Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

# Contact us

## General data

RF 15 (15 x 15 mm) and RF 19 (19 x 19 mm) with distinct key click, for use under an overlay or with RK 90 keycaps. Can be fully illuminated.

## Content

**4**

**RF**

Stock items are marked
by **bold printed** order numbers.

## Content

**4**

**RF**

Stock items are marked
by **bold printed** order numbers.

# Specifications LED

- - - - - - - - - - - - -

## 3 mm LED

| (valid for 25 °C) | Red LED | Green LED | Yellow LED |
|---|---|---|---|
| Max. forward current $I_F$: | 30 mA | 30 mA | 20 mA |
| Current reduction from: $T_0$ = 50 °C: | approx 0.5 mA/°C | approx 0.5 mA/°C | approx 0.2 mA/°C |
| Wavelength typ: | 635 nm | 565 nm | 586 nm |
| Forward voltage $U_F/I_F$ typ: | 2 V/10 mA | 2 V/10 mA | 2 V/10 mA |
| Reverse voltage $U_R/I_F$ typ: | 5 V/100 µA min. | 5 V/100 µA min. | 5 V/100 µA min. |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C |
| | **Blue LED** | **Red low-current LED** | |
| Max. forward current $I_F$: | 20 mA | 30 mA | |
| Current reduction from: $T_0$ = 50 °C: | approx 0.6 mA/°C | approx 0.5 mA/°C | |
| Wavelength typ: | 470 nm | 645 nm | |
| Forward voltage $U_F/I_F$ typ: | 2.7 V/10 mA | 1.6 V/1 mA | |
| Reverse voltage $U_R/I_F$ typ: | 5V/100 µA min. | 5 V/100 µA min. | |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C | |

## 2 mm LED

| (valid for 25 °C) | Red LED | Green LED | Green LED superbright |
|---|---|---|---|
| Max. forward current $I_F$: | 30 mA | 30 mA | 30 mA |
| Current reduction from: $T_0$ = 50 °C: | 0.5 mA/°C | 0.5 mA/°C | - |
| Light current $f_V/I_F$ typ: | - | - | - |
| Wavelength typ: | 637 nm | 569 nm | 510-545 nm |
| Forward voltage $U_F/I_F$ typ: | 1.8 V/20 mA | 2.1 V/10 mA | 3.5 V/20 mA |
| Reverse voltage $U_R/I_F$ typ: | 5 V/100 µA min. | 5 V/100 µA min. | - |
| Ambient temperature, operating: | - 55 °C . . . + 100 °C | - 40 °C . . . + 100 °C | -30 °C . . . + 100 °C |
| | **Yellow LED** | **White LED** | **Blue LED** |
| Max. forward current $I_F$: | 50 mA | 25 mA | 30 mA |
| Current reduction from: $T_0$ = 50 °C: | 0.8 mA/°C | - | - |
| Light current $f_V/I_F$ typ: | 250 mlm/20 mA | - | - |
| Wavelength typ: | 590 nm | - | 464-485 nm |
| Forward voltage $U_F/I_F$ typ: | 1.9 V/20 mA | 3.6 V/20 mA | 3.6 V/20 mA |
| Reverse voltage $U_R/I_F$ typ: | 5 V/100 µA min. | - | - |
| Ambient temperature, operating: | -40 °C . . . + 100 °C | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C |
| | **Multi-colour LED** | | |
| Max. forward current $I_F$: | 30 mA | | |
| Current reduction from: $T_0$ = 50 °C: | approx 0.6 mA/°C | | |
| Light current $f_V/I_F$ typ: | - | | |
| Wavelength typ: | 635/565 nm | | |
| Forward voltage $U_F/I_F$ typ: | 2 V/10 mA | | |
| Reverse voltage $U_R/I_F$ typ: | - | | |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | | |

**4**

**RF**

Calculating the series resistor:

$$R_V = \frac{U_B - U_F}{I_F}$$

Rated power of series:

$$P_V = I_F{}^2 \times R_V$$

Example for 5 Volt:

$$R_V = \frac{5V - 2.0\ V}{0.02\ A} = 150\ \Omega \text{ (= standard value)}$$

# RF 15 short-travel keyswitch



## General data

Low-profile keyboards with RF 15 components should be designed with a 19.05 mm grid. With this grid, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlays.

## Technical data

**General information**

| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |

**Dimensions**

| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 9.7 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering into PCB |
| Terminals | contacts tin-plated, fix contact Ag plated |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au/Ag |
| Illumination | spot-/fully illuminated |
| LED colour | see order block |
| LED type | see order block |

**Mechanical characteristics**

| | |
|---|---|
| Operating force max. | 2 ... 3 N |
| Operating travel | 0.5 mm |
| Switching travel | 0.5 mm |
| Robustness min. | with through-plated PCB 100 N |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 42 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |

| | |
|---|---|
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Insulation resistance | $10^9$ Ω |
| ESD strength (underneath overlay) | 15 kV |
| Bouncing time max. | 5 ms |

**Other specifications**

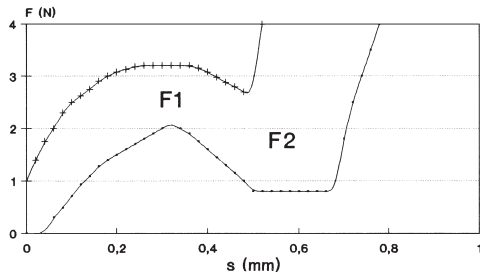| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (in tube) | +50 °C |
| Resistance to constant environment | according to IEC 600 68-2-3 and 2-30 |
| Resistance at variable environment | according to IEC 600 68-2-14 and 2-33 |
| Operating life min. | 1000000 |
| Soldering time max. | 2.5 sec. |
| Soldering temperature max. | 250 °C |
| Flammability of materials | UL 94 HB |

4

RF

## Force/Travel Diagram – Keyswitch RF 15

### Operation characteristic limits RF



F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

## Circuit Diagram – Keyswitch RF 15



| Keyswitch, non-illuminated | Keyswitch, fully illuminated | Keyswitch, spot-illuminated |

## Dimensional Drawing RF 15



## Hole Pattern RF 15



View on component side, all hole diameters 1,1 $^{+/- 0,1}$ mm

## Hole Pattern – Front Panel

## RF 15 short-travel keyswitch, non-illuminated



| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | transparent | | | **3.14.100.001/0000** |
| Ag | not illuminated | transparent | | | **3.14.100.006/0000** |

Technical data see page 4 - 26

**Accessories:**
Keycap for RF 15, snap-on, for overall height 12.5 mm: 5.46.654.059/0227
Other keycaps see chapter RK90

**Stock items** are marked
by **bold printed** order numbers.

PCB Keyswitches

## RF 15 short-travel keyswitch, fully illuminated with 2 LEDs



Pict.: red

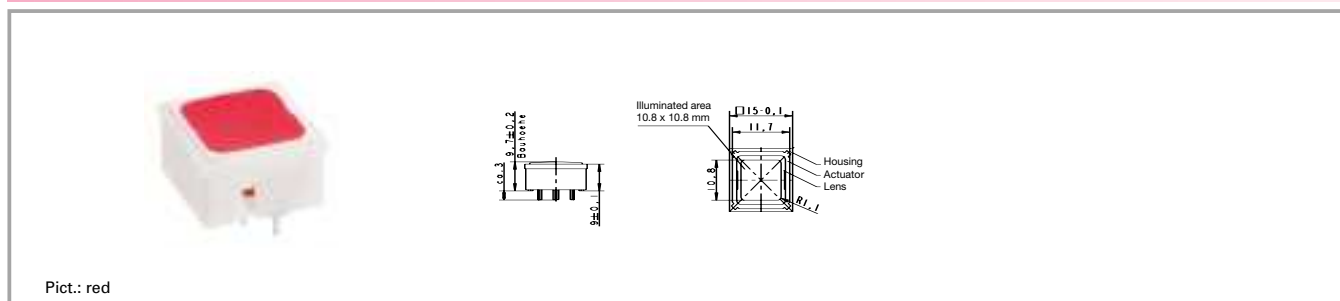| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LEDs | red | red | 2 mm | **3.14.200.011/0000** |
| Au | fully illuminated 2 LEDs | green | green | 2 mm | **3.14.200.012/0000** |
| Au | fully illuminated 2 LEDs | yellow | yellow | 2 mm | **3.14.200.013/0000** |
| Au | fully illuminated 2 LEDs | orange | yellow | 2 mm | 3.14.200.014/0000 |
| Au | fully illuminated 2 LEDs | blue | blue | 2 mm | 3.14.200.015/0000 |
| Ag | fully illuminated 2 LEDs | red | red | 2 mm | **3.14.200.021/0000** |
| Ag | fully illuminated 2 LEDs | green | green | 2 mm | **3.14.200.022/0000** |
| Ag | fully illuminated 2 LEDs | yellow | yellow | 2 mm | **3.14.200.023/0000** |
| Ag | fully illuminated 2 LEDs | orange | yellow | 2 mm | 3.14.200.024/0000 |
| Ag | fully illuminated 2 LEDs | blue | blue | 2 mm | 3.14.200.025/0000 |

Technical data see page 4 - 26

**4**

**RF**

## RF 15 short-travel keyswitch, 1 LED spot-illumination



Pict.: red
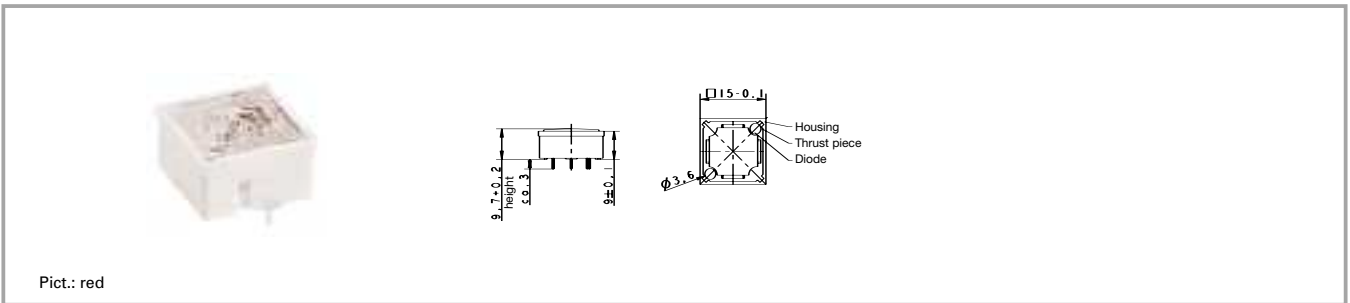
| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.100.030/0000 |
| Au | spot illumination 1 LED | transparent | red | 3 mm | **3.14.100.031/0000** |
| Au | spot illumination 1 LED | transparent | green | 3 mm | **3.14.100.032/0000** |
| Au | spot illumination 1 LED | transparent | yellow | 3 mm | **3.14.100.033/0000** |
| Ag | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.100.040/0000 |
| Ag | spot illumination 1 LED | transparent | red | 3 mm | **3.14.100.041/0000** |
| Ag | spot illumination 1 LED | transparent | green | 3 mm | **3.14.100.042/0000** |
| Ag | spot illumination 1 LED | transparent | yellow | 3 mm | **3.14.100.043/0000** |

Technical data see page 4 - 26

Double-spot LED illumination available on request.

**4**

RF

Stock items are marked
by **bold printed** order numbers.

## RF 15 N short-travel keyswitch



## General data

The RF 15N keyswitch provides a minimum overall height of 6.2 mm. The overall height can be varied by extension plungers which are inserted into the cross-like notches on the actuator tops.
LEDs can only be arranged separately next to the keyswitches up to an overall height of 10 mm (i.e. without plunger or with small plunger).
Keyswitches with overall heights of 12 mm or more can be provided with a maximum of 2 LEDs which are inserted into the recesses of the keyswitch housing. LEDs of keyswitches with overall heights of 12.5 mm or more should be placed onto LED spacers in order to obtain satisfactory illumination.

## Technical data

**General information**
| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |

**Dimensions**
| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 6.2 mm |

**Mechanical design**
| | |
|---|---|
| Mounting | soldering into PCB |
| Terminals | contacts tin-plated, fix contact Ag plated |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au/Ag |
| Illumination | external 3 mm LED possible if height ‹ 12 mm |

**Mechanical characteristics**
| | |
|---|---|
| Operating force max. | 2 ... 3 N |
| Operating travel | 0.5 mm |
| Switching travel | 0.5 mm |
| Robustness min. | with through-plated PCB 100 N |

**Electrical characteristics**
| | |
|---|---|
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 42 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |

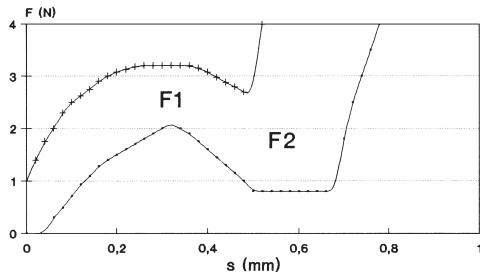| | |
|---|---|
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Insulation resistance | $10^9$ Ω |
| ESD strength (underneath overlay) | 15 kV |
| Bouncing time max. | 5 ms |

**Other specifications**
| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (in tube) | +50 °C |
| Resistance to constant environment | according to IEC 600 68-2-3 and 2-30 |
| Resistance at variable environment | according to IEC 600 68-2-14 and 2-33 |
| Operating life min. | 1000000 |
| Soldering time max. | 2.5 sec. |
| Soldering temperature max. | 250 °C |
| Flammability of materials | UL 94 HB |

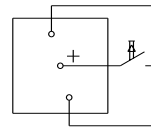**Stock items** are marked by **bold printed** order numbers.

## Force/Travel Diagram – Keyswitch RF 15 N

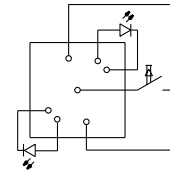### Operation characteristic limits RF



F 1 = Max. operating force
F 2 = Force at contact
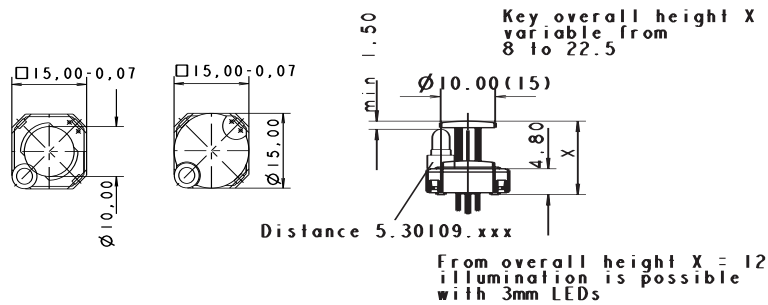F 2 is max. 55% of F 1

## Circuit Diagram – Keyswitch RF 15 N



Keyswitch,
non illuminated

Keyswitch,
spot-illuminated

## Dimensional Drawings RF 15 N



□15,00-0,07    □15,00-0,07

Ø10,00

Ø15,00

Ø10,00

min 1,50

Key overall height X
variable from
8 to 22.5

Ø10.00(15)

4.80

X

Distance 5.30109.xxx

From overall height X = 12
illumination is possible
with 3mm LEDs



Front mounting          RF 15N          Recessed front mounting

1.25-1.50 with steel version
2-3 with aluminium version

With pressed-in stud M3
min.5.50

Thread stud welded-on with steel version,
pressed-in with aluminium version

□16.00
0.50          0.50

0.50

5.75 ±0.1

19.05          15.24

Spacer

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

Ø10.00    Ø15.00

8...22.5

PCB

15.24

Spacer

4

RF
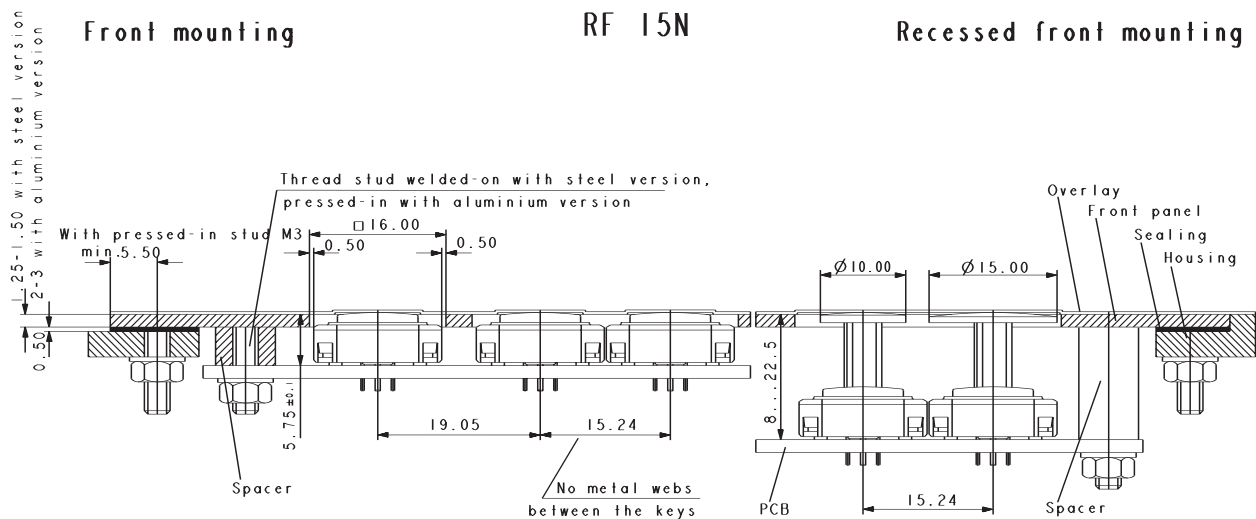
## Hole Patterns – Front Panel RF 15 N

RF 15 N without plunger
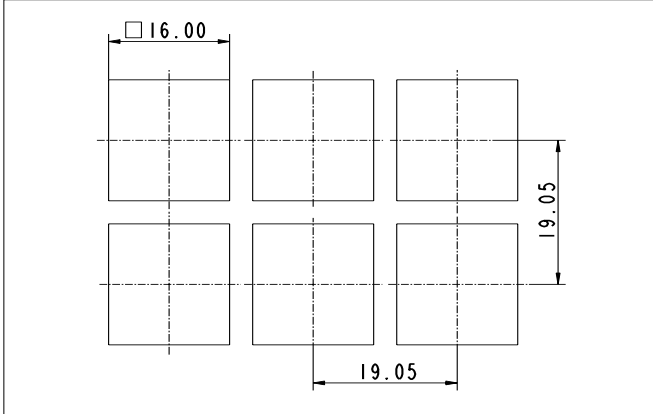


□ 16.00

19.05

19.05

RF 15 N with plunger ø 10 mm, non-illuminated
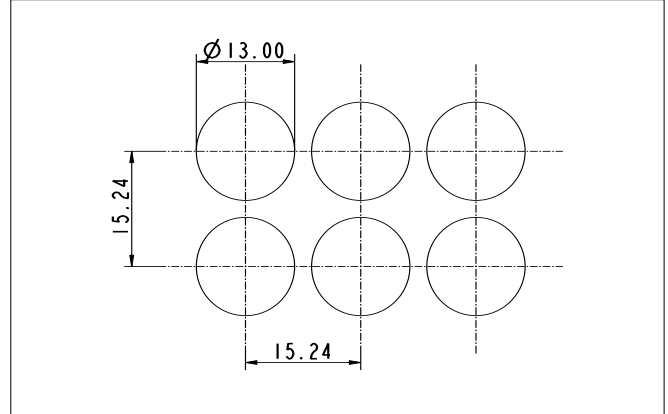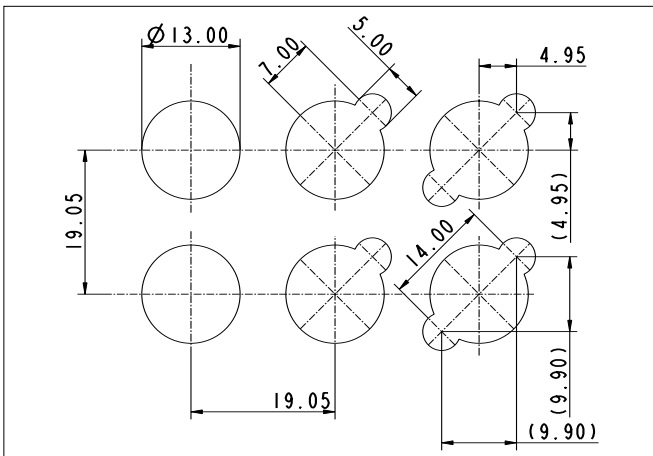


Ø 13.00

15.24

15.24

RF 15 N with plunger ø 10 mm, illuminated



Ø 13.00

7.00

5.00

4.95

19.05

(4.95)

14.00

(9.90)

19.05

(9.90)

RF 15 N with plunger ø 15 mm, illuminated



Ø 17.00

7.00

5.00

14.00

19.05

(9.90)

19.05

(9.90)

## Hole Pattern RF 15 N



RF15R, RF15N

Double-spot illumitation

5.84

7.00

4.04

Diode

5.84

4.04

19.05

(15.24)

12.70

3.556

19.05
(15.24)

19.05
(15.24)

✳Single-spot illuminatin

View on component side
All hole diameters 1,1 $^{+/- 0,1}$ mm
PCB layout Keyswitch 1/400" grid

**4**

RF
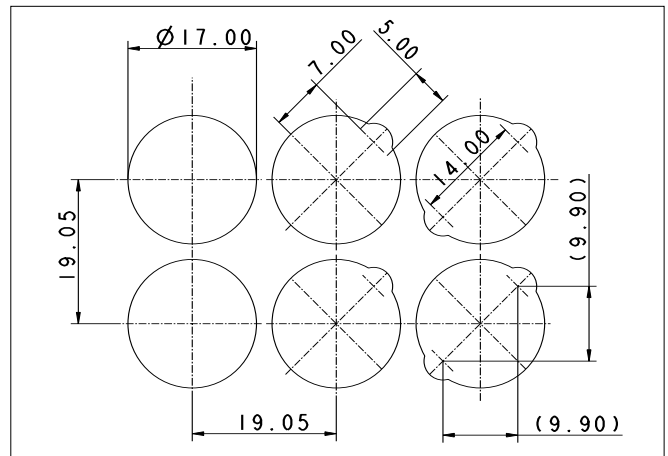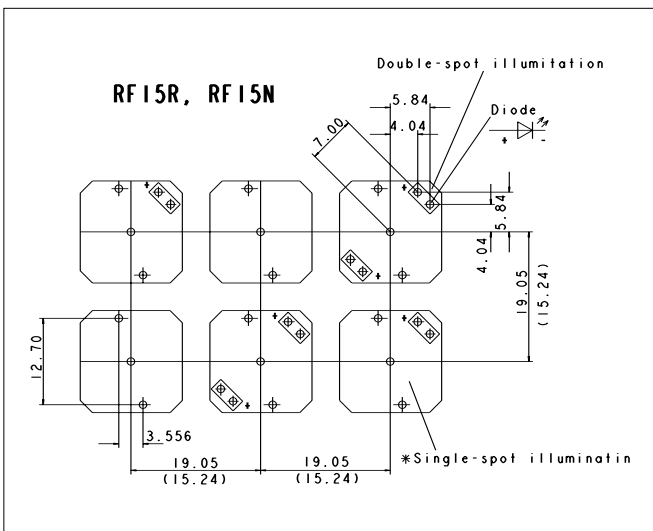
## Accessories RF 15 N short-travel keyswitch

| Description | Photo | Order no. | Page |
|---|---|---|---|
| LED yellow, 3mm | | 1.90.690.103/0000 | |
| LED spacer for RF 15 N, Ø 5 mm, spacing length 2.2 mm, light grey, for use with overall height of 12.5 mm | | 5.30.109.010/0756 | |
| Extension plunger for RF 15 N, Ø 10 mm, overall height 22.5 mm | | **5.46.011.028/0710** | |
| Extension plunger for RF 15 N, Ø 15 mm, overall height 22.5 mm | | **5.46.017.028/0710** | |

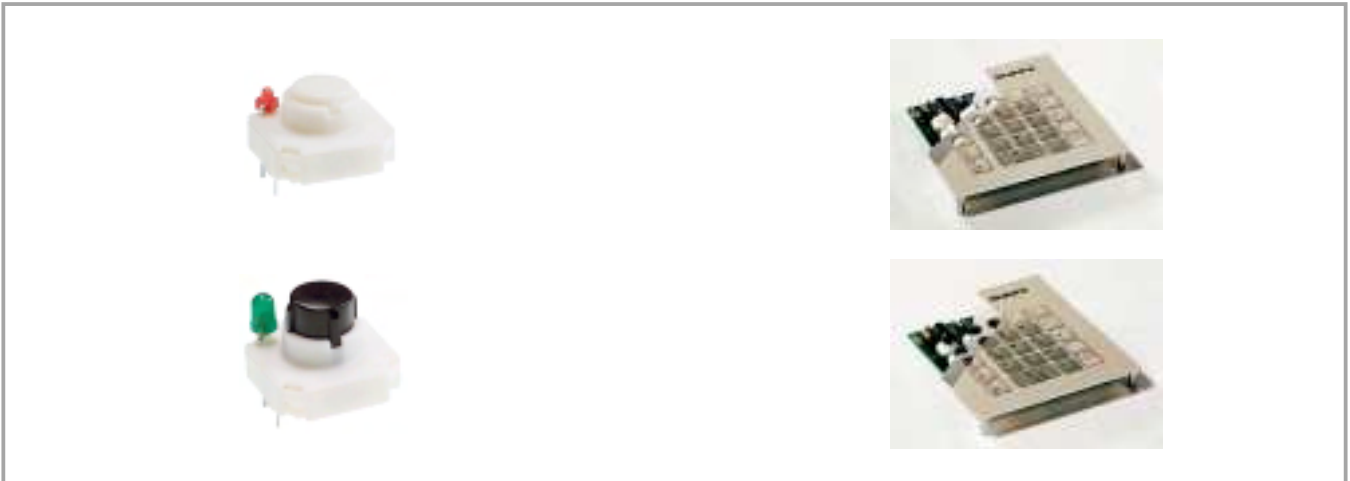## RF 15 N short-travel keyswitch, non-illuminated
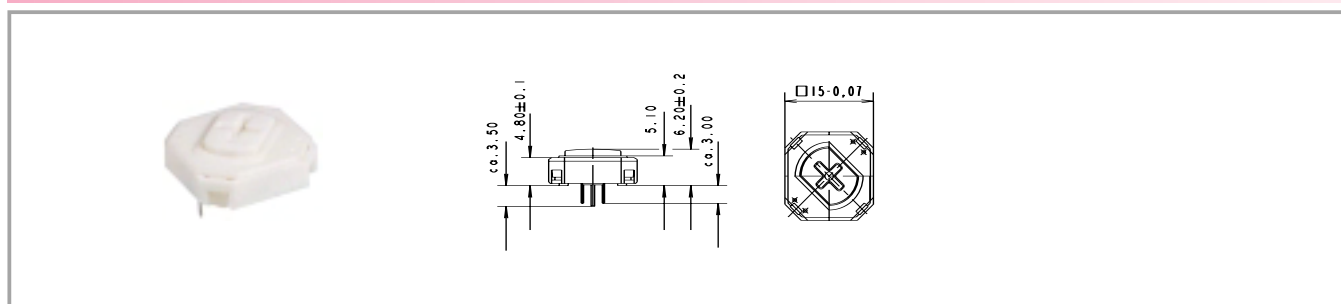
| Contact materials | Illumination | Recommended key grid | Overall height | Order no. |
|---|---|---|---|---|
| Au | external 3 mm LED possible if height | 19.05 mm | 6.2 mm | **3.14.100.601/0000** |
| Ag | external 3 mm LED possible if height | 19.05 mm | 6.2 mm | **3.14.100.606/0000** |

Technical data see page 4 - 32

## RF 15 R short-travel keyswitch



## General data

The round actuator of the RF 15 R keyswitch requires round front panel cut-outs. These make it possible to use a narrow keyboard grid of only 15.24 mm with sufficiently large frame webs between the individual keys. We recommend area embossing over the actuators for the overlay.

## Technical data

**General information**

| | |
|---|---|
| Recommended key grid | 15.24 mm |

**Dimensions**

| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 9,7/12,5 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering into PCB |
| Terminals | contacts tin-plated, fix contact Ag plated |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au/Ag |
| Illumination | spot illumination |
| LED colour | see order block |
| LED type | see order block |

**Mechanical characteristics**

| | |
|---|---|
| Operating force max. | 2 ... 3 N |
| Operating travel | 0.5 mm |
| Switching travel | 0.5 mm |
| Robustness min. | with through-plated PCB 100 N |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 42 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |

| | |
|---|---|
| Contact resistance when new max. | 100 m$\Omega$ |
| Contact resistance acc. to life max. | 3 $\Omega$ |
| Insulation resistance | $10^9$ $\Omega$ |
| ESD strength (underneath overlay) | 15 kV |
| Bouncing time max. | 5 ms |

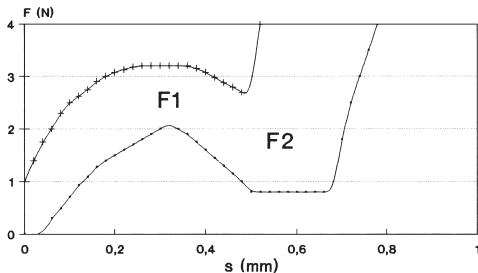**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (in tube) | +50 °C |
| Resistance to constant environment | according to IEC 600 68-2-3 and 2-30 |
| Resistance at variable environment | according to IEC 600 68-2-14 and 2-33 |
| Operating life min. | 1000000 |
| Soldering time max. | 2.5 sec. |
| Soldering temperature max. | 250 °C |
| Flammability of materials | UL 94 HB |

**4**

**RF**

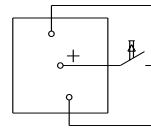Stock items are marked by bold printed order numbers.

## Force/Travel Diagram – Keyswitch RF 15 R

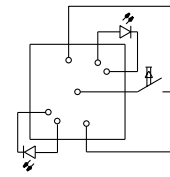**Operation characteristic limits RF**



F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

## Circuit Diagram – Keyswitch RF 15 R



Keyswitch,
non-illuminated

Keyswitch,
spot-illuminated

## Dimensional Drawing RF 15 R
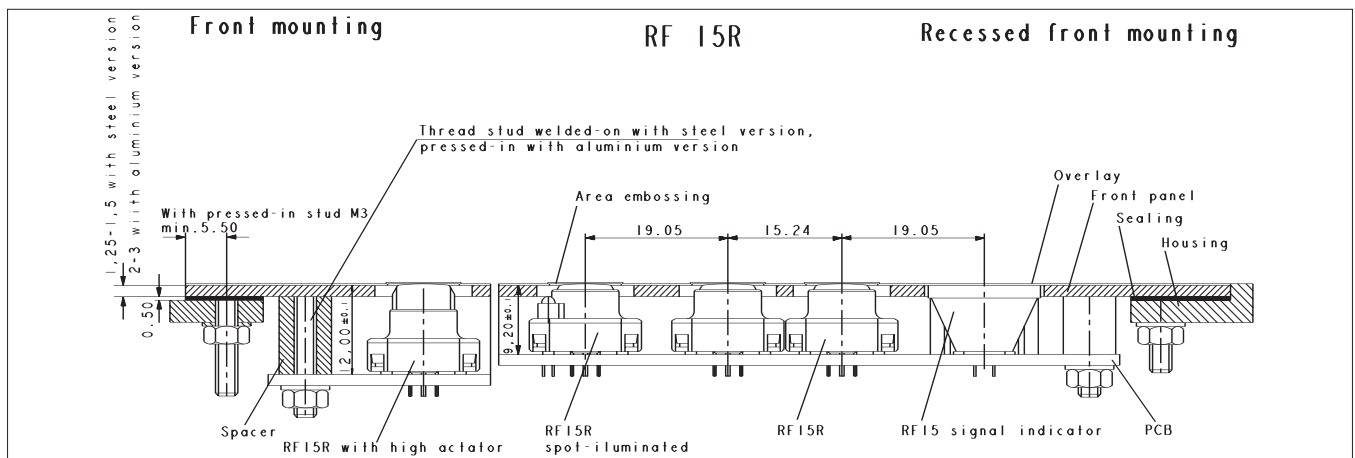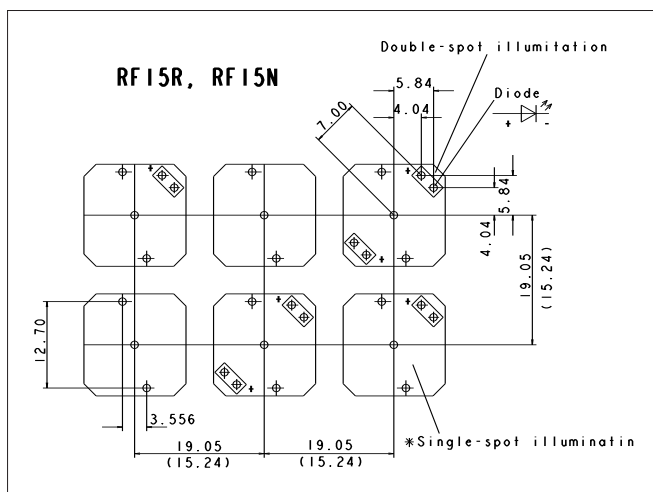


Front mounting          RF 15R          Recessed front mounting

Thread stud welded-on with steel version,
pressed-in with aluminium version

Area embossing

Overlay
Front panel
Sealing
Housing

With pressed-in stud M3
min.5.50

19.05        15.24        19.05

Spacer

RF15R with high actator

RF15R
spot-iluminated

RF15R

RF15 signal indicator

PCB

## Hole Pattern RF 15 R



RF15R, RF15N

Double-spot illumitation

5.84
7.00
4.04

Diode

12.70

3.556

19.05
(15.24)

19.05
(15.24)

19.05
(15.24)

*Single-spot illuminatin

View on component side
All hole diameters 1,1 $^{+/- 0,1}$ mm
PCB layout Keyswitch 1/400" grid

4

RF

## Hole Pattern – Front Panel RF 15 R

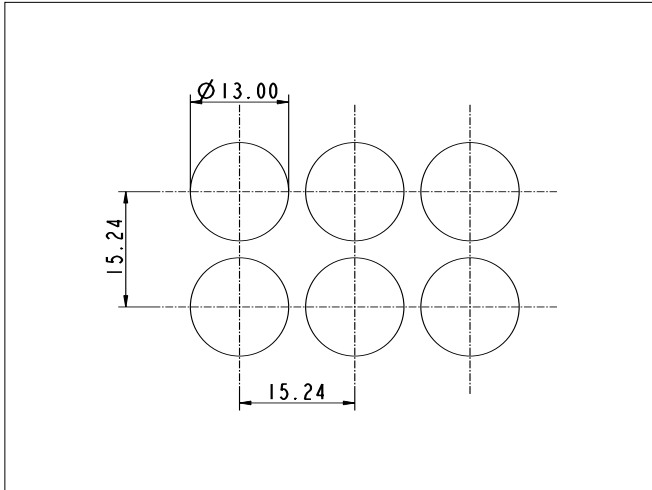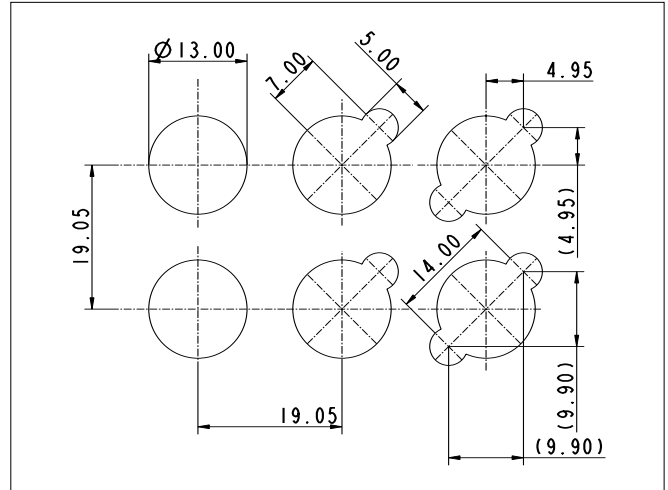RF 15 R, non-illuminated



RF 15 R, illuminated

## RF 15 R low short-travel keyswitch, non-illuminated
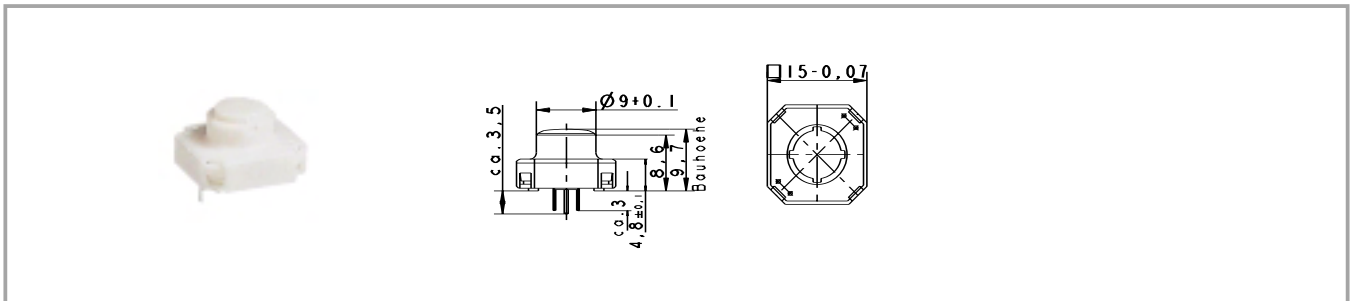
| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 9.7 mm | not illuminated | | | **3.14.100.501/0000** |
| Ag | 9.7 mm | not illuminated | | | **3.14.100.506/0000** |

Technical data see page 4 - 36

## RF 15 R high short-travel keyswitch, non-illuminated
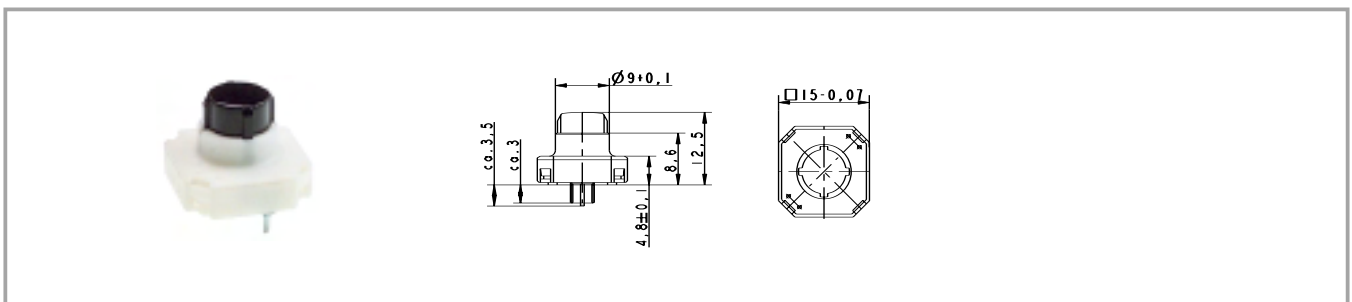
| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 12.5 mm | not illuminated | | | **3.14.100.801/0000** |
| Ag | 12.5 mm | not illuminated | | | **3.14.100.806/0000** |

Technical data see page 4 - 36

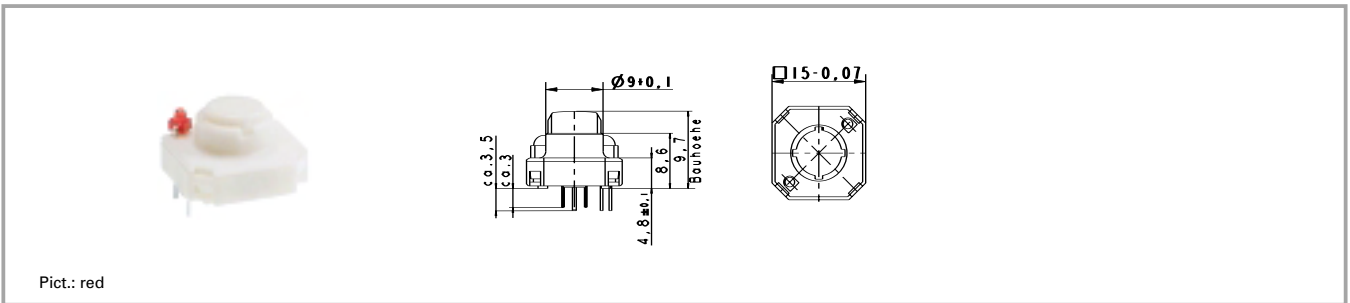**4**

**RF**

Stock items are marked
by **bold printed** order numbers.

## RF 15 R low short-travel keyswitch, 1 LED spot-illumination



Pict.: red

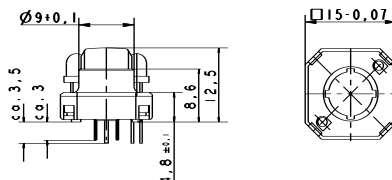| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | red | **3.14.100.531/0000** |
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | green | **3.14.100.532/0000** |
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | yellow | **3.14.100.533/0000** |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | red | 3.14.100.541/0000 |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | green | 3.14.100.542/0000 |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | yellow | 3.14.100.543/0000 |

Technical data see page 4 - 36

Versions with 2 LEDs available on request.

**4**

**RF**

**Stock items** are marked
by **bold printed** order numbers.

## RF 15 R high short-travel keyswitch, 1 LED spot-illumination



Pict.: green

| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | blue | 3.14.100.830/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | red | 3.14.100.831/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | green | 3.14.100.832/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | yellow | 3.14.100.833/0000 |
| Ag | 12.5 mm | spot illumination 1 LED | 3 mm | blue | 3.14.100.840/0000 |
| Ag | 12.5 mm | spot illumination 1 LED | 3 mm | red | 3.14.100.841/0000 |
| Ag | 12.5 mm | spot illumination 1 LED | 3 mm | green | 3.14.100.842/0000 |
| Ag | 12.5 mm | spot illumination 1 LED | 3 mm | yellow | 3.14.100.843/0000 |

Technical data see page 4 - 36

Versions with 2 LEDs available on request.

## RF 15 H short-travel keyswitch



## General data

**Application notes:**
The RF 15 H key has an overall height of 12.5 mm and can be fully illuminated. When designing membrane keyboards, we recommend using a key grid of at least 19.05 mm and a 0.13 mm overlay with area embossing over the keys.
You can use the O-ring (accessory) to block the key and use it as an indicator field or blank spaceholder.

## Technical data

**General information**

| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 20 mm |

**Dimensions**

| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 12.5 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering into PCB |
| Terminals | see order block |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au/Ag |
| Illumination | not illuminated / fully illuminated |
| LED colour | see order block |
| LED type | see order block |

**Mechanical characteristics**

| | |
|---|---|
| Operating force max. | 2 ... 3 N |
| Operating travel | 0.5 mm |
| Switching travel | 0.5 mm |
| Robustness min. | with through-plated PCB 100 N |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 42 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |

| | |
|---|---|
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Insulation resistance | $10^9$ Ω |
| ESD strength (underneath overlay) | 15 kV |
| Bouncing time max. | 5 ms |

**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (in tube) | +50 °C |
| Resistance to constant environment | according to IEC 600 68-2-3 and 2-30 |
| Resistance at variable environment | according to IEC 600 68-2-14 and 2-33 |
| Operating life min. | 1000000 |
| Soldering time max. | 2.5 sec. |
| Soldering temperature max. | 250 °C |
| Flammability of materials | UL 94 HB |

**Stock items** are marked by **bold printed** order numbers.
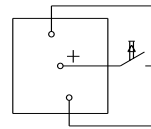
# RF short-travel keyswitches

## Force/Travel Diagram – Keyswitch RF 15 H

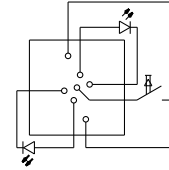### Operation characteristic limits RF
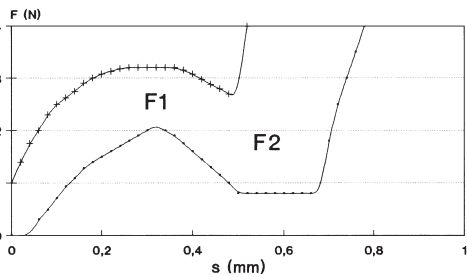
F 1 = Max. operating force
F 2 = Force at contact
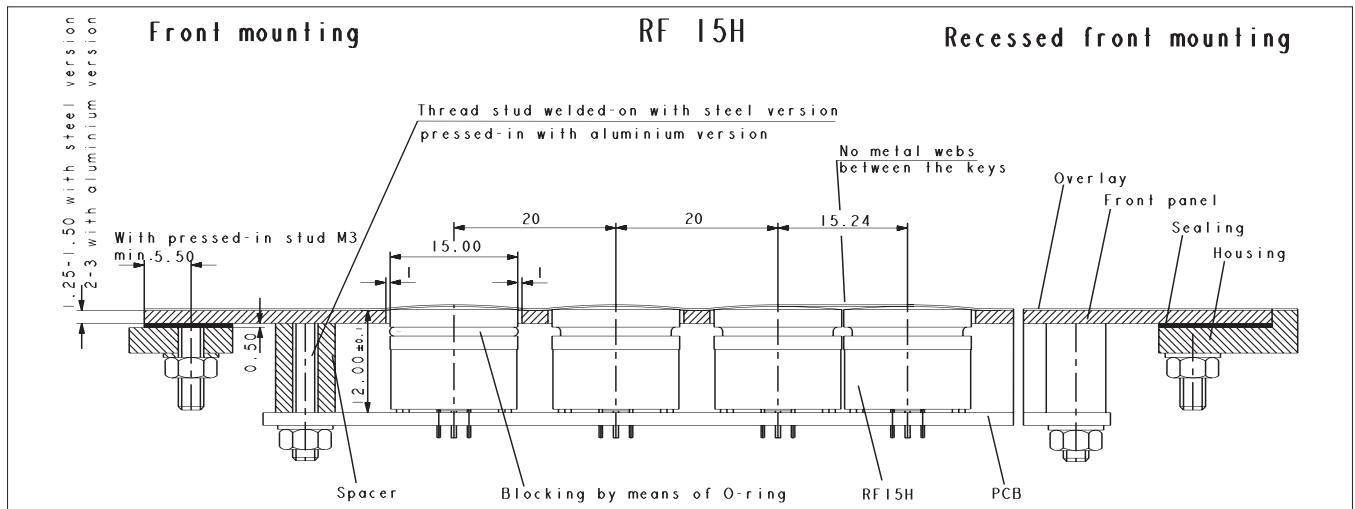F 2 is max. 55% of F 1

## Circuit Diagram – Keyswitch RF 15 H

Keyswitch,
non-illuminated

Keyswitch,
fully illuminated

## Dimensional Drawing

Front mounting     RF 15H     Recessed front mounting

Thread stud welded-on with steel version
pressed-in with aluminium version

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

With pressed-in stud M3
min.5.50

20     20     15.24

15.00

1.25-1.50 with steel version
2-3 with aluminium version

0.50

12.00±0.

Spacer     Blocking by means of O-ring     RF15H     PCB

## Hole Pattern

LED

5,72

1.27

5.08

□ 15.00     12.70     7,50

3.556     1.27     5.08

Taste unbeleuchtet
Keyswitch not illuminated

No metal webs with 15.24 mm. View on component side.
All hole diameters 1,1 $^{+/- 0,1}$ mm. PCB layout Keyswitch 1/400" grid.

## Hole Pattern – Front Panel

17

17

20

20     20

**4**

**RF**

## Accessories RF 15 H short-travel keyswitch

| Description | Photo | Order no. | Page |
|---|---|---|---|
| O-ring, black, for blocking the operating stroke | | 5.30.120.009/0100 | |

## RF 15 H short-travel keyswitch, non-illuminated
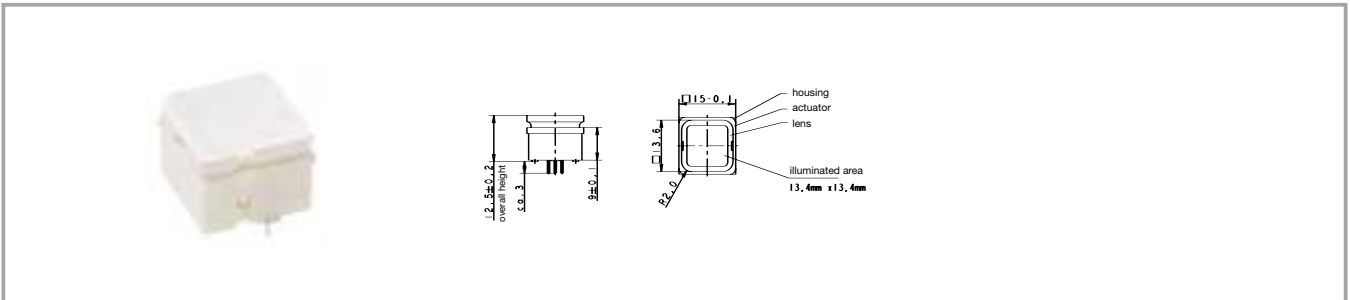


| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | white | | | **3.14.100.702/0000** |
| Ag | not illuminated | white | | | **3.14.100.707/0000** |

Technical data see page 4 - 42

Stock items are marked
by **bold printed** order numbers.

## RF 15 H short-travel keyswitch, fully illuminated



Pict.: yellow
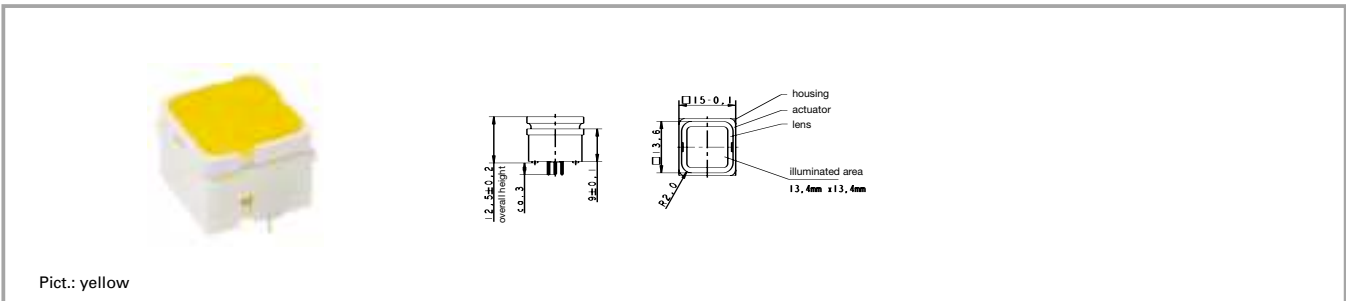
| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LEDs | red | red | 2 mm | **3.14.200.731/0000** |
| Au | fully illuminated 2 LEDs | green | green | 2 mm | **3.14.200.732/0000** |
| Au | fully illuminated 1 LED | green | green super bright | 3 mm | **3.14.200.736/0000** |
| Au | fully illuminated 2 LEDs | yellow | yellow | 2 mm | **3.14.200.733/0000** |
| Au | fully illuminated 1 LED | white | white | 3 mm | **3.14.200.735/0000** |
| Au | fully illuminated 2 LEDs | orange | yellow | 2 mm | **3.14.200.738/0000** |
| Au | fully illuminated 1 LED | blue | blue | 3 mm | **3.14.200.739/0000** |
| Au | fully illuminated 2 LEDs | white | multi colour | 3 mm | 3.14.100.734/0000 |
| Ag | fully illuminated 2 LEDs | red | red | 2 mm | **3.14.200.741/0000** |
| Ag | fully illuminated 2 LEDs | green | green | 2 mm | **3.14.200.742/0000** |
| Ag | fully illuminated 1 LED | green | green super bright | 3 mm | **3.14.200.746/0000** |
| Ag | fully illuminated 2 LEDs | yellow | yellow | 2 mm | **3.14.200.743/0000** |
| Ag | fully illuminated 1 LED | white | white | 3 mm | **3.14.200.745/0000** |
| Ag | fully illuminated 2 LEDs | orange | yellow | 2 mm | **3.14.200.748/0000** |
| Ag | fully illuminated 1 LED | blue | blue | 3 mm | **3.14.200.749/0000** |
| Ag | fully illuminated 2 LEDs | white | multi colour | 3 mm | 3.14.100.744/0000 |

When using the keyswitches with multicolour LEDs the illumination colour can be varied from red to green by change of polarity. Due to the frequency of the polarity-changes the colours red, green, yellow as well as all secondary colours from these are possible.

4

RF

Stock items are marked by **bold printed** order numbers.

## RF 15 signal indicator



## Technical data

**General information**
| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |

**Dimensions**
| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 9.7 mm |

**Mechanical design**
| | |
|---|---|
| Mounting | soldering into PCB |
| Illumination | fully illuminated 1 LED |
| LED colour | see order block |
| LED type | 2 mm |

**Other specifications**
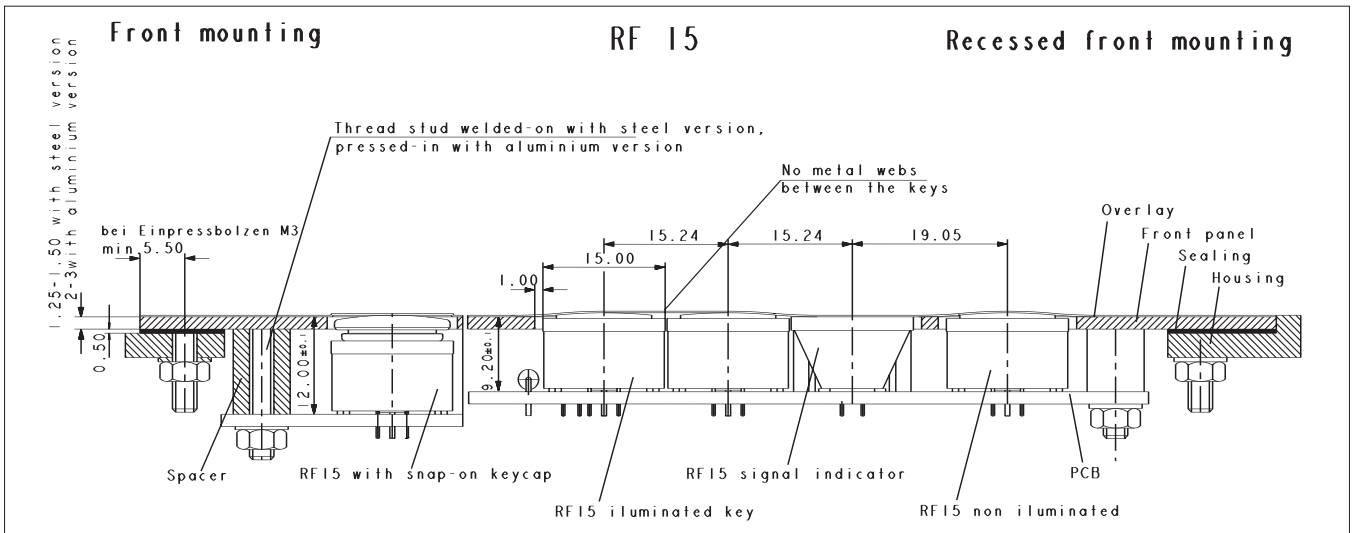| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |

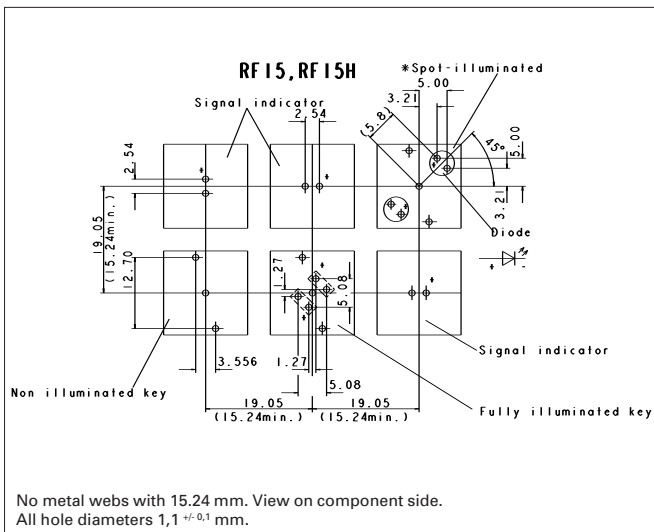| | |
|---|---|
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (in tube) | +50 °C |
| Resistance to constant environment | according to IEC 600 68-2-3 and 2-30 |
| Resistance at variable environment | according to IEC 600 68-2-14 and 2-33 |
| Soldering time max. | 2.5 sec. |
| Soldering temperature max. | 250 °C |
| Flammability of materials | UL 94 HB |

**4**

**RF**

**Stock items** are marked by **bold printed** order numbers.

PCB Keyswitches

## Dimensional Drawing Signal Indicator RF 15



## Hole Pattern



No metal webs with 15.24 mm. View on component side.
All hole diameters 1,1 $^{+/- 0,1}$ mm.

## Hole Pattern – Front Panel
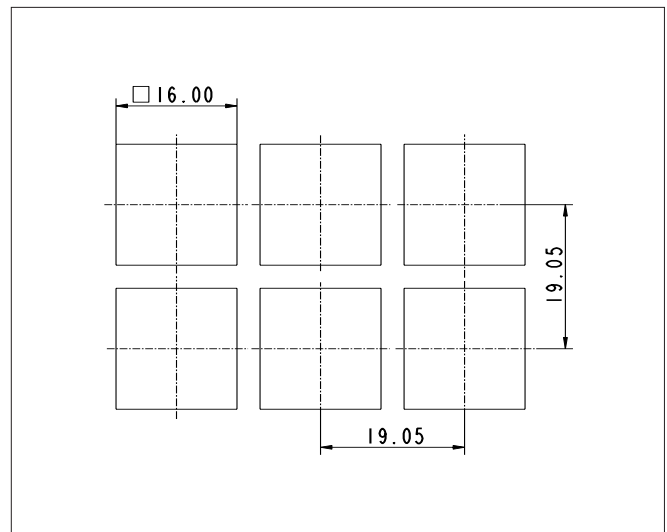


**4**

**RF**

## RF 15 signal indicator, fully illuminated, 1 LED



Pict.: green
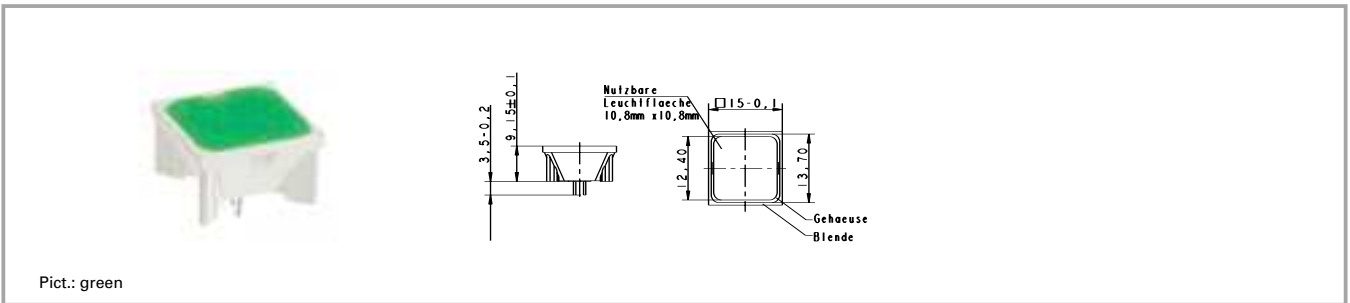
| Overall height | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| 9.7 mm | fully illuminated 1 LED | red | red | 2 mm | **3.14.200.051/0000** |
| 9.7 mm | fully illuminated 1 LED | green | green | 2 mm | **3.14.200.052/0000** |
| 9.7 mm | fully illuminated 1 LED | yellow | yellow | 2 mm | **3.14.200.053/0000** |
| 9.7 mm | fully illuminated 1 LED | orange | yellow | 2 mm | 3.14.200.054/0000 |
| 9.7 mm | fully illuminated 1 LED | blue | blue | 2 mm | 3.14.200.055/0000 |

Technical data see page 4 - 46

**4**

**RF**

Stock items are marked
by **bold printed** order numbers.