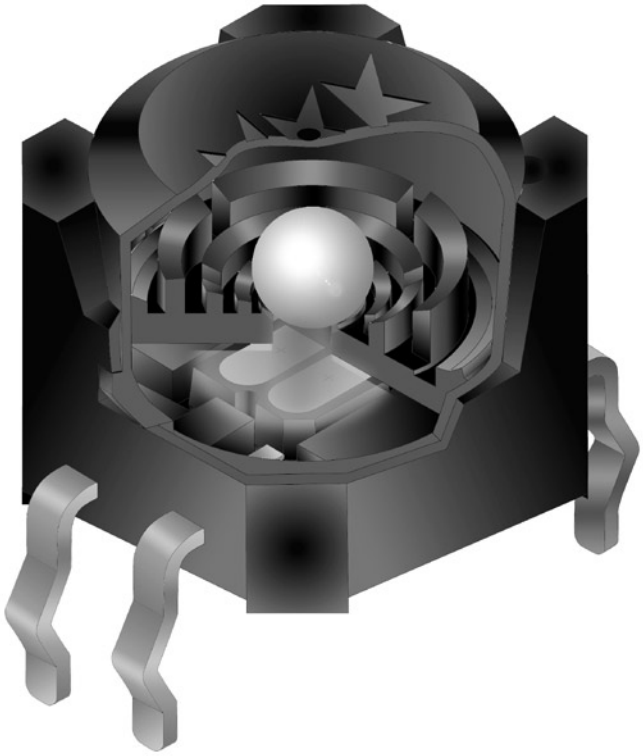
Distinctive Characteristics

Photo interrupter, rather than contacts, ensures high reliability.

Sealed construction for protection from environmental elements, including hydrogen sulfide, sulfur dioxide, and nitrogen hydroxide. Terminals are made of ammonia-resistent materials.



Totally sealed body allows process compatibility for time- and money-saving automatic soldering and cleaning.

Space-saving compact dimensions allow high density mounting.

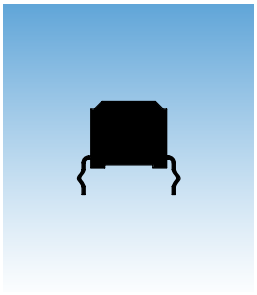
Internal steel ball movement allows functionality of 360° circumference rotation.

The DS series switch is well-suited to meet product safety concerns due to normally closed (on) status.

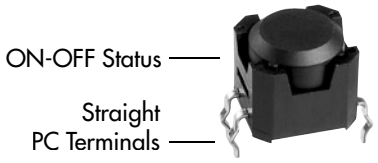
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

The switch is triggered when tilted beyond 30° in any direction.

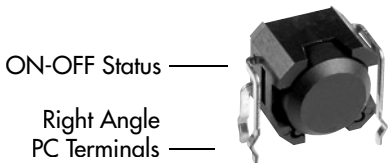
Actual Size



SWITCH PART NUMBERS & DESCRIPTION



DSBA1P



DSBA1H

SPECIFICATIONS

Absolute Maximum Ratings
Temperature at 25°C

		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	5	V
	Power Dissipation	P_D	75	mW
Output	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	3	V
	Collector Current	I_C	20	mA
	Collector Power Dissipation	P_C	50	mW
	Total Power Dissipation	P_{tot}	100	mW

Mechanical Specifications

Mechanical Life:	150,000 operations minimum
Electrical Life:	150,000 operations minimum using applicable circuit

Materials & Finishes

Housing:	Glass fiber reinforced polyamide (UL94V-0 flammability rating)
Base:	Glass fiber reinforced polyamide (UL94V-0 flammability rating)
Terminals:	Phosphor bronze with tin plating

Environmental Specifications

Operating Temperature Range:	–25°C ~ +80°C (–13°F ~ +176°F)
Storage Temperature Range:	–30°C ~ +85°C (–22°F ~ +185°F)
Humidity:	85% humidity for 500 hours @ +85°C (+185°F)
Vibration:	10Hz with peak-to-peak amplitude of 10mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 500,000 cycles
Shock:	100G (981m/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Notes:
1. Prevent exposure to magnetic fields.
2. Do not install switch near vibration source.

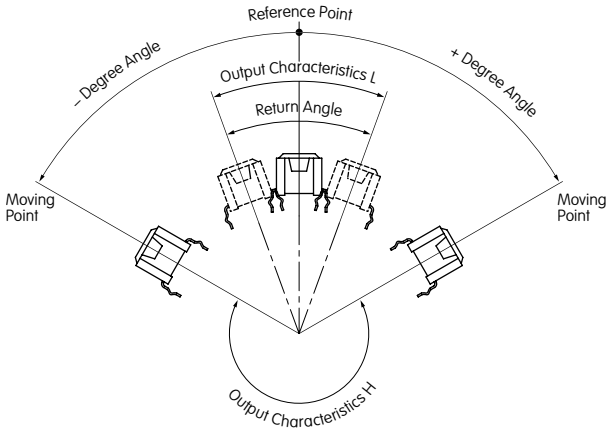
SPECIFICATIONS (Continued)

Operating Characteristics

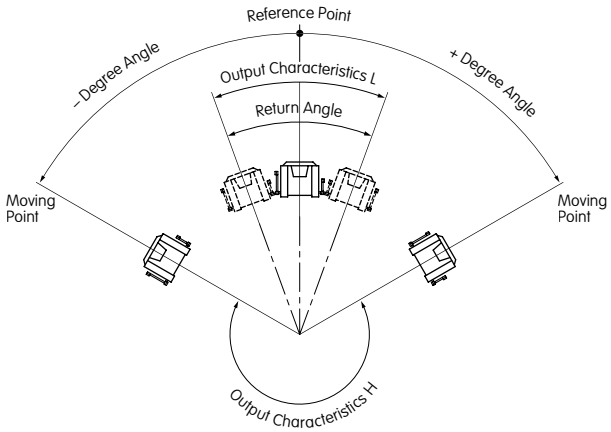
	Operating Angle	Return Angle
Circuit Characteristics (ON-OFF)	±30° to ±60°	Minimum 10°
	Output $V_{OL} \rightarrow V_{OH}$	Output $V_{OH} \rightarrow V_{OL}$

Output Characteristics V_{OL} with Photo transistor ON: 1.0V maximum (horizontal)
Output Characteristics V_{OH} with Photo transistor OFF: 4.0V minimum (inclined at an angle of −60° minimum)

Output Characteristics



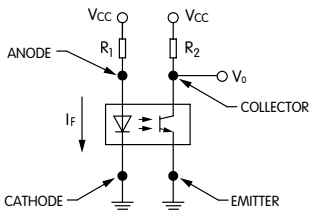
Straight PC



Right Angle PC

Circuit Design Considerations

V_{CC} = 5V
R_2 = 100kΩ
I_F = 19mA (V_{CC} = 5V, R_1 = 200Ω)
V_F of the LED Maximum = 1.3V

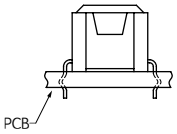


PCB Processing

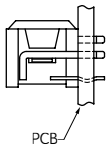
Soldering: Wave Soldering: 10 seconds maximum @ 260°C maximum
Manual Soldering: 3 seconds maximum @ 350°C maximum

Automated Cleaning: Use alcohol based solution at 50°C maximum. Do not submerge over 2 inches (5cm) for 1 minute maximum. Do not use organic solvents.

MOUNTING OPTIONS



PCB mounting option for Straight PC

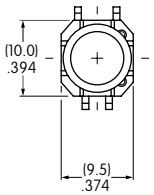


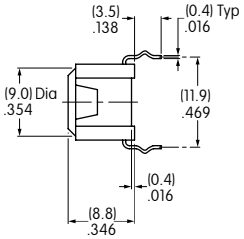
PCB mounting option for Right Angle PC

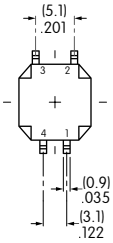
Install switch at an angle less than ±3°

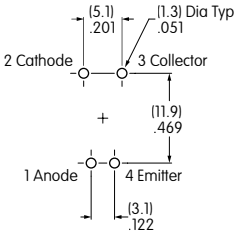
TYPICAL SWITCH DIMENSIONS

Straight PC





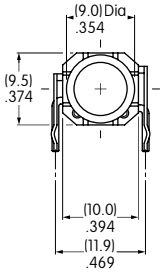


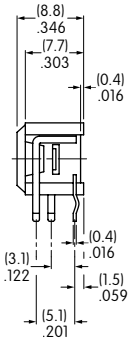


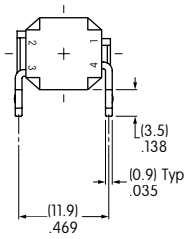
DSBA1P

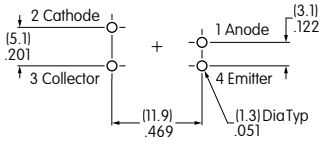
Terminal numbers are on bottom of switch.

Right Angle PC









DSBA1H

Terminal numbers are on bottom of switch.