

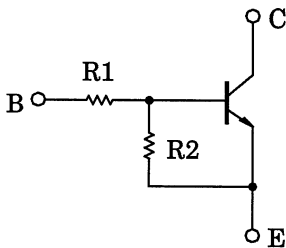
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

## RN1421, RN1422, RN1423, RN1424 RN1425, RN1426, RN1427

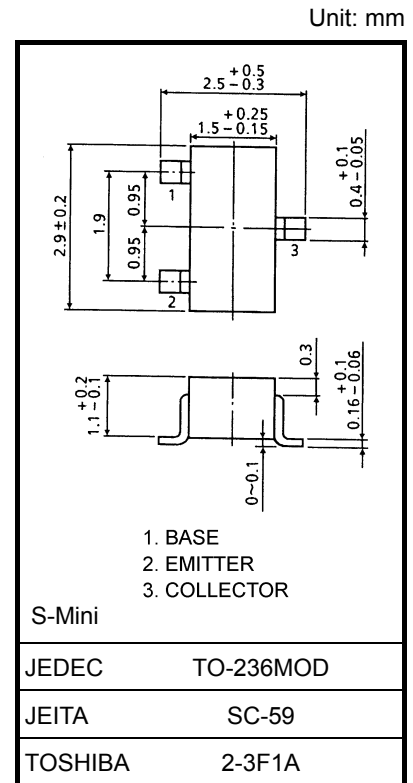
Switching, Inverter Circuit, Interface Circuit  
and Driver Circuit Applications

- High current type ( $I_C$  (max) = 800mA)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Low  $V_{CE}$  (sat)
- Complementary to RN2421 to RN2427

### Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1421	1	1
RN1422	2.2	2.2
RN1423	4.7	4.7
RN1424	10	10
RN1425	0.47	10
RN1426	1	10
RN1427	2.2	10



Weight: 12 mg (typ.)

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	50	V
Emitter-base voltage	$V_{EBO}$	10	V
		5	
		6	
Collector current	$I_C$	800	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

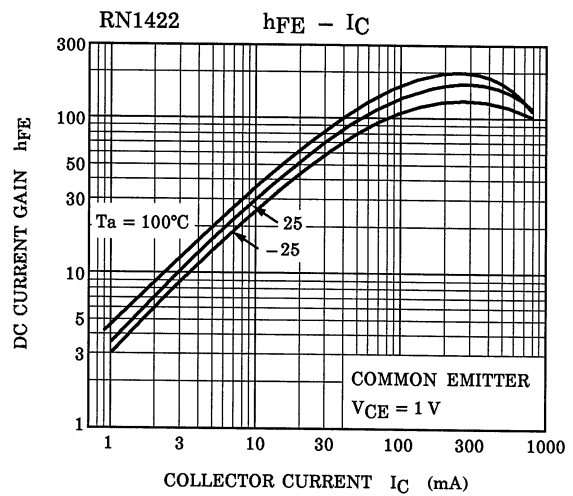
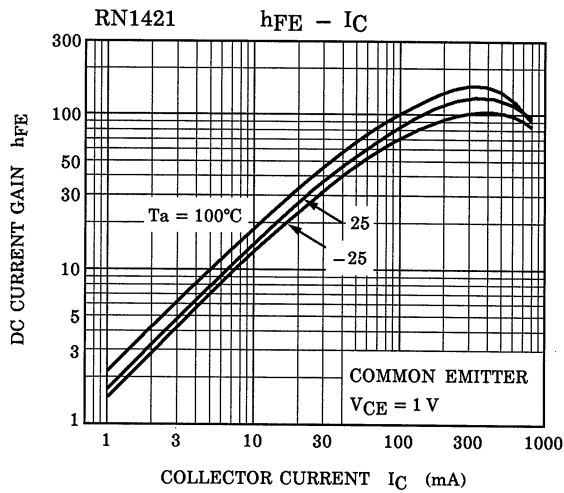
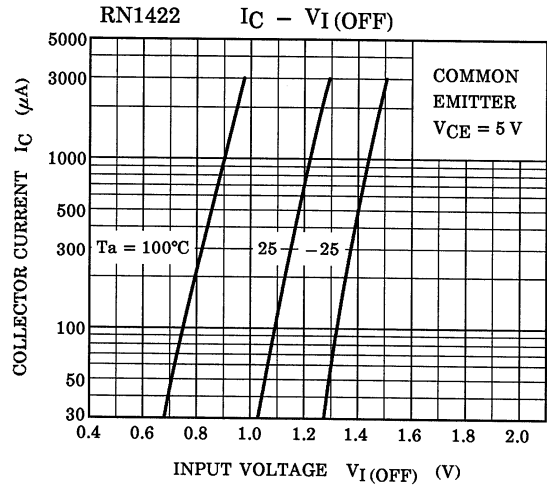
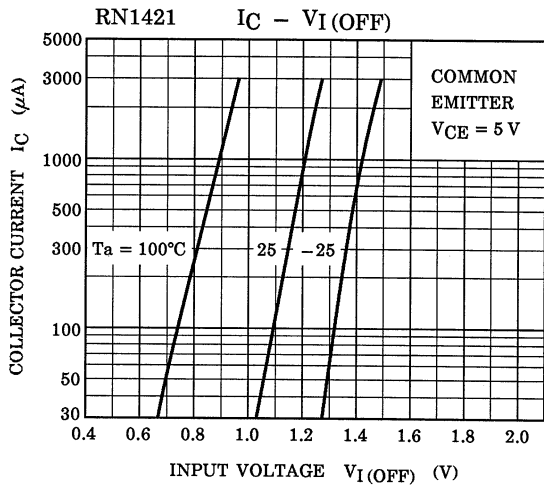
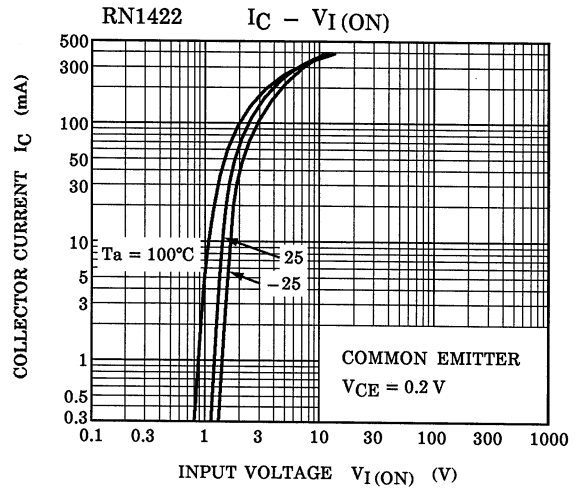
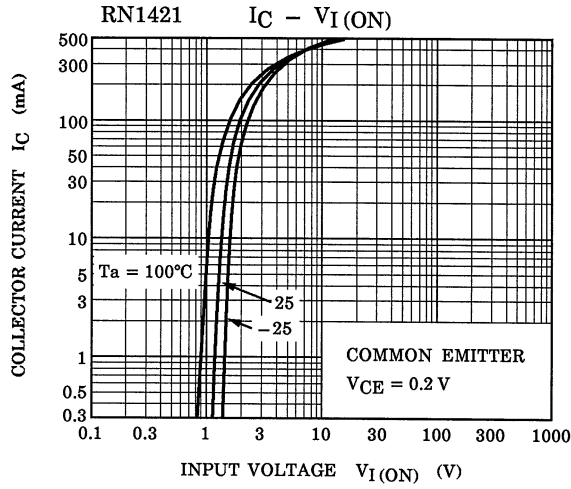
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

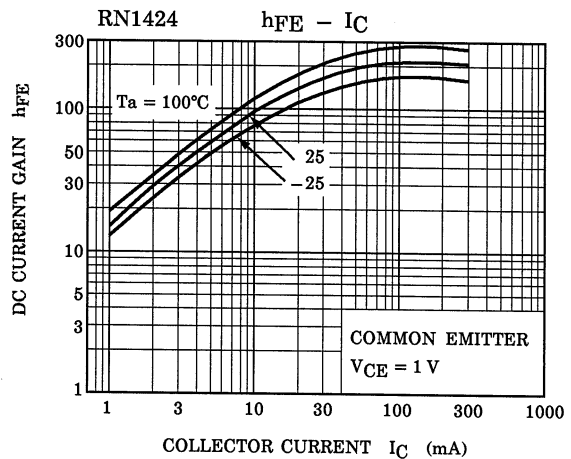
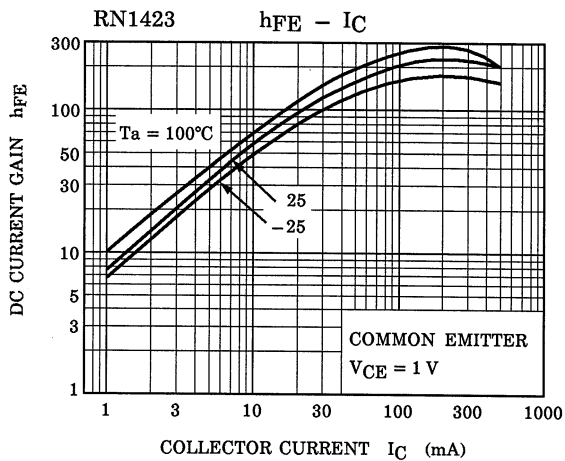
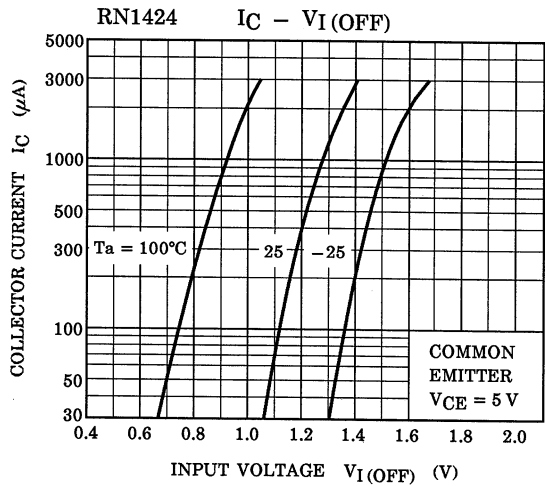
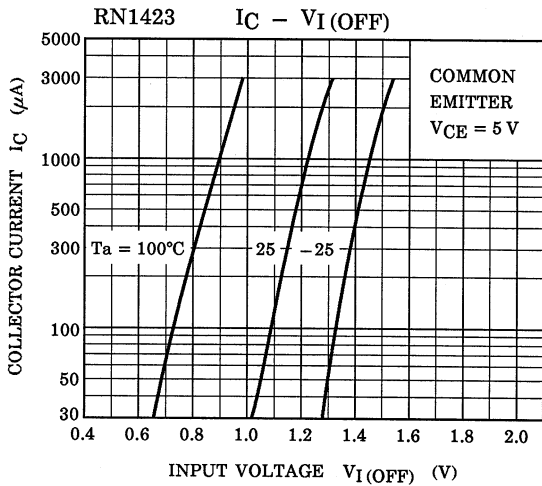
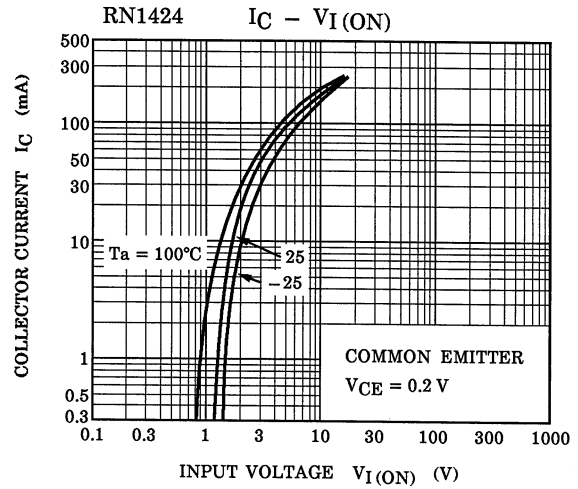
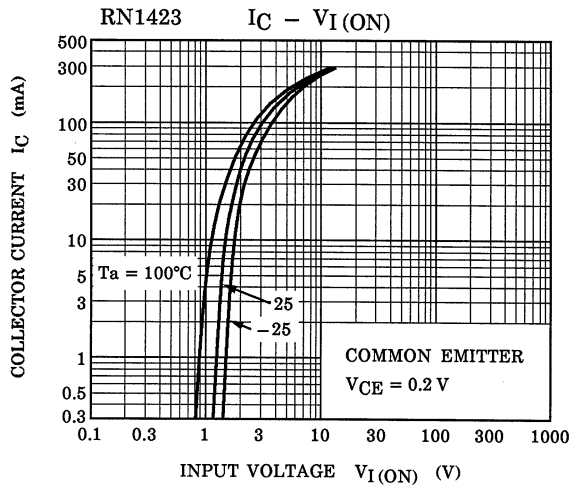
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

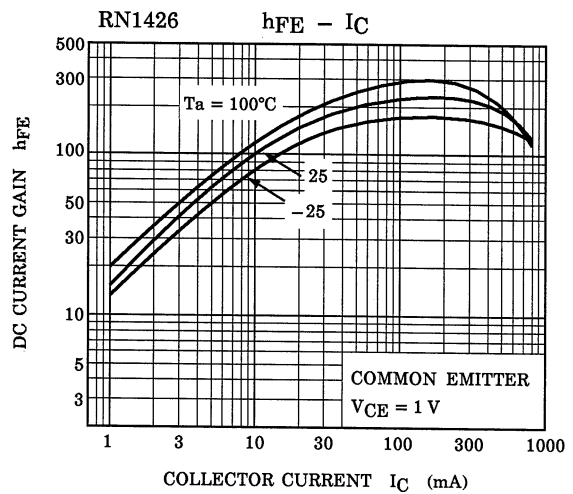
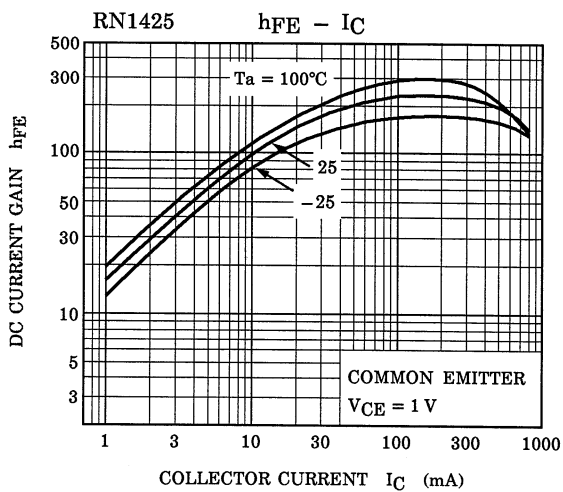
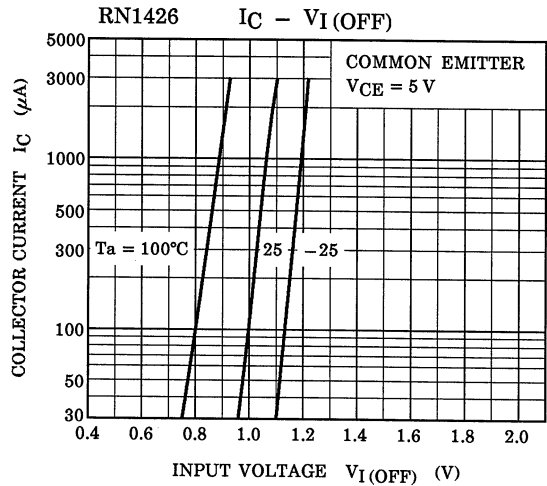
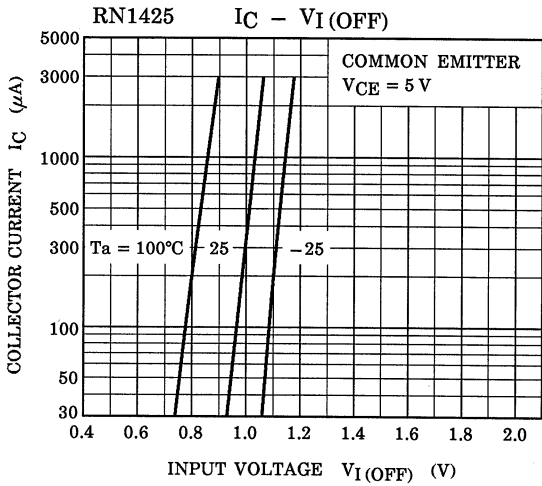
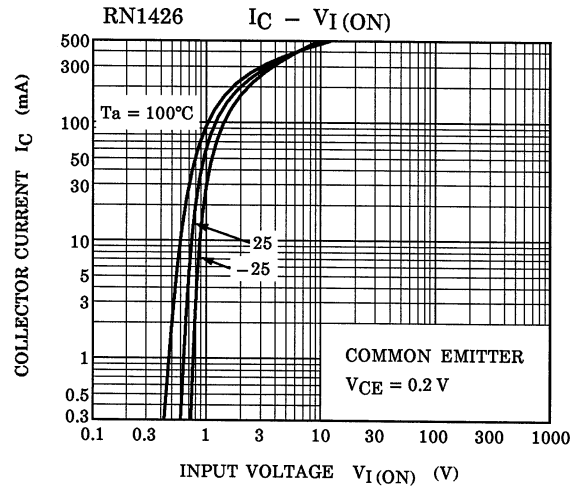
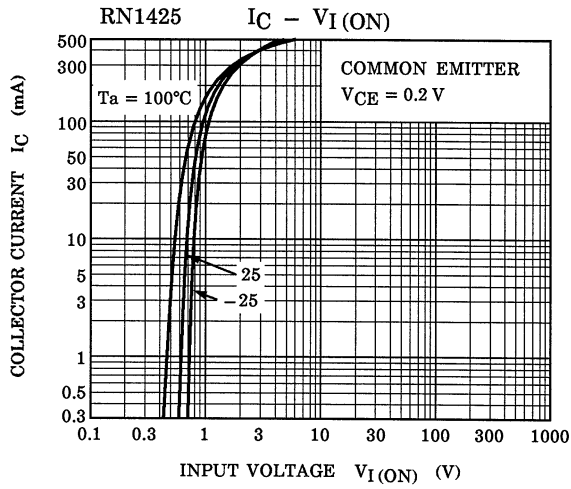
Start of commercial production  
1988-03

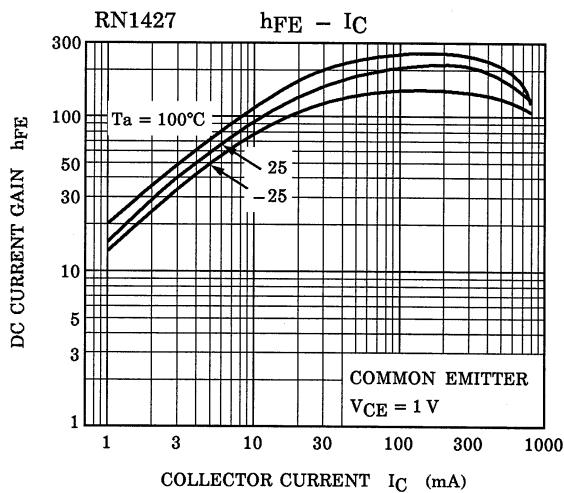
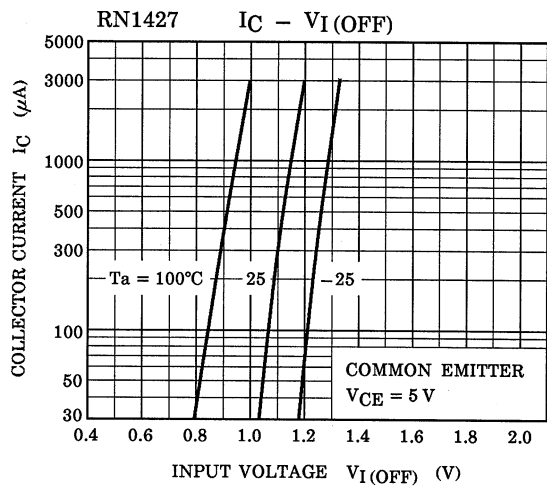
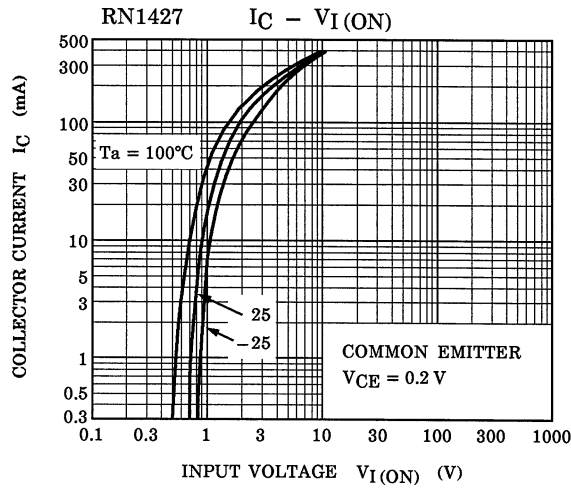
## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	RN1421 to 1427	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		
Emitter cut-off current	RN1421	I <sub>EBO</sub>	—	V <sub>EB</sub> = 10V, I <sub>C</sub> = 0	3.85	—	7.14	mA	
	RN1422				1.75	—	3.25		
	RN1423				0.82	—	1.52		
	RN1424			0.38	—	0.71			
	RN1425			V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	0.365	—	0.682		
					RN1426	0.35	—		0.65
					RN1427	0.378	—		0.703
DC current gain	RN1421	h <sub>FE</sub>	—	V <sub>CE</sub> = 1V, I <sub>C</sub> = 100mA	60	—	—	—	
	RN1422				65	—	—		
	RN1423				70	—	—		
	RN1424				90	—	—		
	RN1425				90	—	—		
	RN1426				90	—	—		
	RN1427				90	—	—		
Collector-emitter saturation voltage	RN1421	V <sub>CE(sat)</sub>	—	I <sub>C</sub> = 50mA, I <sub>B</sub> = 2mA	—	—	0.25	V	
	RN1422 to 1427			I <sub>C</sub> = 50mA, I <sub>B</sub> = 1mA					
Input voltage (ON)	RN1421	V <sub>I(ON)</sub>	—	V <sub>CE</sub> = 0.2V, I <sub>C</sub> = 100mA	1.0	—	3.5	V	
	RN1422				1.4	—	4.5		
	RN1423				2.0	—	6.5		
	RN1424				3.0	—	12.0		
	RN1425				0.6	—	2.0		
	RN1426				0.7	—	2.5		
	RN1427				1.0	—	3.0		
Input voltage (OFF)	RN1421 to 1424	V <sub>I(OFF)</sub>	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.1mA	0.8	—	1.3	V	
	RN1425, 1426				0.4	—	0.8		
	RN1427				0.5	—	1.0		
Transition frequency	RN1421 to 1427	f <sub>T</sub>	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 20mA	—	300	—	MHz	
Collector Output capacitance	RN1421 to 1427	C <sub>ob</sub>	—	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz	—	7	—	pF	
Input resistor	RN1421	R <sub>1</sub>	—	—	0.7	1.0	1.3	kΩ	
	RN1422				1.54	2.2	2.86		
	RN1423				3.29	4.7	6.11		
	RN1424				7	10	13		
	RN1425				0.329	0.47	0.61		
	RN1426				0.7	1.0	1.3		
	RN1427				1.54	2.2	2.86		
Resistor ratio	RN1421 to 1424	R <sub>1/R2</sub>	—	—	0.9	1.0	1.1	—	
	RN1425				0.0423	0.047	0.0517		
	RN1426				0.09	0.1	0.11		
	RN1427				0.2	0.22	0.24		

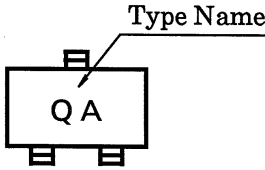
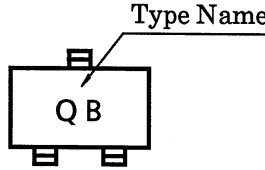
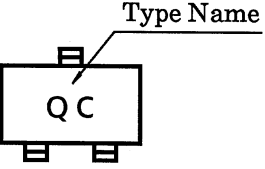
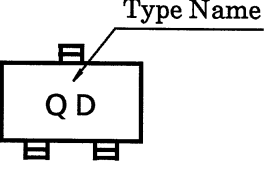
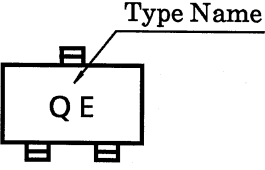
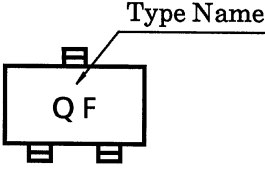
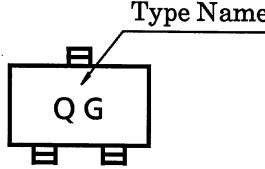








## Marking

Type Name	Marking
RN1421	
RN1422	
RN1423	
RN1424	
RN1425	
RN1426	
RN1427	

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