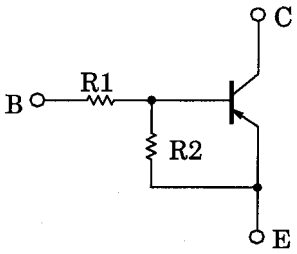
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2421,RN2422,RN2423,RN2424 RN2425,RN2426,RN2427

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

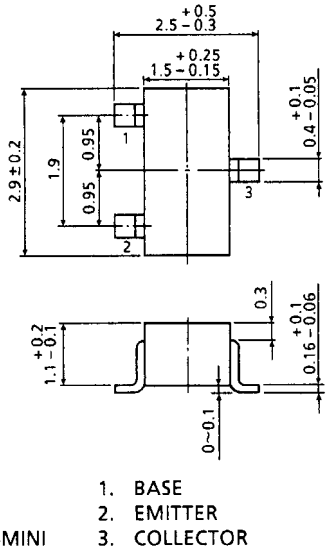
- High current type ($I_{C(MAX)}$ = −800mA)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Low $V_{CE\ (sat)}$
- Complementary to RN1421~RN1427

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2421	1	1
RN2422	2.2	2.2
RN2423	4.7	4.7
RN2424	10	10
RN2425	0.47	10
RN2426	1	10
RN2427	2.2	10

Unit: mm



JEDEC	—
JEITA	SC-59
TOSHIBA	2-3F1A

Weight: 0.012 g (typ.)

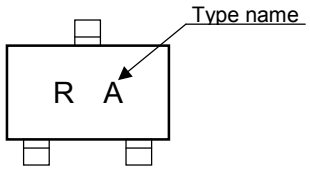
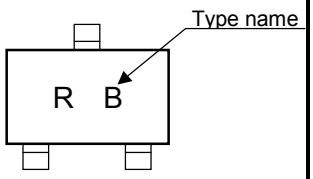
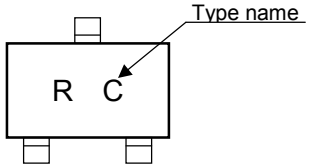
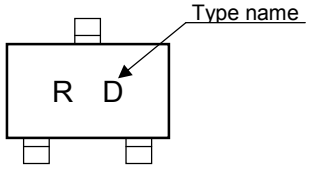
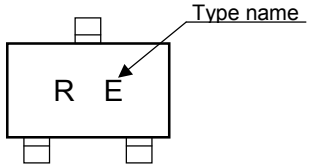
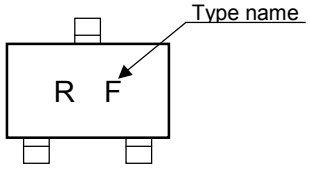
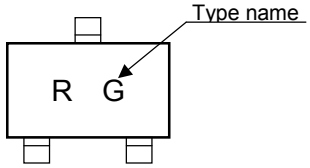
Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-Base voltage	RN2421~2427	V_{CBO}	−50	V
Collector-Emitter voltage		V_{CEO}	−50	V
Emitter-Base voltage	RN2421~2424	V_{EBO}	−10	V
	RN2425, 2426		−5	
	RN2427		−6	
Collector current	RN2421~2427	I_c	−800	mA
Collector power dissipation		P_c	200	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

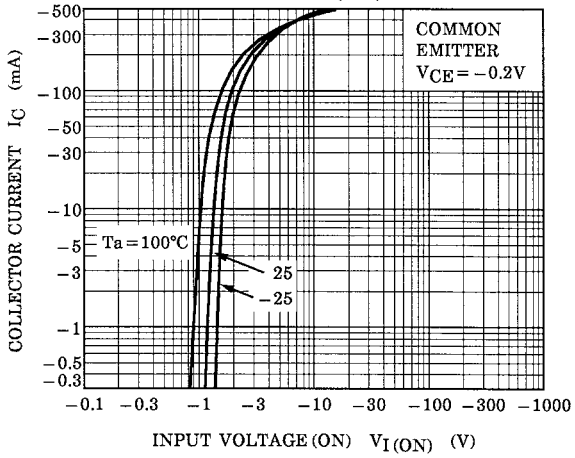
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2421~2427	I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2421	I_{EBO}	—	V_{EB} = −10V, I_C = 0	−3.85	—	−7.14	mA
	RN2422		—		−1.75	—	−3.25	
	RN2423		—		−0.82	—	−1.52	
	RN2424		—		−0.38	—	−0.71	
	RN2425		—	V_{EB} = −5V, I_C = 0	−0.365	—	−0.682	
	RN2426		—		−0.35	—	−0.65	
	RN2427		—	V_{EB} = −6V, I_C = 0	−0.378	—	−0.703	
DC current gain	RN2421	h_{FE}	—	V_{CE} = −1V, I_C = −100mA	60	—	—	
	RN2422		—		65	—	—	
	RN2423		—		70	—	—	
	RN2424		—		90	—	—	
	RN2425		—		90	—	—	
	RN2426		—		90	—	—	
	RN2427		—		90	—	—	
Collector-Emitter saturation voltage	RN2421	$V_{CE\ (sat)}$	—	I_C = −50mA, I_B = −2mA	—	—	−0.25	V
	RN2422~2427			I_C = −50mA, I_B = −1mA				
Input voltage (ON)	RN2421	$V_{I\ (ON)}$	—	V_{CE} = −0.2V I_C = −100mA	−1.0	—	−3.5	V
	RN2422		—		−1.4	—	−4.5	
	RN2423		—		−2.0	—	−6.5	
	RN2424		—		−3.0	—	−12.0	
	RN2425		—		−0.6	—	−2.0	
	RN2426		—		−0.7	—	−2.5	
	RN2427		—		−1.0	—	−3.0	
Input voltage (OFF)	RN2421~2424	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−0.8	—	−1.3	V
	RN2425, 2426		—		−0.4	—	−0.8	
	RN2427		—		−0.5	—	−1.0	
Transition frequency	RN2421~2427	f_T	—	V_{CE} = −5V, I_C = −20mA	—	200	—	MHz
Collector output capacitance	RN2421~2427	C_{ob}	—	V_{CB} = −10V, I_E = 0 f = 1MHz	—	13	—	pF
Input resistor	RN2421	R1	—	—	0.7	1.0	1.3	kΩ
	RN2422		—		1.54	2.2	2.86	
	RN2423		—		3.29	4.7	6.11	
	RN2424		—		7	10	13	
	RN2425		—		0.329	0.47	0.61	
	RN2426		—		0.7	1.0	1.3	
	RN2427		—		1.54	2.2	2.86	
Resistor ratio	RN2421~2424	R1/R2	—	—	0.9	1.0	1.1	
	RN2425		—		0.0423	0.047	0.0517	
	RN2426		—		0.09	0.1	0.11	
	RN2427		—		0.2	0.22	0.24	

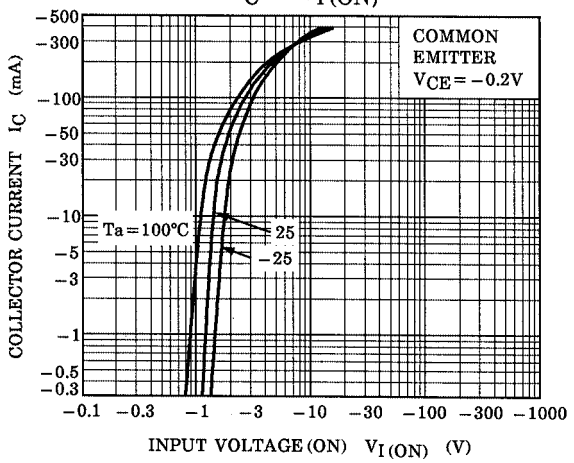
Marking

Type No.	Marking
RN2421	
RN2422	
RN2423	
RN2424	
RN2425	
RN2426	
RN2427	

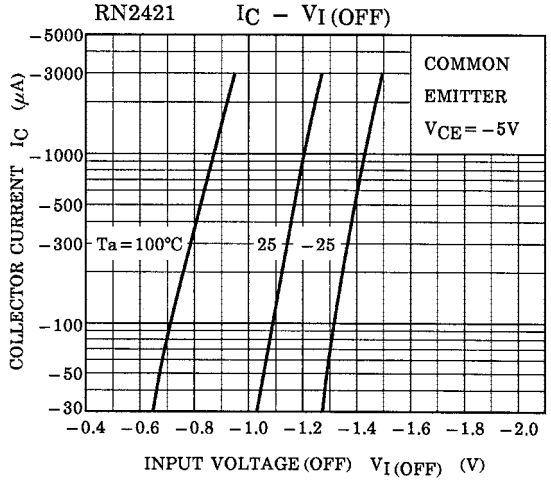
RN2421 $I_C - V_{I(ON)}$



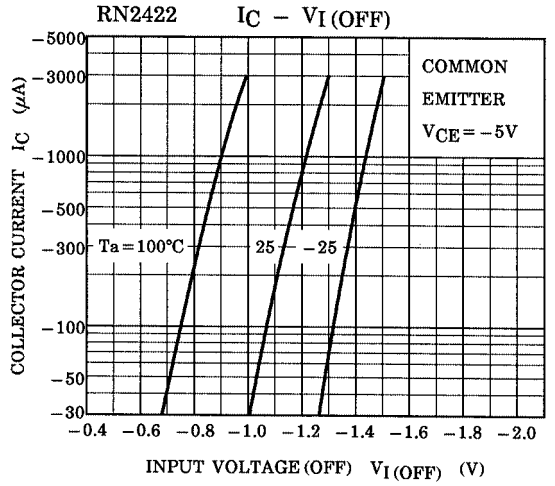
RN2422 $I_C - V_{I(ON)}$



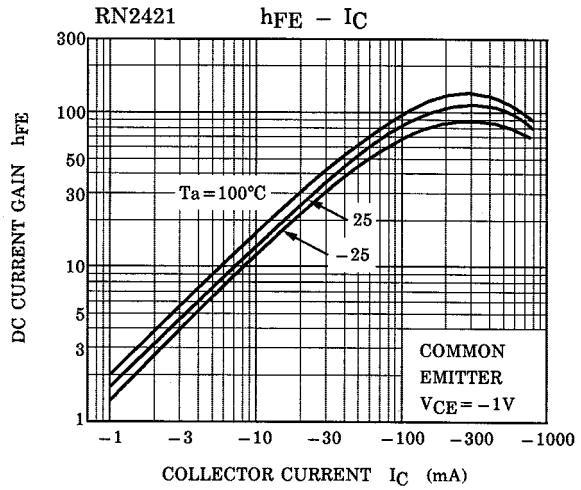
RN2421 $I_C - V_{I(OFF)}$



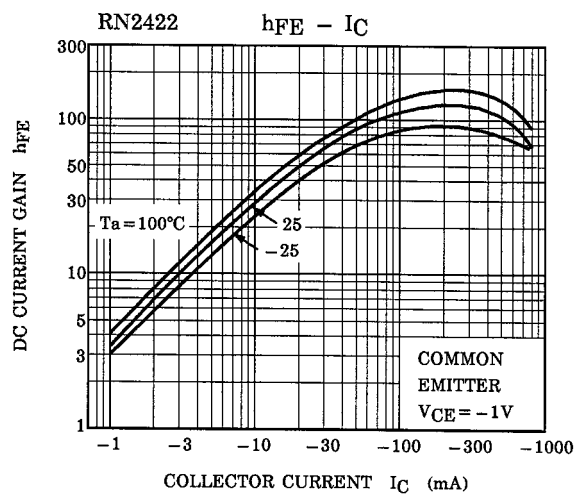
RN2422 $I_C - V_{I(OFF)}$



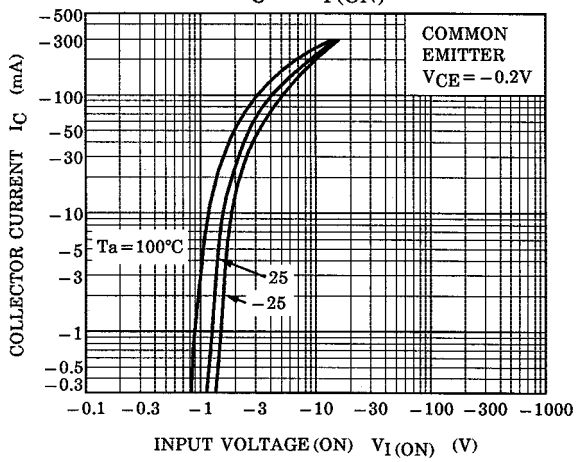
RN2421 $h_{FE} - I_C$



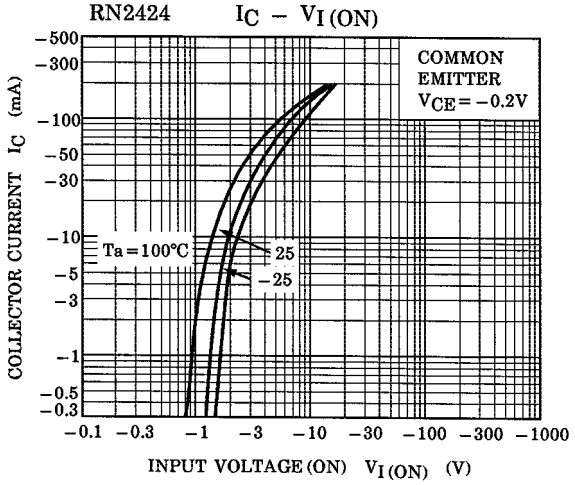
RN2422 $h_{FE} - I_C$



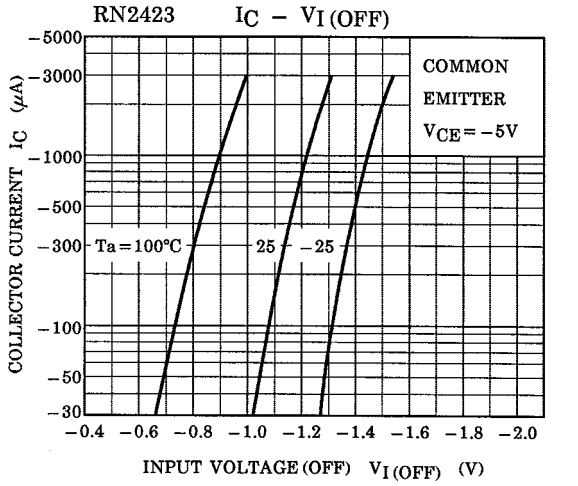
RN2423 $I_C - V_{I(ON)}$



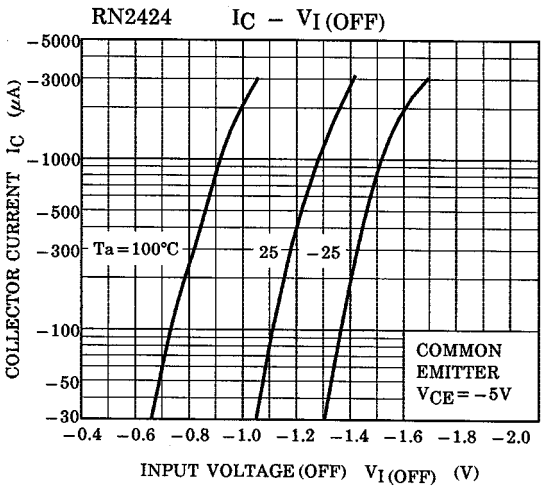
RN2424 $I_C - V_{I(ON)}$



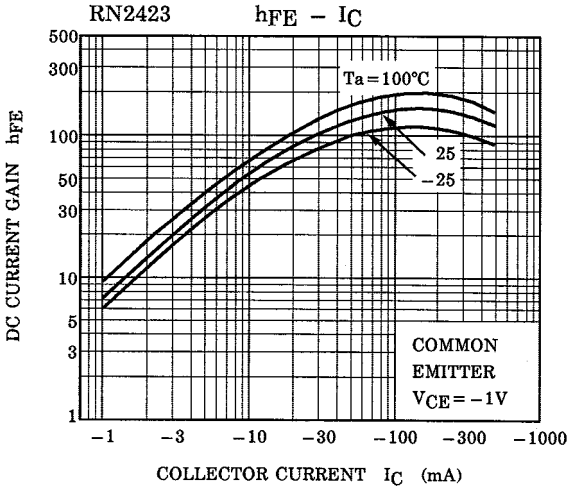
RN2423 $I_C - V_{I(OFF)}$



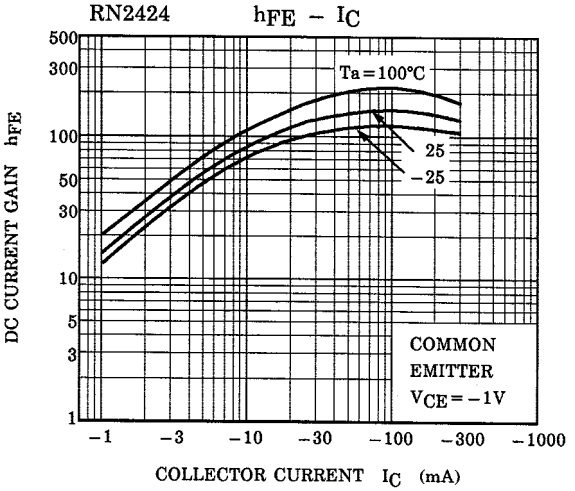
RN2424 $I_C - V_{I(OFF)}$



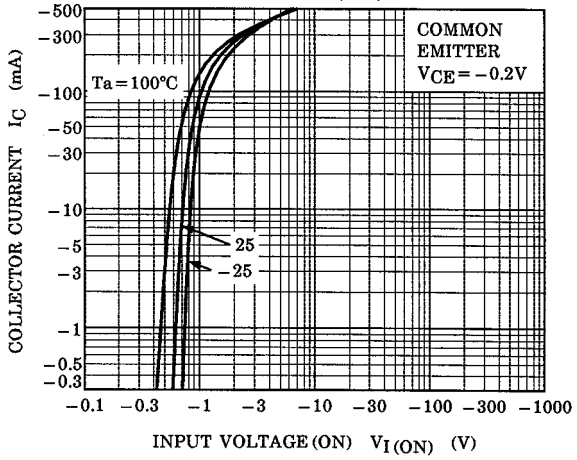
RN2423 $h_{FE} - I_C$



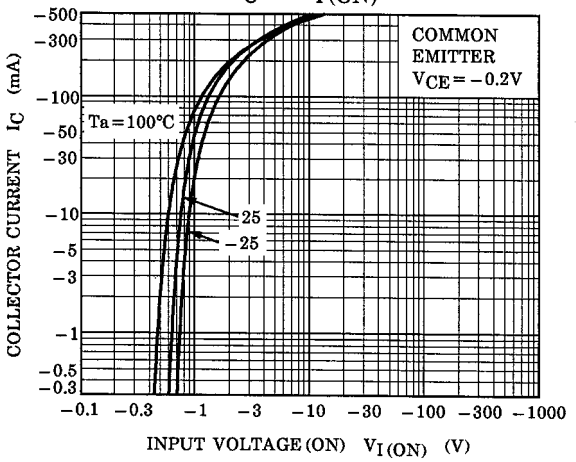
RN2424 $h_{FE} - I_C$



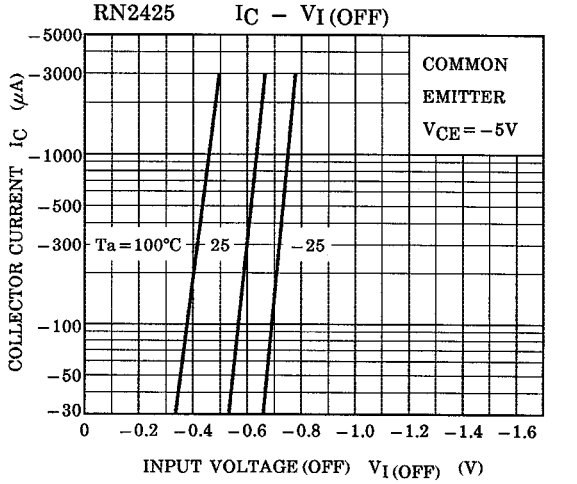
RN2425 $I_C - V_{I(ON)}$



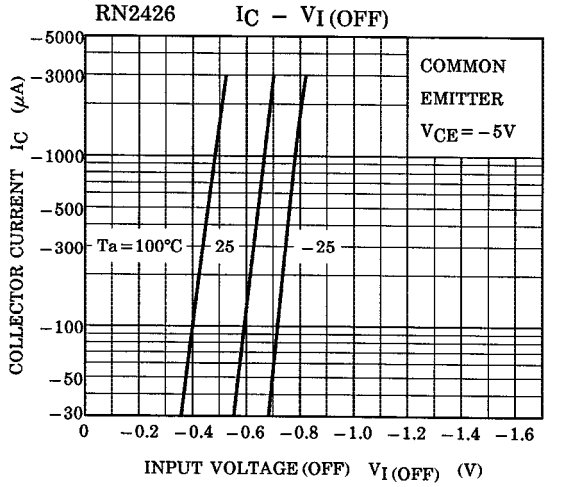
RN2426 $I_C - V_{I(ON)}$



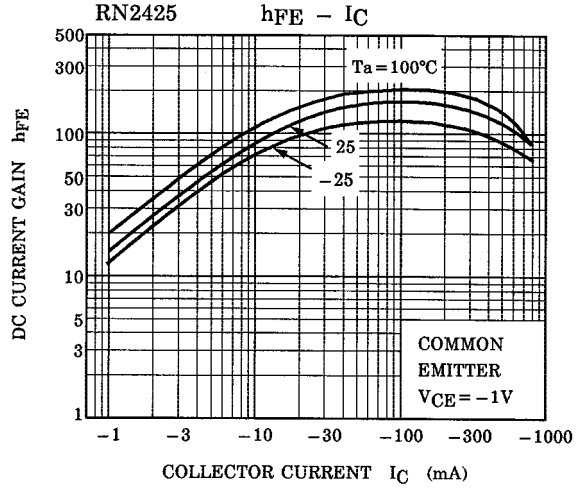
RN2425 $I_C - V_{I(OFF)}$



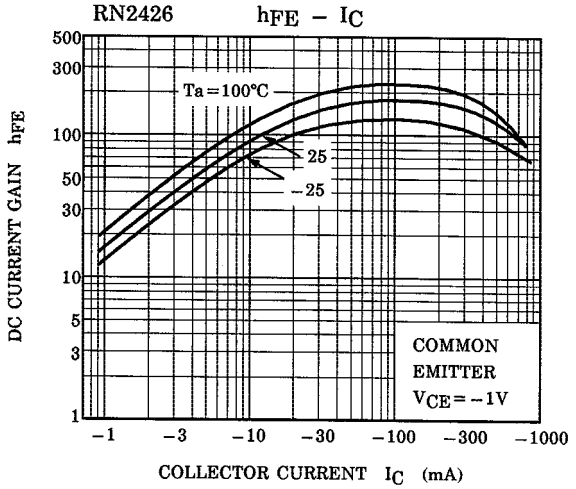
RN2426 $I_C - V_{I(OFF)}$



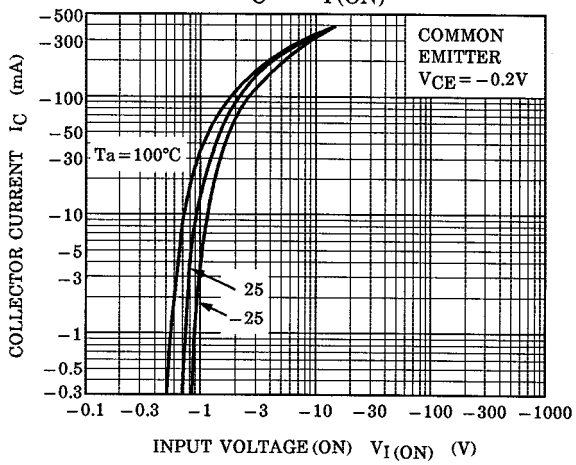
RN2425 $h_{FE} - I_C$



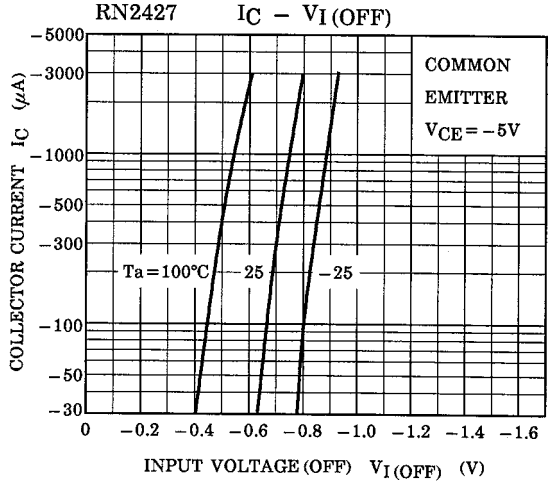
RN2426 $h_{FE} - I_C$



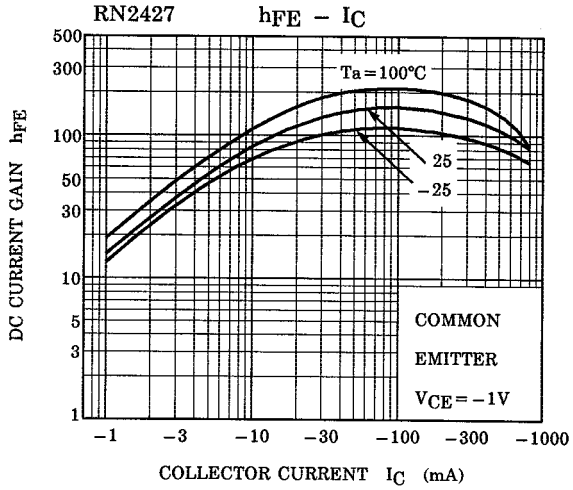
RN2427 $I_C - V_{I(ON)}$



RN2427 $I_C - V_{I(OFF)}$



RN2427 $h_{FE} - I_C$



RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.