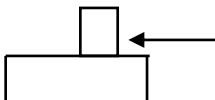
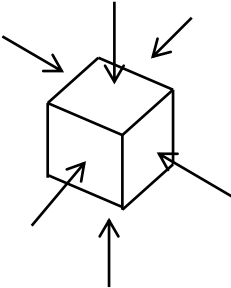


|                                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
|----------------------------------------------------|--------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|-------------------------------------------------------------------------------------|-------------------|-------------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|
| DOCUMENT No.<br>SSSS2-S-859                        |                                      |            | TITLE<br>製品仕様書                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      |      |      |                                                                                     |                   |             |      |      | PAGE<br>1／6                                                                                                                                                                                                                                                                       |             |             |             |
| BACKGROUND                                         |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      | 鉛フリー(S)<br><br>DIP                                                                                                                                                                                                                                                                |             |             |             |
| 1. General 一般事項                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 1.1 Application 適用範囲                               |                                      |            | This specification is applied to low current circuit (Secondary circuit) slide switch used for electronic equipment.<br>この仕様書は主として電子機器に用いる低電流回路用(2次側回路用)スライドスイッチに適用する。                                                                                                                                                                                                                                                                                                    |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 1.2 Operating temperature range                    |                                      |            | 使用温度範囲: -40 ～ 85℃                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 1.3 Storage temperature range                      |                                      |            | 保存温度範囲: -40 ～ 85℃                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 1.4 Test conditions 試験状態                           |                                      |            | Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows.<br>試験及び測定は特に規定がない限り以下の標準状態のもとで行う。<br>Ambient temperature 温度: 5～35℃<br>Relative humidity 相対湿度: 25～85％<br>Air pressure 気圧: 86～106kPa<br>Should any doubt arise in judgement, tests shall be conducted at the following conditions.<br>ただし、判定に疑義を生じた場合は以下の基準状態で行う。<br>Ambient temperature 温度: 20±2℃<br>Relative humidity 相対湿度: 60～70％<br>Air pressure 気圧: 86～106kPa |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 2.Appearance, construction and dimensions 外観、構造、寸法 |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 2.1 Appearance 外観                                  |                                      |            | Switch shall have good finishing, and no rust, crack or plating failures.<br>各部の仕上げは良好で、機能上有害な錆、傷、割れ、めっき不良及び剥離等があってはならない。                                                                                                                                                                                                                                                                                                                                                 |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 2.2 Construction and dimensions 構造、寸法              |                                      |            | Refer to individual product drawing. 個別製品図による。                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 3.Rating 定格                                        |                                      |            | Maximum 最大定格 6 V DC 0.3 A (Resistive load)(抵抗負荷)<br><br>Minimum 最小定格 3 V DC 50 μA (Resistive load)(抵抗負荷)                                                                                                                                                                                                                                                                                                                                                                  |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
| 4. Electrical specification 電気的性能                  |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
|                                                    | Items 項目                             |            | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |      |      |                                                                                     |                   |             |      |      | Criteria 判定基準                                                                                                                                                                                                                                                                     |             |             |             |
| 4.1                                                | Contact resistance<br>接 触 抵 抗        |            | Shall be measured at 1 kHz±200 Hz (20 mV MAX, 50 mA MAX)<br>1 kHz±200 Hz、電圧 20 mV 以下、電流 50 mA 以下による方法。                                                                                                                                                                                                                                                                                                                                                                    |      |      |      |      |                                                                                     |                   |             |      |      | 70 mΩ MAX                                                                                                                                                                                                                                                                         |             |             |             |
| 4.2                                                | Insulation<br>resistance<br>絶 縁 抵 抗  |            | Test voltage: 500 V DC, measured after 1 min ± 5 s<br>Applied position: Between all terminals<br>Between terminals and ground(frame)<br>DC 500 V の電圧を 1分±5秒間端子相互間、端子フレーム間に印加し、測定する。                                                                                                                                                                                                                                                                                       |      |      |      |      |                                                                                     |                   |             |      |      | 100 MΩ MIN                                                                                                                                                                                                                                                                        |             |             |             |
| 4.3                                                | Voltage proof<br>耐 電 圧               |            | Test voltage: 500 V AC (50～60Hz, cut-off current 2 mA)<br>Duration: 1 min<br>Applied position: Between all terminals<br>Between terminals and ground(frame)<br>AC 500 V (50～60Hz、感度電流 2 mA) の電圧を 1分間端子相互間、端子フレーム間に印加する。                                                                                                                                                                                                                                                   |      |      |      |      |                                                                                     |                   |             |      |      | No dielectric breakdown shall occur.<br>絶縁破壊のないこと。                                                                                                                                                                                                                                |             |             |             |
| 4.4                                                | Changeover timing<br>切換タイミング         |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      | Refer to individual product drawing.<br>個別製品図による。                                                                                                                                                                                                                                 |             |             |             |
| 5. Mechanical specification 機械的性能                  |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   |             |             |             |
|                                                    | Items 項目                             |            | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |      |      |                                                                                     |                   |             |      |      | Criteria 判定基準                                                                                                                                                                                                                                                                     |             |             |             |
| 5.1                                                | Operating force<br>作 動 力             |            | A static load shall be applied to the root of actuator in operating direction.<br>操作部の根元に作動方向へ静荷重を加えて測定する。<br>                                                                                                                                                                                                                                                                       |      |      |      |      |                                                                                     |                   |             |      |      | Refer to individual product drawing.<br>個別製品図による。                                                                                                                                                                                                                                 |             |             |             |
| 5.2                                                | Robustness of<br>terminal<br>端 子 強 度 |            | A static load of 3 N shall be applied to the tip of terminal in a desired direction for 1 min. The test shall be done once per terminal.<br>端子先端の一方向へ 3 N の静荷重を1分間加える。<br>ただし、回数は1端子当たり1回とする。                                                                                                                                                                                                                                                                             |      |      |      |      |                                                                                     |                   |             |      |      | Shall be free from terminal looseness.<br>damage and breakage of terminal holding portion. Terminals may be bent after test. Electrical performance requirement specified in item 4 shall be satisfied.<br>端子の脱落、破損及び端子保持部の破損のないこと。ただし、端子の曲がりは差し支えないものとする。また、試験後 4項の電気的性能を満足すること。 |             |             |             |
|                                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   | APPD.       | CHKD.       | DSGD.       |
|                                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     |                   |             |      |      |                                                                                                                                                                                                                                                                                   | Feb.01.2019 | Feb.01.2019 | Feb.01.2019 |
|                                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      | 5,6  |  | Usage notes added | Feb.01,2019 | F. Y | F. Y | H. K                                                                                                                                                                                                                                                                              | F. Yasuda   | F. Yasuda   | H. Kamada   |
|                                                    |                                      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                                                                                     | Initial design    | June16,2009 | K. T | K. T | T. U                                                                                                                                                                                                                                                                              |             |             |             |
| PAGE                                               | SYMB                                 | BACKGROUND | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | APPD | CHKD | DSGD | PAGE | SYMB                                                                                | BACKGROUND        | DATE        | APPD | CHKD | DSGD                                                                                                                                                                                                                                                                              |             |             |             |

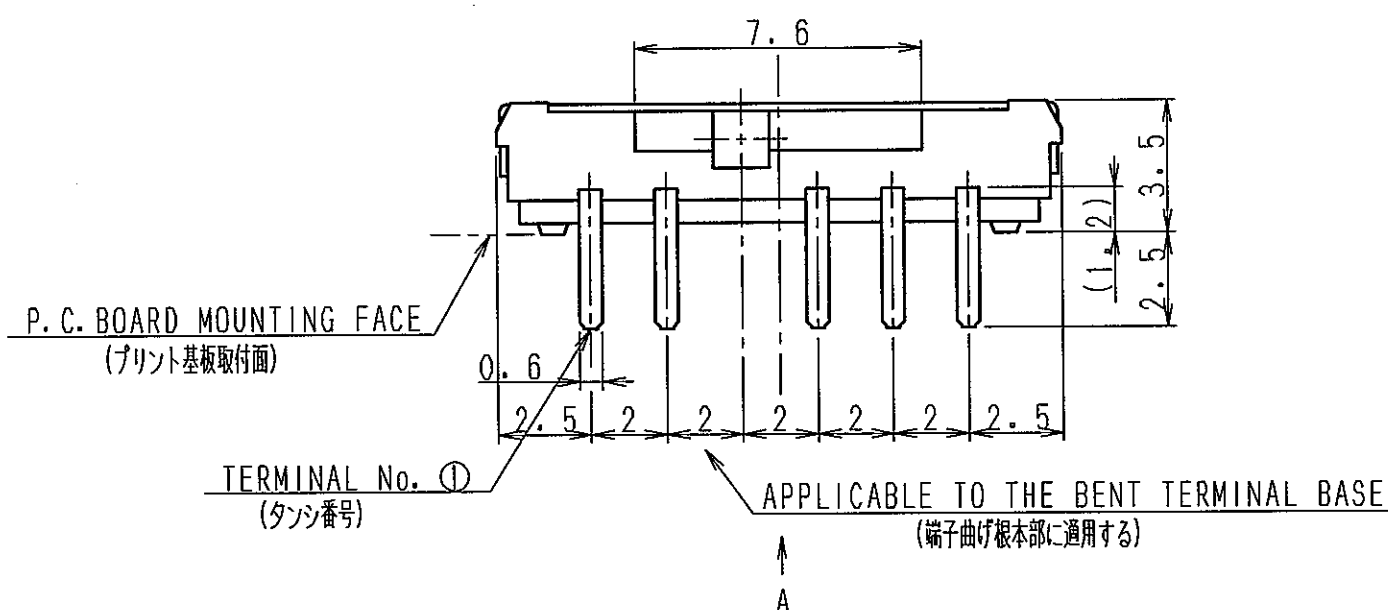
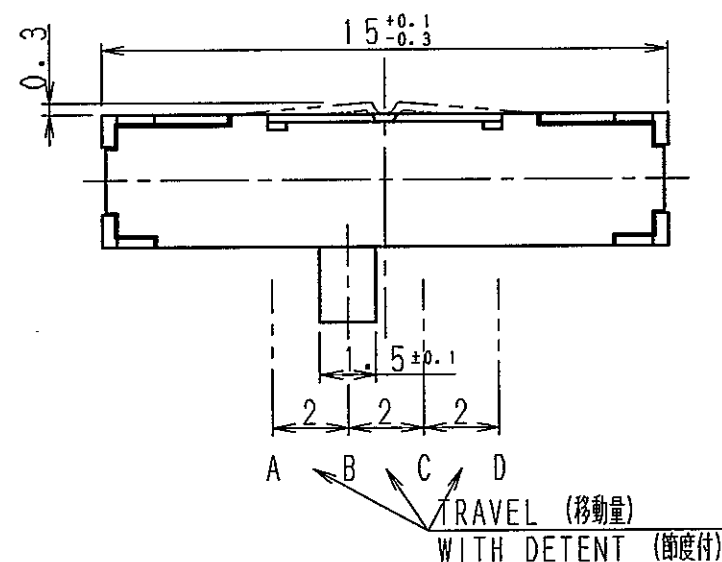
| DOCUMENT No. |                                     | TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | PRODUCT SPECIFICATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PAGE |
|--------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| SSSS2-S-859  |                                     | 製品仕様書                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2/6  |
|              |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |
|              | Items 項目                            | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | Criteria 判定基準                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |
| 5.3          | Robustness of actuator<br>操 作 部 強 度 | A static load of <u>20 N</u> shall be applied in the operating direction of actuator for 15 s.<br>操作部の作動方向に <u>20 N</u> の静荷重を15秒間加える。<br>A static load of <u>10 N</u> shall be applied in the pull direction of actuator for 15 s.<br>操作部の引張方向に <u>10 N</u> の静荷重を15秒間加える。<br>Vertical knob type(つまみ上出しタイプ)<br>A static load of <u>10 N</u> shall be applied in the perpendicular direction of operation at the tip of actuator for 15 s.<br>操作部の先端に作動方向と直角に <u>10 N</u> の静荷重を15秒間加える。<br>Horizontal knob type(つまみ横出しタイプ)<br>A static load of <u>5 N</u> shall be applied in the perpendicular direction of operation at the tip of actuator for 15 s.<br>操作部の先端に作動方向と直角に <u>5 N</u> の静荷重を15秒間加える。 |  | Shall be free from pronounced wobble, deformation and mechanical abnormalities.<br>Electrical performance requirement specified in item 4 shall be satisfied.<br>著しいガタ及び曲がりのないこと。<br>機械的に異常のないこと。<br>また、試験後 4項の電気的性能を満足すること。                                                                                                                                                                                                                                                        |      |
| 5.4          | Wobble of actuator<br>操 作 部 の 振 れ   | Run-out(P-P) shall be measured by applying a static load of 0.5N in the perpendicular direction of operation at the tip of actuator.<br>操作部の先端に作動方向と直角に 0.5N の静荷重を加え、振れ幅(最大値)を測定する。                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | P-P: <u>0.6</u> mm MAX                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |
| 5.5          | Vibration<br>耐 振 性                  | Switch shall be secured to a testing machine by a normal mounting device and method.<br>Switch shall be measured after following test.<br>スイッチを正規の取付用具、取付方法で試験機に固定し、下記条件で試験を行い、試験後測定する。<br>(1)Vibration frequency range 振動数範囲: 10~55 Hz<br>(2>Total amplitude 全振幅: 1.5 mm<br>(3)Sweep ratio 掃引の割合: 10-55-10 Hz Approx. 1 min 約1分<br>(4)Method of changing the sweep vibration frequency: Logarithmic or linear<br>掃引振動数の変化方法 対数又は直線近似<br>(5)Direction of vibration: Three perpendicular directions including actuator<br>振動の方向 操作部を含む垂直3方向<br>(6)Duration 振動時間: 2 h each (6 h in total) 各 2時間 (計 6時間)                                                                                             |  | Contact resistance 接触抵抗 (Item 4.1):<br><u>70</u> mΩ MAX<br>Insulation resistance 絶縁抵抗(Item 4.2):<br><u>100</u> MΩ MIN<br>Voltage proof 耐電圧 (Item 4.3):<br>Apply <u>500</u> V AC for 1 min.<br>No dielectric breakdown shall occur.<br>絶縁破壊のないこと。<br>Operating force 作動力 (Item 5.1):<br>Within specified value.<br>規格値内とする。<br>Shall be free from mechanical abnormalities.<br>機械的に異常がないこと。                                                                                          |      |
| 5.6          | Shock<br>耐 衝 撃 性                    | Switch shall be measured after following test.<br>下記条件で試験を行い、試験後測定する。<br>(1)Mounting method 取付方法: Normal mounting method<br>正規の方法で取り付ける。<br>(2)Acceleration 加速度: 490 m/s <sup>2</sup><br>(3)Duration 作用時間: 11 ms<br>(4)Test direction 試験方向: 6 directions 6 面<br>(5)Number of shocks 試験回数: 3 times per direction<br>(18 times in total)<br>各方向各3回 (計18回)                                                                                                                                                                                                                                                                                                                                           |  | <br>Contact resistance 接触抵抗 (Item 4.1):<br><u>70</u> mΩ MAX<br>Insulation resistance 絶縁抵抗(Item 4.2):<br><u>100</u> MΩ MIN<br>Voltage proof 耐電圧 (Item 4.3):<br>Apply <u>500</u> V AC for 1 min.<br>No dielectric breakdown shall occur.<br>絶縁破壊のないこと。<br>Operating force 作動力 (Item 5.1):<br>Within specified value.<br>規格値内とする。<br>Shall be free from mechanical abnormalities.<br>機械的に異常がないこと。 |      |
| 5.7          | Solderability<br>はんだ付け性             | Switch shall be checked after following test.<br>下記条件で試験を行い、試験後確認する。<br>(1)Solder はんだ: Sn-3.0Ag-0.5Cu<br>(2)Flux フラックス: EC-19S-8<br>(3)Soldering temperature はんだ温度: 245±5 °C<br>Immersing time 浸漬時間: 3±0.5 s<br>Flux immersing time shall be 5~10 s in normal room temperature.<br>ただし、フラックス浸漬は常温で5~10秒とする。<br>(4)Immersion depth: Immersion depth shall be at copper plating portion for<br>浸漬深さ P.C.B. terminal after mounting.<br>Thickness of P.C.B.: 1.6 mm<br>プリント基板用端子はプリント基板(t1.6)実装後、銅箔面まで浸漬。                                                                                                                                                                                            |  | More than <u>90</u> % of immersed part shall be covered with solder.<br>If frame is made of tin-plate, cutting section shall not be applied.<br>浸漬した部分の <u>90</u> %以上がはんだで覆われていること。<br>ただし、ぶりき枠の場合は、破断面は適用しない。                                                                                                                                                                                                                                                                      |      |

|                                     |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
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| DOCUMENT No.<br>SSSS2-S-859         |                                          | TITLE<br>PRODUCT SPECIFICATIONS<br>製品仕様書                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PAGE<br>3／6        |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
|                                     |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
|                                     | Items 項目                                 | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Criteria 判定基準                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 5.8                                 | Resistance to soldering heat<br>はんだ耐熱性   | <div>The test shall be conducted under the following conditions.<br/>下記条件で試験を行う。</div> <div>(1)Solder はんだ: Sn-3.0Ag-0.5Cu<br/>(2)Flux フラックス: EC-19S-8<br/>(3)Temperature and immersing time 温度と浸漬時間</div> <table><tr><td></td><td>Temperature 温度(°C)</td><td>Time 時間 (s)</td></tr><tr><td>Dip soldering ディップはんだ</td><td>260± 5</td><td>3±1 Once 1回</td></tr><tr><td>Manual soldering 手はんだ</td><td>350±10</td><td>3 +1/0 * Twice 2回</td></tr></table> <div>* Second soldering shall be conducted after the switch cooled down.<br/>1回目終了後、一旦常温に戻すことを条件とする。</div> <div>(4)Immersion depth: Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting.<br/>浸漬深さ Thickness of P.C.B.(Single sided copper clad phenolic resin P.C.B.): 1.2mm 1.6 mm<br/>プリント基板用端子はプリント基板(片面銅張りフェノール樹脂積層板t1.2 t1.6)実装後、銅箔面まで浸漬。</div> <div>(5)Pre-heating condition of dip soldering *Temperature(At the upside surface of P.C.B.): 100°C MAX<br/>ディップはんだのプリヒート条件 温度(プリント基板の上面)<br/>*Time :60 s MAX<br/>時間</div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Temperature 温度(°C) | Time 時間 (s)                         | Dip soldering ディップはんだ | 260± 5                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3±1 Once 1回 | Manual soldering 手はんだ | 350±10 | 3 +1/0 * Twice 2回 | <div>No abnormalities shall be observed in appearance and operation. The electrical performance requirements specified in item 4 shall be satisfied.<br/>外観に著しい変形のないこと。<br/>また、動作に異常がなく、4項の電氣的性能を満足すること。</div> |  |
|                                     | Temperature 温度(°C)                       | Time 時間 (s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| Dip soldering ディップはんだ               | 260± 5                                   | 3±1 Once 1回                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| Manual soldering 手はんだ               | 350±10                                   | 3 +1/0 * Twice 2回                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 6.Durability 耐久性能                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
|                                     | Items 項目                                 | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Criteria 判定基準                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 6.1                                 | Operating life without load<br>無 負 荷 寿 命 | <div>Switch shall be operated 10,000 cycles at 15～20 cycles/min without load.<br/>無負荷にて10,000サイクル(動作速度15～20サイクル／分)連続動作を行う。</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <div>Contact resistance 接触抵抗 (Item 4.1):<br/>100 mΩ MAX<br/>Insulation resistance. measured at DC 100V.<br/>絶縁抵抗 DC 100V : 10 MΩ MIN<br/>Voltage proof 耐電圧 (Item 4.3):<br/>Apply 100 V AC for 1 min.<br/>No dielectric breakdown shall occur.<br/>絶縁破壊のないこと。<br/>Operating force 作動力 (Item 5.1):<br/>Within +10, -30% of specified value.<br/>規格値の +10, -30% 以内。<br/>No abnormalities shall be recognized in appearance and construction.<br/>外観、構造に異常がないこと。</div> |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 6.2                                 | Operating life with load<br>負 荷 寿 命      | <div>Switch shall be operated at 15～20 cycles/min with condition as following table.<br/>下記表にて(動作速度15～20サイクル／分)連続動作を行う。</div> <table><tr><td>Load 負 荷</td><td>Cycles</td></tr><tr><td>6 V DC 0.3 A (Resistive load)(抵抗負荷)</td><td>10,000</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Load 負 荷                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Cycles             | 6 V DC 0.3 A (Resistive load)(抵抗負荷) | 10,000                | <div>Contact resistance 接触抵抗 (Item 4.1):<br/>130 mΩ MAX<br/>Insulation resistance. measured at DC 100V.<br/>絶縁抵抗 DC 100V : 10 MΩ MIN<br/>Voltage proof 耐電圧 (Item 4.3):<br/>Apply 100 V AC for 1 min.<br/>No dielectric breakdown shall occur.<br/>絶縁破壊のないこと。<br/>Operating force 作動力 (Item 5.1):<br/>Within +10, -30% of specified value.<br/>規格値の +10, -30% 以内。<br/>No abnormalities shall be recognized in appearance and construction.<br/>外観、構造に異常がないこと。</div> |             |                       |        |                   |                                                                                                                                                                                                                |  |
| Load 負 荷                            | Cycles                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 6 V DC 0.3 A (Resistive load)(抵抗負荷) | 10,000                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 7.Environmental test 耐候性            |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
|                                     | Items 項目                                 | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Criteria 判定基準                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |
| 7.1                                 | Cold<br>耐 寒 性                            | <div>After testing at -40±2°C for 500h, the switch shall be allowed to stand under normal room temperature and humidity conditions for 1 h, and then measurement shall be made within 1 h. Water drops shall be removed.<br/>-40±2°Cにて500時間試験後、常温常湿中に1時間放置し1時間以内に測定する。<br/>ただし、水滴は取り除く。</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <div>Contact resistance 接触抵抗 (Item 4.1):<br/>100 mΩ MAX<br/>Insulation resistance 絶縁抵抗(Item 4.2):<br/>10 MΩ MIN<br/>Voltage proof 耐電圧 (Item 4.3):<br/>Apply 500 V AC for 1 min.<br/>No dielectric breakdown shall occur.<br/>絶縁破壊のないこと。<br/>Operating force 作動力 (Item 5.1):<br/>Within +10, -30% of specified value.<br/>規格値の +10, -30% 以内。<br/>No abnormalities shall be recognized in appearance and construction.<br/>外観、構造に異常がないこと。</div>                      |                    |                                     |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                       |        |                   |                                                                                                                                                                                                                |  |

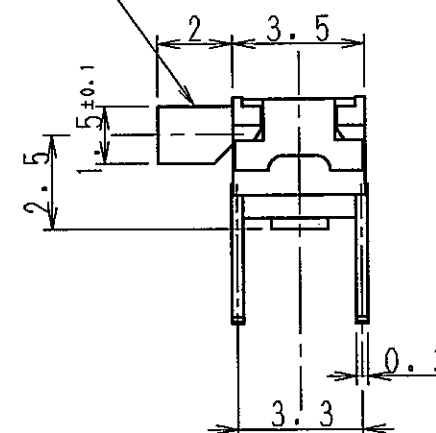
| DOCUMENT No.<br>SSSS2-S-859 |                                                                                   | TITLE<br>PRODUCT SPECIFICATIONS<br>製品仕様書                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        | PAGE<br>4/6 |
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|                             | Items 項目                                                                          | Test conditions 試験条件                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Criteria 判定基準                                                                                                                                                                                                                                                                                                                                                                                                          |             |
| 7.2                         | Dry heat<br>耐熱性                                                                   | After testing at 85±2℃ for 500h, the switch shall be allowed to stand under normal room temperature and humidity conditions for 1 h, and then measurement shall be made within 1 h.<br>85±2℃にて500時間試験後、常温常湿中に1時間放置し1時間以内に測定する。                                                                                                                                                                                                                                             | Contact resistance 接触抵抗 (Item 4.1):<br>100 mΩ MAX<br>Insulation resistance 絶縁抵抗(Item 4.2):<br>10 MΩ MIN<br>Voltage proof 耐電圧 (Item 4.3):<br>Apply 500 V AC for 1 min.<br>No dielectric breakdown shall occur.<br>絶縁破壊のないこと。<br>Operating force 作動力 (Item 5.1):<br>Within +10, -30% of specified value.<br>規格値の +10, -30% 以内。<br>No abnormalities shall be recognized in appearance and construction.<br>外観、構造に異常がないこと。 |             |
| 7.3                         | Damp heat<br>耐湿性                                                                  | After testing at 60±2℃ and 90~95%RH for 500h, the switch shall be allowed to stand under normal room temperature and humidity conditions for 1 h, and then measurement shall be made within 1 h. Water drops shall be removed.<br>60±2℃、相対湿度90~95%にて500時間試験後、常温常湿中に1時間放置し1時間以内に測定する。ただし、水滴は取り除く。                                                                                                                                                                           | Contact resistance 接触抵抗 (Item 4.1):<br>100 mΩ MAX<br>Insulation resistance 絶縁抵抗(Item 4.2):<br>10 MΩ MIN<br>Voltage proof 耐電圧 (Item 4.3):<br>Apply 100 V AC for 1 min.<br>No dielectric breakdown shall occur.<br>絶縁破壊のないこと。<br>Operating force 作動力 (Item 5.1):<br>Within +10, -30% of specified value.<br>規格値の +10, -30% 以内。<br>No abnormalities shall be recognized in appearance and construction.<br>外観、構造に異常がないこと。 |             |
| 7.4                         | Salt mist<br>塩水噴霧<br>(EIA-364-26)                                                 | Switch shall be checked after following test.<br>下記条件で試験を行い、試験後確認する。<br>(1)Temperature 温度: 35±2℃<br>(2)Salt solution 塩水濃度: 5±1% (Solids by mass) (質量比)<br>(3)Duration 試験時間: 48 ±1 h<br>After the test, salt deposit shall be removed in running water.<br>試験後試料に付着した塩堆積物を流水で落とす。                                                                                                                                                                                           | No remarkable corrosion shall be recognized in metal part.<br>機能上有害な著しいさびがないこと。                                                                                                                                                                                                                                                                                                                                        |             |
| 7.5                         | Change of temperature<br>温度サイクル                                                   | After 5 cycles of following conditions, the switch shall be allowed to stand under normal room temperature and humidity conditions for 1 h, and measurement shall be made within 1 h after that. Water drops shall be removed.<br>下記条件で5サイクル試験後、常温常湿中に1時間放置し1時間以内に測定する。<br>ただし、水滴は取り除く。<br><div><div>85±2℃</div><div>Normal room Temperature 常温</div><div>-40±3℃</div><div><div>30min</div><div>2~3min</div><div>30min</div><div>2~3min</div><div>1cycle</div></div></div> | Contact resistance 接触抵抗 (Item 4.1):<br>100 mΩ MAX<br>Insulation resistance 絶縁抵抗(Item 4.2):<br>10 MΩ MIN<br>Voltage proof 耐電圧 (Item 4.3):<br>Apply 100 V AC for 1 min.<br>No dielectric breakdown shall occur.<br>絶縁破壊のないこと。<br>Operating force 作動力 (Item 5.1):<br>Within +10, -30% of specified value.<br>規格値の +10, -30% 以内。<br>No abnormalities shall be recognized in appearance and construction.<br>外観、構造に異常がないこと。 |             |
| 7.6                         | Damp heat with load<br>(Resistance to silver migration)<br>耐湿負荷<br>(耐銀マイグレーション特性) | DC voltage 1.5 times as much as rated voltage shall be applied continuously between adjacent terminals at 60±2℃ and 90~95%RH. After 500 h testing, switch shall be allowed to stand under normal room temperature and humidity conditions for 1 h, and measurement shall be made within 1 h after that.<br>Water drops shall be removed.<br>60±2℃、相対湿度90~95%にて隣接端子間に定格電圧の1.5倍の直流電圧を連続印加し、500時間試験後、常温常湿中に1時間放置し1時間以内に測定する。ただし、水滴は取り除く。                                      | Insulation resistance 絶縁抵抗 (50V DC):<br>10 MΩ MIN<br>Voltage proof 耐電圧:<br>Apply 100V AC for 1 min.<br>No dielectric breakdown shall occur.<br>AC 100V、1分間印加。<br>絶縁破壊のないこと。                                                                                                                                                                                                                                            |             |

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| <div>△【Precaution in use】ご使用上の注意</div> <div>A. General 一般項目</div> <div>A1. For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.<br/>国内外の輸出関連法規により規制されている製品の輸出に際しては、同法規を遵守の上、必要な許可、手続き等をとってください。</div> <div>A2. Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.<br/>軍事用途又はテロ等の反社会活動目的では、当製品を一切使用しないでください。 また、最終的にそれら用途・目的で使用するおそれがある法人・団体・個人等へも当製品を一切供給しないでください。</div> <div>A3. Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market, such as AV (audio visual) equipment, home electric equipment, office and commercial electronic equipment, information and communication equipment or amusement equipment.<br/>The products are not intended for use in, and must not be used for, any application of nuclear equipment, driving control equipment for aerospace or any other unauthorized use.<br/>With the exception of the above mentioned banned applications, for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment, please contact an ALPSALPINE sales representative and/or evaluate the total system on the applicability. Also, implement a fail-safe design, protection circuit, redundant circuit, malfunction protection and/or fire protection into the complete system for safety and reliability of the total system.<br/>当製品は、特に用途を指定していないかぎり、本来、AV、家電、事務機、情報機器、通信機器、アミューズメント機器等の一般電子機器用に設計、製造されたものです。したがいまして、原子力制御機器、宇宙・航空機で運行にかかわる機器等の用途では一切使用しないでください。<br/>上記の使用禁止の用途以外で、医療機器、防犯機器、防災機器、海底用機器等の高度の安全性・信頼性を必要とする機器でのご使用の際は、弊社営業担当迄ご相談いただくか、またはセットでの十分な適合性の確認を行っていただいた上で、フェールセーフ設計、保護回路、冗長回路、誤動作防止設計、延焼対策設計等のセットでの安全対策設計を設けてください。</div> <div>A4. Do not operate switches continuously at extremes of high and low temperatures of the specified temperature range. The maximum operating duration under the specific environmental conditions is specified in the part specifications.<br/>使用温度範囲の上限付近及び下限付近での長時間の連続使用は出来ませんのでご注意下さい。使用条件の規定は製品仕様書の各種環境試験の範囲内となりますのでご注意下さい。</div> <div>A5. The specified operation life is determined at the temperature between 5℃ and 35℃, not at temperature extremes.<br/>動作寿命の規定は、常温（5～35℃）によるもので使用温度上限及び下限付近での連続動作は出来ませんのでご注意下さい。</div> <div>A6. When switches are to be operated at temperature extremes continuously, we need to examine each specification whether it is possible.<br/>使用温度上限及び下限付近で連続動作を行う場合は、機種毎に仕様規定が可能かどうかの確認が必要となりますのでご注意下さい。</div> <div>A7. This product is designed and manufactured assuming that it is to be used with the resistance for direct current. If you use other kinds of resistance (inductive (L) or capacitive (C)), please let us know beforehand.<br/>本製品は直流の抵抗負荷を想定して設計・製造されています。その他の負荷（誘導性負荷(L)、容量性負荷(C)）で使用される場合は、別途ご相談ください。</div> <div>B. Soldering and assemble to P.C.Board process はんだ付、基板実装工程</div> <div>B1. Note that if the load is applied to the terminals during soldering they might suffer deformation and defects in electrical performance.<br/>端子をはんだ付けされる場合、端子に荷重が加わりますと条件によりガタ、変形及び電氣的特性劣化のおそれがありますのでご注意下さい。</div> <div>B2. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.<br/>はんだ付けの際、水溶性フラックスはスイッチを腐食させるおそれがありますのでご使用はお避けください。</div> <div>B3. Following the soldering process, do not try to clean the switch with a solvent or the like.<br/>はんだ付け後、溶剤等でスイッチを洗浄しないでください。</div> <div>C. Using environment 使用環境</div> <div>C1. Foreign matter invaded from outside. 外部浸入物</div> <div>Since this switch does not have sealed structure, it may have contact failure caused by the dust from outside up to the environment.<br/>当スイッチは完全密閉構造ではありませんので、使用環境によっては塵埃が内部に侵入し、接点障害を起こす場合があります。<br/>When you use this switch, precaution must be taken against the dust. The followings are examples of dust invasion:<br/>ご使用の際はスイッチに異物が侵入しないようにご注意下さい。 以下に塵埃侵入例を示します。ご参考にして下さい。</div> <div>(1) Debris from the cut or hole of PCB in process, or wastes from the PCB protection material (e.g. newspaper, foamed polystyrene etc.) invaded the switch.<br/>工程内におけるPCB切断面や穴から発生するクズやPCB保護材（新聞紙、発泡スチロール等）から出るゴミがスイッチに侵入した。</div> <div>(2) Flux or powdered flux produced by stacking PCB's or excess foaming invaded the switch.<br/>基板重ねによりフラックス粉末がスイッチに侵入した。</div> <div>C2. If you use this product in one of the following environmental conditions, progress of sulfuration and oxidization on the contact part will be accelerated, which may cause contact failure. Therefore, be careful about the supposed environment.<br/>以下の様な環境下で使用されますと、当製品の性能に影響を及ぼすおそれがありますので使用環境に十分にご注意下さい。</div> <div>(1) Around a sulfate hot spring where sulfide gas is generated. And in case this product is always used in a place where exhaust gas from automobiles exist.<br/>硫黄系温泉地等常時ガスが発生する場所や、自動車等の排気ガスの発生する場所で常時使用する場合</div> <div>(2) Follow the directions if you have parts/materials described below within the module where the switch is installed.<br/>同一セット内に以下のような部材に関しましては以下の点にご注意願います。<ul style="list-style-type: none"><li>For parts, rubber materials, adhesive agents, plywood, packing materials and lubricant used for the mechanical part of the device, there is something that generates sulfide and oxidizing gas Please be careful.<br/>部品、ゴム材料、接着剤、合板、機器の梱包材、機器内の駆動部に使用される潤滑剤については、硫化、酸化ガスを発生するものがありますのでご注意願います。<br/>When you use silicon rubber, grease, adhesive agents and oil, there is something that generates low molecular siloxane gas Please be careful<br/>The low molecular siloxane gas may form silicon dioxide coat on the SW contact part, resulting in the contact failure.<br/>シリコン系ゴム、グリース、接着剤、オイルを使用される場合は、低分子シロキサンガスを発生するものがありますのでご注意願います。<br/>低分子シロキサンガスが発生しますとSW接点部に2酸化珪素の皮膜を形成して接点障害を引き起こす場合があります。</li></ul></div> |       |                        |      |

| DOCUMENT No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TITLE | PRODUCT SPECIFICATIONS | PAGE |
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| SSSS2-S-859                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       | 製品仕様書                  | 6／6  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                        |      |
| <div>D. Storage method. 保管方法</div> <div>D1. If you don't use the product immediately, store it as delivered in the following environment: with neither direct sunshine nor corrosive gas and in normal temperatures. However, it is recommended that you should use it as soon as possible before six months pass.<br/>製品は納入形態のまま常温, 常湿で直射日光の当たらず腐食性ガスが発生しない場所に保管し納入から6ヶ月以内を限度として出来るだけ早くご使用下さい。</div> <div>D2. Storage conditions the switches packed before being mounted.<br/>実装前、梱包状態での保管条件<br/>Temperature 温度: -5~35℃<br/>Humidity 湿度: 35~85%RH</div> <div>D3. After you break the seal, you should put the remaining in a plastic bag to separate it from the outside and store it in the same environment mentioned above. You should use it up as soon as possible.<br/>開封後はポリ袋で外気との遮断を図り上記と同じ環境下で保管しすみやかにご使用下さい。</div> <div>D4. Do not stack too many switches for strafe.<br/>過剰な積み重ねは行わないで下さい。</div> <div>E. Others. その他</div> <div>E1. This specification will be invalid one year after it is issued, if you don't return it or don't place an order<br/>本仕様書は発行日より1年間を経過して、ご返却又は発注の無い場合は、無効とさせていただきます。</div> <div>E2. Please understand that the specifications other than electric and mechanical characteristics and outside dimensions may be changed at our own direction.<br/>電氣的, 機械的特性, 外観寸法および取付寸法以外につきましては、当社の都合により変更させて頂く事が有りますので、あらかじめご了承下さい。</div> <div>E3. Never use the product beyond the rating. It may catch fire. If you think that the product may be used beyond the rating due to some abnormal conditions, you must take certain protective measures, such as a protective circuit to shut down the current.<br/>定格を超えての使用は火災発生の恐れがありますので絶対に避けて下さい。また異常使用等で定格を超える恐れがある場合は保護回路等で電流遮断等の対策をして下さい。</div> <div>E4. It is recommended to install a protective or redundant circuit, or to perform safety tests when you use the switches for the equipment requiring expensive safety, whatever purposes the equipment is applied for.<br/>用途の如何にかかわらず、高い安全性が求められる機器にお使いになるときは、保護回路や冗長回路を設けて機器の安全を図られると同時に、お得意先において安全性のテストをされることをお勧めします。</div> <div>E5. Though we are confident in switch quality, we cannot deny the possibility that they could fail due to short or open circuit.<br/>Therefore, if you use a switch for a product requiring special safety, we would like you to verify in advance what effects your module would receive in case the switch alone should fail. And secure safety as a whole system by introducing that fail-safe design, i.e. a protection network.<br/>スイッチの品質には万全を尽くしてますが故障モードとしてショート、オープンの発生が皆無とは言えません。安全性が重視されるセットの設計に際しては、SWの単品故障にたいしてセットとしての影響を事前にご検討いただき、保護回路等のフェールセーフ設計のご検討を十分に行い安全を確保して頂きますようにお願いします。</div> |       |                        |      |

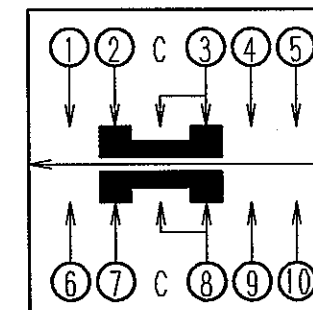


COLOR: GRAY



APPLICABLE TO THE BENT TERMINAL BASE  
PROVIDED THAT THE TERMINAL TIP IS (3.3)  
(端子曲げ根本部に適用する。但し、端子先端は (3.3) とする)

CIRCUIT DIAGRAM (回路図)  
SEE DIRECTION "A" (A方向より見る)



2. OPERATING FORCE: B~A, C~D, B~C, C~B  $2.5 \pm 1.5 \text{ N}$  ( $255 \pm 153 \text{ gf}$ )

(作動力)

A~B, D~C  $1.5 \pm 1 \text{ N}$  ( $153 \pm 102 \text{ gf}$ )

(MEASURE AT THE BOTTOM OF KNOB)

(但しツマミ根本にて測定する)

NOTES 1. CHANGEOVER TIMING OF CONTACTS: NONSHORTING  
(注記) (接点の切換タイミング: ノンショータイミング)

| TOLERANCES UNLESS OTHERWISE SPEC. |               |      |      | ALPS ELECTRIC CO., LTD. |              |                  |                       |
|-----------------------------------|---------------|------|------|-------------------------|--------------|------------------|-----------------------|
| BASIC DIMENSIONS                  | TOLERANCES    |      |      | UNIT                    | SCALE        | MODEL NO. (製品番号) |                       |
| UP TO 4                           | $\pm 0.2$     |      |      | m m                     | %            | SSSS224100       |                       |
| OVER 4 UP TO 16                   | $\pm 0.3$     |      |      |                         |              | TITLE            |                       |
| OVER 16 UP TO 63                  | $\pm 0.4$     |      |      | APPD.                   | CHKD.        | DSGD.            | PRODUCT DRAWING (製品図) |
| ABOVE 63 TO 250                   | $\pm 0.5$     |      |      | Sep. 18. '97            | Sep. 18. '97 | Sep. 18. '97     | DOCUMENT NO.          |
| ABOVE 250                         | $\pm 0.7$     |      |      | H. Yoshizawa            | M. Kise      | M. Kishi         | SSSS224100. AE11. 003 |
| ANGULAR DIMENSIONS                | $\pm 3^\circ$ | ZONE | SYMB | DATE                    | APPD         | CHKD             | DSGD                  |