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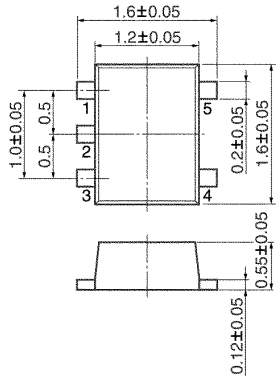
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

RN2710JE, RN2711JE

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Two devices are incorporated into an Extreme-Super-Mini (5-pin) package.
- Incorporating a bias resistor into a transistor reduces parts count.
- Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- A wide range of resistor values are available for use in various circuit designs.
- Complementary to RN1710JE, RN1711JE

Unit: mm

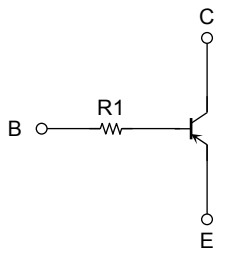


	1.BASE1	(B1)
	2.EMITTER	(E)
	3.BASE2	(B2)
	4.COLLECTOR2	(C2)
ESV	5.COLLECTOR1	(C1)

JEDEC	—
JEITA	—
TOSHIBA	2-2P1D

Weight: 0.003g (typ.)

Equivalent Circuit



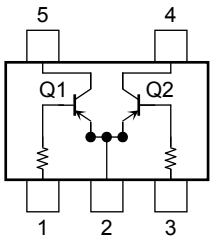
Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−50	V
Collector-emitter voltage	V_{CEO}	−50	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	I_C	−100	mA
Collector power dissipation	P_C (Note 1)	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	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).

Note 1: Total rating

Equivalent Circuit (top view)

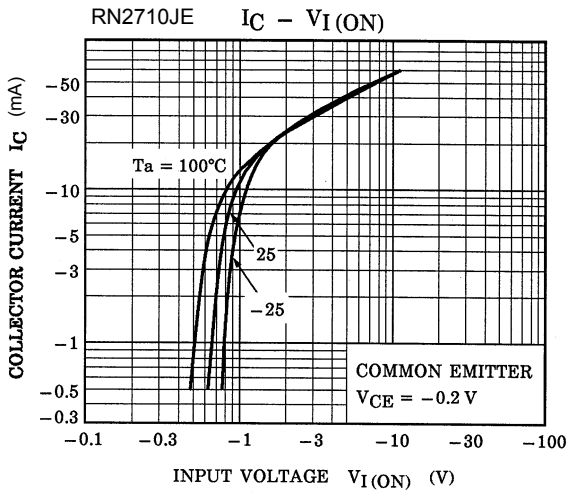


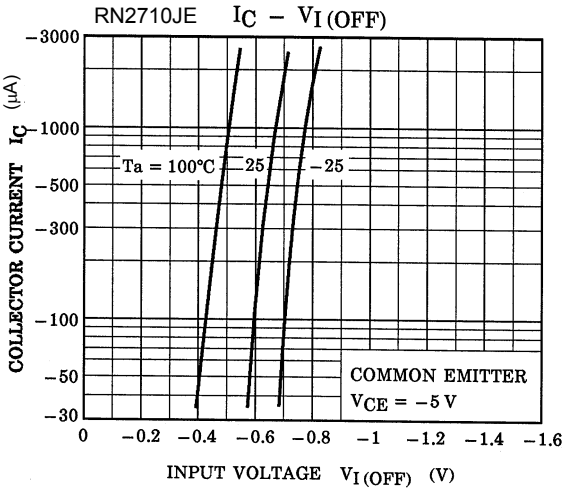
Start of commercial production
2000-06

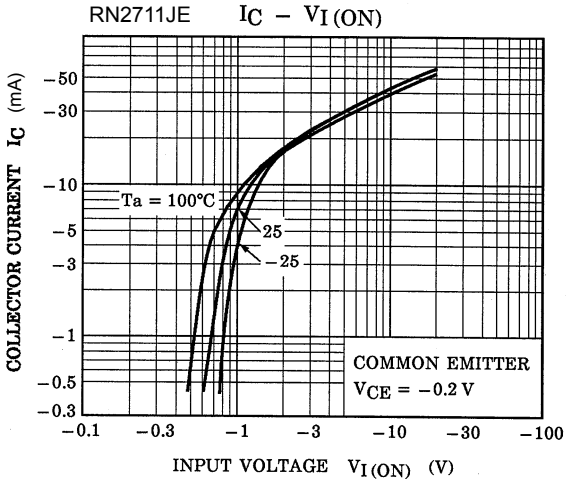
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

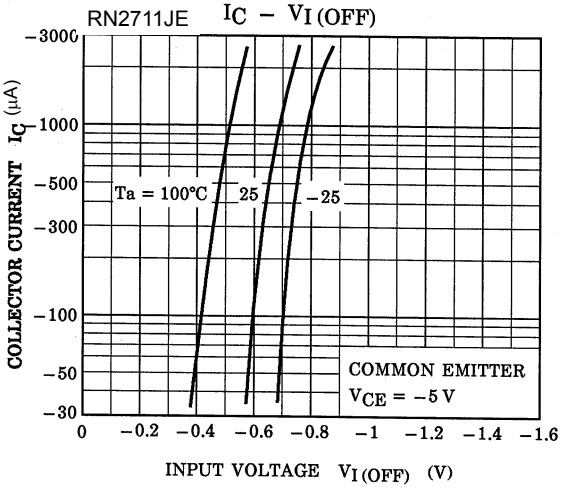
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−100	nA
Emitter cut-off current		I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−100	nA
DC current gain		h_{FE}	V_{CE} = −5 V, I_C = −1 mA	120	—	400	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	−0.1	−0.3	V
Transition frequency		f_T	V_{CE} = −10 V, I_C = −5 mA	—	200	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	3	6	pF
Input resistor	RN2710JE	R1	—	3.29	4.7	6.11	kΩ
	RN2711JE			7	10	13	

Q1, Q2 Common


RN2710JE $I_C - V_{I(ON)}$
COLLECTOR CURRENT I_C (mA)
−50
−30
−10
−5
−3
−1
−0.5
−0.3
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = −0.2 V
−0.1 −0.3 −1 −3 −10 −30 −100
INPUT VOLTAGE $V_{I(ON)}$ (V)

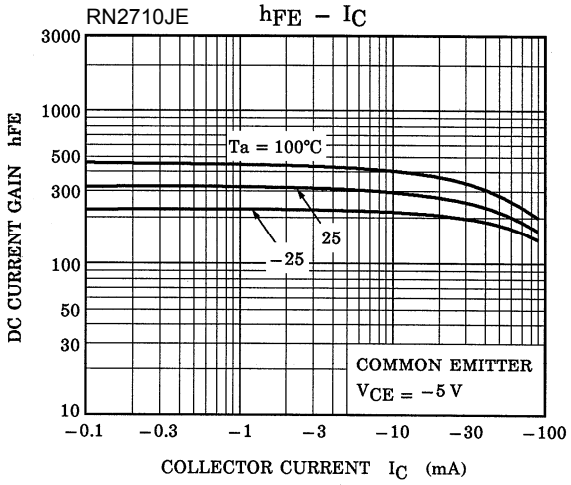

RN2710JE $I_C - V_{I(OFF)}$
COLLECTOR CURRENT I_C (μA)
−3000
−1000
−500
−300
−100
−50
−30
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = −5 V
0 −0.2 −0.4 −0.6 −0.8 −1 −1.2 −1.4 −1.6
INPUT VOLTAGE $V_{I(OFF)}$ (V)


RN2711JE $I_C - V_{I(ON)}$
COLLECTOR CURRENT I_C (mA)
−50
−30
−10
−5
−3
−1
−0.5
−0.3
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = −0.2 V
−0.1 −0.3 −1 −3 −10 −30 −100
INPUT VOLTAGE $V_{I(ON)}$ (V)

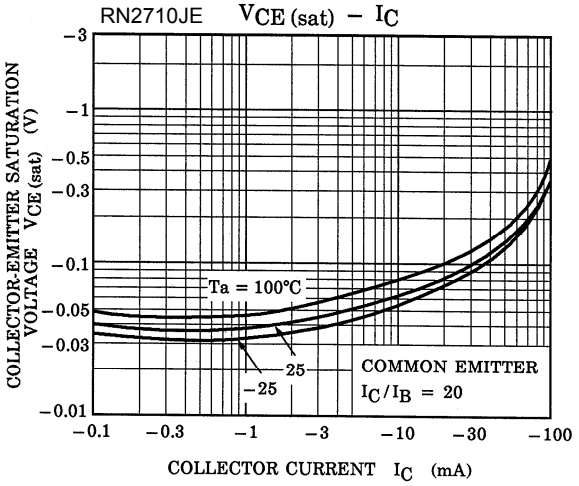

RN2711JE $I_C - V_{I(OFF)}$
COLLECTOR CURRENT I_C (μA)
−3000
−1000
−500
−300
−100
−50
−30
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = −5 V
0 −0.2 −0.4 −0.6 −0.8 −1 −1.2 −1.4 −1.6
INPUT VOLTAGE $V_{I(OFF)}$ (V)

Q1, Q2 Common

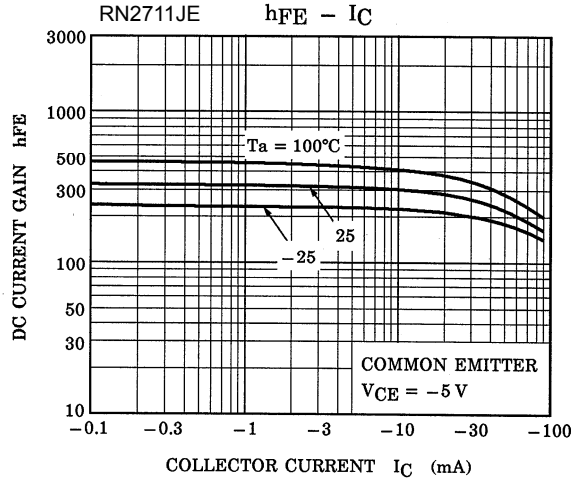
RN2710JE h_{FE} – I_C



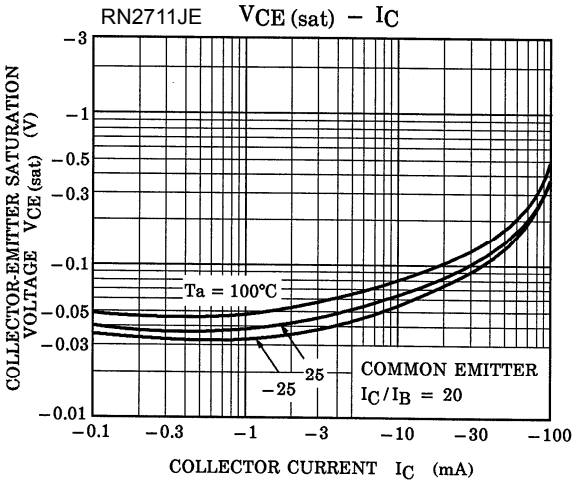
RN2710JE $V_{CE\,(sat)}$ – I_C

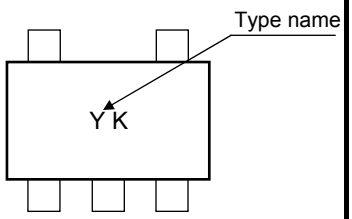
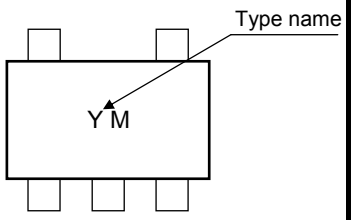


RN2711JE h_{FE} – I_C



RN2711JE $V_{CE\,(sat)}$ – I_C



Type Name	Marking
RN2710JE	
RN2711JE	

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