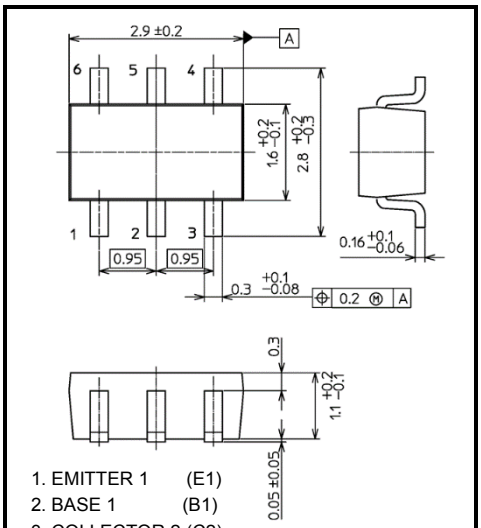
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

RN2601, RN2602, RN2603
RN2604, RN2605, RN2606

Unit: mm

Switching, Inverter Circuit, Interface Circuit
and Driver Circuit Applications

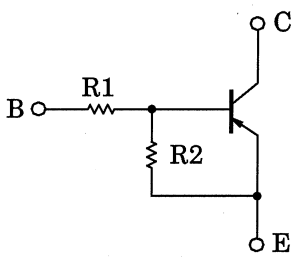
- Including two devices in SM6 (super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1601 to RN1606



JEDEC	—
JEITA	—
TOSHIBA	2-3N1S

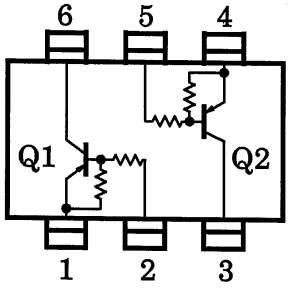
Weight: 0.015 g (typ.)

Equivalent Circuit and Bias Resistor Values



Part No.	R1 (kΩ)	R2 (kΩ)
RN2601	4.7	4.7
RN2602	10	10
RN2603	22	22
RN2604	47	47
RN2605	2.2	47
RN2606	4.7	47

Equivalent Circuit (top view)



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

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2601 to RN2606	V_{CBO}	−50	V
Collector-emitter voltage	RN2601 to RN2606	V_{CEO}	−50	V
Emitter-base voltage	RN2601 to RN2604	V_{EBO}	−10	V
	RN2605, RN2606		−5	
Collector current	RN2601 to RN2606	I_C	−100	mA
Collector power dissipation	RN2601 to RN2606	P_C*	300	mW
Junction temperature	RN2601 to RN2606	T_j	150	°C
Storage temperature range	RN2601 to RN2606	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).

* Total rating

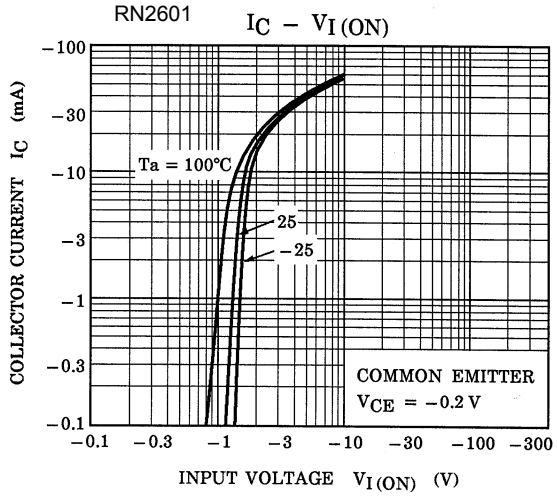
Start of commercial production
1988-11

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

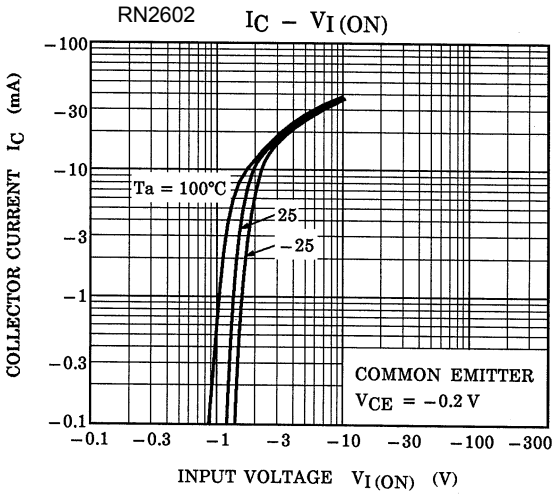
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2601 to RN2606	I_{CBO}	V_{CB} = −50 V, I_E = 0 mA	—	—	−100	nA
		I_{CEO}	V_{CE} = −50 V, I_B = 0 mA	—	—	−500	
Emitter cut-off current	RN2601	I_{EBO}	V_{EB} = −10 V, I_C = 0 mA	−0.82	—	−1.52	mA
	RN2602			−0.38	—	−0.71	
	RN2603			−0.17	—	−0.33	
	RN2604			−0.082	—	−0.15	
	RN2605		V_{EB} = −5 V, I_C = 0 mA	−0.078	—	−0.145	
	RN2606			−0.074	—	−0.138	
DC current gain	RN2601	h_{FE}	V_{CE} = −5 V, I_C = −10 mA	30	—	—	—
	RN2602			50	—	—	
	RN2603			70	—	—	
	RN2604			80	—	—	
	RN2605			80	—	—	
	RN2606			80	—	—	
Collector-emitter saturation voltage	RN2601 to RN2606	$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2601	$V_{I\ (ON)}$	V_{CE} = −0.2 V, I_C = −5 mA	−1.1	—	−2.0	V
	RN2602			−1.2	—	−2.4	
	RN2603			−1.3	—	−3.0	
	RN2604			−1.5	—	−5.0	
	RN2605			−0.6	—	−1.1	
	RN2606			−0.7	—	−1.3	
Input voltage (OFF)	RN2601 to RN2604	$V_{I\ (OFF)}$	V_{CE} = −5 V, I_C = −0.1 mA	−1.0	—	−1.5	V
	RN2605, RN2606			−0.5	—	−0.8	
Transition frequency	RN2601 to RN2606	f_T	V_{CE} = −10 V, I_C = −5 mA	—	200	—	MHz
Collector output capacitance	RN2601 to RN2606	C_{ob}	V_{CB} = −10 V, I_E = 0 mA, f = 1 MHz	—	3	6	pF
Input resistor	RN2601	R1	—	3.29	4.7	6.11	kΩ
	RN2602			7	10	13	
	RN2603			15.4	22	28.6	
	RN2604			32.9	47	61.1	
	RN2605			1.54	2.2	2.86	
	RN2606			3.29	4.7	6.11	
Resistor ratio	RN2601 to RN2604	R1/R2	—	0.9	1.0	1.1	—
	RN2605			0.0421	0.0468	0.0515	
	RN2606			0.09	0.1	0.11	

(Q1, Q2 Common)

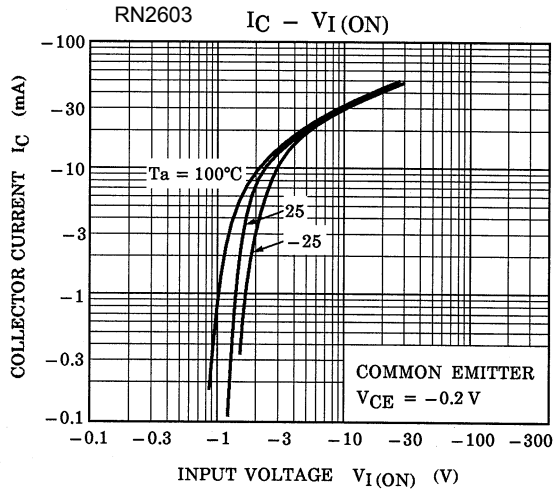
RN2601



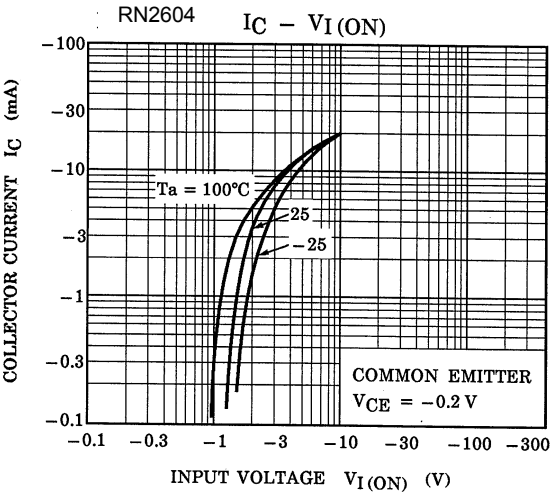
RN2602



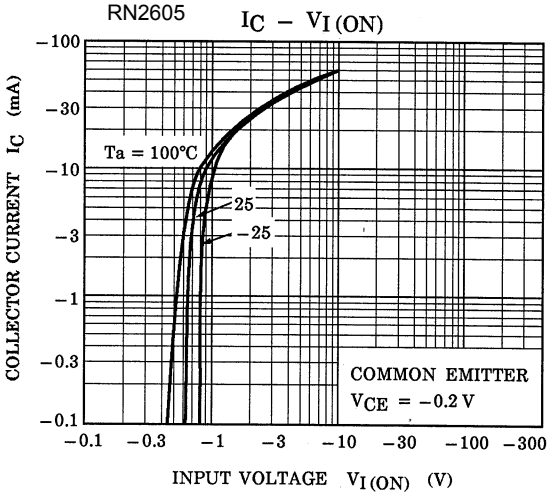
RN2603



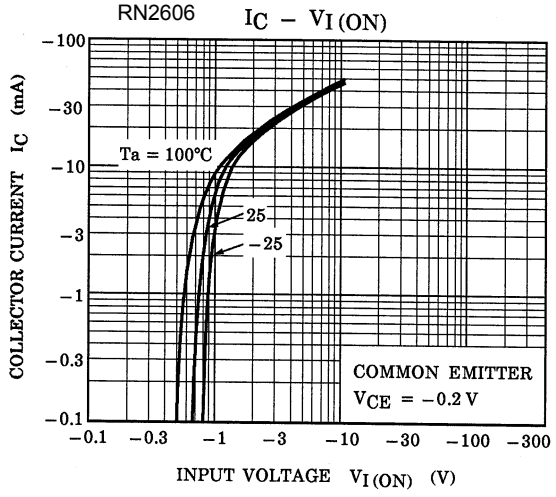
RN2604



RN2605



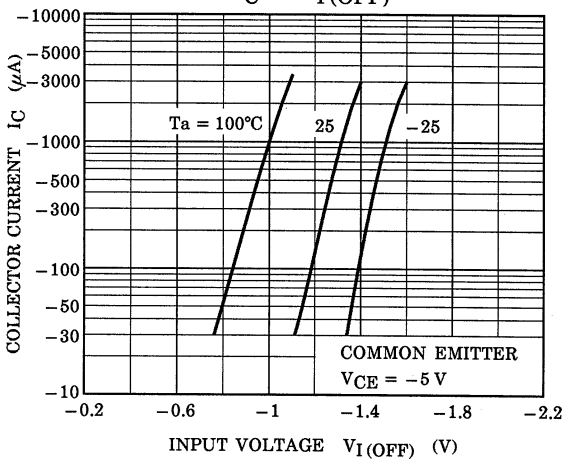
RN2606



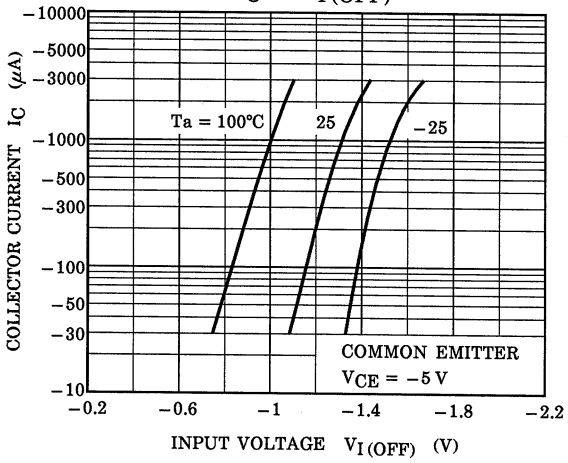
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

(Q1, Q2 Common)

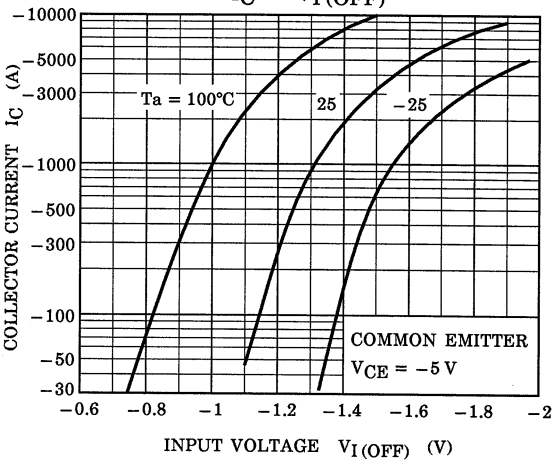
RN2601 $I_C - V_{I(OFF)}$



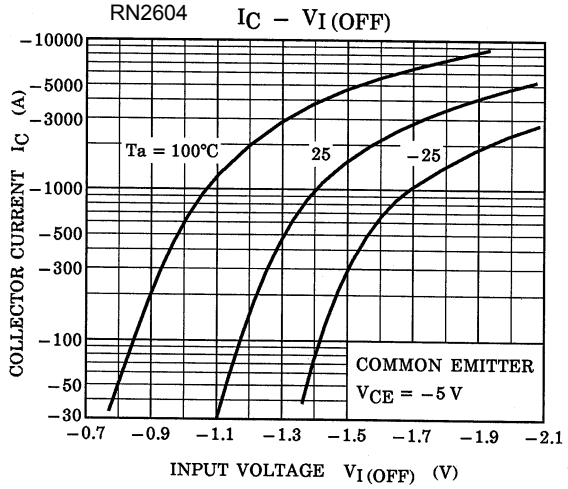
RN2602 $I_C - V_{I(OFF)}$



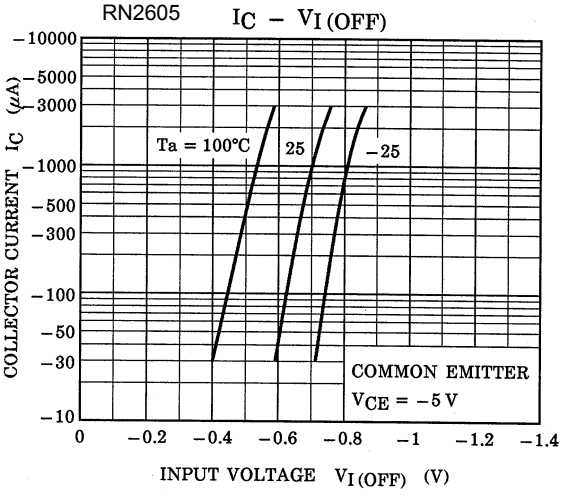
RN2603 $I_C - V_{I(OFF)}$



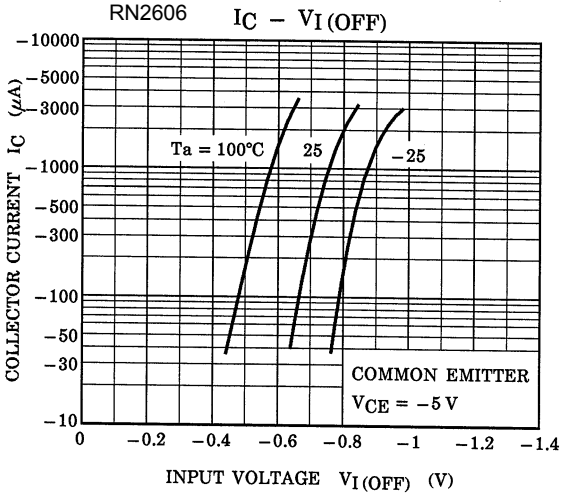
RN2604 $I_C - V_{I(OFF)}$



RN2605 $I_C - V_{I(OFF)}$



RN2606 $I_C - V_{I(OFF)}$



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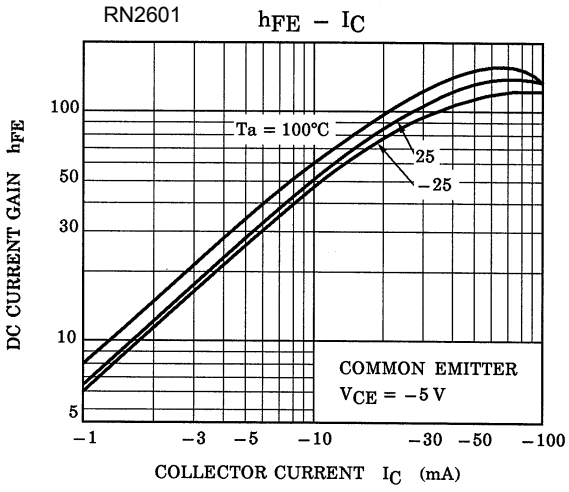
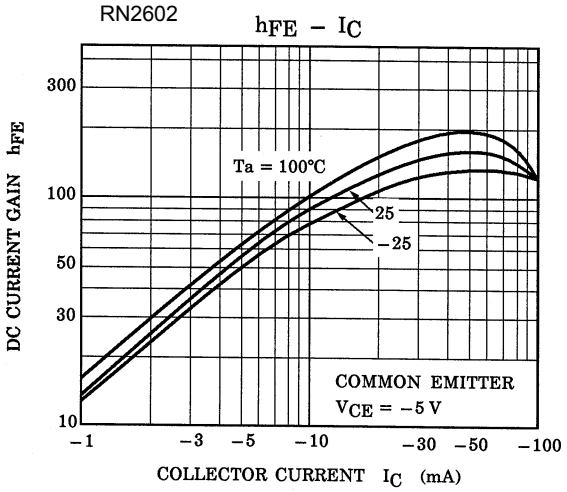
(Q1, Q2 Common)

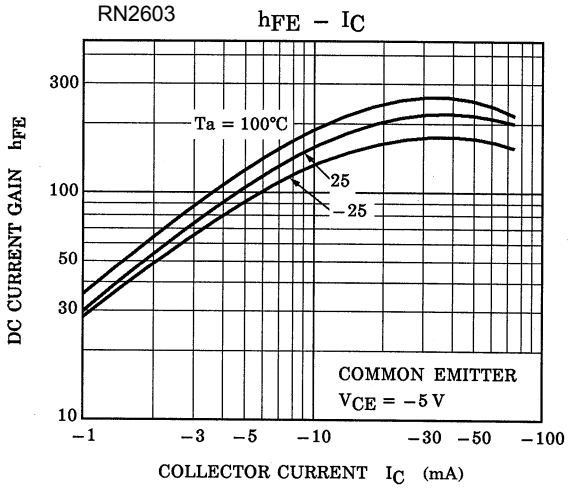
RN2601



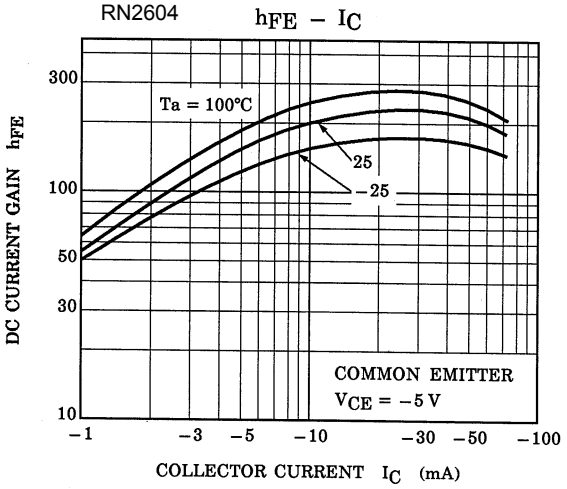
RN2602



RN2603



RN2604



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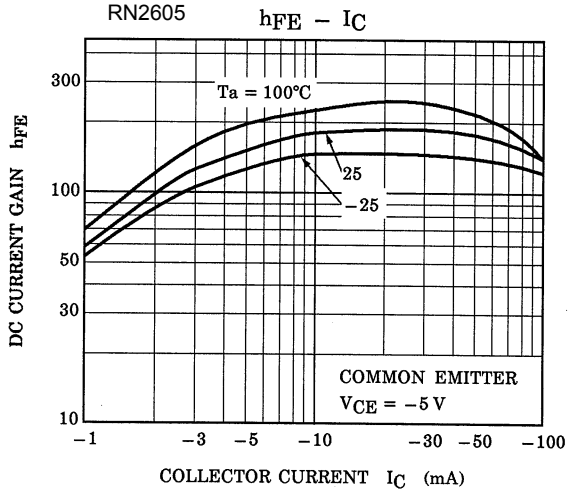
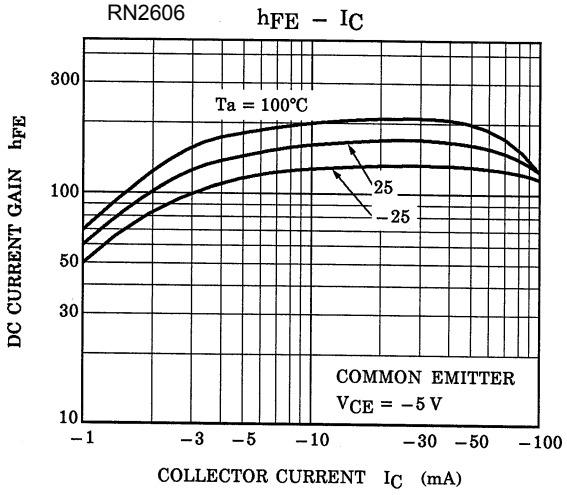


RN2606



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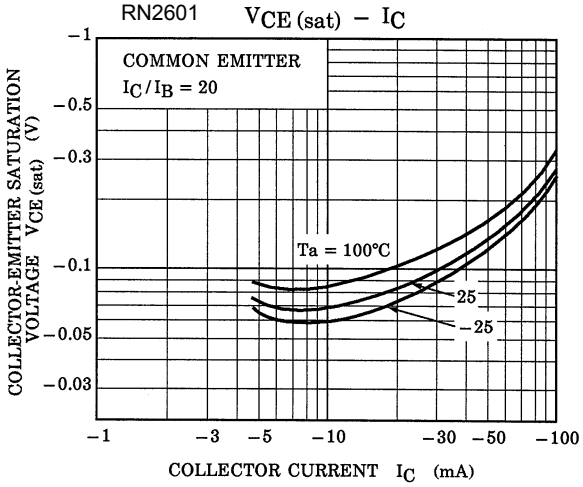
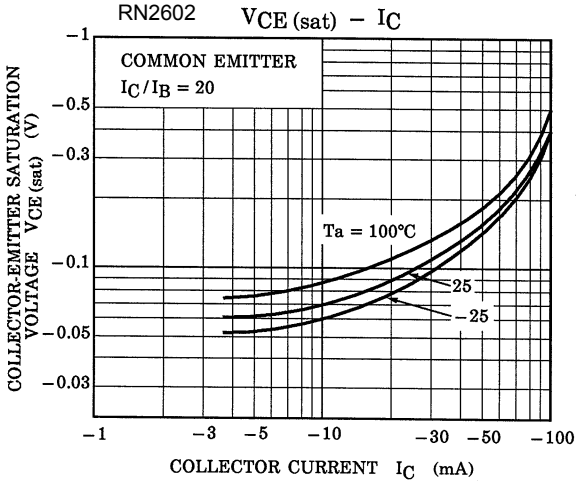
(Q1, Q2 Common)

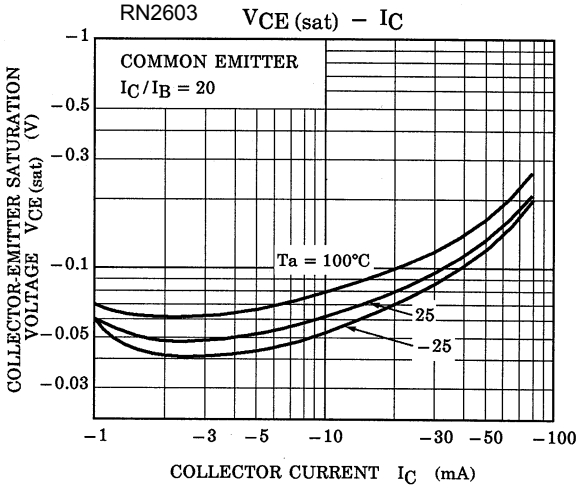
RN2601 $V_{CE\,(sat)}$ – I_C



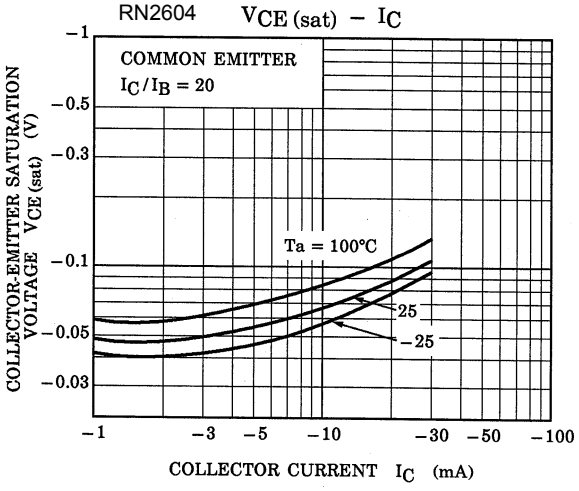
RN2602 $V_{CE\,(sat)}$ – I_C



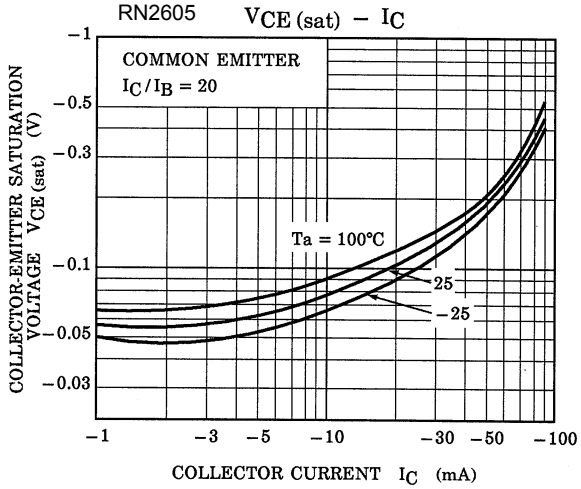
RN2603 $V_{CE\,(sat)}$ – I_C



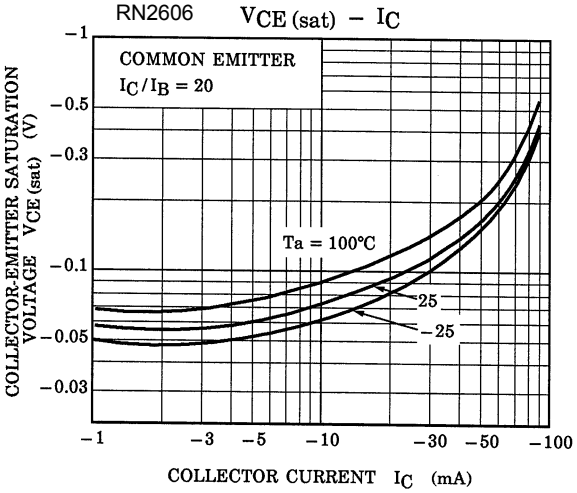
RN2604 $V_{CE\,(sat)}$ – I_C



RN2605 $V_{CE\,(sat)}$ – I_C



RN2606 $V_{CE\,(sat)}$ – I_C



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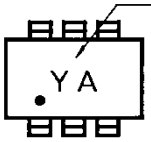
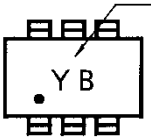
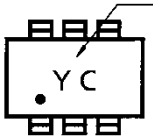
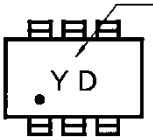
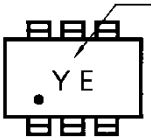
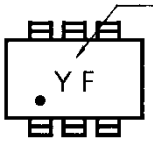
Marking

Part No.	Marking
RN2601	Part No.(abbreviation code) 
RN2602	Part No.(abbreviation code) 
RN2603	Part No.(abbreviation code) 
RN2604	Part No.(abbreviation code) 
RN2605	Part No.(abbreviation code) 
RN2606	Part No.(abbreviation code) 

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