

# General Specifications

## Electrical Capacity (Resistive Load)

**Power Level (silver):** 6A @ 125V AC or 3A @ 250V AC or 6A @ 12V DC for silver  
**Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum for gold  
 (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)  
 Note: See Supplement Index for explanation of operating range.

## Other Ratings

**Contact Resistance:** 10 milliohms maximum for silver; 20 milliohms maximum for gold  
**Insulation Resistance:** 1,000 megohms minimum @ 500V DC  
**Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum;  
 1,500V AC minimum between contacts & case for 1 minute minimum  
**Mechanical Life:** 50,000 operations minimum  
**Electrical Life:** 25,000 operations minimum for silver; 50,000 operations minimum for gold  
**Static Capability:** Withstands 20 kilovolts ESD minimum  
**Nominal Operating Force:** 1.9N for .689" (17.5mm) toggle; 2.5N for .433" (11.0mm) toggle  
**Angle of Throw:** 25°

## Materials & Finishes

**Toggle:** Polycarbonate  
**Housing:** Glass fiber reinforced polyamide  
**Sealing Ring:** Nitrile butadiene rubber  
**Base:** Diallyl phthalate (UL94V-0)  
**Movable Contactor:** Phosphor bronze with silver or gold plating  
**Movable Contacts:** Silver alloy or copper with gold plating  
**Stationary Contact:** Silver plus copper with silver plating or copper with gold plating  
**Lamp Contacts:** Beryllium copper with silver plating  
**Power Terminals:** Copper with silver or gold plating  
**Lamp Terminals:** Brass with silver plating

## Environmental Data

**Operating Temperature Range:** -10°C through +55°C (+14°F through +131°F)  
**Humidity:** 90 ~ 95% humidity for 240 hours @ 40°C (104°F)  
**Vibration:** 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 1.75 hours  
**Shock:** 50G (490m/s<sup>2</sup>) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

## Installation

**Mounting Torque:** .98Nm (8.67 lb•in) maximum  
**Soldering Time & Temperature:** Manual Soldering: See Profile B in Supplement section.

## Standards & Certifications

**Flammability Standards:** UL94V-0 base

# Distinctive Characteristics

Choice of long or short toggles in translucent colors combine with bright LEDs available in red, amber, and green, plus super bright LEDs available in white, green, and blue.

Black face nut enhances front panel appearance.

Antistatic material used for toggle withstands 20 kilovolts electrostatic discharge.

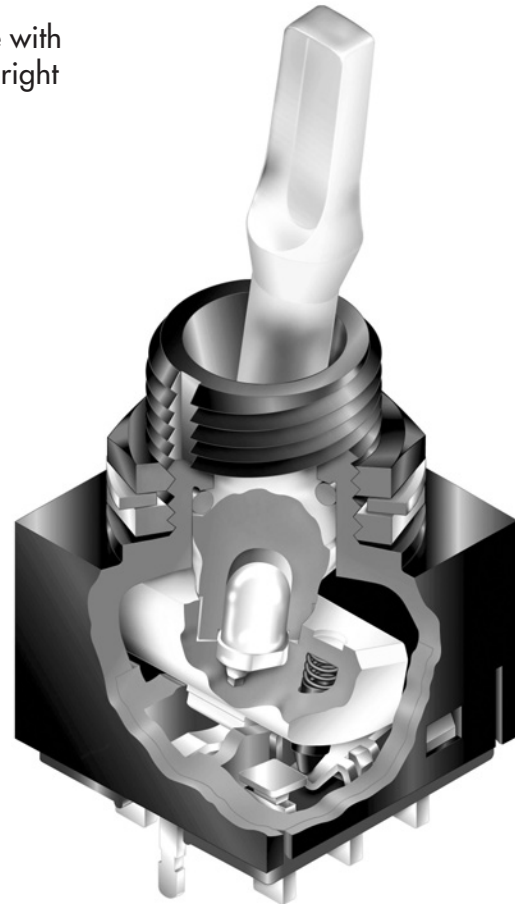
Panel seal, achieved with use of optional exterior o-ring, conforms to IP65 of IEC60529 Standards.

Interior o-ring protects contacts from oil, dust, water, and other contaminants.

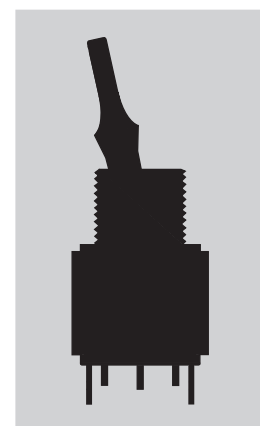
UL94V-0 flammability rated for base.

High insulating barriers protect against crossover.

Terminals are molded in and epoxy sealed to lock out flux, dust, and other contaminants.



Actual Size



A  
Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

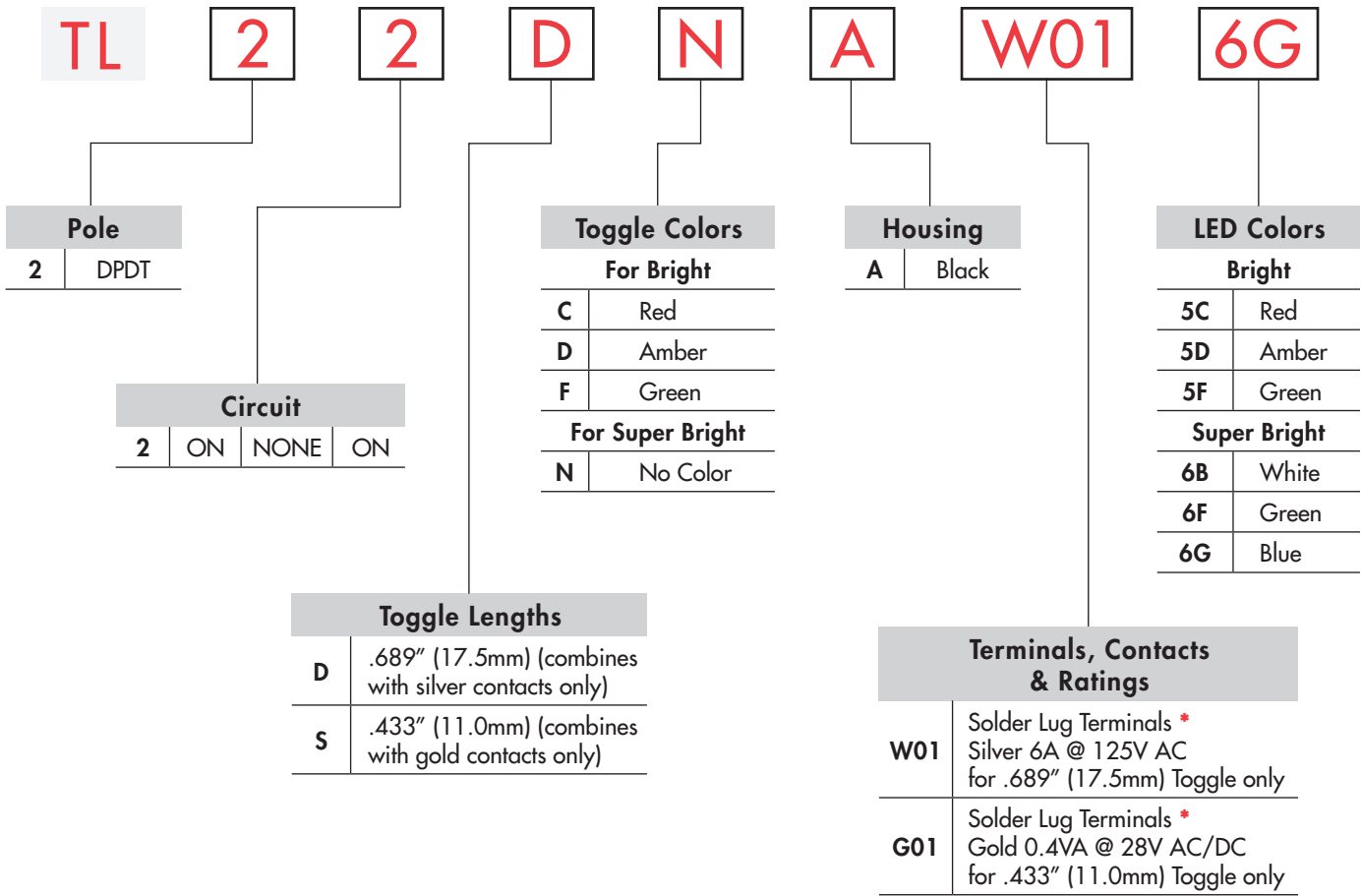
Touch

Indicators

Accessories

Supplement

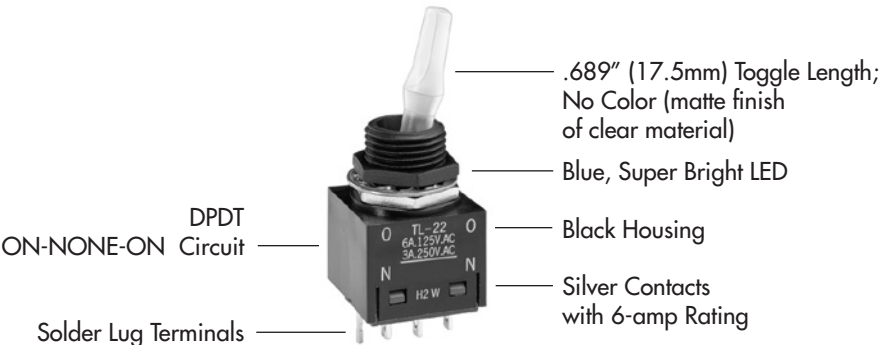
TYPICAL SWITCH ORDERING EXAMPLE



\* Wire harness & cable assemblies offered only in Americas

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

TL22DNAW016G



## POLE &amp; CIRCUIT

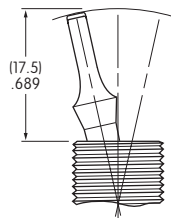
| Pole | Model | Toggle Position                                                                           |        |                                                                                         | Connected Terminals                                                                       |        |                                                                                         | Throw & Power/Lamp Schematics                                                                                                                                                                              |
|------|-------|-------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |       | Down<br> | Center | Up<br> | Down<br> | Center | Up<br> |                                                                                                                                                                                                            |
| DP   | TL22  | ON                                                                                        | NONE   | ON                                                                                      | 1-1b 2-2b                                                                                 | OPEN   | 1-1a 2-2a                                                                               | Notes: Terminal numbers are not actually on switch. Lamp circuit is isolated and requires an external power source.<br> |

## TOGGLE LENGTHS &amp; COLORS

**D** .689"  
(17.5mm)

Combines with  
Silver Contacts only

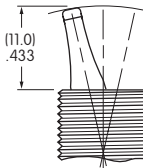
Material:  
Polycarbonate



**S** .433"  
(11.0mm)

Combines with  
Gold Contacts only

Material:  
Polycarbonate



## Colors Available for Bright LED

**C** Red **D** Amber **F** Green

## Color Available for Super Bright LED

**N** No Color (Appearance is matte finish of clear material)

## HOUSING

**A** Black

The housing consists of the one-piece bushing/case of glass fiber reinforced polyamide in black color only.

The diallyl phthalate material used for the base is UL flammability rated 94V-0; housing material is not.

## CONTACT MATERIALS, RATINGS, &amp; TERMINALS

**W**

**Silver Contacts** Power Level  
6A @ 125V AC & 3A @ 250V AC  
& 6A @ 12V DC

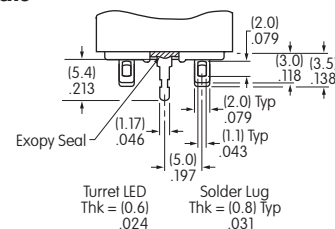
**G**

**Gold Contacts** Logic Level  
0.4VA maximum @ 28V AC/DC

See Supplement Index for complete explanation of operating range.

**01**

**Solder Lug  
Terminals**



## LED CODES &amp; SPECIFICATIONS

Electrical specifications are determined at a basic temperature of 25°C. Lamp circuit is independent of switch operation.

If the source voltage is greater than rated voltage, a ballast resistor is required.

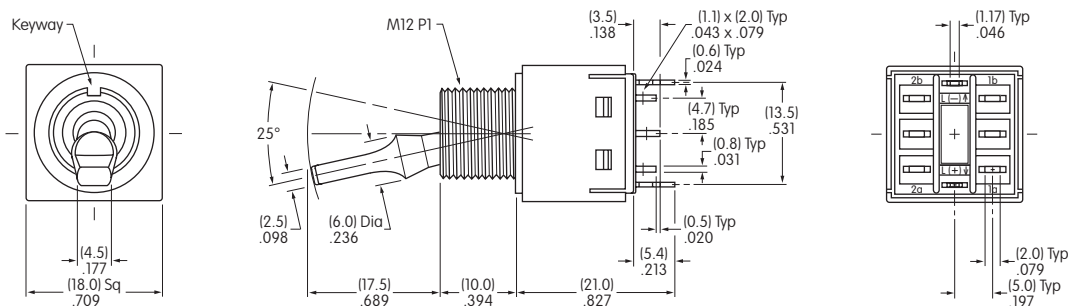
The ballast resistor calculation and more lamp detail are shown in Supplement section.

| Super Bright LEDs are Electrostatic Sensitive            | Color        | Colored Toggles |                |                | Clear Toggles         |                |               |
|----------------------------------------------------------|--------------|-----------------|----------------|----------------|-----------------------|----------------|---------------|
|                                                          |              | <b>5</b> Bright |                |                | <b>6</b> Super Bright |                |               |
|                                                          |              | <b>C</b> Red    | <b>D</b> Amber | <b>F</b> Green | <b>B</b> White        | <b>F</b> Green | <b>G</b> Blue |
| LED Factory Assembled<br><b>Not Available Separately</b> |              |                 |                |                |                       |                |               |
| Forward Peak Current                                     | $I_{FM}$     | 30mA            | 30mA           | 50mA           | 30mA                  | 30mA           | 30mA          |
| Typical Forward Current                                  | $I_F$        | 20mA            | 20mA           | 20mA           | 20mA                  | 20mA           | 20mA          |
| Forward Voltage                                          | $V_F$        | 2.0V            | 2.1V           | 2.27V          | 3.6V                  | 3.5V           | 3.6V          |
| Reverse Peak Voltage                                     | $V_{RM}$     | 4V              | 4V             | 4V             | 5V                    | 5V             | 5V            |
| Current Reduction Rate Above 25°C                        | $\Delta I_F$ | 0.32mA/°C       | 0.32mA/°C      | 0.50mA/°C      | 0.50mA/°C             | 0.50mA/°C      | 0.50mA/°C     |
| Ambient Temperature Range                                |              | -10°C ~ +55°C   |                |                | -10°C ~ +55°C         |                |               |



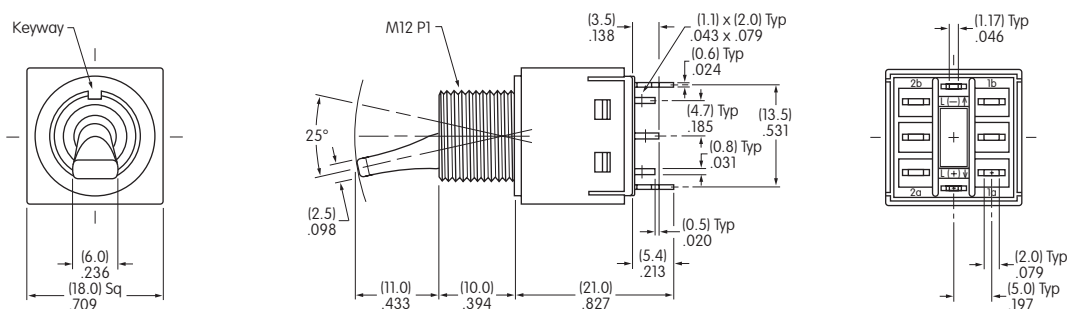
## TYPICAL SWITCH DIMENSIONS

### 17.5mm Toggle



TL22DNAW016G

### 11.0mm Toggle

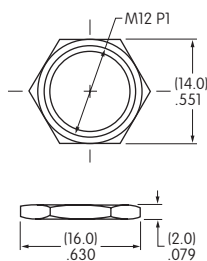


TL22SCAG015C

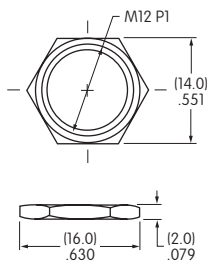
## STANDARD HARDWARE

## OPTIONAL HARDWARE

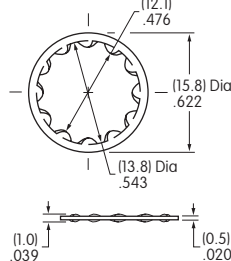
**AT527MA Black Hex Nut**  
Use as Face Nut  
Chrome/Steel



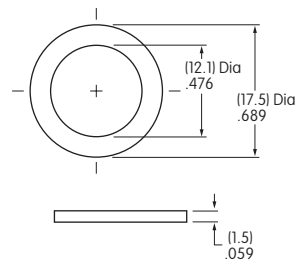
**AT527M Hex Nut**  
Use as Backup Nut  
Nickel/Steel



**AT508 Lockwasher**  
Not to use with Panel Seal  
Steel with Chromate/Zinc



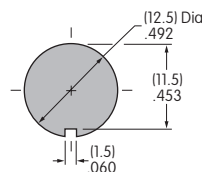
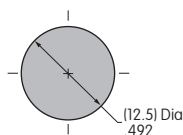
**AT401P O-ring**  
Use for Panel Seal  
Nitrile butadiene rubber



Hardware details in Accessories & Hardware section.

## Panel Cutouts

Maximum Panel Thickness  
with Standard Hardware  
.157" (4.0mm)



Maximum Panel Thickness  
with Standard Hardware  
& AT401P O-ring  
.236" (6.0mm)



## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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