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GLORYFIELDS

Issue No. : 151EVMA051006A1

Date of Issue : October 06.2005

Classification New Changed

PRODUCT SPECIFICATION FOR APPROVAL

Product Description : 3mm Square SMT Trimmer Potentiometers

Product Part Number : EVM3ESX50B**

Country of Origin : JAPAN

Applications : Standard Components for Generalized Electric Equipment

*If you approve this specification, please fill in and sign the below and return 1 copy to us.

Approval No :	
Approval Date :	
Executed by :	

	(signature)
Title :	
Dept. :	

Circuit Components Business Unit
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Prepared by : Engineering Section

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Signature

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Name(Print)

Title : Manager of Engineering

Panasonic

1 Part Numbering System

EVM	3ES	X50	B13
A	B	C	D

A:Product Code
C:Packaging Spec.

B:Type and Construction
D:Taper and Resistance

2 Appearance and Shape

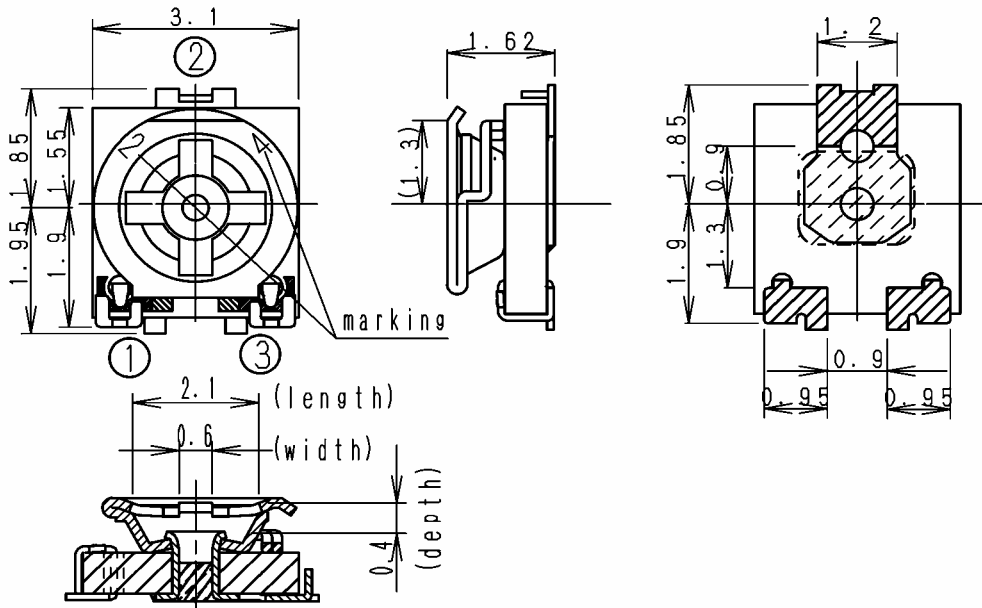
2.1 Marking

Nominal Total Resistance shall be marked by 2 digits. Please refer to table noted right side.

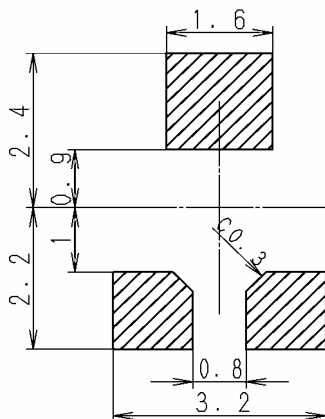
Nominal Total Resistance	Marking
100 ohm	12
1 k ohm	13
10 k ohm	14
1 M ohm	16

2.2 Dimensions in mm(not to scale)

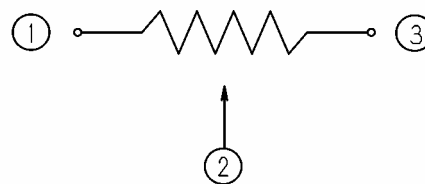
General Tolerance ± 0.3



Recommended Land Pattern

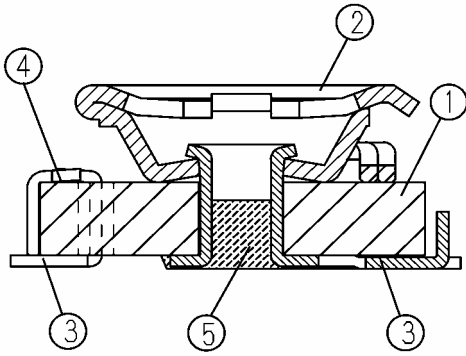


Circuit Diagram



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2.3 Constructions and Part List



NO	Parts	Materials	Notes
1	Resistor Base	Base Alumina Resist. Metalgraze	
2	Brush	Stainless Steel	
3	Terminal	Stainless Steel	Tin Plating
4		Solder	Tin, Silver, Copper Alloy Solder
5	Coating	UV Resin	

3 Performance

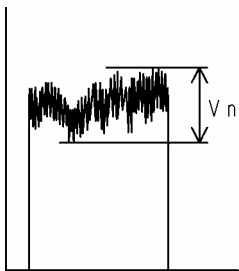
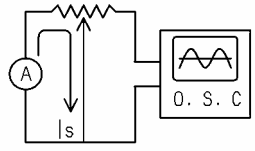
3.1 Rating

Item	Performance	Remarks
Power Rating	0.15 W For potentiometers operated in ambient temperature above 70 deg.C , Power Rating shall be derated in accordance with the figure at right.	<p>Power Derating Curve</p> <p>Voltage Rating</p> $E = \sqrt{P \times R}$ <p>E: Voltage Rating(V) P: Power Rating(W) R: Nominal Total Resistance (ohm)</p>
Maximum Operating Voltage	50 V [DC]	
Voltage Rating	Voltage Rating should be Maximum Operating Voltage when E shall exceed Maximum Operating Voltage.	
Operating Temperature Range	-40 deg.C to 100 deg.C	
Nominal Total Resistance	100 ohm to 1 M ohm	
Tolerance of Total Resistance	± 25 %	

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3.2 Characteristics

3.2.1 Electrical Characteristics

Item	Performance	Test Methods						
Resistance Law	0B (Linear)	Conforming to JIS C 5260-1 4.9						
Minimum Resistance	Shall be below 2 % of Nominal Total Resistance.	Conforming to JIS C 5260-1 4.7						
Temperature Coefficients of Resistance	Shall be within $\pm 250 \times 10^{-6}$ /deg.C	Conforming to JIS C 5260-1 2.2.19						
Sliding Noise	<p>Shall be below 5 % of Nominal Total Resistance.</p> $\frac{V_n / I_s}{R} \times 100 \leq 5 \%$ <p>V_n :Noise voltage I_s</p> 	<p>Conforming to JIS C 5260-1 4.15 method B.</p> <p>Constant current power source</p>  <p>Oscilloscope or X-Y recorder</p> <p>rate of actuator at measurement 5 s/cycle to 15 s/cycle</p> <p>Test current I_s</p> <table border="1" data-bbox="925 1142 1348 1317"> <tr> <td>less than 10 k ohm</td> <td>10</td> </tr> <tr> <td>more than 10 k ohm and less than 1 M ohm</td> <td>100</td> </tr> <tr> <td>more than 1 M ohm</td> <td>1000</td> </tr> </table>	less than 10 k ohm	10	more than 10 k ohm and less than 1 M ohm	100	more than 1 M ohm	1000
less than 10 k ohm	10							
more than 10 k ohm and less than 1 M ohm	100							
more than 1 M ohm	1000							

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3.2.2 Mechanical Characteristics

Item	Performance	Test Methods
Angle of Rotation	Electrically Effective Range 260 ° ±20 °	Conforming to JIS C 5260-1 4.4.6
Rotation Torque	2 mN m to 20 mN m	Conforming to JIS C 5260-1 4.18
Adhesion	No damage on appearance, mechanical and electrical performance.	<p>at recommended land pattern on the test printed wiring board.</p> <p>horizontal direction 10 N vertical direction 5 N Apply the pressure in two direction for each time 10 s as illustrated above.</p>
Resistance to	$V_{12} / V_{13} \times 100 < \pm 2$ <p>(4 r i m k l - 3)</p>	.5 m m

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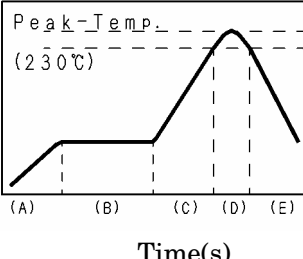
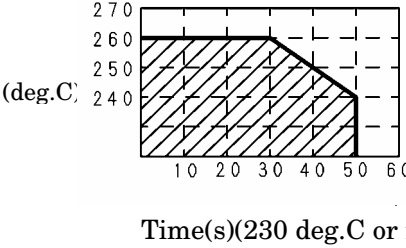
3.2.3 Environmental Characteristics

Item	Performance	Test Methods
Resistance to Cold	Total resistance change shall be within $\pm 5\%$ of initial value.	Test temperature : -40 deg.C \pm 3 deg.C Test duration : 96 h \pm 4 h Brush setting point : middle point
Resistance to Heat	Total resistance change shall be within $\pm 5\%$ of initial value.	Test temperature : 70 deg.C \pm 2 deg.C Test duration : 500 h \pm 12 h Brush setting point : middle point
Change of Temperature	Total resistance change shall be within $\pm 5\%$ of initial value.	Low temperature : -40 deg.C \pm 3 deg.C 30 min High temperature : 85 deg.C \pm 2 deg.C 30 min Room temperature : 5 min Number of temperature change cycle : 50 cycle Brush setting point : middle point
Resistance to Damp, Heat	Total resistance change shall be within $\pm 5\%$ of initial value.	Test temperature : 60 deg.C \pm 2 deg.C Relative humidity : 90 %RH to 95 %RH Test duration : 500 h \pm 12 h Brush setting point : middle point
Endurance (Under Damp Load)	Total resistance change shall be within $\pm 5\%$ of initial value.	Test temperature : 60 deg.C \pm 2 deg.C Relative humidity : 90 %RH to 95 %RH Test duration : 500 h \pm 12 h Load : Voltage Rating Loading method : 1.5 h on and 0.5 h off (across terminations 1 and 3) Brush setting point : middle point
Endurance (Under Rated Load)	Total resistance change shall be within $\pm 5\%$ of initial value.	Test temperature : 70 deg.C \pm 2 deg.C Test duration : 500 h \pm 12 h Load : Voltage Rating Loading method : 1.5 h on and 0.5 h off (across terminations 1 and 3) Brush setting point : middle point
Endurance (To Sliding)	Total resistance change shall be within $\pm 15\%$ of initial value.	Number of test revolution : 20 revolution (without electrical load) Revolutional speed : 5 /min to 10 /min One revolution means more than 90 % of the total electrical range.

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4 Application Notes

4.1 Mounting Notes

<p>Reflow Soldering</p>	<p>When reflow soldering, please observe below conditions.</p> <div style="text-align: center;">  <p>Peak-Temp. (230°C)</p> <p>Time(s)</p> </div> <p style="text-align: right;">to the following (230 deg.C or more) graph. (E)Cooling zone 200 deg.C to 100 deg.C 1 deg.C/s to 4 deg.C/s</p> <div style="text-align: center;">  <p>Time(s)(230 deg.C or more)</p> </div> <p style="text-align: right;">please consult with us before use. (3)The temp. strongly depends on measuring method of profile, please note how to do it. (4)In case that temp.changes by PWB size, mounting density and so on, please check them by each PWB.</p>
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<p>Manual Soldering</p>	<p>When manual soldering, please observe below condition.1</p>
<p>(2)</p>	<p>ement and contactor cause fatal damage, therefore in case of making wash and rinse, please consult before use.</p>

(2)Design PCB

When designing land pattern, please design it,in accordance with recommended land layout described in this production specifications for information.

(3)Mounting Notes

Mounting top side pressure loaded on the trimmer potentiometer shall be 9 N maximum. Overload is afraid to cause fatal damage as transform or breakdown.

After soldering ,solder ball or solder scrap may cause short between the land pattern,so please make enough insulation there.

(4)Adjustment Notes

Adjusting top side pressure loaded on the contactor shall be 9 N maximum. Overload is afraid to cause fatal damage as transform or breakdown of adjustment knob.

In case that the moving contact is set near the border portion between electrically effective and non-effective range ,electrically non-effective and open range, be afraid to be deviation of setting value. So avoid the setting like this.

(5)Lock paint

Avoid applying any lockpaint otherwise intrusion or dissipation of the paint may cause contact dectect. In case of being subjected to apply it,please avoid using adhesives that may generate corrosive gas.

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4.2 Circuit Diagram Notes

(1)Power Rating

The Maximum value of electric power which can continuously dissipated from all area of a resistive element at the rated ambient temperature.

In general, rated power shall be registrated in accordance with size & kind of them.

Please observe to use below rated power. Continuously dissipation is afraid to cause fatal damage, for example, deviation, firing, smoking.

(2)Influence of ambient temperature

Influence of ambient temperature can not be neglected for operating trim-pot in general case.

Please comply with power derated curve, in case of using it under the condition of exceeding specified power rating.

4.3 Mounting Notes

This trimmer potentiometer is not available for sealed type, so this is afraid to be influented fatally under the following conditions.

(1)Corrosive gas atomosphere of Cl, H₂S, NH₃, NO_x, SO₂ and so on.

(2)Moisture atomosphere of waterdrop, dewdrop and so on.

(3)Water, Salt, oil, chemicals, solvents and so on.

(4)Atmosphere of direct solar radiation.

4.4 Storage Notes

Storage under the following condition should be avoided.

Be afraid to degrade some performances and soldering wettability.

(1)Temperature: less than -10 deg.C and more than 40 deg.C,

Relative humidity: more than 85 %.

(2)Atmosphere of corrosive gas.

(3)Long term storage of over 6 months after delivery.

(4)Atmosphere of direct solar radiation.

Please store the package without unsuitable load and stress.

While remaining some product after opening the package, any countermeaure of shutting moisture gas and so on, should be done.

4.5 Application Notes for electric equipments and instruments

Although enough care is taken to ensure trimmer potentiometer quality.

As life-end breakage mode, some fatal trouble might generate, such as spec-out resistance change, short or open circuits, abnormally generated heat.

So please review the affect of any single fault of a potentiometer in advance.

(1)The product specification for information ensures the quality of pre-set potentiometers.

For applying, please should evaluate this product under the condition built in the appliances.

(2)The troubles caused by applying this product under out-specification should not be warranbted.

(3)When applying for high-excellent liabilty and security appliances, for example, traffic transportation equipments (train, auto vehicles, traffic-signal equipments), medical apparatus, aircraft, spacecraft, heating, firing, gas, rotating equipment, security equipment, atomic-power equipment, machine-tool, and so on.

Please make enough considerations to design fail-safe circuit system for safety as followings.

*To make a safety system by a protective circuit or a protective device.

*To make a safety system by the redundant circuit so that the single fault of a trimmer potentiometer does not cause a dangerous situation.

(4)In case of arising some questions on the safety of this product, please don't hesitate to contact with our company and further technical evaluation should be done.

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5 Operation of product specification for information

(1) Please return one set specification as approval one with accepted stamp or sign, after confirming and checking it .

In case that it will not be returned, in spite of taking three months or more from issue date noted on the cover page of this specification.

We could estimate that it has been already accepted, so please consider to operate it.

(2) Changing the content of product of specification for information is to be performed after pre-coordination with customer.

When you confirm revision of this specification, the previous version shall lose its validity.

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