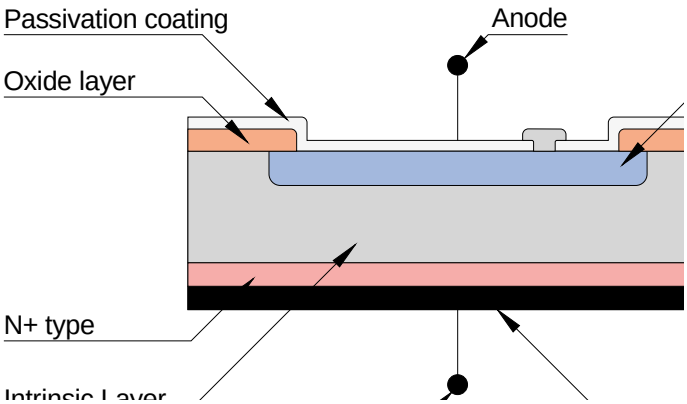
SMP SERIES



HIGH SENSITIVITY SINGLE ELEMENT SILICON PHOTODIODES

Description

The SMP devices are a range of single element Silicon P.I.N. photodiodes. The device structure has be designed to give maximum sensitivity and high speed of response.

The device structure shown above has a high resistance intrinsic layer sandwiched between P and N+ layers.

Various optical filters can be incorporated inside the package to pass selected regions of the ultra-violet to infra-red spectrum. The optical filters can be ionically coloured glass or vapour-deposited dielectric layers on a glass substrate. For more details of the filter permutations, contact Semelab Plc.

FEATURES:

- **HIGH RESPONSIVITY**
- **WIDE RANGE OF ELEMENT SIZES**
- **LOW LEAKAGE CURRENT**
- **LOW CAPACITANCE**
- **EXCELLENT LINEARITY**
- **LOW NOISE**
- **WIDE SPECTRAL RESPONSE**
- **WIDE INTRINSIC BANDWIDTH**
- **INTEGRAL OPTICAL FILTER OPTION***
- **EMI SCREENING MESH AVAILABLE**
- **HERMETIC METAL PACKAGES**
- **LOW COST**

APPLICATIONS:

- **MEDICAL INSTRUMENTS**
- **METROLOGY**
- **LABORATORY INSTRUMENTATION**
- **POSITION AND PROXIMITY SENSORS**
- **REMOTE SENSING**
- **PHOTO-INTERRUPTORS**
- **SMOKE DETECTORS**
- **FIBRE OPTIC DETECTORS**

Electrical Specifications (T_A = 25°C unless otherwise stated)

Device Type	Photodiode element size		Responsivity (typical)	Minimum Breakdown Voltage	Capacitance (typical)		Maximum Dark Current	Rise Time (typical)	NEP (typical)
	Area mm^2	Linear mm	@900nm A / W	@10µA V	@0V pF	@20V pF	@1V nA	@30V ns	x 10^{14} W/√Hz
SMP400	0.62	1 x 1	0.55	60	12	2.5	0.1	4	7.2
SMP525	2.05	4.5 x 0.7	0.55	60	45	6	0.25	n/a	n/a
SMP550	5.19	2.5 x 2.5	0.55	60	55	10	0.7	8	9.8
SMP600	14.74	4 x 4	0.55	60	90	25	2	9	19
SMP690	35.00	6 x 6	0.55	60	150	20	3	12	20
SMP900	42.35	7 x 7	0.55	60	350	65	4	13	24
SMP1500	76.85	9 x 9	0.55	60	800	150	9	16	28
SMP2000	100.11	12 x 12	0.55	60	1800	200	12	19	30

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

SEME LAB

SMP SERIES

PHOTODIODE SELECTION TABLE

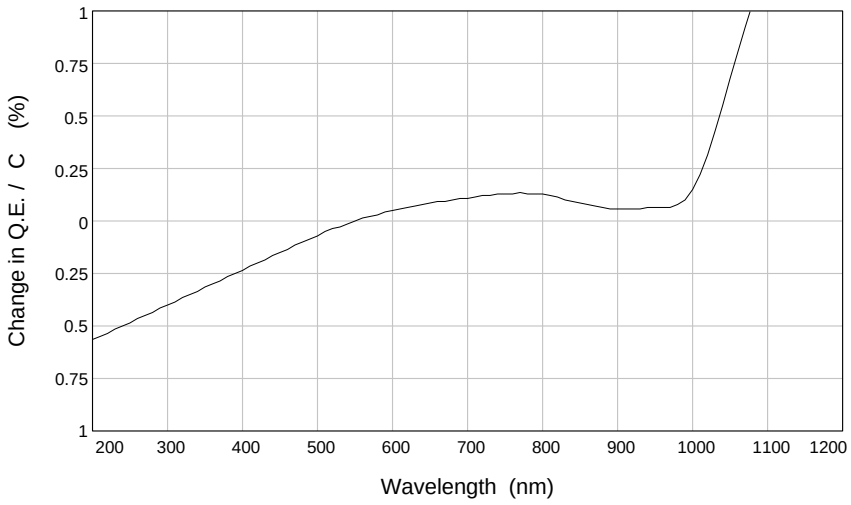
Part Number	Photodiode Size (mm)	TO-18						
		2 Leads	3 Leads	Low Profile	UV Glass	Lensed Cap	Standard	Bead Lens Cap
SMP400G-BA	1 x 1	●		●				
SMP400G-BB	1 x 1	●			●			
SMP400G-BC	1 x 1	●				●		
SMP400G-BD	1 x 1	●					●	
SMP400G-BE	1 x 1	●						●
SMP400G-CA	1 x 1		●	●				
SMP400G-CB	1 x 1		●		●			
SMP400G-CC	1 x 1		●			●		
SMP400G-CD	1 x 1		●				●	
SMP400G-CE	1 x 1		●					●
Part Number	Photodiode Size (mm)	TO-39						
		2 Leads	3 Leads	Standard Glass	UV Glass	BG18 Filter	RG850 Filter	Lensed Cap
SMP525G-EJ	4.5 x 0.7	●		●				
SMP525G-EK	4.5 x 0.7	●			●			
SMP525G-EL	4.5 x 0.7	●				●		
SMP525G-EM	4.5 x 0.7	●					●	
SMP525G-EN	4.5 x 0.7	●						●
SMP525G-FJ	4.5 x 0.7		●	●				
SMP525G-FK	4.5 x 0.7		●		●			
SMP525G-FL	4.5 x 0.7		●			●		
SMP525G-FM	4.5 x 0.7		●				●	
SMP525G-FN	4.5 x 0.7		●					●
SMP550G-EJ	2.5 x 2.5	●		●				
SMP550G-EK	2.5 x 2.5	●			●			
SMP550G-EL	2.5 x 2.5	●				●		
SMP550G-EM	2.5 x 2.5	●					●	
SMP550G-EN	2.5 x 2.5	●						●
SMP550G-FJ	2.5 x 2.5		●	●				
SMP550G-FK	2.5 x 2.5		●		●			
SMP550G-FL	2.5 x 2.5		●			●		
SMP550G-FM	2.5 x 2.5		●				●	
SMP550G-FN	2.5 x 2.5		●					●
SMP600G-EJ	4 x 4	●		●				
SMP600G-EK	4 x 4	●			●			
SMP600G-EL	4 x 4	●				●		
SMP600G-EM	4 x 4	●					●	
SMP600G-EN	4 x 4	●						●
SMP600G-FJ	4 x 4		●	●				
SMP600G-FK	4 x 4		●		●			
SMP600G-FL	4 x 4		●			●		
SMP600G-FM	4 x 4		●				●	
SMP600G-FN	4 x 4		●					●
Part Number	Photodiode Size (mm)	TO-8					TO-M	
		Small	2 Leads	3 Leads	Standard Glass	UV Glass	Multi-Leads	Standard Glass
SMP690G-JPS	6 x 6	●	●		●			
SMP690G-JQS	6 x 6	●	●			●		
SMP690G-KPS	6 x 6	●		●	●			
SMP690G-KQS	6 x 6	●		●		●		
SMP900G-JP	7 x 7		●		●			
SMP900G-JQ	7 x 7		●			●		
SMP900G-KP	7 x 7			●	●			
SMP900G-KQ	7 x 7			●		●		
SMP1000G-JP	9 x 9		●		●			
SMP1000G-JQ	9 x 9		●			●		
SMP1000G-KP	9 x 9			●	●			
SMP1000G-KQ	9 x 9			●		●		
SMP2000G-MV	12 x 12						●	●

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

Prelim. 8/96

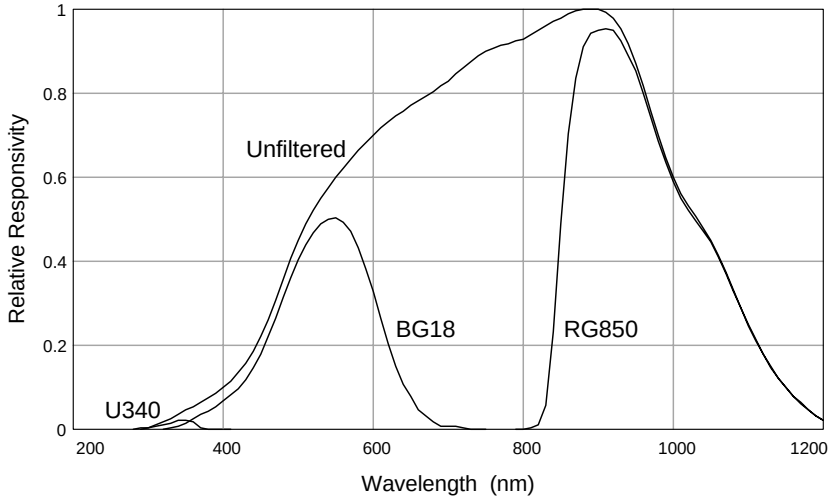
SMP SERIES

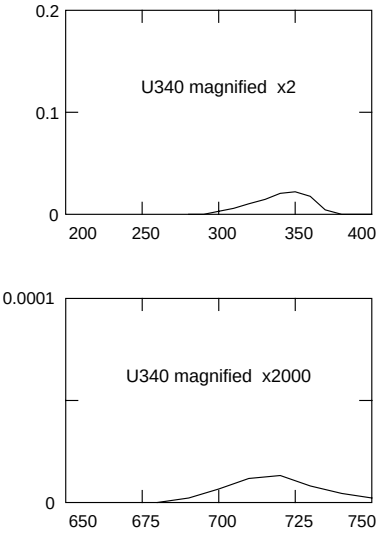
Responsivity of SMP Photodiodes vs. Temperature



Note:
Theoretical prediction of interpolated data.

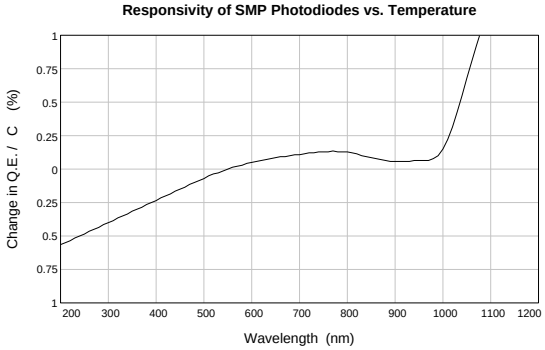
Spectral Responsivity of SMP Photodiodes with and without integral optical filters

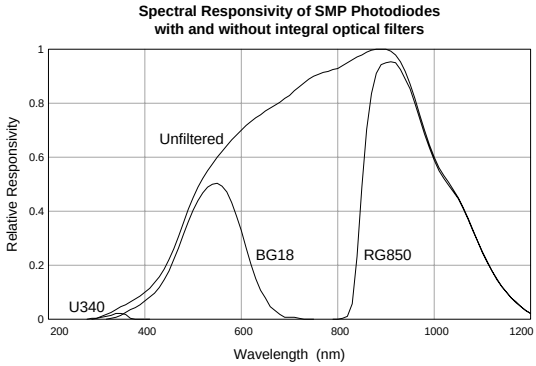




Note:

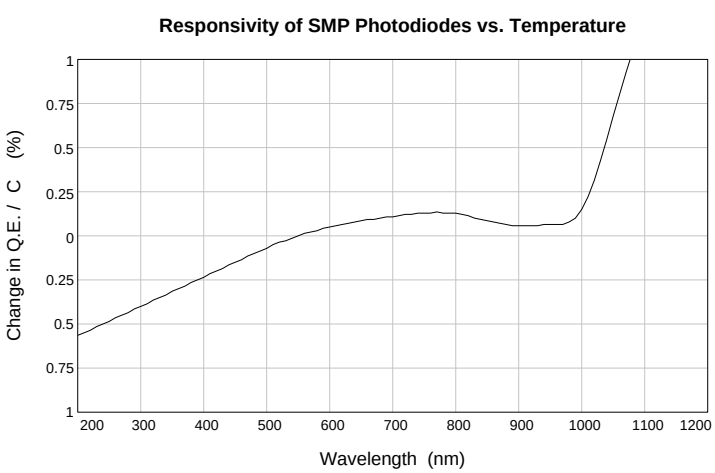
The photodiodes are operated at zero bias for best sensitivity. Operation at reverse bias will enhance further the speed of response. Typical circuits for these configurations are show below.

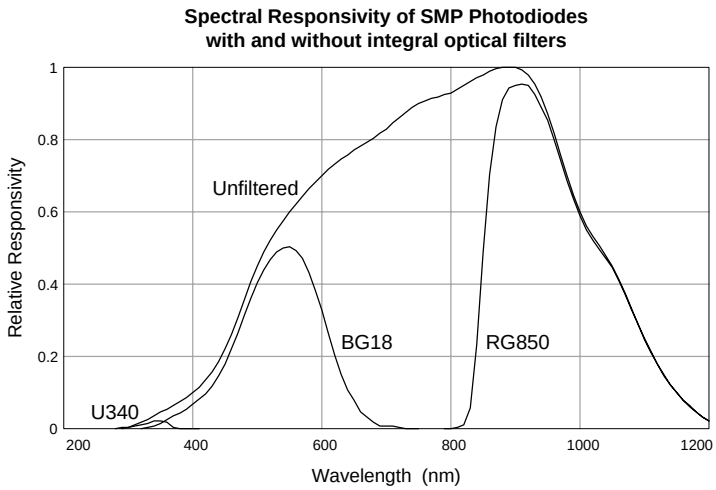




Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

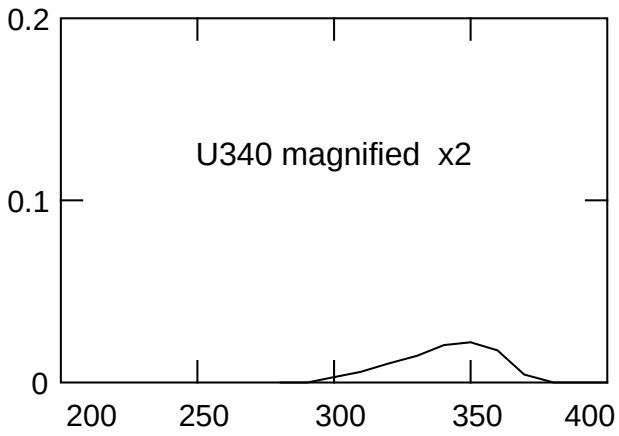
SMP SERIES

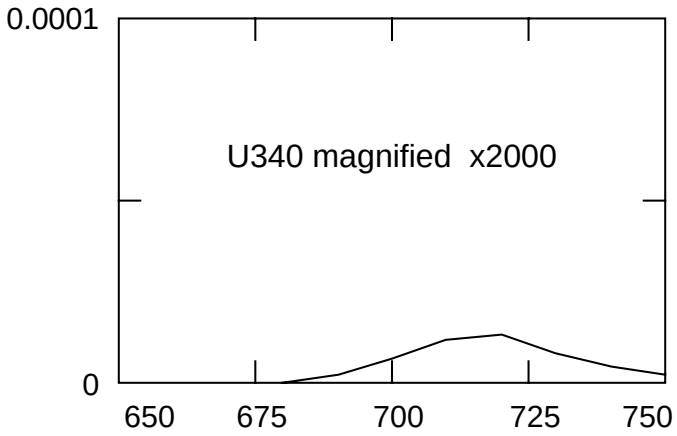




Standard TO–18

Lensed TO–18



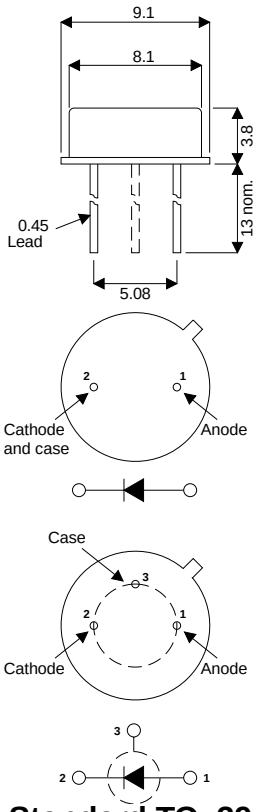


Bead Lens TO–18

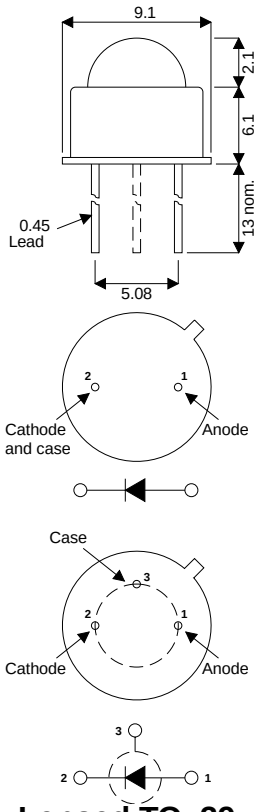
Low Profile TO–18

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

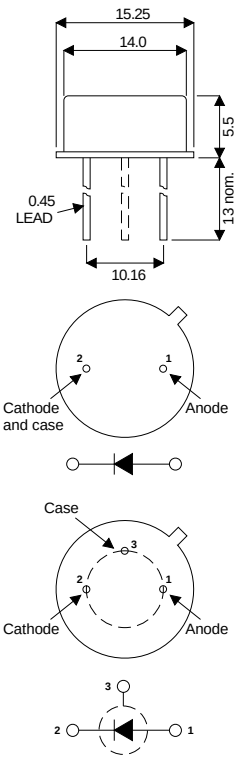
SMP SERIES



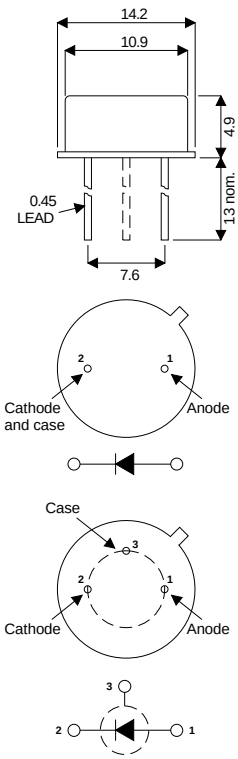
Standard TO–39



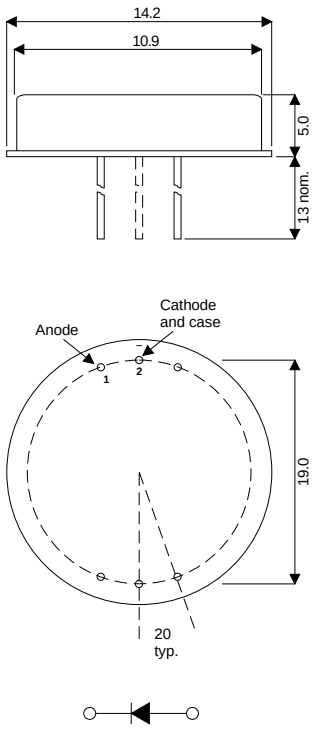
Lensed TO–39



Standard TO–8



Small TO–8



TO–M

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk