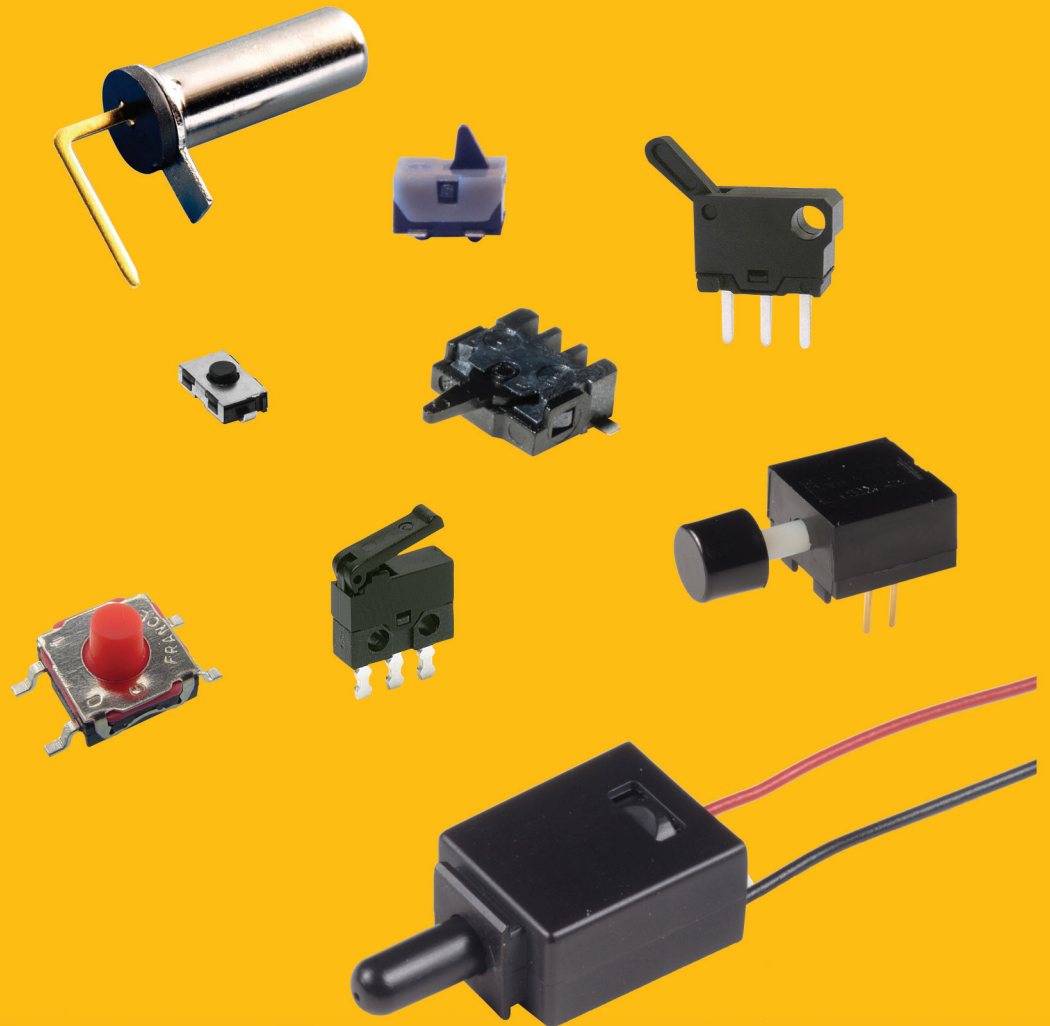
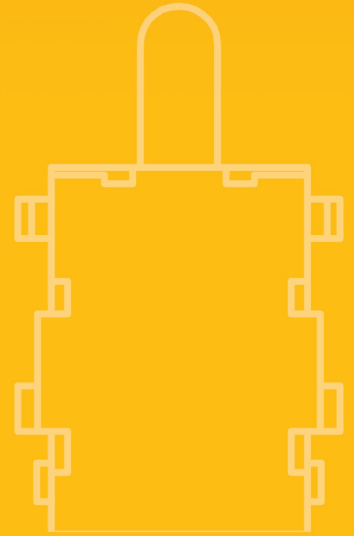
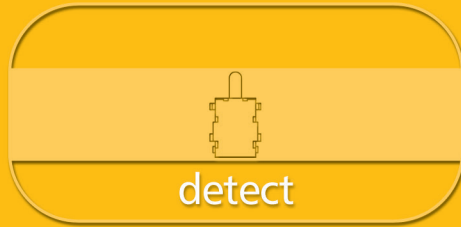







audio
automotive
aerospace
communication devices
consumer appliances
consumer electronics
datacom
data storage
handheld devices
industrial
industrial equipment
instrumentation
medical
military
mobile phones
portable tools
pumps & motors
security alarms
telecom
test equipment
thermostatic controls








detect

Detect Switches







Product Selection Guide



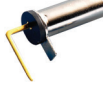



Detect					
Series	HDT	DS	HDS	HDP	SDS
Travel to Make (mm)	0.3	See datasheet	0.17	0.24	0.35
Overtravel (mm)	0.75	See datasheet	0.5	1.66	1.65
Total Travel (mm)	1.05	See datasheet	0.5	1.66	1.65
Actuator Length (mm)	1.4	See datasheet	1.17	2.15	2.5
Life Cycle	100,000	20,000; 50,000; 100,000	100,000	100,000	50,000
Contact Type	SPST N.O.	SPST/SPDT	SPST N.O.	SPST N.O.	SPST N.O. SPST N.C.
Max. Voltage	5 V	5 V; 16 V; 30 V	5 V	5 V	12 V
Max. Switching Current	1 mA	1 mA; 5 mA; 100 mA	1 mA	1 mA	100 mA
Sealing	No	No	No	No	No
Mounting	Surface mount	Thru-hole, Solder lug	Surface mount	Surface mount	Surface mount
Page Number	E-4	E-10	E-14	E-17	E-20

Detect					
Series	DDS	FDSD	FDSE	KDS	KSU
Travel to Make (mm)	0.45	1.6 (15°)	1.44	1.25 max.	0.5
Overtravel (mm)	1.95	1.45	1.07	8.9	1.0
Total Travel (mm)	2.4	3.05 (60°)	3.14 (60°)	10.16	1.5
Actuator Length (mm)	2.6	2.3	2.67	10.16	1.5
Life Cycle	50,000	50,000	50,000	10,000	100,000
Contact Type	SPST N.O.	SPST N.O.	SPST N.C.	SPST N.O. SPST N.C.	SPST N.O.
Max. Voltage	30 V	5	5	20 V	32 V
Max. Switching Current	100 mA	10 mA	1 mA	0.4 VA	50 mA
Sealing	No	No	No	No	Dust & water drop proof
Mounting	Thru-hole	Surface mount	Surface mount	Snap-in panel	Surface mount
Page Number	E-22	E-26	E-28	E-30	E-32



Detect Switches Product Selection Guide

Detect						
Series	ATS	KSR D	KSC D	KSJ D	KMT0 D	KMR D
Travel to Make (mm)	0.7 (to break)	0.3	0.6	0.5	0.15	0.225
Overtravel (mm)	0.4		0.65	0.4		
Total Travel (mm)	1.1	0.3	1.5	1.05	0.25	0.4
Actuator Length (mm)	1.6	0.8	2.6	1.4	0.35	1.1
Life Cycle	5,000	100,000	500,000; 2,000,000	200,000	300,000	100,000
Contact Type	SPST N.C.	SPST N.O.	SPST N.O.	SPST N.O.	SPST N.O.	SPST N.O.
Max. Voltage	32 V	32 V	32 V	32 V	32 V	32 V
Max. Switching Current	50 mA	10 mA	10 mA; 50 mA	10 mA; 50 mA	25 mA	50 mA
Sealing	IP54	Dust & flux tight	IP67	Flux tight	IP68	IP40
Mounting	Surface mount	Surface mount	Surface mount	Thru-hole	Surface mount	Surface mount
Page Number	E-35	E-38	E-40	E-42	E-44	E-46

Detect						
Series	K12S D	K12 D	RB	HS	MPS	MPSR
Travel to Make (mm)	0.85*	0.55*	10°/90°		See datasheet	See datasheet
Overtravel (mm)	0.65	0.95; 1.45			See datasheet	See datasheet
Total Travel (mm)	1.5	1.5; 2			See datasheet	See datasheet
Actuator Length (mm)					N/A	N/A
Life Cycle	300,000	1,000,000	20,000; 100,000	100,000; 300,000	4,000,000	2,000,000
Contact Type	SPST N.O./N.C. DPST N.O./N.C.	SPST N.O./N.C.	SPST/SPDT	DPDT	SPST N.O.	SPDT N.O./N.C.
Max. Voltage	30 V	32 V	5 V; 24 V	30 V	30 V	30 V
Max. Switching Current	100 mA	100 mA	1 mA; 25 mA	0.2 A	300 mA	300 mA
Sealing	IP40/6x	IP40			Yes	Yes
Mounting	Surface mount	Thru-hole	Thru-hole	Thru-hole	Wire lead	Wire lead
Page Number	E-48	E-52	E-54	E-56	E-58	E-60



D

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; 10 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 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.

How To Order

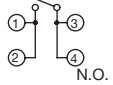
Part number list is shown below. For individual part details, please refer to the following pages.

Part Number (Part Description)	Product Details
HDT0001	Micro mini surface mount detect switches normaly open with locating posts
HDT0001NP	Micro mini surface mount detect switches normaly open without locating posts
HDT0004	Micro mini surface mount detect switches normaly open without locating posts
HDT0104	Micro mini surface mount detect switches normaly open without locating posts
HDT0204	Micro mini surface mount detect switches normaly open with locating posts
HDT0301	Micro mini surface mount detect switches normaly open without locating posts

HDT Series

Micro Mini Surface Mount Detect Switches

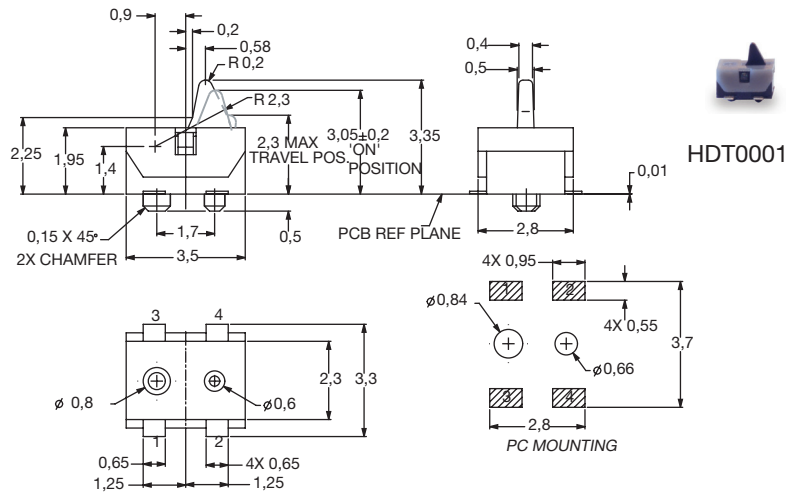
Complete part numbers for HDT Series are shown below.

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:

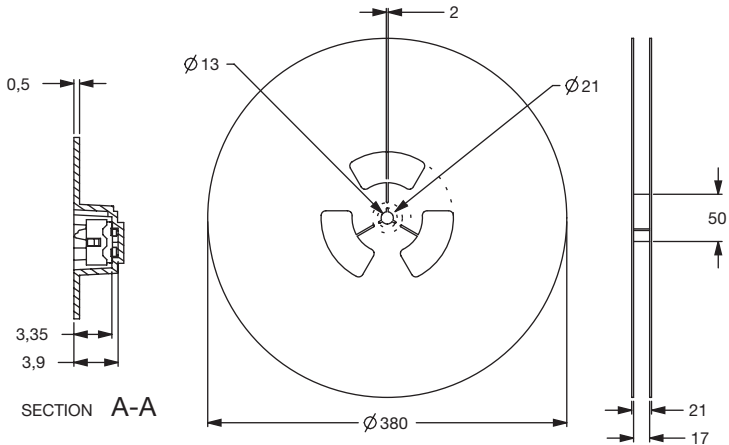
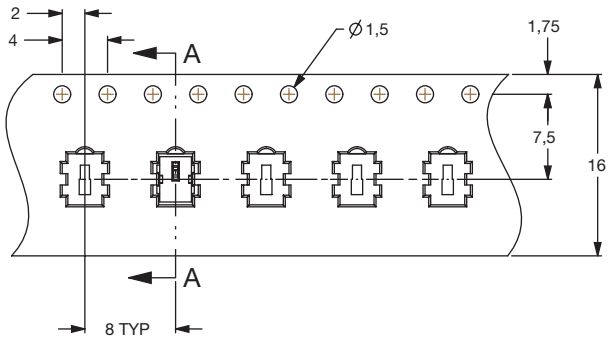
- Pre-travel: 0.3 mm
- Overtravel: 0.75 mm
- Total: 1.05 mm



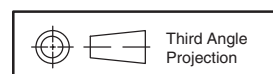
HDT0001

TAPE & REEL

HDT0001



Detect



Dimensions are shown: mm
Specifications and dimensions subject to change

HDT Series Micro Mini Surface Mount Detect Switches

HDT0004

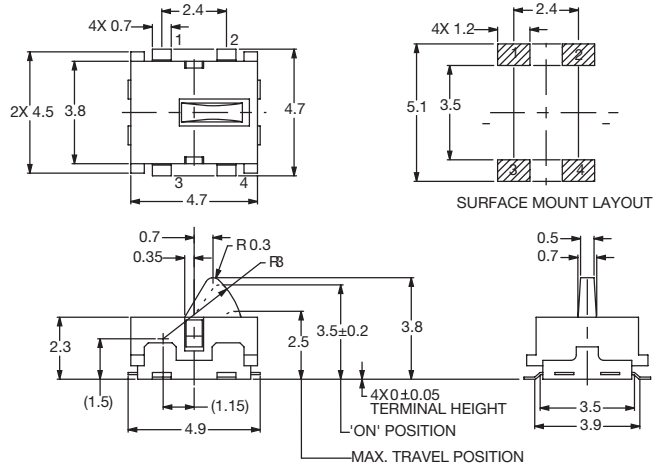


HDT0004

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

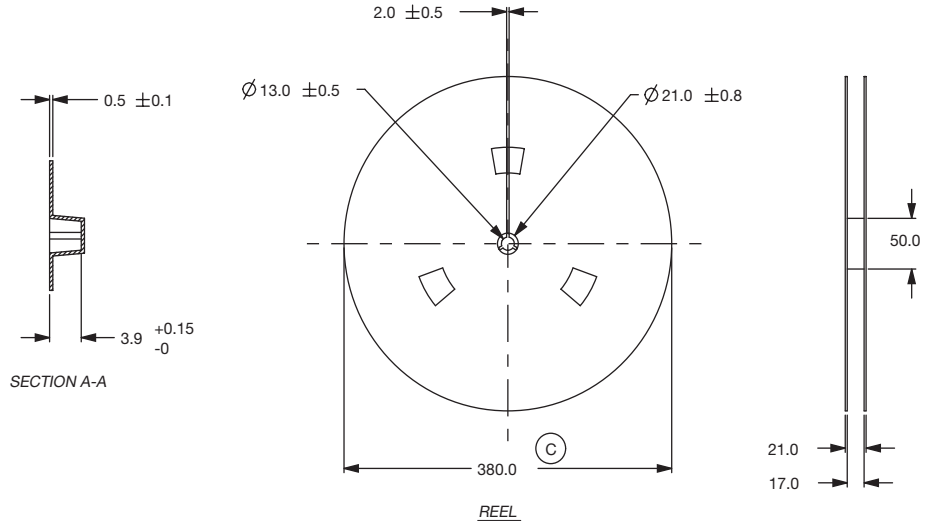
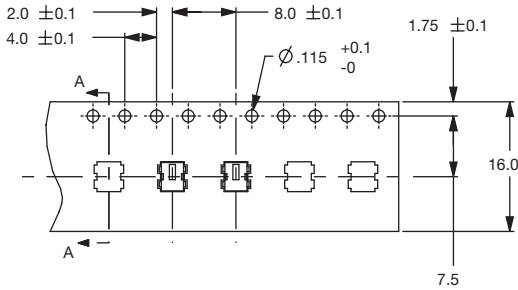
TRAVEL:

Pre-travel: 0.3 mm
Overtravel: 1.0 mm
Total: 1.3 mm



TAPE & REEL

HDT0004



HDT0104



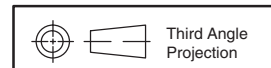
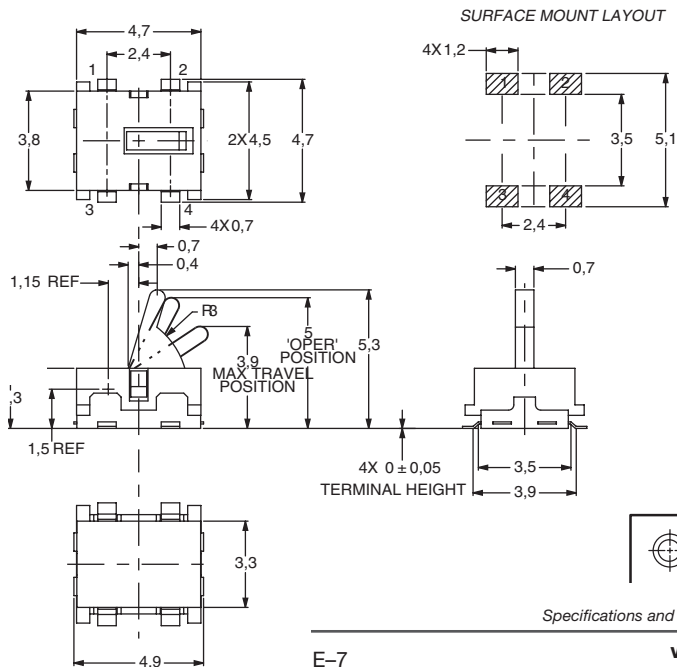
HDT0104

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

NOTE: This product comes without locating post

TRAVEL:

Pre-travel: 0.3 mm
Overtravel: 1.1 mm
Total: 1.4 mm



Dimensions are shown: mm
Specifications and dimensions subject to change



24 Oct 22

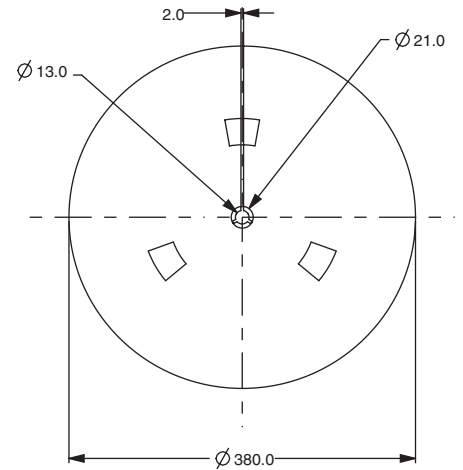
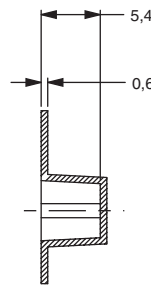
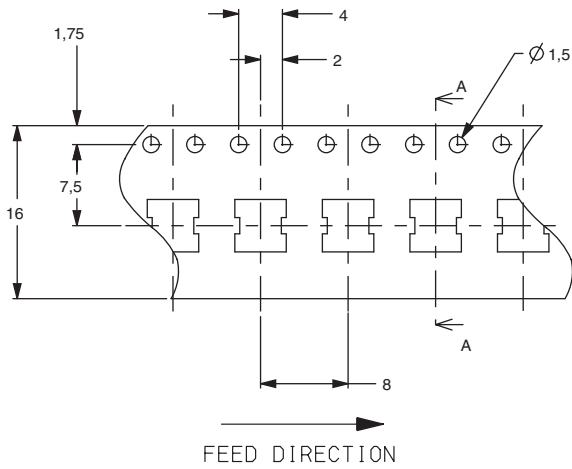


Detect

HDT Series Micro Mini Surface Mount Detect Switches

TAPE & REEL

HDT0104



HDT0204



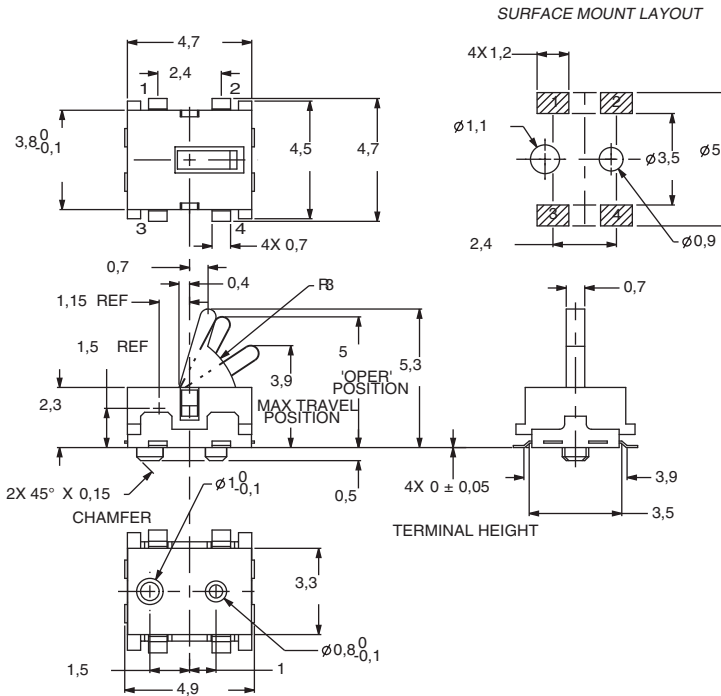
HDT0204

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

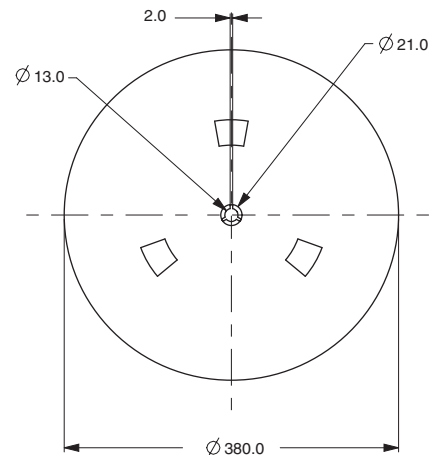
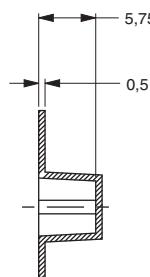
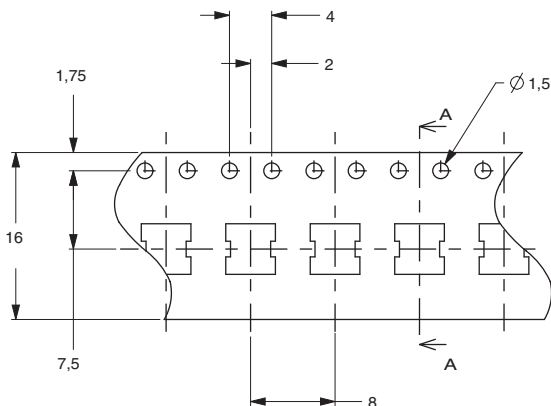
NOTE: This product comes with locating post

TRAVEL:

- Pre-travel: 0.3 mm
- Overtravel: 1.1 mm
- Total: 1.4 mm



Detect



HDT Series Micro Mini Surface Mount Detect Switches

HDT0301



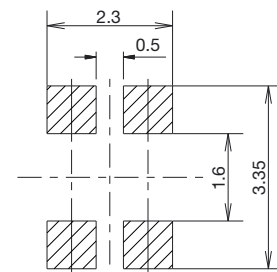
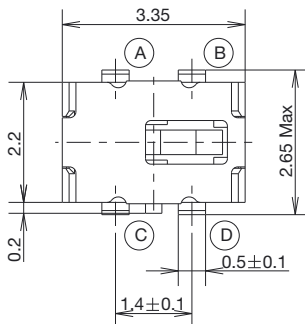
HDT0301

PART NUMBER	PACKAGING	SCHEMATIC
HDT0301	TAPE & REEL 3,000 per reel	

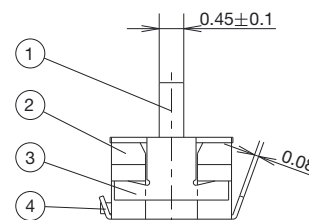
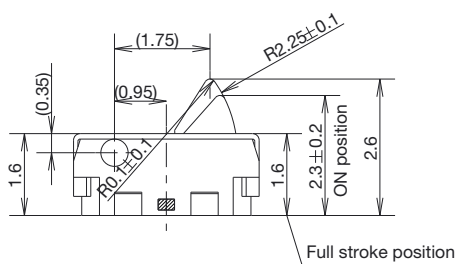
Note: Terminals B/D are for mechanical attachment to PCB. They are non-switching and may or may not be shorted internally.

TRAVEL:

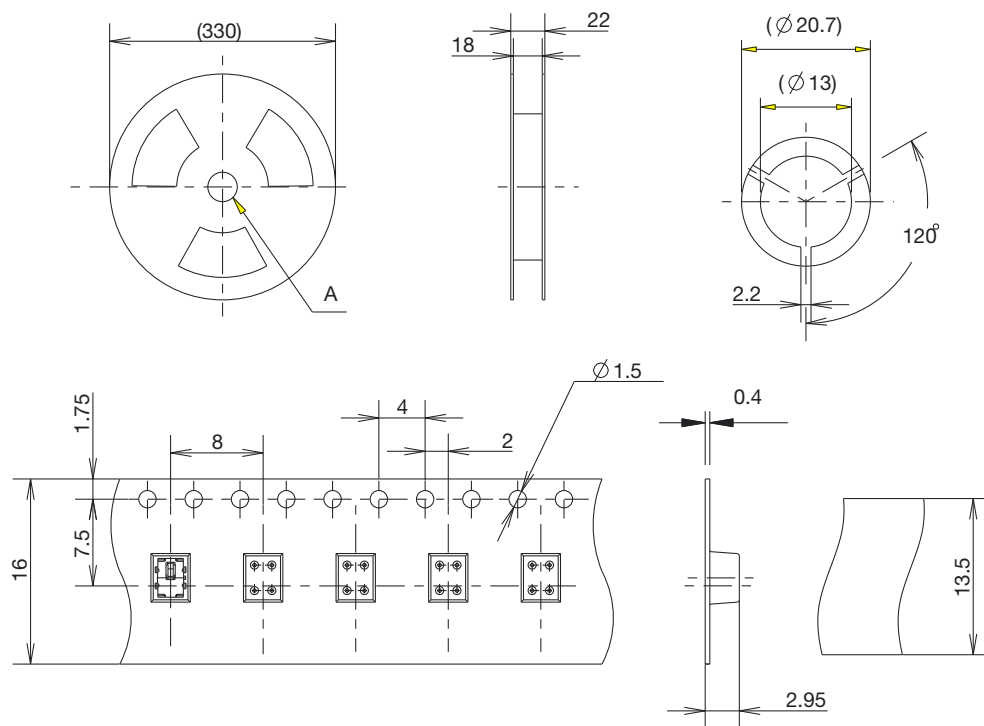
- Pre-travel: 0.3 mm
- Overtravel: 0.7 mm
- Total: 1.0 mm



PCB LAND DIMENSION ± 0.05



TAPE & REEL



→ Roll-direction



Detect

DS Series Detect Switch



Features/Benefits

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

Typical Applications

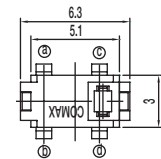
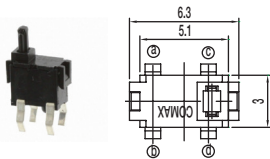
- Computer peripherals
- Office equipment
- Consumer electronics
- Appliances
- Audio and visual equipment

How To Order

Part number list is shown below. For individual part details, please refer to the following pages.

Part Number (Part Description)	Product Details
DS-02005	Detect switch normally open top actuated
DS-02005 (30)	Detect switch normally open top actuated
DS-040-02	Detect switch normally open SPST
DS-080	Detect switch normally open SPDT
DS-080-C PA	Detect switch normally open SPDT
DS-09005-02 RP	Detect switch normally open SPST
DS-180 RT	Detect switch normally open side actuated

Complete part numbers for DS Series are shown below.



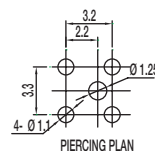
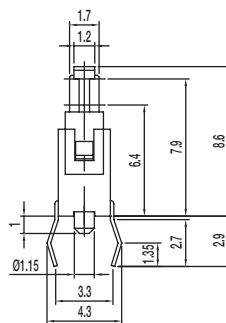
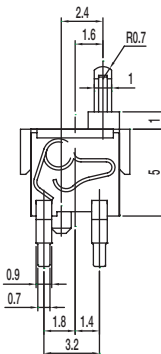
PART NUMBER	PACKAGING	SCHEMATIC
DS-02005	1,000 pieces	1P-1T

Specifications

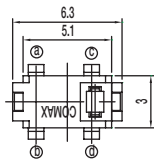
CONTACT ARRANGEMENT: SPST, NO
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 50,000 cycles
 OPERATING FORCE: 50 gf max.
 PRE-TRAVEL: 0.7 mm
 TOTAL TRAVEL: 2.6 mm
 INITIAL CONTACT RESISTANCE: 1 Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -40°C to +85°C.

Materials

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



Detect m



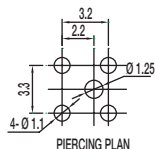
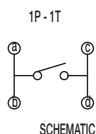
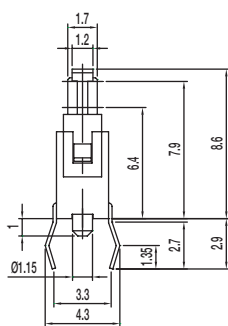
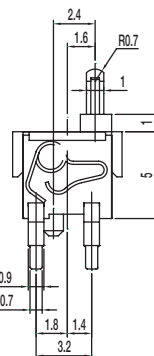
PART NUMBER	PACKAGING	SCHEMATIC
DS-02005 (30)	1,000 pieces	1P-1T

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: -40°C to +85°C.

Materials

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



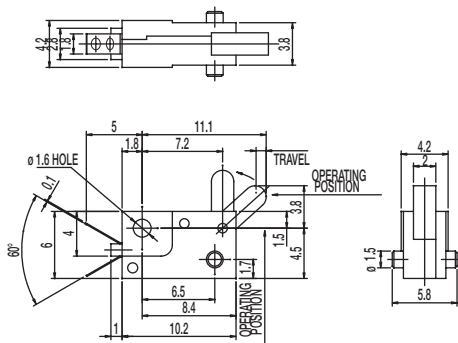
PART NUMBER	PACKAGING	SCHEMATIC
DS-040-02	1,000 pieces	1P-1T N.O.

Specifications

CONTACT ARRANGEMENT: SPST, NO
 CONTACT RATING: 0.1A @ 16 VDC
 OPERATING LIFE: 20,000 cycles
 OPERATING FORCE: 30 ± 15 gf
 TRAVEL: 0.90 ± 0.20 mm
 INITIAL CONTACT RESISTANCE: 40 m Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 250 VDC 60 sec.
 DIELECTRIC STRENGTH: 250 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -20°C to +70°C.

Materials

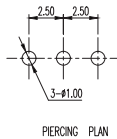
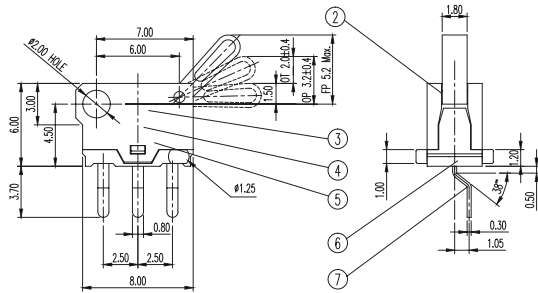
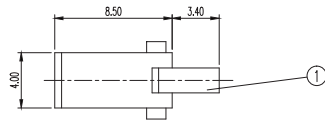
LEVER: POM
 CASE: PBT
 COVER: PC



DS Series Detect Switch



PART NUMBER	PACKAGING	SCHEMATIC
DS-080	1,000 pieces	1P - 2T



Specifications

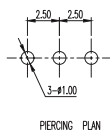
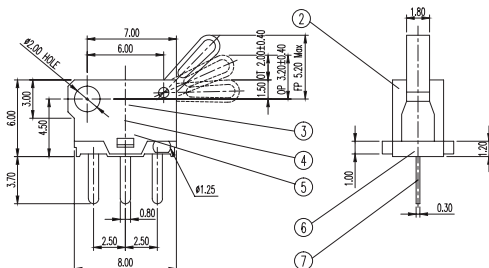
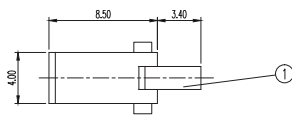
CONTACT ARRANGEMENT: SPDT
 CONTACT RATING: 100mA @ 30 VDC
 OPERATING LIFE: 20,000 cycles
 OPERATING FORCE: 30 ± 20 gf
 OVER TRAVEL: 2.0 ± 0.40 mm
 INITIAL CONTACT RESISTANCE: 200 m Ω max.
 INSULATION RESISTANCE: 10 M Ω min. @ 250 VDC 60 sec.
 DIELECTRIC STRENGTH: 250 V AC (50-60Hz) 60 sec.
 OPERATING 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	1P - 2T



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

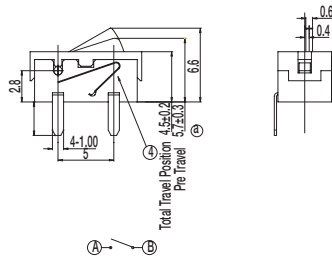
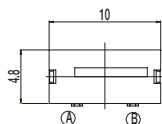


D

Detect



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



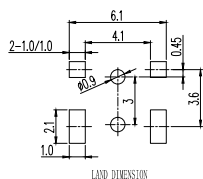
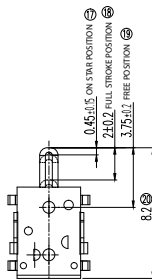
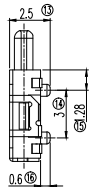
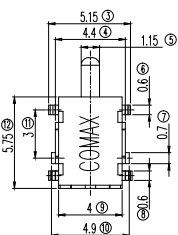
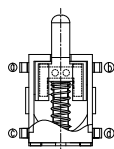
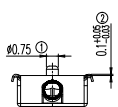
Specifications

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

PART NUMBER	PACKAGING	SCHEMATIC
DS-180 RT	3000 pieces	 N.O.



Specifications

CONTACT ARRANGEMENT: SPST NO
 CONTACT RATING: 1mA @ 5 VDC
 OPERATING LIFE: 50,000 cycles
 OPERATING FORCE: 60 gf max.
 TOTAL TRAVEL: 2.0±0.2 mm
 INITIAL CONTACT RESISTANCE: 5Ω max.
 INSULATION RESISTANCE: 100 M Ω min. @ 100 VDC 60 sec.
 DIELECTRIC STRENGTH: 100 V AC (50-60Hz) 60 sec.
 OPERATING TEMPERATURE: -40°C to +85°C.

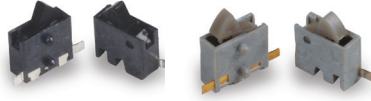
Materials

KNOB: PA
 COVER: SPTE
 SPRING: SUS
 HOUSING: LCP
 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

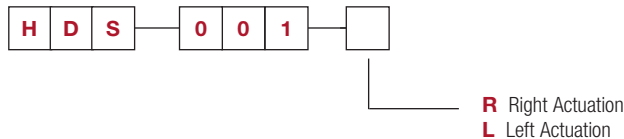
MOVABLE BLADE: Stainless Steel, Ag over Ni plating.

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.

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.




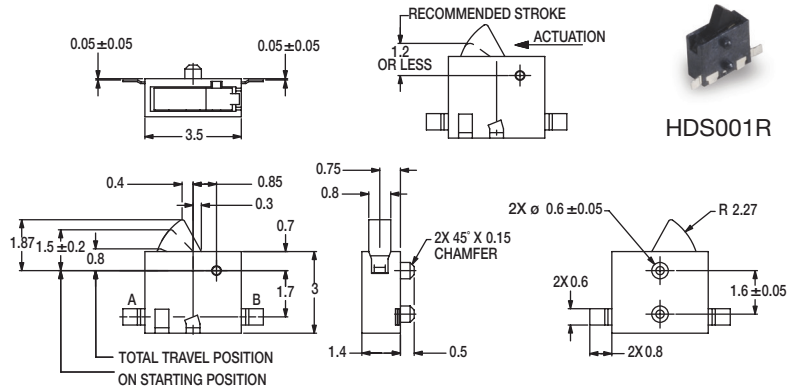
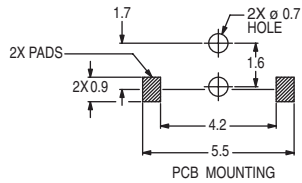
m


Detect

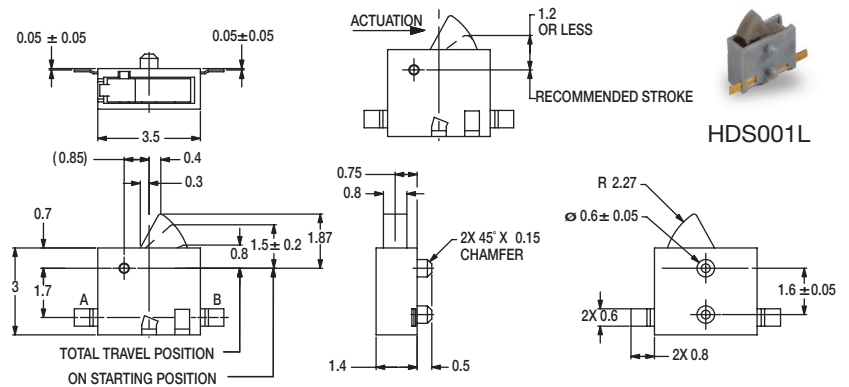
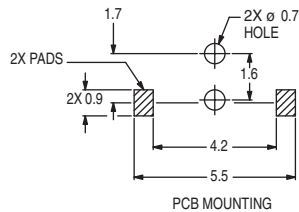
HDS Series Micro Mini Side Actuated Surface Mount Detect Switches

Complete part numbers for HDS Series are shown below.

PART NUMBER	PACKAGING	SCHEMATIC
HDS001R	TAPE & REEL	



PART NUMBER	PACKAGING	SCHEMATIC
HDS001L	TAPE & REEL	

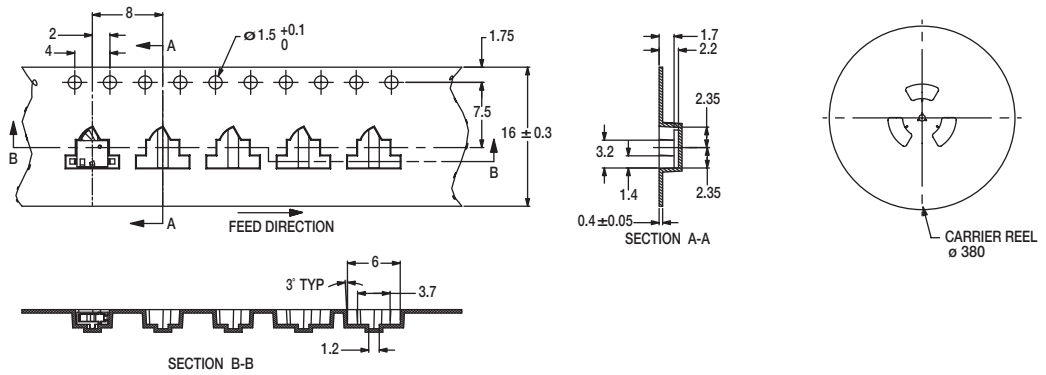


Detect

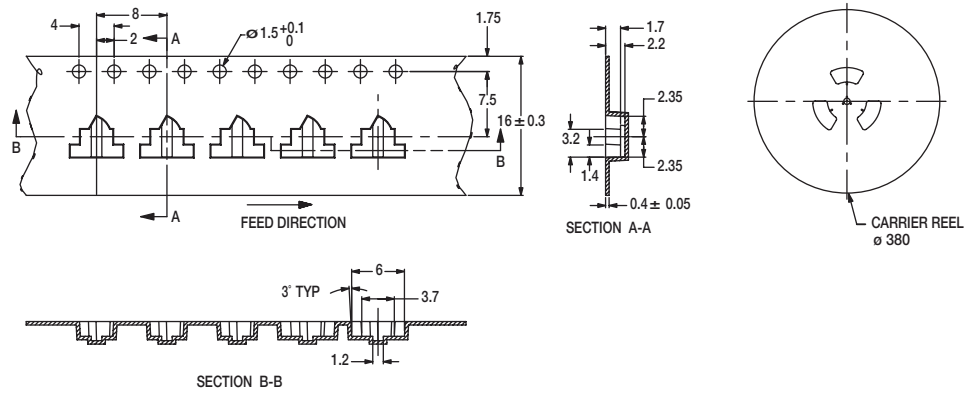
HDS Series Micro Mini Side Actuated Surface Mount Detect Switches

TAPE & REEL

HDS001R



HDS001L



NOTE: Quantity per reel: 5,000 pieces



D

Detect



Third Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

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 Travel Position:	1.3 mm
Total Travel:	1.9 mm

Materials

BASE: PA 46 (UL94HB) - halogen free

ACTUATOR: PA 46 (UL94HB) - halogen free

HDP001R - black body/actuator

HDP001L - grey body/actuator

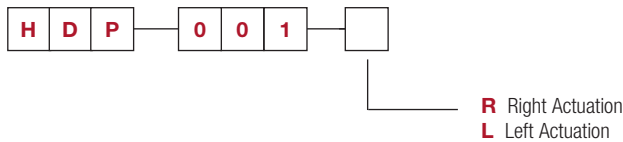
MOVABLE CONTACTS: Stainless Steel, Silver over nickel plate.

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.

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.



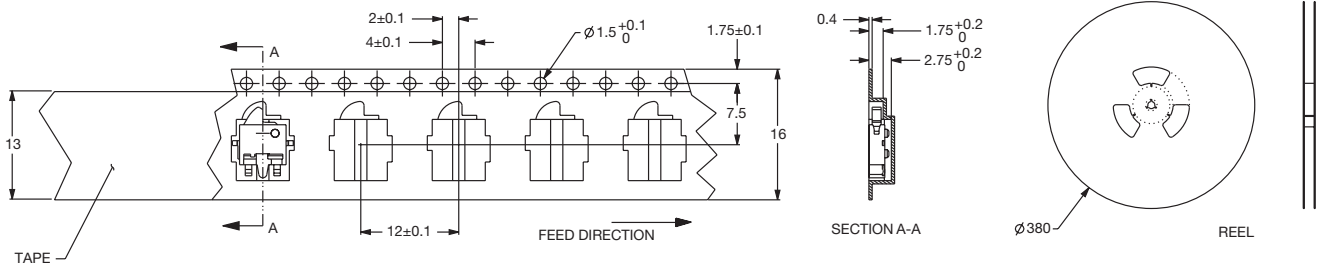
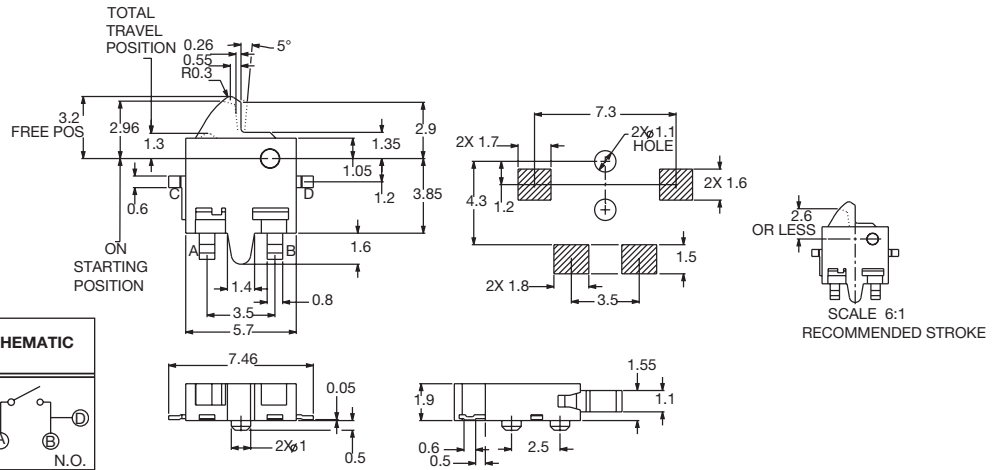
Detect

HDP Series Micro Mini Side Actuated Surface Mount Detect Switches

Complete part numbers for HDP Series are shown below.



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



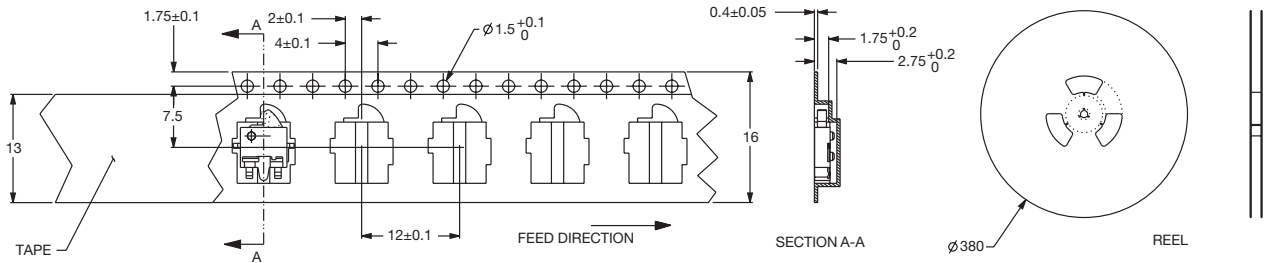
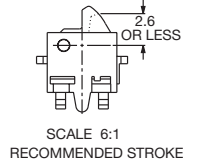
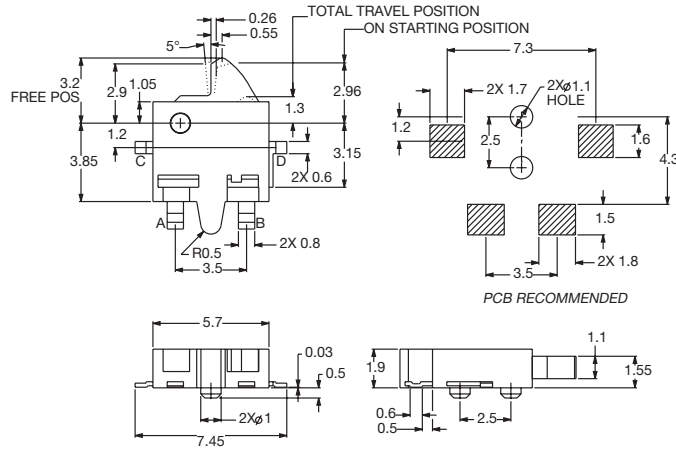
Detect

HDP Series

Micro Mini Side Actuated Surface Mount Detect Switches



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



E

Detect

SDS Series Side Actuated Detect Switches

NEW

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
- Ultra low current capabilities
- RoHS compliant and compatible

Typical Applications

- Medical devices
- Consumer electronics
- PCB lock cam detect
- IoT devices
- ATCA and MicroTCA



Specifications

CONTACT RATING: 100mA @ 12 VDC

* For ULC version, min. current is 10µA @ 1.8 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)

COVER: Nickel silver w/silver plate

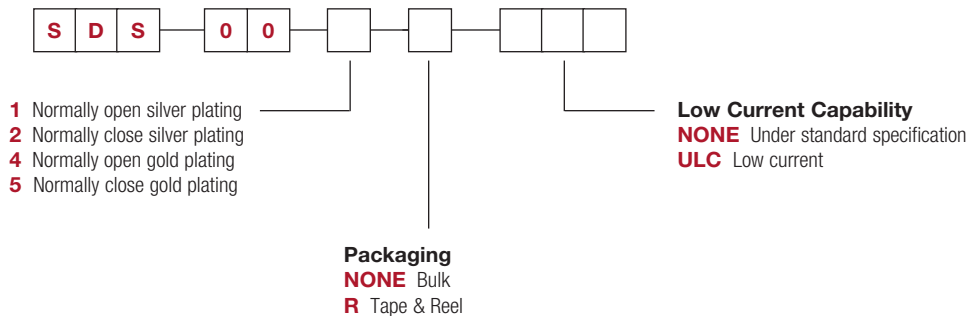
MOVABLE CONTACT: Phosphor bronze, see table for plating

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

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.



m

Detect



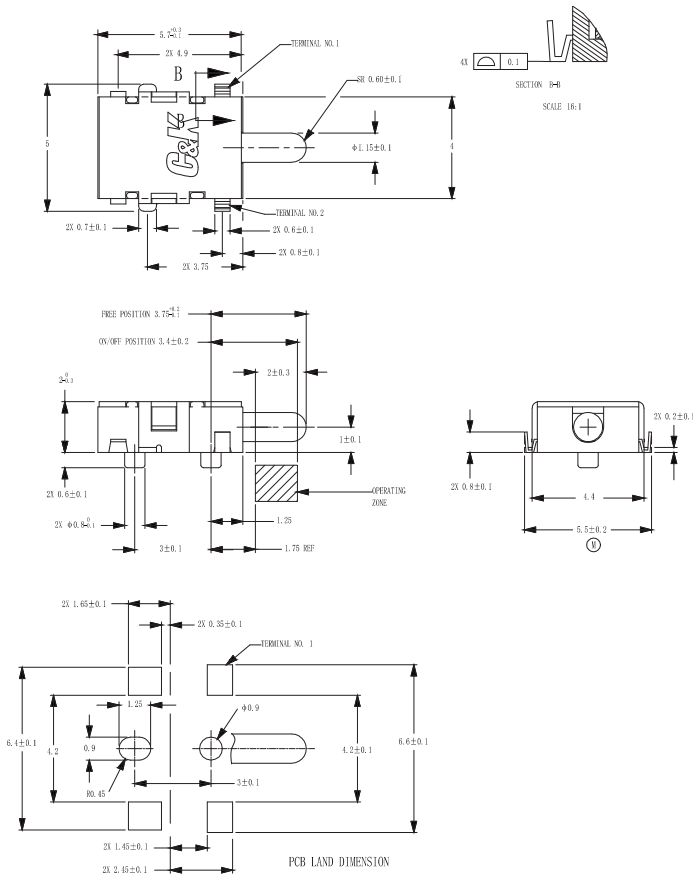
Dimensions are shown: mm

Specifications and dimensions subject to change

NEW

SDS Series Side Actuated Detect Switches

Complete part numbers for SDS Series Switches are shown below.



PART NUMBER	HOUSING COLOR	PACKAGING	SCHEMATIC	Contact Plating	Terminal Plating
SDS001	Black	Bulk		Silver Clad	Silver Plate
SDS001R		Tape & Reel			
SDS001RULC					
SDS002	White	Bulk		Silver Clad	Silver Plate
SDS002R		Tape & Reel			
SDS002RULC					
SDS004	Black	Bulk		Gold Flash	Gold Flash
SDS004R		Tape & Reel			
SDS004RULC					
SDS005	White	Bulk		Gold Flash	Gold Flash
SDS005R		Tape & Reel			
SDS005RULC					

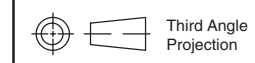
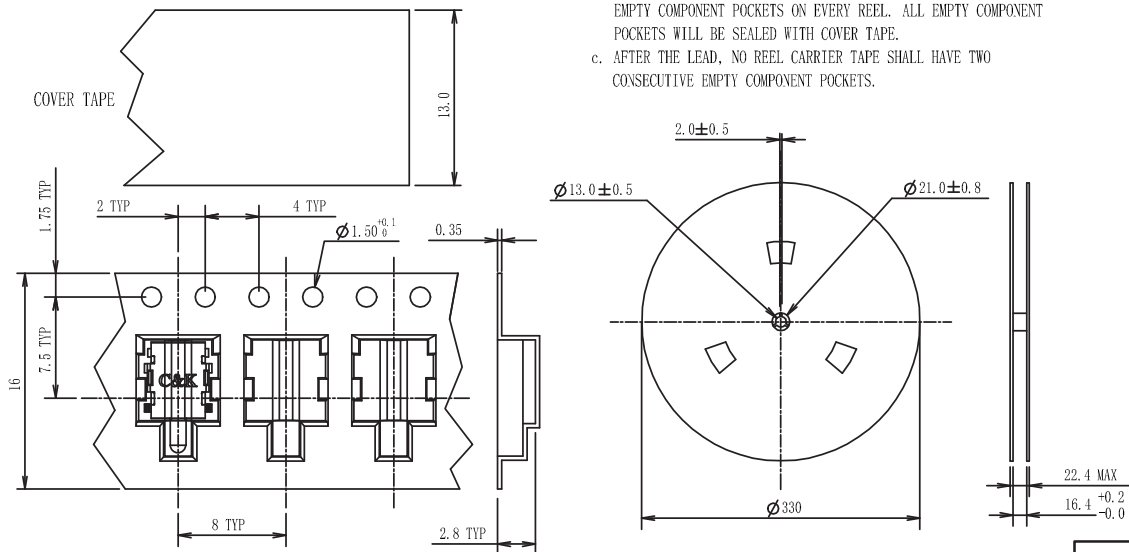


**SDS001
SPST**

TAPE & REEL

TAPE & REEL PACKAGING NOTES:

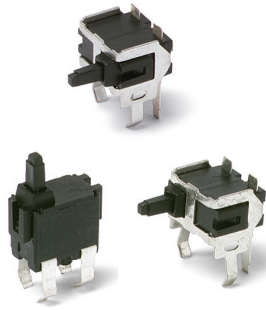
- a. PACKAGE QUANTITY: 3,000 PCS/REEL.
- b. SPECIFICATION OF TAPING PACKAGE: THE REEL CARRIER TAPE WILL HAVE A LEAD OF 33 EMPTY COMPONENT POCKETS AND AN END OF 14 EMPTY COMPONENT POCKETS ON EVERY REEL. ALL EMPTY COMPONENT POCKETS WILL BE SEALED WITH COVER TAPE.
- c. AFTER THE LEAD, NO REEL CARRIER TAPE SHALL HAVE TWO CONSECUTIVE EMPTY COMPONENT POCKETS.



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: -40°C to +85°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.

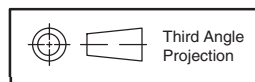
How To Order

Part number list is shown below. For individual part details, please refer to the following pages.

Part Number (Part Description)	Product Details
DDS001	Micro mini thru-hole detect switches top actuated
DDS002	Micro mini thru-hole detect switches side actuated right
DDS003	Micro mini thru-hole detect switches side actuated left
DDS004	Micro mini SMT detect switches top actuated



Detect



Third Angle Projection

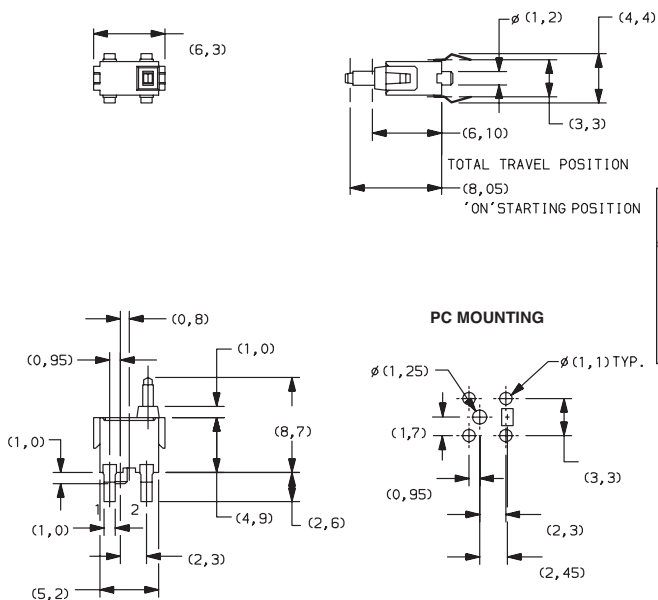
Dimensions are shown: mm
 Specifications and dimensions subject to change

DDS Series Micro Mini Thru-hole Detect Switches

Complete part numbers for DDS Series Switches are shown below.

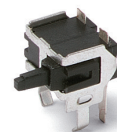
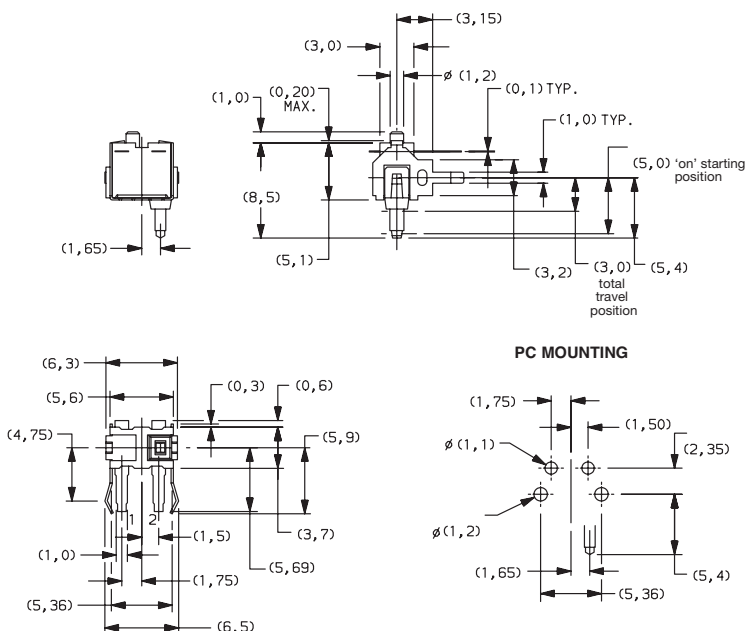


**DDS001
SPST**

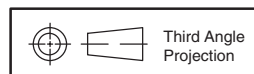


PART NUMBER	DESCRIPTION	SCHEMATIC
DDS001	Vertical Actuator	 SPST N.O.

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




**DDS002
SPST**

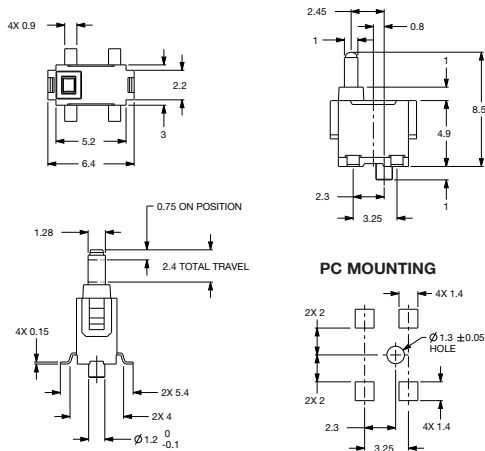
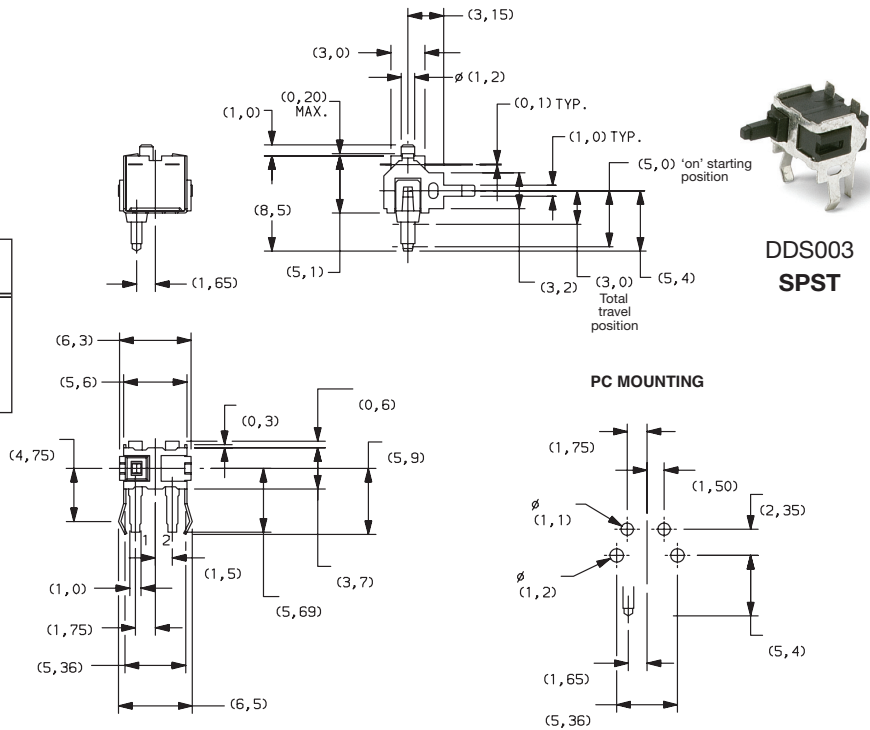



Dimensions are shown: mm
Specifications and dimensions subject to change



DDS Series Micro Mini Thru-hole Detect Switches

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



PART NUMBER	DESCRIPTION	SCHEMATIC
DDS004	Vertical actuator	
		SPST N.O.



Detect

FDSD Series Micro Mini Side Actuated Detect Switches



Features/Benefits

- Extremely small package size
- Vertical Side Actuation
- Flat or Bending Terminations
- Long Travel Type
- RoHS Compatible and Compliant

Typical Applications

- Consumer electronics
- Medical devices
- Safety control devices

Specifications

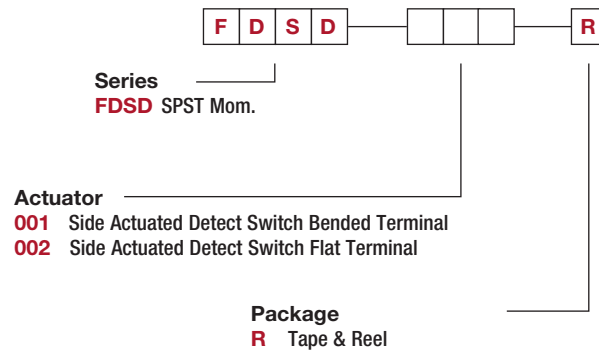
CONTACT RATING: 50 μ A @ 3VDC, 10 mA @ 5 VDC
 MECHANICAL & ELECTRICAL LIFE: 50,000 operations
 CONTACT RESISTANCE: 1 Ω max
 INSULATION RESISTANCE: 100M Ω min
 DIELECTRIC STRENGTH: 100VAC @ 1 minute
 OPERATING TEMPERATURE: -40°C to +85°C
 OPERATING FORCE: 40gf max.
 TRAVEL: 3.05 mm or 60°
 SOLDERABILITY: According to lead free solder profiles
 PACKAGING: 3,500 pieces per reel.

Materials

BASE: PA9T
 COVER: C7701R
 ACTUATOR: PA 46
 MOVABLE CONTACT: Beryllium Copper
 TERMINALS: Phosphor Bronze, Ag over Ni Plating

Build-A-Switch

Complete part numbers for FDSD Series are shown below.

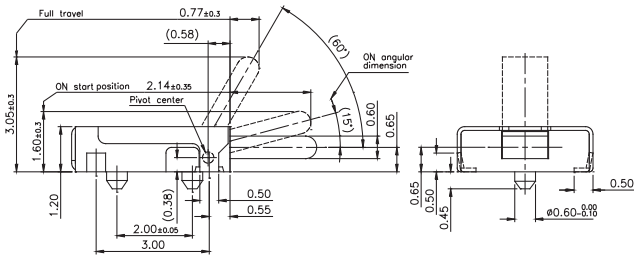
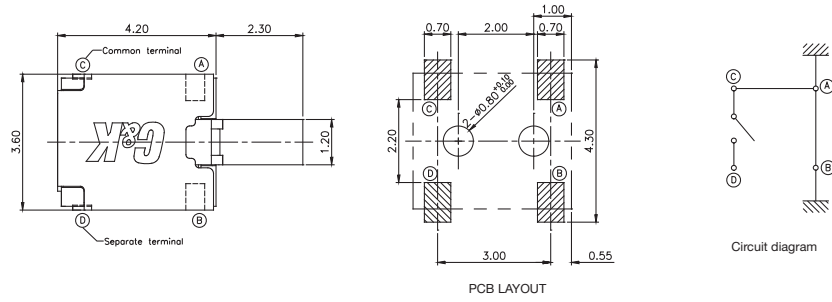


Detect

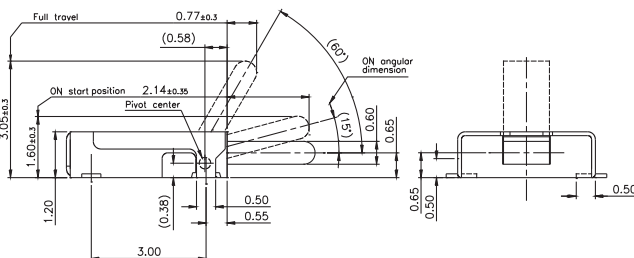
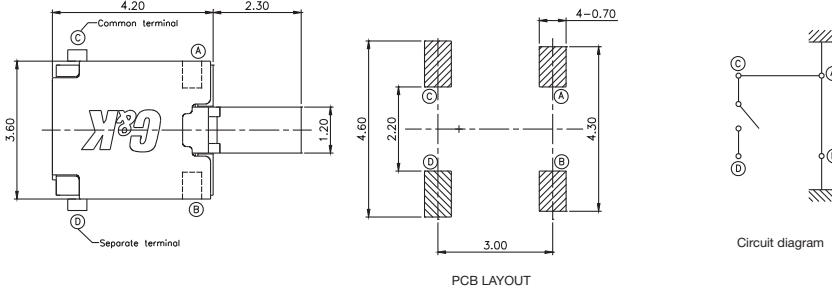
FDSD Series Micro Mini Side Actuated Detect Switches

SERIES

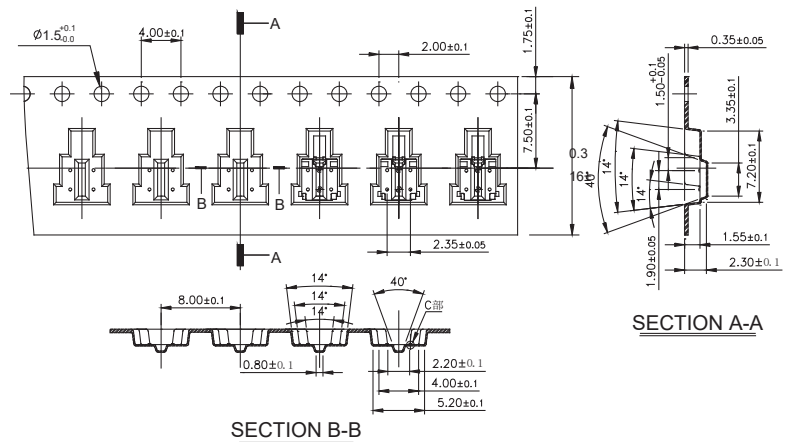
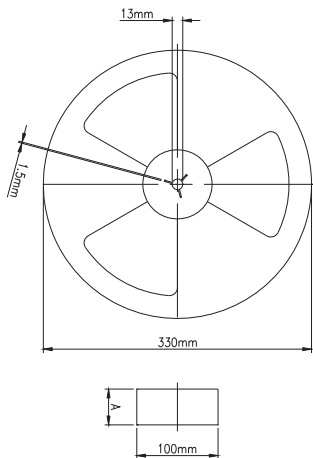
FDSD001R



FDSD002R

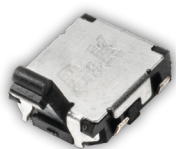


TAPE & REEL



Detect

FDSE Series Micro Mini Angled Actuated Detect Switches



Features/Benefits

- Extremely small package size
- Angled Actuation
- Flat or Bending Terminations
- Long Travel Type
- RoHS Compatible and Compliant

Typical Applications

- Consumer electronics
- Medical devices
- Safety control devices

Specifications

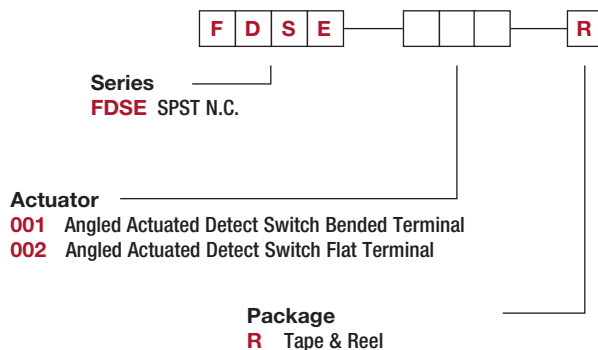
CONTACT RATING: 100 μ A @ 3VDC, 1 mA @ 5 VDC
 MECHANICAL & ELECTRICAL LIFE: 50,000 operations
 CONTACT RESISTANCE: 3 Ω max
 INSULATION RESISTANCE: 100M Ω min 100 VDC
 DIELECTRIC STRENGTH: 100VAC @ 1 minute
 OPERATING TEMPERATURE: -40°C to +85°C
 OPERATING FORCE: 35 gf max.
 TRAVEL: 3.14 mm or 60°
 SOLDERABILITY: According to lead free solder profiles
 PACKAGING: 2,000 pieces per reel.

Materials

BASE: PA9T
 COVER: C7701R
 ACTUATOR: PA 46
 MOVABLE CONTACT: Beryllium Copper
 TERMINALS: Phosphor Bronze, Ag over Ni Plating

Build-A-Switch

Complete part numbers for FDSE Series are shown below.

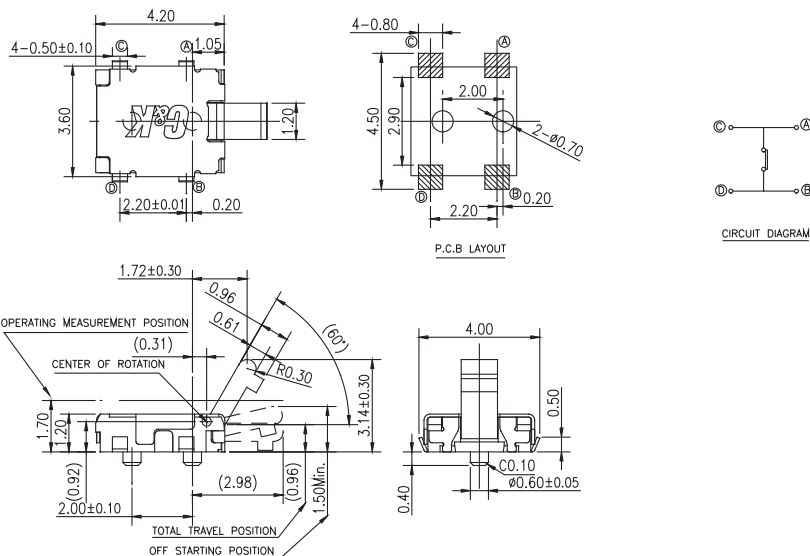


Detect

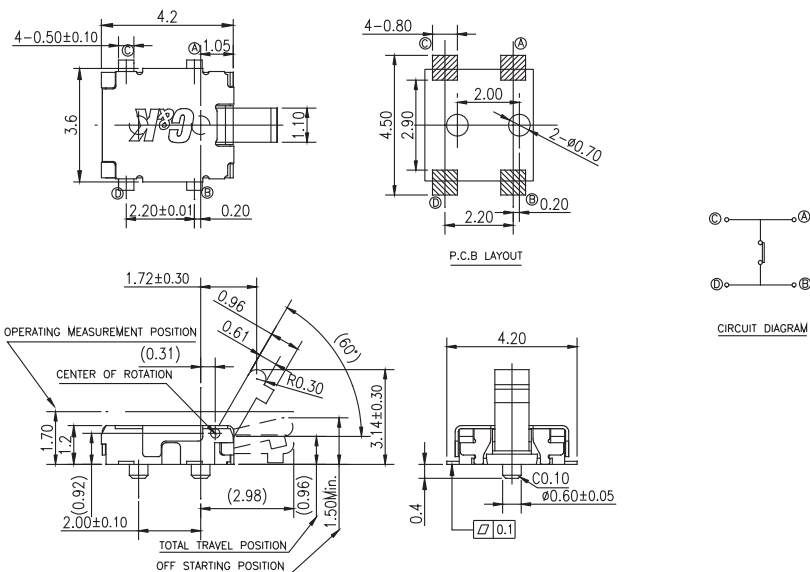
FDSE Series Micro Mini Angled Actuated Detect Switches

SERIES

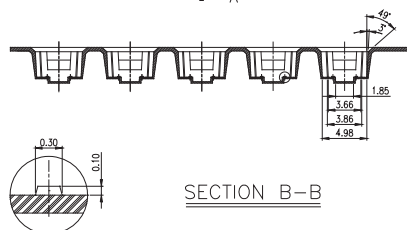
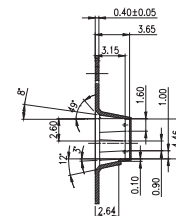
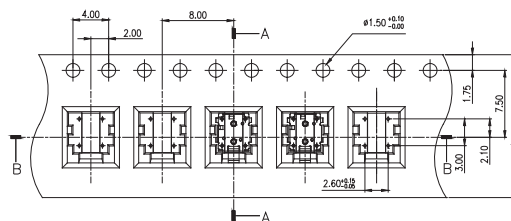
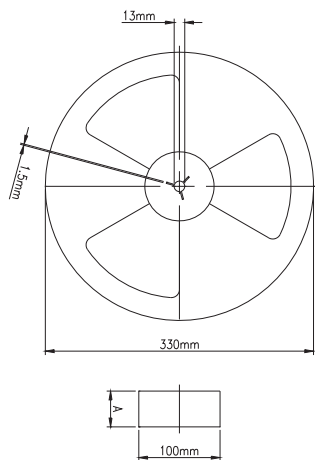
FDSE001R



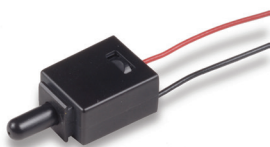
FDSE002R



TAPE & 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: Travel to make from 1.9 mm to 5.9 mm*
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.

* For information

How To Order

Part number list is shown below. For individual part details, please refer to the following pages.

Part Number (Part Description)	Product Details
KDS11	Intrusion switches normally open
KDS33	Intrusion switches normally close

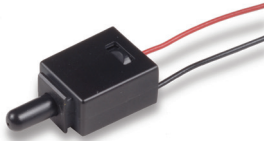


m

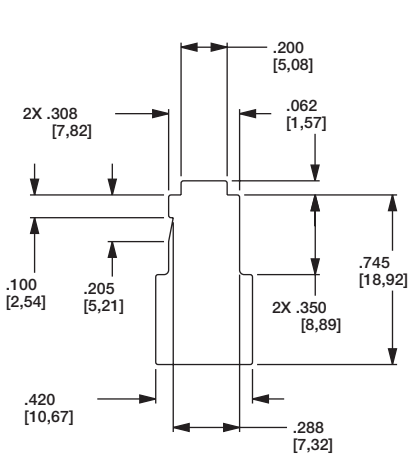
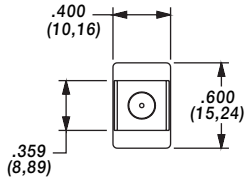
Detect

KDS Series Intrusion Switches

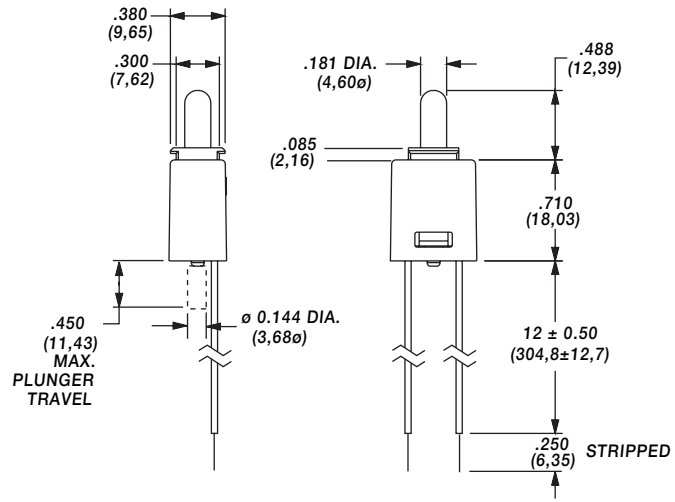
PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS. 1	POS. 2	
KDS11	OFF	MOM.	SPST N.O.
KDS33	ON	OFF	SPST N.C.



KDS33



PANEL CUT-OUT
THICKNESS 1,02



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

	GOLD	SILVER
MAXIMUM POWER:	0.2 VA	0.1 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	10 mA	50 mA
MINIMUM CURRENT:	0.01 mA	1 mA
CONTACT RESISTANCE:	≤ 100 m Ω	
INSULATION RESISTANCE:	(100 VDC) 10^9 Ω	
DIELECTRIC STRENGTH:	≥ 250 Vrms	
BOUNCE TIME:	≤ 3 ms	

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

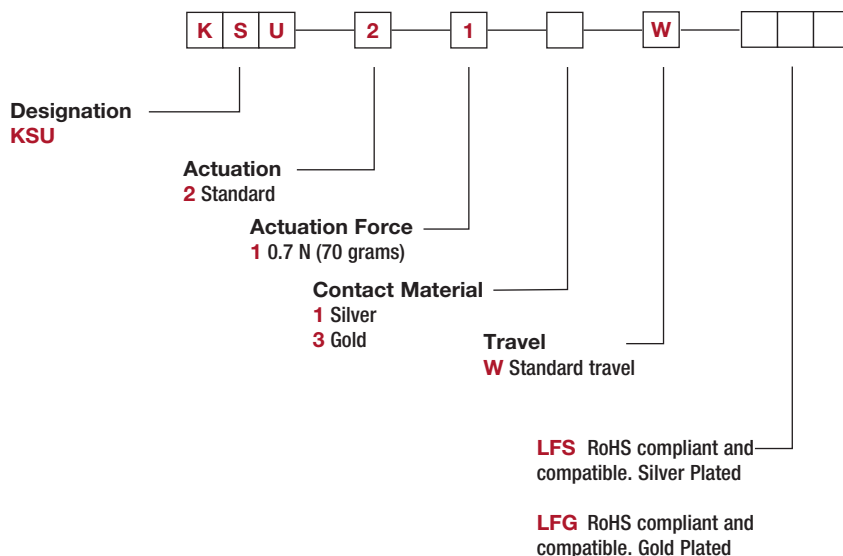
SOLDERING: Compatible with lead free reflow process

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

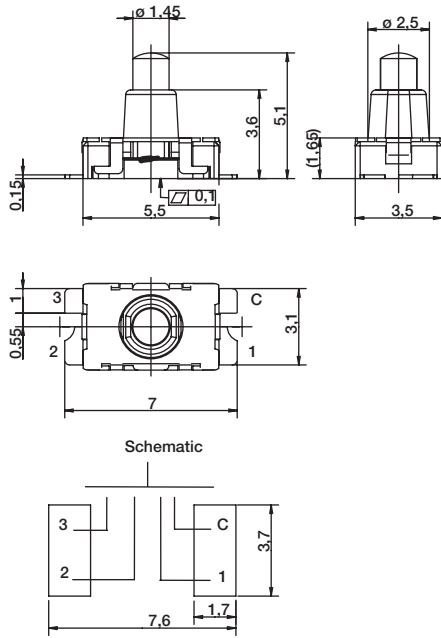
How To Order

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.

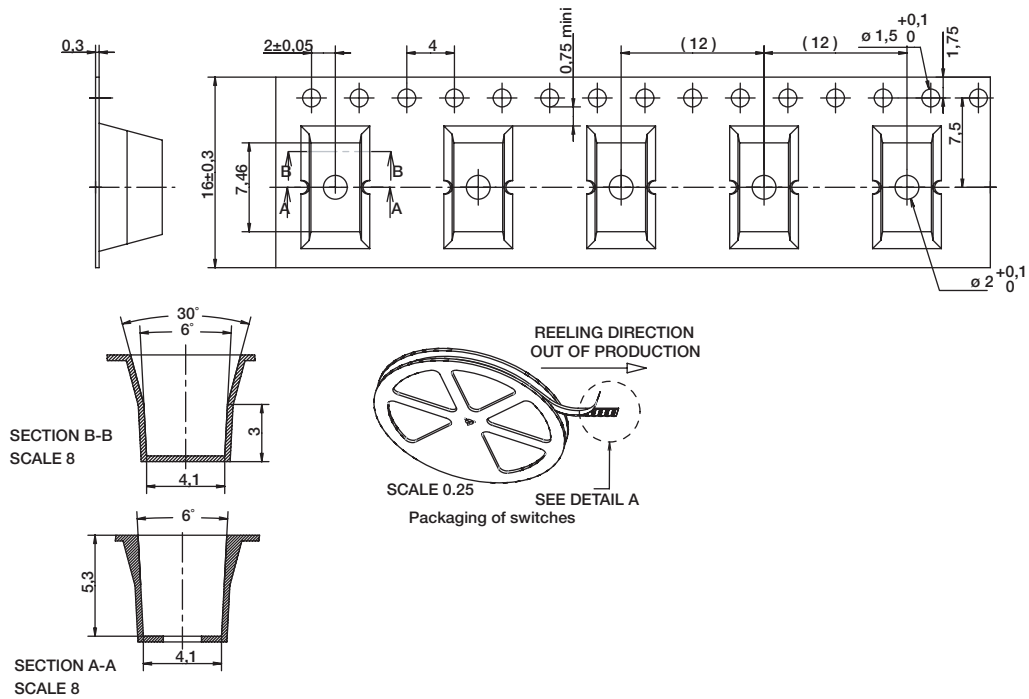
For any part number different from those listed above, please consult your local representative.



KSU Series Micro Mini Surface Mount Detect Switches



TAPE & REEL



Detect



First Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

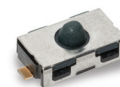
ATS Series Anti-Tampering Detect Switches

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

MAXIMUM POWER: 0.2 VA

MAXIMUM VOLTAGE: 32 VDC

MINIMUM VOLTAGE: 20 mVDC

MAXIMUM CURRENT: 10 mA

MINIMUM CURRENT: 1 μA

CONTACT RESISTANCE: ≤ 350 mΩ

INSULATION RESISTANCE: > 1 G Ω

DIELECTRIC STRENGTH: ≥ 250 Vrms

GOLD

0.2 VA

32 VDC

20 mVDC

10 mA

1 μA

≤ 350 mΩ

> 1 G Ω

≥ 250 Vrms

SILVER

1 VA

32 VDC

20 mVDC

50 mA

1 mA

Environmental

OPERATING TEMPERATURE: -40°C to +125°C

STORAGE TEMPERATURE: -55°C to + 125°C

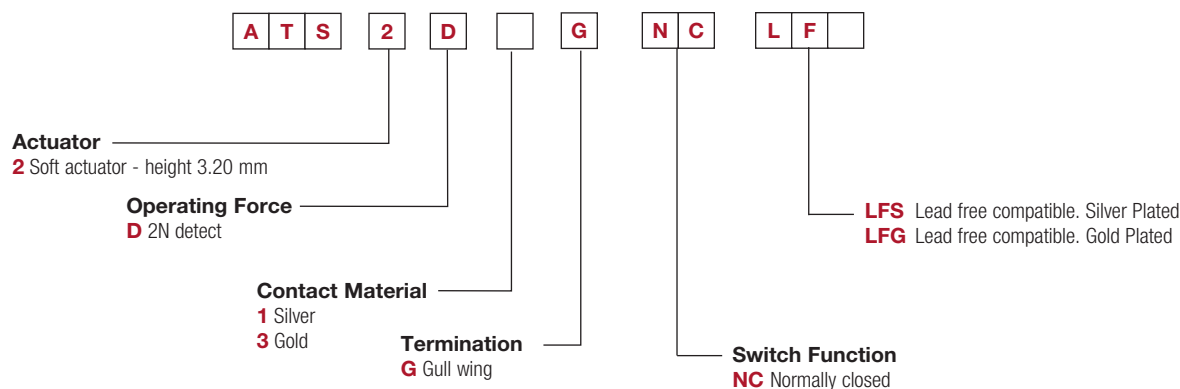
Process

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.

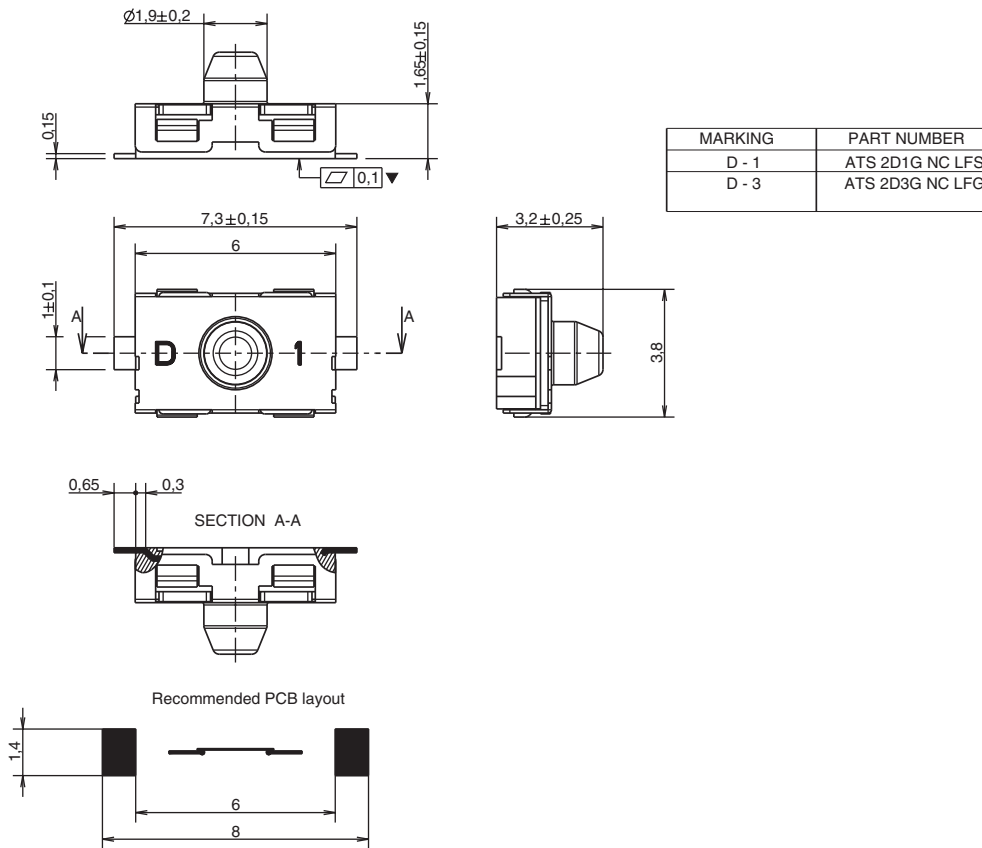
Build-A-Switch

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.

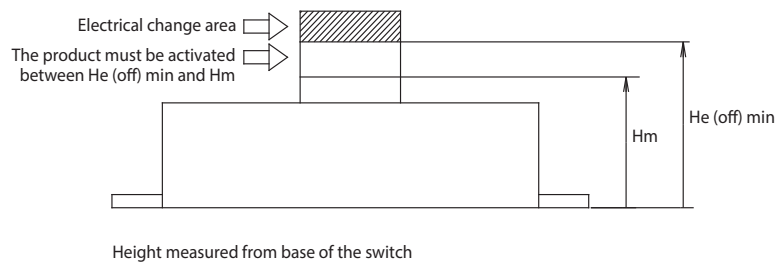


ATS Series Anti-Tampering Detect Switches

SERIES



CHARACTERISTICS



Minimum Activation Height (Hm)	Maximum force at Hm = 6N Switch damage can occur if product is actuated below minimum actuation height (Hm)	2.1 mm
Minimum Electrical Height (He (OFF) min)	Product height for contact opening Contact closing: the switch must be completely release	2.5 mm

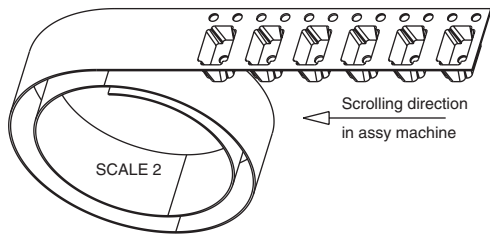
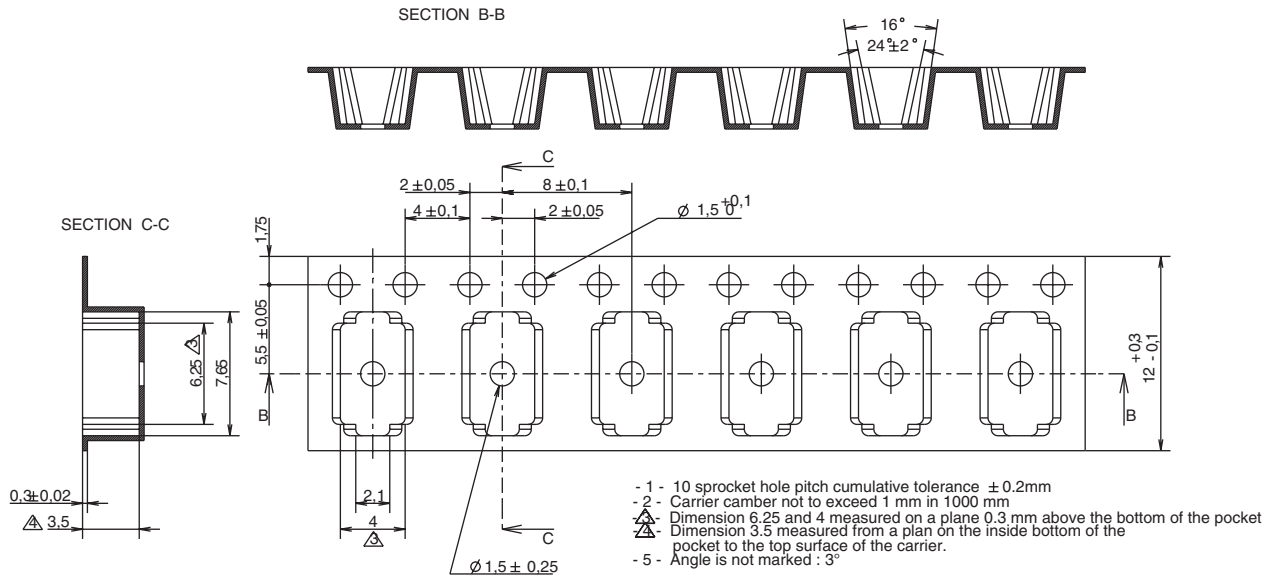


E

Detect

ATS Series Anti-Tampering Detect Switches

TAPE & REEL



Detect

KSR D 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

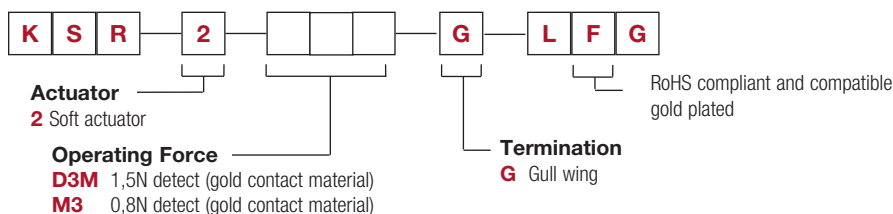
Process

SOLDERING: Compatible with lead free reflow soldering process

How To Order

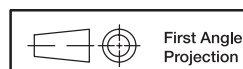
Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

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



m

Detect

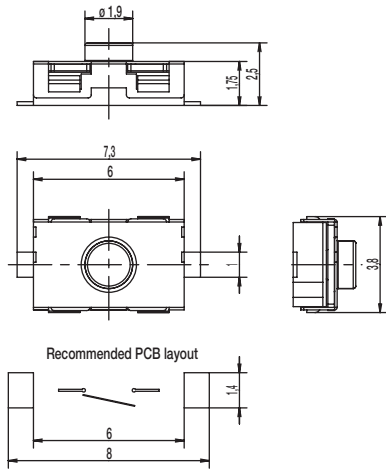


First Angle
Projection

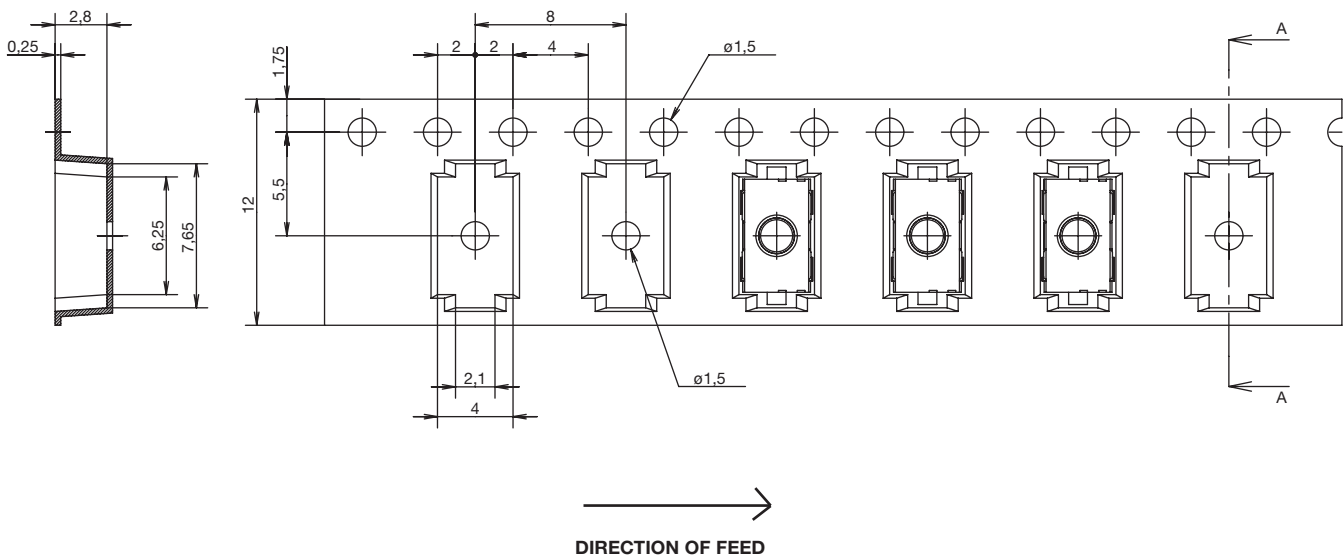
Dimensions are shown: mm
Specifications and dimensions subject to change

KSR D Series Subminiature Detect Switch for SMT

KSR2D/M



TAPE & REEL



Detect

KSC D Series Sealed Detect Switch for SMT



Features/Benefits

- Soft actuator
- J or G terminations
- Tape & reel
- IP67
- 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)
KSC4D1	1,0 - 3,0	500,000	0,6 ± 0,25
KSC4D2	1,0 - 3,0	2,000,000	0,6 ± 0,25
KSC4D3	1,0 - 3,0	500,000	0,6 ± 0,25

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	
ULC: Ultra Low Current	0.01 mA @ 1.8 V DC	

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

KSC4: Reels of 1,000 pieces
 Dimensions of reels according to EIA RS481 or IEC 60286-3
 External diameter 330 mm ± 2 mm

NOTE

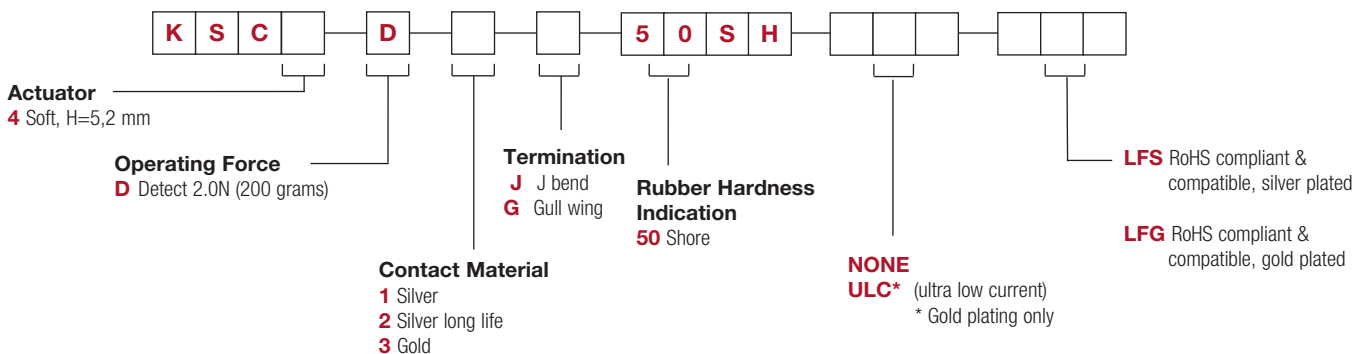
- Part numbers listed above do not represent all possible configurations. For information on specific and custom switches, consult Customer Service Center.
- This data sheet does not provide enough information for applications which require a certain level of quality or safety such as automotive, medical 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.

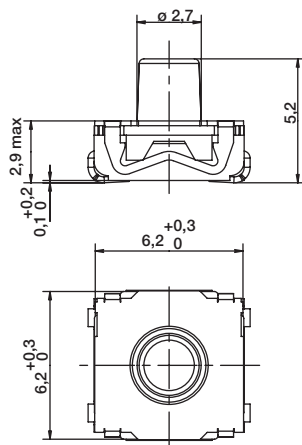
However, please note that all the combinations of these options are not feasible.

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

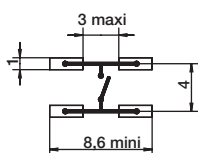


KSC D Series Sealed Detect Switch for SMT

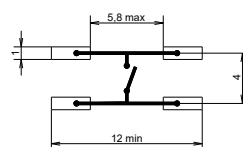
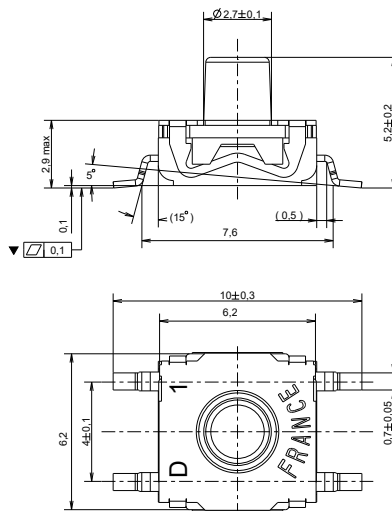
KSC4D1J SOFT, 5,2 mm high



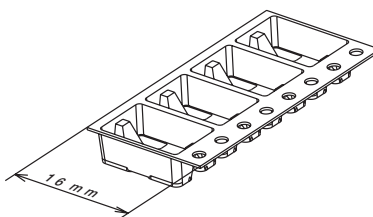
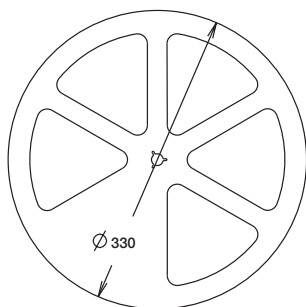
PAD LAYOUT



KSC4D1G SOFT, 5,2 mm high



TAPE AND REEL KSC2G & KSC4



Detect

KSJ D 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
KSJ0VD1860SHLFTR	6,0 (600)	100,000	0,50 ± 0,25
KSJ0MD1860SHLFTR	6,0 (600)	100,000	0,50 ± 0,25

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	

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

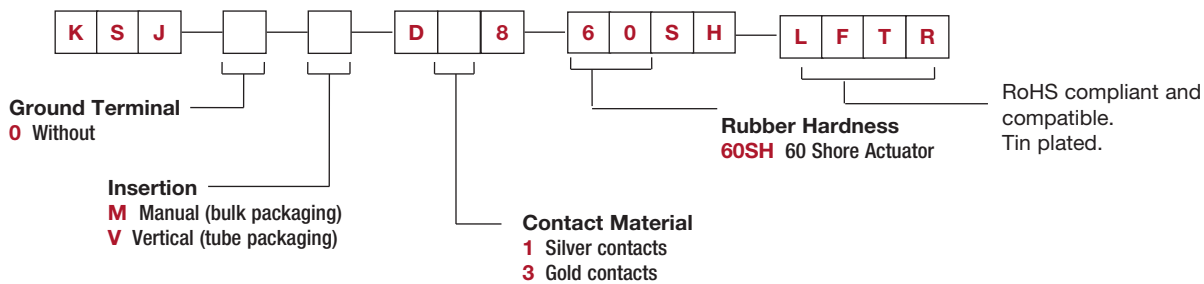
In boxes of 250 pieces

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.

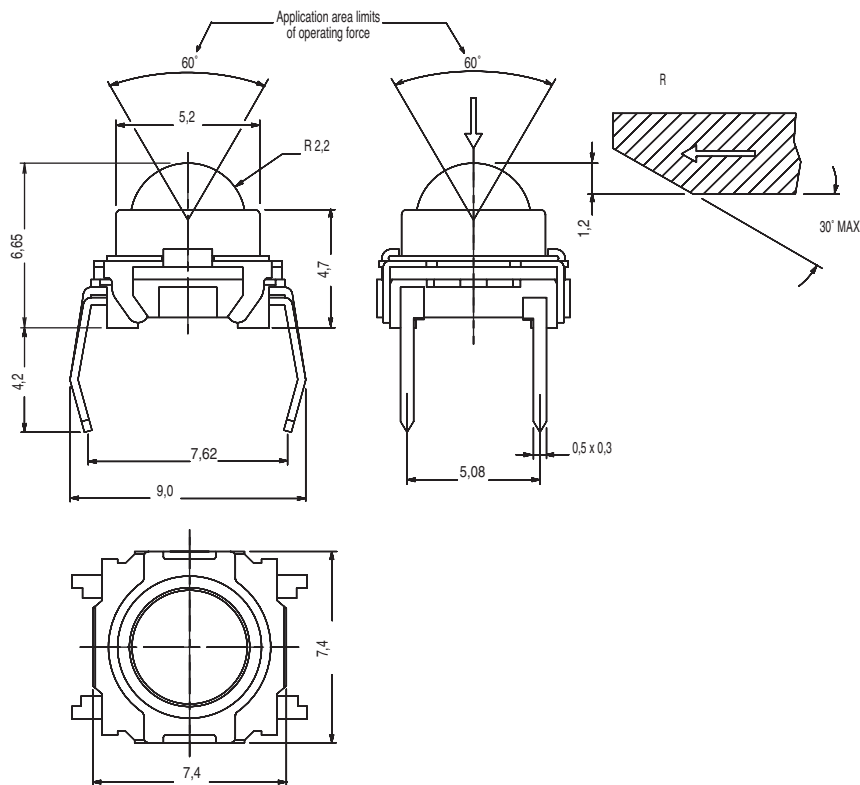
For any part number different from those listed above, please consult your local representative.



Detect m

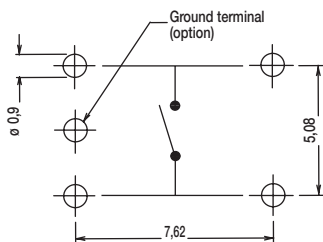
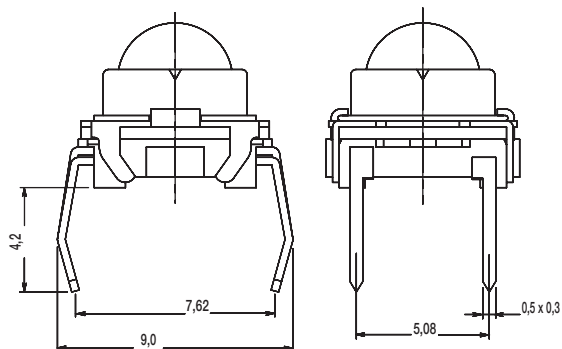
KSJ D Series Spherical Actuator Detect Switches

KSJ

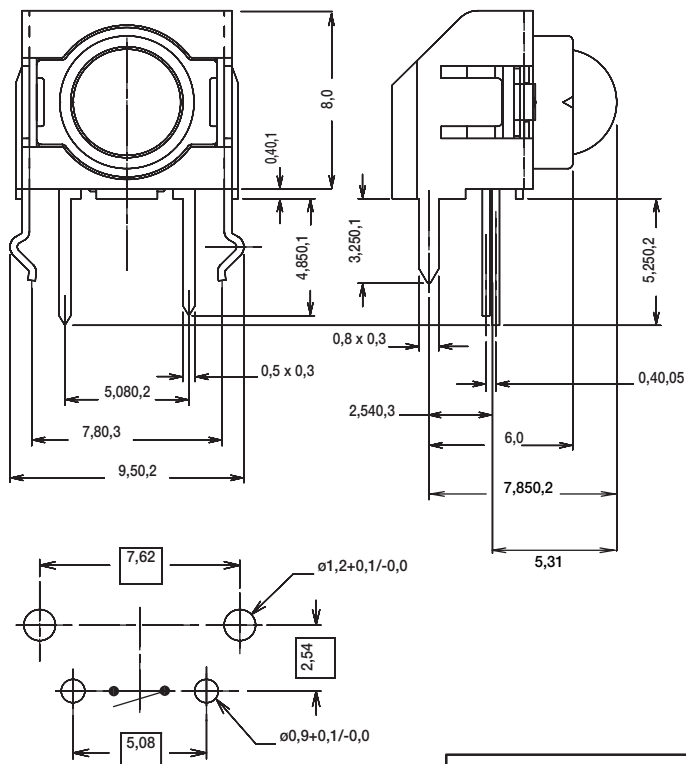


INSERTION

M MANUAL



V VERTICAL



First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change



Detect

KMT0 D Series Nano-Miniature SMT Top Actuated

Features

- 3.0 x 2.6 mm footprint
- Smallest thickness with integrated actuator
- IP68
- Momentary detect

Typical Applications

- Hearing aids
- Medical device
- Bluetooth headset
- IoT
- Consumer electronics



Specification

FUNCTION: momentary action, normally open
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: J lead type for SMT

Mechanical

TRAVEL (mm): 0.15 ± 0.1

	Operating Force Newtons (grams)	Operating Life
KMT0D1 NGJ LHS	1.5 (150) ± 25%	300 000
KMT0D3 NGJ LHG	1.5 (150) ± 25%	300 000

Packaging

In reels of 5,000 pieces.
Dimensions of reels according to EIA 481B
External diameter 180 mm

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

Electrical

MAXIMUM POWER:	0.3 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mV
MAXIMUM CURRENT DC:	25 mA
MINIMUM CURRENT DC:	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms (1mn)
CONTACT RESISTANCE:	≤ 150 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 6 ms

Environmental

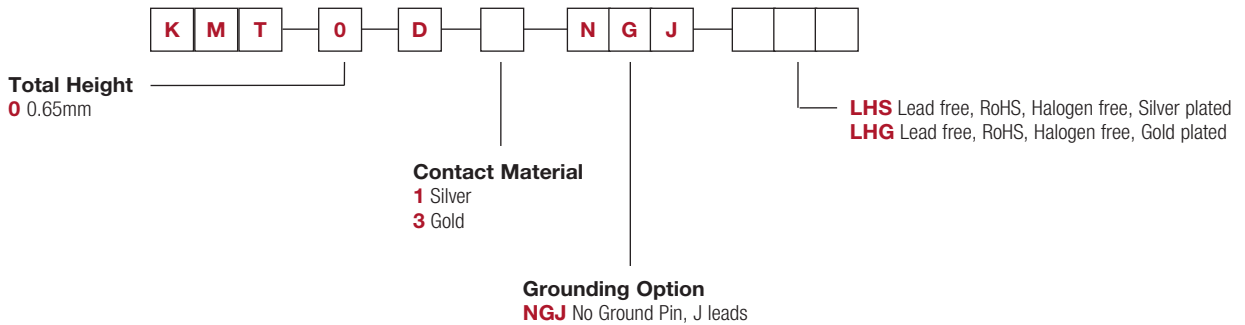
OPERATING TEMPERATURE: -40°C to 85°C
STORAGE TEMPERATURE: -55°C (10 days) +85°C (4 days)

Process

SOLDERING: This component is suited to the following methods:
– Lead free reflow soldering process in accordance with IEC 61760-1.

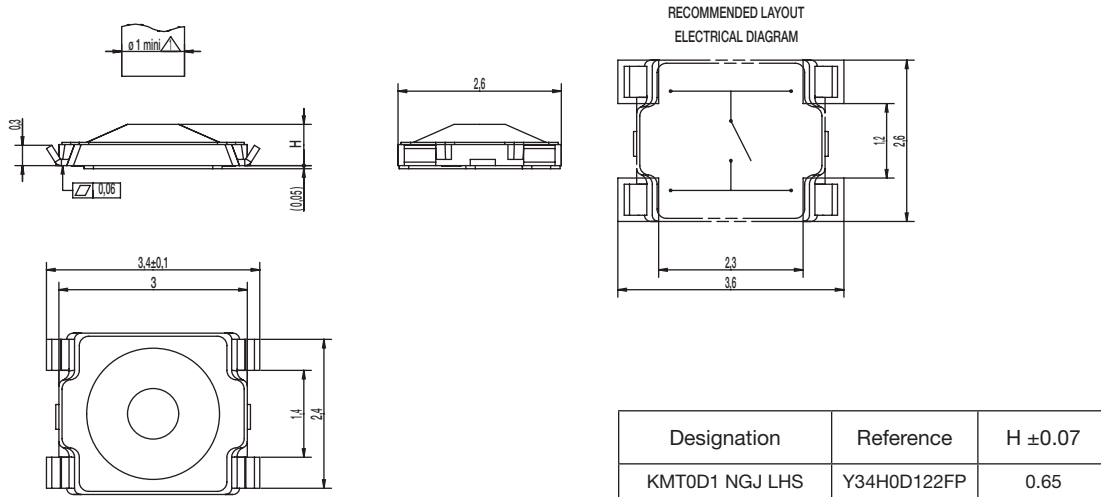
Build-A-Switch

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.

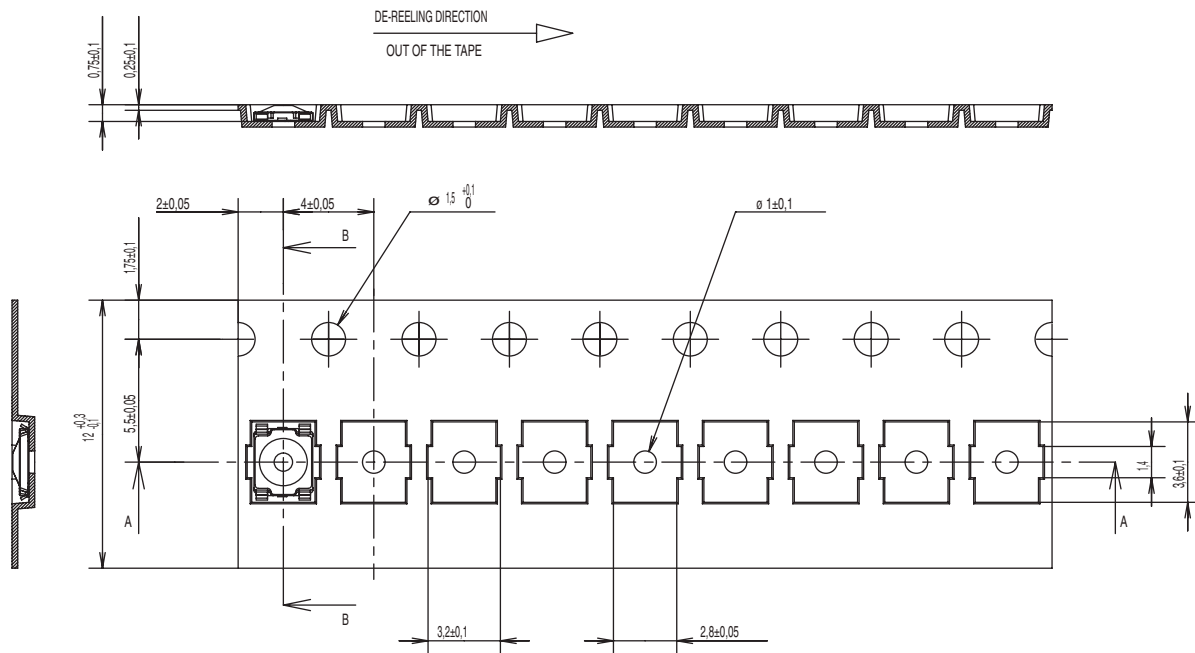


KMT0 D Series Nano-Miniature SMT Top Actuated

Minimum actuator diameter is 1.0 mm. It is recommended to enlarge this diameter to a full flat surface covering the switch.



TAPE & REEL



Dimensions are shown: mm
Specifications and dimensions subject to change

KMR D Series Microminiature SMT Top Actuated

Features/Benefits

- Ground pin
- Height 2.5 mm
- Compact size 4.6 x 2.8
- Momentary detect
- IP40

Typical Applications

- IoT
- Consumer electronics
- Bluetooth headset



Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

	Force at electrical contact (Fce)		Travel (mm)	Operating Life
	Fce Forward (N)	Fce Return		
KMR401G LFS	$0.35 \leq F_{ce} \leq 1.85N$	$0.15 \leq F_{ce} \leq 1.65N$	0.225 ± 0.175	100 000

Packaging

In reels of 6,000 pieces
External diameter 330 mm \pm 2 mm

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

Electrical

MAXIMUM POWER:	1 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mVDC
MAXIMUM CURRENT:	50 mA
MINIMUM CURRENT:	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms
CONTACT RESISTANCE:	≤ 100 m Ω
INSULATION RESISTANCE:	$\geq 1G\Omega$
BOUNCE TIME:	≤ 3 ms

Environmental

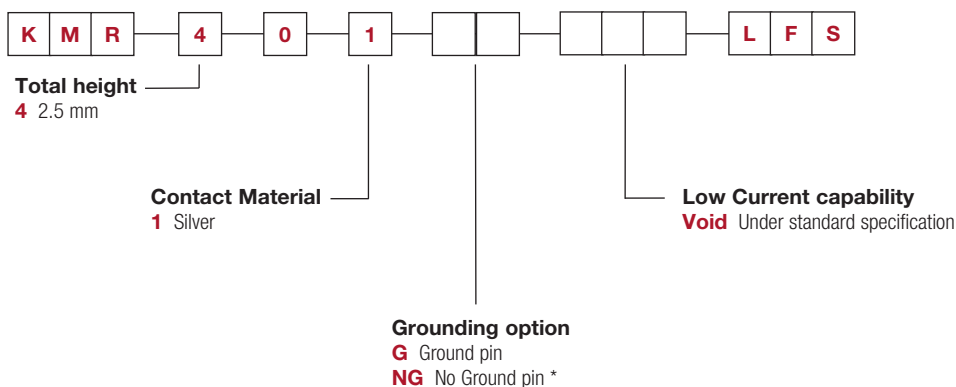
OPERATING TEMPERATURE:	-40°C to 85°C
STORAGE TEMPERATURE:	-55°C to 85°C

Process

Soldering: Lead free reflow soldering process in accordance with IEC 61760-1.

Build-A-Switch

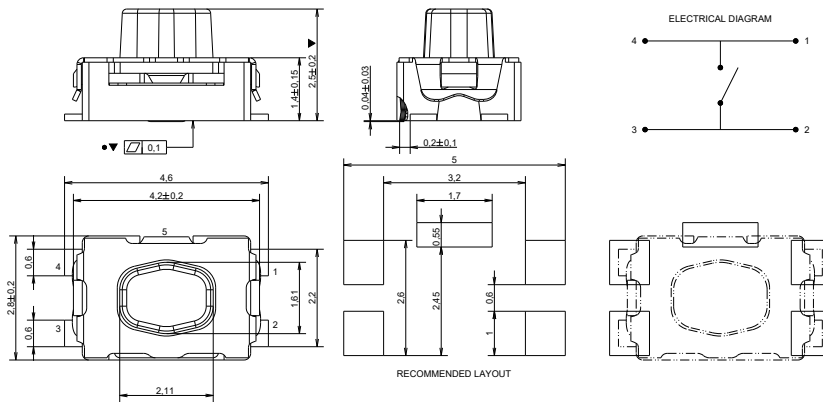
To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on the next page. For additional options not shown in catalog, consult Customer Service Center.



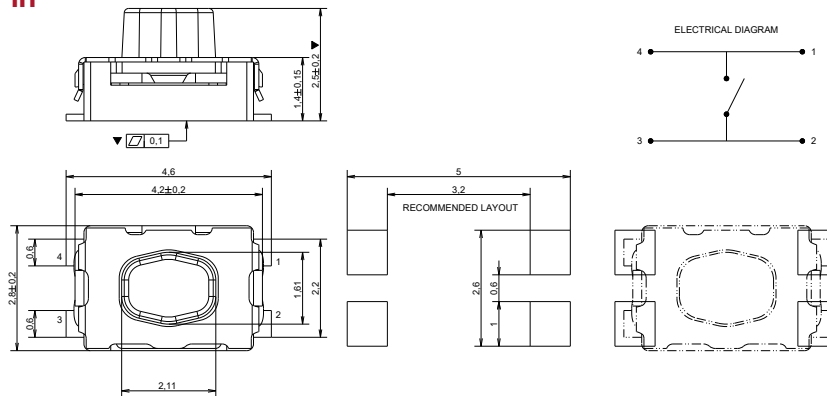
* On request

KMR D Series Microminiature Tact Switch for SMT

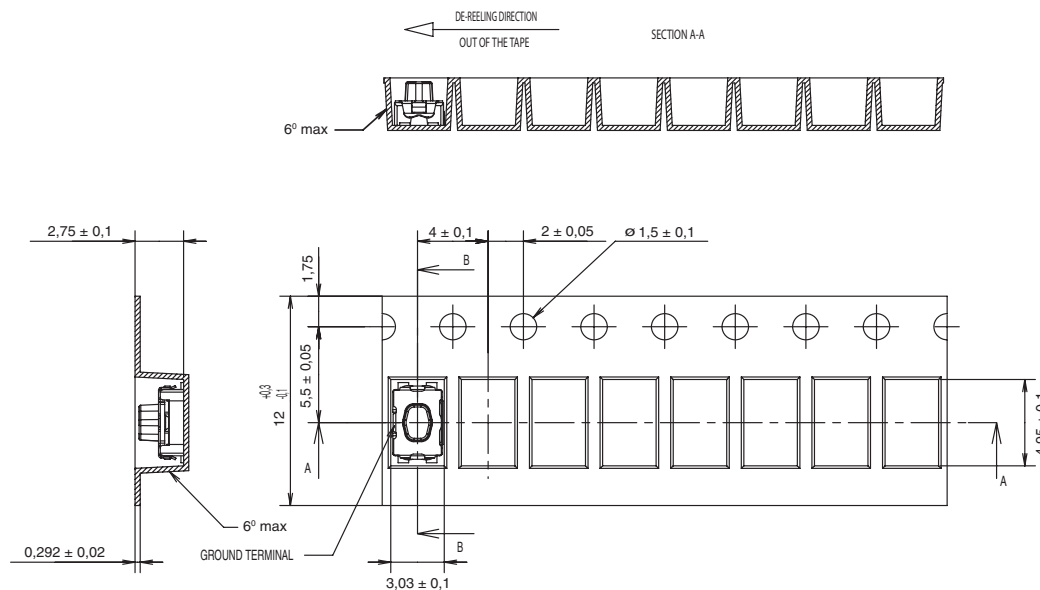
G - Ground Pin



NG - No Ground Pin



TAPE & REEL



Dimensions are shown: mm
Specifications and dimensions subject to change

www.ckswitches.com

K12S D

High Performance SMT Detect Switches



Features/Benefits

- Harsh environment applications - IP67
- Compatible with SMT lead free soldering process
- Illuminated
- Permanent actuation possible
- High reliability / long life
- DPST version available
- RoHS compliant

Typical Applications

- Automotive
- Joysticks
- Off-road transportation
- Motorcycles
- Industrial
- Medical

Construction:

FUNCTION: Momentary
 CONTACT ARRANGEMENT: SPST or DPST
 CONTACT TYPE: NO or NC
 TERMINALS: SMT

Mechanical

TOTAL TRAVEL: 1,5 mm
 OPERATING FORCE: 3N
 SEALING: IP40 or IP67

Packaging

Reels of 900 pieces

Electrical

SWITCHING POWER MIN./MAX.: 0.02mW/3 W DC
 SWITCHING VOLTAGE MIN./MAX.: 2 V / 30 V DC
 SWITCHING CURRENT MIN./MAX.: 10 mA /100 mA DC
 DIELECTRIC STRENGTH: > 300 V RMS
 OPERATING LIFE: > 10⁶ operations (detect version)
 CONTACT RESISTANCE: Initial < 100mΩ - After test < 250mΩ
 INSULATION RESISTANCE: >10⁹Ω
 BOUNCE TIME: < 10 ms

Environmental

OPERATING TEMPERATURE: -40°C to 85°C.
 STORAGE TEMPERATURE: -40°C to 95°C.
 RoHS compliant and Halogen free.

Process

SOLDERABILITY: Lead free soldering compatible.

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.



Sub-Series

- A** IP40 with peg
- B** IP67 with peg
- C** IP40 without peg
- D** IP67 without peg

Option

- S** SPST version
- L** LED version (SPST)
- D** DPST version

LED Color

- NONE** No LED
- YE0** Yellow
- RD0** Red
- GN0** Green
- OR0** Orange
- WH0** White
- AM0** Amber

Travel
1.5 1.5 mm

Operating Force
3N 3 N
 (detect - no tactile)

LFTX Lead free, RoHS
 terminals tin plated
 Translucent button

Contact Arrangement

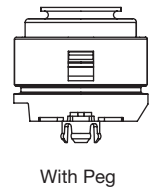
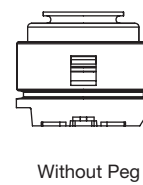
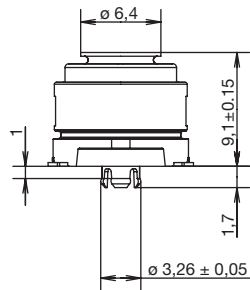
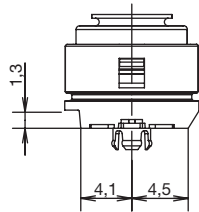
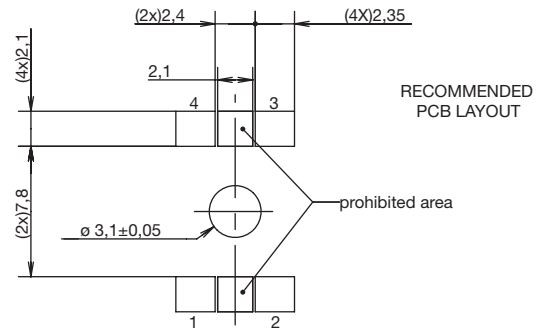
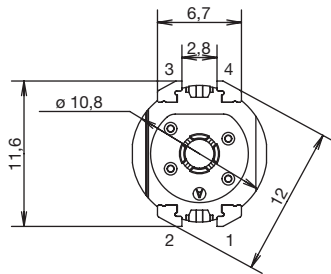
- O** Normally open (SPST)
- C** Normally closed (SPST)
- OO** 2 Normally open (DPST)
- CC*** 2 Normally closed (DPST)
- OC*** 1 Normally open
- 1 Normally closed (DPST)

* Please contact technical support for this configuration

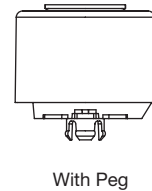
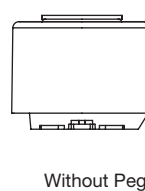
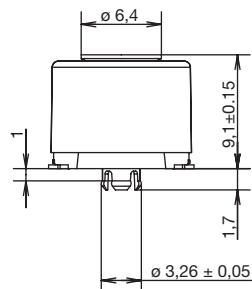
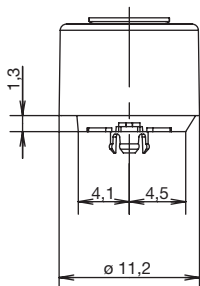
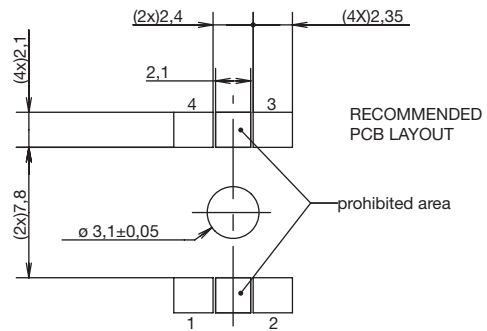
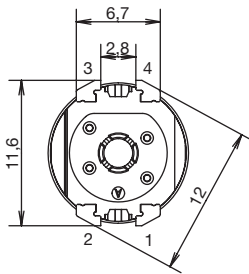
Detect

K12S D High Performance SMT Detect Switches

K12SA/K12SC IP40 with peg / IP40 without peg



K12SB / K12SD IP67 with peg / IP67 without peg



Detect



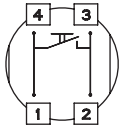
Dimensions are shown: mm
Specifications and dimensions subject to change

K12S D High Performance SMT Detect Switches

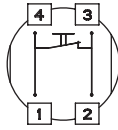
OPTION

S SPST version

Single NO

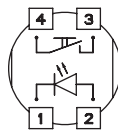


Single NC

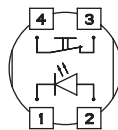


L LED version

Single NO
+ LED

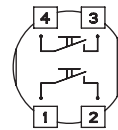


Single NC
+ LED

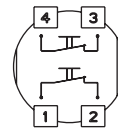


D DPST version

Double NO



Double NC



LED COLOR

OPTION CODE	LED COLOR
	No LED
YE0	Yellow
RD0	Red
GN0	Green
OR0	Orange
WH0	White
AM0	Amber

TRAVEL

1.5 1.5 mm

OPERATING FORCE

OPTION CODE	OPERATING FORCE
3N	3N (detect - no tactile)

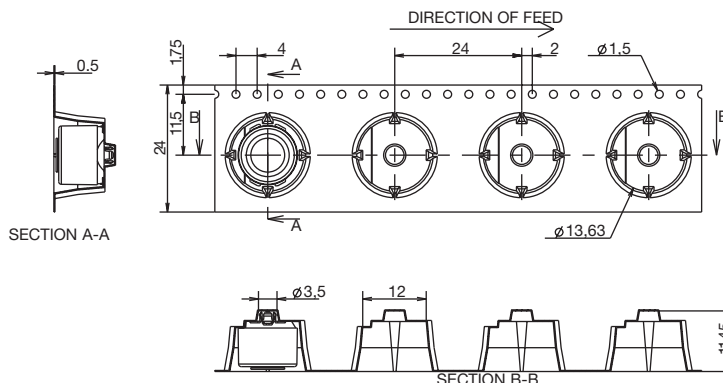
CONTACT ARRANGEMENT

- O** Normally open (SPST and LED versions)
- C** Normally closed (SPST and LED versions)
- OO** 2 Normally open (DPST version)

- CC*** 2 Normally closed (DPST version)
- OC*** 1 Normally open/ 1 Normally closed (DPST)

* Please contact technical support for this configuration

TAPE AND REEL



First Angle
Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

K12 D

High Performance Detect Switches

Features/Benefits

- Overtravel up to 1.4 mm
- Permanent actuation possible
- Designed for low-level switching

Typical Applications

- Off-road transportation
- Industrial electronics
- Joysticks
- Medical equipment



Construction

FUNCTION: momentary
 DISTANCE BETWEEN BUTTON CENTERS:
 min. 11 (0.433)
 TERMINALS: PC pins, tinned
 MOUNTING: Locating pins; K12P additionally with
 snap-in housing

Mechanical

TOTAL TRAVEL: 1.5 mm, 2 mm
 SWITCHING TRAVEL: 0,6 mm *
 OPERATING FORCE: 1.5 N OD without snap-point as detector
 switch

* Additional switching travel (with pre-travel) available by request

Packaging

Bulk in boxes of 300 pieces

Electrical

SWITCHING POWER MIN./MAX.: 0.02mW/3 W
 SWITCHING VOLTAGE MIN./MAX.: 2 V DC / 30 V DC
 SWITCHING CURRENT MIN./MAX.: 10 mA /100 mA
 DIELECTRIC STRENGTH (50 Hz, 1 min): ≥ 500 V
 OPERATING LIFE with max. switching power: ≥ 10⁶ operations
 CONTACT RESISTANCE: Initial ≤ 50 mΩ
 INSULATION RESISTANCE: ≥ 10¹⁰ Ω
 BOUNCE TIME: ≤ 1 ms
 Operating speed 100 mm/s (3.94/s)

Environmental

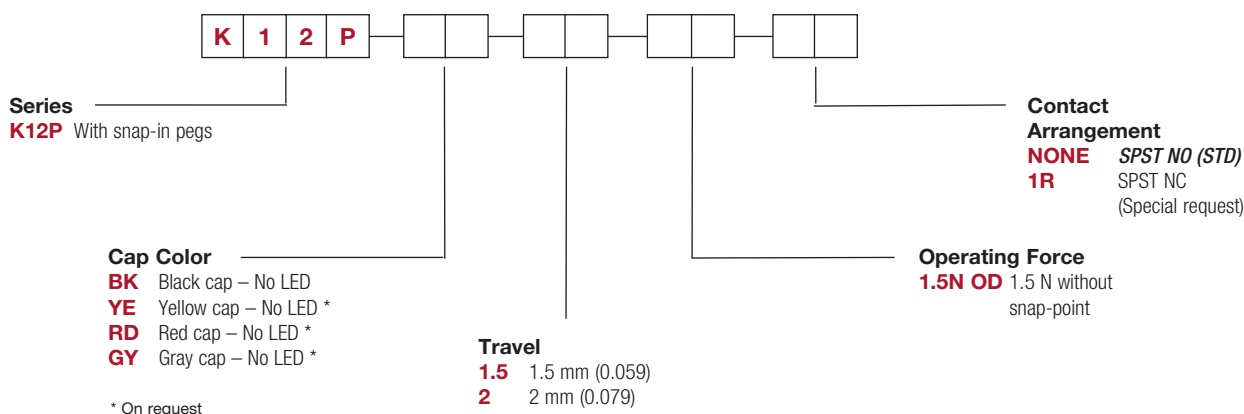
OPERATING TEMPERATURE: -40°C to 85°C.
 STORAGE TEMPERATURE: -40°C to 95°C.

Process

SOLDERABILITY:
 Wave soldering, compatible with lead free soldering profile
 Hand soldering, 350°C

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.

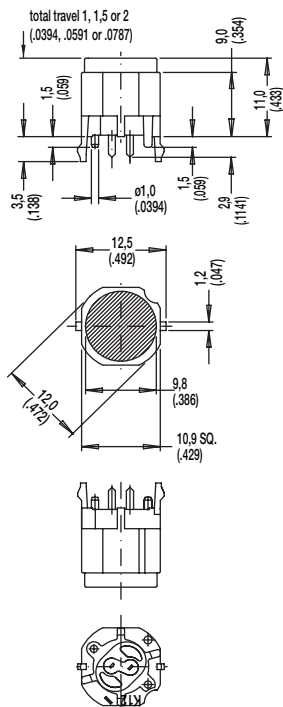


Detect

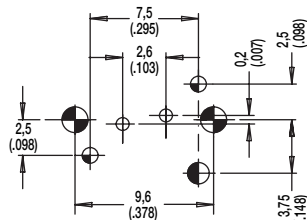
K12 D High Performance Detect Switches

SERIES

K12P with snap in



PCB LAYOUT, MOUNTING SIDE



Hole	Ø	Without LED	Description	Terminal Section	Surface
	1,7 (.069)	2x	snap-in		
	1,6 (.062)	1x	coding hole (L,M,N)		
	1,1 (.043)	2x	center hole		Sn
	0,9 (.035)	2x	switch	0.7 x 0.2 (.028 x .081)	Sn

RB Series Rolling Ball Sensor Switch



Features/Benefits

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

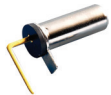
Typical Applications

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

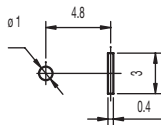
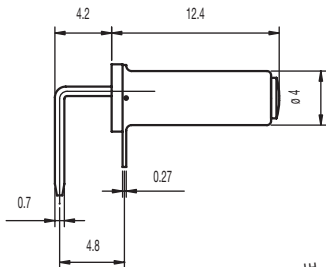
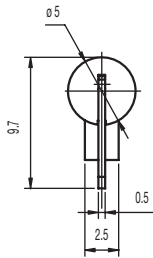
How To Order

Part number list is shown below. For individual part details, please refer to the following.

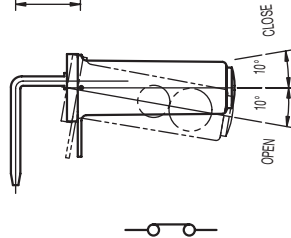
Part Number (Part Description)	Product Details
RB-231X2	Rolling Ball Sensor Switch
RB-220-07A R	Rolling Ball Sensor Switch



PART NUMBER	PACKAGING
RB-231X2	1,000 pieces



PCB LAYOUT



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)

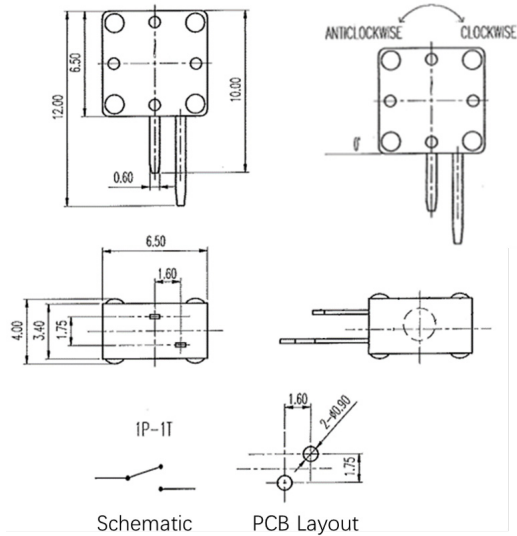
MOVABLE CONTACT: Copper alloy, nickel plated

TERMINALS: Copper alloy, gold plated

BRASS BALL: Brass, gold plated

RB Series Rolling Ball Sensor Switch

PART NUMBER	PACKAGING
RB-220-07A R	500 pieces



Specifications

CONTACT ARRANGEMENT: SPST

SENSOR ANGLE: In the range of 15° to 90°, current appears between terminals

MINIMUM VOLTAGE: 1 VDC 10 μ A (resistive load)

MAXIMUM VOLTAGE: 5 VDC 1mA (resistive load)

OPERATING LIFE WITH LOAD: 100,000 cycles

INSULATION RESISTANCE: 10 M Ω min. @ 100 VDC

DIELECTRIC STRENGTH: 100 V AC (50-60 Hz)

OPERATING TEMPERATURE: -10°C to +50°C

Materials

COVER: PA

HOUSING: PA

SILICON SHEET: Silica

TERMINALS: Copper alloy, gold plated

BRASS BALL: Brass, gold plated



Detect

HS Series Hook Switches



Features/Benefits

- Connect headsets and phones
- Answer and hang up for telephone
- Various lever designs

Typical Applications

- Telecommunication
- Computer peripherals
- Medical devices

Specifications

CONTACT ARRANGEMENT: DPDT
 CONTACT RATING: 0.2 A @ 30 VDC
 INITIAL CONTACT RESISTANCE: 50 m Ω max.
 INSULATION RESISTANCE: 100M Ω min. @ 500 VDC
 DIELECTRIC STRENGTH: 500 V AC (50-60 Hz)
 OPERATING TEMPERATURE: -20°C to + 70°C
 OPERATING FORCE: 50 ± 20 gf

Materials

LEVER: POM (UL94 HB)
 COVER: POM (UL94 HB)
 TERMINAL: Silver plated

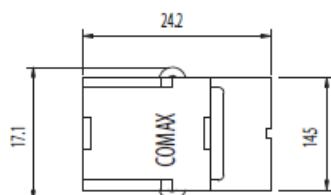
NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How To Order

Part number list is shown below. For individual part details, please refer to the following pages.

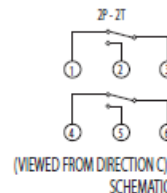
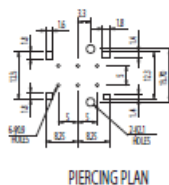
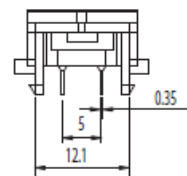
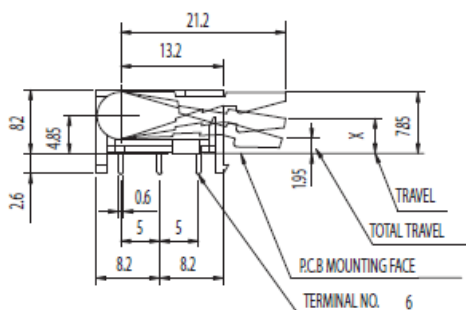
Part Number (Part Description)	Product Details
HS-2206-A1 NS	Hook Switches 24.2 *17.1
HS-2206-D NS	Hook Switches 35.9 * 17.2
HS-2206-E NS	Hook Switches 34* 17.2

PART NUMBER	LIFE CYCLE	PACKAGING
HS-2206-A1 NS	300,000 cycles	5,000 pieces



TRAVEL POSITION (X)			
①	③	ON	OFF
②	③	OFF	ON
④	⑥	ON	OFF
⑤	⑥	OFF	ON

6.85 Max 2.65 Min (m/m)

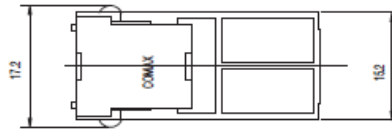


Detect



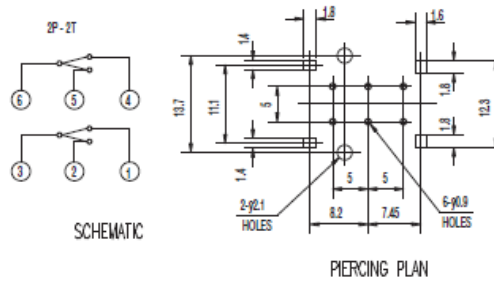
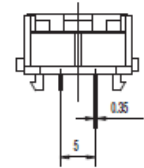
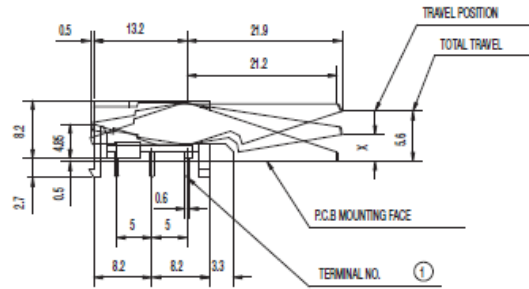
HS Series Hook Switches

PART NUMBER	LIFE CYCLE	PACKAGING
HS-2206-D NS	100,000 cycles	5,000 pieces

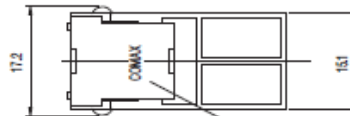


TRAVEL POSITION (q)			
①	③	ON	OFF
②	④	OFF	ON
④	⑥	ON	OFF
⑤	⑥	OFF	ON

0 1.5Min. 5.2Max. (m/m)

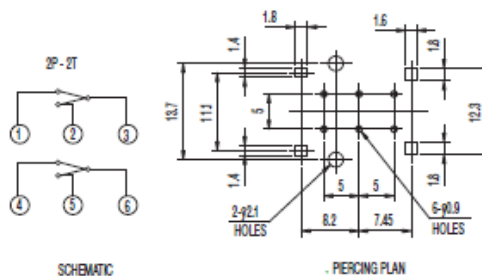
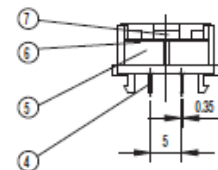
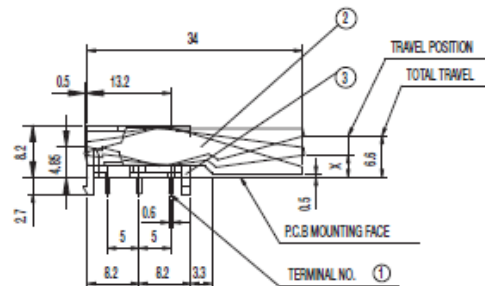


PART NUMBER	LIFE CYCLE	PACKAGING
HS-2206-E NS	100,000 cycles	5,000 pieces



TRAVEL POSITION (q)			
①	③	ON	OFF
②	④	OFF	ON
④	⑥	ON	OFF
⑤	⑥	OFF	ON

0 1.5Min. 5.9Max. (m/m)



Detect

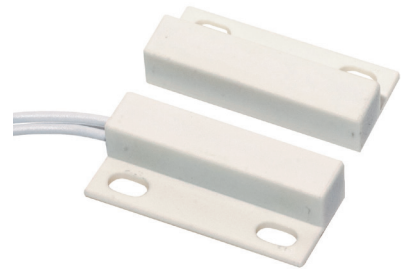
MPS Series Magnetic Proximity Sensors

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: 50V AC/DC 50/60Hz 5W (0.25A maximum)
RESISTIVE

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

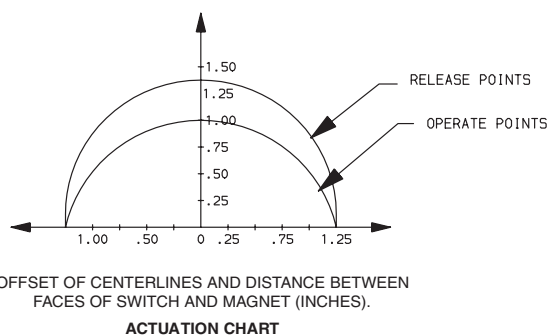
ADHESIVE MOUNTING: Foam-backed, pressure-sensitive adhesive with release liner.

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

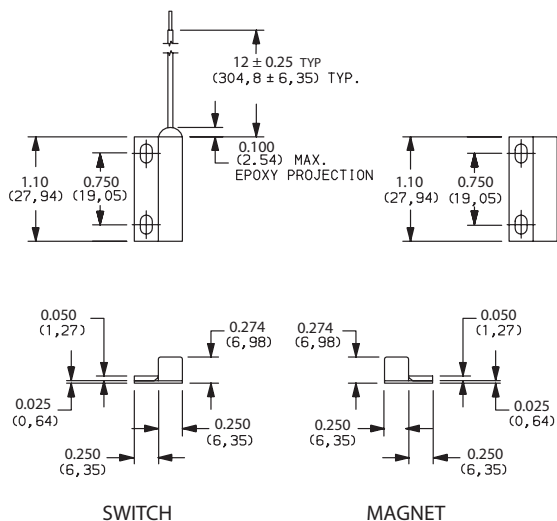
How To Order

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

UL 61058



NOTE: UL 61058 Rating



Dimensions are shown: mm
Specifications and dimensions subject to change

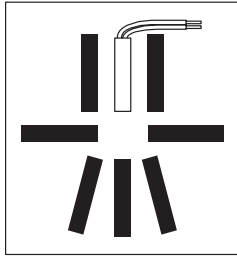
Actuating Positions

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.

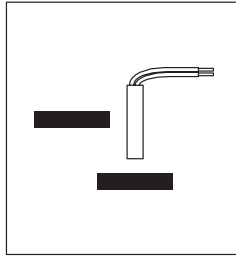
Gap Distance

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"

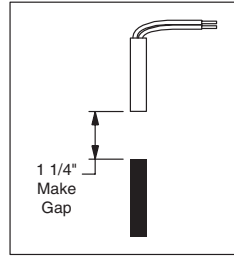
Correct Configuration



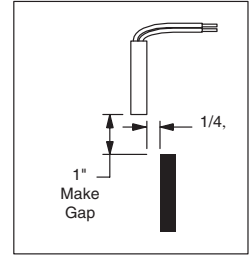
Incorrect Configuration



Center Alignment



Off Center Alignment



MPSR Series Ruggedized Magnetic Proximity Sensors

Features/Benefits

- Long life—2M operations
- Sealed contacts
- Quality construction
- Quick and easy installation
- IP69 rating
- Form C SPDT contacts

Typical Applications

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



Specifications

CONTACT RATINGS: 200mA @ 3W, 15 VDC

CONTACT RESISTANCE: 300 m Ω max. initial.

DIELECTRIC STRENGTH: 150V DC min.

ELECTRICAL CIRCUIT: SPDT NO/NC (Contact Form C). Reed switch normally open contact opens when magnet is removed from proximity. Normally open contact contacts are held closed when magnet is within actuation range.

OPERATING TEMPERATURE: -40°F to 176°F (-40°C to 80°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: 2 million operations.

PACKAGING: Bulk packaging, 1 switch and magnet pairs per package.

Materials

HOUSING/SPACER/COVER: Aluminum, black.

REED SWITCH: Rhodium coated reed contacts in hermetically sealed, nitrogen filled glass capsule. Used in closed loop circuits.

WIRE LEADS: UL 1061/ UL1007 / UL2468

All are 22 AWG wire: stranded, made of copper or aluminum; Length: 2 meters with ends stripped; Jacket: Stainless steel.

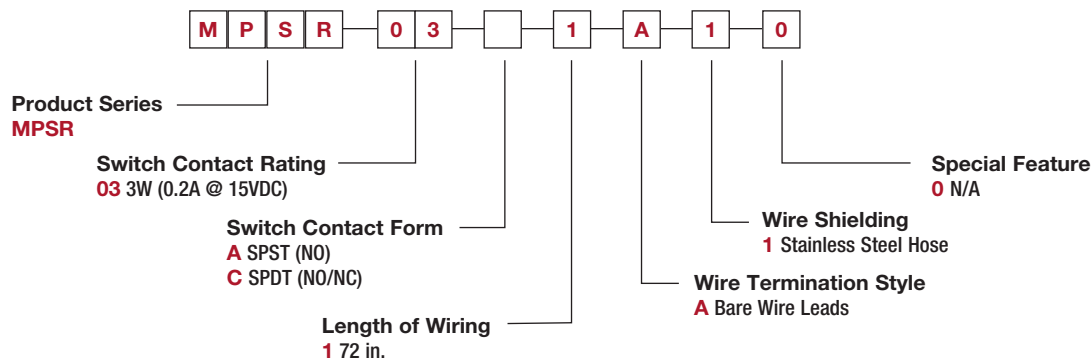
POTTING (around wires): Epoxy.

MAGNETS: NdFeB

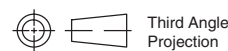
NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

How To Order

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.



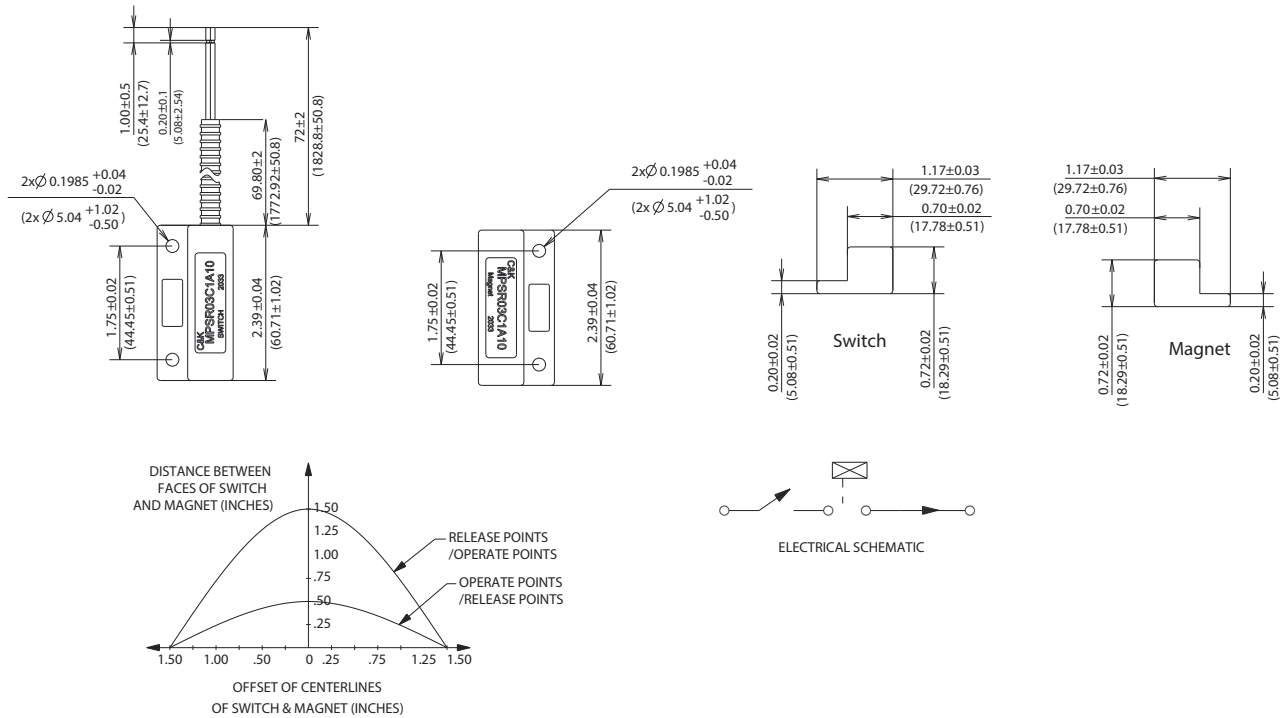
* Please consult factory to see if your custom application requirements can be accommodated by a tailored solution



Dimensions are shown: mm
Specifications and dimensions subject to change

MPSR Series Ruggedized Magnetic Proximity Sensors

Dimensions unit: inch (mm)



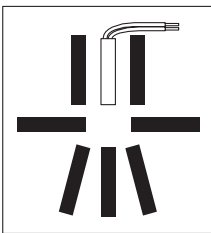
Actuating Positions

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.

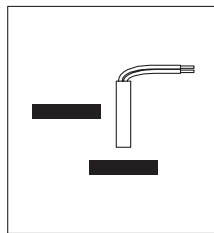
Gap Distance

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 $1/4''$.

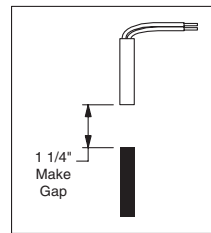
Correct Configuration



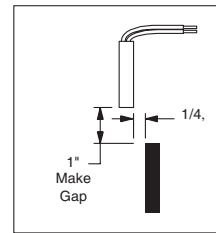
Incorrect Configuration



Center Alignment



Off Center Alignment



SWITCH CONTACT FORM

Switch Contact Form	Circuit Schematic	Wire Color
A	<p>COM N.O.</p>	COM: Black N.O.: Red
C	<p>COM N.C. N.O.</p>	COM: Black N.O.: Yellow N.C.: Red



Dimensions are shown: mm
Specifications and dimensions subject to change