Datasheet

Vertically Integrated Systems

Customized High Speed 840-960 nm Photodetector up to 200 Gbaud

Product Code:	D85-SWDM-C1	1x1
	D85-SWDM-C4	4x1


Sample image only. Actual product may vary.

Product Description

Customized top-illuminated InP-based pin photodetector chip at high responsivity within the400-1650 nm spectral range. The design is optimized for data rates of up to 200Gbaud in the SWDM range 840-960nm for application in data communication systems. The device has at 20µm aperture diameter, allowing efficient coupling to single mode and multi-mode fibers. Single chips or 4-channel array at a 250 µm pitch are available.

Features

- 20µm aperture, high responsivity
- 85GHz optical bandwidth (15-Ohm load)
- Low mesa capacitance <60fF
- Low series resistance ~5Ω
- High time-of-flight bandwidth >150GHz
- Qualified. Lifetime at 125°C -2.5V is above 4000h (dark current ~0.6nA, -2V, 300K)

Applications

- Single mode fiber transceivers
- SWDM multimode datatcom
- Single aperture chips or 4-channel arrays
- Active Optical Cables
- Fiber-optic
- On board waveguide links

Parameter	Typical	Notes
Operating Wavelength	840 - 960 nm*	Normal reflectivity <~1%
Sensitivity range	400 – 1650nm	
Data Rate	up to 200Gbaud per channel	PAM-2,PAM-4, DMT
Responsivity	min 0.5 A/W	at 850 nm
Small signal -3dBo bandwidth	> 85 GHz	typ. 15Ω TIA

*reflectivity <-20dB

Absolute Maximum Ratings

Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate irreversible damage to the component even if all other parameters are within the electro-optical specifications. Exposure to any of the Absolute Maximum Ratings for extended periods can adversely affect the reliability of these chips.

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating temperature	T_{op}		0		85	°C
Storage temperature	T_{st}		-40		85	°C
Soldering temperature	T_{sl}	10 sec			260	°C
Forward current	I_{FW}				10	mA
Reverse Voltage	V_R				10	V
HBM ESD Threshold	V_{ESD}				90	V

Electro-Optical Specifications (T = 0 to 85°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Dark current	I_d	V_{Bias} = -2.5 V			4	nA
S_{21} 3 *dBo* Bandwidth*	BW_{f3dB}	15Ω load**		85		GHz
Operating wavelength	λ		840		960	nm
Responsivity***	R	850 nm	0.5	0.52	0.6	A/W
	R	880 nm		0.54		A/W
	R	910 nm		0.60		A/W
	R	940 nm		0.63		A/W
Capacitance (total)	C	-5V 1 MHZ		70		fF
Series resistance	R_s	-2V		5		Ohm

* the optimal bias point depends on the particular application: 0.7-1.2V.

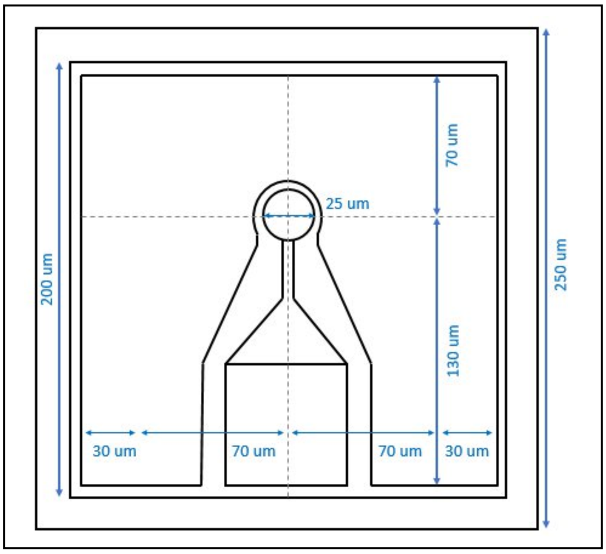
** beyond 1300nm the HF modulation response is not studied

*** for coupling to 50µm core multimode fiber

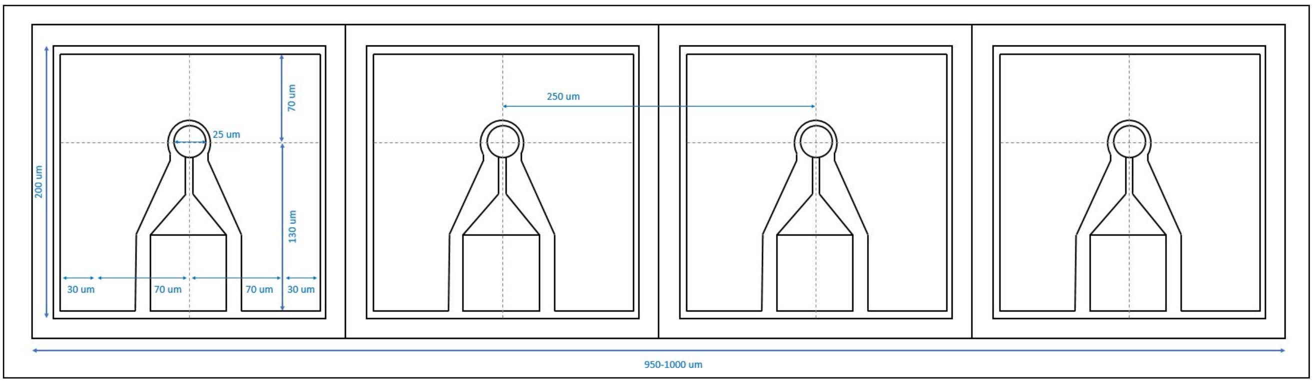
Mechanical Dimensions

Parameter	Type	Min	Typ	Max	Unit
Length	D85-SWMD-C1		250	260	µm
	D85-SWMD-C4		1000	1040	
Height			150		µm
Width			250	260	

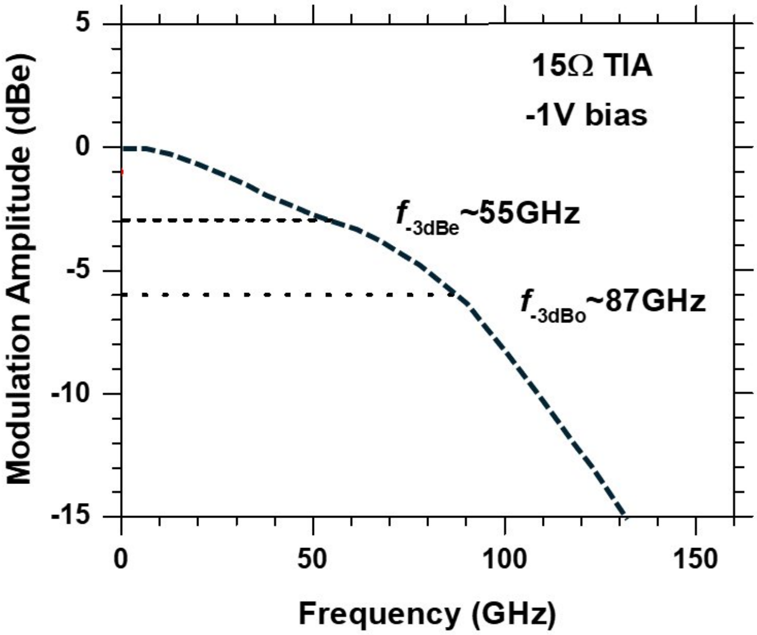
Dimensions of D85-SWDM-C1



Dimensions of D85-SWDM-C4



Modulation response at -1V bias*



*data extracted under HF probes and at on chip inductance ~25pH. Wire bond inductance can modify the HF response: enhance the modulation bandwidth, sharpen the HF onset, result in inductance peaking. Proper optimization is needed for wirebond applications (particularly for TIAs at high input resistance)

Qualification Notification

The D85-SWDM-Cxx chips have been tested to meet the specifications outlined in this datasheet. A Telcordia reliability assessment report is available as a separate document.

RoHS Compliant

ATTENTION
Observe Precautions
for Handling
Electrostatic Sensitive
Device

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