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# 1KS/1KBS/ 1KCS+2K

Square caps • different top surfaces • insertable legend option



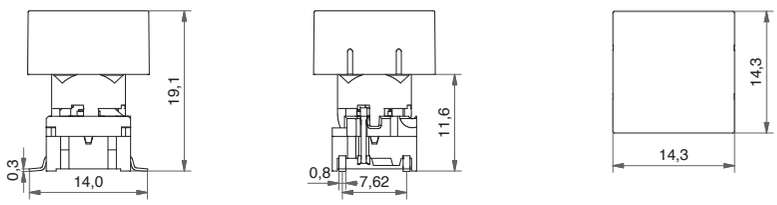
## DISTINCTIVE FEATURES

Square caps 14.3 x 14.3 mm
h=19.1-20.2 mm
Flat, convex or concave top surface
A layer with legend can be inserted between cap and diffusor
Bezel option

SWITCH SPECIFICATIONS : see Multimec™ 5 series.

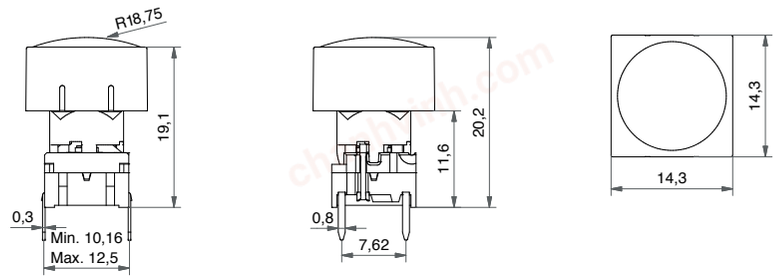
### 5G+1KS - SMD - W/LED





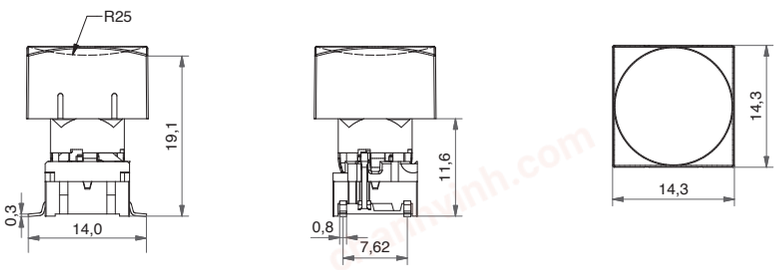

### 5G+1KBS - TH - W/LED






### 5G+1KCS - SMD - W/LED






### 2K






The company reserves the right to change specifications without notice. All tolerance if not otherwise specified ±0.2mm.

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# 1KS/1KBS/1KCS + 2K

Square caps • different top surfaces • insertable legend option

## BUILD YOUR PART NUMBER

### ILLUMINATED

5G _ _ _ _ _ _ _

**SERIES**: 5G

**MOUNTING**

| | |
|---|---|
| TH9 | through-hole |
| SH9 | surface mount |

**ACTUATION FORCE**

| | |
|---|---|
| 20 | 2.0N |
| 35 | 3.5N |
| 65 | 6.5N |

**LED**

| | |
|---|---|
| 02 | blue |
| 22 | green |
| 29 | high intensity green |
| 42 | yellow |
| 61 | white |
| 82 | red |
| 2242 | green/yellow |
| 8222 | red/green |
| 8242 | red/yellow |

**CAP**

| | |
|---|---|
| 1KS | |
| 1KBS | |
| 1KCS | |

**COLOR**

| | |
|---|---|
| 1116 | frosted white lens with transparent lid |

**BEZEL***

| | |
|---|---|
| 2K | |

**COLOR***

| | |
|---|---|
| 03 | grey |
| 06 | white |
| 08 | red |
| 09 | black |

### NON-ILLUMINATED

5G _ _ 1KS _ _ _

**SERIES**: 5G

**MOUNTING**

| | |
|---|---|
| TH9 | through-hole |
| SH9 | surface mount |

**ACTUATION FORCE**

| | |
|---|---|
| 20 | 2.0N |
| 35 | 3.5N |
| 65 | 6.5N |

**CAP**: 1KS

**COLOR**

incl. frosted white lens

| | |
|---|---|
| 0016 | blue |
| 0216 | green |
| 0316 | grey |
| 0416 | yellow |
| 0616 | white |
| 0816 | red |
| 0916 | black |

**BEZEL***

| | |
|---|---|
| 2K | |

**COLOR***

| | |
|---|---|
| 03 | grey |
| 06 | white |
| 08 | red |
| 09 | black |

*optional

**NOTICE :** Other versions : Please refer to www.apem.com for information on the 3F & 4F series versions - 1K/1KB/1KC

## MOUNTING

- Panel cut-out :
  - cap only : min. 14.7 x 14.7 mm
  - cap + 2K : 16.5 x 16.5 mm
- Switch spacing AxB :
  - cap only : min. 14.6 x 14.6 mm
  - cap + 2K : min. 18.05 x 18.05 mm

## MATERIALS

- Cap :
  - solid color : ABS UL94HB
  - illuminated : polycarbonate UL94HB
- Lens : polycarbonate UL94HB
- Bezel : ABS UL94HB

# Legends

Available for Multimec caps

## STANDARD LEGENDS

| STANDARD LEGENDS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LEGEND | 1DS09_ | 1FS096R_ | 1ZB09D_<br>1ZB16DLMH_ | 1ZCS_ | 1Z_<br>1ZW_ | 10A_ | 10C_ | 10D_ | 10Q_<br>10QM16_ | 10R_ & 10RF_<br>10RM16_ |
| 0 | 000 | 000 | | | | | | | | |
| 1 | 001 | 001 | | | | | | | | |
| 2 | 002 | 002 | | | | | | | | |
| 3 | 003 | 003 | | | | | | | | |
| 4 | 004 | 004 | | | | | | | | |
| 5 | 005 | 005 | | | | | | | | |
| 6 | 006 | 006 | | | | | | | | |
| 7 | 007 | 007 | | | | | | | | |
| 8 | 008 | 008 | | | | | | | | |
| 9 | 009 | 009 | | | | | | | | |
| # | 107 | 107 | | | | | | | | |
| * | 019 | 019 | | | | | | | | |
| ← | 033 | | | | | | | | | |
| → | 133 | | | | | | | | | |
| ↑ | 034 | | | | | | | | | |
| ↓ | 134 | | | | | | | | | |
| ↵ | 135 | 135 | | | | | | | | |
| + | | | | | | 054 | | | 054 | 054 |
| - | | | | | | 059 | | | 059 | 059 |
| ▲ | | | 136 | | 136 | 136 | | | | |
| ⏻ | 123 | 123 | | 123* | 123 | | 123 | 123 | 123 | 123 |
| ON/OFF | | | | | | | | | 017 | 017 |
| STOP | | | | | | | | | 018 | 018 |
| START | | | | | | | | | 031 | 031 |
| RESET | | | | 038 | | | | | 038 | 038 |
| CANCEL | | | | | | | | | 048 | 048 |
| ENTER | | | | | | | | | 105 | 105 |
| ESC | | | | 051 | | | | | | |
| ON | | | | | | 116 | | | | |
| OFF | | | | | | 117 | | | | |
| OK | | | | 118* | 118 | | 118 | 118 | 118 | 118 |
| SET | | | | 119 | | | | | | |
| MENU | | | | 120 | | | | | | |
| FUNC | | | | 121 | | | | | | |
| HOME | | | | 122 | | | | | | |

STANDARD OPTIONS

- 1DS: pad printed
- 1FS: reverse printed
- 1ZB: pad printed / laser marked
- 1ZCS: pad printed / *reverse printed / *laser marked
- 1Z & 1ZW: pad printed / laser marked
- 10A: pad printed / laser marked
- 10C: pad printed / laser marked
- 10D: UV printed / laser marked
- 10R(F) & 10Q: pad printed / reverse printed
- 10RM & 10QM: metal symbol

# Legends

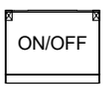
Available for Multimec caps

## HOW TO ORDER

### POSITIONING OF LEGENDS ON ROCKER-ACTION CAPS

When ordering legends for caps with hinge-type cap retention system, it is important to note the position of the cap. An extra letter (U, D, R or L) needs to be added to the part number to refer to the position of the hinges in relation to the legend. See samples:

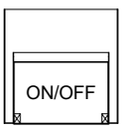
Rocker-action caps without a lens: 1A, 1B, 1M, 1ZA and 1ZB



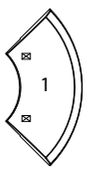

UP
**1A09U01706**




RIGHT
**1ZB16RLMH11809**




DOWN
**1B09D01706**

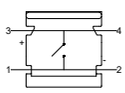



LEFT
**1ZB09L00106**

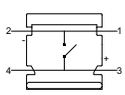
### LEGEND ILLUMINATION

- **Option 1 - laser marked**: In case of laser marked legends an “LM” is added after the cap colour, before the legend code. We recommend using hard paint (additional “H” ) for increased lifetime of the paint. E.g. 1ZB16DLMH13609
- **Option 2 - reverse printed**: In case of reverse printed caps an “R” is added after the cap colour, before the legend code. Especially relevant when standard legends have both negative and positive print options. E.g. 1FS096R00009
- **Option 3 - metal symbol:** Only available for 10RM and 10QM (therefore the “M”). E.g. 10RM16059

### ORIENTATION OF THE SWITCH




UP




DOWN

### STANDARD AND CUSTOM LEGENDS

- Standard are only certain legends on certain caps. See the table on the previous page.
- All standard pad-printed legends are white on black caps.
- All standard reverse-printed and laser marked legends are black on frosted white cap.

**STANDARD LEGENDS**

| CAP | CAP COLOR | DIRECTION* | TYPE* | LEGEND | LEGEND COLOR* |
|---|---|---|---|---|---|
| 1DS | 00 Blue | D Down | UV UV printed | 001 1 | 00 Blue |
| 1FS | 02 Green | U Up | LM Laser marked on soft paint | 002 2 | 02 Green |
| ... | 03 Grey | R Right | LMH Laser marked on hard paint | 003 3 | 03 Grey |
| | 04 Yellow | L Left | R Reverse printed | ... etc | 04 Yellow |
| | 06 White | *Only for hinge-type caps | *In case of illumination | | 06 White |
| | 08 Red | | | | 08 Red |
| | 09 Black | | | | 09 Black |
| | 16 Frosted white | | | | ... Etc |
| | ... Etc | | | | *In case of reverse printed and laser marked legends the colour of the paint |

**Notice**: The size of the legends listed may not correspond to the actual size.

If you decide to use one of the standard legends without any adjustments (without a new cliché or programming) on another cap than designated in the table, then there is no cliché or programming cost, for this to apply the cap has to be black and the print white.

For further information on legends please contact your local distributor or MEC.

# Solid colors

## Available for Multimec™ caps

| | Colour / RAL Code | Blue / 5012 | green / 6018 | Grey / 7004 | Yellow / 1023 | White / 9010 | Red / 3000 | Black / 9004 | Ultra blue / 5002 | Mint green / 6029 | Tele grey / 7046 | Melon / 1028 | Signal white / 9003 | Noble red / 3002 | Dusty blue / 5014 | Aqua blue / 5021 | Metal dark blue / No ral code | Metal light grey / No ral code | Metal dark grey / No ral code | Metal bordeaux / No ral code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAP | CODE | 00 | 02 | 03 | 04 | 06 | 08 | 09 | 30 | 32 | 33 | 34 | 36 | 38 | 40 | 42 | 50 | 53 | 57 | 58 |
| 1A |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1B |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1DS |  | • | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | • |
| 1ES/1FS |  | | | • | | | • | • | | | | | | | | | | | | |
| 1GAS/1GCS |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1H |  | | | • | | | | • | | | | | | | | | | | | |
| 1JS |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1KS |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1LS |  | | | | | | | • | | | | | | | | | | | | |
| 1M |  | | • | • | | | • | • | | | | | | | | | | | | |
| 1NS |  | | | • | | | | • | | | | | | | | | | | | |
| 1PS |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1QS |  | • | | • | | | | • | | | | | | | | | | | | |
| 1RS |  | | | • | | | | | | | | | | | | | | | | |
| 1SS |  | • | • | • | • | • | • | • | | | | | | | | | | | | |
| 1TS/1US/1VS |  | • | | • | | | • | • | | | | | | | | | | | | |
| 1WAS/ 1WDS/1WPS |  | | | • | | | | • | | | | | | | | | | | | |
| 1XS |  | | | • | | • | | • | | | | | | | | | | | | |
| 1ZA |  | | | • | | • | | • | • | | | | | | • | • | • | • | • | • |
| 1ZB |  | | | • | | • | | • | • | | | | | | • | • | • | • | • | • |
| 1ZCS |  | | | • | | • | • | • | • | | | | | | • | • | • | • | • | • |
| 1Z/1ZW |  | | | • | | • | | • | | | | | | | | | | | | |
| 10A |  | | | • | | | • | • | | | | | | | | | | | | |
| 10C |  | • | | • | | | • | • | | | | | • | | | | | | | |
| 10D |  | | | • | | • | | • | | | | | | | | | | | | |
| 10R/10RF + 10Q |  | • | • | • | • | • | • | • | | | | | | | | | | | | |

The RAL Codes mentioned are the codes nearest to the solid colors in the multimec™ range.

# Cap & Bezel Specifications

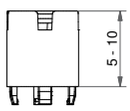
## Multimec™ caps

| ACCERSSORY SPECIFICATIONS | | | |
|---|---|---|---|
| MATERIAL | PARTS | TEMP. LIMIT | UL RATING |
| ABS | Solid color 1A, 1B, 1DS, 1ES, 1FS, 1H, 1JS, 1KS, 1LS, 1M, 1NS, 1PS, 1QS, 1RS, 1TS, 1US, 1VS, 1WAS, 1WDS, 1WPS, 1XS, 1Z, 1ZA, 1ZB, 1ZCS, 1ZW, 10A, 10C, 10Q, 10R, 10RF and AQCS Bezels 2C, 2D and 2K, reflectors for 1KBS, 1KCS, 1YS and 1YAS | Max 65 °C Max 149 °F | UL94HB |
| Polycarbonate | All lenses and transparent colour caps, lids for 1KBS & 1KCS | Max 85 °C Max 185 °F | UL94HB |
| Polyamide | 1GAS, 1GCS, 1SS and 2SS | Max 160 °C Max 320 °F | UL94V2 |
| Legends adhesion | DS/EN ISO 2409 Class 1 & ASTM D3359 Class 4B | | |

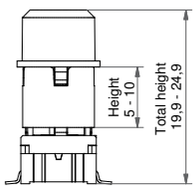
## EXTENDERS



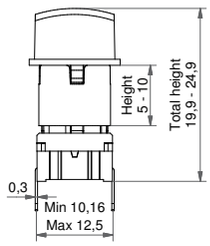
5 mm, 6 mm,
7 mm , 8 mm,
9 mm, 10 mm




2SS

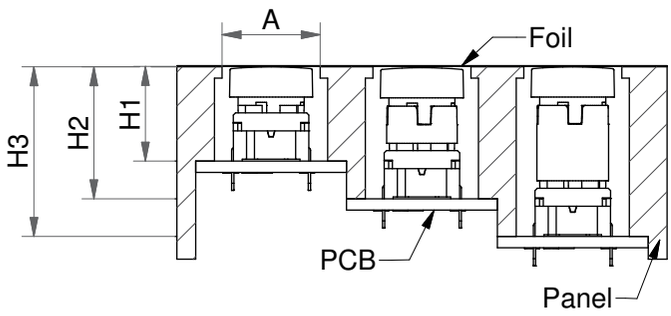



SMD + 2SS+1DS




TH+2SS+1TS

HOW TO USE 1GAS/1GCS + 2SS UNDER FOIL




- A=We recommend space for travel of the foil and leave the area free from adhesive.
- H=We recommend you to calculate this dimension from the top of the PCB to the inner top of the panel.

2SS CAN BE USED WITH ALL 5G-TYPE SNAP-ON CAPS

All 2SS extenders are stackable giving the possibility to match most overall heights.

| CAP SERIES | ORIGINAL HEIGHT (H1) | HEIGHT WITH A SINGLE EXTENDER (H2;H3) |
|---|---|---|
| 1DS/1ES/1FS | 14.9 | 19.9-24.9 |
| 1GAS/1GCS | 12.5 | 17.5-22.5 |
| 1KS/1KBS/1KCS | 19.1 ; 20.2 ; 20.1 | 24.1; 25.2; 25.1-29.1; 30.2; 30.1 |
| 1NS | 14.9 | 19.9-24.9 |
| 1TS/1US/1VS | 14.9 | 19.9-24.9 |
| 1WAS/1WDS/1WPS | 15.7 | 20.7-25.7 |
| 1XS | 18.5 | 23.5-28.5 |
| 1ZCS | 11.7 | 16.7-21.7 |
| 10C | 13.7 | 18.7-23.7 |
| 10D | 12.0 | 17.0-22.0 |

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# Cap & Bezel Specifications

## Multimec™ caps

### HOW TO ORDER

EXTENDERS

| SWITCH | MOUNTING | ACTUATION FORCE | LED (OPTIONAL) | | CAP | EXTENDER 2SS HEIGHT |
|---|---|---|---|---|---|---|
| 5G | TH9 Through-hole | 20 | 02 | blue | See the table on the previous page | 05 |
| | SH9 Surface mount | 35 | 22 | green | | 06 |
| | | 65 | 42 | yellow | | 07 |
| | | | 61 | white | | 08 |
| | | | 82 | red | | 09 |
| | | | 2242 | green/yellow | | 10 |
| | | | 8222 | red/green | | |
| | | | 8242 | red/yellow | | |

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MEC-MULTIMEC5G-2108

# Multimec™ 5G

High performance tactile switches • MIL-PRF-28855H • excellent illumination



## DISTINCTIVE FEATURES

Large range of accessories
Momentary switches with NO or NC/NO function
Sealed to IP67
Single or bi-color illumination option
Illumination with integrated chip-LEDs



## ENVIRONMENTAL SPECIFICATIONS

- Sealing : IP67 according to IEC 60529
- Working and storage temperature :
  - non-illuminated: -40 °C/+160 °C (-40 °F to +320 °F)
  - illuminated: -30 °C/+85 °C (-22 °F to +185 °F)
- Soldering :
  - through-hole : IEC 60068-2-20 8
  - surface mount : JEDEC J-STD-020E

## ELECTRICAL SPECIFICATIONS

- Recommended load :
  - Gold contacts : 0.5µ-50 mA 24 VDC
  - Silver contacts : 0.5-50 mA 24 VDC
- Contact resistance : <30 mΩ - typically 10 mΩ
- Insulation resistance : >10 MΩ
- Contact bounce : <2 mS - typically 0.5 mS

## MECHANICAL SPECIFICATIONS

- Standard actuation force :
  - momentary NO : 2.0 N, 3.5 N, 6.5 N
  - quiet version : 2.0 N
  - NC/NO function : 3.5 N
- Max. actuation force :
  - momentary : 115 N for 60 sec (according to MIL-PRF-22885H)
  - NC/NO : 100 N for 10 sec
- Travel : 1 mm
- Lifetime :
  - NO : >10,000,000 cycles
  - NC/NO : >1,000,000 cycles

The company reserves the right to change specifications without notice.

## MATERIALS

- Housing : PPS UL94V0
- Actuator : PPS UL94V0
- Sealing : Silicone rubber
- Contacts spring : Stainless steel
  Silver : +3 µAg
  Gold : +1 µAu
- Fixed contacts :
  Silver : SnCu + 2 µNI + 3 µAg
  Gold : SnCu + 2 µNI + 1 µAu
- Terminals : SnCu + 2 µNI + 3 µSn100

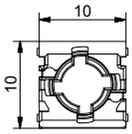
All tolerance if not otherwise specified ±0.2 mm.

# Multimec™ 5G

High performance tactile switches •
MIL-PRF-28855H • excellent illumination

## 5G NON-ILLUMINATED

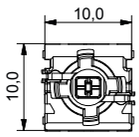





- SMD, TH or right angle TH
- NO or NC/NO

## 5G ILLUMINATED

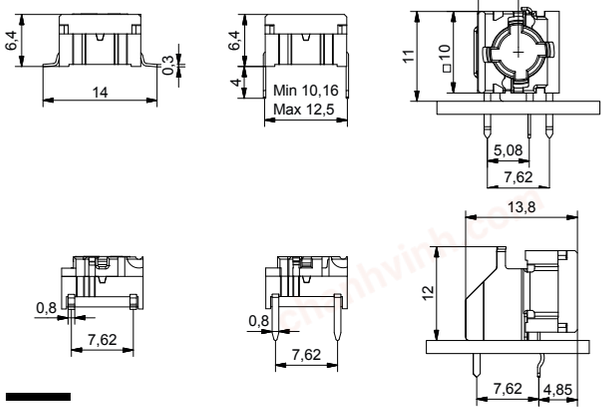




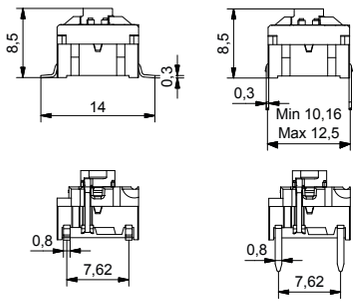

- SMD or TH
- NO
- single or bi-color LEDs

All tolerances unless otherwise noted : ±0.2 mm

SMD TH RAS

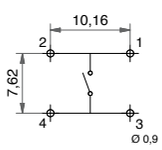


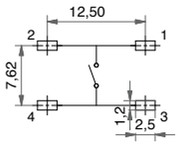

SMD TH



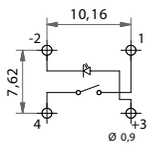

## PCB LAYOUT & CIRCUIT DIAGRAM

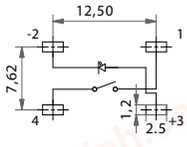
Non-illuminated



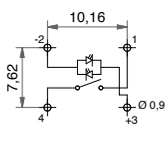



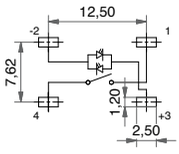

Single LED



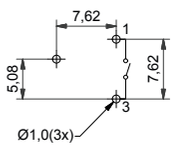




Bicolor - 2 LEDs



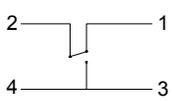




RAS




NC/NO function

*not for sale in Japan



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# Multimec™ 5G

High performance tactile switches • MIL-PRF-28855H • excellent illumination

## BUILD YOUR PART NUMBER

### ILLUMINATED

| 5G | ___ | ___ | ___ | ___ |
|---|---|---|---|---|
| SERIES | MOUNTING | ACTUATION FORCE | LED | OPTIONAL |

**MOUNTING**

| | |
|---|---|
| TH9 | Through-hole |
| SH9 | Surface mount |

**ACTUATION FORCE**

| | |
|---|---|
| 20 | 2.0 N |
| 35 | 3.5 N |
| 65 | 6.5 N |

**LED**

| | |
|---|---|
| 02 | Blue |
| 22 | Green |
| 29 | High intensity Green |
| 42 | Yellow |
| 61 | White |
| 82 | Red |
| 2242 | Green/yellow |
| 8222 | Red/green |
| 8242 | Red/yellow |

**OPTIONAL**

| | |
|---|---|
| Q | Quiet contact (with 2.0 N only) |
| R | Tape & reel (with SMD only) |
| G | Gold contacts |

### NON-ILLUMINATED

| 5G | ___ | ___ | ___ |
|---|---|---|---|
| SERIES | MOUNTING | ACTUATION FORCE | OPTIONAL |

**MOUNTING**

| | |
|---|---|
| TH9 | Through-hole |
| SH9 | Surface mount |

**ACTUATION FORCE**

| | |
|---|---|
| 20 | 2.0 N |
| 35 | 3.5 N |
| 65 | 6.5 N |

**OPTIONAL**

| | |
|---|---|
| Q | Quiet contact (with 2.0 N only) |
| RAS | Right angle (with TH only) |
| NCNO | Normally closed/ normally open function (with 3.5 N only) |
| R | Tape & reel (with SMD only) |
| G | Gold contacts |

## ABOUT THIS SERIES

**Laser marking on the switch for identification :** WWYS, WW=week, Y=year, S=suffix for the type of switch, e.g. P=2.0 N and silver contacts, S=3.5 N and silver contacts, E6.5 N and silver contacts

**Caps and accessories :** for the full range of accessories for Multimec™ 5G please see the website.

# Multimec™ 5G

High performance tactile switches •
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## TAPE & REEL

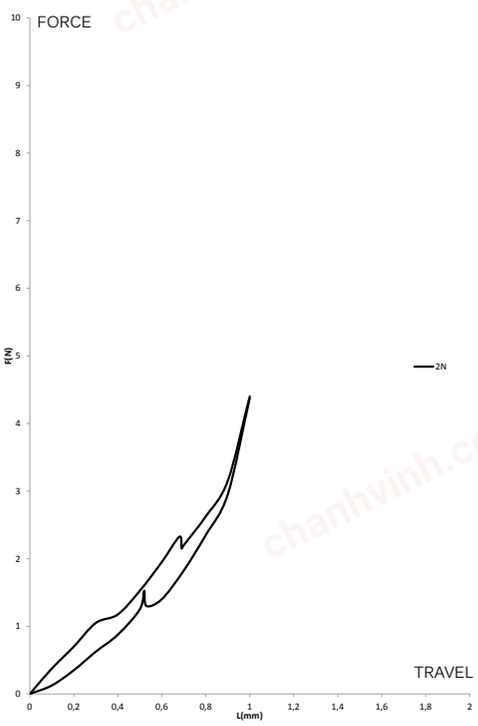
Tape and reel is available for the parts listed and has the following specifications

- Reel diameter: Ø330 mm
- Tape width: 24 mm
- Pitch: see list
- Tape and reel material: antistatic or better
- Quantity per reel: see list

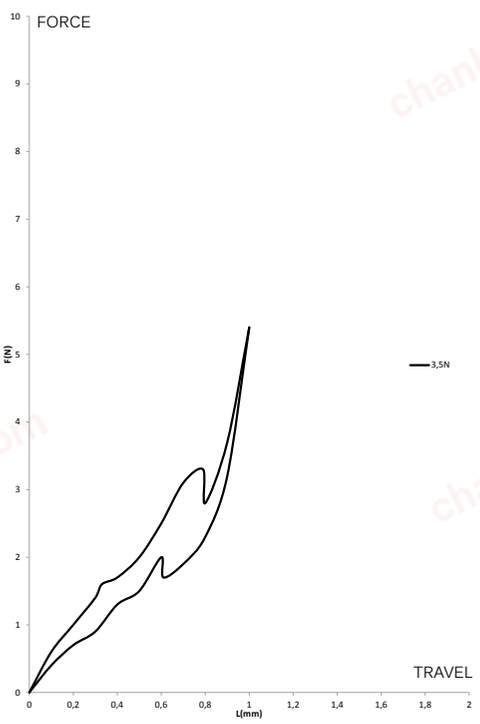
| PART NO. | ORDERING CODE | PITCH | QUANTITY PER REEL |
|---|---|---|---|
| 5GSH9XX | 5GSH9XXR | 16 | 500 |
| 5GSH9XX1SSXX-08.0 | 5GSH9XXR1SSXX-08.0 | 20 | 250 |
| 5GSH9XX1SSXX-09.5 | 5GSH9XXR1SSXX-09.5 | 20 | 250 |
| 5GSH9XX1SSXX-10.4 | 5GSH9XXR1SSXX-10.4 | 20 | 250 |
| 5GSH9XX1SSXX-11.0 | 5GSH9XXR1SSXX-11.0 | 20 | 250 |
| 5GSH9XX1SSXX-12.0 | 5GSH9XXR1SSXX-12.0 | 20 | 250 |
| 5GSH9XX02 | 5GSH9XX02R | 20 | 250 |
| 5GSH9XX22 | 5GSH9XX22R | 20 | 250 |
| 5GSH9XX29 | 5GSH9XX29R | 20 | 250 |
| 5GSH9XX42 | 5GSH9XX42R | 20 | 250 |
| 5GSH9XX61 | 5GSH9XX61R | 20 | 250 |
| 5GSH9XX82 | 5GSH9XX82R | 20 | 250 |
| 5GSH9XX2242 | 5GSH9XX2242R | 20 | 250 |
| 5GSH9XX8222 | 5GSH9XX8222R | 20 | 250 |
| 5GSH9XX8242 | 5GSH9XX8242R | 20 | 250 |

## OPERATING FORCE

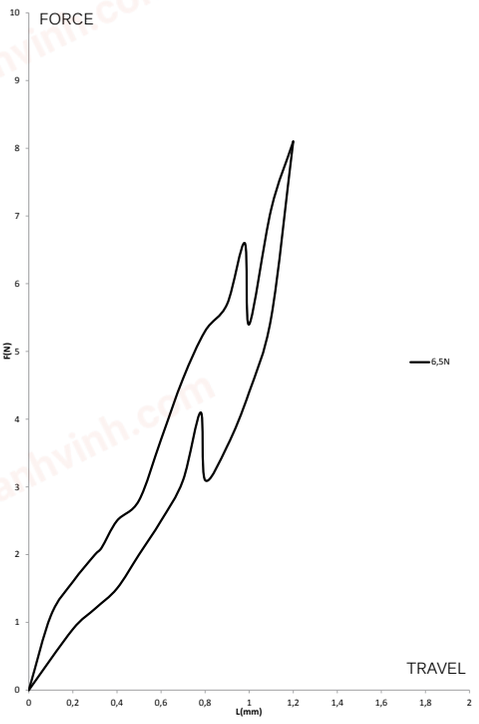
2.0 N




3.5 N




6.5 N



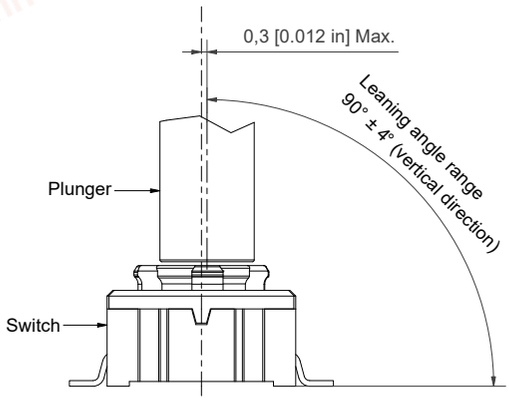
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# Multimec™ 5G

High performance tactile switches •
MIL-PRF-28855H • excellent illumination

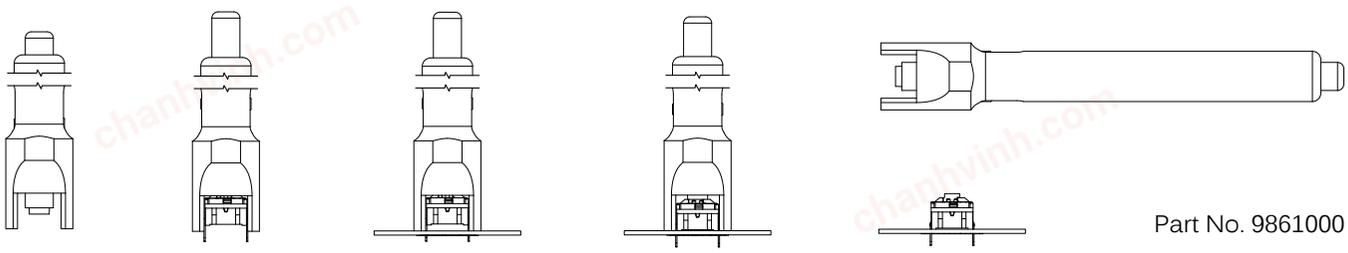
## RECOMMENDED OPERATING CONDITIONS




For the optimal performance of the switch use the recommended operating conditions.

## MOUNTING

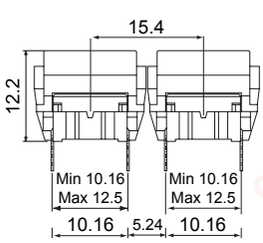
MOUNTING TOOLS FOR MULTIMEC™ THROUGH-HOLE SWITCHES



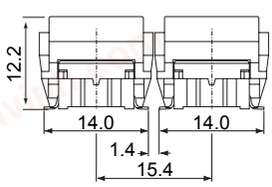
1 2 3 4 5

Part No. 9861000

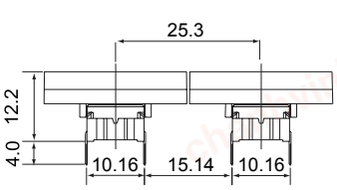
MULTIMEC™ SPACING EXAMPLES



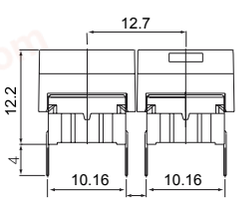

5GT+1B+2C/D



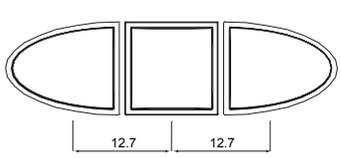

5GS+1B+2C/D




5GT+1M




5GT+1A/H



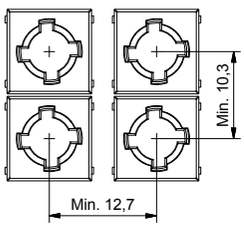

1VS+1TS+1VS

# Multimec™ 5G

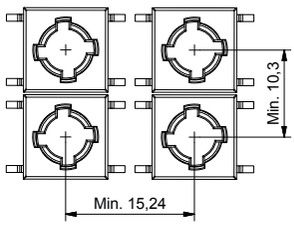
High performance tactile switches •
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## MOUNTING (CONTINUED)

SPACE REQUIREMENT - MATRIX MOUNTING

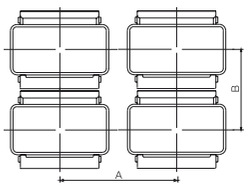



Through-hole (TH)

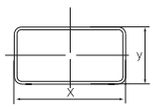



Surface mount (SMD)

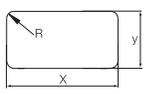
SPACE REQUIREMENT - SWITCH/CAP




Switch spacing




Cap dimensions




Panel cut-out

| CAP SERIES | RECOMMENDED MIN.SWITCH SPACING AxB | NOMINAL CAP DIMENSION WxH | RECOMMENDED MIN. PANEL CUT-CUT |
|---|---|---|---|
| 1A/1H | 12.7x10.3 | 12.6x10.1 | 13.0x10.5 |
| 1B+2C/2D | 15.4x15.4 | 15.1x15.1 | 15.5x15.5 |
| 1DS/1ES/1FS | 12.7x11.3 | Ø9.6 | Ø10.0 |
| 1GAS | 12.7x11.3 | Ø11.0 | Ø11.4 |
| 1GCS | 15.3x15.3 | Ø15.0 | Ø15.4 |
| 1JS | 12.7x10.3 | Ø10.0 | Ø10.4 |
| 1KS/1KBS/1KCS | 14.6x14.6 | 14.3x14.3 | 14.7x14.7 |
| 1M | 25.3x10.3 | 25x10 | 25.7x10.5 |
| 1NS | 13.6x11.3 | Ø9.8/ □4.9 | Ø10.2/□5.1 |
| 1PS/ 1QS/1RS | 12.8x10.3 | 6.5x12.5 | 7x13, R max. 1.0 |
| 1SS/1IS/1LS | 12.7x10.3 | Ø6.5 | Ø7.0 |
| 1TS | 12.7x12.3 | 10.6x10.6 | 11.0x11.0 |
| 1US | 12.7x12.3 | Ø10.6 | Ø11.0 |
| 1VS | 15.95x12.1 | 10.6x13.25 | 11.0x13.65 |
| 1WAS/1WPS | 14.2x10.3 | 12.5x6.5 | 12.9x6.9 |
| 1WDS | 16.9X10.3 | 15.2x8.0 | 15.6x8.4 |
| 1XS | 12.7x10.3 | 9.4x7.4 | 9.8x7.9 |
| 1ZA | 19.0X10.3 | 18.7x10.1 | 19.4x10.5 |
| 1ZB | 24.34x12.1 | R1=7.4; R2=17.5 90° | R1=7.1; R2=17.5-17.75 90° |
| 1ZCS | 14.6x14.6 | Ø14.3 | Ø14.7 |
| 1Z/1ZW | 35.5x35.5; 41.6x41.6 | Ø29.5 | Ø30.3 |
| 10C | 22.3x22.3 | Ø19.2 | Ø19.8 |
| 10D (+10DWY) | 19x19 (27x27) | Ø16 | Ø16.4 |
| 10R/10RF/10RM | 37.3X37.3 | Ø30.0 | Ø30.6 |
| 10Q/10QM | 29.3X29.3 | 22x22 | 22.5x22.5 |

# Multimec™ 5G

High performance tactile switches •
MIL-PRF-28855H • excellent illumination

## LED COMPONENT SPECIFICATIONS

| LED COMPONENT SPECIFICATIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Color | | Blue | Green | Yellow | White | Red | High Intensity Green |
| Color Codes | | 02 | 22 | 42 | 61 | 82 | 29 |
| ABSOLUTE MAXIMUM RATINGS (Ta= 25°C) | | | | | | | |
| Power | mW | 75 | 75 | 60 | 46.5 | 65 | 102.5 |
| Current forward | mA | 20 | 30 | 25 | 15 | 25 | 25 |
| Forward peak current | mA | 100 | 80 | 60 | 100 | 100 | 150 |
| Voltage reverse | V | 5 | 5 | 5 | 5 | 12 | 5 |
| Operating temperature | °C | -40/+85 | -55/+85 | -40/+85 | -40/+85 | -30/+85 | -40/+85 |
| Storage temperature | °C | -40/+90 | -55/+85 | -40/+90 | -40/+85 | -40/+85 | -40/+85 |
| Soldering temperature | °C | 245 for max 10 sec | | | | | |
| ELECTRICAL-OPTICAL CHARACTERISTICS (Ta=25 °C) | | | | | | | |
| Voltage forward | Typ. V | 2.7 | 2 | 1.75** | 2.85 | 2 | 3.3 |
| | Max. V | 3.7 | 2.4 | 2.35 | 3.1 | 2.5 | 4.1 |
| Current reverse (VR=5V) | Max. µA | 50 | 100 | 10 | 10 | 100 | 50 |
| Wave length | nm | 468 | 571 | 591 | NA | 633 | 525 |
| Spread | △nm | 25 | NA | 15 | NA | 16 | 30 |
| Spread angle | degree | 120 | 130 | 120 | 150 | 160 | 60 |
| Luminous Intensity | Min. mcd | 45 | 18 | 28.5 | 56 | 28 | 500 |
| | Typ. mcd | 112* | 35 | 72* | max 450* | max 180* | 1000 |
| Optical intensity | Lm/w | NA | NA | NA | 36 | 7 | NA |

*/F=20 mA, **Pulse width 1ms Duty cycle 1:5, ***/F=50 mA, ****Luminous Flux mlm

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# Multimec™ 5G

High performance tactile switches • MIL-PRF-28855H • excellent illumination

## USAGE GUIDELINES

### HOW TO GET THE BEST RESULTS WITH MEC SWITCHES ?

These guidelines are offered to users of MEC Switches as an aid to ensure successful and reliable switch operation. Please see the technical specifications for details on operating and storage temperatures and soldering guidelines to make sure you select the best switch for your application. When reflow soldering is taking place, MEC strongly recommend that the temperature profile is analyzed and compared with the temperature rating of the switch. It is also important to monitor the accumulated heat buildup from both the pre-heat zones and the solder zone.

Most standard accessories for multimec™ 5 series switches are made from ABS plastic with a maximum operating temperature of 65 °C. It is strongly recommended that accessories are mounted after soldering of the switch. If this is not possible care must be taken not to overheat the accessories during the soldering process. The 1SS and 1GAS/1GCS caps are, however, made of high temperature materials and will meet the same temperature specifications as the switches. For accessories made from other plastic materials please see multimec™ 5 series cap & bezel technical specifications.

LEDs have their own temperature specifications. When fitted in a switch the LED will determine the max. operating temperature, i.e. 5GTH93522 has an upper temperature limit of 85 °C!

### MOUNTING AND DISMOUNTING

If switches are to be mounted in rows it is essential that the recommendations regarding spacing are followed. PC board thickness should be 1.4 ±0.2 mm and terminal hole diameter should be 0.9 mm.

All multimec™ 5 series caps and bezels are easily snapped onto the switch modules and can be changed at a later time.

A mounting tool is available for through hole multimec™ 5 series switches.

### SOLDERING AND CLEANING MULTIMEC™ SERIES

Multimec™ 5 series switches are fully sealed to IP67 specifications to minimize solder flux and aqueous based cleaning solutions from entering the switch and contaminating the contacts. The switches can be placed on the PC board with other components and reflow soldered. Multimec™ 5 series offers a high level of sealing, however, with aqueous solvent solutions care must be taken to avoid the worst case situation with water jets, complete immersion into a liquid with a temperature below the board or surface tension reducing additives.

Recommended cleaning methods are demineralized water. Any surface tension reducing agents, such as soap, must not be used as they risk causing a potential leakage of the switch.

### SOLDERING - THROUGH HOLE VERSIONS

**Hand soldering:** max. 350 °C for max. 3 sec

**Wave soldering:** heat built up in the switch during pre-heating and soldering must not exceed the maximum operating temperature of the switch. Peak temperature must not exceed 260 °C, and soldering time is max 10 sec. (IEC 60068-2-20 8)

### SOLDERING - SURFACE MOUNT VERSIONS

For all methods - infrared, convection and vapor phase. The upper limit 240 °C/40 sec must be observed. The soldering temperature profile must have moderate temperature gradients. (JEDEC J-STD-020E)

### ROHS COMPLIANCE

As of 1 July 2006 MEC has completed the conversion to RoHS compliance. For more info please see our homepage www.apem.com

### TEMPERATURE LIMITS:

| | |
|---|---|
| Switch | 160 °C |
| LEDs | 85/90 °C |
| Accessories | 65/85/160 °C |

### PACKAGING

Multimec™ 5 series switches are packed in rigid tubes of 50 pieces each.
A box contains 1.000 pcs.

The surface mount versions of multimec™ 5 series switches with a height up to 12.5 mm can also be delivered on tape/reel.
Each reel contains 250/500 pcs.

Right angle switches are packed into trays.
Each tray contains 100 pcs.