

T-41-49



Spectra-Band Photocell Series

A series of spectral-response silicon photocells designed for unique product applications.

VIO-BLUE

Enhanced violet and blue response. Also can be used in U.V. detection because of high sensitivity to short wavelength radiation.

GREEN BLAZE

Photopic curve response for use in innumerable light response applications — with high reliability and low cost.

INFRA-R

Visible cut-off, high infrared response. Solves ambient light problems in IR activated photoelectric applications.

FEATURES

- Select spectral response
- No bias power source needed
- High temperature stability and high sensitivity through silicon construction
- Low noise
- High reliability
- A wide variety of sizes and packages, special geometries available

APPLICATIONS

- Photographic equipment
- Color, pattern recognition equipment
- Light discriminating systems

SPECTRA-BAND PHOTOCELLS

TOIs' special spectral response photocells are designed for the photographic industry, photometric instrumentation, and photoelectric control/switching applications.

MECHANICAL SPECIFICATIONS

| Spectra-Band Cell Configurations | | | | | | | |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|-------------|-------------|
| | Part Number | Part Number | Part Number | Part Number | Part Number | Part Number | Part Number |
| GREEN BLAZE | GB02505EPL | GB0505EPL | GB1010EPL | GB1020EPL | GBTO-18 | GBTO-5 | GBTO-8 |
| INFRA-R | FR02505EPL | FR0505EPL | FR1010EPL | FR1020EPL | FRTO-18 | FRTO-5 | FRTO-8 |
| VIO-BLUE | VB02505EPL | VB0505EPL | VB1010EPL | VB1020EPL | VBTO-18 | VBTO-5 | VBTO-8 |
| Package | Coated Cell | Coated Cell | Coated Cell | Coated Cell | Modified TO-18 | TO-5 | TO-8 |
| Lead Termination | 6" Length Std. | 6" Length Std. | 6" Length Std. | 6" Length Std. | Leads | Leads | Leads |
| Cell Dimensions | In. | 0.1 x 0.2 | 0.2 x 0.2 | 0.4 x 0.4 | 0.055 x 0.055 | 0.1 x 0.2 | 0.28 x 0.28 |
| | Cm. | 0.25 x 0.5 | 0.5 x 0.5 | 1.0 x 1.0 | 0.14 x 0.14 | 0.25 x 0.5 | 0.72 x 0.72 |
| Active Area (Sq. Cm.) | 0.1 | 0.2 | 0.9 | 1.8 | 0.018 | 0.1 | 0.5 |





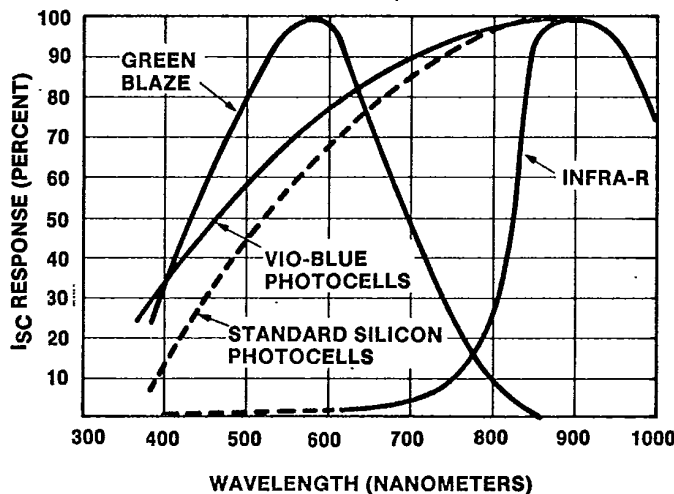
Spectra-Band Photocell Series

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

| INFRA-R SERIES | | | | | | | | | | | |
|-----------------------|----------|---------|--|------------|-----------|-----------|-----------|---------|--------|--------|--|
| Parameter | Symbol | Unit | Test Condition | FR02505EPL | FR0505EPL | FR1010EPL | FR1020EPL | FRT0-18 | FRT0-5 | FRT0-8 | |
| Short Circuit Current | I_{SC} | mA | 100 mW/cm ² , AM1 Solar Radiation | 1.3 | 2.6 | 11.5 | 23.0 | 0.3 | 1.3 | 6.4 | |
| Open Circuit Voltage | V_{OC} | Volts | 100 mW/cm ² , AM1 Solar Radiation | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | |
| Forward Voltage | V_F | Volts | $I_F = 1$ mA | 0.50 | 0.50 | 0.45 | 0.40 | 0.50 | 0.50 | 0.45 | |
| Dark Current | I_D | μ A | $V_R = 0.1$ V | 0.2 | 0.4 | 0.8 | 0.9 | 0.2 | 0.2 | 0.5 | |
| Capacitance | C_T | pF | $V_R = 0$ V | 1.0 | 3.0 | 10.0 | 15.0 | 1.0 | 1.0 | 8.0 | |
| Responsivity | R_e | A/W | $\lambda_p = 900$ nm, $V_R = 0$ | 0.45 | 0.45 | 0.45 | 0.45 | 0.40 | 0.40 | 0.40 | |

| VIO-BLUE SERIES | | | | | | | | | | | |
|-----------------------|----------|---------|--|------------|-----------|-----------|-----------|---------|--------|--------|--|
| Parameter | Symbol | Unit | Test Condition | VB02505EPL | VB0505EPL | VB1010EPL | VB1020EPL | VBTO-18 | VBTO-5 | VBTO-8 | |
| Short Circuit Current | I_{SC} | mA | 100 mW/cm ² , AM1 Solar Radiation | 2.3 | 4.7 | 21.0 | 42.0 | 0.5 | 2.3 | 11.6 | |
| Open Circuit Voltage | V_{OC} | Volts | 100 mW/cm ² , AM1 Solar Radiation | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | |
| Forward Voltage | V_F | Volts | $I_F = 1$ mA | 0.50 | 0.50 | 0.45 | 0.40 | 0.50 | 0.50 | 0.45 | |
| Dark Current | I_D | μ A | $V_R = 0.1$ V | 0.2 | 0.4 | 0.8 | 0.9 | 0.2 | 0.2 | 0.5 | |
| Capacitance | C_T | pF | $V_R = 0$ V | 1.0 | 3.0 | 10.0 | 15.0 | 1.0 | 1.0 | 8.0 | |
| Responsivity | R_e | A/W | $\lambda_p = 900$ nm, $V_R = 0$ | 0.48 | 0.48 | 0.48 | 0.48 | 0.44 | 0.44 | 0.44 | |

| GREEN-BLAZE SERIES | | | | | | | | | | | |
|-----------------------|----------|---------|--|------------|-----------|-----------|-----------|---------|--------|--------|--|
| Parameter | Symbol | Unit | Test Condition | GB02505EPL | GB0505EPL | GB1010EPL | GB1020EPL | GBTO-18 | GBTO-5 | GBTO-8 | |
| Short Circuit Current | I_{SC} | mA | 100 mW/cm ² , AM1 Solar Radiation | 0.27 | 0.55 | 2.5 | 5.0 | 0.06 | 0.27 | 1.38 | |
| Open Circuit Voltage | V_{OC} | Volts | 100 mW/cm ² , AM1 Solar Radiation | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | |
| Forward Voltage | V_F | Volts | $I_F = 1$ mA | 0.50 | 0.45 | 0.45 | 0.40 | 0.50 | 0.50 | 0.45 | |
| Dark Current | I_D | μ A | $V_R = 0.1$ V | 0.3 | 0.4 | 0.8 | 1.0 | 0.3 | 0.3 | 0.5 | |
| Capacitance | C_T | pF | $V_R = 0$ V | 1.0 | 2.0 | 3.0 | 5.0 | 1.0 | 1.0 | 2.0 | |
| Responsivity | R_e | A/W | $\lambda_p = 555$ nm | 0.20 | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 | 0.19 | |



TYPICAL SHORT CIRCUIT CURRENT (I_{SC}) RESPONSE

- Standard Silicon Photovoltaic Cell (at 900 nm) ~ 0.48 A/W
- Vio-Blue (at 900 nm) ~ 0.48 A/W
- Green Blaze (at 555 nm) ~ 0.20 A/W
- Infra-R (at 900 nm) ~ 0.45 A/W

TYPICAL SPECTRAL RESPONSE CHARACTERISTICS — NORMALIZED



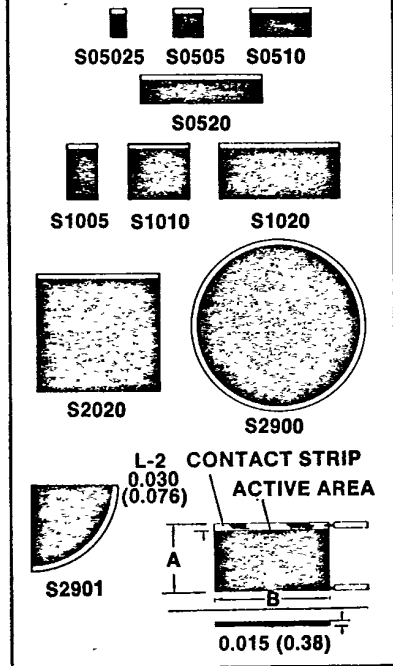
Silicon Photocell Sensors

SILICON PHOTOCELL SENSORS

TOI silicon photocells are employed in photometer, switching, position detection, tape and disc EOT-BOT sensing, solar energy conversion, and other numerous applications. Silicon photosensors with special geometries, spectral response and switching characteristics, are available on a custom basis, and are widely used in the optical encoder, character recognition, and optical instrumentation fields.

STANDARD CELL OUTLINES

Also available as gridded type.



| Standard Size Part Numbers | Cell Dimensions | | Photo Active Area | | (1) Test Voltage (Volts) |
|----------------------------|--------------------------|------------|-------------------|-----------------|--------------------------|
| | in. | cm. | in. ² | cm ² | |
| S05025 | 0.20 x 0.10 | 0.5 x 0.25 | .017 | 0.1 | .43 |
| S0505 | 0.20 x 0.20 | 0.5 x 0.5 | .034 | 0.2 | .43 |
| S0510 | 0.20 x 0.40 | 0.5 x 1.0 | .068 | 0.4 | .43 |
| S0520 | 0.20 x 0.80 | 0.5 x 2.0 | .136 | 0.8 | .43 |
| S1005 | 0.40 x 0.20 | 1.0 x 0.5 | .074 | 0.4 | .43 |
| S1010 | 0.40 x 0.40 | 1.0 x 1.0 | .148 | 0.9 | .43 |
| S1020 | 0.40 x 0.80 | 1.0 x 2.0 | .296 | 1.9 | .43 |
| S2020 | 0.80 x 0.80 | 2.0 x 2.0 | .620 | 3.8 | .43 |
| S2900 | 1.125 Dia. | 2.86 | .88 | 5.7 | .43 |
| S2901 | Quarter Section of S2900 | — | .22 | 1.4 | .43 |

NOTE: (1) Irradiance: 100 mW/cm², AM1 solar radiation.

Part Number Code for Ordering Silicon Light Sensors

EXAMPLE:

S 05 05 G E 6 PL

| Silicon | "A" Width | "B" Length | Gridded Type | Device Type | Minimum Conversion Efficiency | Leads If Desired |
|---------------|---|------------|---|-------------|-------------------------------|----------------------|
| (Outline L-2) | 05 = 0.20" (0.5 cm) 10 = 0.40" (1.0 cm) 20 = 0.80" (2.0 cm) | | Add "G" for cells 0.4" x 0.4" (1.0 x 1.0 cm) and larger | "E" P on N | 5% to 10% (6 = 6%, etc.) | PL — (Pigtail Leads) |

TYPICAL PERFORMANCE CHARACTERISTICS

| STANDARD SILICON PHOTOCELL | | | | | | |
|----------------------------|-----------------|-------|--|--------|-------|-------|
| Parameter | Symbol | Unit | Test Condition | S05025 | S0505 | S0510 |
| Short Circuit Current | I _{SC} | mA | 100 mW/cm ² , AM1 Solar Radiation | 1.8 | 3.8 | 7.5 |
| Short Circuit Current | I _{SC} | mA | 100 fc, Tungsten @ 2870°K | 0.07 | 0.13 | 0.27 |
| Open Circuit Voltage | V _{OC} | Volts | 100 mW/cm ² , AM1 Solar Radiation | 0.43 | 0.43 | 0.43 |
| Forward Voltage | V _F | Volts | I _F = 1 mA | 0.50 | 0.50 | 0.42 |
| Dark Current | I _D | μA | V _R = 0.1 V | 0.3 | 0.5 | 0.6 |
| Capacitance | C _T | pF | V _R = 0 V | 1.5 | 2.4 | 5.0 |
| Responsivity | R _e | A/W | λ _p = 900 nm | 0.48 | 0.48 | 0.48 |

| STANDARD SILICON PHOTOCELL (Continued) | | | | | | |
|--|-----------------|-------|--|-------|-------|-------|
| Parameter | Symbol | Unit | Test Condition | S1010 | S1020 | S2020 |
| Short Circuit Current | I _{SC} | mA | 100 mW/cm ² , AM1 Solar Radiation | 17.0 | 35.0 | 72.0 |
| Short Circuit Current | I _{SC} | mA | 100 fc, Tungsten @ 2870°K | 0.55 | 1.10 | 2.2 |
| Open Circuit Voltage | V _{OC} | Volts | 100 mW/cm ² , AM1 Solar Radiation | 0.43 | 0.43 | 0.43 |
| Forward Voltage | V _F | Volts | I _F = 1 mA | 0.42 | 0.40 | 0.30 |
| Dark Current | I _D | μA | V _R = 0.1 V | 0.8 | 1.8 | 25.0 |
| Capacitance | C _T | pF | V _R = 0 V | 20.0 | 25.0 | 70.0 |
| Responsivity | R _e | A/W | λ _p = 900 nm | 0.48 | 0.48 | 0.48 |