Customer:
ALPS ELECTRIC EUROPA GMBH

No. 394K4944

Date:

Attention:

Your ref.No:

Your Part No: STTSKHCAB

SPECIFICATION

ALPS';

MODEL: SKHCAB

Spec. NO.: KHC-901

Sample No: F3692945M

RECEIPT STATUS

RECEIVED

By. Date

Signature

Name

Title

ALPS ELECTRIC CO., LTD

HEAD OFFICE
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Sales

1MSME111 #02

CLASS.NO.	TITLE TACT SWITCH SPECIFICATION	

1. GENERAL

1.1 Scope — This specification covers the requirements for single key switches which have no keytop (TACT SWITCHES: MECHANICAL CONTACT).

1.2 Operating Temperature Range
-20 to 70°C (normal humidity, normal press.)

1.3 Storage Temperature Range
-30 to 80°C (normal humidity, normal press.)

1.4 Test Conditions
Tests and measurements shall be made in the following standard conditions unless otherwise specified:
Normal temperature (temperature 5 to 35°C)
Normal humidity (relative humidity 45 to 85%)
Normal pressure (pressure 860 to 1060 m bars)
In case any question arises from the judgement made, tests shall be conducted in the following conditions:

Temperature	(20±2°C)
Relative humidity	(65±5%)
Pressure	(860 to 1060 m bars)

2. APPEARANCE, STYLE, AND DIMENSIONS

2.1 Appearance — There shall be no defects that affect the serviceability of the product.

2.2 Style and Dimensions
Shall conform to the assembly drawings.

3. TYPE OF ACTUATION — Tactile feedback

4. CONTACT ARRANGEMENT — 1 poles 1 throws
(Details of contact arrangement are given in the assembly drawings.)

5. MAXIMUM RATINGS — DC 12 V 50 mA

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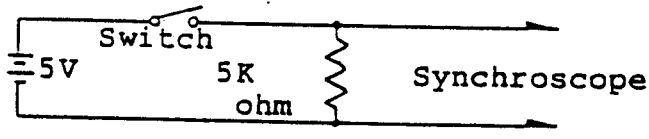
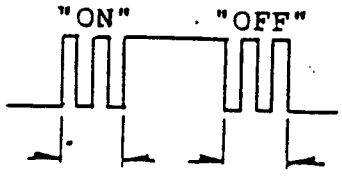
6. PERFORMANCE

6.1 Electrical

Item	Test Conditions	Requirements
6.1.1. Contact Resistance	Applying a static load twice the actuating force to the center of the stem, measurements shall be made with a 1 kHz small-current contact resistance meter.	100 m ohm max.
6.1.2. Insulation Resistance	Measurements shall be made following application of DC 100 V potential across terminals and across terminals and frame for one minute.	100 M ohm min.
6.1.3. Dielectric With-standing Volatge	AC 250 V (50Hz or 60Hz) shall be applied across terminals and across terminals and frame for one minute.	There shall be no breakdown.
6.1.4. Bounce	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec.), bounce shall be tested at "ON" and "OFF".  	5 m sec max.

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6.2 Mechanical

Item	Test Conditions	Requirements
6.2.1 Actuating Force	Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center of the stem, the maximum load required for the stem to come to a stop shall be measured.	130 ± 50 gf
6.2.2 Travel	Placing the switch such that the direction of switch operation is vertical and then applying a static load twice the actuating force to the center of the stem, the travel distance for the stem to come to a stop shall be measured.	0.3 ± 0.2 / 0.05 mm
6.2.3 Return Force	The sample switch is installed such that the direction of switch operation is vertical and, upon depression of the stem in its center the whole travel distance, the force of the stem to return to its free position shall be measured.	30 gf min.
6.2.4 Stop Strength	Placing the switch such that the direction of switch operation is vertical, a static load of 5 kgf shall be applied in the direction of stem operation for a period of 60 seconds.	There shall be no sign of damage mechanically and electrically.
6.2.5 Stem Strength	Placing the switch such that the direction of switch operation is vertical, the maximum force to withstand a pull applied opposite to the direction of stem operation shall be measured.	3 kgf

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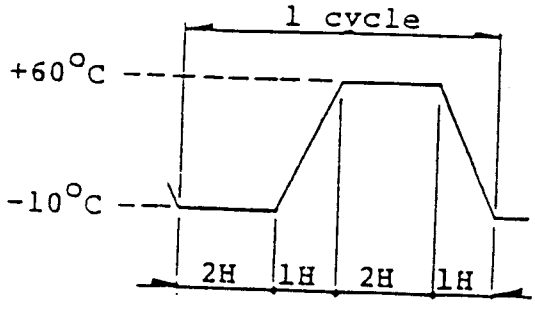
6.3 Environmental

Item	Test Conditions	Requirements
6.3.1 Resistance to Low Temperatures	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1)Temperature: $-30\pm2^{\circ}C$ (2) Time: 96 hours (3)Waterdrops shall be removed.	Item 6.1 Item 6.2.1 Item 6.2.2
6.3.2 Heat Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1)Temperature: $80\pm2^{\circ}C$ (2) Time: 96 hours	Item 6.1 Item 6.2.1 Item 6.2.2
6.3.3 Moisture Resistance	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made: (1) Temperature: $60\pm2^{\circ}C$ (2)Relative humidity: 90 to 95% (3) Time: 96 hours (4)Waterdrops shall be removed.	Contact resistance: 200 m ohm max. Insulation resistance: 10 M ohm min. Item 6.1.3 Item 6.1.4 Item 6.2.1 Item 6.2.2
6.3.4 Temperature Cycling	Following five cycles of the temperature cycling test set forth below the sample shall be left in normal temperature and humidity conditions for one hour before measurements are made. During this test, waterdrops shall be removed.  	Item 6.1 Item 6.2.1 Item 6.2.2

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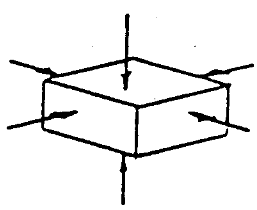
6.4 Endurance

Item	Test Conditions	Requirements
6.4.1 Operating Life	Measurements shall be made following the test set forth below: (1)DC 5V 5mA resistive load (2)Rate of operation: 2 to 3 operations per second (3)Depression: 180 gf (4)Cycles of operation: 10×10^6 cycles	Contact resistance: 200 m ohm max. Insulation resistance: 10 M ohm min. Bounce: 10 m sec max. Actuating force: + 30 % or - 30 % of initial force Item 6.1.3 Item 6.2.2
6.4.2 Vibration Resistance	Measurements shall be made following the test set forth below: (1)Range of oscillation: 10 to 55 Hz (2)Amplitude, pk-to-pk: 1.5 mm (3)Cycle of sweep: 10 - 55 - 10 Hz in one minute, approx. (4)Mode of sweep: Logarithmical sweep or uniform sweep (5)Direction of oscillation: Three mutually perpendicular directions, including the direction of stem travel (6)Duration of testing: 2 hours each, for a total of 6 hours	Item 6.1 Item 6.2.1 Item 6.2.2
6.4.3 Impact Shock Resistance	Measurements shall be made following the test set forth below: (1)Acceleration: 80g (2)Cycles of test: 3 cycles each in 6 directions, for a total of 18 cycles 	Item 6.1 Item 6.2.1 Item 6.2.2

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***** Switch Handling Precautions****

1. In case an automatic flow soldering apparatus is used for soldering, adhere to the following conditions:

Item	Soldering condition
(1)Preheat Temperature	100°C max. (Ambient temperature of printed circuit board on its soldering side)
(2)Preheat Time	45 sec. max.
(3)Flux Foaming	To such an extent that flux will be kept flush with the printed circuit board's top surface on which components are mounted. Preparatory flux must not be applied to that side of printed circuit board on which components are mounted and to the area where terminals are located.
(4)Soldering Temperature	255°C max.
(5)Duration of Solder Immersion	5 sec. max.
(6)Allowable Frequency of Soldering Process	2 times max.

2.Other Precautions

(1) Following the soldering process, do not try to clean the switch with a solvent or the like.

(2) Safeguard the switch assembly against flux penetration from its top side.

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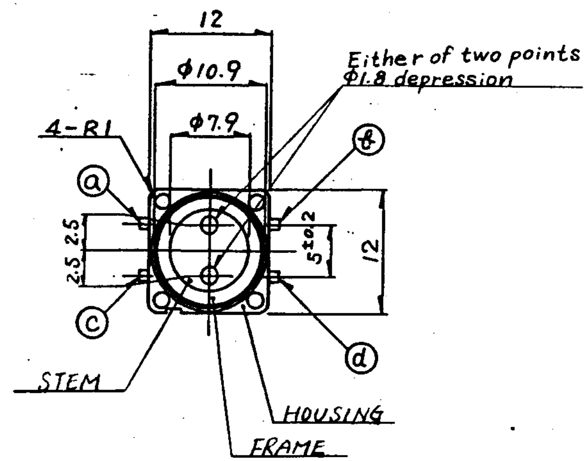
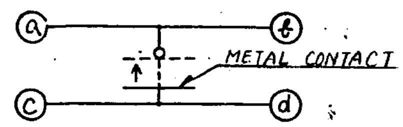
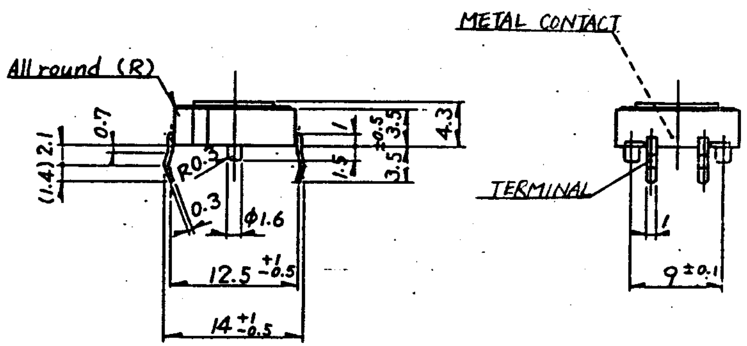
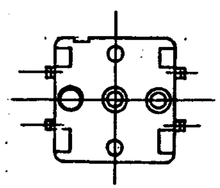


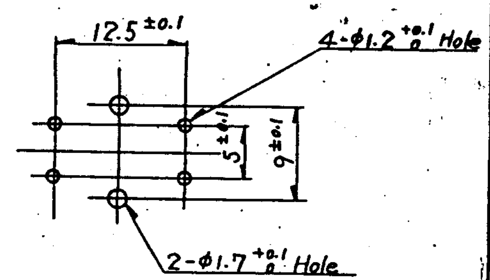
CIRCUIT DIAGRAM







*PRINTED CIRCUIT BOARD MOUNTING HOLE DIMENSIONS
(WHEN VIEWED FROM SWITCH MOUNTIG FACE)



NOTE
4. HOUSING COLOR TO BE BLACK.
3. STEM COLOR TO BE BLACK.
2. TERMINALS ©, Ⓓ TO BE CONNECTED TO THE GROUND OF A PRINTED CIRCUIT BOARD.
1. MANUFACTURING SPECIFICATION TO BE ACCORDANCE WITH KHC-901.

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

PART NO.	NAME	MATERIAL	SPEC	FINISH

ZONE | SYMB. | DATE | APPD. | CHKD. | DSGD.

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UNIT	SCALE	
mm	2:1	SKHCAB
APPD. Aug. 30 '84	CHKD.	DSGD.
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