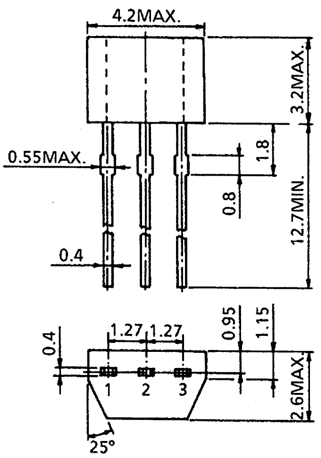
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2207,RN2208,RN2209

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1207~RN1209

Unit in mm

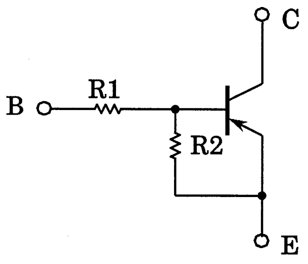


1. EMITTER
2. COLLECTPR
3. BASE

JEDEC	―
EIAJ	―
TOSHIBA	2-4E1A

Weight: 0.13g

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2207	10	47
RN2208	22	47
RN2209	47	22

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2207	V_{EBO}	−6	V
	RN2208		−7	
	RN2209		−15	
Collector current		I_C	−100	mA
Collector power dissipation		P_C	300	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

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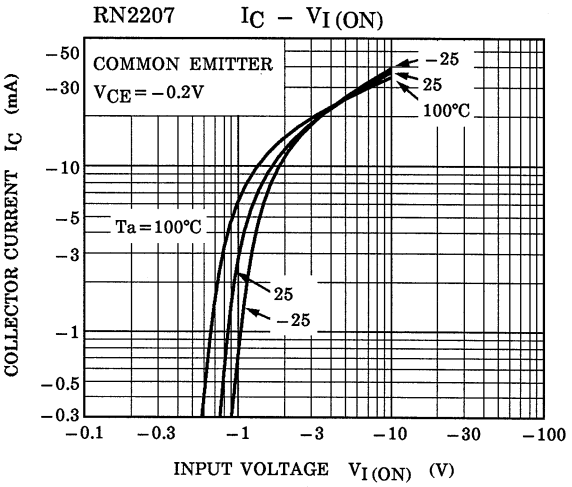
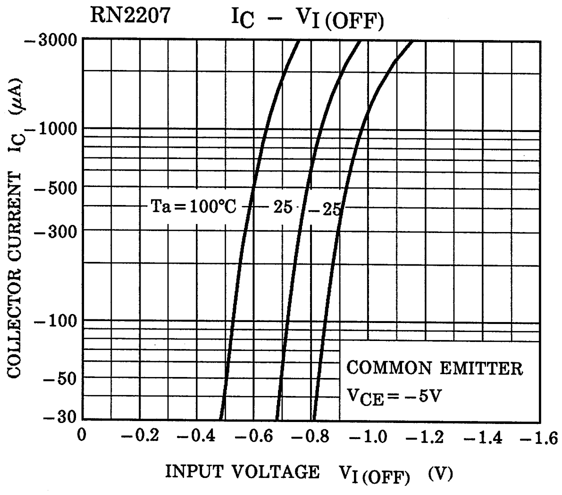
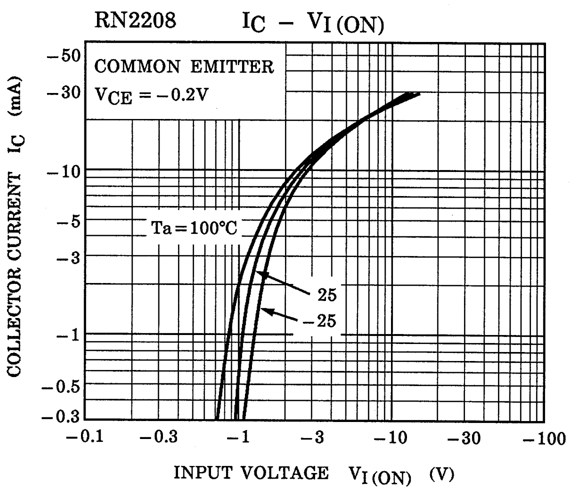
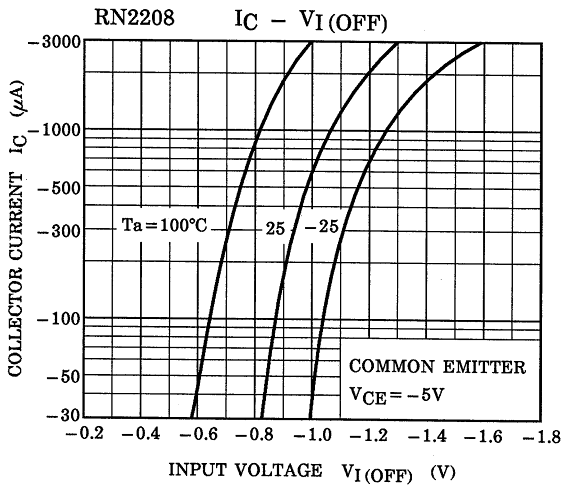
Electrical Characteristics (Ta = 25°C)

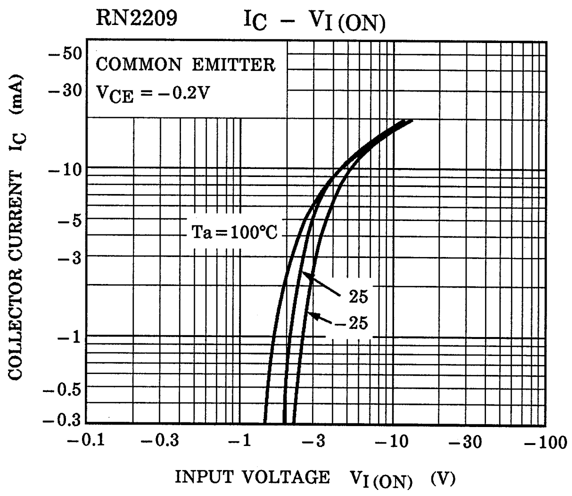
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2207	I_{EBO}	—	V_{EB} = −6V, I_C = 0	−0.081	—	−0.15	mA
	RN2208		—	V_{EB} = −7V, I_C = 0	−0.078	—	−0.145	
	RN2209		—	V_{EB} = −15V, I_C = 0	−0.167	—	−0.311	
DC current gain	RN2207	h_{FE}	—	V_{CE} = −5V, I_C = −10mA	80	—	—	—
	RN2208		—		80	—	—	
	RN2209		—		70	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	—	I_C = −5mA, I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2207	$V_{I\ (ON)}$	—	V_{CE} = −0.2V, I_C = −5mA	−0.7	—	−1.8	V
	RN2208		—		−1.0	—	−2.6	
	RN2209		—		−2.2	—	−5.8	
Input voltage (OFF)	RN2207	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−0.5	—	−1.0	V
	RN2208		—		−0.6	—	−1.16	
	RN2209		—		−1.5	—	−2.6	
Translation frequency		f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector output capacitance		C_{ob}	—	V_{CB} = −10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN2207	R1	—	—	7	10	13	kΩ
	RN2208		—		15.4	22	28.6	
	RN2209		—		32.9	47	61.1	
Resistor ratio	RN2207	R1/R2	—	—	0.191	0.213	0.232	—
	RN2208		—		0.421	0.468	0.515	
	RN2209		—		1.92	2.14	2.35	

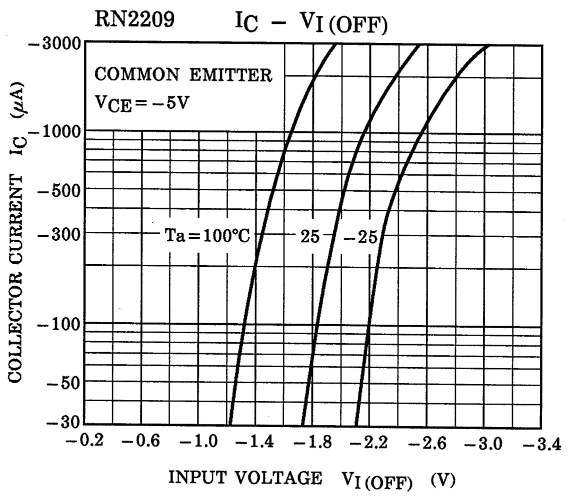

RN2207
$I_C - V_{I(ON)}$
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
−25
25
100°C
COLLECTOR CURRENT I_C (mA)
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100
INPUT VOLTAGE $V_{I(ON)}$ (V)


RN2207
$I_C - V_{I(OFF)}$
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE} = -5V$
COLLECTOR CURRENT I_C (μA)
−3000
−1000
−500
−300
−100
−50
−30
0
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
−1.4
−1.6
INPUT VOLTAGE $V_{I(OFF)}$ (V)

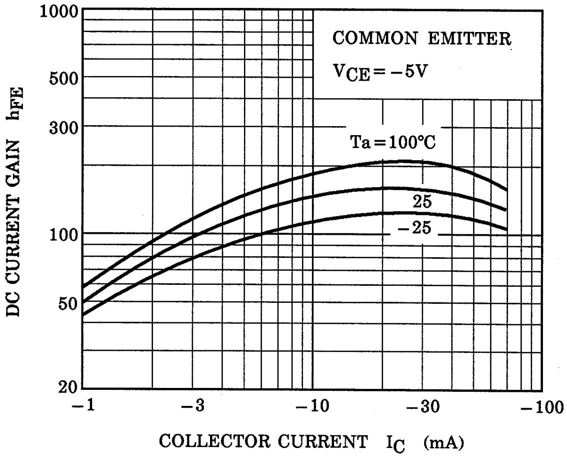

RN2208
$I_C - V_{I(ON)}$
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100
INPUT VOLTAGE $V_{I(ON)}$ (V)


RN2208
$I_C - V_{I(OFF)}$
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE} = -5V$
COLLECTOR CURRENT I_C (μA)
−3000
−1000
−500
−300
−100
−50
−30
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
−1.4
−1.6
−1.8
INPUT VOLTAGE $V_{I(OFF)}$ (V)

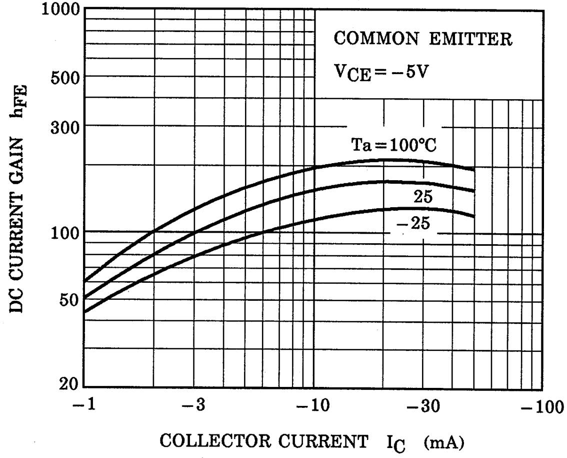

RN2209
$I_C - V_{I(ON)}$
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100
INPUT VOLTAGE $V_{I(ON)}$ (V)


RN2209
$I_C - V_{I(OFF)}$
COMMON EMITTER
$V_{CE} = -5V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (μA)
−3000
−1000
−500
−300
−100
−50
−30
−0.2
−0.6
−1.0
−1.4
−1.8
−2.2
−2.6
−3.0
−3.4
INPUT VOLTAGE $V_{I(OFF)}$ (V)

RN2207 $h_{FE} - I_C$



RN2208 $h_{FE} - I_C$



RN2209 $h_{FE} - I_C$