

# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series



## Snap-Action Switches

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### DESCRIPTION

The industry-defining name in snap-action switches, Honeywell MICRO SWITCH™ standard subminiatures are designed for repeatability and enhanced product life. The MICRO SWITCH™ Z Series combines small size and light weight with ample electrical capacity, low cost, and enhanced life.

The MICRO SWITCH™ Z Series consists of six product families with unique features that can drop right into an application.

These reliable and rugged switches offer a variety of actuators, terminations, circuitry configurations, electrical ratings, contact materials, operating characteristics, and sealing allows them to be utilized in numerous potential applications.

Carefully manufactured and thoroughly inspected, the MICRO SWITCH™ Z Series standard subminiatures are a great value for applications requiring sensing presence or absence of an object.

### FEATURES

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- Small size and light weight switches lend themselves to numerous potential applications
- Choice of low energy or power-duty electrical ratings allow the switch to be specified in more types of applications
- Broad range of amp ratings (from 0.1 A to 10.1 A)
- Watertight IP67 sealing available on some listings allows the switch to be used where sealing and presence/absence detection is required
- UL/CSA, cUL, ENEC, and CE approvals




### POTENTIAL APPLICATIONS

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- **Industrial:** Appliances, communication equipment, computers, electromechanical timers, mechanical cam assemblies (timers), office equipment, electric tools, HVAC wall controls, instrumentation, valves, vending machines
- **Transportation:** Automotive, truck, and boat wire harnesses; sub-assemblies for convertible roofs; lock modules for tail-gate/trunk; tank and hood latch detection
- **Medical:** Medical and hospital beds, foot pedal controls, and chair lifts
- Applications where a pre-wired sealed on/off switch is required

# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series

## SPECIFICATIONS

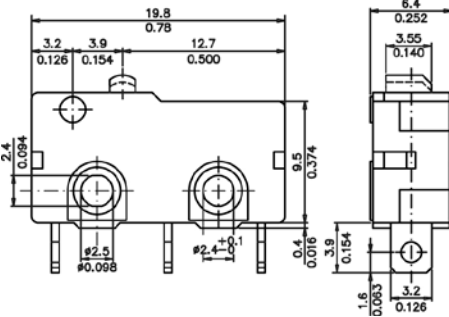
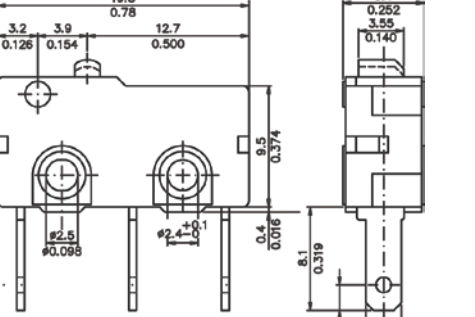
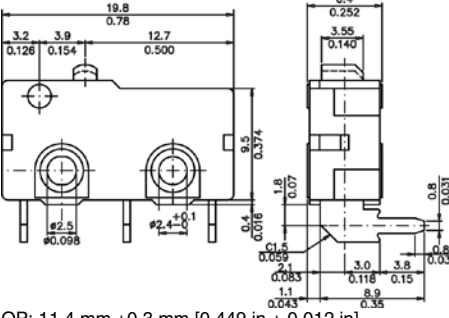
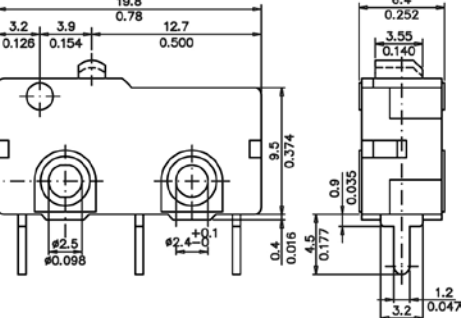
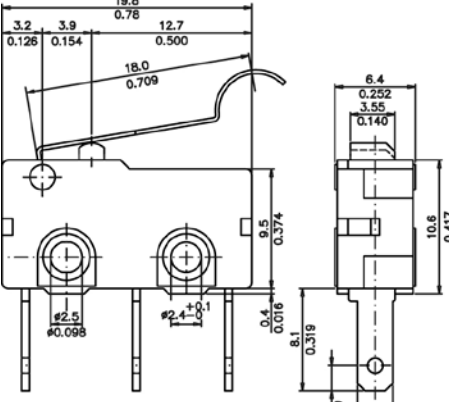
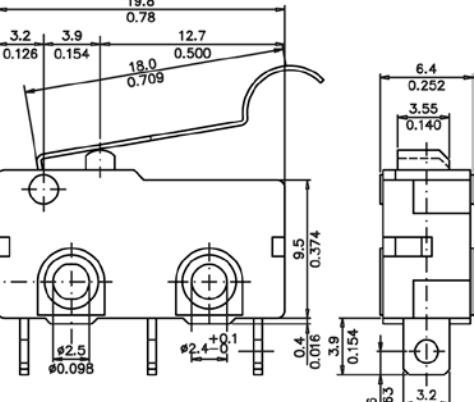
			
<b>SERIES</b>	<b>ZM (coil internal spring)</b>	<b>ZM1 (flat internal spring)</b>	<b>ZV (coil spring)</b>
Differentiator	Integral lever, no ENEC, and an internal coil spring	Integral lever, ENEC, and a flat internal spring	Snap-on lever, ENEC, and coil spring
Use	Use when ENEC is not required and the lever needs to be better secured to the switch	Used when added forces of a flat snap spring, ENEC, and a secured lever are required	Use when ENEC and a snap-on lever are required
Potential applications	alarms, computers, food processors, gas detectors, humidifiers, joysticks, money sorters, water pumps	air conditioners, consumer electronics, gas detectors, humidifiers, telephones, time recorders, toys	air conditioners, computers, consumer appliances, gas detectors, joysticks, money sorters, telephones, toys
Ampere rating	0.1 A, 5 A, 10.1 A	0.1 A, 3 A, 6 A, 10.1 A	0.1 A, 6 A, 10.1 A
Circuitry	SPDT, SPNO	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC
Operating force	0.18 oz to 8.78 oz	12 gf to 355 gf	0.78 oz to 11.01 oz
Termination	Quick connect, solder, pcb	Quick connect, solder, pcb	quick connect, solder, pcb
Actuator	Pin plunger, straight, roller, sim. roller, L-shaped	Pin plunger, straight, roller, sim. roller, L-shaped	pin plunger, straight, roller, sim. roller
Voltage	125 Vac, 250 Vac, 30 Vdc	125 Vac, 250 Vac	125 Vac/125 Vdc 6(2) A 250 Vac
Agency approvals	UL, CE, CSA	UL, cUL, ENEC	UL, CE, CSA, ENEC
Agency file info	CE: 61058-1; UL: E12252; CSA: LR212438	UL: E12252; c-UL: E12252	CE: 61058-1; UL:12252; c-UL: E12252
Operating temperature	-40 °C to 120 °C [-40 °F to 248 °F]	-40 °C to 120 °C [-40 °F to 248 °F]	-40 °C to 120 °C [-40 °F to 248 °F]
Contacts	Silver, gold-plated silver, gold-plated brass, silver-tin-indium oxide	Silver, gold-plated silver, gold-plated brass, silver-tin-indium oxide	Silver, gold-plated silver, silver-tin-indium oxide
Housing	Polyamide (nylon)	Polyamide (nylon)	Polyamide (nylon)
Sealing	None		
Storage humidity	85 % RH max. at 40 °C [104 °F]		
Dielectric strength	1000 Vac (50 Hz to 60 Hz) between contacts, between terminals and ground, for one minute	1000 Vac (50 Hz to 60 Hz)/min	1000 Vac (50 Hz to 60 Hz) between contacts, between terminals and ground, for one minute
Contact resistance	300 mOhm max.	300 mOhm max.	300 mOhm max.
Insulation resistance	100 mOhm min. (at 500 Vdc/min)	100 mOhm min. (at 250 Vdc/min)	100 mOhm min. (at 500 Vdc/min)
Vibration	10 Hz to 55 Hz, displacement 0,75 mm (p-p)		
Expected mechanical life	10 million min.	10,000 operations min.	10 million min.
Electrical service life	Min. 1,000,000 operations on resistive load current 0.1 A at 125 Vac; 0.1 A at 30 Vdc; Min. 6,000 operations on resistive load 5 A at 125/250 Vac	Min. 10 million @ <10 A; Min. 1 million min. @ 10 A	Min. 1,000,000 operations @ 0.1 A; Min 10,000 operations on resistive and motor load current 6(2) A 250 Vac
Electrical operating frequency	0.1 A – 120 operations/min other – 10 to 30 operations/min	10 to 30 operations/min	0.1 A – 120 operations/min; Other – 10 to 30 operations/min
Mechanical operation frequency	120 operations/min.		

## Snap-Action Switches

			
<b>SERIES</b>	<b>ZW (water-tight)</b>	<b>ZD (water-tight)</b>	<b>ZX</b>
Differentiator	IP67 rating with lead wires; snap-on lever, coil spring, and ENEC	Smaller sized (like the ZX), sealed to IP67 (with leadwires only); plunger travel can be restricted, offers side-post quick mounting	Two-thirds the size of the ZM Series; unsealed, integral lever, and coil spring
Use	Use when a sealed position switch in a small and cost-effective package is required	Use for automotive applications due to sealing and quick mounting option	Use when a much smaller unsealed position switch is required
Potential applications	air conditioners, computers, consumer appliances, gas detectors, joysticks, money sorters, telephones, toys	automotive (operation systems and engine area interior), air conditioners, communication, electric toothbrushes, toys	calculators, computer mouse, cordless phones, electric knife & stapler, tester machines, walkie-talkies
Ampere rating	0.1 A, 5 A	0.1 A, 3 A	0.1 A, 3 A
Circuitry	SPDT, SPNO, SPNC	SPDT	SPDT
Operating force	1.94 oz to 7.16 oz	130 gf to 195 gf	0.53 oz to 5.3 oz
Termination	quick connect, solder, cable bottom exit, cable side exit	Solder, pcb straight, pcb left angle, pcb right angle, pre-wired	solder, pcb snap-in, pcb left angle, pcb right angle
Actuator	pin plunger, straight, roller, sim. roller	Pin plunger, straight, sim. roller	pin plunger, straight, roller, special
Voltage	125 Vac, 250 Vac	125 Vac, 12 Vdc	125 Vac, 48 Vdc
Agency approvals	UL, cUL, CE, ENEC	UL, cUL, CE, ENEC	UL, CE, CSA
Agency file info	CE: 61058-1; UL: E12252; c-UL: E12252	UL: E12252; c-UL: E12252	CE: 61058-1; UL:12252; CSA: LR212438
Operating temperature	-40 °C to 120 °C [-40 °F to 248 °F] (w/o wires) -40 °C to 105 °C [-40 °F to 221 °F] (w/ wires)	-40 °C to 120 °C [-40 °F to 248 °F]	-40 °C to 120 °C [-40 °F to 248 °F]
Contacts	silver, gold-plated silver	Silver, gold-plated silver	silver, gold-plated silver
Housing	PBT polyester thermoplastic	PBT polyester thermoplastic	Polyamide (nylon)
Sealing	IP67 (with leadwires only)	IP67 (with leadwires only)	None
Storage humidity	85 % RH max. at 40 °C [104 °F]		
Dielectric strength	1000 Vac (50 Hz to 60 Hz) between contacts and 1250 Vac (50 Hz to 60 Hz), between terminals and ground, for one minute	150 Vac (50 Hz to 60 Hz)/minute between contacts, 500 Vac (50 Hz to 60 Hz)/minute between live parts and dead metal parts	1000 Vac (50 Hz to 60 Hz) between contacts, between terminals and ground, for one minute
Contact resistance	30 mOhm max.	100 mOhm max.	100 mOhm max.
Insulation resistance	100 mOhm min. (at 500 Vdc/min)	100 mOhm min. (at 250 Vdc/min)	100 mOhm min. (at 500 Vdc/min)
Vibration	10 Hz to 55 Hz, displacement 0,75 mm (p-p)		
Expected mechanical life	2 million min.	500,000 min.	1 million min.
Electrical service life	Min. 10,000 operations	Min. 500,000 operations on resistive load current 10 mA; Min. 6000 operations on resistive load current 3 A	Min. 1,000,000 operations on resistive load current 0.1 A at 48 Vdc; Min. 10,000 operations on resistive load current 3 A at 125 Vac
Electrical operating frequency	10 to 30 operations/min	10 mA – 120 operations/min 3 A – 10 to 30 operations/min	0.1 A – 120 operations/min 3 A – 10 to 30 operations/min
Mechanical operation frequency	120 operations/min.		

# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series

## ZM AND ZM1 STANDARD LEVER OPTIONS & DIMENSIONS mm/in

Lever/ Terminals	Dimensions	Lever/ Terminals	Dimensions
Pin plunger/ solder	 <p>OP: 11,4 mm ±0,3 mm [0.449 in ± 0.012 in] DT: 0,2 mm [0.008 in max.]</p>	Pin plunger/ quick connect	 <p>OP: 11,4 mm ±0,3 mm [0.449 in ± 0.012 in] DT: 0,2 mm [0.008 in max.]</p>
Pin plunger/ PCB right	 <p>OP: 11,4 mm ±0,3 mm [0.449 in ± 0.012 in] DT: 0,2 mm [0.008 in max.]</p>	Pin plunger/PCB	 <p>OP: 11,4 mm ±0,3 mm [0.449 in ± 0.012 in] DT: 0,2 mm [0.008 in max.]</p>
Simulated roller/quick connect	 <p>OP: 15,1 mm ±1,5 mm [0.591 in ± 0.059 in] DT: 0,9 mm [0.035 in max.]</p>	Simulated roller/solder	 <p>OP: 15,1 mm ±1,5 mm [0.591 in ± 0.059 in] DT: 0,9 mm [0.035 in max.]</p>

# Snap-Action Switches

Continued – ZM AND ZM1 STANDARD LEVER OPTIONS & DIMENSIONS mm/in

Lever/ Terminals	Dimensions	Lever/ Terminals	Dimensions
Roller/solder	<p>OP: 17,5 mm ±0,8 mm [0.689 in ± 0.032 in] DT: 0,81 mm [0.032 in max.]</p>	Straight/ solder	<p>OP: 11,8 mm ±0,89 mm [0.465 in ± 0.035 in] DT: 0,81 mm [0.032 in max.]</p>
Roller/ quick connect	<p>OP: 17,5 mm ±0,8 mm [0.689 in ± 0.032 in] DT: 0,81 mm [0.032 in max.]</p>	Roller/PCB	<p>OP: 17,5 mm ±0,8 mm [0.689 in ± 0.032 in] DT: 0,81 mm [0.032 in max.]</p>
Straight/PCB right	<p>OP: 11,8 mm ±0,89 mm [0.465 in ± 0.035 in] DT: 0,81 mm [0.032 in max.]</p>	Straight/PCB left	<p>OP: 11,8 mm ±0,89 mm [0.465 in ± 0.035 in] DT: 0,81 mm [0.032 in max.]</p>
Straight/ quick connect	<p>OP: 11,8 mm ±0,89 mm [0.465 in ± 0.035 in] DT: 0,81 mm [0.032 in max.]</p>		

# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series

## ZV STANDARD LEVER OPTIONS & DIMENSIONS mm/in

Lever/ Terminals	Dimensions	Lever/ Terminals	Dimensions
Pin plunger/ quick connect	<p>OP: 11,4 mm <math>\pm 0,3</math> mm [0.449 in <math>\pm 0.012</math> in] DT: 0,2 mm [0.008 in max.]</p>	Pin plunger/ solder	<p>OP: 11,4 mm <math>\pm 0,3</math> mm [0.449 in <math>\pm 0.012</math> in] DT: 0,2 mm [0.008 in max.]</p>
Straight/ solder	<p>OP: 11,8 mm <math>\pm 1,6</math> mm [0.465 in <math>\pm 0.063</math> in] DT: 0,81 mm [0.032 in max.]</p>	Roller/solder	<p>OP: 17,5 mm <math>\pm 1,1</math> mm [0.689 in <math>\pm 0.043</math> in] DT: 0,81 mm [0.032 in max.]</p>
Straight/ quick connect	<p>OP: 11,8 mm <math>\pm 1,2</math> mm [0.465 in <math>\pm 0.047</math> in] DT: 0,81 mm [0.032 in max.]</p>	Roller/ quick connect	<p>OP: 17,5 mm <math>\pm 1,1</math> mm [0.689 in <math>\pm 0.043</math> in] DT: 0,81 mm [0.032 in max.]</p>

# Snap-Action Switches

## ZW STANDARD LEVER OPTIONS & DIMENSIONS mm/in

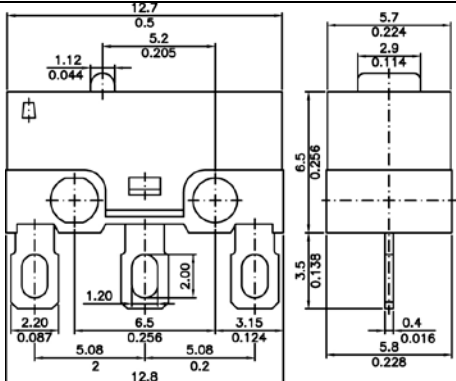
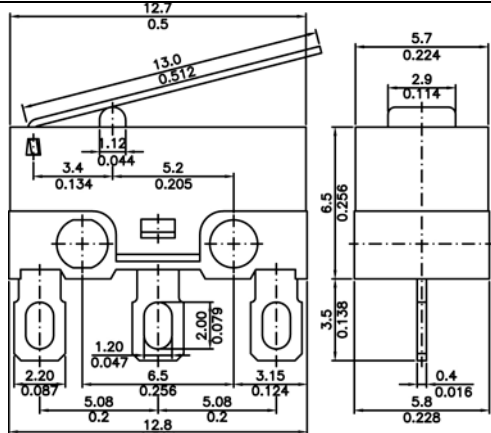
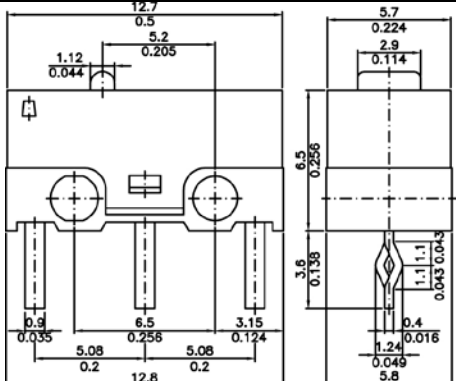
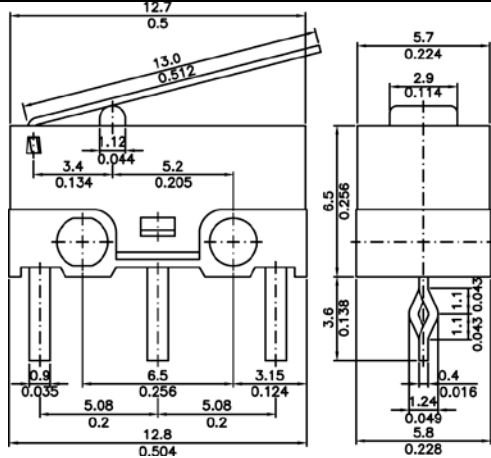
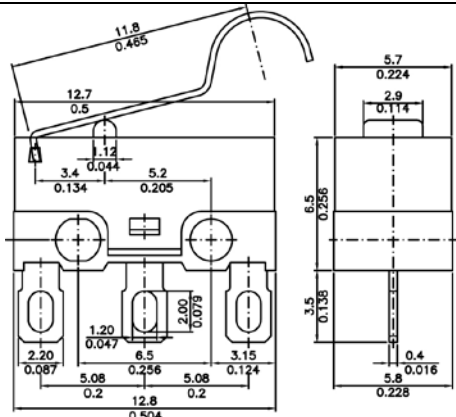
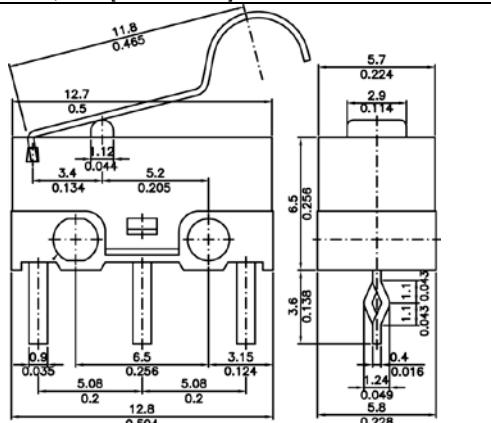
Lever/Term.	Dimensions
Straight/ solder angled	<p>OP: 8.8 mm <math>\pm</math> 1.2 mm [0.347 in <math>\pm</math> 0.047 in] DT: 0.71 mm [0.028 in max.]</p>
Roller/cable bottom exit	<p>OP: 14.5 mm <math>\pm</math> 1.1 mm [0.571 in <math>\pm</math> 0.043 in] DT: 0.6 mm [0.024 in max.]</p>
Pin plunger/ solder angled	<p>OP: 8.4 mm <math>\pm</math> 0.3 mm [0.331 in <math>\pm</math> 0.012 in] DT: 0.2 mm [0.008 in max.]</p>
Roller/quick connect	<p>OP: 14.5 mm <math>\pm</math> 1.1 mm [0.571 in <math>\pm</math> 0.043 in] DT: 0.6 mm [0.024 in max.]</p>

## ZD STANDARD LEVER OPTIONS & DIMENSIONS mm/in

Lever/ Terminals	Dimensions
Pin plunger/ solder terminals	<p>OP: 3.05 mm <math>\pm</math> 0.2 mm [0.12 in <math>\pm</math> 0.008 in] DT: 0.30 mm [0.012 in max.]</p>
Pin plunger/PCB straight terminals	<p>OP: 3.05 mm <math>\pm</math> 0.2 mm [0.12 in <math>\pm</math> 0.008 in] DT: 0.30 mm [0.012 in max.]</p>
Pin plunger/wire leads	<p>OP: 3.05 mm <math>\pm</math> 0.2 mm [0.12 in <math>\pm</math> 0.008 in] DT: 0.30 mm [0.012 in max.]</p>

# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series

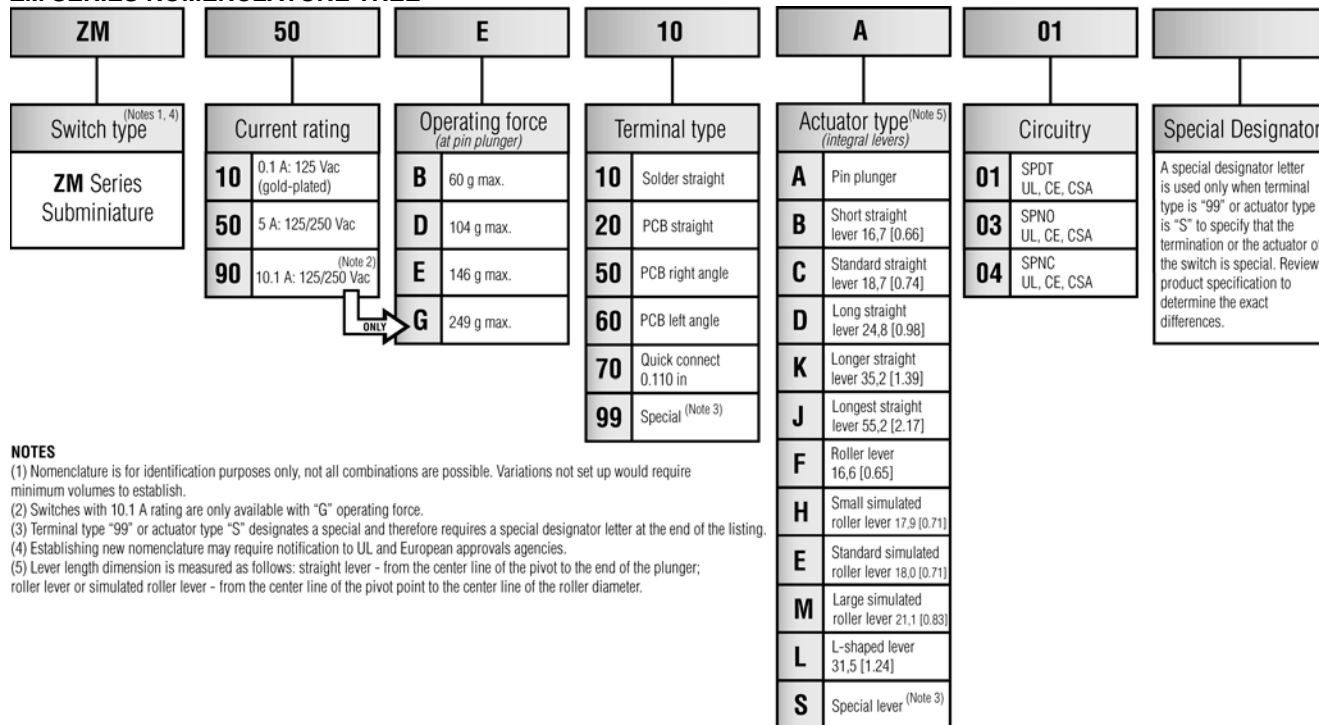
## ZX STANDARD LEVER OPTIONS & DIMENSIONS mm/in

Lever/ Terminals	Dimensions	Lever/ Terminals	Dimensions
Pin plunger/ solder	 <p data-bbox="272 743 621 789">OP: 7,0 mm ±0,3 mm [0.276 in ± 0.012 in] DT: 0,30 mm [0.012 in max.]</p>	Straight/ Solder	 <p data-bbox="938 800 1287 846">OP: 8,4 mm ±0,8 mm [0.331 in ± 0.032 in] DT: 1,3 mm [0.051 in max.]</p>
Pin plunger/PCB	 <p data-bbox="272 1230 621 1276">OP: 7,0 mm ±0,3 mm [0.276 in ± 0.012 in] DT: 0,30 mm [0.012 in max.]</p>	Straight/PCB	 <p data-bbox="938 1293 1287 1339">OP: 8,4 mm ±0,8 mm [0.331 in ± 0.032 in] DT: 1,3 mm [0.051 in max.]</p>
Simulated roller/solder	 <p data-bbox="272 1751 621 1797">OP: 11,1 mm ±0,8 mm [0.437 in ± 0.032 in] DT: 1,3 mm [0.051 in max.]</p>	Simulated roller/PCB	 <p data-bbox="938 1755 1287 1801">OP: 11,1 mm ±0,8 mm [0.437 in ± 0.032 in] DT: 1,3 mm [0.051 in max.]</p>



# Snap-Action Switches

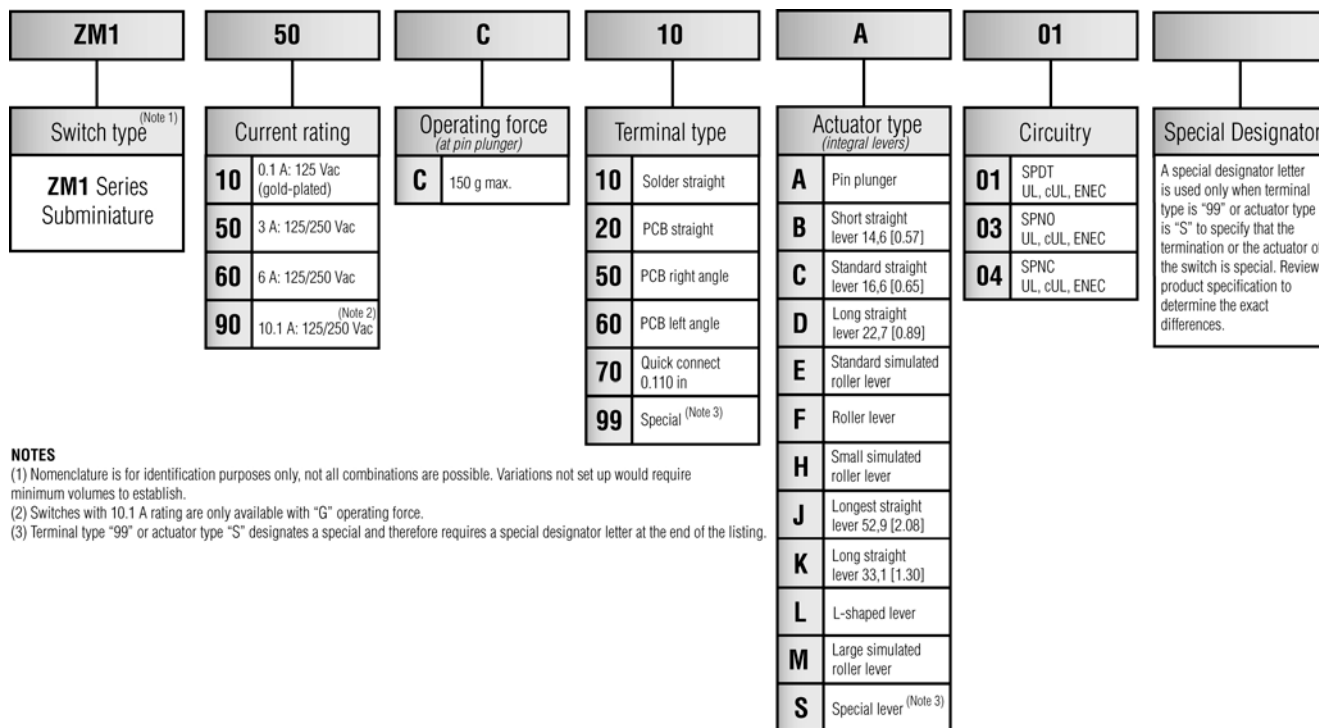
## ZM SERIES NOMENCLATURE TREE



**NOTES**

- (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.
- (2) Switches with 10.1 A rating are only available with "G" operating force.
- (3) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.
- (4) Establishing new nomenclature may require notification to UL and European approvals agencies.
- (5) Lever length dimension is measured as follows: straight lever - from the center line of the pivot to the end of the plunger; roller lever or simulated roller lever - from the center line of the pivot point to the center line of the roller diameter.

## ZM1 SERIES NOMENCLATURE TREE

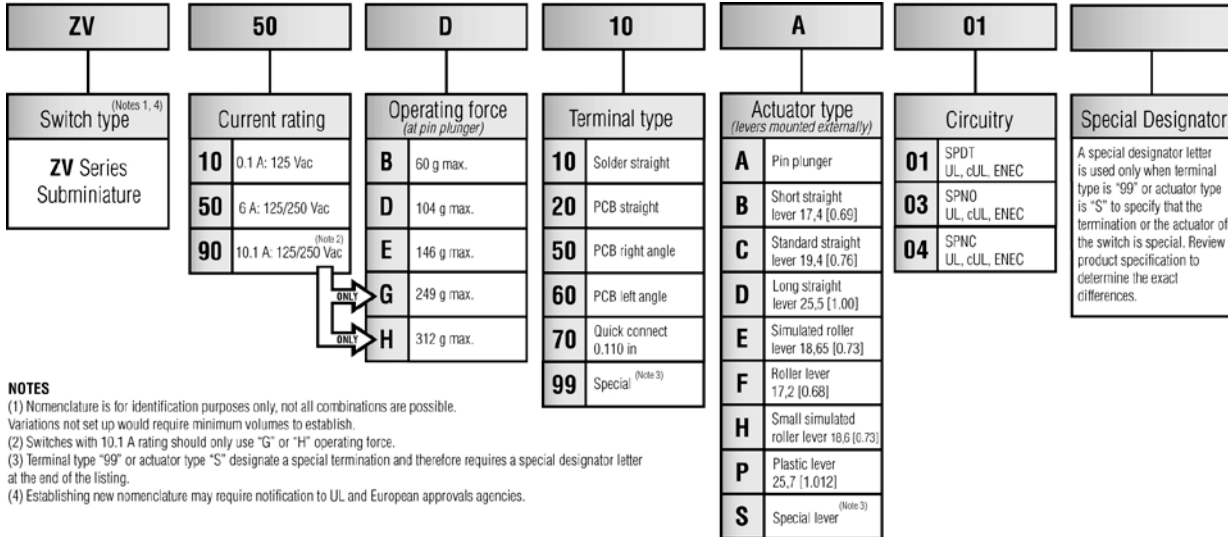


**NOTES**

- (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.
- (2) Switches with 10.1 A rating are only available with "G" operating force.
- (3) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.

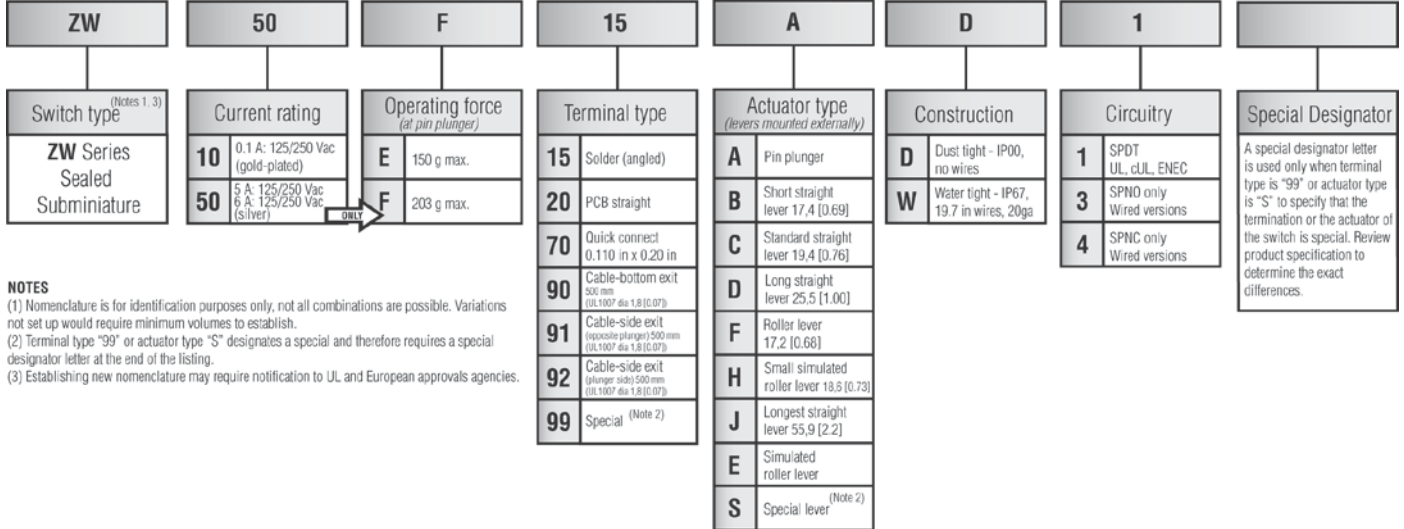
# MICRO SWITCH™ Standard Subminiature Snap-Action Z Series

## ZV SERIES NOMENCLATURE TREE



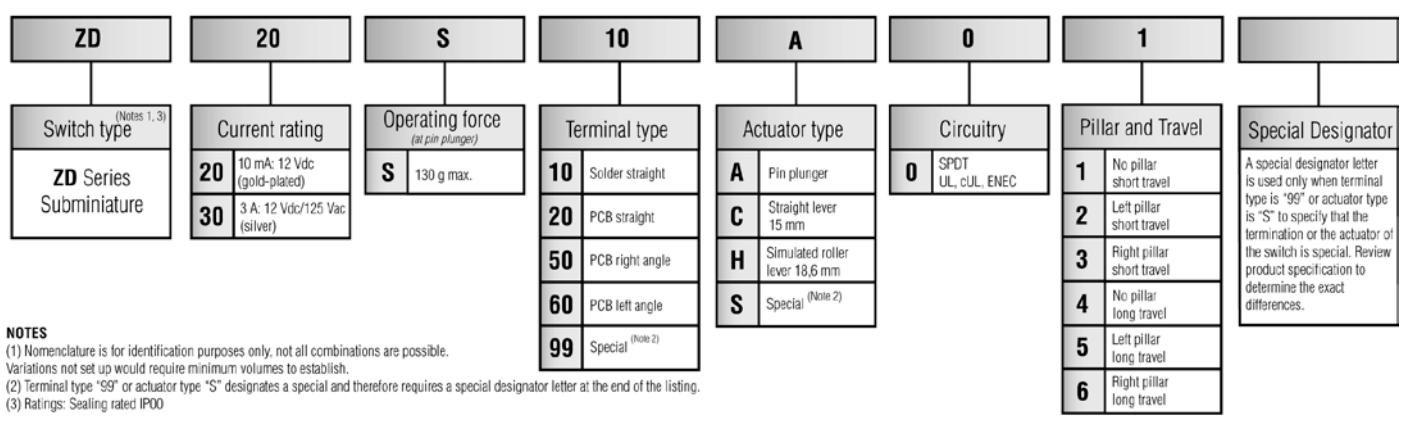
**NOTES**  
 (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.  
 (2) Switches with 10.1 A rating should only use "G" or "H" operating force.  
 (3) Terminal type "99" or actuator type "S" designate a special termination and therefore requires a special designator letter at the end of the listing.  
 (4) Establishing new nomenclature may require notification to UL and European approvals agencies.

## ZW SERIES NOMENCLATURE TREE



**NOTES**  
 (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.  
 (2) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.  
 (3) Establishing new nomenclature may require notification to UL and European approvals agencies.

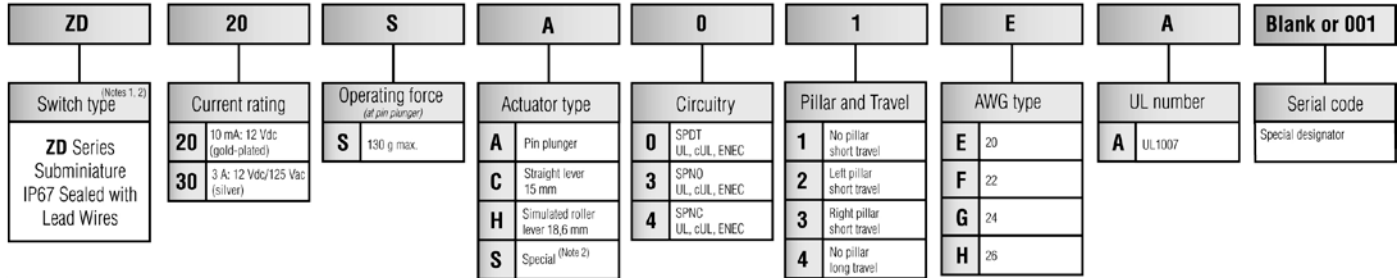
## ZD SERIES (NO WIRES) NOMENCLATURE TREE



**NOTES**  
 (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.  
 (2) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.  
 (3) Ratings: Sealing rated IP00

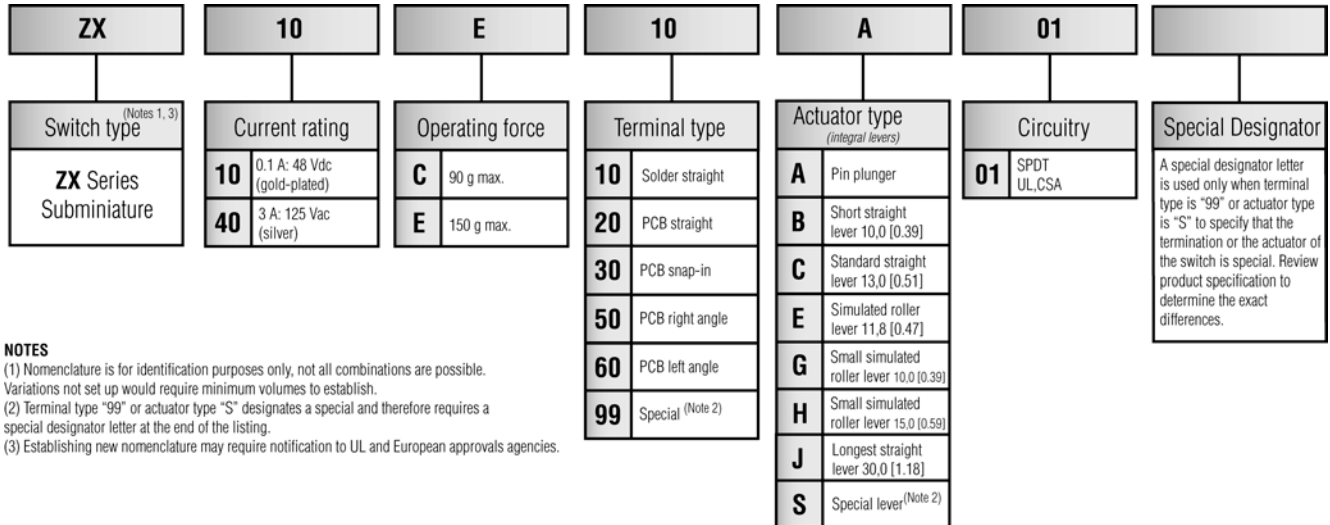
# Snap-Action Switches

## ZD SERIES (WITH WIRES) NOMENCLATURE TREE



**NOTES**  
 (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.  
 (2) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.

## ZX SERIES NOMENCLATURE TREE



**NOTES**  
 (1) Nomenclature is for identification purposes only, not all combinations are possible. Variations not set up would require minimum volumes to establish.  
 (2) Terminal type "99" or actuator type "S" designates a special and therefore requires a special designator letter at the end of the listing.  
 (3) Establishing new nomenclature may require notification to UL and European approvals agencies.

## **WARNING**

### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

## **WARNING**

### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## **WARRANTY/REMEDY**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

## **SALES AND SERVICE**

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

**E-mail:** [info.sc@honeywell.com](mailto:info.sc@honeywell.com)

**Internet:** [sensing.honeywell.com](http://sensing.honeywell.com)

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USA/Canada	+1-800-537-6945
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[ZM50E10D01](#) [ZM50E10F01](#) [ZM50E20A01](#) [ZM50E50D01](#) [ZM50E60B01](#) [ZM50E70B01](#) [ZM50E70D01](#) [ZM50E70E01](#)  
[ZM50E70F01](#) [ZM10D70A01](#) [ZM90G70A01](#) [ZM50D10B01](#) [ZV10B10E01](#) [ZV10D10D01](#) [ZV10D20E01](#) [ZV50B20A01](#)  
[ZV50B70A03](#) [ZV50E20A01](#) [ZV50E20F01](#) [ZV50E70C04](#) [ZV50E70F01](#) [ZV10D10P01](#) [ZV50B50A01](#) [ZV10D99PO1-](#)  
[A](#) [ZV10B50C01](#) [ZV50B60A01](#)

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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