

8 Series

Toggle Switches

■ Introduction

The **8 Series Toggles** is Copal Electronics' high-reliability miniature switch product offering. This product line meets and exceeds all basic international switch standards.

With **8** toggle options, PC and solder lug terminals, power and logic level current ratings, 1-4 pole and many circuit offerings these switches can be used in many industries and various applications within these industries.

Four of the **8 Series** lines are washable. Specifically designed for PC applications with automated solder and cleaning methods.

The **8 Series** is available with **UL** Recognition and **CSA** Certification upon request from the customer.

■ Applications

- Communication equipment
- Computer peripheral equipment
- Measuring instruments
- Medical equipment
- Automotive diagnosis

The switches can be used in a wide range of fields from industrial to consumer equipment.

■ Features of 8 Series Toggles

1. Terminal style :

Solder, Straight, Right angle and vertical mount PC terminals.

2. Contacts :

Silver or gold.

3. Epoxy resin case :

UL94V-0 self-extinguishing epoxy.

4. Actuator styles :

Over 30 actuator variations.

5. Insulation between terminal and ground :

4 mm minimum.

6. Prevention of flux entry

The epoxy resin seal on bottom of the switch helps prevent the entry of solder and flux.

7. Insulation barrier :

Insulation barrier design between poles helps prevent short-circuiting between poles ensuring high reliability.

8. UL Recognized product File No.E43275

9. CSA Certified product File No.LR38341

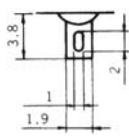
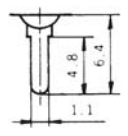
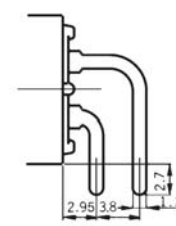
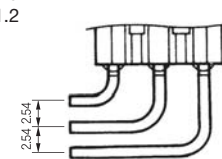
10. For the UL Recognized and CSA Certified products please see page 412.

8 Series Toggles Selection Table

Part No.	Name	Actuator shape	Number of poles	Switching function	Terminals	Page
8A	Standard toggle		1·2·3·4	ON — ON ON — OFF — ON (ON) — OFF — (ON) ON — OFF — (ON) ON — — (ON) ※ 1/2 Poles ON — ON ON — OFF — ON ※ 3/4 Poles ON — ON — ON ON — ON — (ON) (ON) — ON — (ON) ※ 8A Type 2&4 Poles only	 	389 ~ 391
8B	Mustang Toggle		1·2·3·4		 	392 ~ 393
8C	Flatted Toggle		1·2·3·4		 	394 ~ 395
8D	Long Toggle		1·2·3·4		 	396 ~ 397
8E	Lever Lock Toggle		1·2·3·4		 	398 ~ 399
8F	Splash Proof Toggle		1·2·3·4		 	400 ~ 401
8J	Short Toggle		1·2·3·4		 	402 ~ 403
8S	Color Tip Toggle		1·2·3·4		 	404 ~ 405
Washable	8G Short Toggle Washable		1·2	ON — ON ON — OFF — ON (ON) — OFF — (ON) ON — OFF — (ON) ON — — (ON)	  	406 ~ 407
	8GA Standard Toggle Washable		1·2		  	408
	8GD Long Toggle Washable		1·2		  	409
	8GS Color Tip Toggle Washable		1·2		  	410

() indicates momentary actuation

■ Terminals

Solder Terminal (Style:1)	PC Straight (Style:2)	Right Angle (Style:4)	Vertical Mount (Style:6)
t=0.8 	t=0.8 PC 	t=0.8 R/A 	t=0.8 w=1.2 V/M 

8 Series Toggles

Part Numbering

8

A

1

01

1

C

—

Z

Series code

Actuator shape

Number of poles

Switching function

Terminals

Contact material and plating

Code	Type
A	Standard Toggle
B	Mustang Toggle
C	Flatted Toggle
D	Long Toggle
E	Lever—lock Toggle
F	Splash Proof Toggle
J	Short Toggle
S	Color Tip Toggle
G	Washable

Fig.	Number of poles
1	1 pole
2	2 poles
3	3 poles
4	4 poles

Code	Switching function
01	ON — ON
02	ON — OFF — ON
04	(ON)—OFF—(ON)
05	ON — OFF —(ON)
06	ON — — (ON)
※10	ON — ON — ON
※11	ON — ON — (ON)
※12	(ON) — ON — (ON)

※8AType only.

Fig.	Terminals
1	Solder Terminal
2	PC Straight
4	Right Angle
6	Vertical Mounting

Code	Contact material	Plating
None	Bs+Ag or Cu+Ag	Ag
C	Bs+Ag or Cu+Ag	Ni+Au

※1

Bs=Brass
Cu=Copper
Ag=Silver
Ni=Nickel
Au=Gold

(※1) : Switches with gold-plated contacts ("C") are made-to order products.
MOQ is 25 pcs.

Note : Some combinations may not be available. Please check the "Table of Part Numbers" for each series.

8 Series Toggles Common Specifications

Contact specs.		Silver	Gold
Rating	Max.	AC125V 6A AC250V 3A DC30V 4A	AC125V 6A AC250V 3A DC20V 25mA
Initial contact resistance		10mΩ Max. (DC2~4V 1A)	20mΩ Max. (AC200μV 1.5mA)
Initial dielectric strength		AC1500V 1 minute	
Initial insulation resistance		1000MΩMin. (DC500V)	
Electrical life	Alternate type	50,000cycles	
	Momentary type	25,000cycles	
Operating temperature range		-30~+85℃	
Storage temperature range		-40~+85℃	

(ON) : Momentary.

8G

Washable Toggle Switch

Washable

RoHS Compliant



■ Features

The **8G** Washable Toggle Switch is designed for PC boards and are easily mountable on the board. A PC support terminal is provided for stable mounting. The process-sealed structure allows cleaning after soldering.

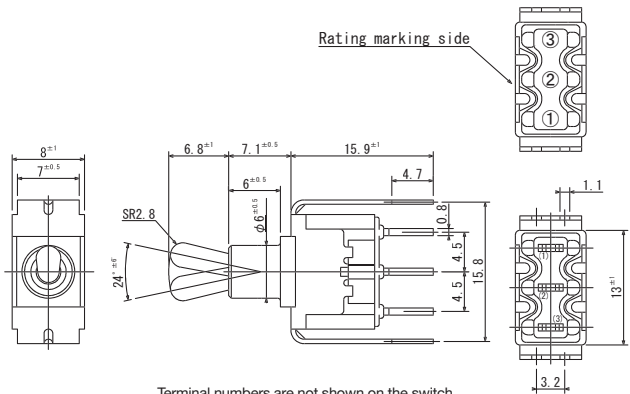
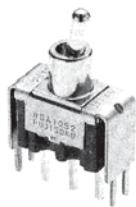
■ Specifications

Rating	Max.	6A 125VAC · 3A 250VAC · DC30V 4A
Initial contact resistance	10mΩ max.	(1A 200μVAC)
Initial dielectric strength	500VAC 1 minute	
Initial Insulation resistance	10,000MΩ min.	(250VDC)
Electrical life	Alternate type	50,000 cycles
	Momentary type	25,000 cycles
Operating temperature range	-30~+85°C	
Storage temperature range	-40~+85°C	

8G : Short Toggle

SPDT

PC Straight



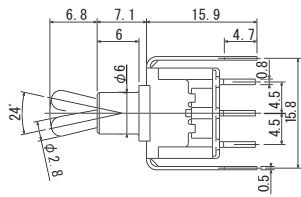
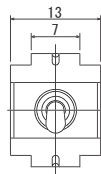
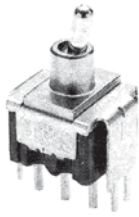
Part No.	Viewed from rating marking side		
8G1012-Z	ON	—	ON
▲ 8G1012C-Z	ON	OFF	ON
★ 8G1022-Z	ON	OFF	ON
▲ 8G1022C-Z	(ON)	OFF	(ON)
8G1042-Z	ON	OFF	(ON)
▲ 8G1042C-Z	ON	OFF	(ON)
★ 8G1052-Z	ON	OFF	(ON)
▲ 8G1052C-Z	ON	—	(ON)
▲ 8G1062-Z	ON	—	(ON)
▲ 8G1062C-Z	2-3	—	2-1
Connecting terminals	2-3	—	2-1

■PC Hole LayoutsPage 411.

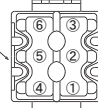
■Terminal StylesPage 387.

DPDT

PC Straight



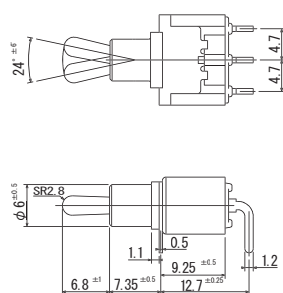
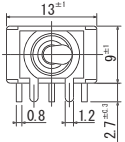
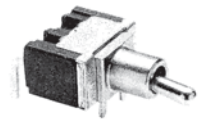
Rating marking side



Terminal numbers are not shown on the switch.

SPDT

Right Angle



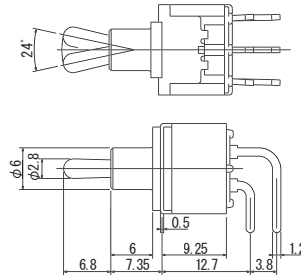
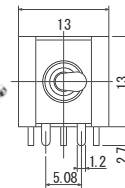
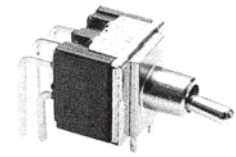
Rating marking side



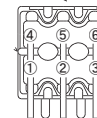
Terminal numbers are not shown on the switch.

DPDT

Right Angle



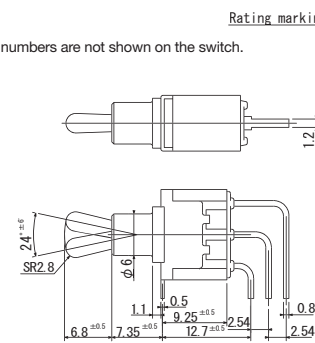
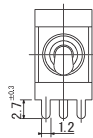
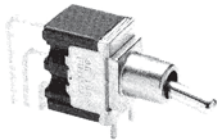
Rating marking side



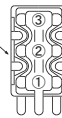
Terminal numbers are not shown on the switch.

SPDT

Vertical Mount



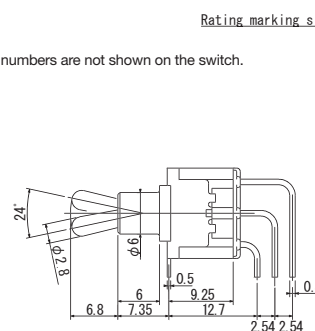
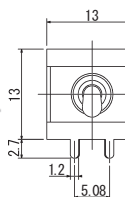
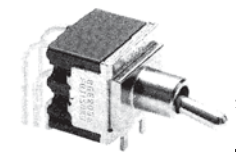
Rating marking side



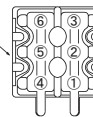
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DPDT

Vertical Mount



Rating marking side



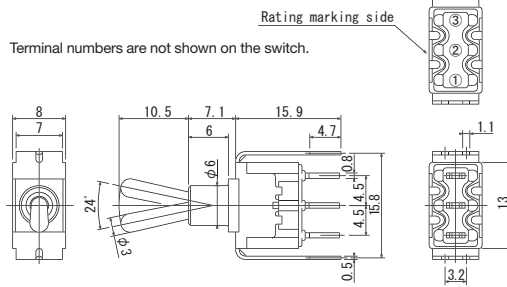
Terminal numbers are not shown on the switch.

Part No.	Viewed from rating marking side		
8G2012-Z	ON	—	ON
▲ 8G2012C-Z	ON	OFF	ON
▲ 8G2022-Z	ON	OFF	ON
▲ 8G2022C-Z	(ON)	OFF	(ON)
★ 8G2042-Z	(ON)	OFF	(ON)
▲ 8G2042C-Z	ON	OFF	(ON)
★ 8G2052-Z	ON	OFF	(ON)
▲ 8G2052C-Z	ON	—	(ON)
▲ 8G2062-Z	ON	—	(ON)
▲ 8G2062C-Z	ON	—	(ON)
Connecting terminals	2-3 5-6	—	2-1 5-4

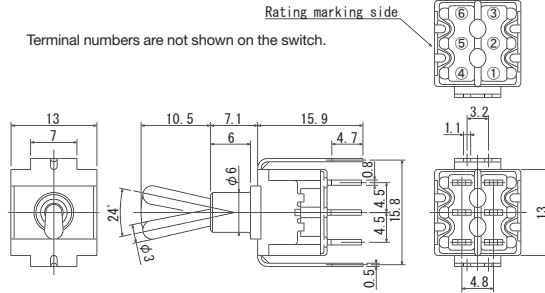
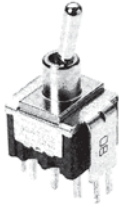
Part No.	Viewed from rating marking side		
8G1014-Z	ON	—	ON
★ 8G1014C-Z	ON	OFF	ON
★ 8G1024-Z	ON	OFF	ON
★ 8G1024C-Z	(ON)	OFF	(ON)
★ 8G1044-Z	(ON)	OFF	(ON)
★ 8G1044C-Z	ON	OFF	(ON)
★ 8G1054-Z	ON	OFF	(ON)
▲ 8G1054C-Z	ON	—	(ON)
☆ 8G1064-Z	ON	—	(ON)
★ 8G1064C-Z	ON	—	(ON)
Connecting terminals	2-3 5-6	—	2-1 5-4

Part No.	Viewed from rating marking side		
8G1016-Z	ON	—	ON
▲ 8G1016C-Z	ON	OFF	ON
★ 8G1026-Z	ON	OFF	ON
▲ 8G1026C-Z	(ON)	OFF	(ON)
★ 8G1046-Z	(ON)	OFF	(ON)
★ 8G1046C-Z	ON	OFF	(ON)
★ 8G1056-Z	ON	OFF	(ON)
▲ 8G1056C-Z	ON	—	(ON)
★ 8G1066-Z	ON	—	(ON)
▲ 8G1066C-Z	ON	—	(ON)
Connecting terminals	2-3 5-6	—	2-1 5-4

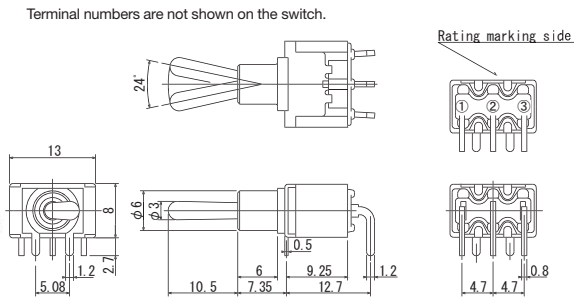
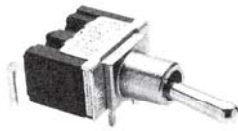
Washable

8GA : Standard Toggle**SPDT****PC Straight**

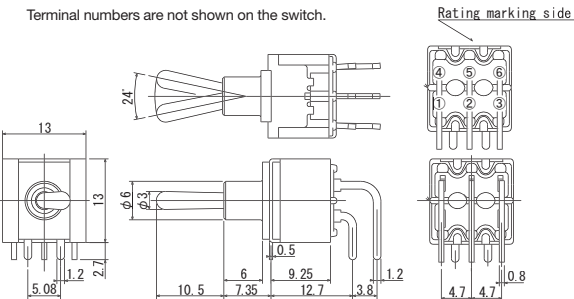
Part No.	Switching function		
	Viewed from rating marking side		
8GA1012-Z		—	
★8GA1022-Z		OFF	
Connecting terminals	2-3	—	2-1

DPDT**PC Straight**

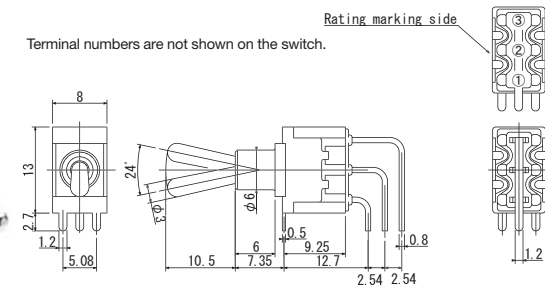
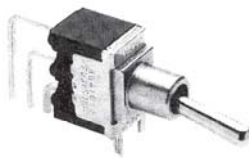
Part No.	Switching function		
	Viewed from rating marking side		
★8GA2012-Z		—	
★8GA2022-Z		OFF	
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Right Angle**

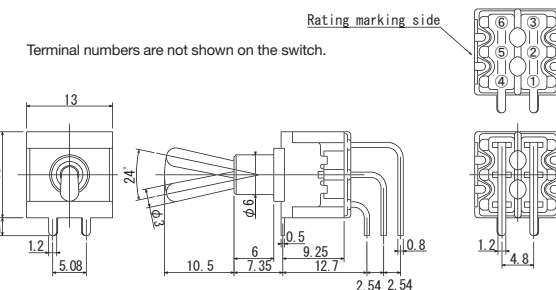
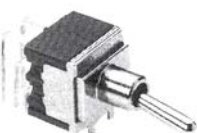
Part No.	Switching function		
	Viewed from rating marking side		
8GA1014-Z		—	
▲8GA1024-Z		OFF	
Connecting terminals	2-3	—	2-1

DPDT**Right Angle**

Part No.	Switching function		
	Viewed from rating marking side		
★8GA2014-Z		—	
★8GA2024-Z		OFF	
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Vertical Mount**

Part No.	Switching function		
	Viewed from rating marking side		
☆8GA1016-Z		—	
▲8GA1026-Z		OFF	
Connecting terminals	2-3	—	2-1

DPDT**Vertical Mount**

Part No.	Switching function		
	Viewed from rating marking side		
★8GA2016-Z		—	
▲8GA2026-Z		OFF	
Connecting terminals	2-3 5-6	—	2-1 5-4

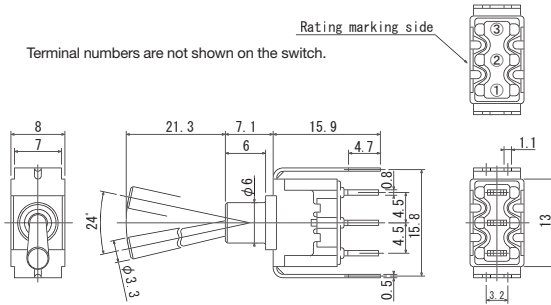
▲ : Inquiry products. ☆ : Semi-standard products. ★ : Made to order products. Optional accessories (Color Caps) for 8GA series are shown on P.415.

(ON) : Momentary.

Washable

8GD : Long Toggle**SPDT****PC Straight**

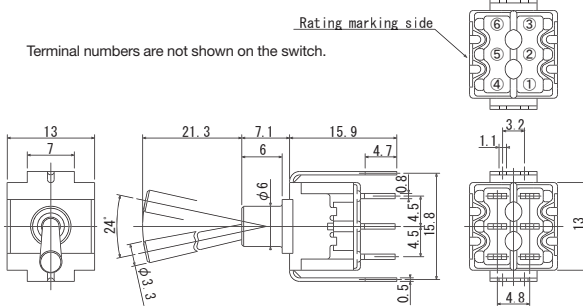
Terminal numbers are not shown on the switch.



Part No.	Switching function		
	Viewed from rating marking side		
★8GD1012-Z	ON	—	ON
▲8GD1022-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT**PC Straight**

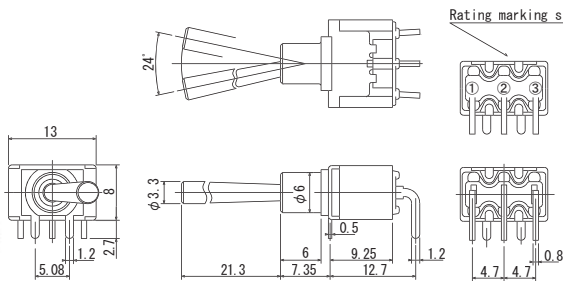
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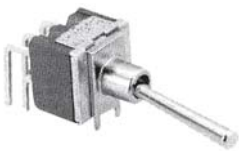
Part No.	Switching function		
	Viewed from rating marking side		
★8GD2012-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Right Angle**

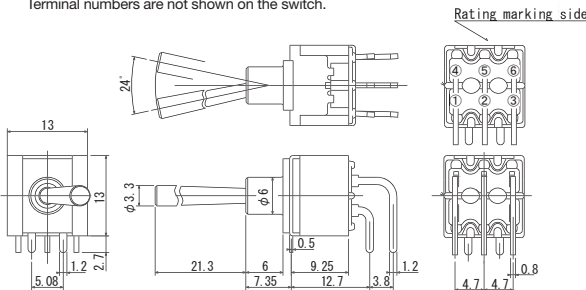
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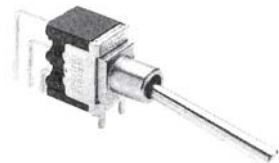
Part No.	Switching function		
	Viewed from rating marking side		
★8GD1014-Z	ON	—	ON
▲8GD1024-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT**Right Angle**

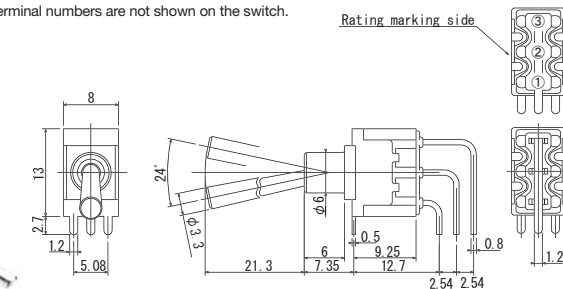
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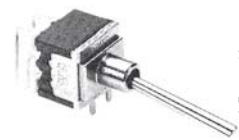
Part No.	Switching function		
	Viewed from rating marking side		
★8GD2014-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Vertical Mount**

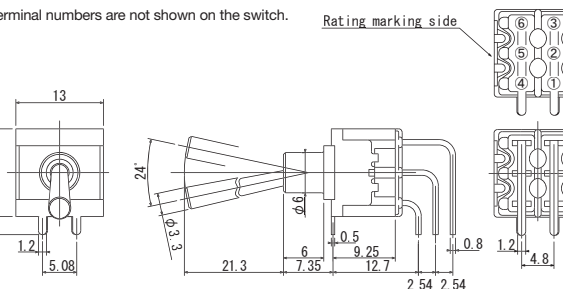
Terminal numbers are not shown on the switch.



Part No.	Switching function		
	Viewed from rating marking side		
★8GD1016-Z	ON	—	ON
▲8GD1026-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT**Vertical Mount**

Terminal numbers are not shown on the switch.



Part No.	Switching function		
	Viewed from rating marking side		
▲8GD2016-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

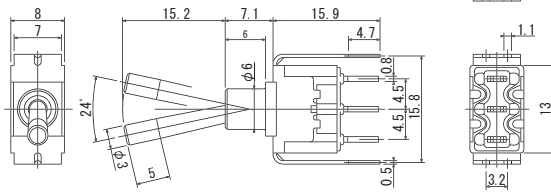
★ : Made to order products.

▲ : Inquiry products.

(ON) : Momentary.

SPDT**PC Straight**

Terminal numbers are not shown on the switch.



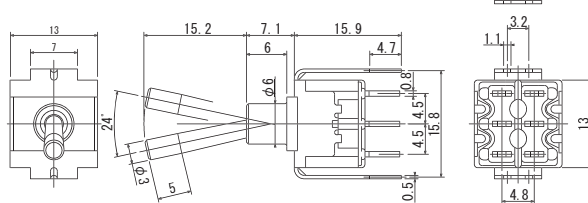
Rating marking side



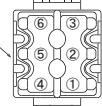
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★8GS1012-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT**PC Straight**

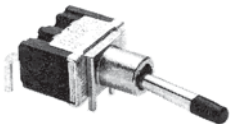
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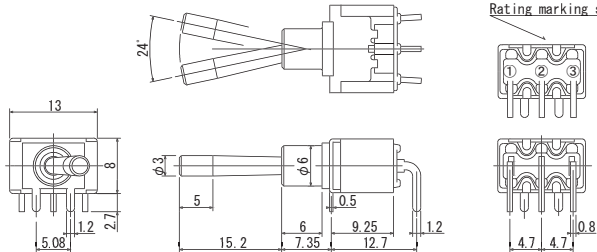
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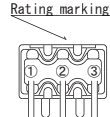
Part No. \ Switching function	Viewed from rating marking side		
★8GS2012-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Right Angle**

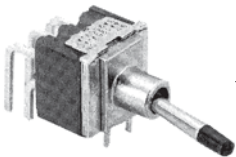
Terminal numbers are not shown on the switch.



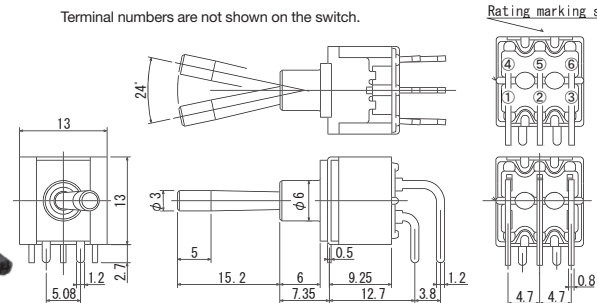
Rating marking side



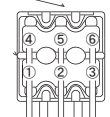
Part No. \ Switching function	Viewed from rating marking side		
▲8GS1014-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT**Right Angle**

Terminal numbers are not shown on the switch.



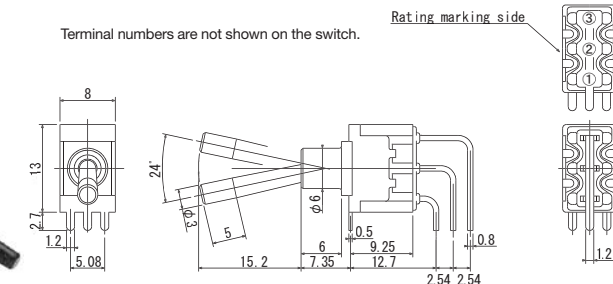
Rating marking side



Part No. \ Switching function	Viewed from rating marking side		
▲8GS2014-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT**Vertical Mount**

Terminal numbers are not shown on the switch.



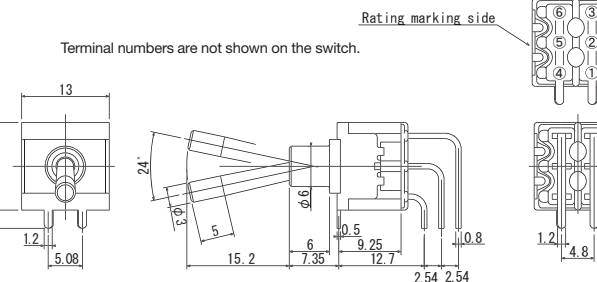
Rating marking side



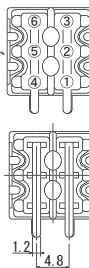
Part No. \ Switching function	Viewed from rating marking side		
▲8GS1016-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT**Vertical Mount**

Terminal numbers are not shown on the switch.



Rating marking side



Part No. \ Switching function	Viewed from rating marking side		
▲8GS2016-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

PC Hole Layouts

Terminal style	PC PC Straight	R/A Right Angle	V/M Vertical Mount
1 pole			
2 poles			

● Pattern restricted area is black. If a different color is required, specify part number.
To replace **Color Tip**, remove with a pair of radio pliers.

Precaution (8G, 8GA, 8GD, 8GS)

1. Soldering Specifications

(1) Manual soldering

Device : Solder iron

- ① 350°C Max. 3 sec. Max.
- ② 310°C Max. 7 sec. Max.

(2) Auto soldering

Device : Jet wave or dip type

- ① 270°C Max. 5 sec. Max.
- ② 250°C Max. 7 sec. Max.

Pre-heating should be done at temperatures below 100°C and within 30 seconds.

2. Flux Cleaning

- (1) Solvent : Fluorine or Alcohol type.
- (2) Cleaning after soldering should be done after the terminal temperature falls to 90°C or below, or after leaving the switch for five minutes or longer at room temperature.
- (3) Do not use the ultrasonic cleaning.

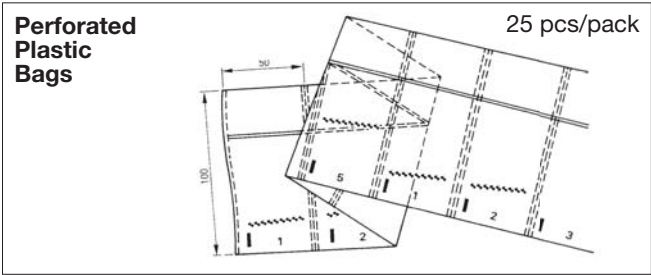
3. Mounting

- Do not bend the terminals before mounting the switch on the PC board.
- After mounting the switch, do not place the device in such a way that the device weight will be applied on to the actuator of the switch.

4. Mounting Accessories

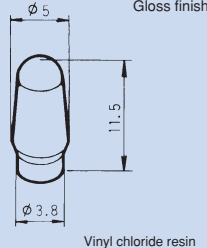
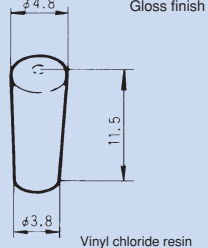
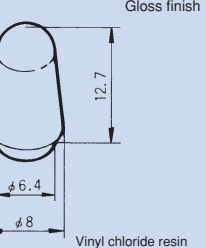
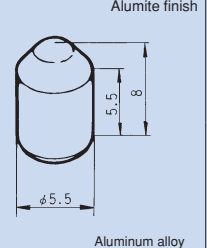
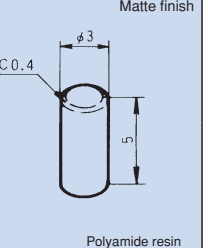
Mount the accessories after soldering and flux cleaning.

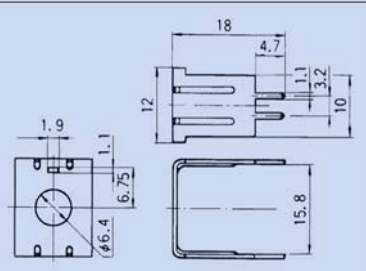
Packaging Specification



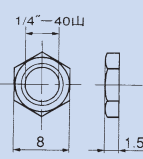
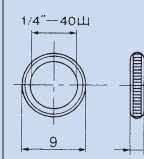
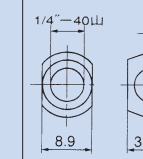
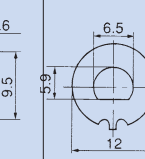
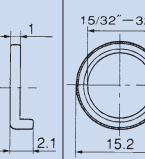
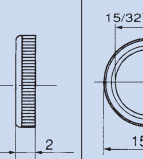
Optional Accessories

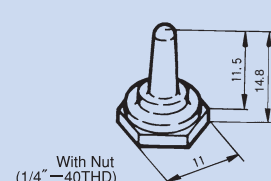
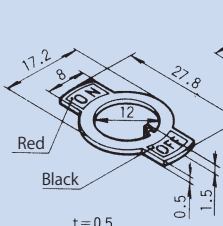
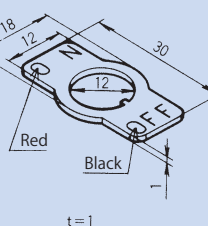
《Sold separately》

Type	8A・8F・8GA BT	8A・8F・8GA BT	8B	8E	8S・8GS
Part Name	Color Cap				Color Tip
Dimensions					
Silver	—	—	—	140000470058	—
White	140000470030	140000470038	140000470063	—	140000470118
Red	140000470098	140000470100	140000470108	140000470060	140000470119
Black	140000470031	140000470039	140000470064	140000470059	140000470112
Gray	140000470037	140000470077	140000470102	—	140000470120

Type	8A・8C・8D・8J・8S 1, 2 poles※
Part Name	Bracket
Part No.	140000260715
Dimensions	

※The Bracket cannot be used with switches with switching functions "10", "11", or "12" (ref. P.388). The size of the housings are different in switches with switching functions "10", "11", and "12" and the Bracket cannot be used.

Type	8A・8C・8D・8E・8J・8N・8S・8R			8F・8P	8B・8Y	
Part Name	Lock Nut	Round Nut	Pocketed Nut	Locking Ring	Round Nut	Round Nut
Part No.	140008010276	140008010258	140008010274	140008020066	140008010272	140008010273
Dimensions						
Finish	Nickel	Chromium	Nickel	Zinc	Chromium	

Type	8A	8B	
Part Name	Boot	Plate	Plate
Part No.	140000470422	140008040021	140008040025
Dimensions			

■ 8 Series Toggles

(ON) : Momentary.

Poles	Switching function			UL (※1.)				CSA (※2.)			
				8G	8GA	8GD	8GS	8G	8GA	8GD	8GS
1 pole	1012	ON — ON		○	○	○	○	○	○	○	○
	1022	ON — OFF — ON		○	○	○	○	○	○	○	○
	1042	(ON) — OFF — (ON)		○	○	○	○	○	○	○	○
	1052	ON — OFF — (ON)		○	○	○	○	○	○	○	○
	1062	ON — (ON)		○	○	○	○	○	○	○	○
2 poles	2012	ON — ON		○	○	○	○	○	○	○	○
	2022	ON — OFF — ON		○	○	○	○	○	○	○	○
	2042	(ON) — OFF — (ON)		○	○	○	○	○	○	○	○
	2052	ON — OFF — (ON)		○	○	○	○	○	○	○	○
	2062	ON — (ON)		○	○	○	○	○	○	○	○

(※1.) **UL File No.E43275 FUJISOKU**

(※2.) **CSA File No.LR38341 FUJISOKU**

UL, CSA marked switches are available upon request.