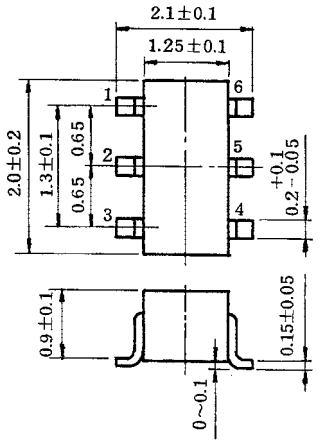
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2961,RN2962,RN2963,RN2964,RN2965,RN2966

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1961~RN1966

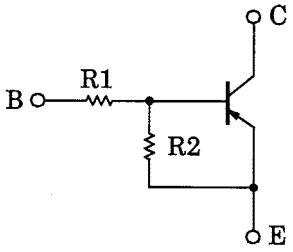
Unit: mm



JEDEC	—
EIAJ	—
TOSHIBA	2-2J1B

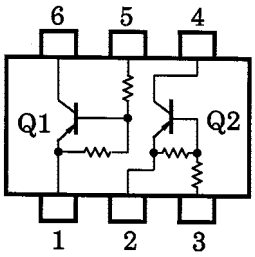
Weight: 6.8mg

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2961	4.7	4.7
RN2962	10	10
RN2963	22	22
RN2964	47	47
RN2965	2.2	47
RN2966	4.7	47

Equivalent Circuit (Top View)



Maximum Ratings (Ta = 25°C)

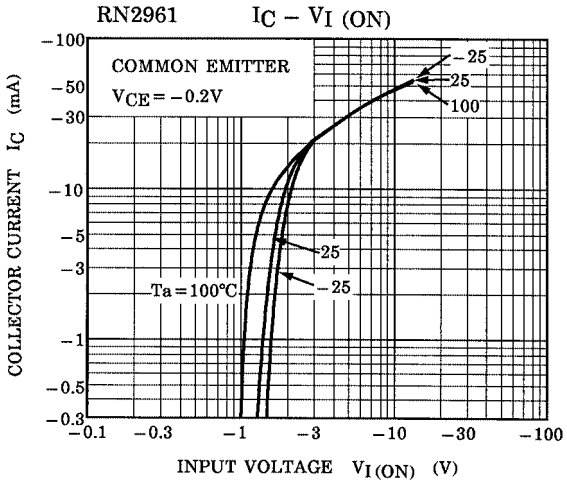
Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN2961~2966	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
	RN2961~2964		−10	
	RN2965, 2966		−5	
Collector current		I_C	−100	mA
Collector power dissipation		P_C *	200	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

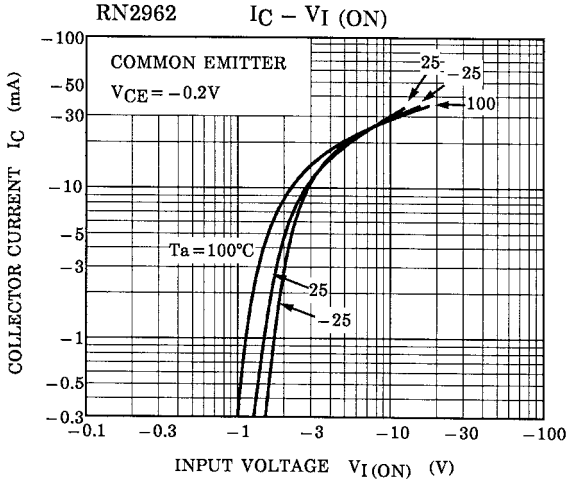
* : Total rating

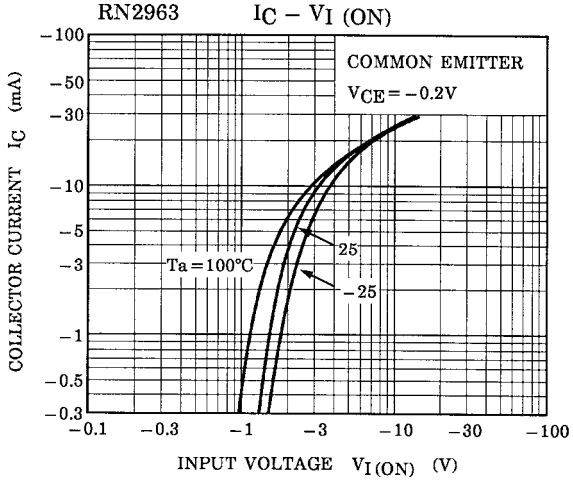
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

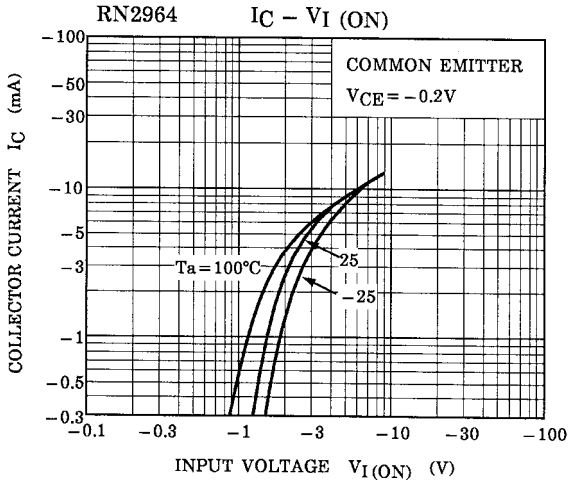
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2961~2966	I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2961	I_{EBO}	—	V_{EB} = −10V, I_C = 0	−0.82	—	−1.52	mA
	RN2962		—		−0.38	—	−0.71	
	RN2963		—		−0.17	—	−0.33	
	RN2964		—		−0.082	—	−0.15	
	RN2965		—	V_{EB} = −5V, I_C = 0	−0.078	—	−0.145	
	RN2966		—		−0.074	—	−0.138	
DC current gain	RN2961	h_{FE}	—	V_{CE} = −5V I_C = −10mA	30	—	—	—
	RN2962		—		50	—	—	
	RN2963		—		70	—	—	
	RN2964		—		80	—	—	
	RN2965		—		80	—	—	
	RN2966		—		80	—	—	
Collector-emitter saturation voltage	RN2961~2966	$V_{CE\ (sat)}$	—	I_C = −5mA I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2961	$V_{I\ (ON)}$	—	V_{CE} = −0.2V I_C = −5mA	−1.1	—	−2.0	V
	RN2962		—		−1.2	—	−2.4	
	RN2963		—		−1.3	—	−3.0	
	RN2964		—		−1.5	—	−5.0	
	RN2965		—		−0.6	—	−1.1	
	RN2966		—		−0.7	—	−1.3	
Input voltage (OFF)	RN2961~2964	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−1.0	—	−1.5	V
	RN2965, 2966		—		−0.5	—	−0.8	
Translation frequency	RN2961~2966	f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector output capacitance	RN2961~2966	C_{ob}	—	V_{CB} = −10V, I_E = 0 f = 1MHz	—	3	6	pF
Input resistor	RN2961	R1	—	—	3.29	4.7	6.11	kΩ
	RN2962		—		7	10	13	
	RN2963		—		15.4	22	28.6	
	RN2964		—		32.9	47	61.1	
	RN2965		—		1.54	2.2	2.86	
	RN2966		—		3.29	4.7	6.11	
Resistor ratio	RN2961~2964	R1/R2	—	—	0.9	1.0	1.1	—
	RN2965		—		0.0421	0.0468	0.0515	
	RN2966		—		0.09	0.1	0.11	

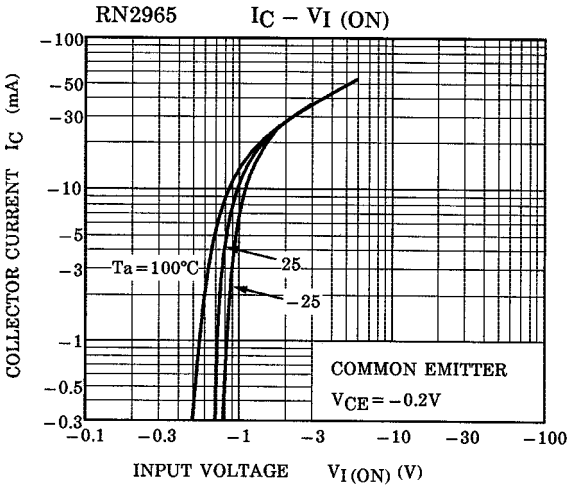
(Q1, Q2 Common)

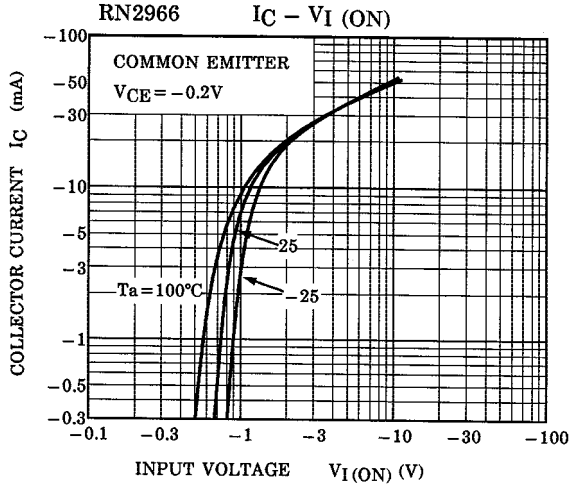

RN2961 $I_C - V_I$ (ON)
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
100
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100


RN2962 $I_C - V_I$ (ON)
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
100
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100


RN2963 $I_C - V_I$ (ON)
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100

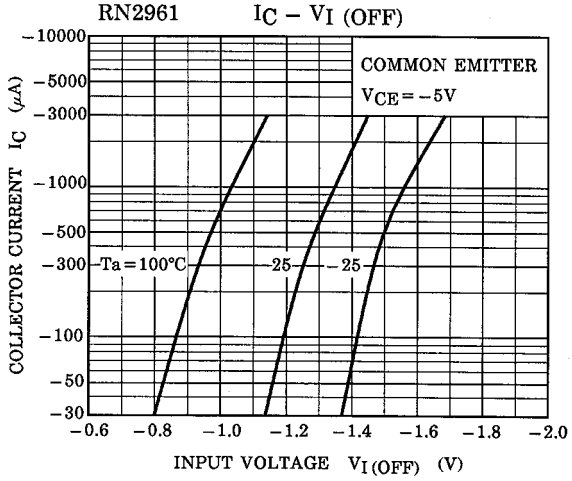

RN2964 $I_C - V_I$ (ON)
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100


RN2965 $I_C - V_I$ (ON)
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE} = -0.2V$
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100

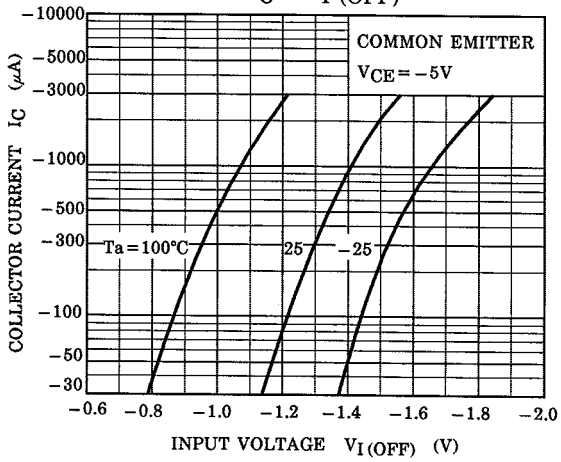

RN2966 $I_C - V_I$ (ON)
COMMON EMITTER
$V_{CE} = -0.2V$
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
−100
−50
−30
−10
−5
−3
−1
−0.5
−0.3
−0.1
−0.3
−1
−3
−10
−30
−100

(Q1, Q2 Common)

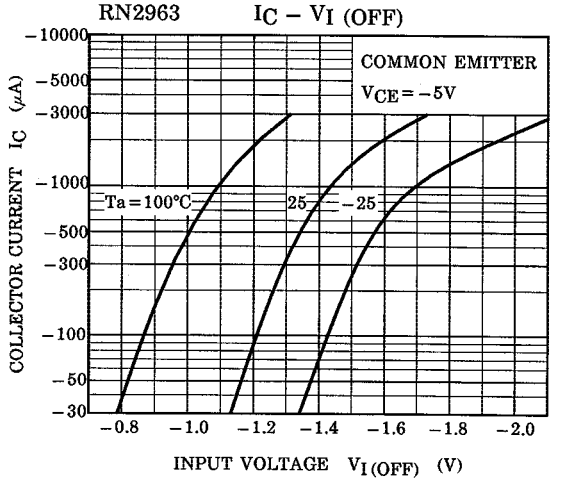
RN2961 $I_C - V_{I\,(OFF)}$



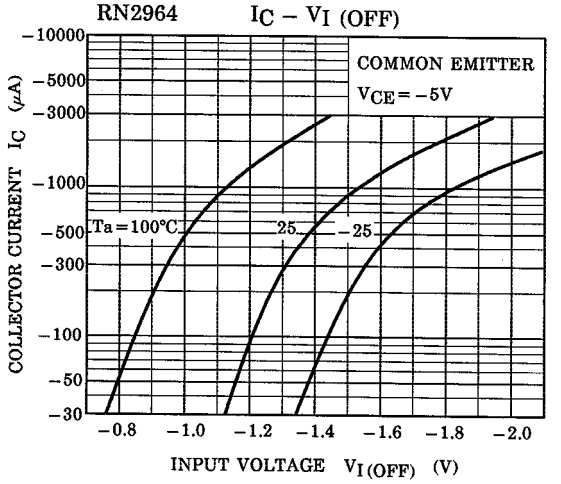
RN2962 $I_C - V_{I\,(OFF)}$



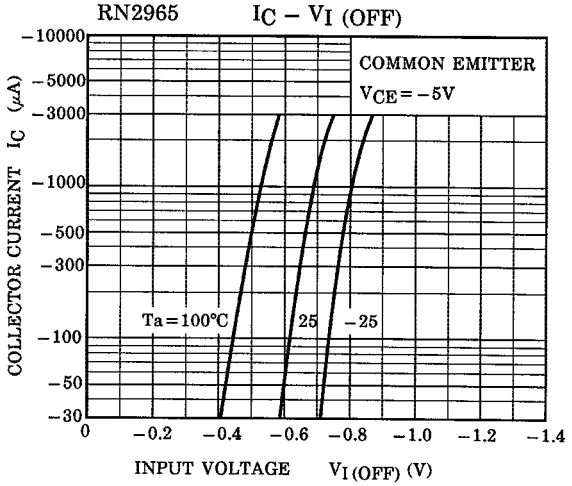
RN2963 $I_C - V_{I\,(OFF)}$



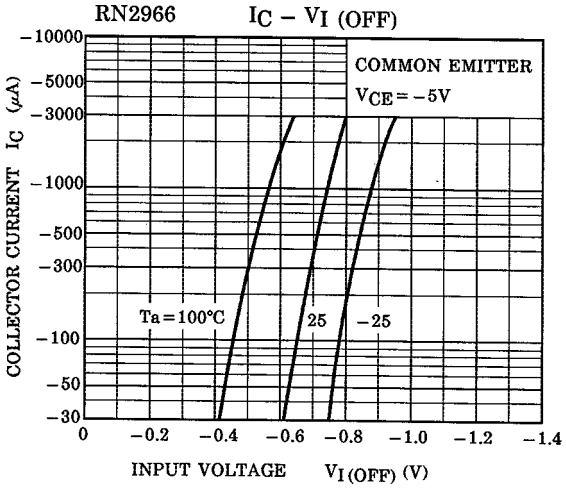
RN2964 $I_C - V_{I\,(OFF)}$



RN2965 $I_C - V_{I\,(OFF)}$

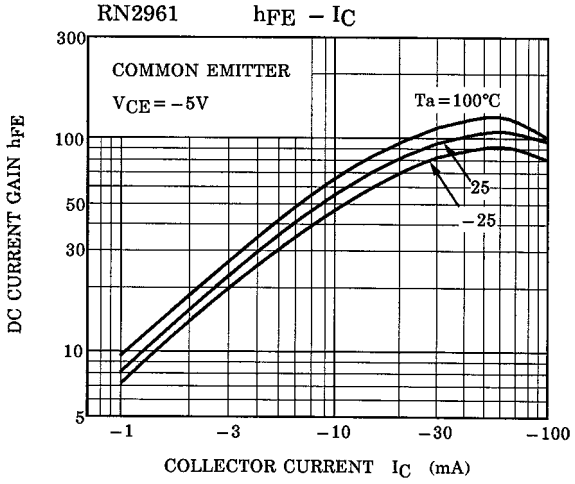


RN2966 $I_C - V_{I\,(OFF)}$

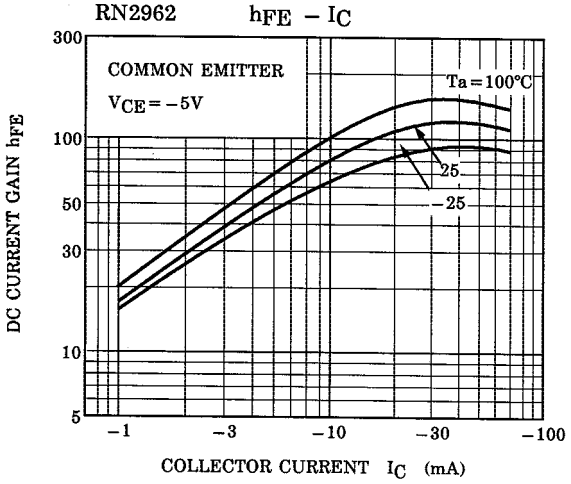


(Q1, Q2 Common)

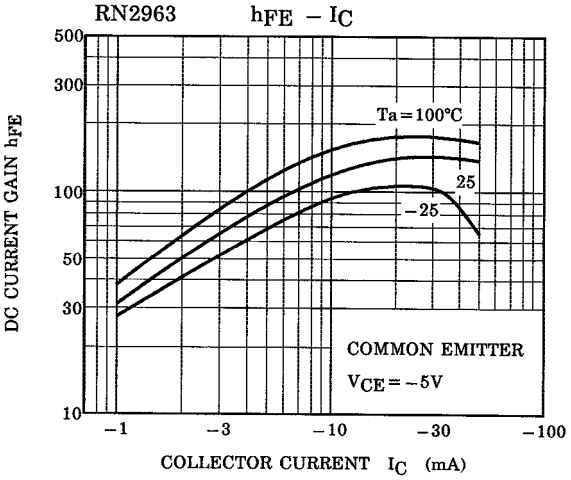
RN2961 h_{FE} – I_C



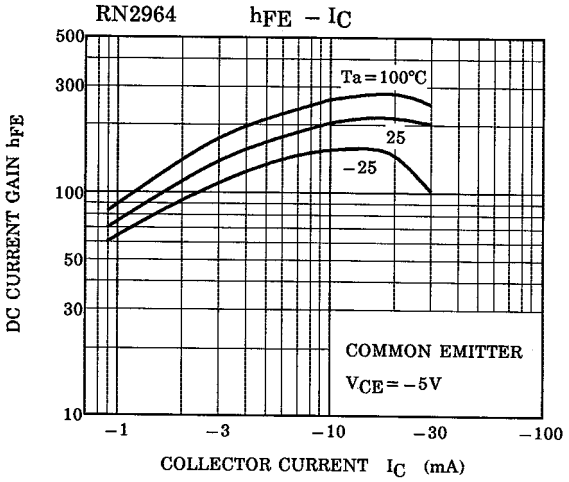
RN2962 h_{FE} – I_C



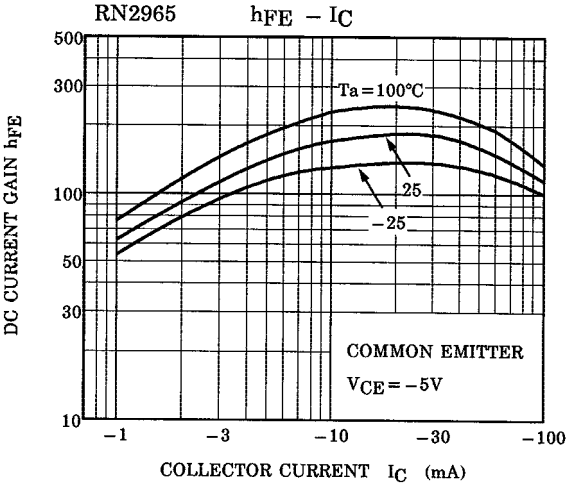
RN2963 h_{FE} – I_C



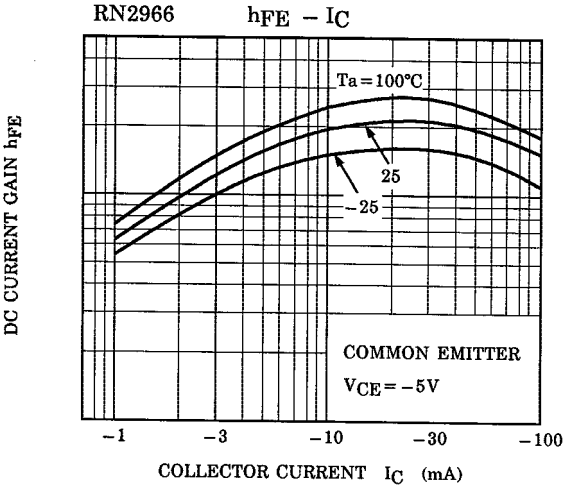
RN2964 h_{FE} – I_C



RN2965 h_{FE} – I_C



RN2966 h_{FE} – I_C



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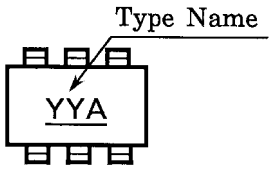
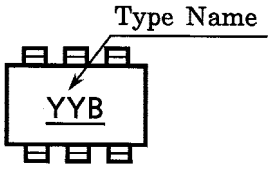
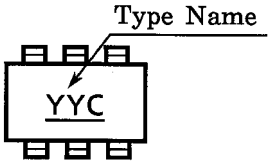
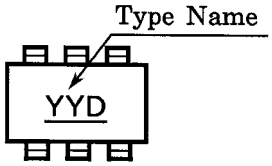
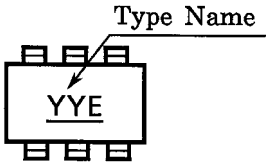
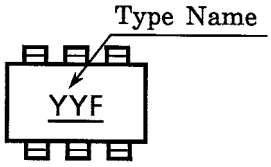
RN2961	
RN2962	
RN2963	
RN2964	
RN2965	
RN2966	

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000707EAA

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