

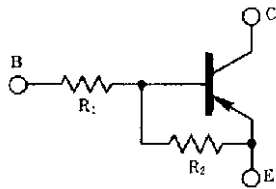
Phase-out/Discontinued

COMPOUND TRANSISTOR AQ1 SERIES

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

FEATURES

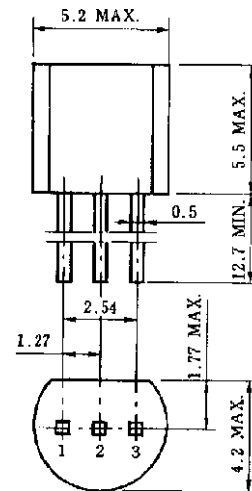
- High current drives such as IC and motor solenoid available up to 2 A
- On-chip bias resistor
- Low power consumption during drive



AQ1 SERIES LISTS

Products	R ₁ (KΩ)	R ₂ (KΩ)
AQ1L2N	0.47	1.0
AQ1A3M	1.0	1.0
AQ1F3M	2.2	2.2
AQ1F3P	2.2	10
AQ1L2Q	0.47	4.7
AQ1F2Q	0.22	2.2
AQ1A4A	—	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}	-20	V
Collector to emitter voltage	V _{CEO}	-20	V
Emitter to base voltage	V _{EBO}	-10	V
Collector current (DC)	I _{C(DC)}	-2.0	A
Collector current (Pulse)	I _{C(pulse)} *	-3.0	A
Base current (DC)	I _{B(DC)}	-0.04	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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AQ1L2N

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 V, I _E = 0			100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	50			-
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{CE(sat)} **	I _C = -5.0 A, I _C = -0.7 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		0.7	1.0	1.3	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AQ1A3M

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 V, I _E = 0			-100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	50			-
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{OL} **	I _C = -5.0 A, I _C = -0.5 A			-0.4	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		0.7	1.0	1.3	kΩ
E-to-B resistance	R ₂		0.7	1.0	1.3	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AQ1F3M

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 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 = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{OL} **	I _C = -5.0 A, I _C = -0.3 A			-0.3	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		1.54	2.2	2.86	kΩ
E-to-B resistance	R ₂		1.54	2.2	2.86	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AQ1F3P

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 V, I _E = 0			-100	nA
DC current gain	h _{FE1} **	V _{CE} = -2.0 V, I _C = -0.1 A	200			-
DC current gain	h _{FE2} **	V _{CE} = -2.0 V, I _C = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{OL} **	I _C = -5.0 A, I _C = -0.3 A			-0.3	V
Low level input voltage	V _{IL} **	V _{CE} = -5.0 V, I _C = -100 μA			-0.3	V
Input resistance	R ₁		1.54	2.2	2.86	kΩ
E-to-B resistance	R ₂		7	10	13	kΩ

** PW ≤ 350 μs, duty cycle ≤ 2 %

AQ1L2Q

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 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 = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{OL} **	I _C = -5.0 A, I _C = -0.7 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 %

AQ1F2Q

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	ICBO	V _{CB} = -20 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 = -1.0 A	150			-
DC current gain	h _{FE3} **	V _{CE} = -2.0 V, I _C = -2.0 A	50			-
Low level output voltage	V _{OL} **	I _C = -5.0 A, I _C = -0.7 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 %

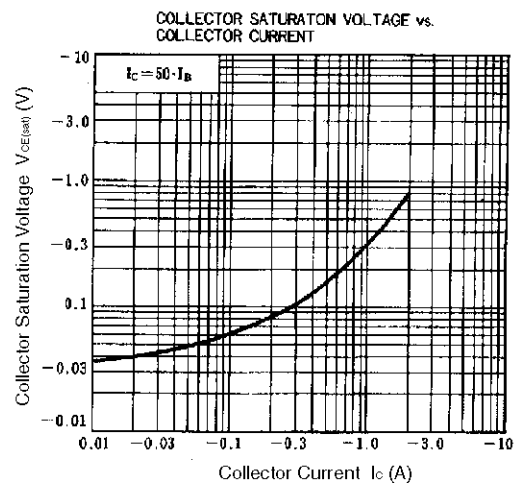
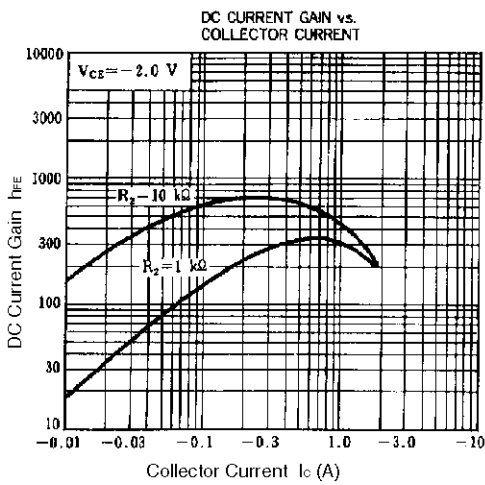
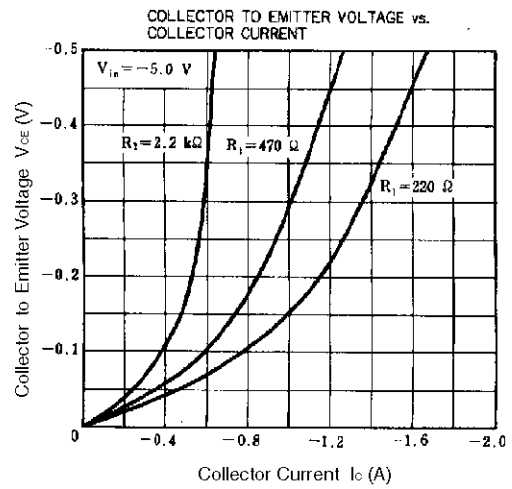
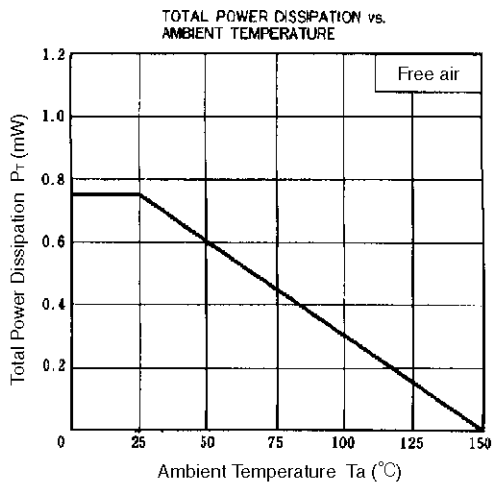
AQ1A4A

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -20\text{ V}, I_E = 0$			-100	nA
DC current gain	h_{FE1}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -0.1\text{ A}$	200			-
DC current gain	h_{FE2}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -1.0\text{ A}$	150			-
DC current gain	h_{FE3}^{**}	$V_{CE} = -2.0\text{ V}, I_C = -2.0\text{ A}$	50			-
Collector saturation voltage	V_{OL}^{**}	$I_C = -1.0\text{ A}, I_E = -20\text{ mA}$		-0.35	-0.45	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 μ s, duty cycle \leq 2 %

TYPICAL CHARACTERISTICS (T_a = 25°C)



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