Unit: mm

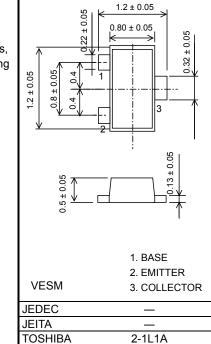
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

## RN2101MFV,RN2102MFV,RN2103MFV RN2104MFV,RN2105MFV,RN2106MFV

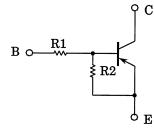
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- 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 RN1101MFV to RN1106MFV

Absolute Maximum Ratings (Ta = 25°C)



### **Equivalent Circuit and Bias Resistor Values**



Type No.	R1 (kΩ)	R2 (kΩ)
RN2101MFV	4.7	4.7
RN2102MFV	10	10
RN2103MFV	22	22
RN2104MFV	47	47
RN2105MFV	2.2	47
RN2106MFV	4.7	47



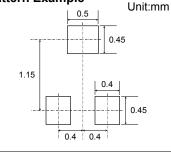
Charac	Symbol	Rating	Unit		
Collector-base voltage	RN2101MFV to 2106MFV	V <sub>CBO</sub>	-50	V	
Collector-emitter voltage		V <sub>CEO</sub>	-50	V	
Emitter-base voltage	RN2101MFV to 2104MFV	V <sub>FBO</sub>	-10	V	
Emilier-base vollage	RN2105MFV, 2106MFV	▲EBO	-5		
Collector current		IC	-100	mA	
Collector power dissipation	RN2101MFV to 2106MFV	P <sub>C</sub> (Note 1)	150	mW	
Junction temperature		Tj	150	°C	
Storage temperature range	rature range		–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  $\times$  25.4 mm  $\times$  1.6 mm)

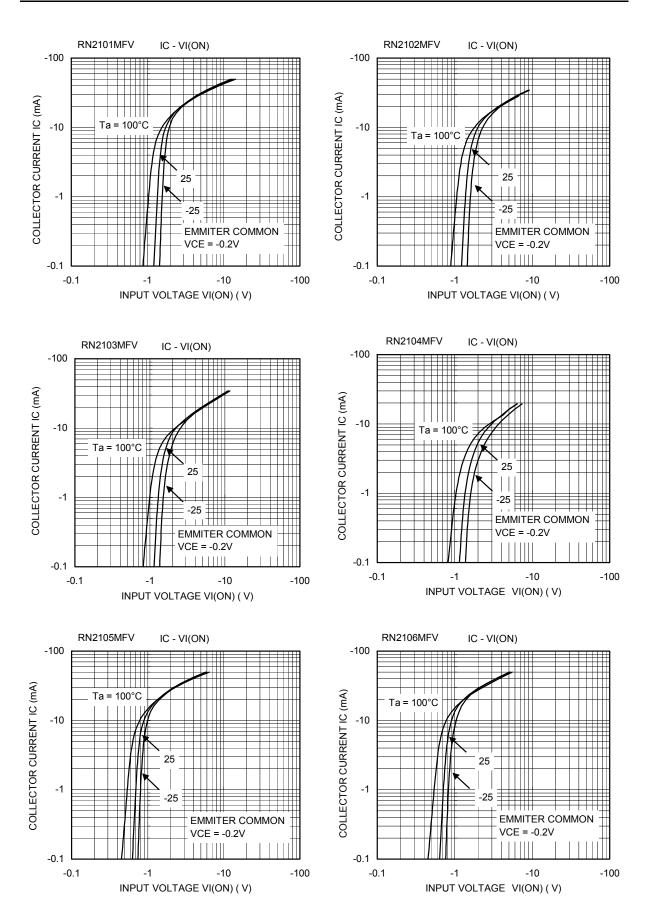
#### Land Pattern Example

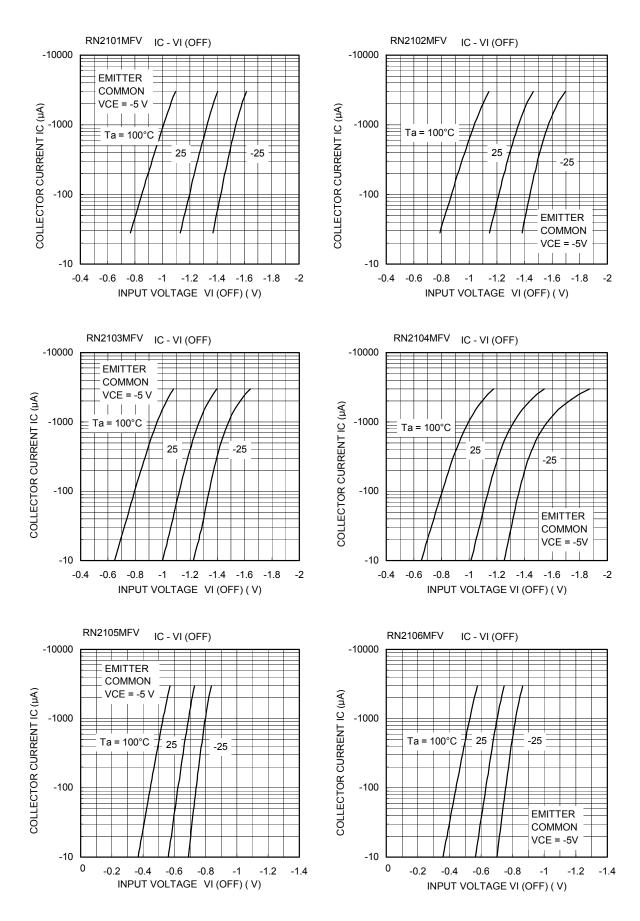


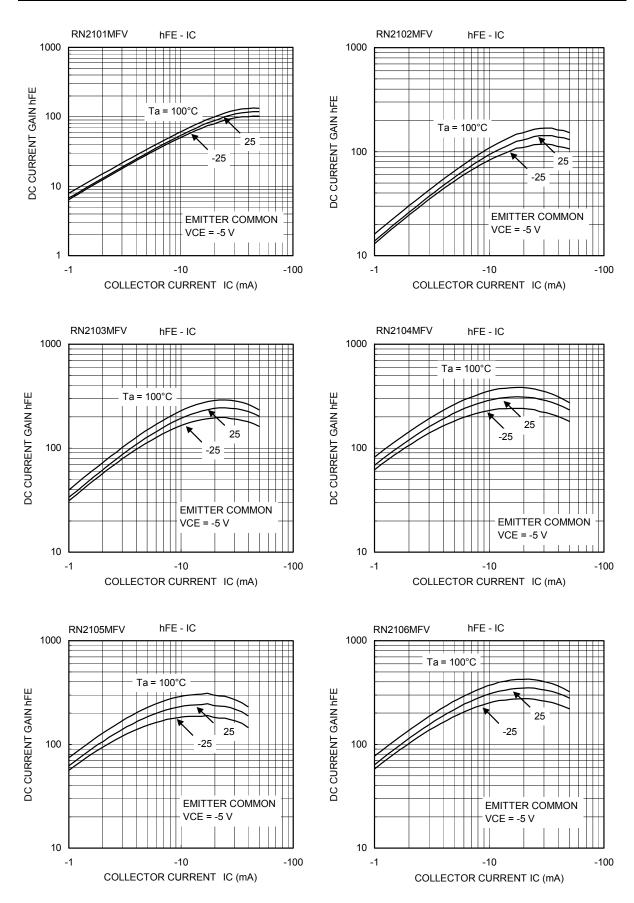
Downloaded from Elcodis.com electronic components distributor

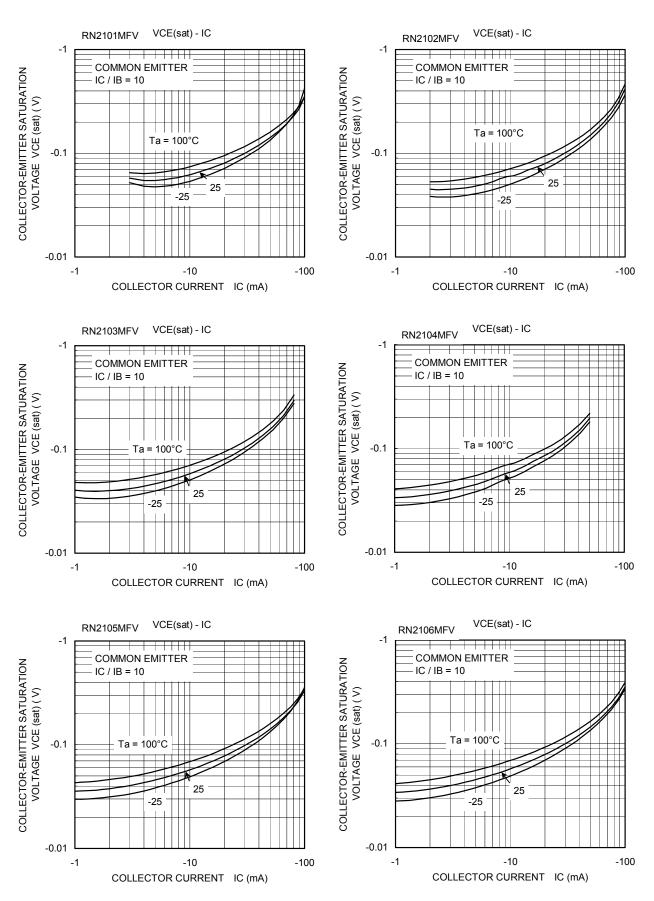
## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cutoff current	RN2101MFV to	I <sub>CBO</sub>	-	$V_{CB}$ = -50 V, I <sub>E</sub> = 0	_	-	-100	nA
	2106MFV			$V_{CE}$ = -50 V, I <sub>B</sub> = 0	_	—	-500	
Emitter cutoff current	RN2101MFV	I <sub>EBO</sub>	_	V <sub>EB</sub> = -10 V, I <sub>C</sub> = 0	-0.82	—	-1.52	mA
	RN2102MFV				-0.38	_	-0.71	
	RN2103MFV				-0.17	_	-0.33	
	RN2104MFV				-0.082	_	-0.15	
	RN2105MFV				-0.078	_	-0.145	
	RN2106MFV			$V_{EB} = -5 V, I_C = 0$	-0.074	_	-0.138	
	RN2101MFV			V <sub>CE</sub> = -5 V, I <sub>C</sub> = -10 mA	30	_		
	RN2102MFV				50	_	_	
	RN2103MFV	1.			70	_	_	_
DC current gain	RN2104MFV	h <sub>FE</sub>	_		80	_	_	
	RN2105MFV				80	_	_	
	RN2106MFV				80	_	_	
Collector-emitter saturation voltage	RN2101MFV to 2106MFV	V <sub>CE (sat)</sub>	_	I <sub>C</sub> = –5 mA, I <sub>B</sub> = –0.5 mA	_	-0.1	-0.3	V
	RN2101MFV	V <sub>I (ON)</sub>		V <sub>CE</sub> = -0.2 V, I <sub>C</sub> = -5 mA	-1.1	_	-2.0	V
	RN2102MFV		_		-1.2	_	-2.4	
	RN2103MFV				-1.3	_	-3.0	
Input voltage (ON)	RN2104MFV				-1.5	—	-5.0	
	RN2105MFV				-0.6	_	-1.1	
	RN2106MFV				-0.7	_	-1.3	
Input voltage (OFF)	RN2101MFV to 2104MFV	N	(OFF) —	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -0.1 mA	-1.0	_	-1.5	v
input voltage (OFF)	RN2105MFV, 2106MFV	VI (OFF)			-0.5	-	-0.8	
Transition frequency	RN2101MFV to 2106MFV	fT	_	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA	_	250	_	MHz
Collector output capacitance	RN2101MFV to 2106MFV	C <sub>ob</sub>	_	V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz	_	0.9	_	pF
	RN2101MFV	- R1	_		3.29	4.7	6.11	kΩ
	RN2102MFV				7	10	13	
	RN2103MFV				15.4	22	28.6	
Input resistor	RN2104MFV				32.9	47	61.1	
	RN2105MFV				1.54	2.2	2.86	
	RN2106MFV	1			3.29	4.7	6.11	
	RN2101MFV to 2104MFV				0.8	1.0	1.2	
Resistor ratio	RN2105MFV	R1/R2	-		0.0376	0.0468	0.0562	—
	RN2106MFV	1			0.08	0.1	0.12	









Type Name	Marking
RN2101MFV	Type Name Y A
RN2102MFV	Type Name Y B
RN2103MFV	Y C.
RN2104MFV	Type Name Y D
RN2105MFV	
RN2106MFV	Type Name Y F

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