☐~~For Receipt~~ ■ For reference

Date of Issue : Feb.17. 2009

TO: _____

OMRON CORPORATION
OMRON KURAYOSHI Co., Ltd.
Product Engineering Group, 1st Product Department

Prepared by	Checked by	Approved by
17 Feb, 2009 K. Izawa		H. Yamada

RoHS directive Compliant part

PRODUCT SPECIFICATIONS

Description : Ultra Subminiature Basic Switch

Part Number : D2L-D

Product Specifications No. : 2795827-8

■ Please return __—__ copy (copies) of this specification sheet signifying your acceptance by stamping below.
Due date : ———

Registration part number for customer
Description : Part number :

Receipt Stamp (For receipt purpose only)
■Please accept handling of this specification sheet as for reference use if not reply received.

Submitted Stamp
SUBMITTED FEB. 17. 2009 OMRON OMRON Corporation
Handled by

Distribution

	Copy
Customer	
Sales ( )	

PRODUCT SPECIFICATIONS	Description : Ultra Subminiature Basic Switch
	Part number : D2L-D

1. Safety Standard (File No.)
   ---

2. Structure
   2. 1 Outline drawing No. 9455919-1
   2. 2 Mechanism Snap action
   2. 3 Contact form Single pole Single throw (SPST) C-NO
   2. 4 Protective structure IP40 Conforming to *IEC standard *IEC : International Electrotechnical Commission
   2. 5 Terminal PCB terminals (Refer to outline drawing for details)

3. Mechanical Characteristics
   3. 1 Operating characteristics (Initial value)

	Item	Abbr.	Unit	Specification value	
1	Operating force	OF	N	Max.	0.8
2	Releasing force	RF	N	Min.	0.15
3	Overtravel	OT	mm	Min.	0.10
4	Movement differential	MD	mm	Max.	0.12
5	Free position	FP	mm		3.5±0.2
6	Operating position	OP	mm		3.2±0.2

   3. 2 Malfunction vibration
   Open contact duration shall be 1msec. max. when the following vibration is applied;
   Amplitude : 1.5mm
   Frequency : 10 to 55Hz
   Cycle : 3 to 5 minutes
   Direction : X, Y and Z axis
   Time : 10 minute per axis
   3. 3 Vibration durability
   No electrical or mechanical defect after the following vibration is applied;
   Amplitude : 1.5mm
   Frequency : 10 to 55Hz
   Cycle : 3 to 5 minutes
   Direction : X, Y and Z axis
   Time : 2 hours per axis
   3. 4 Malfunction shock
   Open contact duration shall be 1msec. max. when the following shock is applied;
   Shock : 300m/s^2 Max.
   Direction : X, Y and Z axis
   Time : 3 times per axis
   3. 5 Shock durability
   No electrical or mechanical defect after the following shock is applied;
   Shock : 1000m/s^2 Max.
   Direction : X, Y and Z axis
   Time : 10 times per axis

Condition common to Section 3. 2 and 3. 4
Applied voltage : 5VDC
Applied current : 1mA
Actuator position : Free position or total travel position (detected by oscilloscope)

3. 6 Actuator strength

No electrical or mechanical defect when the following force is applied to the actuator;

Direction : Actuator operation direction

Force : 10 times of the specified operating force (OF)　8N

Time : 1 minute

3. 7 Permissible operating frequency

200 operations/minute max.

3. 8 Permissible operating speed

1 to 500mm/second

4. Electrical Characteristics

4. 1 Ratings

0.1A, 30VDC (resistive load)

4. 2 Contact resistance

Initial value 100mΩ max.

Measured by milliohm meter at total travel position (TTP)

4. 3 Insulation resistance, Dielectric strength

Item / Measuring part	Insulation resistance (500VDC megger)	Dielectric strength (50/60Hz for 1 minute)
Between terminals of the same polarity	100MΩ Min.	600VAC

4. 4 Degree of protection against electric shock

Class I (protecting by ground in addition to basic insulation for shock prevention)

4. 5 Proof tracking index (PTI)

175 level (Classification according to UL Yellow Book : PLC level 3　175≦CTI＜250)

5. Environmental Characteristics

5. 1 Heat resistance

No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of 85±2°C for 96 hours.

5. 2 Cold resistance

No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of −40±2°C for 96 hours.

There shall be no icing at a lower temperature range.

5. 3 Humidity resistance

No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of 40±2°C and 90 to 95%RH for 96 hours.

6. Usage/Storage Environment

6. 1 Ambient temperature/humidity range

Temperature : −25 to +65°C (No dewing or icing)　Humidity : 60%RH Max.

Humidity : 95%RH Max. (+5 to +65°C)

6. 2 Storage temperature/humidity range

Temperature : −25 to +65°C (No dewing or icing)　Humidity : 85%RH Max.

Humidity : 95%RH Max. (+5 to +35°C)

7. Durability

7. 1 Durability

No electrical or mechanical defect at the standard test condition when switching the rated load at 1mA, 6VDC (resistive load) by 3,000,000 operations at the operating frequency of 120 operations/minute at the full stroke.

The contact resistance shall be 10Ω max. and the dielectric strength between terminals of the same polarity shall be excluded.

8. Standard Test Condition and Criteria

8. 1 Standard test condition

Temperature : 20±15°C Humidity : 65±20%RH

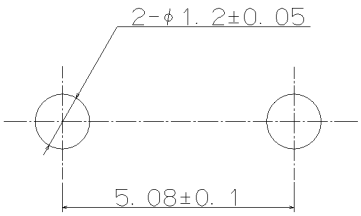
8. 2 Definition of "No electrical or mechanical defect"

Operating characteristics : Not exceeding ±20% of the specification value

Contact resistance : 4 times the initial specification value Max.

Insulation resistance : 10MΩ Min.

Dielectric strength : Meeting the specification value



9. Precautions

9. 1 Switch mounting

・Please refer to the figure in the right for mounting holes.

・Cuttng or bending of terminals shall be prohibited. It can result in failure.

9. 2 Stroke setting for switch

・Setting an operating dog in the direction where the actuator moves and detaching the dog from the actuator completely when the switch is at the free position (FP).

・Avoiding an impact operation as much as possible as it can cause life deterioration.

9. 3 Wiring for switch

・Flux shall not go up to mounting surface.
Furthermore it shall be applicated thinly and evenly on the soldering surface in order to avoid the penetration of flux into the switch inside. Flux penetration into switch inside can result in contact failure or operating failure.

・Spray fluxer shall be used for applicating flux and dip type shall be prohibited.

・Non-corrosible rosinous flux shall be used.

・For automatic soldering, the condition for single PCB with thickness 1.6 mm shall be as follows:
Temperature : 260 °C Max.
Soldering time : 3 seconds Max.

・Preheat shall be 100°C Max., 60 sec. Max. on mounting surface and applying excess heat shall be avoided. Excess heat can cause deformation of molding parts and result in the operating failure.

・Manual soldeing condition shall be tip temerature at 300°C, 3 sec. Max.

・Not applying any external force for 1 minute after soldering.

・Washing by solvent shall be avoided as D2L-D is not sealed type switch.

・Leaving switch in the place with PCB powder or handling switch with gloves with PCB powder shall be avoided as it can cause flux or PCB powder penetrated into switch inside after soldering.

・Switch after removing solder shall not be reused, as it can be deformed by heat.

9. 4 Usage/storage environment for switch

・Avoiding the location where a corrosive gas is generated or temperature changes suddenly, the ambience of high temperature or humidity, dusts and others.

・It is recommended that the switch should be inspected before use if it is stored for more than 6 months after the production, depending on the location.

10. Warranty

10. 1 Content

(1) Warranty period

The warranty period for an OMRON product is one year from either the date of purchase or the date on which the OMRON product is delivered to the specified location.

(2) Extent of warranty

If an OMRON product is subject to a failure for which OMRON is responsible during the warranty period, either a replacement product will be provided or the defective product will be repaired free of charge at the place of purchase.

This warranty, however, will not cover the problems that occur as a result of any of the following;

1) Using the OMRON product under conditions or in an environment not described in catalogs or in the specifications, or not operating the OMRON product according to the instructions contained in catalogs or in the specifications

2) Problem caused by something other than the OMRON product.

3) Modifications or repairs performed by a party other than OMRON.

4) Using the OMRON product for other than its designed purpose.
5) Problems that could not have been foreseen with the level of science and technology that existed at the time the OMRON product was shipped.
6) Problems caused by an Act of God or other circumstances for which OMRON is not responsible.
This warranty covers only the OMRON product itself. It does not cover any other damages that may occur directly or indirectly as a result of a problem with the OMRON product.

10. 2 Limitations of liability
OMRON shall not be responsible for special, indirect, or consequential damages originating in an OMRON product.

10. 3 Applicable conditions
(1) When using OMRON products in combination with other products, it is the user's responsibility to confirm compliance with all applicable standards and regulations. It is also the user's responsibility to confirm the suitability of the OMRON products for the system, devices, and equipment that are being used.
OMRON accepts no responsibility for the suitability of OMRON products used in combination with other products.
(2) When using OMRON products in any of the following applications, consult an OMRON representative and check specifications to allow sufficient leeway in ratings and performance, and to implement suitable safety measures, such as safety circuits, to minimize danger in the event of an accident.
1) Outdoor applications, applications with potential for chemical contamination or electrical interference, or application under conditions or environments not described in catalogs.
2) Nuclear control systems, railroad systems, aviation systems, combustion systems, medical equipment, amusement machines, or equipment regulated by government or industrial standards.
3) Other systems, machines, and equipment that may have a serious influence on human life and property.
4) Equipment requiring a high level of reliability, such as gas, water, or electrical supply systems, and systems that operate 24 hours a day.
5) Other applications requiring a high level of safety, corresponding to items 1) to 4), above.
(3) When OMRON products are used in an application that could pose significant risk to human life or property, the overall system must be designed so that the required safety can be ensured by providing notice of the danger and incorporating redundancy into the design. Make sure that OMRON products are appropriately wired and mounted to serve their intended purpose in the overall system.
(4) Application examples provided in catalogs are for reference only. Confirm functionality and safety before actually using the devices and equipment.
(5) To prevent unexpected problems from arising due to the OMRON product being used incorrectly by the customer or any other party, make sure that you understand and carefully observe all of the relevant prohibitions and precautions.
(6) Each rating and performance value given in catalogs etc. is the value in an independent examination, and does not guarantee simultaneously the compound conditions of each rating and performance value.
(7) Do not use the OMRON Product for automotive applications (including two-wheeled motor vehicle.) .
Please consult with your OMRON representative if the OMRON Product is used in the automotive applications.

10. 4 Changes of specifications
Specifications and accessories to the products in catalogs may be changed as needed to improve the products or for any other reason. Check with your OMRON representative for the actual specifications for OMRON products at the time purchase.

10. 5 Treatment of the specifications for reference
When these specifications are issued for reference, please consult with your OMRON representative before actually using the specifications and confirm the latest specifications for the OMRON product.

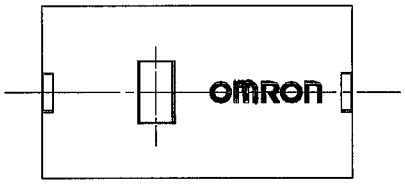
10. 6 Extent of service
The price of an OMRON product does not include service costs, such as dispatching technical staff. If you wish for service, please consult with your OMRON representative.

10. 7 Effective term
These specifications will be invalid when there is not return or an order for one year from the date of issue.

A	06. 07. 18	Newly prepared	N.Arai		K.Maeta
Code	Date	Revision content	Issue	Check	Approval

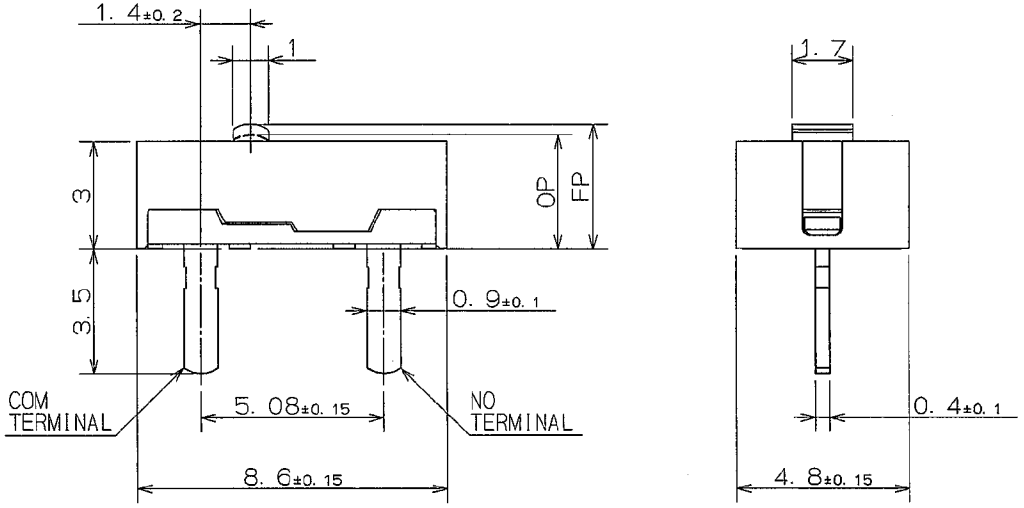
1. CHARACTERISTICS

ITEM			
OPERATING FORCE	0.8	N	MAX.
RELEASE FORCE	0.15	N	MIN.
OVER TRAVEL	0.1	mm	MIN.
MOVEMENT DIFFERENTIAL	0.12	mm	MAX.
OPERATING POSITION	3.2±0.2	mm	
FREE POSITION	3.5±0.2	mm	



2. ELECTRICAL RATINGS

1mA 6VDC



SYM	DATE	E/C CONTENTS	E/C NO.	SIGN

MATERIAL

FINISH

TOLERANCES UNLESS SPECIFIED	DESIGNED	CHECKED	APPROVED
±0.4mm	JUL. 18' 06 N. ARAI		Jul.18'06 K. Inaba

SCALE 5:1

3RD ANGLE

SHEET

TYPE D2L-D

ULTRA SUB MINIATURE BASIC SWITCH

OUTLINE DRAWING

DRWG NO. 9455919-1 A

DESIGNED FOR

OMRON

A4