Customer:

ALPS EUROPE DISTRIBUTION

Attention:

Your ref. No.:

Your Part No.: SPUJ193900

N o . SW065067A

Date: 2006 - 07 - 20

SPECIFICATION

ALPS';

MODEL: SPUJ193900

Spec. No.: SPUJ-S-501

Sample No.: F3289725M

RECEIPT STATUS
RECEIVED
By Date
Signature

Name
Title



K.
DSG'D Tomita

APP'D **K.ITO**ENG. DEPT. DIVISION

Sales

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SPUJ PRODUCT SPECIFICATIONS

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- 1. General
- 1.1 Application This specification is applied to low current circuit (Secondary circuit) push switch used for electronic equipment.
- 1.1 Application into specification is applied to the control of the standard into specific to the standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C in temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C In temperature, 45~85°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions shall be 5~35°C RH and 86~106kPa (860~1060mbar) Ain 1.3 Test conditions The standard test conditions the standa atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at $20\pm2\%$, $65\pm5\%$ RH and 86~106kPa (860~1060mbar]
- 2. Appearance, construction and dimensions
- 2.1 Appearance Switch shall have good finishing, and shall have no rust, crack or plating failures.
- 2.2 Construction and dimensions Per individual product drawing
- .2.3 Markings Per individual product drawing
 3. Rating 30 V DC 0.1 A (Resistive load) 3. Rating

4. Electr	ical	perfo	rman	^6	

		Items	Test conditions	Criterion
	4.1	Contact resistance	I what be meded to the truck that that the truck of the be	20 mΩ HAX
L		<u> </u>	by voltage drop method.	
İ	4.2	Insulation	Test voltage: 500 V DC, measured after 1 minute±5 seconds.	100 HQ HIN
-		resistance	Applied position : Between all terminals	
1	•		Between terminals and ground (frame)	1
` ¦	4.3	Valtara anas		
ı	4.5	Voltage proof	Test voltage: 500 V AC (50~60Hz, cut-off current 2 mA)	No dielectric breakdown shall occur.
-			Applied position : Between all terminals	
ŀ	4.4	Capacitance	Between terminals and ground (frame)	
	7.4	Capacitance	Shall be measured at 1MHz ± 10kHz	1.5 pF HAX
ı			Between all terminals	•
- [Between terminals and ground (frame)	
ŀ	4.5	Changeover timing	Between all circuits	4
t				As per individual product drawing.
Ļ	<u>5. H</u>	echanical performanc	<u>e</u>	
L		Items	Test conditions	Criterion
	5.1	Operating force	A static load shall be applied to the tip of actuator in operating	As per individual product drawing.
L			direction.	
1	5.2	Terminal strength	A static load of 5N \(\int \) 510 rf \(\int \) shall be applied to the tip of	Shall be free from terminal looseness
1	-		terminal in a desired direction for 1 minute. The number of test shall	and damage and breakage of terminal
1	l l		be once per terminal.	holding portion. Terminals may be bent
1				after test, electrical performance
- [requirement specified in item 4 shall
┝				be satisfied.
-	5.3	Mounting strength	Thread shall be mounted at 0.6 N·m 1-6-12 kgf-cm// by normal	Shall be free from damage of thread
-	_	of thread portion	mounting method.	portion.(Applied to frame with screw.)
	5.4	Control strength	(1) A static load of 50 N = 5.1-kgf/A hall be applied in the	Shall be free from pronounced wobble
	ŀ	5.4.1 Control	operating direction of actuator for 15 seconds.	and mechanical abnormalities.
	ľ	strength	(2) A static load of 50N 51 kgf Ashall be applied in the	
-1			pull direction of actuator for 15 seconds.	•
1	1		(For construction with lock, the test shall be conducted at the	
ł	ľ		condition of lock released.)	
			(3) A static load of 10 N f102kef14 hall be applied to the vertical	
	-	F 4 0 1 1 1 1 1	direction of operation at the tip of actuator for 15 seconds.	
		5.4.2 Lock hold-	(1) A static load of 10 N (102 ksf) Phall be applied in the pull	Lock shall not be dislocated.
.		ing strength of	direction at the condition of locking actuator.	Shall be free from pronounced wobble
		actuator (Applied to the		and abnormalities in operation.
1		switch with lock	, and the second se	
	I	mechanism)		
7	5.5	Wobble of actuator	Run-out(P-P) shall be measured by applying a static load of 1N (102sf)	AD-D · O S WAY
Ι,	ا. ```	HODDIG OF BECRETOL		1.8 mm MAX, without frame.)
h	5.6	Row of actuator	Switch shall be mounted as shown. Difference of sides shall be	Difference between actuators
1		(Applied to	measured.	t ₁ = Within <u>0.5</u> nm
	1	multipul-key		Maximum difference of actuator
1		push switch)		t ₂ = Within <u>O.8</u> mm
	ļ	- CON CHI (CII)		Difference between mounting hole and
		-		actuator
-			Hole for mounting frame	t ₃ = Within <u>O.5</u> mm
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Notice frame strength (Spelled to multipul-key push sirely the property of the strength (Spelled to multipul-key push sirely		· · · · · · · · · · · · · · · · · · ·	
Soldwrability Seldwrability Seldwr			
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Fixed Solderish Bet Solderise Bet Solderise Bet		DON 45:00 Kerry anall be applied to the center of mounting frame	
Soldershility Soldershilit	1 1 1 1	in A, b, c and b directions each is seconds.	in operation.
Fixed Svitch shall be secured to a zeating machine by a regular agenting device and asthod. (1) Whrstion frequency range: 10-55 lb. (2) Total assistance (loss 4.2): (3) Total assistance (loss 4.2): (4) Nethod of changing the sweep with ration frequency: locarithmic or linear including actuator. (5) Fixed of changing the sweep with ration frequency: locarithmic or linear including actuator. (6) Time: 2 hours each (b hours In total) 9 Hechanical shock (5,9.1 Mechanical) (6) Time: 2 hours each (b hours In total) 9 Hechanical shock (6) Time: 2 hours each (b hours In total) (7) Acceptance of the fixed including actuator. (8) Contact resistance (ites 4.2): (9) Acceptance of the hours In total) (10) Mounting school in Horal mounting sethod (2) Acceptant in: 450-45-65 (2) Accepta		C .	
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Syltch shall be secured to a festing machine by a regular nounting device and method. Or therefore and method. Or the property range: 10-550k Or the property			
Sylich shall be secured to a testing machine by a regular agunting device and method. (1) Vibration frequency range : 10-550t. 20 m2 MM 20 m2 magnitude : 1.5mm (2) m2 m3 m3 (3) Sweep ratio : 10-55-100k2 Approx. 1 minute (4) Method of changing the sweep vibration frequency : Logarithmic or linear (5) Direction of vibration : Three vertical directions (6) Time : 2 hours each (6 hours in total) (6) Time : 2 hours each (6 hours in total) (7) Mechanical (7) Mechanical (7) Mechanical (8) Musher of shock (2) Acceleration : 40 m3/s (4) Musher of shock (3) Duration : 11ms (4) Musher of shock (3) Duration : 1.1 m (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction (4) Musher of shock (4) Musher of shock (4)		^ BU 1	
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Solderability Solderability Solderability Soldering heat freestance 13]		
Sylich shall be secured to a testing machine by a regular agunting device and method. (1) Vibration frequency range : 10-550t. 20 m2 MM 20 m2 magnitude : 1.5mm (2) m2 m3 m3 (3) Sweep ratio : 10-55-100k2 Approx. 1 minute (4) Method of changing the sweep vibration frequency : Logarithmic or linear (5) Direction of vibration : Three vertical directions (6) Time : 2 hours each (6 hours in total) (6) Time : 2 hours each (6 hours in total) (7) Mechanical (7) Mechanical (7) Mechanical (8) Musher of shock (2) Acceleration : 40 m3/s (4) Musher of shock (3) Duration : 11ms (4) Musher of shock (3) Duration : 1.1 m (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction : 6 directions (4) Musher of shock (3) Test direction (4) Musher of shock (4) Musher of shock (4)		D	
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(1) Vibration frequency range: 10~5514 (2) Tional amplitude: 1.5ms (3) Sweer ratio: 10~5510 (bits) Approx. 1 minute (4) Hethod of changing the sweep vibration frequency: Logarithmic or linear (5) Direction of vibration: Three vertical directions including actuator. (6) Time: 2 hours each (6) hours in total) 8 Hechanical shock (5.9.1 Mechanical shock (2) Acceleration: 409a/s² +600+) (3) Duration: 11ss (3) Duration: 11ss (3) Duration: 11ss (4) Heat directions (5) Number of shock: 3 times per direction (6) Hours in total) 5.9.2 Lock holding shock (4) Test direction (18 times in total) 5.9.2 Lock holding shock (4) Duration: 11ss (5) Duration: 11ss (6) Duration: 11ss (7)	8 Vibration		
(2) Total amplitude: 1.5mm (3) Sweep ratio: 10.65=10(Ms) Approx. 1 minute (6) Hethod of changing the sweep vibration frequency: Logarithmic or linear including actuator. (6) Direction of vibration: Three vertical directions including actuator. (6) Time: 2 hours each (6 hours in total) P Rechanical shock S. 1. Rechanical shock S. 2. Rechanical shock (2) Acceleration: 490/ms² -490-4) (3) Duration: 11ms (4) Test direction is directions (5) Rumber of shock: 3 times per direction (18 times in total) (1) Solderability (2) Experimental stock of the shall be conducted at the condition of locking actuator. (1) Acceleration: 40 firections (3) Switch shall be conducted at the condition of locking actuator. (1) Acceleration: 1 of 4 Tu/s² +4-5-6+ Acceleration: 40 firections (3) Test direction: 5 directions (4) Rumber of shock: 3 times per direction (1) Solderability (1) Solders in 1 more of shock: 3 times per direction (2) Flux Resin flux (11S K 5902) having a nominal composition of 25x solide by weight of vacter white rosin in methyl alcohol (1) Solder: 1533 (11S X 2322) (2) Flux Resin flux (11S K 5902) having a nominal composition of 10x solidering temperature: 230±50 lamers into the shall be accorded at the rosin in methyl alcohol (1) Solder: 1533 (11S X 2322) (2) Flux: Resin flux (11S K 5902) having a nominal composition of 10x soliders weight of vacter white rosin in methyl alcohol (1) Solder: 1534 (1) Solder: 1534 (1) Solder in methyl alcohol (1) Solder: 1534 (1) Sol			
(3) Sweep ratio: iO-55-10(Rb) Approx. 1 minute (4) Wethod of changing the sweep vibration frequency: Logarithmic or linear (5) Direction of vibration: Three vertical directions including actuator. (6) Time: 2 hours each (6 hours in total) (7) Hechanical shock in the second of the following test. (8) Site habil be measured after following test. (9) Acceleration: 490a/s² 4-500-7 A. (9) Duration: 11se shock (1) Hounting method: (2) Acceleration: 490a/s² 4-500-7 A. (3) Duration: 11se shock (Applied to the switch with lock mechanism.) (5) Number of shock: 3 times per direction (18 times in total) (5) Sulderability (6) Number of shock: 3 times per direction (18 times in total) (6) Mumber of shock: 3 times per direction (18 times in total) (7) Acceleration: 14 Ta/s² 4-15-9-A. (7) Duration: 11se shock (Applied to the switch with lock mechanism.) (8) Test direction: 14 Ta/s² 4-15-9-A. (10) Solderability (10) Solderability (11) Solder: E533 (11S z 3222) (21) Flux: Rosin flux (11s K 5902) having a nominal composition of 25x solide by weight of water white rosin in methyl alcohol (11se in the shall be 5-01 seconds in normal temperature. (A) Immersing time: 3±0.5 s Flux immersing time: 3±0.5 s Flux immersing time shall be 5-01 seconds in normal temperature. (A) Immersion depth: Immersion depth shall be are copper plating portion for P.C.B. ternals after mounting. Thickness of P.C. hoard: 1.6 m 10) Soldering heat feel shall be assured after following test. (1) Solder: E534 (IIS Z 3222) (2) Flux: Rosin flux (IIS K 5902) having a nominal composition of 10x solides by weight of water white rosin in methyl alcohol (IIS K 1501) solution. (3) Temperature is also be weight of water white rosin in methyl alcohol (IIS K 1501) solution. (3) Temperature is also be weight of water white rosin in methyl alcohol (IIS K 1501) solution. (3) Temperature is almost in the shall be accopper plating portion for P.C.B. ternals after mounting. Thickness of P.C. hoard: 1.6 m 10) Temperature and interesting time. 11) Soldering heat feed in the sh			I
(4) Method of changing the sweep vibration frequency: locarithmic or linear (5) Direction of vibration: There writted directions including actuator. (6) Time: 2 hours each (6 hours in total) (7) Mechanical shock (8) Time: 2 hours each (6 hours in total) (9) Mechanical shock (1) Nounting method: Kormal mounting method: (2) Acceleration: 490m/s² +500±/M (3) Duration: 11ms (4) Test direction is directions (5) Humber of shock: 3 times per direction (18 times in total) (1) Solderability (2) Acceleration: 1 4 Tm/s² +4-5-9-1/M (3) Duration: 11 ms (3) Test direction is directions (4) Number of shock: 3 times per direction (10) Acceleration: 1 4 Tm/s² +4-5-9-1/M (11) Soldershility (2) Flux: Resin flux (115 K 5902) having a nominal composition of 25% solids by weight of vater white rosin in methyl alcohol (1) IS K 1501) solution. (3) Soldering heat (4) Innearsing time: 33-0.5 solids by weight of vater white rosin in methyl alcohol (1) Solder: 1833 (115 Z 3282) (2) Flux: Resin flux (115 K 5902) having a nominal composition of 25% solids by weight of vater white rosin in methyl alcohol (3) Is Solder: 1833 (115 Z 3282) (2) Flux: Resin flux (115 K 5902) having a nominal composition of 25% solids by weight of vater white rosin in methyl alcohol (3) Is Solder: 1833 (115 Z 3282) (2) Flux: Resin flux (115 K 5902) having a nominal composition of 10% solids by weight of vater white rosin in methyl alcohol (3) Is Solder: 1833 (115 Z 3282) (2) Flux: Resin flux (115 K 5902) having a nominal composition of 10% solids by weight of vater white rosin in methyl alcohol (3) Is Solder: 1833 (115 Z 3282) (3) Flux insersine direction: 100 solution. (3) Temperature: 200±15 5±1 Hennual soldering: 200±15 5±1 Hennual soldering: 300±10 3 3 3 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	· ·	, ,	
Solderiphility Solder is 13 to 18 to 19	· -		• · · · · · · · · · · · · · · · · · · ·
Section Sect		linear	No dielectric breakdown shall oc
Soldersbility Svitch shall be measured after following test. Solder ing the state of the content of the state of the content of the state of t		(5) Direction of vibration: Three vertical directions	
Nechanical shock Switch shall be measured after following test. Substitution Substitutio	·		.
Solderability Solderabilit		(6) Time : 2 hours each (6 hours in total)	
S. 9.1 Wechanical shock 10 Mounting method : Morael mounting method 20 Acceleration : 490m/s² (-586-) 10 Duration : 111 ss 4 Test direction : 6 directions 4 Test direction : 6 directions 4 Test direction : 10 Since : 11	Nechanical shock	Switch chall be measured after following test	
Shock (2) Acceleration: 460m/s/s = 500m/s/s (3) Duration: lins (4) Test direction: 6 directions (5) Humber of shock: 3 times per direction (18 times in total) (18 times in total) Shock (Applied to the switch with lock mechanism.) (4) Rumber of shock: 3 times per direction (10 Solderability Svitch shall be conducted at the condition of locking actuator. (11 Acceleration: 14 7m/s² 44.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.5.6.4.4.4.4	1	· · · · · · · · · ·	l <u> </u>
(3) Duration: 11ms (4) Test direction: 6 directions (5) Humber of shock: 3 times per direction (18 times in total) 5.5.2 Lock holding shock (Applied to the switch with lack (Applied to the switch w			
(5) Number of shock: 3 times per direction (18 times in total) 5.9.2 Lock holding shock (Applied to the switch with lock (Applied to the switch with lock nechanism.) (4) Number of shock: 3 times per direction (18 times in total) Solderability Switch shall be conducted at the condition of locking actuator. (10 Acceleration: 14 Tm/s; 4-4-5-6-4-) (20 Duration: 1.1 ms (3) Test direction: 6 directions (18 times in total) Switch shall be checked after following test. (1) Solder: 1838 (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 220-25°C Immersing time: 3±0.5 s Flux immersing time shall be 5-10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.b. terminal after mounting. Thickness of P.C. board: 1.6 mm 11 Soldering heat resistance: (1) Solder: 1838 (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time		(3) Duration: 11ms	
(5) Number of shock: 3 times per direction (18 times in total) 5.9.2 Lock holding shock (Applied to the switch shall be conducted at the condition of locking actuator. (Applied to the switch with lock mechanism.) (4) Number of shock: 3 times per direction (18 times in total) Switch shall be checked after following test. (1) Solder: HS3A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm 11 Soldering heat feesistance (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time 12 Soldering heat feesistance (3) Temperature and immersing time (4) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time 14 Temperature (C) Time (s) Dip soldering 200±5 5±1 Hanual soldering 300±10 3.7½ DRAWING NO.		(4) Test direction : 6 directions	
(18 times in total) 5.9.2 Lock holding shock (Applied to the switch with lock mechanism.) (4) Number of shock: 3 times per direction (18 times in total) (5) Solderability (6) Number of shock: 3 times per direction (18 times in total) (7) Solderability (8) Switch shall be checked after following test. (1) Solder: BS3A (JIS Z 3282) (9) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C Immersing time is 3±0.5 s Flux immersing time is 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm 11) Soldering heat Fesistance: (1) Solder: BS3A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm (1) Solder: BS3A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersion depth is fine the solid by selection of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersion depth is fine the solid by selection of 10% s	· 9m	(a) II	
S.9.2 Lock holding shock Switch shall be conducted at the condition of locking actuator. 10 Acceleration: 147m/s² + 15-6+			l'
Capplied to the switch with lock mechanism. Capplied to the switch with solder. Capplied to th	5.9.2 Lock holding	Switch shall be conducted at the condition of locking actuator	
(2) Duration: 1 merson depth: Immersion depth shall be accoper plating portion for P.C.B. terminal after mounting. (3) Test direction: 6 directions (4) Number of shock: 3 times per direction (18 times in total) (5) Solderability (6) Solderability (7) Solder: H83A (JIS Z 3282) (8) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (8) Soldering temperature: 230±5°C Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm (1) Solder: H83A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3.7 d DRAWING NO.		(1) Acceleration : $147 \text{ m/s}^2 + 156 \Lambda$	located. Shall be free from
mechanism.) (4) Number of shock: 3 times per direction (18 times in total) Switch shall be checked after following test. (1) Solder: H83A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersing depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H83A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3°T DRAWING NO. DRAWING NO. DRAWING NO.	(Applied to the	(2) Duration : ms	abnormalities in operation.
(4) Number of shock: 3 times per direction (18 times in total) Switch shall be checked after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C		(3) Test direction: 6 directions	
Solderability Switch shall be checked after following test. (1) Solder: HSSA (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C	mechanism.)		
Solderability Switch shall be checked after following test.		l ' '	
(2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C	10 Solderability		More than 90% of immersed part sha
solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature: 230±5°C	•		be covered with solder.
(3) Soldering temperature: 230±5°C Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm 11 Soldering heat Fesistance: (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3.75 HAPPD. CHKD. DSGD. Jan, 30 / 9.3 DRAWING HO.			
(3) Soldering temperature: 230±5°C Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+1 Hanual soldering 300±10 SCHKD. Fig. 260±5 DRAWING NO.			
Immersing time: 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (*C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+1 APPD. CHKD. DSGD. Fun, 30 /93 DRAWING HO.			_
Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+6 APPD. CHKD. DSGD. Jun, 30 '93 DRAWING HO.		- '	
(4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (3) Temperature and immersing time Temperature (*C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3** APPD. CHKD. DSGD. Jun, 30** Jun, 30** Jun, 30** DRAWING NO.			-
Thickness of P.C. board: 1.6 mm Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 280±5 5±1 Hanual soldering 300±10 3+6 APPD. CHKD. DSGD. First Example 1.6 mm No abnormalities shall be recognized in appearance. The electrical perfection and appearance in appearance. The electrical perfection is shall be satisfied.			
Switch shall be measured after following test. (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+6 APPD. CHKD. DSGD. TITLE Jun, 30'93 DRAWING HO.		· · · · · · · · · · · · · · · · · · ·	
Fesistance (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+5 APPD. CHKD. DSGD. Jun, 30 93 DRAWING HO.		Thickness of P.C. board : 1.6 mm	
Tesistance (1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+1 APPD. CHKD. DSGD. Jun, 30 93 DRAWING HO.		•	_
(1) Solder: H63A (JIS Z 3282) (2) Flux: Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s) Dip soldering 260±5 5±1 Hanual soldering 300±10 3+6 APPD. CHKD. DSGD. Jun, 30'93 DRAWING HO.	11 Soldering heat	Switch shall be measured after following test.	
solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s)		(1) Solder : H63A (JIS Z 3282)	
(JIS K 1501) solution. (3) Temperature and immersing time Temperature (°C) Time (s)			I
(3) Temperature and immersing time Temperature (°C) Time (s)			Shall be satisiled.
Temperature (°C) Time (s)			
Dip soldering 260±5 5±1			
Hanual soldering 300±10 3+5 APPD. CHKD. DSGD. TITLE Jun, 30'93 DRAWING HO.	•		
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8. Jun, 30'93 DRAWING HO.		Trained 100 300 3 0	
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SP	UJ -S-501	SPUJ PRODUCT SPECIFICATIONS	
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$\overline{}$	Items	Test conditions	Criterion
	7.00	(4) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board (Single sided copper clad P.C.B.): 1.6mm	
.12	Resistance to flux (Applied to the switch for P.C. board)	Switch shall be checked after following test. (1) Equipment: Auto-dip chamber (2) Solder: H63A (JIS Z 3282) (3) Flux: Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501) solution. (4) Temperature: 260±5°C (5) Immersing time: 5±1 s (6) Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board: 1.6 mm	Flux shall not be risen up to contact Shall be free from abnormalities in operation.
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<u>յ. Մ</u> Լ	urability Items	Test conditions	Criterion
.1	Operating life without load	Switch shall be operated 10,000 cycles at 15~20 cycles/minute without load.	Contact resistance (Item 4.1): 40 mQ MAX Insulation resistance (Item 4.2): 10 MQ MIN Voltage proof (Item 4.3): Apply 500 V AC for 1 minute. No dielectric breakdown shall occur Operating force (Item 5.1): Within ±30 % of specified value No abnormalities shall be recognized in appearance and construction.
.2	Operating life with load	Switch shall be operated 10,000 cycles at 15~20 cycles/minute with 30 V DC 0.1 A. (Resistive load)	Contact resistance (Item 4.1): $40 \text{ m}\Omega$ MAX Insulation resistance (Item 4.2): $10 \text{ M}\Omega$ MIN Voltage proof (Item 4.3): Apply 500 V AC for 1 minute. No dielectric breakdown shall occuprating force (Item 5.1): Within $\pm \frac{40}{30} \text{ X}$ of specified value. No abnormalities shall be recognized.
			in appearance and construction.
7. V	eather proof		•
.1	Items Cold proof	After testing at -20±2°C for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and then measurement shall be made within 1 hour. Water drops shall be removed.	Criterion Contact resistance (Item 4.1): 40 mΩ HAX Insulation resistance (Item 4.2): 10 HΩ MIN Voltage proof (Item 4.3): Apply 500 V AC for 1 minute. No dielectric breakdown shall occuperating force (Item 5.1): Within ±30 % of specified value. No abnormalities shall be recognized in appearance and construction.
'.2	Dry heat	After testing at 85±2°C for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and then measurement shall be made within 1 hour.	Contact resistance (Item 4.1):
	<u> </u>		
			30'93 DRAVING HO. (3/

SPUJ PRODUCT SPECIFICATIONS Test conditions Criterion Items After testing at 40±2°C and 90~95%RH for 96 hours, the switch shall 7.3 Damp heat Contact resistance (Item 4.1) : be allowed to stand under normal temperature and humidity conditions <u>40</u> mΩ HAX for 1 hour, and measurement shall be made within 1 hour after that. Insulation resistance (Item 4.2) : <u>10</u> μα μικ Water drops shall be removed. Voltage proof (Item 4.3): Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1): Within ± 38 % of specified value. No abnormalities shall be recognized in appearance and construction. Switch shall be checked after following test. No remarkable corrosion shall be 7 4 Salt mist recognized in metal part. (1) Temperature : 35±2℃ (2) Salt solution : 5±1% (Solids by weight) (3) Duration : 24±1 h After the test, salt deposit shall be removed in running water Contact resistance (Item 4.1) : After 5 cycles of following conditions, the switch shall be allowed to 7.5 Temperature cycling stand under normal temperature and humidity conditions for 1 hour, and <u>40</u> mΩ MAX measurement shall be made within 1 hour after that. Insulation resistance (Item 4.2) : Water drops shall be removed. <u>10</u> μω μιμ Voltage proof (Item 4.3):
Apply 500 V AC for 1 minute. 70±2℃ -----No dielectric breakdown shall occur. Operating force (Item 5.1): Within $\pm \frac{4}{30}$ % of specified value. No abnormalities shall be recognized in appearance and construction. Normal temperature -25±3°C -----30 30 min min 10~15 10~15 min min 1 cycle DC voltage 1.5 times as much as rated voltage shall be applied Insulation resistance (50V DC) : 7.6 Damp heat with continuously between adjacent terminal at $60\pm2\%$ and $90\sim95\%RH$. After 10 MΩ min. Voltage proof : Apply 100V AC for 1 500 hours testing, switch shall be allowed to stand under normal (Silver migration) minute. No dielectric temperature and humidity condition for 1 hour, and measurement shall breakdown shall occur. be made within 1 hour after that. Water drops shall be removed. 8. Mechanical performance Criterion Test conditions Items A load of 20N 2004 shall be applied 2 keys shall not be locked at 8.1 Preventive between adjacent keys for 15 sec. as follows. strength of the same time. simultaneous locking Applied to the switch with Simultaneous locking prevention cam.

Precaution in use

- 1. Note that if the load is applied to the terminals during soldering they might suffer deformation and defects in electrical performance.
- 2. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.
- 3. The knob should be mounted or demounted after single-lock releasing.

If attempted under single locked condition, the single-acting mechanism may be damaged.

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SPUJ PRODUCT SPECIFICATIONS

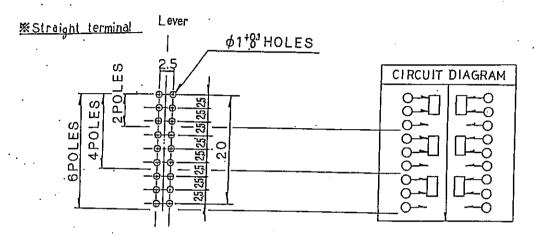
4.Flux flow ...

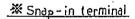
If too much flux is applied to the PCB it may penetrate into the switch and inhibit subsequent operation.

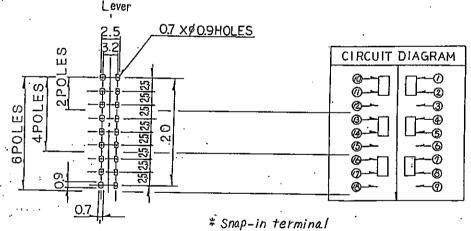


Flux may flow into the switch mount as indicated by

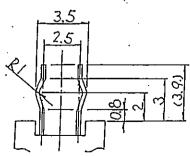
Printed circuit board mounting hole diagram. $(\pm 0.05$ tolerance unless otherwise specified)







Snap-in terminal detail.



2 POLES: TERMINAL NO. (1)(2)(3) (1) (1) 4 POLES: TERMINAL NO. (2)(5) (1) (1)

6. POLES: TERMINAL NO. 258 1 14

5. Soldering should be performed after single lock released. If attempted under single locked condition, the single-acting mechanism may be deformed by soldering heat.

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