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

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

Content

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 mIm/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		

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

4

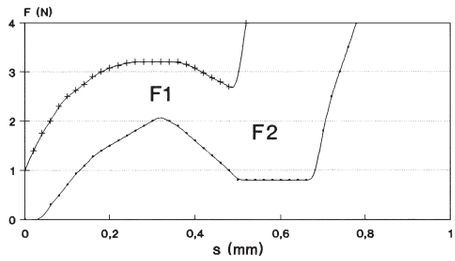
RF

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

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

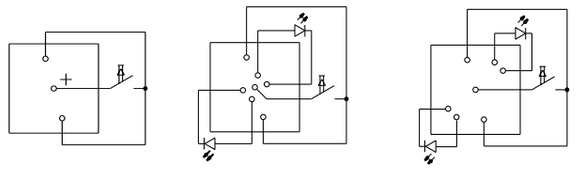
Force/Travel Diagram – Keyswitch RF 15

Operation characteristic limits RF



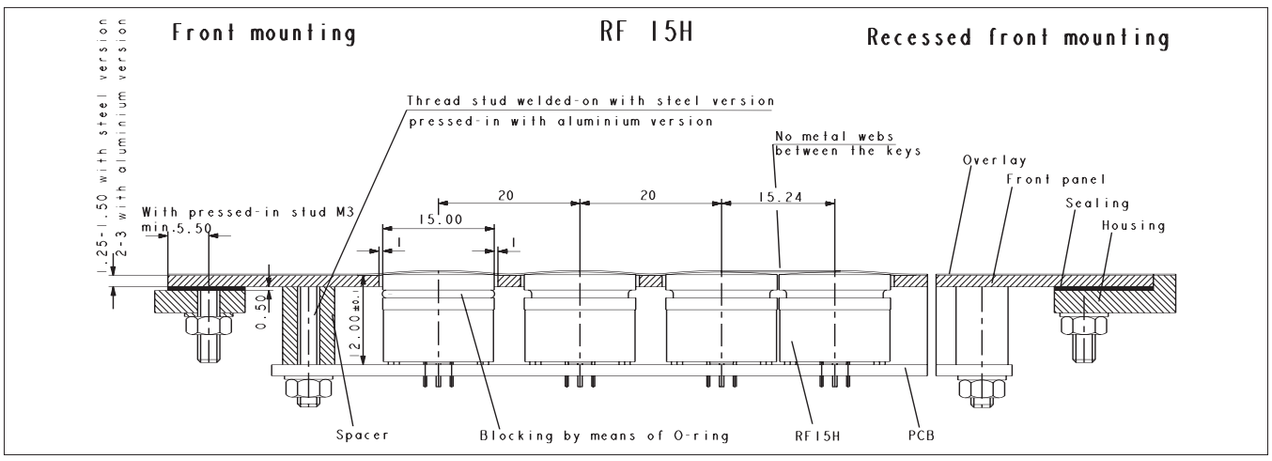
F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 15

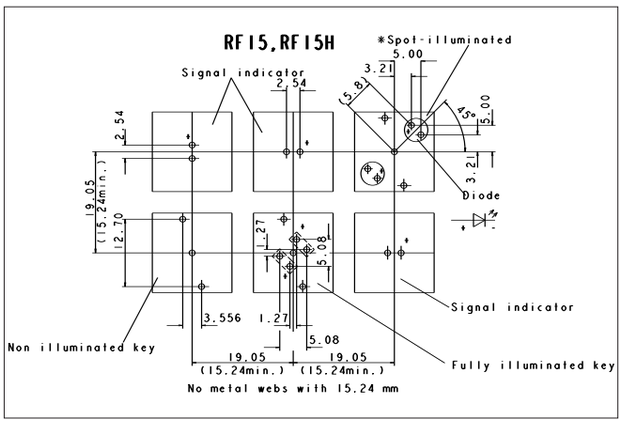


Keyswitch, non-illuminated | Keyswitch, fully illuminated | Keyswitch, spot-illuminated

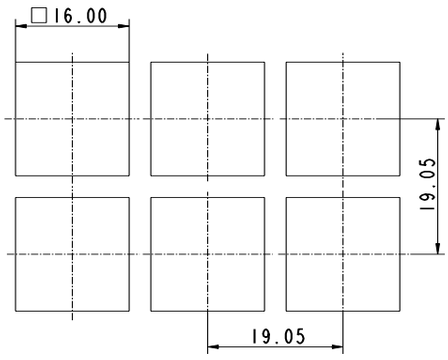
Dimensional Drawing RF 15



Hole Pattern RF 15

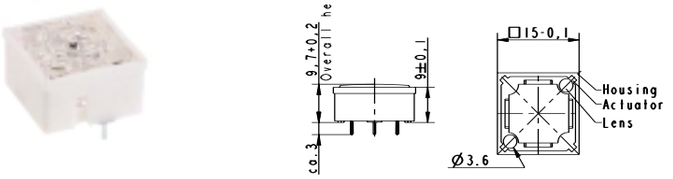


Hole Pattern – Front Panel



View on component side, all hole diameters 1,1 +/- 0,1 mm

RF 15 short-travel keyswitch, non-illuminated



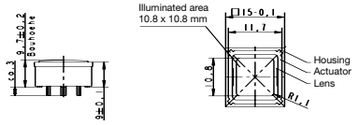
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent			**3.14.100.001/0000**
Ag	not illuminated	transparent			**3.14.100.006/0000**

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.

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

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

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.

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.

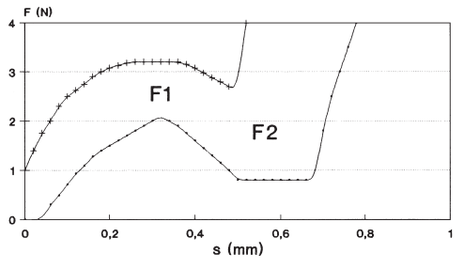
Technical data

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.

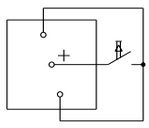
Force/Travel Diagram – Keyswitch RF 15 N

Operation characteristic limits RF

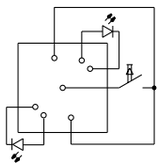


F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 15 N

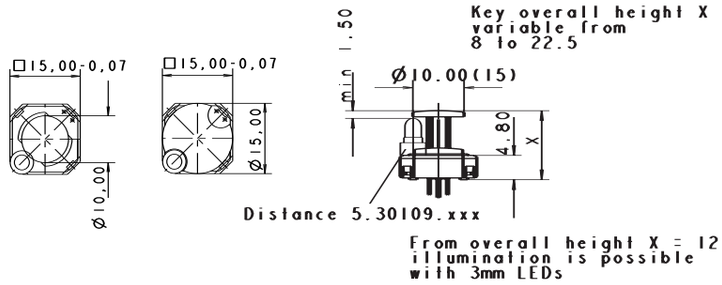


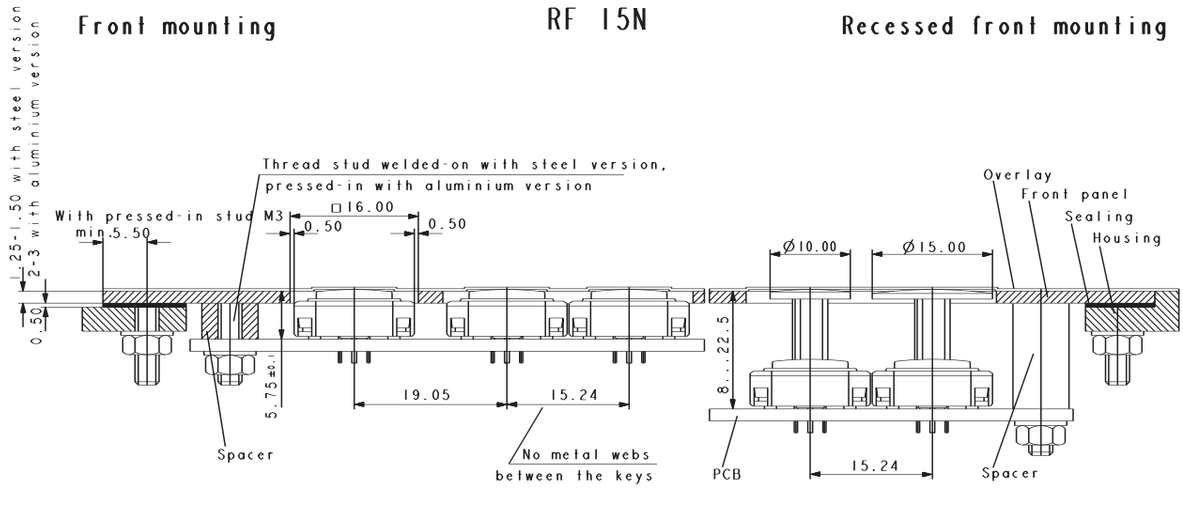
Keyswitch,
non illuminated



Keyswitch,
spot-illuminated

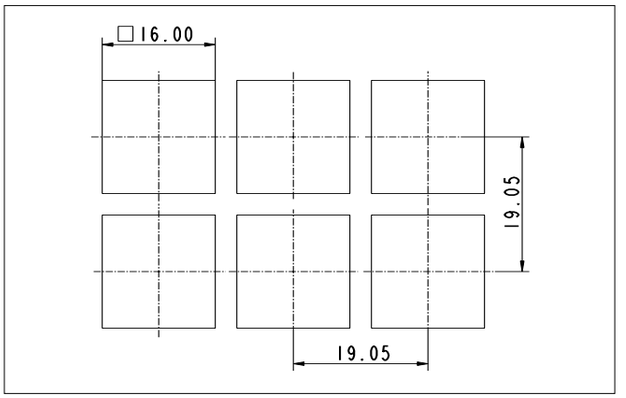
Dimensional Drawings RF 15 N



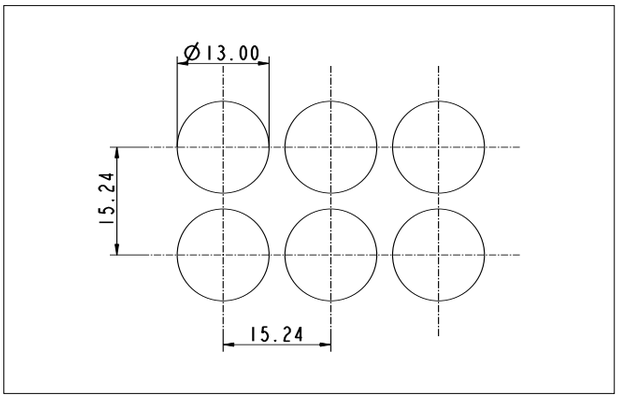


Hole Patterns – Front Panel RF 15 N

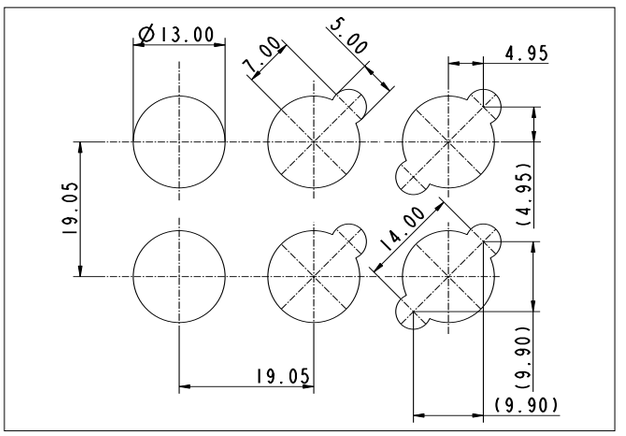
RF 15 N without plunger



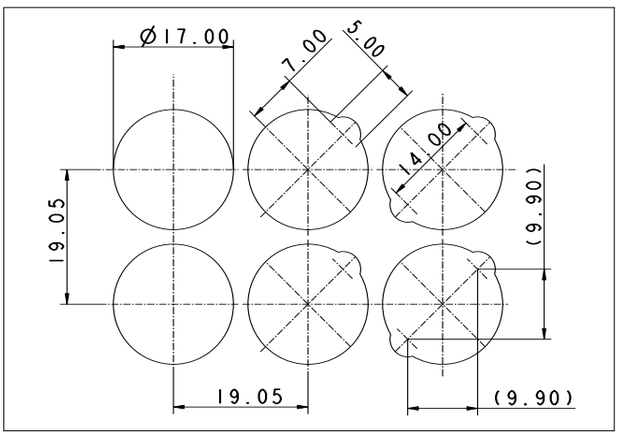
RF 15 N with plunger ø 10 mm, non-illuminated



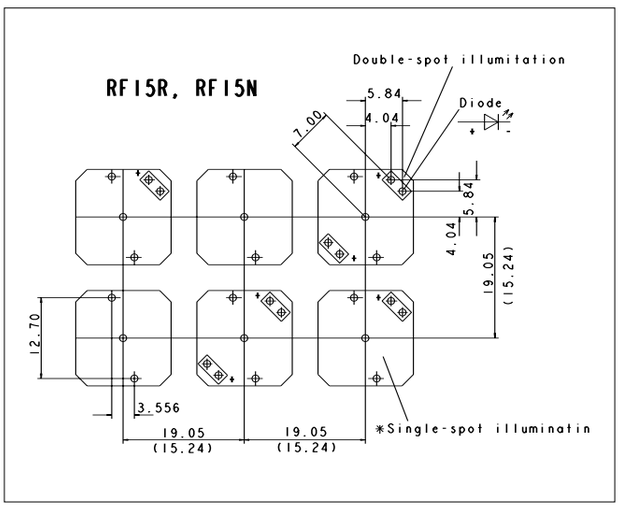
RF 15 N with plunger ø 10 mm, illuminated



RF 15 N with plunger ø 15 mm, illuminated



Hole Pattern RF 15 N



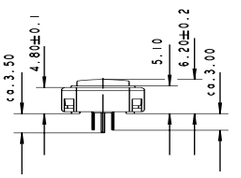
View on component side
All hole diameters 1,1 +/- 0,1 mm
PCB layout Keyswitch 1/400" grid

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

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

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

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

4

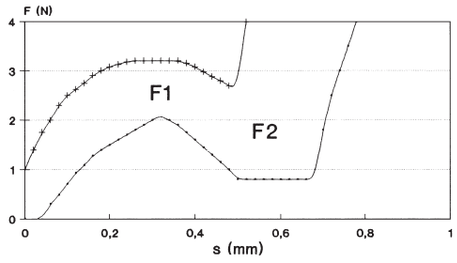
RF

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 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.

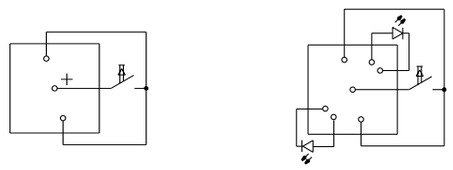
Force/Travel Diagram – Keyswitch RF 15 R

Operation characteristic limits RF



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

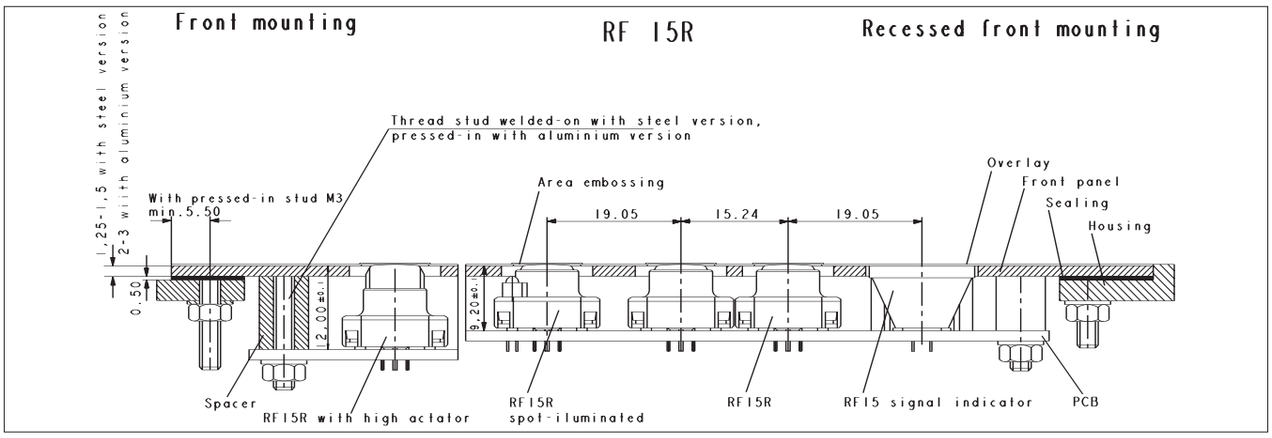
Circuit Diagram – Keyswitch RF 15 R



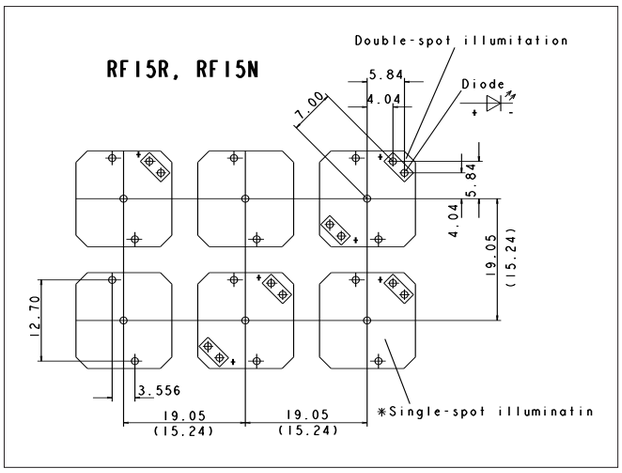
Keyswitch, non-illuminated

Keyswitch, spot-illuminated

Dimensional Drawing RF 15 R



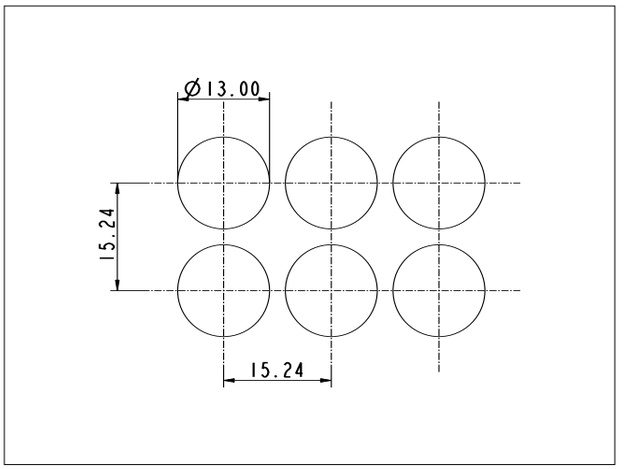
Hole Pattern RF 15 R



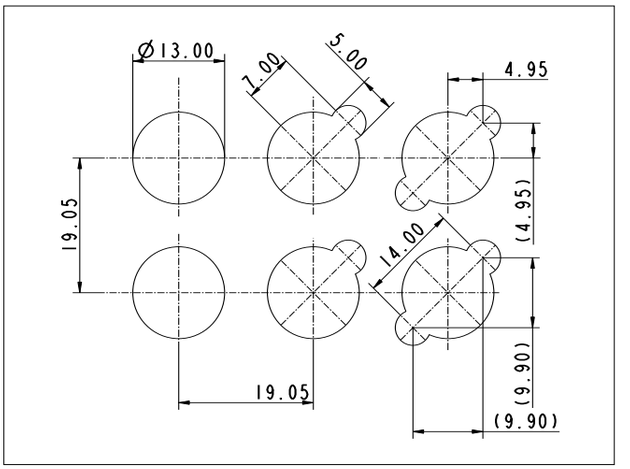
View on component side
All hole diameters 1,1 +/- 0,1 mm
PCB layout Keyswitch 1/400" grid

Hole Pattern – Front Panel RF 15 R

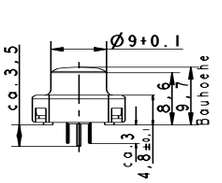
RF 15 R, non-illuminated



RF 15 R, illuminated



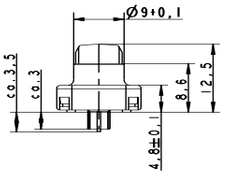
RF 15 R low short-travel keyswitch, non-illuminated



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

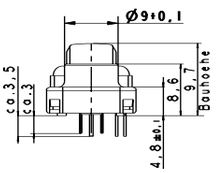


Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	12.5 mm	not illuminated			**3.14.100.801/0000**
Ag	12.5 mm	not illuminated			**3.14.100.806/0000**

Technical data see page 4 - 36

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

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



Pict.: red

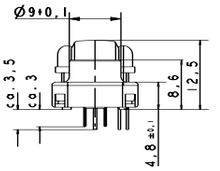
Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	9.7 mm	spot illumination 1 LED	2 mm	red	**3.14.100.531/0000**
Au	9.7 mm	spot illumination 1 LED	2 mm	green	**3.14.100.532/0000**
Au	9.7 mm	spot illumination 1 LED	2 mm	yellow	**3.14.100.533/0000**
Ag	9.7 mm	spot illumination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

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.

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

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.

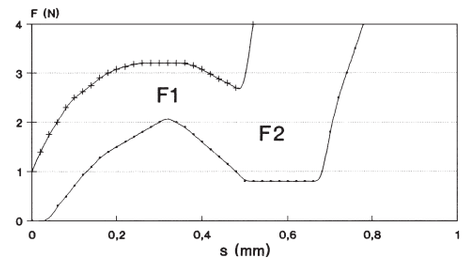
Technical data

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.

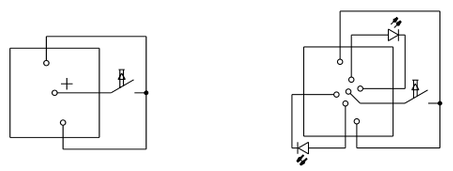
Force/Travel Diagram – Keyswitch RF 15 H

Operation characteristic limits RF



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

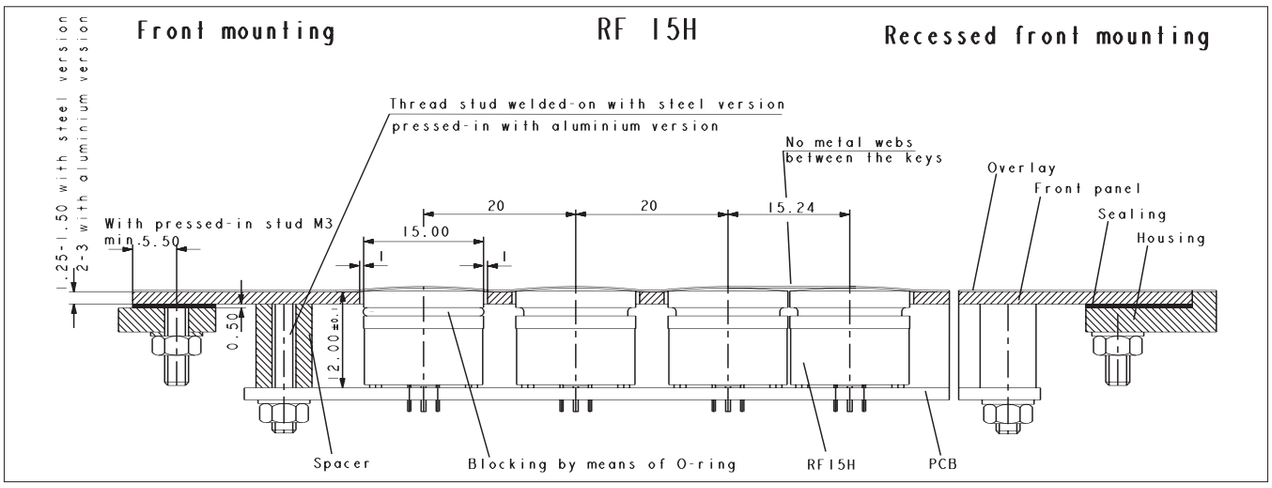
Circuit Diagram – Keyswitch RF 15 H



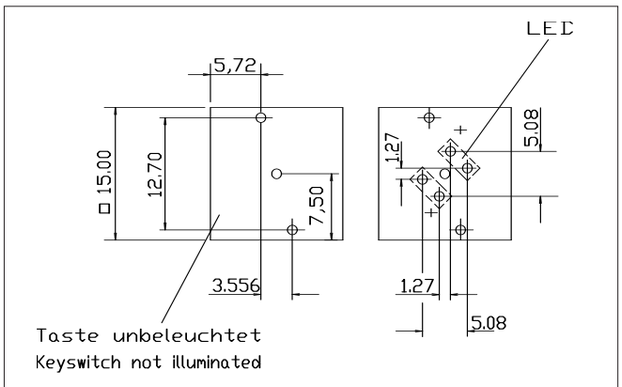
Keyswitch, non-illuminated

Keyswitch, fully illuminated

Dimensional Drawing

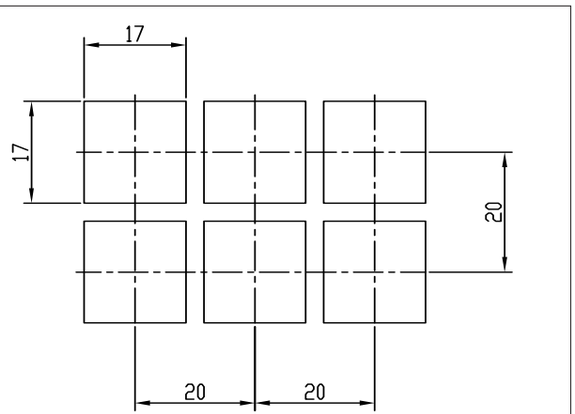


Hole Pattern



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.

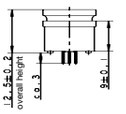
Hole Pattern – Front Panel

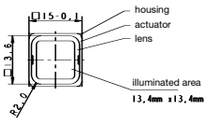


Accessories RF 15 H short-travel keyswitch

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



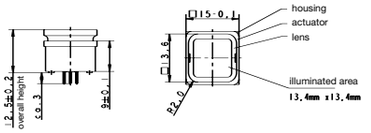


Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white			**3.14.100.702/0000**
Ag	not illuminated	white			**3.14.100.707/0000**

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

Technical data see page 4 - 42

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.

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

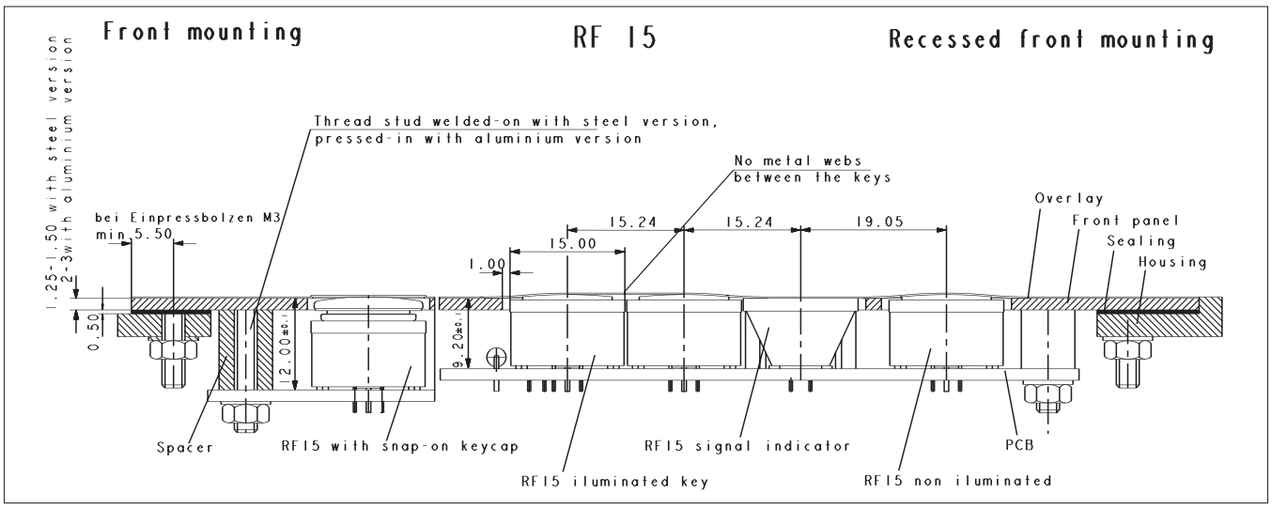
Mounting	soldering into PCB
Illumination	fully illuminated 1 LED
LED colour	see order block
LED type	2 mm

Other specifications

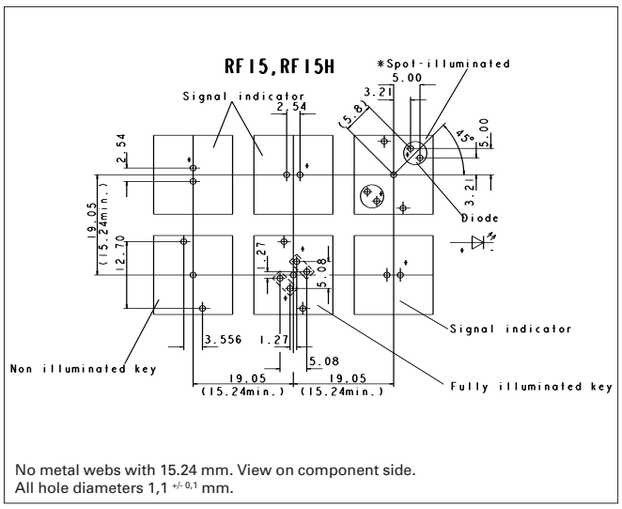
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according 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

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

Dimensional Drawing Signal Indicator RF 15

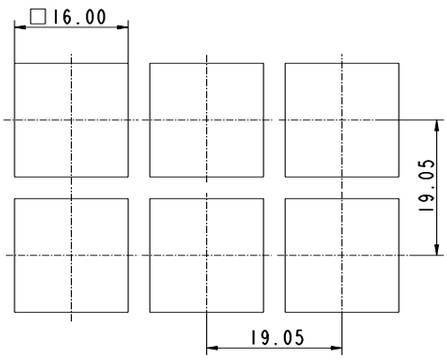


Hole Pattern

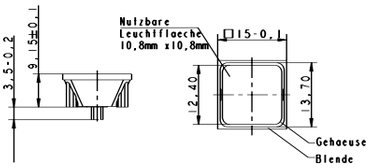


No metal webs with 15.24 mm. View on component side.
All hole diameters 1,1 $^{+/-0,1}$ mm.

Hole Pattern – Front Panel



RF 15 signal indicator, fully illuminated, 1 LED



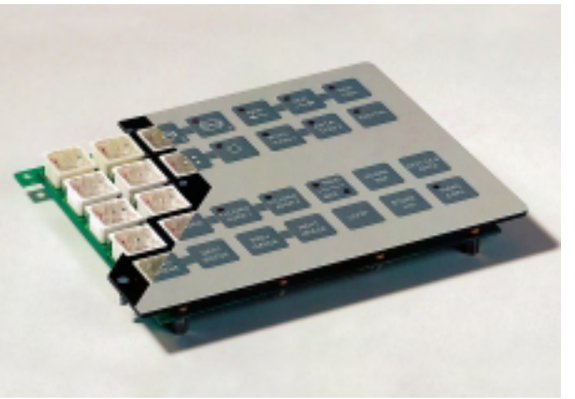
Pict.: green

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

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

RF 19 short-travel keyswitch



General data

Application notes:
RF 19 keys offer a large actuation area. When designing low-profile keyboards with a grid of >= 23 mm, 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 overlay.

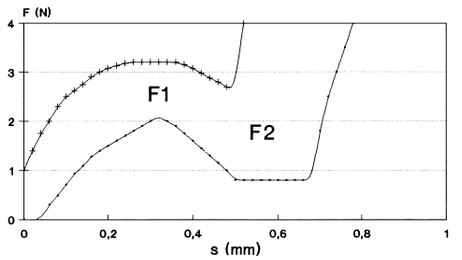
Technical data

General information	
Colour of lens	see order block
Recommended key grid	23 mm
Dimensions	
Length	19.05 mm
Width	19.05 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

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

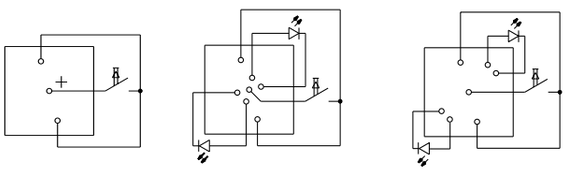
Force/Travel Diagram – Keyswitch RF 19

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 19

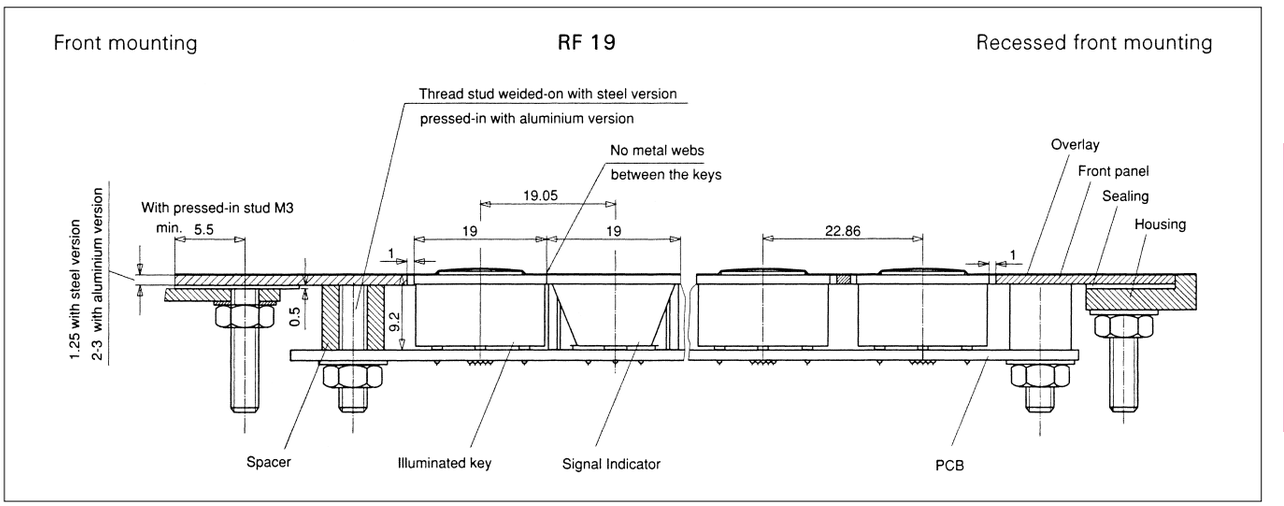


Keyswitch, non-illuminated

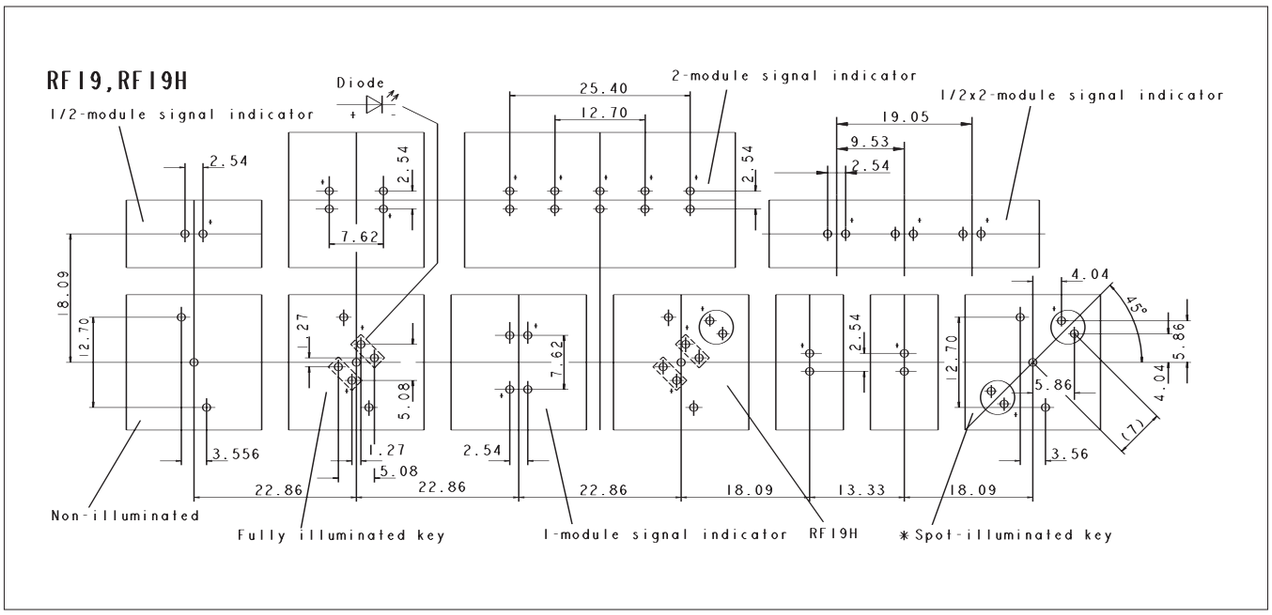
Keyswitch, fully illuminated

Keyswitch, spot-illuminated

Dimensional Drawing

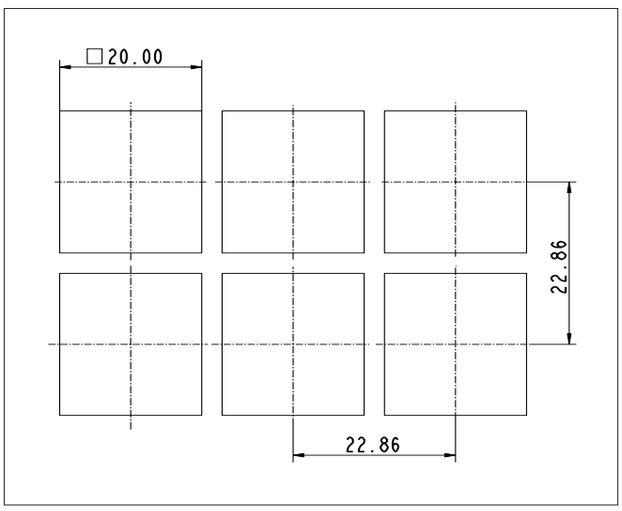


Hole Patterns RF 19

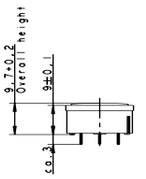


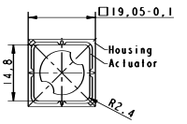
* The LED may be positioned either on the left-hand or right-hand side.
Standard version: LED on left-hand side
View on component side, all hole diameters 1,1 +/- 0,1 mm

Hole Patterns – Front Panel RF 19



RF 19 short-travel keyswitch, non-illuminated



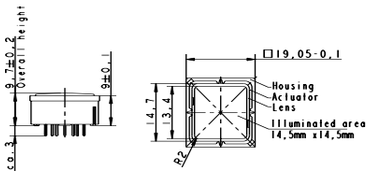


Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent			**3.14.001.001/0000**
Ag	not illuminated	transparent			**3.14.001.006/0000**

Technical data see page 4 - 50

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

RF 19 short-travel keyswitch, fully illuminated with 2 LEDs

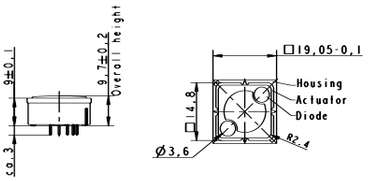


Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LEDs	red	red	2 mm	**3.14.002.011/0000**
Au	fully illuminated 2 LEDs	green	green	2 mm	**3.14.002.012/0000**
Au	fully illuminated 2 LEDs	yellow	yellow	2 mm	**3.14.002.013/0000**
Au	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.014/0000
Au	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.002.015/0000
Ag	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.021/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.022/0000
Ag	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.002.023/0000
Ag	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.024/0000
Ag	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.002.025/0000

Technical data see page 4 - 50

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

RF 19 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	3.14.001.030/0000
Au	spot illumination 1 LED	transparent	red	3 mm	**3.14.001.031/0000**
Au	spot illumination 1 LED	transparent	green	3 mm	**3.14.001.032/0000**
Au	spot illumination 1 LED	transparent	yellow	3 mm	**3.14.001.033/0000**
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.001.040/0000
Ag	spot illumination 1 LED	transparent	red	3 mm	**3.14.001.041/0000**
Ag	spot illumination 1 LED	transparent	green	3 mm	**3.14.001.042/0000**
Ag	spot illumination 1 LED	transparent	yellow	3 mm	**3.14.001.043/0000**

Technical data see page 4 - 50

Versions with 2 LEDs available on request.

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

RF 19 short-travel keyswitch, 1 NC + 1 NO

Technical data

General information

Recommended key grid	23 mm

Dimensions

Length	19.05 mm
Width	19.05 mm
Overall height	9.7 mm

Mechanical design

Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	bridge contact
Contact arrangement	1 NC + 1 NO
Contact materials	Au/Ag
Illumination	none

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

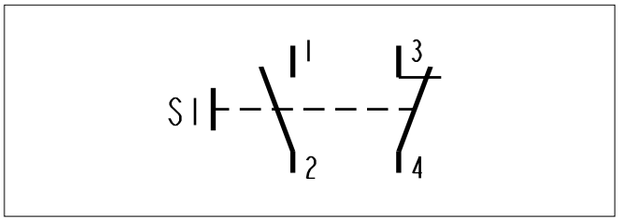
Rated voltage min.	Au: 0.02 V, Ag: 3 V V
Rated voltage max.	Au: 42 V, Ag: 50 V V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA mA
Rated current max.	Au: 100 mA, Ag: 250 mA mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Contact resistance acc. to life max.	3 Ω
Insulation resistance	2 x 10^6 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications

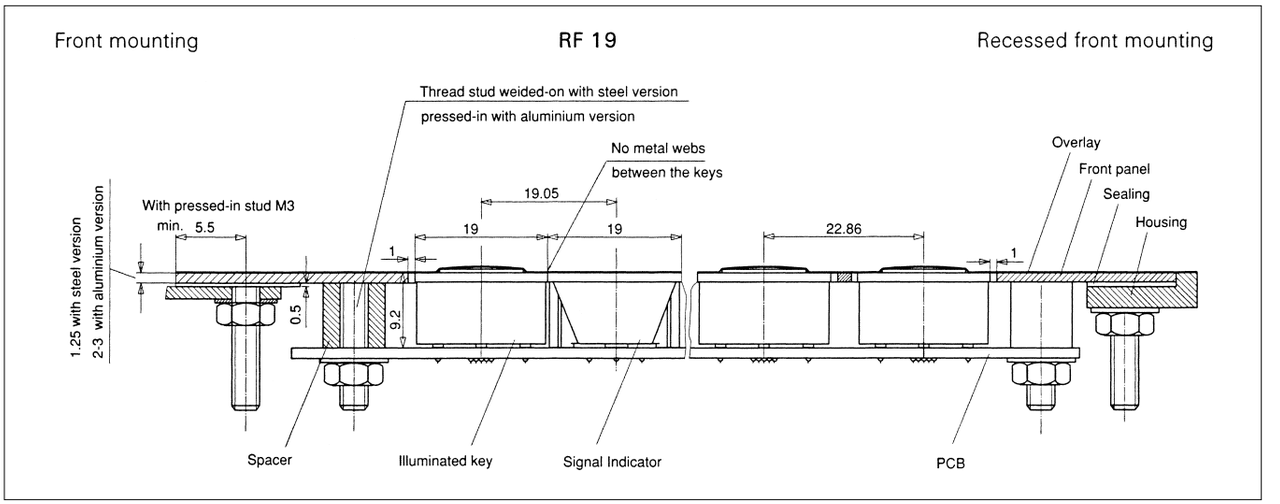
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	100000
Soldering time max.	5 sec.
Soldering temperature max.	265 °C
Flammability of materials	UL 94 HB

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

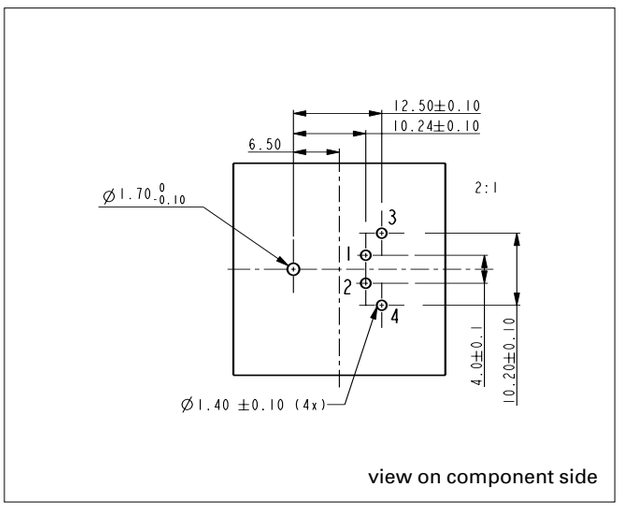
Circuit Diagram



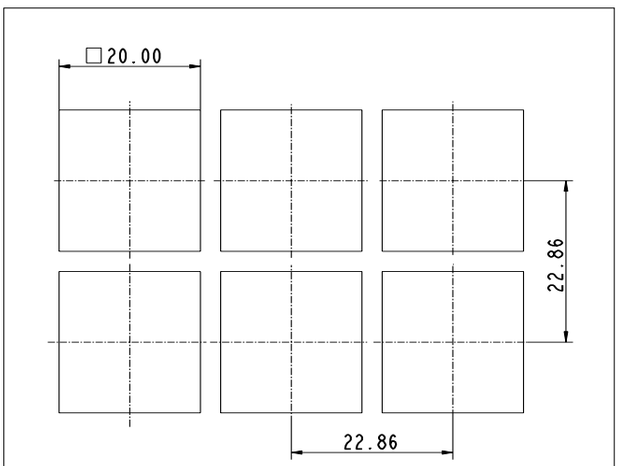
Dimensional Drawing



Hole Pattern



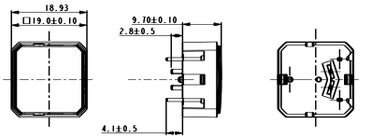
Hole Pattern – Front Panel



4

RF

RF 19 short-travel keyswitch, non-illuminated



Contact materials	Contact arrangement	Illumination	Colour of lens	Order no.
Au	1 NC + 1 NO	not illuminated	opaque white	1.16.000.991/0000
Ag	1 NC + 1 NO	not illuminated	opaque white	1.16.000.990/0000

Technical data see page 4 - 56

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

RF 19 H short-travel keyswitch

General data

Application notes:
The RF 19H 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 23 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

4

RF

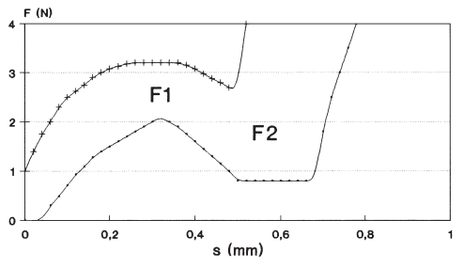
General information	
Colour of lens	see order block
Recommended key grid	24 mm
Dimensions	
Length	19.05 mm
Width	19.05 mm
Overall height	12.5 mm
Mechanical design	
Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	spot-/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

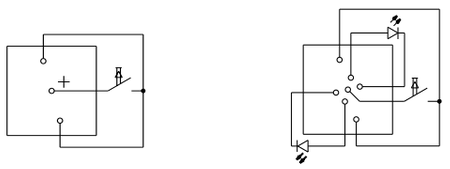
Force/Travel Diagram – Keyswitch RF 19 H

Operation characteristic limits RF



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

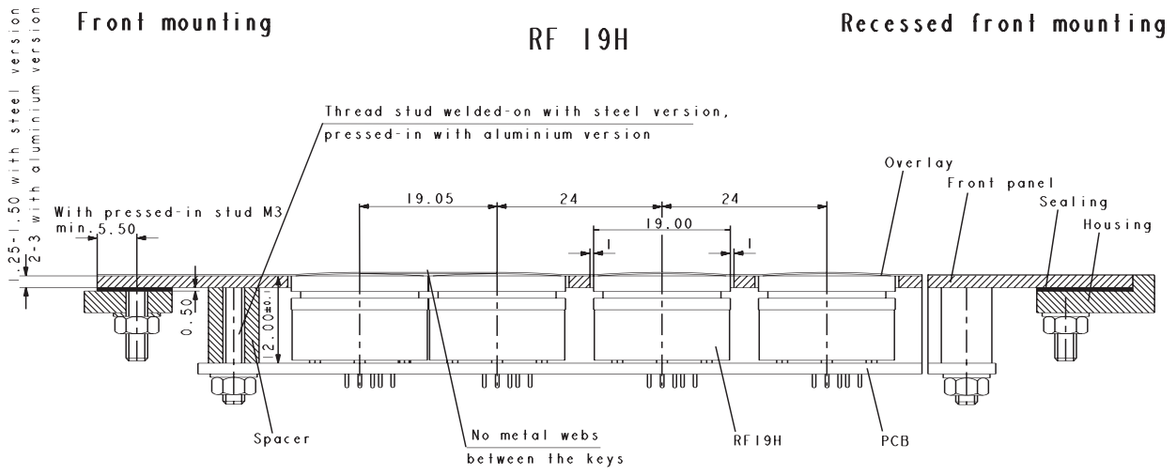
Circuit Diagram – Keyswitch RF 19 H



Keyswitch,
non illuminated

Keyswitch,
fully illuminated

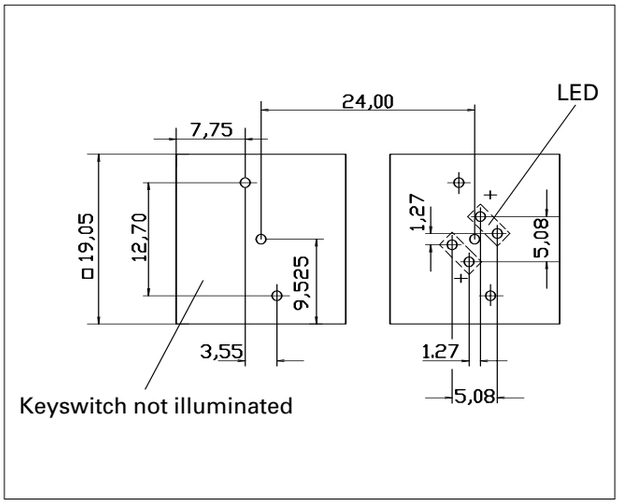
Dimensional Drawing



4

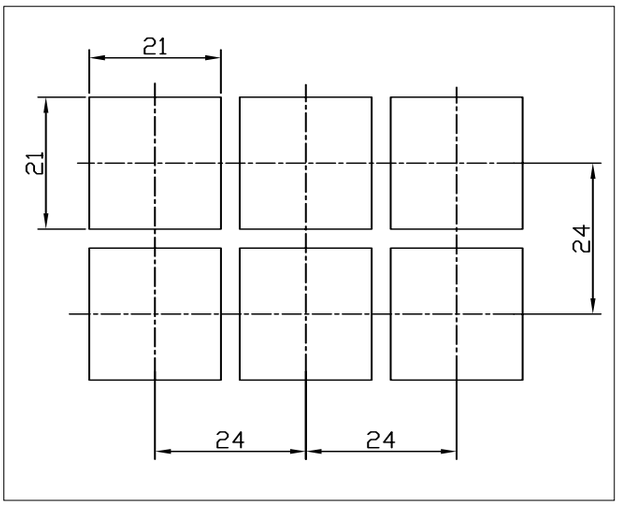
RF

Hole Pattern RF 19 H



* The LED may be positioned either on the left-hand or right-hand side.
Standard version: LED on left-hand side
View on component side, all hole diameters
1,1 +/- 0,1 mm

Hole Pattern – Front Panel RF 19 H



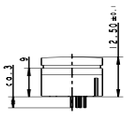
4

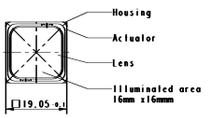
RF

Accessories RF 19 H short-travel keyswitches

Description	Photo	Order no.	Page
O-ring, black, 17.0 x 1.5, for blocking RF 19H keys		5.30.125.003/0100	

RF 19 H keyswitch, non-illuminated



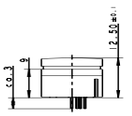


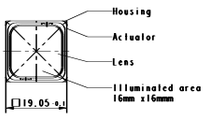
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white			3.14.001.501/0000
Ag	not illuminated	white			3.14.001.506/0000

Technical data see page 4 - 60

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

RF 19 H short-travel keyswitch, fully illuminated





Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.613/0000
Au	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.632/0000
Au	fully illuminated 1 LED	green	green super bright	3 mm	3.14.002.633/0000
Au	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.002.653/0000
Au	fully illuminated 1 LED	white	white	3 mm	3.14.002.684/0000
Au	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.673/0000
Au	fully illuminated 2 LEDs	white	multi colour	3 mm	3.14.001.672/0000
Au	fully illuminated 1 LED	blue	blue	3 mm	3.14.002.683/0000
Ag	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.623/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.642/0000
Ag	fully illuminated 1 LED	green	green super bright	3 mm	3.14.002.643/0000
Ag	fully illuminated 1 LED	blue	blue super bright	3 mm	3.14.002.688/0000
Ag	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.002.663/0000
Ag	fully illuminated 1 LED	white	white	3 mm	3.14.002.689/0000
Ag	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.678/0000
Ag	fully illuminated 2 LEDs	white	multi colour	3 mm	3.14.001.682/0000

Technical data see page 4 - 60

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.

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

RF 19 signal indicator

Technical data

General information

Colour of lens	see order block
Recommended key grid	23/x mm

Dimensions

Length	see order block
Width	see order block
Overall height	9.15 mm

Mechanical design

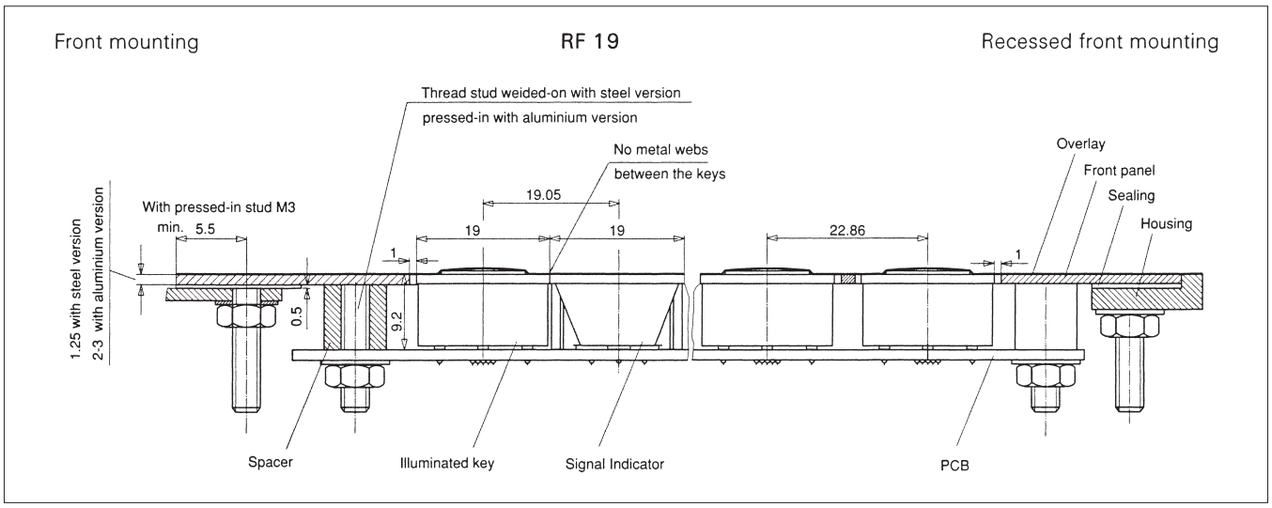
Mounting	soldering into PCB
Illumination	see order block
LED colour	see order block
LED type	see order block

Other specifications

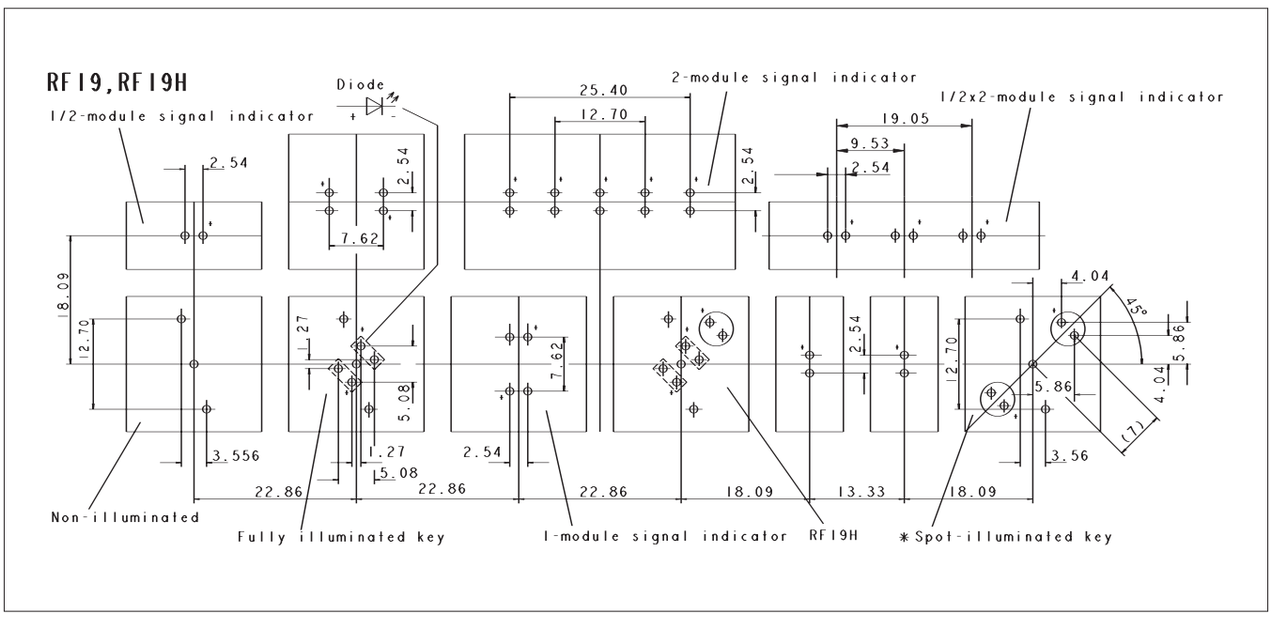
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according 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

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

Dimensional Drawing Signal Indicator RF 19



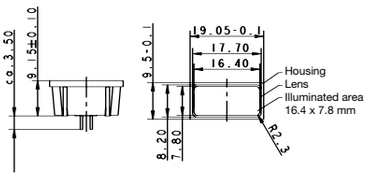
Hole Patterns RF 19



* The LED may be positioned either on the left-hand or right-hand side.
  Standard verstion: LED on left-hand side
  View on component side, all hole diameters 1,1 +/- 0,1 mm

Front panel cut-out = outer keyswitch size + 1 mm

RF 19 signal indicator, $^1/_2$ x 1-module

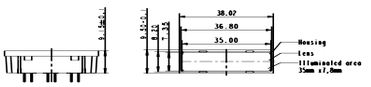


Pict.: yellow

Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 1 LED	red	red	2 mm	**3.14.002.061/0000**
fully illuminated 1 LED	green	green	2 mm	**3.14.002.062/0000**
fully illuminated 1 LED	yellow	yellow	2 mm	**3.14.002.063/0000**
fully illuminated 1 LED	orange	yellow	2 mm	3.14.002.064/0000

Technical data see page 4 - 66

RF 19 signal indicator, $^1/_2$ x 2-module



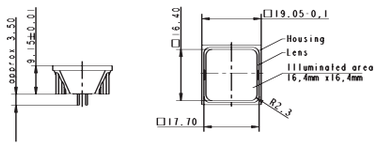
Pict.: yellow

Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 3 LEDs	red	red	2 mm	3.14.002.908/0000
fully illuminated 3 LEDs	green	green	2 mm	3.14.002.909/0000
fully illuminated 3 LEDs	yellow	yellow	2 mm	3.14.002.910/0000
fully illuminated 3 LEDs	orange	yellow	2 mm	3.14.002.911/0000

Technical data see page 4 - 66

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

RF 19 signal indicator, 1 x 1-module

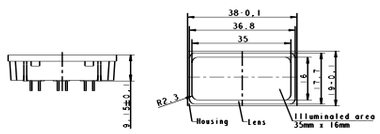


Pict.: green

Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 2 LEDs	red	red	2 mm	**3.14.002.051/0000**
fully illuminated 2 LEDs	green	green	2 mm	**3.14.002.052/0000**
fully illuminated 2 LEDs	yellow	yellow	2 mm	**3.14.002.053/0000**
fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.054/0000
fully illuminated 2 LEDs	blue	blue	2 mm	3.14.001.659/0000

Technical data see page 4 - 66

RF 19 signal indicator, 1 x 2-module



Pict.: red

Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 5 LEDs	red	red	2 mm	**3.14.002.071/0000**
fully illuminated 5 LEDs	green	green	2 mm	**3.14.002.072/0000**
fully illuminated 5 LEDs	yellow	yellow	2 mm	**3.14.002.073/0000**
fully illuminated 5 LEDs	orange	yellow	2 mm	3.14.002.074/0000

Technical data see page 4 - 66

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

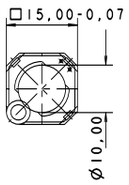
RF special accessories

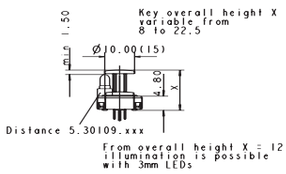
Pict.: light grey

round and triangular versions

Extension plunger for RF 15 N, round head

Pict.: light grey



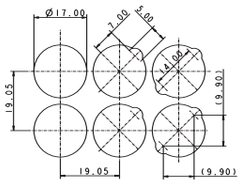


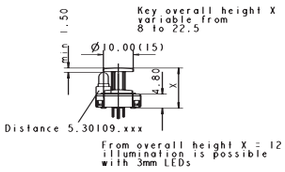
Length	Width	Overall height	Diameter	Colour	Order no. complete
		9 mm	10 mm		**5.46.011.036/0710**
		9.7 mm	10 mm		**5.46.011.030/0710**
		12.5 mm	10 mm		**5.46.011.037/0710**
		13 mm	10 mm		**5.46.011.038/0710**
		22.5 mm	10 mm		**5.46.011.028/0710**

Length of plunger = Overall height - 4.25 mm.

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

Extension plunger for RF 15 N, round head, with recess for LED

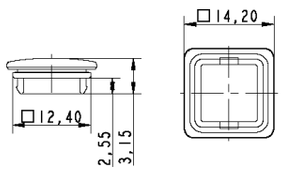




Length	Width	Overall height	Diameter	Colour	Order no. complete
		9 mm	15 mm		**5.46.017.036/0710**
		9.7 mm	15 mm		**5.46.017.030/0710**
		12.5 mm	15 mm		**5.46.017.037/0710**
		13 mm	15 mm		**5.46.017.038/0710**
		22.5 mm	15 mm		**5.46.017.028/0710**

Length of plunger = Overall height - 4.25 mm.

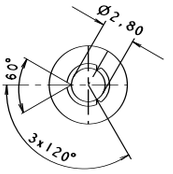
Keycap for RF 15, snap-on, for overall height 12.5 mm

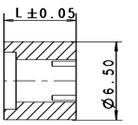


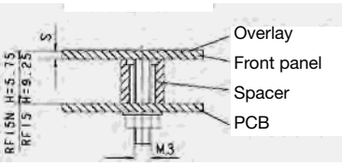
Length	Width	Overall height	Diameter	Colour	Order no. complete
14.2 mm	14.2 mm	12.5 mm		beige	5.46.654.059/0227

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

Spacers, round, for RF 15, RF 19





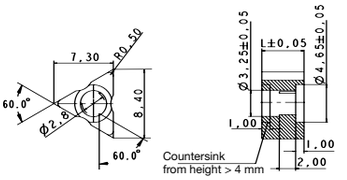


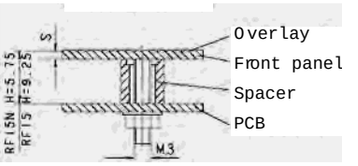
Length	Width	Overall height	Diameter	Colour	Order no. complete
4 mm				green	**5.30.759.025/0000**
4.25 mm				blue	**5.30.759.026/0000**
4.50 mm				red	**5.30.759.027/0000**
4.75 mm				blue transparent	**5.30.759.028/0000**
5 mm				black	**5.30.759.029/0000**
5.25 mm				yellow orange transparent	**5.30.759.030/0000**
5.50 mm				yellow	**5.30.759.031/0000**
5.75 mm				green	**5.30.759.032/0000**
6 mm				blue	**5.30.759.033/0000**
6.25 mm				red	**5.30.759.034/0000**
6.50 mm				blue transparent	**5.30.759.035/0000**
6.75 mm				black	**5.30.759.036/0000**
7 mm				yellow orange transparent	**5.30.759.037/0000**
7.25 mm				yellow	**5.30.759.038/0000**
7.50 mm				green	**5.30.759.039/0000**
7.75 mm				blue	**5.30.759.040/0000**
8 mm				red	**5.30.759.041/0000**
8.25 mm				blue transparent	**5.30.759.042/0000**
10.00 mm				black	**5.30.759.043/0104**

Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

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

Spacers, triangular, for RF 15, RF 19





Length	Width	Overall height	Diameter	Colour	Order no. complete
2.50 mm				blue	**5.30.759.094/0000**
2.75 mm				red	**5.30.759.095/0000**
3 mm				blue transparent	**5.30.759.096/0000**
3.25 mm				black	**5.30.759.097/0000**
3.50 mm				yellow orange transparent	**5.30.759.098/0000**
3.75 mm				yellow	**5.30.759.099/0000**
4 mm				green	**5.30.759.100/0000**
4.25 mm				blue	**5.30.759.101/0000**
4.50 mm				red	**5.30.759.102/0000**
4.75 mm				blue transparent	**5.30.759.103/0000**
5 mm				black	**5.30.759.104/0000**
5.25 mm				yellow orange transparent	**5.30.759.105/0000**
5.50 mm				yellow	**5.30.759.106/0000**
5.75 mm				green	**5.30.759.107/0000**
6 mm				blue	**5.30.759.108/0000**
6.25 mm				red	**5.30.759.109/0000**
6.50 mm				blue transparent	**5.30.759.110/0000**
6.75 mm				black	**5.30.759.111/0000**
7 mm				yellow orange transparent	**5.30.759.112/0000**
7.25 mm				yellow	**5.30.759.113/0000**
7.50 mm				green	**5.30.759.114/0000**
7.75 mm				blue	**5.30.759.115/0000**
8 mm				red	**5.30.759.116/0000**

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

Length	Width	Overall height	Diameter	Colour	Order no. complete
8.25 mm				blue transparent	5.30.759.117/0000
10.00 mm				black	5.30.759.124/0000
10.25 mm				yellow orange transparent	5.30.759.125/0000

Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

LED spacer for RF 15 N

Pict.: light grey

Length	Width	Overall height	Diameter	Colour	Order no. complete
2.2 mm		12.5 mm	5 mm	light grey	5.30.109.010/0756
12 mm		22.5 mm	5 mm	black	5.30.109.019/0105

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

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Switch Bezels / Switch Caps ***category:***

Click to view products by Rafi ***manufacturer:***

Other Similar products are found below :

896809000 LW2A-B1-G 7527 76 760203000 760503000 766601000 785105000 785106000 79211759 MG12KB MH11 MHU31 800C2BLK MJ1216 MJ33 MJ612 908-1634 95CAP-011 11-932.7 99-909.5 99-920.8 A0261A 11-931.2 11-936 AKTSC22B AKTSC61I AT496F AT496H 161006 1825068-3 187-1872 188-1471 18-920.1 1DFBLK 1DS30 1KBS1116 C159 1TS00 1X02 908-1632 92-450.000 29PN 2C00 2F204 2J3 304-1871 304-1875 SK2AA00410 1631409