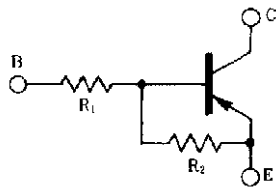


on-chip resistor PNP silicon epitaxial transistor For mid-speed switching

FEATURES

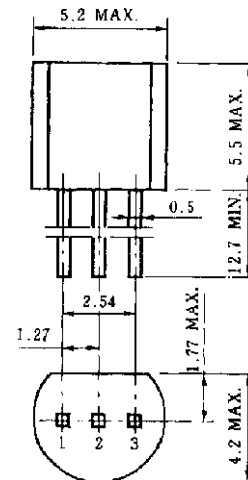
- High current drives such as IC output and actuator available
- On-chip bias resistor
- Low power consumption during drive



AR1 SERIES LISTS

Products	R ₁ (KΩ)	R ₂ (KΩ)
AR1A3M	1.0	1.0
AR1F3P	2.2	10
AR1L3N	4.7	10
AR1A4M	10	10
AR1L2Q	0.47	4.7
AR1F2Q	0.22	2.2
AR1A4A	—	10

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Emitter EIAJ : SC-43B
2. Collector JEDEC: TO-92
3. Base IEC : PA33

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V _{CBO}	−60	V
Collector to emitter voltage	V _{CEO}	−60	V
Emitter to base voltage	V _{EBO}	−10	V
Collector current (DC)	I _{C(DC)}	−1.0	A
Collector current (Pulse)	I _{C(pulse)} *	−2.0	A
Base current (DC)	I _{B(DC)}	−0.02	A
Total power dissipation	P _T	750	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	−55 to +150	°C

* PW ≤ 10 ms, duty cycle ≤ 50 %

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AR1A3M

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -60\text{ V}, I_E = 0$			-100	nA
DC current gain	h_{FE1}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.1\text{ A}$	50			—
DC current gain	h_{FE2}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.5\text{ A}$	100			—
DC current gain	h_{FE3}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -1.0\text{ A}$	50			—
Low level output voltage	V_{OL}^{**}	$V_{IN} = -5.0\text{ V}, I_C = -0.4\text{ A}$			-0.4	V
Low level input voltage	V_{IL}^{**}	$V_{CE} = -5.0\text{ V}, I_C = -100\text{ }\mu\text{A}$			-0.3	V
Input resistance	R_1		0.7	1.0	1.3	k Ω
E-to-B resistance	R_2		0.7	1.0	1.3	k Ω

**PW \leq 350 μs , duty cycle \leq 2 %

AR1F3P

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -60\text{ V}, I_E = 0$			-100	nA
DC current gain	h_{FE1}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.1\text{ A}$	150			—
DC current gain	h_{FE2}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.5\text{ A}$	100			—
DC current gain	h_{FE3}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -1.0\text{ A}$	50			—
Low level output voltage	V_{OL}^{**}	$V_{IN} = -5.0\text{ V}, I_C = -0.35\text{ A}$			-0.3	V
Low level input voltage	V_{IL}^{**}	$V_{CE} = -5.0\text{ V}, I_C = -100\text{ }\mu\text{A}$			-0.3	V
Input resistance	R_1		1.54	2.2	2.86	k Ω
E-to-B resistance	R_2		7	10	13	k Ω

**PW \leq 350 μs , duty cycle \leq 2 %

AR1L3N

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -60\text{ V}, I_E = 0$			-100	nA
DC current gain	h_{FE1}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.1\text{ A}$	150			—
DC current gain	h_{FE2}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.5\text{ A}$	100			—
DC current gain	h_{FE3}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -1.0\text{ A}$	50			—
Low level output voltage	V_{OL}^{**}	$V_{IN} = -5.0\text{ V}, I_C = -0.2\text{ A}$			-0.3	V
Low level input voltage	V_{IL}^{**}	$V_{CE} = -5.0\text{ V}, I_C = -100\text{ }\mu\text{A}$			-0.3	V
Input resistance	R_1		3.29	4.7	6.11	k Ω
E-to-B resistance	R_2		7	10	13	k Ω

**PW \leq 350 μs , duty cycle \leq 2 %

AR1A4M

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -60 V, I _E = 0			-100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	150			—
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -0.5 A	100			—
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -1.0 A	50			—
Low level output voltage	V _{OL} **	V _{IN} = -5.0 V, I _C = -0.1 A			-0.2	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		7	10	13	kΩ
E-to-B resistance	R ₂		7	10	13	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AR1L2Q

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -60 V, I _E = 0			-100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	150			—
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -0.5 A	100			—
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -1.0 A	50			—
Low level output voltage	V _{OL} **	V _{IN} = -5.0 V, I _C = -0.5 A			-0.55	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		329	470	611	Ω
E-to-B resistance	R ₂		3.29	4.7	6.11	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AR1F2Q

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -60 V, I _E = 0			-100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	80			—
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -0.5 A	100			—
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -1.0 A	50			—
Low level output voltage	V _{OL} **	V _{IN} = -5.0 V, I _C = -0.5 A			-0.55	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		154	220	286	Ω
E-to-B resistance	R ₂		1.54	2.2	2.86	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

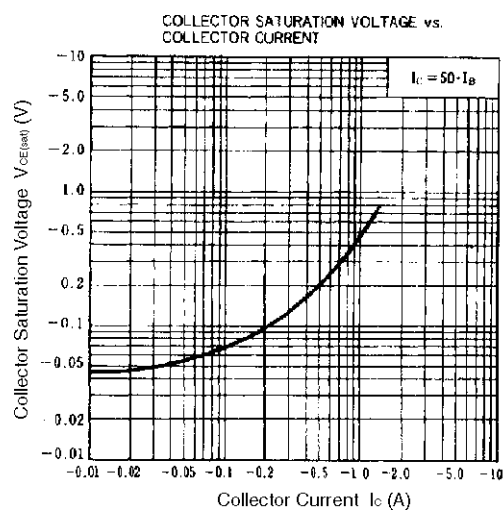
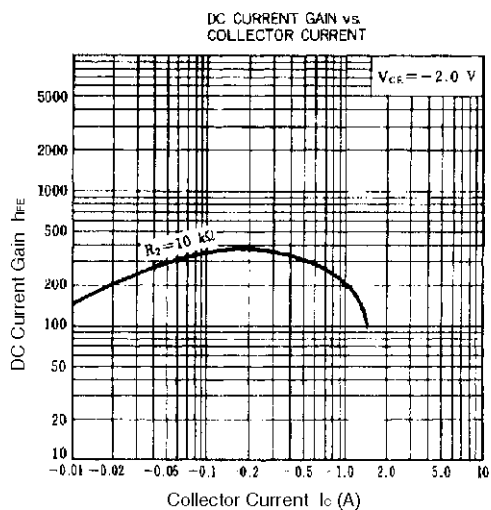
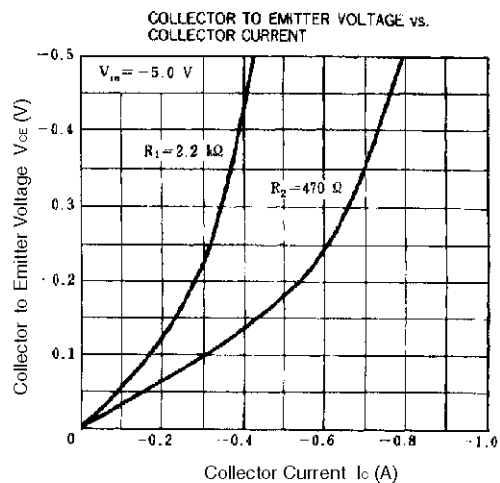
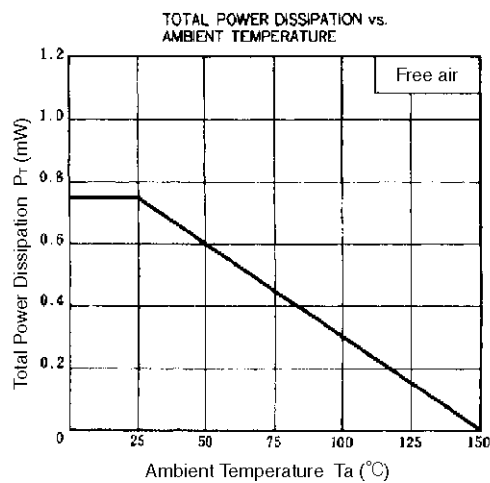
AR1A4A

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -60\text{ V}, I_E = 0$			-100	nA
DC current gain	h_{FE1}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.1\text{ A}$	150			—
DC current gain	h_{FE2}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.5\text{ A}$	100			—
DC current gain	h_{FE3}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -1.0\text{ A}$	50			—
Collector saturation voltage	$V_{CE(sat)}^{**}$	$I_C = -500\text{ mA}, I_B = -10\text{ mA}$		-0.20	-0.35	V
Low level input voltage	V_{IL}^{**}	$V_{CE} = -5.0\text{ V}, I_C = -100\text{ }\mu\text{A}$			-0.3	V
Input resistance	R_1		—	—	—	Ω
E-to-B resistance	R_2		7	10	13	k Ω

****** $PW \leq 350\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



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