

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

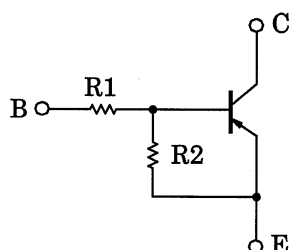
RN2107MFV, RN2108MFV, RN2109MFV

Switching, Inverter Circuit, Interface Circuit
and Driver Circuit Applications

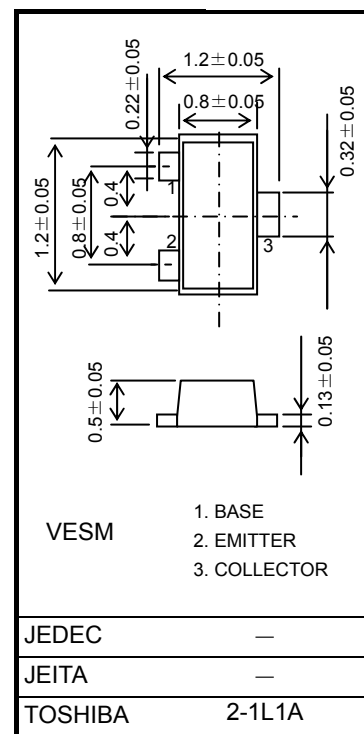
Unit: mm

- 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 RN1107MFV~RN1109MFV

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2107MFV	10	47
RN2108MFV	22	47
RN2109MFV	47	22



Weight: 0.0015 g (typ.)

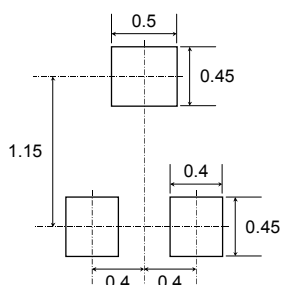
Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-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).

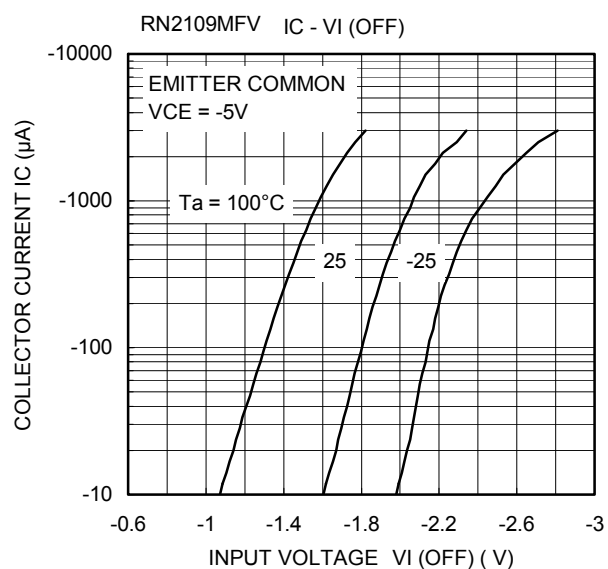
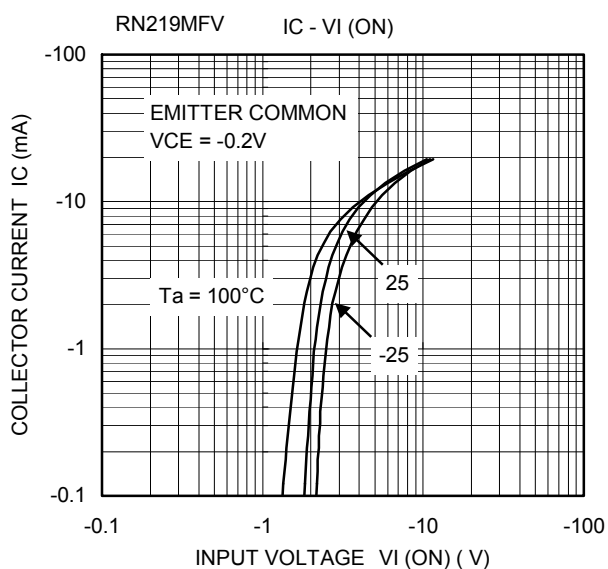
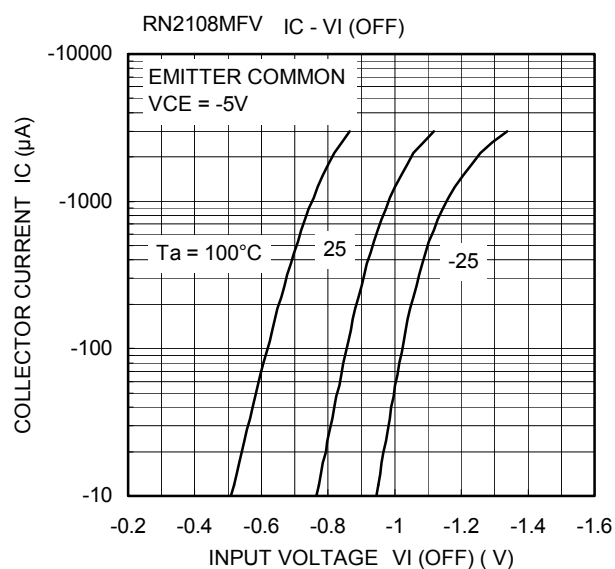
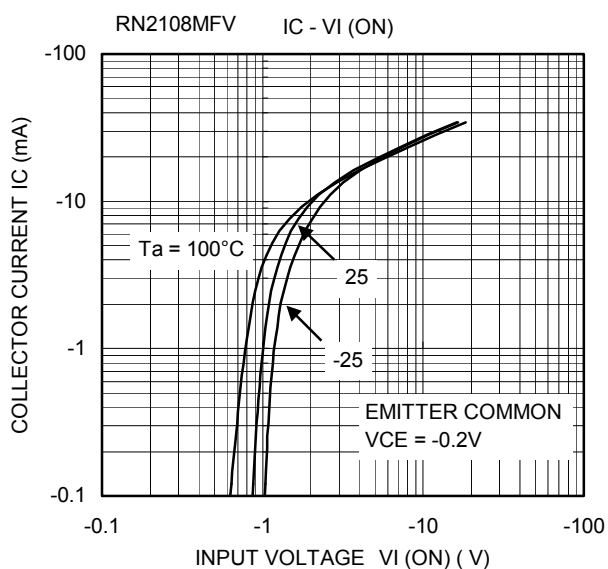
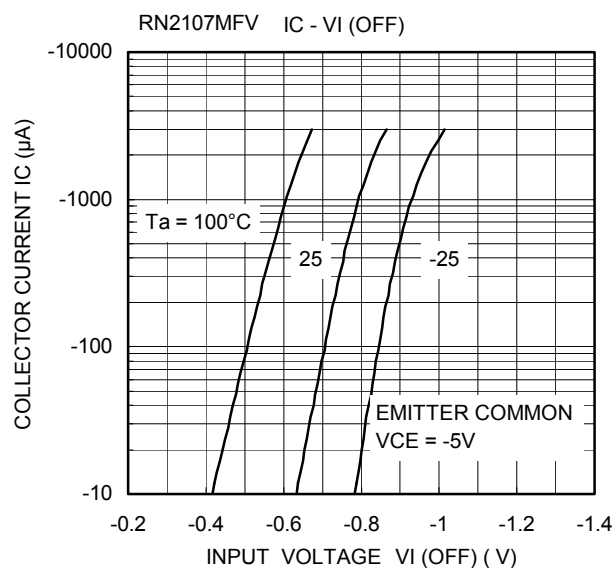
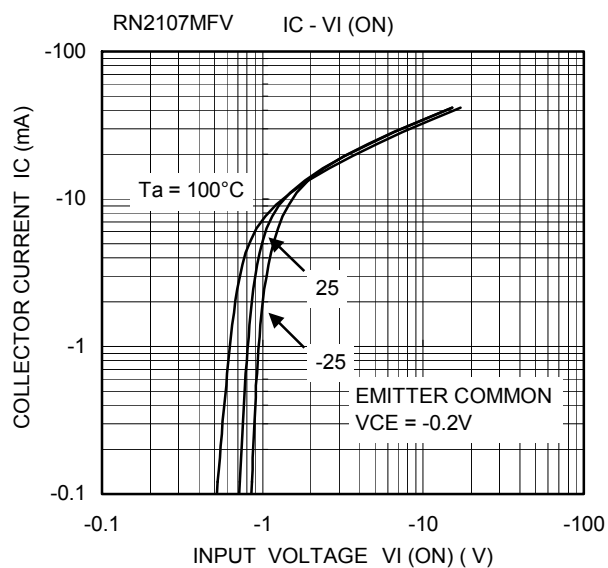
Note 1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

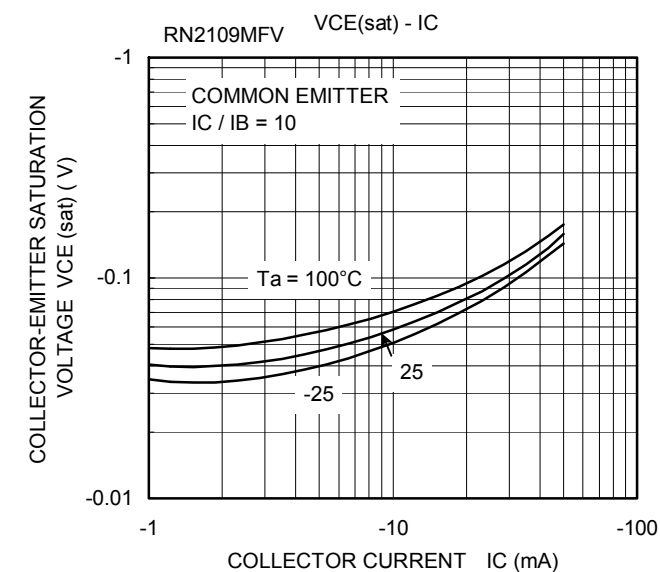
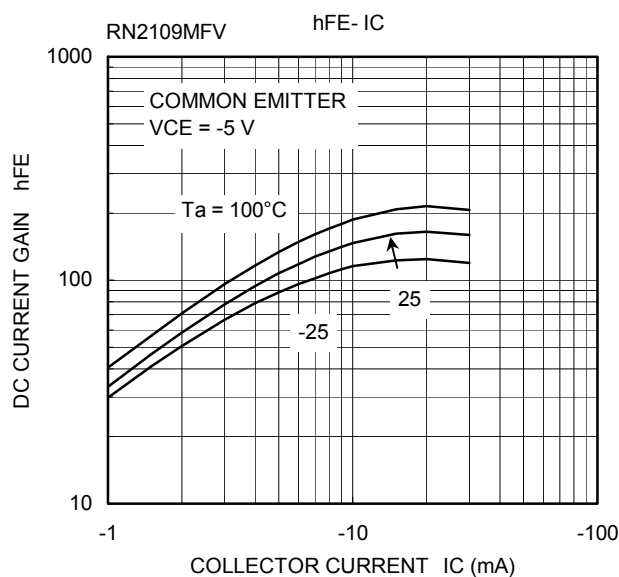
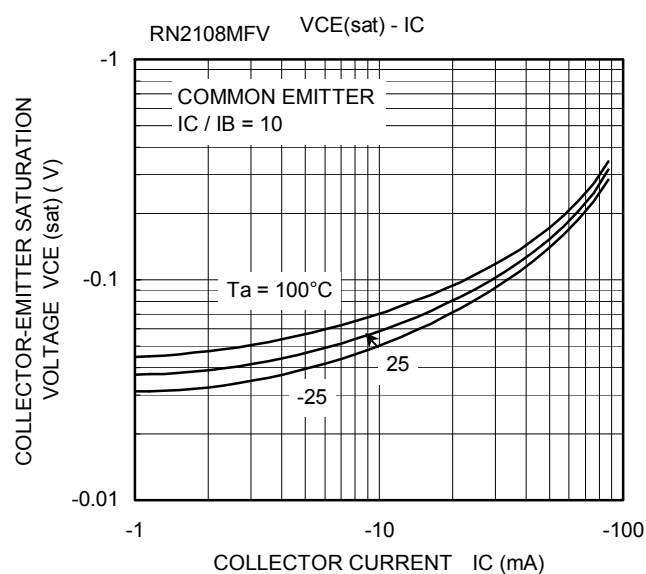
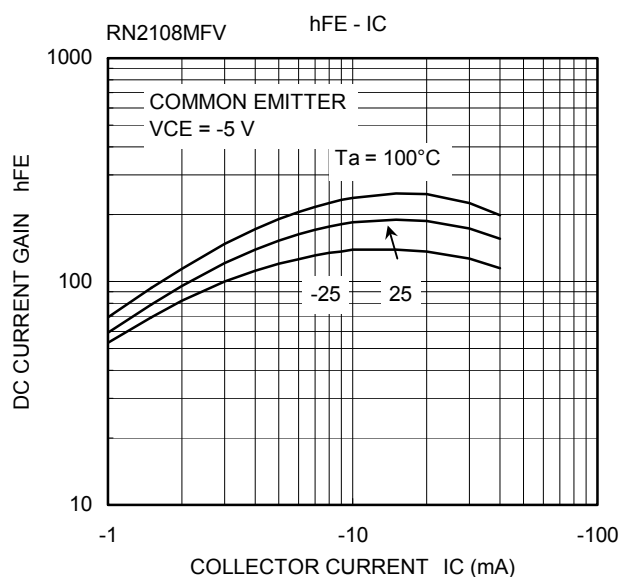
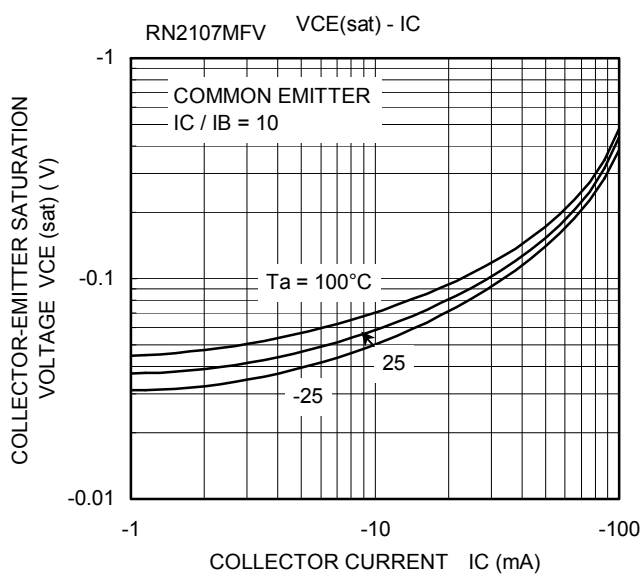
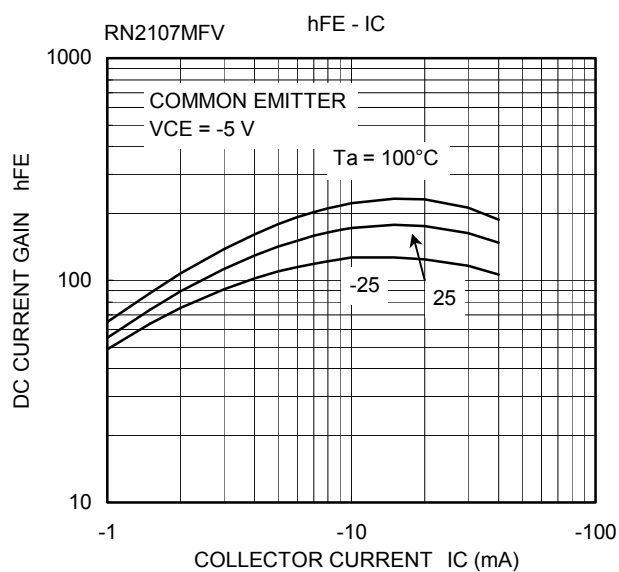


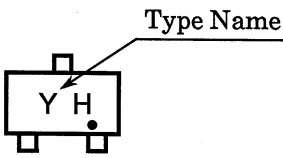
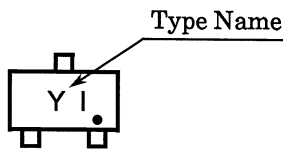
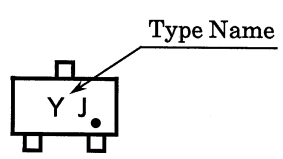
Start of commercial production
2005-02

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	RN2107MFV to RN2109MFV	I_{CBO}	—	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-100	nA
		I_{CEO}		$V_{CE} = -50\text{ V}, I_B = 0$	—	—	-500	nA
Emitter cutoff current	RN2107MFV	I_{EBO}	—	$V_{EB} = -6\text{ V}, I_C = 0$	-0.081	—	-0.15	mA
	RN2108MFV			$V_{EB} = -7\text{ V}, I_C = 0$	-0.078	—	-0.145	
	RN2109MFV			$V_{EB} = -15\text{ V}, I_C = 0$	-0.167	—	-0.311	
DC current gain	RN2107MFV	h_{FE}	—	$V_{CE} = -5\text{ V}, I_C = -10\text{ mA}$	80	—	—	—
	RN2108MFV				80	—	—	
	RN2109MFV				70	—	—	
Collector-emitter saturation voltage	RN2107MFV to RN2109MFV	$V_{CE(sat)}$	—	$I_C = -5\text{ mA}, I_B = -0.25\text{ mA}$	—	-0.1	-0.3	V
Input voltage (ON)	RN2107MFV	$V_I(ON)$	—	$V_{CE} = -0.2\text{ V}, I_C = -5\text{ mA}$	-0.7	—	-1.8	V
	RN2108MFV				-1.0	—	-2.6	
	RN2109MFV				-2.2	—	-5.8	
Input voltage (OFF)	RN2107MFV	$V_I(OFF)$	—	$V_{CE} = -5\text{ V}, I_C = -0.1\text{ mA}$	-0.5	—	-1.0	V
	RN2108MFV				-0.6	—	-1.16	
	RN2109MFV				-1.5	—	-2.6	
Collector output capacitance	RN2107MFV to RN2109MFV	C_{ob}	—	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.9	—	pF
Input resistor	RN2107MFV	R1	—	—	7	10	13	kΩ
	RN2108MFV				15.4	22	28.6	
	RN2109MFV				32.9	47	61.1	
Resistor ratio	RN2107MFV	R1/R2	—	—	0.17	0.213	0.255	—
	RN2108MFV				0.374	0.468	0.562	
	RN2109MFV				1.71	2.14	2.56	





Type Name	Marking
RN2107MFV	 <p>The diagram shows a rectangular component with four pins. The top pin is labeled 'Type Name'. The main body contains the characters 'Y H' and a small dot to the right of the 'H'.</p>
RN2108MFV	 <p>The diagram shows a rectangular component with four pins. The top pin is labeled 'Type Name'. The main body contains the characters 'Y I' and a small dot to the right of the 'I'.</p>
RN2109MFV	 <p>The diagram shows a rectangular component with four pins. The top pin is labeled 'Type Name'. The main body contains the characters 'Y J' and a small dot to the right of the 'J'.</p>

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