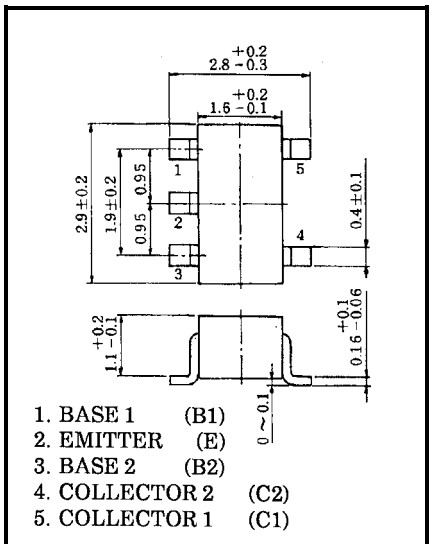
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1501,RN1502,RN1503
RN1504,RN1505,RN1506

Unit: mm

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

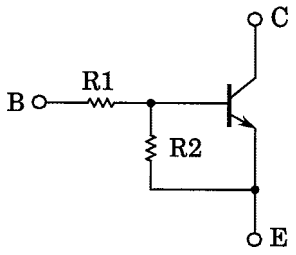
- Including two devices in SMV
  (super mini type with 5 leads)With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2501~RN2506



JEDEC	—
EIAJ	—
TOSHIBA	2-3L1A

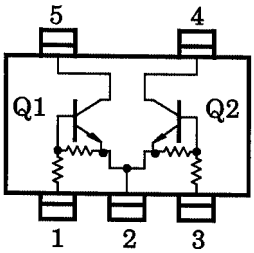
Weight: 6.8mg

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1501	4.7	4.7
RN1502	10	10
RN1503	22	22
RN1504	47	47
RN1505	2.2	47
RN1506	4.7	47

Equivalent Circuit (Top View)



Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1501~1506	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1501~1504	V_{EBO}	10	V
	RN1505, 1506		5	
Collector current	RN1501~1506	I_C	100	mA
Collector power dissipation		P_C *	300	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

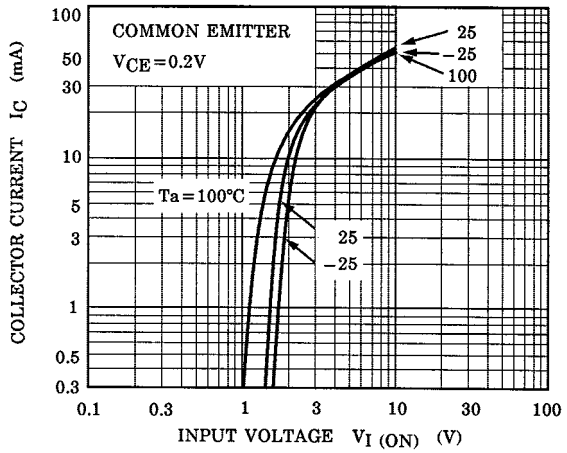
* Total rating

Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

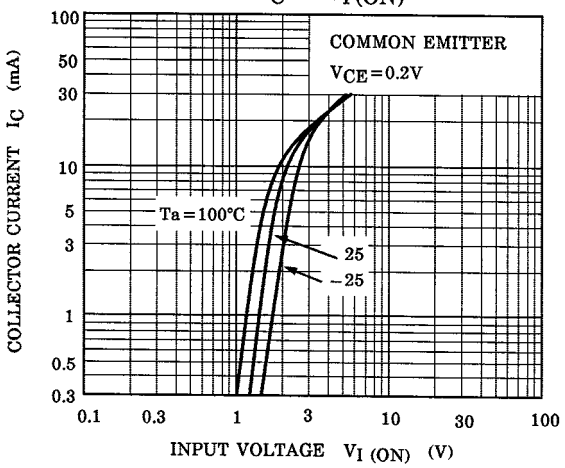
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1501~1506	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}		V_{CE} = 50V, I_B = 0	—	—	500	
Emitter cut-off current	RN1501	I_{EBO}	—	V_{EB} = 10V, I_C = 0	0.82	—	1.52	mA
	RN1502				0.38	—	0.71	
	RN1503				0.17	—	0.33	
	RN1504				0.082	—	0.15	
	RN1505			V_{EB} = 5V, I_C = 0	0.078	—	0.145	
	RN1506				0.074	—	0.138	
DC current gain	RN1501	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	30	—	—	
	RN1502				50	—	—	
	RN1503				70	—	—	
	RN1504				80	—	—	
	RN1505				80	—	—	
	RN1506				80	—	—	
Collector-emitter saturation voltage	RN1501~1506	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1501	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	1.1	—	2.0	V
	RN1502				1.2	—	2.4	
	RN1503				1.3	—	3.0	
	RN1504				1.5	—	5.0	
	RN1505				0.6	—	1.1	
	RN1506				0.7	—	1.3	
Input voltage (OFF)	RN1501~1504	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	1.0	—	1.5	V
	RN1505, 1506				0.5	—	0.8	
Transition frequency	RN1501~1506	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector Output capacitance	RN1501~1506	C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN1501	R1	—		3.29	4.7	6.11	kΩ
	RN1502				7	10	13	
	RN1503				15.4	22	28.6	
	RN1504				32.9	47	61.1	
	RN1505				1.54	2.2	2.86	
	RN1506				3.29	4.7	6.11	
Resistor ratio	RN1501~1504	R1/R2	—		0.9	1.0	1.1	
	RN1505				0.0421	0.0468	0.0515	
	RN1506				0.09	0.1	0.11	

(Q1, Q2 COMMON)

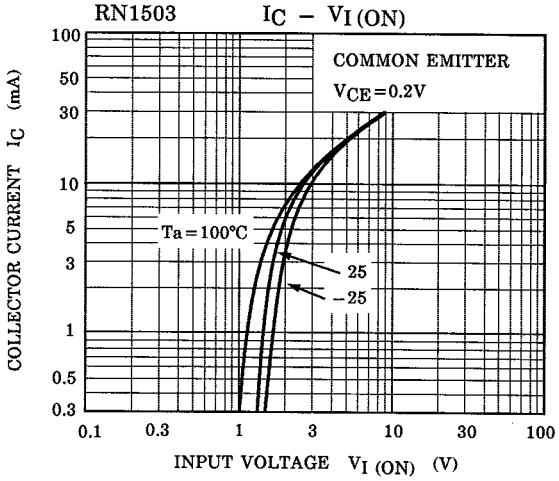
RN1501 $I_C - V_{I(ON)}$



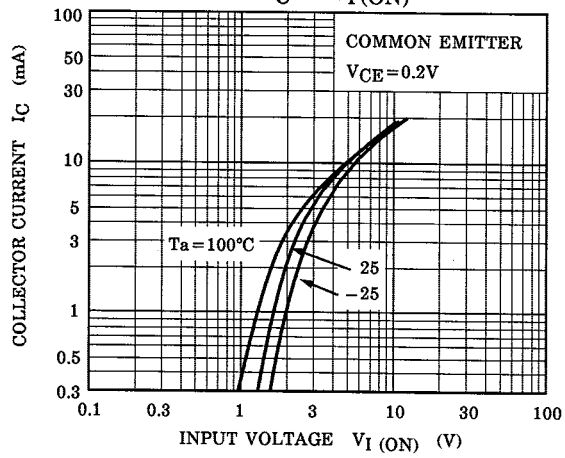
RN1502 $I_C - V_{I(ON)}$



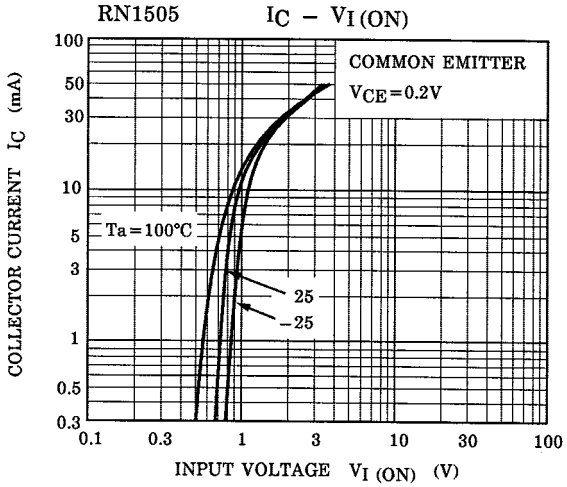
RN1503 $I_C - V_{I(ON)}$



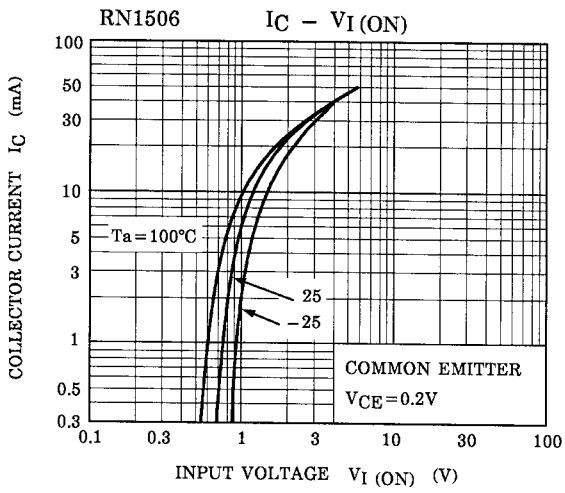
RN1504 $I_C - V_{I(ON)}$



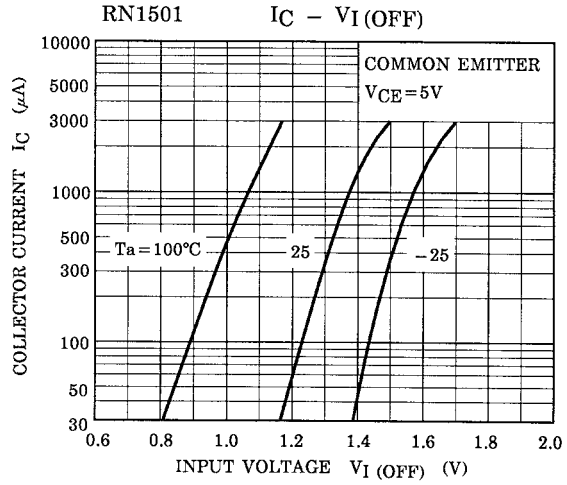
RN1505 $I_C - V_{I(ON)}$

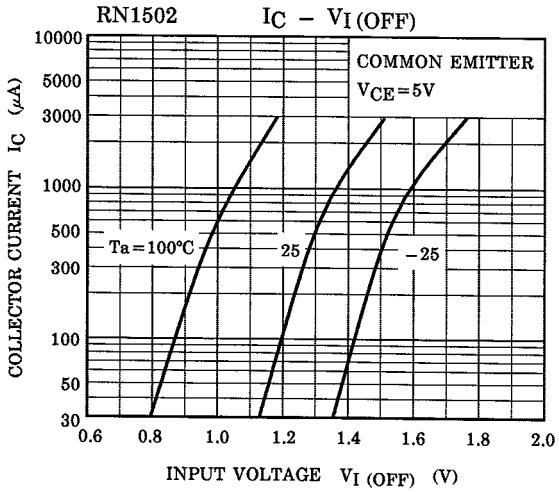


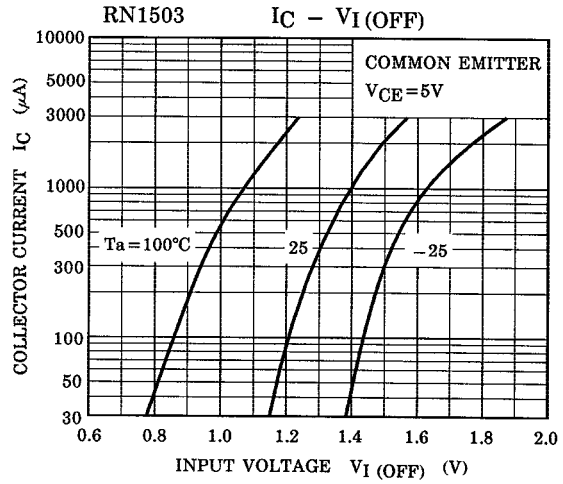
RN1506 $I_C - V_{I(ON)}$

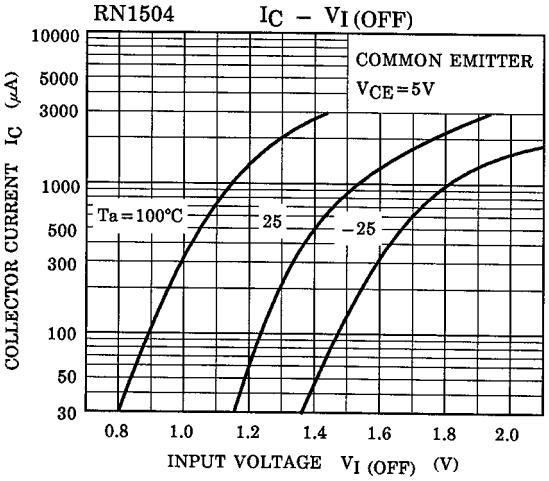


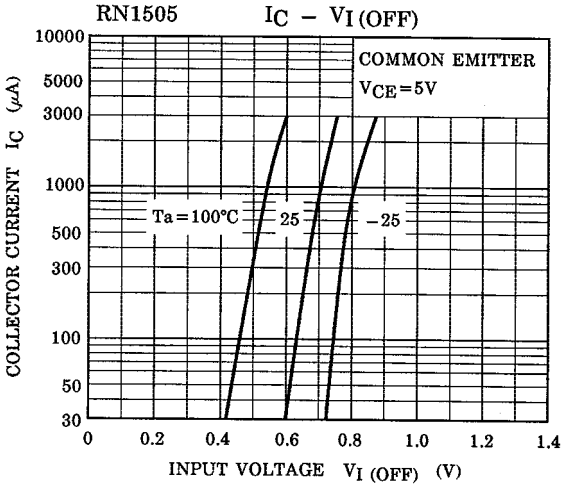
(Q1, Q2 COMMON)

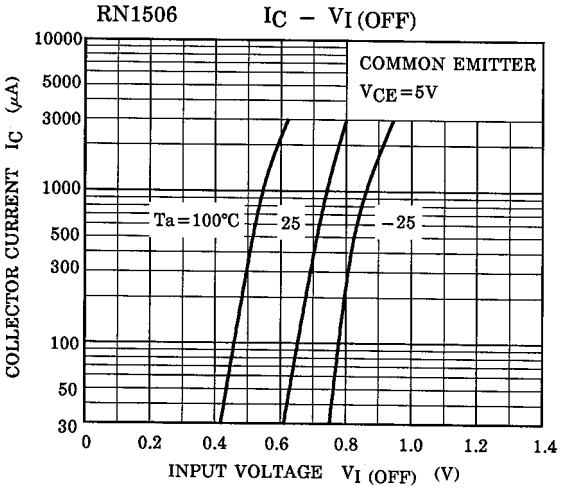

RN1501
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)


RN1502
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)


RN1503
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)

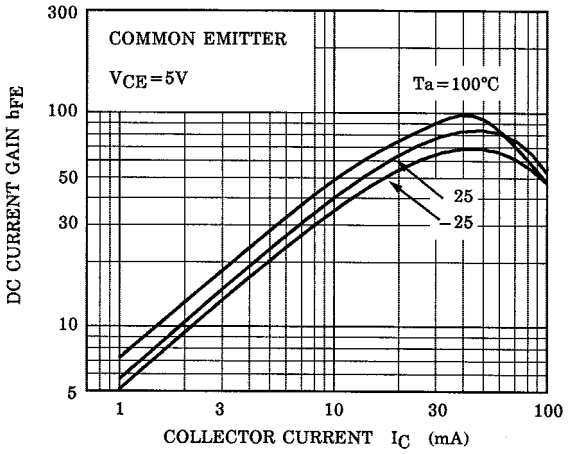

RN1504
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)


RN1505
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)

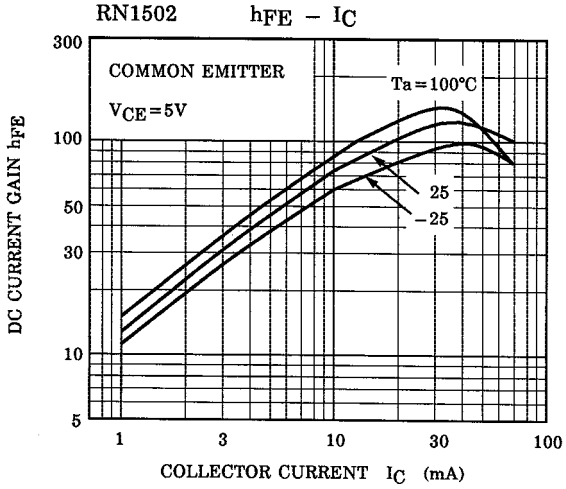

RN1506
I_C – $V_{I\,(OFF)}$
COMMON EMITTER
V_{CE}=5V
Ta=100°C
25
−25
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)

(Q1, Q2 COMMON)

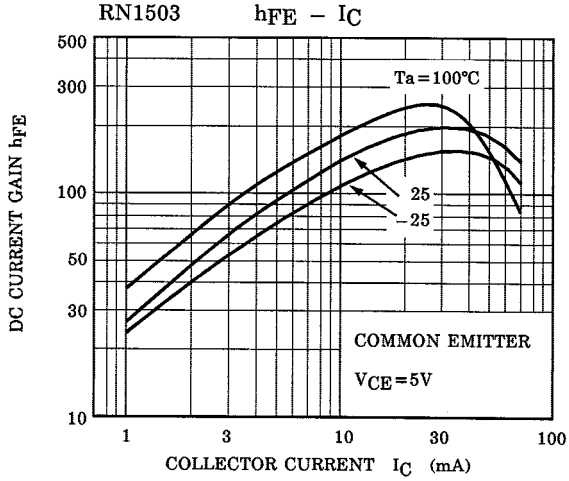
RN1501 h_{FE} – I_C



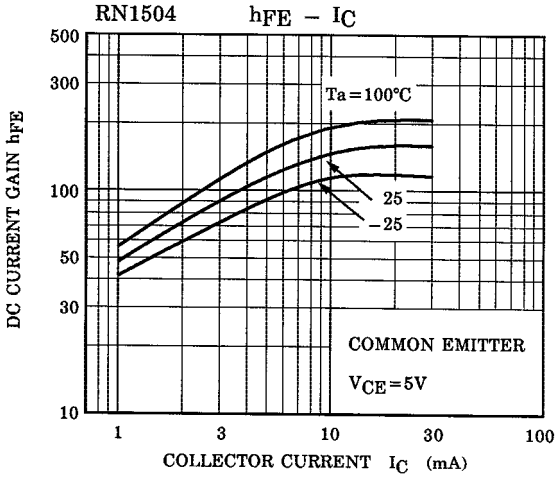
RN1502 h_{FE} – I_C



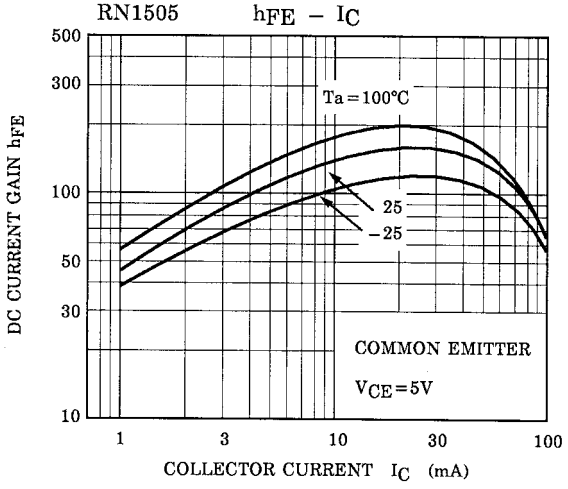
RN1503 h_{FE} – I_C



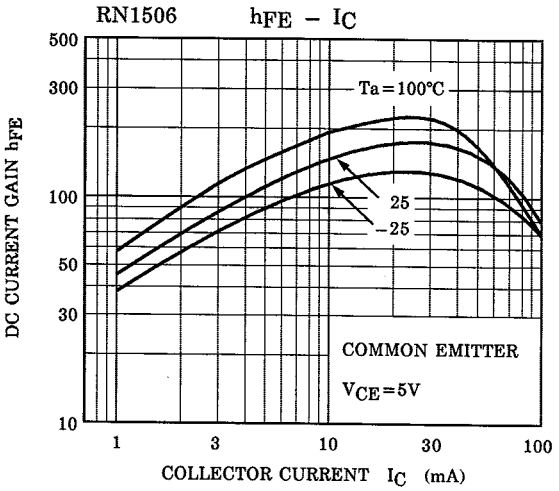
RN1504 h_{FE} – I_C



RN1505 h_{FE} – I_C



RN1506 h_{FE} – I_C



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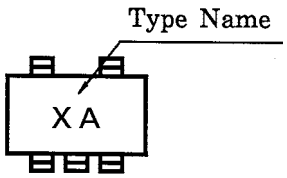
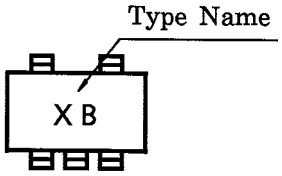
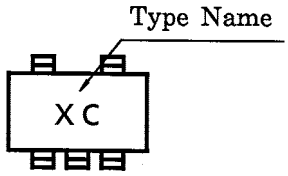
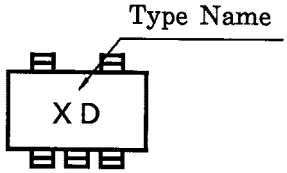
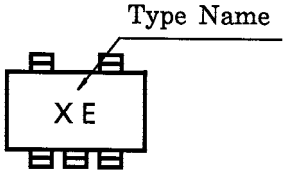
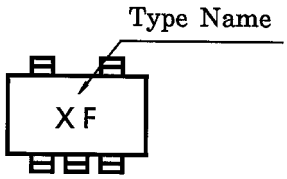
RN1501	
RN1502	
RN1503	
RN1504	
RN1505	
RN1506	

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