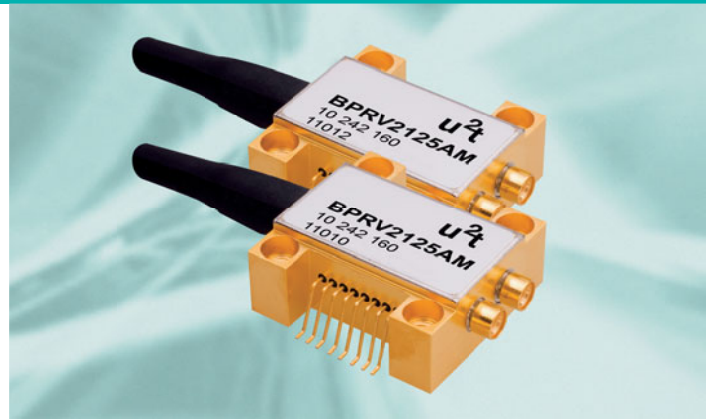


## 43 Gbit/s DQPSK Balanced Photoreceiver Set

Product Code: BPRV2125AM



### Product Description

The balanced photoreceiver set BPRV2125AM consists of two pieces BPRV2125A with matched fiber lengths. The balanced photoreceiver module BPRV2125A is a customized differential front-end for 43 Gbit/s DPSK-applications featuring high differential gain of typically 2800 V/W. The photoreceivers each contain 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 receivers are therefore well suited for OC-768/STM-256 system operation up to 43 Gbit/s but especially designed for DQPSK applications.

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 of each device and 10 ps total skew for all fibers of the pair.

### Features

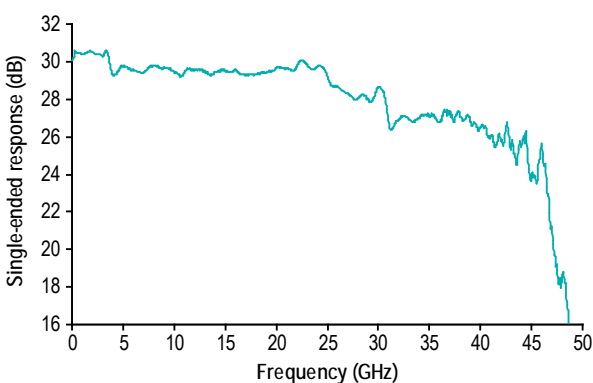
- Set contains 2 balanced PIN / LA photoreceiver modules
- All fiber lengths matched
- Very low skew
- Hermetically sealed SMD package with two GPPO™ connectors
- Dual optical input - differential rf output
- AC-coupled with threshold control option

### Applications

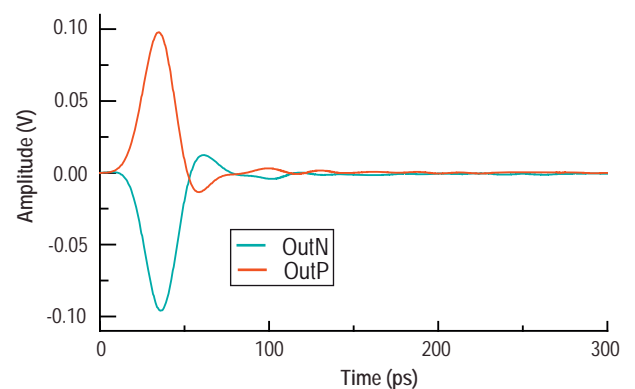
- 43 Gbit/s DQPSK communication systems
- Transponder and line card designs

### 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	$\lambda$		1530		1620	nm
Average optical input power range	$P_{opt}$		-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

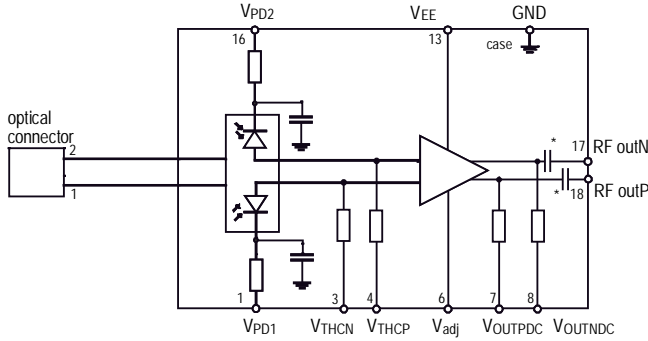
## Optical and Electrical Specifications <sup>1)</sup>

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 DQPSK		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 <sup>3)</sup> f = 15 to 50 GHz <sup>3)</sup>			-10 0	dB
Differential output voltage swing	$V_{out\_diff}$	$P_{opt} \geq 0dBm$ <sup>2)</sup>		600		mV
Skew <sub>Rx</sub>				1	5	ps
Skew <sub>Set</sub>		total skew for all fibers			10	ps
Equivalent input noise density	$i_{noise}$				80	pA/√Hz
Sensitivity	Sens	2), 4)		-10	-5	dBm
Amplifier supply current	$I_{EE}$	per receiver		85	100	mA
Photodiode dark current	$I_{dark}$	per PD		5	300	nA
Power consumption	$P_{con}$			0.45	0.6	W

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

2) Measurements performed in single ended conditions  
4) Evaluated from NRZ eye diagram and BER measurement at 40 Gbit/s (BER  $10^{-12}$ , PRBS  $2^{31}-1$ , back to back)

### Block Diagram

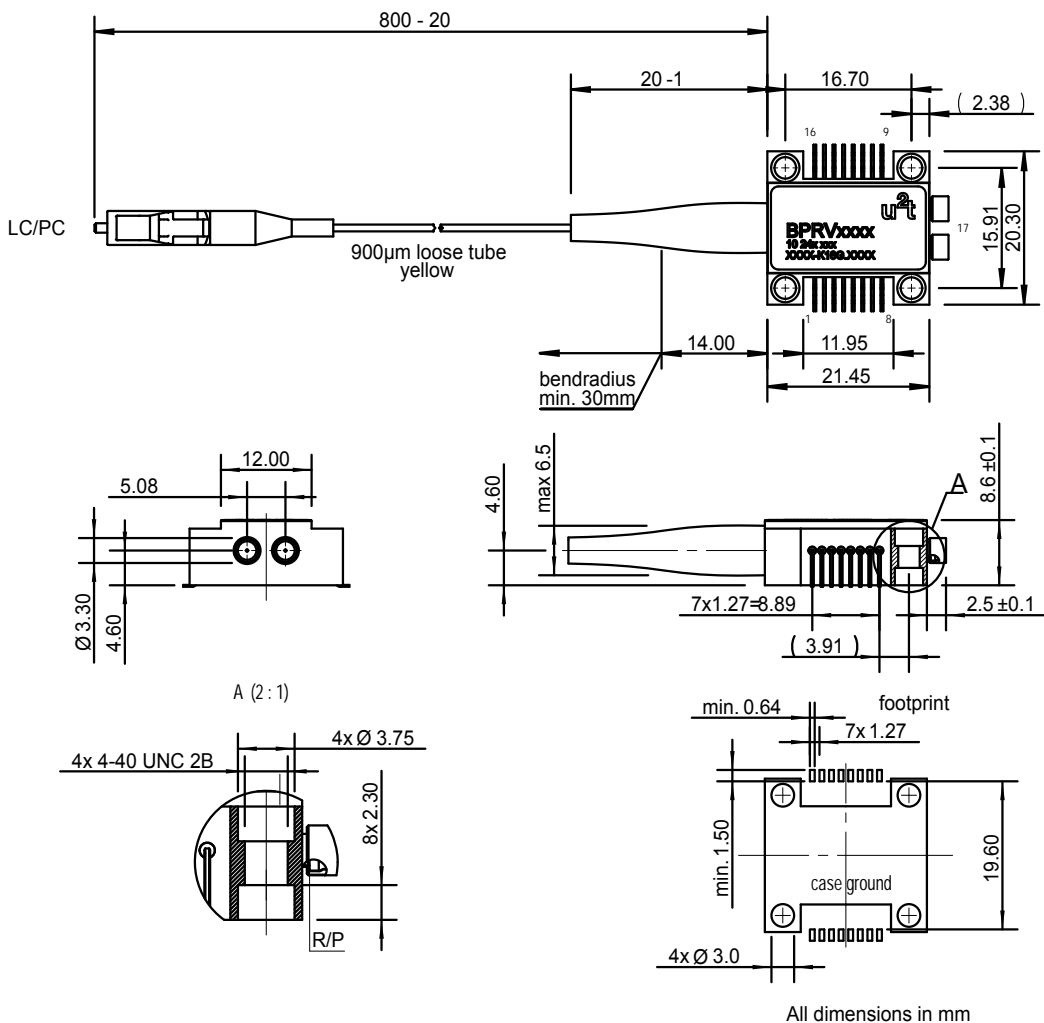


\* optional blocking capacitor

### Pin Description

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

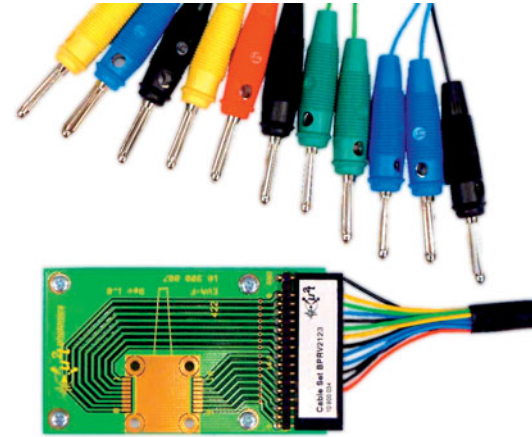
### Mechanical Dimensions



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

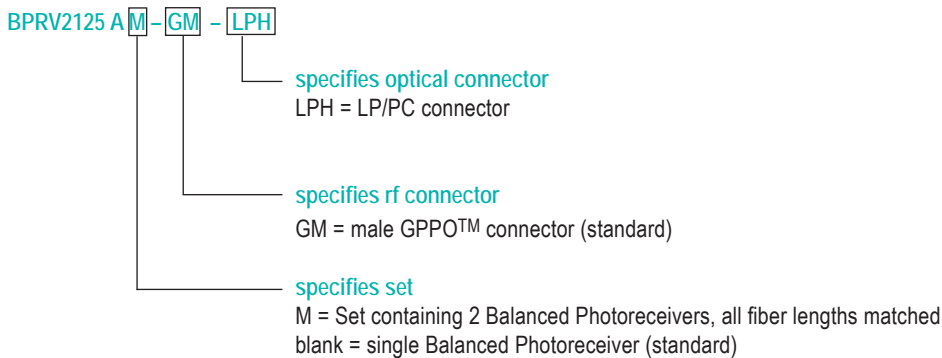
## Accessories

The u2t Evaluation Kit EVA-BPRV serves as easy-to-use utility to characterize a single u2t photoreceiver BPRV2125A 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 balanced photoreceiver set.



For the Evaluation kit please use the following code.



GPPOT™ is a registered trademark of Corning Gilbert Inc.

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