

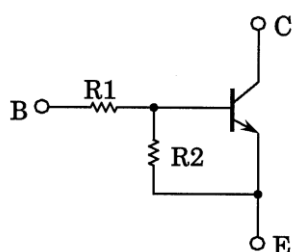
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)(Bias Resistor built-in Transistor)

RN1107MFV, RN1108MFV, RN1109MFV

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Ultra-small package, suited to very high density mounting
- Incorporating a bias resistor into the transistor reduces the number of parts, so enabling the manufacture of ever more compact equipment and lowering assembly cost.
- A wide range of resistor values is available for use in various circuits.
- Complementary to the RN2107MFV to RN2109MFV

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1107MFV	10	47
RN1108MFV	22	47
RN1109MFV	47	22

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CB0}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	6	V
		7	
		15	
Collector current	I_C	100	mA
Collector power dissipation	P_C (Note 1)	150	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

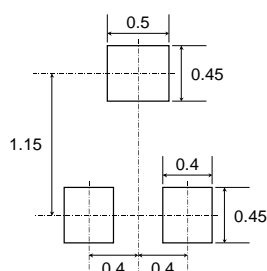
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

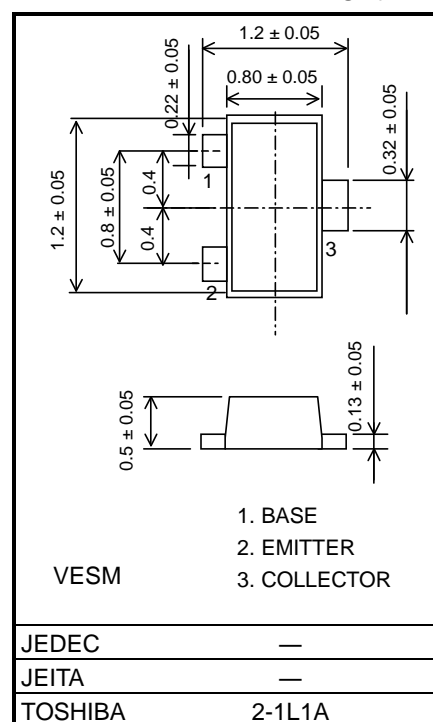
Note 1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

Pad Dimension (Reference)

Unit : mm



Unit: mm



JEDEC —

JEITA —

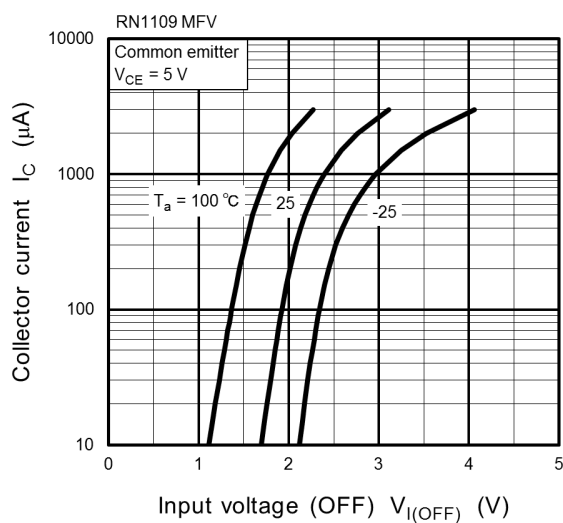
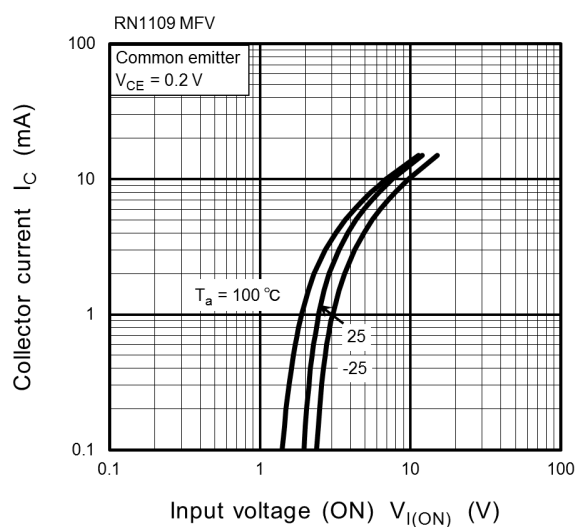
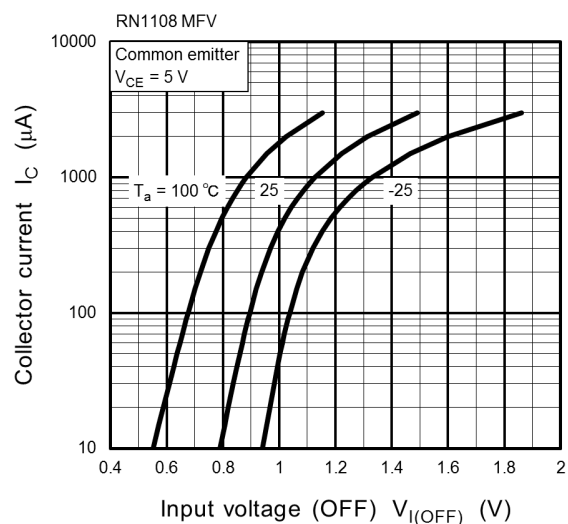
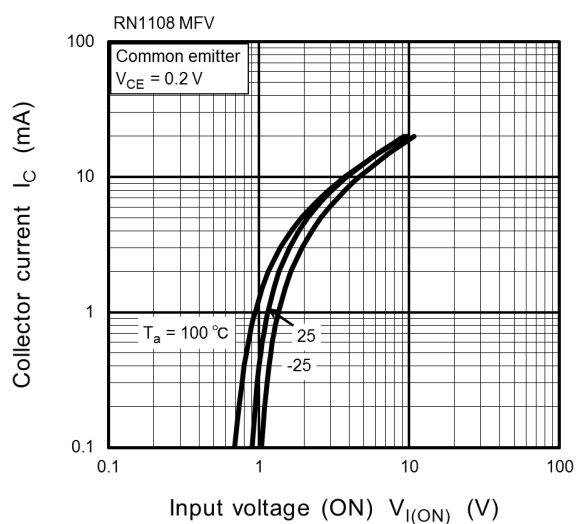
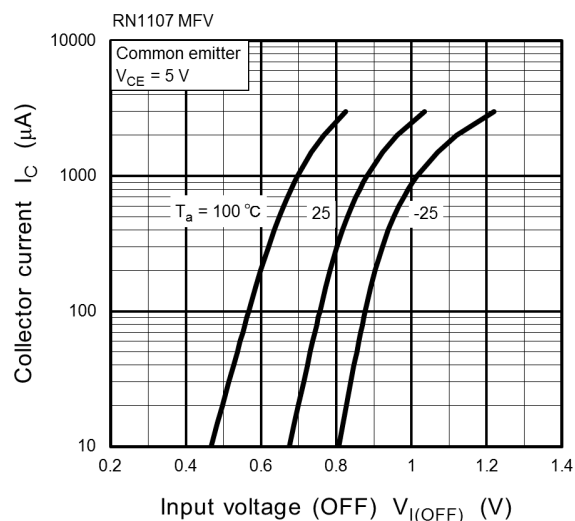
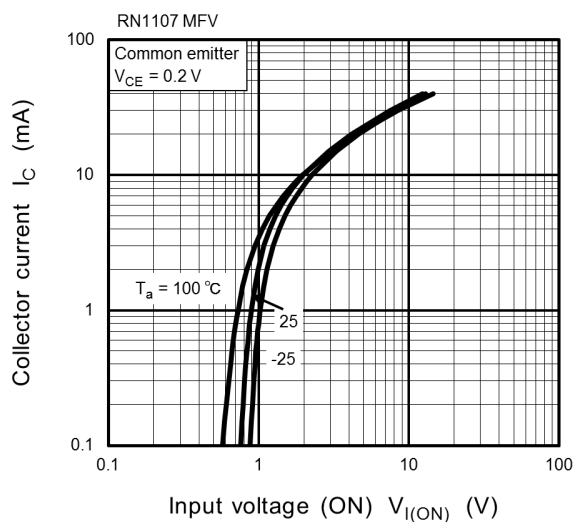
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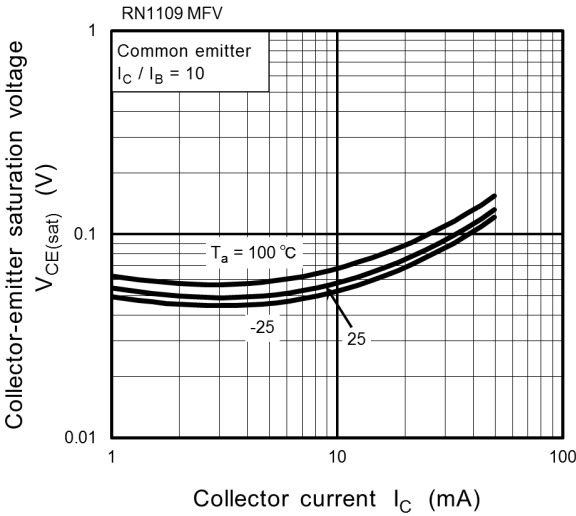
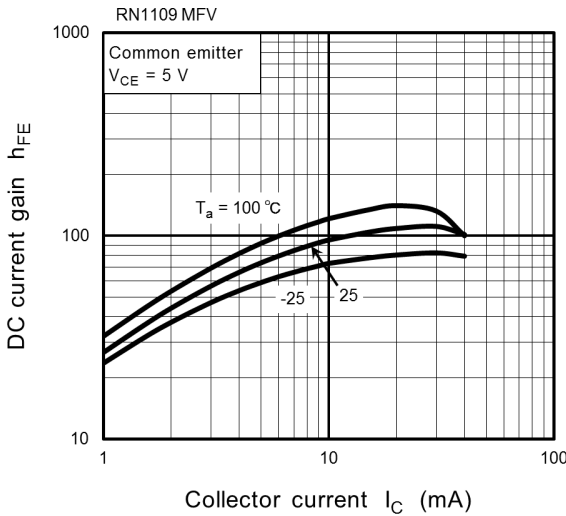
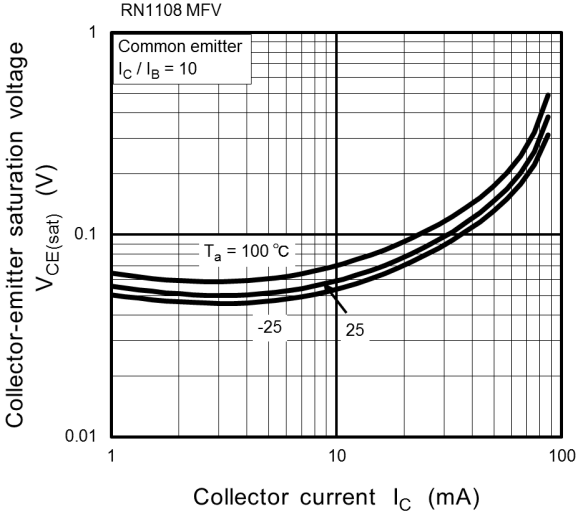
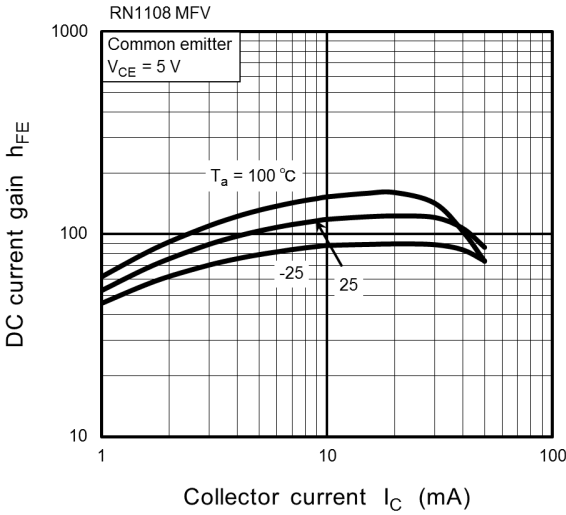
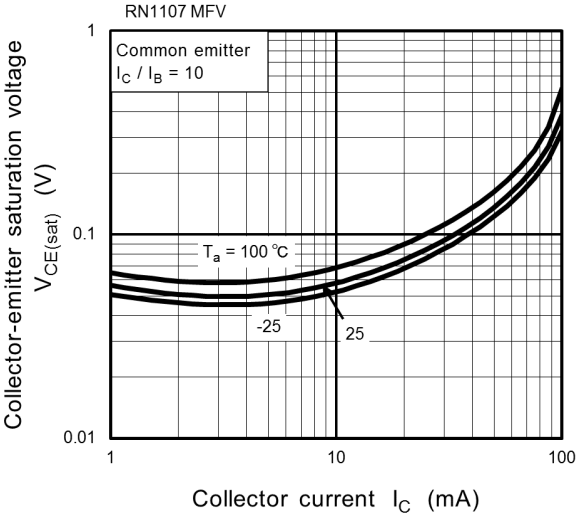
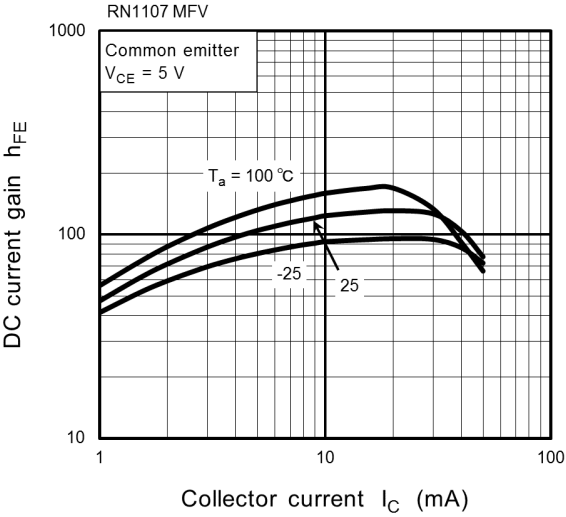
Weight: 1.5 mg (typ.)

Start of commercial production
2005-02

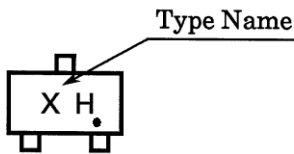
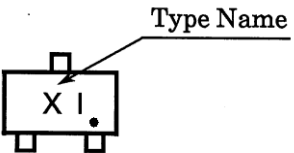
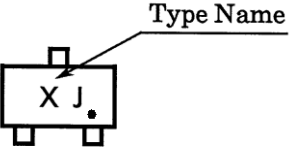
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	RN1107MFV to RN1109MFV	ICBO	V _{CB} = 50 V, I _E = 0 A	—	—	100	nA
		ICEO	V _{CE} = 50 V, I _B = 0 A	—	—	500	nA
Emitter cutoff current	RN1107MFV	IEBO	V _{EB} = 6 V, I _C = 0 A	0.081	—	0.15	mA
	RN1108MFV		V _{EB} = 7 V, I _C = 0 A	0.078	—	0.145	
	RN1109MFV		V _{EB} = 15 V, I _C = 0 A	0.167	—	0.311	
DC current gain	RN1107MFV	h _{FE}	V _{CE} = 5 V, I _C = 10 mA	80	—	—	—
	RN1108MFV			80	—	—	
	RN1109MFV			70	—	—	
Collector-emitter saturation voltage	RN1107MFV to RN1109MFV	V _{CE (sat)}	I _C = 5 mA, I _B = 0.5 mA	—	0.1	0.3	V
Input voltage (ON)	RN1107MFV	V _{I (ON)}	V _{CE} = 0.2 V, I _C = 5 mA	0.7	—	1.8	V
	RN1108MFV			1.0	—	2.6	
	RN1109MFV			2.2	—	5.8	
Input voltage (OFF)	RN1107MFV	V _{I (OFF)}	V _{CE} = 5 V, I _C = 0.1 mA	0.5	—	1.0	V
	RN1108MFV			0.6	—	1.16	
	RN1109MFV			1.5	—	2.6	
Collector output capacitance	RN1107MFV to RN1109MFV	C _{ob}	V _{CB} = 10 V, I _E = 0 A, f = 1 MHz	—	0.7	—	pF
Input resistor	RN1107MFV	R1	—	7	10	13	kΩ
	RN1108MFV			15.4	22	28.6	
	RN1109MFV			32.9	47	61.1	
Resistor ratio	RN1107MFV	R1/R2	—	0.17	0.213	0.255	—
	RN1108MFV			0.374	0.468	0.562	
	RN1109MFV			1.71	2.14	2.56	





Marking

Type Name	Marking
RN1107MFV	 <p>The diagram shows a rectangular marking area with a small square notch at the top center and two small squares at the bottom corners. Inside the rectangle, the text 'X H.' is printed. An arrow points from the label 'Type Name' to the 'H' in the marking.</p>
RN1108MFV	 <p>The diagram shows a rectangular marking area with a small square notch at the top center and two small squares at the bottom corners. Inside the rectangle, the text 'X I.' is printed. An arrow points from the label 'Type Name' to the 'I' in the marking.</p>
RN1109MFV	 <p>The diagram shows a rectangular marking area with a small square notch at the top center and two small squares at the bottom corners. Inside the rectangle, the text 'X J.' is printed. An arrow points from the label 'Type Name' to the 'J' in the marking.</p>

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