

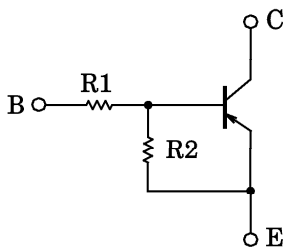
TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

RN2301, RN2302, RN2303 RN2304, RN2305, RN2306

SWITCHING, INVERTER CIRCUIT, INTERFACE CIRCUIT
AND DRIVER CIRCUIT APPLICATIONS

- With Built-in Bias Resistors
- Simplify Circuit Design
- Reduce a Quantity of Parts Manufacturing Process
- Complementary to RN1301~1306

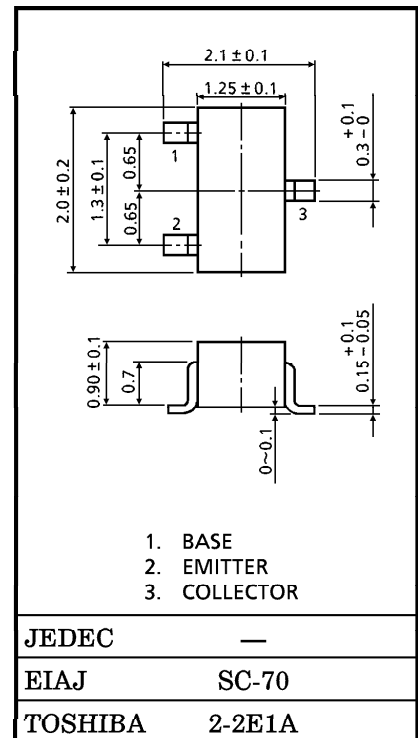
EQUIVALENT CIRCUIT



BIAS RESISTOR VALUES

TYPE No.	R1 (kΩ)	R2 (kΩ)
RN2301	4.7	4.7
RN2302	10	10
RN2303	22	22
RN2304	47	47
RN2305	2.2	47
RN2306	4.7	47

Unit in mm



Weight : 0.006g

MAXIMUM RATINGS (Ta = 25°C)

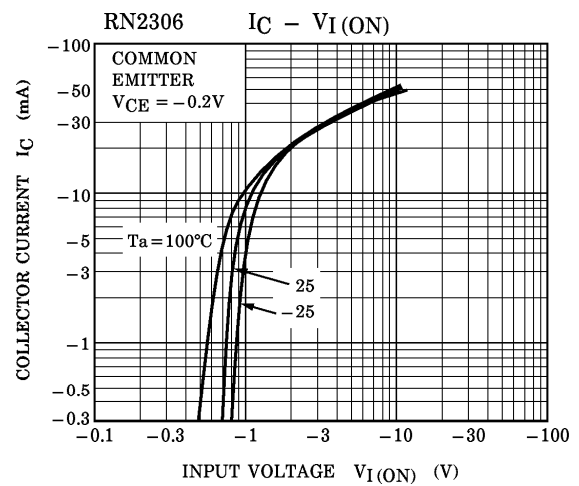
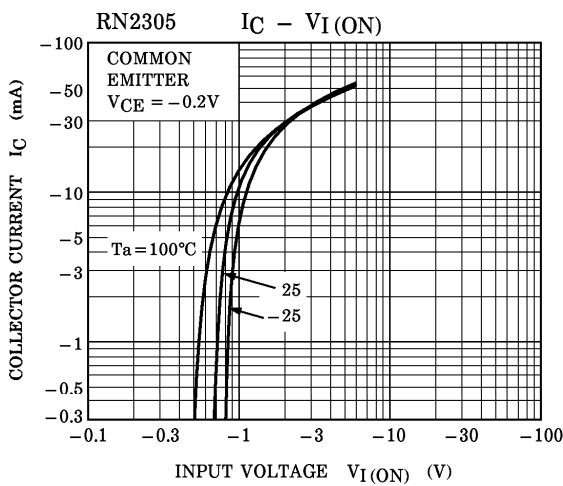
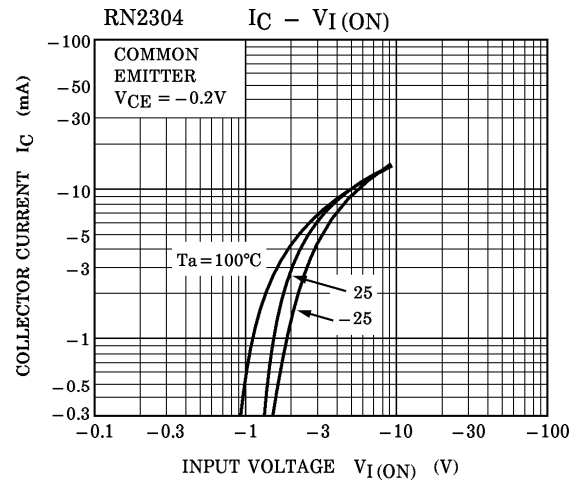
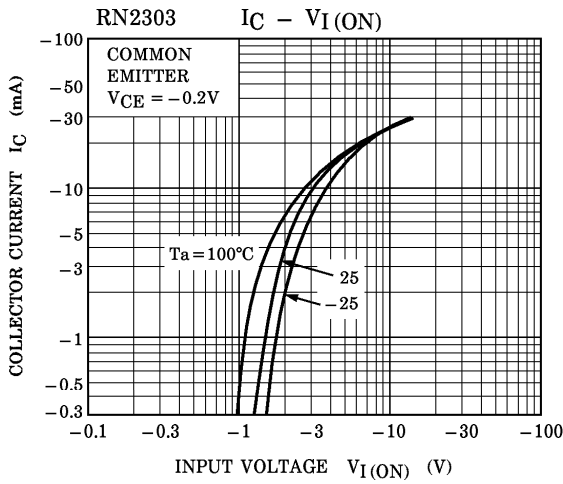
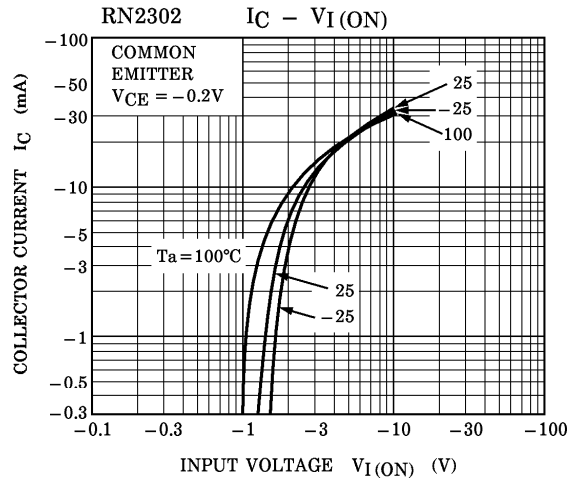
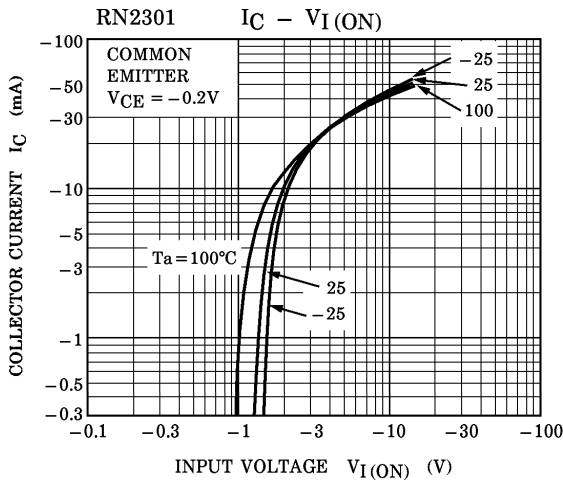
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	RN2301~2306	VCBO	-50 V
Collector-Emitter Voltage		VCEO	-50 V
Emitter-Base Voltage	RN2301~2304	VEBO	-10 V
	RN2305, 2306		-5 V
Collector Current	RN2301~2306	IC	-100 mA
Collector Power Dissipation		PC	100 mW
Junction Temperature		Tj	150 °C
Storage Temperature Range		Tstg	-55~150 °C

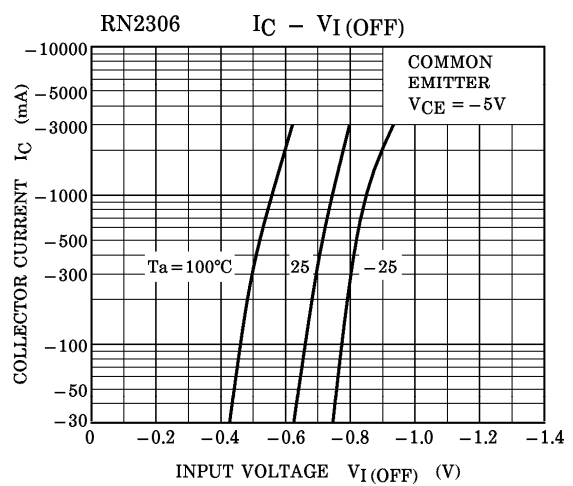
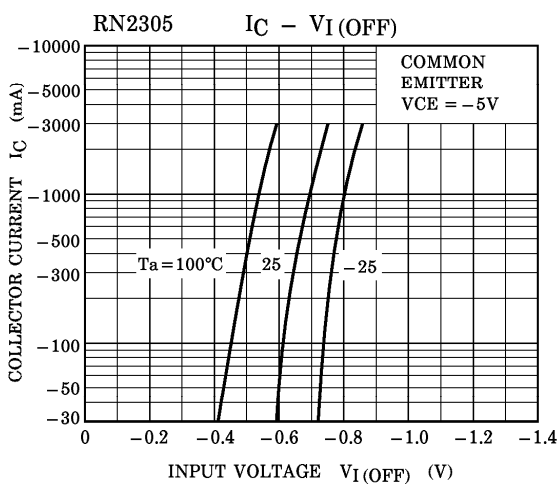
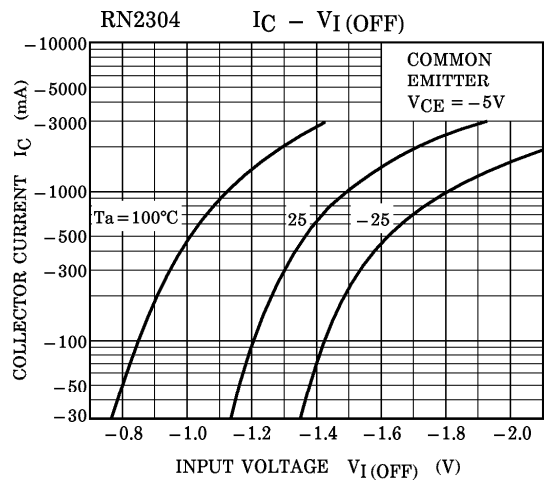
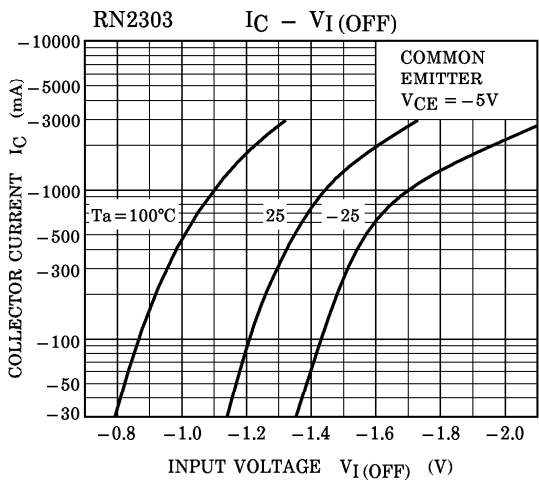
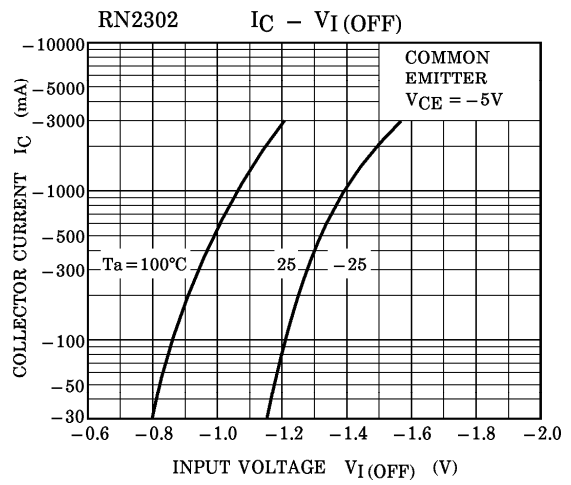
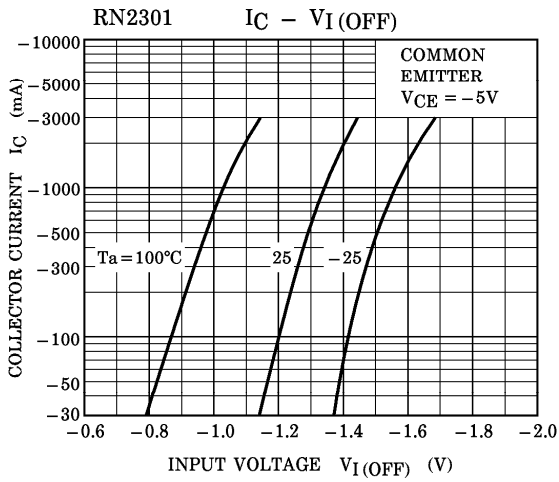
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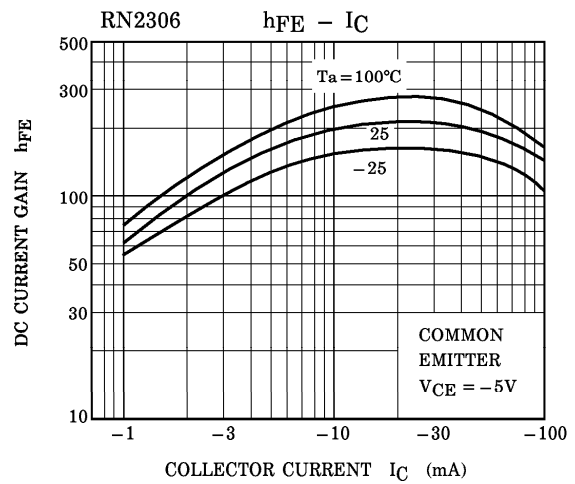
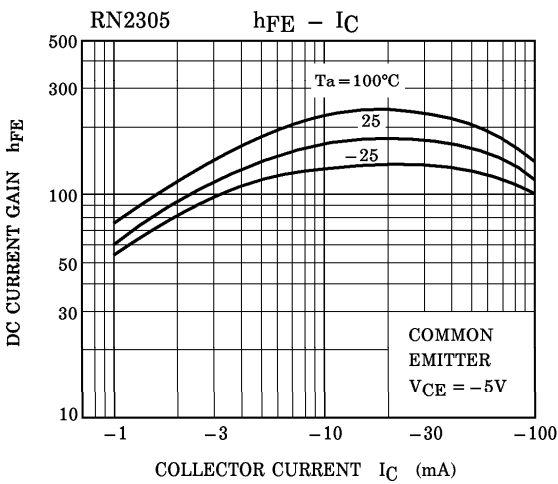
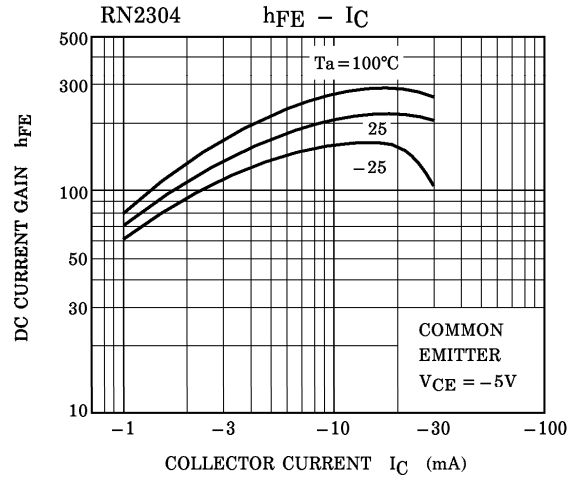
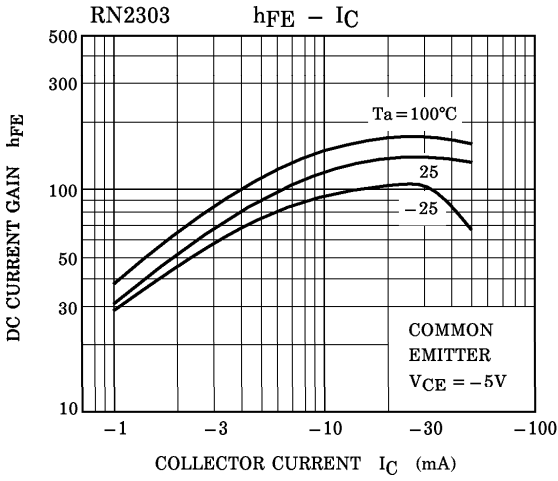
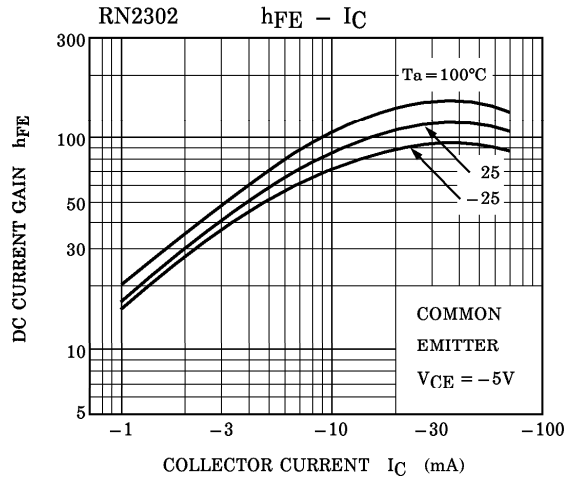
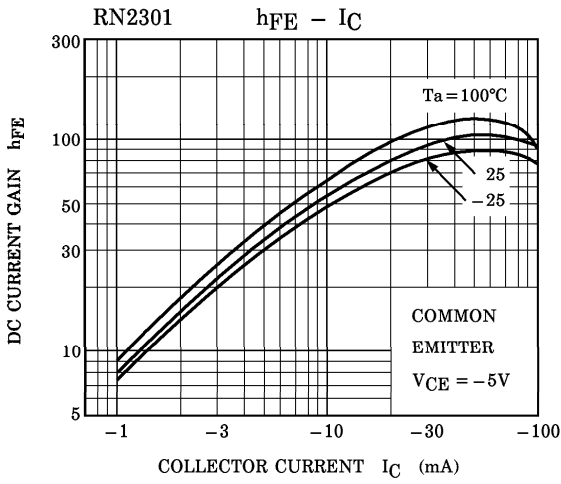
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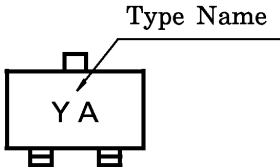
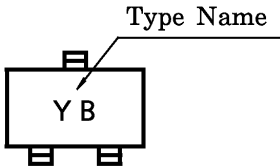
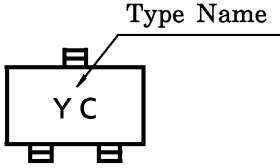
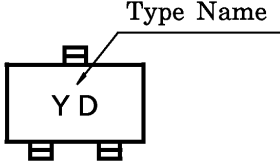
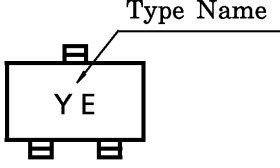
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	RN2301~2306	I_{CBO}	$V_{CB} = -50V, I_E = 0$	—	—	-100	nA
		I_{CEO}	$V_{CE} = -50V, I_B = 0$	—	—	-500	
Emitter Cut-off Current	RN2301	I_{EBO}	$V_{EB} = -10V, I_C = 0$	-0.82	—	-1.52	mA
	RN2302			-0.38	—	-0.71	
	RN2303			-0.17	—	-0.33	
	RN2304		-0.082	—	-0.15		
	RN2305		$V_{EB} = -5V, I_C = 0$	-0.078	—	-0.145	
	RN2306			-0.074	—	-0.138	
DC Current Gain	RN2301	h_{FE}	$V_{CE} = -5V$ $I_C = -10mA$	30	—	—	—
	RN2302			50	—	—	
	RN2303			70	—	—	
	RN2304			80	—	—	
	RN2305			80	—	—	
	RN2306			80	—	—	
Collector-Emitter Saturation Voltage	RN2301~2306	$V_{CE(sat)}$	$I_C = -5mA$ $I_B = -0.25mA$	—	-0.1	-0.3	V
Input Voltage (ON)	RN2301	$V_{I(ON)}$	$V_{CE} = -0.2V$ $I_C = -5mA$	-1.1	—	-2.0	V
	RN2302			-1.2	—	-2.4	
	RN2303			-1.3	—	-3.0	
	RN2304			-1.5	—	-5.0	
	RN2305			-0.6	—	-1.1	
	RN2306			-0.7	—	-1.3	
Input Voltage (OFF)	RN2301~2304 RN2305, 2306	$V_{I(OFF)}$	$V_{CE} = -5V$ $I_C = -0.1mA$	-1.0	—	-1.5	V
Transition Frequency	RN2301~2306	f_T	$V_{CE} = -10V$ $I_C = -5mA$	—	200	—	MHz
Collector Output Capacitance	RN2301~2306	C_{ob}	$V_{CB} = -10V, I_E = 0$ $f = 1MHz$	—	3	6	pF
Input Resistor	RN2301	R1		3.29	4.7	6.11	k Ω
	RN2302			7	10	13	
	RN2303			15.4	22	28.6	
	RN2304			32.9	47	61.1	
	RN2305			1.54	2.2	2.86	
	RN2306			3.29	4.7	6.11	
Resistor Ratio	RN2301~2304	R1 / R2		0.9	1.0	1.1	—
	RN2305			0.0421	0.0468	0.0515	
	RN2306			0.09	0.1	0.11	







TYPE NAME	MARKING
RN2301	
RN2302	
RN2303	
RN2304	
RN2305	
RN2306	