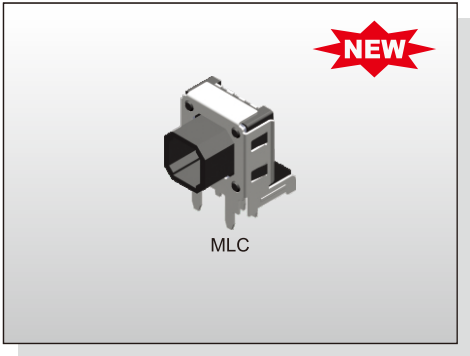


ILLUMINATED SWITCH  
**MLC SERIES**

*Tact Switch*  
*Illuminated*



MLC

**FEATURES**

- ※Horizontal operation
- ※Various LED colors
- ※Long operation life

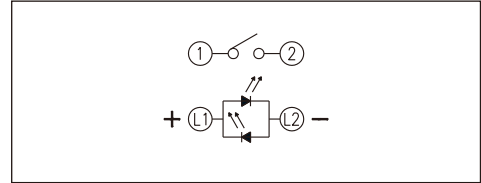
**APPLICATION**

- ※Automotive
- ※Server
- ※Laptop, IPC

**SPECIFICATION**

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	220±50gf
Travel	0.25mm
Operating Life	100, 000 cycles
Operating Temp.	-25°C ~ +70°C
Storage Temp.	-30°C ~ +80°C

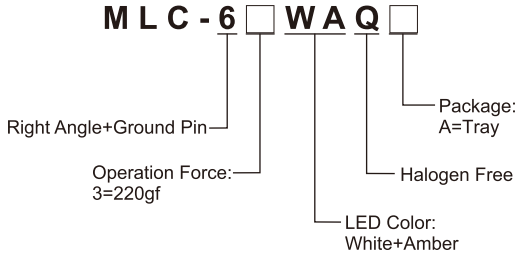
**CIRCUIT**



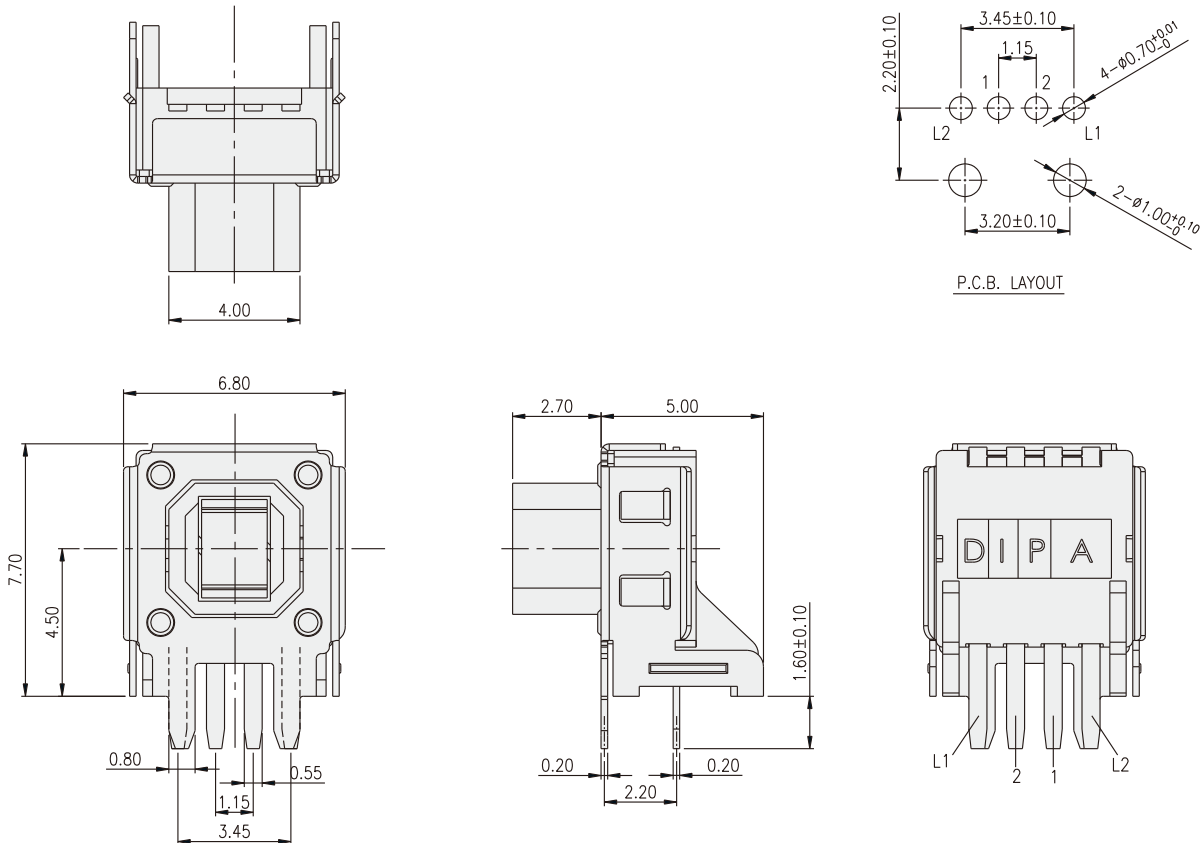
**PACKAGE**

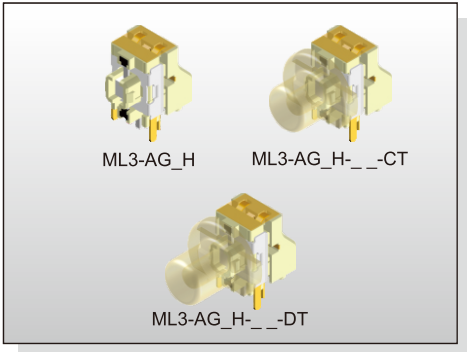
<Tray>  
200 pcs.

**HOW TO ORDER**



**MLC**





### FEATURES

- ※ Compact size, extra thin
- ※ Dual LEDs
- ※ Focused light

### APPLICATION

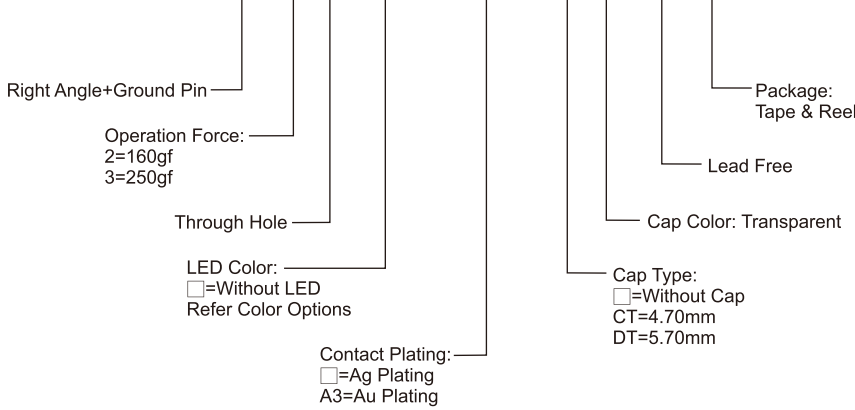
- ※ Server
- ※ Testing Instrument
- ※ Telecommunication

### SPECIFICATION

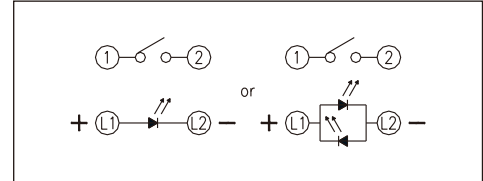
Contact Rating	50mA, 12V DC
Contact Resistance	500mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf, 250±100gf
Travel	0.2mm
Operating Life	100, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

### HOW TO ORDER

**ML3-AG H - - - - - V - R**



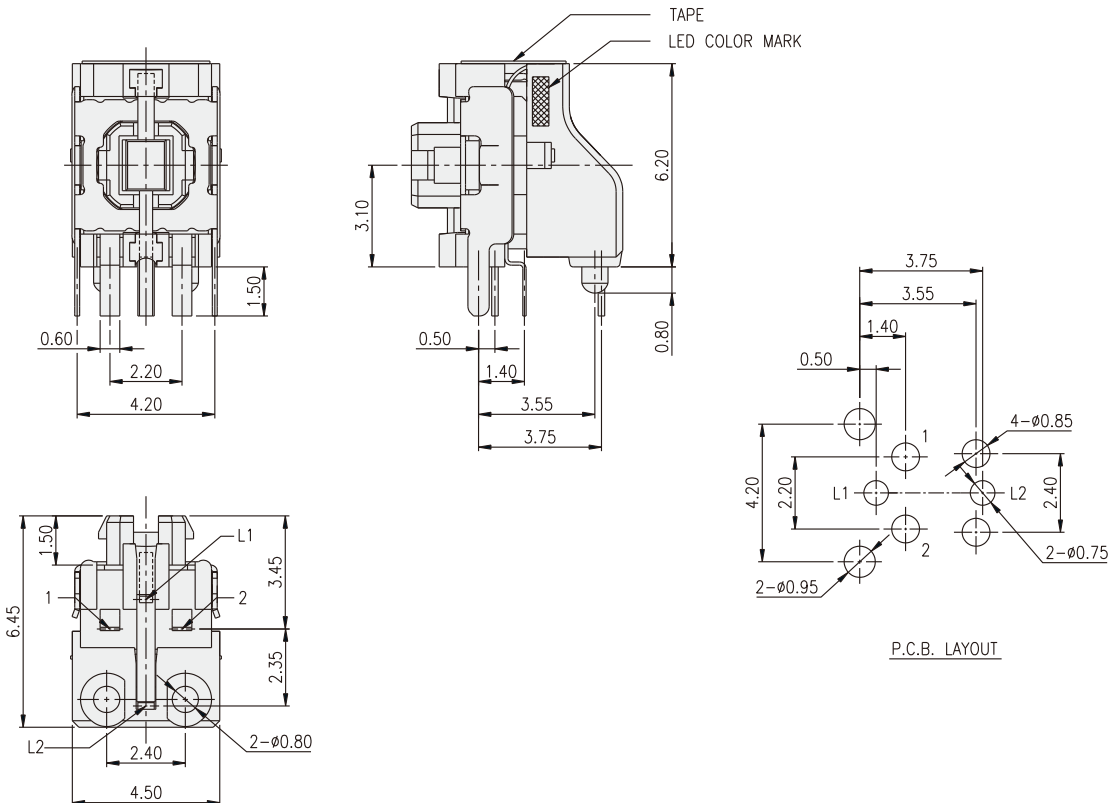
### CIRCUIT



### PACKAGE

Without Cap: 600 pcs/reel  
With Cap: 300 pcs/reel

## ML3

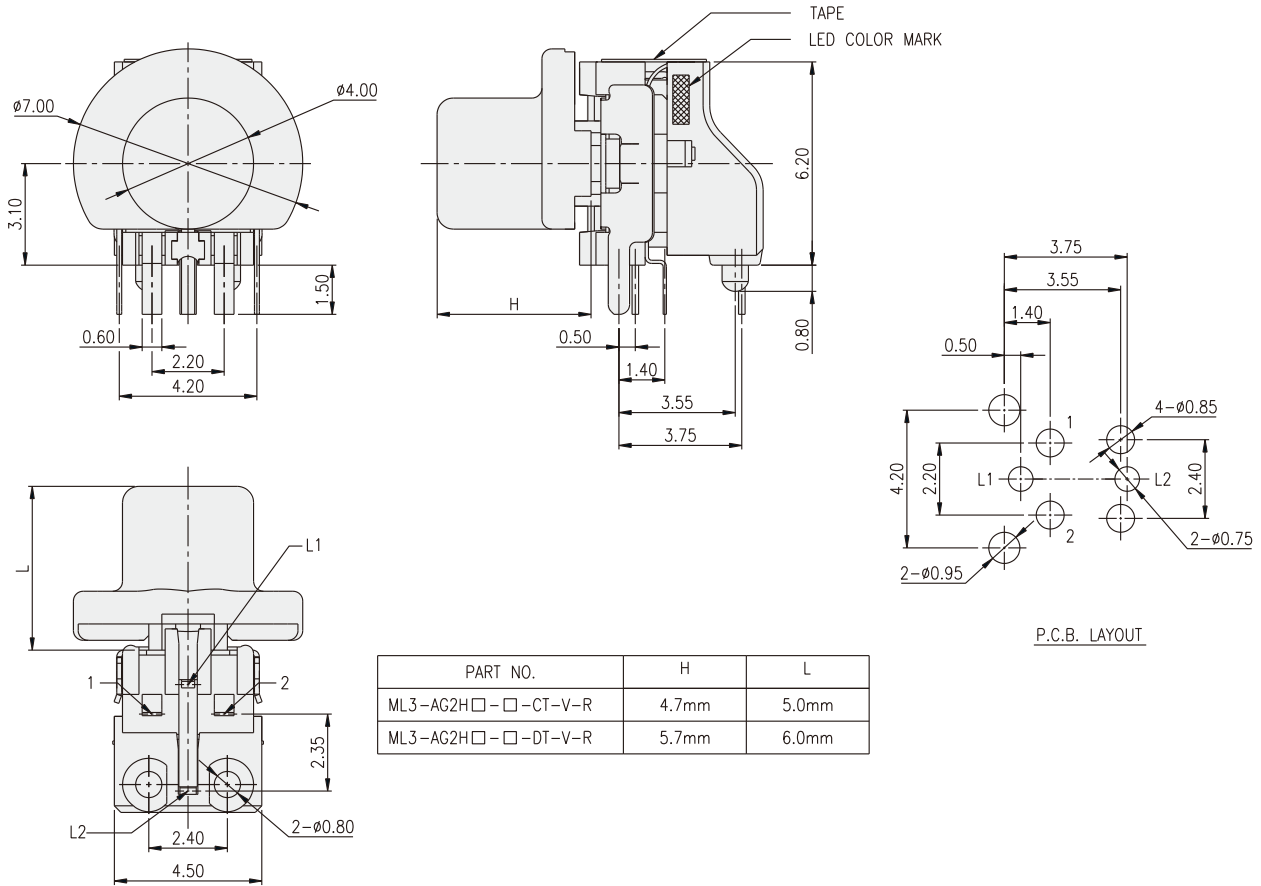


ILLUMINATED SWITCH  
**ML3 SERIES**

**Tact Switch**  
*Illuminated*







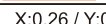


**ML3-AG2H**



PART NO.	H	L
ML3-AG2H□-□-CT-V-R	4.7mm	5.0mm
ML3-AG2H□-□-DT-V-R	5.7mm	6.0mm

**LED Color Options:**

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_F$ (V)		View Angle $2 \cdot \theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	 470	50	3.0	3.6	140°
PB	Blue	 470	70	3.0	3.6	
PG	Pure Gree	 520	160	3.2	3.6	
G	Yellow Green	 570	30	2.0	2.3	
Y	Yellow	 590	60	2.0	2.3	
A	Soft Orange	 605	50	2.0	2.3	
R	Red	 630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	

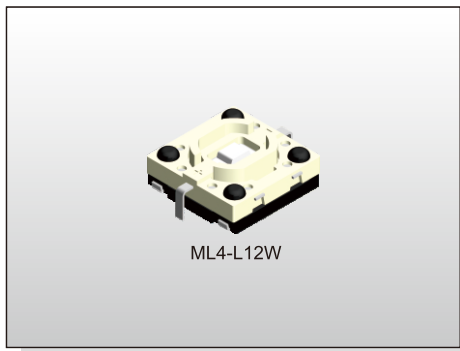
ILLUMINATED SWITCH

# ILLUMINATED SWITCH ML4 SERIES

Tact Switch  
Illuminated



ILLUMINATED SWITCH



### FEATURES

- ※ Compact size 4.9x4.9 with LED
- ※ Ultra-thin: a height of 2.0mm

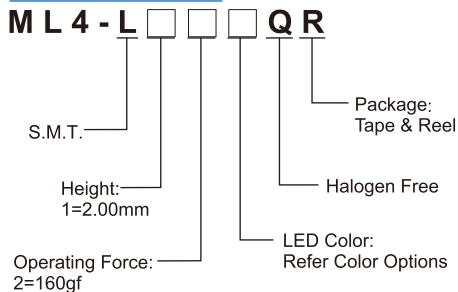
### APPLICATION

- ※ NB, Monitor
- ※ Portable device
- ※ Tablet

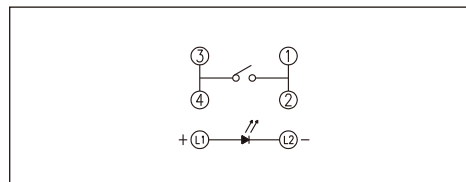
### SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf
Travel	0.25mm
Operating Life	1,000, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

### HOW TO ORDER



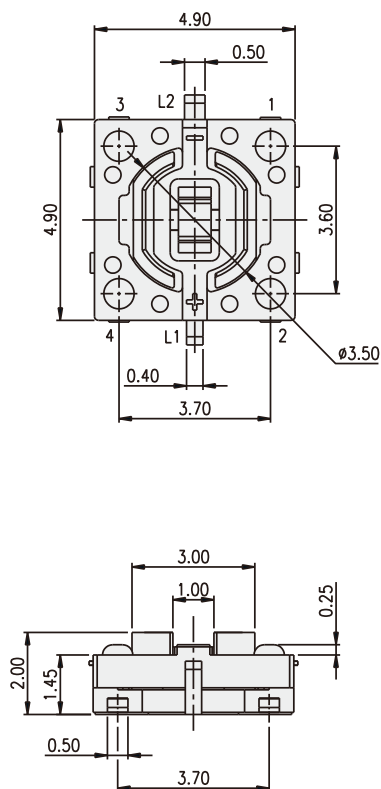
### CIRCUIT



### PACKAGE

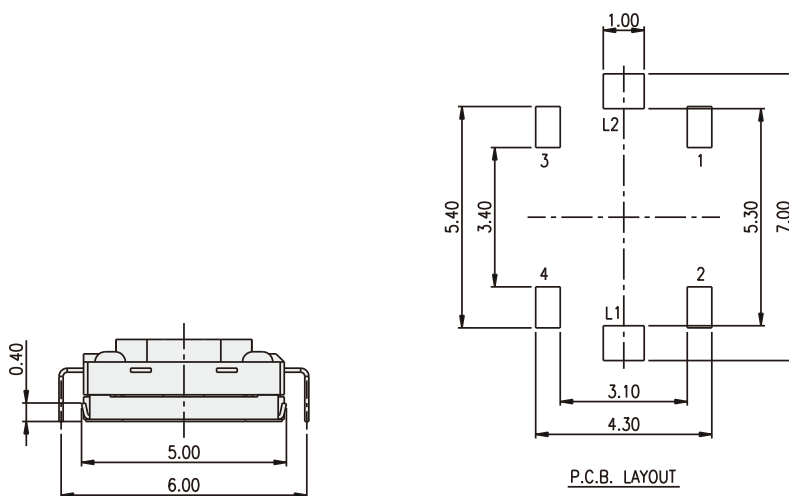
<Tape & Reel>  
2500 pcs.

## ML4



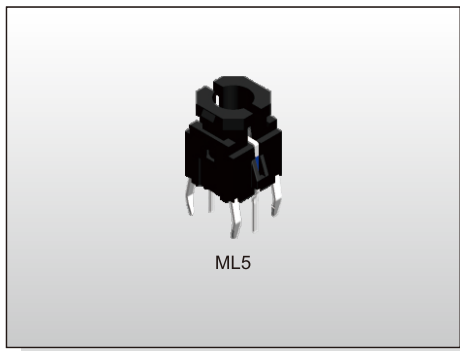
### LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	100	3.0	3.6	120°
G	Green	570	30	2.05	2.4	
R	Red	605	50	1.9	2.4	
W	Cold White	X:0.26 / Y:0.23	150	3.0	3.6	



# ILLUMINATED SWITCH ML5 SERIES

Tact Switch  
Illuminated



## FEATURES

- ※Silicone structure for low noise
- ※Long travel
- ※Options of differen LED color

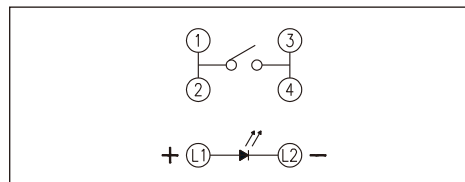
## APPLICATION

- ※Audio device
- ※Office equipment
- ※Communication apparatus

## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	250V AC/1 minute
Operating Force	200±70gf
Travel	1.2mm
Operating Life	50,000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

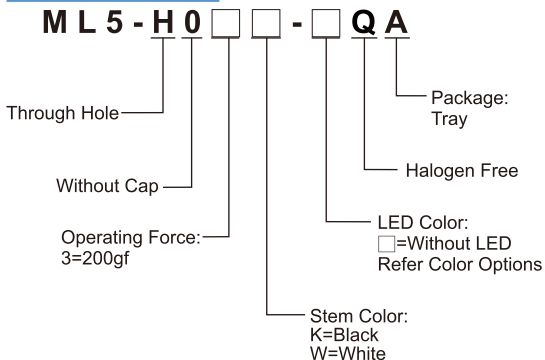
## CIRCUIT



## PACKAGE

<Tray>  
140 pcs.

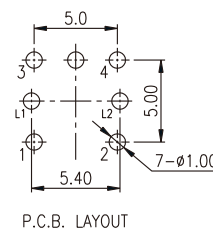
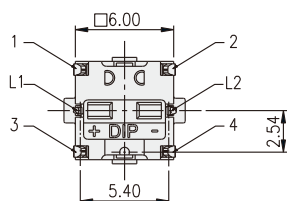
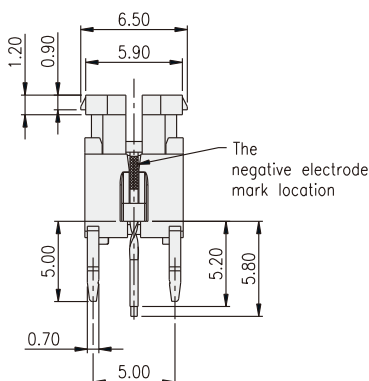
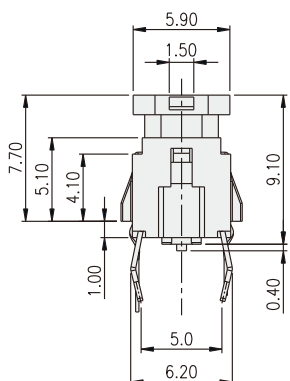
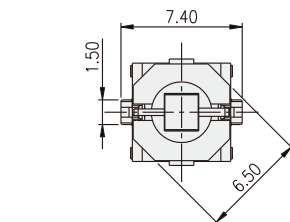
## HOW TO ORDER



## ML5

## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)		Forward Voltage $V_F$ (V)		View Angle $2-\theta_{1/2}$ (Degree)
			Typ.	Max.	Typ.	Max.	
B	Blue	470	80		3.0	3.6	140°
PG	Pure Gree	520	160		3.2	3.6	
G	Yellow Green	570	30		2.0	2.3	
Y	Yellow	590	60		2.0	2.3	
A	Soft Orange	605	50		2.0	2.3	
R	Deep Red	640	25		2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350		3.0	3.6	

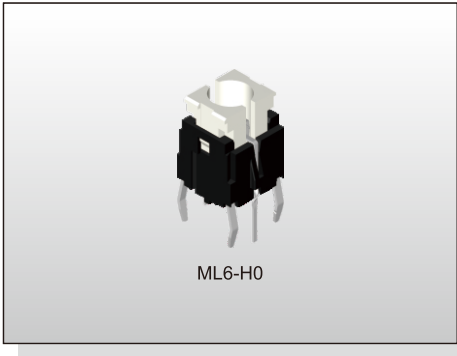


# ILLUMINATED SWITCH ML6-H0 SERIES

Tact Switch  
Illuminated



ILLUMINATED SWITCH



ML6-H0

## FEATURES

- ※ Customized cap options
- ※ Bi-color LED available
- ※ Long operating life

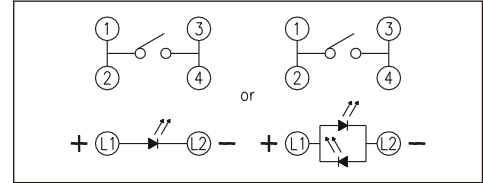
## APPLICATION

- ※ Sever, modem, data storage
- ※ Audio module
- ※ Office equipment

## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf, 180±50gf
Travel	0.25mm
Operating Life	300, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

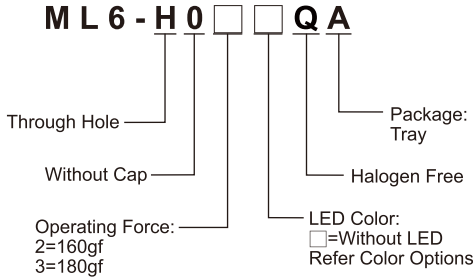
## CIRCUIT



## PACKAGE

<Tray>  
140 pcs.

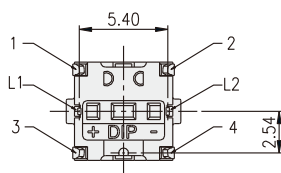
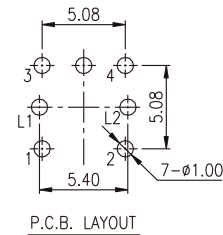
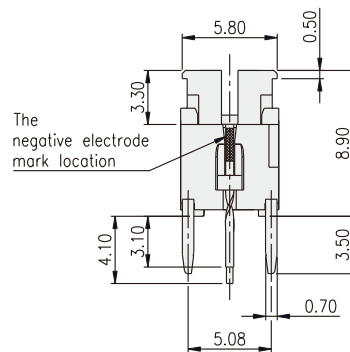
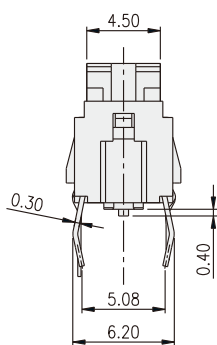
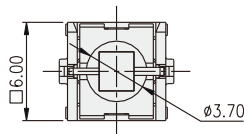
## HOW TO ORDER



## ML6-H0

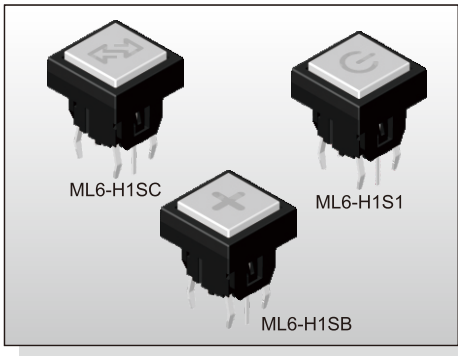
## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_F$ (V)		View Angle $2-\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Gree	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	



# ILLUMINATED SWITCH ML6-H1 SERIES

Tact Switch  
Illuminated



## FEATURES

- ✘ Customized cap options
- ✘ Bi-color LED available
- ✘ Long operating life

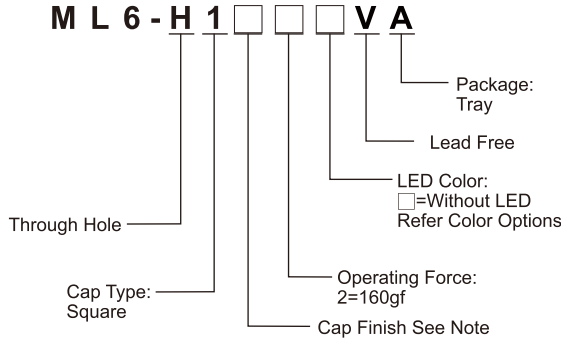
## APPLICATION

- ✘ Sever, modem, data storage
- ✘ Audio module
- ✘ Office equipment

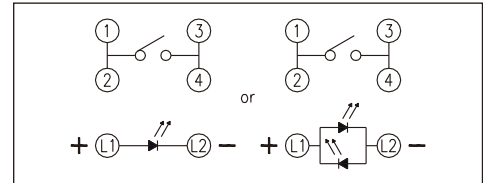
## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf
Travel	0.25mm
Operating Life	300, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

## HOW TO ORDER



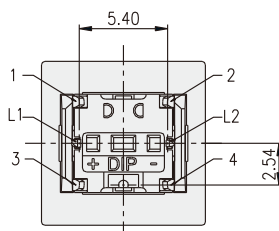
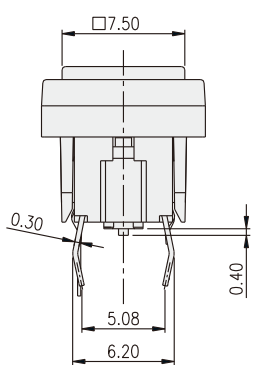
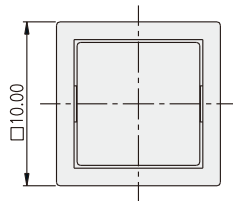
## CIRCUIT



## PACKAGE

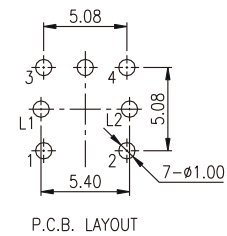
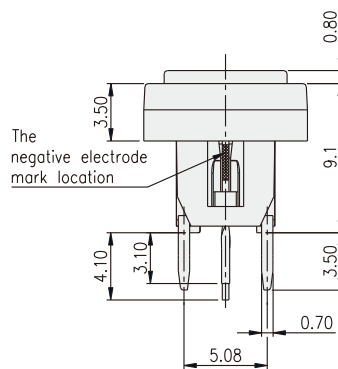
<Tray>  
100 pcs.

## ML6-H1



## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Green	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	



Note :

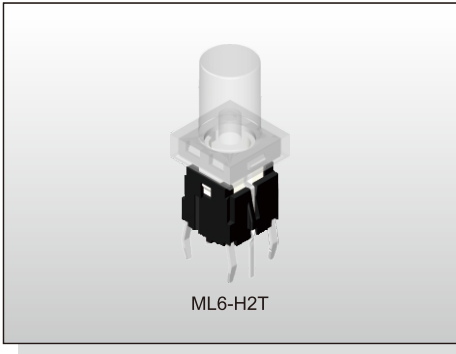
	CAP	
	Mark	Color
S1		Silver
S2	Reset	Silver
SA	-	Silver
SB	+	Silver

# ILLUMINATED SWITCH ML6-H2 SERIES

Tact Switch  
Illuminated



ILLUMINATED SWITCH



## FEATURES

- ✘ Customized cap options
- ✘ Bi-color LED available
- ✘ Long operating life

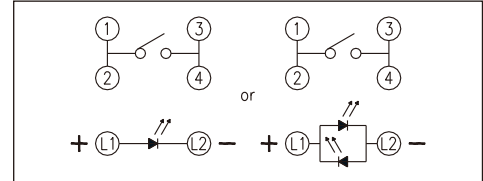
## APPLICATION

- ✘ Sever, modem, data storage
- ✘ Audio module
- ✘ Office equipment

## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf
Travel	0.25mm
Operating Life	300, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

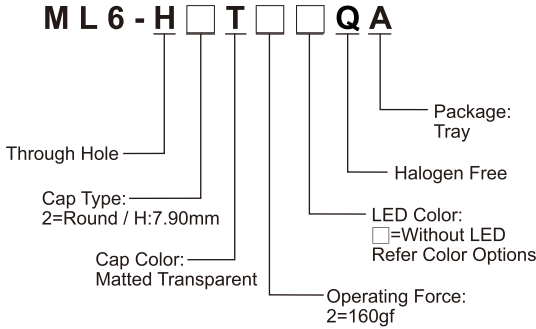
## CIRCUIT



## PACKAGE

<Tray>  
100 pcs.

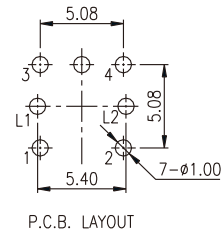
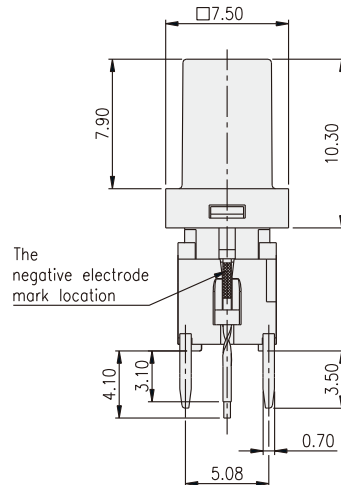
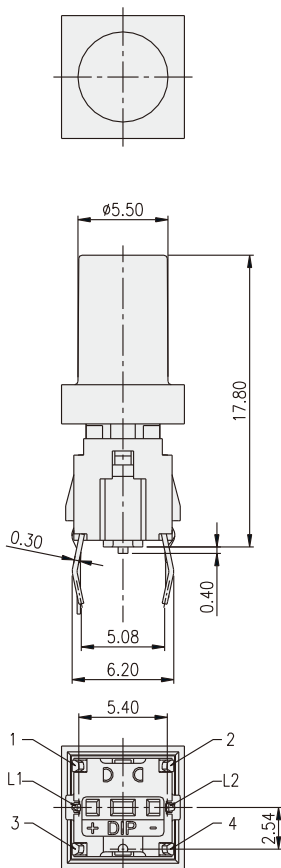
## HOW TO ORDER



## ML6-H2

## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2-\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Green	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	





# ILLUMINATED SWITCH ML6-H4 SERIES

Tact Switch  
Illuminated



## FEATURES

- ※ Customized cap options
- ※ Bi-color LED available
- ※ Long operating life

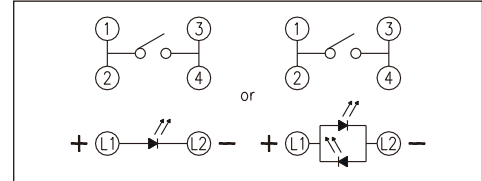
## APPLICATION

- ※ Sever, modem, data storage
- ※ Audio module
- ※ Office equipment

## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf
Travel	0.25mm
Operating Life	300, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

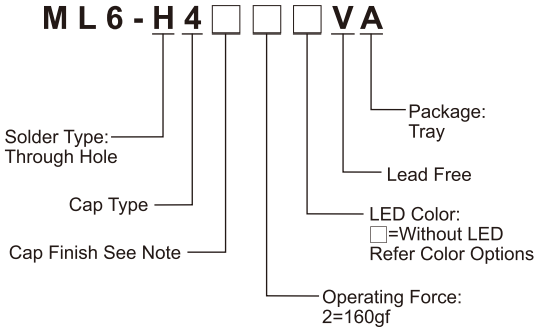
## CIRCUIT



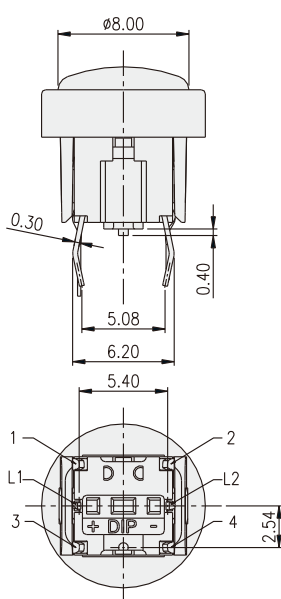
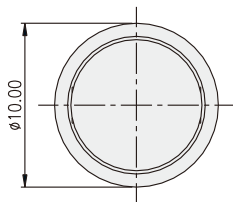
## PACKAGE

<Tray>  
100 pcs.

## HOW TO ORDER

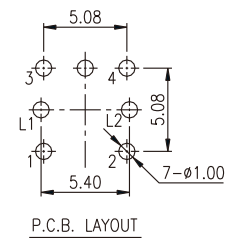
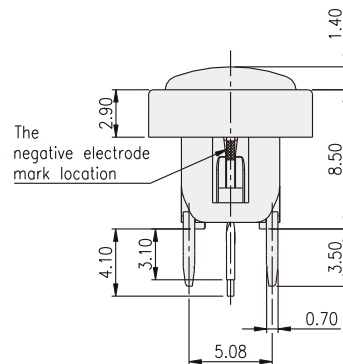


## ML6-H4



## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2-\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Gree	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	



NOTE :

	CAP	
	MARK	COLOR
S1		SILVER
K1		BLACK
S3	RESET	SILVER
K3		BLACK
SA	-	SILVER
KA		BLACK

# ILLUMINATED SWITCH ML6-H5 SERIES

**Tact Switch**  
**Illuminated**



ILLUMINATED SWITCH



### FEATURES

- ※ Customized cap options
- ※ Bi-color LED available
- ※ Long operating life

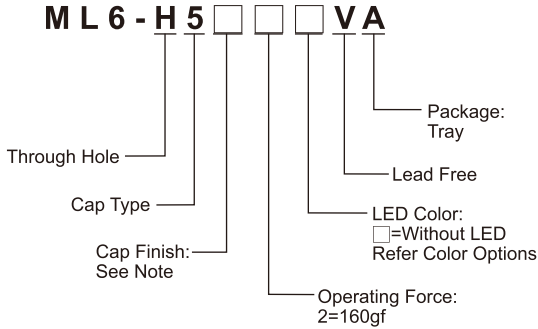
### APPLICATION

- ※ Sever, modem, data storage
- ※ Audio module
- ※ Office equipment

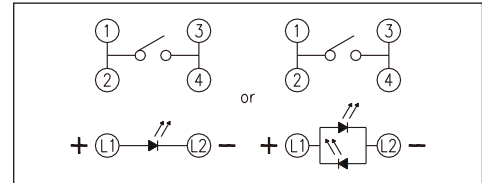
### SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf
Travel	0.25mm
Operating Life	300, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

### HOW TO ORDER



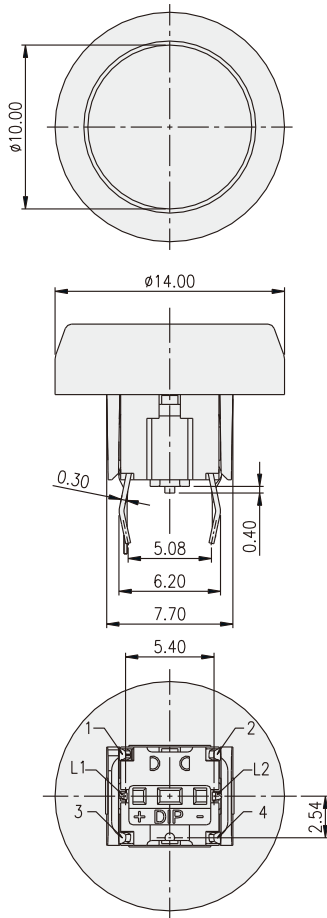
### CIRCUIT



### PACKAGE

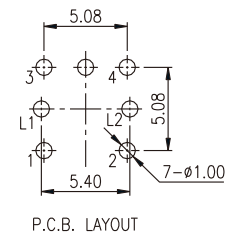
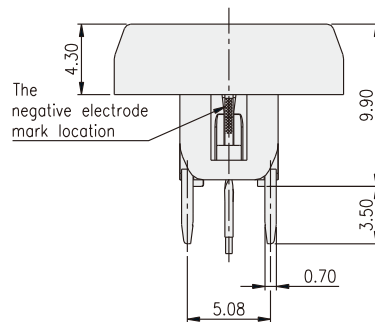
<Tray>  
100 pcs.

### ML6-H5



### LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Green	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	

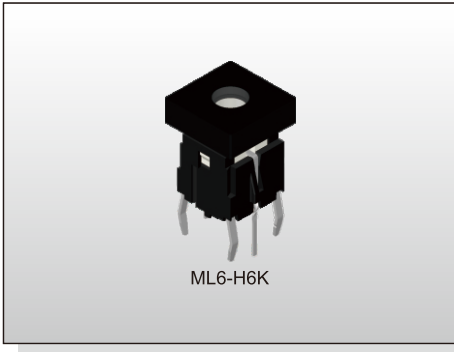


NOTE :

	CAP	
	MARK	COLOR
R4	START	RED

# ILLUMINATED SWITCH ML6-H6 SERIES

Tact Switch  
Illuminated



## FEATURES

- ※ Customized cap options
- ※ Bi-color LED available
- ※ Long operating life

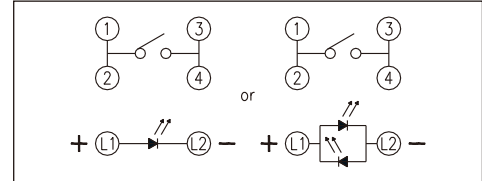
## APPLICATION

- ※ Sever, modem, data storage
- ※ Audio module
- ※ Office equipment

## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 100V DC
Dielectric Strength	250V AC/1 minute
Operating Force	180±50gf
Travel	0.25mm
Operating Life	300,000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

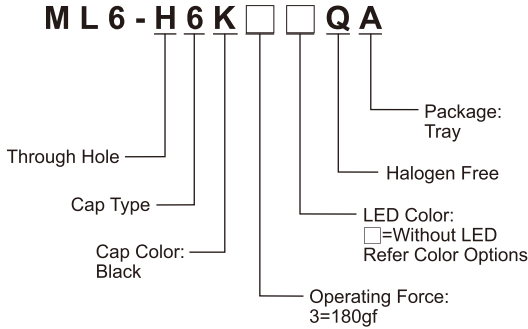
## CIRCUIT



## PACKAGE

<Tray>  
100 pcs.

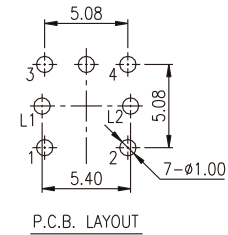
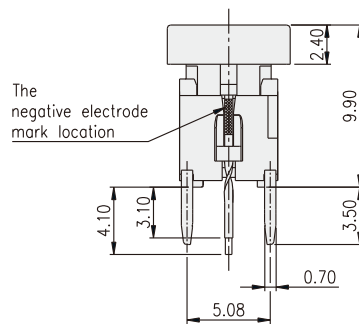
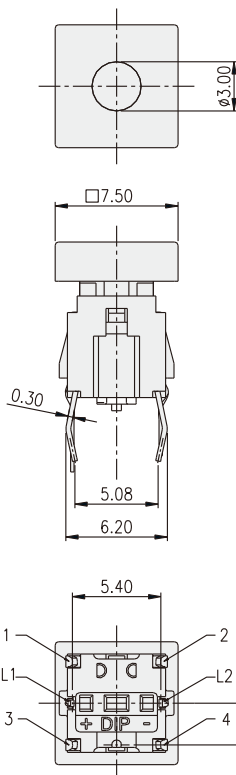
## HOW TO ORDER

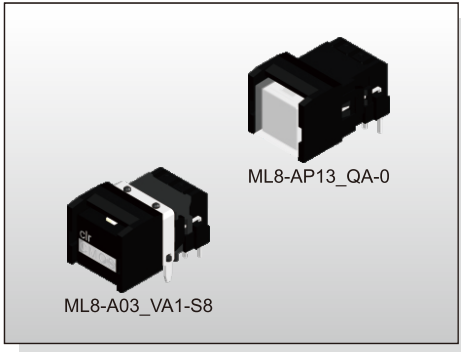


## ML6-H6

## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_F$ (V)		View Angle $2\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Gree	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	





### FEATURES

- ※Push to lock option
- ※Long stroke
- ※Options of different cap color & mark

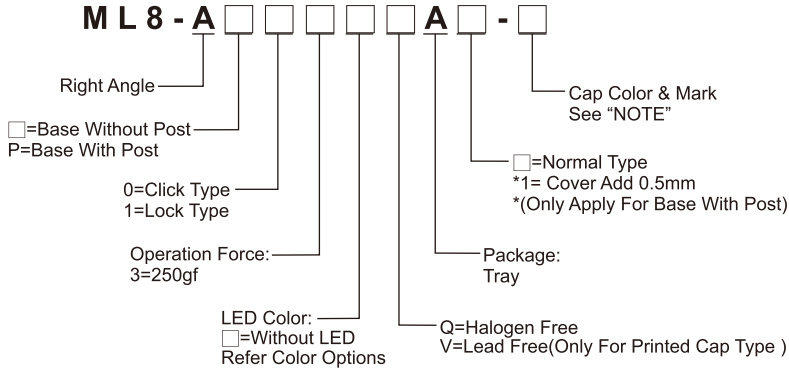
### APPLICATION

- ※Audio device
- ※Office equipment
- ※Communication apparatus

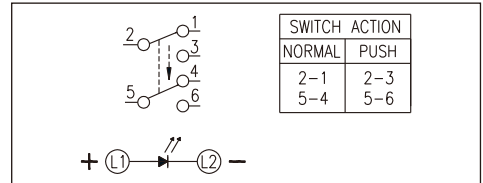
### SPECIFICATION

Contact Rating	0.1A, 30V DC
Contact Resistance	50mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	500V AC/1 minute
Operating Force	250±100gf
Travel	1.5mm
Operating Life	10, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

### HOW TO ORDER



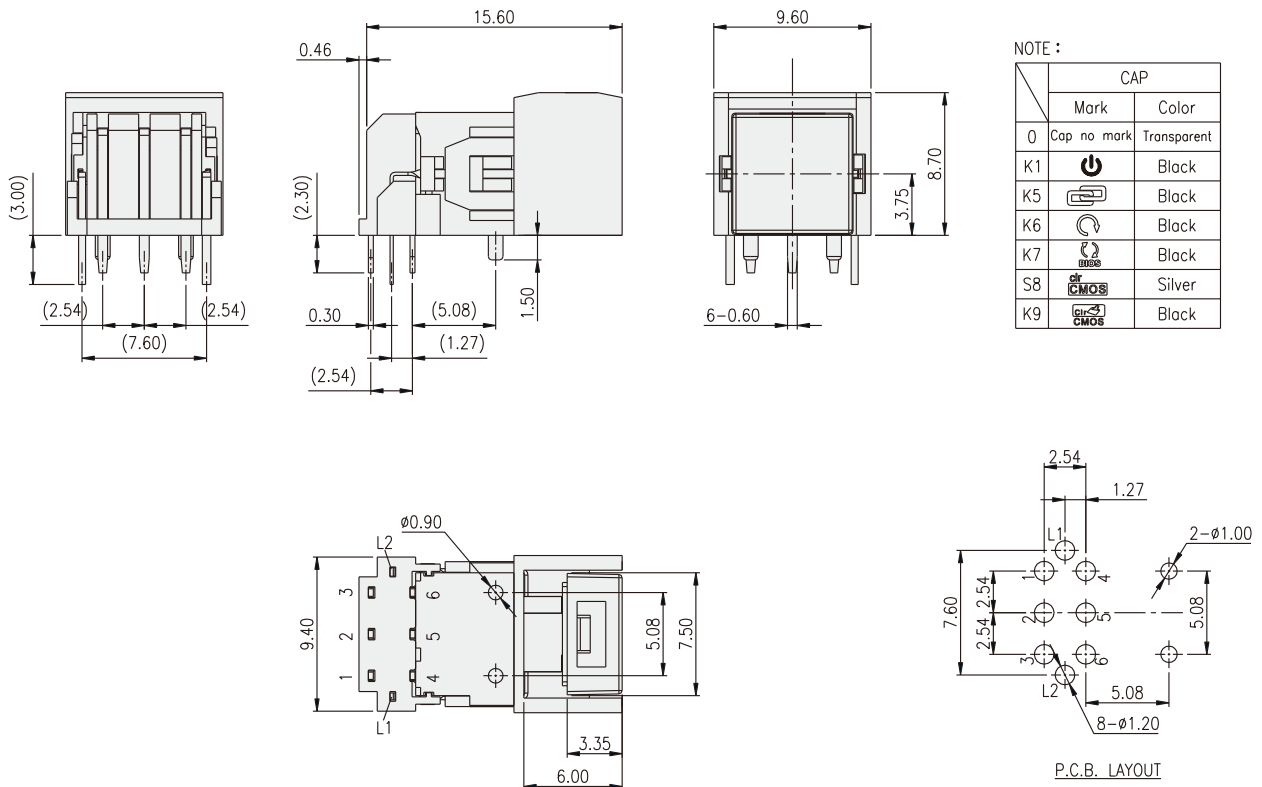
### CIRCUIT



### PACKAGE

<Tray>  
120 pcs.

### ML8-AP13

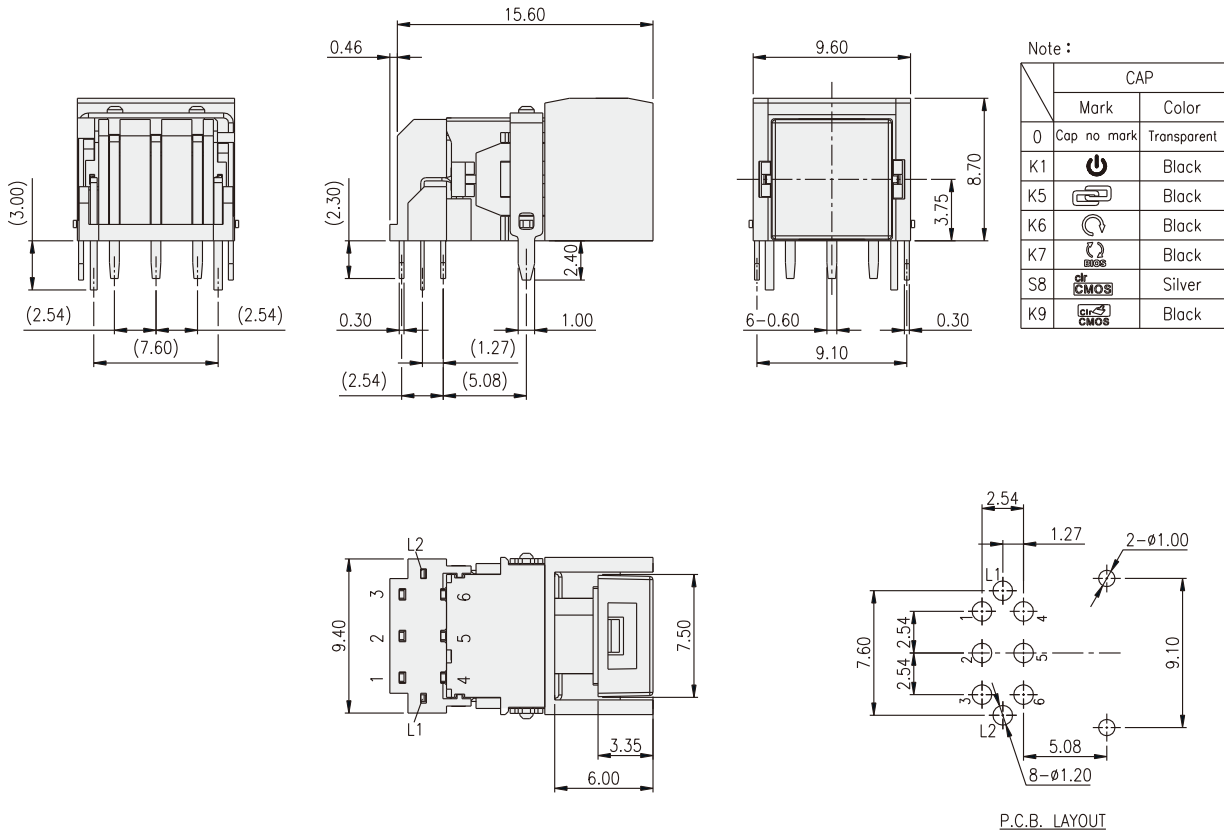


ILLUMINATED SWITCH  
**ML8 SERIES**

**Tact Switch**  
**Illuminated**



ML8-A03



**LED Color Options:**

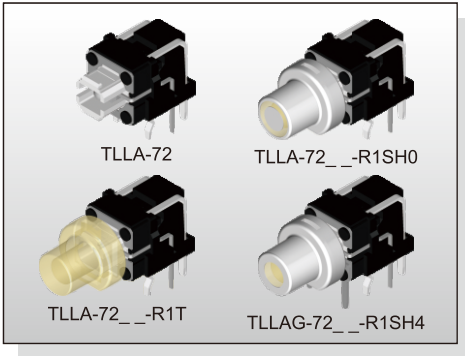
Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2-\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
PG	Pure Gree	520	160	3.2	3.6	
G	Yellow Green	570	30	2.0	2.3	
Y	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Deep Red	640	25	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	

# ILLUMINATED SWITCH TL(L)A(G)-7 SERIES

## Tact Switch Illuminated



ILLUMINATED SWITCH



### FEATURES

- ※Horizontal operation
- ※Various LED colors
- ※Options of different cap color & mark

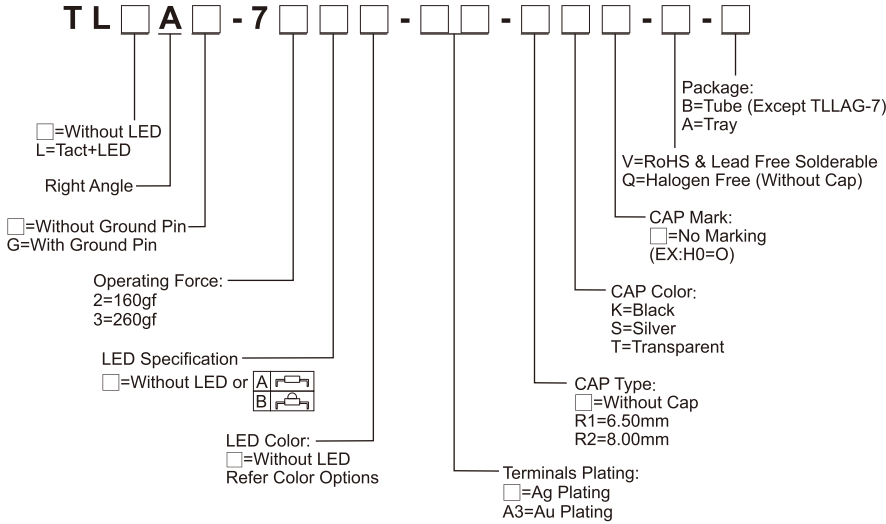
### APPLICATION

- ※Automotive
- ※Server
- ※Laptop, IPC

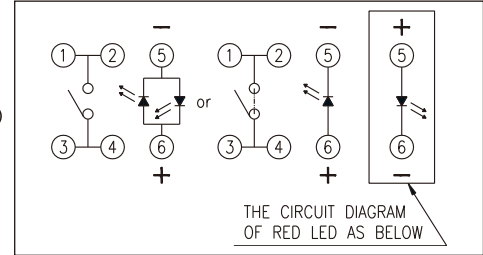
### SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf / 260±50gf
Travel	0.2mm
Operating Life	500, 000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

### HOW TO ORDER



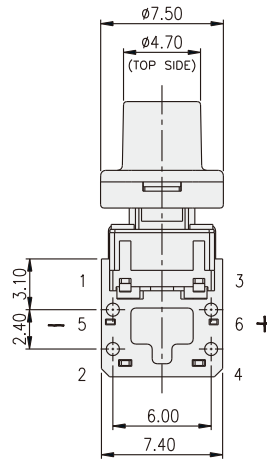
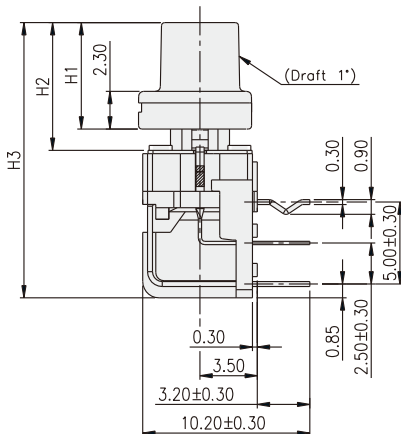
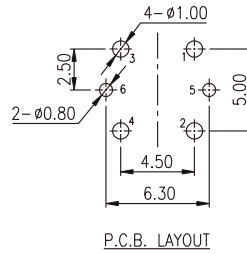
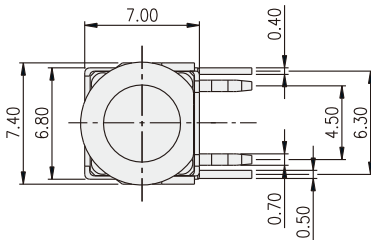
### CIRCUIT



### PACKAGE

- <Tray>  
TL(A)-7□-A: 100 pcs.
- <Tube>  
TL(A)-7□-B: 64 pcs.

### TL(A)-72□□-R□



PART NO.	H1	H2	H3
TL(A)-7□□□-□-R1□	6.50	7.80	16.80
TL(A)-7□□□-□-R2□	8.00	9.30	18.30

NOTE :

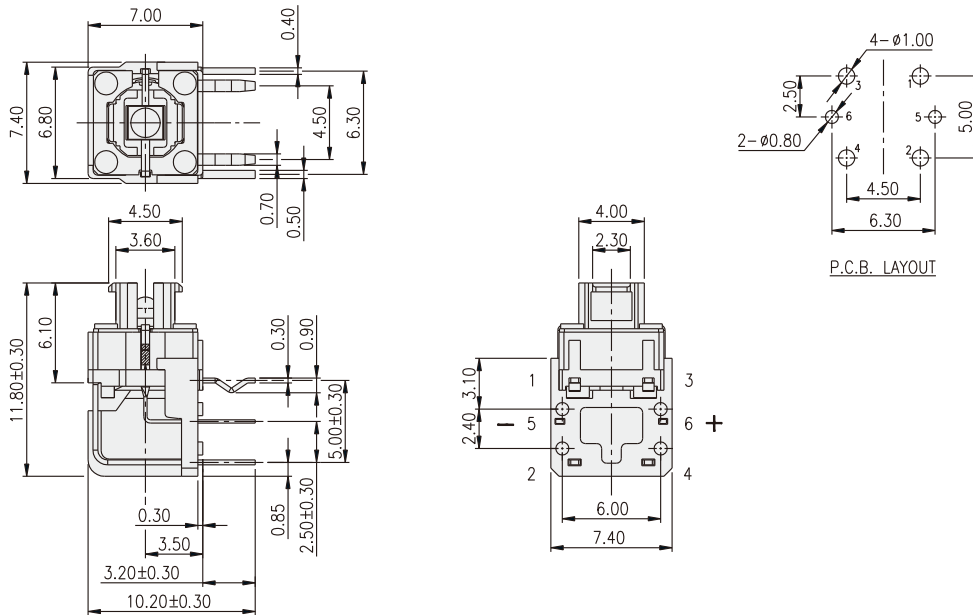
	CAP	
	MARK	COLOR
SH0		SILVER
KH0		BLACK
SH1		SILVER
KH1		BLACK
SH2		SILVER
KH2		BLACK
SH3		SILVER
KH3		BLACK
SH4		SILVER
KH4		BLACK
SH7		SILVER
KH7		BLACK
SH9		SILVER
KH9		BLACK
SHA		SILVER
KHA		BLACK
SHB		SILVER
KHB		BLACK

# ILLUMINATED SWITCH TL(L)A(G)-7 SERIES

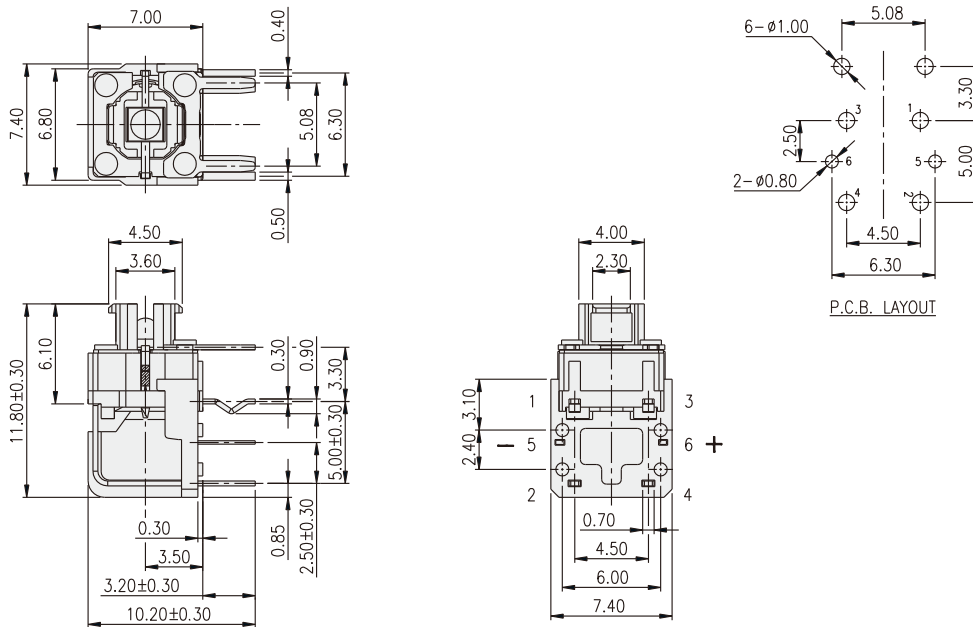
Tact Switch  
Illuminated



## TLLA-72



## TLLAG-7



### LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_D$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)		Forward Voltage $V_f$ (V)		View Angle $2-\theta_{1/2}$ (Degree)	
			Typ.		Typ.	Max.	A	B
			A	B				
B	Blue	470	70	1100	3.0	3.6	140°	30°
PG	Pure Gree	520	160	2500	3.2	3.6		
G	Yellow Green	570	30	550	2.0	2.3		
Y	Yellow	590	60	1500	2.0	2.3		
A	Soft Orange	605	50	1500	2.0	2.3		
R	Deep Red	640	25	800	2.0	2.3		
W	Cold White	X:0.26 / Y:0.23	350	550	3.0	3.6		

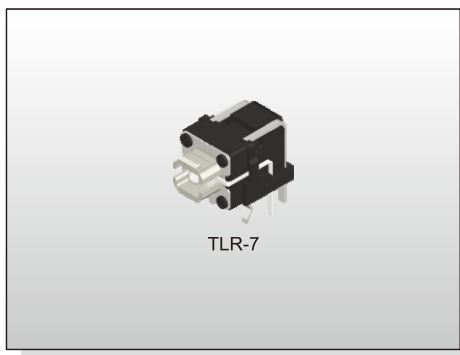
ILLUMINATED SWITCH

# ILLUMINATED SWITCH TLR-7 SERIES

Tact Switch  
Illuminated



ILLUMINATED SWITCH



## FEATURES

- ※ Horizontal operation
- ※ Various LED colors

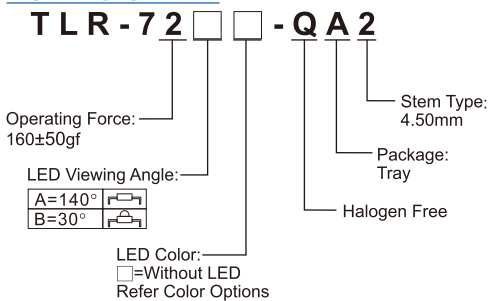
## APPLICATION

- ※ Automotive
- ※ Server
- ※ Laptop, IPC

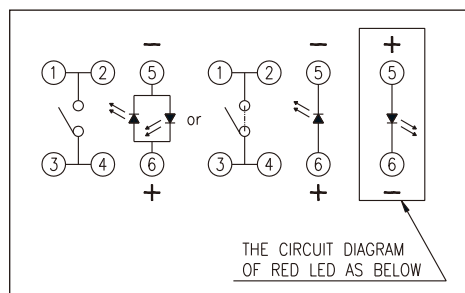
## SPECIFICATION

Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160±50gf / 260±50gf
Travel	0.2mm
Operating Life	500,000 cycles
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C

## HOW TO ORDER



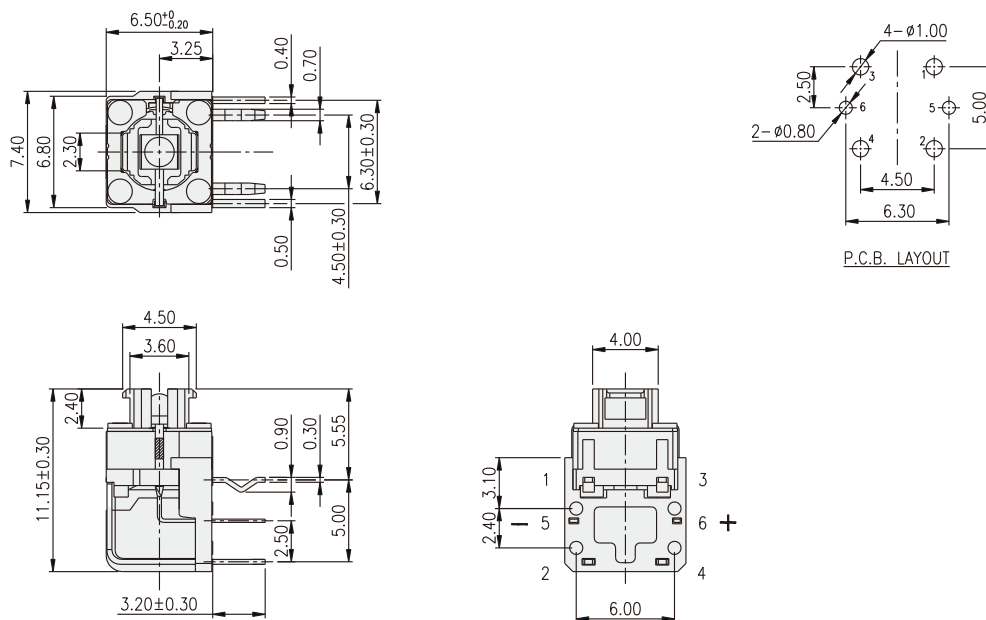
## CIRCUIT



## PACKAGE

<Tray>  
100 pcs.

## TLR-7



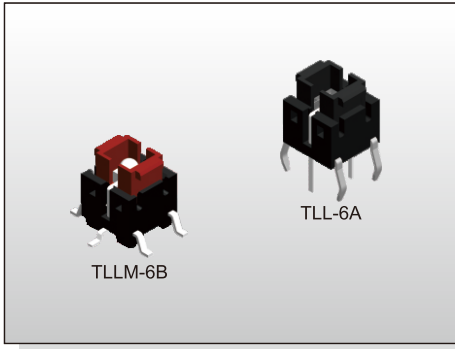
## LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_d$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)		Forward Voltage $V_f$ (V)		View Angle $2-\theta_{1/2}$ (Degree)	
			Typ.	Typ.	Typ.	Max.	A	B
B	Blue	470	70	1100	3.0	3.6	140°	30°
PG	Pure Gree	520	160	2500	3.2	3.6		
G	Yellow Green	570	30	550	2.0	2.3		
Y	Yellow	590	60	1500	2.0	2.3		
A	Soft Orange	605	50	1500	2.0	2.3		
R	Deep Red	640	25	800	2.0	2.3		
W	Cold White	X:0.26 / Y:0.23	350	550	3.0	3.6		



# ILLUMINATED SWITCH TL(L)(M)-6 SERIES

## Tact Switch Illuminated



### FEATURES

- ※ Super bright LED
- ※ Various LED colors
- ※ Options of different cap color

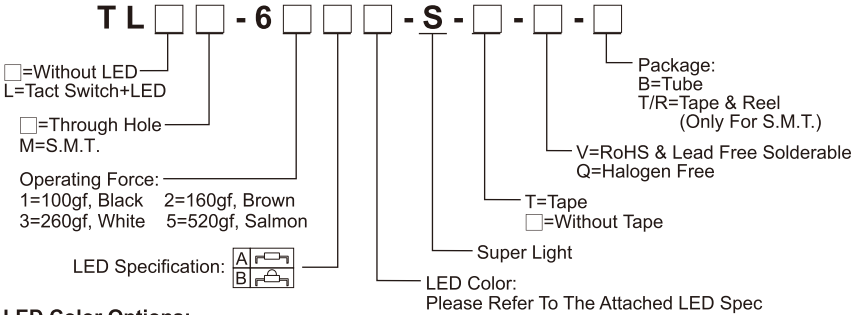
### APPLICATION

- ※ Server
- ※ Laptop, IPC
- ※ Set-top box

### SPECIFICATION

Contact Rating	50mA, 12V DC	
Contact Resistance	100mΩ max.	
Insulation Resistance	100MΩ min. 500V DC	
Dielectric Strength	250V AC/1 minute	
Operating Force	100±50gf	TL(L)-61
	160±50gf	TL(L)-62
	260±50gf	TL(L)-63
	520±130gf	TL(L)-65
Travel	0.2mm	
Operating Life	200,000 cycles for 520/260gf	
	500,000 cycles for 160/100gf	
Operating Temp.	-25°C ~ +70°C	
Storage Temp.	-30°C ~ +80°C	

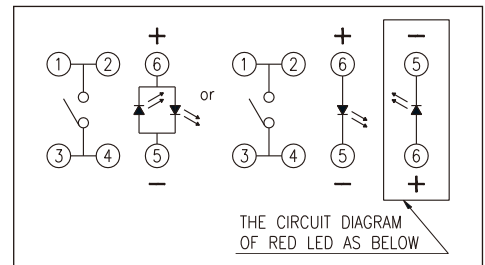
### HOW TO ORDER



### LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_d$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)		Forward Voltage $V_f$ (V)		View Angle 2- $\theta_{1/2}$ (Degree)	
			A	B	Typ.	Max.	A	B
B	Blue	470	70	1100	3.0	3.6	140°	30°
PG	Pure Green	520	160	2500	3.2	3.6		
G	Yellow Green	570	30	550	2.0	2.3		
Y	Yellow	590	60	1500	2.0	2.3		
A	Soft Orange	605	50	1500	2.0	2.3		
O	Red Orange	620	80	3000	2.0	2.3		
R	Red	630	60	1000	2.0	2.3		
W	Cold White	X:0.26 / Y:0.23	350	550	3.0	3.6		

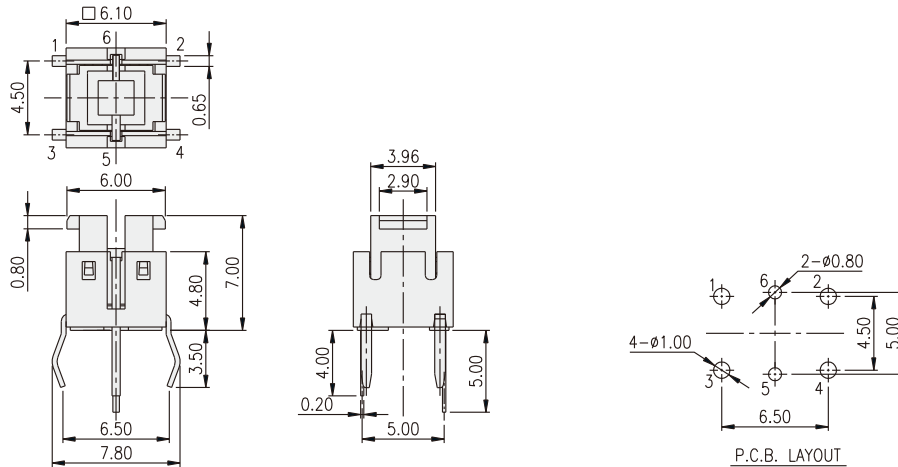
### CIRCUIT



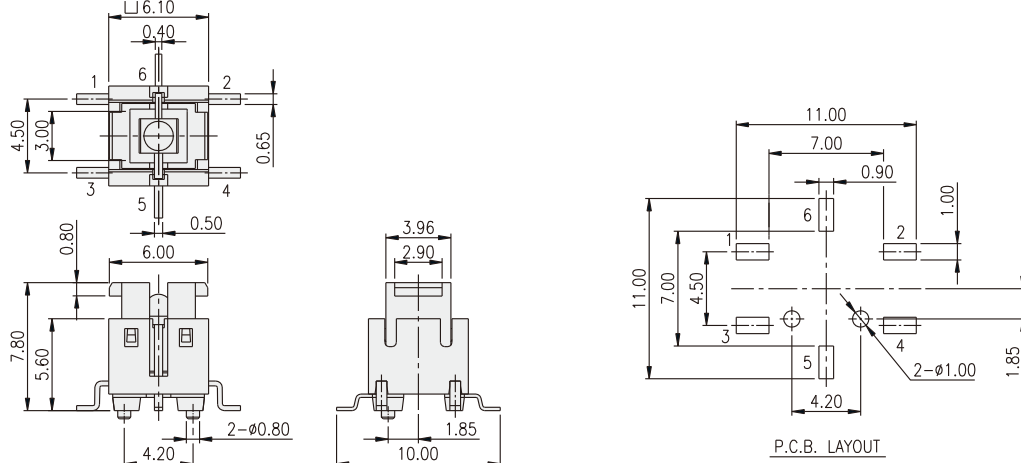
### PACKAGE

- <Tube>  
75 pcs.
- <Tape & Reel>  
450 pcs. (Only for TLLM-6)

### TLL-6 [ ] A



### TLLM-6 [ ] B

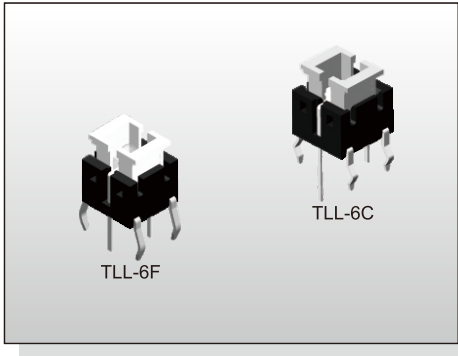


# ILLUMINATED SWITCH TL(L)(M)-6 SERIES

## Tact Switch Illuminated



ILLUMINATED SWITCH



### FEATURES

- ※ Super bright LED
- ※ Various LED colors
- ※ Options of different cap color

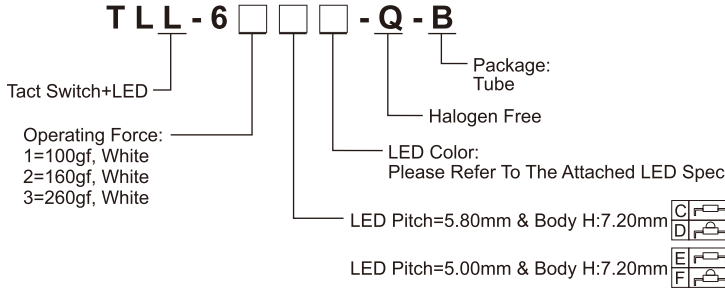
### APPLICATION

- ※ Server
- ※ Laptop, IPC
- ※ Set-top box

### SPECIFICATION

Contact Rating	50mA, 12V DC	
Contact Resistance	100mΩ max.	
Insulation Resistance	100MΩ min. 500V DC	
Dielectric Strength	250V AC/1 minute	
Operating Force	100±50gf	TL(L)-61
	160±50gf	TL(L)-62
	260±50gf	TL(L)-63
Travel	0.2mm	
Operating Life	200,000 cycles for 260gf	
	500,000 cycles for 160/100gf	
Operating Temp.	-25°C ~ +70°C	
Storage Temp.	-30°C ~ +80°C	

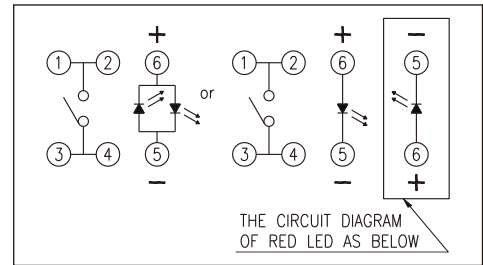
### HOW TO ORDER



### LED Color Options:

Part No.	Color	Dominant Wavelength Typ.(nm)	Luminous Intensity I <sub>v</sub> (mcd)		Forward Voltage V <sub>f</sub> (V)		View Angle 2-θ <sub>1/2</sub> (Degree)	
			Typ.	Typ.	Typ.	Max.	C, E, F	D, F, F
B	Blue	470	70	1100	3.0	3.6	140°	30°
PG	Pure Gree	520	160	2500	3.2	3.6		
G	Yellow Green	570	30	550	2.0	2.3		
Y	Yellow	590	60	1500	2.0	2.3		
A	Soft Orange	605	50	1500	2.0	2.3		
O	Red Orange	620	80	3000	2.0	2.3		
R	Red	630	60	1000	2.0	2.3		
W	Cold White	X:0.26 / Y:0.23	350	550	3.0	3.6		

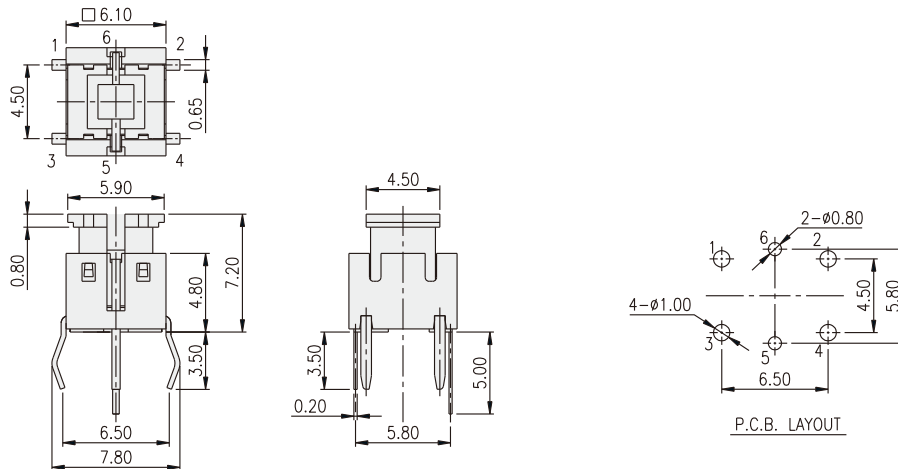
### CIRCUIT



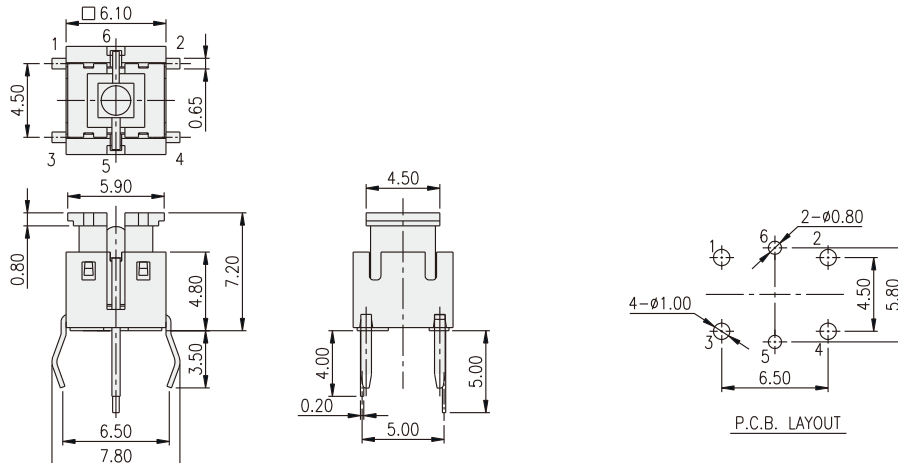
### PACKAGE

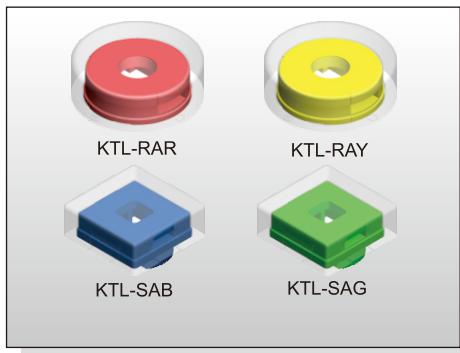
<Tube>  
75 pcs.

### TLL-6□C



### TLL-6□F





### HOW TO ORDER

**KTL - [ ] A [ ]**

R=Round  
S=Square

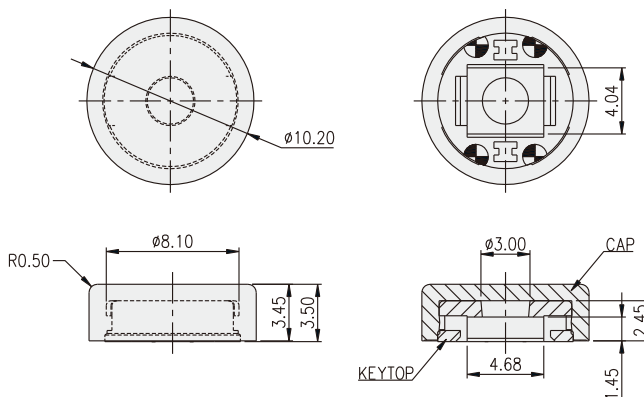
Color:  
Y=Yellow  
B=Blue  
R=Red  
I=Ivory  
K=Black  
G=Green  
S=Salmon

Round 10.20mm or  
Square 10.20mm

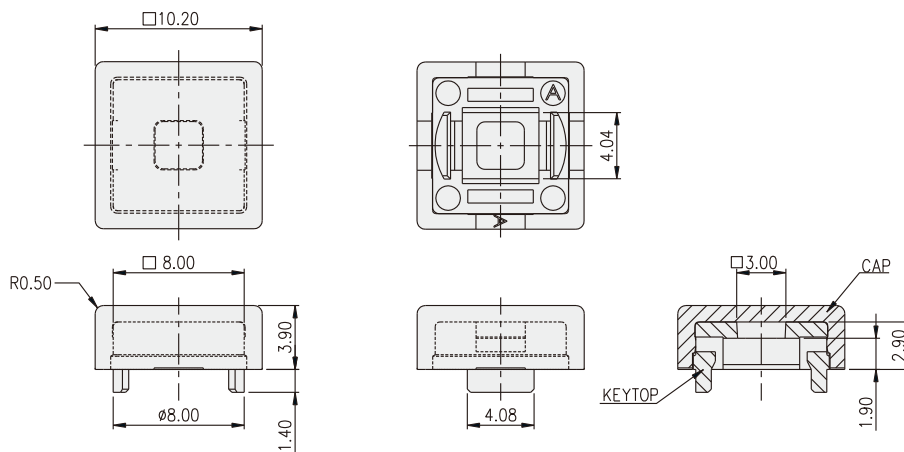
### PACKAGE

<Bag>  
500 pcs.

### KTL-RA



### KTL-SA

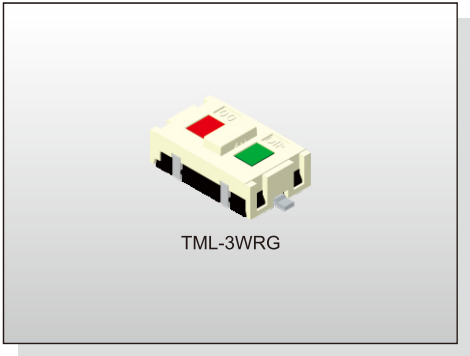


# ILLUMINATED SWITCH TML-3 SERIES

**Tact Switch  
Illuminated**



ILLUMINATED SWITCH



TML-3WRG

### FEATURES

- ※ Compact size
- ※ Bi-color LED light
- ※ Sharp click feeling

### APPLICATION

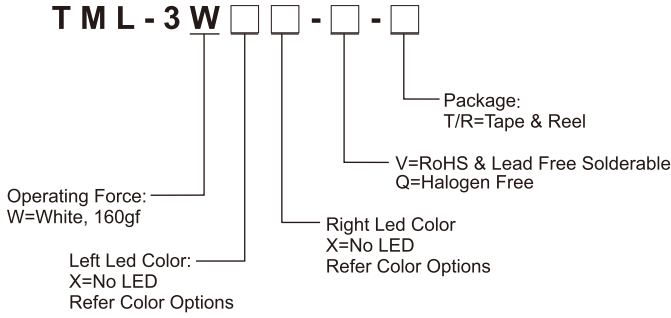
- ※ Testing equipment
- ※ Industrial device
- ※ Automation

### SPECIFICATION

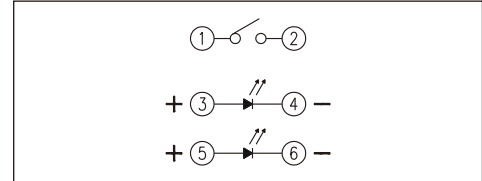
Contact Rating	50mA, 12V DC
Contact Resistance	100mΩ max.
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	250V AC/1 minute
Operating Force	160+80/-30gf
Travel	0.2mm
Operating Life	50,000 cycles
Operating Temp.	-20°C ~ +70°C
Storage Temp.	-30°C ~ +80°C

### HOW TO ORDER

**T M L - 3 W**



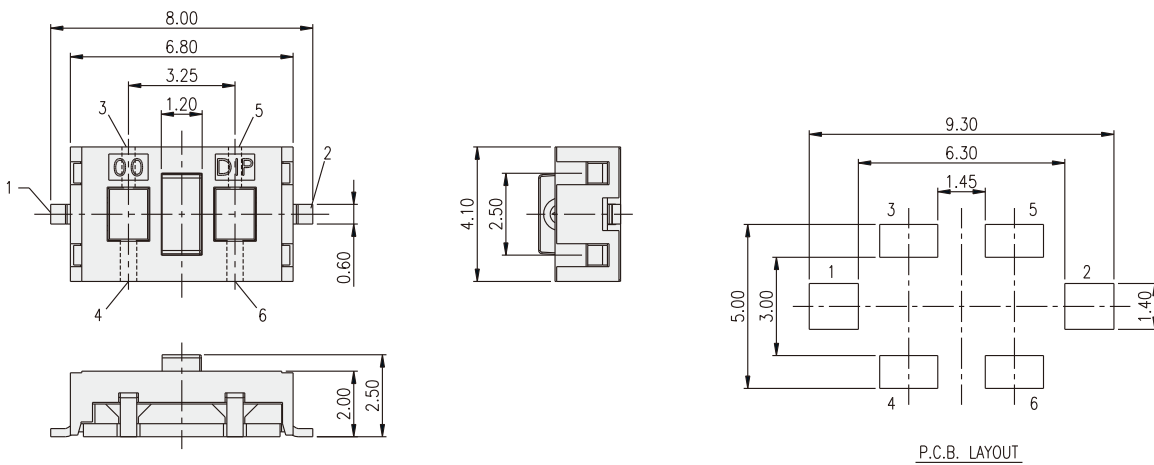
### CIRCUIT



### PACKAGE

<Tape & Reel>  
3000 pcs.

### TML-3



### LED Color Options:

Part No.	Color	Dominant Wavelength $\lambda_p$ Typ.(nm)	Luminous Intensity $I_v$ (mcd)	Forward Voltage $V_f$ (V)		View Angle $2\cdot\theta_{1/2}$ (Degree)
			Typ.	Typ.	Max.	
B	Blue	470	70	3.0	3.6	140°
G	Yellow Green	570	30	2.0	2.3	
O	Yellow	590	60	2.0	2.3	
A	Soft Orange	605	50	2.0	2.3	
R	Red	630	60	2.0	2.3	
W	Cold White	X:0.26 / Y:0.23	350	3.0	3.6	



**FEATURES**

- ✘ Do not have wear and damage problem by pressed contact structure
- ✘ Shock resistant switch, withstands harsh environments, Available in aluminum and plastic housings

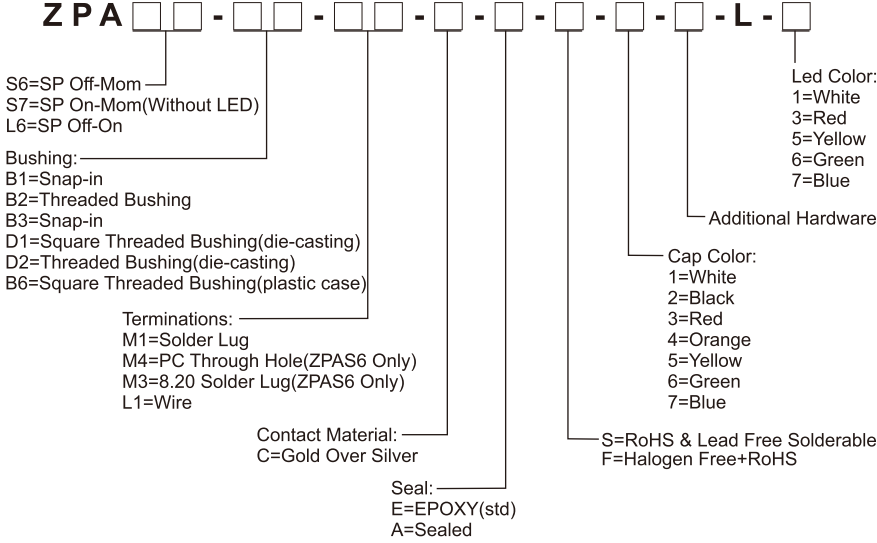
**APPLICATION**

- ✘ Lighting, Computer peripherals
- ✘ Communication
- ✘ Medical equipment.
- ✘ IPC, Marine

**SPECIFICATION**

Contact Rating	400mA 32VAC-100mA 50VDC-125mA 125VAC	ZPA S6/S7
	500mA 48VAC-200mA 50VDC-200mA 250VAC	
Contact Resistance	100mA 24VDC	ZPA L6
	2A 125VAC	
Insulation Resistance	50mΩ max.	
Dielectric Strength	1GΩ min. 500VDC	
Operating Force	1,000VAC rms.	
	1,500VAC rms. for metal material.	
Travel	2N~5N	
	1.5mm	ZPA S6/S7
Operating Life	2.5mm	ZPA L6
	500,000 cycles	ZPA S6/S7
Operating Temp.	200,000 cycles(100mA, 24VDC)	ZPA L6
	10,000 cycles(2A, 125VAC)	
	-30°C ~ +85°C	

**HOW TO ORDER**



**CIRCUIT**

Model No.	POS.1	POS.2
PAL6	OFF	ON
Term. Comm.	OPEN	1-3
SCHEMATIC		

**PACKAGE**

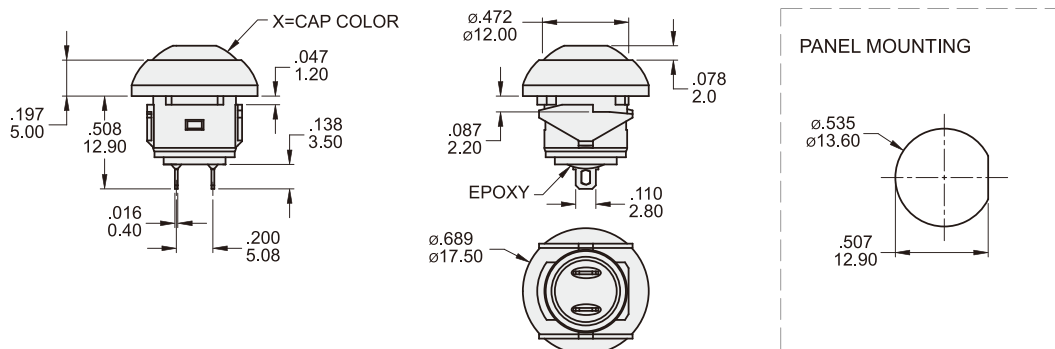
<Tray>  
50 pcs.

**SWITCH FUNCTION**

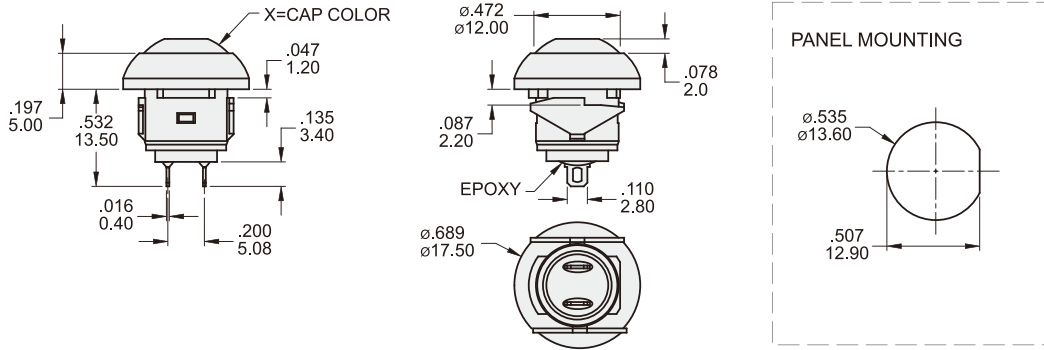
NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS.1	POS.2	POS.1	POS.2	
SP	ZPAS6	OFF	MOM	OPEN	1-3	
SP	ZPAS7	ON	OFF(MOM)	1-3	OPEN	
SP	ZPAL6	OFF	ON	OPEN	1-3	

MOM=MOMENTARY

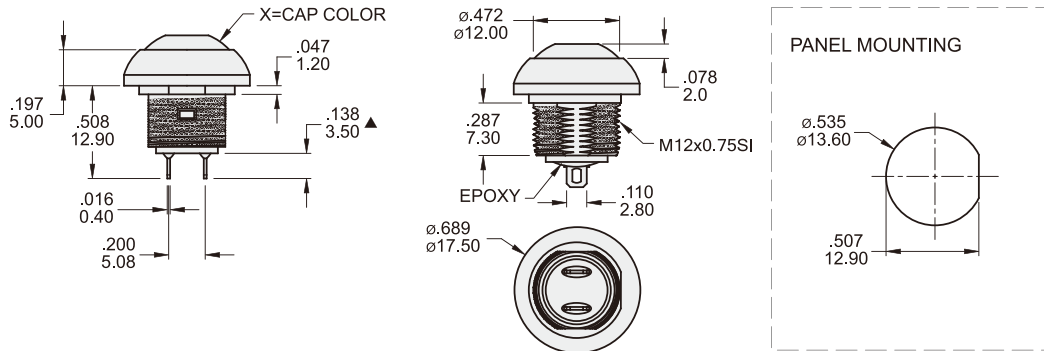
**ZPAS6B1M1CESX-5**



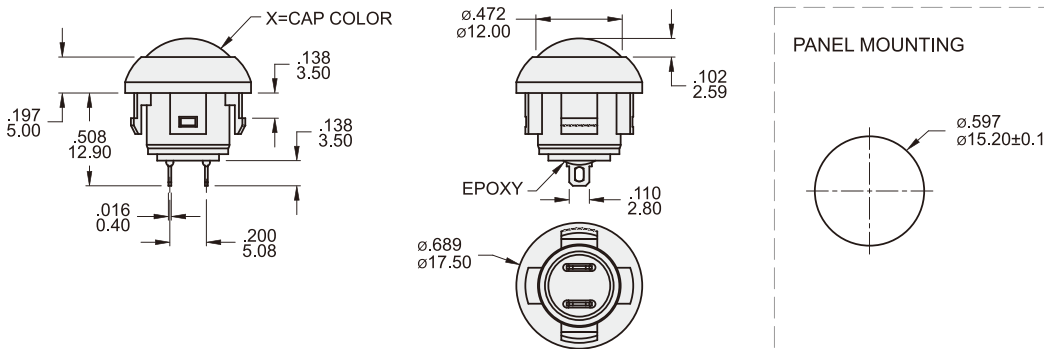
**ZPAS7B1M1CESX-5**



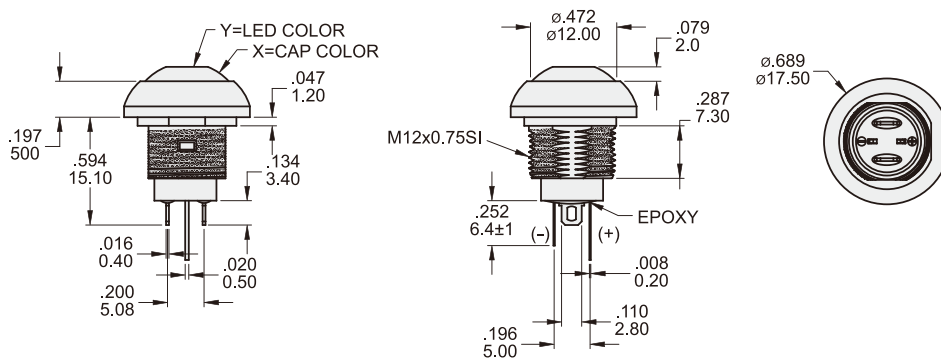
**ZPAS6B2M1CESX-5**



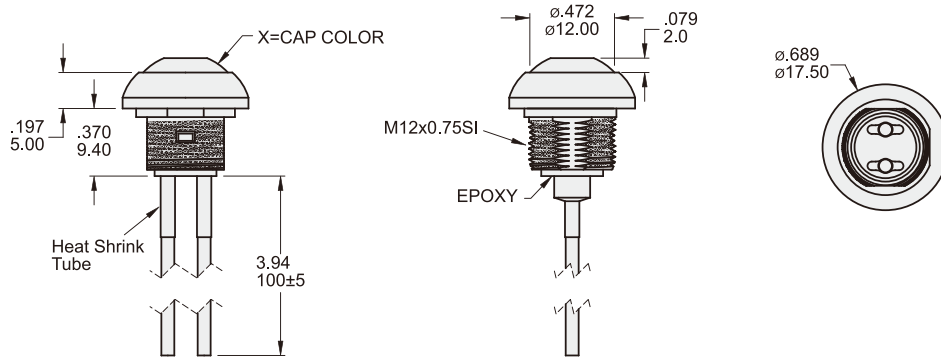
**ZPAS6B3M1CESAX-5**



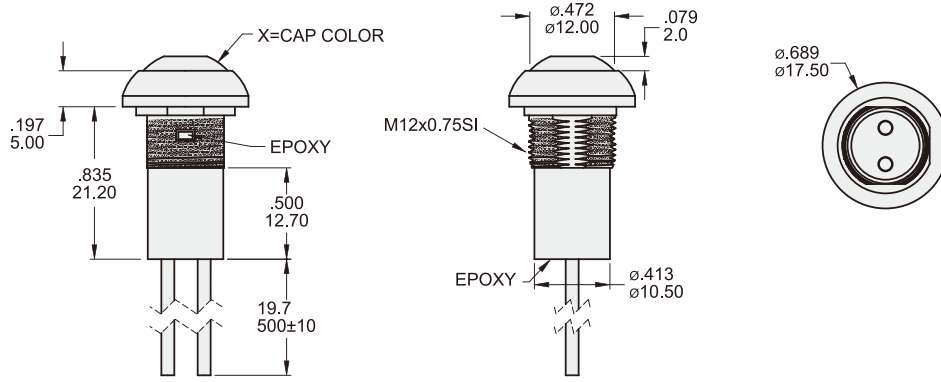
**ZPAS6B2M1CESX-5LY**



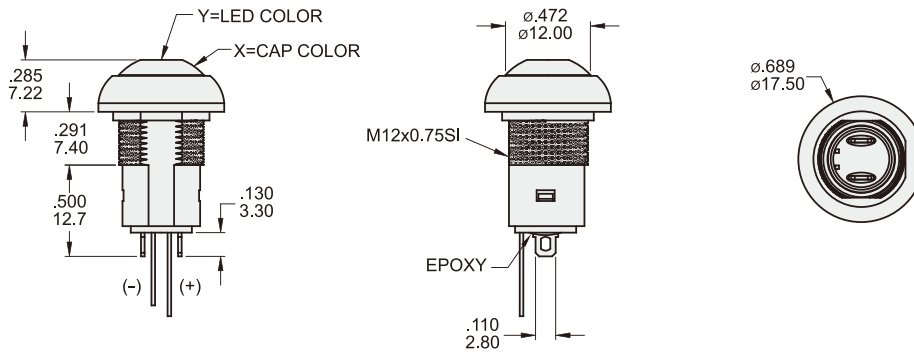
**ZPAS6B2L3CESX-5**



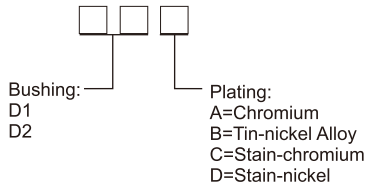
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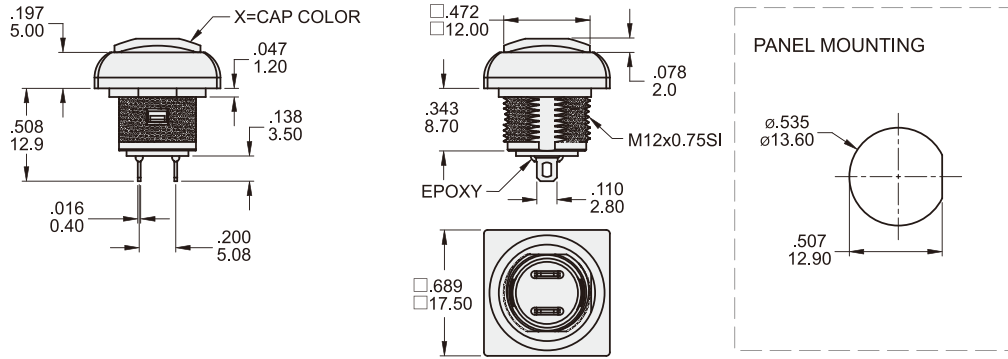
**ZPAL6B2M1CESX-5LY**



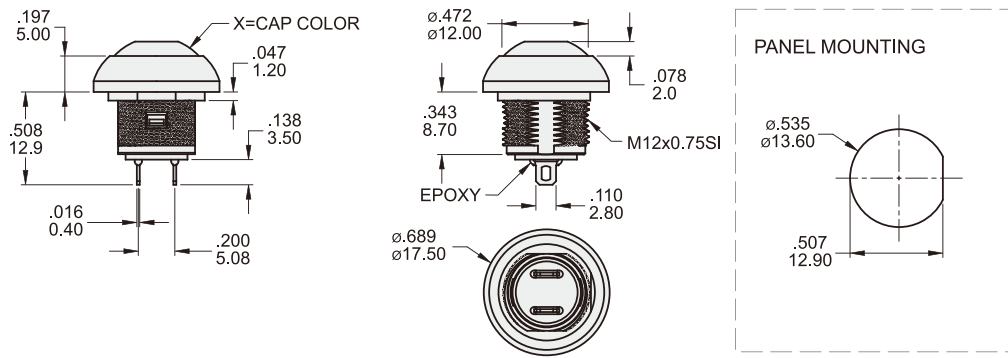
**SWITCH FUNCTION**



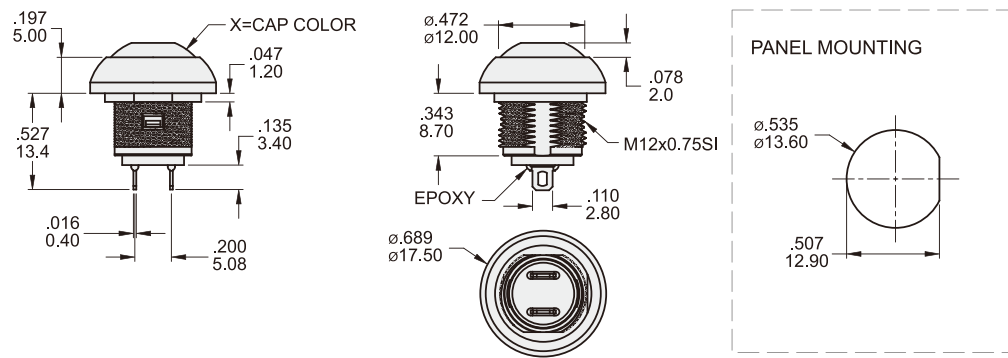
**ZPAS6D1M1CESX-5**



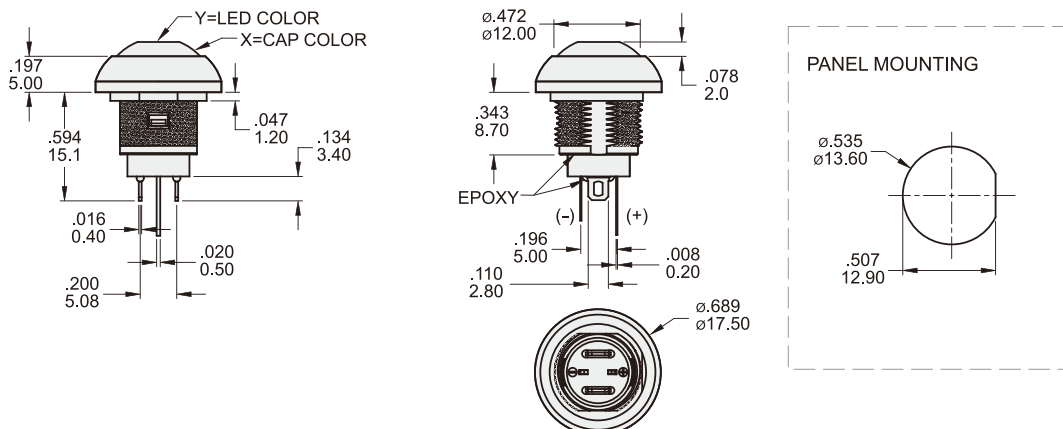
**ZPAS6D2M1CESX-5**



**ZPAS7D2M1CESX-5**



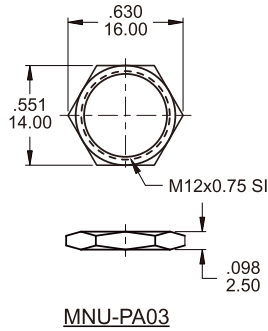
**ZPAS6D2M1CESX-5LY**



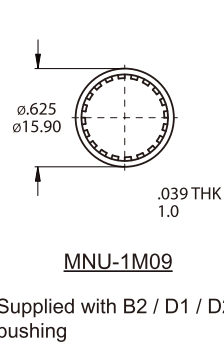


**HARDWARE**

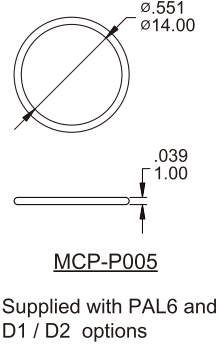
M12 NUT



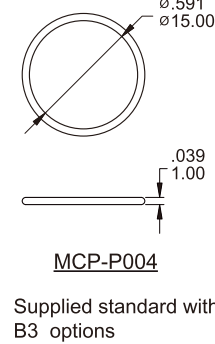
LOCK WASHER



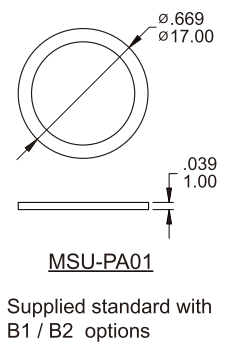
O-RING



O-RING



EVA WASHER



**WITH LED ELECTRO-OPTICAL DATA**

\* The LED specification for reference only

Model No.	Lens Appearance	Color	Electro-optical Data (AT 20mA)				Peak Wavelength	Viewing Angle 2C 1/2 (deg)	
			Vf (V)		Iv (mcd)				
			Typ.	Max.	Typ.	Min.			
PAS6 & PAS7	Water Clear	Super White	2.8	3.3	200	100	X / Y=0.27	35°	
		Super Red	2.0	2.5	700	200	645		
		Yellow	2.1	2.6	100	55	589		
		Green	2.2	2.7	130	70	565		
		Super Blue	3.1	3.6	580	250	460		
		Super Yellow ( Super Green )	Y	2	2.6	475	210		590
			G	2	2.6	210	140		570
		Super Yellow ( Super Blue )	Y	2.1	2.6	200	94		590
			B	3.2	3.6	200	94		460
		Super Yellow ( Super Red )	Y	2.1	2.6	100	63		590
			R	2	2.6	90	42		630
		Super Red ( Super Green )	R	2	2.6	90	42		630
			G	2.0	2.6	90	42		570
		Super Red ( Super Blue )	R	2	2.6	90	42		630
	B	3.2	3.6	200	94	460			
PAL6	Water Clear	White	3.3	4	250	50	X=0.31 Y=0.31	90°	
		Super Red	1.95	2.5	350	70	635		
		Super Yellow	2	2.5	160	70	590		
		Super Green	2.1	2.5	70	18	570		
		Super Blue	3.3	4	150	36	470		
		Super Yellow ( Super Green )	Y	2	2.5	170	50	590	170°
			G	2.1	2.5	50	18	570	
		Super Yellow ( Super Red )	Y	1.95	2.5	220	70	630	
			R	2	2.5	170	50	590	
		Super Red ( Super Green )	R	1.95	2.5	220	70	630	
	G	2.1	2.5	50	18	570			

**SOLDERING PROCESSES**

MANUAL SOLDERING: Use soldering iron of 30 watts, controlled at 350°C approximately 5 seconds while applying solder.

WAVE SOLDERING:

Recommended Soldering Temperature: 260 ± 5°C

Duration of Solder Immersion: Max 5 sec.

(PCB is 1.6mm in thickness)

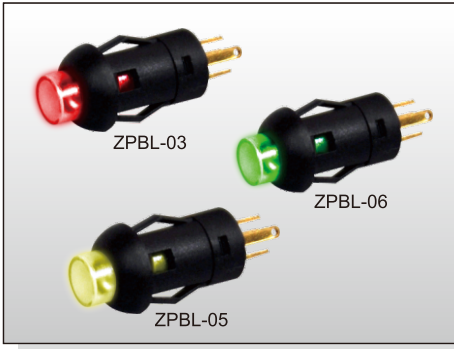
IP 67 for the whole series:  
Protected against the effects of immersion up to 1 m water(30mn)

# ILLUMINATED SWITCH ZPBL SERIES

## Pushbutton Switches Illuminated



ILLUMINATED SWITCH



### FEATURES

- ✘ Small size
- ✘ Long electrical life
- ✘ High brightness LED. Button surface are illuminated and even

### APPLICATION

- ✘ Automotive industry
- ✘ Office appliance
- ✘ Computer products
- ✘ Communication equipments
- ✘ Audio equipment

### SPECIFICATION

Contact Rating	0.1A, 30V DC
Contact Resistance	50mΩ max. 1.5V DC; 100mA, by Method of Voltage DROP
Insulation Resistance	100MΩ min. 500V DC
Dielectric Strength	500V AC/1 minute
Operating Force	250±100gf
Travel	1.2mm
Operating Life	50,000 cycles
Operating Temp.	-40°C ~ +85°C

### HOW TO ORDER

Z P B L -

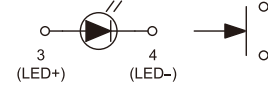
Led Color:  
01=White  
03=Red  
05=Yellow  
06=Green  
07=Blue  
76=Blue(Green)

### WITH LED ELECTRO-OPTICAL DATA

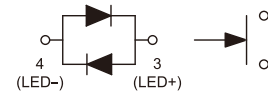
Lens Appearance	Color	Electro-optical Data(AT 20mA)				Peak Wavelength	Viewing Angle 2Θ 1/2(deg)
		Vf(V)		Iv(mcd)			
		Typ.	Max.	Typ.	Min.		
Water Clear	White	3.3	4	1500	900	X/Y=0.31	45°
	Red	1.95	2.5	1300	700	630	
	Yellow	2.1	2.5	25	12	588	
	Green	2.1	2.5	300	100	570	
	Blue	3.3	4	1300	700	470	
	Blue(Green)	B	3.3	4	160	80	470
	G	2.1	2.5	80	30	570	

### CIRCUIT

#### Single LED



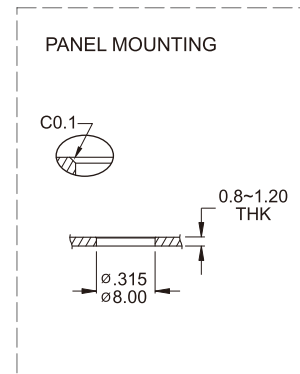
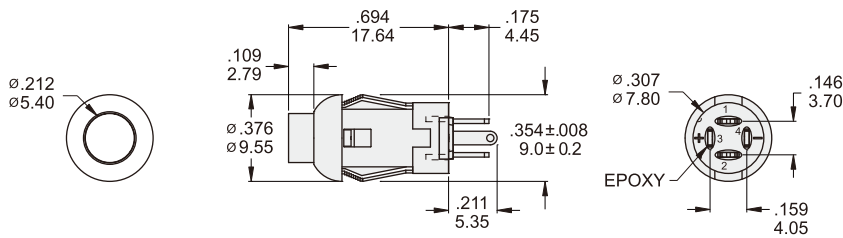
#### Dual Colors LED



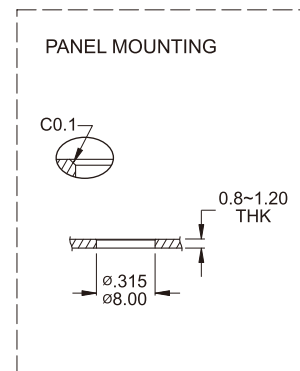
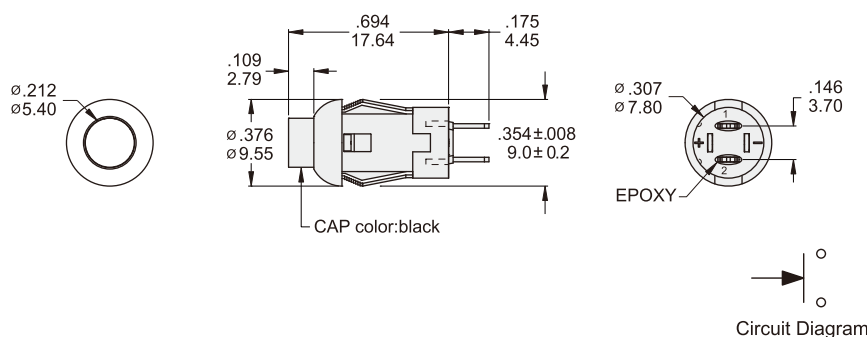
### PACKAGE

<Bag>  
100 pcs.

### ZPBL-XX

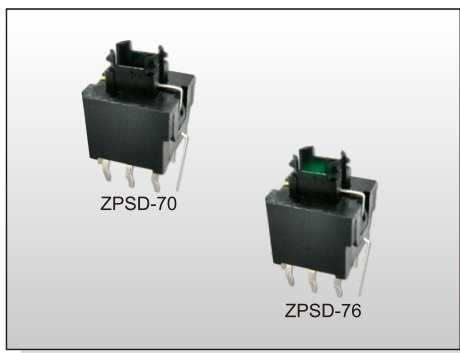


### ZPBL-A2



# ILLUMINATED SWITCH ZPSD SERIES

## Pushbutton Switches Illuminated



### FEATURES

- ✘ Small size
- ✘ Long electrical life

### APPLICATION

- ✘ Audio equipment
- ✘ Consumer products
- ✘ Instrumentation

### SPECIFICATION

Contact Rating	0.1A, 30V DC MAX 100mA, 1.5V DC MIN
Contact Resistance	50mΩ max.
Insulation Resistance	100MΩ min.
Dielectric Strength	500V AC/1 minute
Operating Force	250±100gf
Travel	1mm (Contact Travel) 1.5mm (Full Travel)
Operating Life	50,000 cycles
Operating Temp.	-20°C ~ +70°C

### HOW TO ORDER

Z P S D - [ ] - [ ] + C A P

Function:  
7=On-Mom

Led Color:  
0=Without LED 3=Red  
5=Yellow 6=Green  
7=Blue

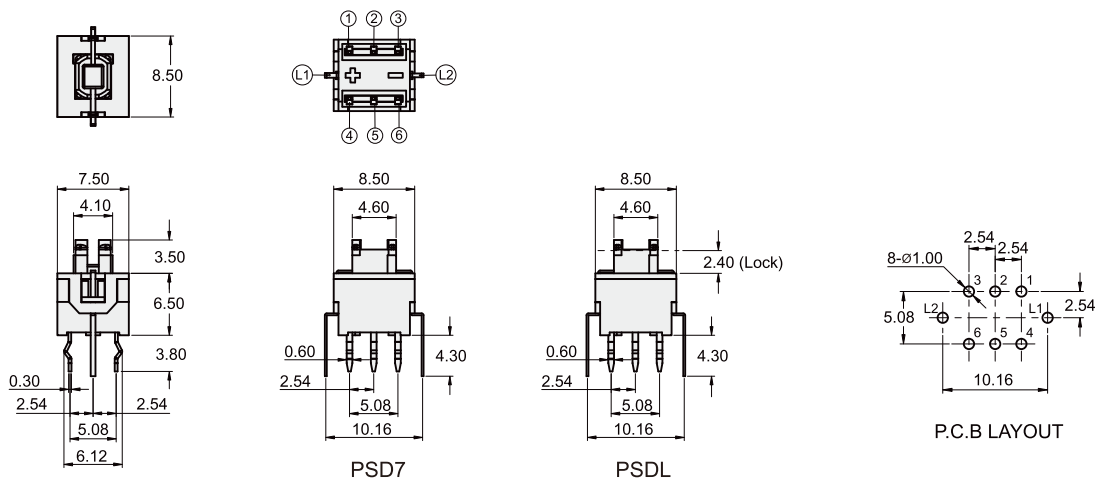
CAP OPTION				
DIMENSION	 7.4	 7.4	 7.4 6.0 7.1	 7.4 6.0 7.1
Transparent with Diffuser	YCA044TD	YCA043TD	—	—
Transparent	YCA044T	YCA043T	—	—
Ice	—	—	YCA045A	YCA046A
Snow	—	—	YCA045B	YCA046B
Transparent Black	—	—	YCA045C	YCA046C
White	YCA0444	YCA0434	—	—

### CIRCUIT

Type	Switch Action	
ZPSD7	Normal ON	Push(ON)
ZPSDL	Normal ON	LOCK(ON)
Connected Terminals	1-2 4-5	2-3 5-6
LED Circuit	L1 → L2	

### PACKAGE

<Tray>  
96 pcs.



### WITH LED ELECTRO-OPTICAL DATA

Lens Appearance	Color	Electro-optical Data(AT 20mA)				Peak wavelength	Viewing Angle 2C 1/2 (deg)
		Vf (V)		Iv (mcd)			
		Typ.	Max.	Min.	Typ.		
Water Clear	Red	1.95	2.5	80	200	630	140°
	Yellow	2	2.5	300	400	590	140°
	Green	3.3	4.1	400	500	525	140°
	Blue	3.3	4	80	190	470	140°

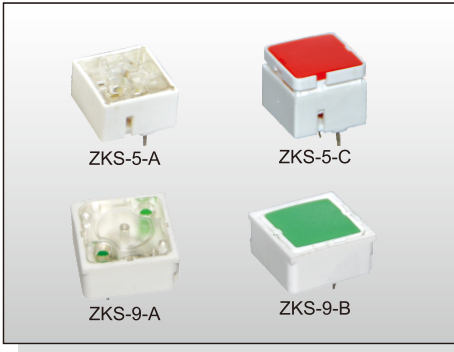
\* The LED specification for reference only

# ILLUMINATED SWITCH ZKS SERIES

## Key Switches Illuminated



ILLUMINATED SWITCH



### FEATURES

- ✧ Several color caps are available
- ✧ High reliability contact · clear switching feedback
- ✧ High brightness LED. Button surface are illuminated and even

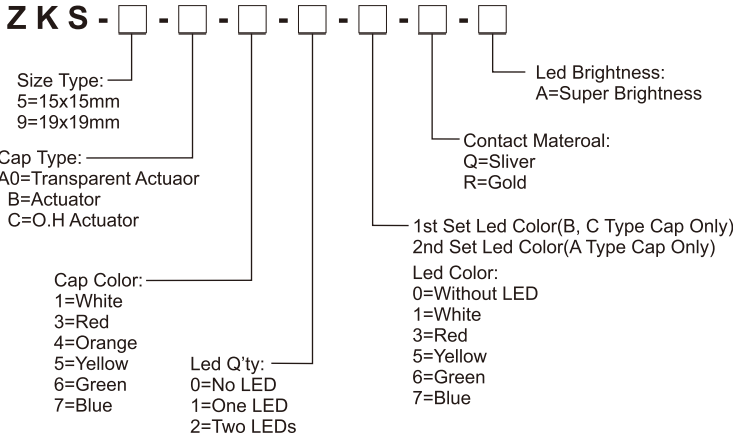
### APPLICATION

- ✧ Medical equipment (Medical Bed)
- ✧ Lighting
- ✧ Instrument panel
- ✧ Operating machine panel
- ✧ Audio control panel, NC panel

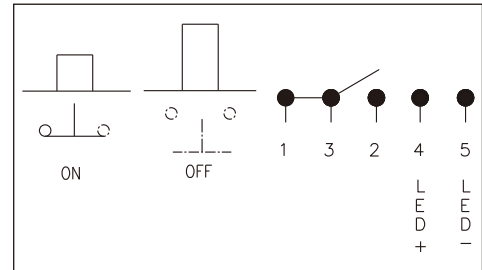
### SPECIFICATION

Contact Rating	100mA max, 42V AC/DC
Contact Resistance	100mΩ max. Initial
Insulation Resistance	1000MΩ min.
Dielectric Strength	1,000V AC
Operating Force	3±0.75N
Travel	0.6mm
Operating Life	1,000, 000 cycles
Operating Temp.	-25°C ~ +75°C

### HOW TO ORDER



### CIRCUIT



### PACKAGE

<Tray>  
135 pcs.

### WITH LED ELECTRO-OPTICAL DATA

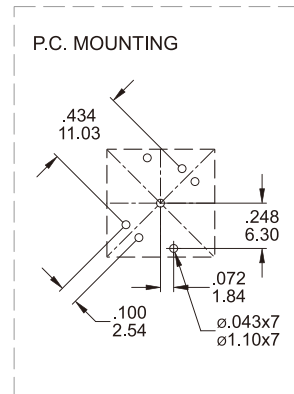
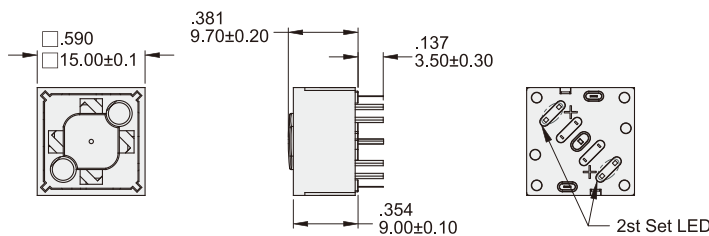
#### ■ 1st Set LED Color

Lens Appearance	Color	Electro-optical Data(AT 20mA)				Peak Wavelength	Viewing Angle 2θ 1/2(deg)
		Vf(V)		Iv(mcd)			
		Typ.	Max.	Typ.	Min.		
Water Clear	White	3.2	3.7	270	160	635	150°
	Red	2	2.5	95	50		
	Yellow	2	2.5	150	80		
	Green	2	2.5	45	25		
	Blue	3.1	3.6	50	20		

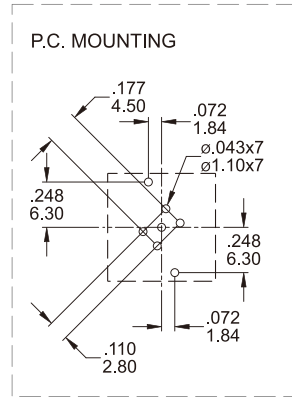
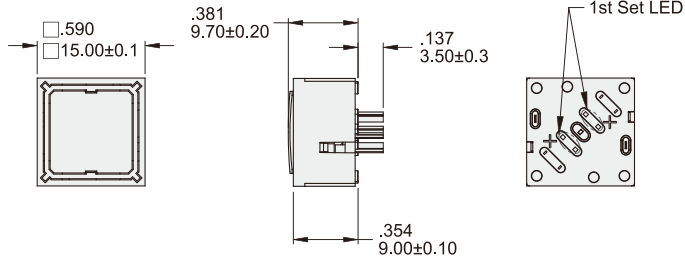
#### ■ 2nd Set LED Color

Lens Appearance	Color	Electro-optical Data(AT 20mA)				Peak Wavelength	Viewing Angle 2θ 1/2(deg)
		Vf(V)		Iv(mcd)			
		Typ.	Max.	Typ.	Min.		
Water Diffused	Cool White	3.3	4	3300	2200	630	45°
Red Diffused	Super Bright Red	2.05	2.6	850	460	630	45°
Yellow Diffused	Super Bright Yellow	2	2.6	500	220	590	40°
Green Diffused	Green	2	2.6	150	63	575	40°
Blue Diffused	Super Bright Blue	3.5	3.8	1300	690	468	45°

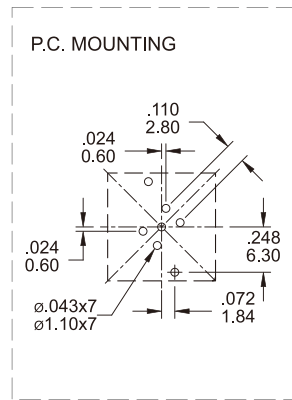
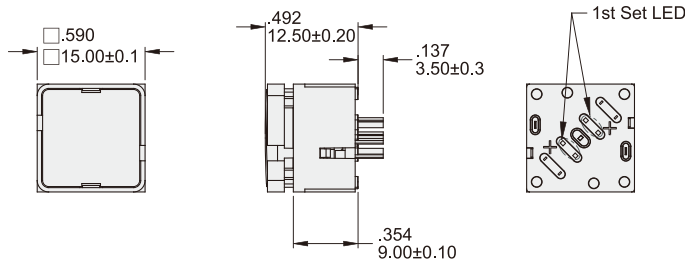
### ZKS5A



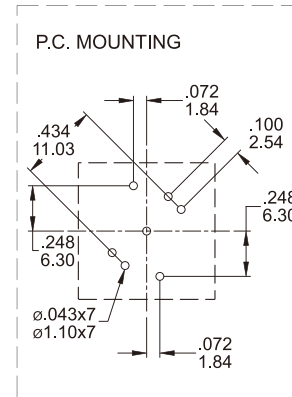
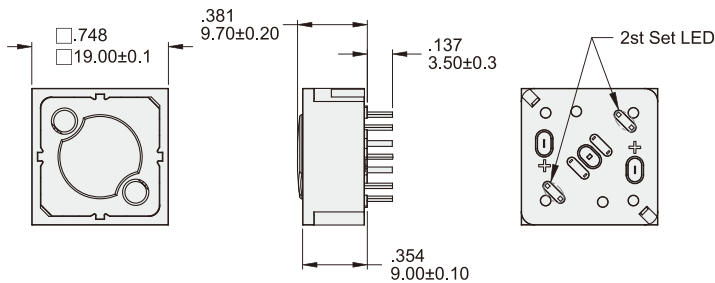
**ZKS5B**



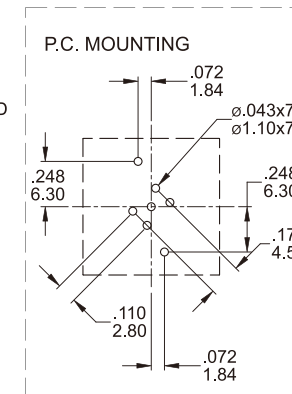
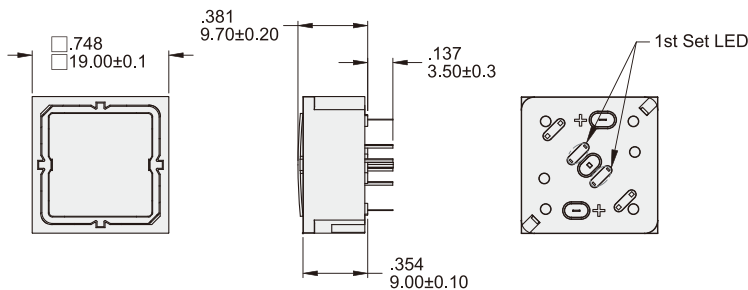
**ZKS5C**



**ZKS9A**



**ZKS9B**



ILLUMINATED SWITCH