

# IP series

Pushbutton switches for harsh environments •  
bushing Ø 12 mm • momentary



## DISTINCTIVE FEATURES

Illuminated or non-illuminated

Tactile feedback

Wide variety of configurations

Flat round actuator for optional marking

Sealed to IP67 and IP69K



## ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing: IP67 according to IEC 60529  
IP69K according to DIN 40050-9 (non-illuminated) with cap U5125
- Shock resistance: 100 g according to IEC 512-4, test 6c
- Vibration resistance: 10-500Hz - 10 g according to IEC 512-4, test 6d
- Salt spray: IEC 512-6, test 11f
- Robustness (non-illuminated): IK06 according to EN 62262 (1 joule)
- Operating temperature: -40 °C to +85 °C (-40 °F to +185 °F)



## ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load (gold plated silver contacts):  
5 A 28 VDC, 70,000 cycles (only function 3)  
0.2 A 48 VDC, 500,000 cycles  
0.5 A 48 VAC, 500,000 cycles
- Initial contact resistance: 100 mΩ max.
- Insulation resistance: 1 GΩ min. at 500 VDC
- Dielectric strength: 1,500 Vrms
- Contact bounce: 10 ms

For W terminals, current has to be limited to 400 mA.



### LED COMPONENT SPECIFICATIONS

LED color	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20 mA	2.1 V	2.3 V
Yellow (LOY)	20 mA	2.1 V	2.3 V
Green (LOG)	20 mA	2.1 V	2.3 V
Blue (LOB)	20 mA	3.2 V	3.8 V
White (LOW)	20 mA	3.35 V	4.25 V
Red/green (LSG)	20 mA	Red: 1.95 V / green: 2.1 V	2.5 V
Yellow/green (LYG)	20 mA	Yellow: 2 V / green: 2.1 V	2.5 V

A resistor must be series-connected by the user.  
Resistor value =  $\frac{\text{supply voltage} - \text{LED forward voltage}}{\text{LED forward current}}$

The company reserves the right to change specifications without notice.

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## GENERAL SPECIFICATIONS

- Panel thickness: 1.5 mm (.059) min.  
4 mm (.157 max.)
- Total travel:  
Function 3: 1.7 mm (.067) ± 0.3 mm (0.012)  
Function 5: 1.3 mm (.051) ± 0.3 mm (0.012)
- Typical operating force: 4 N ± 2 N
- Low level/mech. life: 1,000,000 cycles
- Torque: 1.5 Nm max. applied to nut
- Soldering: 320 °C (608 °F) max. for 3 sec.

## MATERIALS

- Case: thermoplastic UL94-V0
- Actuator: polyamide 6/6
- Bushing/bezel: zinc die-cast (zamak), black painted
- Contacts: - silver, gold plated (std)  
- brass, gold plated (for option 104)
- Output wires (flying lead terminals):  
**F version:** AWG20, section 0.6 mm<sup>2</sup>  
**W version:** AWG24, section 0.23 mm<sup>2</sup>
- LED wires:  
**F version:** AWG26, section 0.12 mm<sup>2</sup>  
**W version:** AWG24, section 0.23 mm<sup>2</sup>
- Lens: polycarbonate
- Terminal seal: epoxy

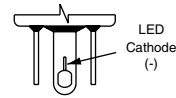
## AGENCY APPROVAL



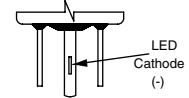
2 A 125 VAC/250 VAC  
File E83438  
See following pages.

## TERMINALS

### ILLUMINATED MODELS

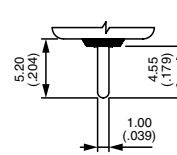


Solder lug S

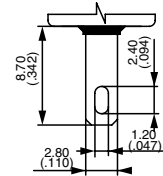


Straight P

### NON-ILLUMINATED MODELS



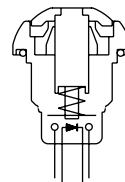
Straight P



Quick-connect Z1

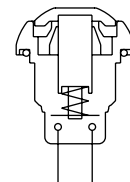
## ELECTRICAL FUNCTIONS

### ILLUMINATED MODELS

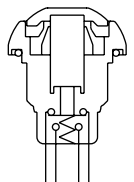


Function 3 (NO)

### NON-ILLUMINATED MODELS



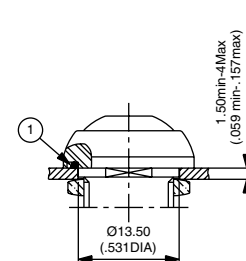
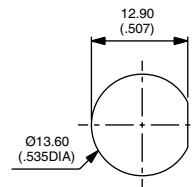
Function 3 (NO)



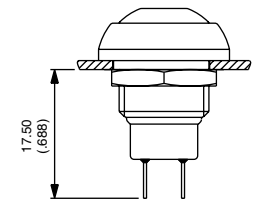
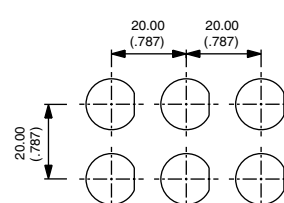
Function 5 (NC/NO)

## MOUNTING

### PANEL CUT-OUT



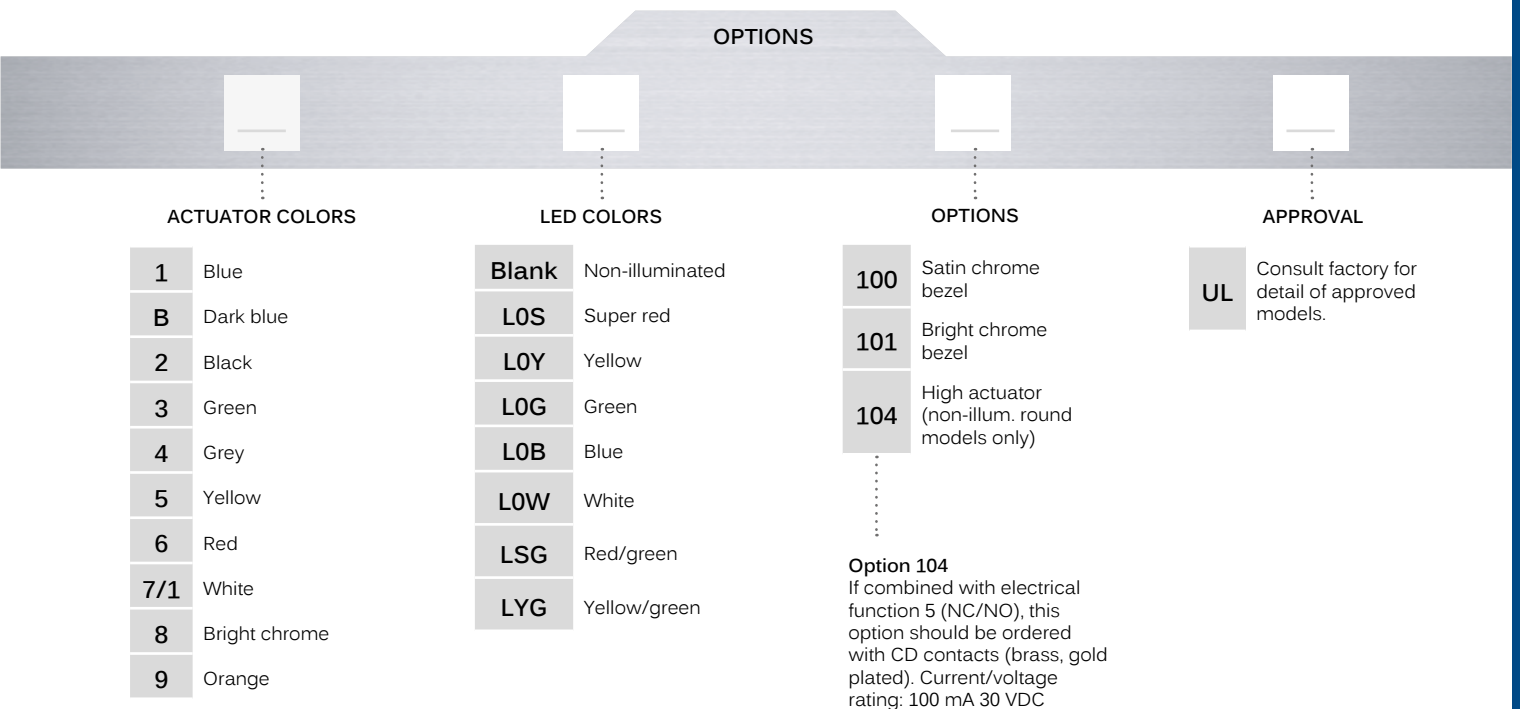
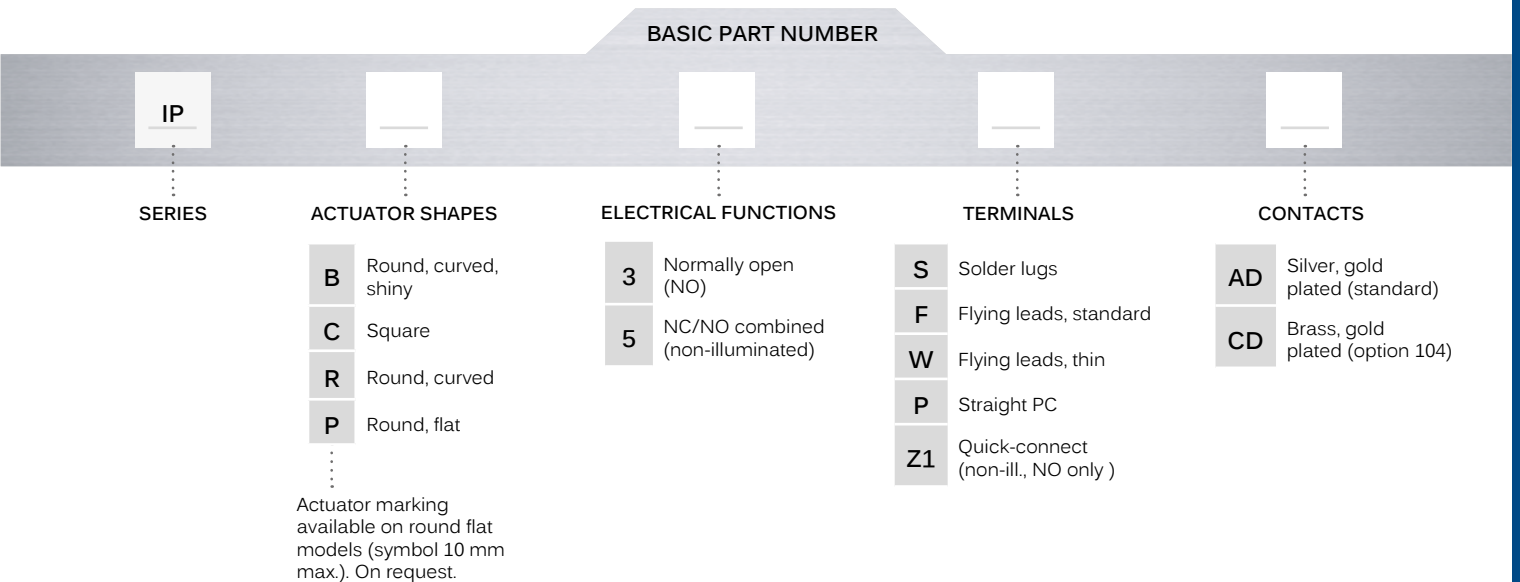
### MATRIX MOUNTING - BACK OF PANEL SPACE REQUIREMENT



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## BUILD YOUR PART NUMBER



## ABOUT THIS SERIES

On the following pages, you will find successively basic part numbers of switches and options in the same order as in above chart.

- Notice:** please note that not all combinations of above numbers are available. Refer to the following pages for further information.
- A sealing boot** is available to protect the switches against frost and sand. See "Sealing Boots" section of website.
- Mounting accessories:** Standard hardware supplied: 1 hex nut 14 mm (.551) across flats and 1 O-ring. Hex nut part number U166.

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## SQUARE - ILLUMINATED SOLDER LUG TERMINALS



IPC3SAD



Normally Open

Also available with straight PC terminals: **IPC3PAD**  
LED color is indicated by the bottom of the switch.

## SQUARE - ILLUMINATED FLYING LEAD TERMINALS



IPC3FAD



Normally Open

For THIN flying leads, replace F with W.  
**Wire colors:** black: NO contact, red: LED anode(+), blue: LED cathode(-)  
Shown with standard flying lead terminals.

## SQUARE - NON ILLUMINATED SOLDER LUG TERMINALS



IPC3SAD



Normally Open

IPC5SAD



Normally Open

Also available with straight PC terminals: **IPC3PAD** (NO) or **IPC5PAD** (NC/NO)  
and quick-connect terminals: **IPC3Z1AD** (NO only)

## SQUARE - NON ILLUMINATED FLYING LEAD TERMINALS



IPC3FAD



Normally Open

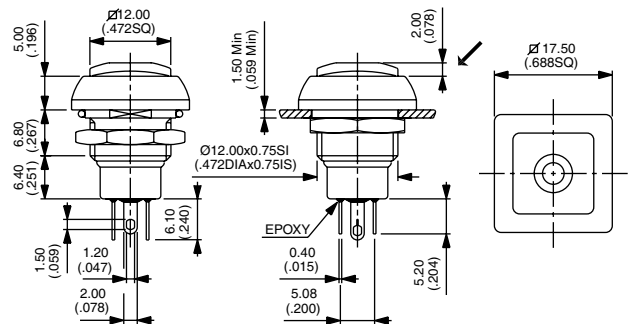
IPC5FAD



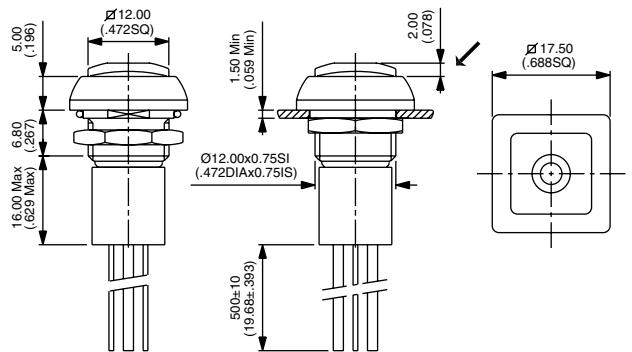
NC/NO combined

For THIN flying leads, replace F with W.  
**Wire colors** (NC/NO): black: NO, blue: NC.  
Shown with standard flying lead terminals.

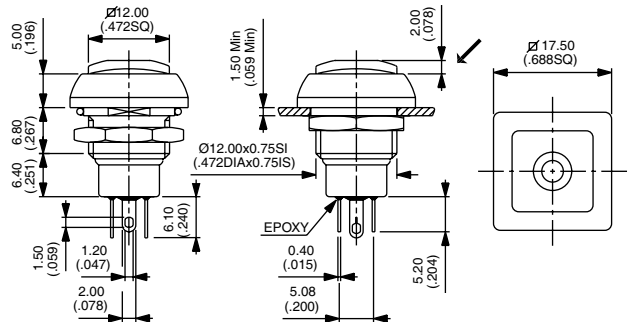
→ FLAT



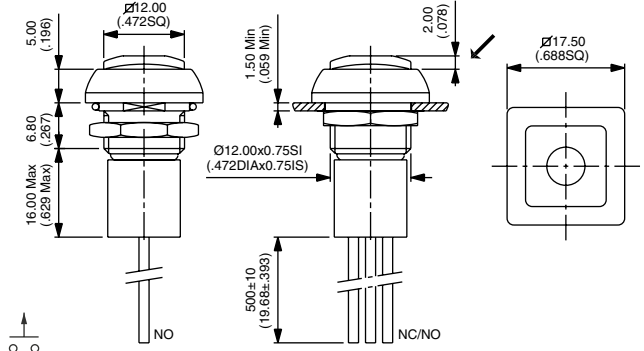
→ FLAT



→ FLAT



→ FLAT



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## ROUND - ILLUMINATED SOLDER LUG TERMINALS



**IPR3SAD**



Normally Open

Also available with straight PC terminals: **IPR3PAD**  
LED colour is indicated by the bottom of the switch.

## ROUND - ILLUMINATED FLYING LEAD TERMINALS



**IPR3FAD**



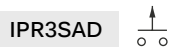
Normally Open

For THIN flying leads, replace F with W.  
**Wire colors:** black: NO contact, red: LED anode(+), blue: LED cathode(-)  
Shown with standard flying lead terminals.

## ROUND - NON ILLUMINATED SOLDER LUG TERMINALS



Curved actuator, NO **IPR3SAD**



Curved actuator, NC/NO **IPR5SAD**



Flat actuator, NO **IPP3SAD**



Flat actuator, NC/NO **IPP5SAD**



Also available with straight PC terminals: **IPC3PAD** (NO) or **IPC5PAD** (NC/NO)  
and quick-connect terminals: **IPC3Z1AD** (NO only)

## ROUND - NON ILLUMINATED FLYING LEAD TERMINALS



Curved actuator, NO **IPR3FAD**



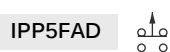
Curved actuator, NC/NO **IPR5FAD**



Flat actuator, NO **IPP3FAD**

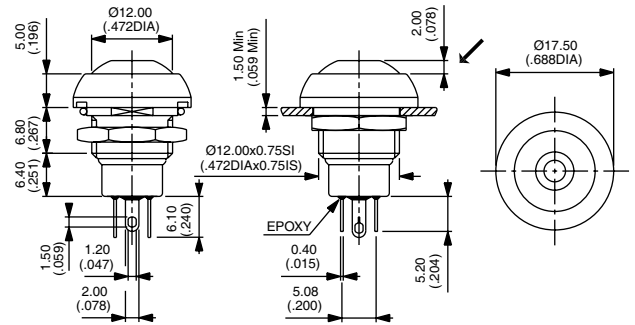


Flat actuator, NC/NO **IPP5FAD**

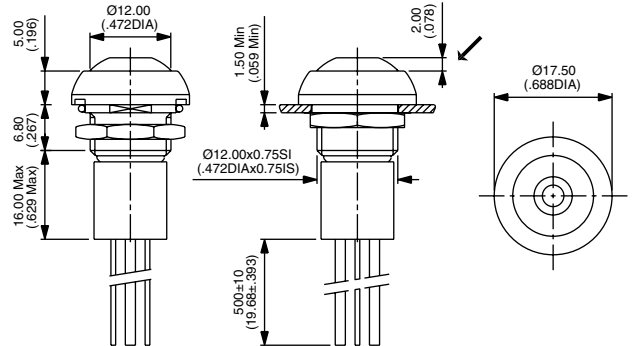


For THIN flying leads, replace F with W.  
**Wire colors** (NC/NO): black: NO, blue: NC  
Shown with standard flying lead terminals.

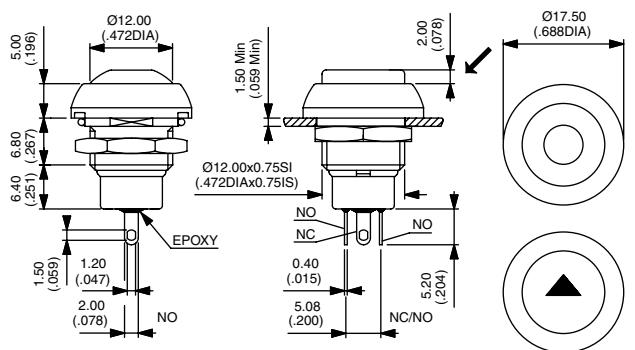
→ FLAT



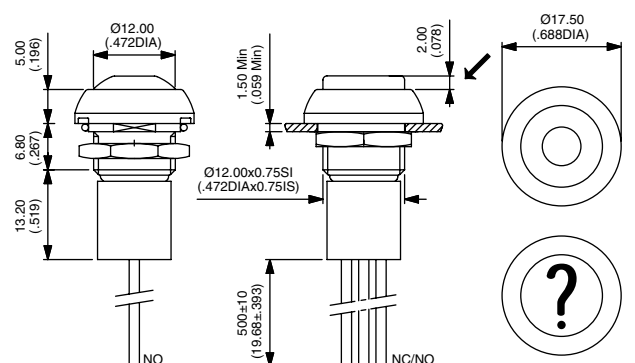
→ FLAT



→ FLAT



→ FLAT



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### ACTUATOR COLORS



- |   |           |     |               |
|---|-----------|-----|---------------|
| 1 | Blue      | 6   | Red           |
| B | Dark blue | 7/1 | White         |
| 2 | Black     | 8   | Bright chrome |
| 3 | Green     | 9   | Orange        |
| 4 | Grey      | A   | Satin chrome  |
| 5 | Yellow    |     |               |

### LED COLORS

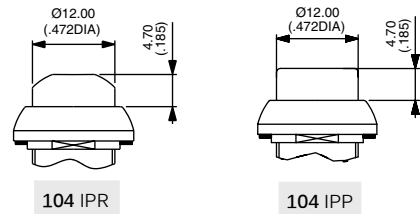


- |       |                 |
|-------|-----------------|
| Blank | Non-illuminated |
| LOS   | Super red       |
| LOY   | Yellow          |
| LOG   | Green           |
| LOB   | Blue            |
| LOW   | White           |
| LSG   | Red/green       |
| LYG   | Yellow/green    |

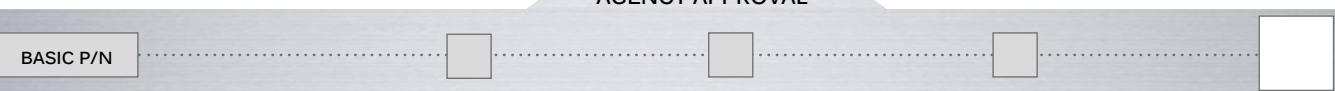
### OPTIONS



- |     |  |
|-----|--|
| 100 | Satin chrome bezel   |
| 101 | Bright chrome bezel  |
| 104 | High actuator - For round, non-illuminated only<br>If combined with function 5 (NC/NO), order with CD contacts (instead of AD contacts). |



### AGENCY APPROVAL



### UL

Consult factory for details of approved models. To order switches marked UL, complete above box with "UL".

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Apem:

[IPC1FAD2](#) [IPC1FAD2L0G](#) [IPC1FAD2L0Y](#) [IPC1FAD6](#) [IPC1FAD7/1L0Y](#) [IPC1SAD1L0G](#) [IPC1SAD1L0Y](#) [IPC1SAD2](#)  
[IPC1SAD3L0G](#) [IPC1SAD6](#) [IPC1SAD6L0S](#) [IPC3FAD1](#) [IPC3FAD2](#) [IPC3FAD2L0G](#) [IPC3FAD2L0S](#) [IPC3FAD2L0Y](#)  
[IPC3FAD3](#) [IPC3FAD5](#) [IPC3FAD6](#) [IPC3FAD6L0S](#) [IPC3FAD7/1](#) [IPC3FAD7/1L0G](#) [IPC3FAD9](#) [IPC3SAD1](#)  
[IPC3SAD1L0G](#) [IPC3SAD2L0G](#) [IPC3SAD2L0S](#) [IPC3SAD2L0Y](#) [IPC3SAD5L0Y](#) [IPC3SAD7/1](#) [IPC3SAD7/1L0G](#)  
[IPC5FAD2](#) [IPC5FAD6](#) [IPC5SAD2](#) [IPC5SAD6](#) [IPC5SAD7/1](#) [IPR1FAD2](#) [IPR1FAD2L0G](#) [IPR1FAD2L0Y](#)  
[IPR1FAD3L0G](#) [IPR1FAD6](#) [IPR1FAD6L0S](#) [IPR1SAD1L0Y](#) [IPR1SAD2104](#) [IPR1SAD2L0G](#) [IPR1SAD2L0S](#)  
[IPR1SAD2L0Y](#) [IPR1SAD3](#) [IPR1SAD3L0G](#) [IPR1SAD5](#) [IPR1SAD5104](#) [IPR1SAD5L0S](#) [IPR1SAD6](#) [IPR1SAD6104](#)  
[IPR1SAD6L0S](#) [IPR3FAD1L0G](#) [IPR3FAD1L0S](#) [IPR3FAD1L0Y](#) [IPR3FAD2L0G](#) [IPR3FAD2L0Y](#) [IPR3FAD3L0G](#)  
[IPR3FAD3L0S](#) [IPR3FAD3L0Y](#) [IPR3FAD5](#) [IPR3FAD5L0G](#) [IPR3FAD5L0S](#) [IPR3FAD5L0Y](#) [IPR3FAD6](#) [IPR3FAD6L0G](#)  
[IPR3FAD6L0Y](#) [IPR3FAD7/1](#) [IPR3FAD7/1L0G](#) [IPR3FAD7/1L0S](#) [IPR3FAD7/1L0Y](#) [IPR3FAD9](#) [IPR3FAD9L0S](#)  
[IPR3SAD1L0G](#) [IPR3SAD1L0S](#) [IPR3SAD1L0Y](#) [IPR3SAD2L0S](#) [IPR3SAD2L0Y](#) [IPR3SAD3L0G](#) [IPR3SAD3L0S](#)  
[IPR3SAD3L0Y](#) [IPR3SAD5L0G](#) [IPR3SAD5L0S](#) [IPR3SAD5L0Y](#) [IPR3SAD6L0G](#) [IPR3SAD6L0S](#) [IPR3SAD6L0Y](#)  
[IPR3SAD7/1L0G](#) [IPR3SAD7/1L0S](#) [IPR3SAD7/1L0Y](#) [IPR3SAD9](#) [IPR5FAD1](#) [IPR5FAD2](#) [IPR5FAD3](#) [IPR5FAD5](#)  
[IPR5FAD7/1](#) [IPR5SAD1](#)