

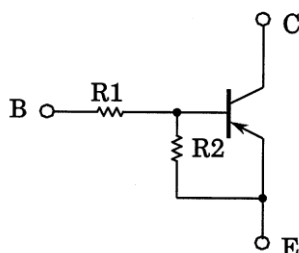
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

RN2114MFV, RN2115MFV, RN2116MFV RN2117MFV, RN2118MFV

Switching Applications
Inverter Circuit Applications
Interface Circuit Applications
Driver Circuit Applications

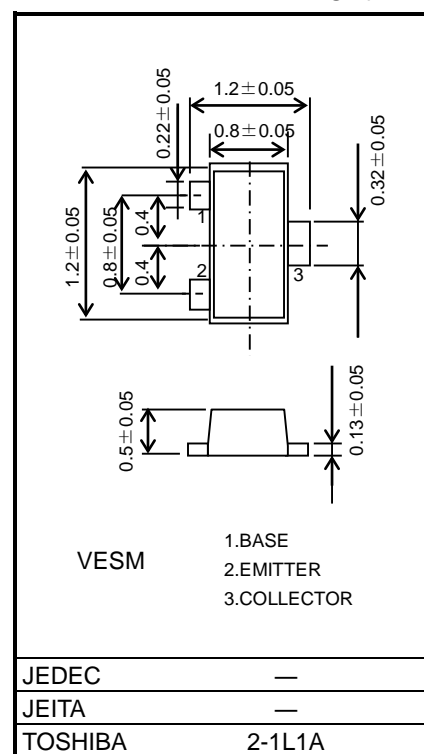
- Ultra-small package, suited to very high density mounting
- Incorporating a bias resistor into the transistor reduces the number of parts, so enabling the manufacture of ever more compact equipment and lowering assembly cost.
- A wide range of resistor values is available for use in various circuits.
- Complementary to RN1114MFV to RN1118MFV

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2114MFV	1	10
RN2115MFV	2.2	10
RN2116MFV	4.7	10
RN2117MFV	10	4.7
RN2118MFV	47	10

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-1L1A

Weight: 1.5 mg (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}	−5	V
		−6	
		−7	
		−15	
		−25	
Collector current	I _C	−100	mA
Collector power dissipation	P _C (Note1)	150	mW
Junction temperature	T _j	150	°C
Storage temperature range	T _{stg}	−55 to 150	°C

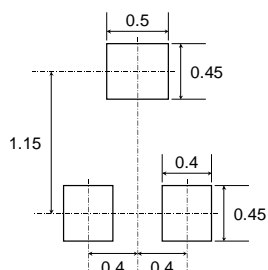
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Note1: Mounted on FR4 board (25.4 mm × 25.4 mm × 1.6mm)

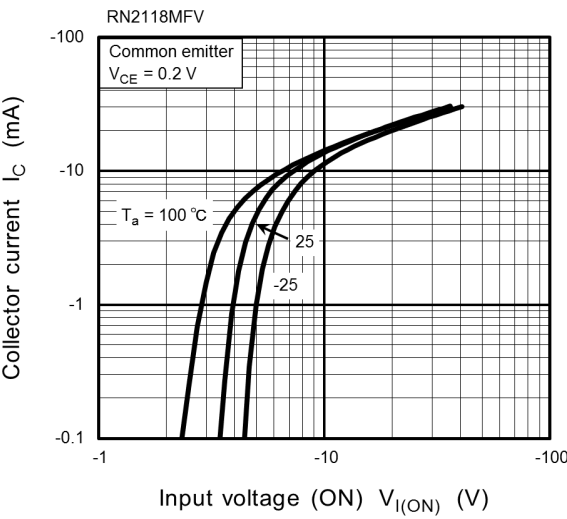
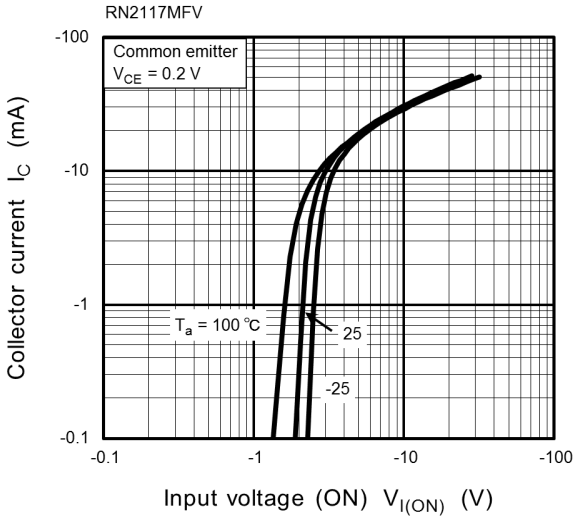
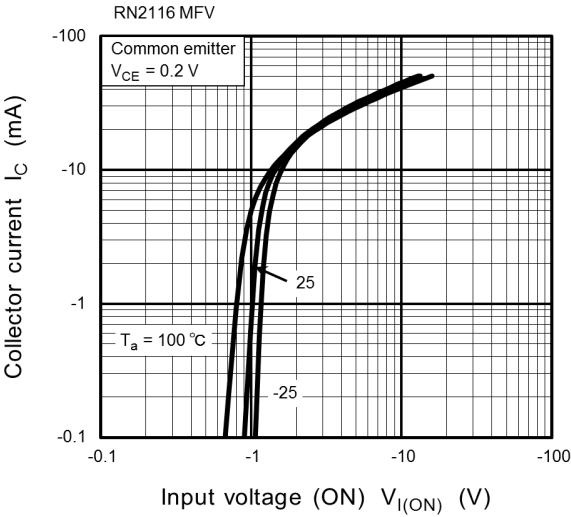
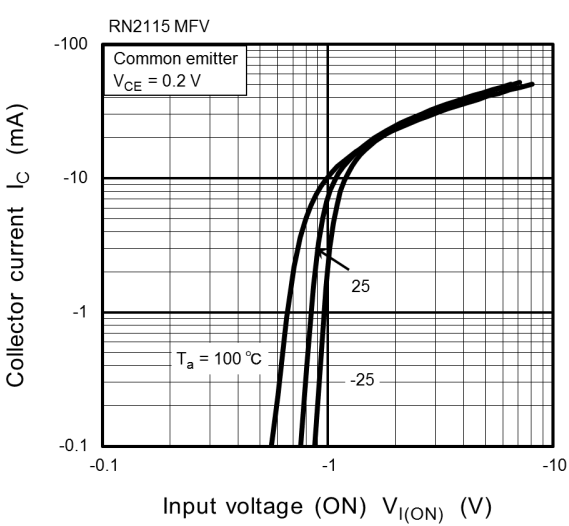
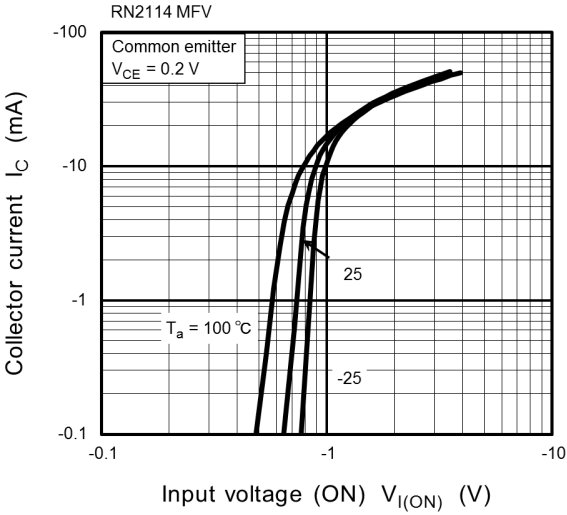
Start of commercial production
2005-09

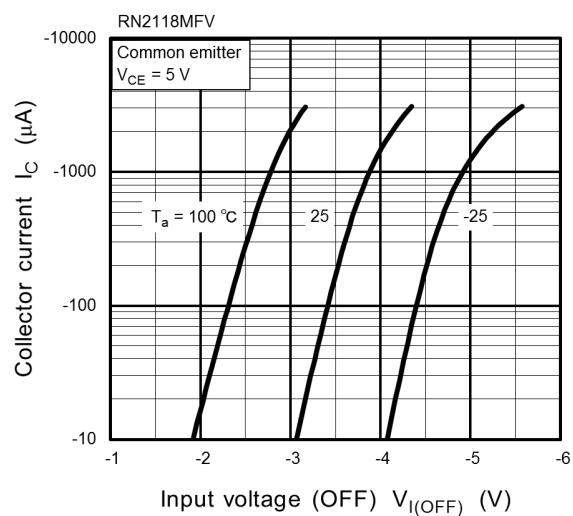
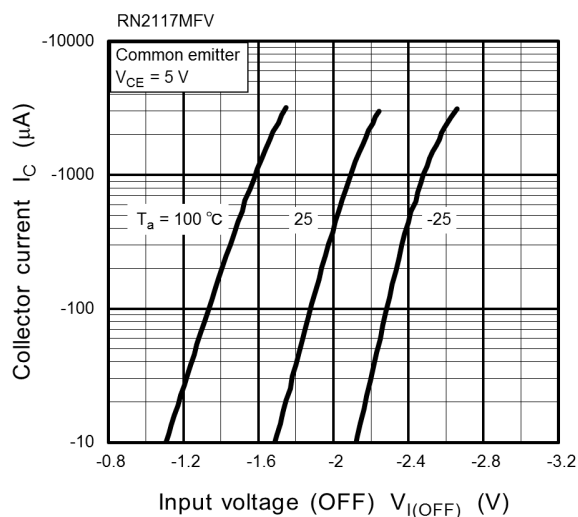
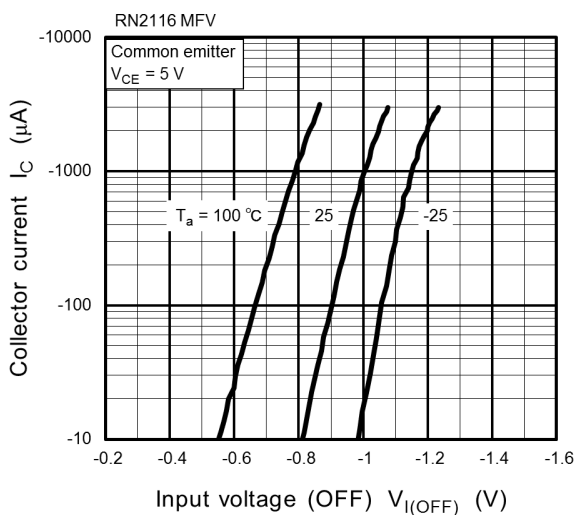
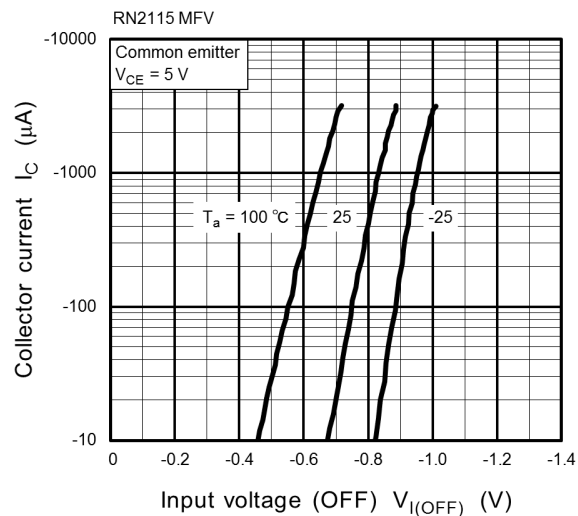
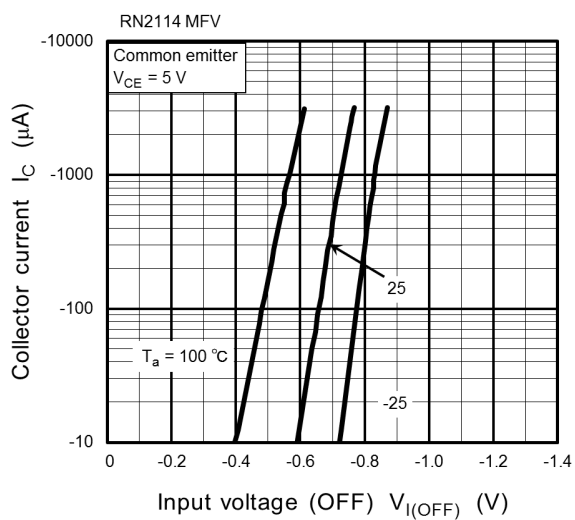
Land Pattern Example unit: mm

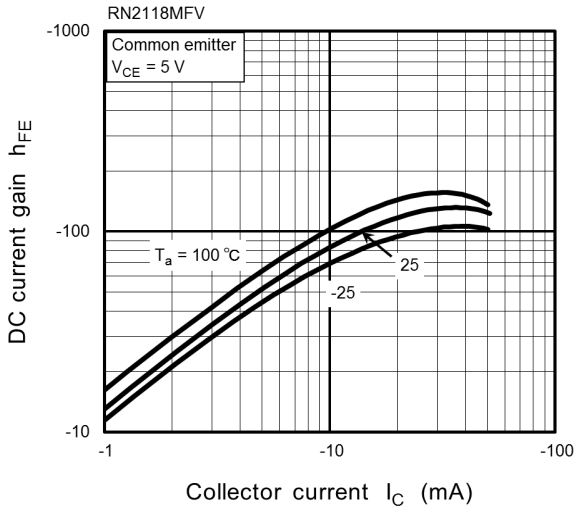
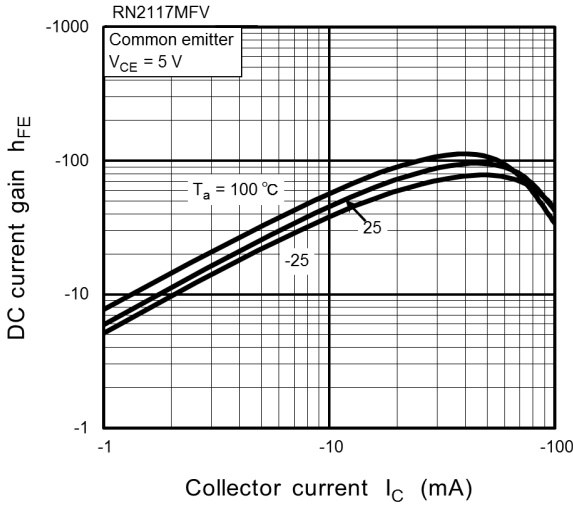
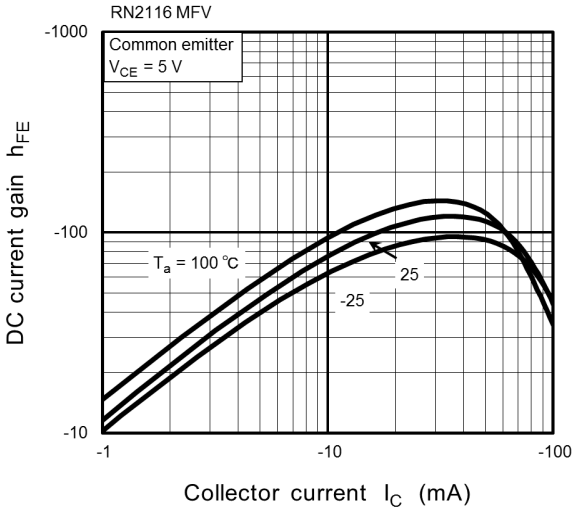
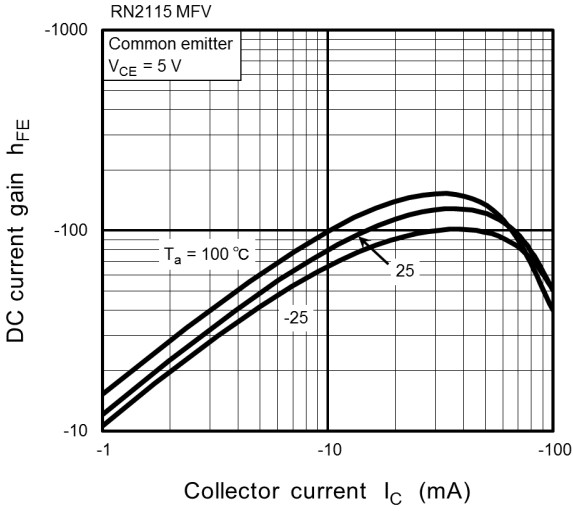
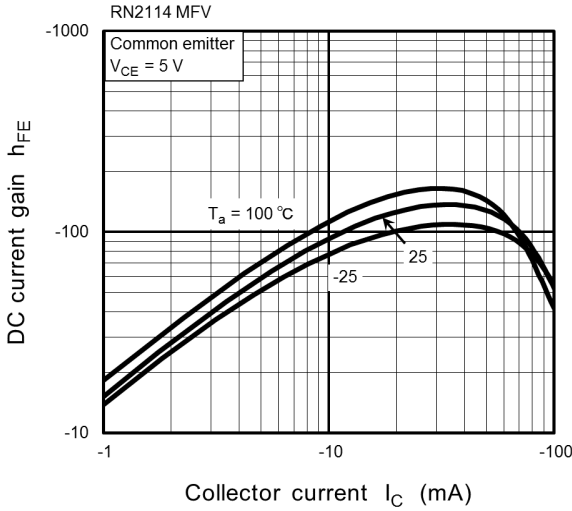


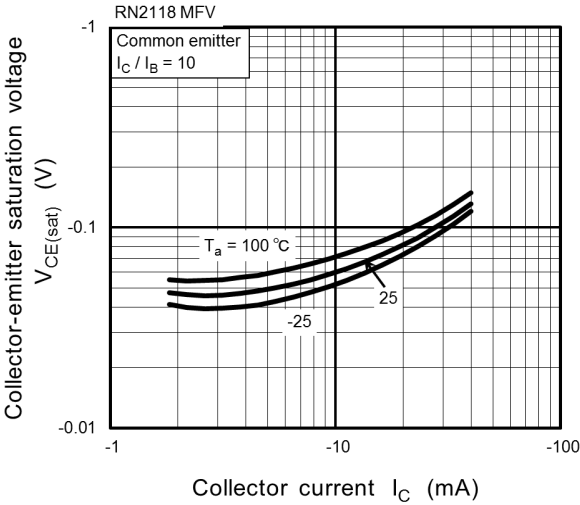
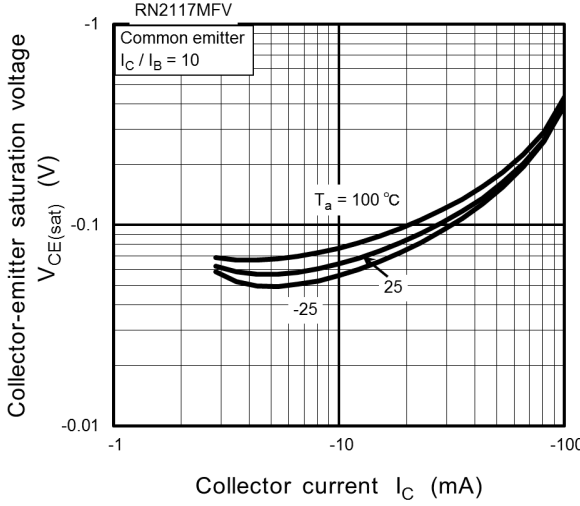
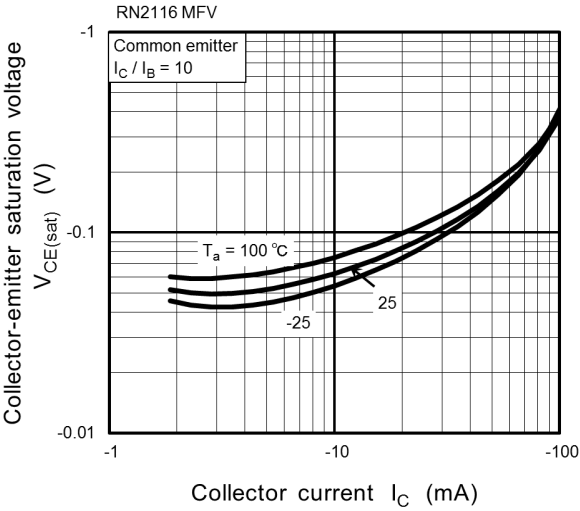
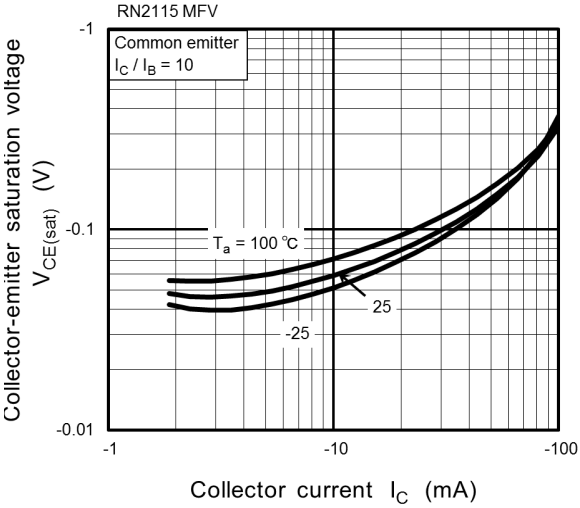
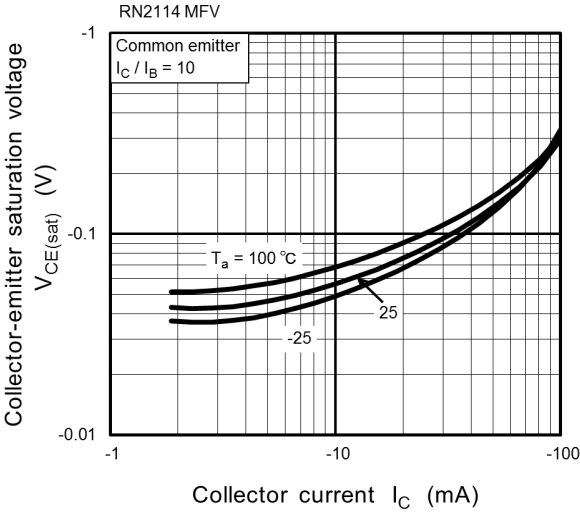
Electrical Characteristics (Ta = 25°C)

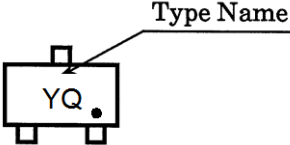
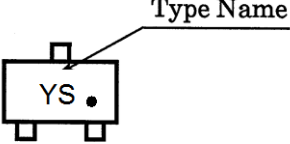
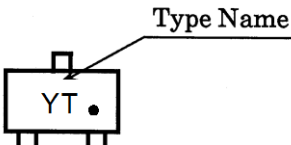
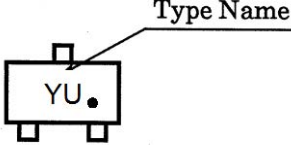
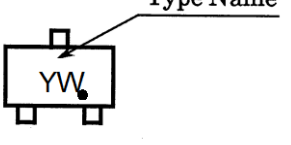
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2114MFV to 2118MFV	ICBO	V _{CB} = -50V, I _E = 0	—	—	-100	nA
		ICEO	V _{CE} = -50V, I _B = 0	—	—	-500	
Emitter cut-off current	RN2114MFV	IEBO	V _{EB} = -5V, I _C = 0	-0.35	—	-0.65	mA
	RN2115MFV		V _{EB} = -6V, I _C = 0	-0.37	—	-0.71	
	RN2116MFV		V _{EB} = -7V, I _C = 0	-0.36	—	-0.68	
	RN2117MFV		V _{EB} = -15V, I _C = 0	-0.78	—	-1.46	
	RN2118MFV		V _{EB} = -25V, I _C = 0	-0.33	—	-0.63	
DC current gain	RN2114MFV to 16MFV, 18MFV	h _{FE}	V _{CE} = -5V, I _C = -10mA	50	—	—	
	RN2117MFV			30	—	—	
Collector-emitter saturation voltage	RN2114MFV to 2118MFV	V _{CE(sat)}	I _C = -5mA, I _B = -0.5mA	—	-0.1	-0.3	V
Input voltage (ON)	RN2114MFV	V _{I (ON)}	V _{CE} = -0.2V, I _C = -5mA	-0.5	—	-2.0	V
	RN2115MFV			-0.6	—	-2.5	
	RN2116MFV			-0.7	—	-2.5	
	RN2117MFV			-1.5	—	-3.5	
	RN2118MFV			-2.5	—	-10.0	
Input voltage (OFF)	RN2114MFV	V _{I (OFF)}	V _{CE} = -5V, I _C = -0.1mA	-0.3	—	-0.9	V
	RN2115MFV			-0.3	—	-1.0	
	RN2116MFV			-0.3	—	-1.1	
	RN2117MFV			-0.3	—	-3.0	
	RN2118MFV			-0.5	—	-5.7	
Collector output capacitance	RN2114MFV to 2118MFV	C _{ob}	V _{CB} = -10V, I _E = 0, f = 1MHz	—	0.9	—	pF
Input resistor	RN2114MFV	R1	—	0.7	1.0	1.3	kΩ
	RN2115MFV			1.54	2.2	2.86	
	RN2116MFV			3.29	4.7	6.11	
	RN2117MFV			7.0	10.0	13.0	
	RN2118MFV			32.9	47	61.1	
Resistor ratio	RN2114MFV	R1/R2	—	—	0.1	—	
	RN2115MFV			—	0.22	—	
	RN2116MFV			—	0.47	—	
	RN2117MFV			—	2.13	—	
	RN2118MFV			—	4.7	—	









Type Name	Marking
RN2114MFV	
RN2115MFV	
RN2116MFV	
RN2117MFV	
RN2118MFV	

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- Техническая поддержка проекта;
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