T-41-49

TOI Texas Optoelectronics, Inc.

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

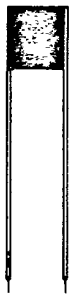
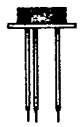
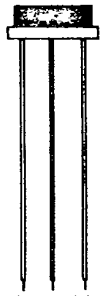
APPLICATIONS

- 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						 Modified TO-206 AA (TO-18)	 TO-205 AA (TO-5)	 TO-233 AA (TO-8)
		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	0.4 x 0.8	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	1.0 x 2.0	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

7

TOI Texas Optoelectronics, Inc.

Spectra-Band Photocell Series

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

INFRA-R SERIES

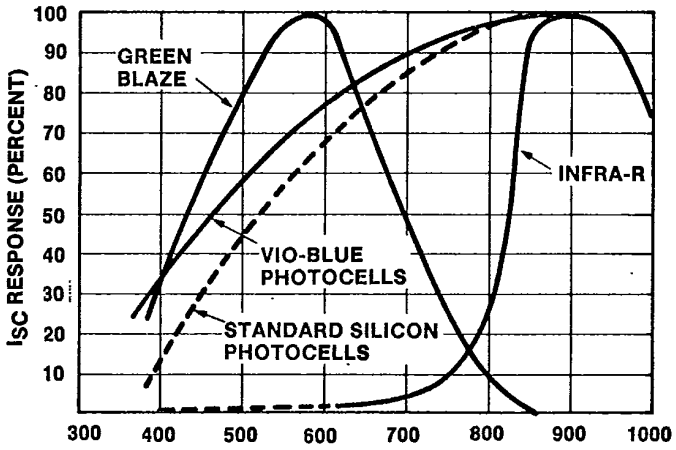
Parameter	Symbol	Unit	Test Condition	FR02505EPL	FR0505EPL	FR1010EPL	FR1020EPL	FRTO-18	FRTO-5	FRTO-8
Short Circuit Current	I_{SC}	mA	100 mW/cm^2, AM1 Solar Radiation	1.3	2.6	11.5	23.0	0.3	1.3	6.4
Open Circuit Voltage	V_{OC}	Volts	100 mW/cm^2, AM1 Solar Radiation	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Forward 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	μA	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	λp = 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	μA	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	λp = 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	μA	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	λp = 555 nm	0.20	0.20	0.20	0.20	0.19	0.19	0.19



TYPICAL SPECTRAL RESPONSE CHARACTERISTICS — NORMALIZED

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

7

TOI Texas Optoelectronics, Inc.

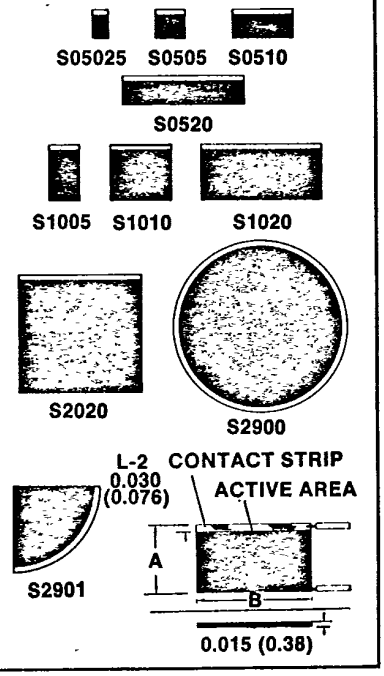
Silicon Photocell Sensors

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/cm^2, 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	S0520	S1005
Short Circuit Current	I_{SC}	mA	100 mW/cm^2, AM1 Solar Radiation	1.8	3.8	7.5	15.0	7.5
Short Circuit Current	I_{SC}	mA	100 fc, Tungsten @ 2870°K	0.07	0.13	0.27	0.54	0.27
Open Circuit Voltage	V_{OC}	Volts	100 mW/cm^2, AM1 Solar Radiation	0.43	0.43	0.43	0.43	0.43
Forward Voltage	V_F	Volts	I_F = 1 mA	0.50	0.50	0.42	0.42	0.42
Dark Current	I_D	μA	V_R = 0.1 V	0.3	0.5	0.6	0.8	0.6
Capacitance	C_T	pF	V_R = 0 V	1.5	2.4	5.0	10.0	5.0
Responsivity	R_e	A/W	λp = 900 nm	0.48	0.48	0.48	0.48	0.48

STANDARD SILICON PHOTOCELL (Continued)

Parameter	Symbol	Unit	Test Condition	S1010	S1020	S2020	S2900	S2901
Short Circuit Current	I_{SC}	mA	100 mW/cm^2, AM1 Solar Radiation	17.0	35.0	72.0	105.0	27.0
Short Circuit Current	I_{SC}	mA	100 fc, Tungsten @ 2870°K	0.55	1.10	2.2	3.3	0.8
Open Circuit Voltage	V_{OC}	Volts	100 mW/cm^2, AM1 Solar Radiation	0.43	0.43	0.43	0.43	0.43
Forward Voltage	V_F	Volts	I_F = 1 mA	0.42	0.40	0.30	0.25	0.40
Dark Current	I_D	μA	V_R = 0.1 V	0.8	1.8	25.0	100.0	100.0
Capacitance	C_T	pF	V_R = 0 V	20.0	25.0	70.0	90.0	25.0
Responsivity	R_e	A/W	λp = 900 nm	0.48	0.48	0.48	0.48	0.48

7

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