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

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

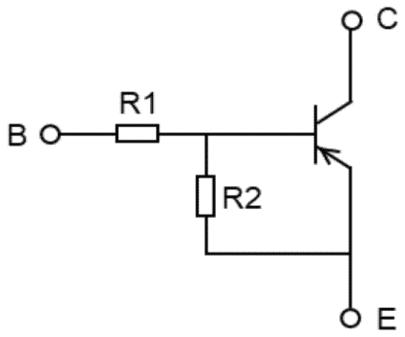
1. Applications

- Switching
- Inverter Circuits
- Interfacing
- Driver Circuits

2. Features

(1) High collector current: I_C = -800 mA (max)
(2) The integrated bias resistor reduces the number of external parts required, making it possible to reduce system size and assembly time.
(3) Toshiba offers transistors with a wide range of resistance to accommodate various circuit designs.
(4) Complementary to RN1421 to RN1427
(5) Low $V_{CE(sat)}$

3. Equivalent Circuit

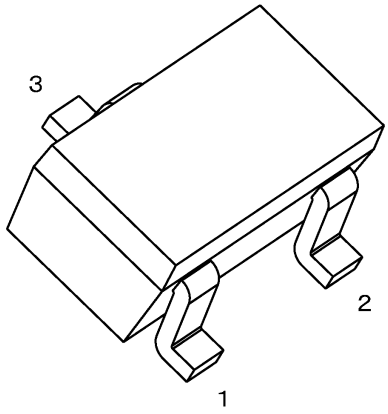


4. Bias Resistor Values

Part 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

Start of commercial production
1988-02

5. Packaging and Pin Assignment



1: Base
2: Emitter
3: Collector

S-Mini

6. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25 °C)

Characteristics	Part Number	Symbol	Rating	Unit
Collector-base voltage	RN2421 to RN2427	V_{CBO}	-50	V
Collector-emitter voltage		V_{CEO}	-50	V
Emitter-base voltage	RN2421 to RN2424	V_{EBO}	-10	V
	RN2425,RN2426		-5	
	RN2427		-6	
Collector current	RN2421 to RN2427	I_C	-800	mA
Collector power dissipation		P_C	200	mW
Junction temperature		T_j	150	°C
Storage temperature		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).

7. Electrical Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2421 to RN2427	I_{CBO}	V_{CB} = -50 V, I_E = 0 mA	—	—	-100	nA
		I_{CEO}	V_{CE} = -50 V, I_B = 0 mA	—	—	-500	
Emitter cut-off current	RN2421	I_{EBO}	V_{EB} = -10 V, I_C = 0 mA	-3.85	—	-7.14	mA
	RN2422			-1.75	—	-3.25	
	RN2423			-0.82	—	-1.52	
	RN2424			-0.38	—	-0.71	
	RN2425		V_{EB} = -5 V, I_C = 0 mA	-0.365	—	-0.682	
	RN2426			-0.35	—	-0.65	
	RN2427		V_{EB} = -6 V, I_C = 0 mA	-0.378	—	-0.703	
DC current gain	RN2421	h_{FE}	V_{CE} = -1 V, I_C = -100 mA	60	—	—	—
	RN2422			65	—	—	
	RN2423			70	—	—	
	RN2424			90	—	—	
	RN2425			90	—	—	
	RN2426			90	—	—	
	RN2427			90	—	—	
Collector-emitter saturation voltage	RN2421	$V_{CE(sat)}$	I_C = -50 mA, I_B = -2 mA	—	—	-0.25	V
	RN2422 to RN2427		I_C = -50 mA, I_B = -1 mA	—	—		
Input voltage (ON)	RN2421	$V_{I(ON)}$	V_{CE} = -0.2 V, I_C = -100 mA	-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 RN2424	$V_{I(OFF)}$	V_{CE} = -5 V, I_C = -0.1 mA	-0.8	—	-1.3	V
	RN2425, RN2426			-0.4	—	-0.8	
	RN2427			-0.5	—	-1.0	
Transition frequency	RN2421 to RN2427	f_T	V_{CE} = -5 V, I_C = -20 mA	—	200	—	MHz
Collector output capacitance	RN2421 to RN2427	C_{ob}	V_{CB} = -10 V, I_E = 0 mA, f = 1 MHz	—	13	—	pF
Input resistance	RN2421	R_1	—	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 RN2424	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	

8. Marking

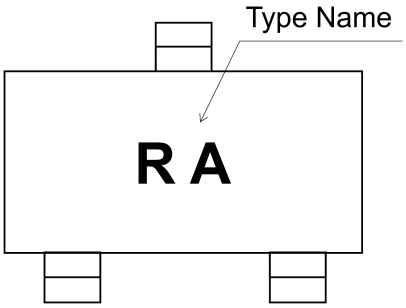


Fig. 8.1 Marking RN2421

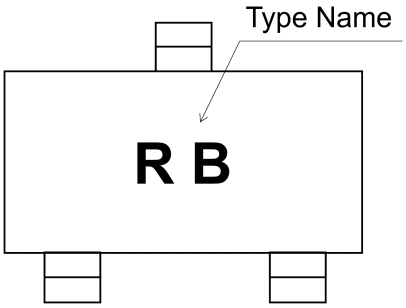


Fig. 8.2 Marking RN2422

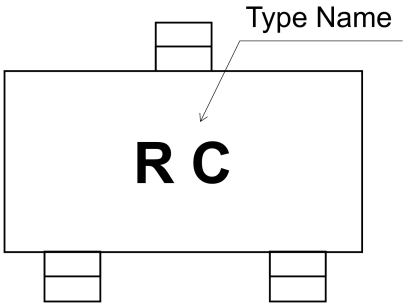


Fig. 8.3 Marking RN2423

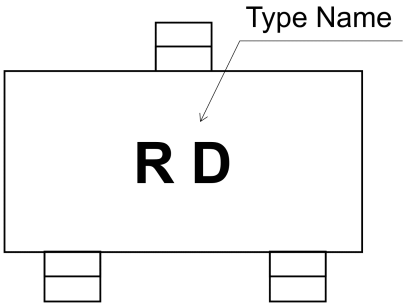


Fig. 8.4 Marking RN2424

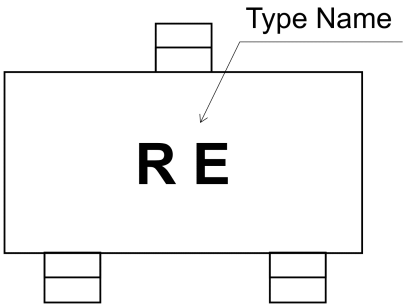


Fig. 8.5 Marking RN2425

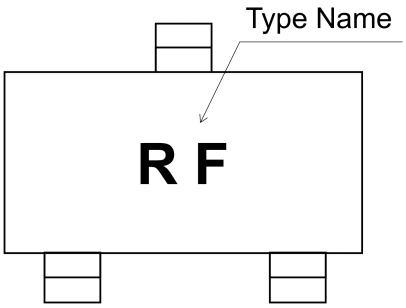


Fig. 8.6 Marking RN2426

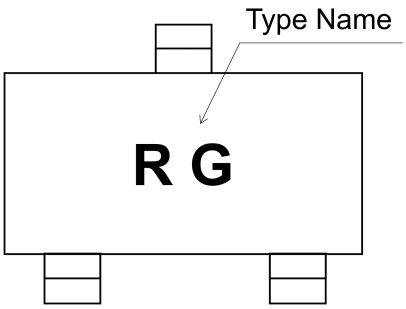


Fig. 8.7 Marking RN2427

9. Characteristics Curves (Note)

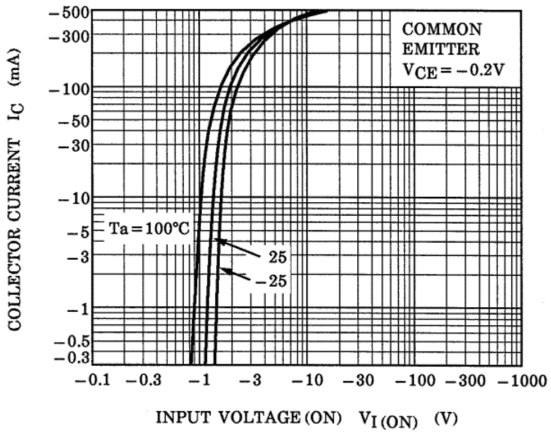


Fig. 9.1 RN2421 I_C-$V_{I(ON)}$

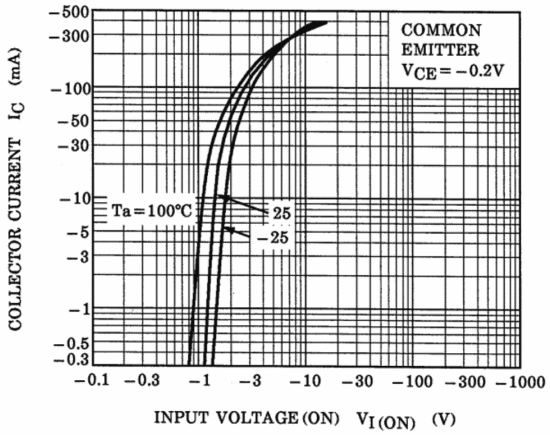


Fig. 9.2 RN2422 I_C-$V_{I(ON)}$

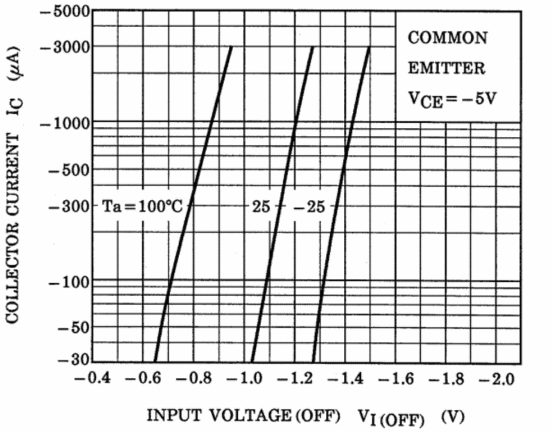


Fig. 9.3 RN2421 I_C-$V_{I(OFF)}$

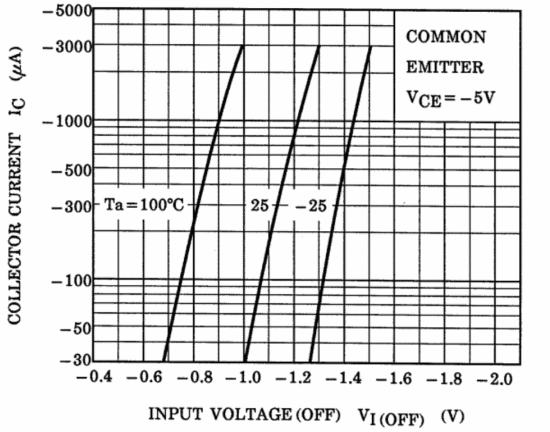


Fig. 9.4 RN2422 I_C-$V_{I(OFF)}$

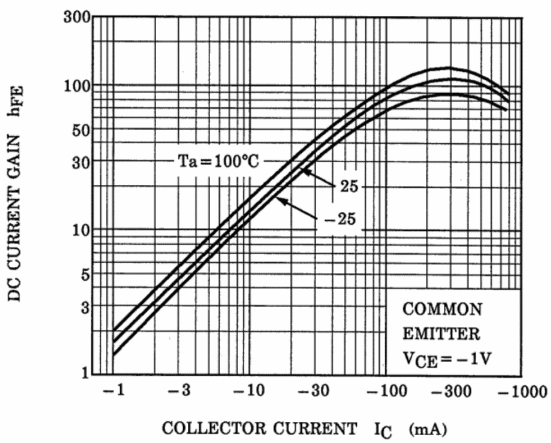


Fig. 9.5 RN2421 h_{FE}-I_C

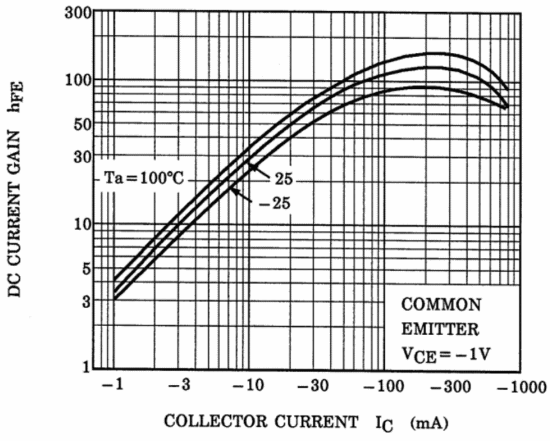


Fig. 9.6 RN2422 h_{FE}-I_C

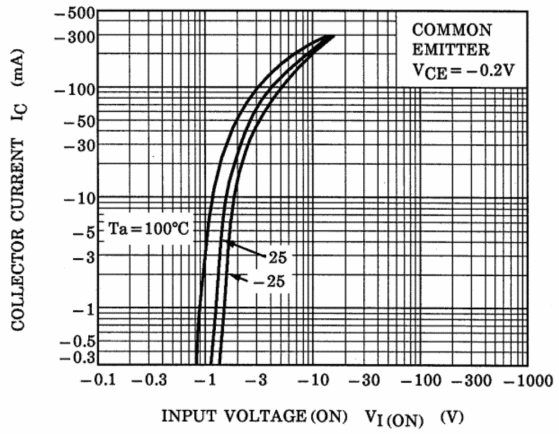


Fig. 9.7 RN2423 I_C-$V_{I(ON)}$

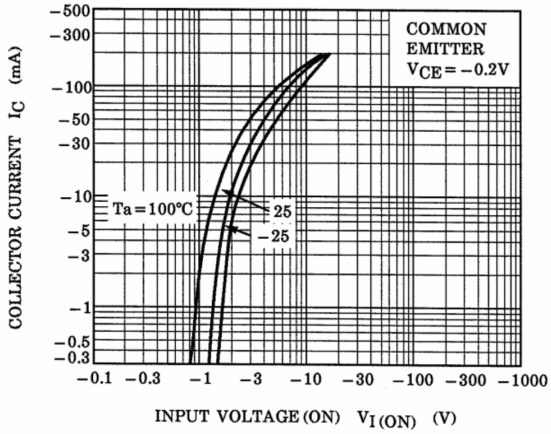


Fig. 9.8 RN2424 I_C-$V_{I(ON)}$

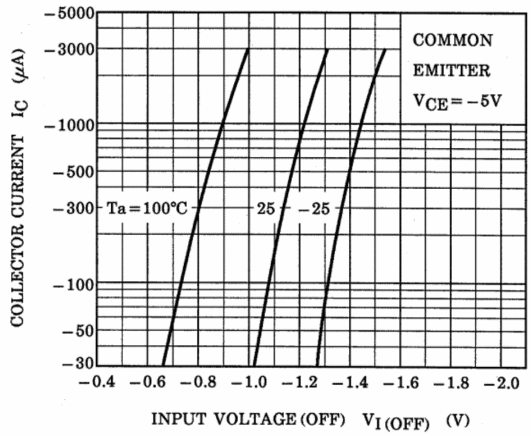


Fig. 9.9 RN2423 I_C-$V_{I(OFF)}$

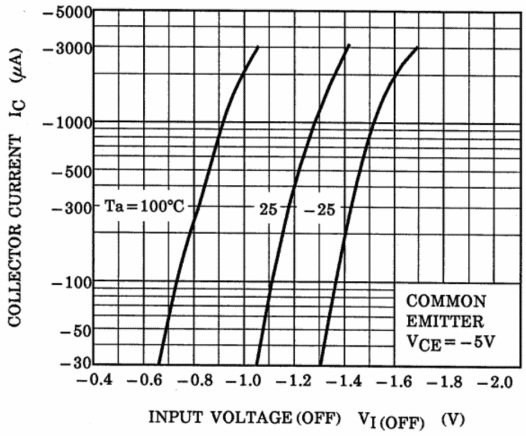


Fig. 9.10 RN2424 I_C-$V_{I(OFF)}$

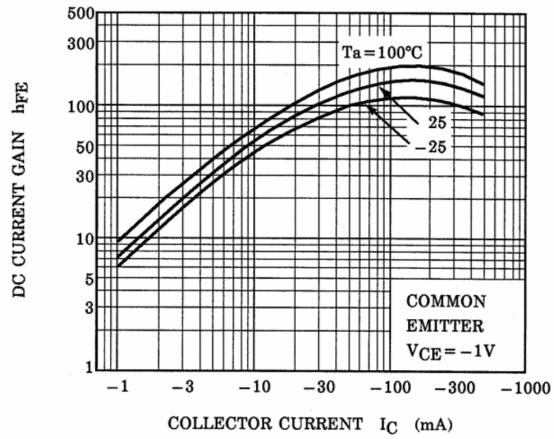


Fig. 9.11 RN2423 h_{FE}-I_C

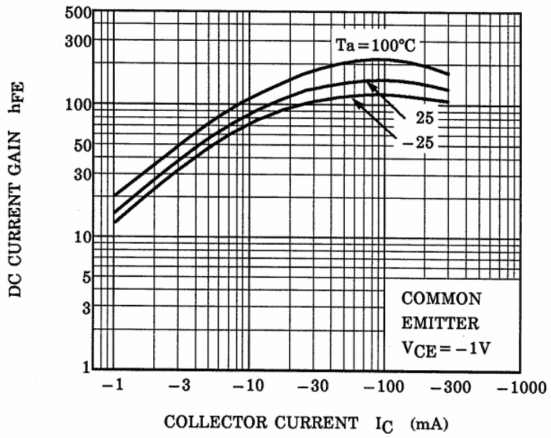


Fig. 9.12 RN2424 h_{FE}-I_C

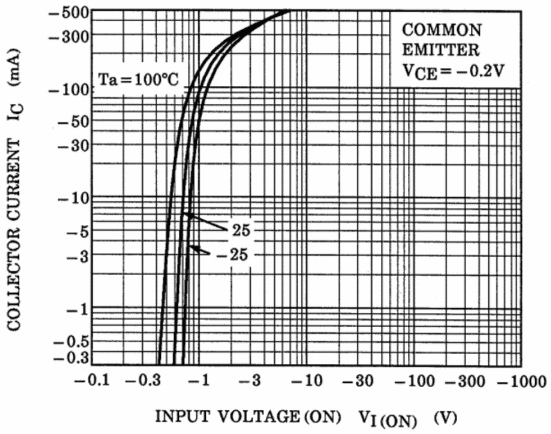


Fig. 9.13 RN2425 I_C-$V_{I(ON)}$

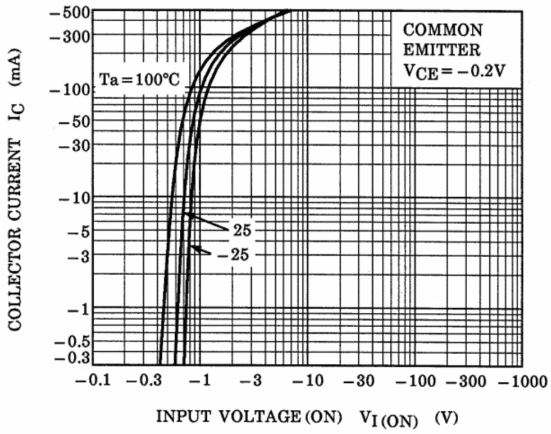


Fig. 9.14 RN2426 I_C-$V_{I(ON)}$

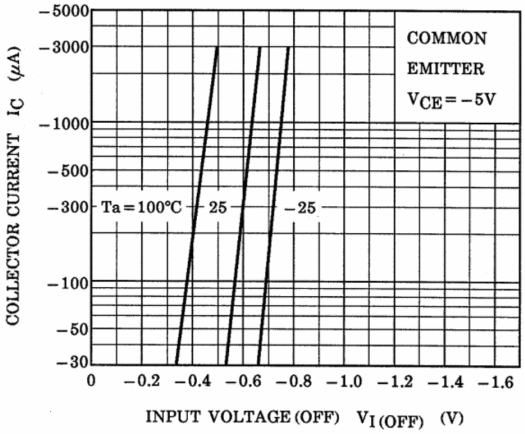


Fig. 9.15 RN2425 I_C-$V_{I(OFF)}$

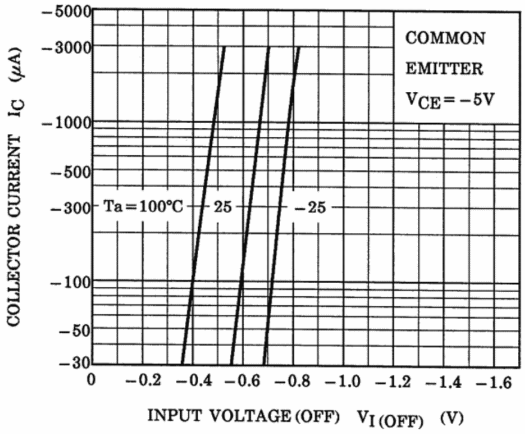


Fig. 9.16 RN2426 I_C-$V_{I(OFF)}$

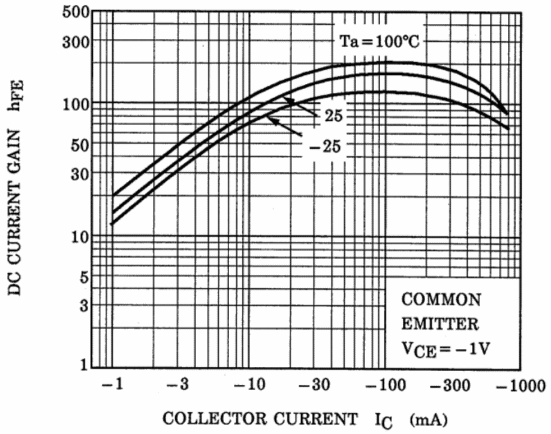


Fig. 9.17 RN2425 h_{FE}-I_C

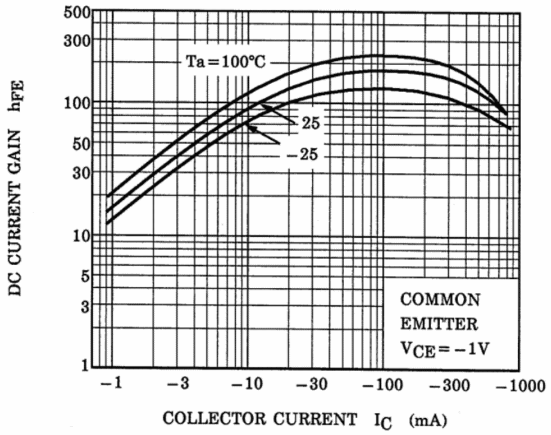


Fig. 9.18 RN2426 h_{FE}-I_C

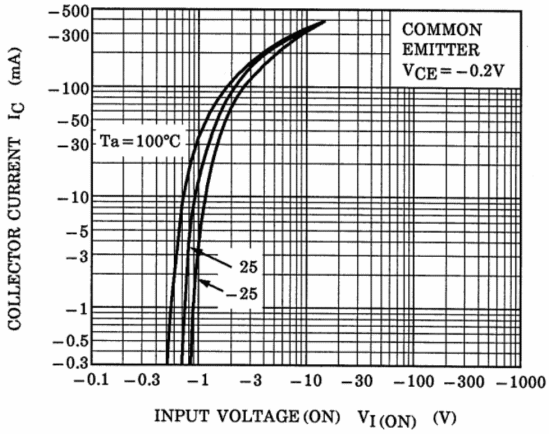


Fig. 9.19 RN2427 I_C-$V_{I(ON)}$

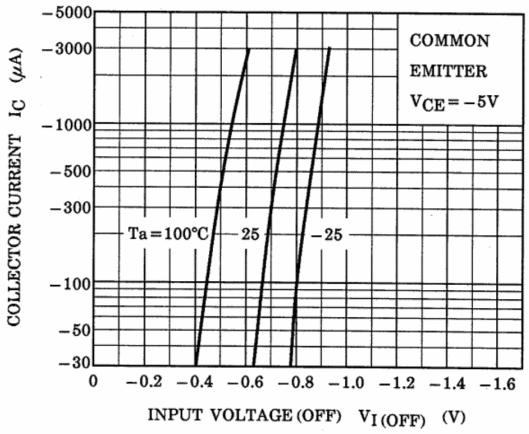


Fig. 9.20 RN2427 I_C-$V_{I(OFF)}$

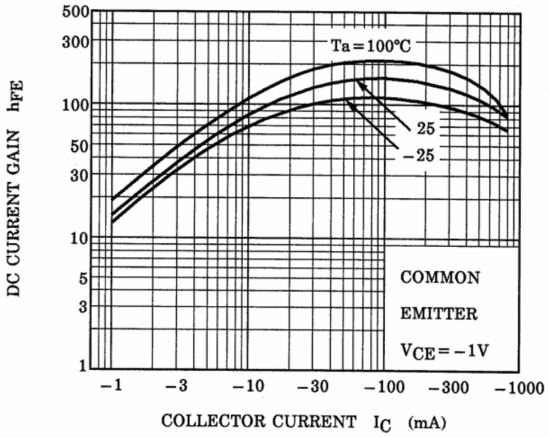
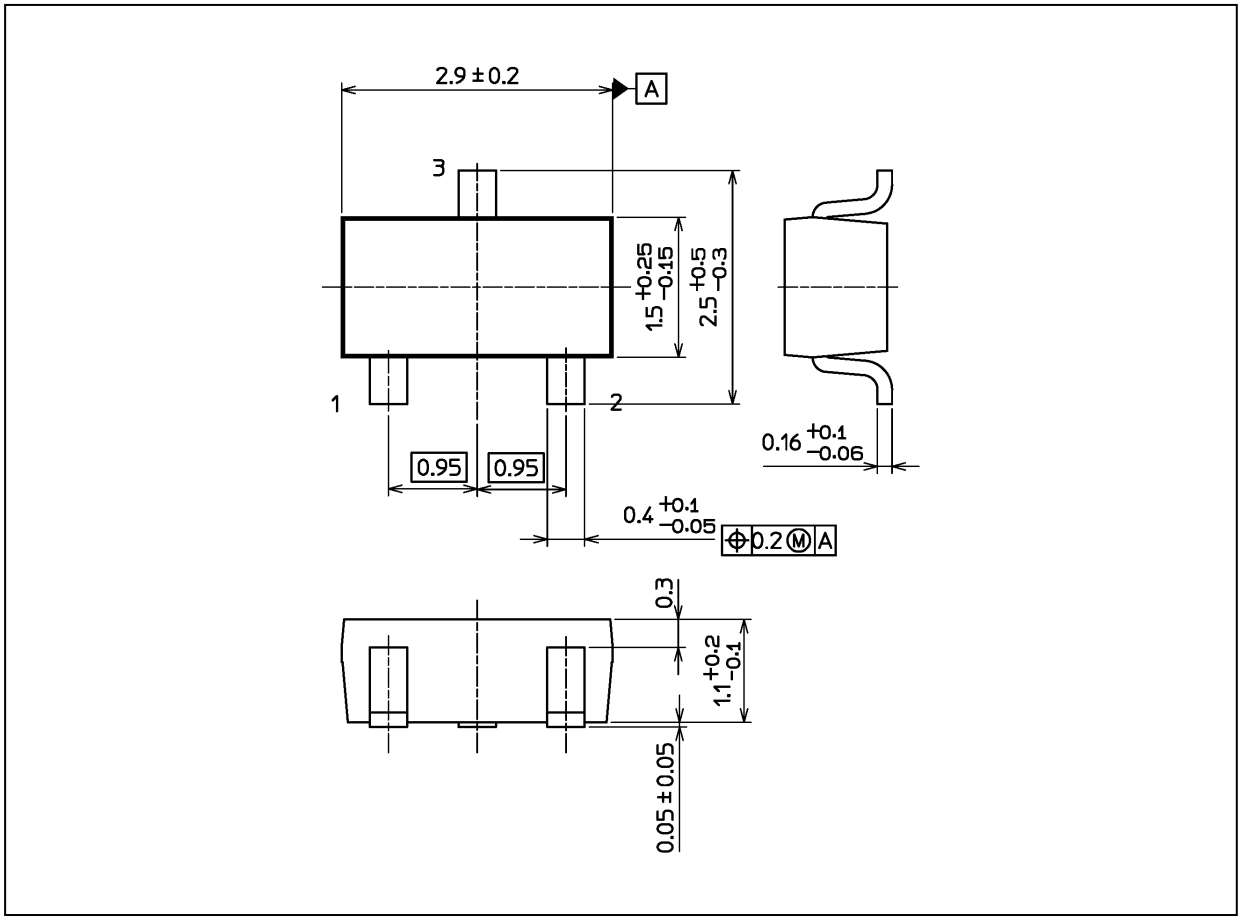


Fig. 9.21 RN2427 h_{FE}-I_C

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 12 mg (typ.)

Package Name(s)
Nickname: S-Mini

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