

Preliminary

Messrs. _____

Shock Sensor Specification

Part No. : PMLE480W-R

RoHS Compliant

Halogen-Free Compliant

16.Dec. 2010

Approved by _____ Kazuki Shimizu _____

Checked by _____ Yasuhiro Nakai _____

Issued by _____ Akira Oikawa _____

KYOCERA CORPORATION

Modification Table

No.	Date	Change	Apploved	Checked	Issued
00	16.Dec 2010	The first edition	Kazuki Shimizu	Yasuhiro Nakai	Akira Oikawa

1.Scope

This specification shall cover the characteristics of the shock sensor.

Preliminary

2.Kyocera's Type Name

PMLE480W-R

3.Customer's Type Name

4.Electrical Characteristics

Items	Specifications
4-1 Primary Axis Inclined Angle	0 ± 3degree
4-2 Capacitance	890pF ± 30%, at 1Vrms, 1kHz
4-3 Charge Sensitivity	0.608 pC/G ± 15% under vibration at 200Hz, 2G
4-4 Insulation Resistance	0.5Gohm minimum, at 10VDC after 1min.
4-5 Resonant Frequency	19.5 ± 3.5kHz
4-6 Non-linearity	5% maximum, under vibration at 25G
4-7 Charge Sensitivity Temperature Drift	Ta : 70°C 7.7±3.0% Ta : 0°C -4.2±2.0% under vibration at 200Hz, 2G

<Measurement Condition>

The reference temperature shall be 25 °C ±5°C.

5.Dimensions and Marking

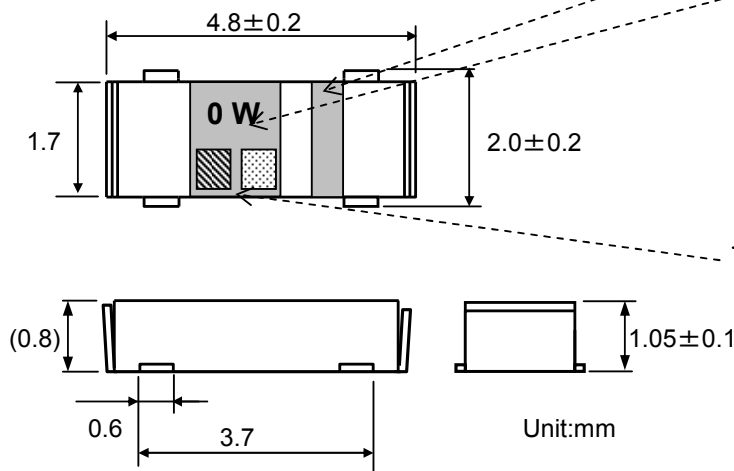


Fig.1

Marking of Polarity

Characteristic Spec

0: Initial of Primary Axis Inclined Angle.

W: Specification

Manufacturing Day Code :

Day	1	2	3	4	5	6	7	8	9	10
Cade	A	B	C	D	E	F	G	H	J	K

Day	11	12	13	14	15	16	17	18	19	20
Cade	L	M	N	P	Q	R	S	T	U	V

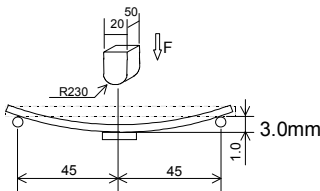
Day	21	22	23	24	25	26	27	28	29	30	31
Cade	W	X	Y	Z	a	b	c	d	e	f	g

Manufacturing Month Code :

2010 Jan. ~ Dec. : N ~Z except "O"
 2011 Jan. ~ Dec. : a ~m except "i"
 2012 Jan. ~ Dec. : n ~z except "o"
 2013 Jan. ~ Dec. : A ~M except "I"

Note:These alphabets should be repeated after Jan.2014.

6.Environmental Characteristics**Preliminary**

Items	Conditions
6-1.High Temperature Storage Test	Keep in a chamber at $85 \pm 2^{\circ}\text{C}$ for 1000 +12/-0 hours, and then keep at room temperature for 1 hour. The characteristics of shock sensor shall meet the specifications.
6-2.Low Temperature Storage Test	Keep in a chamber at $-40 \pm 2^{\circ}\text{C}$ for 1000 +12/-0 hours, and then keep at room temperature for 1 hour. The characteristics of shock sensor shall meet the specifications.
6-3.Moisture Resistance Test	Keep in a chamber at 90 to 95 % R.H. and $60 \pm 2^{\circ}\text{C}$ for 500 +12/-0 hours, and then keep at room temperature for 1 hour. The characteristics of shock sensor shall meet the specifications.
6-4.Temperature Cycling Test	Apply 100 thermal cycles with the following temperatures: <ul style="list-style-type: none"> - upper temperature 85°C for 20 minutes and transfer time 10 minutes - lower temperature -40°C for 20 minutes and transfer time 10 minutes - total cycle time is 1hour and then left at room temperature for 1 hour. The characteristics of shock sensor shall meet the specifications.
6-5.Mechanical Shock Test	After applying the acceleration at 29430m/sec^2 {3000G} in each of X, Y and Z axis (each 3 times). The characteristics of shock sensor shall meet the specifications.
6-6.Solderability Test	At first, being soaked in the Methanol solution containing Rosin for 5 seconds and then being dipped in a bath of Pb/Sn solder at $250 \pm 5^{\circ}\text{C}$ for 4 ± 0.5 seconds. The surface of the electrode terminal shall be soldered more than 95%.
6-7.Resistance to Soldering Heat Test	Pre-heat temperature is 150 to 180°C for 1 minute. High temperature is $250 \pm 5^{\circ}\text{C}$, over 200°C for 20 seconds max.(2times). Then keep at room temperature for 1 hour. The characteristics of shock sensor shall meet the specifications.
6-8.Board Flex Test	After soldered on the circuit board specified as below, then the load which cause 3 mm bend to the board is applied. The characteristics of shock sensor shall meet the specifications. The shock sensor cause no defect in the appearance. (Circuit Board: FR4, 100 x 40 x 1.6) 

<Measurement Condition>The reference temperature shall be $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

7. Recommended Land pattern

Preliminary

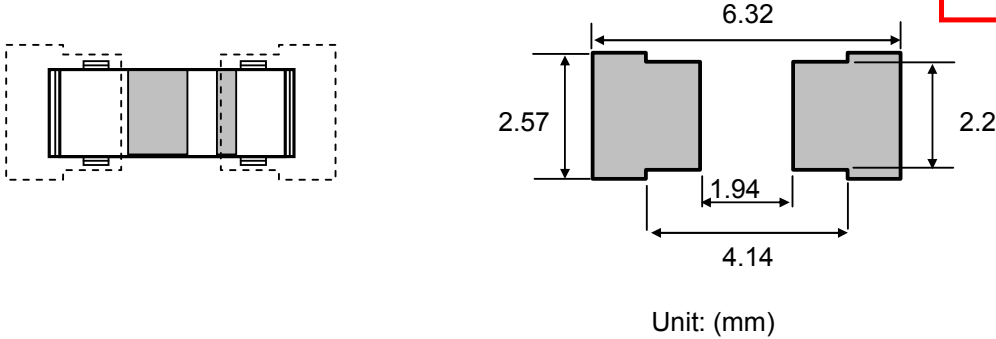


Fig.2 Recommended Land pattern

8. Recommended Convection Reflow profile

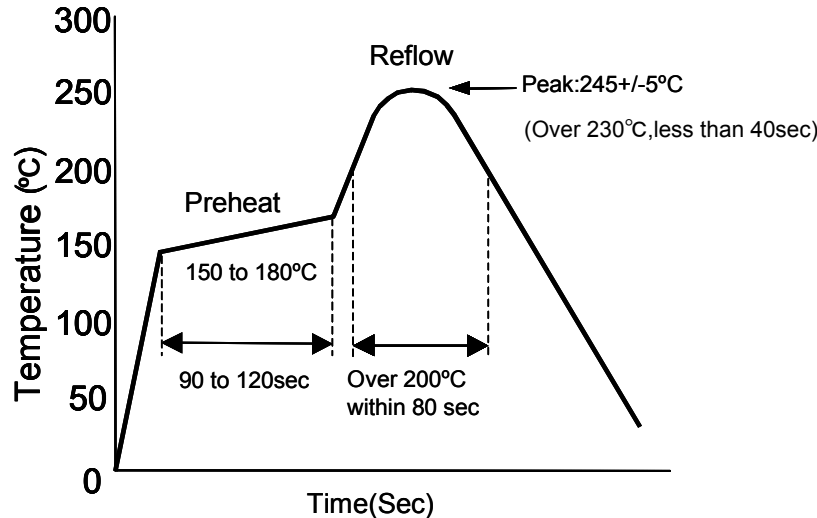
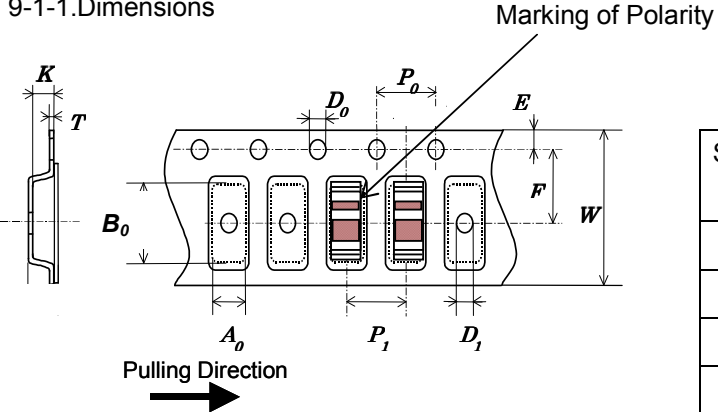


Fig.3 Recommended Convection Reflow profile

9. Taping Specifications

9-1. Carrier Tape

9-1-1. Dimensions



Unit: (mm)

Sym bol	Dimensions	Sym bol	Dimensions
A_0	2.25 ± 0.1	P_0	4.0 ± 0.1
B_0	4.4 ± 0.1	P_1	4.0 ± 0.1
W	$12.0 +0.3/-0.1$	D_0	$1.5 +0.1/-0$
E	1.75 ± 0.1	K	1.25 ± 0.1
F	5.5 ± 0.05	T	0.3 ± 0.05

Fig.4 Emboss Carrier Tape Dimensions

9-2. Taping

Preliminary

9-2-1. Taping Quantity

One reel of the carrier tape shall pack 3500 pcs. Shock sensor shall be contained in pocket continuously.

9-2-2. Dimensions

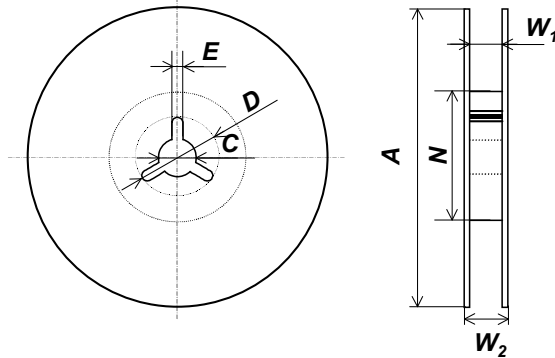


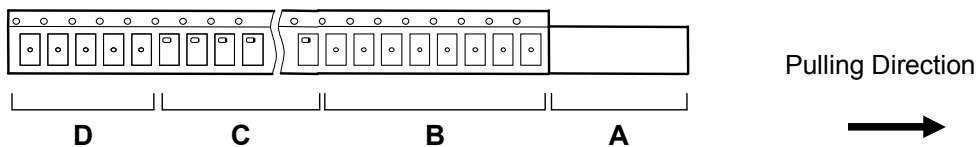
Fig.5 Reel

Unit: (mm)

Symbol	A	N	W₁	W₂
Dimensions	180±5.0	60min.	12.5 +2.0/-0.0	20.5 max.
Symbol	C	D	E	
Dimensions	13.0±0.2	21.0±0.8	2.0±0.5	

9-2-3. Leader and Blank Pocket

Package shall consist of leader, blank pocket and loaded pocket as follows. (fig.6)



- A) Leader
- B) Blank Pocket (160mm Min.)
A+B: 400mm to 560mm
- C) Load Pocket
- D) Blank Pocket (40 to 190mm)

Fig.6 Packing Method

Peeling load of top tape shall be 0.1N {10gf} to 0.7N {70gf} from Carrier Tape.

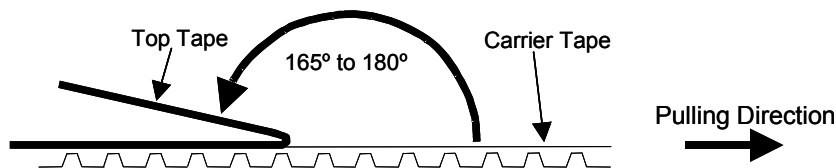


Fig.7 Peeling Strength

Preliminary**9-2-4. Reel label**

A reel label shall be contained as below: (Based on EIAJ C-3 format)

- A) Customer P/N
- B) Lot No.
- C) Quantity
- D) Shipping date
- E) Vender Name

9-2-5. Exterior Package label

Shock sensor shall be packed properly to avoid defect in transportation and the marking of exterior package shall be contained as below:

- A) Name of Customer
- B) P/O No.
- C) Customer P/N
- D) Lot No.
- E) Quantity
- F) Shipping Date
- G) Vender Name

10. The agreement of this specifications

Should any part of the content of this specification become questionable, it shall be settled by mutual deliberations.

11. Remarks on Usage

- A) This part can use only reflow soldering.
- B) Not washable
- C) Maximum temperature is 280 degree.

12. RoHS Compliant

- A) Sensor Case: LCP(liquid crystal polymer)
- B) Terminal: Bronze with phosphate (thickness 100 um)
Plating: Cu(1-2um), Ag(1-3 um)
- C) Element: Piezo Ceramic, contains lead-oxide, however, piezo-electronic devices are exempted from RoHS compliant requirement of article 4(1).
(Refer to Annex, Section 7)

All materials meet to RoHS Compliant.

13. Halogen-Free Compliant

- A) Bromine (Br) <900ppm (0.09%)
- B) Chlorine (Cl) <900ppm (0.09%)
- C) Total concentration of Chlorine (Cl) + Bromine (Br) <1500ppm (0.15%)
- D) Antimony Trioxide (Sb₂O₃) <1000ppm (0.1%)
- E) Red Phosphorus <1000ppm (0.1%)

All materials meet to Halogen-Free Compliant.