



GPON ONU SFP Optical Transceiver

APGPU34AS3xDSE+

■ Product Features

- ✓ 1310nm burst-mode transmitter with DFB laser
- ✓ 1490nm continuous-mode receiver with APD-TIA
- ✓ Compliant to ITU-T G.984.5 Specifications
- ✓ SFP package with SC receptacle form
- ✓ Single +3.3V power supply
- ✓ Low power dissipation <1W
- ✓ Digital diagnostic interface compliant with SFF-8472



■ Applications

- ✓ Gigabit-capable Passive Optical Networks (GPON)

■ General

ATOP's APGPU34AS3xDSE+ Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). The transceivers are single fiber bi-directional data links with asymmetric 1.244Gbps upstream and 2.488Gbps downstream. They are RoHS compliant and lead-free.

■ Product Selection

Part Number	Operating temperature	DDMI
APGPU34AS3CDSE+	Commercial	Yes
APGPU34AS3IDSE+	Industrial	Yes

■ Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Single SC Receptacle: compatible with IEC 61000-4-2
- Immunity compatible with IEC 61000-4-3
- EMI compatible with FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B



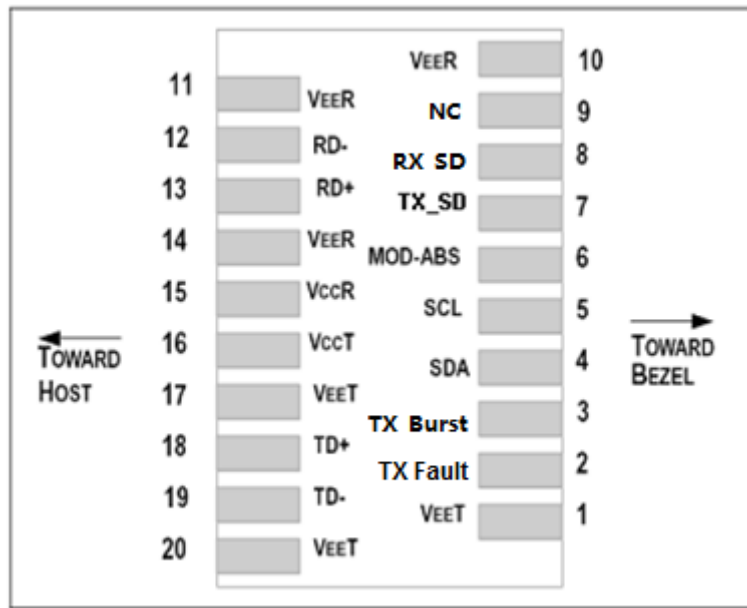
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2
- RoHS compliant with RoHS 2 (2011/65/EU)

■ Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault Indication. High: abnormal; Low: normal	2
3	TX_Burst	Transmitter Burst Mode Control. High: transmitter enable; Low: transmitter disable	3
4	SDA	Module Definition 2. The data line of 2-wire serial interface	
5	SCL	Module Definition 1. The clock line of 2-wire serial interface	
6	MOD_ABS	Module Definition 0. Connected to Ground in the transceiver	
7	TX_SD	TX Signal Detect	4
8	RX_SD	Receiver Signal Detect. High: signal detected; Low: loss of signal	5
9	NC	Not connected	
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Receiver Inverted Data Output, LVPECL logic output	
13	RD+	Receiver Non-inverted Data Output, LVPECL logic output	
14	VeeR	Received Ground	1
15	VCCR	Receiver Power	
16	VCCT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmitter Non-Inverted Data Input, CML with 100ohm differential impedance	
19	TD-	Transmitter Inverted Data Input, CML with 100ohm differential impedance	
20	VeeT	Transmitter Ground	1

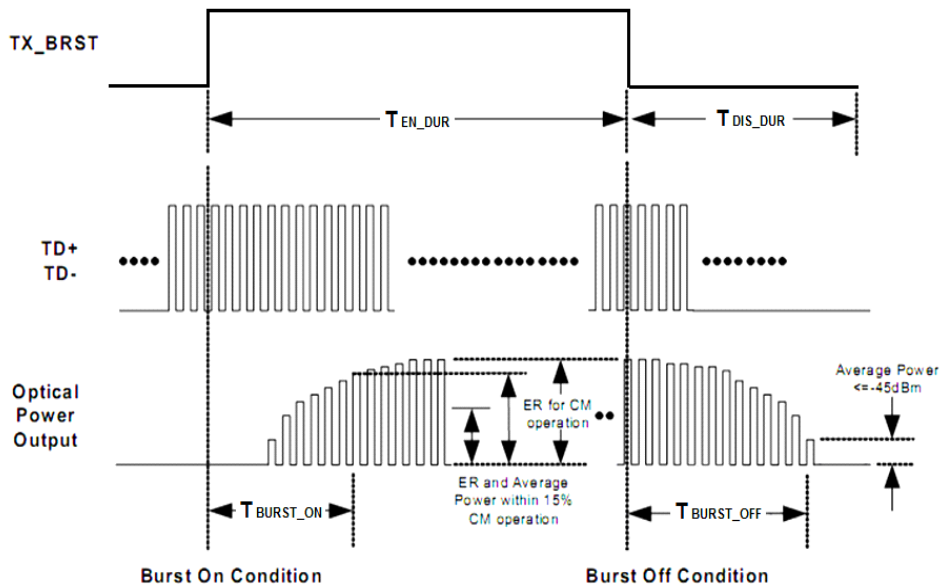
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Shall pulled up with 4.7K-10K ohm to a VccT in the module.
3. High level Enable optical signal output.
4. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V.
5. RX_SD is the indicator of receiver signal detected. High indicates signal detected.

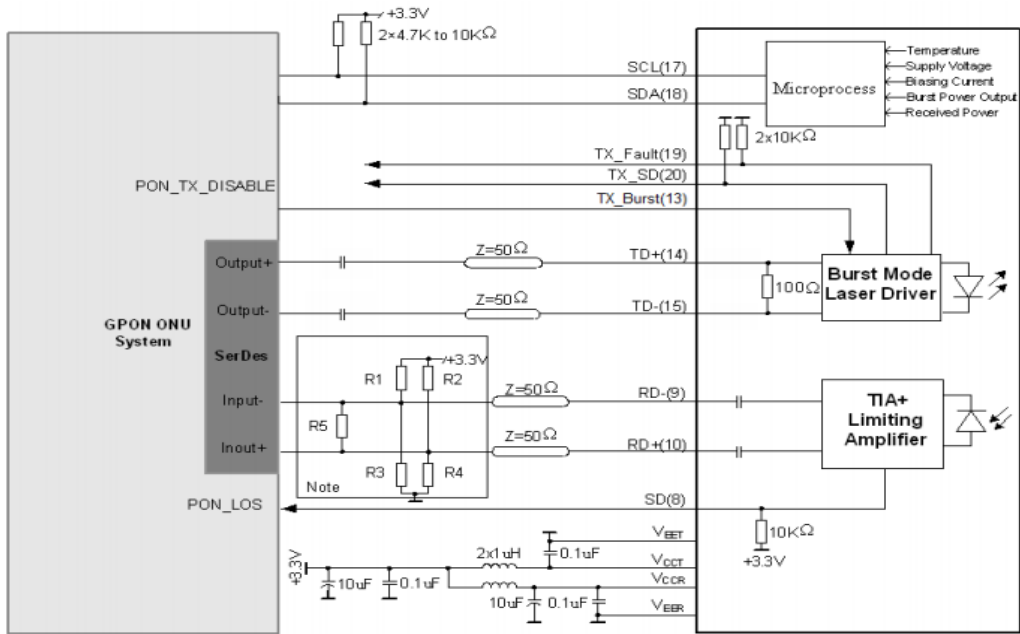


Pin assignment

■ **Burst Mode Sequence**



■ **Recommend Circuit Schematic**



Notes:

1. When input stages of SerDes IC with high impedance and internal bias to Vcc-1.3V, R1=R2=R3=R4=OPEN, R5=100;
2. When input stages of SerDes IC without internal bias to Vcc-1.3V, R1=R2=82, R3=R4=130, R5=OPEN

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		+4.0	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	5		95	%	
9/125um G.652 SMF	Lmax			20	km	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.13	3.30	3.47	V	
Power Supply Current	Icc			300	mA	Industrial
Case Operating Temperature	Tc	0		+70	°C	commercial
	Tl	-40		+85		Industrial
Data Rate(TX)			1.244		Gbps	



Data Rate(RX)			2.488		Gbps	
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■ **Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)**

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Input differential impedance	Rin	-	100	-	Ω	1
Single ended data input swing	Vin, pp	250	-	1200	mV	
TX Ben-High	-	Vcc -1.3	-	Vcc+0.3	V	
TX Ben-Low	-	Vee	-	Vee+0.8	V	
TX Fault-High	-	2.0	-	Vcc+0.3	V	
TX Fault-Low	-	0	-	0.8	V	
Receiver						
Single ended data output swing	Vout, pp	300	-	1000	mV	2
Data output rise time	tr	-	-	250	ps	3
Data output fall time	tf	-	-	250	ps	3
SD-High	-	2.0	-	Vcc+0.3	V	
SD-Low	-	0	-	0.8	V	

Notes:

1. AC coupled.
2. Into 100 ohm differential termination.
3. 20 – 80 %

■ **Optical Characteristics (TOP=25°C, Vcc=3.3 Volts)**

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Power	PO	0.5	-	+5	dBm	1
Optical Wavelength	λ	1290	1310	1330	nm	
Spectral Width(-20dB)	Δ λ	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Optical Rise/Fall Time	tr/tf	-	-	250	ps	2
Burst Turn On/Off Time	Ton/Toff			12.8	ns	

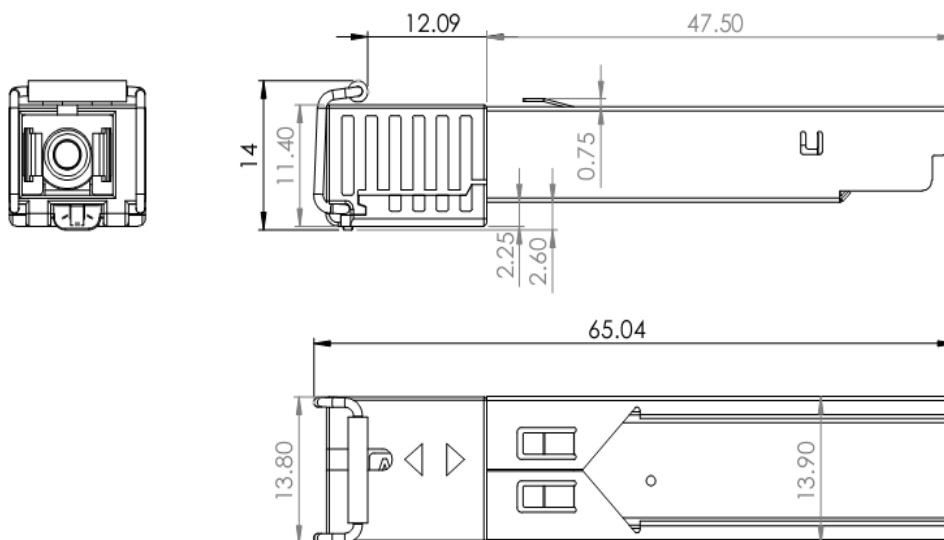
Total Jitter	TJ	-	-	0.35	UI	
Optical Extinction Ratio	ER	10	-	-	dB	
Receiver						
RX Sensitivity @2.488Gb/s (BOL)	SENS	-	-	-29.0	dBm	3, 4
RX Sensitivity @2.488Gb/s (EOL)	SENS			-28.5	dBm	
Receiver Overload	-	-8	-	-	dBm	
Optical Center Wavelength	λ_C	1480	1490	1500	nm	
Signal Detect-Assert	SDA	-	-	-30	dBm	
Signal Detect-Deassert	SDD	-44	-	-	dBm	
Signal Detect-Hysteresis	-	0.5	-	6	dB	

Notes:

1. Class 1 Laser Safety.
2. Unfiltered, 20-80%. Measured with PRBS²³-1 test pattern @1.244Gbps..
3. Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
4. Measured with PRBS 2²³-1 at 10⁻¹⁰ BER.

Mechanical Specifications

ATOP's Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA), dimensions are in mm.

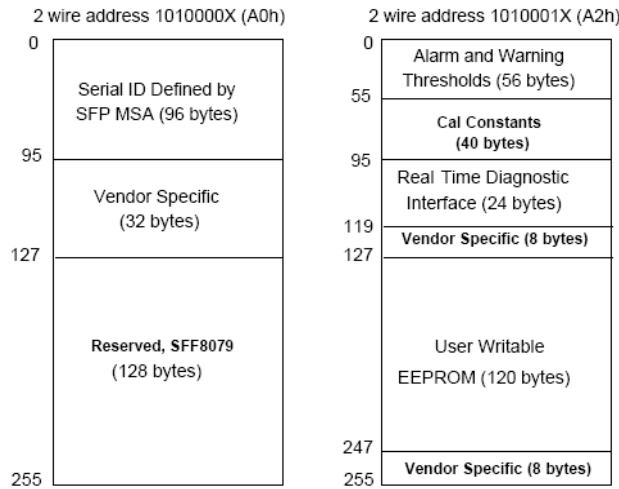


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EEPROM Information



EEPROM memory map specific data field description is as below:



■ Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration
Temperature	0 to +70°C (C)	±3°C	Internal
	-40 to +85°C (I)		
Voltage	3.13 to 3.47V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	+0.5 to +5dBm	±3dB	Internal
RX Power	-29 to -8dBm	±3dB	Internal

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	huangzhengyin	Tangzhiqiang	dingzheng	New Released.	July 31, 2017

■ For More Information

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