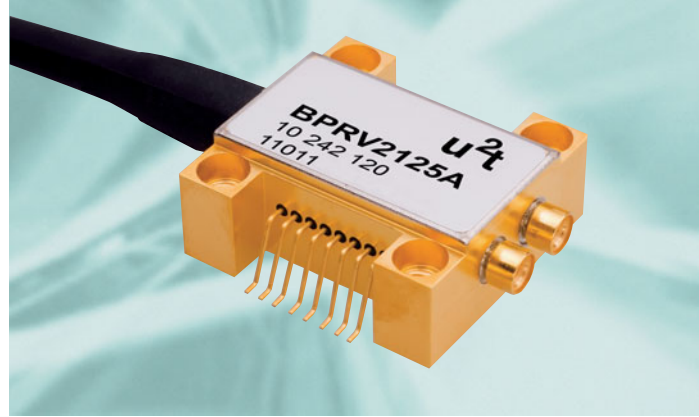


43 Gbit/s DPSK Balanced Photoreceiver

Product Code: BPRV2125(A)



Product Description

The balanced photoreceiver module BPRV2125(A) is a differential front-end for 43 Gbit/s DPSK-applications featuring high differential gain of typically 2800 V/W and is available as AC- or DC-coupled version. The photoreceiver contains two waveguide-integrated pin-photodiodes (PD) on a single chip and a limiting amplifier (LA) within one small form factor SMD-package. The limiting amplifier provides a differential output voltage swing of typ. 600 mV. The receiver is suited for DPSK and DQPSK applications at 40G and 100G with rates between 20 and 56 GBaud.

The DC output voltage can be monitored for OUTN and OUTP independently. For each amplifier path a threshold control at a linear amplification stage should be applied to ensure an optimized differential output signal.

An excellent electrical and optical phase propagation is achieved by a total skew of lower than 5 ps between the balanced signal paths.

Features

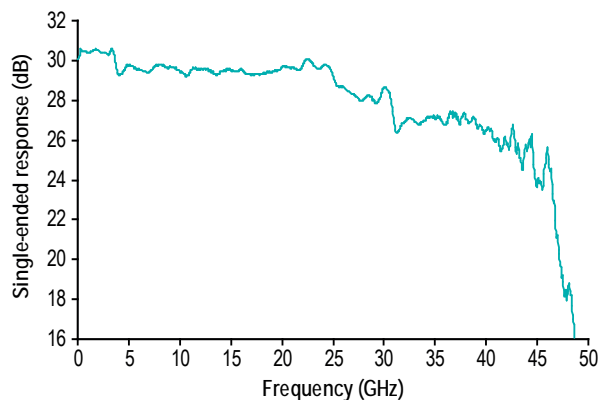
- Balanced PIN / LA photoreceiver module
- Very low skew
- Hermetically sealed SMD package with two GPPO™ connectors
- Dual optical input - differential rf output
- DC- or AC-coupled with threshold control option

Applications

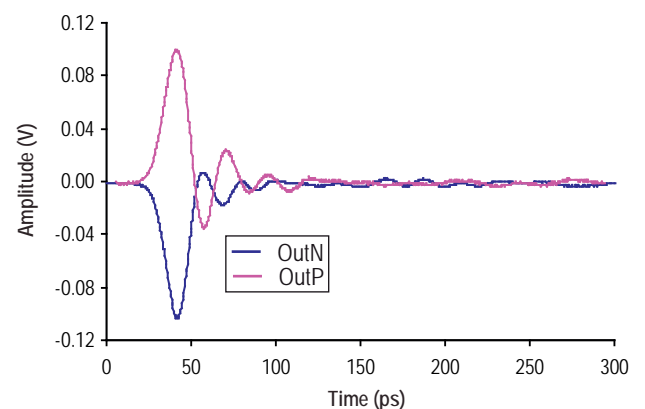
- 43 Gbit/s DPSK communication systems
- Transponder and line card designs

Typical Performance

Frequency Response



Pulse Response



Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage temperature range	T_{stg}	Non condensing	-40		+85	°C
Photo diode bias voltage	$V_{PD1,2}$		0		+3.5	V
Amplifier supply voltage	V_{EE}		-5.5		+0.3	V
Amplifier adjustment voltage	V_{ADJ}		-5.5		+0.3	V
Amplifier threshold control voltage	$V_{THCP,N}$		-7.0		+7.0	V
Maximum average optical input power	P_{opt}	NRZ, per input port			9	dBm
Electro static discharge	V_{ESD}	C= 100 pF, R= 1.5 kΩ HBM	-500		500	V
Fiber bend radius			16			mm

Operation Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating case temperature range	T_{case}		0		+75	°C
Relative humidity range	RH	non condensing	5		85	%
Operating wavelength range	λ		1530		1620	nm
Average optical input power range	P_{opt}	NRZ, per input port	-10		4	dBm
Photodiode bias voltage	V_{PD}		2.0	2.25	2.75	V
Amplifier supply voltage	V_{EE}		-5.3	-5.2	-4.8	V

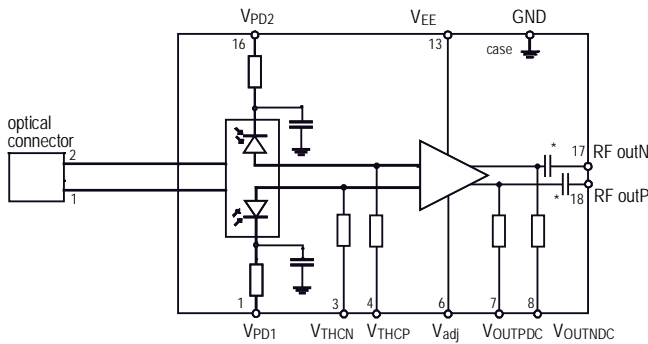
Optical and Electrical Specifications ¹⁾

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Differential conversion gain	CG	2), 3)	2000	2800		V/W
Photodiode DC responsivity	R	optimum polarization	0.5	0.6	0.75	A/W
Polarization dependent loss	PDL			0.4	0.6	dB
Optical return loss	ORL		27	30		dB
Bit rate		NRZ, DPSK		43		Gbit/s
3dB cut-off frequency	f_{3dB}	3)	27	31		GHz
Lower frequency cut off	f_{3dB_L}				100	kHz
Electrical output reflexion coefficient	S_{22}	f = 0.5 to 15 ³⁾ f = 15 to 50 GHz ³⁾			-10 0	dB
Differential output voltage swing BPRV2125A BPRV2125	V_{out_diff}	$P_{opt} \geq 0dBm$ ²⁾ negative CML		600 550		mV
Pulse width		5)		15	25	ps
Skew BPRV2125A BPRV2125				1 1	2 5	ps
Equivalent input noise density	i_{noise}				80	pA/√Hz
Sensitivity	Sens	2), 4)		-10		dBm
Amplifier supply current	I_{EE}			85	100	mA
Photodiode dark current	I_{dark}	per PD		5	300	nA
Power consumption	P_{con}			0.45	0.6	W

Notes: 1) $V_{PD1} = V_{PD2} = +2.25V$, $V_{EE} = -5.2V$; $V_{adj} = -2.4 V$, $\lambda = 1550nm$, $T=25^{\circ}C$
 2) Measurements performed in single ended conditions
 3) Measured using Agilent 860330A 50 GHz Lightwave component analyzer

4) Evaluated from NRZ BER measurement at 40 Gbit/s
 (BER $\leq 10^{-12}$, PRBS 2³¹-1, back to back, DPSK)
 5) Input pulse 1ps, 50MHz, optical power set below saturation level of TIA, test in linear range of receiver

Block Diagram

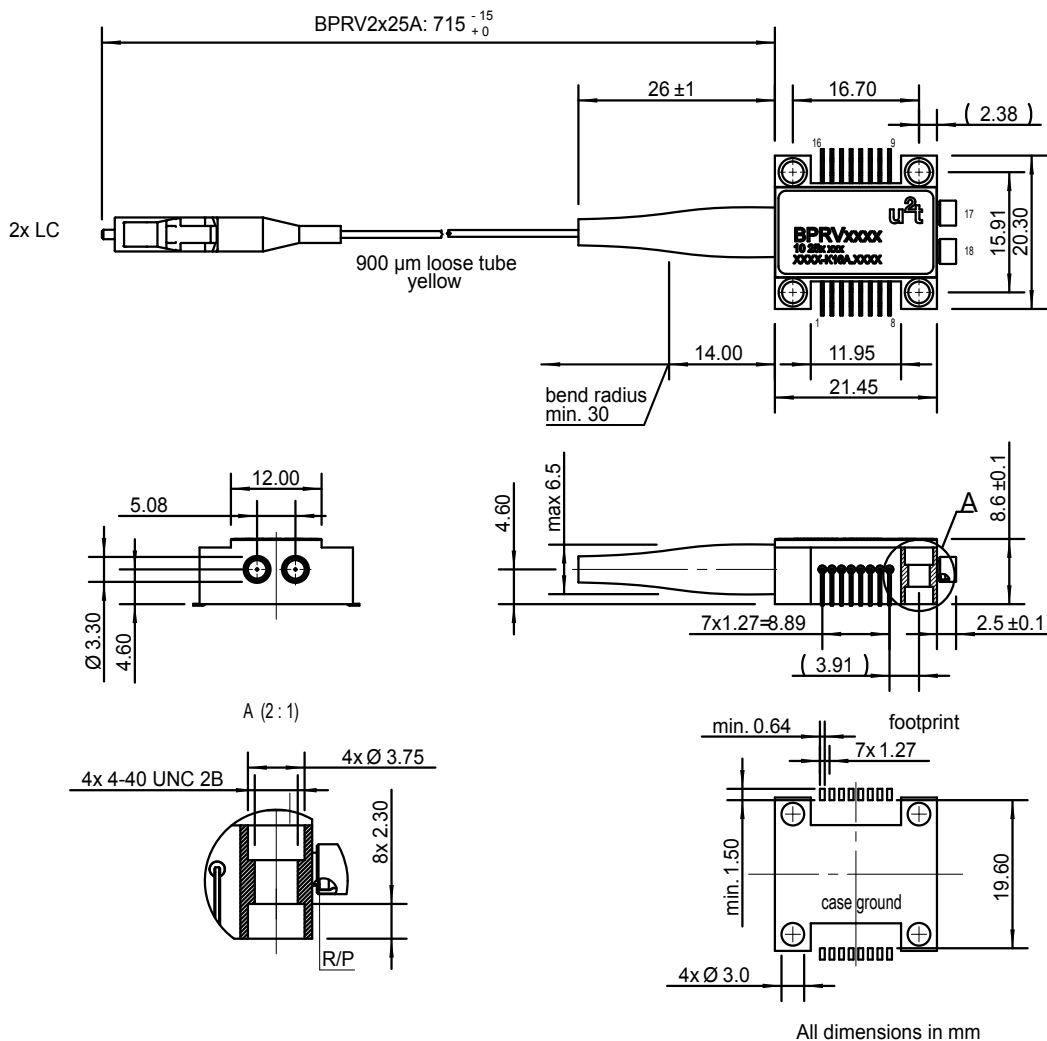


* optional blocking capacitor

Pin Description

Pin#	Symbol	Description
1	V _{PD1}	Photodiode 1 supply
3	V _{THCN}	Amplifier threshold control negativ
4	V _{THCP}	Amplifier threshold control positiv
6	V _{adj}	Amplifier adjustment control
7	V _{OUTPDC}	DC voltage monitor on OUTP
8	V _{OUTNDC}	DC voltage monitor on OUTN
16	V _{PD2}	Photodiode 2 supply
17	outN	Rf-output negativ – GPPO connector
18	outP	Rf-output positiv – GPPO connector
9, 10, 11, 12	N/C	Not connected
13	V _{EE}	Amplifier supply voltage
2, 5, 14, 15	GND	Ground

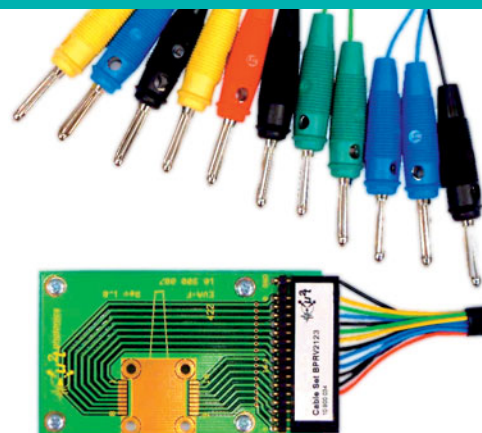
Mechanical Dimensions



GPPO™ Connector is a registered trademark of Corning Gilbert Inc.

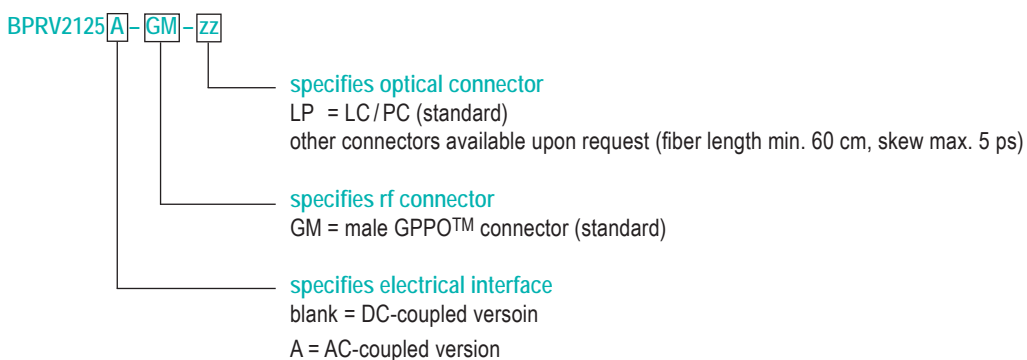
Accessories

The u2t Evaluation Kit EVA-BPRV serves as easy-to-use utility to characterize the u2t photoreceiver BPRV2125(A) under laboratory conditions. The kit consists of a PCB (printed circuit board), a DC cable set and 4 socket head screws 4-40 UNC (see picture).



Ordering Information

Please use the following table to select your required configuration of the photoreceiver.



For the Evaluation kit please use the following code.



GPPO™ is a registered trademark of Corning Gilbert Inc.

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