PRODUCT SPECIFICATIONS	Description : Ultra Sub Miniature Basic Switch
	Part number : D2FC-F-7N(20M)(OF)

1. Safety Standard
   1.1 Approved standard ——
   1.2 File No. ——

2. Structure
   2.1 Outline drawing No. 4060146-0
   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 For PCB board

3. Mechanical Characteristics
   3.1 Operating characteristics (Initial value)

	Item	Abbr.	Unit	Specification value
1	Operating force	OF	N	0.52 to 0.72
2	Releasing force	RF	N	Min. 0.24
3	Pretravel	PT	mm	0.3±0.2
4	Overtravel	OT	mm	Min. 0.20
5	Movement differential	MD	mm	Max. 0.12
6	Operating position	OP	mm	6.9±0.2
7	Free Position	FP	mm	$7.35\ ^{0}_{-04}$

   3.2 Malfunction vibration
   Malfunction 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
   Malfunction shall be 1msec. max. when the following shock is applied;
   Shock : Max. 300m/s^2
   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 : Max. 1000m/s^2
   Direction : X, Y and Z axis
   Time : 10 times per axis

Condition common to Section 3.2 and 3.4
Applied voltage : DC 5V
Applied current : 100mA
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) 7.2N
Time : 1 minute

3.7 Permissible operating frequency
200 operations/minute max.

3.8 Permissible operating speed
1 to 500 mm/second

4. Electrical Characteristics

4.1 Switching capacity ratings
DC6V 1mA Resistive load

4.2 Contact resistance (at total travel position TTP)
Initial value 100mΩ max. at 6VDC 0.1A by voltage drop method

4.3 Insulation resistance, Dielectric strength

Item / Measuring part	Insulation resistance (DC500V megger)	Dielectric strength (50/60Hz for 1 minute)	Remark
Between terminals of the same polarity	100MΩ Min.	600V	
Between each terminal and ground	100MΩ Min.	1500V	Using a separator

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 65±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 −25±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.

5.4 Temperature cycle resistance
No electrical or mechanical defect at the standard test condition after 1 cycle of −40±2°C and 85±2°C soaking (48 hours at each temperature)

6. Usage Environment

6.1 Ambient temperature range
−25 to +65°C 60%RH Max. (No dewing or icing)

6.2 Ambient humidity range
85%RH Max. (at +0 to +65°C)

7. Durability

7.1 Electrical durability
No electrical or mechanical defect at the standard test condition when switching the rated load by 20,000,000 operations at the operating frequency of 120 operations/minute with the stroke of the OT spec value.
The contact resistance shall be 100Ω 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. Correct Use

9.1 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).

・The overtarvel (OT) (0.2mm) is appropriate for the switch stroke setting.

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

9.2 Soldering work

・Do the soldering work under the conditions specified below.

	Condition	Standard	Remarks
Manual soldering	350°C 3 seconds Max.	30 to 40W	Do not apply an excessive force to the terminals during the soldering work.
Automated soldering	260°C 5 seconds Max.		The soldering time should be 3 seconds max. when the switch is mounted on a double-sided PCB (through-hole PCB). Control the liquid level of flux and solder not to exceed PCB.

Note : Do not apply an excessive wattage or too long heating, or do not operate the switch for 1 minute after heating. Otherwise, the switch characteristics may be deteriorated Be sure to apply only the minimum required amount of flux. The switch may have a contact failure if flux enters inside the switch.

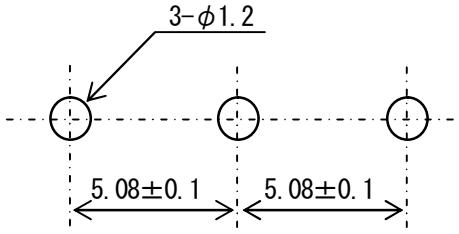
9.3 Usage/storage environment for switch

・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 3 to 6 months after the production, depending on the location.

9.4 Switch mounting

・Referring to the figure on the right for mounting-hole processing drawing.



10. Warranty and Limited Warranty

(1) Definition

The definition of terms used in these Terms and Conditions are as follows:

1) *Usage conditions*: Usage conditions, rating, performance, operating environment, handling instructions, cautions, prohibited use, etc. of *Omron products* described in specifications, documentations or manuals.

2) *Customer application*: Application of *Omron products* by customers which include embedding and/or using *Omron products* in their parts/components, electronic substrates, devices, equipment or systems manufactured by customers.

3) *Fitness*: (a)Fitness, (b)performance, (c) non-infringement of third-party intellectual property, (d) compliance with laws and regulations and (e)conformity to various standards.

(2) Caution on Descriptions

Attention is required to the following points on descriptions in specifications.

1) Rated values and performance values are the product of tests performed for separate single conditions, including but not limited to temperature and humidity. It is not intended to warrant rated values and performance values for multiple combined conditions.

2) Reference data are provided for reference only. *Omron* does NOT warrant that *Omron product*s work properly at all time in the range of reference data.

3) Application examples are provided for reference only. *Omron* does NOT warrant the *Fitness* of *Omron products* under such application.

4) *Omron* may discontinue the production of *Omron products* or change the specifications of them for the purpose of improving such products or other reasons entirely at its own discretion.

(3) Precautions

Please be aware of and accept the following when you introduce or use *Omron products*.

1) Please use *Omron products* in compliance with *usage conditions* including rating and performance.
2) Please confirm *fitness* of *Omron products* in your application and use your own judgment to determine the appropriateness of using them in such application. *Omron* shall not warrant the *fitness* of *Omron products* in customer application.
3) Please confirm that *Omron products* are properly wired and installed for their intended use in your overall system.
4) When using *Omron products*, please make sure to (i) maintain a margin of safety vis-à-vis the published rated and performance values, (ii) design to minimize risks to customer application in case of failure of *Omron products*, such as introducing redundancy, (iii) introduce system-wide safety measures to notify risks to users, and (iv) conduct regular maintenance on *Omron products* and *customer application*.
5) *Omron products* are designed and manufactured as general-purpose products for use in general industrial products. They are not intended to be used in the following applications. If you are using *Omron products* in the following applications, *Omron* shall not provide any warranty for such *Omron products*.
   (a) Applications with stringent safety requirements, including but not limited to nuclear power control equipment, combustion equipment, aerospace equipment, railway equipment, elevator/lift equipment, amusement park equipment, medical equipment, safety devices and other applications that could cause danger/harm to people's body and life.
   (b) Applications that require high reliability, including but not limited to supply systems for gas, water and electricity, etc., 24 hour continuous operating systems, financial settlement systems and other applications that handle rights and property.
   (c) Applications under severe condition or in severe environment, including but not limited to outdoor equipment, equipment exposed to chemical contamination, equipment exposed to electromagnetic interference and equipment exposed to vibration and shocks
   (d) Applications under conditions and environment not described in specification
6) In addition to the applications listed from (a) to (d) above, *Omron products* are not intended for use in automotive applications (including two wheel vehicles). Please do NOT use *Omron products* for automotive applications. Please contact *Omron* sales staff for products for automotive use.

(4) Warranty Terms and Conditions

The terms and conditions for warranty of *Omron products* are as follows:

1) Warranty period: One year after the purchase.
2) Coverage: *Omron* will provide free replacement of the malfunctioning *Omron products* with the same number of replacement/alternative products.
3) Exceptions: *Omron* will not cover *Omron products* under its warranty if the cause of the malfunction falls under any of the following.
   (a) Usage in a manner other than the original intended use for the *Omron products*.
   (b) Usage outside of the *usage conditions*.
   (c) Modification or repair made to the Omron product by other than Omron personnel.
   (d) Software program embedded by other than Omron or usage of such software.
   (e) Cause which could not have been foreseen with the level of science and technology at the time of shipping from *Omron*.
   (f) Causes originating from other than *Omron* or *Omron products* (including force majeure such as but not limited to natural disasters).

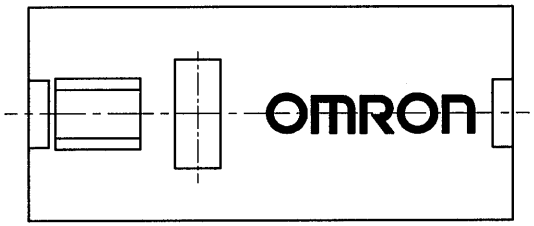
(5) Limitation of Liability

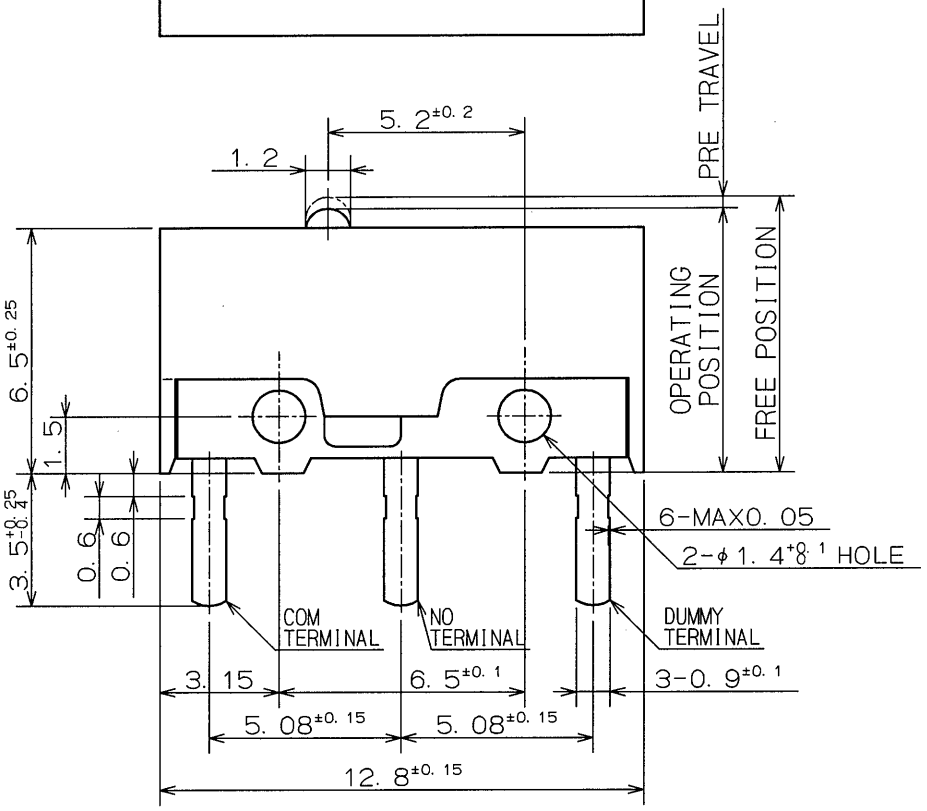
The warranty set out in these Terms and Conditions is the whole and sole liability for *Omron products*. There are no other warranties, expressed or implied. *Omron* and the distributors of *Omron products* are not liable for any damages which may arise from or be related to *Omron products*.

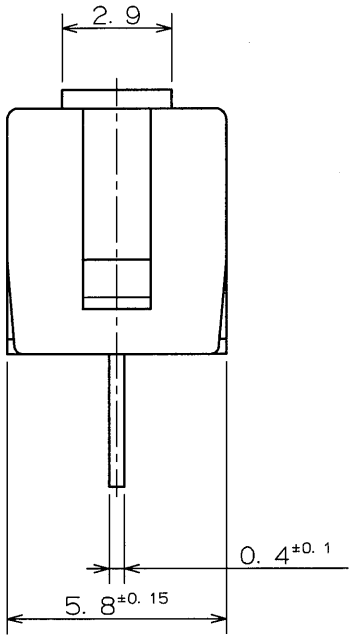
(6) Export Controls

Customers of *Omron products* shall comply with all applicable laws and regulations of Japan and/or other relevant countries with regard to security export control, when exporting *Omron products* and/or technical documents or providing such products and/or documents to a non-resident. *Omron* may not provide customers with Omron products and/or technical documents should they fail to comply with such laws and regulations.

A	14.05.08	Newly prepared	K.Yoshimura		A.Arataki
Code	Date	Revision content	Issue	Check	Approval







1. OPERATING CHARACTERISTICS

ITEM	SPEC.
OPERATING FORCE	0. 52~0. 72N
RELEASE FORCE	0. 24N MIN
PRE TRAVEL	0. 3±0. 2 mm
OVER TRAVEL	0. 2 mm MIN
MOVEMENT DIFFERENTIAL	0. 12 mm MAX
OPERATING POSITION	6. 9±0. 2 mm
FREE POSITION	7. 35 $^{0}_{-0.4}$ mm

2. ELECTRICAL RATINGS

1mA 6VDC (RESISTIVE LOAD)

3. CONTACT FORM

COM-NO

Note. Dummy terminal should not be connected to any circit.

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

MATERIAL

FINISH

TOLERANCES UNLESS SPECIFIED	DESIGNED	CHECKED	APPROVED
±0. 4mm	MAY. 08' 14 K. YOSHIMURA		May. 08'14 A. Arakaki

SCALE 5 : 1

3RD ANGLE

SHEET 1 / 1

TYPE D2FC-F-7N(20M)(OF)
ULTRA SUB MINIATURE BASIC SWITCH
OUTLINE DRAWING

DRWG NO. 4060146-0 A

DESIGNED FOR

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