4.2 μm Back side illuminated Photodiode PD42BS

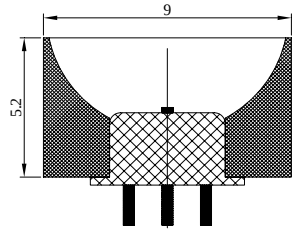
4.2 μm Back side illuminated Photodiode with microimmersion lens PD42BSmIL

			Wide Band (WB)		Narrow Band (NB)	
Spectral range	$\lambda_{0.1}$	μm	2.75÷4.6 (4.7)		3.3 (3.6)÷4.75	
Peak wavelength	λ_{max}	μm	3.7÷3.9	@22 °C	3.9÷4.0	@22 °C
Current sensitivity at λ_{max} according to p-n junction area calculation	$S_I(\lambda_{max})$	A/W	≥2.5		≥4	
Current sensitivity at 4.2 μm	$S_I(\lambda_{3.8\,\mu m})$	A/W	≥1.75		≥2.5	
Shunt Resistance	R_0	Ohm	≥15		≥30	
Immersion lens			No	mIL	No	mIL
Detectivity	$D^*_{\lambda max}$	$cmHz^{1/2}W^{-1}$	$\geq 2.5\times10^9$	$\geq 5\times10^9$	$\geq 5\times10^9$	$\geq 1\times10^{10}$
Switching time	τ	ns	≤20	according estimation		
Reference wafer			599		598, 601	

Code	Sensitive area, mm	Weight, g	Optical components	Field of view, deg.	Optical axis deviation, deg.	Detectivity deviation in lot, %	Operation conditions, °C
PD42BSTO18	0.35×0.35	~0.3	-	~140	-	±25	-60÷+85
PD42BSTO18c		~0.3	sapphire window	~60			
PD42BSTO18PR		~1	reflector				
PD42BSmILTO18	~D=1	~0.3	chalcogenide lens	≈35	≤5	±25	-60÷+60
PD42BSmILTO18c		~0.3	sapphire window, chalcogenide lens				
PD42BSmILTO39TEC		~1.2	sapphire window, chalcogenide lens				

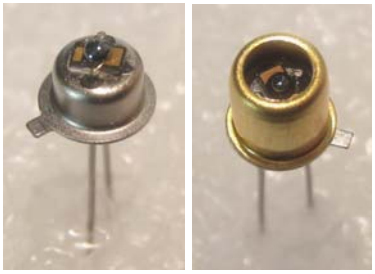
Product view

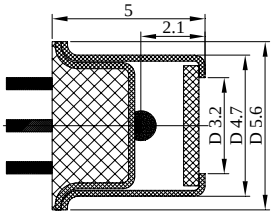
PD42BS TO18, PD42BS PRTO18



Leg near key is negative

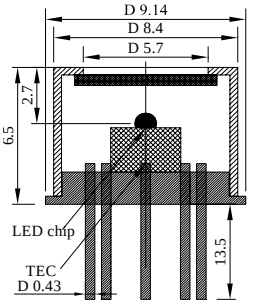
PD42BSmIL TO18, PD42BSmIL TO18c



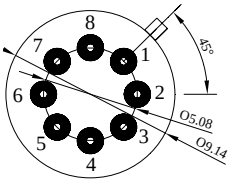


Leg near key is negative

PD42BSmIL TO39TEC



1 TEC negative;
2 TEC positive;
3 PD negative;
4 PD positive;
7, 8 thermosensor



Features

- Original growth of narrow gap A3B5 semiconductor alloys onto n^+-InAs substrate;
- Deep mesa design of PDs;
- Optical coupling through the use of chalcogenide glasses (mIL option)
- Ambient and high temperature operation;
- No bias required;
- Operation from DC to VHF;
- Highest long term stability;
- High value of shunt resistance;

Photodiode could be equipped with preamplifier that is designed for conversion of PD photocurrent into a convenient output voltage and is adjusted for the particular PD taking into account the Ro value and frequency range. Other packages are available upon request. Data are valid for PD thermostabilized at 22°C. Heatsink is essential for TEC operation!

Product specifications are subject to change without prior notice due to improvements or other reasons. Updated 28.10.14

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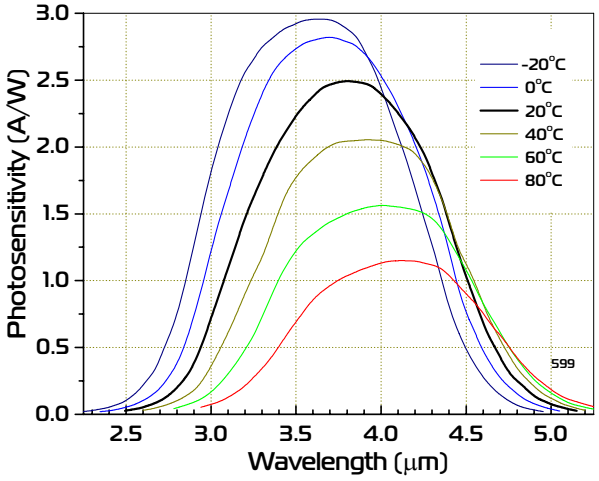
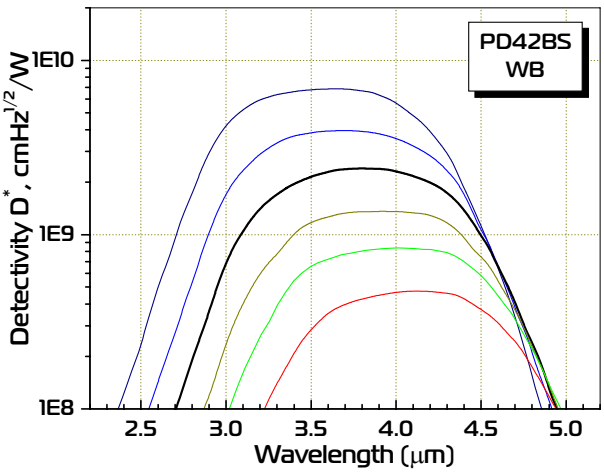
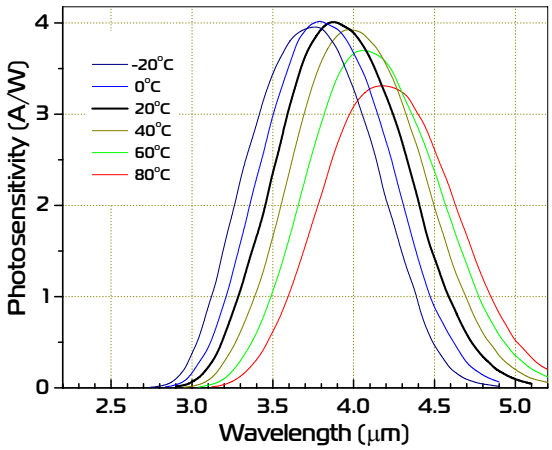
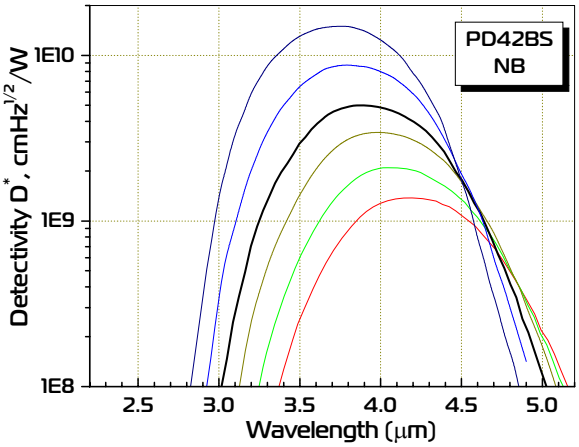
Spectral response



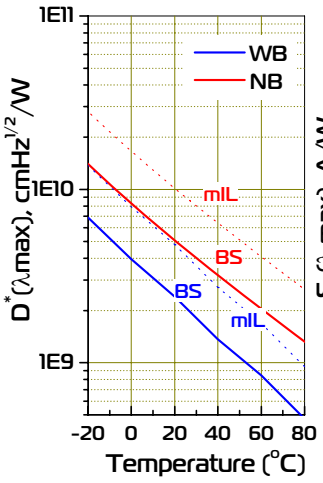


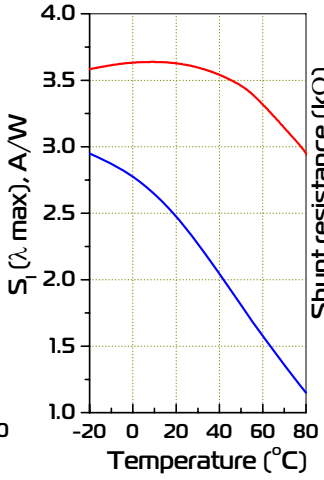


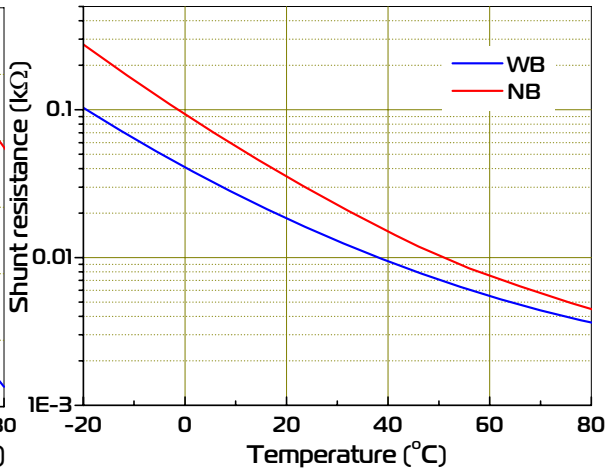


Additional sensitivity in the shortwave spectral range coming from chip edges is allowed (possible)

Detectivity, current sensitivity at λ_{max} and shunt resistance vs. temperature

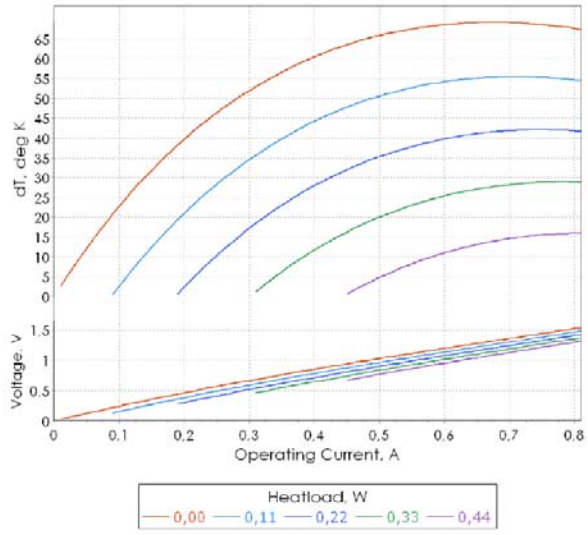


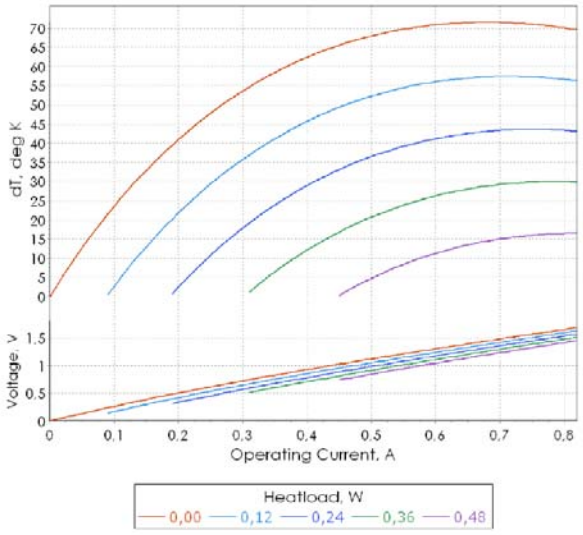




Thermoelectric cooling module datasheet

Mounted TEC	@ 27 °C, Vacuum				@ 50 °C, N2			
1MD04-011/10	ΔT_{max}, K	Q_{max},W	I_{max}, A	U_{max}, V	ΔT_{max}, K	Q_{max},W	I_{max}, A	U_{max}, V
	69	0.54	0.7	1.3	72	0.6	0.7	1.4



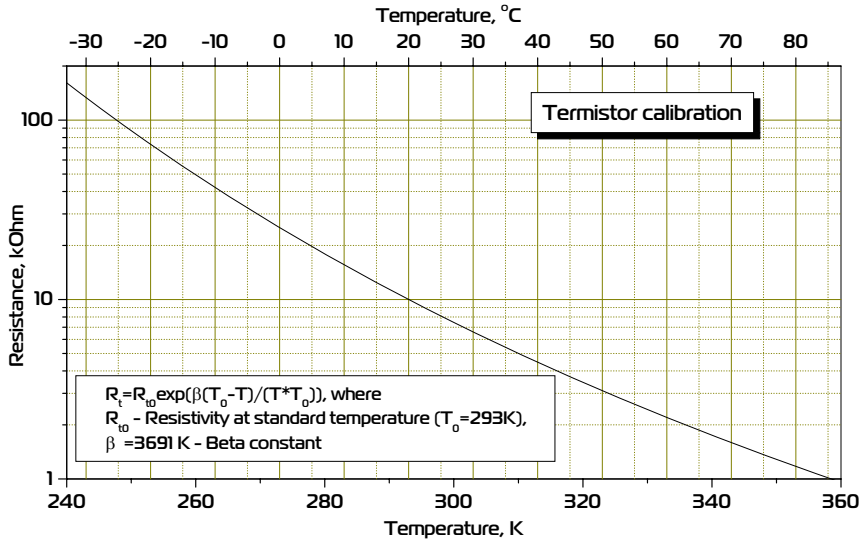


Data from www.tec-microsystems.com; www.rmtltd.ru

Thermistor specification

Type TB04-103

T, °C	R, kΩ	T, °C	R, kΩ
-60	1134.5	15	12.44
-55	762.4	20	10.00
-50	521.6	25	8.09
-45	362.8	25	8.09
-40	256.3	30	6.60
-35	183.8	35	5.41
-30	133.6	40	4.47
-25	98.3	45	3.71
-20	73.3	50	3.10
-15	55.2	55	2.61
-10	42.1	60	2.20
-5	32.4	65	1.87
0	25.2	70	1.59
5	19.7	75	1.37
10	15.6	80	1.18



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