DATA SHEET



AUTOMOTIVE AC RELAYS

AX1 SERIES

DESCRIPTION

The NEXEM AX1 series is AC relay for On Board Charger (OBC) applications of Electric Vehicle for automobiles which require high quality and high performance.

The AX1 series have higher carrying current performance for AC load.

FEATURE

- Large current capacity for AC load (16A and 32A rated current)
- · Small size
- · High heat resistance
- Flux tight
- Pb free

APPLICATION

· On Board Charger (OBC) of Electric Vehicles (PHEV and BEV)



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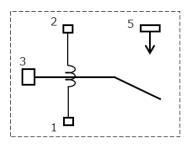
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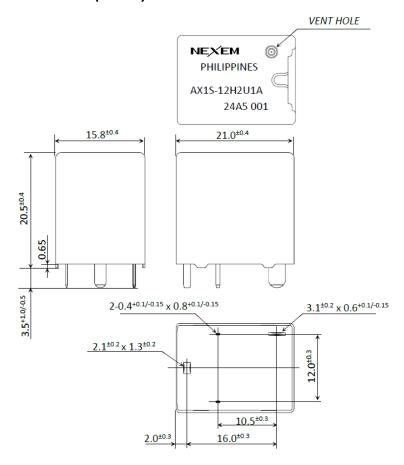


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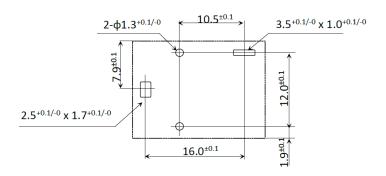
SCHEMATICS (BOTTOM VIEW)



DIMENSIONS (in mm)



RECOMMENDED PCB PAD LAYOUT (BOTTOM VIEW) (in mm)



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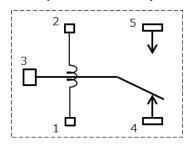
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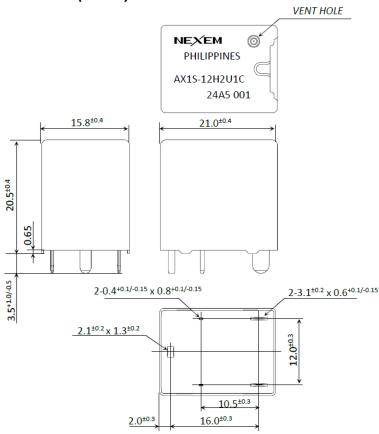


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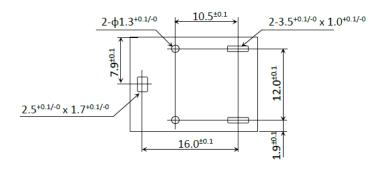
SCHEMATICS (BOTTOM VIEW)



DIMENSIONS (in mm)



RECOMMENDED PCB PAD LAYOUT (BOTTOM VIEW) (in mm)



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< Dielectric Strength (Between open contacts) 1000Vac Type>

[Rated current: 32A SPECIFICATIONS]

Items			Specifi	cations	
Contact form			1 form A	1 form C	
	Max. switching voltage		277Vac		
•	Max. switch	hing current	32	2A	
Contact	Max. conti	nuous current ⁽¹⁾	40A (at	: 105°C)	
rating	Contact res	sistance	10mΩ (2	0A 6Vdc)	
	Rated load		277Vac 32A,	Resistive load	
Contact mate	rial		Ag a	alloy	
Operate time	(2)		15ms	s max.	
Release time	2)		10ms	s max.	
	Insulation r	resistance	1000MΩ mir	n. at 1000Vdc	
Insulation	Dielectric	Between open contacts	1000Vac, 50/60Hz 1minute		
	strength	Between coil and contact	4000Vac, 50/	60Hz 1minute	
Shock	Misoperati	on	98r	Bm/s ²	
resistance	Destructive	e failure	980	m/s²	
Vibration	Misoperati	on	10 to FFII-	1 Fmm DA	
resistance	Destructive	e failure	10 to 55Hz,	, 1.5mm DA	
Ambient tem	perature		-40 to +105°C (no free:	zing and condensation)	
	Mechanica	l	300,00	0 cycles	
	Flootrical /	N/O/(3)	Making 25A, Carrying 32A, Breaking 25A, 277Vac at 105°C		
Life	Electrical (N/O) ⁽³⁾	10,000cycles		
expectancy				Making 5A,	
ехрестансу	Electrical (f	N/C) (3)		Carrying 32A, Breaking 5A,	
	Liectrical (I	N/C/ ··/	-	277Vac at 105°C	
				10,000cycles	
Weight			Appro	ox. 16g	

- (1) After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.
- (2) Excluding contact bounce without flywheel coil diode.
- (3) This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.
- (4) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.
- (5) Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[Rated current: 16A SPECIFICATIONS]

Items		Specifications			
Contact form			1 form A	1 form C	
	Max. switching voltage		277Vac		
	Max. switc	hing current	16A		
Contact	Max. conti	nuous current ⁽⁶⁾	20A (at	: 105°C)	
rating	Contact res	sistance	10mΩ (2	0A 6Vdc)	
	Rated load		277Vac 16A,	Resistive load	
Contact mate	erial		Ag a	alloy	
Operate time	(7)		15ms	s max.	
Release time	(7)		10ms	s max.	
	Insulation resistance		1000MΩ min. at 1000Vdc		
Insulation	Dielectric	Between open contacts	1000Vac, 50/	60Hz 1minute	
	strength	Between coil and contact	4000Vac, 50/	60Hz 1minute	
Shock	Misoperati	on	98r	n/s²	
resistance	Destructive	e failure	980	m/s²	
Vibration	Misoperati	on	10 to FFIJa	, 1.5mm DA	
resistance	Destructive	e failure	10 (0 55H2,	, 1.5IIIII DA	
Ambient tem	perature		-40 to +105°C (no free	zing and condensation)	
	Mechanica	ıl	300,00	0 cycles	
	Electrical (N/O) ⁽⁸⁾	16A- 277Vac at 10	05°C, 10,000cycles	
Life				Making 5A,	
expectancy	Electrical (N / C \ (8)		Carrying 16A, Breaking 5A,	
	Electrical (N/C) (-)	-	277Vac at 105°C	
				10,000cycles	
Weight			Approx. 16g		

- (6) After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.
- (7) Excluding contact bounce without flywheel coil diode.
- (8) This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.
- (9) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.
- (10) Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[COIL RATING]

(Ambient temperature: 20°C)

Nominal Voltage (VDC)	Coil Resistance (Ω)±10%	Must Operate Voltage (11) (VDC)	Must Release Voltage (11) (VDC)	Holding voltage (VDC)	Nominal Operating Power (W)
12	120	9.6	0.6	30~80% of rated voltage (at 23°C) 40~45% of rated voltage (at 105°C)	1.2W

(11) Test by pulse voltage

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< Dielectric Strength (Between open contacts) 1500Vac Type> [Rated current: 32A SPECIFICATIONS]

		Items	Specifications	
Contact form	I		1 form A	
	Max. switching voltage		600Vac	
	Max. switc	hing current	32A	
Contact	Max. conti	nuous current (12)	40A (at 105°C)	
rating	Contact res	sistance	10mΩ (20A 6Vdc)	
	Rated load		277Vac 32A, Resistive load	
Contact mate	erial		Ag alloy	
Operate time	(13)		15ms max.	
Release time	(13)		10ms max.	
	Insulation resistance		1000MΩ min. at 1000Vdc	
Insulation	Dielectric strength	Between open contacts	1500Vac, 50/60Hz 1minute	
		Between coil and contact	4000Vac, 50/60Hz 1minute	
Shock	Misoperati	ion	98m/s ²	
resistance	Destructive	e failure	980m/s²	
Vibration	Misoperati	ion	40 to 551 to 4 5 mm DA	
resistance	Destructive	e failure	10 to 55Hz, 1.5mm DA	
Ambient tem	perature		-40 to +105°C (no freezing and condensation)	
	Mechanical		100,000 cycles	
Life	Floorwine (1	4)	Making 25A, Carrying 32A, Breaking 25A, 277Vac at 105°C	
expectancy	Electrical (14)		10,000cycles	
Weight			Approx. 16g	

- (12) After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.
- (13) Excluding contact bounce without flywheel coil diode.
- (14) This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.
- (15) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.
- (16) Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[Rated current: 16A SPECIFICATIONS]

Items			Specifications	
Contact form	١		1 form A	
	Max. switc	hing voltage	600Vac	
	Max. switc	hing current	16A	
Contact	Max. conti	nuous current ⁽¹⁷⁾	20A (at 105°C)	
rating	Contact re	sistance	10mΩ (20A 6Vdc)	
	Rated load		277Vac 16A, Resistive load	
Contact mate	erial		Ag alloy	
Operate time	e ⁽¹⁸⁾		15ms max.	
Release time	Release time (18)		10ms max.	
	Insulation resistance		1000MΩ min. at 1000Vdc	
Insulation	Dielectric	Between open contacts	1500Vac, 50/60Hz 1minute	
	strength	Between coil and contact	4000Vac, 50/60Hz 1minute	
Shock	Misoperati	ion	98m/s²	
resistance	Destructive	e failure	980m/s²	
Vibration	Misoperati	ion	40 to FFILe 4 Favor DA	
resistance	Destructive	e failure	10 to 55Hz, 1.5mm DA	
Ambient tem	perature		-40 to +105°C (no freezing and condensation)	
Life	Mechanical		100,000 cycles	
expectancy	Electrical (1	.9)	16A- 277Vac at 105°C, 10,000cycles	
Weight			Approx. 16g	

- (17) After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.
- (18) Excluding contact bounce without flywheel coil diode.
- (19) This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.
- (20) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.
- (21) Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[COIL RATING]

Nominal Voltage (VDC)	Coil Resistance (Ω)±10%	Must Operate Voltage (22) (VDC)	Must Release Voltage (22) (VDC)	Holding voltage (VDC)	Nominal Operating Power (W)
5	15	4.0	0.25	32~36% of rated voltage (at 105°C)	1.67W
12	86	9.6	0.6	32~36% of rated voltage (at 105°C)	1.67W

⁽²²⁾ Test by pulse voltage

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< Dielectric Strength (Between open contacts) 2000Vac Type> [Rated current: 32A SPECIFICATIONS]

		Items	Specifications
Contact form	1		1 form A
	Max. switching voltage		600Vac
	Max. switc	hing current	32A
Contact	Max. conti	nuous current (23)	40A (at 105°C)
rating	Contact res	sistance	10mΩ (20A 6Vdc)
	Rated load		277Vac 32A, Resistive load
Contact mate	erial		Ag alloy
Operate time	(24)		15ms max.
Release time	Release time (24)		10ms max.
	Insulation resistance		1000MΩ min. at 1000Vdc
Insulation	Dielectric	Between open contacts	2000Vac, 50/60Hz 1minute
	strength	Between coil and contact	4000Vac, 50/60Hz 1minute
Shock	Misoperati	on	98m/s ²
resistance	Destructive	e failure	980m/s²
Vibration	Misoperati	on	404a FFIII- 4 Fmm DA
resistance	Destructive	e failure	10 to 55Hz, 1.5mm DA
Ambient tem	perature	·	-40 to +105°C (no freezing and condensation)
1:6-	Mechanica	l	100,000 cycles
Life	Electrical (2	5)	Making 25A, Carrying 32A, Breaking 25A, 277Vac at 105°C
expectancy	Electrical		10,000cycles
Weight			Approx. 16g

⁽²³⁾ After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.

⁽²⁴⁾ Excluding contact bounce without flywheel coil diode.

⁽²⁵⁾ This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.

⁽²⁶⁾ EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.

⁽²⁷⁾ Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[Rated current: 16A SPECIFICATIONS]

Items			Specifications		
Contact form	١		1 form A		
	Max. switc	hing voltage	600Vac		
	Max. switc	hing current	16A		
Contact	Max. conti	nuous current ⁽²⁸⁾	20A (at 105°C)		
rating	Contact re	sistance	10mΩ (20A 6Vdc)		
	Rated load		277Vac 16A, Resistive load		
Contact mate	erial		Ag alloy		
Operate time	e ⁽²⁹⁾		15ms max.		
Release time	Release time (29)		10ms max.		
	Insulation resistance		1000MΩ min. at 1000Vdc		
Insulation	Dielectric	Between open contacts	2000Vac, 50/60Hz 1minute		
	strength	Between coil and contact	4000Vac, 50/60Hz 1minute		
Shock	Misoperati	ion	98m/s²		
resistance	Destructive	e failure	980m/s²		
Vibration	Misoperati	ion	40 to FFILe 4 From DA		
resistance	Destructive	e failure	10 to 55Hz, 1.5mm DA		
Ambient tem	perature		-40 to +105°C (no freezing and condensation)		
Life	Mechanical		100,000 cycles		
expectancy	Electrical (30)		16A- 277Vac at 105°C, 10,000cycles		
Weight			Approx. 16g		

- (28) After the rated voltage is applied to the coil for 200ms, the coil excitation voltage is reduced to the holding voltage.
- (29) Excluding contact bounce without flywheel coil diode.
- (30) This performance is Flux tight type. Regarding performance of plastic sealed type, please contact EM Devices Corporation.
- (31) EM Devices recommends that the usage of the coating agent close to the relay is to be avoided.
- (32) Please take care of the relay orientation installed in a car to avoid the malfunction by the vibration, impact and so on. If you have any questions, please contact EM Devices Corporation.

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[COIL RATING]

(Ambient temperature: 20°C)

Nominal Voltage	Coil Resistance	Must Operate Voltage (33)	Must Release Voltage (33)	Holding voltage	Nominal Operating Power
(VDC)	(Ω)±10%	(VDC)	(VDC)	(VDC)	(W)
12	51	9.6	0.6	32~36% of rated voltage (at 105°C)	2.8W

(33) Test by pulse voltage

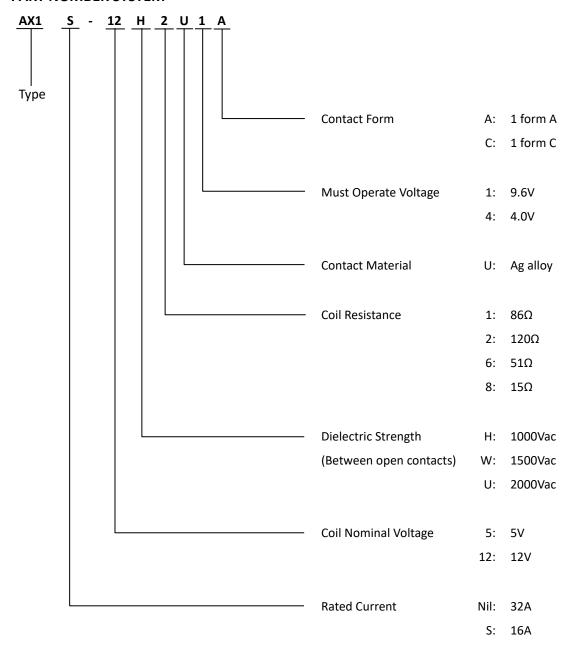
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PART NUMBER SYSTEM



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Rated	Contact	Coil Nominal	Coil	Dielectric Strength	
Current	Form	Voltage	Resistance	(Between open contacts)	Unsealed type
	1a	12VDC	120Ω	1000Vac	AX1S-12H2U1A
	1c	12VDC	120Ω	1000Vac	AX1S-12H2U1C
16A	1a	5VDC	15Ω	1500Vac	AX1S-5W8U4A
	1a	12VDC	86Ω	1500Vac	AX1S-12W1U1A
	1a	12VDC	51Ω	2000Vac	AX1S-12U6U1A
	1 a	12VDC	10Ω	1000Vac	AX1-12H2U1A
	1c	12VDC	120Ω	1000Vac	AX1-12H2U1C
32A	1 a	5VDC	15Ω	1500Vac	AX1-5W8U4A
	1a	12VDC	86Ω	1500Vac	AX1-12W1U1A
	1a	12VDC	51Ω	2000Vac	AX1-12U6U1A

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