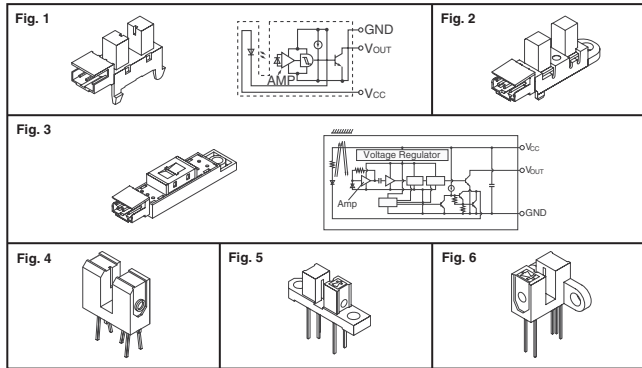


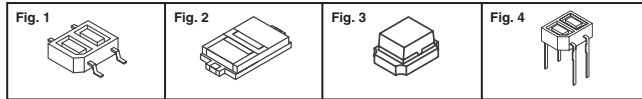
**SHARP** MICROELECTRONICS OF THE AMERICAS **OPIC™ Photointerrupters** 



| Fig. | Detector     |               | Sensing Distance (mm) | Terminal Type | Digi-Key Part No. | Price Each |      |      | Sharp Part No. |
|------|--------------|---------------|-----------------------|---------------|-------------------|------------|------|------|----------------|
|      | Vcc (V) Max. | Icc (mA) Max. |                       |               |                   | 1          | 10   | 100  |                |
| 1    | 5.5          | 16.5          | 5.0                   | Connector     | 425-1771-5-ND§    | 2.46       | 2.05 | 1.64 | GP1A073LCS     |
|      | 5.5          | 16.5          | 5.0                   | Connector     | 425-1953-5-ND†    | 1.85       | 1.55 | 1.24 | GP1A73AJ000F   |
| 2    | 5.5          | 20.0          | 5.0                   | Connector     | 425-2565-ND       | 2.49       | 2.08 | 1.67 | GP1A75E3J00F   |
|      | 5.5          | 20.0          | 5.0                   | Connector     | 425-1954-5-ND     | 1.58       | 1.32 | 1.06 | GP1A75EJ000F   |
| 3    | 5.25         | 30.0          | 1.0 - 9.0             | Connector     | 425-2044-5-ND†    | 5.55       | 4.45 | 3.67 | GP2A25J0000F   |
|      | 5.25         | 30.0          | 2.0 - 22.0            | Connector     | 425-2529-ND†      | 5.81       | 4.65 | 3.84 | GP2A240LCS0F   |
|      | 5.25         | 30.0          | 2.0 - 22.0            | Connector     | 425-2042-ND†      | 5.81       | 4.65 | 3.84 | GP2A200LCS0F   |
| 4    | 17.0         | 3.8           | 3.0                   | PCB           | 425-1950-5-ND     | 1.68       | 1.41 | 1.13 | GP1A52HRJ00F   |
|      | 17.0         | 3.8           | 3.0                   | PCB           | 425-1951-5-ND     | 1.78       | 1.49 | 1.19 | GP1A52LRJ00F   |
|      | 17.0         | 3.8           | 5.0                   | PCB           | 425-2432-5-ND     | 2.36       | 1.97 | 1.58 | GP1A53HRJ00F   |
|      | 17.0         | 3.8           | 10.0                  | PCB           | 425-1935-5-ND     | 2.63       | 2.19 | 1.76 | GP1A57HRJ00F   |
|      | 17.0         | 50.0          | 5.0                   | PCB           | 425-1952-5-ND     | 2.09       | 1.74 | 1.40 | GP1A58HRJ00F   |
| 5    | 17.0         | 3.8           | 3.0                   | PCB           | 425-1948-5-ND     | 1.72       | 1.44 | 1.15 | GP1A50HRJ00F   |
|      | 17.0         | 3.8           | 3.0                   | PCB           | 425-1949-5-ND     | 1.58       | 1.32 | 1.06 | GP1A51HRJ00F   |

§ Inverted † Reflective

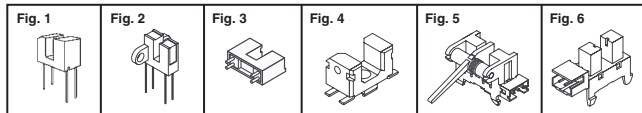
**Reflective Photointerrupters**



| Fig. | Detector     |              | Rise/Fall (µs) Typ. | Sensing Distance (mm) | Terminal Type | Digi-Key Part No. | Tube Price Each |      |     | Sharp Part No. |
|------|--------------|--------------|---------------------|-----------------------|---------------|-------------------|-----------------|------|-----|----------------|
|      | Vcc (V) Max. | Ic (mA) Max. |                     |                       |               |                   | 1               | 10   | 100 |                |
| 1    | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2569-1-ND†    | 1.35            | 1.13 | .90 | GP2S27T2J00F   |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2569-2-ND‡    | 628.41/1,000    |      |     | GP2S27T2J00F   |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2570-1-ND†    | 1.31            | 1.10 | .88 | GP2S27T3J00F   |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2570-2-ND‡    | 612.70/1,000    |      |     | GP2S27T3J00F   |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2051-1-ND†    | 1.25            | 1.04 | .84 | GP2S27TJ000F   |
| 2    | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2051-2-ND‡    | 581.28/1,000    |      |     | GP2S27TJ000F   |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-1097-1-ND†    | .76             | .61  | .42 | GP2S60         |
|      | 35           | 20           | 20/20               | 1                     | SMD           | 425-1097-2-ND‡    | 572.30/2,000    |      |     | GP2S60         |
|      | 35           | 20           | 20/20               | 0.7                   | SMD           | 425-2670-1-ND†    | .81             | .65  | .45 | GP2S60B        |
| 3    | 35           | 20           | 20/20               | 1.2 - 5.5             | SMD           | 425-1913-1-ND†    | 1.31            | 1.10 | .88 | GP2S700HCP     |
|      | 35           | 20           | 20/20               | 1.2 - 5.5             | SMD           | 425-1913-2-ND‡    | 612.70/1,000    |      |     | GP2S700HCP     |
|      | 35           | 20           | 20/20               | 0.7                   | PCB           | 425-2567-5-ND     | 1.01            | .85  | .68 | GP2S24BJ000F   |
| 4    | 35           | 20           | 20/20               | 0.7                   | PCB           | 425-2568-5-ND     | 1.01            | .85  | .68 | GP2S24CJ000F   |
|      | 35           | 20           | 20/20               | 0.7                   | PCB           | 425-2050-5-ND     | .94             | .79  | .63 | GP2S24J0000F   |
|      | 35           | 50           | 80/70               | 0.7                   | PCB           | 425-2049-5-ND     | 1.08            | .90  | .72 | GP2L24J0000F   |

† RoHS Compliant ‡ Cut Tape § Tape and Reel

**Photointerrupters**



| Fig. | Detector     |              | Rise/Fall (µs) Typ. | Sensing Distance (mm) | Terminal Type | Digi-Key Part No. | Tube Price Each |      |     | Sharp Part No. |
|------|--------------|--------------|---------------------|-----------------------|---------------|-------------------|-----------------|------|-----|----------------|
|      | Vcc (V) Max. | Ic (mA) Max. |                     |                       |               |                   | 1               | 10   | 100 |                |
| 1    | 35           | 20           | 3/4                 | 3.0                   | PCB           | 425-1971-5-ND     | 1.01            | .85  | .68 | GP1S52VJ000F   |
|      | 35           | 20           | 3/4                 | 4.2                   | PCB           | 425-1976-5-ND     | 1.28            | 1.07 | .86 | GP1S59J0000F   |
|      | 35           | 20           | 3/4                 | 5.0                   | PCB           | 425-1972-ND       | .98             | .82  | .66 | GP1S53VJ000F   |
|      | 35           | 20           | 3/4                 | 5.0                   | PCB           | 425-1975-5-ND     | 1.01            | .85  | .68 | GP1S58VJ000F   |
|      | 35           | 20           | 35/35               | 1.6                   | PCB           | 425-1978-5-ND     | 1.38            | 1.15 | .93 | GP1S95J0000F   |
|      | 35           | 20           | 35/35               | 1.6                   | PCB           | 425-1062-5-ND     | 1.16            | .97  | .70 | GP1S95         |

| Fig. | Detector     |              | Rise/Fall (µs) Typ. | Sensing Distance (mm) | Terminal Type | Digi-Key Part No. | Tube Price Each |      |      | Sharp Part No. |               |
|------|--------------|--------------|---------------------|-----------------------|---------------|-------------------|-----------------|------|------|----------------|---------------|
|      | Vcc (V) Max. | Ic (mA) Max. |                     |                       |               |                   | 1               | 10   | 100  |                |               |
| 1    | 35           | 20           | 38/48               | 2.0                   | PCB           | 425-1973-5-ND     | 1.65            | 1.38 | 1.10 | GP1S56J0000F   |               |
|      | 35           | 20           | 38/48               | 2.0                   | PCB           | 425-1974-5-ND     | 1.18            | .99  | .79  | GP1S56TJ000F   |               |
|      | 35           | 20           | 50/50               | 1.0                   | PCB           | 425-1965-5-ND     | .47             | .40  | .29  | GP1S096HCZ0F   |               |
|      | 35           | 20           | 50/50               | 2.0                   | PCB           | 425-1963-5-ND     | .63             | .51  | .35  | GP1S093HCZ0F   |               |
|      | 35           | 20           | 50/50               | 2.0                   | PCB           | 425-1966-5-ND     | .63             | .51  | .35  | GP1S097HCZ0F   |               |
|      | 35           | 20           | 50/50               | 3.0                   | PCB           | 425-1964-5-ND     | .63             | .51  | .35  | GP1S094HCZ0F   |               |
|      | 35           | 20           | 150/150             | 1.1                   | PCB           | 425-2509-5-ND     | .63             | .51  | .35  | GP1S196HCZ0F   |               |
|      | 35           | 20           | 150/150             | 1.1                   | SMT           | 425-2510-5-ND     | .57             | .48  | .35  | GP1S196HCZSF   |               |
|      | 2            | 35           | 20                  | 3/4                   | 3.0           | PCB               | 425-1970-5-ND   | 1.18 | .99  | .79            | GP1S551VJ000F |
|      | 3            | 10           | 20                  | 2/2                   | 5.0           | PCB               | 425-2680-5-ND   | 1.12 | .90  | .62            | GP1S525XJ00F  |
| 4    | 35           | 20           | 50/50               | 2.0                   | PCB           | 425-1962-1-ND     | .81             | .65  | .45  | GP1S092HCP1F   |               |
|      | 35           | 20           | 50/50               | 2.0                   | PCB           | 425-1962-2-ND     | 605.97/2,000    |      |      | GP1S092HCP1F   |               |
| 5    | 35           | 20           | 3/3                 | —                     | Conn.         | 425-1934-ND       | 2.78            | 2.34 | 1.67 | GP1S44S1J00F   |               |
|      | 35           | 20           | 3/4                 | 5.0                   | Conn.         | 425-2449-ND       | 1.25            | 1.04 | .84  | GP1S73P2J00F   |               |
| 6    | 35           | 20           | 3/4                 | 5.0                   | Conn.         | 425-2450-5-ND     | 1.35            | 1.13 | .90  | GP1S74PJ000F   |               |

† RoHS Compliant ‡ Cut Tape § Tape and Reel ¶ Low profile

**NIKK SWITCHES** **Contactless Tilt Switches** 

**DSB SERIES:**

Photointerrupter, rather than contacts, ensures high reliability. Sealed construction for protection from environmental elements, including hydrogen sulfide, sulfur dioxide, and nitrogen dioxide. Terminals are made of ammonia resistant materials. The switch is triggered when tilted beyond 30° in any direction

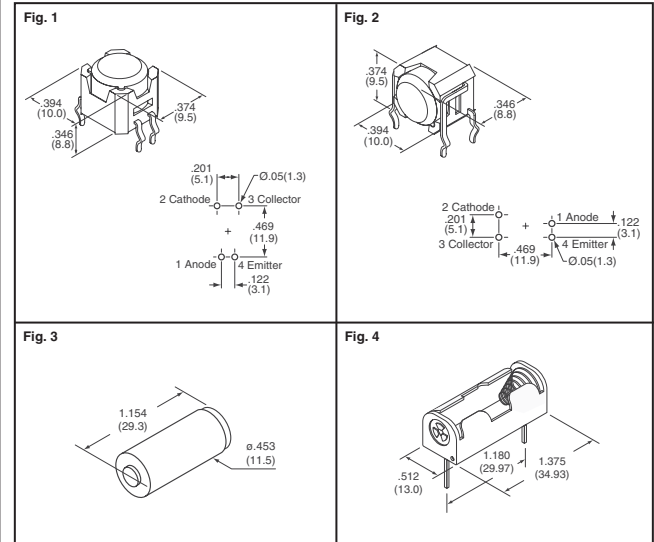
**Specifications:** • Mechanical and Electrical Life: 150,000 Operations Minimum • Forward Current: 20mA • Forward Voltage: 1.3V • Operating Temperature: -25°C - 80°C

Note: Prevent exposure to magnetic fields. Do not install switch near vibration source.

**DSA SERIES:**

Environmentally friendly, contains no mercury • High contact reliability due to sealed body • The switch is triggered when tilted beyond ±10° of the horizontal **Specifications:** • Resistive Load: 0.1A@12VDC • Mechanical Life: 100,000 operations minimum • Operating Temperature: -10°C - 70°C

Dim. in Inches (mm)



| Fig. | Description               | Digi-Key Part No. | Price Each |      |      | NKK Part No. |
|------|---------------------------|-------------------|------------|------|------|--------------|
|      |                           |                   | 1          | 25   | 100  |              |
| 1    | Tilt Switch, Straight     | 360-2187-ND       | 7.38       | 5.11 | 4.52 | DSBA1P       |
| 2    | Tilt Switch, Right Angle  | 360-2188-ND       | 7.38       | 5.11 | 4.52 | DSBA1H       |
| 3    | Tilt Switch, SPST, On/Off | 360-2291-ND       | 8.89       | 6.30 | 5.56 | DSA01        |
| 4    | PCB Adaptor for DSA01     | 360-2292-ND       | 4.02       | 2.48 | 2.19 | AT094        |

**JST Mating Connector, Contact and Crimp Tool**

| Description  | Digi-Key Part No. | Pricing  |     |      | Tape and Reel Pricing | JST Part No.   |
|--|-------------------|----------|-----|------|-----------------------|----------------|
|  |                   | 1        | 10  | 100  | ‡                     |                |
| 3-Pos., 2.5mm, Disconnectable Crimp Style NH Connector | 455-1120-ND       | .09      | .83 | 6.88 | —                     | H3P-SHF-AA     |
| Tin-Plated Phosphor Bronze Crimp Contact, 22-28AWG     | 455-1121-1-ND     | .05      | .45 | 3.75 | 112.57/5,000          | SHF-001T-0.8BS |
| Crimp Tool with Die for 22-28AWG Contacts              | 455-1122-ND       | 555.09/1 |     |      | —                     | WC-122         |

† RoHS Compliant ‡ For Tape and Reel part number, change 1-ND to 2-ND.

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