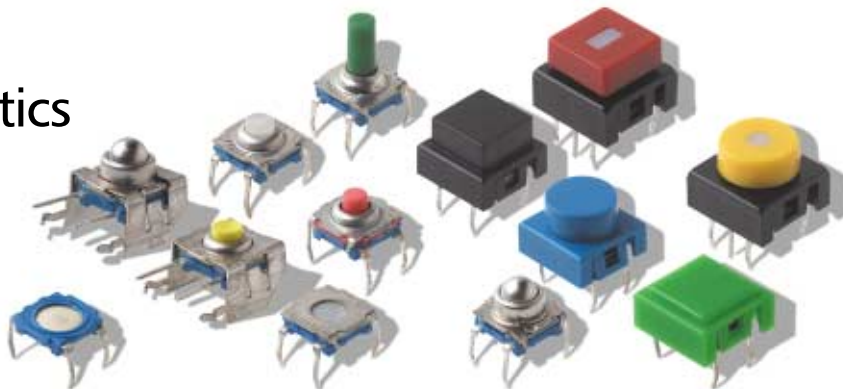


KSA Tact Switches

General Characteristics



Mechanical and environment characteristics of main KS types

All mechanical, electrical and environmental characteristics of main KS types on the following pages are included in the 2 following tables.

Note: KSA, KSB, KSF, KSL are the basic models,
 – with suffix 3N or 5N they are available with 3 Newtons (300 grams) or 5 Newtons (500 grams) actuation force,
 – with suffix V means vertical mounting.

| Data | Type | KSA | KSA 3N | KSA 5N | KSB KSD | KSB 3N | KSF | KSF 3N | KSF 5N | KSL | KSL 3N | KSL 5N | KSAV | KSLV | KSI | KSJ |
|----------------------------------------------------------------------------------|------|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------|-------------------------------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|----------------------------------|----------------------------------|
| Actuator color silver contact version | | White ²⁾ Green | Blue | Yellow | – | – | – | – | – | Dark grey | Blue | Yellow | White | Dark grey | Red | – |
| Actuator color gold contact version | | Red | Dark grey | Orange | – | – | – | – | – | Red | Light grey | Orange | Red | Red | Red | – |
| Travel | | 0.3 ^{+0.04} ₋₀ (0.0118) | 0.4 ^{+0.04} ₋₀ (0.0157) | 0.5 ^{+0.04} ₋₀ (0.0197) | 0.2 ^{+0.01} ₋₀ (0.00787) | 0.2 ^{+0.01} ₋₀ (0.00787) | 0.3 ^{+0.04} ₋₀ (0.0118) | 0.4 ^{+0.04} ₋₀ (0.0157) | 0.5 ^{+0.04} ₋₀ (0.0197) | 0.3 ^{+0.04} ₋₀ (0.0118) | 0.4 ^{+0.04} ₋₀ (0.0157) | 0.5 ^{+0.04} ₋₀ (0.0197) | 0.3 ^{+0.04} ₋₀ (0.0118) | 0.3 ^{+0.04} ₋₀ (0.0118) | 1.1 ^{+0.02} (0.0433) | 0.4 ^{+0.15} (0.0157) |
| Operating force N (grams) ± 25% | | 1.3 (130) | 3 (300) | 5 (500) | 1.6 (160) | 3 (300) | 1.6 (160) | 3 (300) | 5 (500) | 1.3 (130) | 3 (300) | 5 (500) | 1.3 (130) | 1.3 (130) | 3 (300) | 1 (100) 3 (300) |
| Max. actuation force N (grams) | | 40 (4000) | 40 (4000) | 75 (7500) | 40 (4000) | 40 (4000) | 40 (4000) | 40 (4000) | 75 (7500) | 40 (4000) | 40 (4000) | 75 (7500) | 40 (4000) | 40 (4000) | 40 (4000) | 40 (4000) |
| Operating life with actuation force = 2 time 10 ⁶ nominal force | | 5×10 ⁵ or 10 ⁵ (¹⁾) | 10 ⁵ | 10 ⁵ | 10 ⁵ | 5×10 ⁵ | 10 ⁵ (¹⁾) | 10 ⁵ | 5×10 ⁵ | 10 ⁵ (¹⁾) | 10 ⁵ | 5×10 ⁵ | 5×10 ⁵ (¹⁾) | 10 ⁵ | 10 ⁵ | |
| M = Manual insertion A = Automatic insertion A | | M A | M A | M A | M A | M A | M A | M A | M | M | M | M | M | M | M | M |
| S = Silver contacts G = Gold contacts | | S G | S G | S G | S G ³⁾ | S G | S G | S G | S G | S G | S G | S G | S G | S G | S G | S G |
| Storage temperature Silver version °C | | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 55 to + 90 | – 55 to + 90 |
| Gold version °C | | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 40 to + 90 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 55 to + 125 | – 50 to + 125 | – 55 to + 125 |
| Operating temperature Silver version °C | | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 | – 40 to + 90 |
| Gold version °C | | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 | – 40 to + 125 |
| SO ₂ and H ₂ S protected X = Yes O = No | | X | X | X | O | O | X | X | X | X | X | X | X | X | X | X |
| Flux tight | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Flux tight washing without thermal shock | | X | X | X | O | O | X | X | X | X | X | X | X | X | X | X |
| Flux tight washing with thermal shock | | X | X | X | O | O | X | X | X | X | X | X | X | X | X | X |

¹⁾ Basic models KSA, KSF, KSL on request, can be delivered for 1 million operations in silver version, in gold version they are automatically supplied with 1 million operations.

²⁾ White for 500 k operations, green for 1 million operations.

³⁾ KSD not available in gold contacts.

KSA Tact Switches

General Characteristics

| Overview of the main electrical values of KS versions | | | | | | | | | | | |
|---------------------------------------------------------------------|-----------------|------------------------------|----------------------------------|-----------------|---------------|--------------------|----------------------------------|-----------------|-----------------|--------------------|-----------------|
| Contact material | Silver contacts | | | | Gold contacts | | | | Silver contacts | | |
| Type | | 1.3N | 3N | 5N | | 1.3N | 3N | 5N | | 1.6N | 3N |
| Data | KSA | X | X | X | KSA | X | X | X | KSB | X | X |
| | KSF | X (1.6) | X | X | KSF | X (1.6) | X | X | KSD | X | X |
| | KSL | X | X | X | KSL | X | X | X | | | |
| | KSAV | X | X | X | KSAV | X | X | X | | | |
| | KSLV | X | X | X | KSLV | X | X | X | | | |
| | KSI | X (1.1) | X | | KSI | X (1.1) | X | | | | |
| | KSJ | X (1.0) | X | | KSJ | X (1.0) | X | | | | |
| Ground terminal | | Upon request | | | | Upon request | | | | No | |
| Max. voltage | | 50 V | | | | 50 V | | | | 50 V | |
| Min. voltage | | 20 mV | | | | 20 mV | | | | 5 V | |
| Max. switching current | | 50 mA | | | | 10 mA | | | | 50 mA | |
| Min. switching current | | 1 mA | | | | 1 mA | | | | 10 mA | |
| Max. switching power | | 1 VA | | | | 0.2 VA | | | | 1 VA | |
| Contact resistance | | 50 mΩ | | | | 50 mΩ | | | | 100 mΩ | |
| Dielectric strength | | 300 Vrms | | | | 300 Vrms | | | | 300 Vrms | |
| Insulation resistance (100 V) | | 10 ¹¹ Ω | | | | 10 ¹¹ Ω | | | | 10 ¹¹ Ω | |
| Bounce | | ≤ 1 ms | | | | ≤ 1 ms | | | | ≤ 1 ms | |
| Operating life with actuation force less than 2 times nominal force | | 5 × 10 ⁵ | 10 ⁵ | 10 ⁵ | | 10 ⁶ | 10 ⁵ | 10 ⁵ | | 10 ⁵ | 10 ⁵ |
| | | 10 ⁶ upon request | 5 × 10 ⁵ upon request | | | | 5 × 10 ⁵ upon request | | | | |

| Ordering code | | Example: | | | | | | |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Designation: KS | KS | A | 1 | A | 3 | 3 | 1 |
| 2 | Actuator: A = short, L = long, B = without, F = flat, I = soft, J = long travel (spherical) | | | | | | | |
| 3 | Ground terminal: 0 = without (KSB only 0), 1 = with | | | | | | | |
| 4 | Insertion: M = manual, A = automatic, V = vertical (for KSA, KSI and KSL, not for KSB and KSF) | | | | | | | |
| 5 | Operation force (N (grams)), operating life (k operations): 0 = 1.0N (100 grams) and 100 k operations (KSJ) 1 = 1.1N (110 grams) and 500 k operations (KSI) 2 = 1.6N (160 grams) and 100 k operations (KSB) 3 = 1.3N (130 grams) and 500 k operations (KSA/KSL) 4 = 1.6N (160 grams) and 500 k operations (KSF) 5 = 1.3N (130 grams) and more than 1000 k operations 6 = 3.0N (300 grams) and more than 100 k operations 7 = 5.0N (500 grams) and more than 100 k operations 8 = 3.0N (300 grams) and 500 k operations | | | | | | | |
| 6 | Operating temperature: 1 = low temperature - 40°C to + 90°C (silver contacts) 3 = high temperature - 40°C to + 125°C (gold contacts) | | | | | | | |
| 7 | Sealing: 0 = sealed against flux, 1 = totally sealed acc. to EIA RS448-2 2 = Mark2 version | | | | | | | |

KSA Tact Switches



KSA

Miniature tact switch, single pole, single throw, normally open, designed for automatic or manual insertion.

Main features:

- Positive tactile feedback
- Travel 0.3 mm (0.012) ± 0.4 typical
- 5.08 × 7.62 mm (0.200 × 0.300) footprint
- Available with cambered terminals to ensure self-retention on the printed circuit board in manual insertion, or with straight terminals for use in automatic insertion machines
- Minimum center to center spacing of 7.62 × 10.16 mm (0.300 × 0.400)
- Sealed against flux soldering
- Can be delivered in packaging tubes of 65 pieces for automatic insertion or in a box of 500 pieces for manual insertion (250 for KSL-KSLV-KSAV)
- Optional: ground terminal
- KSA can be used in low level applications, with 5 Volts – 10 μ A or 20 mV – 1 mA in TTL or CMOS applications
- Buttons for KSA see following pages.

KSL

KSA with long actuator.
Height above PC board 9.9 mm \pm 0.3 (0.390 \pm 0.012).

KSA 3N (300 grams)

(Blue actuator)

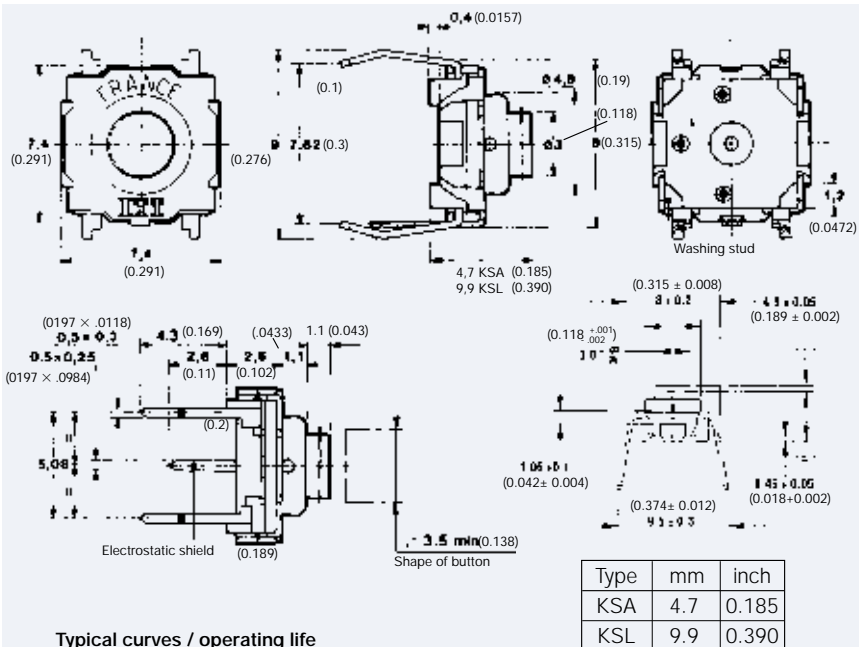
The KSA 3N (300 grams) is a version with higher actuation force 3N (300 grams) \pm 25% instead of 1.3N (130 grams) \pm 25%. This new version is more suited to applications where tactile feedback is necessary. It can be used when the button, or actuation mechanism absorbs a part of the actuation force, with, for example, hinge buttons. This version shows a large difference between the actuation force and the return force, giving a good tactile feedback. See graph.

KSA 5N (500 grams)

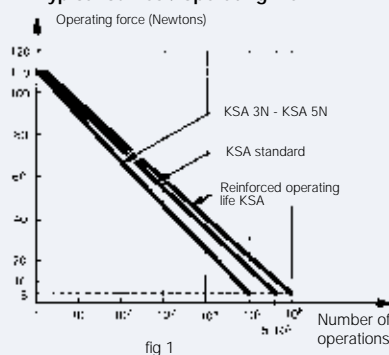
(Yellow actuator)

This version with a higher actuation force of 5N (500 grams) gives a very good tactile feedback. Typical applications are in automotive and aircraft industries.

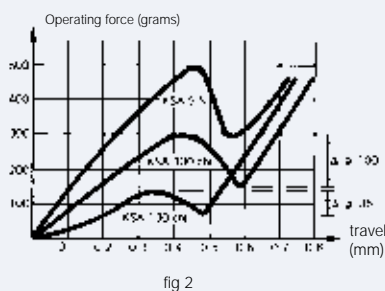
Dimensional Drawings



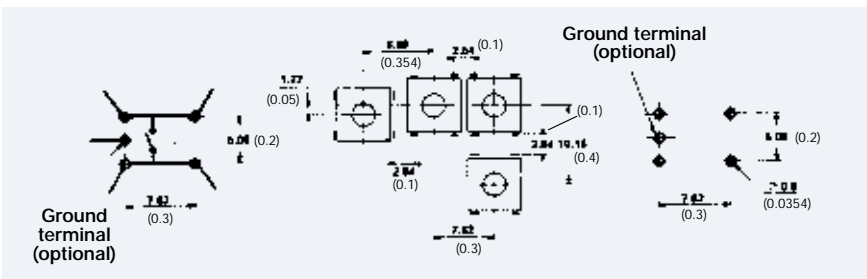
Typical curves / operating life



Typical curves operating force / travel

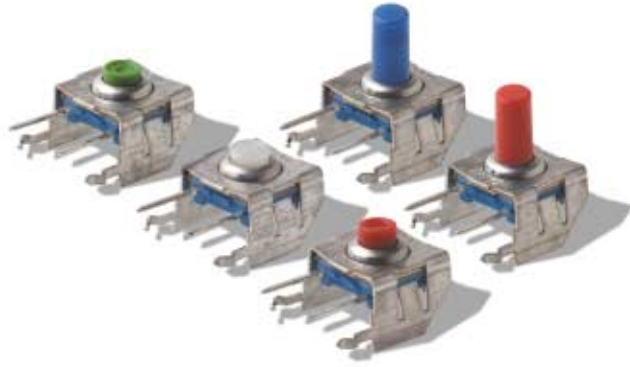


PCB layout



All electrical and mechanical data of these switches can be found on pages A-6 and A-7.

KSAV Side-Actuated Tact Switch



KSA (1 Million operations)

(Green actuator)

In this version, a special bronze click washer is used. The KSA 1 Million operations is particularly adapted for long operating life requirements such as telephone, data processing, and so on.

KSA high temperature

(Red actuator)

The KSA high temperature has been designed for use under wide temperature changes (-40°C to $+125^{\circ}\text{C}$) or very severe climatic conditions. In this version contacts are gold plated and the operating life is 1 million operations.

Applications: heating control systems, household appliances, microwave ovens, automotive.

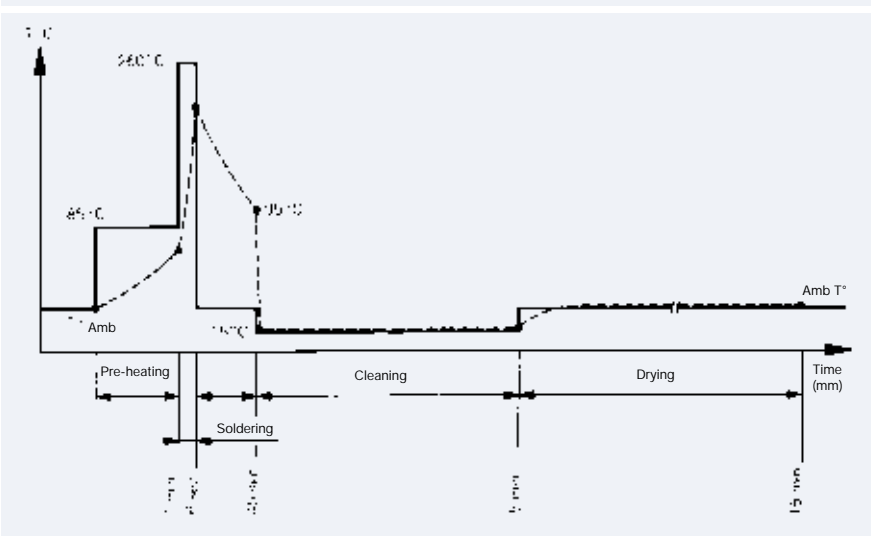
KSA high sealed

The KSA totally sealed version withstands soldering process with organic flux, washing and thermal shock, see diagram EIA – RS-448.

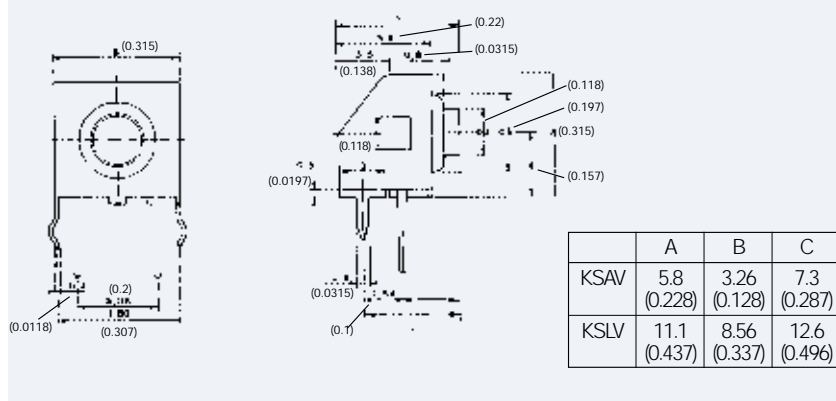
KSAV Right angle

- The KSAV can be inserted vertically and used as part of a front panel when the PCB is perpendicular to this front panel
- The KSAV is made up of a special metallic frame placed directly on a standard KSA
- KSAV pinning is compatible with international grid 1.27 mm (0.050)
- The KSAV version is delivered with straight terminals. The pins of the frame are profiled to ensure self-retention on the PC board and can be used as ground terminals
- All versions shown in this catalog are available in vertical form (except KSB and KSF)
- Applications: cars, radios, TVs and front panel instruments

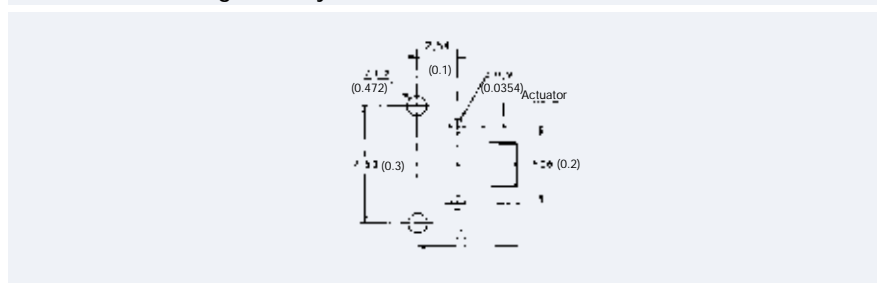
Solder test EIA - RS 448



Dimensional Drawings KSAV – KSLV



Dimensional Drawings PCB layout



All electrical and mechanical data of these switches can be found on pages A-6 and A-7.