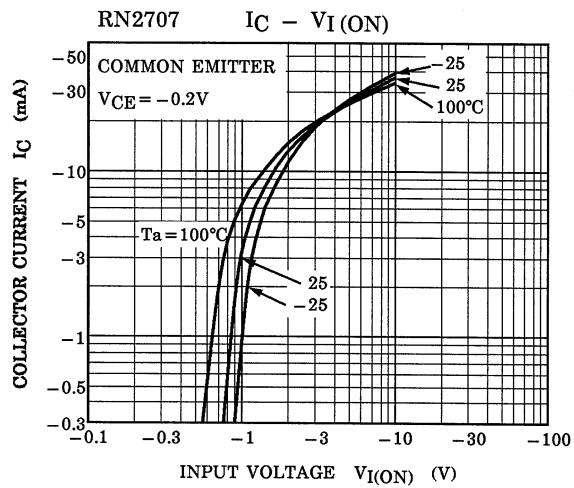
\* Total rating

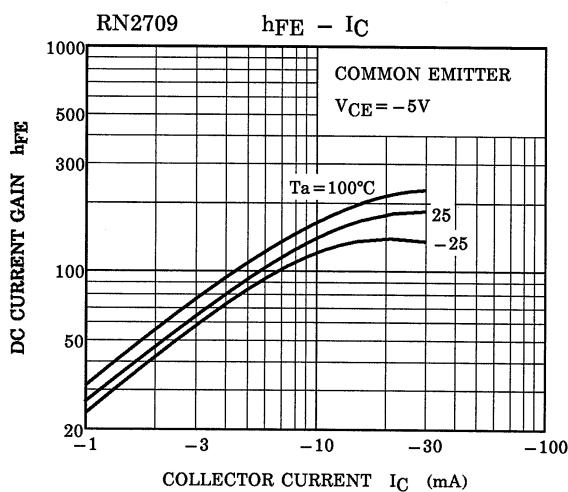
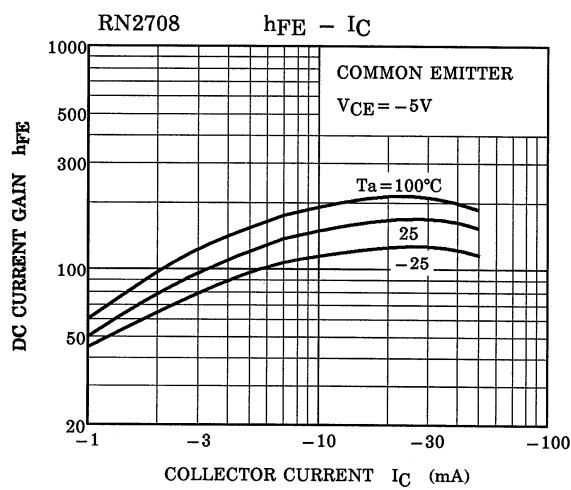
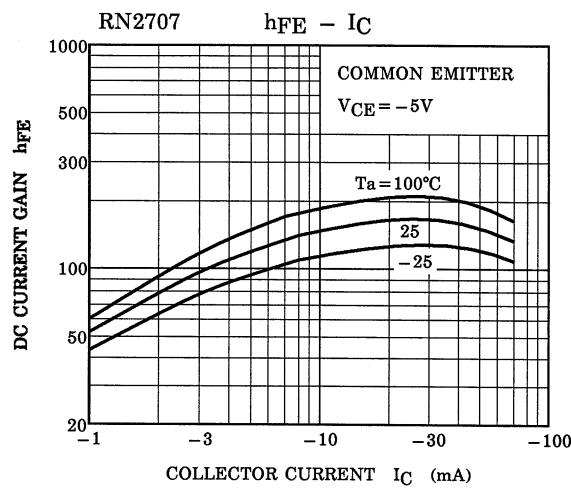
Start of commercial production  
1998-02

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

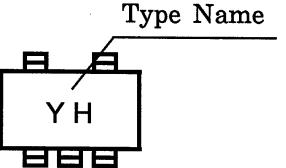
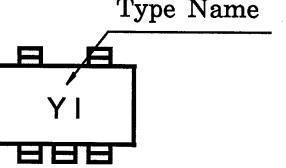
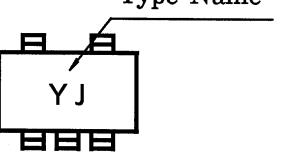
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2707 to 2709	I <sub>CBO</sub>	—	V <sub>CB</sub> = -50V, I <sub>E</sub> = 0	—	—	-100	nA
		I <sub>CEO</sub>	—	V <sub>CE</sub> = -50V, I <sub>B</sub> = 0	—	—	-500	nA
Emitter cut-off current	RN2707	I <sub>EBO</sub>	—	V <sub>EB</sub> = -6V, I <sub>C</sub> = 0	-0.081	—	-0.15	mA
	RN2708		—	V <sub>EB</sub> = -7V, I <sub>C</sub> = 0	-0.078	—	-0.145	
	RN2709		—	V <sub>EB</sub> = -15V, I <sub>C</sub> = 0	-0.167	—	-0.311	
DC current gain	RN2707	h <sub>FE</sub>	—	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA	80	—	—	—
	RN2708		—		80	—	—	
	RN2709		—		70	—	—	
Collector-emitter saturation voltage	RN2707 to 2709	V <sub>CE</sub> (sat)	—	I <sub>C</sub> = -5mA, I <sub>B</sub> = -0.25mA	—	-0.1	-0.3	V
Input voltage (ON)	RN2707	V <sub>I</sub> (ON)	—	V <sub>CE</sub> = -0.2V, I <sub>C</sub> = -5mA	-0.7	—	-1.8	V
	RN2708		—		-1.0	—	-2.6	
	RN2709		—		-2.2	—	-5.8	
Input voltage (OFF)	RN2707	V <sub>I</sub> (OFF)	—	V <sub>CE</sub> = -5V, I <sub>C</sub> = -0.1mA	-0.5	—	-1.0	V
	RN2708		—		-0.6	—	-1.16	
	RN2709		—		-1.5	—	-2.6	
Transition frequency	RN2707 to 2709	f <sub>T</sub>	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA	—	200	—	MHz
Collector output capacitance	RN2707 to 2709	C <sub>ob</sub>	—	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz	—	3	6	pF
Input resistor	RN2707	R1	—	—	7	10	13	kΩ
	RN2708		—		15.4	22	28.6	
	RN2709		—		32.9	47	61.1	
Resistor ratio	RN2707	R1/R2	—	—	0.191	0.213	0.232	—
	RN2708		—		0.421	0.468	0.515	
	RN2709		—		1.92	2.14	2.35	

(Q1, Q2 Common)



**(Q1, Q2 Common)**

**Marking**

Type Name	Marking
RN2707	
RN2708	
RN2709	

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