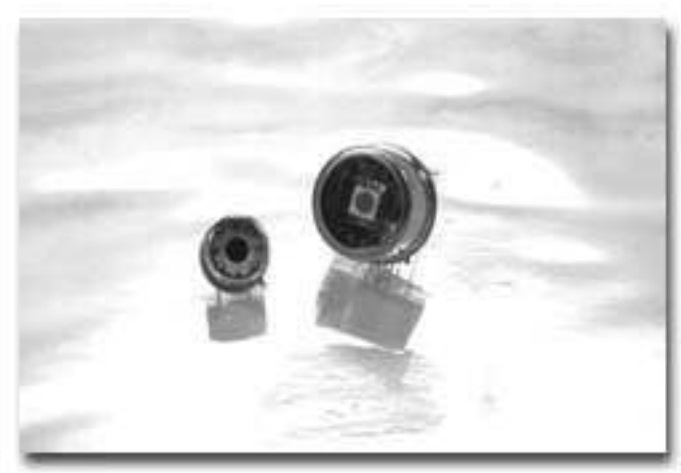
DUAL SANDWICH DETECTOR SERIES

TWO COLOR PHOTODIODES



APPLICATIONS	FEATURES
• Flame Temperature sensing	• Compact
• Spectrophotometer	• Hermetically Sealed
• Dual-wavelength detection	• Low Noise
• IR Thermometers for Heat Treating, induction heating, and other metal parts processing	• Wide Wavelength Range • Remote Measurements • w/ TEC

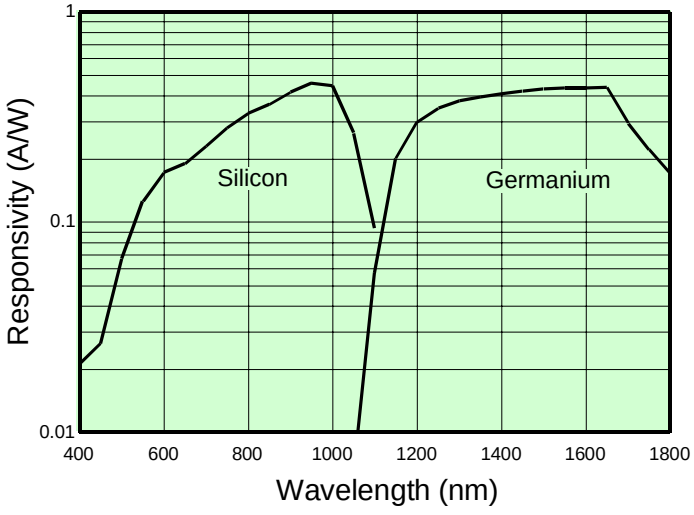
Dual Sandwich Detectors or Two Color Detectors are mostly employed for remote temperature measurements. The temperature is measured by taking the ratio of radiation intensities of two adjacent wavelengths and comparing them with the standard black body radiation curves. The advantages of optical remote measurement have definitely made these devices the perfect match for this type of measurements. They are independent of emissivity and unaffected by contaminants in the field of view or moving targets. In addition, measurements of targets out of the direct line of sight and the ability to function from outside RF/EMI interference or vacuum areas are possible. They also have the advantages of overcoming obstructed target views, blockages from sight tubes, channels or screens, atmospheric smoke, steam, or dust, dirty windows as well as targets smaller than field of view and/or moving within the field of view. These detectors can also be used in applications where wide wavelength range of detection is needed.

UDT Sensors offers three types of dual sandwich detectors. The Silicon-Silicon sandwich, in which one silicon photodiode is placed on top of the other, with the photons of shorter wavelengths absorbed in the top silicon and the photons of longer wavelengths penetrating deeper, absorbed by the bottom photodiode. For applications requiring a wider range of wavelength beyond 1.1 µm, either a Germanium or InGaAs photodiode replaces the bottom photodiode. The Silicon-InGaAs version is also available with a two stage thermoelectric cooler for more accurate measurements by stabilizing the temperature of InGaAs detector.

All devices are designed for photovoltaic operation (no bias), however, they may be biased if needed, to the maximum reverse voltage specified. They are ideal for coupling to an operational amplifier in the current mode. For further details refer to the "Photodiode Characteristics" section of this catalog.

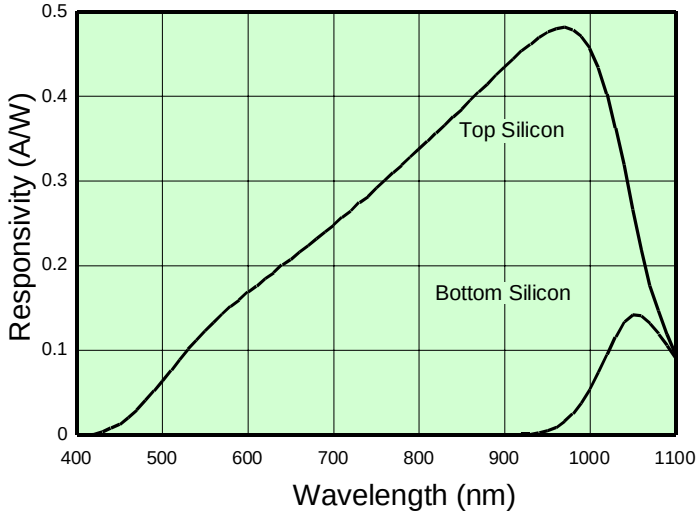
Typical Spectral Response

PIN-DSGe



Typical Spectral Response

PIN-DSS



Model No.	Detector Element	Active Area	Spectral Range (nm)	Peak Wave-length (nm)	Respo-nsivity (A/W)	Cap. (pF)	Shunt Resistance (MΩ)		NEP (W/√Hz)	D* @ peak (cm√Hz/W)	Reverse Voltage (V)	Rise Time (µs)	Temp Range (°C)		Package Style ¶
		Dimension (mm)			Peak λ	0 V	-10 mV		0V Peak λ	0V Peak λ		0 V 50 Ω Peak λ	Operating	Storage	
				typ	typ	typ	min	typ	typ	typ	max	typ			
NON-COOLED															
PIN-DSS	Si (top)	2.54 ϕ	400-1100	950	0.45	70	50	500	1.3 e -14	1.7 e +13	5	10	-40 ~ +100	-55 ~ +125	17 / TO-5
	Si		950-1100	1060	0.12				4.8 e -14	4.7 e +12		150			
PIN-DSGe	Si (top)	2.54 ϕ	400-1100	950	0.45	70	50	500	1.3 e -14	1.7 e +13	5	10			
	Ge	2.00 ϕ	1100-1800	1650	0.45	300*	.006	.012	3.3 e -09	5.3 e +07	15	.035			
					min	max	min		max	max	max	max			
PIN-DSIn	Si (top)	2.54 ϕ	400-1100	950	0.55 §	450	150		1.9 e -14 §	1.2 e +13 §	5	4			
	InGaAs	2.00 ϕ	1000-1800	1300	0.60	500	1.0		2.1 e -13	8.4 e +11	2	4			
TWO STAGE THERMOELECTRICALLY COOLED **															
PIN-DSIn-TEC	Si (top)	2.54 ϕ	400-1100	950	0.55 §	450	150		1.9 e -14 §	1.2 e +13 §	5	4	-40 ~ +100	-55 ~ +125	TO-8/23
	InGaAs	2.00 ϕ	1000-1700	1300	0.60	500	1.0		2.1 e -13	8.4 e +11	2	4			

§ @ 870 nm
* VR=15
** Thermo-Electric Cooler and Thermistor Specifications are specified in the tables below.

For MECHANICAL DRAWINGS Click Here

THERMISTOR SPECIFICATIONS

PARAMETER	CONDITION	SPECIFICATION
Temperature Range	---	-100 ºC to +100 ºC
Nominal Resistance	---	1.25 KΩ @ 25 ºC
Accuracy	-100 ºC to -25 ºC	± 6.5 ºC
	-25 ºC to +50 ºC	± 3.5 ºC
	@ 25 ºC	± 1.5 ºC
	+50 ºC to +100 ºC	± 6.7 ºC

TWO STAGE THERMO-ELECTRIC COOLER SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION		SPECIFICATION
Maxiumum Achieveable Temperature Difference	ΔT_{MAX} (ºC)	$I = I_{MAX}$	Vaccumm	91
		$Q_C = 0$	Dry N_2	83
Maximum Amount Of Heat Absorbed At The Cold Face	Q_{MAX} (W)	$I = I_{MAX}$, $\Delta T = 0$		0.92
Input Current Resulting In Greatest ΔT_{MAX}	I_{MAX} (A)	---		1.4
Voltage At ΔT_{MAX}	V_{NAX} (V)	---		2.0