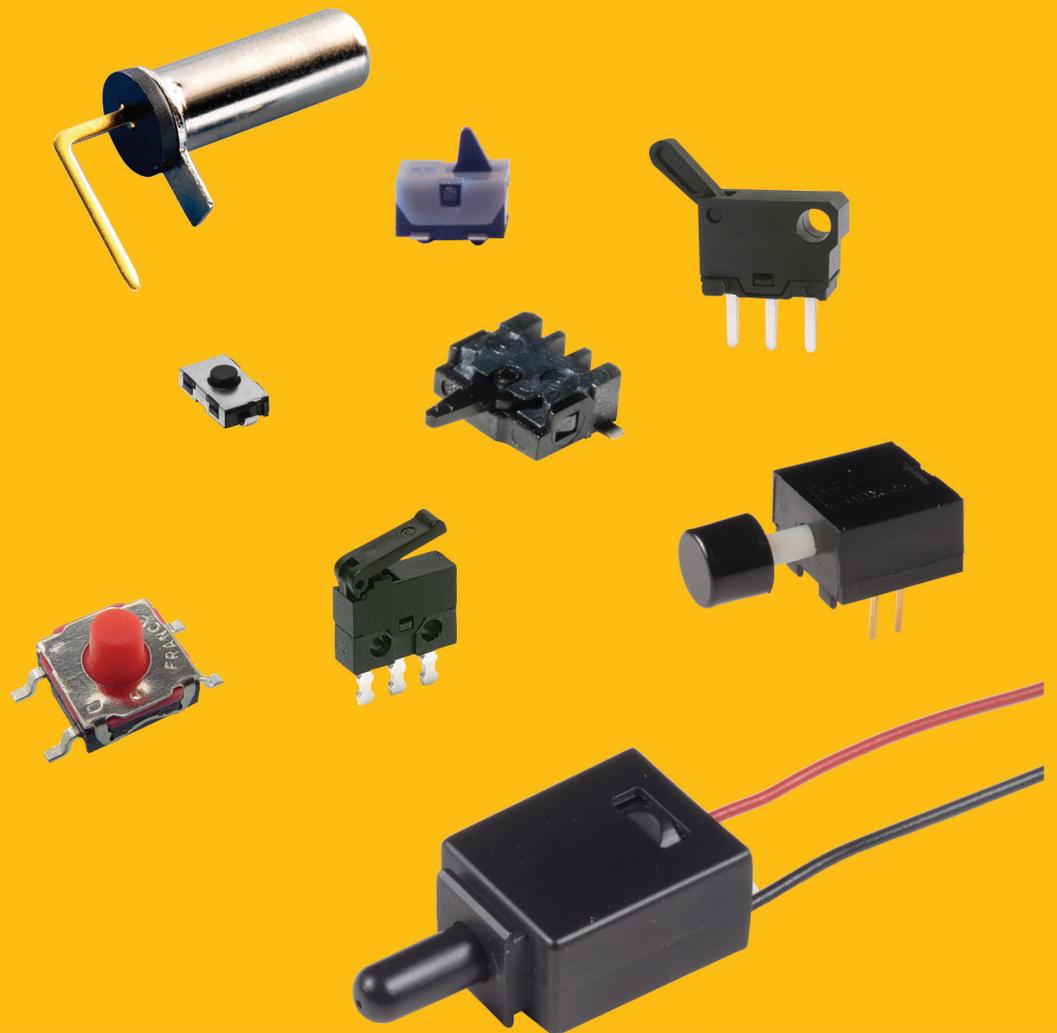
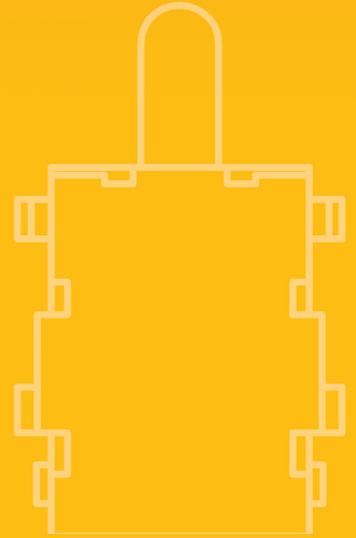
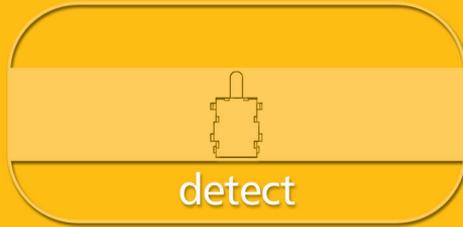


audio
automotive
aerospace
communication devices
consumer appliances
consumer electronics
datacom
data storage
handheld devices
industrial
industrial equipment
instrumentation
medical
military
mobile phones
portable tools
pumps & motors
security alarms
telecom
test equipment
thermostatic controls



detect

Detect Switches

Product Selection Guide

Detect						
Series	HDT	DS	HDS	HDP	SDP	SDS
Travel to Make (mm)	0,3	See datasheet	0,17	0,24	29,2°	0,35
Overtravel (mm)	0,75	See datasheet	0,5	1,66	39,1°	1,65
Total Travel (mm)	1,05	See datasheet	1,07	1,9	68,3°	2,0
Actuator Length (mm)	1,4	See datasheet	1,17	2,15	1,85	2,5
Life Expectancy	100,000 cycles	20,000; 50,000; 100,000 cycles	100,000 cycles	100,000 cycles	50,000 cycles	50,000 cycles
Contact Type	SPST N.O.	SPST SPDT	SPST N.O.	SPST N.O.	SPDT	SPST N.O. SPST N.C.
Max. Voltage (V)	5	5 V; 16 V 30 V	5	5	5	12
Max. Switching Current (mA)	1 mA	1 mA; 5 mA 100 mA	1 mA	1 mA	1 mA	100 mA
Sealing	No	No	No	No	No	No
Mounting	Surface mount	Thru-hole Solder lug	Surface mount	Surface mount	Surface Mount	Surface mount
Page number	E-4	E-7	E-12	E-14	E-16	E-17

Detect						
Series	DDS	MDS	KDS	KM	MPS	ZMA
Travel to Make (mm)	0,45	2,5 max.	1,25 max.	4,06	See datasheet	1,3 max.
Overtravel (mm)	1,95	0,15 min.	8,9	1,78	See datasheet	0,2 min.
Total Travel (mm)	2,4	2,9	10,16	5,84	See datasheet	1,5
Actuator Length (mm)	2,6	R 8,4	10,16	10,11	N/A	
Life Expectancy	50,000 cycles	100,000 cycles	10,000 cycles	10,000 cycles	10,000,000 cycles	300,000 cycles
Contact Type	SPST N.O.	SPDT	SPST N.O. SPST N.C.	SPDT	SPST N.O.	SPDT
Max. Voltage (V)	30	30	20	125 V AC	30	125 V
Max. Switching Current (mA)	100 mA	300 mA	.4 VA	250 mA	300 mA	3 Amps
Sealing	No	No	No	Flux tight	Yes	No
Mounting	Thru-hole	Thru-hole & Surface Mount	Snap-in panel	Thru-hole	Wire lead	Thru-hole
Page Number	E-18	E-20	E-26	E-27	E-30	E-32

Detect Switches Product Selection Guide

Detect						
Series	KSU	KSR2D	KSM	KSC4D	KSJ	RB
Travel to Make (mm)	0,5	0,3	0,3	0,6	0,3	See datasheet
Overtravel (mm)	1,0	N/A	1,15	N/A	0,75	N/A
Total Travel (mm)	1,5	0,3	1,72	0,6	1,05	N/A
Actuator Length (mm)	1,5	0,8	1,8	2,6	1,4	N/A
Life Expectancy	100,000 cycles	100,000 cycles	50,000 cycles	500,000 and 2,000,000 cycles	100,000 cycles	20,000; 100,000 cycles
Contact Type	SPST N.O.	SPST N.O.	SPST N.C.	SPST N.O.	SPST N.O.	SPST SPDT
Max. Voltage (V)	32	32	32	32	5	5 V; 24 V
Max. Switching Current (mA)	50 mA	10 mA	50 mA	50 mA	1 mA	1 mA; 25 mA
Sealing	Dust and water drop proof	Dust and flux tight	Flux tight	IP67	IP60	No
Mounting	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Thru-hole
Page number	E-36	E-38	E-40	E-42	E-44	E-46



Detect

HDT Series Micro Mini Surface Mount Detect Switches



Features/Benefits

- Low profile package
- Design allows top or side actuation
- Low actuation force, 35 grams max.
- Pick and place compatible, available in tape & reel packaging
- RoHS compliant and compatible
- Halogen free

Typical Applications

- Consumer electronics
- Computers
- Medical devices
- ATCA and MicroTCA devices

Specifications

CONTACT RATING: 1 mA 5 VDC
 MECHANICAL AND ELECTRICAL LIFE: 100,000 cycles min.
 CONTACT RESISTANCE: 500 m Ω max. initial.
 INSULATION RESISTANCE: 100 M Ω min. between adjacent contacts.
 OPERATING TEMPERATURE: -40°C to + 85°C
 STORAGE TEMPERATURE: -40°C to + 85°C
 PACKAGING: Tape & reel

Materials

BASE: PA 46 (UL94V-0)
 COVER: PA 46 (UL94V-0)
 ACTUATOR: PA 46 (UL94V-0)
 MOVABLE BLADE: Stainless Steel, Ag over Ni plating.
 TERMINALS: Phosphor Bronze, Ag over Ni plating.
 SOLDERABILITY: Lead free compatible - No clean.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

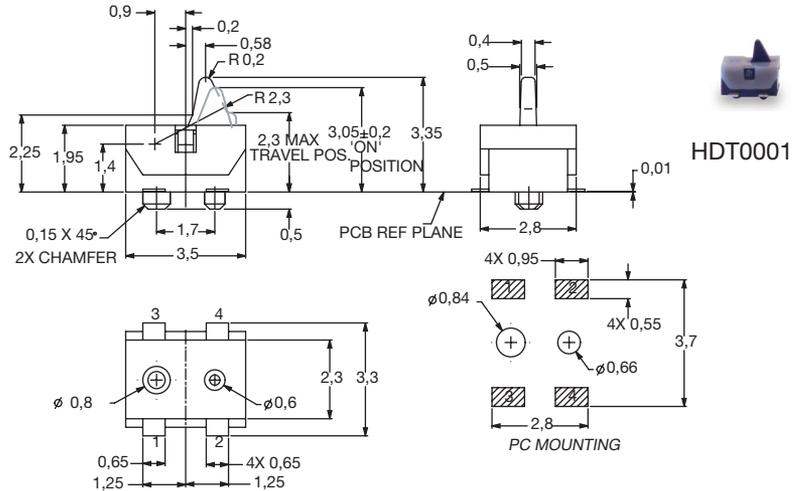
Complete part numbers for HDT Series are shown below.

PART NUMBER	PACKAGING	SCHEMATIC
HDT0001	TAPE & REEL 2,450 per reel	

NOTE: Available with no locating posts by adding "NP" (HDT0001NP) to Part Number.

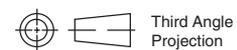
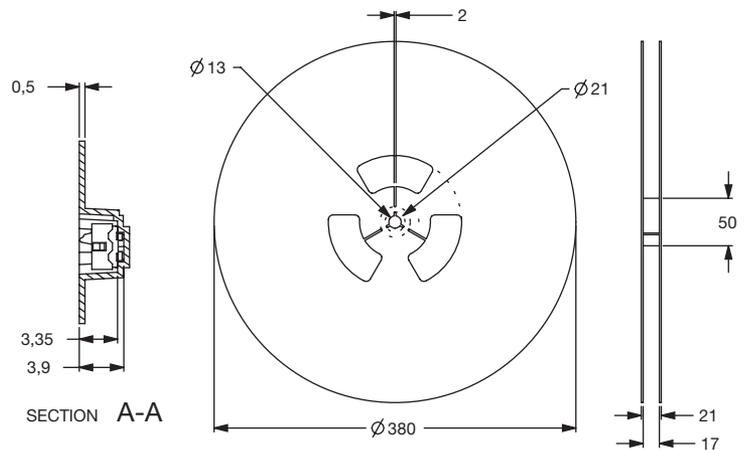
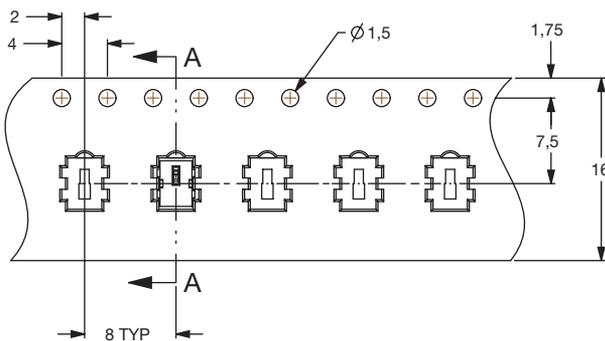
TRAVEL:

Pre-travel .30 mm
 Overtravel: .75 mm
 Total: 1.05 mm



TAPE & REEL

HDT0001



Third Angle Projection

Dimensions are shown: mm
 Specifications and dimensions subject to change



HDT Series Micro Mini Surface Mount Detect Switches

HDT0004

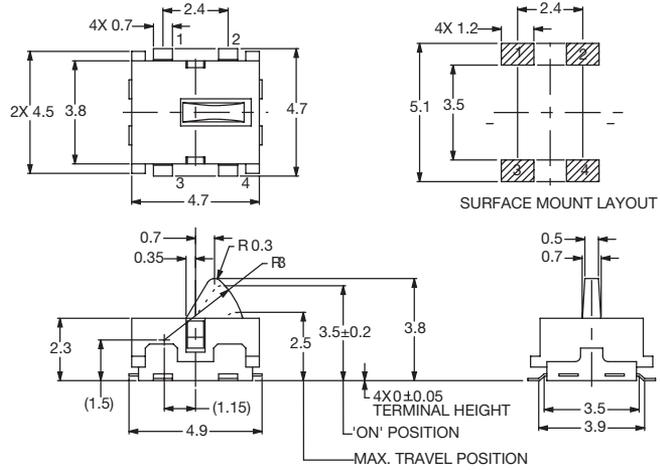


HDT0004

PART NUMBER	PACKAGING	SCHEMATIC
HDT0004	TAPE & REEL 2,800 per reel	

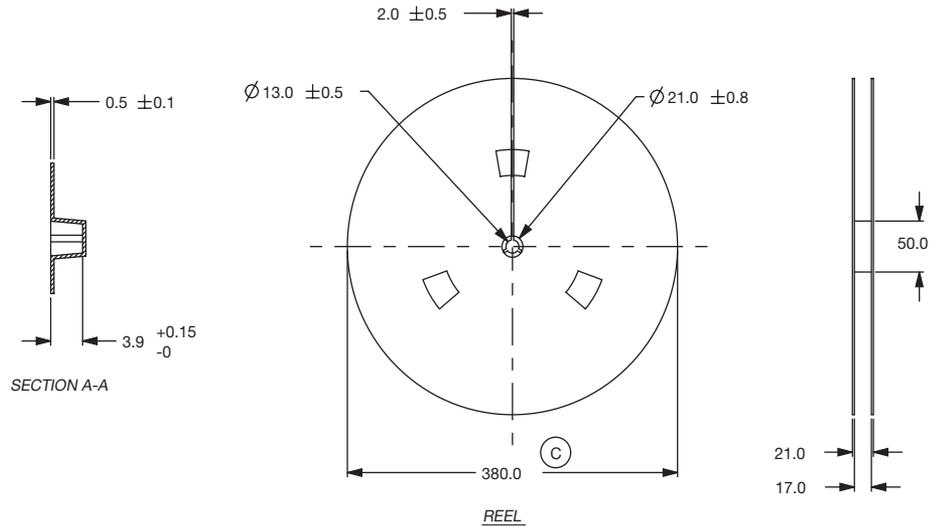
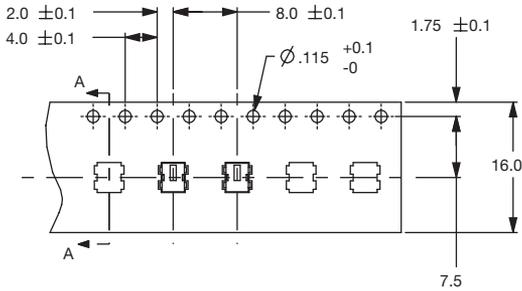
TRAVEL:

Pre-travel: .3 mm
Overtravel: 1.0 mm
Total: 1.3 mm



TAPE & REEL

HDT0004



HDT0104

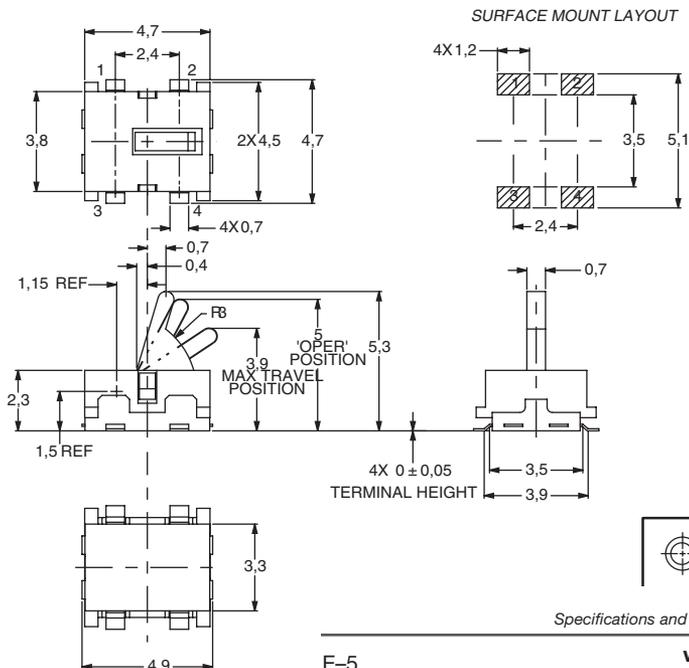


HDT0104

PART NUMBER	PACKAGING	SCHEMATIC
HDT0104	TAPE & REEL 2,500 per reel	

TRAVEL:

Pre-travel: .3 mm
Overtravel: 1.1 mm
Total: 1.4 mm



Dimensions are shown: mm
Specifications and dimensions subject to change

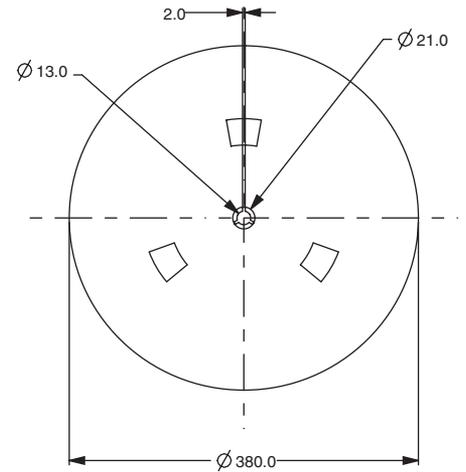
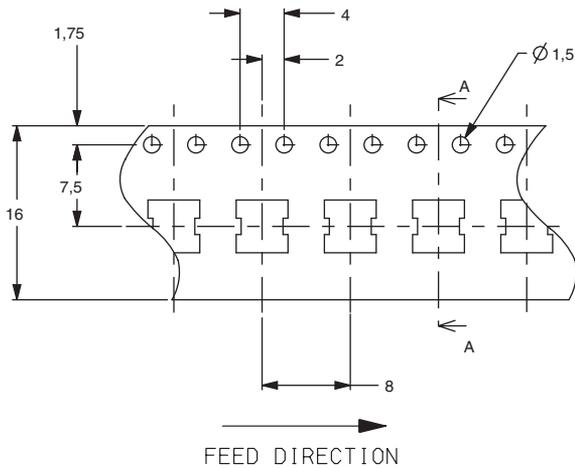


Detect

HDT Series Micro Mini Surface Mount Detect Switches

TAPE & REEL

HDT0104



HDT0204

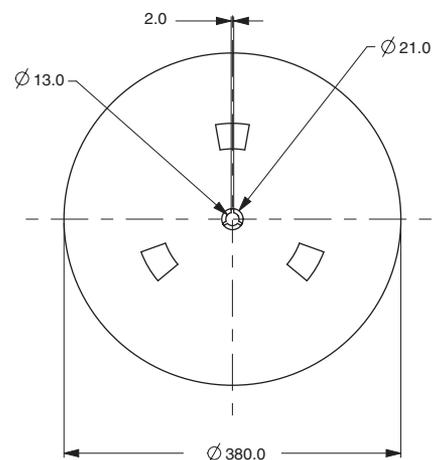
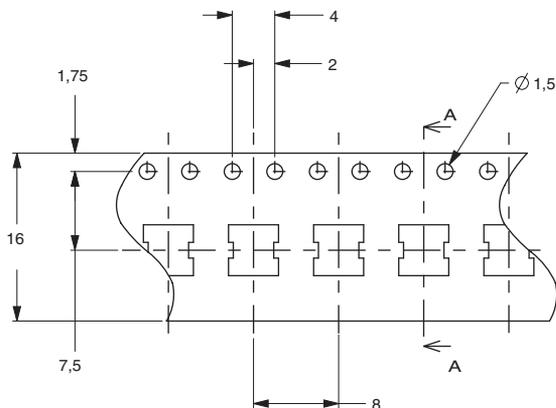
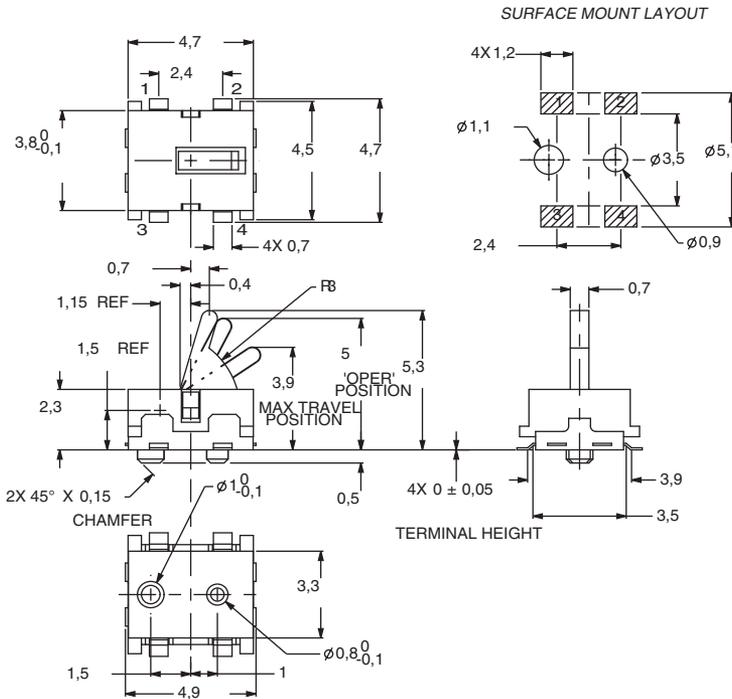


HDT0204

PART NUMBER	PACKAGING	SCHEMATIC
HDT0204	TAPE & REEL 1,400 per reel	

TRAVEL:

- Pre-travel: .3 mm
- Overtravel: 1.1 mm
- Total: 1.4 mm



Detect



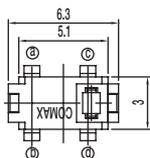


Features/Benefits

- Compact design
- Low actuation force
- Detect mechanical movement
- Left and right options
- Right angle options

Typical Applications

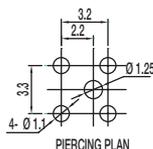
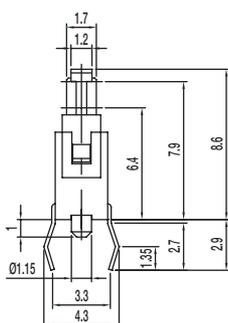
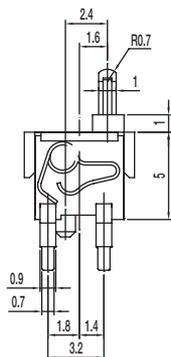
- Computer peripherals
- Office equipment
- Consumer electronics
- Appliances
- Audio and visual equipment



PART NUMBER	PACKAGING	SCHEMATIC
DS-02005	1,000 pieces	1P-1T

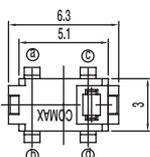
Specifications

CONTACT ARRANGEMENT: SPST, NO
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 50,000 cycles
 OPERATING FORCE: 50 gf max.
 PRE-TRAVEL: 0.7 mm
 TOTAL TRAVEL: 2.6 mm
 INITIAL CONTACT RESISTANCE: 1 Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.



Materials

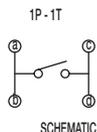
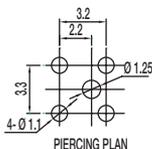
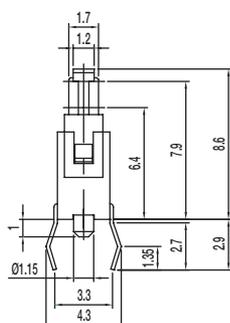
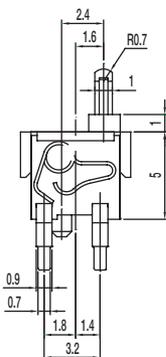
KNOB: PA
 COVER: PA
 SPRING: Gold plated, copper alloy
 HOUSING: PA
 TERMINAL: Silver plated, copper alloy



PART NUMBER	PACKAGING	SCHEMATIC
DS-02005 (30)	1,000 pieces	1P-1T

Specifications

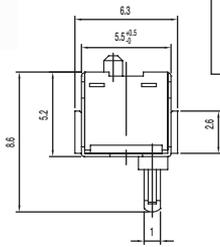
CONTACT ARRANGEMENT: SPST, NO
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 50,000 cycles
 OPERATING FORCE: 30 gf max.
 PRE-TRAVEL: 0.7 mm
 TOTAL TRAVEL: 2.2 mm
 INITIAL CONTACT RESISTANCE: 1 Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.



Materials

KNOB: PA
 COVER: PA
 SPRING: Gold plated, copper alloy
 HOUSING: PA
 TERMINAL: Silver plated, copper alloy

DS Series Detect Switch



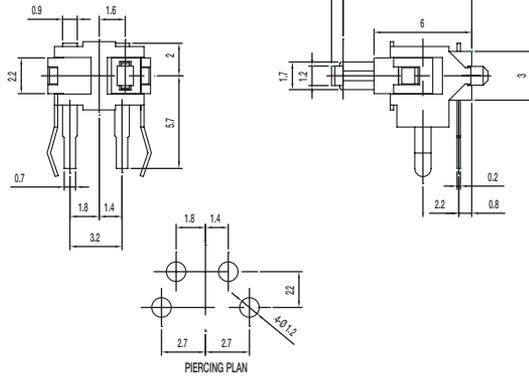
PART NUMBER	PACKAGING	SCHEMATIC
DS-02005-A	1,000 pieces	1P-1T N.O.

Specifications

CONTACT ARRANGEMENT: SPST, NO
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 50,000 cycles
 OPERATING FORCE: 50 gf max.
 PRE-TRAVEL: 0.7 mm
 TOTAL TRAVEL: 2.6 mm
 INITIAL CONTACT RESISTANCE: 1 Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

KNOB: PA
 COVER: PA
 SPRING: Gold plated, copper alloy
 HOUSING: PA
 TERMINAL: Silver plated, copper alloy



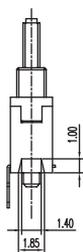
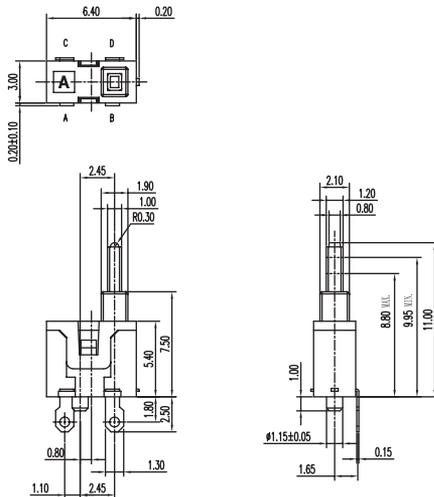
PART NUMBER	PACKAGING	SCHEMATIC
DS-21805	2,500 pieces	C D A B N.O.

Specifications

CONTACT ARRANGEMENT: SPDT
 CONTACT RATING: 5mA @ 5 VDC
 OPERATING LIFE: 100,000 cycles
 OPERATING FORCE: 36 gf
 TOTAL TRAVEL: 2.20 mm
 INITIAL CONTACT RESISTANCE: 1 Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

KNOB: POM
 COVER: PA46
 SPRING: Silver plated
 HOUSING: PPS
 TERMINAL: Silver plated



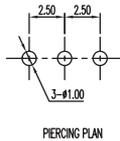
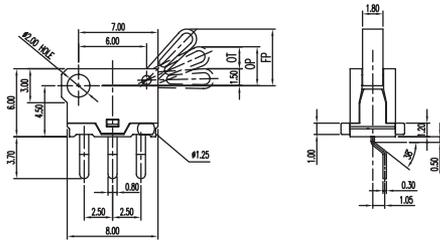
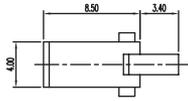
D

Detect

DS Series Detect Switch



PART NUMBER	PACKAGING	SCHEMATIC
DS-080	1,000 pieces	



Specifications

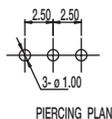
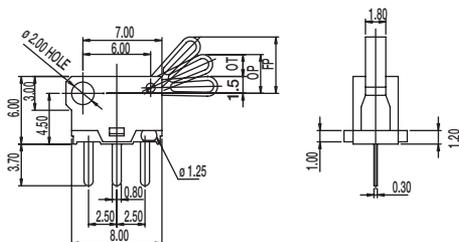
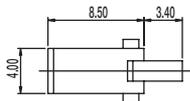
CONTACT ARRANGEMENT: SPDT
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 20,000 cycles
 OPERATING FORCE: 30 ± 20 gf
 OVER TRAVEL: 2.0 ± 0.40 mm
 INITIAL CONTACT RESISTANCE: 200 m Ω max.
 INSULATION RESISTANCE: 10 M Ω min. @ 250 VDC 60 sec.
 DIELECTRIC STRENGTH: 250 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

KNOB: POM
 COVER: PA46
 SLIDER: PBT
 HOUSING: PA46
 TERMINAL: Silver plated



PART NUMBER	PACKAGING	SCHEMATIC
DS-080-C PA	1,000 pieces	



Specifications

CONTACT ARRANGEMENT: SPDT
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 20,000 cycles
 OPERATING FORCE: 30 ± 20 gf
 OVER TRAVEL: 2.0 ± 0.40 mm
 INITIAL CONTACT RESISTANCE: 200 m Ω max.
 INSULATION RESISTANCE: 10 M Ω min. @ 250 VDC 60 sec.
 DIELECTRIC STRENGTH: 250 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

KNOB: POM
 COVER: PA46
 SLIDER: PBT
 HOUSING: PA46
 TERMINAL: Silver plated

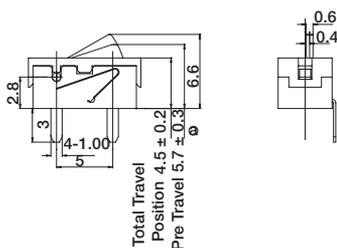
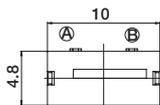


D

Detect



PART NUMBER	PACKAGING	SCHEMATIC
DS-09005-02 BK	500 pieces	 N.O.



Specifications

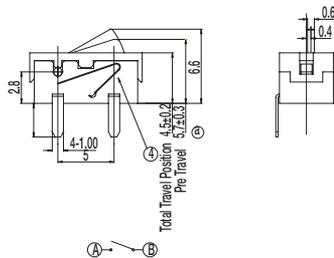
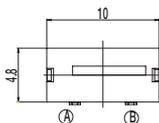
CONTACT ARRANGEMENT: SPST
 CONTACT RATING: 1mA @ 5 VDC
 OPERATING LIFE: 100,000 cycles
 OPERATING FORCE: 50 gf max.
 TOTAL TRAVEL: 4.5±0.2 mm
 INITIAL CONTACT RESISTANCE: 500 m Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 500 VDC 60 sec.
 DIELECTRIC STRENGTH: 500 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

LEVER: POM
 COVER: PA
 HOUSING: PA
 TERMINAL: Silver plated



PART NUMBER	PACKAGING	SCHEMATIC
DS-09005-02 RP	500 pieces	 N.O.



Specifications

CONTACT ARRANGEMENT: SPST
 CONTACT RATING: 1mA @ 5 VDC
 OPERATING LIFE: 100,000 cycles
 OPERATING FORCE: 50 gf max.
 TOTAL TRAVEL: 4.5±0.2 mm
 INITIAL CONTACT RESISTANCE: 500 m Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 500 VDC 60 sec.
 DIELECTRIC STRENGTH: 500 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

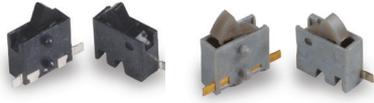
Materials

LEVER: POM
 COVER: PA
 HOUSING: PA
 TERMINAL: Silver plated



Detect

HDS Series Micro Mini Side Actuated Surface Mount Detect Switches



Features/Benefits

- Low profile package sits just 1.4 mm off PCB
- Design allows top or side actuation
- Right and left options available
- Low actuation force, 30 grams max.
- Pick and place compatible, available in tape & reel packaging
- RoHS compliant and compatible

Typical Applications

- Consumer electronics
- Computers
- Medical devices
- Mobile Communications
- ATCA and MicroTCA devices

Specifications

CONTACT RATING: 1 mA 5 VDC

MECHANICAL AND ELECTRICAL LIFE: 100,000 cycles min.

CONTACT RESISTANCE: 1 Ω max. initial.

INSULATION RESISTANCE: 100 M Ω min. between adjacent contacts.

OPERATING TEMPERATURE: -40°C to + 80°C

STORAGE TEMPERATURE: -40°C to + 80°C

PACKAGING: tape & reel; 5,000 per reel.

TRAVEL:

Pre-travel .17 mm min.

Overtravel: .5 mm min.

Total: 1.07 mm

Materials

BASE: LCP HDS001L: Gray HDS001R: Black

COVER: PA 46 (UL94V-0)

ACTUATOR: PA 46 (UL94V-0) HDS001L: Gray HDS001R: Black

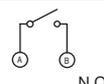
MOVABLE BLADE: Stainless Steel, Ag over Ni plating.

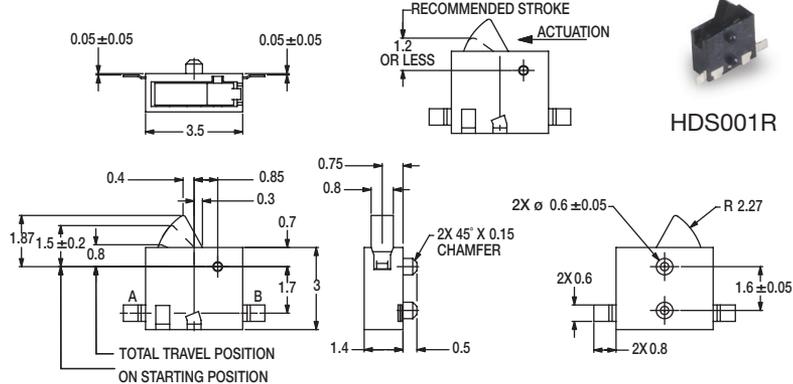
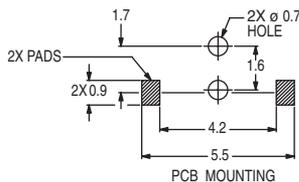
TERMINALS: Phosphor Bronze, Ag plating.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

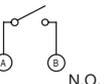
Build-A-Switch

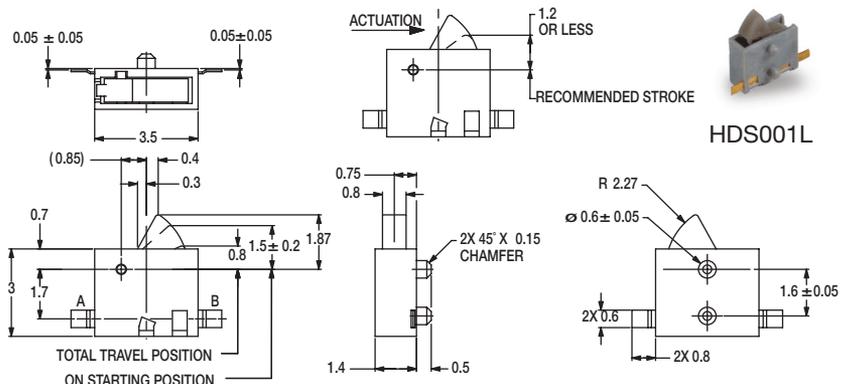
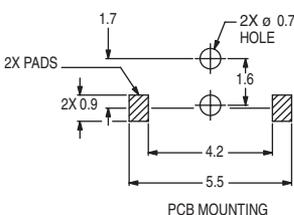
Complete part numbers for HDS Series are shown below.

PART NUMBER	PACKAGING	SCHEMATIC
HDS001R	TAPE & REEL	 N.O.

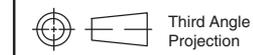


HDS001R

PART NUMBER	PACKAGING	SCHEMATIC
HDS001L	TAPE & REEL	 N.O.



HDS001L



Third Angle Projection

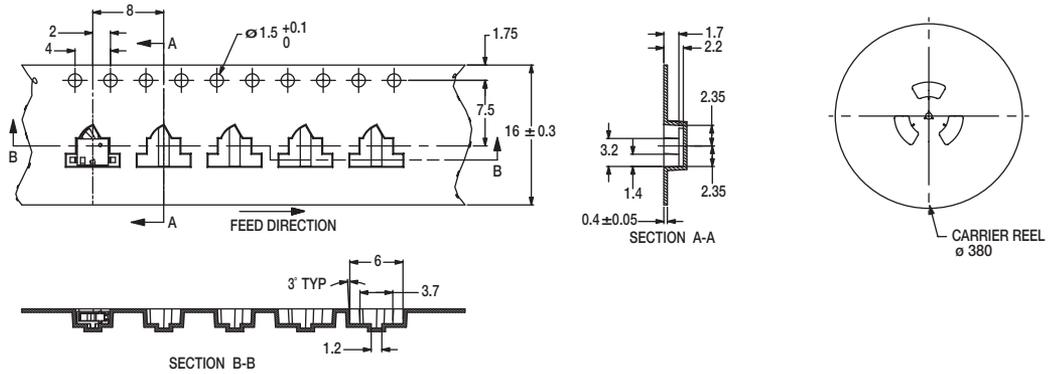
Dimensions are shown: mm
Specifications and dimensions subject to change



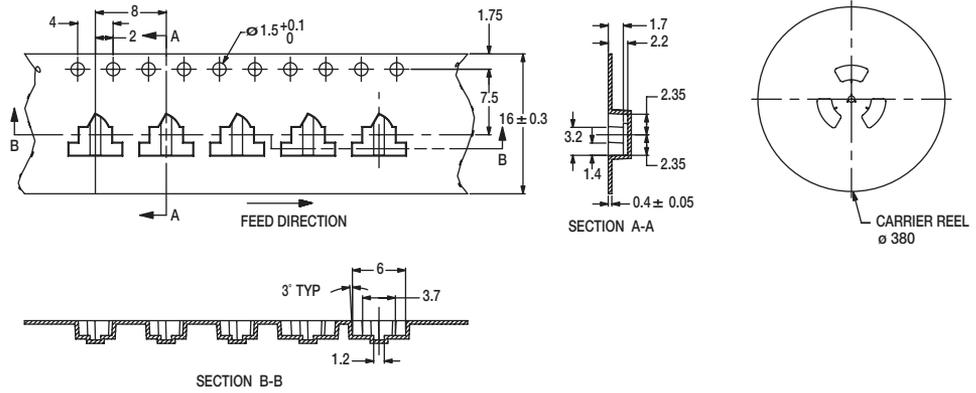
HDS Series Micro Mini Side Actuated Surface Mount Detect Switches

TAPE & REEL

HDS001R



HDS001L



NOTE: Quantity per reel: 5,000 pieces

HDP Series Micro Mini Side Actuated Surface Mount Detect Switches



Features/Benefits

- Low profile
- Side actuation
- Right and left options available
- Low actuation force
- Lead free and halogen free

Typical Applications

- Consumer electronics
- Computers
- Medical devices
- Mobile Communications
- ATCA and MicroTCA devices

Specifications

CONTACT RATING: 1 mA 5 VDC
 MECHANICAL AND ELECTRICAL LIFE: 100,000 cycles min.
 CONTACT RESISTANCE: < 500 m Ω initial.
 INSULATION RESISTANCE: > 100 M Ω
 OPERATING TEMPERATURE: -20°C to + 70°C
 STORAGE TEMPERATURE: -30°C to + 80°C
 PACKAGING: tape & reel; 2,500 per reel.
 TRAVEL:
 Pre-travel 0.15 mm min.
 "ON" starting position 2.96 +/- 0.25 mm
 Total: 1.3 mm
 Mechanical: 1.9 mm

Materials

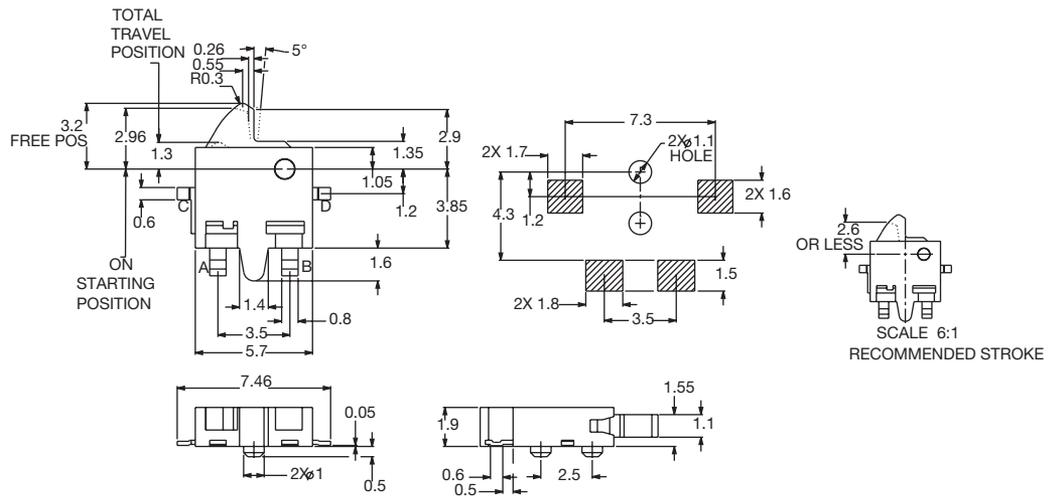
BASE: PA 46 (UL94HB) - halogen free
 ACTUATOR: PA 46 (UL94HB) - halogen free
 HDP001R - black body/actuator
 HDP001L - grey body/actuator
 MOVABLE CONTACTS: Stainless Steel, Silver over nickel plate.
 FIXED CONTACTS/TERMINALS: Phosphor Bronze, Silver plate.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

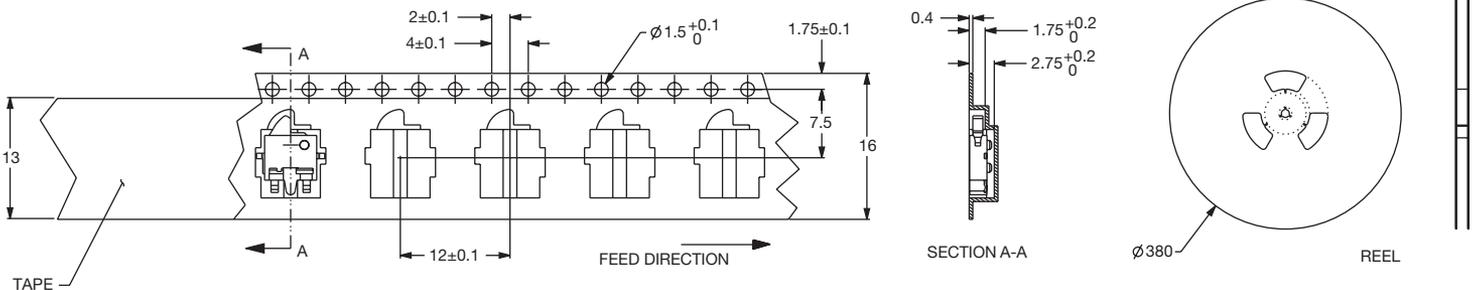
Build-A-Switch

Complete part numbers for HDP Series are shown below.

PART NUMBER	PACKAGING	SCHEMATIC
HDP001R Black body/ actuator	TAPE & REEL	



Detect

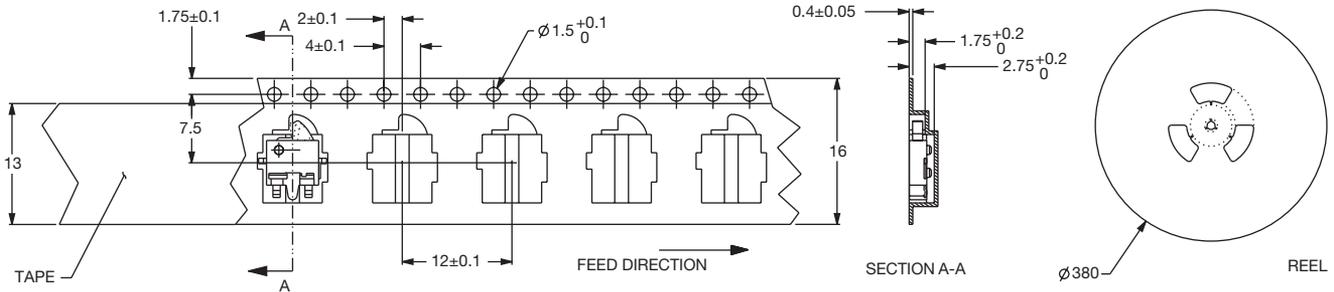
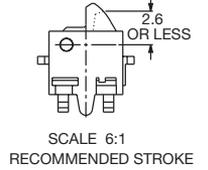
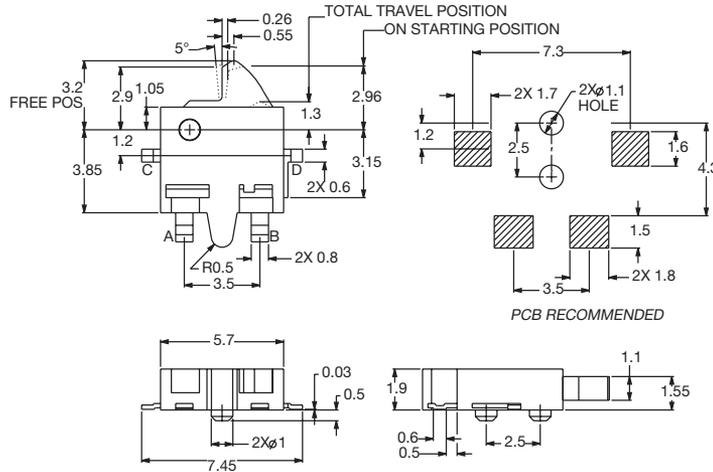


Dimensions are shown: mm
 Specifications and dimensions subject to change

HDP Series Micro Mini Side Actuated Surface Mount Detect Switches



PART NUMBER	PACKAGING	SCHEMATIC
HDP001L	TAPE & REEL	
Grey body/ actuator		



SDS Series Side Actuated Detect Switches

Features/Benefits

- Low profile package sits just 2mm off PCB
- 2mm overtravel ideal for detector applications
- Low actuation force (75 grams max.)
- Pick & place compatible, available in tape & reel packaging
- RoHS compliant and compatible

Typical Applications

- Medical devices
- Consumer electronic devices
- PCB lock cam detect
- Smart card detect
- ATCA and MicroTCA



Specifications

CONTACT RATING: 100 mA @ 12 VDC.
 MECHANICAL & ELECTRICAL LIFE: 50,000 cycles.
 CONTACT RESISTANCE: 100 m Ω max. initial.
 INSULATION RESISTANCE: 10 M Ω min. @ 100 VDC.
 OPERATING TEMPERATURE: -40°C to +85°C.
 SOLDERABILITY: IR compatible, no wash. 260°C max.
 PACKAGING: Bulk or tape & reel (3000 per reel).

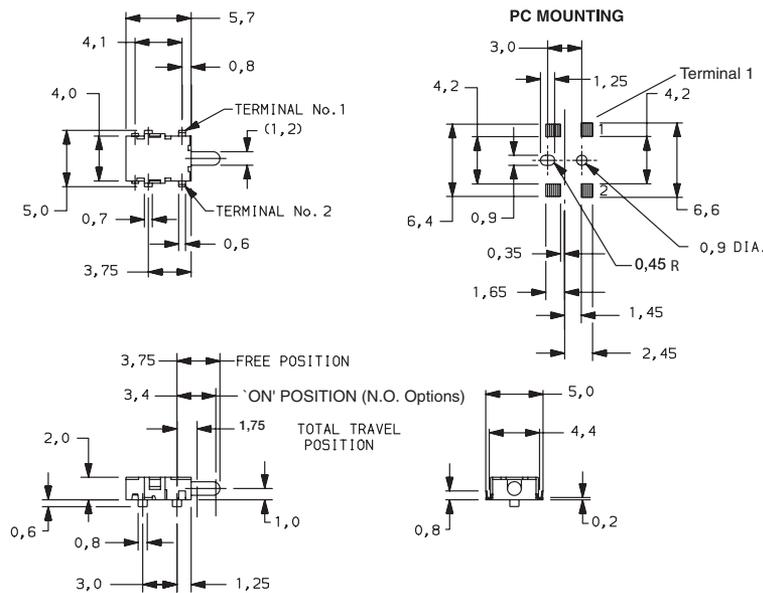
Materials

BASE: Glass filled LCP (UL 94V-0).
 ACTUATOR: Glass Filled LCP (UL94V-0).
 SURFACE PLATE: Nickel silver w/silver plate.
 MOVABLE CONTACT: Phosphor bronze, see table for plating.
 TERMINALS: Phosphor bronze, see table for plating.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How to Order

Complete part numbers for SDS Series Switches are shown below.

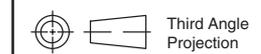
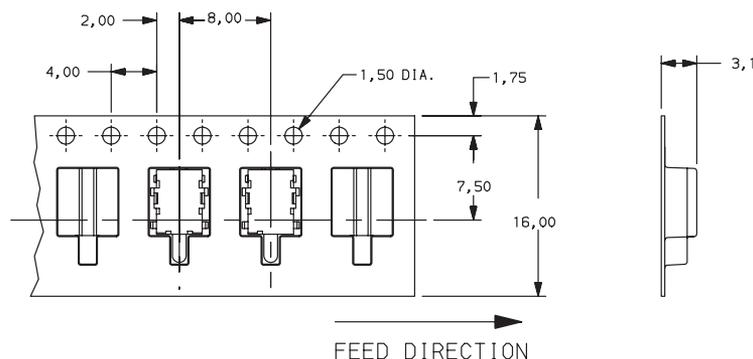


PART NUMBER	HOUSING COLOR	PACKAGING	SCHEMATIC	Contact Plating	Terminal Plating
SDS001	Black	Bulk	N.O. 2 1	Silver Clad	Silver Plate
SDS001R		Tape & Reel			
SDS002	White	Bulk	N.C. 2 1	Silver Clad	Silver Plate
SDS002R		Tape & Reel			
SDS004	Black	Bulk	N.O. 2 1	Gold Flash	Gold Flash
SDS004R		Tape & Reel			
SDS005	White	Bulk	N.C. 2 1	Gold Flash	Gold Flash
SDS005R		Tape & Reel			



SDS001
SPST

TAPE & REEL



Third Angle Projection
 Dimensions are shown: mm
 Specifications and dimensions subject to change

DDS Series Micro Mini Thru-hole Detect Switches



Features/Benefits

- Vertical or horizontal actuation
- 2mm overtravel—Ideal for detector applications
- Low actuations force (less than 40 grams)
- RoHS compliant and compatible

Typical Applications

- Detect the presence of a mechanical device
- Medical devices
- Consumer electronic devices

Specifications

CONTACT RATING: 0.1A @ 30 VDC.
 MECHANICAL & ELECTRICAL LIFE: 50,000 cycles.
 CONTACT RESISTANCE: 150 m Ω max. initial.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC.
 OPERATING TEMPERATURE: -20°C to +70°C.
 DIELECTRIC STRENGTH: 100 volts AC @ 60 Hz.
 PACKAGING: Bulk.

Materials

HOUSING: P.P.S.
 ACTUATOR: PA66
 MOVABLE CONTACT: Tin bronze, silver plated.

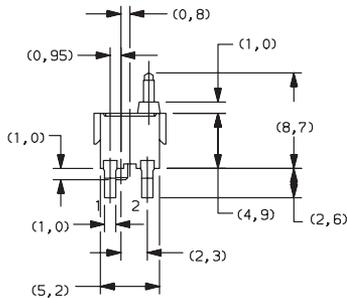
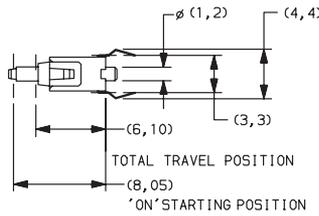
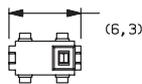
NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How To Order

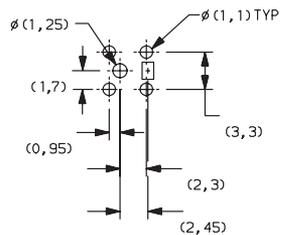
Complete part numbers for DDS Series Switches are shown below.



DDS001
SPST



PC MOUNTING



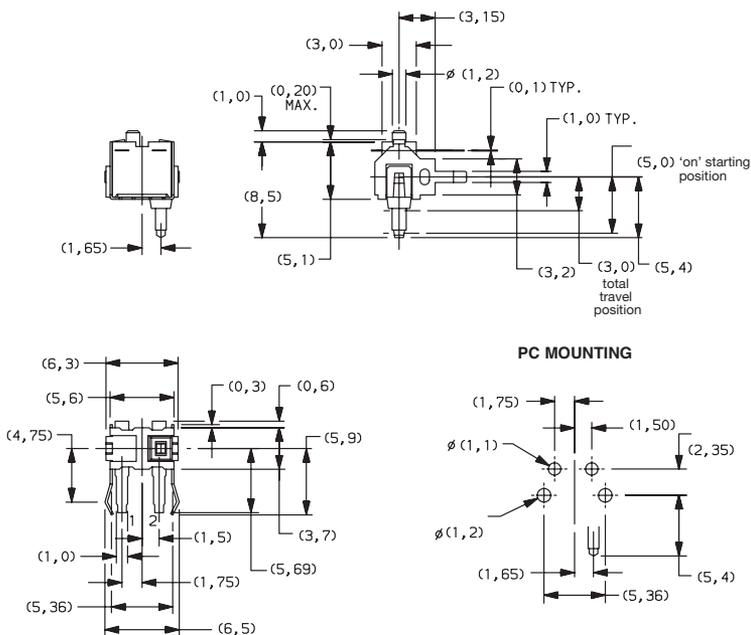
PART NUMBER	DESCRIPTION	SCHEMATIC
DDS001	Vertical Actuator	 SPST N.O.



Detect

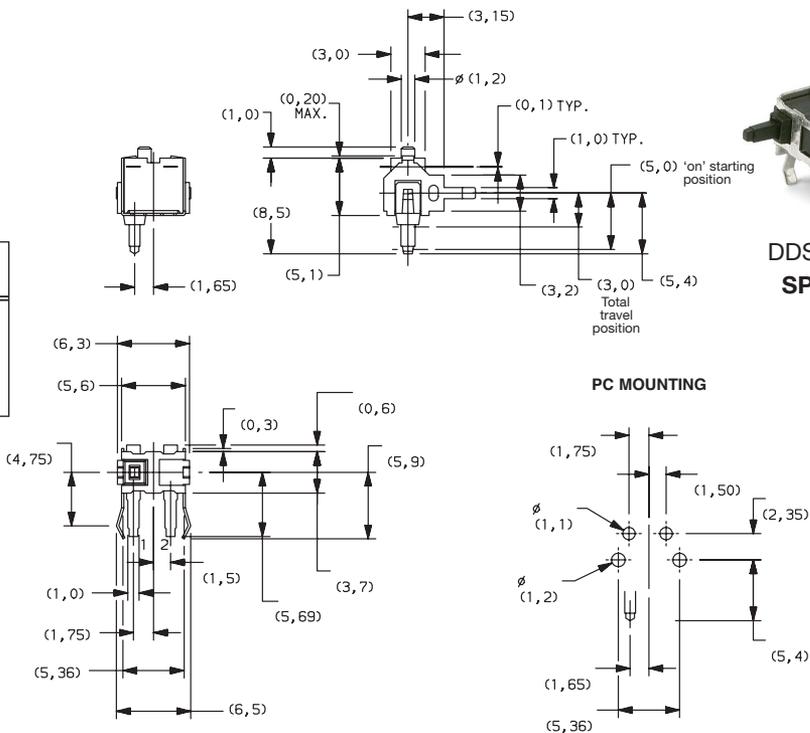
DDS Series Micro Mini Thru-hole Detect Switches

PART NUMBER	DESCRIPTION	SCHEMATIC
DDS002	Right angle, actuator right	 SPST N.O.



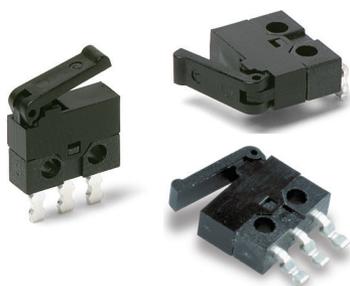
DDS002
SPST

PART NUMBER	DESCRIPTION	SCHEMATIC
DDS003	Right angle, actuator left	 SPST N.O.



DDS003
SPST

MDS Series Micro Snap-acting Detect Switches



Features/Benefits

- Snap-acting tactile feel
- Small package size
- Available in vertical or right angle PCB mount
- RoHS compliant and compatible

Typical Applications

- Detect the presence of a mechanical device
- Medical devices
- Consumer electronic devices
- ATCA or MicroTCA devices

Specifications

CONTACT RATING: 300mA @ 30 VDC.
 MECHANICAL & ELECTRICAL LIFE: 30,000 operations.
 CONTACT RESISTANCE: 100 m Ω max.
 OPERATING TEMPERATURE: -25°C to +70°C.
 SOLDERABILITY: According to lead free solder profiles.
 PACKAGING: Available in bulk or tape and reel.
 OPERATING FORCE: 50 g Max.
 RELEASE FORCE: 3g Min.

Materials

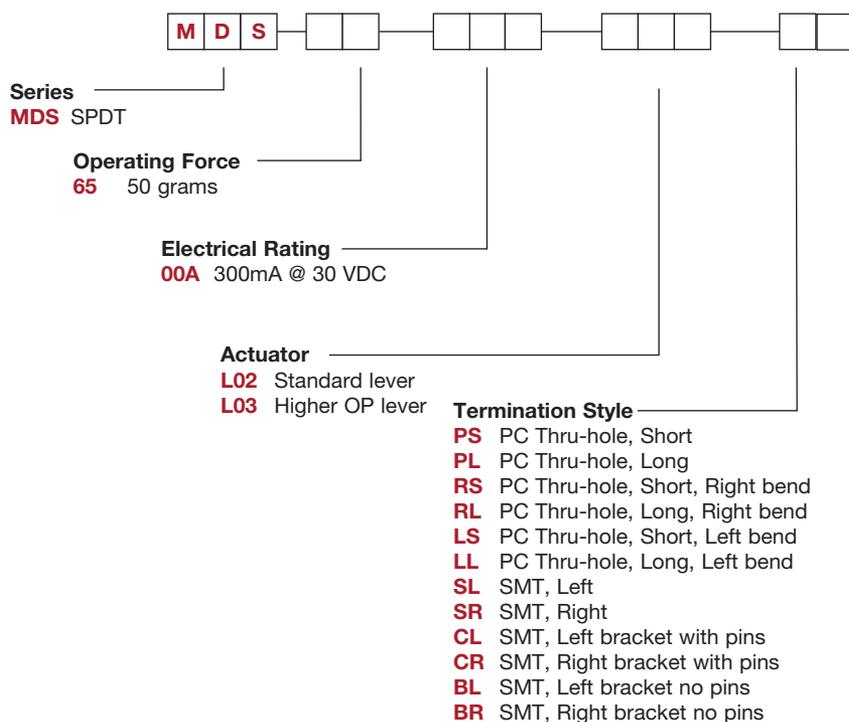
BASE: PA9T
 COVER & ACTUATOR: PA9T
 MOVABLE CONTACT: Copper alloy, silver plated.
 STATIONARY CONTACTS: Copper alloy, silver plated.
 TERMINALS: Copper alloy, silver plated.

NOTE: MDS series is RoHS compliant, and compatible. See technical data section of this catalog for RoHS compliant and compatible definitions and specifications.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages E-21 and E-25. For additional options not shown in catalog, consult Customer Service Center.

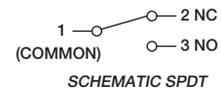
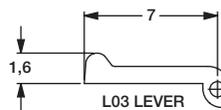
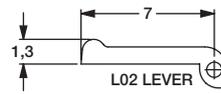
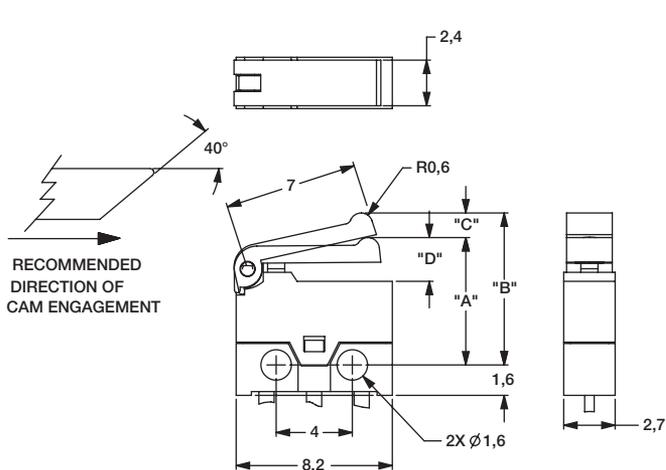


m

Detect

MDS Series Micro Snap-acting Detect Switches

SERIES **MDS**



OPERATING CHARACTERISTICS		LEVER L02	LEVER L03
OPERATING POSITION	DIM 'A'	6.7±0.5	7.0 +/-0.5
FREE POSITION	DIM 'B'	8 MAX	8.5 MAX
PRETRAVEL	DIM 'C'	1.8 MAX	1.8 MAX
OVER TRAVEL	DIM 'D'	0.3 MIN	0.3 MIN
CONTACT RATING		0.3A @ 30 VDC	0.3A @ 30VDC
OPERATING FORCE		50 GRAMS F. MAX	50 GRAMS F. MAX

OPERATING FORCE

OPTION CODE	OPERATING FORCE
65	50 grams max.

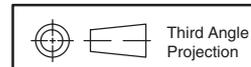
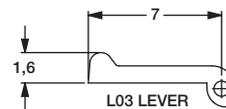
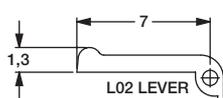
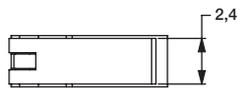
ELECTRICAL RATING

OPTION CODE	ELECTRICAL RATING
00A	300mA @ 30 V DC

ACTUATOR

L02 STANDARD LEVER

L03 HIGHER OP LEVER

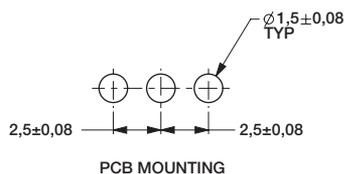


Dimensions are shown: mm
Specifications and dimensions subject to change

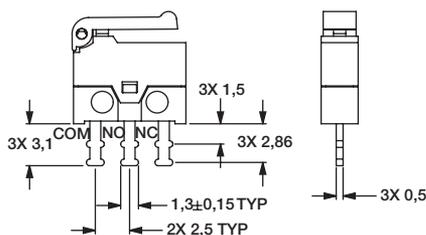
MDS Series Micro Snap-acting Detect Switches

TERMINATIONS

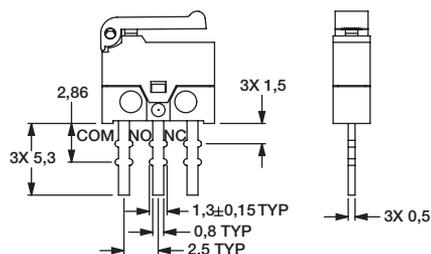
PCB Mounting Pattern



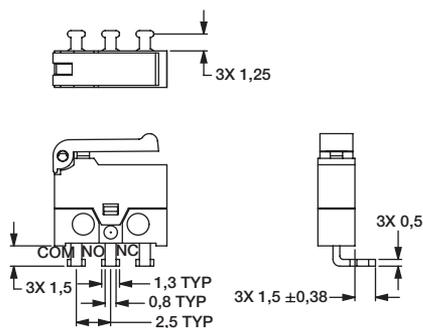
PS PC THRU-HOLE, SHORT STRAIGHT



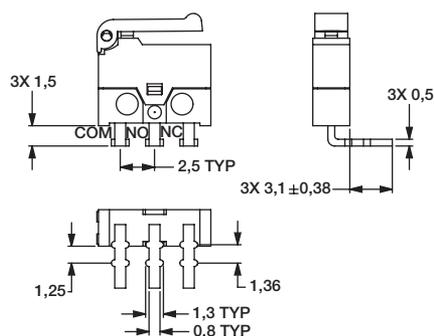
PL PC THRU-HOLE, LONG STRAIGHT



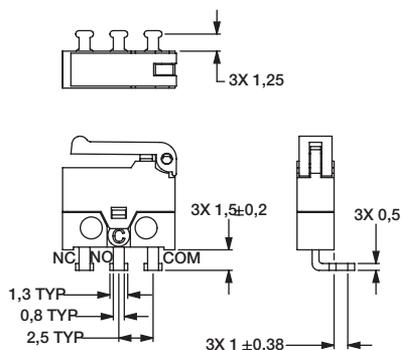
RS PC THRU-HOLE, SHORT RIGHT BEND



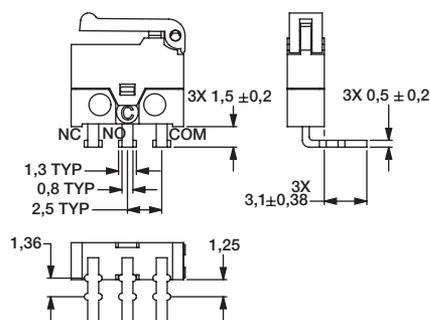
RL PC THRU-HOLE, LONG SHORT BEND



LS PC THRU-HOLE, SHORT LEFT BEND



LL PC THRU-HOLE, LONG LEFT BEND



Detect



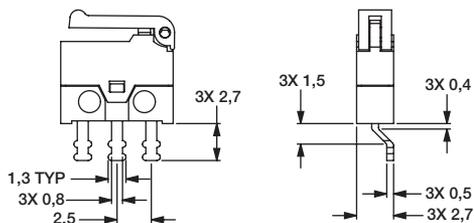
Dimensions are shown: mm
Specifications and dimensions subject to change

MDS Series Micro Snap-acting Detect Switches

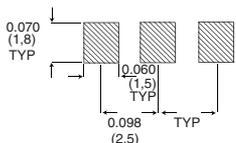
TERMINATIONS



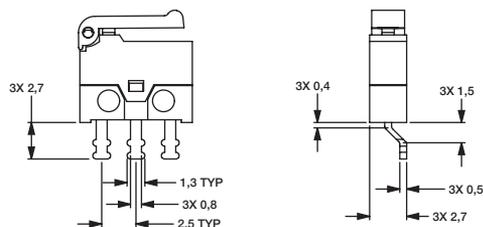
SL SMT, LEFT MOUNT



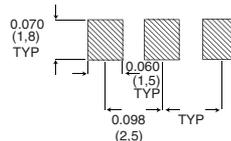
SMT Mounting Pattern



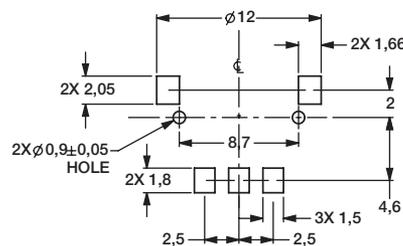
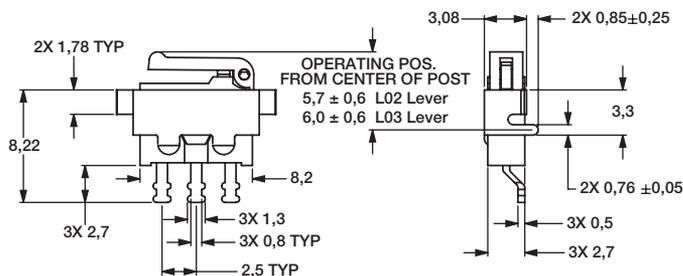
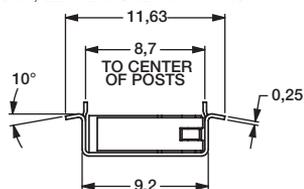
SR SMT, RIGHT MOUNT



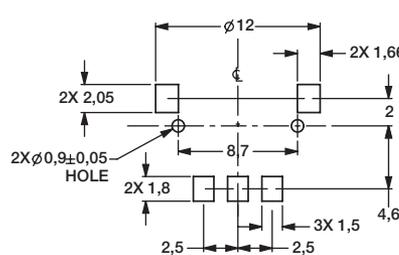
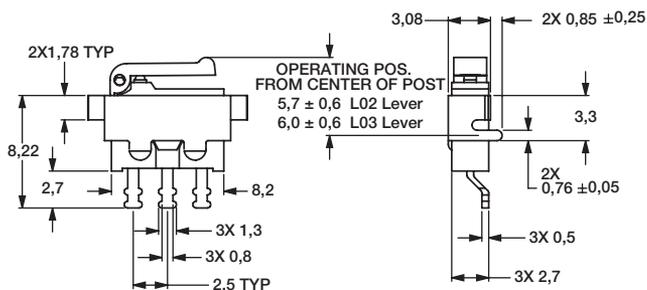
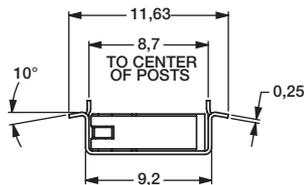
SMT Mounting Pattern



CL SMT, LEFT BRACKET WITH PINS



CR SMT, RIGHT BRACKET WITH PINS



Third Angle
Projection

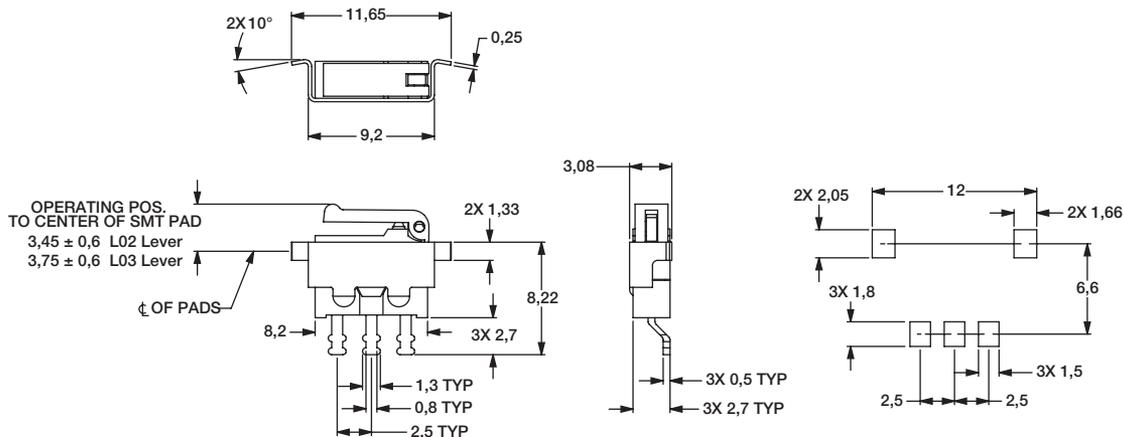


Detect

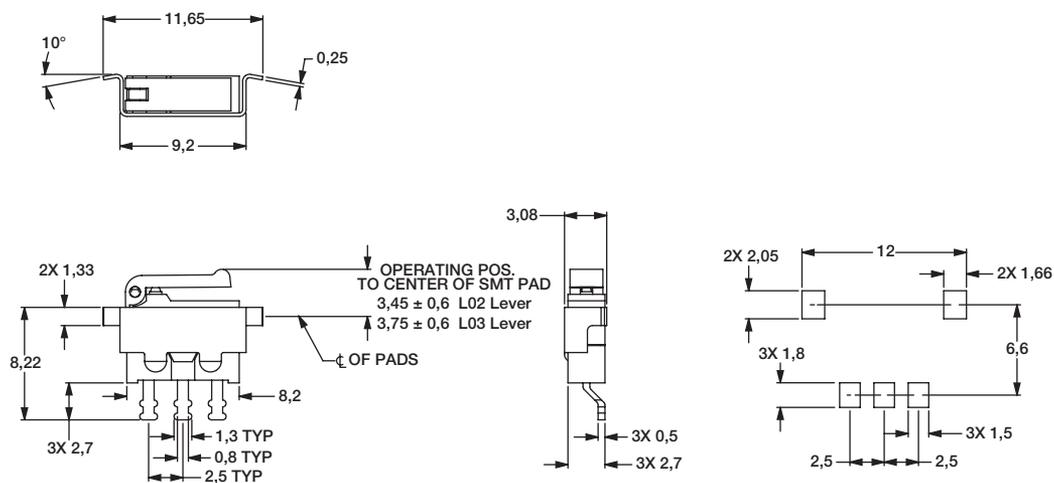
MDS Series Micro Snap-acting Detect Switches

TERMINATIONS

BL SMT, LEFT BRACKET NO PINS

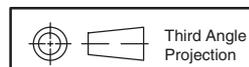


BR SMT, RIGHT BRACKET NO PINS



E

Detect



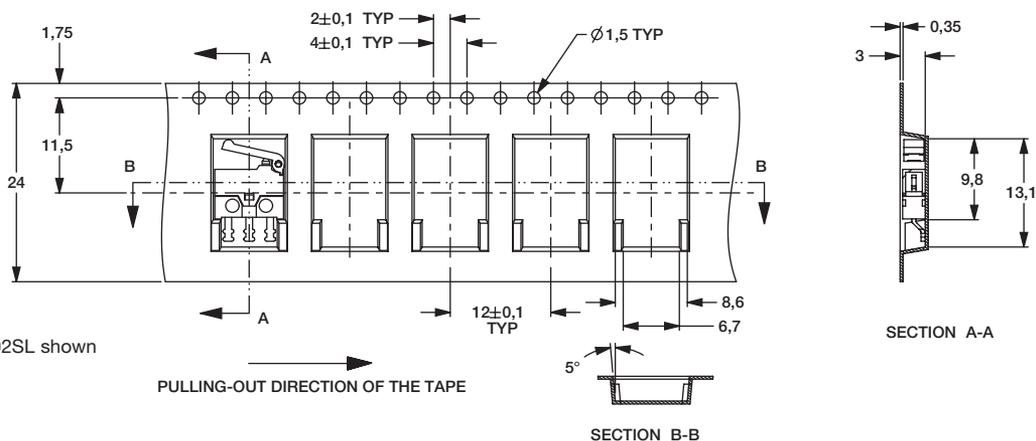
Dimensions are shown: mm
Specifications and dimensions subject to change

MDS Series Micro Snap-acting Detect Switches

TAPE & REEL

SL SMT, LEFT MOUNT

SR SMT, RIGHT MOUNT



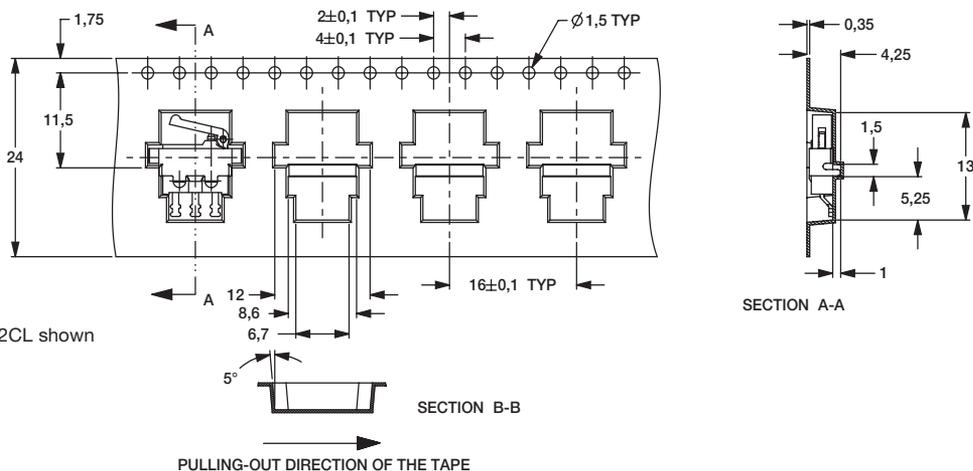
MDS6500AL02SL shown

CL SMT, LEFT MOUNT

CR SMT, RIGHT MOUNT

BL SMT, LEFT MOUNT

BR SMT, RIGHT MOUNT



MDS6500AL02CL shown

Supplied in carrier tape meeting the EIA-481-2 standard for 24mm tape.

Packaging quantity: SL and SR; 1,600 pieces per reel
CL, CR, BL and BR; 1,000 pieces per reel

KDS Series Intrusion Switches



Features/Benefits

- Slot mount into chassis to reduce installation cost
- Wire harness length & connector easily customized
- Available in N.O. or N.C. configuration
- RoHS compliant

Typical Applications

- Intrusion/Alarm switch in network desktop PC
- Intrusion/Alarm switch in telecommunication equipment
- Intrusion/Alarm switch in cellular base station

Specifications

CONTACT RATING: 0.4 VA max. @ 20 V AC or DC.

MECHANICAL & ELECTRICAL LIFE: 10,000 actuations min. at full load.

CONTACT RESISTANCE: 200 m Ω max. initial @ 2-4 V DC, 100mA.

INSULATION RESISTANCE: 10⁹ Ω min.

OPERATING TEMPERATURE: -40°C to +85°C

TRAVEL: KDS11: Pre-travel 0.180" TYP; Overtravel 0.223"

KDS33: No pre-travel, full travel 0.403"

DIELECTRIC STRENGTH: 500 Vrms min. @ sea level.

PACKAGING: Bulk packaging.

Materials

HOUSING: Nylon 6/6 (UL 94V-0)

ACTUATOR: Nylon 6/6 (UL 94V-0)

MOVABLE CONTACT: Copper alloy, gold plate over nickel plate.

FIXED CONTACT: Brass, gold plate over nickel plate.

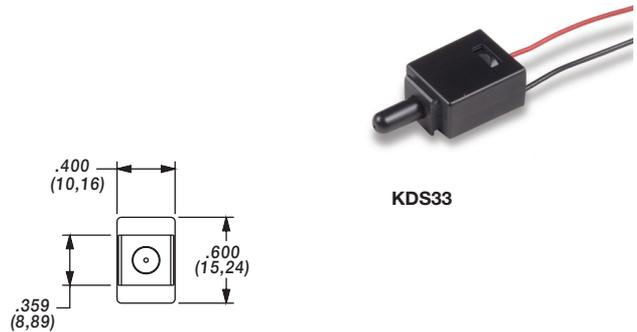
WIRE: UL 1061-24 AWG.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

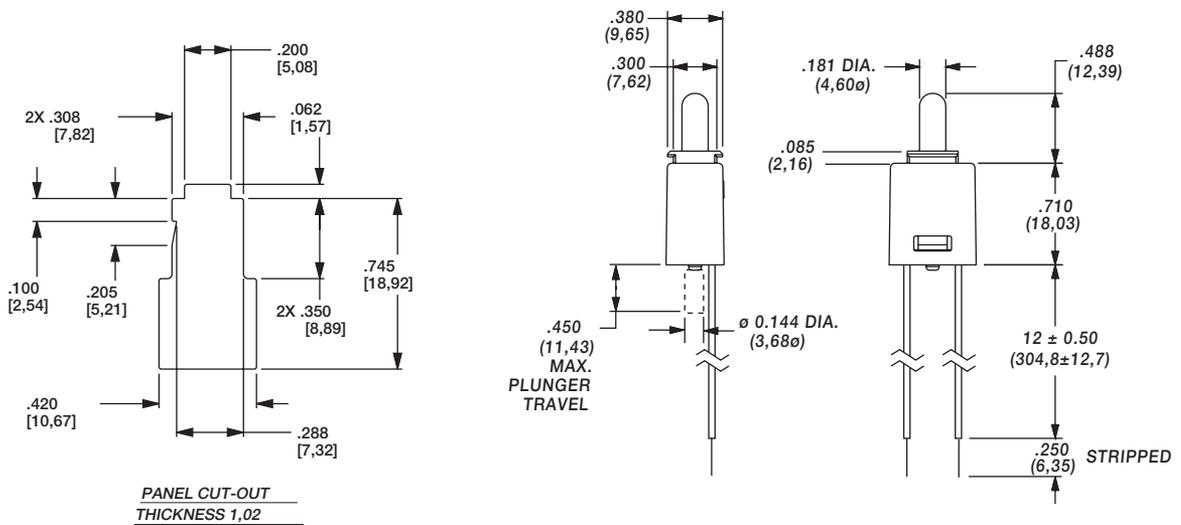
How To Order

Complete part numbers for KDS Series Switches are shown below.

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS. 1	POS. 2	
KDS11	OFF	MOM.	SPST N.O.
KDS33	ON	OFF	SPST N.C.



KDS33



PANEL CUT-OUT
THICKNESS 1,02

Detect

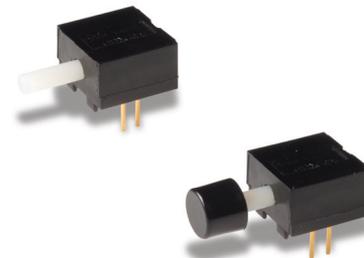
KM Series Subminiature Detect Switches

Features/Benefits

- **Reliable contact design**
- **Available with pretravel and overtravel**
- **RoHS compliant**

Typical Applications

- **Alarm systems**
- **Computers**
- **Detector switch application**



Models Available

Specifications

CONTACT RATING: Q contact material:
0.25 AMPS @ 125 V AC or DC (UL). See page F-29 for additional ratings.

ELECTRICAL LIFE: 10,000 actuations min. at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 85°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

NOTE: Any models supplied with Q or B contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

HOUSING & BUSHING: 6/6 nylon (UL94V-2), black.

ACTUATOR: 6/6 nylon (UL 94V-2), natural.

MOVABLE CONTACT: B contact material: Bronze or copper, with gold plate over nickel plate. See page F-39 for additional contact materials.

STATIONARY CONTACTS & TERMINALS: B contact material: Copper, with gold plate over nickel plate. See page F-29 for additional contact materials.

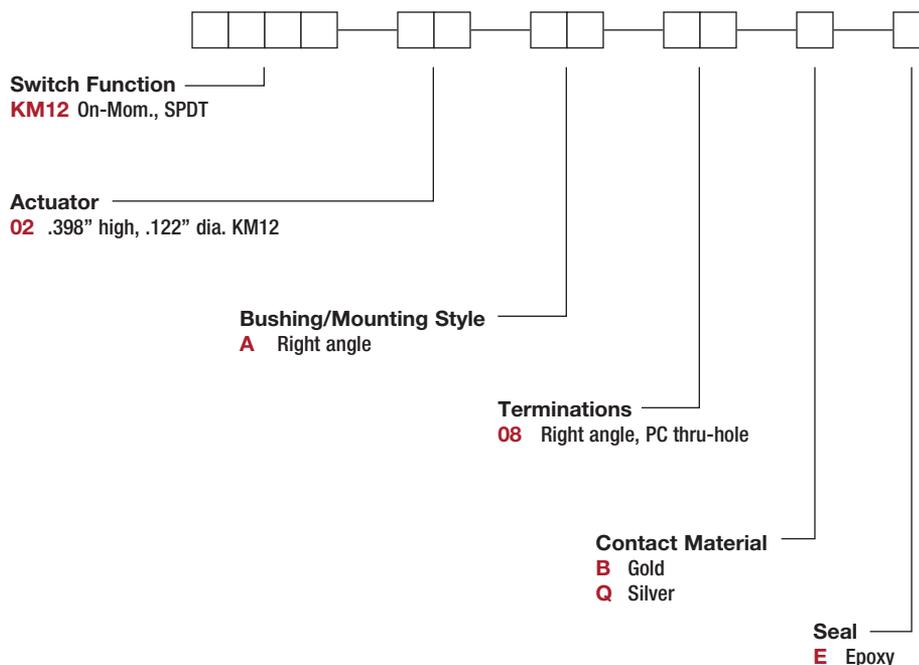
RETURN SPRING: Music wire, phosphor coated.

MOUNTING NUT: Brass, nickel plated.

TERMINAL SEAL: Epoxy.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages E-28 and E-29. For additional options not shown in catalog, consult Customer Service Center.

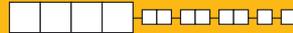


E

Detect

KM Series Subminiature Detect Switches

SWITCH FUNCTION

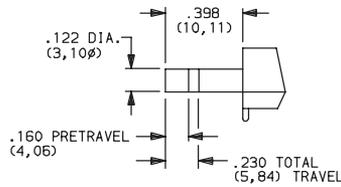


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	KM12					<p>SPDT</p>
<p>SPDT</p> <p>Part number shown: KM1202A08BE</p>						

ACTUATOR



02 .398" HIGH, .122" DIA.

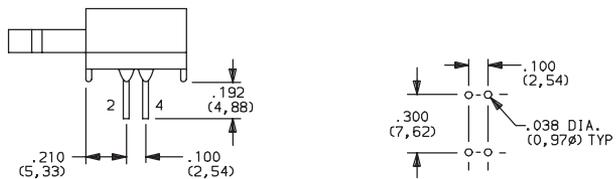


NOTE: Caps available for plunger options, see page E-29.

BUSHING/ MOUNTING STYLE



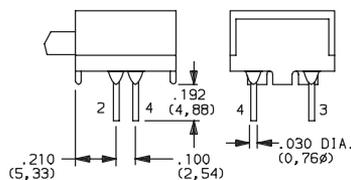
A RIGHT ANGLE



TERMINATIONS



08 RIGHT ANGLE, PC THRU-HOLE



Third Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

MPS Series Magnetic Proximity Sensors

Features/Benefits

- Long life—4M operations
- Sealed contacts
- Quality construction
- Quick and easy installation
- UL 61058 approved

Typical Applications

- Automotive sensors and indicators
- Industrial sensors
- Factory automation equipment
- Server / storage
- Security, alarms for windows



Specifications

CONTACT RATINGS: 3.0 W max. @ 30 V DC or 30 V AC max. @ 0.3 AMP max.; 1.0 msec. max. operate time (including bounce); 1.0 AMP max. carry current.

CONTACT RESISTANCE: 100 m Ω max. initial.

DIELECTRIC STRENGTH: 200 V DC min.

ELECTRICAL CIRCUIT: SPST NO (Contact Form A). Reed switch opens when magnet is removed from proximity. Contacts are held closed when magnet is within actuation range.

OPERATING TEMPERATURE: -40°F to 212°F (-40°C to 100°C).

OPERATING DISTANCE/ALIGNMENT: Operate (pull-in or make) points are nominal values with ± 10% tolerance. Release points are 110% to 150% of the operating points.

MECHANICAL & ELECTRICAL LIFE: 4 million operations.

PACKAGING: Bulk packaging, 10 switch and magnet pairs per package.

Materials

HOUSING/SPACER/COVER: ABS plastic (UL94V-0), white.

REED SWITCH: Rhodium coated reed contacts in hermetically sealed, nitrogen filled glass capsule. Closed when magnet is in close proximity. Used in closed loop circuits.

WIRE LEADS: UL 1061/ UL1007 / UL2468

All are 22 AWG wire: stranded, made of copper or aluminum; Length: 12 in. with ends stripped; Color: white.

POTTING (around wires): Epoxy.

MAGNETS: NdFeB

ADHESIVE MOUNTING: Foam-backed, pressure-sensitive adhesive with release liner.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How To Order

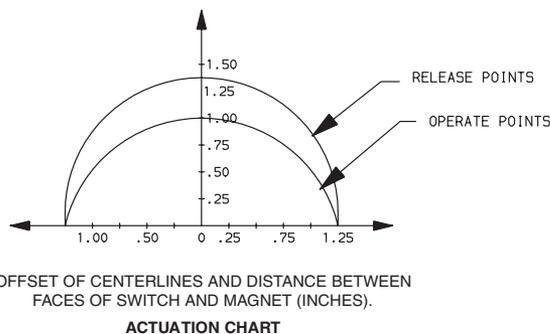
PART NUMBER	SWITCH TYPE
MPS45WGW	Subminiature surface mount (adhesive or flange), side exit leads, 1" make gap.

UL 61058

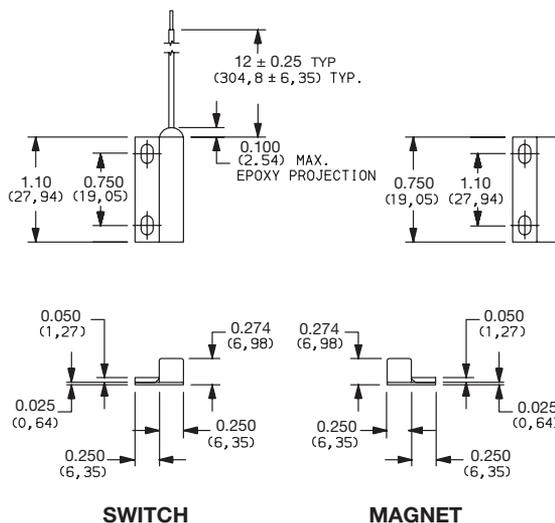


m

Detect



NOTE: UL 61058 Rating



Dimensions are shown: inches (mm)
Specifications and dimensions subject to change

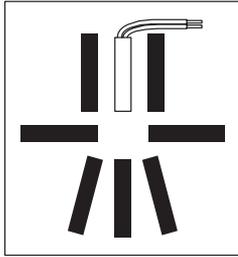
Actuating Positions

When installing recessed and surface mount contacts, magnet position is very important. The switch and magnet must always be parallel or end to end, and never in a 'T' configuration.

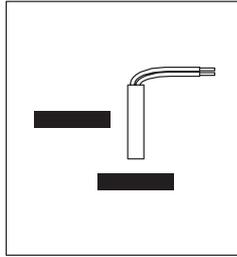
Gap Distance

Gap distance is a combination of the horizontal and vertical plane separation of the switch and magnet. Example: if a recessed magnet is 1/4" off the centerline of the switch, the make gap is reduced by 1/4"

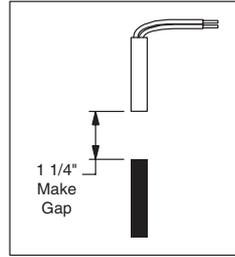
Correct Configuration



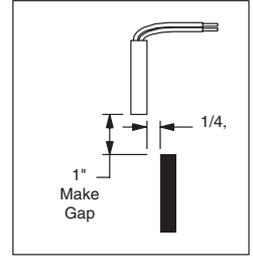
Incorrect Configuration



Center Alignment



Off Center Alignment



ZMA Series Subminiature Snap-acting Switches



Features/Benefits

- Reliable snap-acting mechanism
- Long electrical and mechanical life
- Compact size—Ideal when space is limited
- Various PCB terminals and actuators
- RoHS compatible & compliant

Typical Applications

- PCB detection switch
- Communication devices
- Testing equipment
- Security/Alarm systems
- Consumer electronics

UL61058-1



Specifications

CONTACT RATING: 3A @ 125 V AC 24 V DC
 1 A @ 125 / 250 V AC 24 V DC
 0.1A @ 125 V AC 60 V DC

ELECTRICAL LIFE: 300,000 cycles @ 0.1A / 10,000 cycles @ 3A.
 MECHANICAL LIFE: 1,000,000 cycles.
 INSULATION RESISTANCE: 100 M ohm min.
 DIELECTRIC STRENGTH: 500 Vrms.
 OPERATING TEMPERATURE: -40°C to 85°C
 OPERATING FORCE: 80 or 150 grams.

* Low Level—conditions where no arcing occurs during switching, i.e., 0.4 VA max.
 @ 20 V AC or DC max.

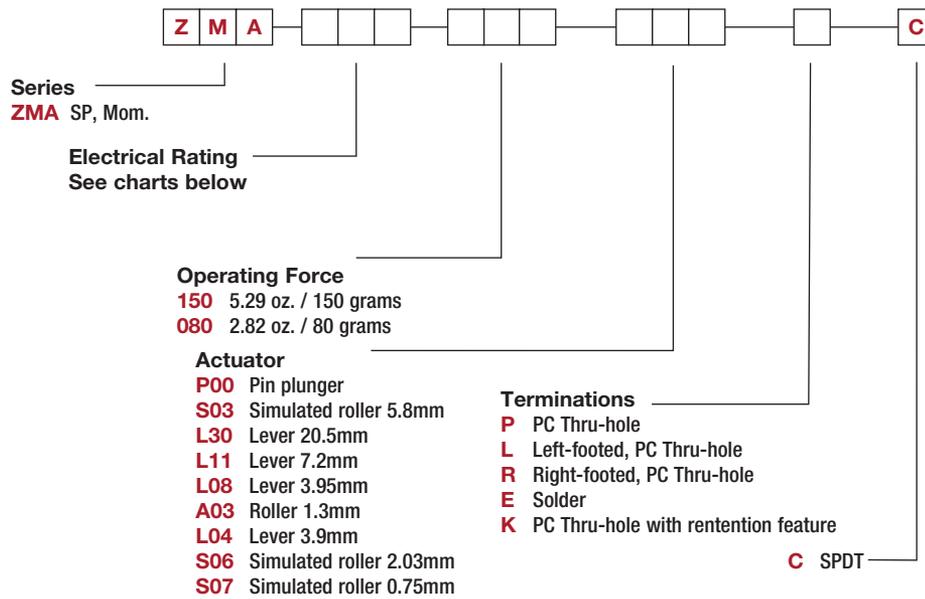
Materials

CASE/COVER: PBT
 ACTUATOR: Button nylon 6/6
 MOVABLE CONTACTS: Silver alloy or gold plated
 STATIONARY CONTACTS: Silver alloy or gold plated
 TERMINALS: Brass, silver plated.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-33 through J-35. For additional options not shown in catalog, consult Customer Service Center.



Detect

Silver Contacts

Option Code	UL 1054	UL 61058-1	ELK4	ELK15
00A	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
03A	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
01A		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

Gold Plated Contacts

Option Code	UL 1054	UL 61058-1	ELK4	ELK15
G00	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
G03	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
G01		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

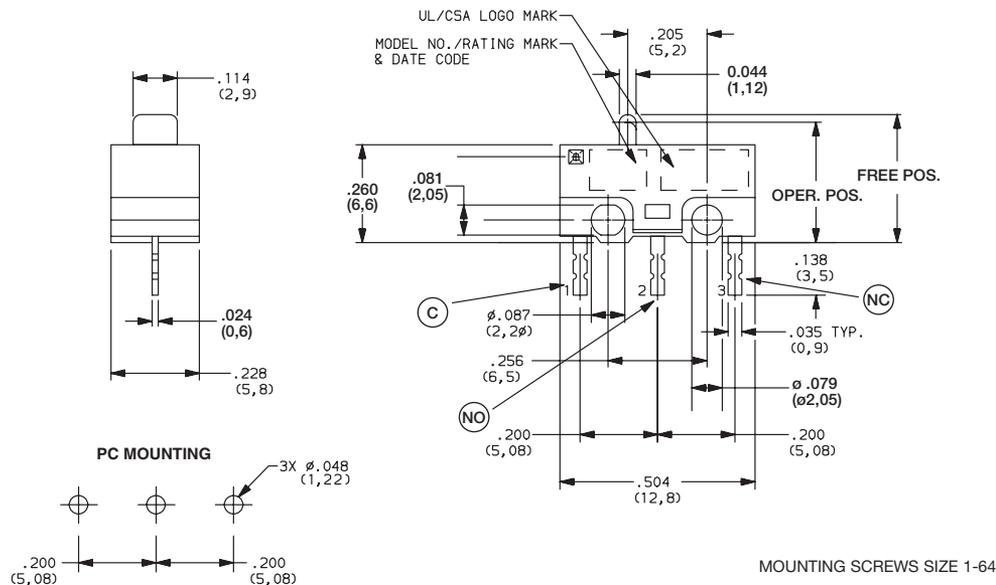


Dimensions are shown: mm
 Specifications and dimensions subject to change

ZMA Series Subminiature Snap-acting Switches

SERIES

ZMA SUBMINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY



ZMA03A150L04PC
SPDT

ELECTRICAL RATING

Silver Contacts

Option Code	UL c US 1054	UL c US 61058-1		
00A	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
03A	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
01A		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

Gold Plated Contacts

Option Code	UL c US 1054	UL c US 61058-1		
G00	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
G03	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
G01		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

* Note: See Technical Data in section N of this catalog for RoHS compliant and compatible definition and specifications.

All models US with all options.

Consult Customer Service center for availability and delivery of nonstandard ratings.

OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
150	5.29 150
080	2.82 80



Third Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

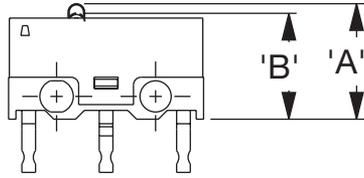


Detect

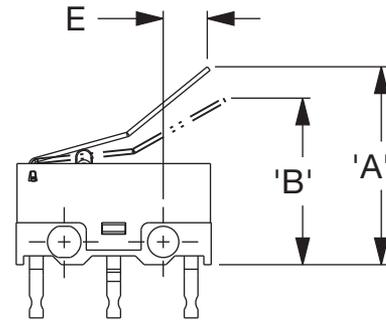
ZMA Series Subminiature Snap-acting Switches

ACTUATOR

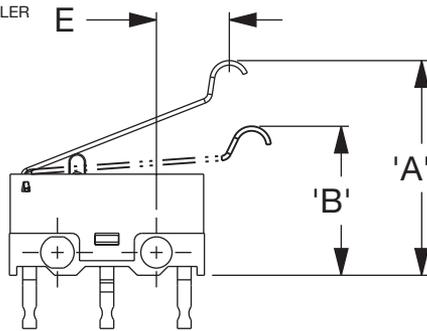
P00 PIN PLUNGER



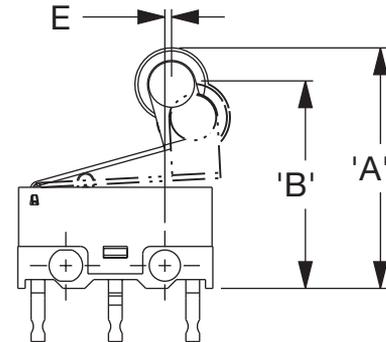
L08 LEVER
3.95MM



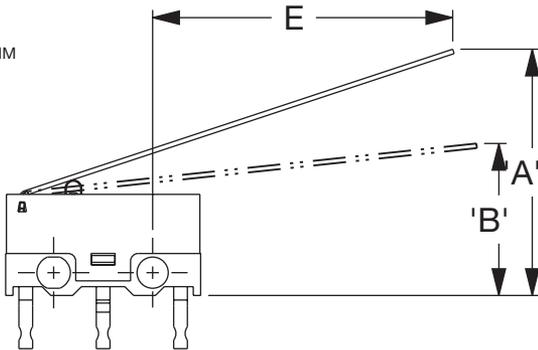
S03 SIMULATED ROLLER
5.8MM



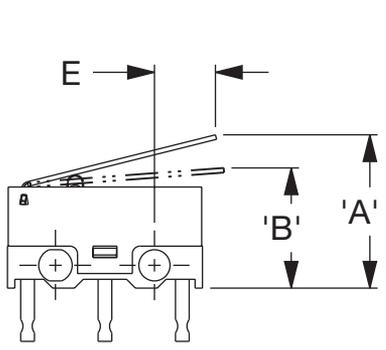
A03 ROLLER
1.3MM



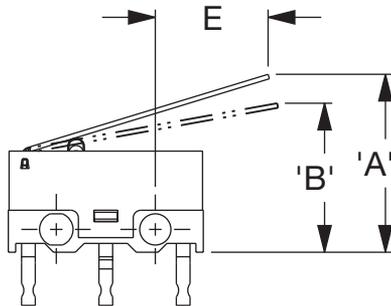
L30 LEVER
20.5MM



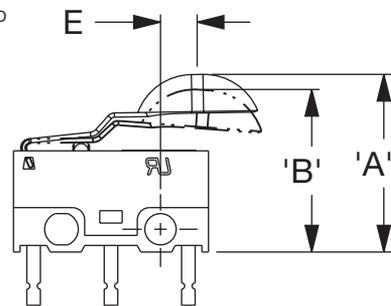
L04 LEVER
3.49MM



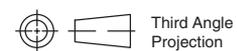
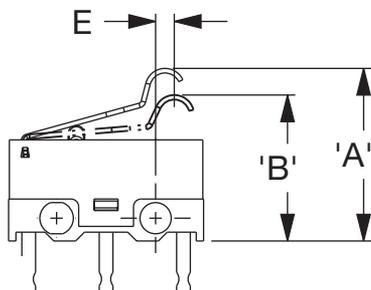
L11 LEVER
7.2MM



S06 SIMULATED ROLLER
2.03MM



S07 SIMULATED ROLLER
0.75MM



Third Angle
Projection

Dimensions are shown: mm

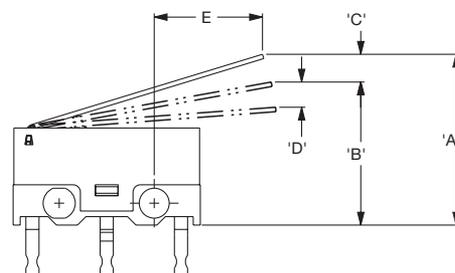
Specifications and dimensions subject to change

Detect 

ZMA Series Subminiature Snap-acting Switches

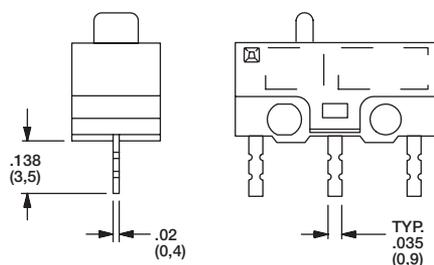
SWITCH CHARACTERISTICS

CODE	OPER. FORCE MAX. (GRAMS)		REL. FORCE MIN. (GRAMS)		'A' FP MAX. (MM)	'B' OP MAX. (MM)	'C' PT MAX. (MM)	'D' OT MIN. (MM)	'E' MIN. (MM)
P00	80	150	21	35	7.35	6.9 ±0.3	0.62	0.2	
S03	25	43	5	7	14.2	9.8 ±0.9	3.5	0.7	5.41
L30 (80gf)	13	21	2	3	16.8	9.5 ±1.9	6.9	0.55	20.15
L30 (150 gf)	13	21	2	3	16.8	9.75 ±1.9	6.9	0.55	20.15
L11	25	39	4	6	11.7	8.68 ±1	4.4	0.6	7.33
L08	27	48	3	8	13.5	10.75 ±0.8	3.5	0.3	3.82
A03	34	65	6	10	16.55	13.65 ±1	3.9	0.5	0.56
L04	30	50	5	8	10.1	7.9 ±0.7	3.0	0.5	3.49
S06	33	49	5	11	12.43	10.7 ±0.8	1.43	1.25	1.97
S07	40	65	2	5	13.0	9.7 ±1	4.3	0.5	0.49

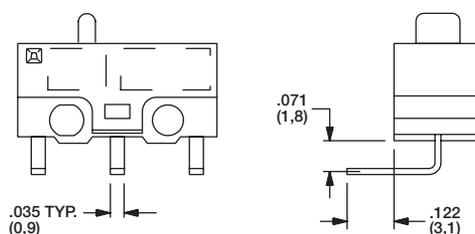


TERMINATIONS

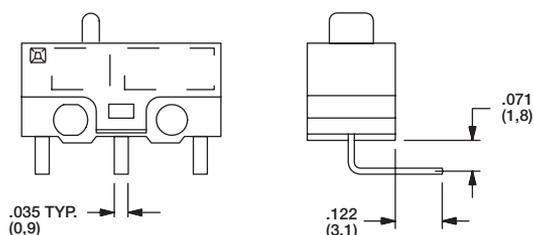
P PC THRU-HOLE



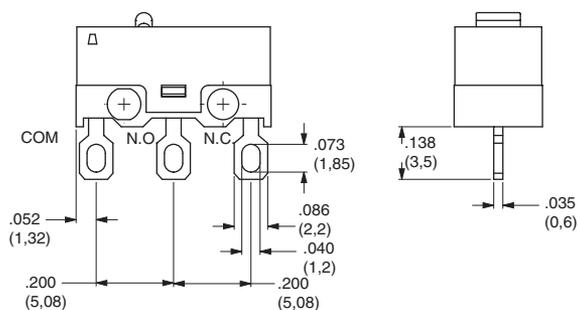
L LEFT FOOTED, PC THRU-HOLE



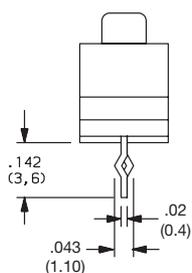
R RIGHT FOOTED, PC THRU-HOLE



E SOLDER



K PC THRU-HOLE WITH RETENTION FEATURE



Detect

KSU Series Micro Mini Surface Mount Detect Switches



Features/Benefits

- New multi contact construction
- Metal actuator
- Low actuating force
- RoHS compliant and compatible

Typical Applications

- Mobile phones and other handheld devices
- Portable medical devices
- Audio devices
- Alarm devices
- Payment terminals
- Smart meters

Specifications

FUNCTION: Momentary action.

CONTACT TYPE: SPST Normally open.

TERMINALS: Gullwing type for SMT.

Mechanical

SWITCHING FORCE: $0,7 \pm 0,5$ N

TRAVEL TO MAKE: $0,65$ mm - $0,45/+0,25$ mm

MECHANICAL TRAVEL: $1,5 \pm 0,2$ mm

OPERATING LIFE: 100,000 cycles

Packaging

Switches are delivered on continuous tape, in reels of 1,000 pieces

Electrical

MAXIMUM POWER:

MAXIMUM VOLTAGE:

MINIMUM VOLTAGE:

MAXIMUM CURRENT:

MINIMUM CURRENT:

CONTACT RESISTANCE:

INSULATION RESISTANCE:

DIELECTRIC STRENGTH:

BOUNCE TIME:

GOLD

0.2 VA

32 VDC

20 mV

10 mA

0.01 mA

≤ 100 m Ω

(100 VDC) 10^9 Ω

≥ 250 Vrms

≤ 3 ms

SILVER

0.1 VA

32 VDC

20 mV

50 mA

1 mA

Environmental

OPERATING TEMPERATURE: -40°C to $+125^{\circ}\text{C}$ -40°C to $+85^{\circ}\text{C}$

STORAGE TEMPERATURE: -55°C to $+125^{\circ}\text{C}$ -40°C to $+85^{\circ}\text{C}$

Process

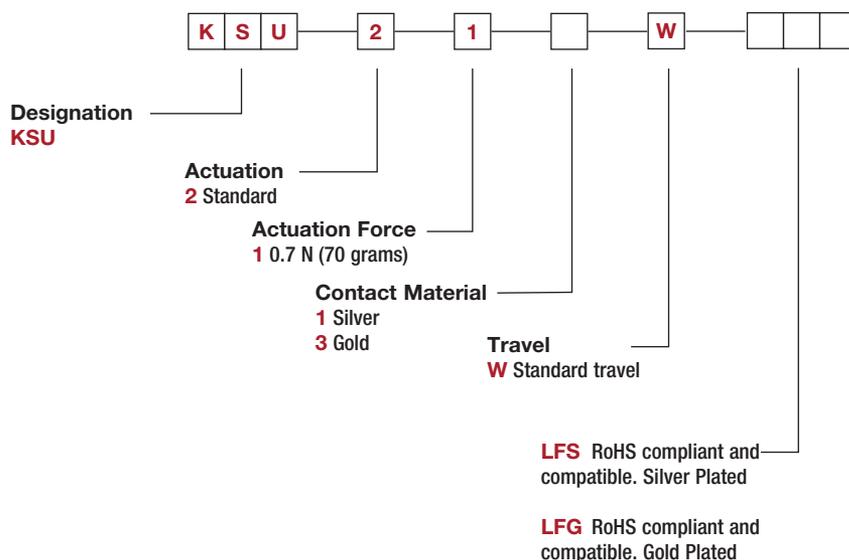
SOLDERING: Compatible with lead free reflow process

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

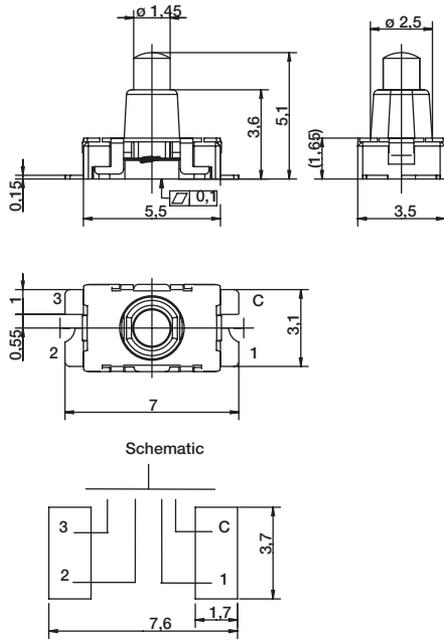
How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

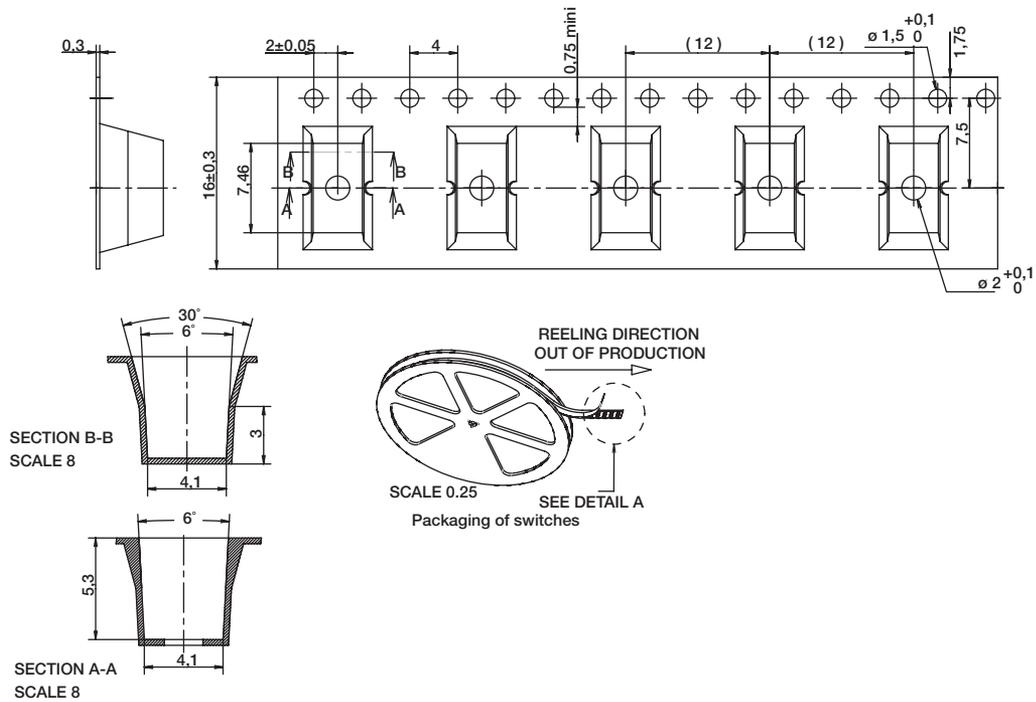
For any part number different from those listed above, please consult your local representative.



KSU Series Micro Mini Surface Mount Detect Switches



TAPE & REEL



KSR2D/M Series Subminiature Detect Switch for SMT



Features/Benefits

- Gold contacts
- G terminations
- Soft actuator
- RoHS compliant and compatible

Typical Applications

- Automotive
- Industrial electronics
- Medical equipment
- Detector switch applications

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type	Operating force Newtons	Operating life (operations)	Travel (mm)
KSR2D3MG LFG	1,5 ± 0,5N	100,000	0,3 ± 0,15
KSR2M3G LFG	0,8 ± 0,4N	100,000	0,19 ± 0,11

Packaging

Switches are delivered on continuous tape, in reels of 2,500 pieces.
For information on specific and custom switches, consult Customer Service Center.

Electrical

MAXIMUM POWER:	Gold
MAXIMUM VOLTAGE:	0.2 VA
MINIMUM VOLTAGE:	32 VDC
MAXIMUM CURRENT DC:	20 mV
MINIMUM CURRENT DC:	10 mA
CONTACT RESISTANCE:	1 mA
INSULATION RESISTANCE	100 mΩ
BOUNCE TIME:	(100 V): 10°Ω
	1 ms

Environmental

OPERATING TEMPERATURE:	Gold
STORAGE TEMPERATURE:	-40°C to 125°C
	-55°C to 125°C

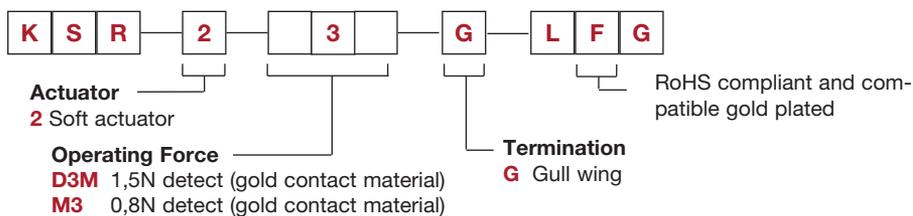
Process

SOLDERING: Compatible with lead free reflow soldering process

How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.

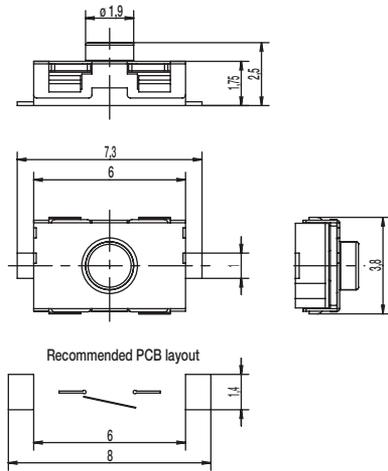


m

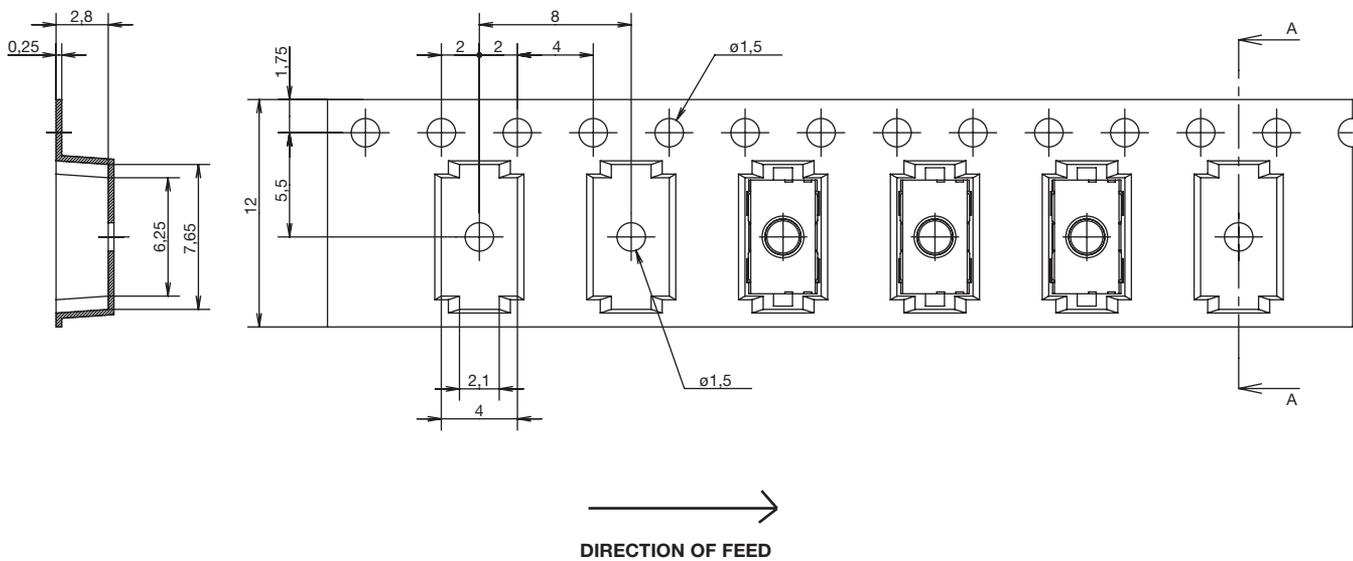
Detect

KSR2D/M Series Subminiature Detect Switch for SMT

KSR2D/M



TAPE & REEL



Detect



First Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

KSM Series Side Actuated Detect Switches



Features/Benefits

- Low profile – 1,5 mm
- Momentary, normally closed contact
- Gold contacts
- RoHS compliant and compatible

Typical Applications

- Automotive
- Position sensing switch
- Edge card reset switch
- Smart card presence switch detector
- DSL and fiber optic networks

Specifications

FUNCTION: Momentary action

CONTACT TYPE: SPST Normally closed

Mechanical

TRAVEL TO BREAK: KSM1131D LFG 0,35 ± 0,15 mm

KSM6161 LFG 0,5 ± 0,20 mm

TOTAL TRAVEL: KSM1131D LFG 1,25 ± 0,2 mm

KSM6161 LFG 1,92 ± 0,2 mm

SWITCHING FORCE:

KSM1131D LFG 0,15N ≤ F_{ce} ≤ 0,90 N

KSM6161 LFG 0,50N ≤ F_{ce} ≤ 0,90 N

OPERATING LIFE: KSM1131D LFG 50,000 cycles

KSM6161 LFG 200,000 cycles

Packaging

Switches are delivered on continuous tape, in reels of 2,000 pieces (KSM1131D LFG) and 1250 pieces (KSM6161 LFG)

Electrical

MAXIMUM POWER:

KSM1131D LFG

0.2 VA

MAXIMUM VOLTAGE:

24 VDC

MINIMUM VOLTAGE:

20 mV

MAXIMUM CURRENT DC:

50 mA

MINIMUM CURRENT DC:

1 mA

CONTACT RESISTANCE:

≤ 300 mΩ

KSM6161 LFG

1.0 VA

32 VDC

20 mV

50 mA

≤ 900 mΩ

INSULATION RESISTANCE:

≥ 10⁹ Ω

≥ 10⁹

DIELECTRIC STRENGTH:

≥ 250 Vrms

≥ 250 Vrms

BOUNCE TIME:

≤ 10 ms

≤ 1,25 ms

Environmental

OPERATING TEMPERATURE: -40°C to +85°C

STORAGE TEMPERATURE: -55°C to +85°C

Process

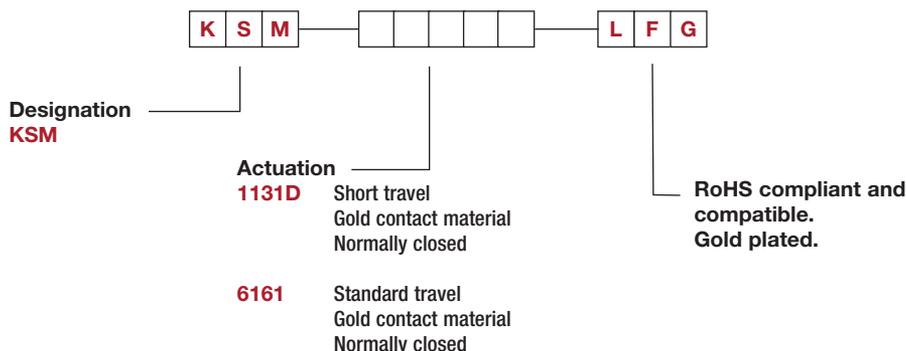
SOLDERING: Compatible with lead free reflow process

NOTE: Specifications listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.

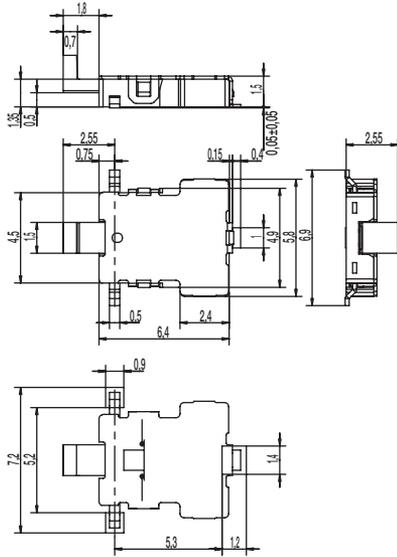


First Angle
Projection

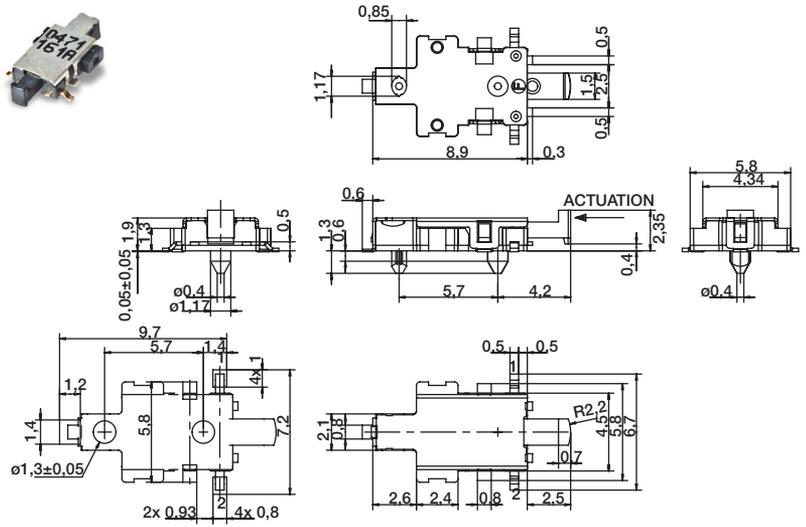
Dimensions are shown: mm
Specifications and dimensions subject to change

KSM Series Side Actuated Detect Switches

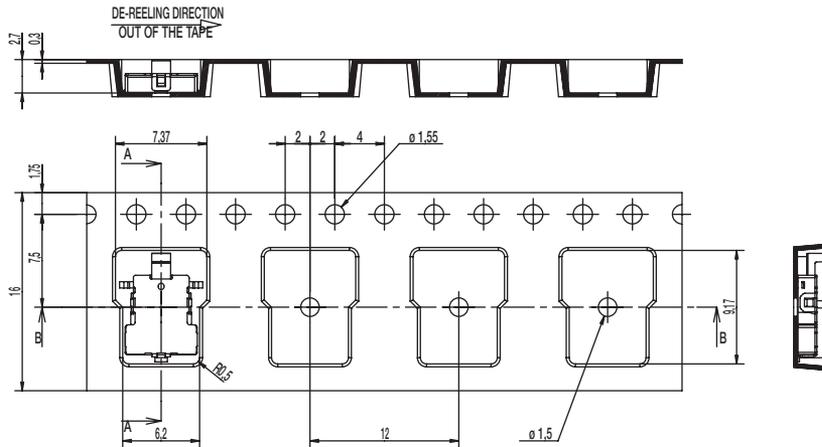
KSM1131D LFG



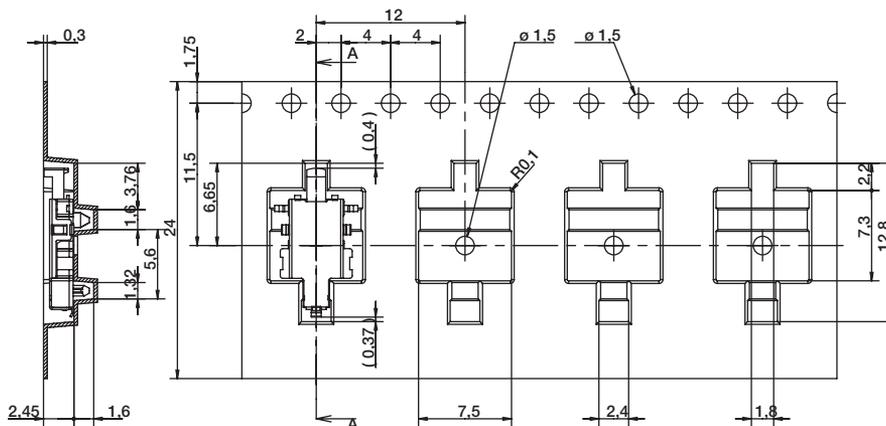
KSM6161 LFG



KSM1131D LFG



KSM6161 LFG



Dimensions are shown: mm
Specifications and dimensions subject to change



KSC4D Series Sealed Detect Switch for SMT



Features/Benefits

- Soft actuator
- J or G terminations
- Tape & reel
- IP 67
- RoHS compliant and compatible

Typical Applications

- Automotive
- Cellular phones
- Industrial electronics
- Computer infrastructure and IT

Specification

FUNCTION: momentary action compatible with permanent actuation
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
 TERMINALS: J bend & Gullwing type for SMT
 Compatible with permanent actuation

Mechanical

Type	Operating force FA Newtons	Operating life (operations)	Travel (mm)
KSC4D1J50SH	1,0 - 3,0	500,000	0,6 ± 0,25
KSC4D2J50SH	1,0 - 3,0	2,000,000	
KSC4D350SH	1,0 - 3,0	500,000	

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	0.1 mA
DIELECTRIC STRENGTH (50 Hz, 1 min.): ≥ 250 V		
CONTACT RESISTANCE: ≤ 100 mΩ		
INSULATION RESISTANCE (100 V): ≥ 10 ⁹ Ω		
BOUNCE TIME: ≤ 1 ms		

Electrical

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

Process

SOLDERING:
 - Infrared Reflow according to free soldering process with IEC 61760-1.

Packaging

Reels of 1,000 pieces. Dimensions of reels according to EIA RS481 or IEC 60286-3. External diameter 330 mm ± 2 mm.

NOTE: Part numbers listed above do not represent all possible configurations. For information on specific and custom switches, consult Customer Service Center.

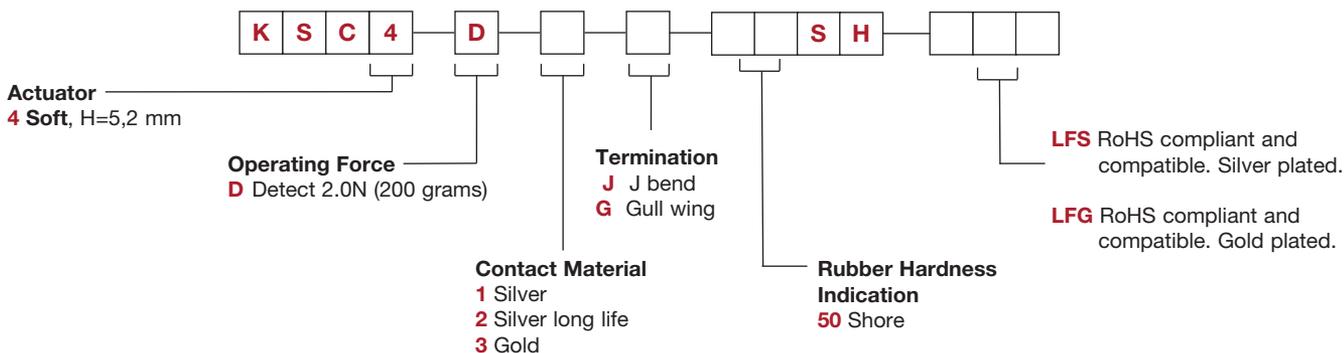
This data sheet does not provide enough information for applications which require a certain level of quality or safety such as automotive, medical systems, safety equipment. Please contact your sales representative to get contractual specification package.

How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

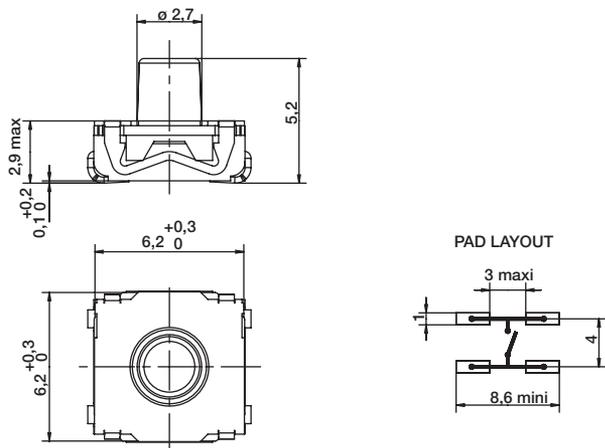
However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.

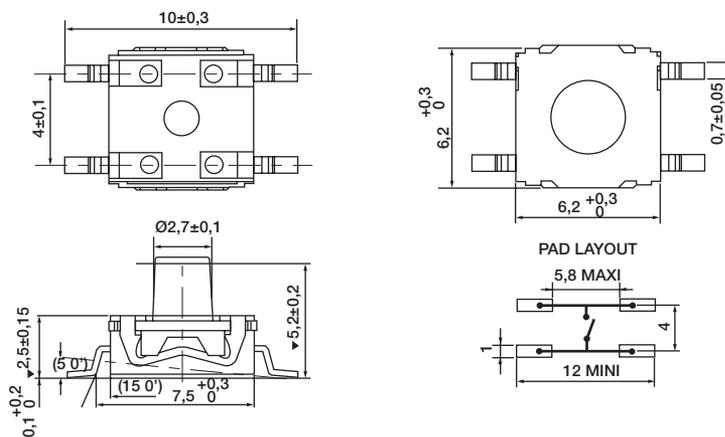


KSC4D Series Sealed Detect Switch for SMT

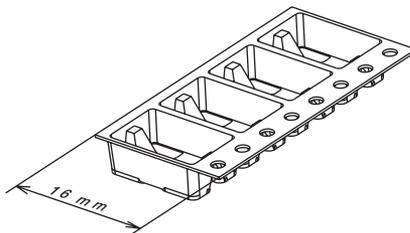
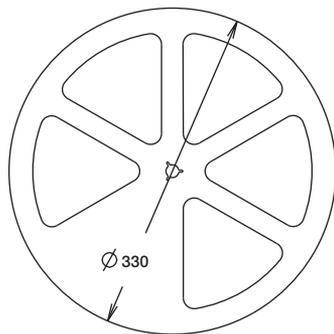
KSC4D1J SOFT, 5,2 mm high



KSC4D1G SOFT, 5,2 mm high



TAPE AND REEL



KSJ Detect Series Spherical Actuator Detect Switches



Features/Benefits

- Straight or vertical detect
- Top or side actuation
- Spherical actuator allows actuation +/- 30°
- High travel
- Adapted for cam actuation
- Sealing IP60

Typical Applications

- Automotive
- Industrial electronics
- Computer infrastructure and IT

Specification

FUNCTION: momentary action

CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.

TERMINALS: PC pins

Compatible with permanent actuation

Mechanical

Type	Operating force FA Newtons (grams)	Operating life (operations)	Travel
KSJ0VD1860SHLFT	6,0 (600)	100,000	0,50 ± 0,25
KSJ0MD1860SHLFT	6,0 (600)	100,000	0,50 ± 0,25

Electrical

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-40°C to 85°C	-55°C to 125°C

Process

Wave soldering, compatible with lead free soldering.

Packaging

In boxes of 250 pieces

Electrical

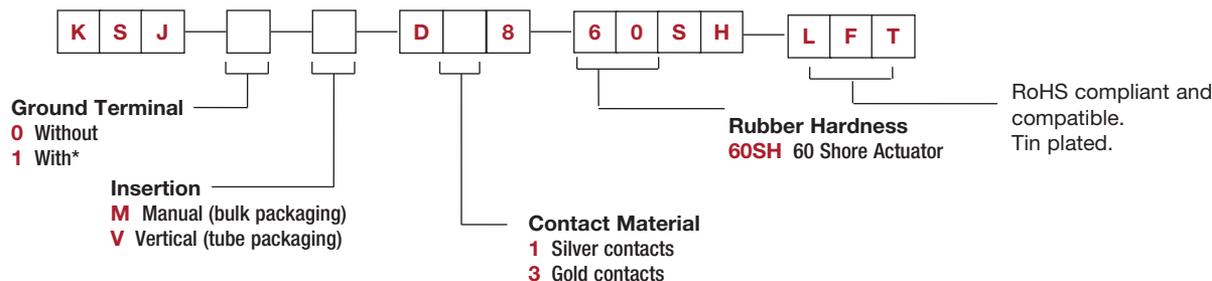
	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM VOLTAGE: VDC	32 VDC	32
MINIMUM CURRENT:	1 mA	1 mA
MAXIMUM CURRENT: mA	50 mA	10
DIELECTRIC STRENGTH (50 Hz, 1 min.):	≥ 250 V	
CONTACT RESISTANCE:	≤ 100 m ohms	
INSULATION RESISTANCE (100 V):	≥ 10 ⁹ ohms	
BOUNCE TIME:	≤ 1 ms	

How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

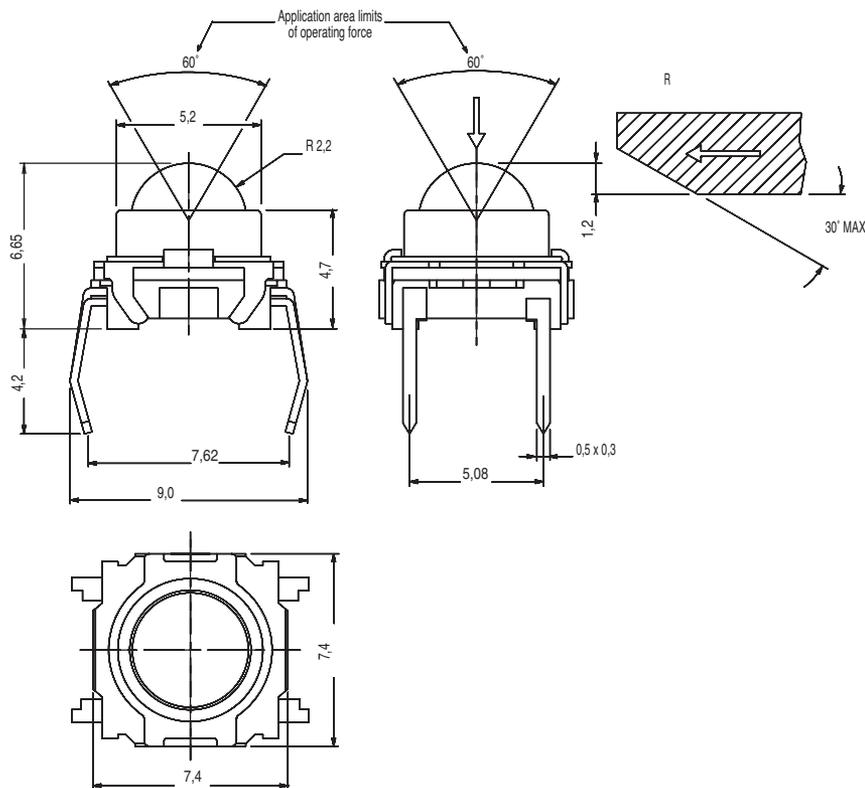
For any part number different from those listed above, please consult your local representative.



*Note: "1" ground terminal option not available with "V" version.
The bracket for the "V" version plays this role.

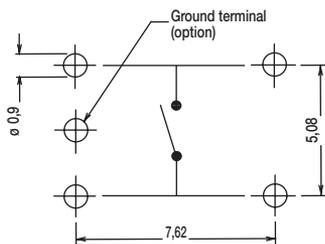
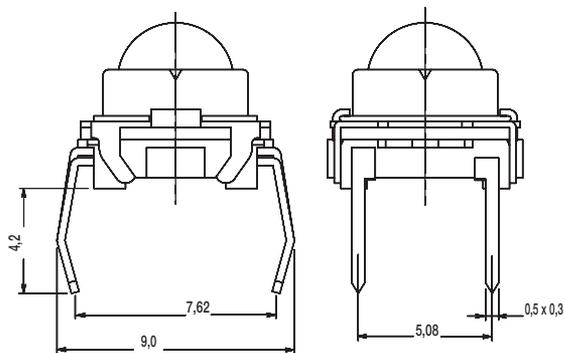
KSJ Detect Series Spherical Actuator Detect Switches

KSJ

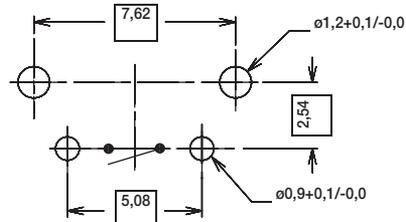
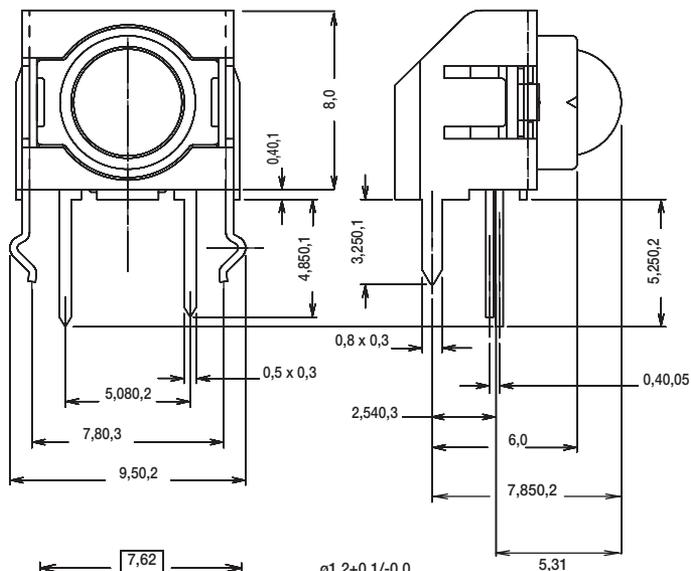


INSERTION

M MANUAL



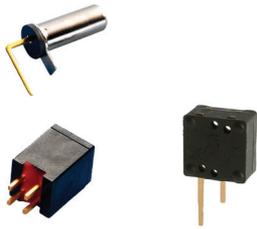
V VERTICAL



First Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

RB Series Rolling Ball Sensor Switch



Features/Benefits

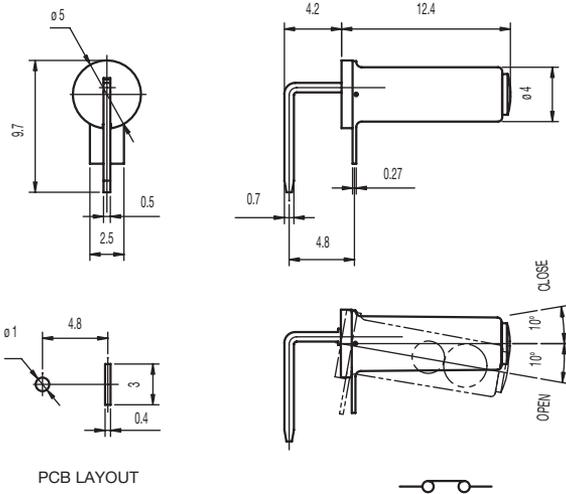
- Different angle options to trigger
- Ultra miniature design
- Patent awarded

Typical Applications

- Household goods
- Electronic toys
- Consumer electronics including irons, portable heaters, games, toys
- Safety and security controls



PART NUMBER	PACKAGING
RB-231X2	1,000 pieces



Specifications

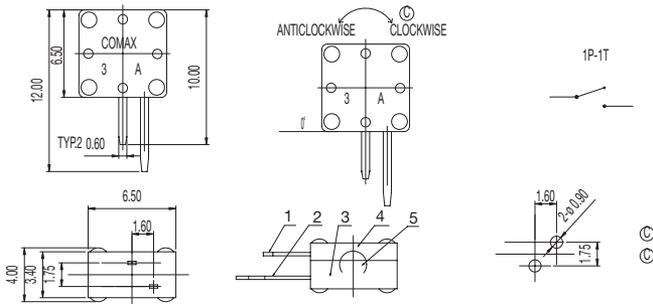
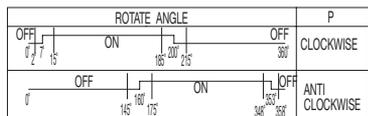
CONTACT ARRANGEMENT: SPST
 SENSOR ANGLE: 0° to -10° scope inside, terminal to disconnection electric current
 MINIMUM VOLTAGE: 1 VDC 10mA (resistive load)
 MAXIMUM VOLTAGE: 5 VDC 1mA (resistive load)
 OPERATING LIFE: 100,000 cycles
 INSULATION RESISTANCE: 1000 M Ω min. @ 100 VDC
 DIELECTRIC STRENGTH: 500 V AC (50-60 Hz)
 OPERATING TEMPERATURE: -20°C to +70°C

Materials

FRAME: Copper alloy, nickel plated
 COVER: PA 46 (UL94V-0).
 MOVABLE CONTACT: Copper alloy, nickel plated
 TERMINALS: Copper alloy, gold plated
 BRASS BALL: Brass, gold plated



PART NUMBER	PACKAGING
RB-220-07 R	500 pieces



Specifications

CONTACT ARRANGEMENT: SPST
 SENSOR ANGLE: 15° to 90° scope inside, terminal to disconnection electric current
 MINIMUM VOLTAGE: 1 VDC 10mA (resistive load)
 MAXIMUM VOLTAGE: 5 VDC 1mA (resistive load)
 OPERATING LIFE: 20,000 cycles (without load);
 100,000 cycles with load
 INSULATION RESISTANCE: 10 M Ω min. @ 100 VDC
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz)
 OPERATING TEMPERATURE: -10°C to +50°C

Materials

HOUSING: PA
 COVER: PA
 BALL: Gold plated

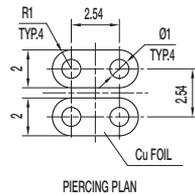
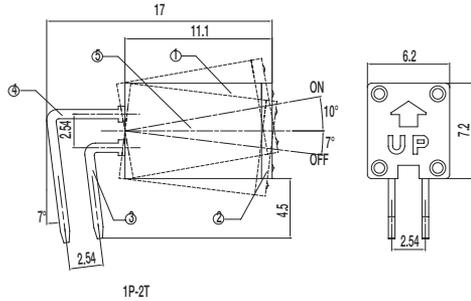


E

Detect

RB Series Rolling Ball Sensor Switch

PART NUMBER	PACKAGING
RB-435B	500 pieces



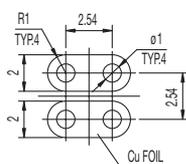
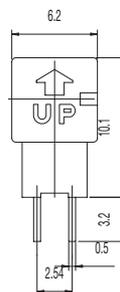
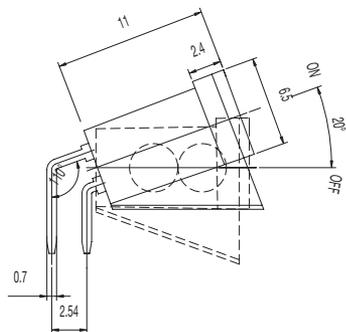
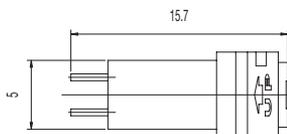
Specifications

CONTACT ARRANGEMENT: SPDT
 MINIMUM VOLTAGE: 1 VDC 10mA (resistive load)
 MAXIMUM VOLTAGE: 5 VDC 1mA (resistive load)
 OPERATING LIFE: 100,000 cycles
 INITIAL CONTACT RESISTANCE: 5 Ω max.
 INSULATION RESISTANCE: 1000 M Ω min. @ 500 VDC
 DIELECTRIC STRENGTH: 500 V AC (50-60 Hz)
 OPERATING TEMPERATURE: -20°C to +70°C

Materials

HOUSING: PA (UL94V-0)
 COVER: PA (UL94V-0)
 MOVABLE CONTACT: Copper alloy, nickel plated
 TERMINALS: Gold plated
 BALL: Steel, gold plated

PART NUMBER	PACKAGING
RB-435X2-20	500 pieces



PCB LAYOUT

Specifications

CONTACT ARRANGEMENT: SPDT
 SENSOR ANGLE: -20° to -30° scope inside, terminal to disconnection electric current
 MINIMUM VOLTAGE: 1 VDC 10mA (resistive load)
 MAXIMUM VOLTAGE: 5 VDC 1mA (resistive load)
 OPERATING LIFE: 100,000 cycles
 INSULATION RESISTANCE: 1000 M Ω min. @ 100 VDC
 DIELECTRIC STRENGTH: 500 V AC (50-60 Hz)
 OPERATING TEMPERATURE: -20°C to +70°C

Materials

HOUSING: PBT (UL94V-0)
 COVER: PBT (UL94V-0)
 TERMINALS: Gold plated
 BALL: Steel, gold plated



Detect

RB Series Rolling Ball Sensor Switch



PART NUMBER	PACKAGING
RB-441-45	500 pieces

Specifications

CONTACT ARRANGEMENT: SPDT

MAXIMUM VOLTAGE: 24 VDC 25mA (resistive load)

OPERATING LIFE: 100,000 cycles

INSULATION RESISTANCE: 1000 M Ω min. @ 100 VDC

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz)

OPERATING TEMPERATURE: -20°C to +70°C

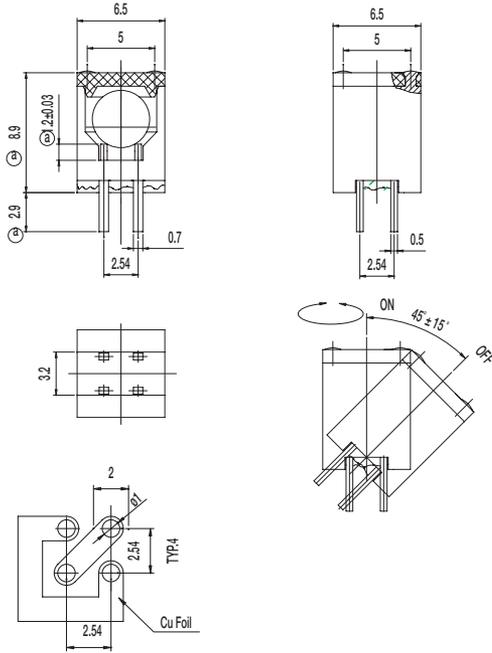
Materials

HOUSING: PBT (UL94V-0)

COVER: PBT (UL94V-0)

TERMINALS: Gold plated

BALL: Gold plated



PCB LAYOUT



Detect

Features/Benefits

- Normally closed function
- Vertical detect
- Reliable long time compression
- IP54
- Tape & reel
- RoHS compliant and compatible

Typical Applications

- Smart meters
- Alarm systems
- Anti-tamper devices



Specifications

FUNCTION: Momentary action.
CONTACT TYPE: SPST Normally Closed.
TERMINALS: Gullwing type for SMT.

Mechanical

SWITCHING FORCE: ≤ 2 N
TRAVEL TO BREAK: 0,7 mm
TOTAL TRAVEL: 1,1 mm

Packaging

Switches are delivered on continuous tape, in reels of 2,000 pieces

Electrical

	GOLD	SILVER
MAXIMUM POWER:	0.2 VA	1 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	10 mA	50 mA
MINIMUM CURRENT:	1 µA	1 mA
CONTACT RESISTANCE:	≤ 350 mΩ	
INSULATION RESISTANCE:	> 1 G Ω	
DIELECTRIC STRENGTH:	≥ 250 Vrms	

Environmental

	GOLD	SILVER
OPERATING TEMPERATURE:	-40°C to +125°C	-40°C to +85°C
STORAGE TEMPERATURE:	-55°C to + 125°C	-40°C to +85°C

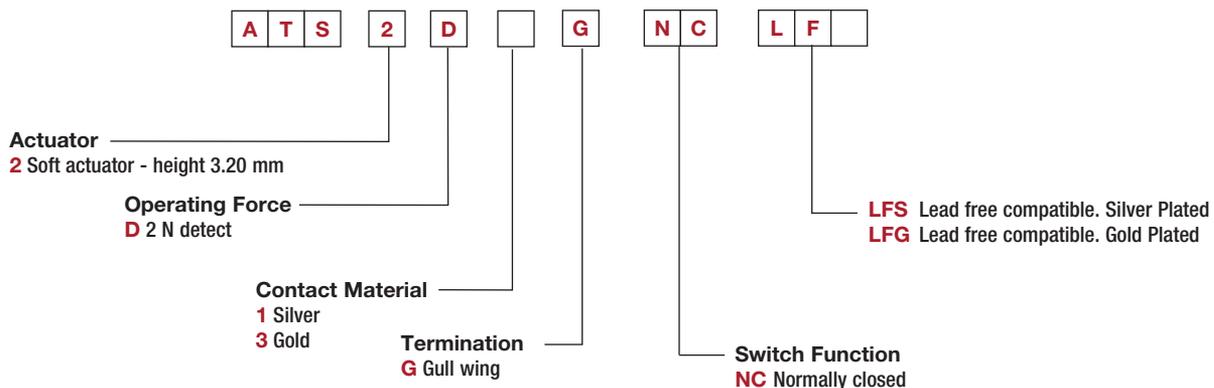
Process

SOLDERING: Compatible with lead free reflow process

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

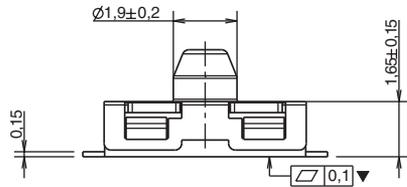
To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on the next page. For additional options not shown in catalog, consult Customer Service Center.



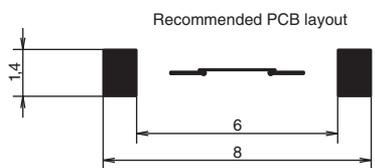
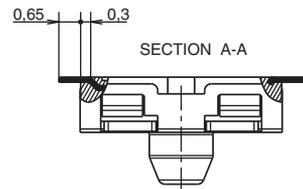
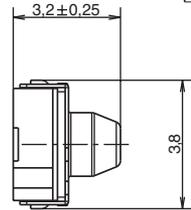
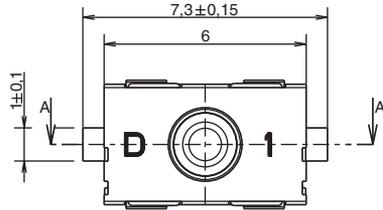
Detect

ATS Series Anti-Tampering Switches

NEW



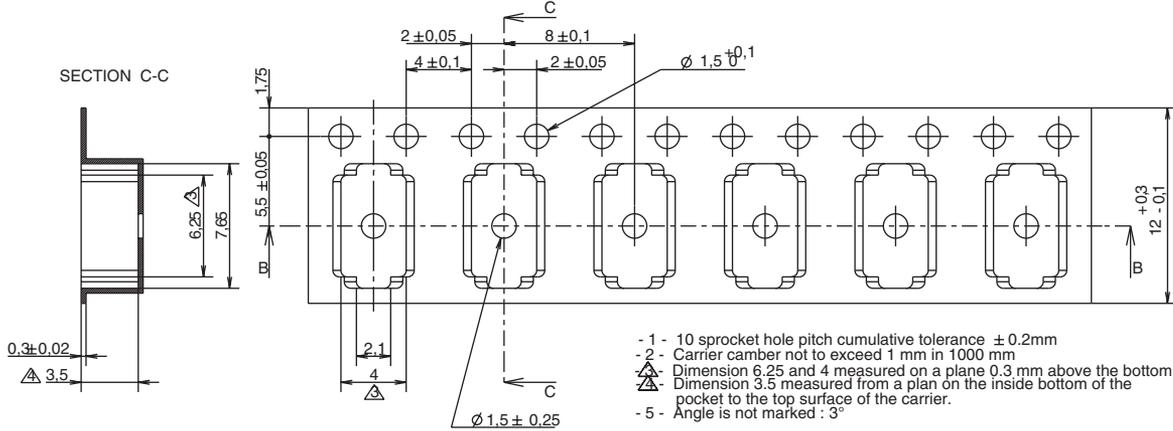
MARKING	PART NUMBER
D - 1	ATS 2D1G NC LFS
D - 3	ATS 2D3G NC LFG



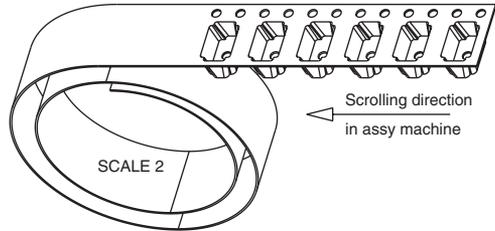
SECTION B-B



SECTION C-C



- 1 - 10 sprocket hole pitch cumulative tolerance ± 0.2mm
- 2 - Carrier camber not to exceed 1 mm in 1000 mm
- 3 - Dimension 6.25 and 4 measured on a plane 0.3 mm above the bottom of the pocket
- 4 - Dimension 3.5 measured from a plan on the inside bottom of the pocket to the top surface of the carrier.
- 5 - Angle is not marked : 3°



Detect