

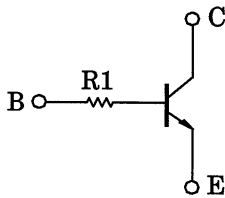
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# RN1441, RN1442, RN1443, RN1444

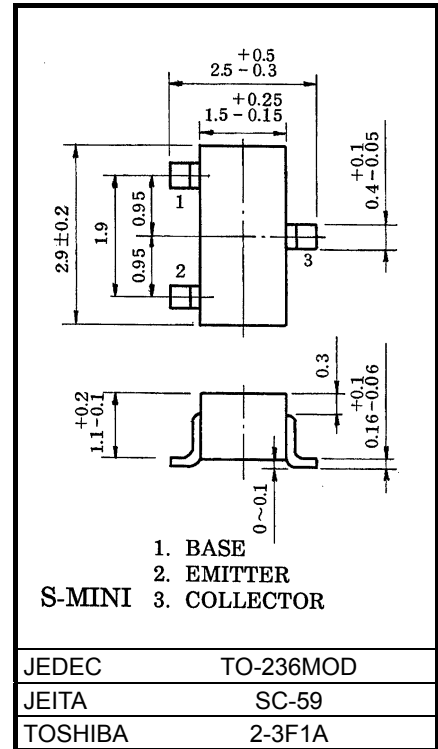
## Muting and Switching Applications

- High emitter-base voltage:  $V_{EBO} = 25V$  (min)
- High reverse  $h_{FE}$ : reverse  $h_{FE} = 150$  (typ.) ( $V_{CE} = -2V, I_C = -4mA$ )
- Low on resistance:  $R_{ON} = 1\Omega$  (typ.) ( $I_B = 5mA$ )
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process

## Equivalent Circuit



Unit in mm



Weight: 0.012g (typ.)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	20	V
Emitter-base voltage	$V_{EBO}$	25	V
Collector current	$I_C$	300	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_j$	150	$^\circ C$
Storage temperature range	$T_{stg}$	-55~150	$^\circ C$

## Marking

Type No.	$h_{FE}$ classification	
	A	B
RN1441	KA	KB
RN1442	LA	LB
RN1443	NA	NB
RN1444	CA	CB

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).

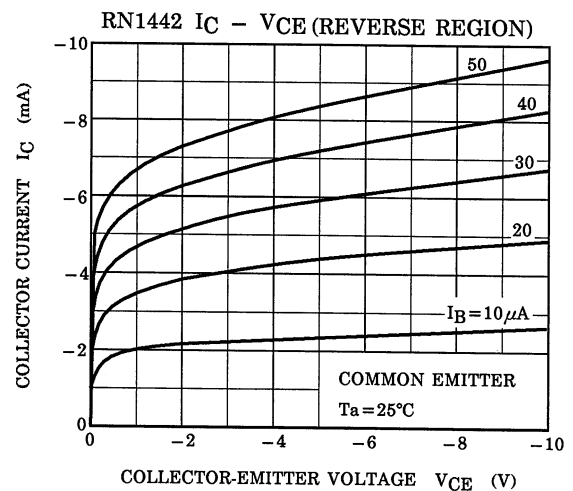
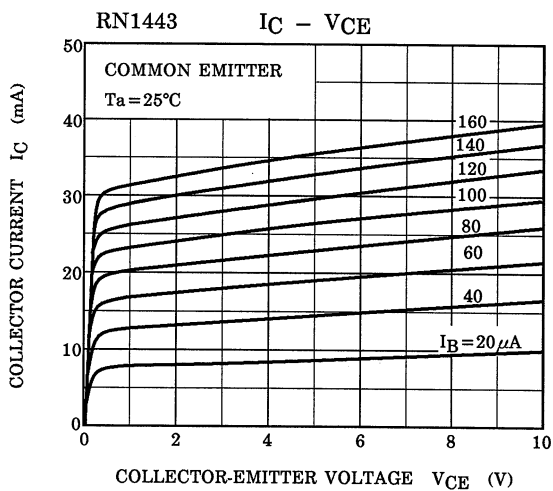
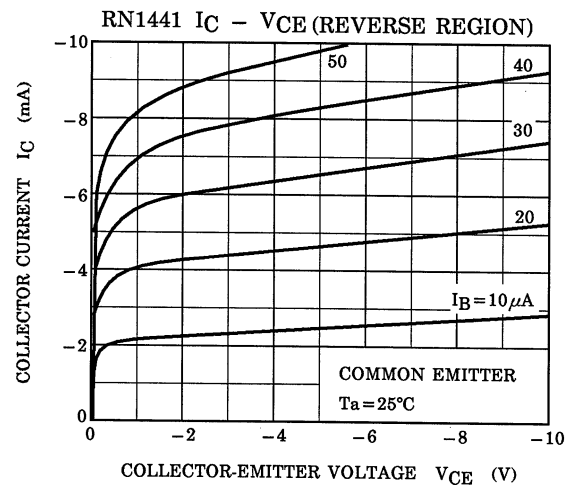
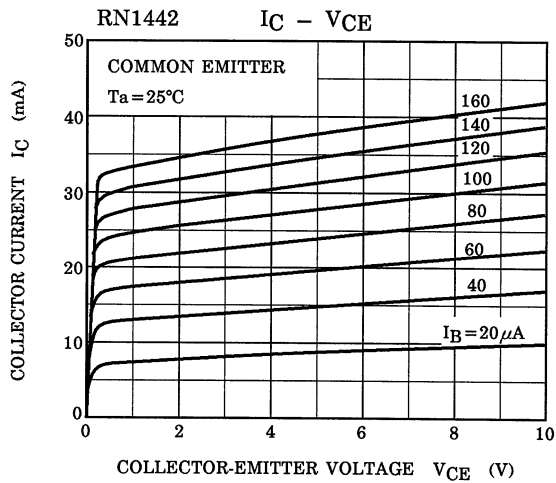
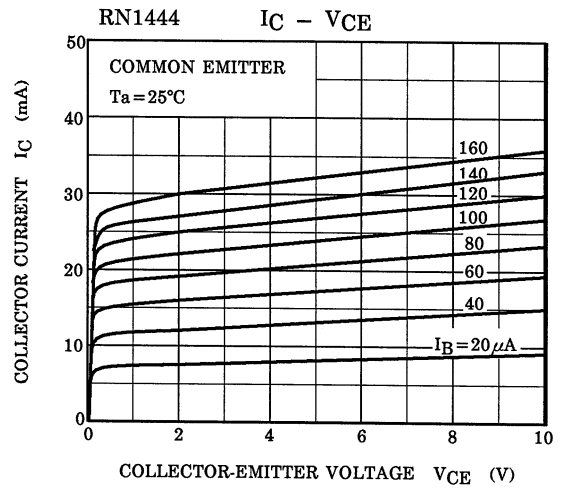
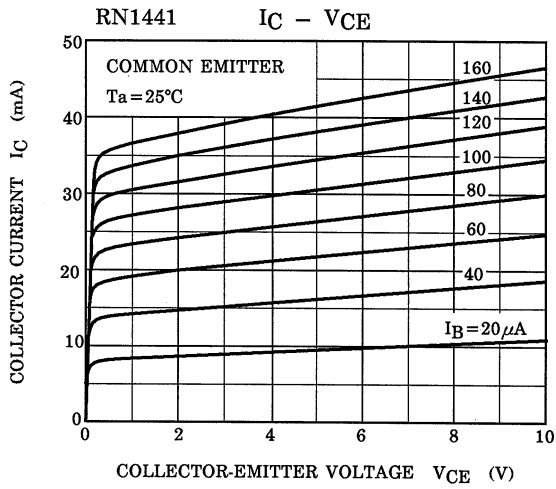
## Electrical Characteristics (Ta = 25°C)

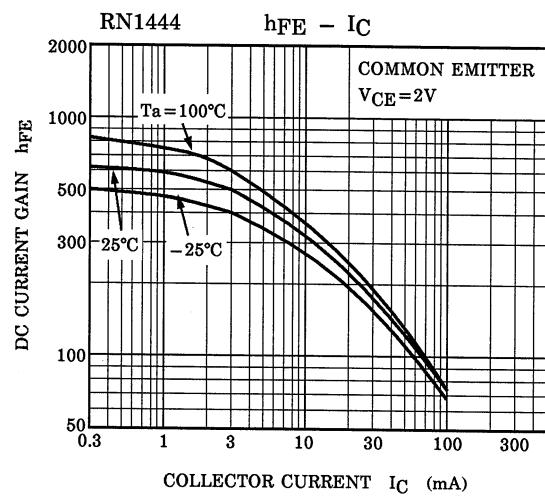
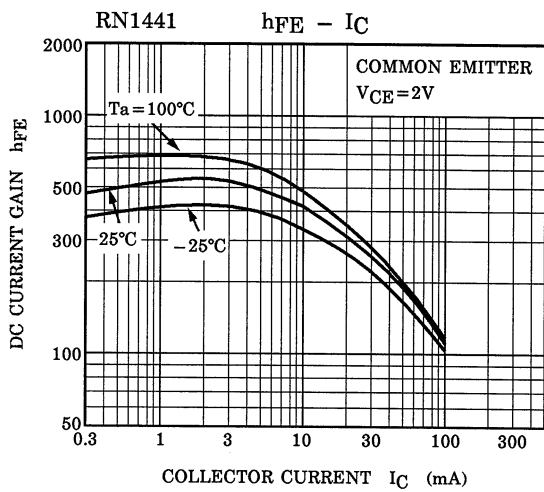
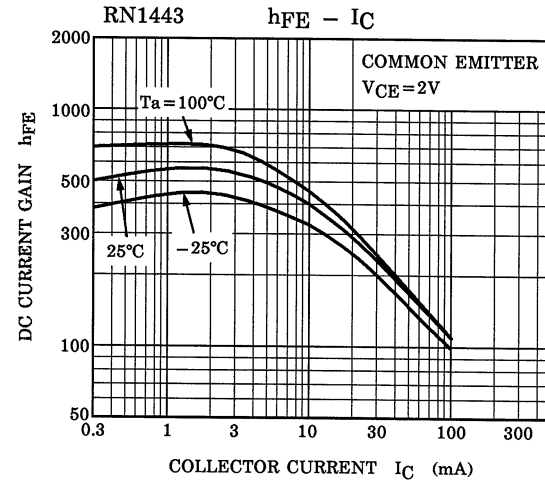
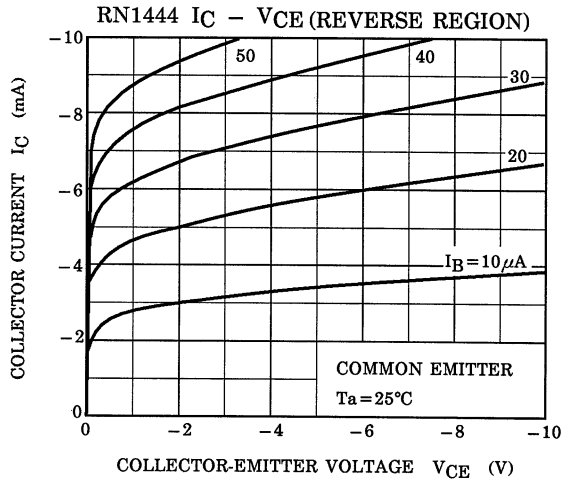
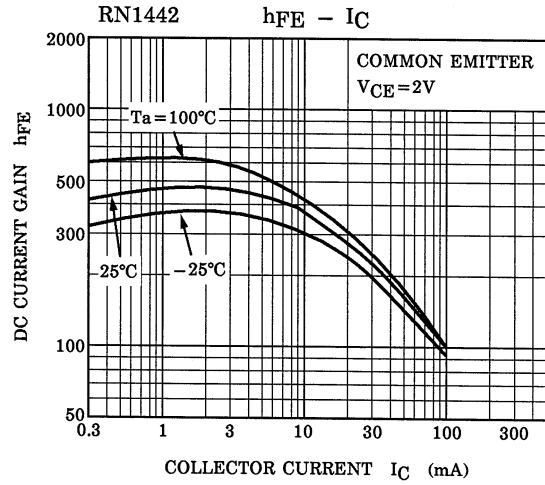
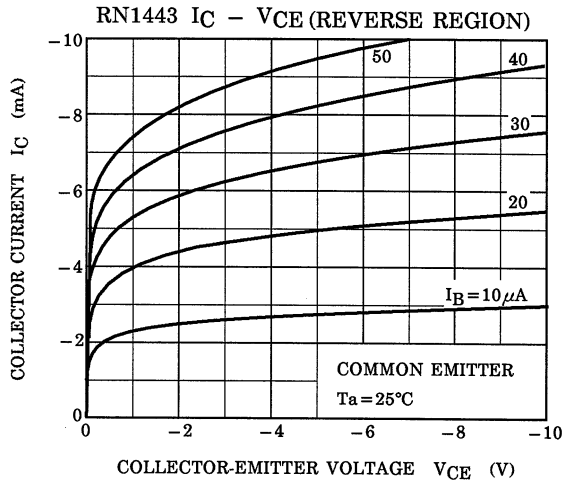
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	—	$V_{CB} = 50V, I_E = 0$	—	—	0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	—	$V_{EB} = 25V, I_C = 0$	—	—	0.1	$\mu A$
DC current gain	$h_{FE}$ (Note)	—	$V_{CE} = 2V, I_C = 4mA$	200	—	1200	
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = 30mA, I_B = 3mA$	—	—	0.1	V
Transition frequency	$f_T$	—	$V_{CE} = 6V, I_C = 4mA$	—	30	—	MHz
Collector output capacitance	$C_{ob}$	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	4.8	—	pF
Input resistor	RN1441	R1	—	3.9	5.6	7.3	k $\Omega$
	RN1442			7	10	13	
	RN1443			15.4	22	28.6	
	RN1444			1.54	2.2	2.86	

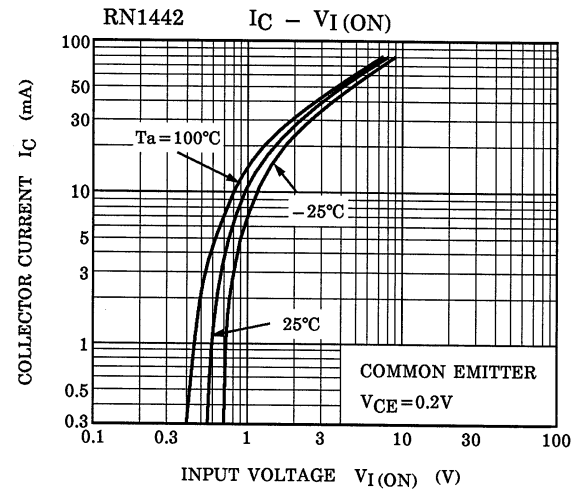
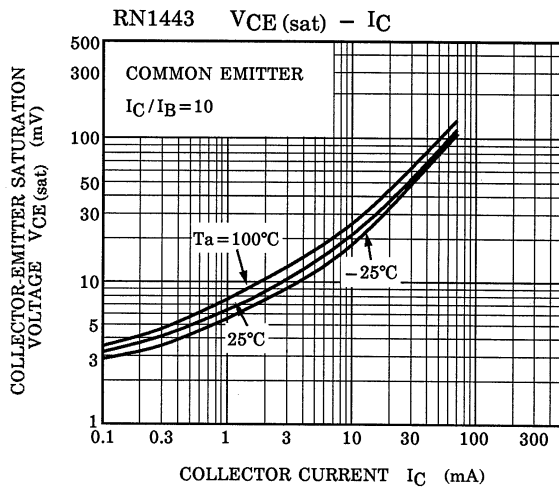
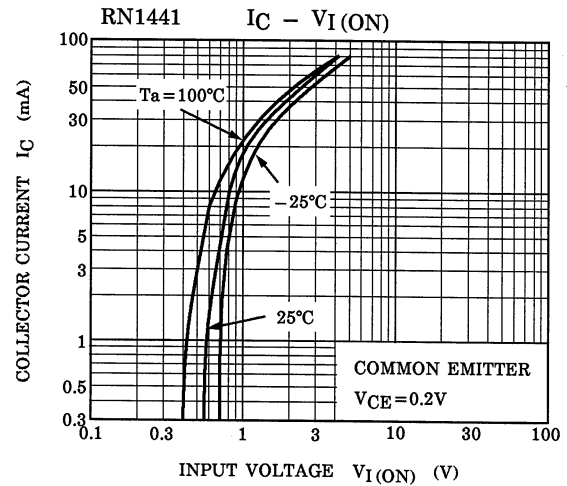
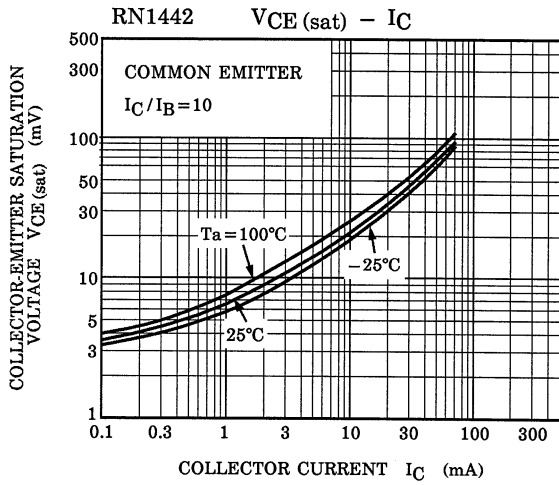
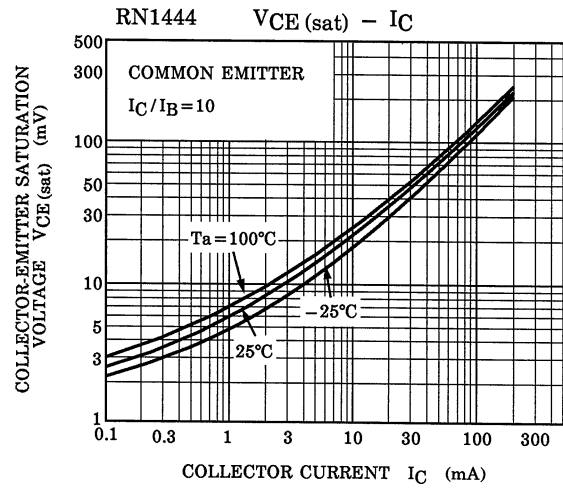
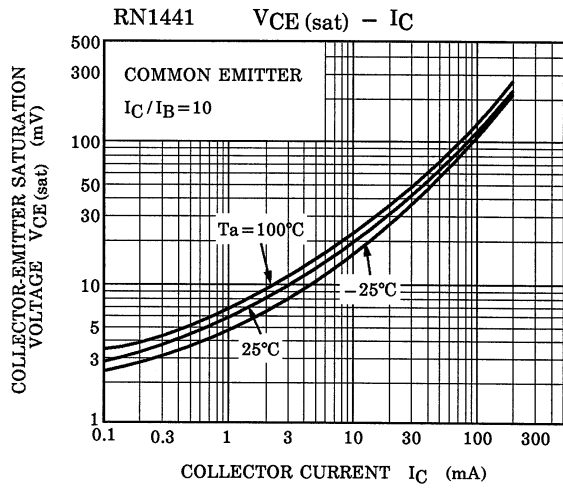
Note :  $h_{FE}$  classification

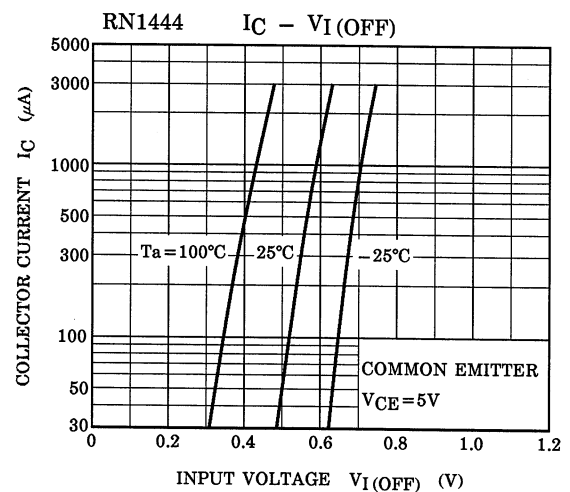
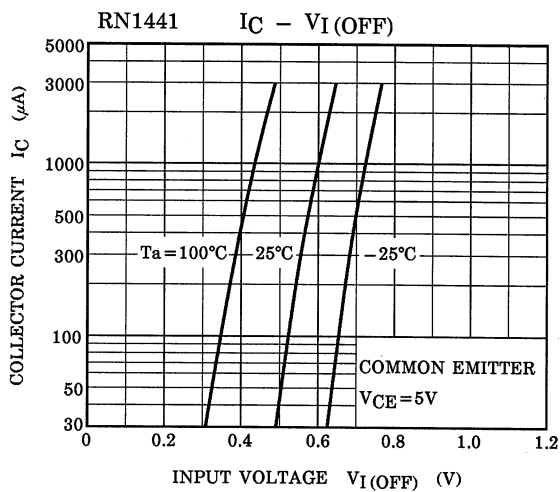
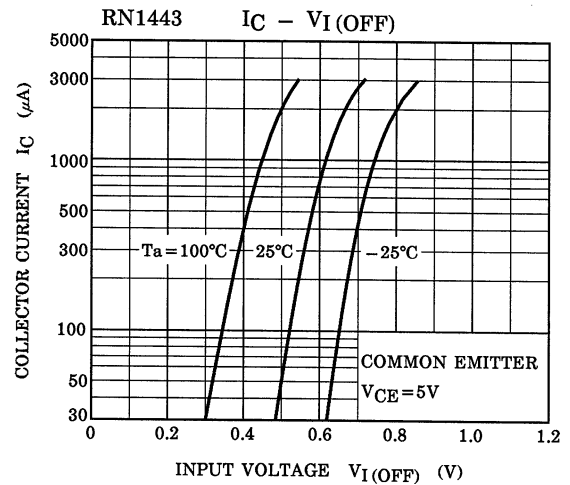
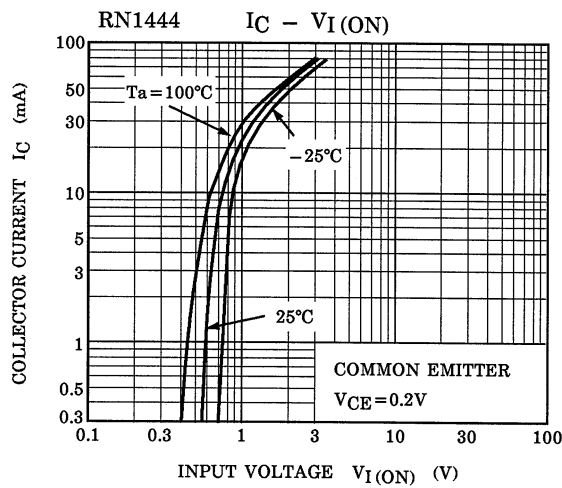
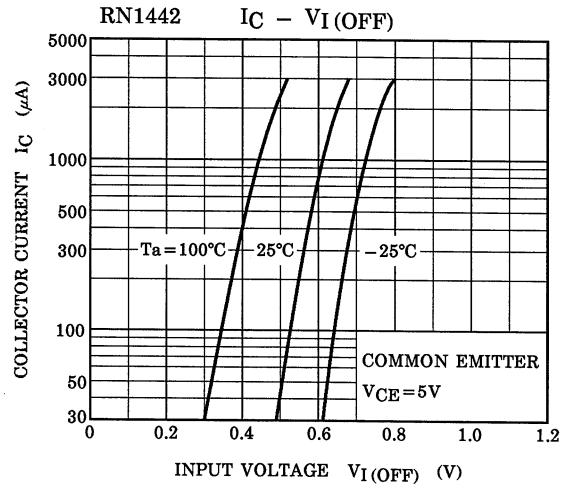
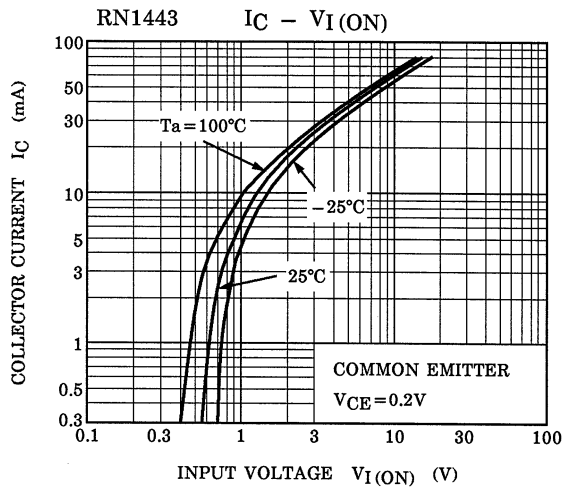
A: 200~700

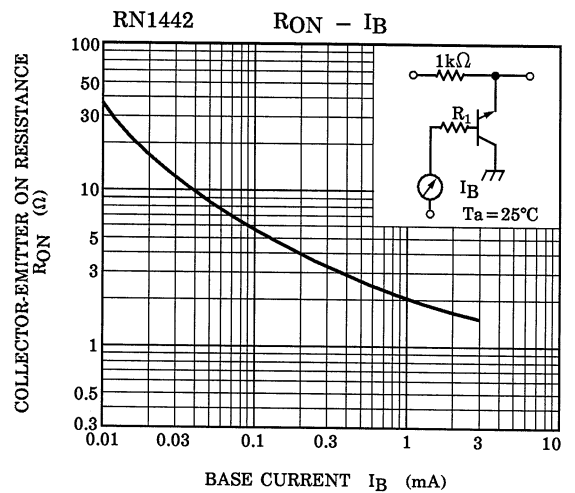
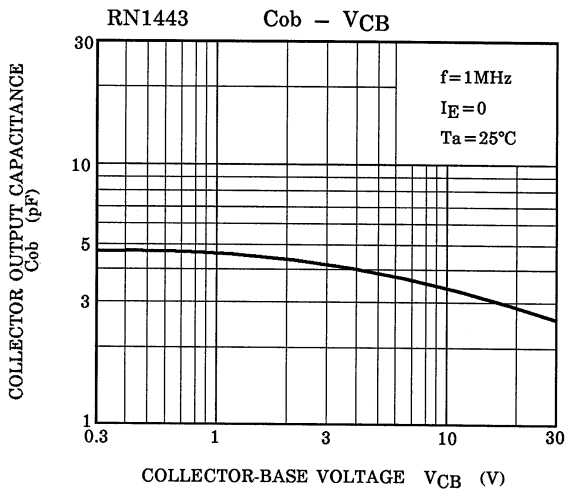
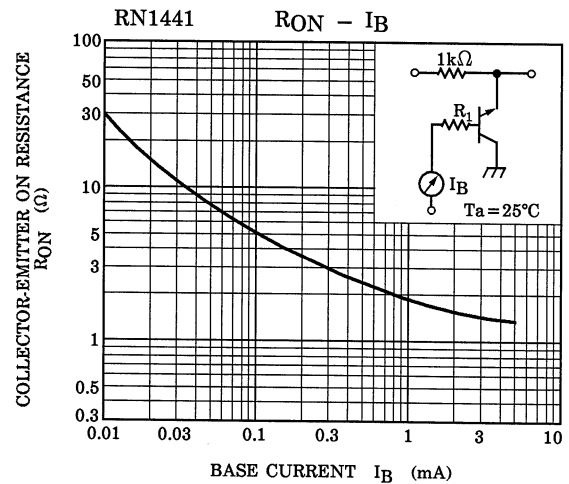
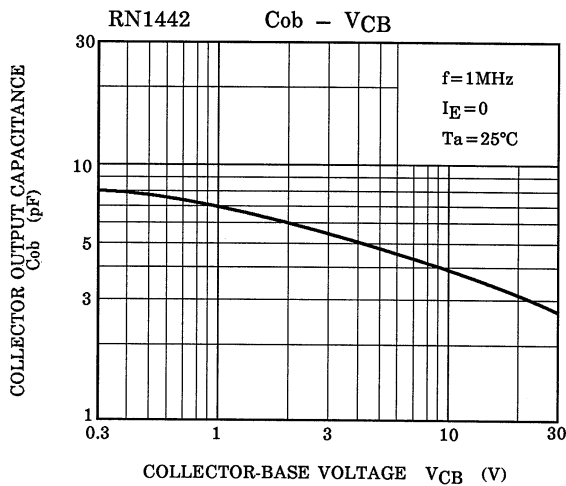
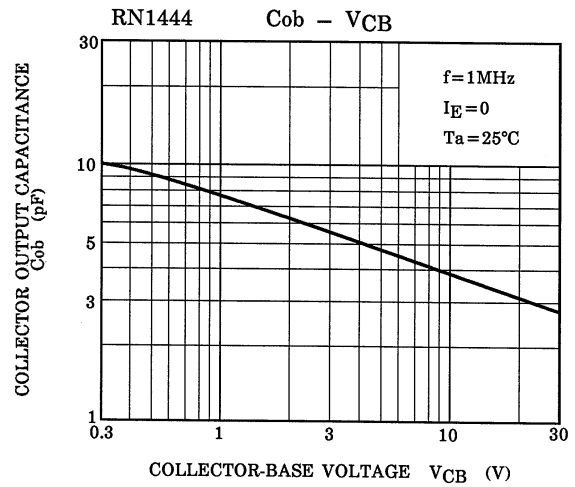
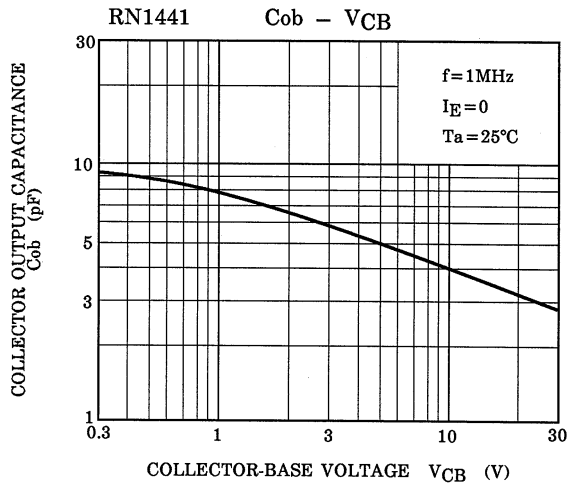
B: 350~1200

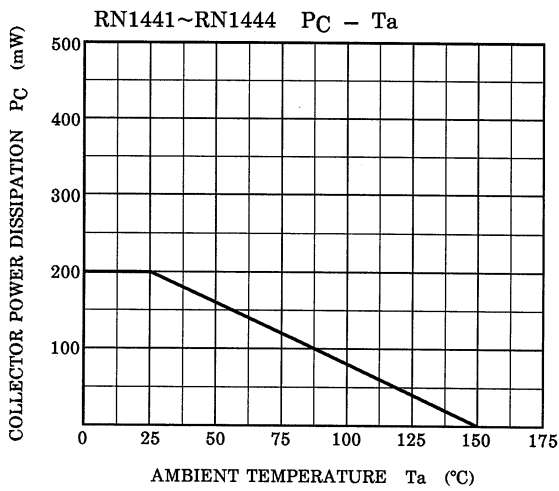
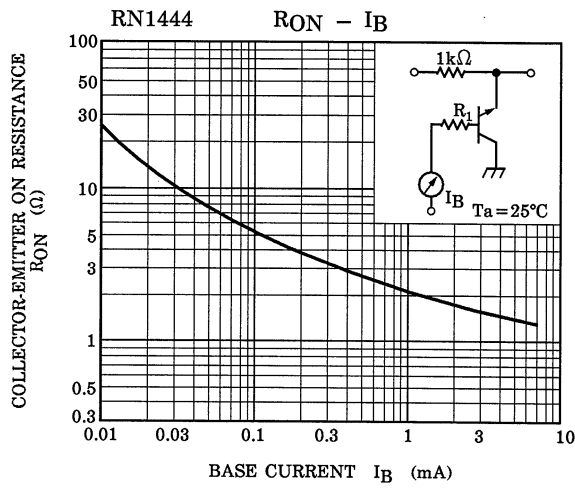
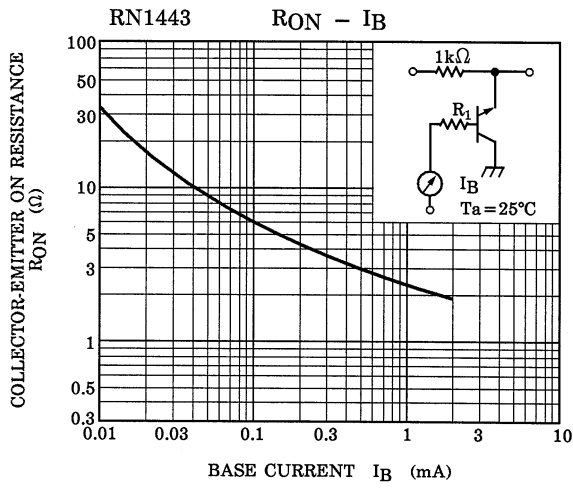














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