

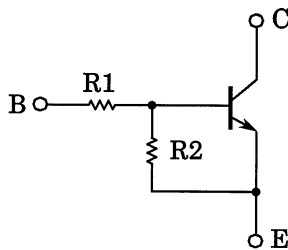
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

## RN1321A, RN1322A, RN1323A, RN1324A RN1325A, RN1326A, RN1327A

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

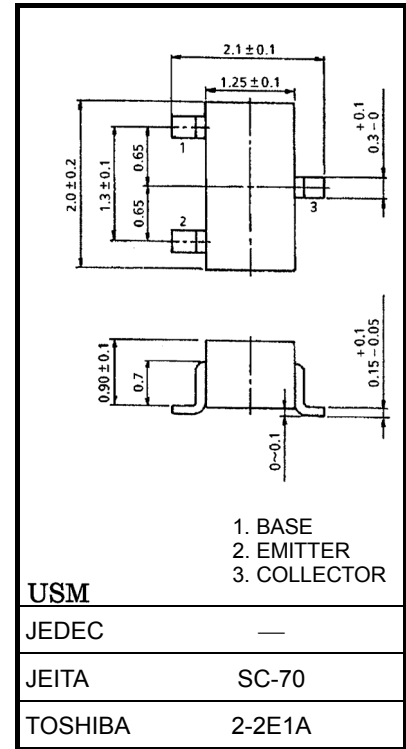
- High current driving is possible.
- Since bias resistors are built in the transistor, the miniaturization of the apparatus by curtailment of the number of parts and labor saving of an assembly are possible.
- Many kinds of resistance value are lined up in order to support various kinds of circuit design.
- Complementary to RN2321A~RN2327A
- Low  $V_{CE(sat)}$  enable to be low power dissipation on high current driving.

### Equivalent Circuit And Bias Resistance Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1321A	1	1
RN1322A	2.2	2.2
RN1323A	4.7	4.7
RN1324A	10	10
RN1325A	0.47	10
RN1326A	1	10
RN1327A	2.2	10

Unit: mm



Weight: 0.006 g (typ.)

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

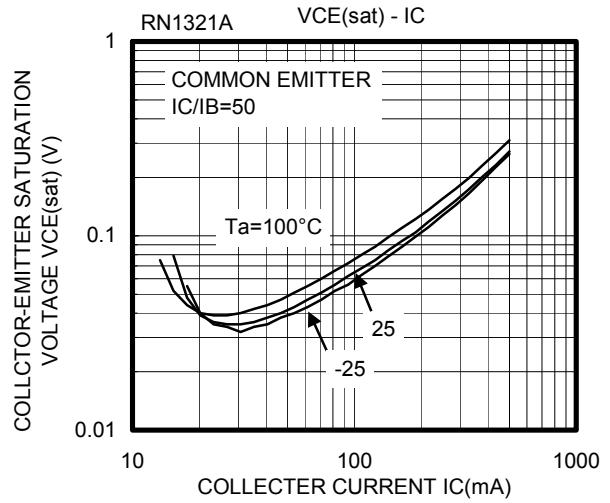
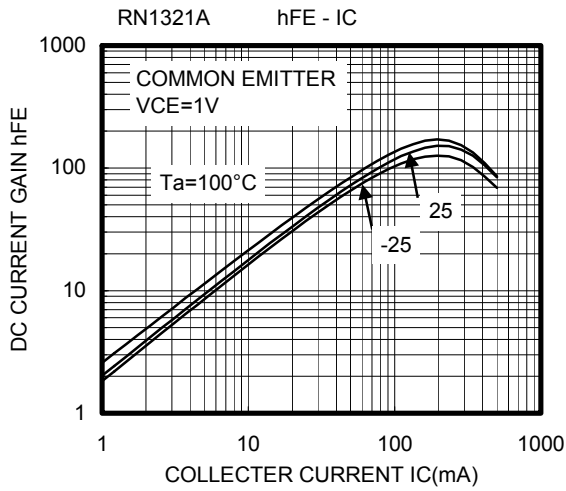
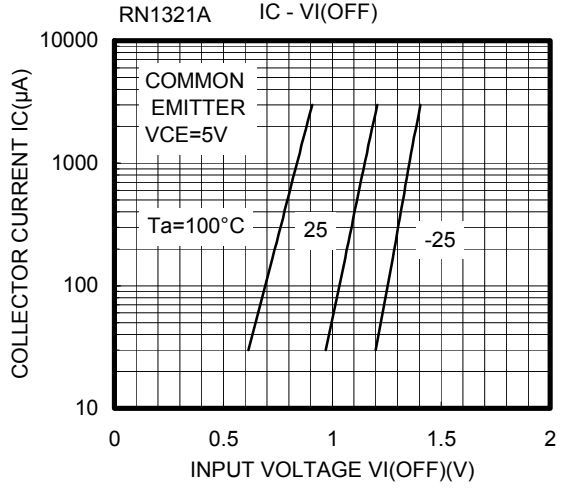
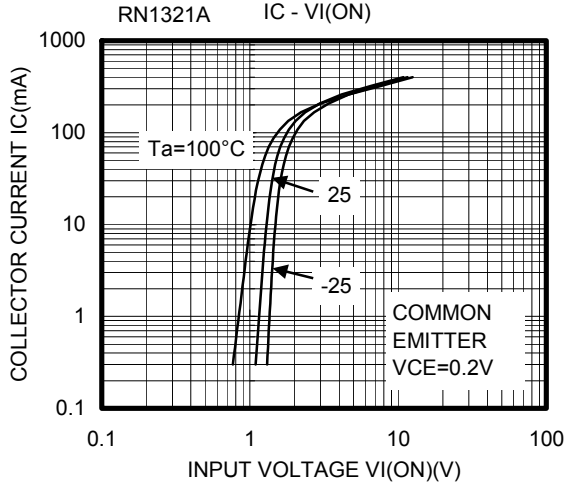
Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	15	V
Collector-emitter voltage			
Emitter-base voltage	$V_{EBO}$	10	V
		5	
		6	
Collector current	$I_C$	500	mA
Collector power dissipation			
Junction temperature			
Storage temperature range			
	$P_C$	100	mW
	$T_j$	150	$^\circ\text{C}$
	$T_{stg}$	-55~150	$^\circ\text{C}$

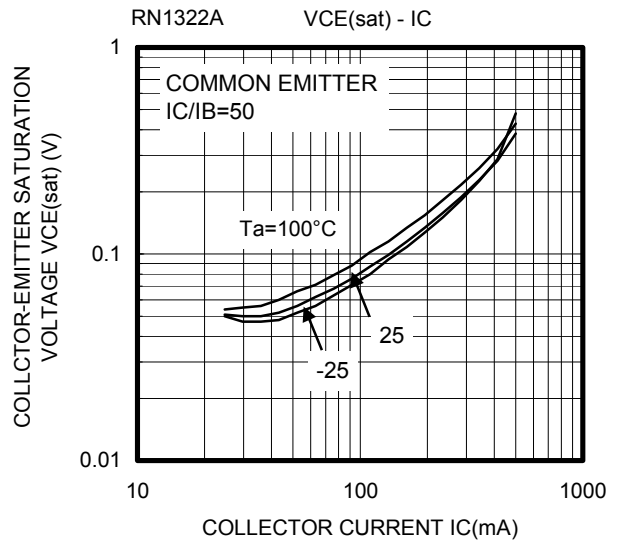
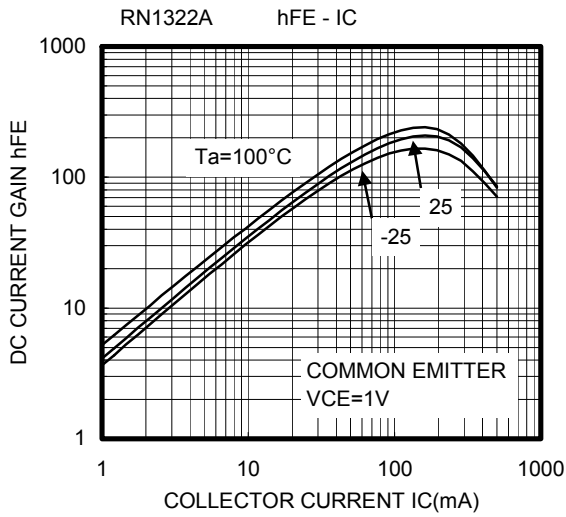
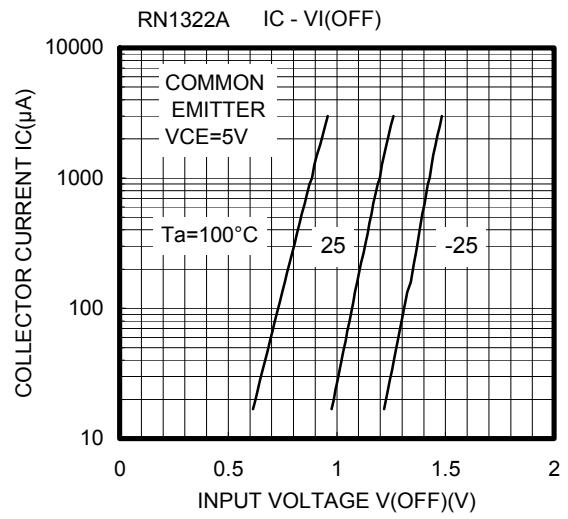
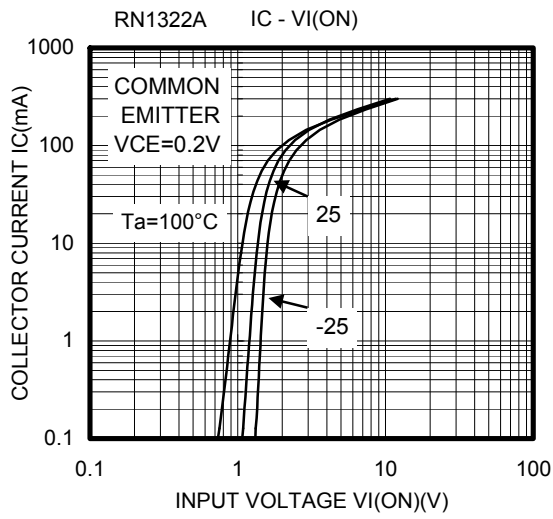
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

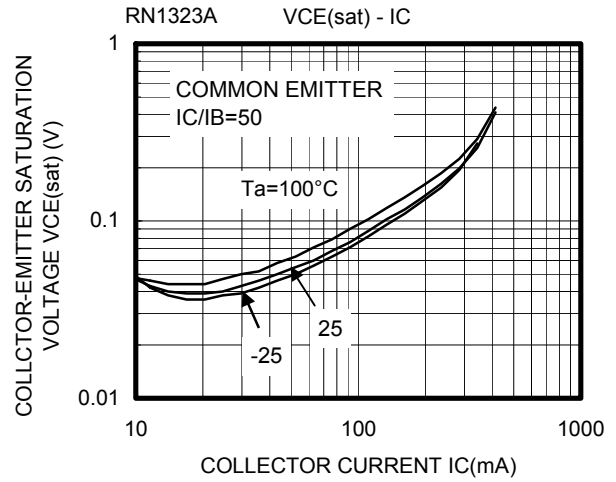
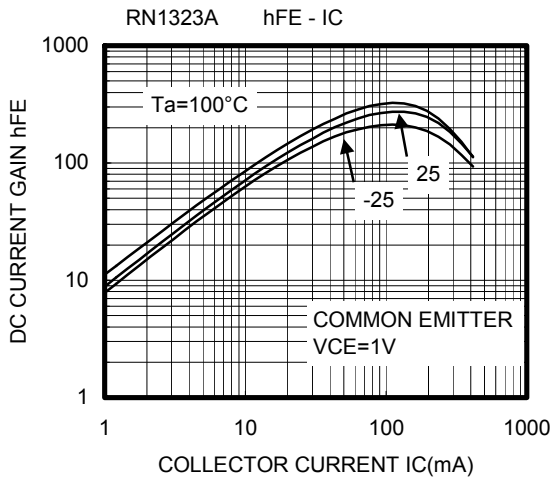
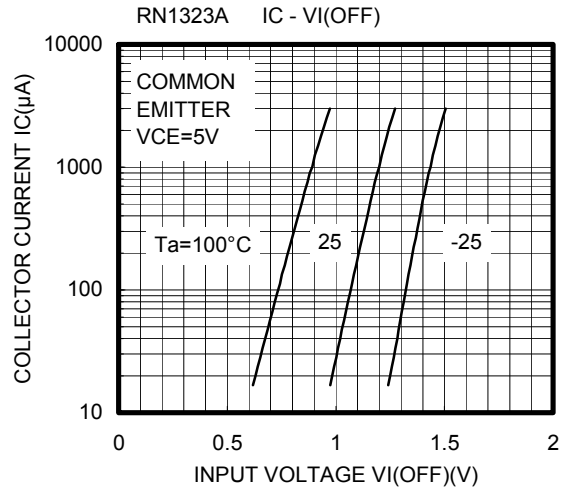
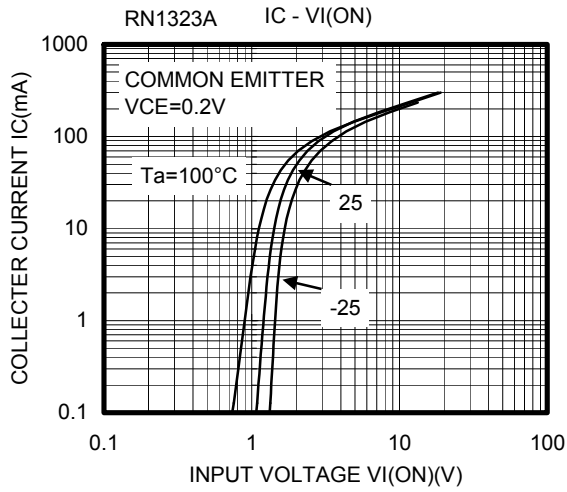
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

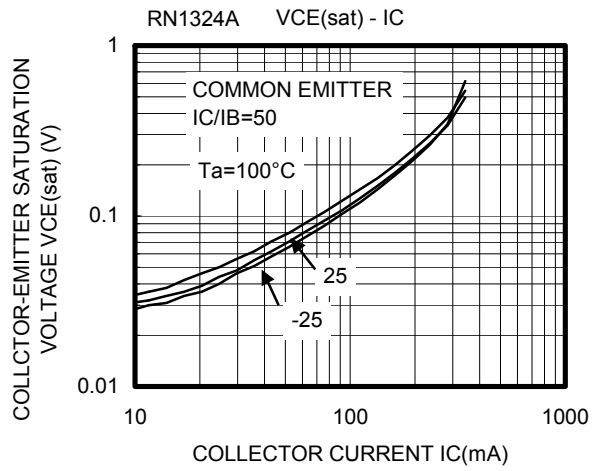
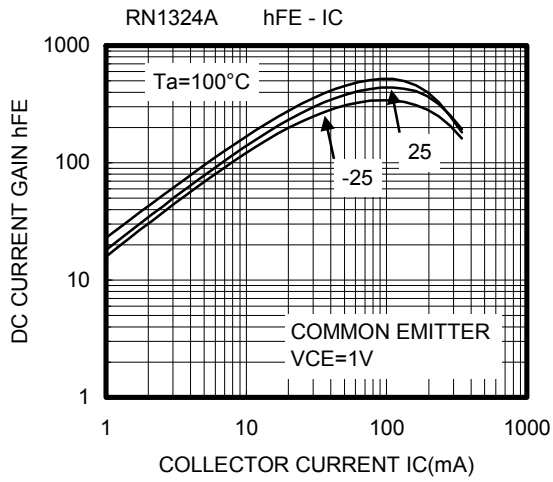
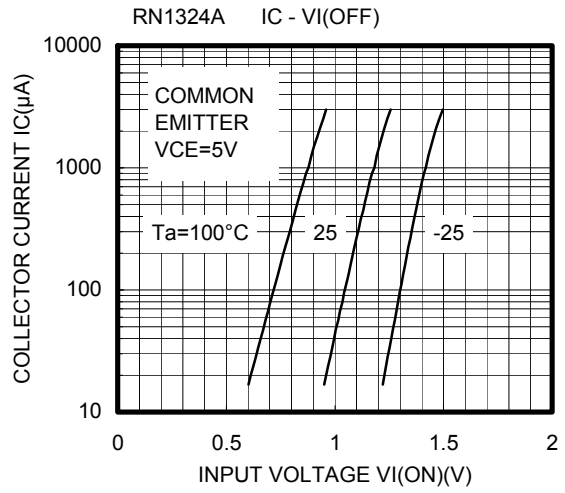
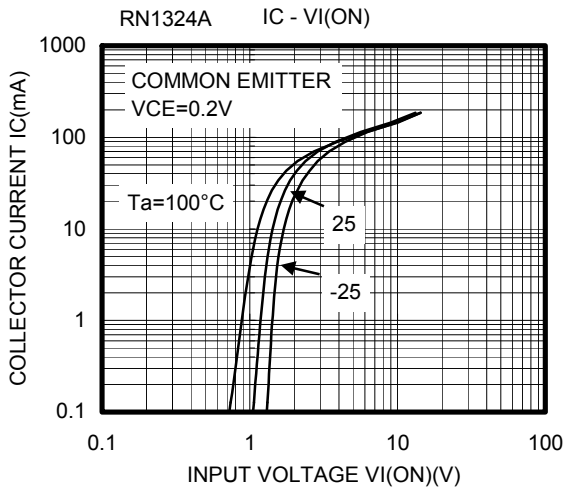
## Electrical Characteristics (Ta = 25°C)

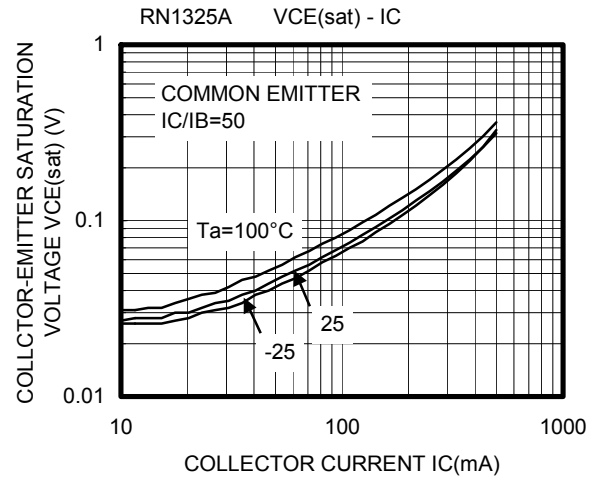
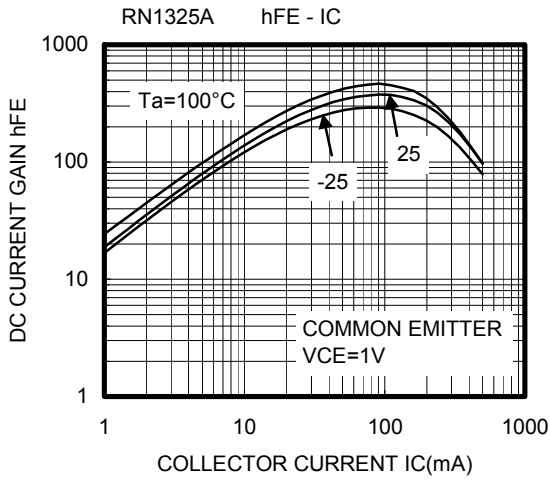
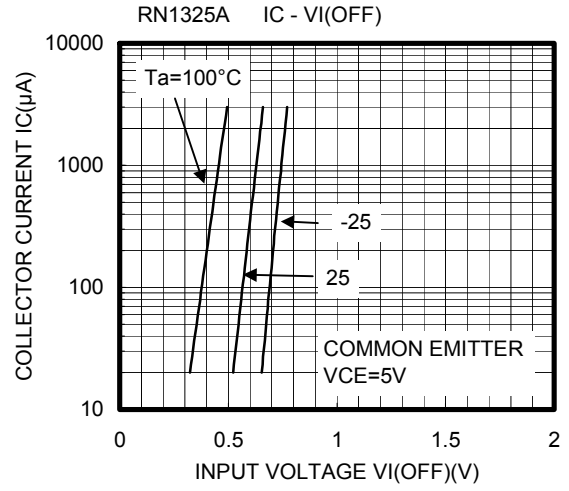
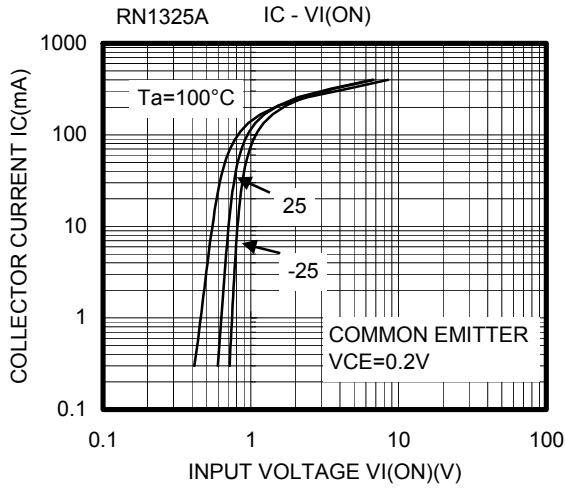
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	RN1321A~1327A	$I_{CBO}$	—	$V_{CB} = 15V, I_E = 0$	—	—	100	nA	
		$I_{CEO}$		$V_{CE} = 12V, I_B = 0$	—	—	500		
Emitter cut-off current	RN1321A	$I_{EBO}$	—	$V_{EB} = 10V, I_C = 0$	3.85	—	7.14	mA	
	RN1322A				1.75	—	3.25		
	RN1323A				0.82	—	1.52		
	RN1324A			0.38	—	0.71			
	RN1325A			$V_{EB} = 5V, I_C = 0$		0.365	—		0.682
	RN1326A			0.35	—	0.65			
	RN1327A			$V_{EB} = 6V, I_C = 0$		0.378	—		0.703
DC current gain	RN1321A	$h_{FE}$	—	$V_{CE} = 1V, I_C = 50mA$	35	—	—		
	RN1322A				65	—	—		
	RN1323A				100	—	—		
	RN1324A				140	—	—		
	RN1325A				140	—	—		
	RN1326A				140	—	—		
	RN1327A				140	—	—		
Collector-emitter saturation voltage	RN1321A	$V_{CE(sat)}$	—	$I_C = 50mA, I_B = 2mA$	—	—	0.25	V	
	RN1322A~1327A			$I_C = 50mA, I_B = 1mA$					
Input voltage (ON)	RN1321A	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 50mA$	1.0	—	2.4	V	
	RN1322A				1.1	—	2.7		
	RN1323A				1.3	—	3.5		
	RN1324A				1.5	—	5.2		
	RN1325A				0.5	—	1.2		
	RN1326A				0.6	—	1.4		
	RN1327A				0.7	—	1.9		
Input voltage (OFF)	RN1321A~1324A	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	0.8	—	1.4	V	
	RN1325A, 1326A				0.4	—	0.8		
	RN1327A				0.5	—	1.0		
Transition frequency	RN1321A~1327A	$f_T$	—	$V_{CE} = 5V, I_C = 20mA$	—	300	—	MHz	
Collector Output capacitance	RN1321A~1327A	$C_{ob}$	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	4	—	pF	
Input resistor	RN1321A	R1	—	—	0.7	1	1.3	kΩ	
	RN1322A				1.54	2.2	2.86		
	RN1323A				3.29	4.7	6.11		
	RN1324A				7	10	13		
	RN1325A				0.329	0.47	0.611		
	RN1326A				0.7	1	1.3		
	RN1327A				1.54	2.2	2.86		
Resistor ratio	RN1321A~1324A	R1/R2	—	—	0.85	1.00	1.15		
	RN1325A				0.040	0.047	0.054		
	RN1326A				0.085	0.100	0.115		
	RN1327A				0.187	0.220	0.253		

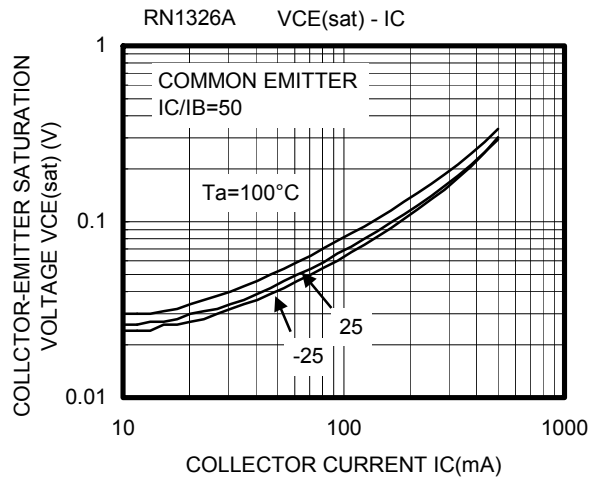
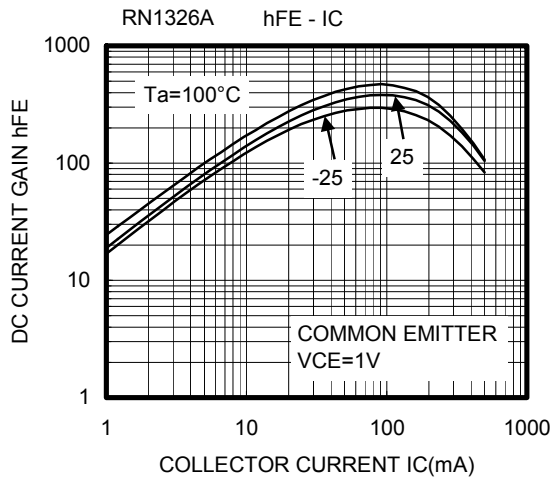
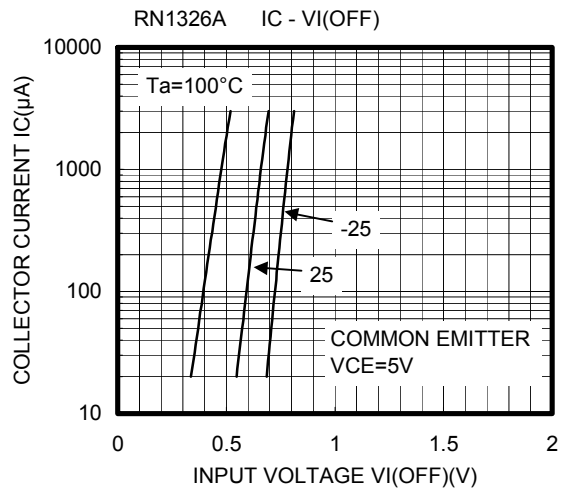
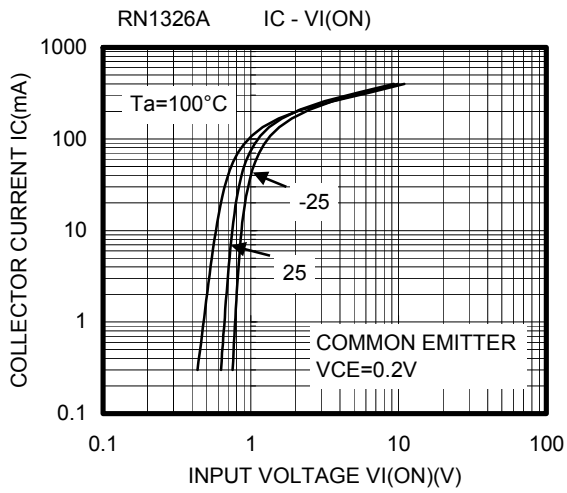




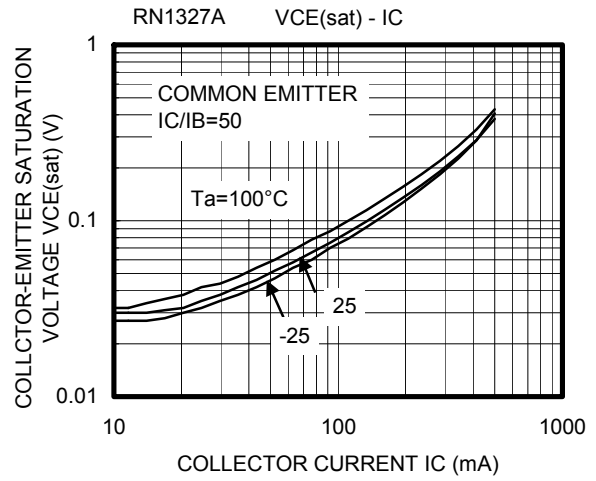
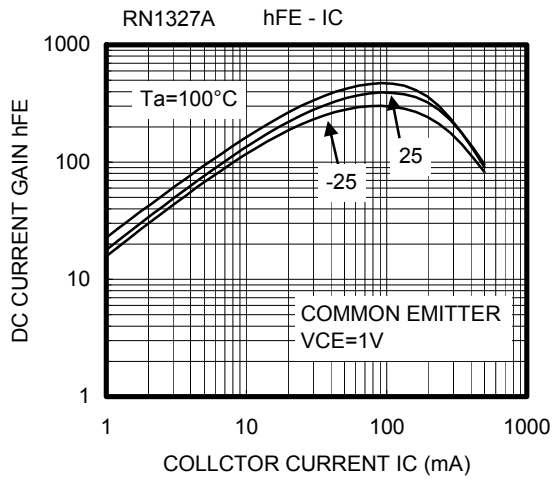
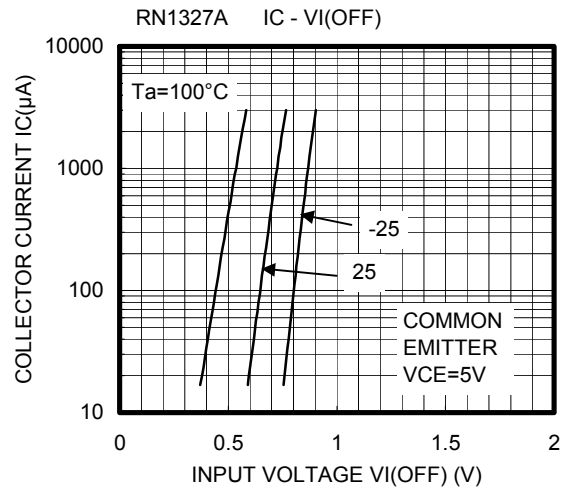
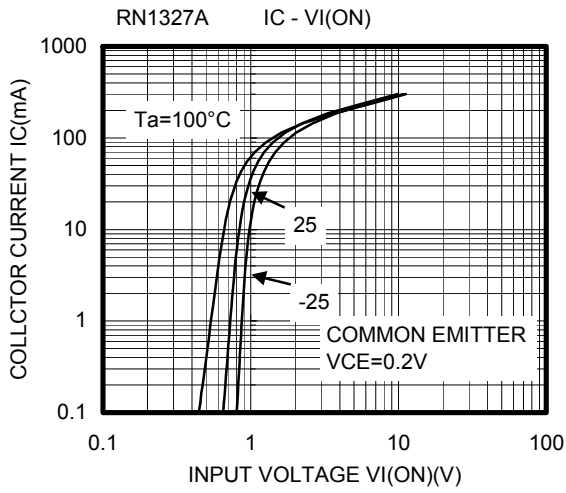


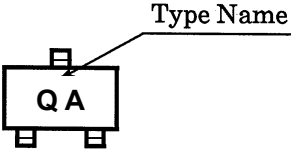
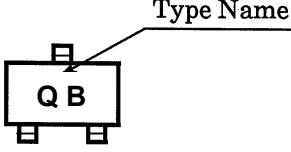
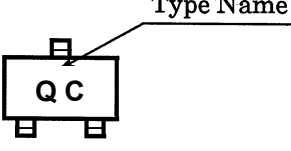
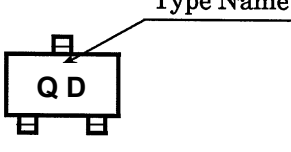
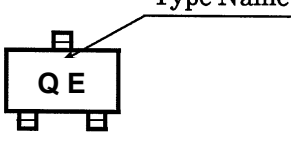
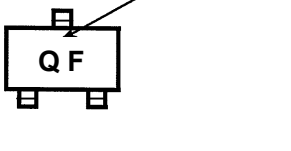











Type Name	Marking
RN1321A	
RN1322A	
RN1323A	
RN1324A	
RN1325A	
RN1326A	
RN1327A	

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20070701-EN GENERAL

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