ELECTRO MECHANICAL COMPONENTS BUSINESS UNIT

Panasonic Electronic Devices Co.,Ltd

OSAKA,JAPAN

SAMPLE SUBMISSION SHEET

TO : DIGI-KEY

ATT :

CC :

CIISD :

DEM. : Mr.MORI

TM. : Mr.WATANABE

Ref No. 3443665-3

Date 09-May-05

Part Name STICK SWITCH Refer to

A) ☑ First submission for ☐ approval ☑ introduction.

☐ Resubmission

B) ☑ The samples are our standard products.

☐ The samples meet your specifications (Dwg No. Rev.)

Part No.	Spec. No.	Quanity	Cost or Quotation No.
EVQQ7GA50		5	

Remarks

- This product has not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.
- All the materials used in this part contatin no brominated materials or PBBOs or PBBs as the flame-retadant.
- All the materials used in this part are registered material under the Law Concerning the Examination and Regulation of Manufacture etc. of Cheminal Substances.

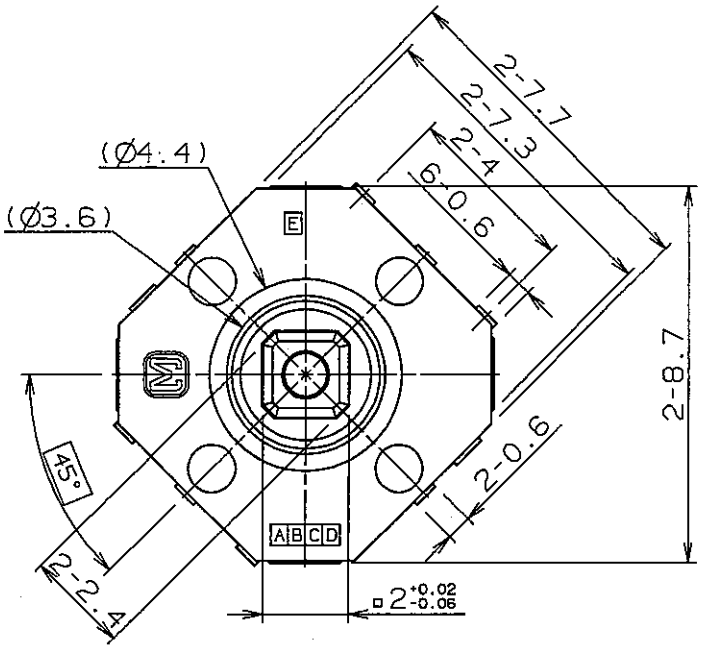
file :

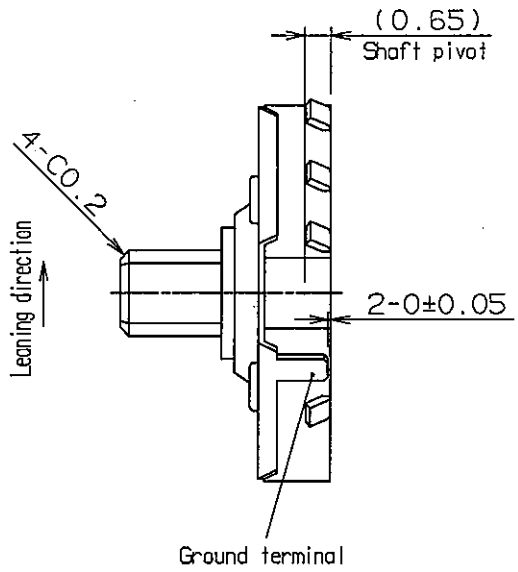
Name

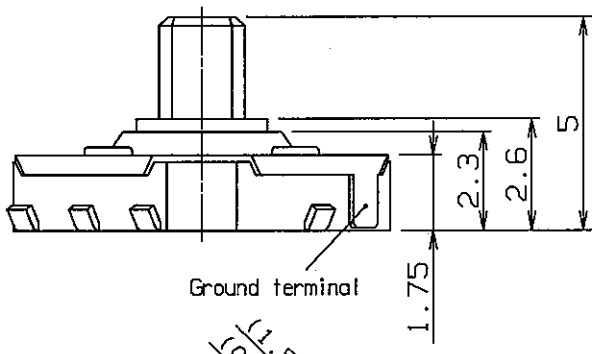
DIGI-KEY

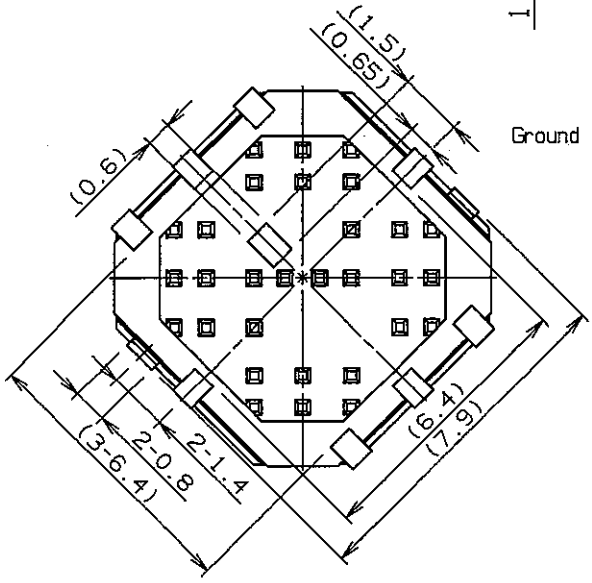
THIRD ANGLE PROJECTION | ALL DIMENSIONS ARE IN MILLIMETERS. | DO NOT SCALE DRAWING

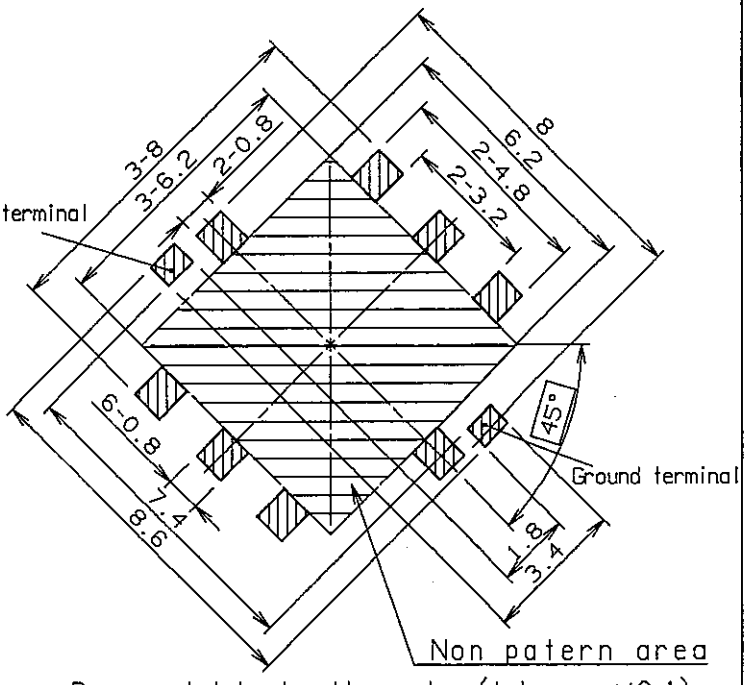
General dimension tolerance : ±0.2







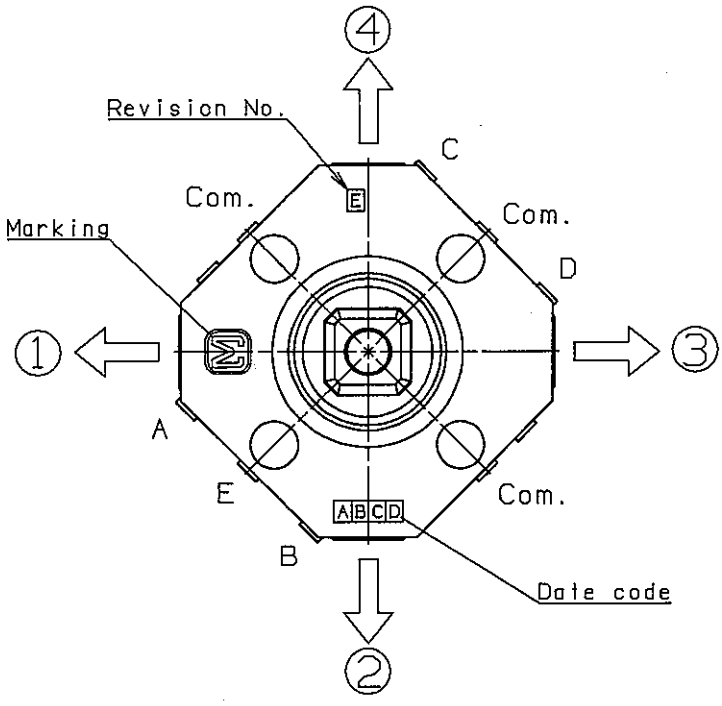




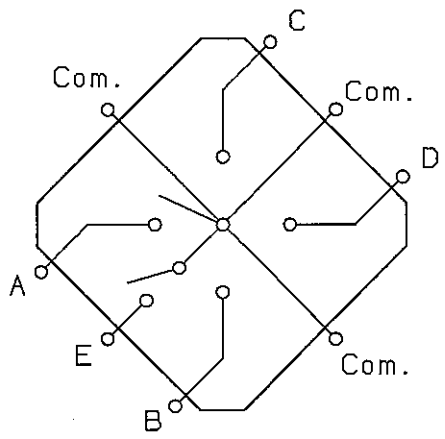
Recommended land pattern plan.(tolerance:±0.1)
(View from switch mounting side)

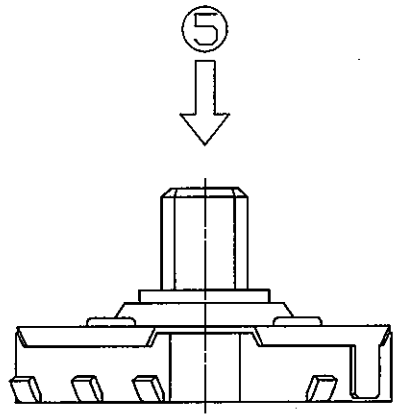
DESIN	M.Takeuchi	May 9.'05	NAME Stick switch			
DRAW	M.Takeuchi	May 9.'05		ISSUE	REVISIONS	DATE
CHECK	——	——	TYPE NO. EVQ Q7G A50	DRAWING NO. RV-H- REFERENCE ONLY		1/9
APPROVAL	H.Watanabe	May.9.'05				

Panasonic Electronic Devices Tsuyama Co.,Ltd.



Circuit Diagram





Terminal No.	Leaning Direction				
	①	②	③	④	⑤
A	●				
B		●			
C			●		
D				●	
E					●
Com.	●	●	●	●	●

Date code

A	Machine No.	1st="A",2nd="B"
B	Year	2004="4",2005="5"
C	Month	Jan="1",Feb="2"
D	Day	1-9="1"-"9" 10="0" 11-31="A"-"W"

NAME	Stick switch			
		ISSUE	REVISIONS	DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H- REFERENCE ONLY		2/9

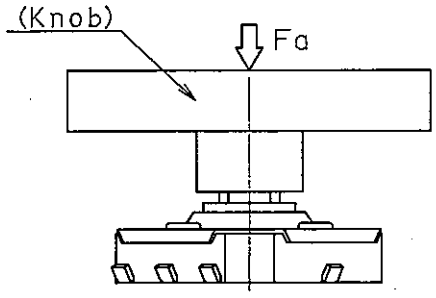
2.Function :

Push switch and Leaning switch(4 direction)

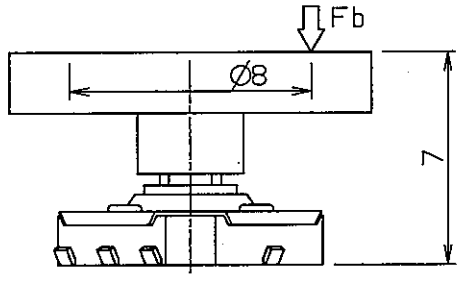
3.Mechanical specifications :

1	Operation force		a).Push force:Fa <Fig-1> 2.6N±1.0N b).Leaning force:Fb <Fig-2> 1.3N±0.8N(Leaning Switch) c).Force difference between push force and leaning force Push force "Fa" - Leaning force "Fb" ≥ 0.1
2	Push stroke		0.15±0.1 mm
3	Leaning operation angle		3° $^{+2°}_{-2°}$ The angles that ①②③④direction Switch turn on when the leaning force(Fb) is applied as shown in the Fig-2. Turning ON angle is same as operating angle.
4	Shaft strength	Push strength	Mount the product to P.C.B. and apply static force(Fa) of 20N/10sec. as shown in the Fig-1.
5	Shaft strength	Leaning strength	Mount the product to P.C.B. and apply static force(Fb) of 20N/10sec. to 4direction (①-④) as shown in the Fig-2. Leaning operation angle deviation against initial is 3° max. Shaft freeplay is 2° max.
6	Shaft strength	Rotational Stopper strength	Mount the product to P.C.B. and apply rotation torque of 0.03Nm/5sec. to the shaft.
7	Shaft freeplay		1° max. The angle when the leaning force(Fb) of 0.02N is applied as shown in the Fig-2.
8	Rotation play		±5° max. The play of the shaft in rotation direction when applying rotation torque of 1mN m to the shaft.

(Fig-1)Push operation



(Fig-2)Leaning operation

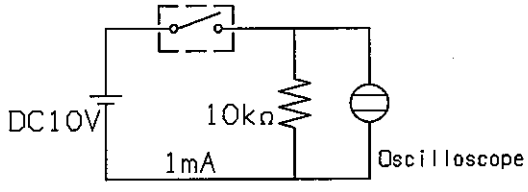


NAME	Stick switch	ISSUE	REVISIONS / DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H-REFERENCE ONLY	3/9

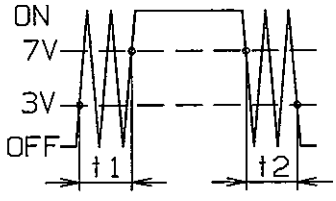
4.Electrical specifications :

1	Rating	D.C 15V - 20mA
2	Contact resistance	Push force:(Operation force) x 2 100 mΩ max. Leaning operation (Leaning force:3.2N) 100 mΩ max.
3	Insulation resistance	50MΩ min. (At D.C 100 V) (between terminals of open circuit)
4	Withstand voltage	A.C250V, 1 min. (Between all terminals.)
5	Bouncing	Hit lightly in synchronous speed (3~4times/sec.) to either direction of the Fig-1 or the Fig-2 in the below measuring circuit. Both t1, t2<Fig-4> a) Push switch : 10 ms max. b) Leaning switch : 20 ms max.

(Fig-3)Measurement circuit diagram



(Fig-4)Bouncing phase



5.Durability :

1	Heat resistance	Temperature : 85±2°C Time : 500 hours After that, leave in ordinary temp and humidity for an hour, then measure.	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 1Ω max.
2	Low temperature resistance	Temperature : -40±2°C Time : 500 hours After that, leave in ordinary temp and humidity for an hour, then measure.	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 1Ω max.
3	Moisture resistance	Temperature : 60±2°C Humidity : 90~95%Rh Time : 500 hours After that, leave in ordinary temp and humidity for an hour, then measure.	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 1Ω max.

4	Heat shock	After that, leave in ordinary temp and humidity for an hour following 20 cycles of test under the following conditions, then measure. +85±2°C -40±2°C 30 min. 3 min. 30 min. 3 min.	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 1Ω max.
5	H_2S resistance	Density : 3±1ppm. Temperature : 40±2°C Humidity : 80~85%Rh Time : 24 hours After that, leave in ordinary temp and humidity for an hour, then measure.	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 100Ω max.
6	Operation life	Operate 1,000,000 cycles at a speed of 2,000 cycles/h. in the ordinary temp and humidity under the following conditions. Push force: 7.0N Leaning force: 7.0N	Item 3.1, 3.2, 4.3, 4.4 The same as the initial spec. Item 4.2 : 10Ω max. Item 4.5 : a)50ms, b)100ms max. Item 3.3 : 3° Item 3.7 : 3° max.
7	Vibration resistance	Amplitude : 1.5 mm Frequency : 10~55~10Hz for 1 min. Vibration directions X, Y, Z, (3 directions) Time : X, Y, Z, each 2 hours	Item 3.1, 3.2, 3.3, 4.3, 4.4, 4.5 The same as the initial spec. Item 4.2 : 1Ω max.

6. Operation temperature range :
-40°C ~ +85°C (45~85%RH)

7. Preservative temperature range
Single condition : -40°C ~ +85°C
Taping condition : -20°C ~ +60°C

8. Marking :

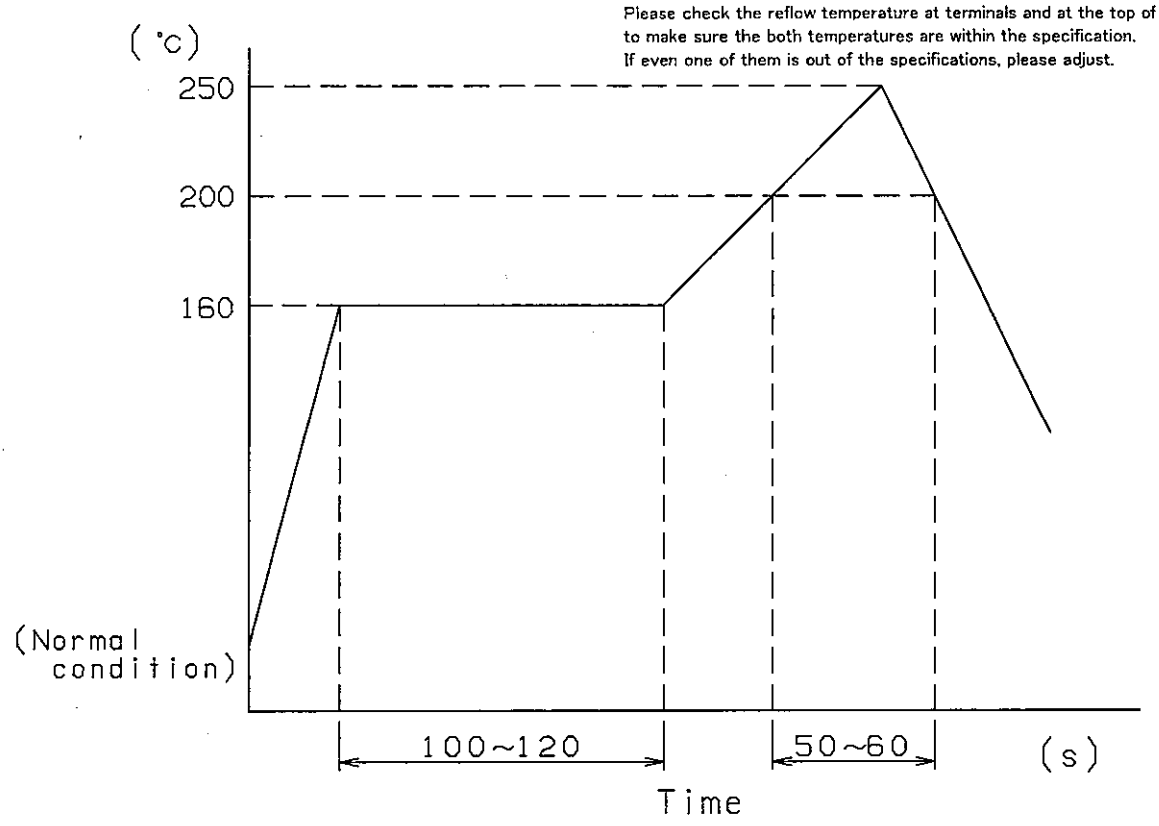
1 Our identification mark (M)
2 Date code
3 Your part No.
(Only packing case)

NAME	Stick switch	ISSUE	REVISIONS	DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H- REFERENCE ONLY		5/9

9.Precaution

9-1.Reflow soldering condition

Reflow temperature may vary by location even in the same reflow condition.
Please check the reflow temperature at terminals and at the top of a switch to make sure the both temperatures are within the specification.
If even one of them is out of the specifications, please adjust.



Our recommended reflow profile is mentioned as above, but this components can tolerate Max 260°C three times (3) without effecting electrical performance, mechanical performance or reliability.

9-1.Hand soldering condition

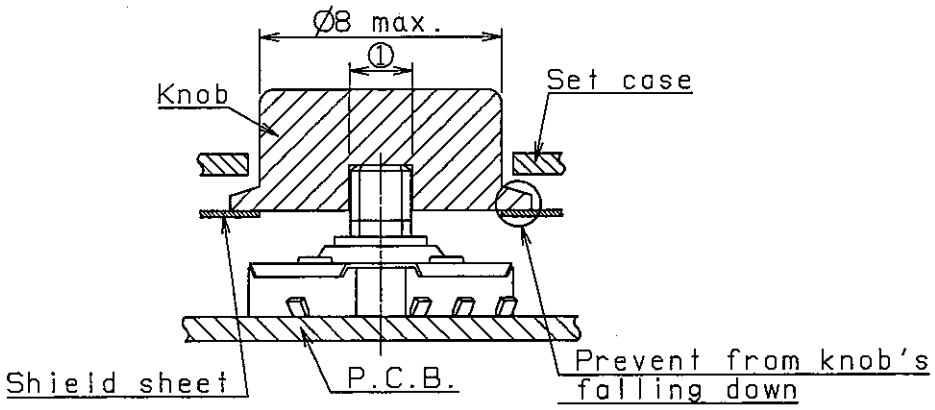
Hand soldering by soldering iron shall be allowed under 280°C max. 3 s max.1 time.
Soldering iron for hand soldering have to be 20 W mmax..

10.Recommended knob design

10-1. Design the operating section on the setting side as shown in the Fig-5.

10-2. The dimension ① should be adjusted depend on knob materials and tightness you required.

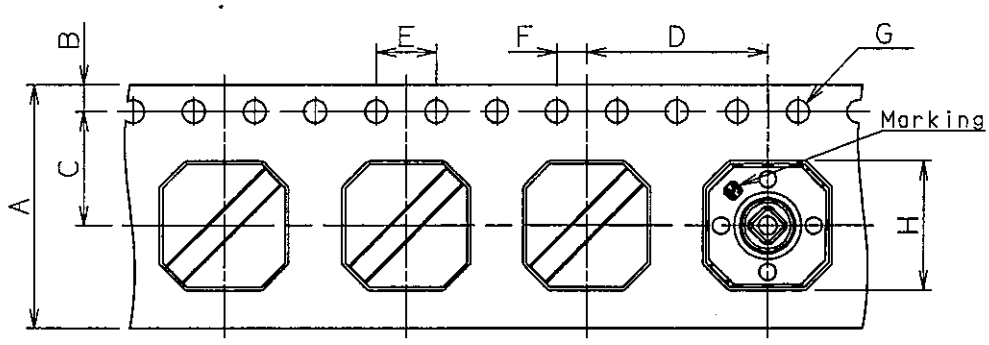
10-3. When you put knob on shaft, you should care push strength. (40 N max.)

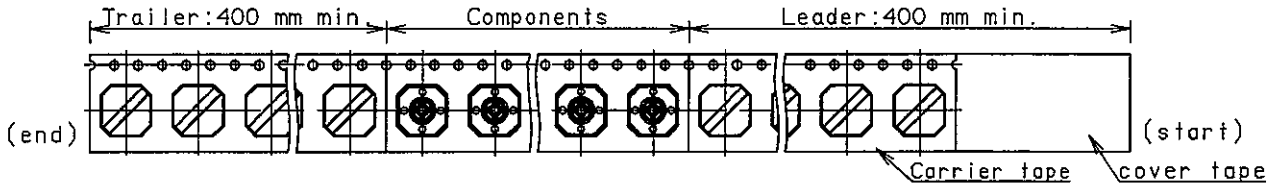


(Fig-5)Recommended knob design

NAME	Stick switch	ISSUE	REVISIONS	DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H-	REFERENCE ONLY	6/9

Carrier tape





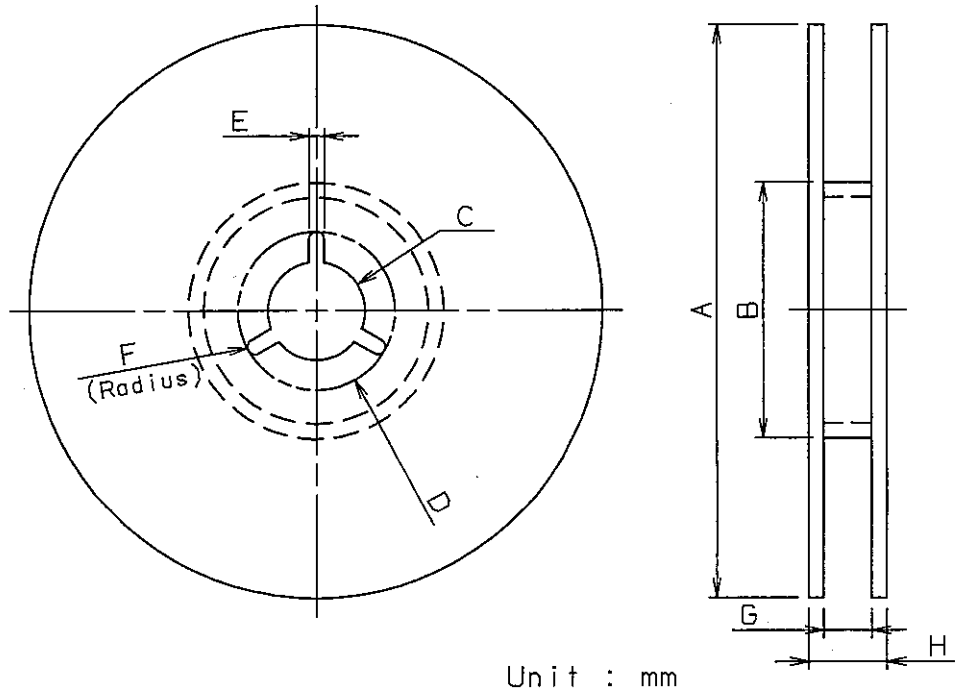
Unit : mm

A	B	C	D	E	F	G	H	I	J	t
+0.3 -0.1	±0.1	±0.1	±0.1	±0.1	±0.1	+0.1 -0	±0.1	±0.1	±0.15	±0.05
16	1.75	7.5	12	4	2	1.5	8.6	12.4	5.8	0.4

Taping condition : Lack of products should not continue 4pcs.
but, all lack of products should within 5pcs.

Top tape (sheel tape) strip strength : 0.3 N to 1.0 N.
(Strip angle : 165 °)

④Reel (750pcs./reel)



Unit : mm

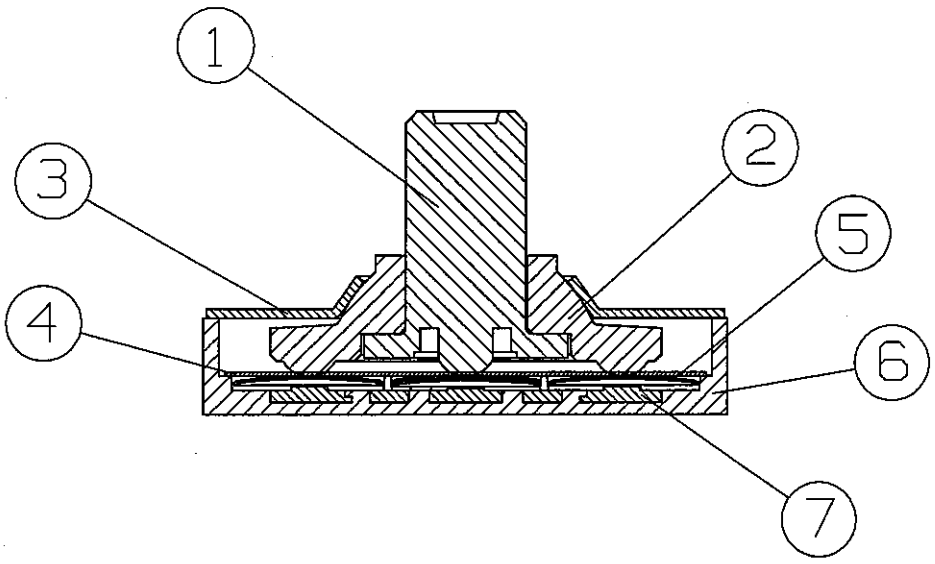
A	B	C	D	E	F	G	H
±2	±1	±0.5	±1	±0.5	±0.5	±0.5	±1
Ø380	Ø80	Ø13	Ø21	2	1	17.5	21.5

NAME	Stick switch			
		ISSUE	REVISIONS	DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H- REFERENCE ONLY		7/9

THIRD ANGLE PROJECTION | ALL DIMENSIONS ARE IN MILLIMETERS. | DO NOT SCALE DRAWING

General dimension toleranace : ± 0.5

Sectional drawing



Material list

No.	Part Name	Material	Treatment
1	Push plate 1	PPA / (LCP)	
2	Push plate 2	4-6 Nylon	Glass 30 %
3	Cover	Stainless steel	One side Ag or Au plating
4	Film	Teflon	
5	Movable cotactor	Cold rolled stainless steel strip for springs	One side silver plating
6	Mounting base	PPA / (LCP)	
7	Immovable contactor	Brass plate	Silver plating

NAME	Stick switch	ISSUE	REVISIONS	DATE
TYPE NO.	EVQ Q7G A50	DRAWING NO. RV-H- REFERENCE ONLY		8/9

Prohibitions and precaution for handlin

1) Prohibited items on fire and smoking

- Absolutely avoid use of a switch beyond its rated range because doing so may cause a fire. If misuse or abnormal use may result in conditions in which the switch is used out of its rated range, take proper measures such as current interruption using a protective circuit.
- The grade of nonflammability for resin used in Light Touch Switches is "94HB," which is based on UL94 Standards (flammability test for plastic materials). Prohibit use in a location where a spreading fire may be generated or prepare against a spreading fire.

2) For use in equipment for which safety requested

- Although care is taken to ensure potentiometer quality, inferior characteristics, short circuits, open circuits are some problems that might be generated, To design a set which places maximum emphasis on safety, review the affect of any single fault of a potentiometer in advance and perform virtually fail-safe design to ensure maximum sagety by:
  - preparing a protective circuit or a protective device to improve system safety, and
  - preparing a redundant circuit or improve system safety so that the single fault of a switch does not cause a dangerous situation.

3) Attentions Required for Storage Condition

- When this product is to be stored in the following circumstances and conditions, it may affect on the performance deteriorations and solderability etc., avoid storing in the following conditions.
  (1) A place where the temperature is -10℃ max., +40℃ min. and the humidity is 85% min.
  (2) In the corrosive gas atmosphere.
  (3) Long-term storage for 6 months min.
  (4) A place where the product is exposed to direct sunlight.
- Store in packed condition so that the load stress is not applied.
- Please use this product as soon as possible, our recommendation is within 3 months and the limitation is 6 months.
- If any remainder left after packing is opened, store it with proper moistureproofing and gasproofing, etc.,
- The switch shall be packed by Nylon sheet in the box like original packaging style when it will be an inventory after using on the assembly machine at your production line.

Hnadling of approval specificatio

- This specification form specify this item only. Please perform your approval test in the actual application conditions beforehand.
- Please return one copy of this specification form with your approval stamp or signature to us.
  Otherwise, it might be happened that the item can not be supplied.
  The terms to return back us after receipt of this product specification shall be one year from the issued date. In case more than one year past, please request us new specifications again before ordering this product.
- Writings in this specification form are subject to change through precautions.

NAME Stick switch	DRAWING NO.
TYPE NO. EVQ Q7G A50	RV-H- REFERENCE ONLY 9/9