TSU Series

6.1 × 3.7 SMD Tact Switch





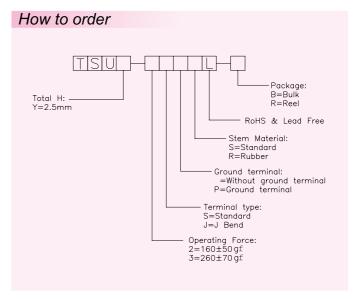
Features

Highly reliable contacts sealed structure.

Larger top surface of stem improves mounting speed.

Reflow solderable.

Packaged with a 16mm wide embossed taping.



Applications

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSUY-S	TSUY-J	TSUY-SP
Dimensions	005 25±61	6.1±0.2 0.7±0.2 2.70 0.7±0.2 2.70 0.7±0.2	2.5±0.2
Circuit Diagram	①——◇ →—② <u>Cirguit Diagram</u>	①———② Cirguit Diagram 8.00	Cirguit Diagram 9.30 6.30
Pad Layout	6.50 <u>月</u> 	PCB Board	2.70 4.70 PCB Board

TSSURX Series

6.2 × 3.6 SMD Tact Switch



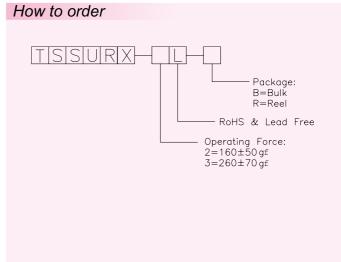


Features

Compact, low-profile surface-mounting type keyboard switches ideal for high-density mounting.

Contacts are comletely sealed, enhancing reliability. Reflow solderable.

Available with ground terminal for electrostatic dischang.

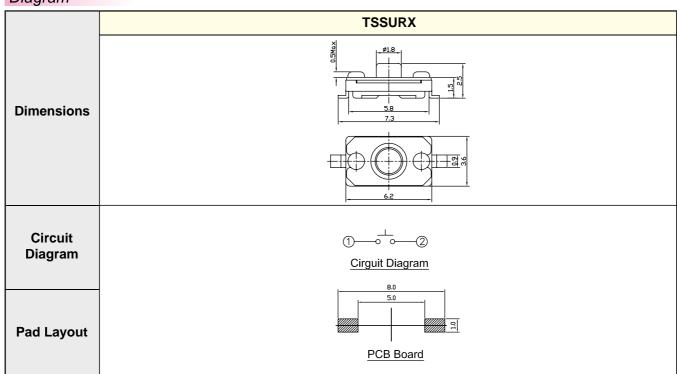


Applications

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.40 ± 0.2mm	



TSY Series

6.0 × 4.0 Normal Closed Type Tact Switch





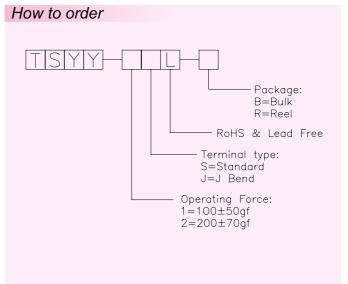
Features

Highly reliable contacts sealed structure.

Larger top surface of stem improves mounting speed.

Reflow solderable.

Packaged with a 16mm wide embossed taping.

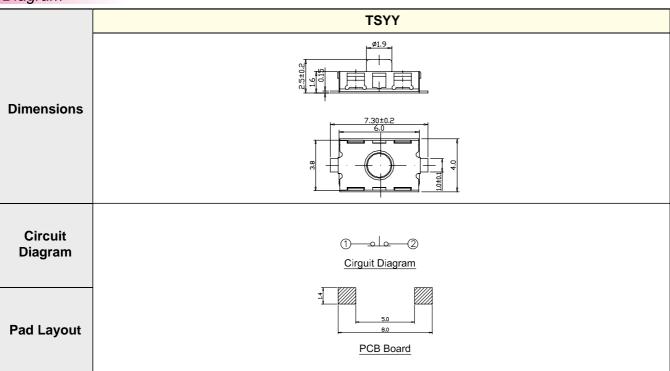


Applications

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	1:100 ± 50gf, 2:200 ± 70gf	
	Travel	0.3 ± 0.15mm	



TSY Series

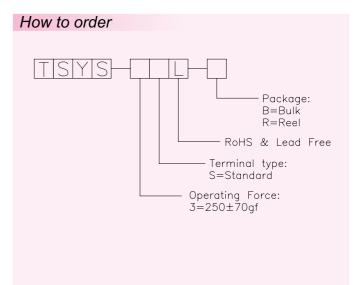
6.0 x 5.0 Normal Closed Type Tact Switch





Highly reliable contacts sealed structure. Larger top surface of stem improves mounting speed. Reflow solderable.

Packaged with a 16mm wide embossed taping.



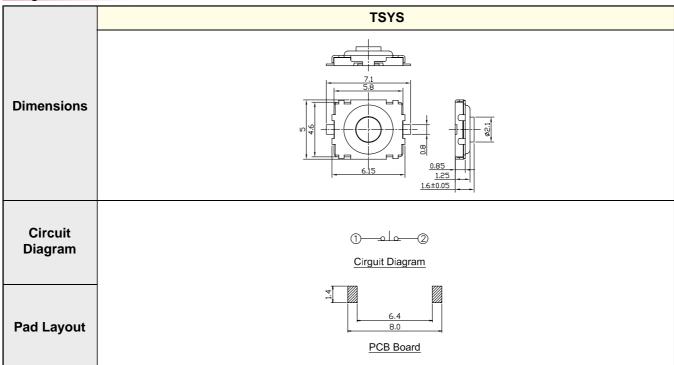
Applications

Features

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	3:250 ± 70gf	
	Travel	0.25 ± 0.1mm	



TSH Series

6.0 x 3.5 Horizontal Push Tact Switch



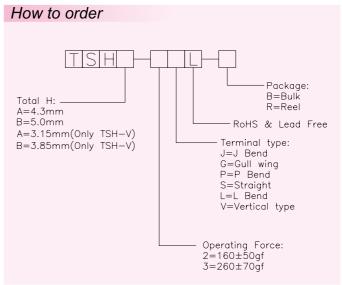


Features

Reflow solderable.

Packaged with a 16mm wide embossed taping.

Sharp "click" feel with a positive tactile feedback.



Applications

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	30,000 Cycles, 50,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSH-J	TSH-G	TSH-P
	4-R0.3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4-R0.3 6
Dimensions	20 20 20 20 20 20 20 20 20 20	70 1.25 10.2	302 6.5 7.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
Circuit Diagram	①——◇ <mark>Cirguit Diagram</mark>	①——° °——② Cirguit Diagram	①—◆ ○—② <u>Cirguit Diagram</u>
Pad Layout	4.3 7.9 PCB Board	6.0 11.5 PCB Board	2:201.3 role 6.5 PCB Board

TSH Series

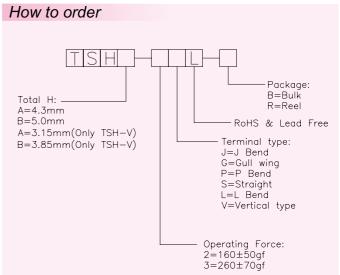
6.0 x 3.5 Vertical Push & Horizontal Push Tact Switch





Features

Reflow solderable.
Packaged with a 16mm wide embossed taping.
Sharp "click" feel with a positive tactile feedback.



Applications

Operating switches in all types of electronic equipment such as audio apparatus, office equipment, communiction apparatus, measuring instruments, TV sets, VCRs, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	30,000 Cycles, 50,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSH-S	TSH₁L	TSH-V
Dimensions	3.5 MAX0.4 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	3.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	7.3 3 40.3 2.6 h 2.5
Circuit Diagram	0 — 0 — ② Cirguit Diagram	①——② Cirguit Diagram	①──◇ Ó ② ③──── ④ ☐ Cirguit Diagram
Pad Layout	22013 1008 — 6.5 — 6.5 — PCB Board	6.2 8.2 PCB Board	2.2013 role

TSCF Series

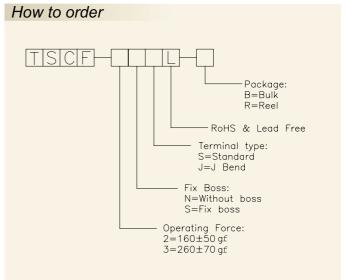
4.7 x 3.5 Side Push Tact Switch





Features

Suitable for high-density mounting.
Vertical type capable of vertical oeration to the PC board.
Contacts are completely sealed, enhancing reliability.
Packaged with a 12mm wide embossed taping.



Applications

Portable devices Mobile phones and personal digital assistants. Operation of variouw digital devices.

Specification

Items		Standard
Operating temperature range		- 20 to +70
	Rating	50mA, 12V DC
Electrical	Insulation resistance	100MΩ min. 100V DC
performance	Dielectric strength	250V AC for 1 min.
	Contact resistance	100mΩ max.
Durability	Lifetime	50,000 Cycles, 100,000 Cycles
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf
	Travel	0.25 ± 0.1mm

	TSCF-NS	TSCF-SS	TSCF-NJ	TSCF-SJ
Dimensions	6.4±0.1 4.7±0.1 9.50 1.00 9.50 1.00 9.50 1.00 9.50 1.00 9.50 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	6.4±0.1 4.7±0.1 10±0 2.6 2.6 2.90.6 2.75	3.5±0.1 4.4±0.1 4.4±0.1 4.4±0.1 4.5	5.5±0.1 4.7±0.1 90 2.60 2.75 90 2.75
Circuit Diagram	① ② ② ③ O Cirguit Diagram	© ©	© Cirguit Diagram	Cirguit Diagram
Pad Layout	3.7±0.1 6.8±0.1 PCB Board	3.7±0.1 6.8±0.1 PCB Board	3.7±0.1 -3.7±0.1 -6.8±0.1 -CB Board	3.7±0.1 6.8±0.1 PCB Board

TS4V Series

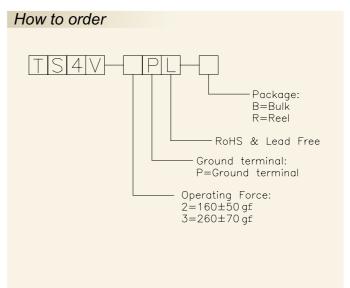
4.6 x 3.35 Side Push Tact Switch





Features

Vertical type capable of Vertical operation to the PC board. The switch is supplied in 12mm embossed taping system.

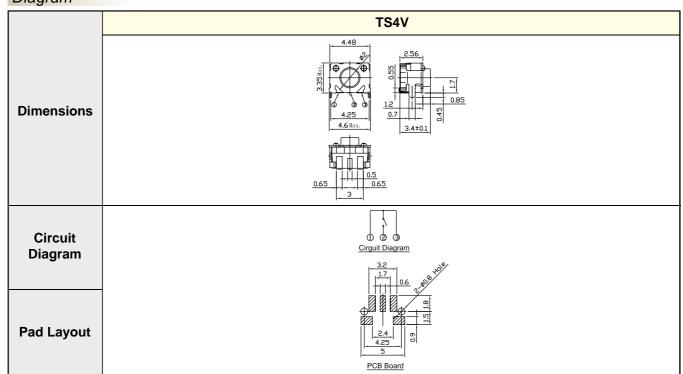


Applications

Portable devices Mobile phones and personal digital assistants. Operation of variouw digital devices.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	



TSSH-VS Series

4.6 x 1.8 Side Push Tact Switch



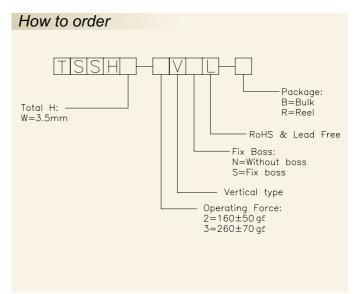


Features

Improve mounting density of components on PC board. Reflow solderable.

Contacts are completely sealed, enhancing reliability.

Packaged with a 12mm wide embossed taping.



Applications

For operating various mobile devices.

For operating various devices that require high density mounting such as mobile phones, communication devices, compact electronic devices.

Specification

	Items	Standard
Operating temperature range		- 20 to +70
	Rating	50mA, 12V DC
Electrical	Insulation resistance	100MΩ min. 100V DC
performance	Dielectric strength	250V AC for 1 min.
	Contact resistance	100mΩ max.
Durability	Lifetime	30,000 Cycles, 50,000 Cycles
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf
	Travel	0.25 ± 0.1mm

Diagraili		
	TSSH-VS	TSSH-VN
Dimensions	4.55 90 4.6±0.1	4.55
Dimensions	2-0.35 3.4 3.65	2 -0.35 3.4 3.85
Circuit Diagram	①——o ——② <u>Cirguit Diagram</u>	⊕—° °—② Cirguit Diagram
Pad Layout	5.4 4.2 3.2 1.7 0.6 3.4 PCB Board	5.4 4.2 3.2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

TSSH-V Series

4.6 x 1.8 Side Push Tact Switch

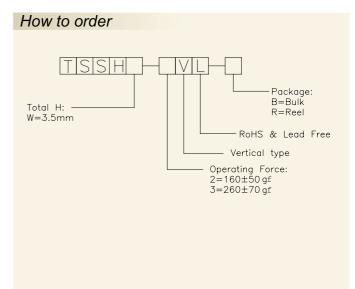




Features

Improve mounting density of components on PC board. Reflow solderable.

Contacts are completely sealed, enhancing reliability. Packaged with a 12mm wide embossed taping.



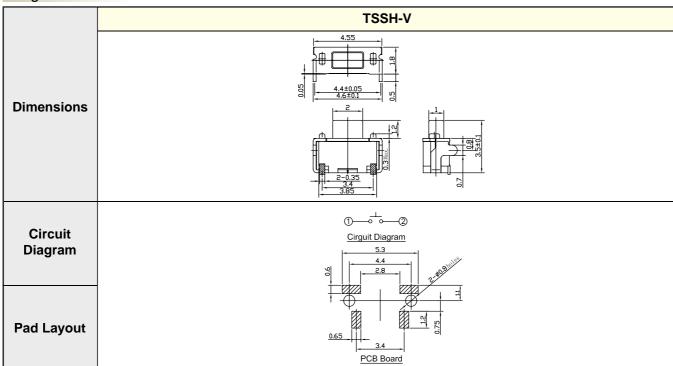
Applications

For operating various mobile devices.

For operating various devices that require high density mounting such as mobile phones, communication devices, compact electronic devices.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	30,000 Cycles, 50,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	



TS01 Series

6.0 × 6.0 SMD Tact Switch

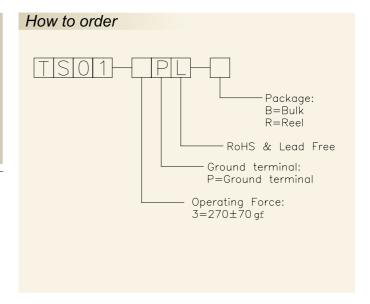




Features

Improve mounting density of components on PC board. Reflow solderable.

Contacts are completely sealed, enhancing reliability. Packaged with a 12mm wide embossed taping.



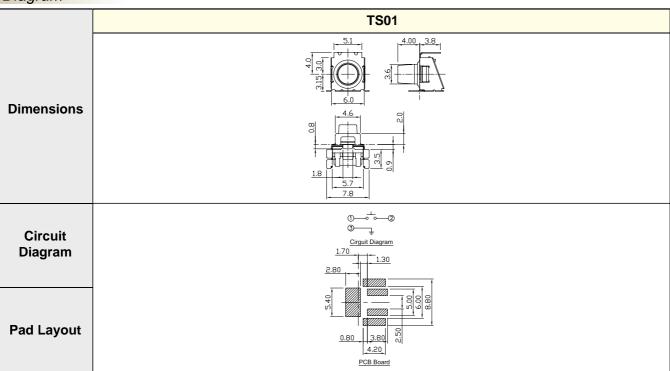
Applications

For operating various mobile devices.

For operating various devices that require high density mounting such as mobile phones, communication devices, compact electronic devices.

Specification

Items		Standard
Operating temperature range		- 20 to +70
	Rating	50mA, 12V DC
Electrical	Insulation resistance	100MΩ min. 100V DC
performance	Dielectric strength	250V AC for 1 min.
	Contact resistance	100mΩ max.
Durability	Lifetime	30,000 Cycles, 50,000 Cycles
Mechanical performance	Operating force	3:270 ± 70gf
	Travel	0.30 ± 0.1mm



TSV-S Series 6.0 × 6.0 SMD Tact Switch



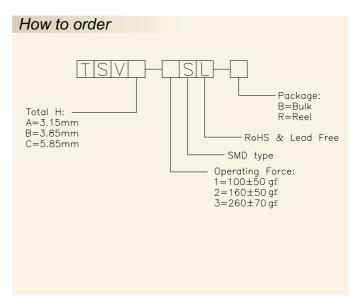




Features

Improve mounting density of components on PC board. Reflow solderable.

Contacts are completely sealed, enhancing reliability. Packaged with a 12mm wide embossed taping.



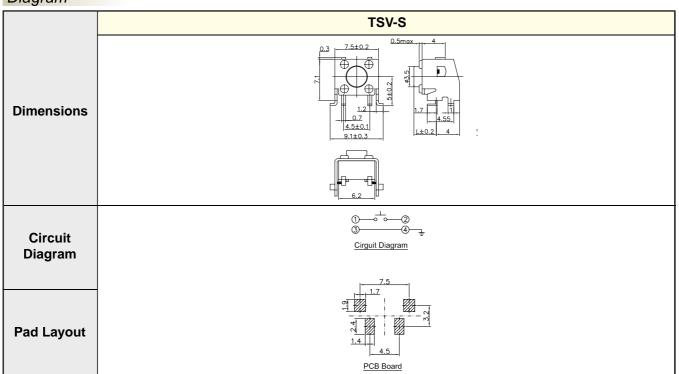
Applications

For operating various mobile devices.

For operating various devices that require high density mounting such as mobile phones, communication devices, compact electronic devices.

Specification

•			
Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	1:100 ± 50gf, 2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	



TSH-VS Series

7.0 x 3.5 Side Push Tact Switch



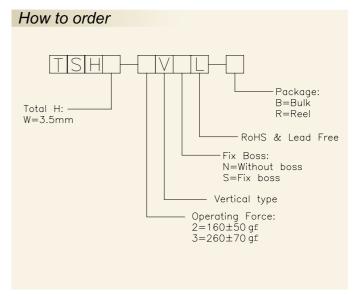


Features

Vertical type capable of operating in the vertical direction to the PC board.

Reflow solderable.

Packaged with a 16mm wide embossed taping.



Applications

Various portable electronic devices.

For operating various compact electronic devices such as mobile phones and communication devices, that require high density mounting. For operating various MP4, MP3.

Specification

Items		Standard
Operating temperature range		- 20 to +70
	Rating	50mA, 12V DC
Electrical	Insulation resistance	100MΩ min. 100V DC
performance	Dielectric strength	250V AC for 1 min.
	Contact resistance	100mΩ max.
Durability	Lifetime	30,000 Cycles, 50,000 Cycles
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf
	Travel	0.25 ± 0.1mm

	TSH-VS	TSH-VN
Dimensions	7 The length loterance range L _S 10	7 The length Tolerance range
		3 5 5 5 7
Circuit Diagram	①——② Cirguit Diagram	①——○ ○——② <u>Cirguit Diagram</u>
Diagram	5.4 2.2 2.3 2.4 2.4 2.4	8.4 5.4 9
Pad Layout	3 3 5.4	3
	PCB Board	PCB Board

TSV Series

6.0 x 6.0 Side Push Tact Switch



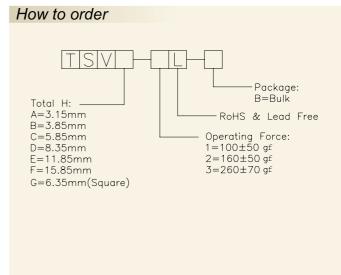


Features

Snap-in type, which can be directly mounted on PC board. Some of output terminals can be also used as jumper leads, thus making circuit design easy.

Available with anti-ESD ground terminal.

Standard knobs are available.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

•			
Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	1:100 ± 50gf, 2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSVA~F	TSV-G
Dimensions	0.50 max 0.50 max 0.50 max 10 10 10 10 10 10 10 10 10 1	0.7 MAX-
Circuit Diagram	① — ② ② ③ — ④ — ② ③ — — ② — — — — — — — — — — — — — — — —	① ② ② ③ ④ ½ — Cirguit Diagram 2-ø1.3±0.1 2-ø1.0±0.1
Pad Layout	4.5±0.1 TO FOR THE PCB Board	4.5±0.1

TSQ Series

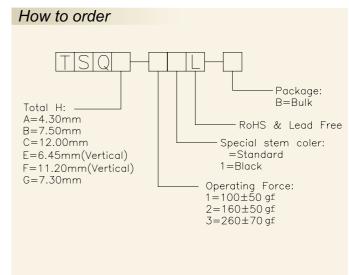
12.0 x 12.0 Other Types Stem With Stable Operation Feeing Tact Switch





Features

Snap-in type, which can be directly mounted on PC board. Some of output terminals can be also used as jumper leads, thus making circuit design easy. Standard knobs are available. SMT Type Available.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles,	
Mechanical performance	Operating force	1:100 ± 50gf, 2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.30 ± 0.15mm	

	TSQA	TSQB	TSQC
Dimensions	XWX E00 200 WXX WX	35.5 AAX	THE TOTAL PARTY OF THE TOTAL PAR
	1.0±0.1 12.5 14.1 1.0±0.1 1.0±0.2	12.5 14.1 15.0±0.2	12.5 14.1 14.1 15.5 16.1
Circuit Diagram	⊕	©	©
	12.5	.2	
Pad Layout	05	12.5	12.5
	PCB Board	PCB Board	PCB Board

TSQ Series

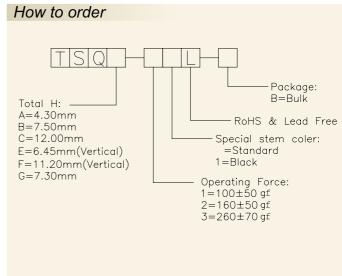
12.0 x 12.0 Other Types Stem With Stable Operation Feeing Tact Switch





Features

Snap-in type, which can be directly mounted on PC board. Some of output terminals can be also used as jumper leads, thus making circuit design easy. Standard knobs are available. SMT Type Available.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

•			
Items		Standard	
Operating temperature range		- 20 to +70	
	Rating	50mA, 12V DC	
Electrical	Insulation resistance	100MΩ min. 100V DC	
performance	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability	Lifetime	50,000 Cycles, 100,000 Cycles,	
Mechanical performance	Operating force	1:100 ± 50gf, 2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.30 ± 0.15mm	

	TSQG	TSQE	TSQF
Dimensions	XW E 0 3.0 0 06.7 0 06.7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.1 012.0 3.4 1.8 3.4 2.0 1.2 1.2 7.5 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	13.1 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 13.1 12.0 12.0 13.1 12.0 13.1 14.0 15.0 16.0
Circuit Diagram	© Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø	⊕—⊶°——② ③——————————————————————————————————	⊕—o o o o o o o o o o o o o o o o o o o
Pad Layout	PCB Board	13.0 12.0 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8	130 20 20 20 3001 PCB Board

TSX Series

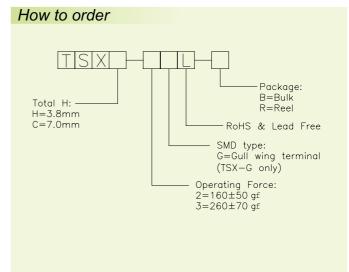
4.5 × 4.5 Through Hole & SMD Tact Switch





Features

Snap-in type, which can be directly mounted on PC board. Some of output terminals can be also used as jumper leads, thus making circuit design easy. Standard knobs are available.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
Electrical performance	Rating	50mA, 12V DC	
	Insulation resistance	100MΩ min. 100V DC	
	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability Lifetime		50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSX-G	TSX	
Dimensions	75 H H TORE TO	02.5±0.1 02.5±0.1 07.±0.1	
Circuit Diagram	©	© ⊕ Cirguit Diagram 4-ø1.0±0.05 hole	
Pad Layout	PCB Board	5.0±0.1 PCB Board	

TSAU Series

6.8 x 6.8 Sealed Tact Switch

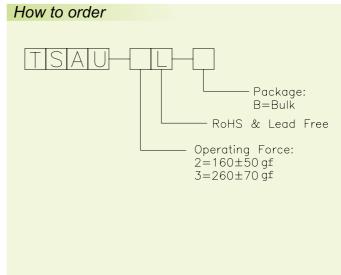




Features

Some of output terminals can be also used as jumper leads, thus making circuit design easy.

This switch is assembling from the P.C. board botton of surface insert, the movement part in the frontage, which is suitable to switch's highly lowest environment.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
Electrical performance	Rating	50mA, 12V DC	
	Insulation resistance	100MΩ min. 100V DC	
	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability Lifetime		50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSAU
Dimensions	6.8
Circuit Diagram	Cirguit Diagram
Pad Layout	PCB Board

TSS Series

6.0 × 6.0 Surface Mounting Tact Switch

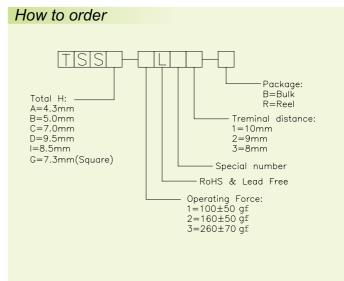




Features

Reflow solderable.

Packaged with a 16mm wide embossed taping.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
Electrical performance	Rating	50mA, 12V DC	
	Insulation resistance	100MΩ min. 100V DC	
	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability Lifetime		50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSSA~D&I	TSS-G	
Dimensions	6.2	6.2 10.0mm 0.0mm 0.0mm	
	\$3.5 \$3.5	2.4 8 8 7 8 7 8 8 7 8 7 8 7 8 7 8 7 8 7 8	
Circuit Diagram	© O Cirguit Diagram	© ©	
Pad Layout	5-#1±005hole PCB Board	5-812005hole PCB Board	

TSL Series

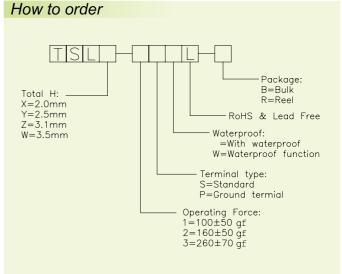
6.2 × 6.2 Flat & U-Type Terminals Type Tact Switch





Features

Reflow solderable. Available with anti-ESD ground terminal. Packaged with a 16mm wide embossed taping.



Applications

Operating switches in all types of electronic equipment such as audio devices, office devices, communication devices, measuring instruments, TVs, video recorders, automotive sets, etc.

Specification

Items		Standard	
Operating temperature range		- 20 to +70	
Electrical performance	Rating	50mA, 12V DC	
	Insulation resistance	100MΩ min. 100V DC	
	Dielectric strength	250V AC for 1 min.	
	Contact resistance	100mΩ max.	
Durability Lifetime		50,000 Cycles, 100,000 Cycles	
Mechanical performance	Operating force	2:160 ± 50gf, 3:260 ± 70gf	
	Travel	0.25 ± 0.1mm	

	TSL-S	TSL-P	TSL-SW	TSL-PW
Dimensions	6.2 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	6.2	6.2	2
Circuit Diagram	Cirguit Diagram 9.5	Cirguit Diagram 9.5	©——© ©irguit Diagram 9.5	Cirguit Diagram 9.5
Pad Layout	PCB Board 4,	92 4 4 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	PCB Board	3.1 1.6 PCB Board