

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

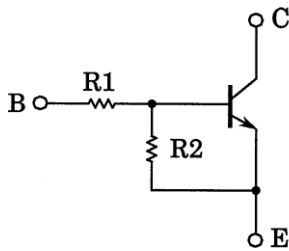
RN1501, RN1502, RN1503 RN1504, RN1505, RN1506

Unit: mm

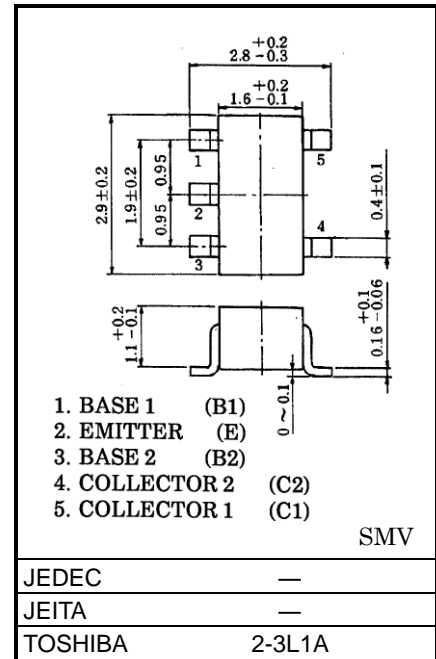
Switching, Inverter Circuit,
Interface Circuit and Driver Circuit

- Including two devices in SMV (ultra super mini type with 5 leads)
- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN2501 to RN2506

Equivalent Circuit and Bias Resistor Values



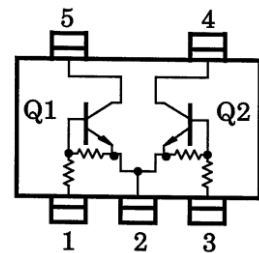
Part No.	R1 (kΩ)	R2 (kΩ)
RN1501	4.7	4.7
RN1502	10	10
RN1503	22	22
RN1504	47	47
RN1505	2.2	47
RN1506	4.7	47



Equivalent Circuit (Top View)

Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1501 to 1506	VCBO	50	V
Collector-emitter voltage		VCEO	50	V
Emitter-base voltage	RN1501 to 1504	VEBO	10	V
	RN1505, 1506		5	
Collector current	RN1501 to 1506	IC	100	mA
Collector power dissipation		PC *	300	mW
Junction temperature		Tj	150	°C
Storage temperature range		Tstg	-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).

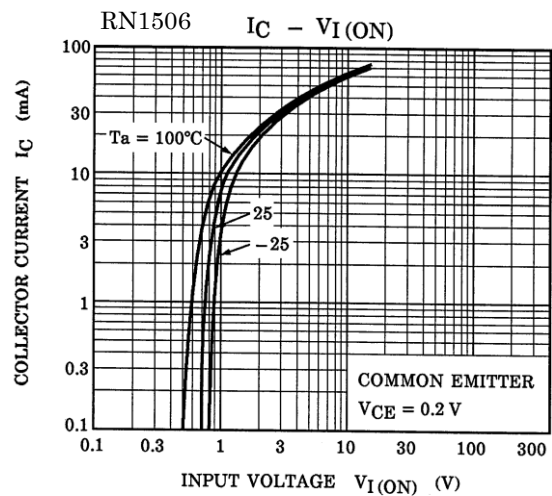
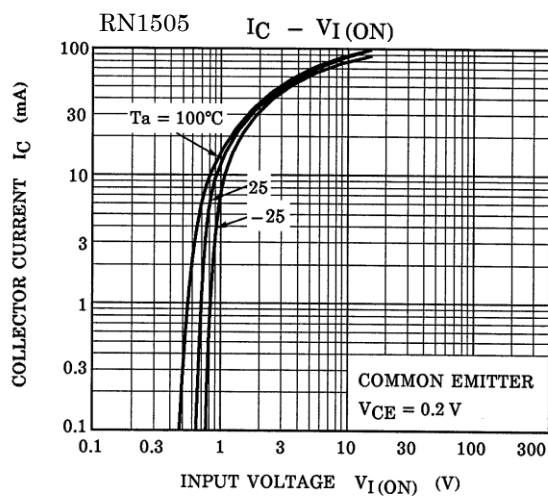
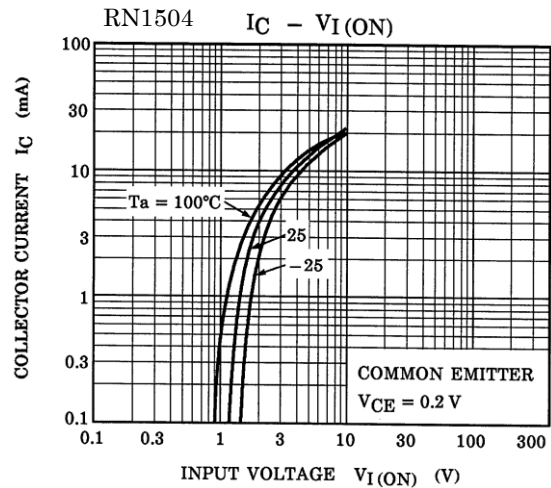
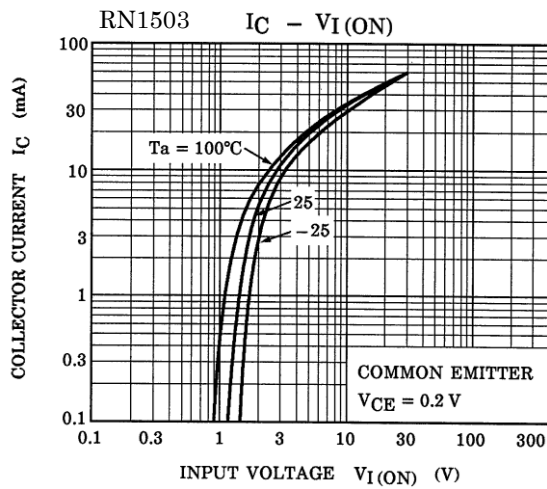
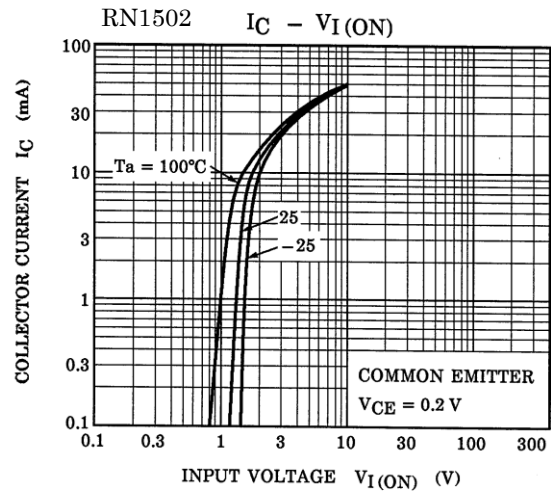
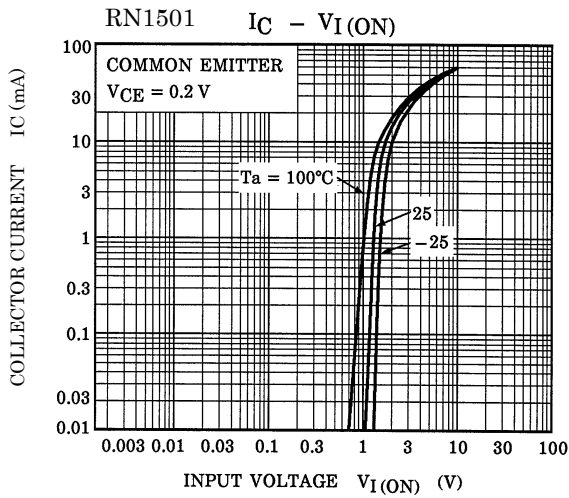
* Total rating

Start of commercial production
1988-10

Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

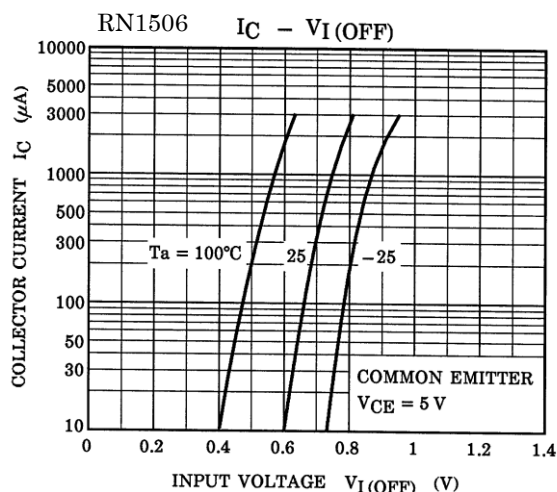
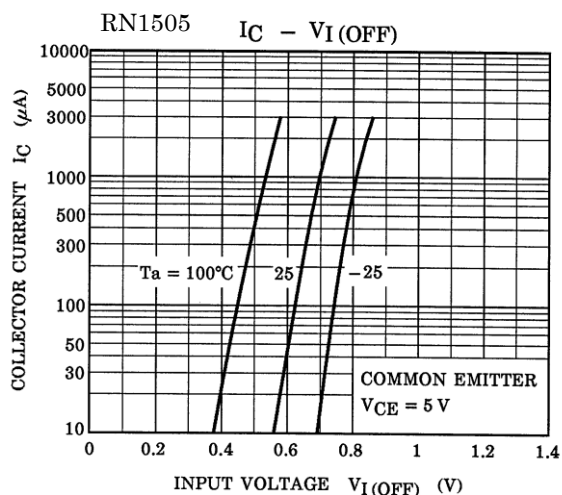
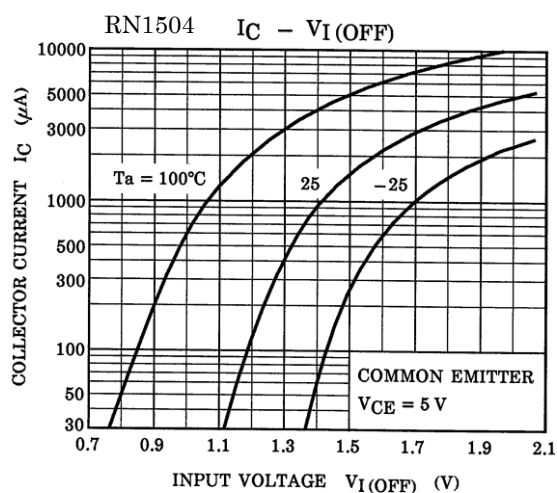
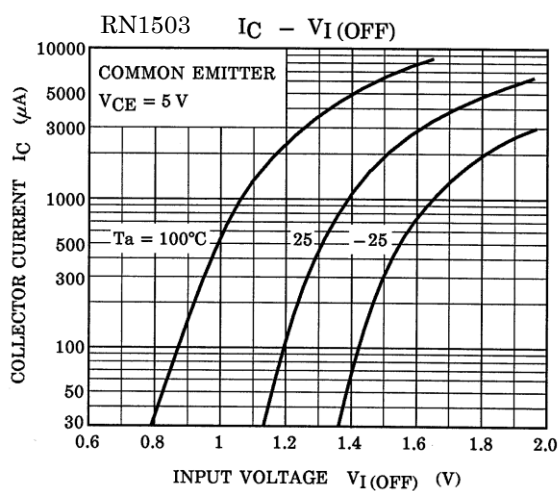
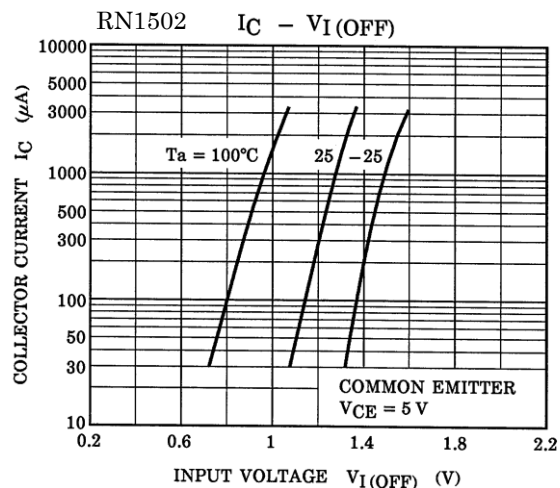
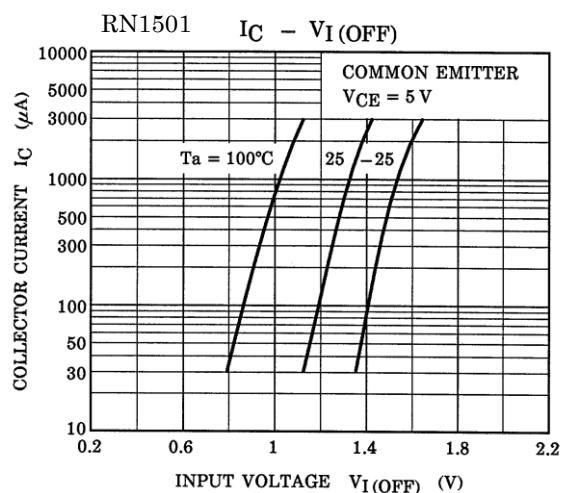
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1501 to 1506	ICBO	V _{CB} = 50 V, I _E = 0 mA	—	—	100	nA
		ICEO	V _{CE} = 50 V, I _B = 0 mA	—	—	500	
Emitter cut-off current	RN1501	IEBO	V _{EB} = 10 V, I _C = 0 mA	0.82	—	1.52	mA
	RN1502			0.38	—	0.71	
	RN1503			0.17	—	0.33	
	RN1504			0.082	—	0.15	
	RN1505		V _{EB} = 5 V, I _C = 0 mA	0.078	—	0.145	
	RN1506			0.074	—	0.138	
DC current gain	RN1501	hFE	V _{CE} = 5 V, I _C = 10 mA	30	—	—	—
	RN1502			50	—	—	
	RN1503			70	—	—	
	RN1504			80	—	—	
	RN1505			80	—	—	
	RN1506			80	—	—	
Collector-emitter saturation voltage	RN1501 to 1506	V _{CE (sat)}	I _C = 5 mA, I _B = 0.25 mA	—	0.1	0.3	V
Input voltage (ON)	RN1501	V _{I (ON)}	V _{CE} = 0.2 V, I _C = 5 mA	1.1	—	2.0	V
	RN1502			1.2	—	2.4	
	RN1503			1.3	—	3.0	
	RN1504			1.5	—	5.0	
	RN1505			0.6	—	1.1	
	RN1506			0.7	—	1.3	
Input voltage (OFF)	RN1501 to 1504	V _{I (OFF)}	V _{CE} = 5 V, I _C = 0.1 mA	1.0	—	1.5	V
	RN1505, 1506			0.5	—	0.8	
Transition frequency	RN1501 to 1506	f _T	V _{CE} = 10 V, I _C = 5 mA	—	250	—	MHz
Collector Output capacitance	RN1501 to 1506	C _{ob}	V _{CB} = 10 V, I _E = 0 mA, f = 1 MHz	—	3	6	pF
Input resistance	RN1501	R ₁	—	3.29	4.7	6.11	kΩ
	RN1502			7	10	13	
	RN1503			15.4	22	28.6	
	RN1504			32.9	47	61.1	
	RN1505			1.54	2.2	2.86	
	RN1506			3.29	4.7	6.11	
Resistance ratio	RN1501 to 1504	R _{1/R2}	—	0.9	1.0	1.1	—
	RN1505			0.0421	0.0468	0.0515	
	RN1506			0.09	0.1	0.11	

Characteristics Curves(Q1, Q2 COMMON)



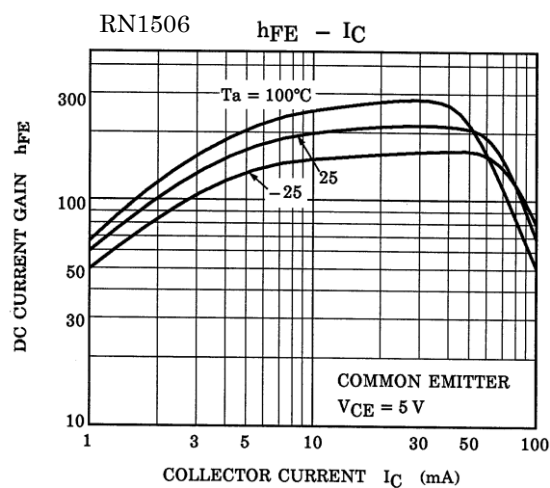
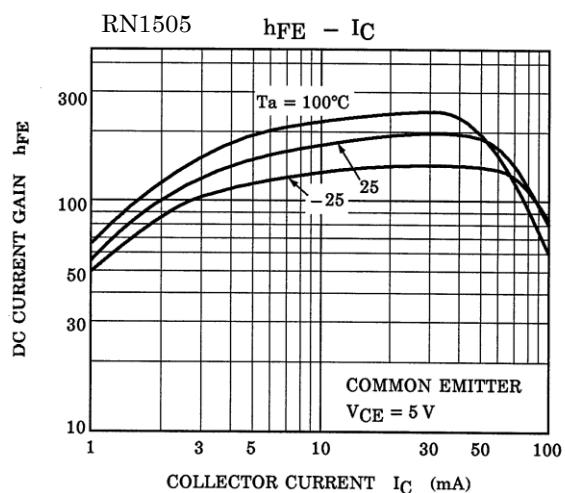
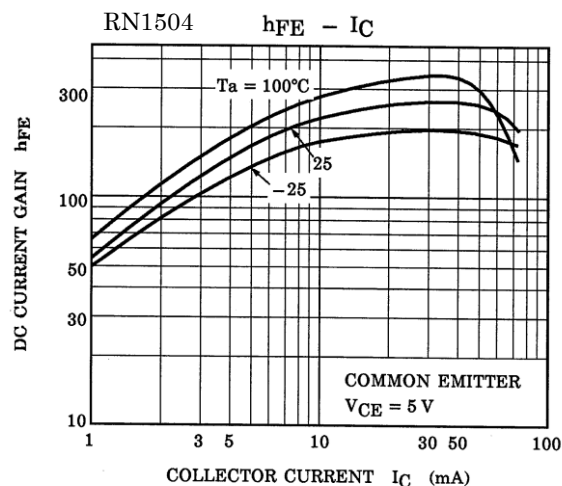
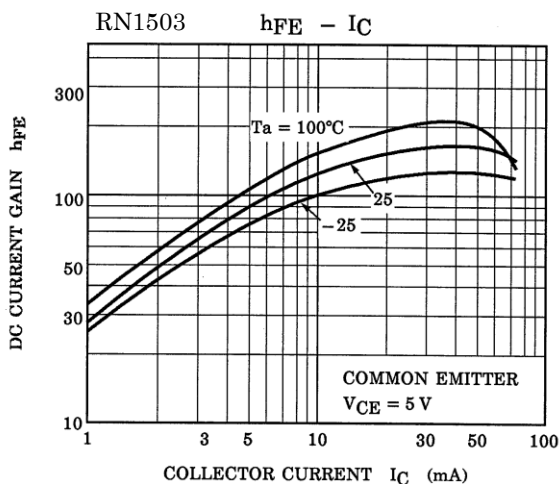
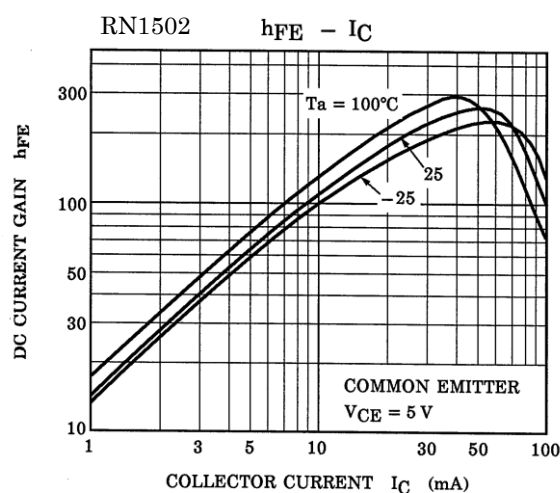
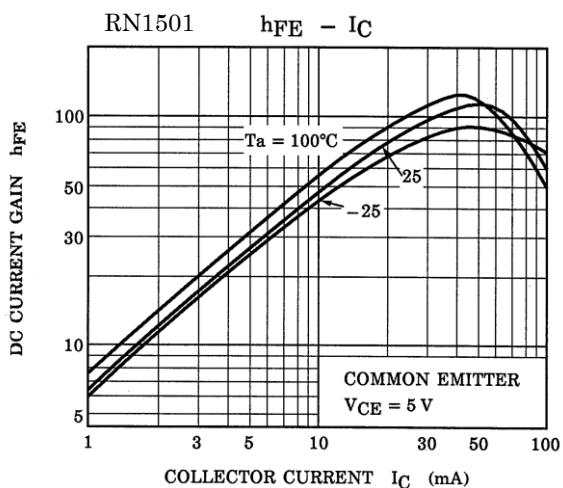
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Characteristics Curves(Q1, Q2 COMMON)



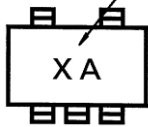
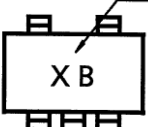
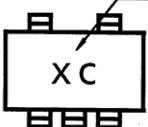
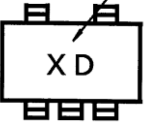
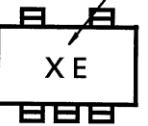
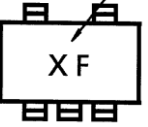
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Characteristics Curves(Q1, Q2 COMMON)



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Marking

Part No	Marking
RN1501	<p data-bbox="603 286 863 315">Part No.(abbreviation code)</p> 
RN1502	<p data-bbox="603 495 863 524">Part No.(abbreviation code)</p> 
RN1503	<p data-bbox="603 725 863 754">Part No.(abbreviation code)</p> 
RN1504	<p data-bbox="603 956 863 985">Part No.(abbreviation code)</p> 
RN1505	<p data-bbox="603 1187 863 1216">Part No.(abbreviation code)</p> 
RN1506	<p data-bbox="603 1417 863 1447">Part No.(abbreviation code)</p> 

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