

DA38 Series; RoHS directive conformable Specification		Drawing No.	Page
Type	DA38 Series	Date	October 27, 2009
		RD-AP-0328E	1/5

REFERENCE  
DRAWING

1. Scope

This specification covers the DA38 series; RoHS directive conformable.

2. Type designation

2-1. Formation of type designation

Example) D A 3 8 - 2 7 2 M T - A 2 1 F - XX11  
                   ①                  ②          ③ ④                  ⑤                  ⑥

2-2. Symbols

① Series name

Symbol	Series name
DA38	DA38 series

② Nominal DC sparkover voltage

The symbol denoting nominal DC sparkover voltage shall be expressed by three numerals. The first and second numerals shall represent the significant figures of nominal DC sparkover voltage in volts (V) and the third numeral shall represent the number of zeros following the significant figures.

Example) 2 7 2 → 2 7 × 1 0<sup>2</sup> = 2 7 0 0

③ Tolerance on DC sparkover voltage

Symbol	M
Tolerances	± 20%

④ Packing style

Symbol	B	T
Packing style	Bulk pack	Taping pack

⑤ Taping form

Symbol	None	A 2 1 F
Contents	Bulk pack(symbol B)	Taping pack(symbol T) A : Taping form Axial taping 2 : Spacing between tapes 52mm 1 : Pitch 5mm F : Packing form Flat pack

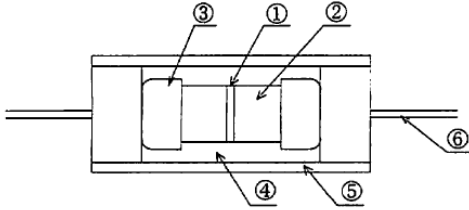
⑥ Registration Code : Option

Customer	Code
Name	XXXX

DA38 Series; RoHS directive conformable Specification	Drawing No.	Page
	RD-AP-0328E	2/5

REFERENCE  
DRAWING

3. Structure

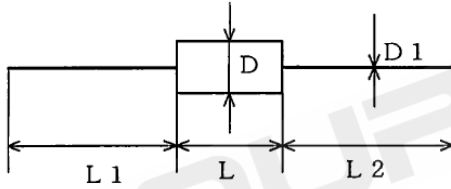


No.	Parts name
①	Micro gap
②	Element (Conductive film coating)
③	Electrode cap
④	Gas
⑤	Glass
⑥	Lead wire(Sn-3.0Ag-0.5Cu) coating

4. Temperature range

- 1) Operating temperature range : - 4 0 ~ + 8 5 °C
- 2) Storage temperature range : - 5 5 ~ + 1 2 5 °C

5. Dimension



Symbol	Dimension(mm)
D <sup>1)</sup>	φ 3.8 ± 0.5
D1	φ 0.50 ± 0.05
L <sup>2)</sup>	10.0 ± 1.0
L1	28.5 ± 3.0
L2	28.5 ± 3.0

- Note 1) Measurement position shall be the maximum diameter.  
 2) Measurement position shall be edge of glass or edge of stud whichever is the larger.

6. Rating (Initial characteristics)

Part number	DC sparkover voltage Vs (V)	Insulation resistance		Capacitance C (pF)	AC withstanding voltage
		IR (MΩ)	Applied voltage		
DA38-102M□-□□□□-XX11	800 ~ 1,200	≥ 100	DC 500V	≤ 1	—
DA38-152M□-□□□□-XX11	1,200 ~ 1,800	≥ 100	DC 500V	≤ 1	—
DA38-272M□-□□□□-XX11	2,160 ~ 3,240	≥ 100	DC 500V	≤ 1	1,200V-3s 1,000V-1min
DA38-302M□-□□□□-XX11	2,400 ~ 3,600	≥ 100	DC 500V	≤ 1	1,500V-1min
DA38-362M□-□□□□-XX11	2,880 ~ 4,320	≥ 100	DC 500V	≤ 1	1,800V-3s
DA38-452M□-□□□□-XX11	3,600 ~ 5,400	≥ 100	DC 1,000V	≤ 1	2,000V-1min
DA38-622M□-□□□□-XX11	4,960 ~ 7,440	≥ 100	DC 1,000V	≤ 1	3,000V-1min

Note; 1mm or more distance shall be needed between glass tube of the above product and a land pattern, or conductor connector to the land pattern, in case such parts exist under the above product.

DA38 Series; RoHS directive conformable Specification	Drawing No.	Page
	RD-AP-0328E	3/5

REFERENCE  
DRAWING

7. Related standards

1) UL Recognized

UL1449

UL1449 approved protector when connected to the appropriate varistor in series by means as twist and soldering, staking and welding. The appropriate varistor is as follows.

	Rated voltage	Varistor	
		V <sub>1mA</sub> *	Diameter
DA38-102M	AC125V	≥270V	≥ φ 5mm
	AC250V	≥470V	≥ φ 5mm
DA38-152M	AC125V	≥270V	≥ φ 5mm
	AC250V	≥470V	≥ φ 5mm
DA38-272M	AC125V	≥270V	≥ φ 5mm
	AC250V	≥470V	≥ φ 5mm
DA38-302M	AC125V	≥270V	≥ φ 5mm
	AC250V	≥470V	≥ φ 5mm
DA38-362M	AC125V	≥270V	≥ φ 5mm
	AC250V	≥470V	≥ φ 5mm

\*)V<sub>1mA</sub> is terminal voltage when 1mA flow.

	Contents
Standard No.	UL1449
Title	Surge Protective Devices
File No.	E318314

DA38 Series; RoHS directive conformable Specification	Drawing No.	Page
	RD-AP-0328E	4/5

REFERENCE  
DRAWING

2) UL(cUL) Recognized

UL1414 (Each of 5th. and 6th. Edition is effective now, described as follows.)

The following product is UL1414 approved protector when connected to the varistor in series by means as twist and soldering, staking and welding. The varistor is as follows.

	Rated voltage	Varistor	
		V <sub>1mA</sub> *	Diameter
DA38-272M	AC125V	≥270V	≥φ5mm
DA38-302M	AC125V	≥270V	≥φ5mm
	AC250V	≥470V	≥φ5mm
DA38-362M	AC125V	≥270V	≥φ5mm
	AC250V	≥470V	≥φ5mm

\*)V<sub>1mA</sub> is terminal voltage when 1mA flow.

Contents	
Standard No.	UL1414 Fifth Edition
Title	Across-the-Line, Antenna-Coupling and Line-By-Pass Capacitors for Radio and Television-Type Appliances
File No.	E89615

	Rated voltage	Varistor	
		V <sub>1mA</sub> *	Diameter
DA38-452M	AC250V	≥470V	≥φ5mm
DA38-622M	AC250V	≥470V	≥φ5mm

\*)V<sub>1mA</sub> is terminal voltage when 1mA flow.

Content	
Standard No.	UL1414 Sixth Edition
Title	Capacitors and Suppressors for Radio-and Television-Type Appliances
Product	Y2 antenna Coupling Gas tube Surge Suppressors to UL1414 Sixth Edition — this includes c-UL coverage to CSA C22.2 No.1-04 Eleventh Edition
File No.	E89615

DA38 Series; RoHS directive conformable Specification	Drawing No.	Page
	RD-AP-0328E	5/5

REFERENCE  
DRAWING

### 3) CSA Recognized

DA38 Series are CSA approved protector when connected to the appropriate varistor in series by means as twist and soldering, staking and welding. The appropriate varistor is as follows.

	Rated voltage	Varistor	
		$V_{1mA}$ *	Diameter
DA38-272M	AC125V	$\geq 270V$	$\geq \phi 5mm$
DA38-302M	AC125V	$\geq 270V$	$\geq \phi 5mm$
	AC250V	$\geq 470V$	$\geq \phi 5mm$
DA38-362M	AC125V	$\geq 270V$	$\geq \phi 5mm$
	AC250V	$\geq 470V$	$\geq \phi 5mm$

\* )  $V_{1mA}$  is terminal voltage when 1mA flow.

Contents	
Standard No.	CSA C22.2 No.1
Title	Audio, Video, and Similar Electronic Equipment
File No.	CA 111411

### 8. Others

This is a product with glass tube. Please pay attention to handle when this product is mounted to the board.

DA38 series; RoHS directive conformable		Drawing No.	Page
Characteristic Specification		RD-AQ 0126E	1/3
Type	DA38 series	Date	March 15, 2008

REFERENCE  
DRAWING

#### 1. Scope

This specification covers the DA38 series; RoHS directive conformable.

#### 2. Appearance

Item	Testing method	Performance
Appearance	Outer appearance shall be visually examined.	No visual damage.

#### 3. Electric performance

Item	Testing method	Performance
DC sparkover voltage(Vs)	Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 1mA max, and test period is 1 second max.	Meet specified value.
Insulation resistance(IR)	Measure the insulation resistance (IR) applying regulated voltage across the terminals.	100MΩ or over
Capacitance(C)	Measure the electrostatic capacitance(C) by applying a voltage of less than 6V (at 1kHz) across the terminals.	1pF or less
AC withstanding voltage	Measure the current across the terminals with withstand voltage tester or ammeter at regulated voltage (frequency of 50 to 60Hz) and regulated time.	1mA or less

#### 4. Mechanical performance

Item	Testing method	Performance
Lead wire pull strength	(In accordance with JIS C 60068-2-21) After gradually applying a 5N(0.5kgf) load, keep the unit fixed for 10±1 seconds. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.
Lead wire bending strength	(In accordance with JIS C 60068-2-21) The unit shall be secured with its lead wire kept vertical and a 2.5N (0.25kgf) weight applied below in the axial direction. The lead wire shall gradually be bent to 90° in one direction at a point of 3mm from the body along the radius of curvature (0.75 to 0.80mm), and again back to the original position. This shall be repeated 2 times. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.
Vibration	(In accordance with JIS C 60068-2-6) The specimen shall be vibrated by its lead wires with total amplitude of 1.5mm and a varying frequency of 10Hz to 55Hz to 10Hz (each 1 minute) for a period of 120 minutes respectively in each X, Y and Z directions. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.

DA38 series; RoHS directive conformable Characteristic Specification	Drawing No.	Page
	RD-AQ-0126E	2/3

REFERENCE  
DRAWING

5. Reliability performance

Item	Testing method	Performance															
Resistance to cold	(In accordance with JIS C 60068-2-1) The specimen shall be subjected to $-55 \pm 3^{\circ}\text{C}$ for 1,000 hours without load and then stored at room temperature and humidity for 4 hours. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.															
Resistance to heat	(In accordance with JIS C 60068-2-2) The specimen shall be subjected to $125 \pm 2^{\circ}\text{C}$ for 1,000 hours without load and then stored at room temperature and humidity for 4 hours. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.															
Resistance to humidity	(In accordance with JIS C 60068-2-3) The specimen shall be subjected to $85 \pm 2^{\circ}\text{C}$ 85%RH for 1,000 hours without load and then stored at room temperature and humidity for 4 hours. Thereafter, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.															
Heat cycle	(In accordance with JIS C 0025) Repeat the temperature cycle shown below 25 times then store parts at room temperature and humidity for 4 hours. Thereafter, the characteristics of items Vs, IR and C shall be measured. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Period</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-55 \pm 3^{\circ}\text{C}</math></td> <td>30 minutes</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>3 minutes</td> </tr> <tr> <td>3</td> <td><math>125 \pm 2^{\circ}\text{C}</math></td> <td>30 minutes</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>3 minutes</td> </tr> </tbody> </table>	Step	Temperature	Period	1	$-55 \pm 3^{\circ}\text{C}$	30 minutes	2	Room Temp.	3 minutes	3	$125 \pm 2^{\circ}\text{C}$	30 minutes	4	Room Temp.	3 minutes	Vs, IR, C are satisfied; 3.Electrical performance.
Step	Temperature	Period															
1	$-55 \pm 3^{\circ}\text{C}$	30 minutes															
2	Room Temp.	3 minutes															
3	$125 \pm 2^{\circ}\text{C}$	30 minutes															
4	Room Temp.	3 minutes															
Surge life	Apply an impulse current (8/20 100A) for 300 times at 30 second intervals across the terminals. Thereafter, the characteristics of items Vs, IR and C shall be measured. For 622M apply an impulse current for 200 times at 30 second intervals.	Vs: $ \Delta V_s/V_s  \leq 30\%$ IR, C: satisfied; 3.Electrical performance.															
Surge current characteristic capacity	Apply an impulse current for 1 time across the terminals. Thereafter, the characteristics of items Vs, IR and C shall be measured. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Item</th> <th>Impulse current</th> </tr> </thead> <tbody> <tr> <td>272M, 302M, 362M</td> <td>8/20 2,000A</td> </tr> <tr> <td>622M</td> <td>8/20 1,500A</td> </tr> <tr> <td>102M, 152M, 452M</td> <td>8/20 1,000A</td> </tr> </tbody> </table>	Item	Impulse current	272M, 302M, 362M	8/20 2,000A	622M	8/20 1,500A	102M, 152M, 452M	8/20 1,000A	Vs: $ \Delta V_s/V_s  \leq 50\%$ IR, C: satisfied; 3.Electrical performance.							
Item	Impulse current																
272M, 302M, 362M	8/20 2,000A																
622M	8/20 1,500A																
102M, 152M, 452M	8/20 1,000A																

DA38 series: RoHS directive conformable Characteristic Specification	Drawing No.	Page
	RD-AQ-0126E	3/3

REFERENCE  
DRAWING

5. Reliability performance [Continued]

Item	Testing method	Performance						
Surge current capacity	Apply an impulse current for 3 times at 5 minute intervals across the terminals. Thereafter, outer appearance shall be visually examined.	No visual damage.						
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Item</th> <th>Impulse current</th> </tr> </thead> <tbody> <tr> <td>102M, 152M, 272M, 302M, 362M</td> <td>8/20 2,000A</td> </tr> <tr> <td>452M, 622M</td> <td>8/20 1,500A</td> </tr> </tbody> </table>		Item	Impulse current	102M, 152M, 272M, 302M, 362M	8/20 2,000A	452M, 622M	8/20 1,500A
	Item		Impulse current					
	102M, 152M, 272M, 302M, 362M		8/20 2,000A					
452M, 622M	8/20 1,500A							

6. Mountability

Item	Testing method	Performance
Solderability	(In accordance with JIS C 60068-2-20) After dipping the lead wire within 3mm of the body in 235±5°C solder for 5±0.5 seconds, the lead wire shall be visually examined.	Lead wire is evenly covered with solder, no less than 90%.
	After dipping the lead wire within 3mm of the body in 245±5°C solder(Sn/3.0Ag/0.5Cu) for 5±0.5 seconds, the lead wire shall be visually examined.	
Resistance to soldering heat	(In accordance with JIS C 60068-2-20) After dipping the lead wire within 3mm of the body in 350±10°C solder for 3±1 seconds, the characteristics of items Vs, IR and C shall be measured.	Vs, IR, C are satisfied; 3.Electrical performance.
	After dipping the lead wire within 3mm of the body in 350±10°C solder(Sn/3.0Ag/0.5Cu) for 3±1 seconds, the characteristics of items Vs, IR and C shall be measured.	
	In the use of soldering iron, after soldering the lead wire at 3mm or more distance from the body, at 400±10°C for 3±1 seconds, the characteristics of items Vs, IR and C shall be measured. Note: Please be careful not to touch glass directly by the iron chip.	

Note: The flux to be used shall consist of 25% by mass of resin (colophony: JIS K 5902) in 75% by mass of 2-propanol (isopropanol) of JIS K 8839 or of ethyl alcohol 99.5 of JIS K 8101.  
(In accordance with JIS C 60068-2-20)