PRODUCT / PROCESS CHANGE NOTIFICATION
PCN-000714
Date: APR-28-2021

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012

Change Details

Part Number(s) Affected:	**Customer Part Number(s) Affected:** ☒ N/A
GN3361-3EJ3AY2E3 GN3361-3EJ3AY3E3	

Description, Purpose and Effect of Change:

GN3361 ROSA Data Sheet has been updated to reflect the following changes:

1. DC Electrical Characteristics (VB_R & TB_R) – updated in Table 2-3
2. LC ROSA Barrel and Flex Dimensions - updated in Figure 3-1

The changes in dimensions are corrections to match the actual size of the finished product. The update in the data sheet is to align with the product characterization test result and part of the product development.

Change Classification	☒ **Major** ☐ **Minor**	**Impact to Form, Fit, Function**	☒ **Yes** ☐ **No**
Impact to Data Sheet	☒ **Yes** ☐ **No**	**New Revision or Date**	**Rev. 1** ☒ **N/A**

Impact to Performance, Characteristics or Reliability:

No impact to performance, characteristics or reliability.

Implementation Date	**May-28-2021**	**Work Week**	**21**
Last Time Ship (LTS) **Of unchanged product**	**N/A**	**Affecting Lot No. / Serial No. (SN)**	**N/A**
Sample Availability	**Available Upon Request**	**Qualification Report Availability**	**See following pages**

Supporting Documents for Change Validation/Attachments:

- **PDS-062273 Rev. 1**

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From	To
DC Electrical Characteristics (VB_R & TB_R)	DC Electrical Characteristics (VB_R & TB_R)

Table 2-3: DC Electrical Characteristics

Conditions: V_{CC} = 3.3V ±10%, T_C = -40 to 85°C

Symbol	Parameter	Min	Typ	Max
I_{CC}	Supply Current	44	50	69
Vout	Output Bias Voltage	—	V_{CC} - 0.3	—
$Rout_{diff}$	Output Resistance (differential)	80	106	126
V_{OOFF}	Differential Output Offset	-25	–	+25
V_{BR}	APD Break-down Voltage in dark at I_d=10µA	25	34	40
T_{VBR}	Temperature Coefficient of APD V_{BR}	20	35	40

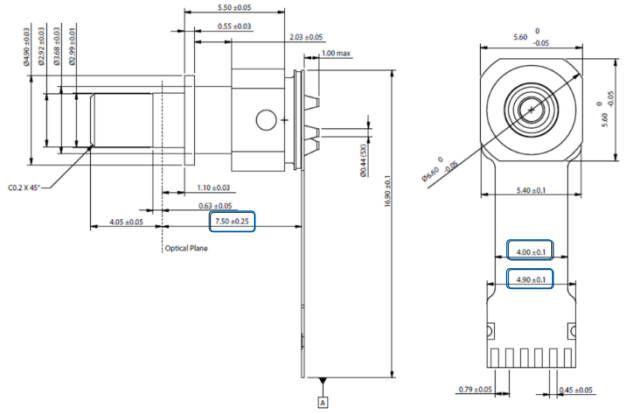

Figure 3-1: LC ROSA Barrel and Flex Dimensions

Table 2-3: DC Electrical Characteristics

Conditions: V_{CC} = 3.3V ±10%, T_C = -40 to 85°C

Symbol	Parameter	Min	Typ	Max
I_{CC}	Supply Current	44	50	69
Vout	Output Bias Voltage	—	V_{CC} - 0.3	—
$Rout_{diff}$	Output Resistance (differential)	80	106	126
V_{OOFF}	Differential Output Offset	-25	–	+25
V_{BR}	APD Break-down Voltage in dark at I_d=10µA	26	34	45
T_{VBR}	Temperature Coefficient of APD V_{BR}	15	25	35

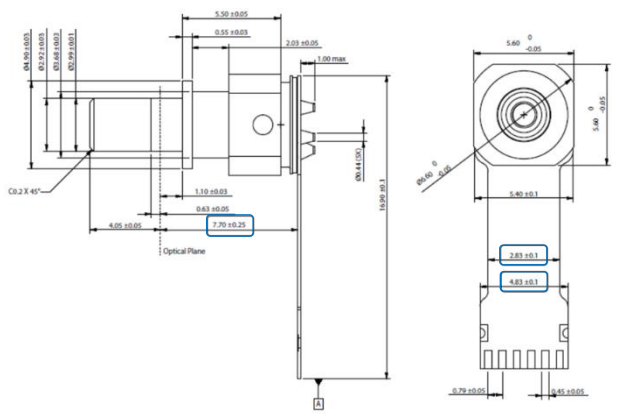

Figure 3-1: LC ROSA Barrel and Flex Dimensions

Issuing Authority		
Semtech Business Unit:	Signal Integrity Product Group (SIP)	
Semtech Contact Info:	Pedro Jr. Bernas Quality Assurance pbernas@semtech.com (289) 856-9326 x1162	

FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: http://www.semtech.com/contact/index.html#support

GN3361

10/11.3Gb/s AGC APD ROSA – Long Wavelength 80km Receiver

Features

- Linear dynamic range designed for optimal OSNR performance
- Power dissipation 165mW typical
- Integral InGaAs avalanche photodiode
- Optical unstressed sensitivity (10^{-12} BER) -26.5dBm mean typical
- Optical overload (10^{-12} BER) -4dBm mean minimum
- Optical Return Loss < -27dB
- Optical wavelength range 1270nm to 1577nm
- Operates from 9.95Gb/s to 11.3Gb/s NRZ rates
- Upper OE bandwidth 7GHz typical
- Lower OE bandwidth 80kHz maximum
- AGC TIA with differential transimpedance, at sensitivity, of 8.5kΩ typical
- Receptacle is electrically isolated from TO46 can
- LC receptacle with flexible circuit
- Pb-free/Halogen-free/RoHS & WEEE compliant

Applications

- Long Haul WDM applications
- Meets requirements of OTU2, OTU2e, OTUFlex

Product Description

Semtech offers a portfolio of ROSAs for use in high performance optical data transmission applications. Semtech's GN3361 APD ROSA is a fully integrated device with design features that ensure excellent RF stability, together with high sensitivity.

The GN3361 offers excellent performance in low OSNR environments, coupled with low power consumption. Automatic Gain Control (AGC) is employed to maximize the dynamic range over which linearity is maintained. This enables state of the art sensitivity for both stressed and unstressed data. The GN3361 optical design is optimized for very low back-reflection.

Revision History

Version	ECO	Date	Changes
1	055157	January 2021	Converted Data Sheet to "Final" status. Updates to Table 2-1: Absolute Maximum Ratings, Table 2-2: Recommended Operating Conditions, Table 2-3: DC Electrical Characteristics and Figure 3-1: LC ROSA Barrel and Flex Dimensions.
0	050583	February 2020	New document.

Contents

1. Pin Out

1.1 Pin Assignment

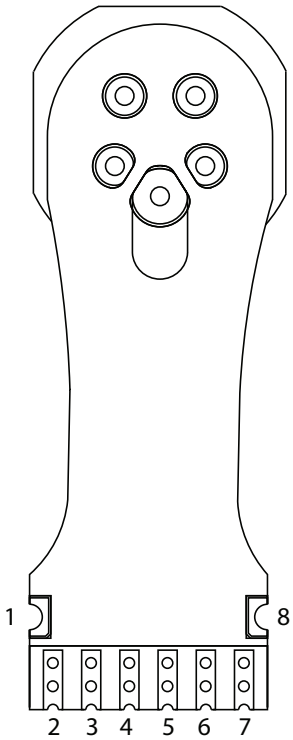

Figure 1-1: Type 1 Flex Pad Numbering (XMD PIN Style)

1.2 Pin Descriptions

Table 1-1: Pad Numbering for XMD PIN Flex

Pad Number	Name	Type	Description
1	GND	Ground	Ground
2	VCC	Power Supply	+ TIA Voltage Supply
3	GND	Ground	RF ground
4	OUTP	RF Output	Positive output
5	OUTN	RF Output	Negative output
6	GND	Ground	RF ground
7	VAPD	APD Bias	+ APD Voltage Supply
8	GND	Ground	Ground

2. Electrical Characteristics

2.1 Absolute Maximum Ratings

These are stress ratings only. Exposure to stresses beyond these maximum ratings may cause permanent damage to, or affect the reliability of the device. Avoid operating the device outside the recommended operating conditions defined below.

Table 2-1: Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	-0.5	4.0	V
V_{IO}	Voltage at either output	-0.5	V_{CC}+0.5	V
P_{OP}	Mean Optical Power (applied for 60 seconds)	+6.7	—	dBm
$V_{ESD\ APD}$	Electrostatic Discharge on APD (100pF, 1.5kΩ)	0.15	—	kV
V_{ESD}	Electrostatic Discharge on all pads except APD (100pF, 1.5kΩ)	2	—	kV
Tstg	Storage Temperature	-40	100	℃
V_{APD}	APD Bias	1	45	V

2.2 Recommended Operating Conditions

Table 2-2: Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	2.97	3.3	3.63	V
T_C	ROSA Case Temperature	-40	—	85	℃
V_{APD}	APD bias at gain M=9	24	33	42	V

2.3 DC Electrical Characteristics

Table 2-3: DC Electrical Characteristics

Conditions: V_{CC} = 3.3V ±10%, T_C = -40 to 85°C

Symbol	Parameter	Min	Typ	Max	Unit	Note
I_{CC}	Supply Current	44	50	69	mA	1
Vout	Output Bias Voltage	—	V_{CC} - 0.3	—	V	2
$Rout_{diff}$	Output Resistance (differential)	80	106	126	Ω	—
V_{OOFF}	Differential Output Offset	-25	–	+25	mV	—
V_{BR}	APD Break-down Voltage in dark at I_d=10µA	26	34	45	V	—
T_{VBR}	Temperature Coefficient of APD V_{BR}	15	25	35	mV/°C	—
I_d	Dark Current at gain M=9	—	30	500	nA	—
R_{1550} M=1	Responsivity (1550nm) at gain M=1 and P_{OP}=10µW	—	0.85	—	A/W	—
Rth	Nominal Thermistor Resistance at 25°C	9.7	10	10.3	kΩ	3
$B_{25/85}$	B Value calculated with thermistor resistances at 25°C and 85°C	3890	3970	4050	K	3

Notes:

1. Typical I_{CC} specified under dark conditions. Worst case I_{CC} specified under input overload conditions.
2. Value for FLEX circuit without filtering components. Typically V_{CC} -0.4V when filtering components fitted.
3. Only applicable to devices with thermistor fitted.

2.4 AC Electrical Characteristics

Table 2-4: AC Electrical Characteristics

Conditions: V_{CC} = 3.3V ±10%, T_C = -40 to 85°C, R_L = 100Ω differential AC-coupled via 100nF for each output, M=7

Symbol	Parameter	Min	Typ	Max	Unit	Note
Psens	Mean unstressed optical sensitivity at 10.709Gb/s data rate	—	-26.5	-25.5	dBm	1, 2
Povrld	Mean unstressed optical overload at 10.709Gb/s data rate	-4	-2	—	dBm	1, 3, 6
BW (3dB) M=7	OE Small Signal Upper Bandwidth at –3dB point	—	7	—	GHz	1
Dri	Input Data Rate	—	—	11.3	Gb/s	—
V_{OUT_AGCMAX}	Maximum differential output swing under AGC	270	320	370	mV_{ppd}	7
V_{OUT_MAX}	Maximum Differential Output Voltage at overload	—	530	—	mV_{ppd}	1
I_{AGC}	Onset of AGC	—	40	—	μA_{pp}	—
BW_I (3dB)	OE Small Signal Lower Bandwidth at –3dB point	20	40	80	kHz	1, 4
td	OE Group Delay Ripple peak-to-peak (100MHz to 6GHz)	—	20	50	ps_{pp}	1, 5
ORL_{1550}	Optical Return Loss (1550nm)	—	—	-27	dB	—
THD	Total Harmonic Distortion	—	2	5	%	—

Notes:

1. Typical values defined as typical process, T_C at 25°C and V_{CC} at 3.3V while minimum and maximum values are under worst or best case process, power supply and junction temperature for the parameter specified.
2. BER = 10^{-12}, input signal Extinction Ratio 10dB. The stated performance should be achievable dependent upon the RF environment in which the user packages the ROSA.
3. Measured with APD biased to give M=3 at -20dBm mean input power.
4. Maximum lower bandwidth is under the conditions maximum optical power. Lower bandwidth specified is represented by the device only, i.e. the AC-coupling of the output ports is not included.
5. Group Delay Ripple does not assume any transmission line delay as a result of connecting the output ports to external traces.
6. Input signal Extinction Ratio 10dB.
7. Defined at $1mA_{pp}$ input OMA.

3. Mechanical Details

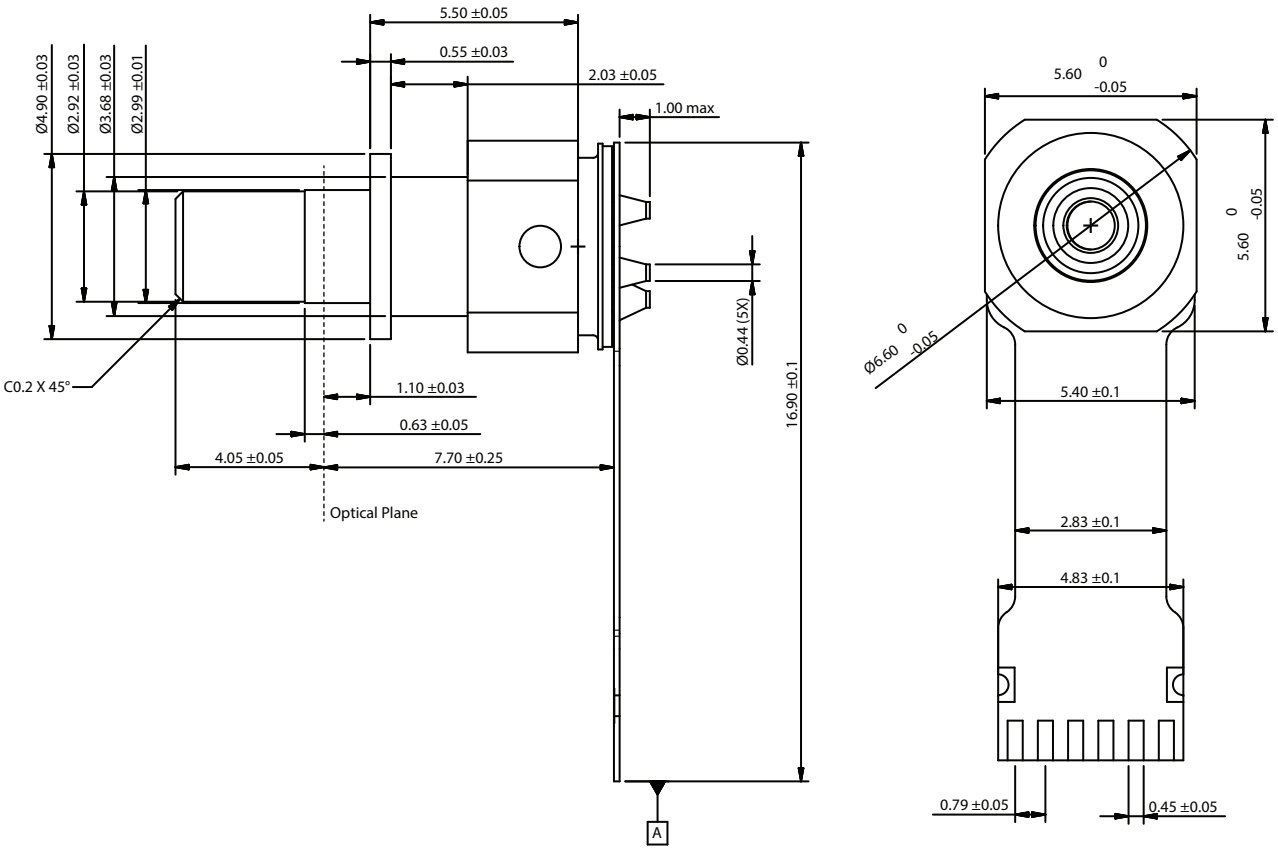

Figure 3-1: LC ROSA Barrel and Flex Dimensions

Ordering Information

Part Number	Device Package
GN3361-3EJ3AY2E3	LC with Flex

Contact Information

Semtech Corporation
200 Flynn Road, Camarillo, CA 93012
Phone: (805) 498-2111, Fax: (805) 498-3804
www.semtech.com