Customer:

ALPS ELECTRIC EUROPA GMBH

No. SW945489 A

Date: Nov. 14'94

Attention:

Your ref. No.:

Your Part No.: STSPPJ301

SPECIFICATIONS

ALPS':

MODEL: SPPJ32

Spec. No.:

Sample No.: F3710935M
SPPJ32150A

RECEIPT STATUS

RECEIVED

By. Date

Signature

Name

Title

ALPS ELECTRIC CO., LTD.

DSG'D H. Yamaguchi

APP'D T. Maruyama

ENG. DEPT. DIVISION

Sales

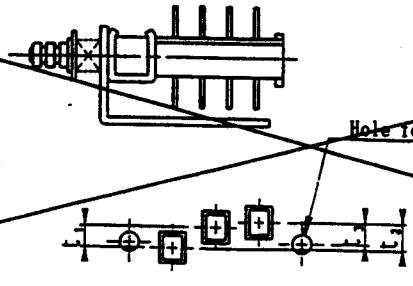
HEAD OFFICE
1-7, YUKIGAYA-OHTSUKA-CHO,
OHTA-KU, TOKYO 145 JAPAN

SPPJ3-S-501	SPPJ3 PRODUCT SPECIFICATIONS	⑧

1. General
 1.1 Application This specification is applied to lov current circuit (Secondary circuit) push switch used for electronic equipment.
 1.2 Operating temperature range : -10 ～ 60℃
 1.3 Test conditions The standard test conditions shall be 5～35℃ in temperature, 45～85% RH and 86～106kPa {860～1060mbar} in atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at 20±2℃, 65±5% 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 draving
 2.3 Markings Per individual product draving
3. Rating 30 V DC 0.2 A (Resistive load)
4. Electrical performance

	Items	Test conditions	Criterion
4.1	Contact resistance	Shall be measured at 1kHz±200Hz (20mV MAX , 50mA MAX) or 1A, 5V DC by voltage drop method.	20 mΩ MAX
4.2	Insulation resistance	Test voltage : 500 V DC, measured after 1 minute±5 seconds. Applied position : Between all terminals Between terminals and ground (frame)	100 MΩ MIN
4.3	Voltage proof —	Test voltage : 500 V AC (50～60Hz, cut-off current 2 mA) Applied position : Between all terminals Between terminals and ground (frame)	No dielectric breakdown shall occur.
4.4	Capacitance	Shall be measured at 1MHz ± 10kHz Between all terminals Between terminals and ground (frame) Between all circuits	____ pF MAX
4.5	Changeover timing		As per individual product drawing.

5. Mechanical performance

	Items	Test conditions	Criterion
5.1	Operating force	A static load shall be applied to the tip of actuator in operating direction.	As per individual product draving.
5.2	Terminal strength	A static load of 5 N { 510 gf} shall be applied to the tip of terminal in a desired direction for 1 minute. The number of test shall be once per terminal.	Shall be free from terminal looseness and damage and breakage of terminal holding portion. Terminals may be bent after test, electrical performance requirement specified in item 4 shall be satisfied.
5.3	Mounting strength of thread portion	Thread shall be mounted at 0.3N·m { 3.06 kgf·cm} by normal mounting method.	Shall be free from damage of thread portion.
5.4	Control strength 5.4.1 Control strength	(1) A static load of 50N { 5.1 kgf} shall be applied in the operating direction of actuator for 15 seconds. (2) A static load of 50N { 5.1 kgf} shall be applied in the pull direction of actuator for 15 seconds. (For construction with lock, the test shall be conducted at the condition of lock released.) (3) A static load of 1 N {0.102kgf} shall be applied to the vertical direction of operation at the tip of actuator for 15 seconds.	Shall be free from pronounced vobble, bending and mechanical abnormalities.
	5.4.2 Lock holding strength of actuator (Applied to the switch with lock mechanism)	(1) A static load of 10N {1.02 kgf} shall be applied in the pull direction at the condition of locking actuator.	Lock shall not be dislocated. Shall be free from pronounced vobble and abnormalities in operation.
5.5	Wobble of actuator	Run-out(P-P) shall be measured by applying a static load of 1N {102gf} in the vertical direction of operation at the tip of actuator.	P-P : 1.8 mm MAX
5.6	Rov of actuator (Applied to multipul-key push switch)	Switch shall be mounted as shown. Difference of sides shall be measured.  	Difference between actuators t_1 = Within ____ mm Maximum difference of actuator t_2 = Within ____ mm Difference between mounting hole and actuator t_3 = Within ____ mm

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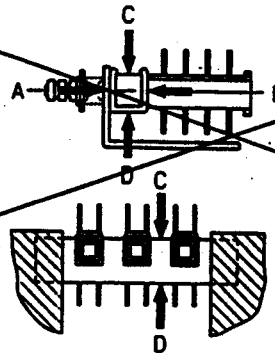
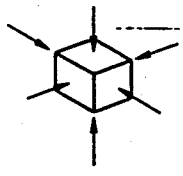
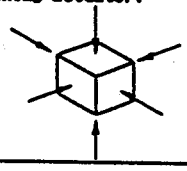
	Items	Test conditions	Criterion
5.7	Mounting frame strength (Applied to multi-pul-key push switch)	Both ends of mounting frame shall be secured. A static load of ___ N { ___ kgf} shall be applied to the center of mounting frame in A, B, C and D directions each 15 seconds. 	Warp on mounting frame shall be 0.5mm max. Shall be free from abnormalities in operation.
5.8	Vibration —	Switch shall be secured to a testing machine by a regular mounting device and method. (1) Vibration frequency range : 10~55Hz (2) Total amplitude : 1.5mm (3) Sweep ratio : 10-55-10(Hz) Approx. 1 minute (4) Method 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)	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ 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.
5.9	Mechanical shock 5.9.1 Mechanical shock	Switch shall be measured after following test. (1) Mounting method : Normal mounting method (2) Acceleration : 490m/s² { 50G } (3) Duration : 11ms (4) Test direction : 6 directions (5) Number of shock : 3 times per direction (18 times in total) 	Contact resistance (Item 4.1) : 40 mΩ MAX Operating force (Item 5.1) Within ±30 % of specified value. Shall be free from mechanical abnormalities. (Dislocation of lock of actuator shall not be regarded as abnormalities.)
	5.9.2 Lock holding shock (Applied to the switch with lock mechanism.)	Switch shall be conducted at the condition of locking actuator. (1) Acceleration : 196m/s² { 20 G } (2) Duration : 11 ms (3) Test direction : 6 directions (4) Number of shock : 3 times per direction (18 times in total) 	Lock of actuator shall not be dislocated. Shall be free from abnormalities in operation.
5.10	Solderability	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℃ 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 Immersion depth shall be at wiring portion of lead wire for lead wire terminal.	More than90% of immersed part shall be covered with solder.
5.11	Soldering heat resistance	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 Dip soldering : 260± 5 ℃, 10±1 s Manual soldering : 350±10 ℃, 3 +1 −0 s	No abnormalities shall be recognized in appearance. The electrical performance requirements specified in item 4 shall be satisfied.

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	Items	Test conditions	Criterion
		(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 Immersion depth shall be at wiring portion of lead wire for lead wire terminal.	
5.12	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℃ (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.

6. Durability

	Items	Test conditions	Criterion
6.1	Operating life without load	Switch shall be operated 10,000 cycles at 15~20 cycles/minute without load.	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.
6.2	Operating life with load	Switch shall be operated 10,000 cycles at 15~20 cycles/minute with 30 V DC 0.2 A. (Resistive load)	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.

7. Weather proof

	Items	Test conditions	Criterion
7.1	Cold proof	After testing at -20±2℃ 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.	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.
7.2	Dry heat	After testing at 85±2℃ 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) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.

(Push

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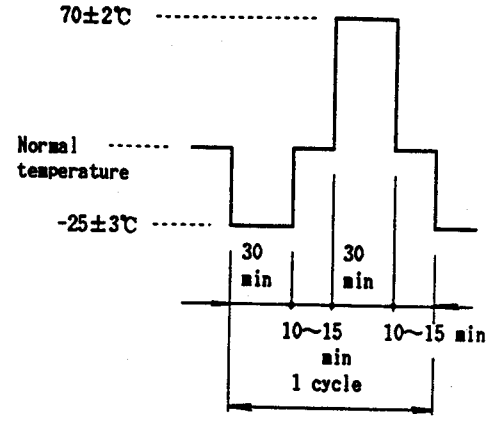
	Items	Test conditions	Criterion
7.3	Damp heat	After testing at 40±2℃ and 90~95%RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be removed.	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10/30 % of specified value. No abnormalities shall be recognized in appearance and construction.
7.4	Salt mist	Switch shall be checked after following test. (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.	No remarkable corrosion shall be recognized in metal part.
7.5	Temperature cycling	After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be removed. 	Contact resistance (Item 4.1) : 40 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 500 V AC for 1 minute. No dielectric breakdown shall occur. Operating force (Item 5.1) : Within ±10/30 % of specified value. No abnormalities shall be recognized in appearance and construction.
7.6	~~Damp heat with~~ load (Silver migration)	DC voltage 1.5 times as much as rated voltage shall be applied ~~continuously between~~ adjacent terminal at 60±2℃ and 90~95%RH. After 500 hours testing, ~~switch shall be allowed to stand under normal temperature and humidity condition~~ for 1 hour, and ~~measurement shall be made within~~ 1 hour after that. Water drops shall be removed.	Insulation resistance ~~(50V DC)~~ : 10 MΩ min. Voltage proof : Apply 100V AC for 1 minute. No dielectric breakdown shall occur.

Precaution in use

1. Load of solder :
   The terminals may wobble, be damaged in appearance, and be degenerated in the electrical performances when they are soldered and then added to extra load in some conditions.
2. The knob should be mounted or demounted after single-lock releasing.
   If attempted under single locked condition, the single-acting mechanism may be damaged.
3. Note that flox is apt to immerse because of small construction for this product.
4. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.

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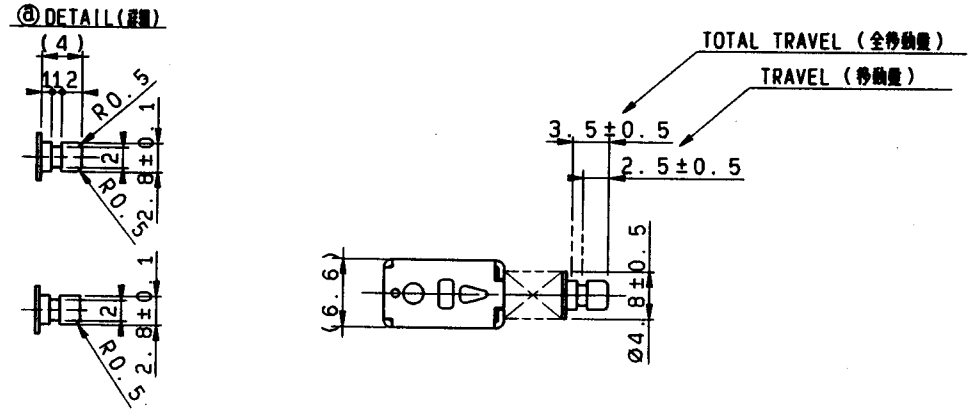
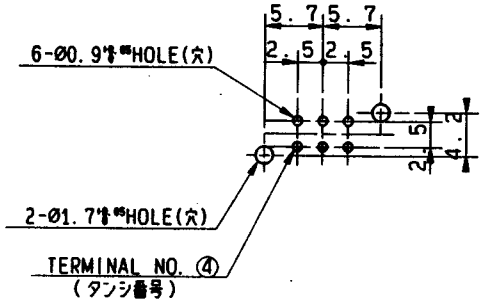
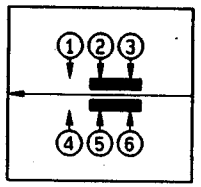
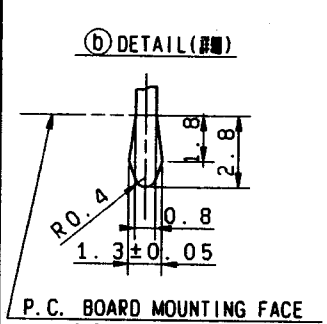
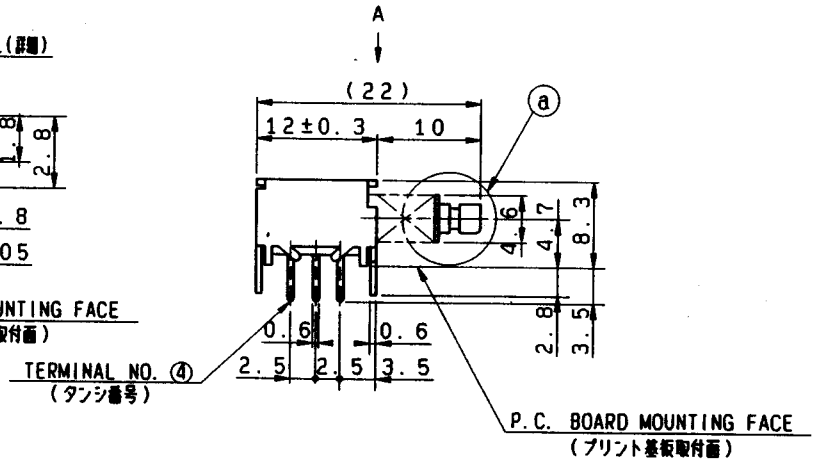
						M. K. Ezaki	S. Takahashi	Jun.3,93 F. Umezaki	DRAWING NO. (4/4)

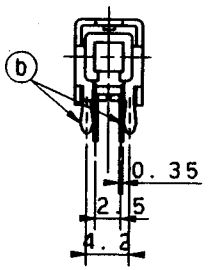


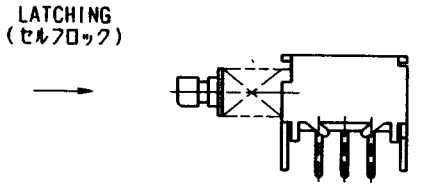












NOTES (注記)

1. PRODUCT SPECIFICATIONS NO. SPPJ3-S-501
(適用製品仕様書番号)

2. CHANGEOVER TIMING OF CONTACTS: NONSHORTING
(接点の切換タイミング: ノンショーティング)

3. OPERATING FORCE: 3.3±1N {337±102gf}
(作動力)

TOLERANCES UNLESS OTHERWISE SPEC.	
BASIC DIMENSIONS	TOLERANCES
UP TO 10	±0.3
ABOVE 10 TO 100	±0.5
ABOVE 100	±0.8
ANGULAR DIMENSIONS	±3°

ZONE	SYMB	DATE	APPD	CHKD	DSGD
	INITIAL DESIGN	July 14,'88	K.S	H.N	H.Y

ALPS ELECTRIC CO., LTD.

UNIT	SCALE	MODEL NO. (機種名)
mm	½	SPPJ32

APPD.	CHKD.	DSGD.	TITLE
Oct.17,'94 T. Maruyama	Oct.17,'94 M. Kise	Oct.17,'94 H. Yamaguchi	PRODUCT DRAWING (製品図)

DOCUMENT NO. SPPJ32150A △5

FURUKAWA DIV.

RE:ABOUT ADDITION OF SWITCHES PRODUCTION LOCATIONS
スイッチの製造場所追加に付いて

WE WOUID LIKE TO CHANGE THE PRODUCTION PLACE REASON WHY TO PROMOTE FOR SUITABLE PRODACTION PLACE. THE FOLLOWING SWITCHES ARE APPLIED.
弊社では適地生産推進及び生産のグローバル化から，下記スイッチの生産場所を次の通り追加致します。本製品も対象となりますので，何卒ご了解の程宜しくお願い致します。

1. THE SWITCHES AND PRODUCTION LOCATION
該当スイッチ及び生産場所

PRODUCT NAME 品　名	TYPE NAME OF ALPS 弊社機種名	CURRENT LOCATION 現生産場所	NEW LOCATION 新現生産場所
SLIDE SWITCHES スライドスイッチ	SSSJ (A PART OF VARIETY) （一部のバラエティ） SSSS7 (2 POLES,2 POSITION) （２回路２接点）	ALPS ELECTRIC CO.,LTD. MECHATRONIC DEVICED DEVISION アルプス電気（株） 電子部品事業本部 第１機構事業部	1.ALPS ELECTRIC CO.,LTD. MECHATRONIC DEVICED DEVISION アルプス電気（株） 電子部品事業本部 第１機構事業部 2.DUNG GUAN AN FIHUA (CHINA) ELECTRONICS FACTORY 東莞長安日華電子廠（中国）
PUSH SWITCHES プッシュスイッチ	SPPJ3 (E TYPE AND H TYPE) （E，Hタイプ） SPPJ6 (A PART OF VARIETY) （一部のバラエティ）		

DUNG GUAN AN FIHUA (CHINA) ELECTRONICS FACTORY:
THE PRODUCTION OF SIMILAR TYPES STARTED IN NOVEMBER 1993.
東莞長安日華電子廠：１９９３年１１月より類似製品の生産を開始しております。

2. SCHEDULE OF IMPLEMENTATION
実施時期

SSSJ・・・・FEBRURY 1995 (PLANNED)
１９９５年２月より順次実施させて頂きます。
SSSS7・・・・MARCH 1995 (PLANNED)
１９９５年３月より順次実施させて頂きます。
SPPJ3・・・・JANUARY 1995 (PLANNED)
１９９５年１月より順次実施させて頂きます。
SPPJ6・・・・FEBRURY 1995 (PLANNED)
１９９５年２月より順次実施させて頂きます。