



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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General Specifications

Electrical Capacity (Resistive Load)

Logic Level: 0.4VA maximum @ 48V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 48V)
Note: Find additional explanation of operating range in Supplement section.

Other Ratings

Contact Resistance: 50 milliohms maximum
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: 100,000 operations minimum for bat lever models
50,000 operations minimum for locking lever models
Electrical Life: 50,000 operations minimum
Contact Timing: Nonshorting (break-before-make)
Angle of Throw: 24°

Materials & Finishes

Toggle/Lever: Brass with chrome plating
Bushing: Brass with nickel plating
Support Bracket: Straight PC: phosphor bronze with tin plating; right angle & vertical: brass with tin plating
Housing: Polybutylene terephthalate (PBT) (UL94V-0)
Base: 1- and 2-pole GFR polyamide (UL94V-0); 4-pole liquid crystal polymer (LCP) (UL94V-0)
Movable Contacts: Phosphor bronze with gold plating
Stationary Contacts: Brass with gold plating
Terminals: Brass with gold plating

Environmental Data

Operating Temp Range: -10°C through +70°C (+14°F through +158°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 2 hours
Shock: 50G (490m/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering recommended. See Profile A in Supplement section.
Manual Soldering: 1- & 2-pole: 3 seconds maximum @ 350°C maximum;
4-pole: 4 seconds maximum @ 410°C maximum
Cleaning: Hand clean locally using alcohol based solution.
See Cleaning specifications in Supplement section.

Standards & Certifications

Flammability Standards: UL94V-0 rated housing & base
The D2 Series toggles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-current, logic level circuit.
When used as intended in a logic level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Base of heat resistant resin meets UL94V-0 flammability rating.

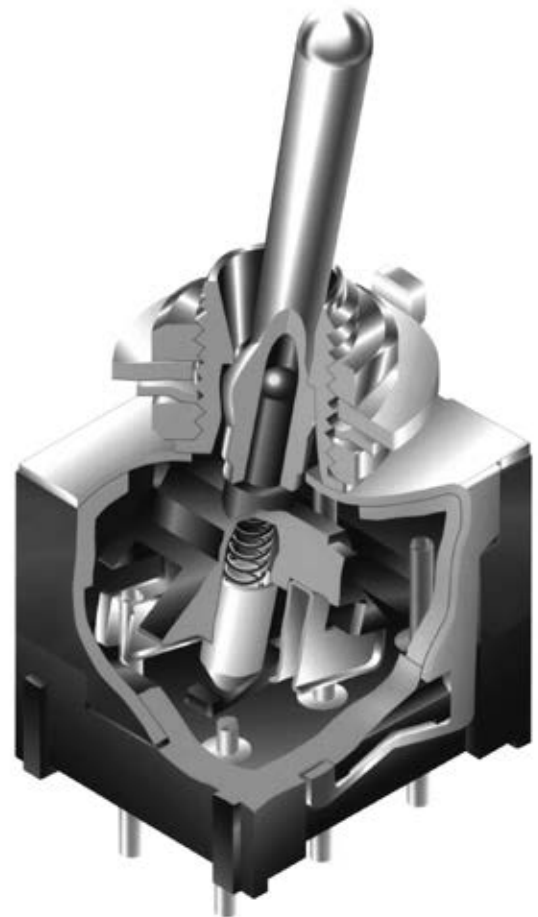
Maximized voltage capability of 48V allows use in medium source applications and increases operating life.

Award-winning STC contact mechanism with benefits unavailable in conventional mechanisms: smoother positive detent actuation, increased contact stability, and unparalleled reliability. (Additional STC details under Terms and Acronyms in the Supplement section.)

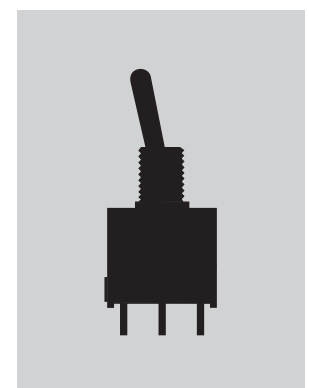
Round .031" (0.8mm) diameter PC terminals for easy PCB assembly.

Terminal spacing conforms to standard .100" (2.54mm) PC board grid spacing.

Molded-in terminals prevent entry of flux, solvents, and other contaminants.



Actual Size

A
Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

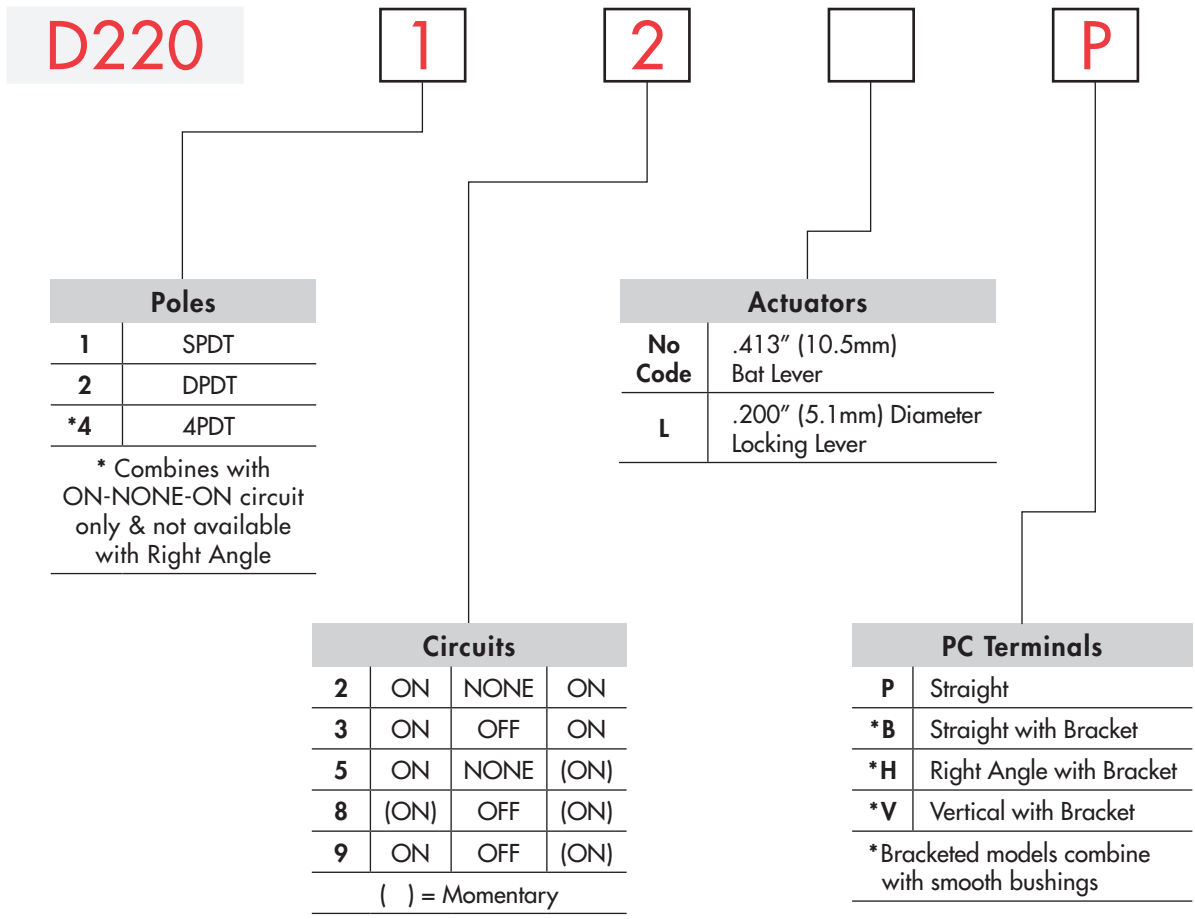
Touch

Indicators

Accessories

Supplement

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

D22012P

.413" (10.5mm)
Bat Lever



SPDT
ON-NONE-ON Circuit

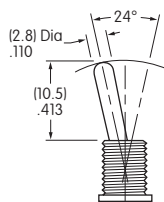
Straight PC Terminals

POLES & CIRCUITS								
Pole	Model	Toggle Position () = Momentary			Connected Terminals			Throw & Schematics
		Down <small>Keyway</small>	Center	Up	Down <small>Keyway</small>	Center	Up	
								Note: Terminal numbers are not actually on the switch.
SP	D22012 D22013 D22015 D22018 D22019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	SPDT
DP	D22022 D22023 D22025 D22028 D22029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT
4P	D22042	ON	NONE	ON	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	4PDT

ACTUATORS

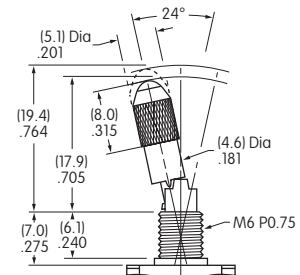
No Code .413" (10.5mm)
Bat Lever

Material:
Chrome over brass



L .413" (5.1mm) Diameter
Locking Lever

Material:
Chrome over brass



PC TERMINALS

P Straight



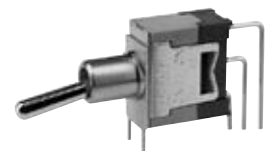
B Straight with Bracket



H Right Angle with Bracket



V Vertical with Bracket

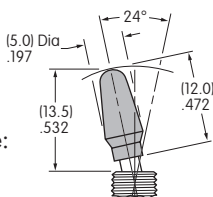


OPTIONAL CAPS & CAP COLORS

AT415
Bat Lever Cap

Material:
Polyethylene

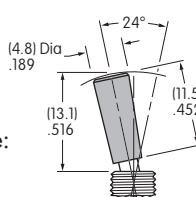
Colors Available:
A B C E F G



AT444 Bat Lever
Conical Cap

Material:
Polyethylene

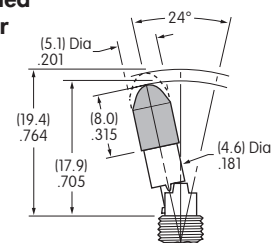
Colors Available:
A B C E F G



AT427 Cap Supplied
with Locking Lever

Material:
Anodized
Aluminum

Colors Available:
A C G



Colors Codes: A Black B White C Red E Yellow F Green G Blue

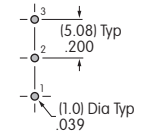
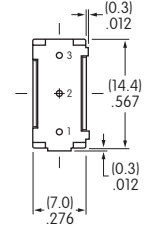
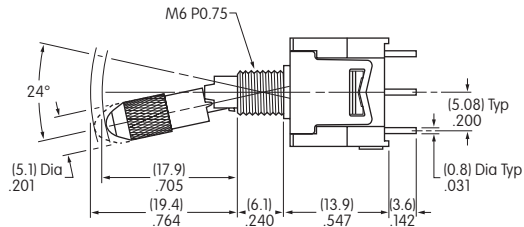
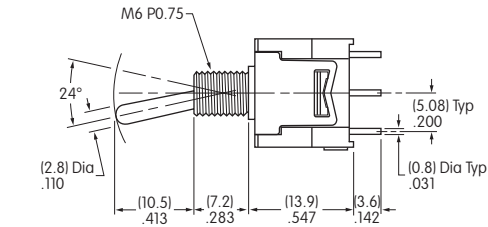
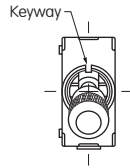
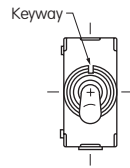
TYPICAL SWITCH DIMENSIONS

Straight PC • Single Pole



D22012P

D22012LP



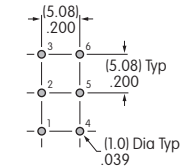
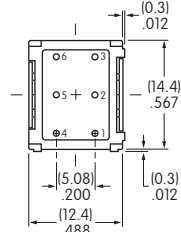
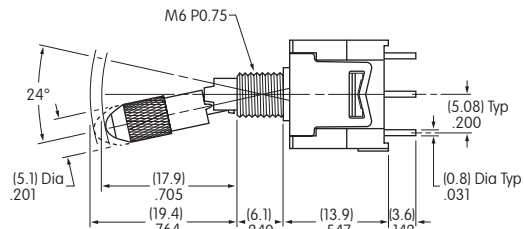
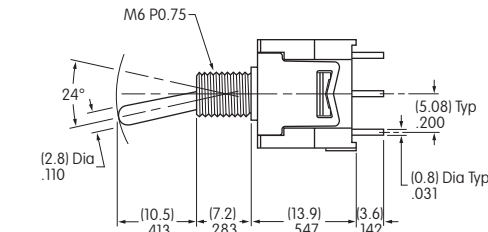
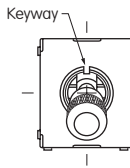
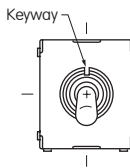
Actuator in Down Position

Straight PC • Double Pole



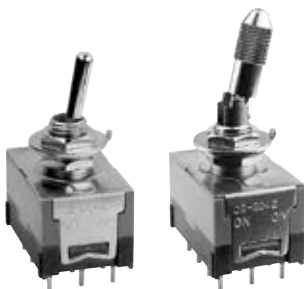
D22022P

D22022LP



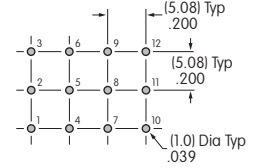
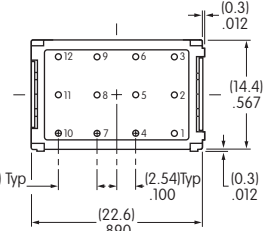
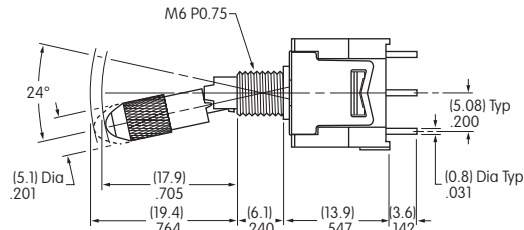
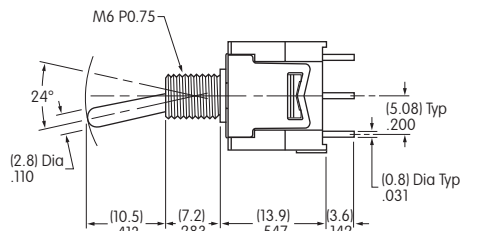
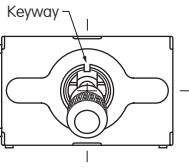
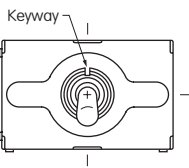
Actuator in Down Position

Straight PC • Four Pole



D22042P

D22042LP



Actuator in Down Position

Rockers

Pushbuttons

Programmable Illuminated PB

Keylocks

Rotaries

Slides

Tactiles

Tilt

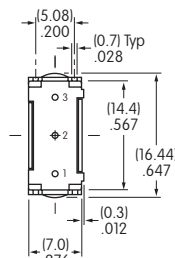
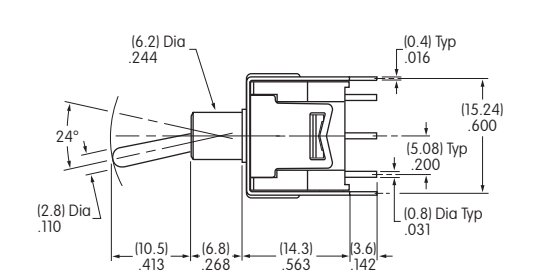
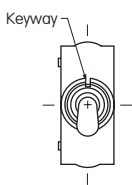
Touch

Indicators

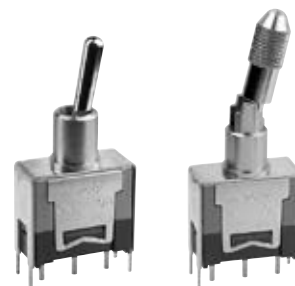
Accessories

Supplement

TYPICAL SWITCH DIMENSIONS

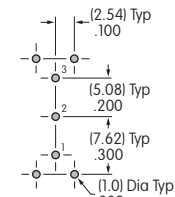
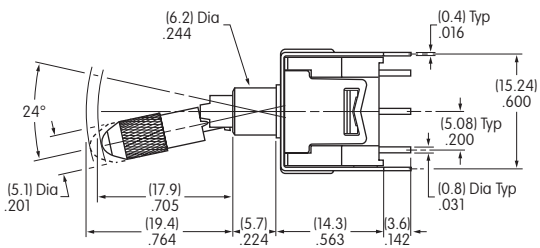
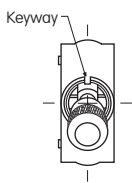


Straight PC • Bracket
Single Pole

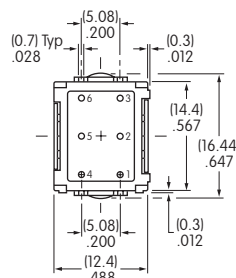
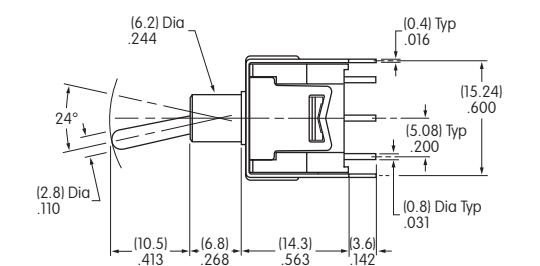
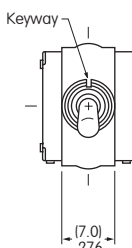


D22012B

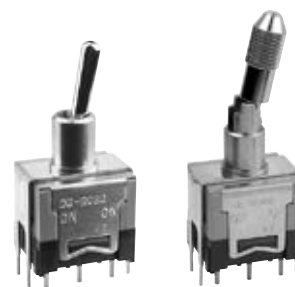
D22012LB



Actuator in Down Position

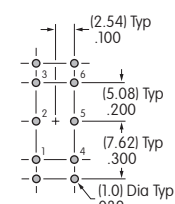
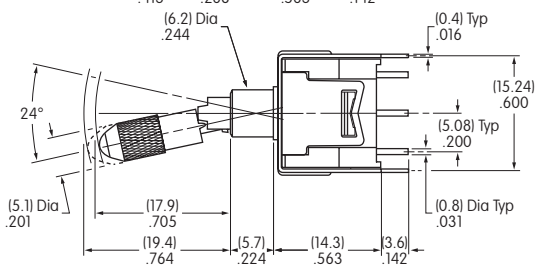
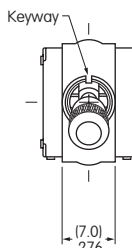


Straight PC • Bracket
Double Pole

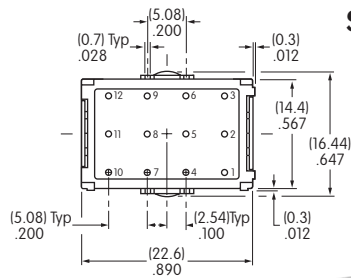
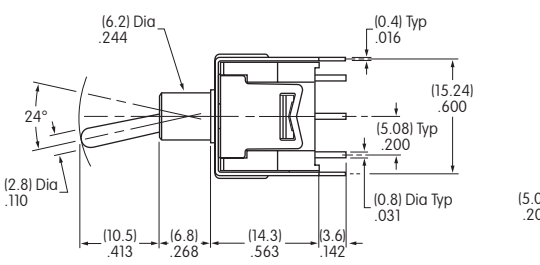
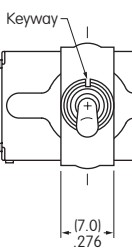


D22022B

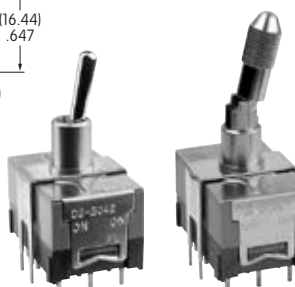
D22022LB



Actuator in Down Position

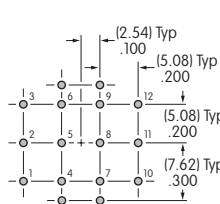
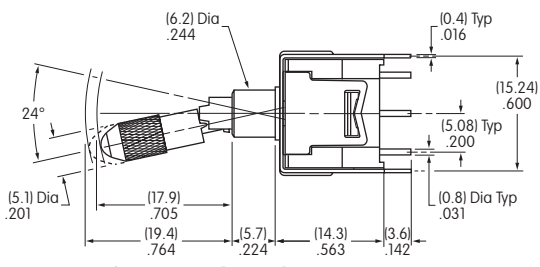
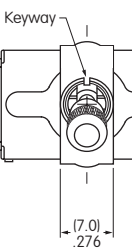


Straight PC • Bracket
Four Pole



D22042B

D22042LB



Actuator in Down Position

A Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

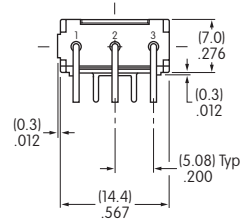
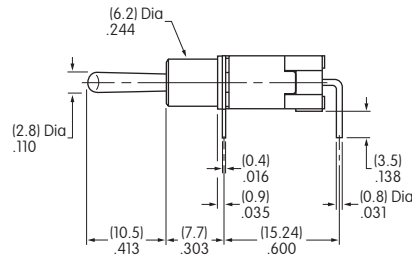
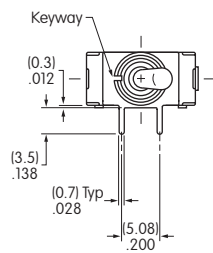
Supplement

TYPICAL SWITCH DIMENSIONS

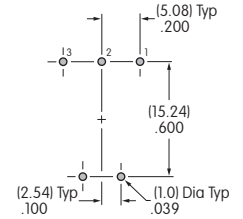
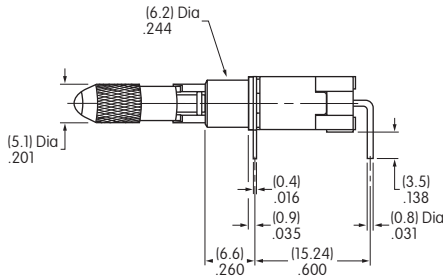
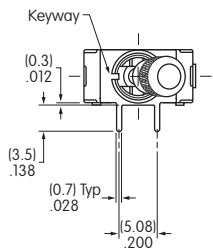
Right Angle PC • Single Pole



D22012H



D22012LH

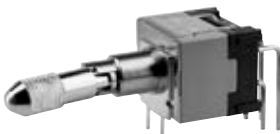
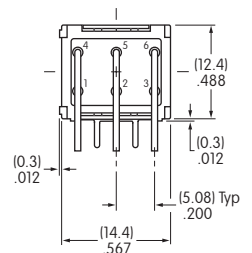
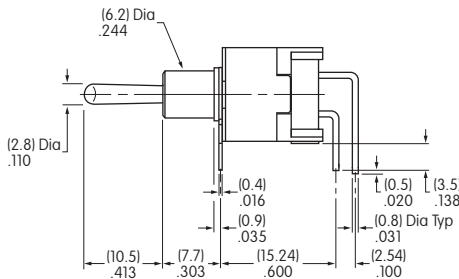
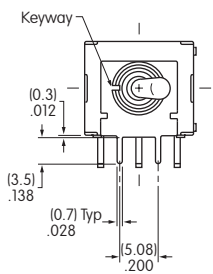


Actuator in Down Position

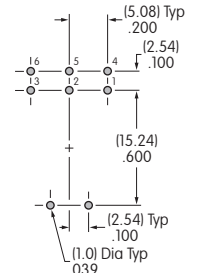
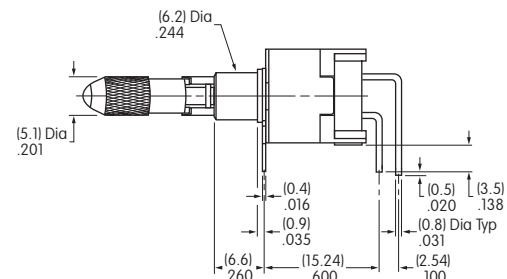
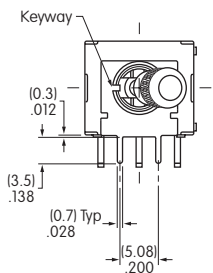
Right Angle PC • Double Pole



D22022H



D22022LH



Actuator in Down Position

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

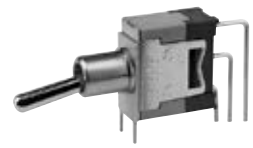
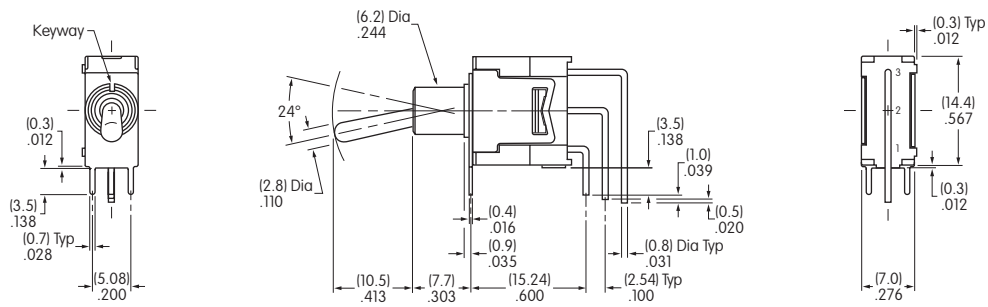
Accessories

Supplement

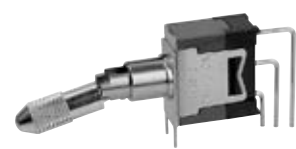
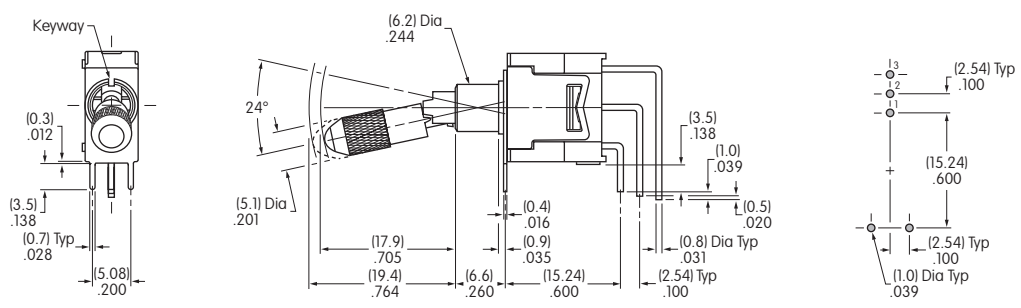
TYPICAL SWITCH DIMENSIONS

A
Toggles

Vertical PC • Single Pole



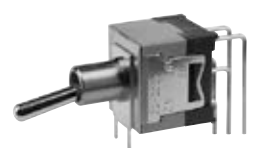
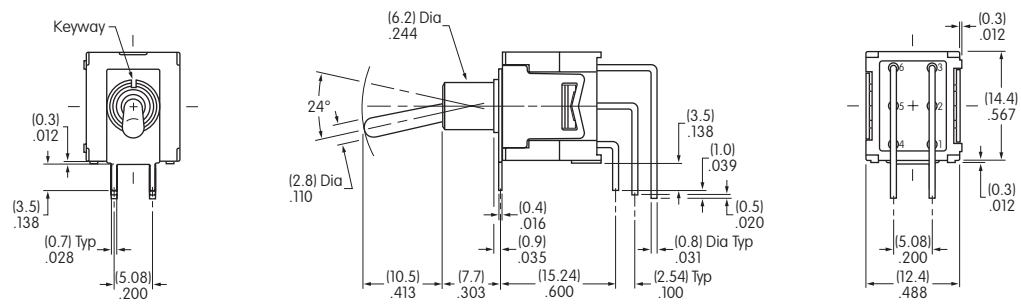
D22012V



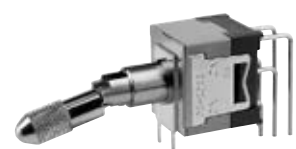
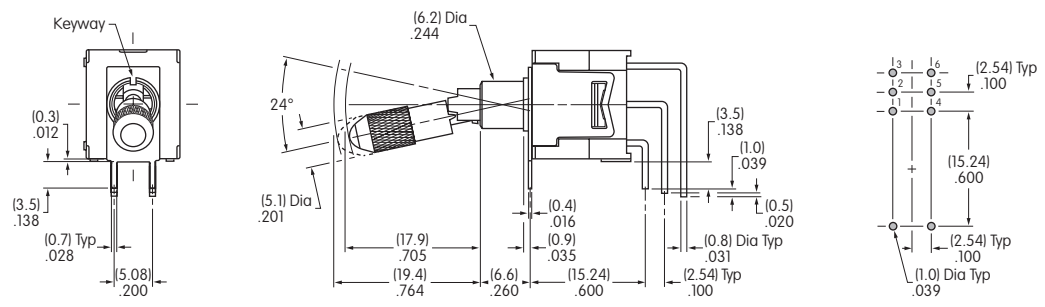
D22012LV

Actuator in Down Position

Vertical PC • Double Pole



D22022V



D22022LV

Actuator in Down Position

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

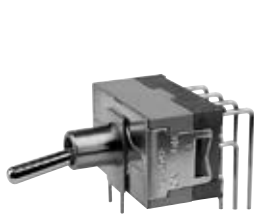
Indicators

Accessories

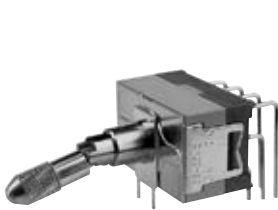
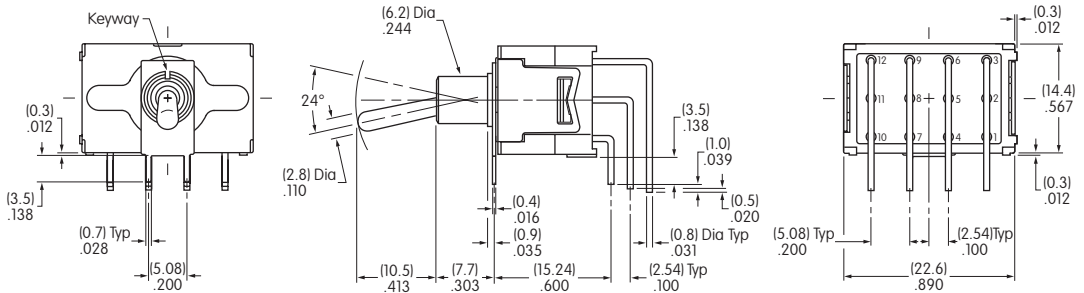
Supplement

TYPICAL SWITCH DIMENSIONS

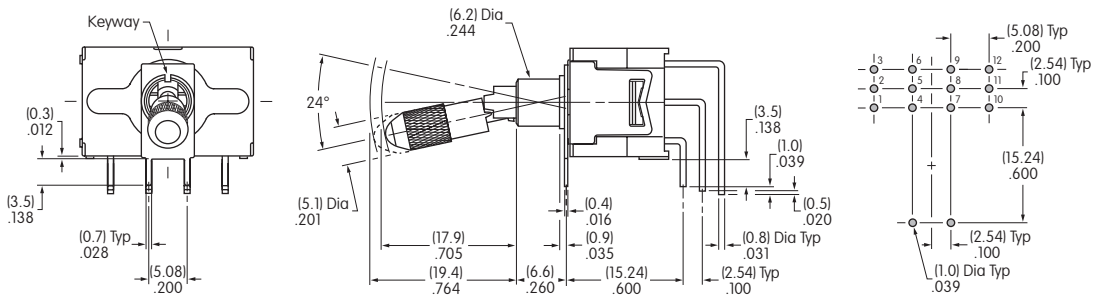
Vertical PC • Four Pole



D22042V



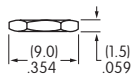
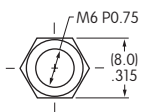
D22042LV



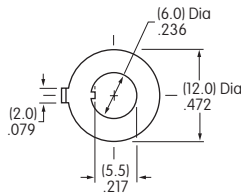
Actuator in Down Position

STANDARD HARDWARE

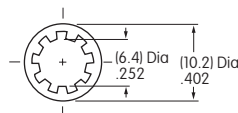
AT513M Hex Nut
Brass with nickel plating
2 supplied



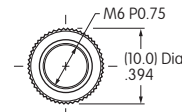
AT507M Locking Ring
Steel with zinc/chromate
1 supplied



AT509 Lockwasher
Steel with zinc/chromate
1 supplied



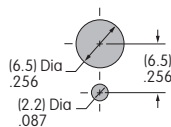
AT501M Knurled Face Nut
Brass with chrome plating



PANEL CUTOUTS & MAXIMUM PANEL THICKNESS

With Standard Hardware

.087" (2.2mm) for Standard Lever



.051" (1.3mm) for Locking Lever

Without Bottom Hex Nut

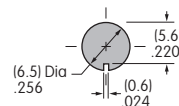
.154" (3.9mm) for Standard Lever

.110" (2.8mm) for Locking Lever

Without Locking Ring

.118" (3.0mm) for Standard Lever

.083" (2.1mm) for Locking Lever



Without Locking Ring & Bottom Hex Nut

.185" (4.7mm) for Standard Lever

.142" (3.6mm) for Locking Lever

