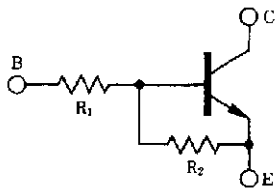


# COMPOUND TRANSISTOR AB1 SERIES

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

### FEATURES

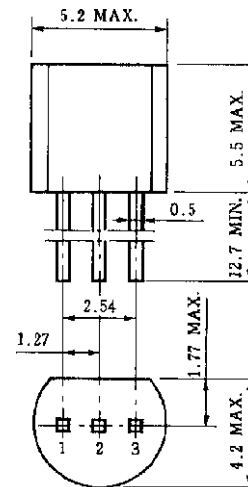
- Current drive available up to 0.7 A
- On-chip bias resistor
- Low power consumption during drive



### AB1 SERIES LISTS

Products	R <sub>1</sub> (KΩ)	R <sub>2</sub> (KΩ)
AB1A4A	—	10
AB1L2Q	0.47	4.7
AB1A3M	1.0	1.0
AB1F3P	2.2	10
AB1J3P	3.3	10
AB1L3N	4.7	10
AB1A4M	10	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 <sub>CBO</sub>	30	V
Collector to emitter voltage	V <sub>CEO</sub>	25	V
Emitter to base voltage	V <sub>EBO</sub>	10	V
Collector current (DC)	I <sub>C(DC)</sub>	0.7	A
Collector current (Pulse)	I <sub>C(pulse)</sub> *	1.0	A
Base current (DC)	I <sub>B(DC)</sub>	0.02	A
Total power dissipation	P <sub>T</sub>	750	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\* PW ≤ 10 ms, duty cycle ≤ 50 %

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**AB1A4A**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	300			–
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	300			–
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135			–
Collector saturation voltage	V <sub>CE(sat)</sub> **	I <sub>C</sub> = 5.0 A, I <sub>C</sub> = 5 mA		0.27	0.4	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		–	–	–	Ω
E-to-B resistance	R <sub>2</sub>		7	10	13	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

**AB1L2Q**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	150	400		–
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	300	700		–
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135	600		–
Low level output voltage	V <sub>OL</sub> **	V <sub>IN</sub> = 5.0 V, I <sub>C</sub> = 0.5 A		0.2	0.3	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		329	470	611	Ω
E-to-B resistance	R <sub>2</sub>		3.29	4.7	6.11	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

**AB1A3M**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	80			–
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	100			–
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135			–
Low level output voltage	V <sub>OL</sub> **	V <sub>IN</sub> = 5.0 V, I <sub>C</sub> = 0.5 A		0.3	0.4	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		0.7	1.0	1.3	kΩ
E-to-B resistance	R <sub>2</sub>		0.7	1.0	1.3	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

**AB1F3P**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CB0</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	300			—
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	300			—
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135			—
Low level output voltage	V <sub>OL</sub> **	V <sub>IN</sub> = 5.0 V, I <sub>C</sub> = 0.3 A			0.3	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		1.54	2.2	2.86	kΩ
E-to-B resistance	R <sub>2</sub>		7	10	13	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

**AB1J3P**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CB0</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	300	600		—
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	300	700		—
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135	600		—
Low level output voltage	V <sub>OL</sub> **	V <sub>IN</sub> = 5.0 V, I <sub>C</sub> = 0.2 A		0.14	0.3	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		2.31	3.3	4.29	kΩ
E-to-B resistance	R <sub>2</sub>		7	10	13	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

**AB1L3N**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I <sub>CB0</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0			100	nA
DC current gain	h <sub>FE1</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.1 A	300			—
DC current gain	h <sub>FE2</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	300			—
DC current gain	h <sub>FE3</sub> **	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.7 A	135			—
Low level output voltage	V <sub>OL</sub> **	V <sub>IN</sub> = 5.0 V, I <sub>C</sub> = 0.2 A			0.3	V
Low level input voltage	V <sub>IL</sub> **	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 100 μA			0.3	V
Input resistance	R <sub>1</sub>		3.29	4.7	6.11	kΩ
E-to-B resistance	R <sub>2</sub>		7	10	13	kΩ

\*\* PW ≤ 350 μs, duty cycle ≤ 2 %

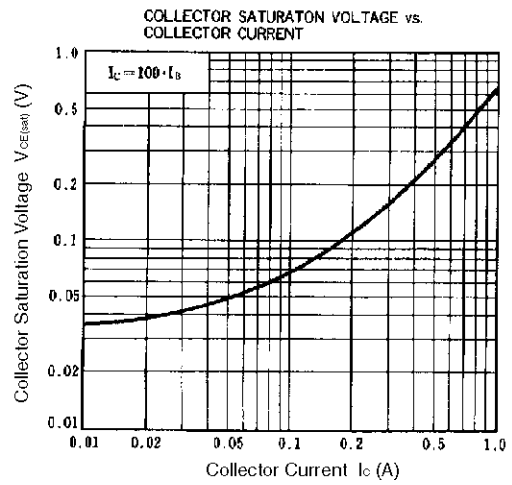
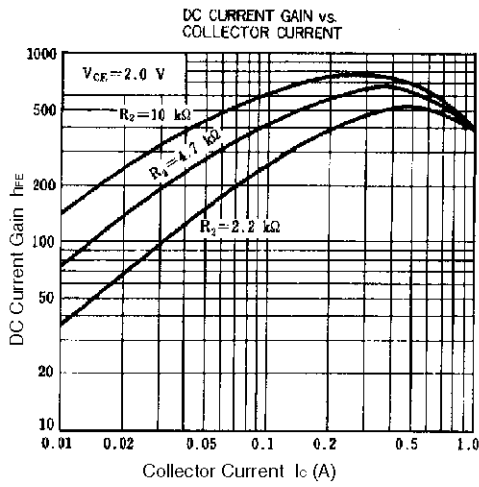
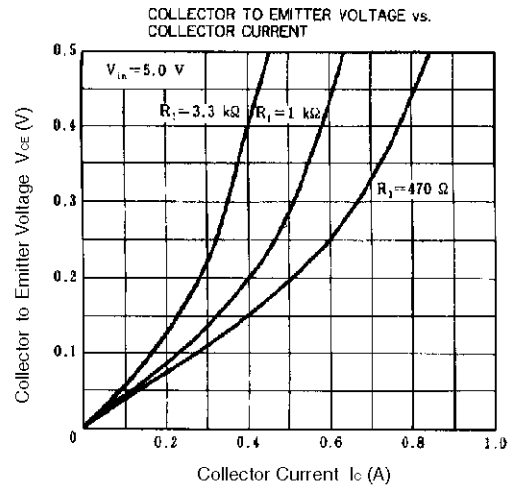
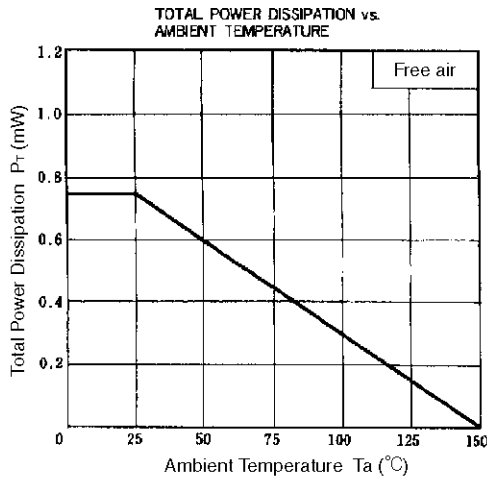
**AB1A4M**

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 30\text{ V}, I_E = 0$			100	nA
DC current gain	$h_{FE1}^{**}$	$V_{CE} = 2.0\text{ V}, I_C = 0.1\text{ A}$	300			—
DC current gain	$h_{FE2}^{**}$	$V_{CE} = 2.0\text{ V}, I_C = 0.5\text{ A}$	300			—
DC current gain	$h_{FE3}^{**}$	$V_{CE} = 2.0\text{ V}, I_C = 0.7\text{ A}$	135			—
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	$V_{IL}^{**}$	$V_{CE} = 5.0\text{ V}, I_C = 100\ \mu\text{A}$			0.3	V
Input resistance	$R_1$		7	10	13	k $\Omega$
E-to-B resistance	$R_2$		7	10	13	k $\Omega$

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

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



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