

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

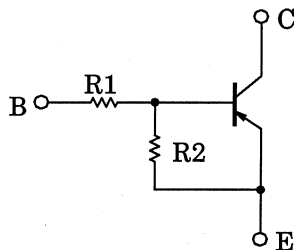
## RN2421, RN2422, RN2423, RN2424 RN2425, RN2426, RN2427

Switching, Inverter Circuit, Interface Circuit  
and Driver Circuit Applications

Unit: mm

- High current type ( $I_{C(MAX)} = -800\text{mA}$ )
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Low  $V_{CE(sat)}$
- Complementary to RN1421 to RN1427

### Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2421	1	1
RN2422	2.2	2.2
RN2423	4.7	4.7
RN2424	10	10
RN2425	0.47	10
RN2426	1	10
RN2427	2.2	10

1. BASE	
2. EMITTER	
3. COLLECTOR	
JEDEC	—
JEITA	SC-59
TOSHIBA	2-3F1A

Weight: 0.012 g (typ.)

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

Characteristics	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.

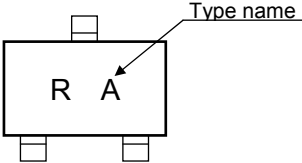
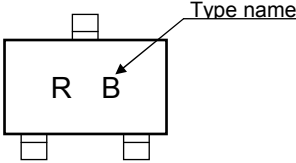
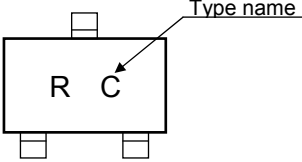
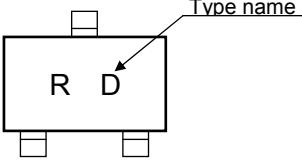
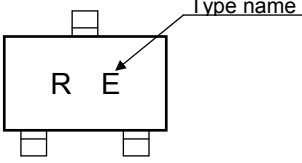
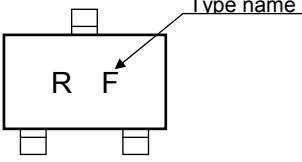
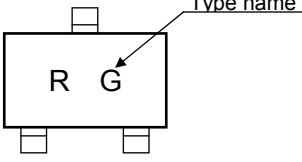
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

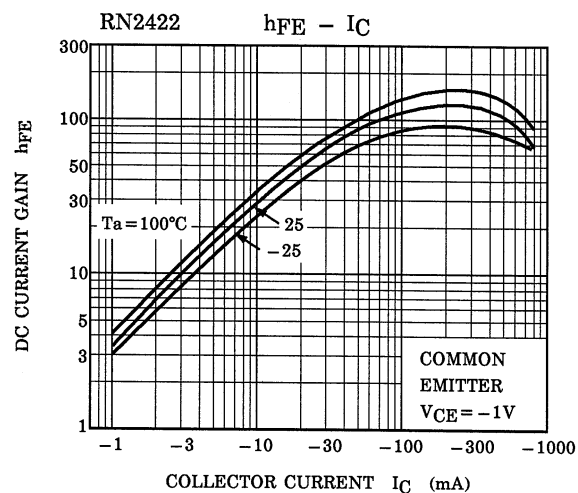
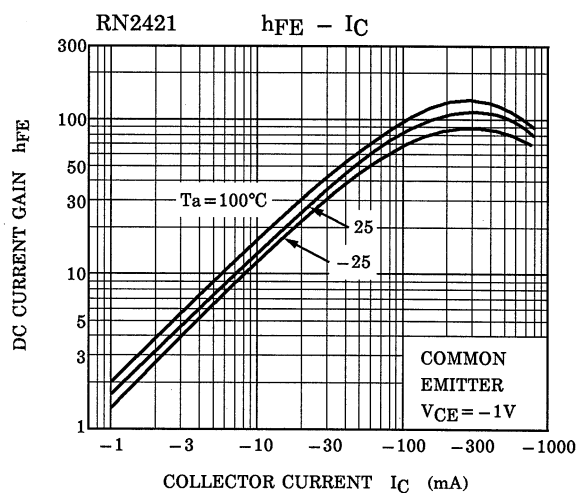
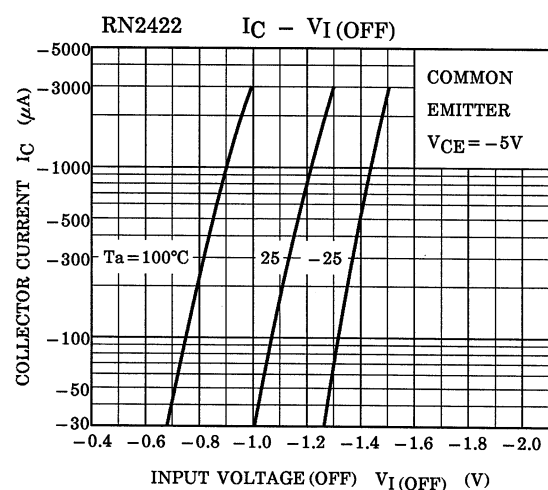
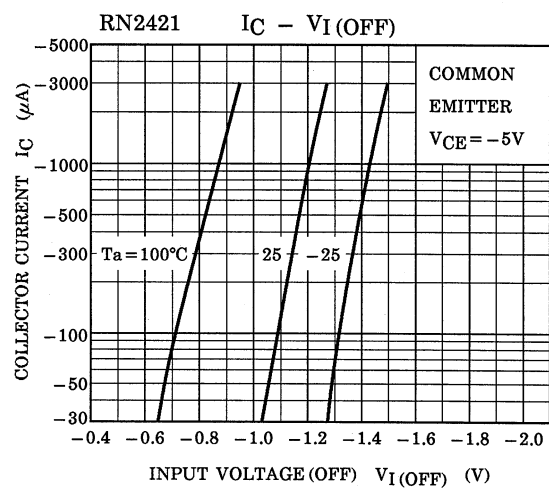
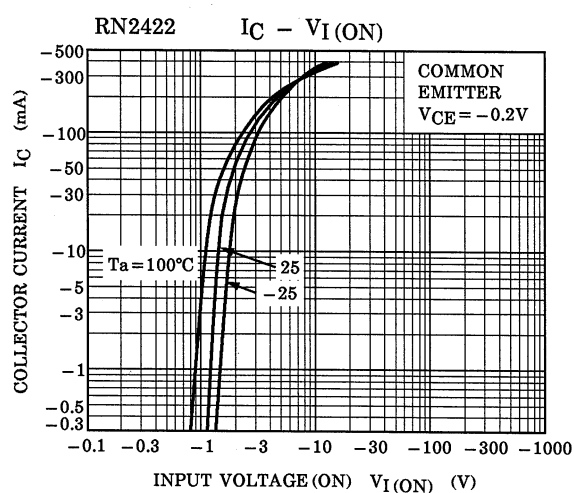
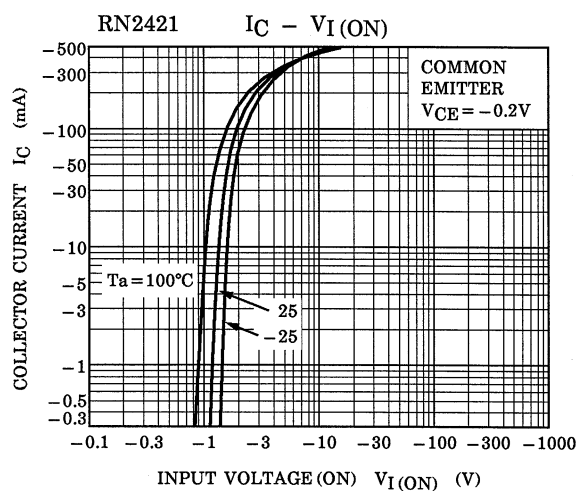
Start of commercial production  
1988-02

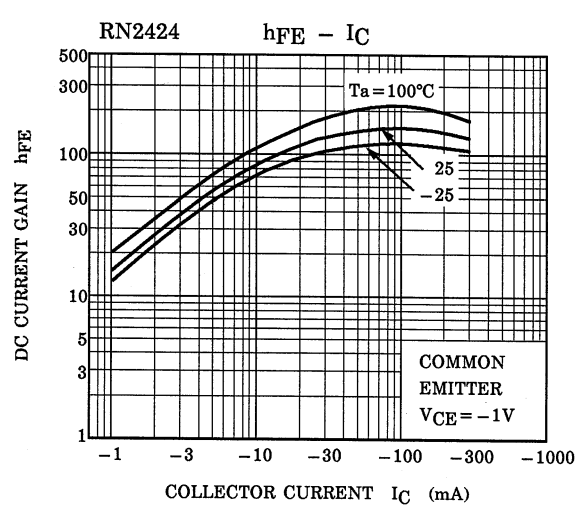
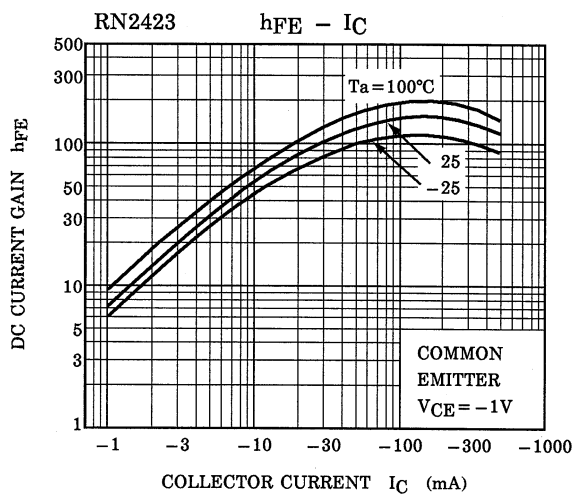
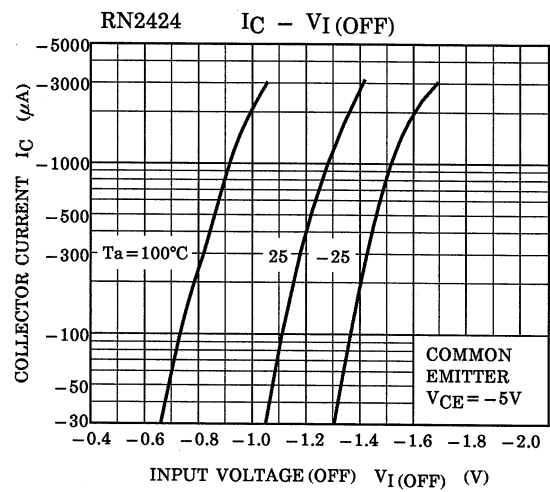
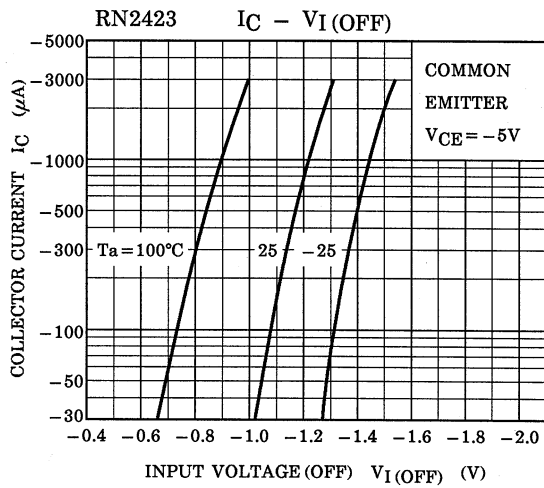
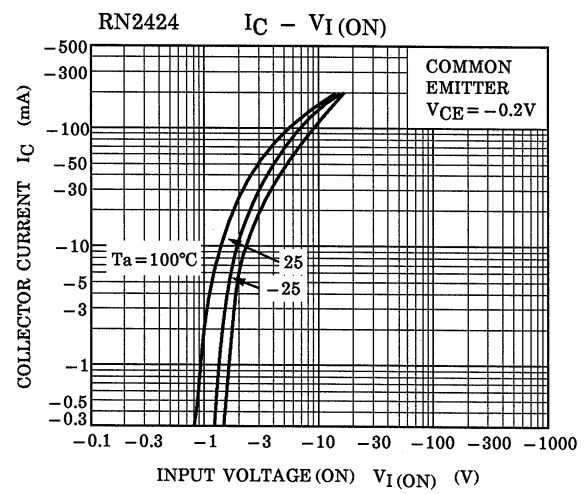
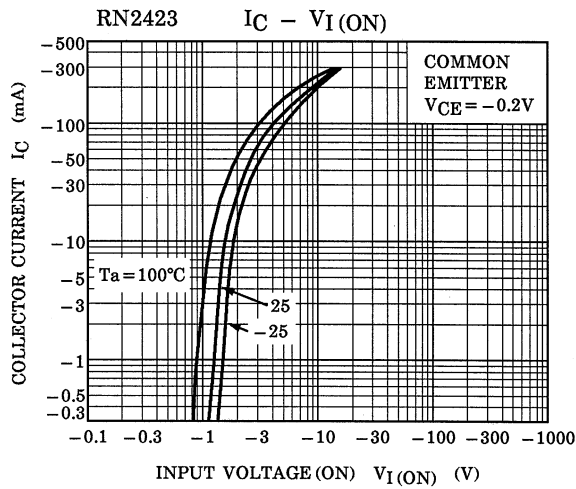
## Electrical Characteristics (Ta = 25°C)

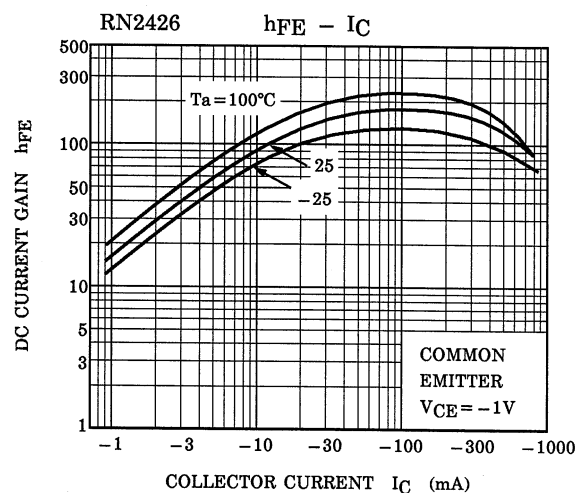
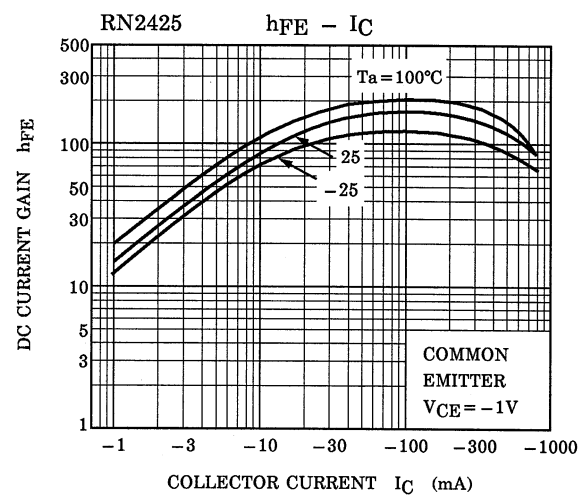
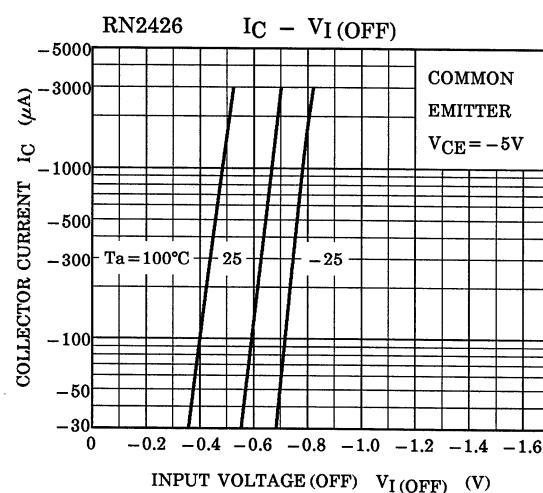
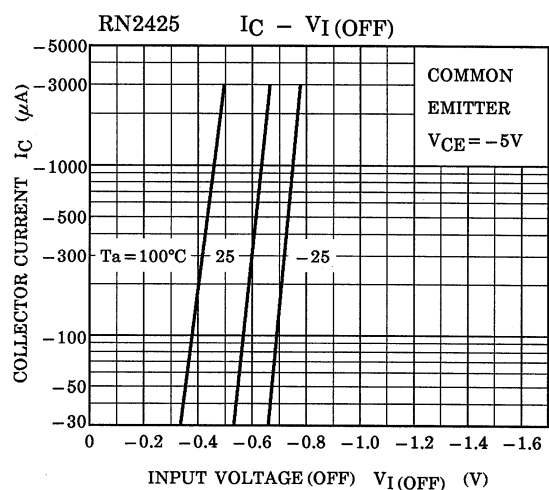
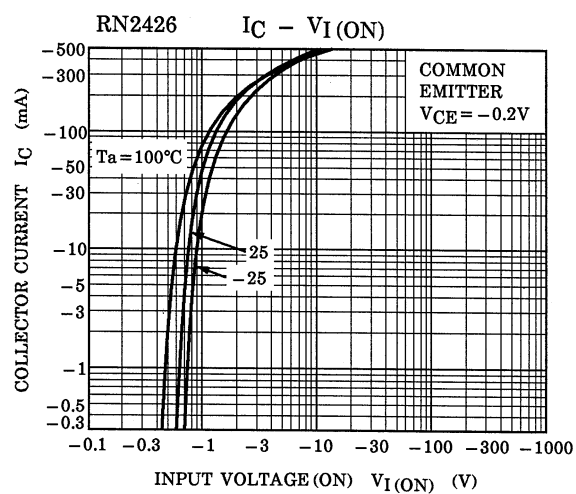
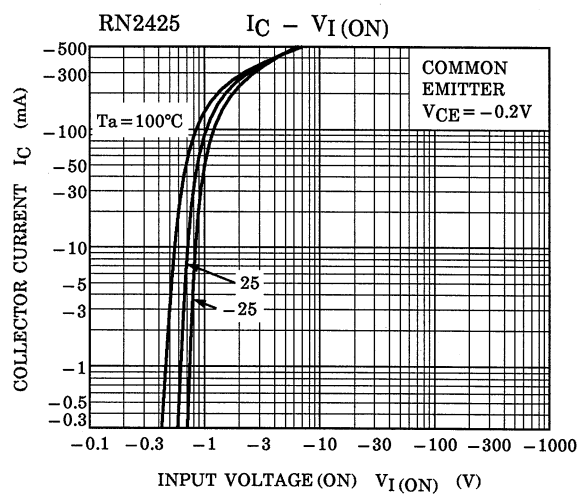
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2421 to 2427	$I_{CBO}$	—	$V_{CB} = -50V, I_E = 0$	—	—	-100	nA
		$I_{CEO}$	—	$V_{CE} = -50V, I_B = 0$	—	—	-500	
Emitter cut-off current	RN2421	$I_{EBO}$	—	$V_{EB} = -10V, I_C = 0$	-3.85	—	-7.14	mA
	RN2422		—		-1.75	—	-3.25	
	RN2423		—		-0.82	—	-1.52	
	RN2424		—		-0.38	—	-0.71	
	RN2425		—	$V_{EB} = -5V, I_C = 0$	-0.365	—	-0.682	
	RN2426		—		-0.35	—	-0.65	
	RN2427		—	$V_{EB} = -6V, I_C = 0$	-0.378	—	-0.703	
DC current gain	RN2421	$h_{FE}$	—	$V_{CE} = -1V, I_C = -100mA$	60	—	—	
	RN2422		—		65	—	—	
	RN2423		—		70	—	—	
	RN2424		—		90	—	—	
	RN2425		—		90	—	—	
	RN2426		—		90	—	—	
	RN2427		—		90	—	—	
Collector-Emitter saturation voltage	RN2421	$V_{CE(sat)}$	—	$I_C = -50mA, I_B = -2mA$	—	—	-0.25	V
	RN2422 to 2427			$I_C = -50mA, I_B = -1mA$				
Input voltage (ON)	RN2421	$V_{I(ON)}$	—	$V_{CE} = -0.2V$ $I_C = -100mA$	-1.0	—	-3.5	V
	RN2422		—		-1.4	—	-4.5	
	RN2423		—		-2.0	—	-6.5	
	RN2424		—		-3.0	—	-12.0	
	RN2425		—		-0.6	—	-2.0	
	RN2426		—		-0.7	—	-2.5	
	RN2427		—		-1.0	—	-3.0	
Input voltage (OFF)	RN2421 to 2424	$V_{I(OFF)}$	—	$V_{CE} = -5V,$ $I_C = -0.1mA$	-0.8	—	-1.3	V
	RN2425, 2426		—		-0.4	—	-0.8	
	RN2427		—		-0.5	—	-1.0	
Transition frequency	RN2421 to 2427	$f_T$	—	$V_{CE} = -5V, I_C = -20mA$	—	200	—	MHz
Collector output capacitance	RN2421 to 2427	$C_{ob}$	—	$V_{CB} = -10V, I_E = 0$ $f = 1MHz$	—	13	—	pF
Input resistor	RN2421	R1	—	—	0.7	1.0	1.3	kΩ
	RN2422		—		1.54	2.2	2.86	
	RN2423		—		3.29	4.7	6.11	
	RN2424		—		7	10	13	
	RN2425		—		0.329	0.47	0.61	
	RN2426		—		0.7	1.0	1.3	
	RN2427		—		1.54	2.2	2.86	
Resistor ratio	RN2421 to 2424	R1/R2	—	—	0.9	1.0	1.1	
	RN2425		—		0.0423	0.047	0.0517	
	RN2426		—		0.09	0.1	0.11	
	RN2427		—		0.2	0.22	0.24	

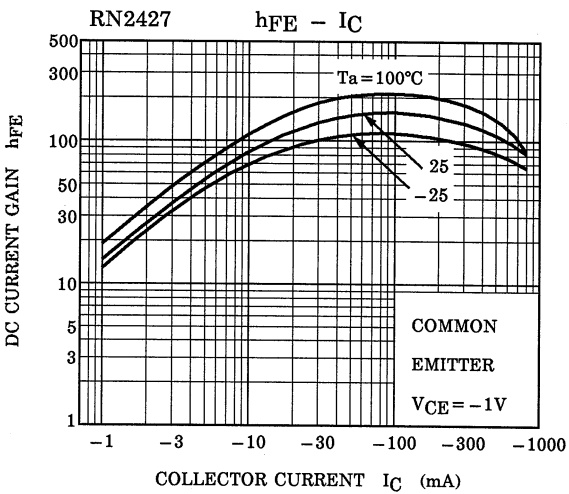
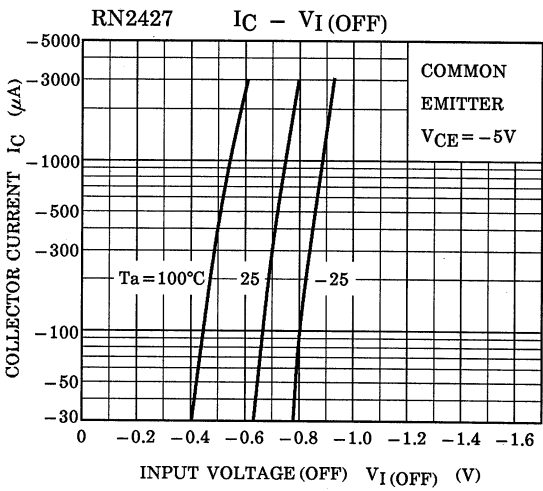
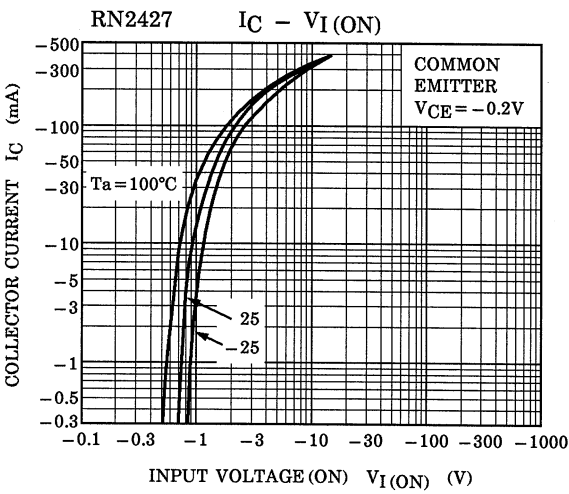
**Marking**

Type No.	Marking
RN2421	
RN2422	
RN2423	
RN2424	
RN2425	
RN2426	
RN2427	









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