

# Connectors Tactile Switches

Rotary Potentiometers/Position Sensors/Encoders/  
Push Switches/Detector Switches

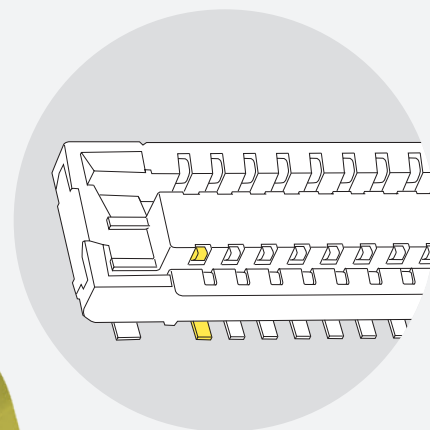
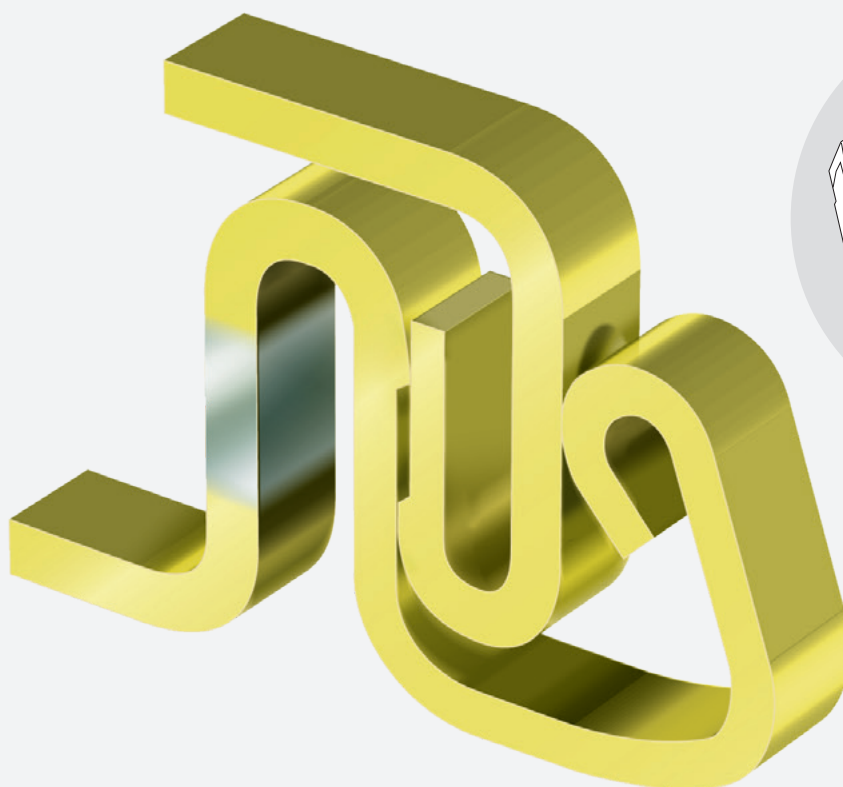
◆◆◆ SELECTION GUIDE ◆◆◆





## INDEX

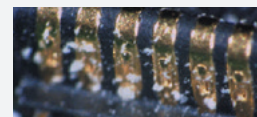
◆ Feature of TOUGH CONTACT .....	2
◆ Narrow pitch connectors Selector chart .....	4
◆ High current connectors Selector chart .....	10
◆ FPC/FFC connectors Selector chart .....	13
◆ Active optical connectors Selector chart .....	15
◆ Switch series introduction .....	16
◆ Tactile switches Selector chart .....	18
◆ Rotary potentiometers, Encoders Selector chart .....	31
◆ Position sensors Selector chart .....	32
◆ Encoders Selector chart .....	33
◆ Push switches Selector chart .....	38
◆ Detector Switches Selector chart .....	39
◆ Application .....	42



Contact image of A4S



Evaluation example of plastic powder adhered on post contact surface

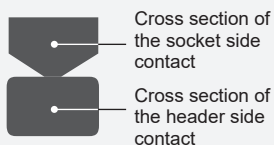


## Tough against exposure to foreign particles and solder flux! V notch contact construction

The amount of contact pressure (per unit area) was dramatically increased by taking into consideration the contact edge design. This further improves the overall ability to resist foreign particles from entering inside the contact area.

### Improved with 2-point contacting and edge contact

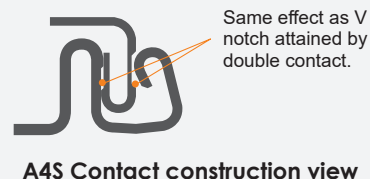
#### Product without notch



#### V notched product



### Improved with use of double contact



<The combination of these effects greatly improves contact reliability (resistance to entry of foreign matter)>

\*Japan: Registration of patent (Patent No. 3726836) Korea: Registration of patent (Patent No. 531938) Taiwan: Registration of patent (Patent No. 1225323)  
China: Registration of patent (Patent No. 1314171) North America: Registration of patent (Patent No. 7278861)



# High reliability contact that can stand up to various environmental conditions

Our unique technology

For Board-to-board/Board-to-FPC

Narrow pitch connector series/High current connector series

## Tough against shock impact! Bellows contact construction

The high precision design curved molding provides the right amount of spring action from the contacts which is made possible by means of high precision-metal-processing, one of Panasonic's core technologies. This spring-like feature is key in many mobile devices.



### Simulation Analysis

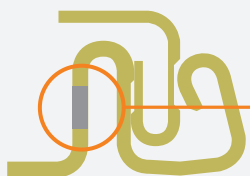
Through extensive analysis, the contacts are optimally designed to bring the best spring action. Once this is set, the contacts are then precision molded.

## Tough against solder rise! Ni Barrier construction

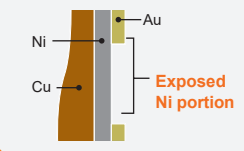
Exposed nickel is placed on mid part of socket contacts. This contact, while being ultra low in profile, prevents solder rise.

### Exposing Ni plated area prevents solder rise

#### Exposed Ni barrier portion



#### Cross section of the socket side contact



### Solder remains in the terminals and stable fillet mold is possible.

#### Solder rise after reflow<sup>\*1</sup>

##### Example without Ni barrier



Solder rises horizontal area

##### Example with Ni barrier

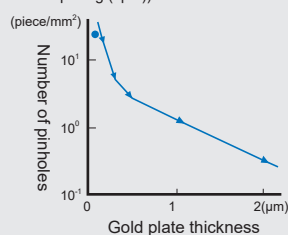


Ni exposure part  
Limit of solder rise.

## Tough against corrosive gases! Porosity Treatment

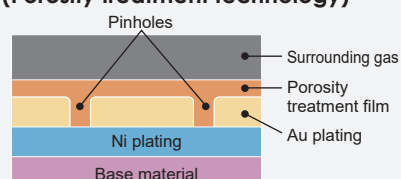
This treatment consists of coating surface with a very thin film to seal pinholes in the gold plating. We have developed this porosity treatment technology, which ensures the same contact reliability for thin gold plating as that of thick gold plating.

### Relationship between gold plate thickness and number of pinholes (on the nickel plating (1μm))



### Improvement in resistance to corrosion, insertion/removal durability and contact reliability for digital signals

#### Plating technology (Porosity treatment technology)

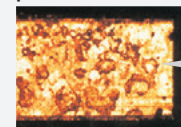


#### Status of the post's contact after the sulfur dioxide test<sup>\*2</sup>

##### Porosity-treated product



##### Conventional product



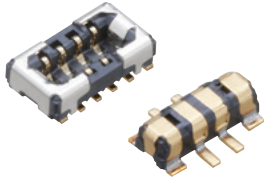
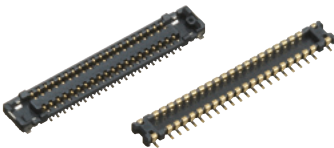
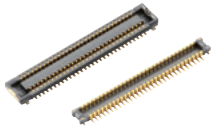
Corroded mainly at the pinholes.



<sup>\*1</sup> Solder paste coating conditions: Metal screen thickness; 120 μm; Open ratio 90% (solder amount 136% of recommended value)

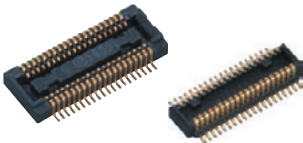
Reflow conditions: (lead-free solder conditions) temperature profile; 260C peak temperature, atmosphere; N<sub>2</sub> reflow (oxygen concentration 1,000 ppm)


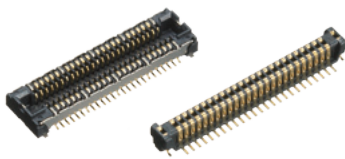
<sup>\*2</sup> Test conditions SO<sub>2</sub> concentration: 103 ppm, Humidity: 90 to 95% RH, Temperature: 402C Time: 145 hours

# Narrow pitch connectors Selector chart

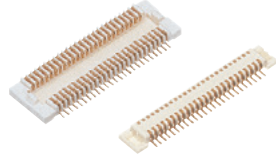
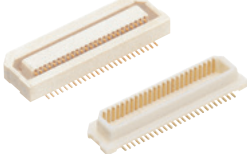
Terminal pitch	0.35mm pitch			
Types	For Board-to-FPC			
Product name	R35K	S35		A35S
Part No.	Socket: AXF5K*** Header: AXF6K***	Socket: AXG1*** Header: AXG2***	Socket: AXE7*** Header: AXE8***	
Shape				
Features	<ul style="list-style-type: none"> <li>● Slim: width 1.3 mm</li> <li>● Low profile construction: mated height 0.6 mm</li> <li>● Supports 3A power terminals</li> <li>● <b>"TOUGH CONTACT"</b> construction withstands tough environments despite being slim and low profile.</li> <li>● Double contact with a simple lock structure made this connector realize low profile, make a good clicking feel and high removal force.</li> </ul>	<ul style="list-style-type: none"> <li>● Slim: width 1.7mm</li> <li>● Low profile construction: mated height 0.6mm/0.8mm</li> <li>● <b>"TOUGH CONTACT"</b> construction withstands tough environments despite being slim and low profile.</li> <li>● For 0.6mm mated height, thanks to our proprietary "Fine fitting" construction, high removability with a nice click feel is maintained while being low profile.</li> </ul>		<ul style="list-style-type: none"> <li>● 0.35mm terminal pitch, 2.5mm width and 0.8mm mated height</li> <li>● Low profile type with up to 100 pins</li> <li>● <b>"TOUGH CONTACT"</b> construction provides high resistance to various environmental.</li> <li>● Simple lock structure provides tactile feedback to ensure excellent mating / unmating operation feel.</li> <li>● Connectors for inspection available</li> </ul>
Mated height	0.6mm	0.6mm	0.8mm	0.8mm
Dimensions (short width) (Include terminal)	Socket: 1.3mm Header: 1.1mm	Socket: 1.7mm Header: 1.5mm		Socket: 2.5mm Header: 2.0mm
No. of pins	100			100
	90			
	80			80
	70			70
	60	60		60 64
	50	50 54		50 54
	40	40 44	44	40 44
	30	30 34	34	30 34
	20	20 24	24	20 24
	10	4 6 6 10 12 16	12	10 12 16
Rated current	3.0A/pin contact (Power terminal) 0.3A/pin contact (Signal terminal)	0.3A/pin contact (Max. 5A at total pin contacts)		0.25A/pin contact (Max. 4A at total pin contacts)
Rated voltage	30V AC/DC	60V AC/DC		60V AC/DC
Ambient temperature	-55 to +85°C	-55 to +85°C		-55 to +85°C
Insertion and removal life	10times	30times		30times

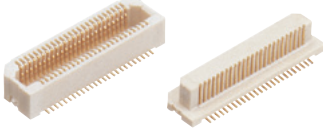
Terminal pitch	0.4mm pitch		
Types	For Board-to-FPC		
Product name	A4S		F4S
Part No.	Socket: AXE5*** Header: AXE6***		Socket: AXT5*** Header: AXT6***
Shape			
Features	<ul style="list-style-type: none"> <li>● Simple lock structure provides tactile feedback to ensure excellent mating / unmating operation feel.</li> <li>● <b>"TOUGH CONTACT"</b> construction provides high resistance to various environmental.</li> <li>● Connectors for inspection available</li> </ul>		<ul style="list-style-type: none"> <li>● <b>"TOUGH CONTACT"</b> construction provides high resistance to various environmental.</li> <li>● Simple lock structure provides tactile feedback to ensure excellent mating/unmating operation feel.</li> <li>● Connectors for inspection available</li> </ul>
Mated height	0.8mm	1.0mm	1.0mm
Dimensions (short width) (Include terminal)	Socket: 2.5mm Header: 2.0mm		Socket: 3.6mm Header: 2.6mm
No. of pins	100		
	90		
	80	80	80
	70	70	70
	60	60	60
	50	50 54	50
	40	40 44	40 42 48
	30	30	30 34
	20	20 24	20 24 26
	10	10 12 14	10 16
Rated current	0.3A/pin contact (Max. 5A at total pin contacts)		0.3A/pin contact (Max. 5A at total pin contacts)
Rated voltage	60V AC/DC		60V AC/DC
Ambient temperature	-55 to +85°C		-55 to +85°C
Insertion and removal life	30times		50times

Terminal pitch	0.4mm pitch				
Types	For Board-to-FPC/Board-to-Board				
Product name	P4				
Part No.	Socket: AXK7*** Header: AXK8***				
Shape					
Features	<ul style="list-style-type: none"> <li>● Mated heights of 1.5, 2.0, 2.5, 3.0 and 3.5mm is available</li> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> <li>● Pattern wiring is possible on PC board of the connector undersurface</li> </ul>				
Mated height	1.5mm	2.0mm	2.5mm	3.0mm	3.5mm
Dimensions (short width) (Include terminal)	Socket: 5.1mm Header: 3.96mm				
No. of pins	100	100			
	90				
	80	80	80	80	
	70	70	70		
	60	60	60	60	
	50	50	50	50	
	40	40	40	40	40
	30	30	30	30	30
	20	20 24	20 24	20 24	20
	10				
Rated current	0.3A/pin contact (Max. 5A at total pin contacts)				
Rated voltage	60V AC/DC				
Ambient temperature	-55 to +85°C				
Insertion and removal life	50times				

Terminal pitch	0.4mm pitch				
Types	For Board-to-FPC/Board-to-Board				
Product name	P4S				P4S shield type
Part No.	Socket: AXT3*** Header: AXT4***				Socket: AXT3*** Header: AXT4***
Shape					
Features	<ul style="list-style-type: none"> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> <li>● Pattern wiring is possible on PC board of the connector undersurface</li> <li>● Connectors for inspection available</li> <li>● Shield type is also available.</li> </ul>				<ul style="list-style-type: none"> <li>● Radiation noise is reduced thanks to better grounding with multi-point ground construction and covering using a shield plate.</li> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> <li>● Previous standard product (P4S) can also be used on the header side</li> <li>● Freedom of design is increased, because it has the same foot pattern as the previous standard product (P4S).</li> </ul>
Mated height	1.5mm	2.0mm	2.5mm	3.0mm	1.5mm
Dimensions (short width) (Include terminal)	Socket: 3.6mm Header: 2.35mm				Socket: 3.8mm Header: 2.35mm
No. of pins	100	100	100	100	
	90	90			
	80		80	80	
	70				74
	60		60	60	
	50				50
	40	40	40		
	30 34 38	30	30	30	38
	20 24 26	20	20	20	
	10 16				14
Rated current	0.3A/pin contact (Max. 5A at total pin contacts)				0.3A/pin contact (Max. 5A at total pin contacts)
Rated voltage	60V AC/DC				60V AC/DC
Ambient temperature	-55 to +85°C*1				-55 to +85°C
Insertion and removal life	50times				50times

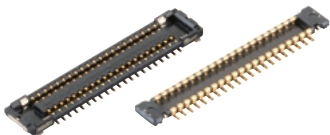
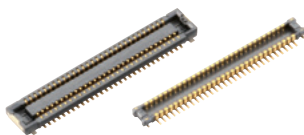
\*1 Products available that can handle ambient temperatures of -55 to +105°C. For details, please contact our sales office.

Terminal pitch	0.5mm pitch			
Types	For Board-to-FPC/Board-to-Board			For Board-to-Board
Product name	P5KF			P5K
Part No.	Socket: AXK5F*** Header: AXK6F***			Socket: AXK5*** Header: AXK6***
Shape				
Features	<ul style="list-style-type: none"> <li>● Wide lineup for pin counts</li> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> <li>● Simple lock structure provides tactile feedback to ensure excellent mating / unmating operation feel.</li> <li>● Effective mating length 0.55mm</li> </ul>			<ul style="list-style-type: none"> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> <li>● The effective mating length is long and there is enough space for mating.</li> </ul>
Mated height	1.5mm	2.0mm	2.5mm	3.0mm
Dimensions (short width) (Include terminal)	Socket: 5.8mm Header: 3.3mm			Socket: 5.8mm Header: 4.6mm
No. of pins	100	100	100	100 120
	90			
	80	80	80	80
	70	70	70	70
	60	60	60	60
	50	50	50	50
	40	40	40	40
	30 34	30 34	30 34	30
	20 24	20 24	20 24	20
	10 12 16	10 12 16	10 12 16	
Rated current	0.5A/pin contact (Max. 10A at total pin contacts)			0.5A/pin contact (Max. 10A at total pin contacts)
Rated voltage	60V AC/DC			60V AC/DC
Ambient temperature	-55 to +85°C			-55 to +85°C
Insertion and removal life	50times			50times

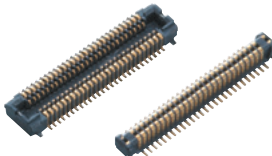
Terminal pitch	0.5mm pitch								
Types	For Board-to-Board								
Product name	P5KS								
Part No.	Socket: AXK5S*** Header: AXK6S***								
Shape									
Features	<ul style="list-style-type: none"> <li>● Wide range of mated heights (4.0mm, 4.5mm, 5.0mm, 5.5mm, 6.0mm, 6.5mm, 7.0mm, 8.0mm, and 9.0mm) is available</li> <li>● <b>"TOUGH CONTACT"</b> construction provides high resistance to various environmental.</li> <li>● The effective mating length is long and there is enough space for mating.</li> </ul>								
Mated height	4.0mm	4.5mm	5.0mm	5.5mm	6.0mm	6.5mm	7.0mm	8.0mm	9.0mm
Dimensions (short width) (Include terminal)	Socket: 5.4mm Header: 5.0mm								
No. of pins	100	100	100	100	100	100	100	100	100
	90								
	80	80	80	80	80	80	80	80	80
	70	70	70	70	70	70	70	70	70
	60	60	60	60	60	60	60	60	60
	50	50	50	50	50	50	50	50	50
	40	40	40	40	40	40	40	40	40
	30	30 34	30 34	30 34	30 34	30	30	30	30
	20	20 24	20 24	20 24	20 24	20	20	20	20
	10								
Rated current	Power terminal	—							
	Signal terminal	0.5A/pin contact (Max. 16A at total pin contacts)							
Rated voltage		60V AC/DC							
Ambient temperature		-55 to +85°C*1							
Insertion and removal life		50times							

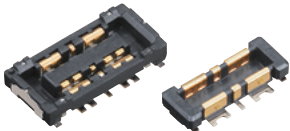
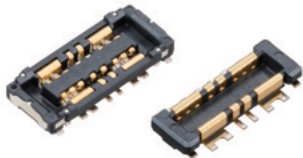
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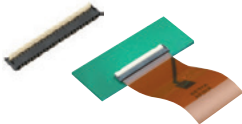
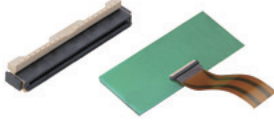


# High current connectors Selector chart

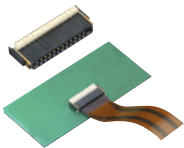
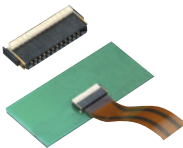

Terminal pitch		0.35mm pitch	
Types		Connector for Board-to-FPC	
Product name		A35UH	A35P
Part No.		Socket: AXF5D**12 Header: AXF6D**12	Socket: AXF5A*** Header: AXF6A***
Shape			
Features		<ul style="list-style-type: none"> <li>● Supports 5A power terminals</li> <li>● With power terminal, so number of pins can be reduced</li> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> </ul>	<ul style="list-style-type: none"> <li>● High current rating 5A (using 1.25A/pin × 8pins)</li> <li>● By supporting high current rating, small number of pins design is available.</li> <li>● Increased design flexibility (pin layout, high current multiple lines)</li> <li>● Supports 5A power terminals</li> <li>● With power terminal, so number of pins can be reduced</li> <li>● “<b>TOUGH CONTACT</b>” construction provides high resistance to various environmental.</li> </ul>
Mated height		0.6mm	0.8mm
Dimensions (short width) (Include terminal)		Socket: 2.2mm Header: 1.8mm	Socket: 2.5mm Header: 2.0mm
No. of pins	100		100
	90		
	80		80
	70	70	70
	60	60	60 64
	50	50 54	50 54
	40	40 44	40 44
	30	30 34	30 34
	20	20 24	20 24
	10	10 12 16	10 12 16
Rated current	Power terminal	5A/pin contact	—
	Signal terminal	0.3A/pin contact (Max. 5A at total pin contacts)	For power contact: 1.5A/pin contact × 4pin contacts or 1.25A/pin contact × 8pin contacts For signal contact: 0.5A/pin contact (12A or less at total pin contacts)
Rated voltage		30V AC/DC	30V AC/DC
Ambient temperature		−55 to +85°C	−55 to +85°C
Insertion and removal life		30times	30times



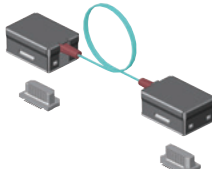
Terminal pitch		0.4mm pitch		
Types		Connector for Board-to-FPC		
Product name		P4SP		
Part No.		Socket: AXF5G**12 Header: AXF6G**12		
Shape				
Features		<ul style="list-style-type: none"><li>● Capable of MAX. 5A for power</li><li>● Rated current 1A/pin (for power) 0.5A/pin (for signal), Total: Max. 12A</li><li>● Any terminal can be applied for power terminal</li><li>● Low contact resistance: Max. 40mΩ</li><li>● High speed transmission of 10Gbps is available</li><li>● Supports 5A power terminals</li><li>● With power terminal, so number of pins can be reduced</li><li>● <b>"TOUGH CONTACT"</b> construction provides high resistance to various environmental.</li></ul>		
Mated height		1.5mm	2.5mm	3.0mm
Dimensions (short width) (Include terminal)		Socket: 3.6mm Header: 2.35mm		
No. of pins	100	100	100	100
	90	90		
	80	80	80	80
	70	70		
	60	60	60	60
	50	50		
	40	40	40	
	30	30 34 38	30	30
	20	20 24 26	20	20
	10	10 16		
Rated current	Power terminal	—		
	Signal terminal	For power contact: 1.0A/pin contact × 10pin contacts For signal contact: 0.3A/pin contact (12A or less at total pin contacts)		
Rated voltage		30V AC/DC		
Ambient temperature		−55 to +85°C		
Insertion and removal life		50times		

Terminal pitch		0.8mm pitch	
Types		Connector for Board-to-FPC	
Product name		B01	B02
Part No.		Socket: AXF36*500 Header: AXF46*500	Socket: AXF38*700 Header: AXF48*700
Shape			
Features		<ul style="list-style-type: none"> <li>● High current rating: 6A (3A/pin × 4pins)</li> <li>● High removal force while miniature and low profile</li> </ul>	<ul style="list-style-type: none"> <li>● High current rating: 10A (5A/pin × 4pins)</li> <li>● 4 signal pin type for wide range of control applications</li> <li>● High removal force while miniature and low profile</li> </ul>
Mated height		0.6mm/0.8mm	0.7mm
Dimensions (short width) (Include terminal)		Socket: 2.4mm Header: 1.8mm	Socket: 2.2mm Header: 1.8mm
No. of pins	100		
	90		
	80		
	70		
	60		
	50		
	40		
	30		
	20		
10		6	8
Rated current	Power terminal	3A/pin contact	5A/pin contact
	Signal terminal	0.3A/pin contact	0.3A/pin contact
Rated voltage		30V AC/DC	30V AC/DC
Ambient temperature		−55 to +85°C	−55 to +85°C
Insertion and removal life		30times	30times

Contact pitch	0.3mm pitch	0.5mm pitch
Product name	<b>Y3B</b>	<b>Y5BH</b>
Part No.	<b>AYF33**35</b>	<b>AYF56**35</b>
Shape		
Features	<ul style="list-style-type: none"> <li>● Double top and bottom contacts construction</li> <li>● Time and effort can be reduced by delivering with lever open.</li> <li>● Wiring patterns can be placed under the connector</li> <li>● Ni barrier with high resistance to solder creepage</li> </ul>	<ul style="list-style-type: none"> <li>● Differential impedance matching (90Ω, 85Ω) compliant with various high-speed transmission standards</li> <li>● 0.5mm pitch, 1.8mm height and double top and bottom contact construction</li> <li>● Supports USB 3.1 high-speed transmission standard (transmission speed: up to 10Gbps)*</li> <li>● Contributes to customer cost savings by using impedance matching FFC.</li> </ul> <p><small>*Universal serial Bus3.1 Specification Reversion1.0.</small></p>
Lock structure	 Back lock	 Back lock
Compatibility with FPC/FFC	FPC	FPC/FFC
Applicable FPC thickness	0.2mm	0.3mm
Contact structure	Top and bottom double contacts	Top and bottom double contacts
Terminal pitch	0.6mm	0.5mm
Mounting height	0.9mm	1.8mm
Dimensions (width)	3.15mm (Including lever) 2.95mm	5.5mm (Including lever) 3.9mm
No. of pins	70	
	60	
	50	
	40	40
	30	
	20	
	10	
	2 to 9	
Rated current	0.2A/pin contact	0.4A/pin contact
Rated voltage	50V AC/DC	50V AC/DC
Ambient temperature	−55 to +85°C	−55 to +85°C
Insertion and removal life	20times	20times

Contact pitch	0.5mm pitch	
Product name	Y5B	Y5BW
Part No.	AYF53**35	AYF53**65T
Shape		
Features	<ul style="list-style-type: none"> <li>● Double top and bottom contacts construction</li> <li>● Wiring patterns can be placed under the connector</li> <li>● Lock hold type (Y5BW) with excellent holding force is available (Y5BW: support only FPC)               <ol style="list-style-type: none"> <li>1. With a structure that temporarily holds the FPC</li> <li>2. Higher FPC holding force</li> </ol> </li> </ul> <p>*V-by-One®HS: An interface for the next-generation high-speed signals developed by THine Electronics, Inc. V-by-One® is a registered trademark of THine Electronics, Inc.</p>	
Lock structure	 Back lock	
Compatibility with FPC/FFC	FPC/FFC	FPC
Applicable FPC thickness	0.3mm	
Contact structure	Top and bottom double contacts	
Terminal pitch	0.5mm	
Mounting height	1.0mm	
Dimensions (width)	3.7mm (Including lever) 3.2mm	
No. of pins	70	
	60	
	50	
	40	
	30	30 32 34
	20	24 28
	10	10 12 14 16
2 to 9	4 5 6 8	2 3 4 6 8
Rated current	0.5A/pin contact	
Rated voltage	50V AC/DC	
Ambient temperature	-55 to +85°C*1	
Insertion and removal life	20times	

\*1 Products available that can handle ambient temperatures of -55 to +105°C. For details, please contact our sales office.

Type	1 channel-Bi-direction	2 channel-Uni-direction
Product name	<b>Active optical connectors V series</b>	
Part No.	<b>Integrated cable and plug: AYG4V1****M*</b> <b>Receptacle: AXK6S20447M*</b>	<b>Integrated cable and plug: AYG5V1****M*</b> <b>Receptacle: AXK6S20447M*</b>
Shape		
Features	<ul style="list-style-type: none"> <li>● Plug is equipped with electrical / optical conversion function.</li> <li>● Noise reduction of high speed signal and electrical isolation easily achieved.</li> <li>● High speed and wide data rate transmission possible</li> <li>● Lineup includes 1 channel-Bi-direction and 2 channel-Uni-direction</li> </ul> <p>1 channel-Bi-direction: 20 Mbps to Max. 8 Gbps 2 channel-Uni-direction: 20 Mbps to Max. 16 Gbps (20 Mbps to 8 Gbps/ch)</p>	
Transmission rate	20Mbps to 8Gbps/ch	
Power consumption	Max. 230mW 3.3V DC±0.1	
Operating ambient temperature	0 to +70°C	
Insertion and removal life	50times	

# Switch series introduction

## Tactile·Detector·Push Switches

\*Light touch switch is our unique name of tactile switch.

### Variations

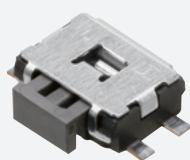
Tactile SW

Detector SW

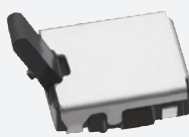
To satisfy different design needs, many variations are offered such as top push operation, side push operation and vertical and horizontal direction detection.



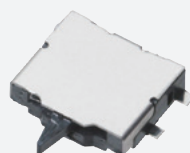
Top push type



Side push type



Vertical type



Horizontal type

Vehicle



Health care  
Medical



Appliance

### Operation feeling

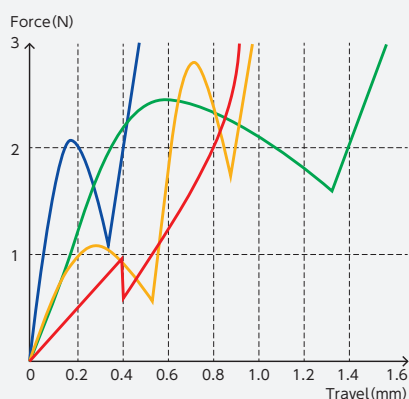
Tactile SW

Push SW

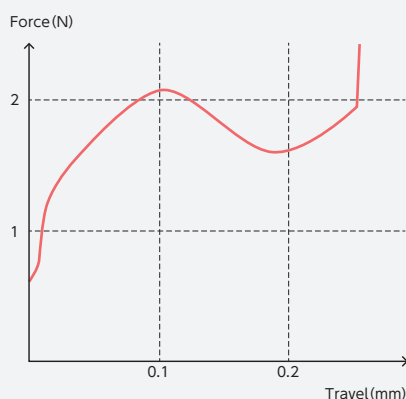
Operation feeling is one of the key feature of switches. Our large selection of operation feeling and travel meet customer requests.

#### Feeling curve

Tactile switch



Push switch



## Meeting customer needs with our extensive features.

Offering suitable switch features such as operation feeling and reliability for our customer. Panasonic switch products have been adopted into various field applications.

### Reliability

Tactile SW

Detector SW

Push SW

In order to raise reliability of customer's product, our switches make progress on operating life, water-proof and dust-proof property (IP67), anti-flux characteristics, contact reliability and shock resistance.

\*IP67; Protected from dust and capable of withstanding water immersion between 15 cm and 1 meter for 30 minutes (LTSW meets IP67).

ICT



Wearable



Industry and O.A.

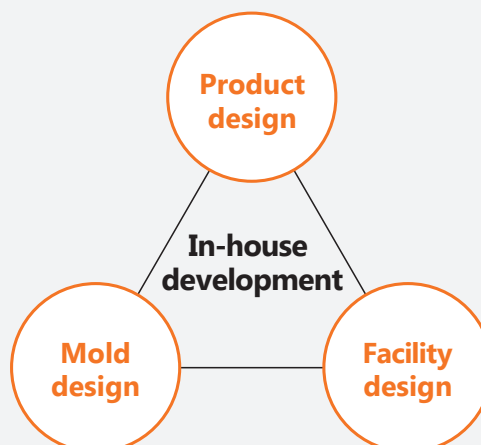


Complete waterproof structure by laser processing of cover film.

### Customization

Tactile SW

All Tactile SW parts are designed and produced by our own factory so that able to offer customization of click feeling and provide quick customer services.






# Tactile switches Selector chart

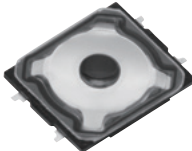
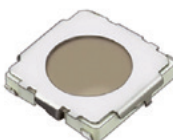

Types		Tactile switches		
		Top push type		
Product name		<b>2.6mm × 1.6mm SMD</b>	<b>2.8mm × 1.9mm SMD</b>	<b>3.0mm × 2.0mm SMD</b>
Part No.		EVPBB	EVPBL	EVPAW
Shape				
Features		Low profile and small size		
Vehicle compatible		—	—	—
Protective structure		IP67	IP67	IP67
External dimensions (mm)	W × D	2.6 × 1.6	2.8 × 1.9	3.0 × 2.0
	H	0.5/0.53/0.55	0.53/0.57	0.6
Operating force		0.7N·1.0N·1.6N	1.6N	1.6N
		2.4N	2.25N	2.4N
			3.0N	3.3N
Travel (mm)		0.7N, 1.0N: 0.08 1.6N, 2.4N: 0.11	0.15	1.6N, 2.4N: 0.13 3.3N: 0.15
Operating life (cycles min)		0.7N: 200,000 1.0N, 1.6N, 2.4N: 500,000	300,000	1.6N, 2.4N: 500,000 3.3N: 300,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)		
Temperature	Operating temperature	−40°C to +85°C		
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.		
	Insulation resistance	50MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

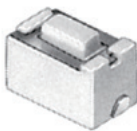





Types		Tactile switches	
		Top push type	
Product name		<b>3.0mm × 2.6mm SMD</b>	<b>3.4mm × 2.9mm SMD</b>
Part No.		EVPAF/EVP0A	EVPAY
Shape			
Features		Low profile and small size	
Vehicle compatible		—	—
Protective structure		—	IP67
External dimensions (mm)	W × D	3.0 × 2.6	3.4 × 2.9
	H	0.65/0.7	0.7
Operating force		1.3N·1.6N	1.6N
		2.4N	2.4N
		3.4N	
Travel (mm)		0.15	0.15
Operating life (cycles min)		1.3N, 1.6N, 3.4N: 100,000 1.6N (Low profile), 2.4N: 500,000	500,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)	
Temperature	Operating temperature	−40°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C	
Characteristics	Contact resistance	500mΩ max.	
	Insulation resistance	50MΩ min. (at 100V DC)	
	Dielectric withstanding voltage	250V AC for 1 minute	
	Bouncing	10ms max. (ON, OFF)	
Environment		RoHS compliant, ELV compliant	


Types		Tactile switches		
		Top push type		
Product name		<b>3.5mm × 2.9mm SMD</b>	<b>4.7mm × 3.5mm SMD</b>	
Part No.		EVPA A	EVQP2/EVQP9/EVQ3P2	
Shape				
Features		High operating force	High operating force, Short travel	High operating force, Middle travel
Vehicle compatible		•	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	3.5 × 2.9	4.7 × 3.5	4.7 × 3.5
	H	1.7	2.1/2.5	2.5
Operating force		1.0N·1.6N	1.0N·1.6N	
		2.4N	2.4N	2.5N
		3.5N	3.5N	3.5N
		5.0N	4.0N	
		7.0N	5.0N	5.0N
Travel (mm)		0.15	0.25	0.7
Operating life (cycles min)		1.0N: 1,000,000 3.5N: 500,000 1.6N, 2.4N, 3.5N, 5.0N: 200,000 5.0N, 7.0N: 100,000	1.0N, 1.6N: 1,000,000 2.4N: 500,000 3.5N, 4.0N, 5.0N: 200,000	2.5N: 1,000,000 3.5N: 500,000 5.0N: 200,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)		
Temperature	Operating temperature	−40°C to +85°C		
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	100mΩ max.		
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Top push type		
Product name		4mm Square SMD		
Part No.		EVQP6	EVQ7P6/EVQ6P6/EVQ9P6	EVQP6
Shape				
Features		Low profile, Wide variations		
Vehicle compatible		—	—	—
Protective structure		—	—	—
External dimensions (mm)	W × D	4.1 × 4.1	4.1 × 4.1	4.1 × 4.1
	H	0.35	0.43	0.58
Operating force		1.6N	1.0N·1.6N	1.6N
		2.4N	2.4N	2.4N
Travel (mm)		0.2	1.0N: 0.15 1.6N, 2.4N: 0.2	0.2
Operating life (cycles min)		1.6N: 1,000,000 2.4N: 500,000	1.0, 1.6N: 1,000,000 2.4N: 500,000	1.6N: 1,000,000 2.4N: 500,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)		
Temperature	Operating temperature	−20°C to +70°C		
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.		
	Insulation resistance	50MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	100V AC for 1 minute		
	Bouncing	3ms max. (ON) /10ms max. (OFF)		
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Top push type		
Product name		4.9mm × 4.0mm SMD	4.9mm Square SMD	
Part No.		EVPBK	EVQPL/EVQ5PL	EVQPL/EVQPT/EVQ3PL
Shape				
Features		Low profile	Low profile, Long operating life	
Vehicle compatible		—	—	●
Protective structure		IP67	—	—
External dimensions (mm)	W × D	4.9 × 4.0	4.9 × 4.9	4.9 × 4.9
	H	0.63	0.8	1.5
Operating force			1.6N	1.0N·1.6N
		2.5N	2.6N	2.6N
			3.5N	3.5N
Travel (mm)		0.23	0.25	0.25
Operating life (cycles min)		1,000,000	1.0N, 1.6N: 500,000 2.6N, 3.5N: 200,000	
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)		
Temperature	Operating temperature	−40°C to +85°C	−20°C to +70°C	
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.	50mΩ max.	
	Insulation resistance	50MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)	3ms max. (ON) /8ms max. (OFF)	
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Top push type		
Product name		6.0mm × 3.5mm SMD	6mm Square Thin Type SMD	
Part No.		EVQPE1/EVQPN/EVQ5P	EVQP0/EVQQ2/EVQ6Q2 EVQ7Q2/EVPBT	EVQP0
Shape				
Features		SMD	Long operating life	Over travel
Vehicle compatible		—	—	—
Protective structure		—	—	—
External dimensions (mm)	W × D	6.0 × 3.5	6.5 × 6.0	6.5 × 6.0
	H	4.3/5.0	2.0/2.5/3.1/4.3	2.5
Operating force		1.0N·1.6N	0.5N	0.6N
		2.4N	0.8N·1.0N·1.3N·1.6N	1.0N
			2.6N	
			3.5N	
Travel (mm)		0.25	0.5N, 0.8N, 1.0N: 0.20 1.3N, 1.6N, 2.6N, 3.5N: 0.25	0.3
Operating life (cycles min)		1.0N, 1.6N: 50,000 2.4N: 30,000	0.5N, 0.8N: 2,000,000 1.0N, 1.3N, 1.6N: 1,000,000 2.6N: 200,000 3.5N: 100,000	0.6N: 2,000,000 1.0N: 1,000,000
Rating		10μ A 2V DC to 50mA 12V DC (Resistive load)	10μ A 2V DC to 20mA 15V DC (Resistive load)	
Temperature	Operating temperature	−30°C to +85°C	−40°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	100mΩ max.		
	Insulation resistance	100MΩ min.(at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Top push type		
Product name		6mm Square Middle Travel SMD	6mm Square Middle Travel 2 terminals SMD	6mm Square Long Travel SMD
Part No.		EVPBF	EVPBD/EVP0B	EVQP0/EVQP1/EVQ9P
Shape				
Features		Long operating life	Middle travel	Long travel
Vehicle compatible		—	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	6.0 × 6.0	6.0 × 6.0	6.1 × 6.0
	H	3.5	4.0	5.0
Operating force				1.6N
		2.0N		2.0N·2.2N·2.5N
		3.5N	3.5N	3.0N·3.5N
			4.0N	
			7.0N	
Travel (mm)		0.25	3.5N : 0.75 4.0N : 0.7 7.0N : 0.80	2.2N, 2.5N: 1.0 1.6N, 2.0N, 2.5N, 3.0N, 3.5N: 1.3
Operating life (cycles min)		2.0N: 1000000 3.5N: 100,000	3.5N/7.0N : 100,000 4.0N : 200,000	1.6N, 2.0N, 2.2N, 2.5N, 3.0N: 100,000 3.5N: 30,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)		10μ A 2V DC to 50mA 12V DC (Resistive load)
Temperature	Operating temperature	−40°C to +85°C	−40°C to +90°C	−40°C to +85°C
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.		100mΩ max.
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

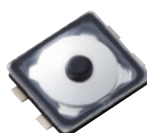
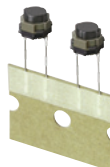

Types		Tactile switches		
		Top push type		
Product name		6mm Square Long Travel 2 terminals SMD	8mm Square Long Travel SMD	10mm Square Center Space Long Travel SMD
Part No.		EVPAS	EVQQ1	EVPAD
Shape				
Features		Long travel	Long travel High operating force	Center space structure, Long travel, High operating force
Vehicle compatible		•	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	6.1 × 6.0	8.5 × 8.5	9.8 × 9.8
	H	5.0	6.5	4.7
Operating force		1.6N		
		2.0N·2.2N·2.5N		
		3.0N·3.5N·3.6N		
		4.0N	4.0N	4.0N
			5.0N	
Travel (mm)		2.2N, 2.5N, 3.0N, 3.6N, 4.0N: 1.0 1.6N, 2.0N, 2.5N, 3.0N, 3.5N: 1.3	1.0	
Operating life (cycles min)		1.6N, 2.0N, 2.2N, 2.5N: 100,000 3.0N: 200,000 3.5N: 100,000 Operating force narrow tolerance 3.0N, 3.6N: 300,000 4.0N: 200,000	100,000	
Rating		10μ A 2 V DC to 50mA 12V DC (Resistive load)		
Temperature	Operating temperature	−40°C to +90°C	−40°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	100mΩ max.		
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		


Types		Tactile switches		
		Side push type		
Product name		<b>2.8mm × 2.3mm Side-operational Edge Mount SMD</b>	<b>3.4mm × 1.7mm Side-operational Edge Mount SMD</b>	<b>3.5mm × 2.9mm Side-operational SMD</b>
Part No.		EVPBS	EVPAT	EVQP7/EVQP3/EVQ9P7
Shape				
Features		Low profile		
Vehicle compatible		—	—	—
Protective structure		—	IP67	—
External dimensions (mm)	W × D	2.8 × 2.3 (Excluding the push plate)	3.4 × 1.73 (Excluding the push plate)	3.5 × 2.9 (Excluding the push plate)
	H	1.95	1.65	1.35
Operating force		1.6N	1.0N·1.6N	1.6N
			2.4N	2.2N
Travel (mm)		0.13	0.11	0.2
Operating life (cycles min)		300,000	500,000	100,000
Rating		10μ A 2 V DC to 20mA 15V DC (Resistive load)		10μ A 2 V DC to 50mA 12V DC (Resistive load)
Temperature	Operating temperature	-40°C to +85°C		-20°C to +70°C
	Storage temperature (Taping)	-20°C to +60°C		-20°C to +60°C
Characteristics	Contact resistance	500mΩ max.		
	Insulation resistance	50MΩ min. (at 100V DC)		100MΩ min. (at 100V DC)
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		



Types		Tactile switches		
		Side push type		
Product name		3.5mm × 2.9mm Side-operational Half Dive SMD	3.8mm × 1.9mm Side-operational SMD	4.5mm × 2.2mm Side-operational Edge Mount SMD
Part No.		EVPAN	EVPAK	EVPAE
Shape				
Features		Low profile, Half Dive	High soldering strength against operating force	Edge Mount, High soldering strength against operating force
Vehicle compatible		—	—	●
Protective structure		—	IP67	—
External dimensions (mm)	W × D	3.5 × 2.9 (Excluding the push plate)	3.9 × 2.05 (Excluding the push plate)	4.5 × 2.25 (Excluding the push plate)
	H	1.2	1.6	2.9
Operating force		1.6N	1.6N	1.6N
		2.2N		2.4N
				3.0N-3.5N
Travel (mm)		0.2	0.12	1.6N (with L-shape terminals) : 0.13 1.6N, 2.4N, 3.0N, 3.5N: 0.15
Operating life (cycles min)		100,000	500,000	200,000
Rating		10μ A 2 V DC to 50mA 12V DC (Resistive load)	10μ A 2 V DC to 20mA 15V DC (Resistive load)	
Temperature	Operating temperature	−20°C to +70°C	−40°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.	100mΩ max.	1,000mΩ max.
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Side push type		
Product name		Small-sized Side-operational SMD	6.2mm × 2.5mm Side-operational Edge Mount SMD	
Part No.		EVQPU	EVQP4	
Shape				
Features		Low profile	Edge Mount, High soldering strength against operating force	Middle travel, Edge Mount, High soldering strength against operating force
Vehicle compatible		—	●	●
Protective structure		—	—	—
External dimensions (mm)	W × D	4.7 × 3.5 (Excluding the push plate)	6.2 × 2.55 (Excluding the push plate)	6.2 × 2.55 (Excluding the push plate)
	H	1.65	3.5	3.5
Operating force		1.6N	1.0N-1.6N	
		2.2N	2.4N	2.5N
			3.5N	3.5N
				5.0N
Travel (mm)		0.3	0.25	0.7
Operating life (cycles min)		100,000	1.0N, 1.6N: 1,000,000 2.4N: 500,000 3.5N: 200,000	2.5N: 1,000,000 3.5N: 500,000 5.0N: 200,000
Rating		10μ A 2 V DC to 50mA 12V DC (Resistive load)	10μ A 2V DC to 20mA 15V DC (Resistive load)	
Temperature	Operating temperature	−20°C to +70°C	−40°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C		
Characteristics	Contact resistance	500mΩ max.	100mΩ max.	
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	10ms max. (ON, OFF)		
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches		
		Double-action	Radial	Bulk
Product name		3.0mm × 2.6mm Double-action SMD	6mm Square Long Travel 2R	6.0mm × 3.5mm
Part No.		EVPA <del>X</del>	EVQP <del>V</del>	EVQP <del>E</del>
Shape				
Features		Double-action	High mountability, Section terminals	Main body prevents the escape of flux.
Vehicle compatible		—	•	—
Protective structure		—	—	—
External dimensions (mm)	W × D	3.0 × 2.6	6.0 × 6.1	6.0 × 3.5
	H	0.7	5.0	4.3/5.0
Operating force		1st action: 0.7N	1.6N	1.0N·1.6N
		2nd action: 2.0N	2.0N·2.2N·2.5N	2.4N
			3.5N	
Travel (mm)		1st action: 0.07 2nd action: 0.16	2.2N: 1.0 1.6N, 2.0N, 2.5N, 3.5N: 1.3	0.25
Operating life (cycles min)		100,000	1.6N, 2.0N, 2.2N, 2.5N: 100,000 3.5N: 30,000	1.0N, 1.6N: 50,000 2.4N: 30,000
Rating		10μ A 2V DC to 20mA 15V DC (Resistive load)	10μ A 2V DC to 50mA 12V DC (Resistive load)	
Temperature	Operating temperature	−20°C to +70°C	−30°C to +85°C	
	Storage temperature (Taping)	−20°C to +60°C	−20°C to +40°C	−40°C to +85°C
Characteristics	Contact resistance	500mΩ max.	100mΩ max.	
	Insulation resistance	100MΩ min. (at 100V DC)		
	Dielectric withstanding voltage	250V AC for 1 minute		
	Bouncing	3ms max. (ON) / 20ms max. (OFF)	10ms max. (ON, OFF)	
Environment		RoHS compliant, ELV compliant		

Types		Tactile switches	
		Bulk	
Product name		Over Travel	
Part No.		EVQP0	
Shape			
Features		Over travel	
Vehicle compatible		—	
Protective structure		—	
External dimensions (mm)	W × D	6.2 × 6.2	
	H	7.45	
Operating force		0.74N·1.3N	
Travel (mm)		0.2	
Operating life (cycles min)		0.74N: 5,000,000 1.3 N: 1,000,000	
Rating		10μ A 2V DC to 50mA 30V DC (Resistive load)	
Temperature	Operating temperature	−20°C to +70°C	
	Storage temperature (Taping)	−40°C to +85°C	
Characteristics	Contact resistance	100mΩ max. (1Ω max. after life test)	
	Insulation resistance	100MΩ min.(at 100V DC)	
	Dielectric withstanding voltage	600V AC for 1 minute	
	Bouncing	3ms max. (ON) /8ms max. (OFF)	
Environment		RoHS compliant, ELV compliant	




# Rotary potentiometers Selector chart



Types		Rotary potentiometers		
Product name		18mm Square	39/20mm Center Space	44/25mm Center Space
Part No.		EVCX	EWVY-E/K/M/N	EWVY-G/H/J/L/P
Shape				
Features		Output accuracy (±3%)	Able to put LED inside	
Vehicle compatible		●	●	●
External dimensions (mm)	W	18.0	39.3	45.5
	D	18.0	40.3	45.2
	H	8 (Excluding shaft)	8 (Excluding rotating parts)	8 (Excluding rotating parts)
Rotation angle		280° max. ±5°	300° max. ±5°	
Rotation torque		20mN·m to 100mN·m	15mN·m to 50mN·m	15mN·m to 60mN·m
Nominal total resistance		5kΩ to 100kΩ (Tolerance ±20%)	10kΩ (Tolerance ±20%)	
Power rating		0.05W	0.1W	
Temperature	Operating temperature	-40°C to +85°C		
	Storage temperature	-40°C to +85°C		
Noise level		100mV max.	47mV max.	
Operating life (cycles min.)		15,000	30,000	
Environment		RoHS compliant, ELV compliant		

# Position Sensors Selector chart




Types		Position Sensors		
Product name		10mm GS	Linear Position	
Part No.		EVWAE/EVWAD	EVAW7	
Shape				
Features		Low profile, Long life sensor, Suitable for detecting the angles of rotating axes	A wide variety of operation travels	
Vehicle compatible		●	●	●
External dimensions (mm)	W	10.60	9.0	10.0
	D	12.65	15.8	3.0 (Excluding lever)
	H	2.20	3.8 (Excluding lever)	15.0
Terminal (mm)		—	9.0 ±0.5	8.0 ±0.5
Operating force		3mN·m max.	2N max.	1N max.
Rating		0.05W		
Temperature	Operating temperature	−40°C to +85°C	−40°C to +105°C	
	Storage temperature	−40°C to +85°C	−40°C to +105°C	
Total resistance		5kΩ ±30%, 10kΩ ±30%	10kΩ ±30%	4.7kΩ ±30%
Linearity		±2% max.	±2%	±1%
Operating life (cycles min)		1,000,000 (Operation angle ±30°)	10,000	
Environment		RoHS compliant, ELV compliant		

# Encoders Selector chart

Types		Encoders		
Product name		7mm Square	10mm Square GS	10mm Square SMD
Part No.		EVQVU	EVQVX	EVQVV
Shape				
Features		Small and low profile	Compact and thin design	Low profile, Shaft hole dimeters of up to 4mm
Vehicle compatible		—	—	●
External dimensions (mm)	W	7.7	9.7	10.6
	D	5.1	6.8	12.65
	H	7 (10)	7 (11.1) /9 (13.1) /11 (15.1)	2.2 (3.4)
Rotation angle		360° (Endless)		
Rotation torque		5mN·m	5mN·m	2mN·m max.
Resolution/Detents		12pulses/24points	12pulses/24points 12pulses/12points	3pulses/None
Rating		1mA 10V DC		
Temperature	Operating temperature	-40°C to +85°C		
	Storage temperature	-40°C to +85°C		-40°C to +85°C
Output signals		Incremental		
Rotation life (cycles min)		100,000	200,000	70,000
Bouncing		15ms max. (at rotational speed 30r/min.)	5ms max.	
Environment		RoHS compliant, ELV compliant		

Types		Encoders	
Product name		<b>11mm Square GS</b>	<b>11mm Square GS Encoders G2</b>
Part No.		EVER/EVEU/EVEV/EVEY	EVED/EVEE
Shape			
Features		Low profile, High reliability, Wide variations	
Vehicle compatible		•	•
External dimensions (mm)	W	12.0	12.0
	D	11.6	12.0
	H	3.5 (SMD) Excluding shaft 4.0 (THD) Excluding shaft	4.5 (Excluding shaft)
Rotation angle		360° (Endless)	
Rotation torque		8mN·m, 12mN·m 10mN·m, 14mN·m	8mN·m, 12mN·m 14mN·m
Resolution/Detents		8pulses/16points, 12pulses/24points 15pulses/30points, 16pulses/32points	8pulses/16points 15pulses/30points
Rating		1mA 10V DC	
Temperature	Operating temperature	-40°C to +85°C	
	Storage temperature	-40°C to +85°C	
Output signals		Incremental	
Rotation life (cycles min)		30,000	
Bouncing		5ms max.	
Environment		RoHS compliant, ELV compliant	




Types		Encoders		
Product name		18mm Square (High Rotational Torque)	18mm Square (Waterproof type)	20/12mm Center Space
Part No.		EVQW	EVQV9	EVQV6
Shape				
Features		Absolute 5 bit available	Water resistant	Center space
Vehicle compatible		●	—	●
External dimensions (mm)	W	18.0	18.8	20.0
	D	18.0	20.0	20.6
	H	8.0 (Excluding shaft)	9.22 (Excluding shaft)	5.0 (Excluding rotating parts)
Rotation angle		360° (Endless)		
Rotation torque		20mN·m to 100mN·m	50mN·m	7mN·m, 11mN·m 18mN·m
Resolution/Detents		5bit/(Pitch: 10° to 30°)	3bit/ 8positions 4bit/16positions	9pulses/18points 15pulses/30points
Rating		5mA 10V DC	1mA 10V DC	
Temperature	Operating temperature	−40°C to +85°C	−20°C to +60°C	−40°C to +85°C
	Storage temperature	−40°C to +85°C	−40°C to +70°C	−40°C to +85°C
Output signals		Absolute		Phase A and B
Rotation life (cycles min)		15,000	30,000	
Bouncing		5ms max.		
Environment		RoHS compliant, ELV compliant		

Types		Encoders		
Product name		<b>27/17mm Center Space</b>	<b>27/18mm Center Space</b>	<b>38/25mm Center Dpace</b>
Part No.		EVQWF/EVQVP	EVQV5/EVQVT	EVQVN
Shape				
Features		Center space		
Vehicle compatible		•	•	•
External dimensions (mm)	W	28.0	28.0	38.4
	D	29.0	29.0	38.9
	H	6.0 (Excluding rotating parts)	6.0 (Excluding rotating parts)	7.5 (Excluding rotating parts)
Rotation angle		360° (Endless)		
Rotation torque		8mN·m, 12mN·m 20mN·m	9mN·m, 13.5mN·m 18mN·m	12mN·m 20mN·m
Resolution/Detents		9pulses/18points 15pulses/30points		15pulses/30points
Rating		1mA 10V DC		
Temperature	Operating temperature	-40°C to +85°C		
	Storage temperature	-40°C to +85°C		
Output signals		Phase A and B		
Rotation life (cycles min)		30,000		
Bouncing		5ms max.		
Environment		RoHS compliant, ELV compliant		

Types		Encoders
Product name		<b>60/40mm Center Space</b>
Part No.		EVQV0
Shape		
Features		Center space
Vehicle compatible		•
External dimensions (mm)	W	63.8
	D	64.3
	H	11.5 (Excluding rotating parts)
Rotation angle		360° (Endless)
Rotation torque		35mN·m
Resolution/Detents		15pulses/30points
Rating		1mA 10V DC
Temperature	Operating temperature	-40°C to +85°C
	Storage temperature	-40°C to +85°C
Output signals		Phase A and B
Rotation life (cycles min)		30,000
Bouncing		5ms max.
Environment		RoHS compliant, ELV compliant




# Push Switches selector chart

Types		Push switches		
Product name		<b>ESB33</b>	<b>ESB30</b>	<b>ESE20</b>
Part No.		ESB33	ESB30	ESE20C/ESE20D
Shape				
Features		Low profile, SMD	Long travel	User friendly tactile feedback
Vehicle compatible		•	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	9.85 × 8.6	10.9 × 10.0	7.8 × 7.9
	H	12.5	20.5	17.5/12.5
	Mounting height (mm)	6.0	12.5	8.9
Operating force		3.0N	2.0N 3.5N	2.0N 4.0N
Travel (mm)		Lock travel: 1.5 Full travel: 2.3	Lock travel: 2.5 Full travel: 3.5	Full travel: 2.5
Operating Life (cycles min)		10,000 (for standard use) 30,000 (for vehicle)		
Poles and throws		2 poles 2 throws		1 pole 1 throw
Rating		50 $\mu$ A 3 V DC to 0.2A 14V DC (Resistive load)		0.01A 5 V DC to 0.1A 14V DC (Resistive load)
Temperature	Operating Temperature	−10 to +70°C, (for standard use) , −40°C to +85°C (for vehicle)		
	Heat resistance	+70°C 96 hours		
	Low temperature resistance	−10°C 96 hours		
	Humidity resistance	+40°C, 90% to 95% RH 96 hours		
Electrical Characteristics	Insulation resistance	Terminal to terminal and terminal to frame: 100M $\Omega$ min. (500V DC)		
	Dielectric withstanding voltage	Terminal to terminal and terminal to frame: 500V AC for 1 minute		
Environment		RoHS compliant, ELV compliant		

# Detector switches Selector chart

Types		Detector switches		
Product name		ESE58	ESE16	ESE13
Part No.		ESE58	ESE16	ESE13
Shape				
Features		Low profile	Small size	Low profile, Long stroke
Vehicle compatible		—	●	●
Protective structure		—	—	—
External dimensions (mm)	W × D	3.5 × 3.0	2.2 × 3.35	4.2 × 3.6
	H	0.9	1.5	1.2
Operating force		350mN max.	250mN max.	300mN max.
Poles and throws		1 pole 1 throw		
Full travel (pushing distance) (mm)		With boss: 1.5 (1.4) Without boss: 1.25 (1.4)	1.5 (1.0)	ESE13V type: 0.95 (2.1) ESE13H type: 3.05 (2.1)
Operating life (cycles min)		50,000		
Rating		50μ A 3 V DC to 10mA 5 V DC (Resistive load)		
Temperature	Operating temperature	−10°C to +60°C (for standard use)	−10°C to +60°C (for standard use) , −40°C to +85°C (for vehicle)	
	Heat resistance	+70°C 96 hours		
	Low temperature resistance	−25°C 96 hours		
	Humidity resistance	+40°C 90% to 95% RH 96 hours		
Electrical Characteristics	Operating temperature	500MΩ max.		
	Insulation resistance	100MΩ min. (100V DC for 1 minute)		
	Dielectric withstanding voltage	100V AC (50Hz to 60Hz for 1 minute)		
Environment		RoHS compliant, ELV compliant		

Types		Detector switches		
Product name		<b>ESE18</b>	<b>ESE31</b>	<b>ESE22</b>
Part No.		ESE18	ESE31	ESE22
Shape				
Features		Low profile, NO/NC are available	Improved mounting strength	Multi direction detection (horizontal and vertical direction)
Vehicle compatible		•	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	4.0 × 4.4	5.9 × 5.4	ESE22MH type: 5.7 × 5.0
	H	1.2	1.7	ESE22MH type: 2.1
Operating force		300mN max.	390mN max.	290mN max.
Poles and throws		1 pole 1 throw		
Full travel (pushing distance) (mm)		·Standard travel type with boss: 1.4 (1.5) without boss: 2.1 (1.5) ·Long travel type with boss: 1.4 (2.15) without boss: 2.1 (2.15)	3.2 (2.15)	ESE22MV type: 4.25 (2.05) ESE22MH type: 1.2 (2.0) ESE22MH5 type: 0.6 (2.0)
Operating life (cycles min)		50,000		
Rating		50μ A 3 V DC to 10mA 5 V DC (Resistive load)		
Temperature	Operating temperature	−10°C to +60°C (for standard use), −40°C to +85°C (for vehicle)		
	Heat resistance	+70°C 96 hours	+85°C 96 hours	+80°C 96 hours
	Low temperature resistance	−25°C 96 hours	−40°C 96 hours	−25°C 96 hours
	Humidity resistance	+40°C 90% to 95% RH 96 hours	+60°C 90% to 95% RH 96 hours	+40°C 90% to 95% RH 96 hours
Electrical Characteristics	Operating temperature	500MΩ max.		
	Insulation resistance	100MΩ min. (100V DC for 1 minute)		
	Dielectric withstanding voltage	100V AC (50Hz to 60Hz 1 minute)		
Environment		RoHS compliant, ELV compliant		

Types		Detector switches		
Product name		<b>ESE11</b>	<b>ESE23</b>	<b>ESE24</b>
Part No.		ESE11	ESE23	ESE24
Shape				
Features		Large selection of mounting types and mounting directions	Bidirectional operation, Midpoint auto-return type	
Vehicle compatible		•	•	•
Protective structure		—	—	—
External dimensions (mm)	W × D	ES11SV type: 5.2 × 3.0	5.0 × 4.4	ESE24SV type: 7.5 × 3.0
	H	ESE11SV type: 4.9	1.5	ESE24SV type: 5.6
Operating force		350mN max.	300mN max.	350mN max.
Poles and throws		1 pole 1 throw	1 pole 2 throws	
Full travel (pushing distance) (mm)		ESE11SV type: 6.1 (2.4) ESE11MV type: 6.1 (2.4) ESE11SH type: 3.0 (2.4) ESE11MH type: 1.7 (2.4) ESE11HS type: 6.3 (2.4)	with boss: 1.0 (1.5) without: 2.2 (1.5)	ESE24SV type: 6.1 (2.45) ESE24SH type: 2.6 (2.45) ESE24MV type: 6.1 (2.45) ESE24MH type: 1.4 (2.45)
Operating life (cycles min)		50,000		
Rating		50μ A 3 V DC to 10mA 5 V DC (Resistive load)		
Temperature	Operating temperature	−10°C to +70°C (for standard use) −40°C to +85°C (for vehicle)	−10°C to +60°C (for standard use) −40°C to +85°C (for vehicle)	−10°C to +70°C (for standard use) −40°C to +85°C (for vehicle)
	Heat resistance	+80°C 96 hours	+70°C 96 hours	+80°C 96 hours
	Low temperature resistance	−25°C 96 hours		
	Humidity resistance	+40°C 90% to 95% RH 96 hours		
Electrical Characteristics	Operating temperature	500MΩ max.		
	Insulation resistance	100MΩ min. (100V DC for 1 minute)		
	Dielectric withstanding voltage	100V AC (50Hz to 60Hz for 1 minute)		
Environment		RoHS compliant, ELV compliant		

# ■ Application ■

## Connectors / Tactile switches

- Next generation smart equipment
- ICT / Social infrastructure equipment
- Measuring / Industrial equipment



## AI speaker

### Tactile switches

For power on and operation / Volume UP•DOWN

3020  
SMD

EVPAW



3529  
SMD

EVPAW



4735  
SMD

EVQP2



### Board

For FPC

Y3B



For FPC/FFC

Y5B



### Board

Board-to-FPC  
Board-to-Board

P4S



Board-to-Board

P5KS



Board-to-FPC  
Board-to-Board

P5KF



Wearable watch

LCD

Board-to-FPC

S35

Main camera

Board-to-FPC

S35

For FPC

Y3B

Touch panel

Board-to-FPC

S35

Tactile switches

For operation

3417 side-operational

EVPAT

2823 side-operational

EVPAV

2616 SMD

EVPBB

Battery

Board-to-FPC

R35K

Board-to-FPC

B01

Board-to-FPC

B02

Board

Board-to-FPC

R35K

Board-to-FPC

S35

Sensor

Board-to-FPC

R35K

Board-to-FPC

S35

For FPC

Y3B

## Hearable devices

### Tactile switches

#### For Power on and operation

2616  
SMD

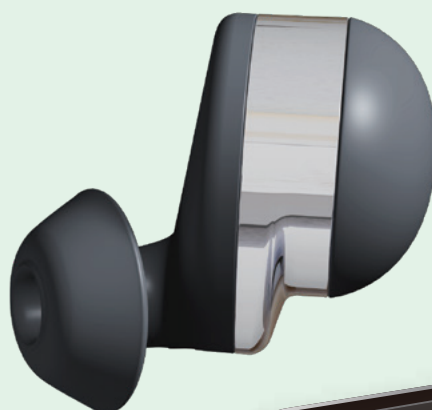
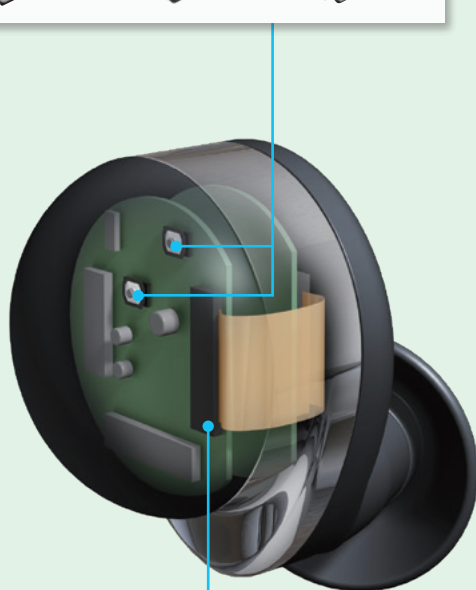
EVPBB

2819  
SMD

EVPBL

3020  
SMD

EVPAW



#### Board

Board-to-FPC  
R35KBoard-to-FPC  
S35For FPC  
Y3B

### Detector switches

#### Battery cover open-close detection

ESE  
16 type

ESE16

ESE  
13 type

ESE13



Heated tobacco

Board

Board-to-FPC  
A35P

Board-to-FPC  
A35UH

Tactile switches

For power on

3529  
SMD  
EVPA

4735  
SMD  
EVQP2

Tactile switches

For operation

3020  
SMD  
EVPAW

Battery

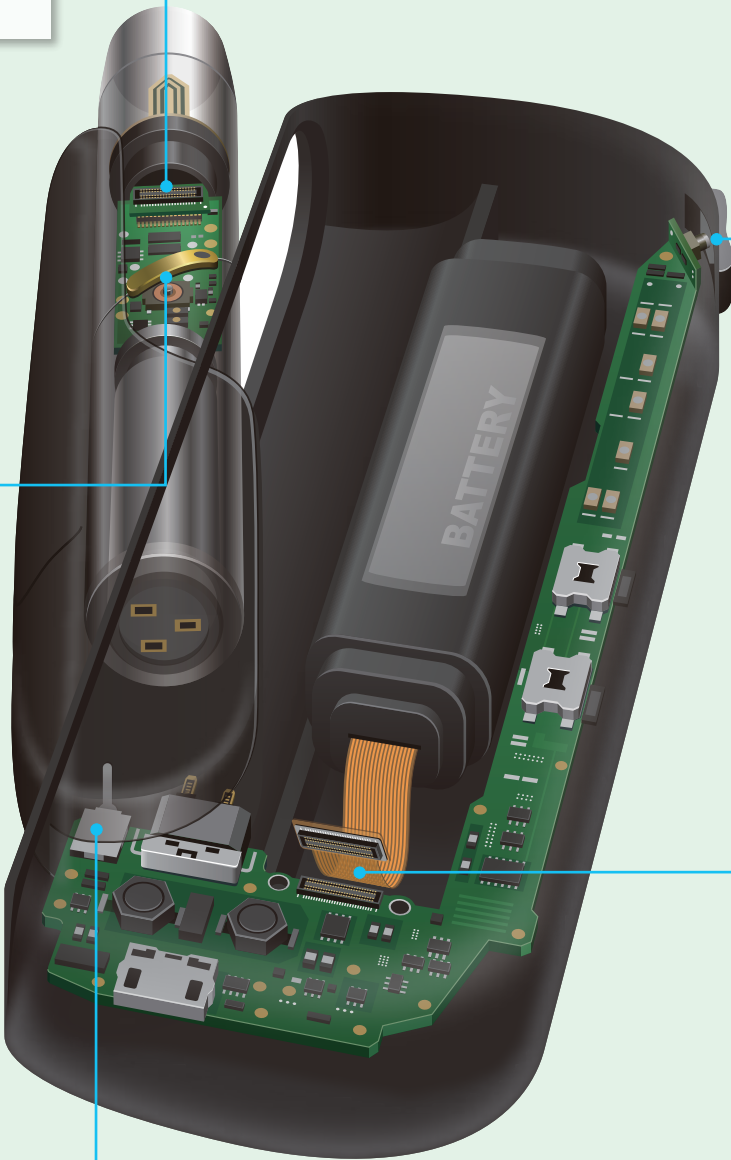
Board-to-FPC  
B01

Board-to-FPC  
B02

Detector switches

Insertion and open-close detection

ESE  
18 type  
ESE18



## Smart toy

### Board

For FPC

Y3B



### Battery

Board-to-FPC

B01



Board-to-FPC

B02



### Main camera

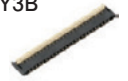
Board-to-FPC

S35



For FPC

Y3B



### Position sensors

#### Angle detection

10 mm  
GS

EVWAE



### Tactile switches

#### For operation

3529  
SMD

EVPAA

4735  
SMD

EVQP2

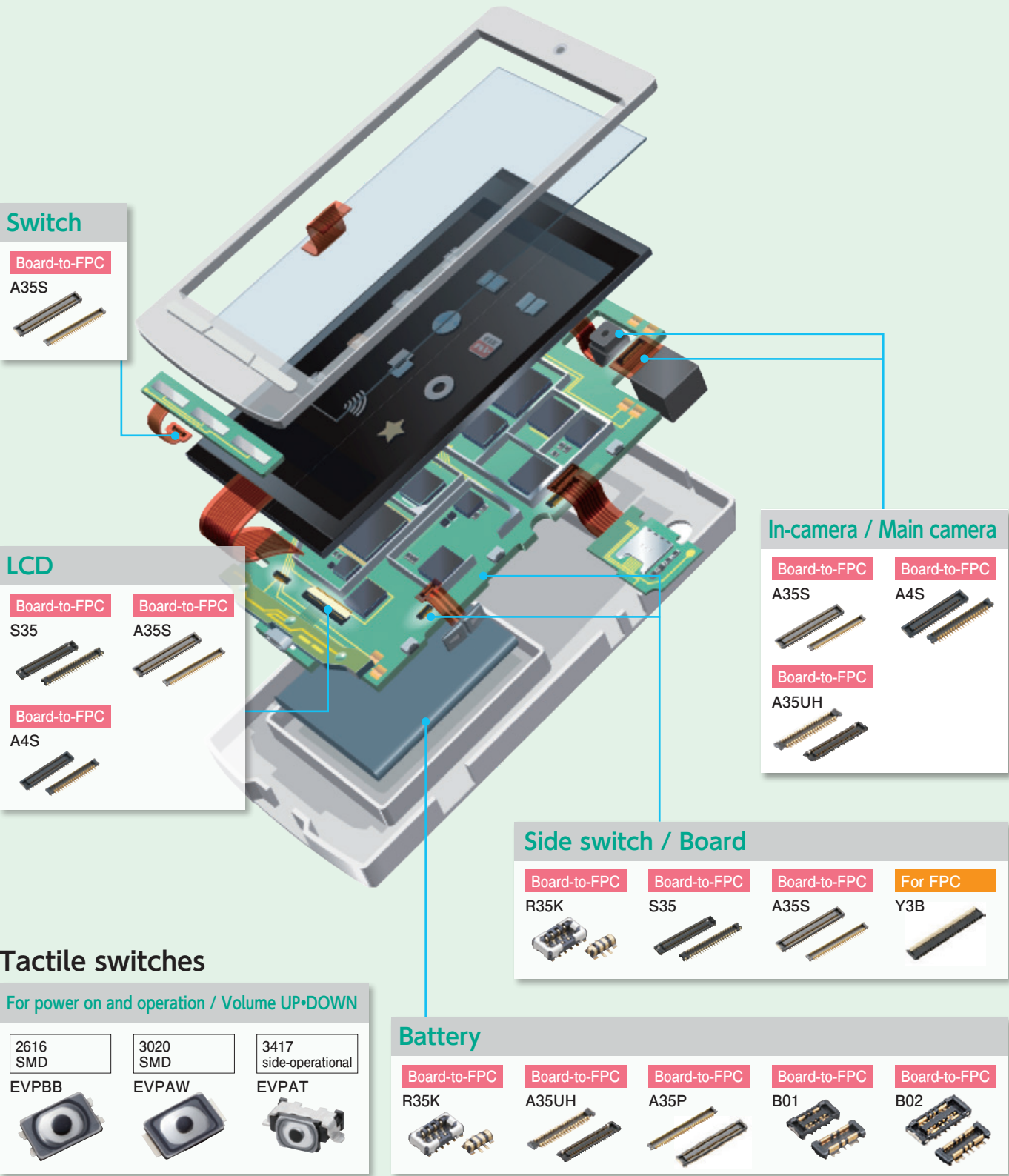
6 mm thin type  
SMD

EVQQ2



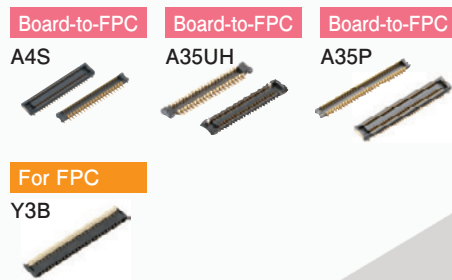


Smartphone

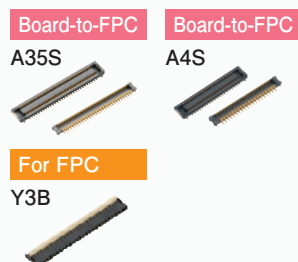


## Tablet

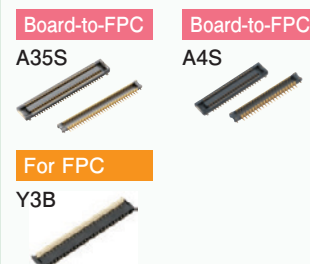
### Main camera



### LCD / Sub camera



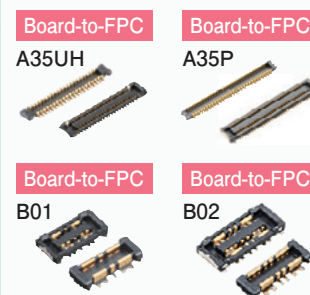
### Touch panel / Switch



### Board



### Battery



### Tactile switches

For power on and operation / Volume UP•DOWN



### Communication module



Laptop computer

LCD

For FPC

Y3B



Touch panel

For FPC

Y3B



For FPC/FFC

Y5B



Camera

Board-to-FPC

A4S



Board-to-FPC

F4S



I/O Board

Board-to-FPC

A35UH



Board-to-FPC

A35P



Board-to-FPC

B01



For FPC/FFC

Y5BH



Tactile switches

For power on

4735  
SMD

EVQP2



6 mm thin type  
SMD

EVQQ2



Communication module

Board-to-FPC

F4S



Board-to-FPC  
Board-to-Board

P4



Board-to-FPC  
Board-to-Board

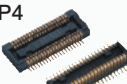
P5KF



Board

Board-to-FPC  
Board-to-Board

P4



Board-to-FPC  
Board-to-Board

P4S



Board-to-FPC  
Board-to-Board

P4S Shield type



Board-to-FPC  
Board-to-Board

P5KF



Board-to-FPC

P4SP

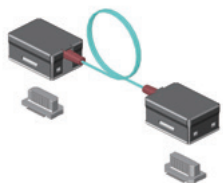




## Security camera

### Board

#### Active optical connectors



### Tactile switches

#### For power on

4735  
SMD

EVQP2

4522  
EM

EVPAE

6225  
EM

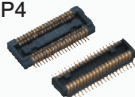
EVQP4



### Camera / Board

Board-to-FPC  
Board-to-Board

P4

Board-to-FPC  
Board-to-Board

P4S

Board-to-FPC  
Board-to-Board

P5KF



### Camera / Board

For FPC

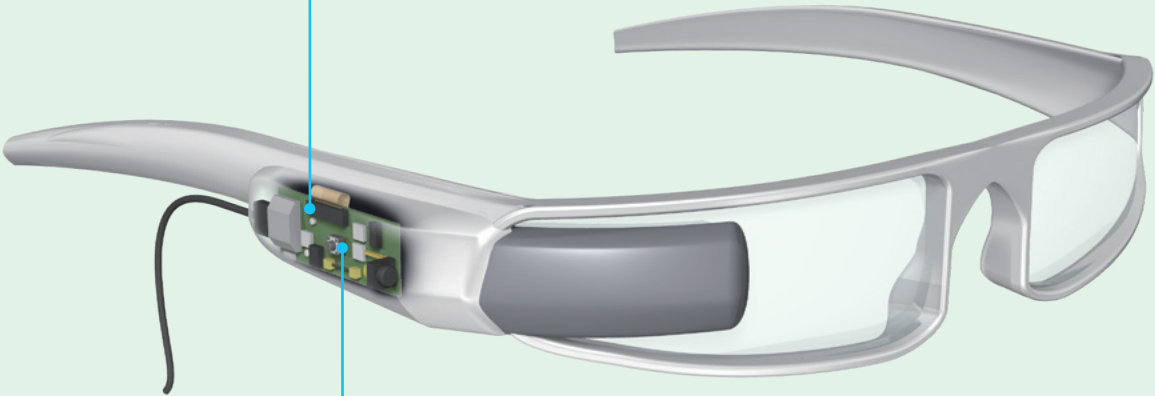
Y5BW



Smart glasses

Board

Board-to-FPC	Board-to-FPC	For FPC
R35K	S35	Y3B

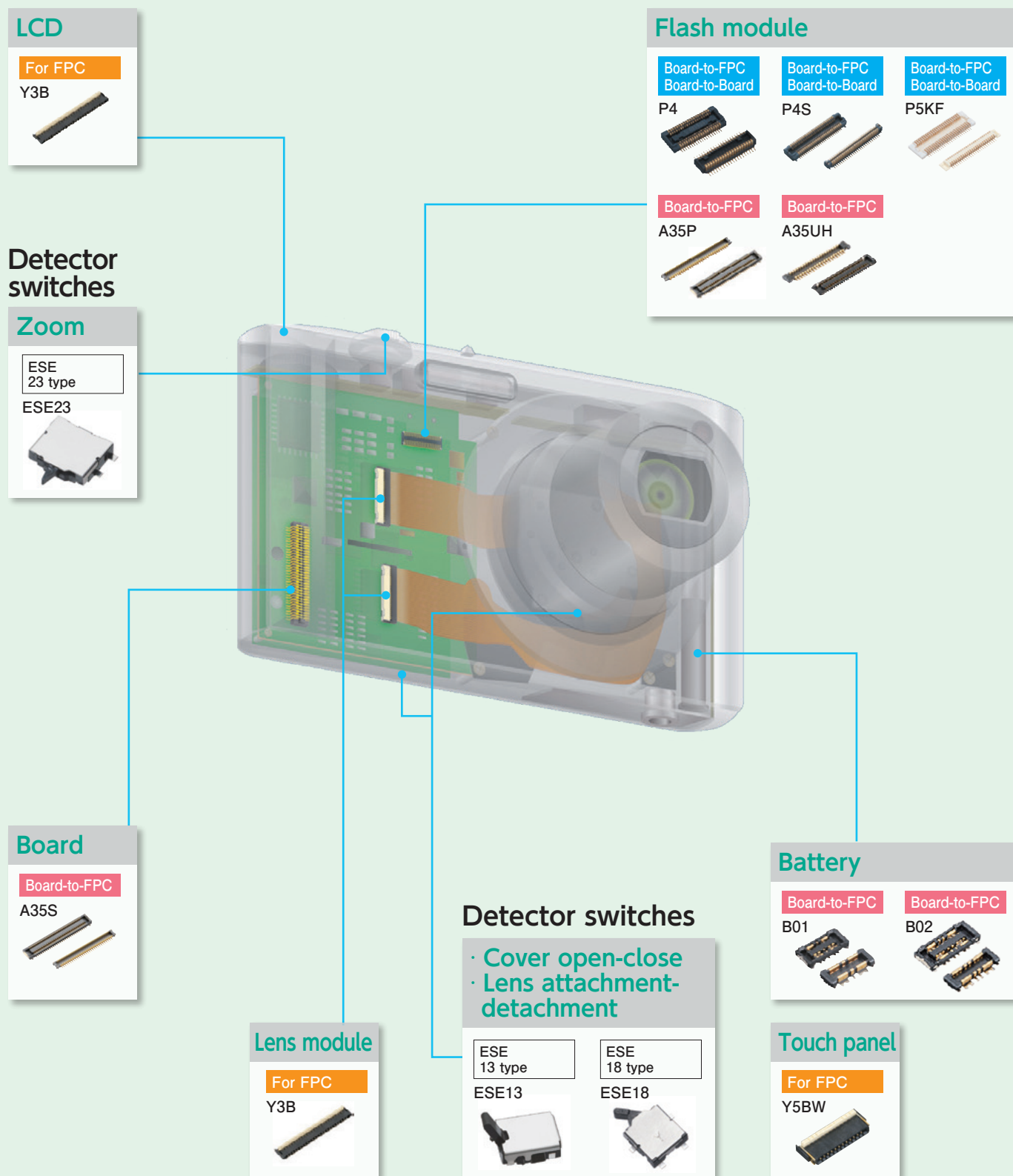


Tactile switches

For power on / For operation

2616 SMD	3020 SMD	3417 side-operational
EVPBB	EVPAW	EVPAT

## Digital still camera



Drive recorder

Board


Board-to-FPC  
Board-to-Board

P4S




Board-to-Board

P5KS




Board-to-FPC  
Board-to-Board

P5KF



Board-to-FPC  
Board-to-Board

P4SP




Tactile switches

For operation

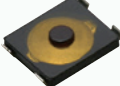
3529  
SMD

EVPAA



3026  
SMD

EVPAF



LCD

For FPC/FFC

Y5B



For FPC


Y5BW



Modules – Main Board


Board-to-FPC  
Board-to-Board

P4S




Board-to-FPC  
Board-to-Board

P4S Shield type




Board-to-Board

P5KS




Board-to-FPC  
Board-to-Board

P5KF




Board-to-FPC

P4SP



For FPC/FFC

Y5BH



## Drone

### Board

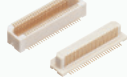
Board-to-FPC  
Board-to-Board

P4S



Board-to-Board

P5KS



Board-to-FPC  
Board-to-Board

P5KF



Board-to-FPC

A35UH



Board-to-FPC

A35P



Board-to-FPC  
Board-to-Board

P4SP



For FPC/FFC

Y5B



For FPC

Y5BW



### Tactile switches

#### For power on

6 mm Middle travel  
SMD

EVPBF



6 mm thin type  
SMD

EVQQ2



### Detector switches

#### Battery position detection

ESE  
58 type

ESE58



ESE  
16 type

ESE16



### Battery

Board-to-FPC

A35UH



Board-to-FPC

A35P



For FPC/FFC

Y5B



For FPC

Y5BW



Smart meter

LCD

For FPC

Y3B



For FPC/FFC

Y5B



For FPC

Y5BW



Board

Board-to-FPC  
Board-to-Board

P4S



Board-to-Board

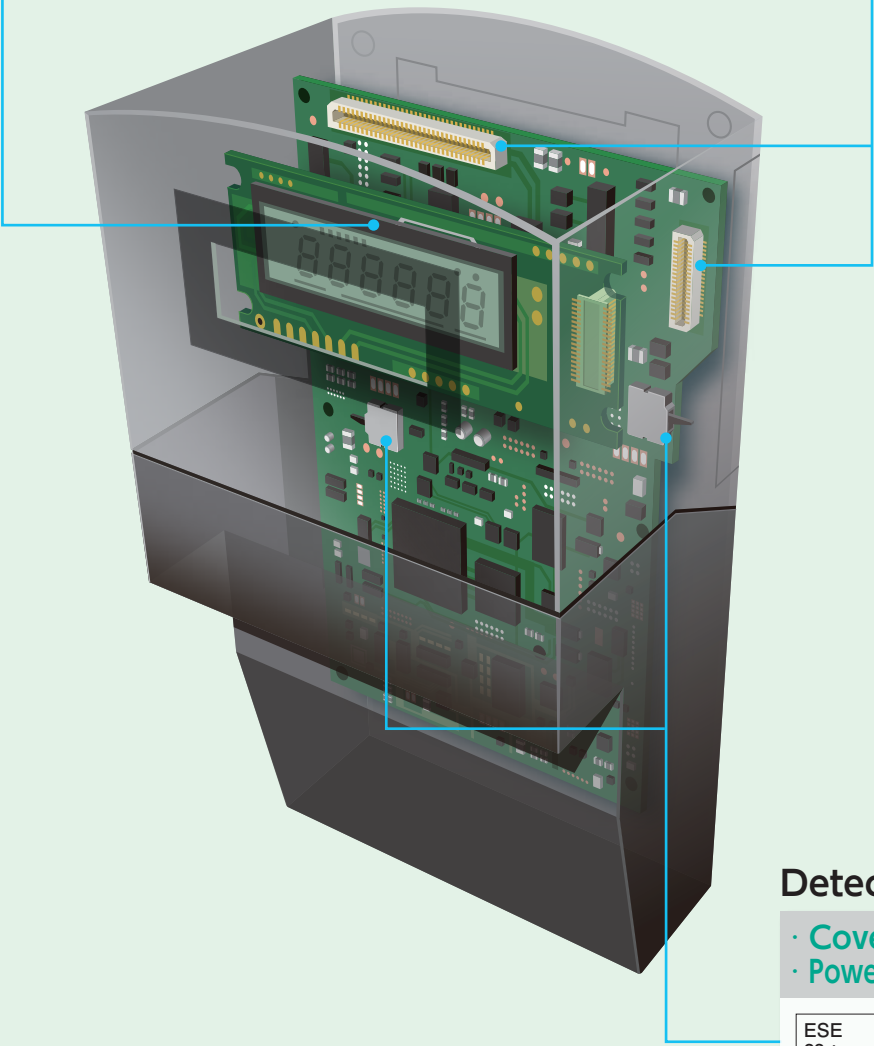
P5KS



Board-to-FPC  
Board-to-Board

P5KF






Detector switches

- Cover open-close
- Power shutoff position


ESE  
23 type

ESE23



ESE  
13 type

ESE13

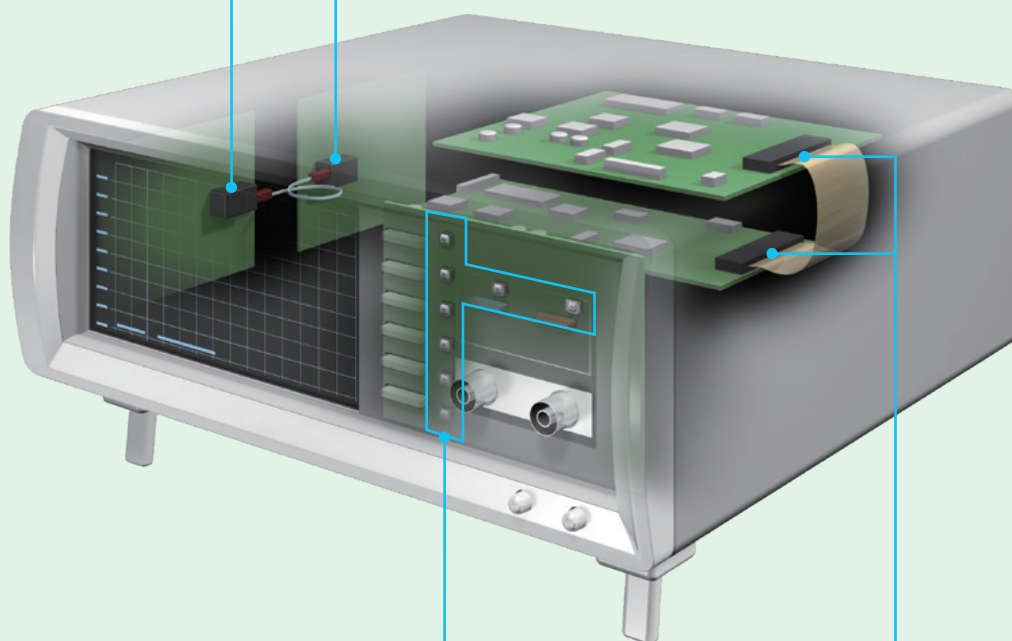
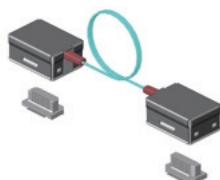




## Measuring devices

### Board

Active optical connectors



### Tactile switches

#### Menu operation

3529  
SMD

EVPA4



4735  
SMD

EVQP2



6 mm thin type  
SMD

EVQQ2



### Board

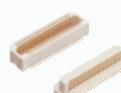
Board-to-FPC  
Board-to-Board

P4S



Board-to-Board

P5KS



Board-to-FPC  
Board-to-Board

P5KF



Board-to-FPC  
Board-to-Board

P4SP



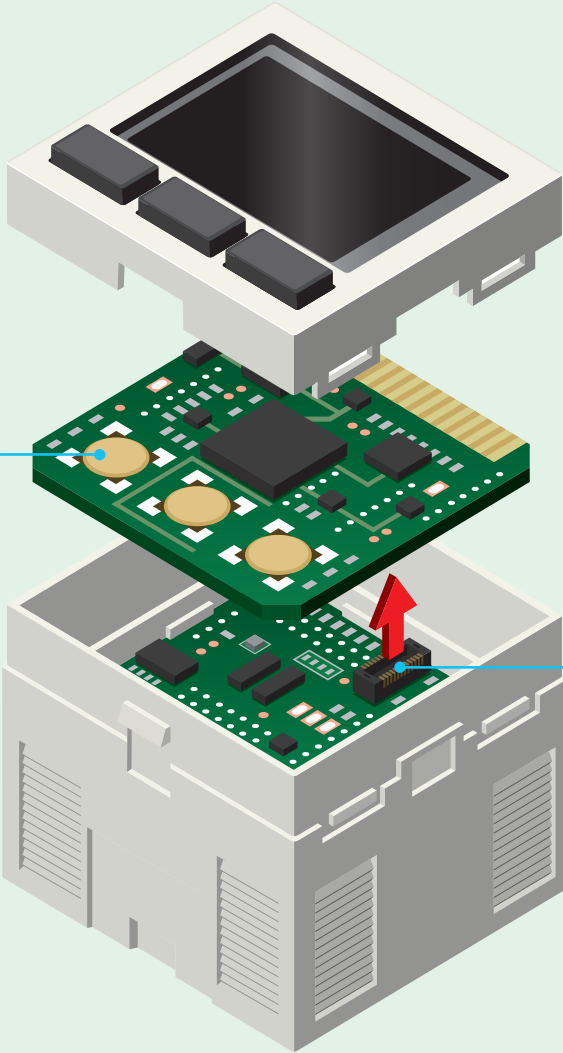
Pressure sensor

Tactile switches

For operation

4 mm  
SMD  
EVQP6

4.9 mm  
SMD  
EVQPL



Board

Board-to-FPC Board-to-Board P4	Board-to-FPC Board-to-Board P4S	Board-to-Board P5KS	Board-to-FPC Board-to-Board P5KF	Board-to-FPC Board-to-Board P4SP



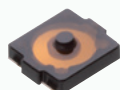
## Blood glucose meter

### Tactile switches

#### For operation

3429  
SMD

EVPAY

3529  
SMD

EVPAA

4735  
SMD

EVQP2

4.9mm  
SMD

EVQPL



#### LCD

For FPC

Y3B



For FPC/FFC

Y5B



For FPC

Y5BW



#### Board

Board-to-FPC

F4S

Board-to-FPC  
Board-to-Board

P4S

Board-to-FPC  
Board-to-Board

P4SP



For FPC

Y3B



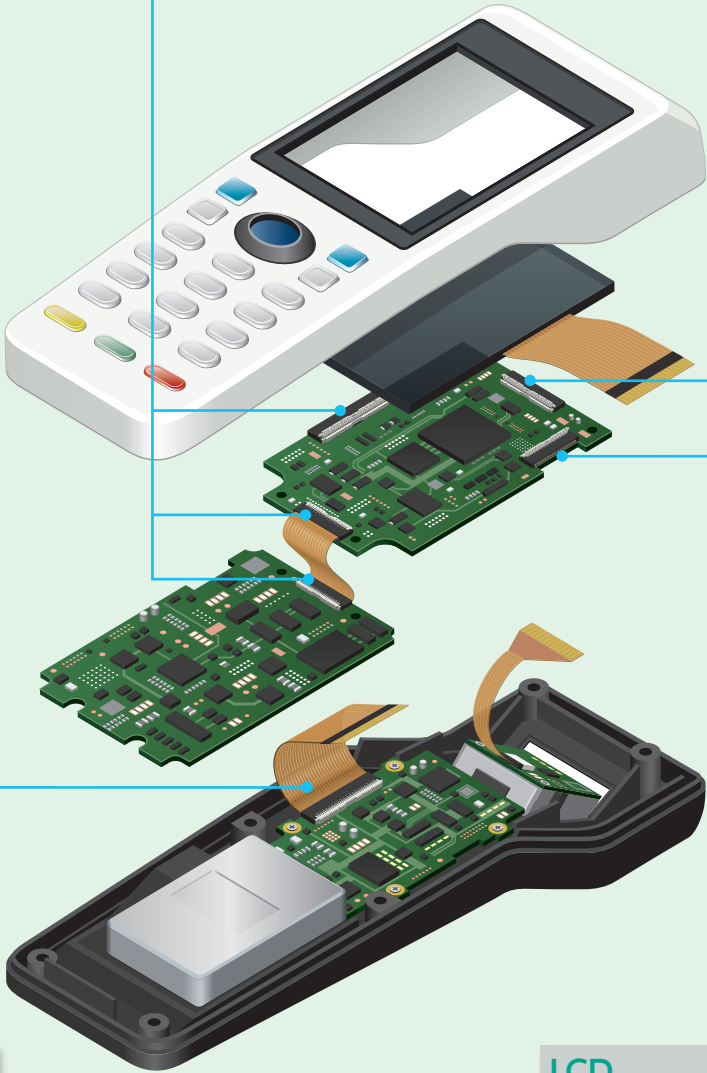
Handheld terminal

Board

Board-to-FPC F4S	Board-to-FPC Board-to-Board P4S	Board-to-Board P5KS	Board-to-FPC Board-to-Board P5KF	Board-to-FPC Board-to-Board P4SP
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LCD

Board-to-FPC A35P	For FPC/FFC Y5B	For FPC Y5BW
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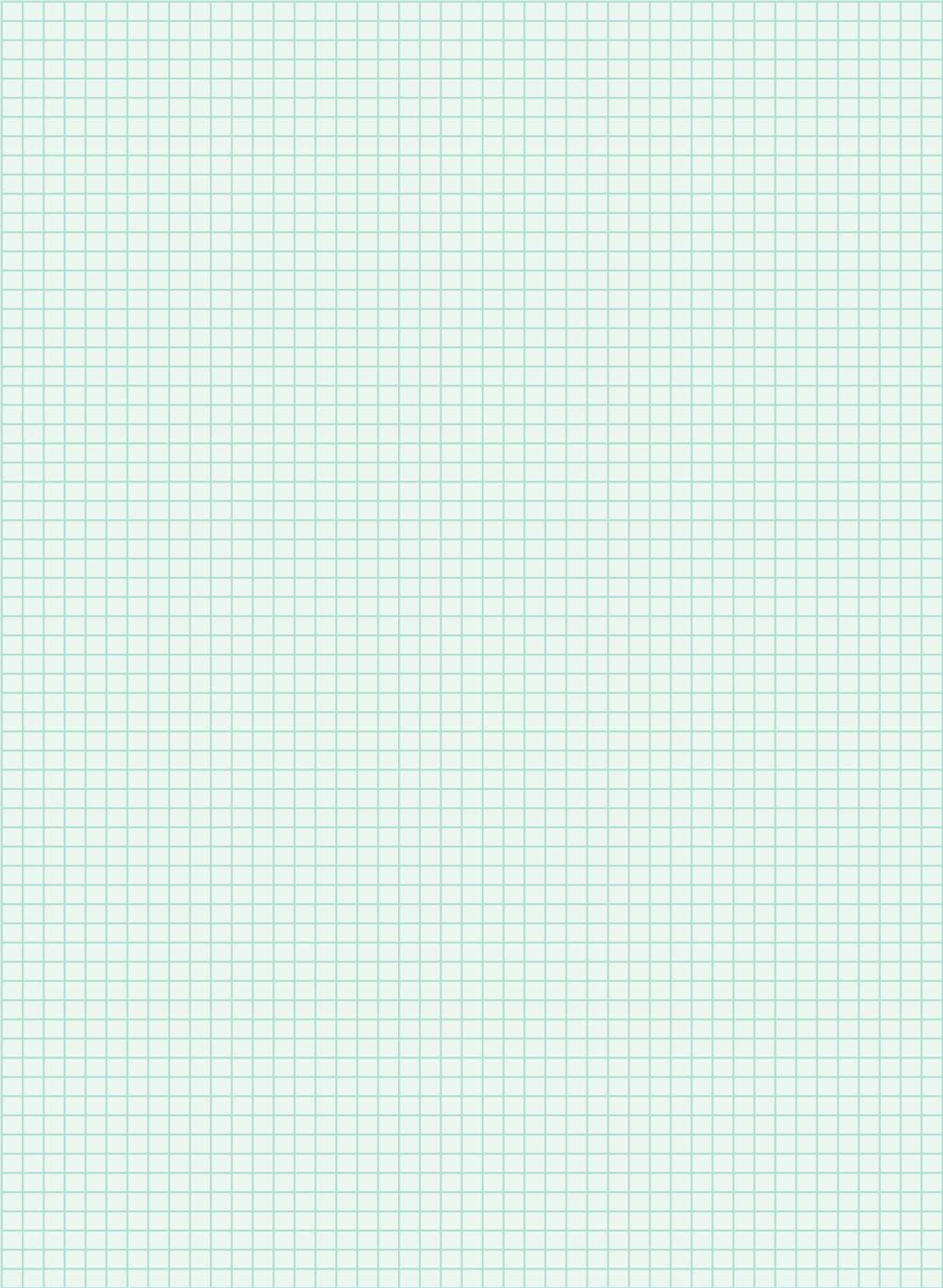


Board

For FPC/FFC Y5B	For FPC Y5BW
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LCD

For FPC Y3B	For FPC/FFC Y5B	For FPC Y5BW
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Please refer to **"the latest product specifications"**  
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