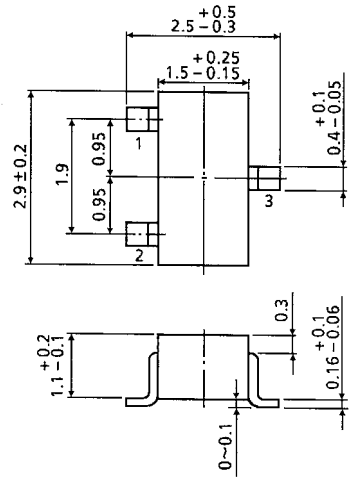
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1401,RN1402,RN1403 RN1404,RN1405,RN1406

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 RN2401~RN2406

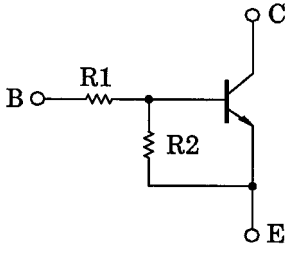
Unit: mm



JEDEC	TO-236MOD
EIAJ	SC-59
TOSHIBA	2-3F1A

Weight: 0.012g

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ	R2 (kΩ
RN1401	4.7	4.7
RN1402	10	10
RN1403	22	22
RN1404	47	47
RN1405	2.2	47
RN1406	4.7	47

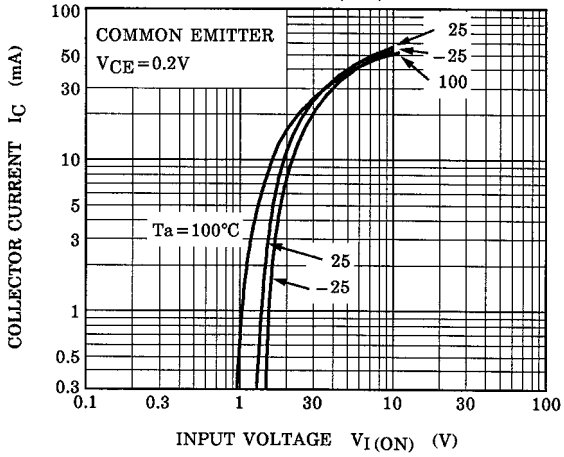
Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1401~1406	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1401~1404	V_{EBO}	10	V
	RN1405, 1406		5	
Collector current	RN1401~1406	I_C	100	mA
Collector power dissipation		P_C	200	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

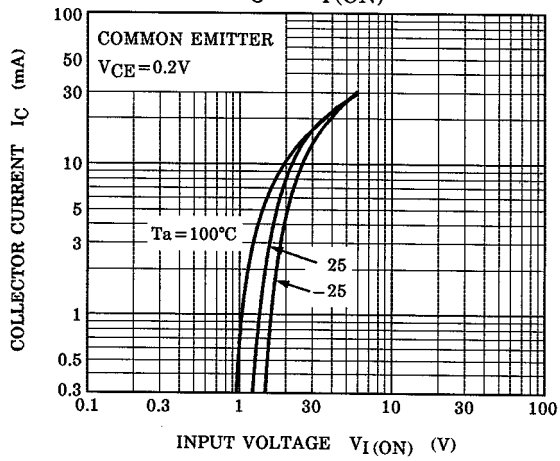
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1401~1406	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}		V_{CE} = 50V, I_B = 0	—	—	500	
Emitter cut-off current	RN1401	I_{EBO}	—	V_{EB} = 10V, I_C = 0	0.82	—	1.52	mA
	RN1402				0.38	—	0.71	
	RN1403				0.17	—	0.33	
	RN1404				0.082	—	0.15	
	RN1405			V_{EB} = 5V, I_C = 0	0.078	—	0.145	
	RN1406				0.074	—	0.138	
DC current gain	RN1401	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	30	—	—	—
	RN1402				50	—	—	
	RN1403				70	—	—	
	RN1404				80	—	—	
	RN1405				80	—	—	
	RN1406				80	—	—	
Collector-emitter saturation voltage	RN1401~1406	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1401	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	1.1	—	2.0	V
	RN1402				1.2	—	2.4	
	RN1403				1.3	—	3.0	
	RN1404				1.5	—	5.0	
	RN1405				0.6	—	1.1	
	RN1406				0.7	—	1.3	
Input voltage (OFF)	RN1401~1404	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	1.0	—	1.5	V
	RN1405, 1406				0.5	—	0.8	
Transition frequency	RN1401~1406	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector Output capacitance	RN1401~1406	C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN1401	R1	—	—	3.29	4.7	6.11	kΩ
	RN1402				7	10	13	
	RN1403				15.4	22	28.6	
	RN1404				32.9	47	61.1	
	RN1405				1.54	2.2	2.86	
	RN1406				3.29	4.7	6.11	
Resistor ratio	RN1401~1404	R1/R2	—	—	0.9	1.0	1.1	—
	RN1405				0.0421	0.0468	0.0515	
	RN1406				0.09	0.1	0.11	

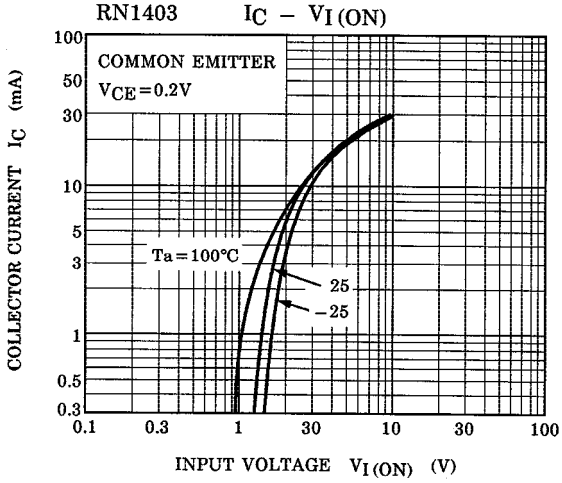
RN1401 $I_C - V_{I(ON)}$



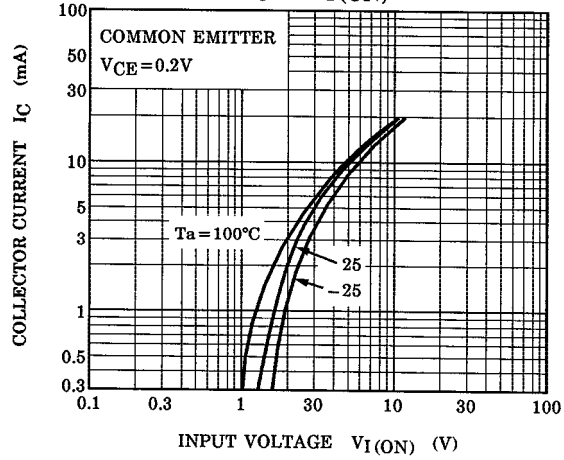
RN1402 $I_C - V_{I(ON)}$



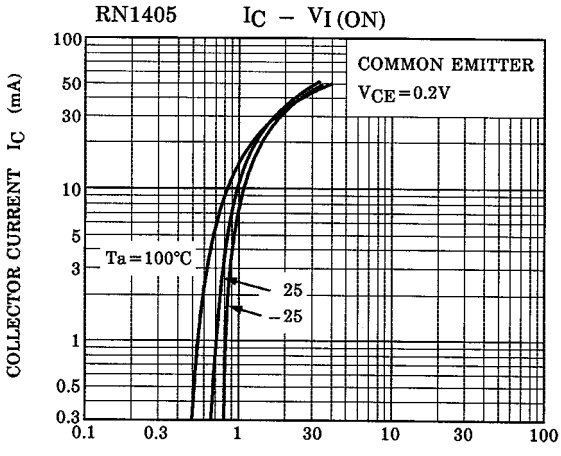
RN1403 $I_C - V_{I(ON)}$



RN1404 $I_C - V_{I(ON)}$



RN1405 $I_C - V_{I(ON)}$



RN1406 $I_C - V_{I(ON)}$