

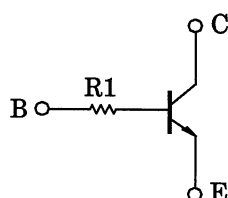
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1441, RN1442, RN1443, RN1444

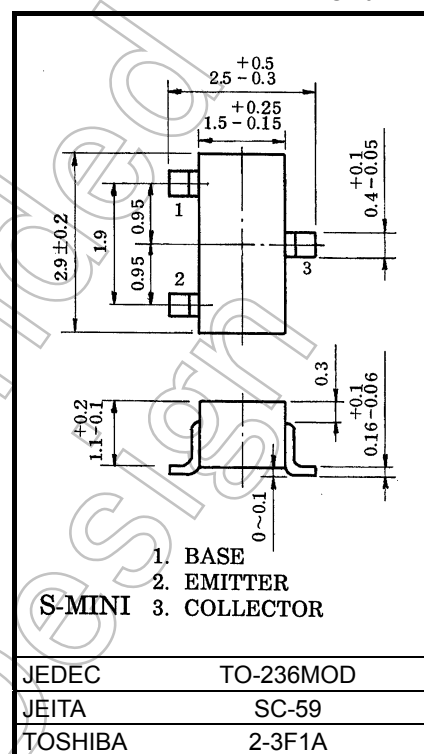
Muting and Switching Applications

- 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: 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 to 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).

Start of commercial production
1987-07

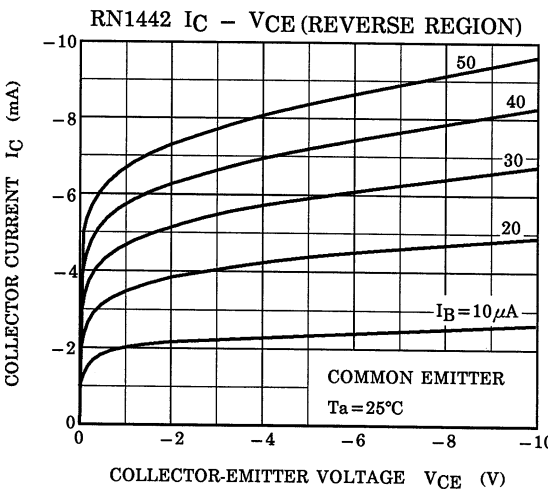
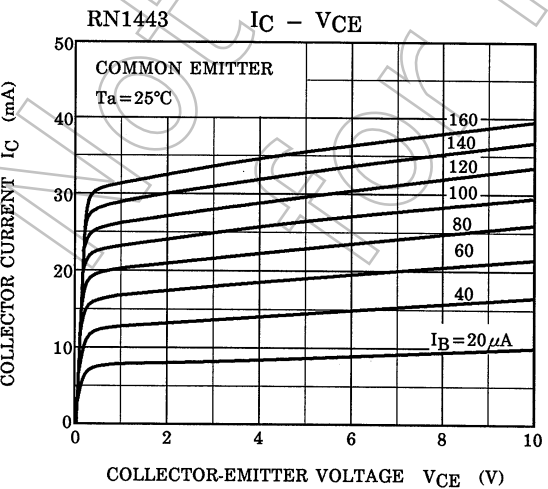
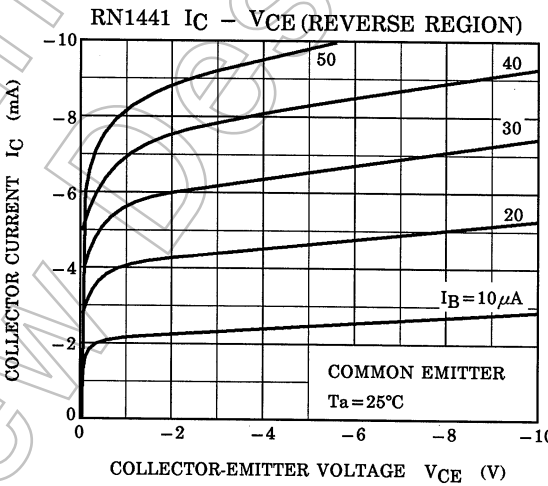
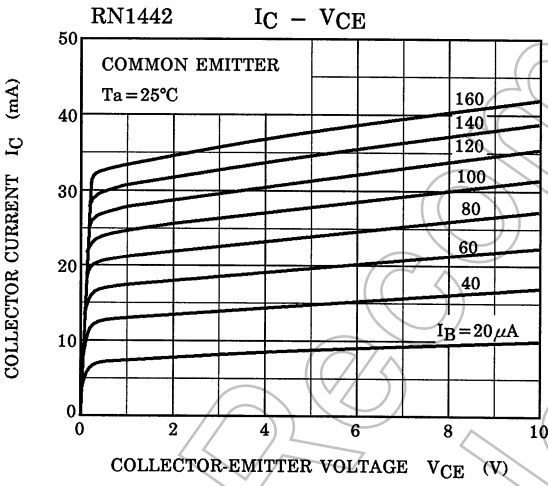
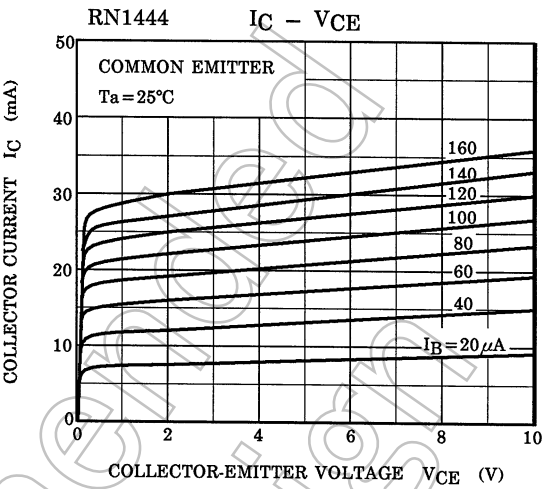
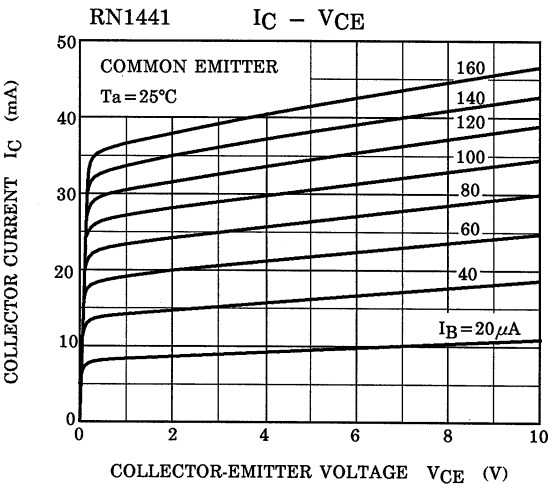
Electrical Characteristics (Ta = 25°C)

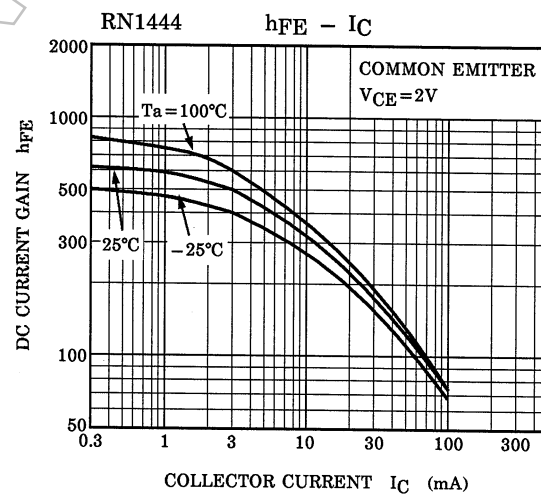
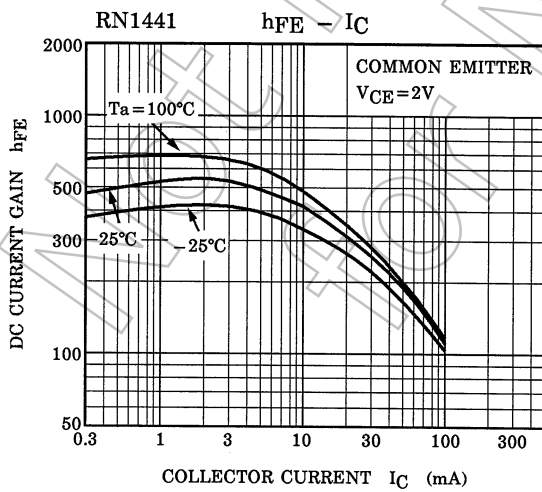
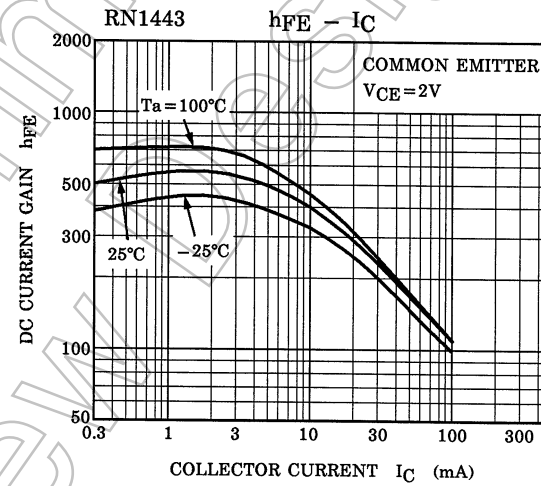
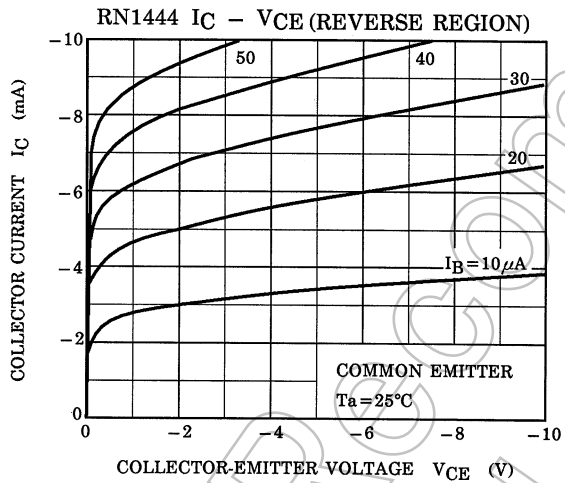
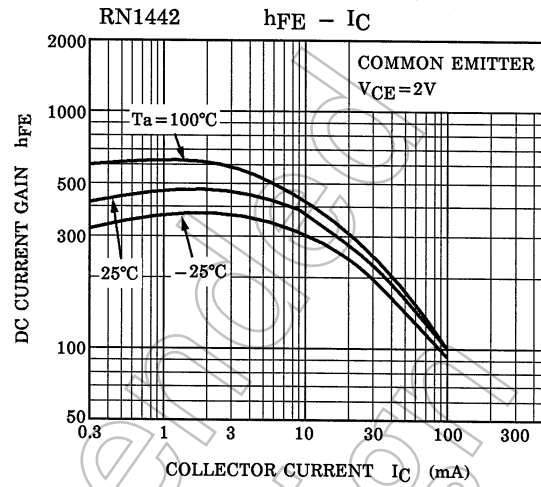
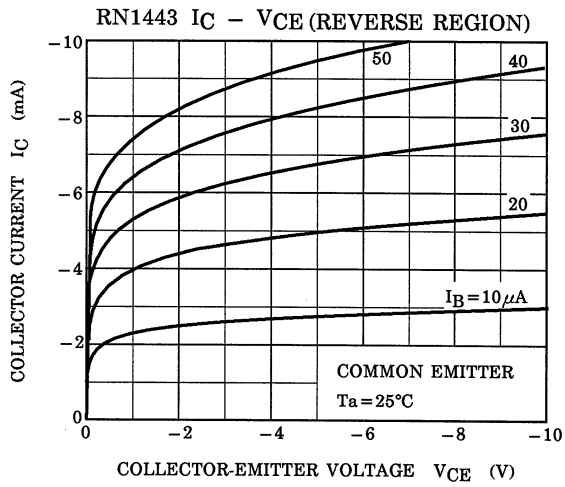
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	$V_{CB} = 50V, I_E = 0$	—	—	0.1	μA
Emitter cut-off current		I_{EBO}	—	$V_{EB} = 25V, I_C = 0$	—	—	0.1	μA
DC current gain		h_{FE} (Note)	—	$V_{CE} = 2V, I_C = 4mA$	200	—	1200	
Collector-emitter saturation 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 Ω
	RN1442				7	10	13	
	RN1443				15.4	22	28.6	
	RN1444				1.54	2.2	2.86	

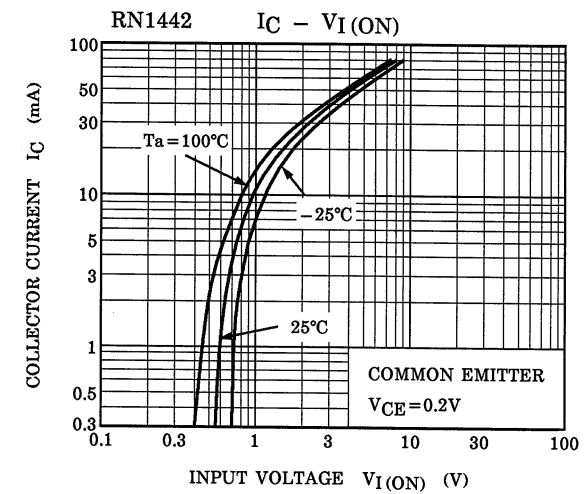
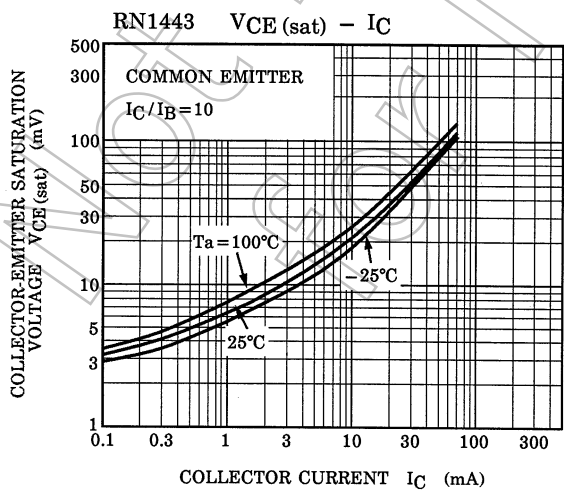
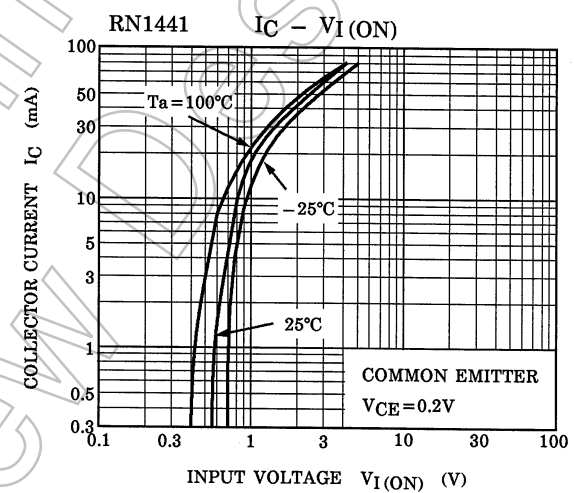
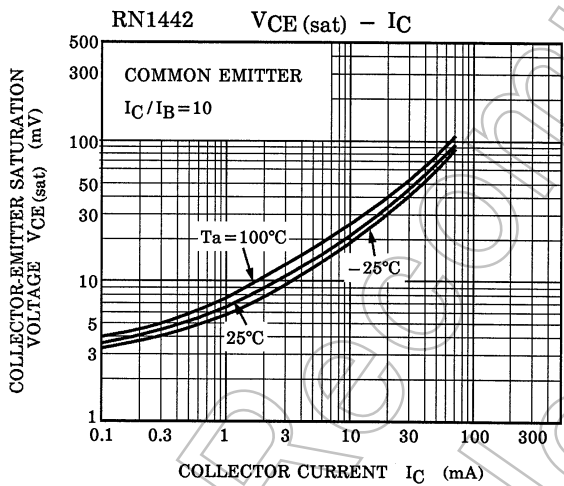
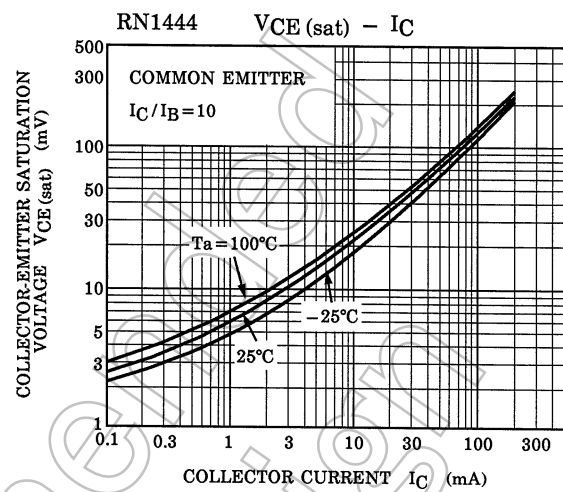
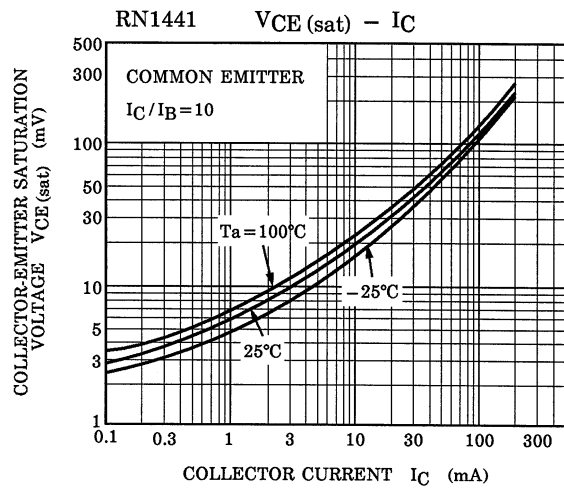
Note : h_{FE} classification

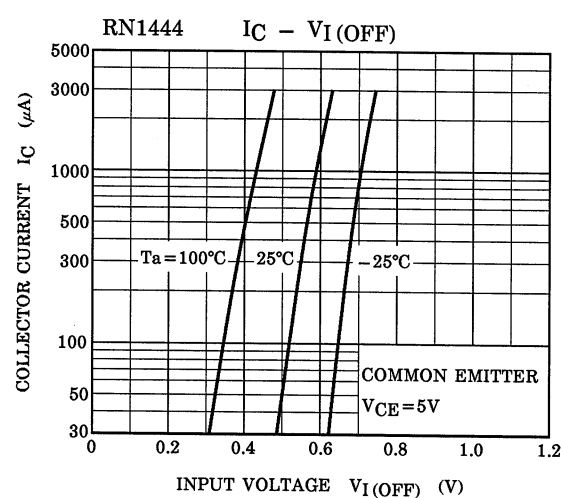
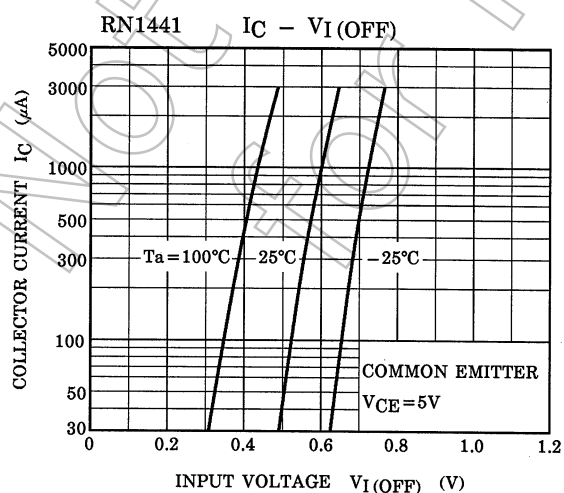
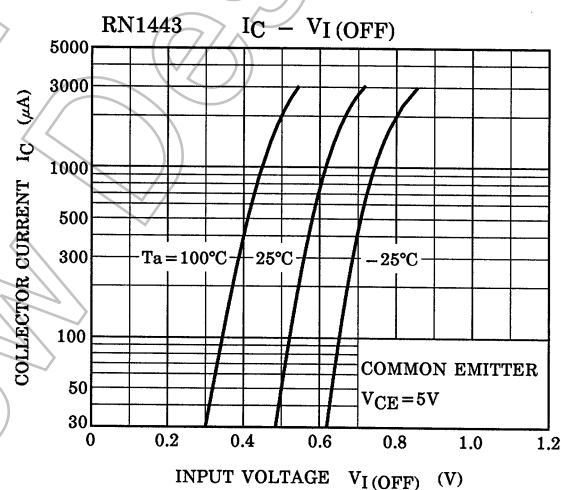
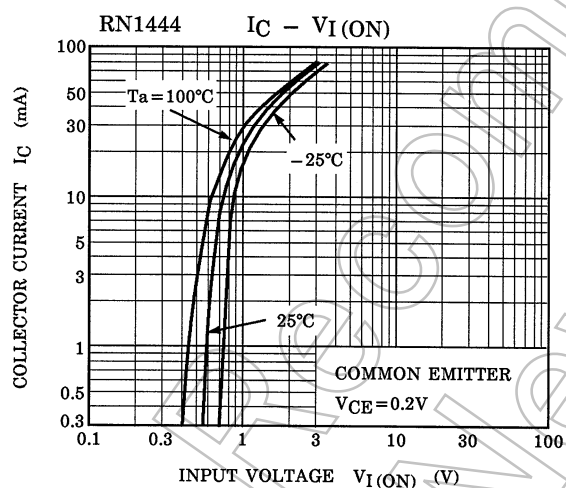
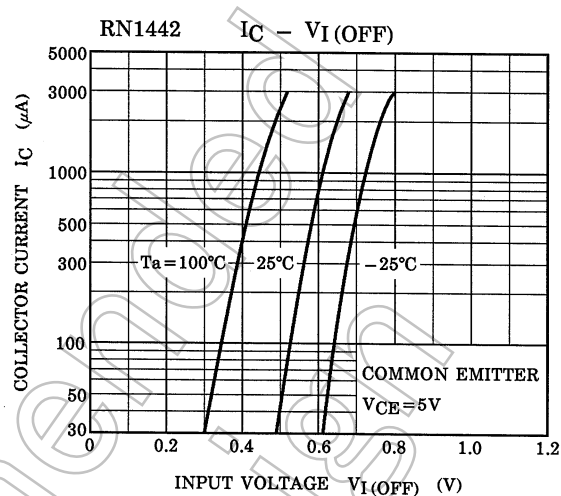
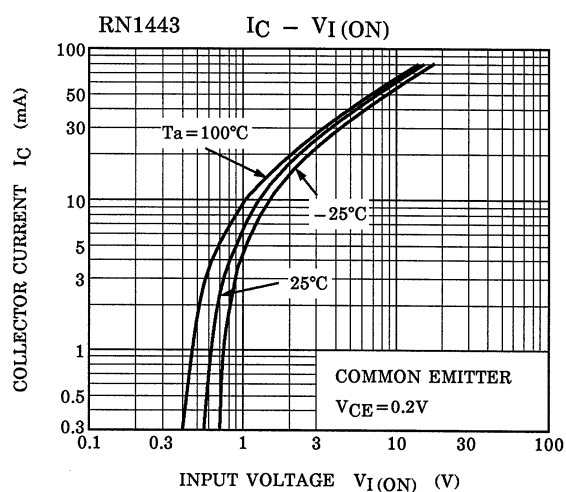
A: 200 to 700

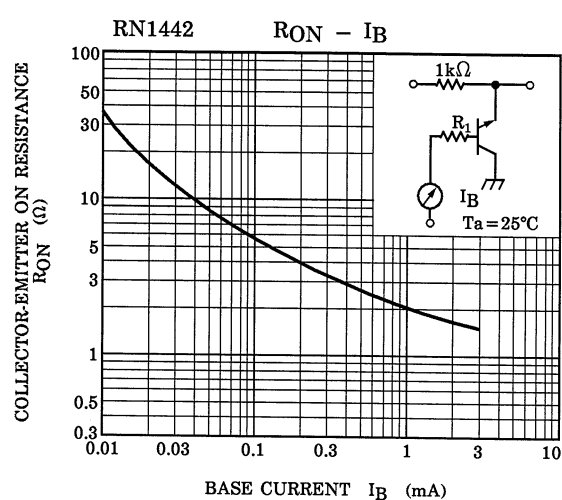
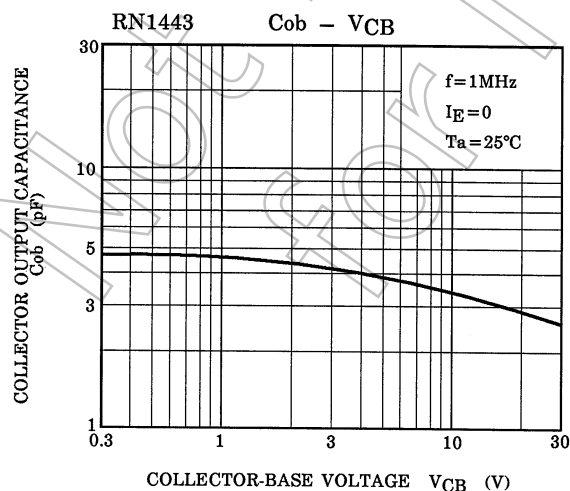
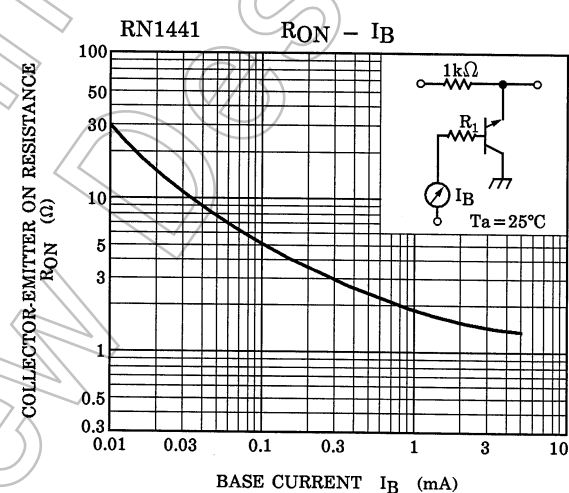
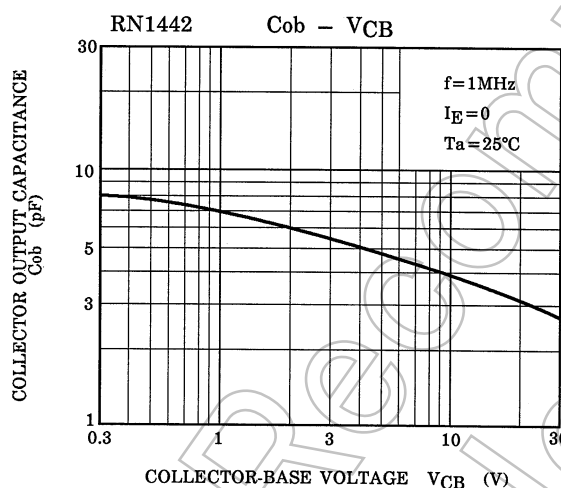
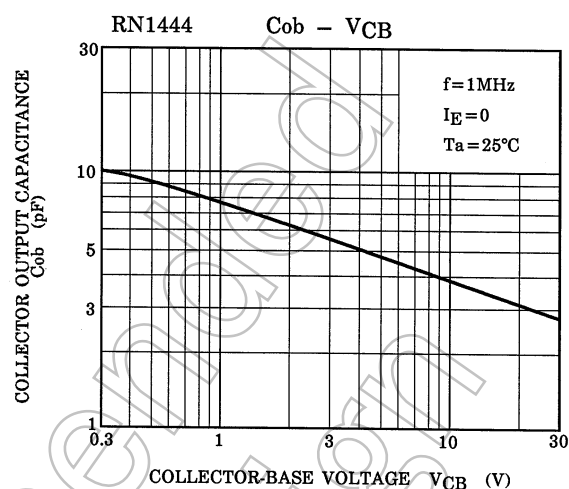
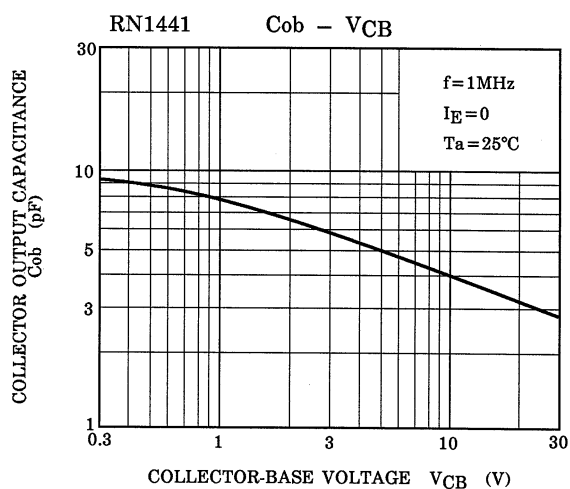
B: 350 to 1200

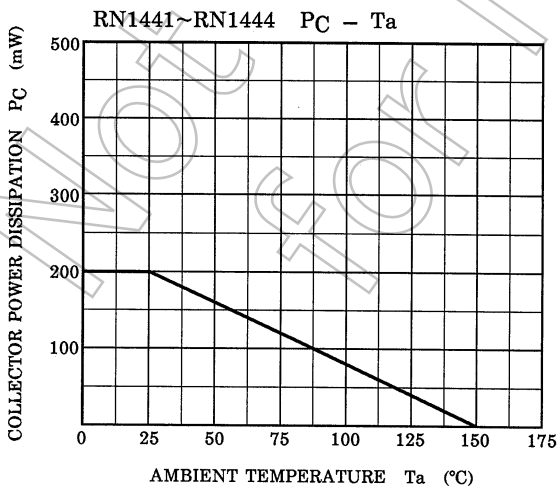
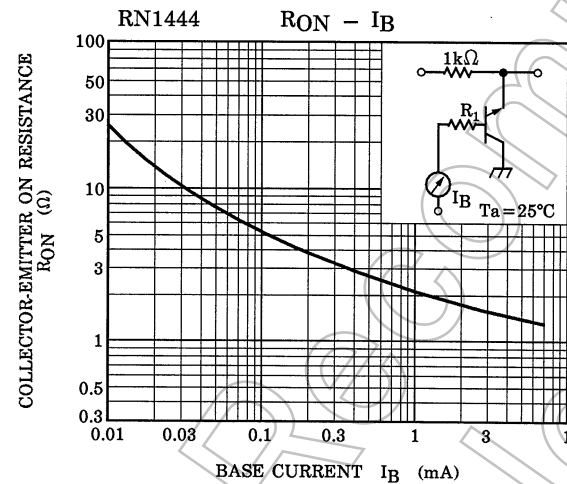
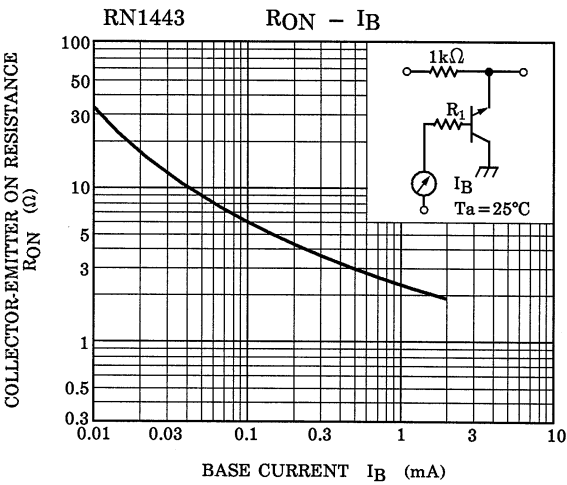












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