

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

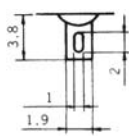
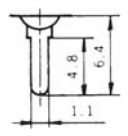
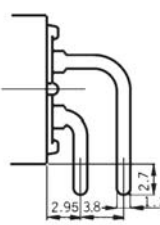
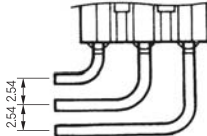
- 1. Terminal style :**
Solder, Straight, Right angle and vertical mount PC terminals.
- 2. Contacts :**
Silver or gold.
- 3. Epoxy resin case :**
UL94V-0 self-extinguishing epoxy.
- 4. Actuator styles :**
Over 30 actuator variations.
- 5. Insulation between terminal and ground :**
4 mm minimum.
- 6. 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	  Solder Lug Straight PC	389 } 391	
8B	Mustang Toggle		1·2·3·4		  Solder Lug Straight PC	392 } 393	
8C	Flatted Toggle		1·2·3·4		  Solder Lug Straight PC	394 } 395	
8D	Long Toggle		1·2·3·4		  Solder Lug Straight PC	396 } 397	
8E	Lever Lock Toggle		1·2·3·4		  Solder Lug Straight PC	398 } 399	
8F	Splash Proof Toggle		1·2·3·4		  Solder Lug Straight PC	400 } 401	
8J	Short Toggle		1·2·3·4		  Solder Lug Straight PC	402 } 403	
8S	Color Tip Toggle		1·2·3·4		  Solder Lug Straight PC	404 } 405	
Washable	8G	Short Toggle Washable	1·2		ON — ON ON — OFF — ON (ON) — OFF — (ON) ON — OFF — (ON) ON — — (ON)	   Straight PC Right Angle Vertical	406 } 407
	8GA	Standard Toggle Washable	1·2			   Straight PC Right Angle Vertical	408
	8GD	Long Toggle Washable	1·2	   Straight PC Right Angle Vertical		409	
	8GS	Color Tip Toggle Washable	1·2	   Straight PC Right Angle Vertical		410	

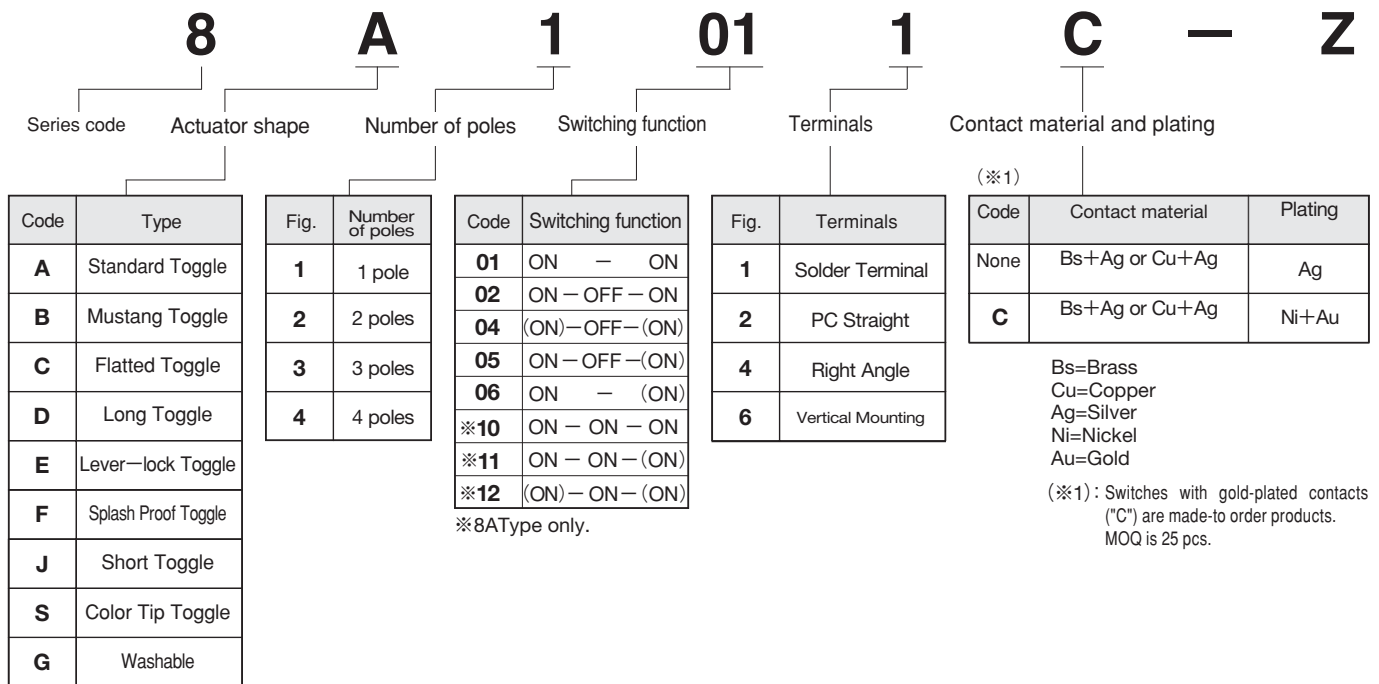
() indicates momentary actuation

■ 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



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°C	
Storage temperature range		-40~+85°C	

(ON) : Momentary.

8G

Washable



RoHS Compliant

Washable Toggle Switch

■ 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.

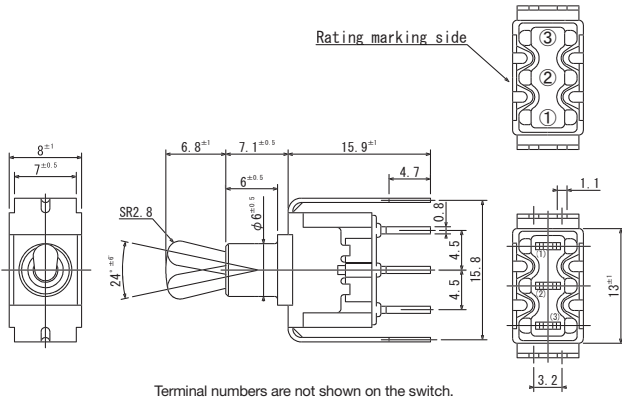
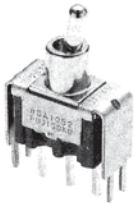
■ Specifications

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



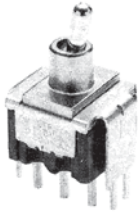
Part No.	Viewed from rating marking side		
8G1012-Z			
▲ 8G1012C-Z	ON	-	ON
★ 8G1022-Z	ON	OFF	ON
▲ 8G1022C-Z	ON	OFF	ON
8G1042-Z	(ON)	OFF	(ON)
▲ 8G1042C-Z	(ON)	OFF	(ON)
★ 8G1052-Z	ON	OFF	(ON)
▲ 8G1052C-Z	ON	OFF	(ON)
▲ 8G1062-Z	ON	-	(ON)
▲ 8G1062C-Z	ON	-	(ON)
Connecting terminals	2-3	-	2-1

■ PC Hole LayoutsPage 411.

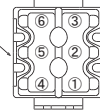
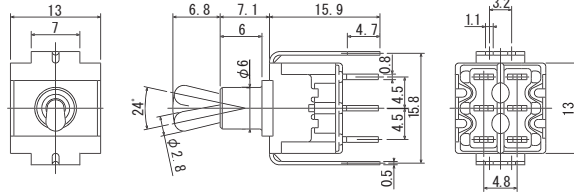
■ Terminal StylesPage 387.

DPDT

PC Straight



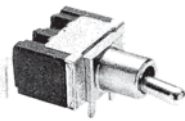
Terminal numbers are not shown on the switch.



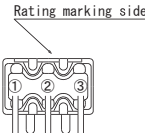
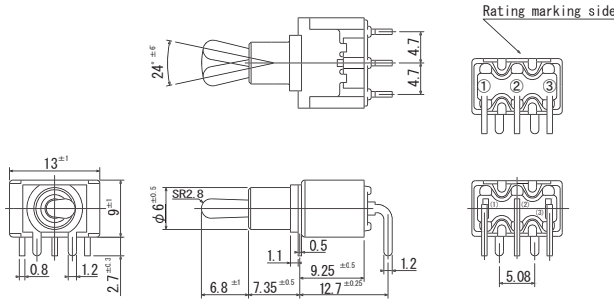
Switching function	Viewed from rating marking side		
Part No.			
8G2012-Z	ON	-	ON
▲ 8G2012C-Z	ON	OFF	ON
▲ 8G2022-Z	ON	OFF	ON
▲ 8G2022C-Z	(ON)	OFF	(ON)
★ 8G2042-Z	(ON)	OFF	(ON)
▲ 8G2042C-Z	ON	OFF	(ON)
★ 8G2052-Z	ON	OFF	(ON)
▲ 8G2052C-Z	ON	-	(ON)
▲ 8G2062-Z	ON	-	(ON)
▲ 8G2062C-Z	ON	-	(ON)
Connecting terminals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

SPDT

Right Angle



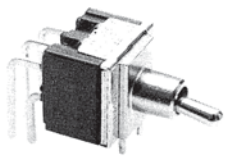
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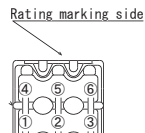
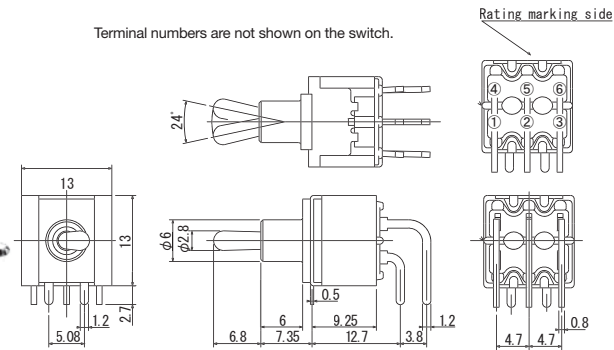
Switching function	Viewed from rating marking side		
Part No.			
8G1014-Z	ON	-	ON
★ 8G1014C-Z	ON	OFF	ON
★ 8G1024-Z	ON	OFF	ON
★ 8G1024C-Z	(ON)	OFF	(ON)
★ 8G1044-Z	(ON)	OFF	(ON)
★ 8G1044C-Z	ON	OFF	(ON)
★ 8G1054-Z	ON	OFF	(ON)
▲ 8G1054C-Z	ON	-	(ON)
☆ 8G1064-Z	ON	-	(ON)
★ 8G1064C-Z	ON	-	(ON)
Connecting terminals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

DPDT

Right Angle



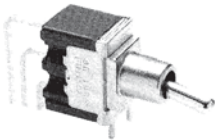
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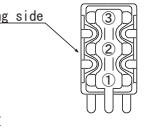
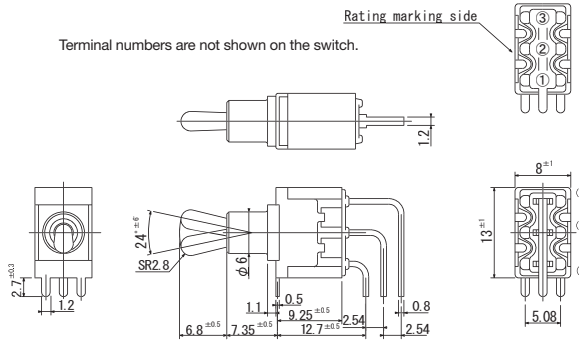
Switching function	Viewed from rating marking side		
Part No.			
8G1016-Z	ON	-	ON
▲ 8G1016C-Z	ON	OFF	ON
★ 8G1026-Z	(ON)	OFF	(ON)
▲ 8G1026C-Z	ON	OFF	(ON)
★ 8G1046-Z	(ON)	OFF	(ON)
★ 8G1046C-Z	ON	OFF	(ON)
★ 8G1056-Z	ON	OFF	(ON)
▲ 8G1056C-Z	ON	-	(ON)
★ 8G1066-Z	ON	-	(ON)
▲ 8G1066C-Z	ON	-	(ON)
Connecting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

SPDT

Vertical Mount

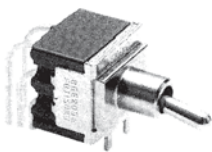


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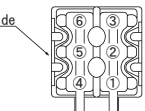
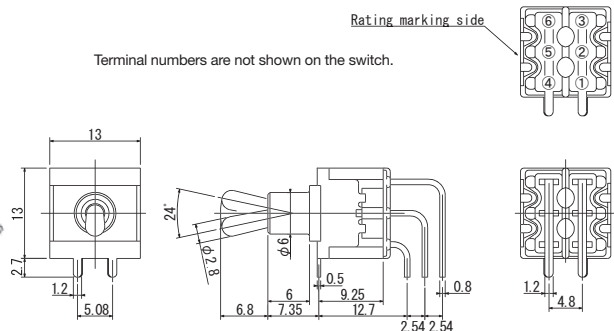


DPDT

Vertical Mount



Terminal numbers are not shown on the switch.

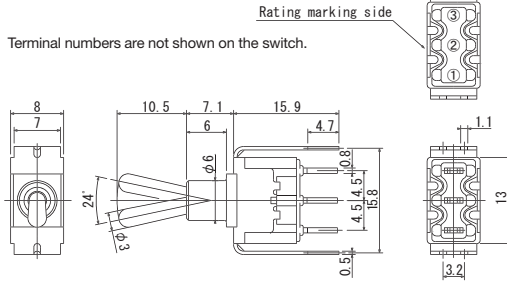


Washable

8GA : Standard Toggle

SPDT

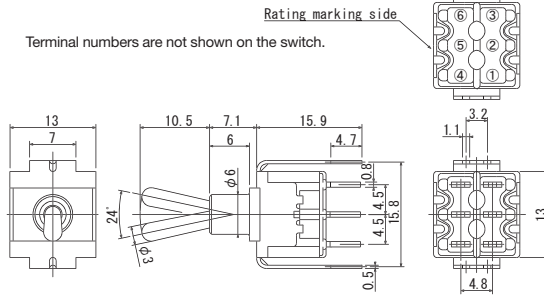
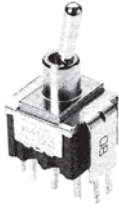
PC Straight



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

DPDT

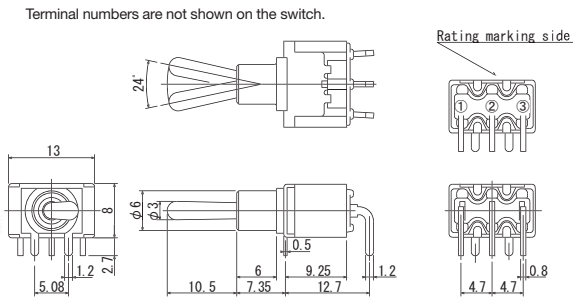
PC Straight



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

SPDT

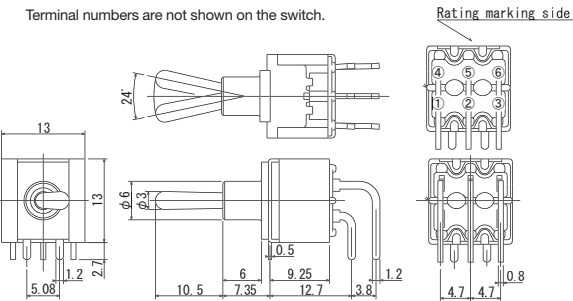
Right Angle



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

DPDT

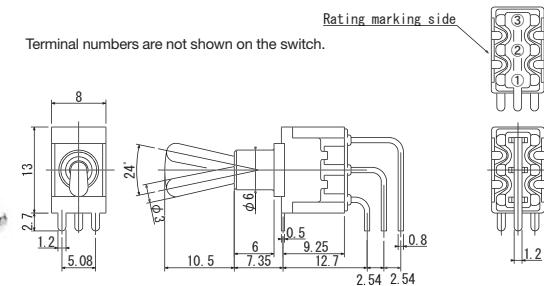
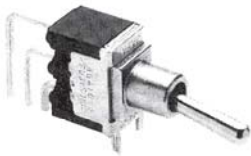
Right Angle



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

SPDT

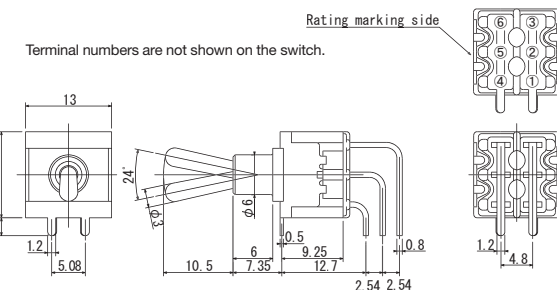
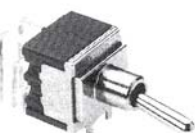
Vertical Mount



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

DPDT

Vertical Mount



Part No.	Viewed from rating marking side		
★8GA2016-Z	ON	—	ON
▲8GA2026-Z	ON	OFF	ON
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

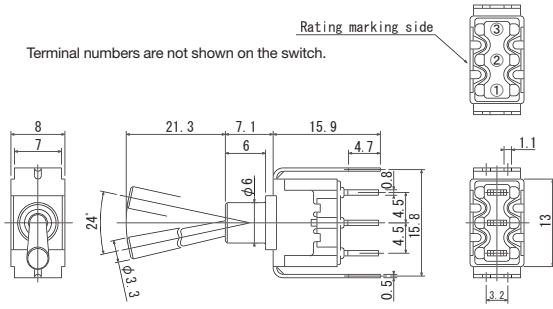
8GD : Long Toggle

SPDT

PC Straight



Terminal numbers are not shown on the switch.



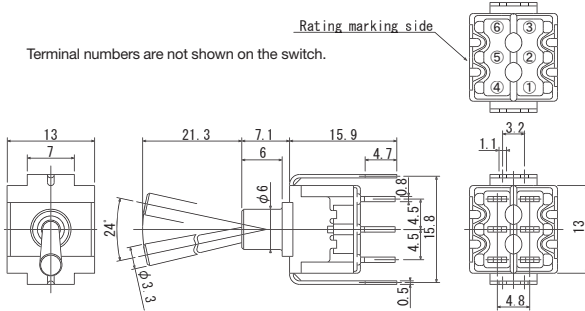
Part No.	Viewed from rating marking side		
★8GD1012-Z	ON	—	ON
▲8GD1022-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT

PC Straight



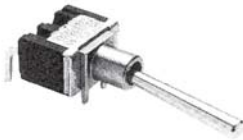
Terminal numbers are not shown on the switch.



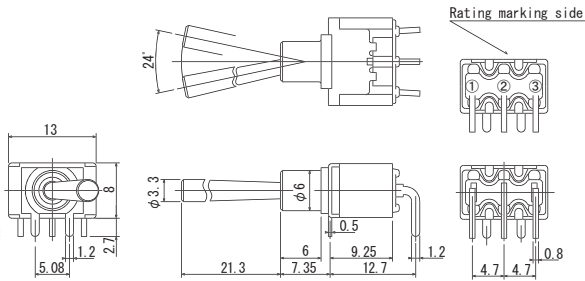
Part No.	Viewed from rating marking side		
★8GD2012-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT

Right Angle



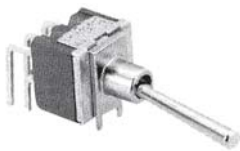
Terminal numbers are not shown on the switch.



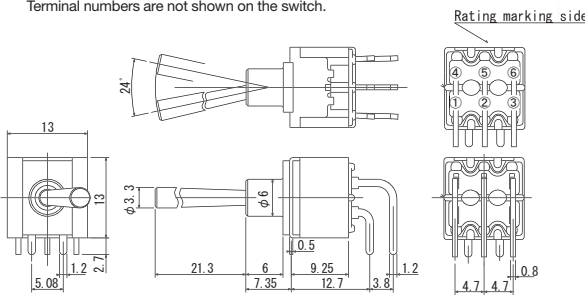
Part No.	Viewed from rating marking side		
★8GD1014-Z	ON	—	ON
▲8GD1024-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT

Right Angle



Terminal numbers are not shown on the switch.



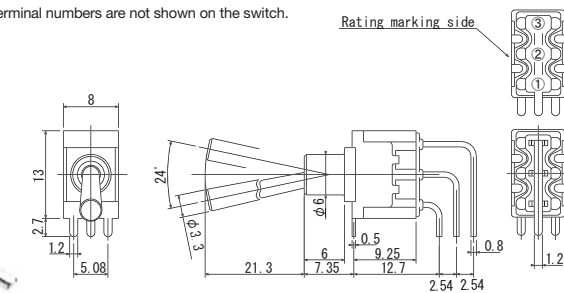
Part No.	Viewed from rating marking side		
★8GD2014-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT

Vertical Mount



Terminal numbers are not shown on the switch.



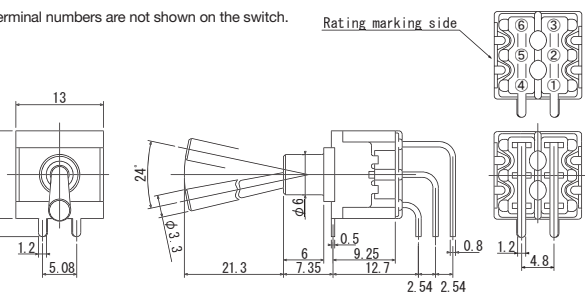
Part No.	Viewed from rating marking side		
★8GD1016-Z	ON	—	ON
▲8GD1026-Z	ON	OFF	ON
Connecting terminals	2-3	—	2-1

DPDT

Vertical Mount



Terminal numbers are not shown on the switch.



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

Washable

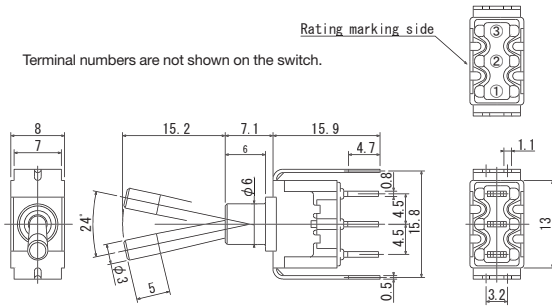
8GS : Color Chip Toggle

SPDT

PC Straight



Terminal numbers are not shown on the switch.



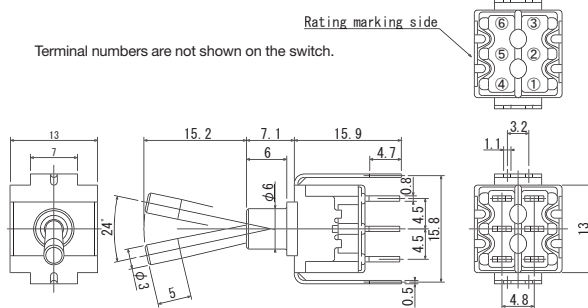
Part No.	Viewed from rating marking side		
	Switching function		
★8GS1012-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT

PC Straight



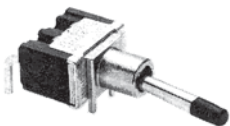
Terminal numbers are not shown on the switch.



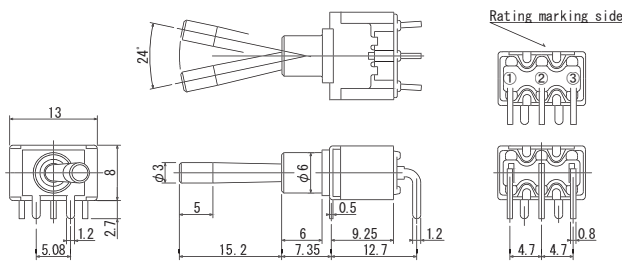
Part No.	Viewed from rating marking side		
	Switching function		
★8GS2012-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT

Right Angle



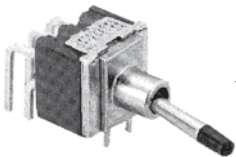
Terminal numbers are not shown on the switch.



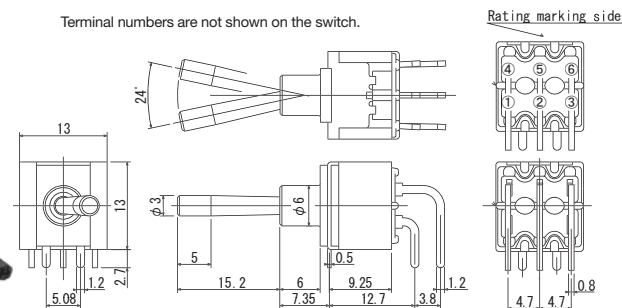
Part No.	Viewed from rating marking side		
	Switching function		
▲8GS1014-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT

Right Angle



Terminal numbers are not shown on the switch.



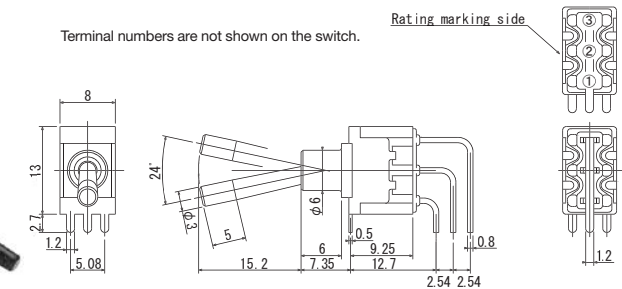
Part No.	Viewed from rating marking side		
	Switching function		
▲8GS2014-Z	ON	—	ON
Connecting terminals	2-3 5-6	—	2-1 5-4

SPDT

Vertical Mount



Terminal numbers are not shown on the switch.



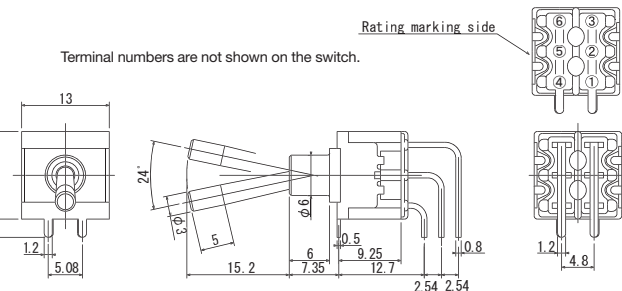
Part No.	Viewed from rating marking side		
	Switching function		
▲8GS1016-Z	ON	—	ON
Connecting terminals	2-3	—	2-1

DPDT

Vertical Mount



Terminal numbers are not shown on the switch.



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

(ON) : Momentary.

▲ : Inquiry products.

★ : Made to order products.

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.

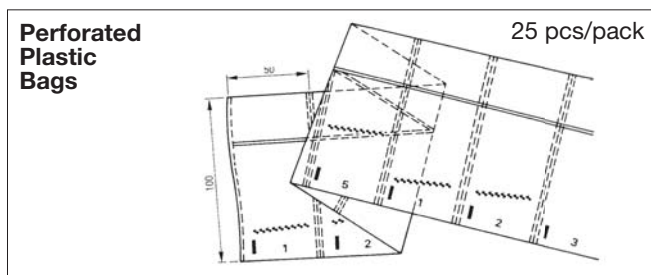
3. Mounting

- 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

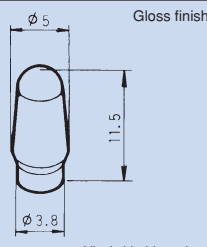
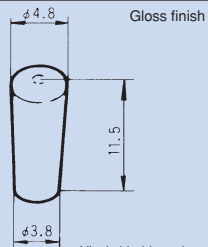
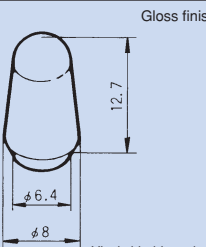
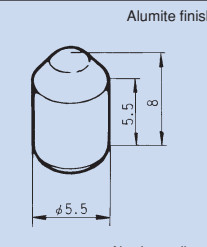
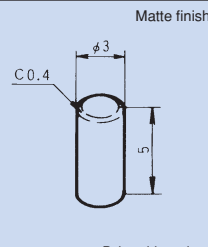
Mount the accessories after soldering and flux cleaning.

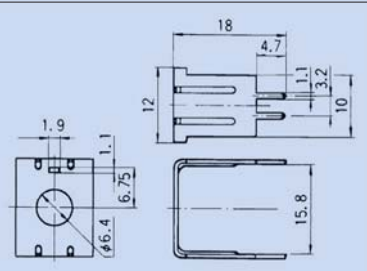
Packaging Specification



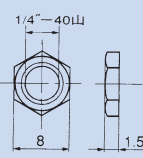
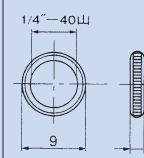
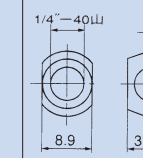
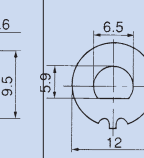
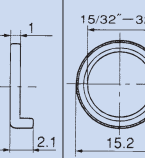
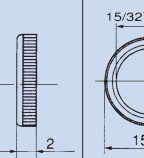
Optional Accessories

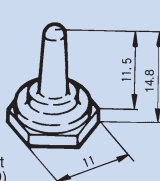
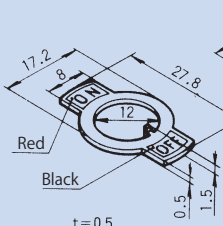
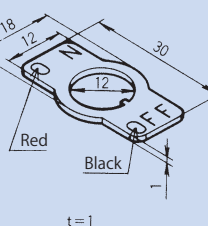
《Sold separately》

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)	○	○	○	○	○	○	○	○

UL, CSA marked switches are available upon request.

(※1.) **UL File No.E43275 FUJISOKU**

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