

FAST RESPONSE SILICON PHOTODIODES FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS

Silicon Photodiodes – VTP Series

Applications

- Smoke detection
- Barcode scanning
- Light meters
- Pulse oximeters

Features and Benefits

- Visible to IR spectral range
- Integral visible rejection filters available
- 1 to 2 % linearity over 7 to 9 decades
- Low dark currents
- High shunt resistance
- Low capacitance



Product Description

Photodiodes in this series have been designed for low junction capacitance. The lower the capacitance, the faster the response of the photodiode when the RC time constant is your limiting factor. Also, speed can be further increased by reverse biasing the photodiodes. These devices have excellent response in the IR region and are well matched to IR LEDs (VTE series). Some photodiodes are available in packages which incorporate a visible rejection filter, effectively blocking light below 700 nm. Photodiodes made with the VTP process are suitable for operation under reverse bias conditions but may be used in the photovoltaic mode. Typical reverse breakdown voltages are around 140 V. Low dark currents under reverse bias are also a feature of this series.

Product Table

Silicon Photodiodes – VTP Series

Symbol	Package	Active Area mm ²	Short Circuit Current	Dark Current	Junction Capacitance	Radiometric Sensitivity @ λ _P	Spectral Range λ _{RANGE} nm	Peak Wavelength	Active Area
			min	max	max	typ		λ _P	typ
			I _{SC} μA	I _D nA	C _J pF	S _R A/W		NEP W/√Hz	
VTP100H	Flat sidelooker IRT	7.45	35	30	50	0.5	725-1150	925	2.5 x 10 ⁻¹⁴
VTP100CH	Flat sidelooker	7.45	50	30	50	0.55	400-1150	925	9.0 x 10 ⁻¹⁴
VTP1012H	TO-46	1.6	10	7	6	0.55	400-1150	925	8.7 x 10 ⁻¹⁴
VTP1112H	TO-46 lensed	1.6	30	7	6	0.55	400-1150	925	8.7 x 10 ⁻¹⁴
VTP1188SH	Lensed ceramic	11	200 (typ)	30	300	0.55	400-1100	925	-
VTP1220FBH	T-1¾ flat	1.219	0.7	10	18	0.27	400-725	550	-
VTP1232H	T-1¾	2.326	100	25	180	0.6	400-1100	920	-
VTP1232FH	T-1¾ flat	2.326	21	25	180	0.6	400-1100	920	-
VTP1332H	T-1¾ IRT	2.326	75	25	180	0.55	725-1150	920	-
VTP1332FH	T-1¾ flat IRT	2.326	17	25	180	0.55	725-1150	920	-
VTP3310LAH	T1	0.684	24	35	25	0.55	400-1150	925	1.9 x 10 ⁻¹³
VTP3410LAH	T1 IRT	0.684	15	35	25	0.55	700-1150	925	1.9 x 10 ⁻¹³

Electrical characteristics at T_{Ambient} = 25 °C

Product Table

Silicon Photodiodes – VTP Series

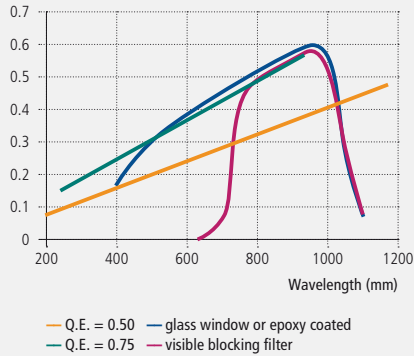
Symbol	Package	Active Area mm ²	Short Circuit Current		Dark Current		Junction Capacitance	Radiometric Sensitivity @ λ _P	Spectral Range	Peak Wavelength	Active Area
			min	max	max	typ	λ _{RANGE}	λ _P	typ		
			I _{SC}	I _D	C _J	S _R	λ _{RANGE}	λ _P	NEP		
Unit			μA	nA	pF	A/W	nm	nm	W/√Hz		
VTP413H	Lensed sidelooper	7.45	120 (typ)	30	50	0.55	400-1150	925	2.3 x 10 ⁻¹⁴		
VTP4085H	Ceramic	21	200 (typ)	100	500	0.55	400-1100	925	-		
VTP4085SH	Ceramic	21	200 (typ)	50	500	0.55	400-1100	925	-		
VTP5050H	TO-5	7.45	40	18	24	0.55	400-1150	925	1.4 x 10 ⁻¹³		
VTP6060H	TO-8	20.6	120	35	60	0.55	400-1150	925	1.9 x 10 ⁻¹³		
VTP7110H	Lateral	0.684	6	35	25	0.55	400-1150	925	1.9 x 10 ⁻¹³		
VTP7210H	Lateral IRT	0.684	5	35	25	0.55	700-1150	925	1.9 x 10 ⁻¹³		
VTP7840H	Lensed sidelooper IRT	5.27	50	20	40	0.55	725-1150	925	5.3 x 10 ⁻¹⁴		
VTP8350H	Ceramic	7.45	65	30	50	0.55	400-1150	925	1.8 x 10 ⁻¹³		
VTP8440H	8 mm ceramic	5.16	30	15	15	0.55	400-1150	925	1.3 x 10 ⁻¹³		
VTP8551H	Mini-DIP	7.45	50	30	50	0.55	400-1150	925	1.8 x 10 ⁻¹³		
VTP8651H	Mini-DIP IRT	7.45	35	30	50	0.5	725-1150	925	2.0 x 10 ⁻¹³		
VTP8740_TRH	SMT clear plastic	5.269	75	20	50	0.6	400-1150	925	2.0 x 10 ⁻¹³		
VTP8840_TRH	SMT IRT	5.269	50	20	50	0.6	725-1150	925	2.0 x 10 ⁻¹³		
VTP9412H	6 mm ceramic	1.6	10	7	6	0.55	400-1150	925	8.7 x 10 ⁻¹⁴		
VTP9812FH	T-1 3/4 flat	1.548	0.7	10	18	0.034	400-700	580	-		
SR10SPD 880-0.9	SMT	0.73	-	0.01	-	-	820-935	890	-		

Electrical characteristics at T_{ambient} = 25 °C

Graph 1

Absolute Spectral Response*

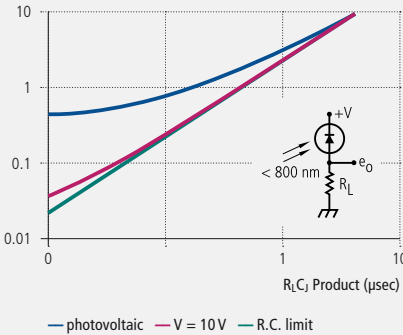
Radiometric Sensitivity, A/W



Graph 2

Rise/Fall Times – Non Saturated*

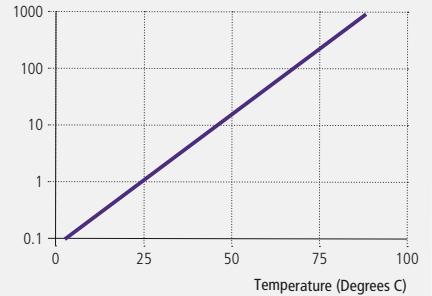
Response Time (μsec 10–90%)



Graph 3

Relative Dark Current vs. Temperature*

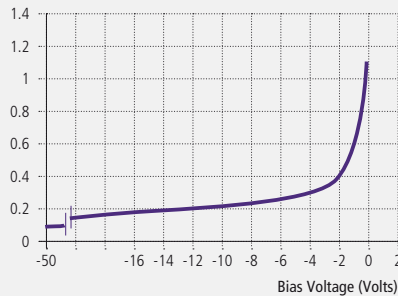
Relative Dark Current



Graph 4

Rel. Junction Capacitance vs. Voltage*

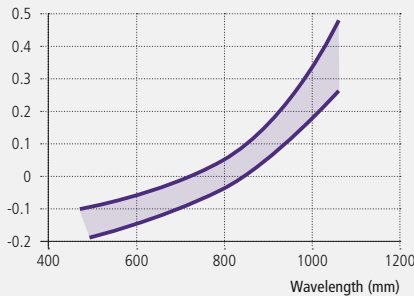
Relative Capacitance



Graph 5

Temp. Coefficient of Light Current vs. Wavelength*

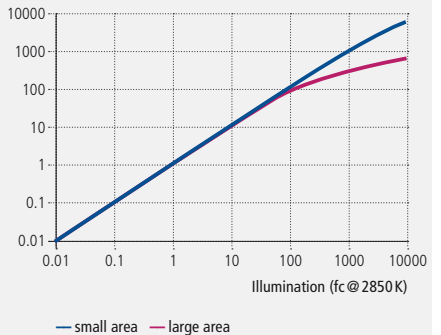
Temperature Coefficient (%) / Degree (C)



Graph 6

Rel. Short Circuit Current vs. Illumination*

Relative Short Circuit Current



* Typical characteristic curves @ 25°C (unless otherwise noted)