



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.

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

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Specifications LED

3 mm LED

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

2 mm LED

(valid for 25 °C)	Red LED	Green LED	Green LED superbright
	Neu 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 1.8 V/20 mA	569 nm 2.1 V/10 mA	510-545 nm 3.5 V/20 mA
Forward voltage U _F /I _F typ: Reverse voltage U _B /I _F typ:	5 V/100 μA min.	5 V/100 μA min.	3.5 V/20 IIIA
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: Light current f_V/I_F typ:	0.8 mA/°C 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 $U_{\rm B}/I_{\rm F}$ 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		
, and one composition operating.	20 0 1 00 0		

Calculating the series resistor:

Rated power of series:

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

 $P_V = I_F^2 x R_V$

Example for 5 Volt:

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

4



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 Recommended key grid

Dimensions

RF

Length Width Overall height

Mechanical design Mounting Terminals

Contact system Contact arrangement Contact materials Illumination LED colour LED type

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics Rated voltage min. Rated voltage max. Rated current min. Rated current max. see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W Contact resistance when $100 \text{ m}\Omega$ new max. Contact resistance acc. to life max. 3Ω 10⁹ Ω Insulation resistance ESD strength (underneath 15 kV overlay) Bouncing time max. 5 ms Other specifications Ambient temp. operating -25 °C min. Ambient temp. operating +70 °C max. 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 250 °C max. UL 94 HB Flammability of materials



Force/Travel Diagram – Keyswitch RF 15



F 1 = Max. operating force

F 2 = Force at contact

F 2 is max. 55% of F 1

Dimensional Drawing RF 15



Hole Pattern RF 15



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

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Keyswitch,

non-illuminated

Circuit Diagram – Keyswitch RF 15



₩.

Keyswitch, fully illuminated

Keyswitch, spot-illuminated

RF



Hole Pattern – Front Panel



RF 15 short-travel keyswitch, non-illuminated

		Co.3 0 - 7+0.2 0 - 7+0.2 0	Housing Actuator Lens		
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

Δ



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

Pict: red			Housing 115-0,1 11.7 Housing Actuato Actuato Actuato		
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



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.



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		Contact resistance when	
Colour of lens	see order block	new max.	100 m Ω
Recommended key grid	19.05 mm	Contact resistance acc.	
, 0		to life max.	3Ω
Dimensions		Insulation resistance	10 ⁹ Ω
Length	15 mm	ESD strength	
Width	15 mm	(underneath overlay)	15 kV
Overall height	6.2 mm	Bouncing time max.	5 ms
Mechanical design		Other specifications	
Mounting	soldering into PCB	Ambient temp. operating	
Terminals	contacts tin-plated,	min.	-25 °C
	fix contact Ag plated	Ambient temp. operating	
Contact system	snap-action contact	max.	+70 °C
Contact arrangement	1 NO	Storage temperature min.	-40 °C
Contact materials	Au/Ag	Storage temperature max.	
Illumination	external 3 mm LED	(product)	+80 °C
	possible if height < 12 mm	Storage temperature max.	
	,	(in tube)	+50 °C
Mechanical characteristics		Resistance to constant	
Operating force max.	2 3 N	environment	according to
Operating travel	0.5 mm		IEC 600 68-2-3 and 2-30
Switching travel	0.5 mm	Resistance at variable	
Robustness min.	with through-plated PCB	environment	according to
	100 N		IEC 600 68-2-14 and 2-33
		Operating life min.	100000
Electrical characteristics		Soldering time max.	2.5 sec.
Rated voltage min.	Au: 0.02 V, Ag: 3 V	Soldering temperature	
Rated voltage max.	Au: 42 V, Ag: 50 V	max.	250 °C
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA	Flammability of materials	UL 94 HB
Rated current max.	Au: 100 mA, Ag: 250 mA	,	
Rated power max.			
· · · · · · · · · · · · · · · · · · ·			

Au: 2 W, Ag: 12.5 W

(ohmic load)

RF

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



Force/Travel Diagram – Keyswitch RF 15 N



Keyswitch,

spot-illuminated

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+

Keyswitch,

non illuminated



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









Hole Patterns – Front Panel RF 15 N

RF 15 N without plunger



RF 15 N with plunger ø 10 mm, illuminated



RF 15 N with plunger ø 10 mm, non-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

Δ

RF

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	T	5.46.011.028/0710	
Extension plunger for RF 15 N, Ø 15 mm, overall height 22.5 mm	T	5.46.017.028/0710	

RF 15 N short-travel keyswitch, non-illuminated



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

Dimensions Length Width Overall height

Mechanical design Mounting Terminals

Contact system Contact arrangement Contact materials Illumination LED colour LED type

RF

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics

Rated voltage min. Rated voltage max. Rated current min. Rated current max. Rated power max. (ohmic load) 15.24 mm

15 mm 15 mm 9,7/12,5 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot illumination see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA

Au: 2 W, Ag: 12.5 W

Contact resistance when new max. Contact resistance acc. to life max. Insulation resistance ESD strength	100 mΩ 3 Ω 10 ⁹ Ω
(underneath overlay) Bouncing time max.	15 kV 5 ms
Other specifications	
Ambient temp. operating min.	-25 °C
Ambient temp. operating max. Storage temperature min.	+70 °C -40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube) Resistance to constant	+50 °C
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. Soldering time max. Soldering temperature	1000000 2.5 sec.
max. Flammability of materials	250 °C UL 94 HB



Force/Travel Diagram – Keyswitch RF 15 R

Circuit Diagram – Keyswitch RF 15 R

Keyswitch,

spot-illuminated

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Keyswitch,

non-illuminated



F 1 = Max. operating force F 2 = Force at contact

F 2 is max. 55% of F 1

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



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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



Technical data see page 4 - 36

RF

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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.



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.

4



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 Recommended key grid

Dimensions

Length Width **Overall height**

Mechanical design

Mounting Terminals Contact system Contact arrangement Contact materials Illumination

LED colour LED type

Mechanical characteristics

Operating force max. **Operating travel** Switching travel Robustness min.

Electrical characteristics

Rated voltage min. Rated voltage max. Rated current min. Rated current max. see order block 20 mm

15 mm 15 mm 12.5 mm

soldering into PCB see order block snap-action contact 1 NÖ Au/Ag not illuminated / fully illuminated see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA

Rated power max.	
(ohmic load) Contact resistance when	Au: 2 W, Ag: 12.5 W
new max. Contact resistance acc.	100 mΩ
to life max.	3Ω
Insulation resistance ESD strength	10 ⁹ Ω
(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.	+80 °C
(product) Storage temperature max.	+80 °C
(in tube)	+50 °C
Resistance to constant	
environment	according to
B	IEC 600 68-2-3 and 2
Resistance at variable	
environment	according to IEC 600 68-2-14 and
Operating life min.	1000000

Operating life min. Soldering time max. Soldering temperature max. Flammability of materials and 2-30

4 and 2-33 1000000 2.5 sec.

250 °C UL 94 HB



Force/Travel Diagram – Keyswitch RF 15 H



F 1 = Max. operating force F 2 = Force at contact

F 2 is max. 55% of F 1

Dimensional Drawing



Hole Pattern



Hole Pattern – Front Panel



Circuit Diagram – Keyswitch RF 15 H

non-illuminated



fully illuminated



Accessories RF 15 H short-travel keyswitch

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

RF 15 H short-travel keyswitch, non-illuminated



Technical data see page 4 - 42



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.



RF 15 signal indicator



Technical data

General information Colour of lens Recommended key grid

Dimensions Length Width Overall height

Mechanical design Mounting Illumination LED colour LED type

Other specifications

Ambient temp. operating min. Ambient temp. operating max. see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering into PCB fully illuminated 1 LED see order block 2 mm

-25 °C

+70 °C

Storage temperature min. Storage temperature max. (product) Storage temperature max. (in tube) Resistance to constant environment

Resistance at variable environment

Soldering time max. Soldering temperature max. Flammability of materials -40 °C

+80 °C +50 °C according to IEC 600 68-2-3 and 2-30

according to IEC 600 68-2-14 and 2-33 2.5 sec.

250 °C UL 94 HB



Dimensional Drawing Signal Indicator RF 15



Hole Pattern

*Spot-illuminated RFI5, RFI5H 3.<u>21</u> Sianal ator 5.00 2.54 2 (15.24min.) 1 ٩ Diode _**₽*** Signal indicator 3.556 1.27 5.08 Non illuminated key <u>19.05</u> (15.24min.) (15.24min.) Fully illuminated key No metal webs with 15.24 mm. View on component side. All hole diameters 1,1 $^{\rm +\prime+0.1}$ mm.

Hole Pattern – Front Panel





RF 15 signal indicator, fully illuminated, 1 LED



Technical data see page 4 - 46



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 Recommended key grid

Dimensions

RF

Length Width Overall height

Mechanical design Mounting Terminals

Contact system Contact arrangement Contact materials Illumination LED colour LED type

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics

Rated voltage min. Rated voltage max. Rated current min. Rated current max. see order block 23 mm

19.05 mm 19.05 mm 9.7 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W Contact resistance when 100 m Ω new max Contact resistance acc. to life max. 3Ω Insulation resistance $10^9 \Omega$ ESD strength 15 kV (underneath overlay) Bouncing time max. 5 ms Other specifications Ambient temp. operating -25 °C min. Ambient temp. operating +70 °C max. -40 °C Storage temperature min. Storage temperature max. +80 °C (product) 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 250 °C max. Flammability of materials UL 94 HB



Force/Travel Diagram – Keyswitch RF 19



F 1 = Max. operating force

F 2 = Force at contact

F 2 is max. 55% of F 1

Dimensional Drawing



Circuit Diagram – Keyswitch RF 19

Keyswitch, non-illuminated

Keyswitch, fully illuminated

Keyswitch, spot-illuminated





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





RF 19 short-travel keyswitch, non-illuminated

		<u>co.3</u> <u>0.1.0.2</u> height	Housing Actualor		
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

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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

RF

4



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.



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



Technical data

General information Recommended key grid

Dimensions Length Width Overall height

Mechanical design Mounting Terminals

Contact system Contact arrangement Contact materials Illumination

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics

Rated voltage min. Rated voltage max. Rated current min.

Rated current max.

Rated power max. (ohmic load)

23 mm

19.05 mm 19.05 mm 9.7 mm

soldering into PCB contacts tin-plated, fix contact Ag plated bridge contact 1 NC + 1 NO Au/Ag none

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V V Au: 42 V, Ag: 50 V V Au: 0.01 mA, Ag: 0.1 mA mA Au: 100 mA, Ag: 250 mA mA

Au: 2 W, Ag: 12.5 W

Contact resistance when $100 \text{ m}\Omega$ new max Contact resistance acc. to life max. 3Ω $2 \times 10^6 \Omega$ Insulation resistance ESD strength (underneath overlay) 15 kV Bouncing time max. 5 ms Other specifications Ambient temp. operating min. -25 °C Ambient temp. operating +70 °C max. -40 °C Storage temperature min. Storage temperature max. +80 °C (product) Storage temperature max. (in tube) +50 °C Resistance to constant environment according to IEC 600 68-2-3 and 2-30 Resistance at variable according to environment IEC 600 68-2-14 and 2-33 Operating life min. 100000 Soldering time max. 5 sec. Soldering temperature max.

Flammability of materials

265 °C UL 94 HB



Circuit Diagram



Dimensional Drawing



Hole Pattern



Hole Pattern – Front Panel





RF 19 short-travel keyswitch, non-illuminated



Technical data see page 4 - 56

Δ



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

General information Colour of lens Recommended key grid

Dimensions

RF

Length Width Overall height

Mechanical design Mounting Terminals

Contact system Contact arrangement Contact materials Illumination LED colour LED type

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics Rated voltage min. Rated voltage max. Rated current min. Rated current max.

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see order block 24 mm

19.05 mm 19.05 mm 12.5 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA

Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W Contact resistance when $100 \text{ m}\Omega$ new max Contact resistance acc. 30 to life max. Insulation resistance $10^9 \Omega$ ESD strength (underneath overlav) 15 kV Bouncing time max. 5 ms Other specifications Ambient temp. operating -25 °C min. Ambient temp. operating +70 °C max. -40 °C Storage temperature min. Storage temperature max. +80 °C (product) 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 250 °C max. Flammability of materials UL 94 HB



Force/Travel Diagram – Keyswitch RF 19 H



F 1 = Max. operating force

F 2 = Force at contact

F 2 is max. 55% of F 1

Dimensional Drawing



Circuit Diagram – Keyswitch RF 19 H



Keyswitch, non illuminated

Keyswitch, fully illuminated


Hole Pattern RF 19 H



Hole Pattern – Front Panel 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

Δ



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	\bigcirc	5.30.125.003/0100	

RF 19 H keyswitch, non-illuminated

	Y		Hossing Actualor Lens 119.05-44 16mm x16mm		
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



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.



RF 19 signal indicator



Technical data

General information Colour of lens Recommended key grid

Dimensions Length Width Overall height

Mechanical design Mounting Illumination LED colour LED type see order block 23/x mm

see order block see order block 9.15 mm

soldering into PCB see order block see order block see order block

Other specifications

Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (in tube) Resistance to constant environment

Resistance at variable environment

Soldering time max. Soldering temperature max. Flammability of materials -40 °C +80 °C +50 °C according to IEC 600 68-2-3 and 2-30 according to

IEC 600 68-2-14 and 2-33 2.5 sec.

250 °C UL 94 HB

-25 °C

+70 °C



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



Technical data see page 4 - 66

RF 19 signal indicator, ¹/₂ x 2-module



Technical data see page 4 - 66

3 LEDs



RF 19 signal indicator, 1 x 1-module



Technical data see page 4 - 66



Technical data see page 4 - 66



RF special accessories



Extension plunger for RF 15 N, round head



Length of plunger = Overall height - 4.25 mm.



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

T		¢17.00 50 0 0 0 0 0 0 0 0			Distance 5.30109.xxx From overall height X 0.00(15) 0	
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.





Spacers, round, for RF 15, RF 19

		<u>∖</u> ø,			
		82.80 50 3t/200	L±0.05	RF15N H=5.75 RF15 H=9.25 S	Overlay Front panel Spacer PCB
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).



Spacers, triangular, for RF 15, RF 19

2.50 mm 2.50 mm blue 5.30.759.094/000 2.75 mm red 5.30.759.095/000 3 mm blue transparent 5.30.759.096/000 3.25 mm blue transparent 5.30.759.096/000 3.50 mm blue transparent 5.30.759.096/000 3.50 mm blue transparent 5.30.759.096/000 3.75 mm mm 5.30.759.096/000 4 mm green 5.30.759.096/000 4.50 mm green 5.30.759.106/000 4.50 mm green 5.30.759.106/000 4.50 mm green 5.30.759.106/000 5.50 mm green 5.30.759.106/000 5.50 mm green 5.30.759.106/000 5.50 mm green 5.30.759.106/000 5.50 mm green 5.30.759.106/000 6.75 mm green 5.30.759.106/000 6.75 mm green 5.30.759.106/000 6.75 mm green 5.30.759.106/000 6.75 mm green 5.30.759.111/000 7.75 mm green 5.30.759.111/000 7.75 mm green 5.30.759.111/000				Countersink	RF15N H=5.15 RF15 H=9.25	Overlay Front panel Spacer PCB
2.75 mm red 5.30.759.095/000 3 mm blue transparent 5.30.759.096/000 3.25 mm black 5.30.759.097/000 3.50 mm yellow orange 5.30.759.098/000 3.75 mm yellow orange 5.30.759.098/000 4 mm green 5.30.759.099/000 4 mm green 5.30.759.109/000 4.25 mm blue 5.30.759.109/000 4.50 mm red 5.30.759.109/000 4.75 mm blue transparent 5.30.759.109/000 5.00 mm blue transparent 5.30.759.109/000 5.75 mm blue transparent 5.30.759.109/000 5.75 mm black 5.30.759.104/000 5.75 mm green 5.30.759.105/000 5.75 mm green 5.30.759.106/000 6.75 mm green 5.30.759.108/000 6.25 mm ced 5.30.759.108/000 6.25 mm blue transparent 5.30.759.108/000 6.25 mm ced 5.30.759.108/000 6.25 mm blue transparent 5.30.759.108/000 6.50 mm black 5.30.75	Length	Width	Overall height	Diameter	Colour	Order no. complete
3 mm blue transparent 530.759.096/000 3.25 mm blue transparent 530.759.097/000 3.50 mm s30.759.097/000 pellow orange transparent 530.759.098/000 3.75 mm s30.759.098/000 pellow orange transparent 530.759.098/000 4 mm s30.759.098/000 pellow orange transparent 530.759.098/000 4 mm s30.759.098/000 pellow orange transparent 530.759.098/000 4.25 mm green 530.759.103/000 4.50 mm s30.759.104/000 pellow orange transparent 530.759.103/000 5.50 mm s30.759.104/000 pellow orange transparent s30.759.105/000 5.25 mm green s30.759.104/000 s30.759.105/000 5.75 mm green s30.759.106/000 s30.759.106/000 6.75 mm i green s30.759.108/000 6.50 mm i i jultow s30.759.108/000 6.50 mm i jultow s30.759.110/000 jultow s30.759.110/000 6.50 mm i jultow s30.759.111/000 jultow s30.759.111/000 jultow s30	2.50 mm				blue	5.30.759.094/0000
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5 mm black 5.0.759.104/000 5.25 mm black 5.00 mm 5.00 mm 5.00 mm 5.00 mm 5.75 mm green 5.00 mm 6 mm green 5.00 mm 6.25 mm image 5.00 mm 6.75 mm image 5.00 mm 6.25 mm image 5.00 mm 6.50 mm image 5.00 mm 6.75 mm image 5.00 mm 7 mm image 5.00 mm 7.25 mm image 5.00 mm 7.25 mm image 5.00 mm 7.50 mm image 5.00 mm 7.75 mm image 5.00 mm 7.75 mm image 5.00 mm	4.50 mm				red	5.30.759.102/0000
5.25 mm yellow orange transparent yellow orange transparent yellow 5.30.759.105/0000 5.50 mm yellow 5.30.759.106/0000 5.75 mm green 5.30.759.106/0000 6 mm blue 5.30.759.107/0000 6 mm blue 5.30.759.108/0000 6.25 mm red 5.30.759.108/0000 6.50 mm red 5.30.759.109/0000 6.75 mm blue transparent 5.30.759.110/0000 6.75 mm jellow orange transparent jellow orange transparent 7.75 mm jellow orange transparent jellow orange transparent 7.25 mm jellow orange transparent jellow orange transparent 7.50 mm jellow orange transparent jellow orange transparent 7.75 mm jellow orange transparent jellow orange transparent 9.000000000000000000000000000000000000	4.75 mm				blue transparent	5.30.759.103/0000
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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 5.30.759.108/0000 6.25 mm red 5.30.759.109/0000 6.50 mm blue transparent 5.30.759.110/0000 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 green 5.30.759.113/0000 7.50 mm green 5.30.759.114/0000 7.75 mm blue s.30.759.114/0000	5.25 mm					5.30.759.105/0000
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6.50 mm blue transparent 5.30.759.110/000 6.75 mm black 5.30.759.111/000 7 mm yellow orange transparent 5.30.759.112/000 7.25 mm yellow 5.30.759.113/000 7.50 mm green 5.30.759.114/000 7.75 mm blue 5.30.759.115/000	6 mm				blue	5.30.759.108/0000
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7.75 mm blue 5.30.759.115/000	7.25 mm					5.30.759.113/0000
	7.50 mm				green	5.30.759.114/0000
8 mm red 5.30.759.116/000	7.75 mm				blue	5.30.759.115/0000
	8 mm				red	5.30.759.116/0000

RF

PCB Keyswitches

RF short-travel keyswitches

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	8				
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

Mouser Electronics

Authorized Distributor

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

C&K Switches:

 3.14001.0010000
 3.14001.0330000
 3.14002.0110000
 3.14002.0120000
 3.14002.0630000
 3.14002.6880000

 3.14100.0060000
 3.14100.0300000
 3.14100.5330000
 3.14100.6010000
 3.14200.023
 3.14002.0130000

 3.14200.0220000
 3.14100.5320000
 3.14100.5010000
 3.14200.023
 3.14002.0130000