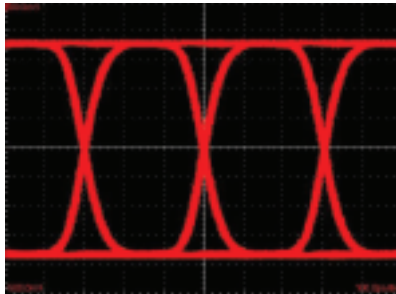


Product Bulletin

PMD Electronics—Post Amplifiers, Transimpedance Amplifiers, Laser Drivers

Physical-media-dependent (PMD) electronics from Texas Instruments (TI) provide optical component and systems developers with key building blocks such as post amplifiers, transimpedance amplifiers and laser diode drivers. TI solutions provide wide dynamic data-rate range support while minimizing power, space and implementation



ONET3301PA output eye diagram at 3.3 Gbps, $V_{IN} = 10 \text{ mV}_{(PP)}$

cost. A wide selection of devices with industry-standard footprints enables designers to move existing designs quickly to lower power points/higher data rates without significantly impacting overall implementation costs.

Post Amplifiers

ONET2501PA, ONET2511PA, ONET3301PA, ONET4201PA, ONET9901PA, ONET3311PA, ONET4211PA, ONET9911PA

The optical networking (ONET) line of post amplifiers is a versatile set of high-speed-limiting amplifiers for multiple fiber optic applications with data rates of up to 10.7 Gbps. These devices provide a gain of about 50 dB (42 dB for ONET9901PA), which ensures a fully differential

Post Amplifiers

Key Features

- Data rates of up to 10.7 Gbps
- Low-jitter output
- Single 3.3-V supply
- Small-footprint package

Applications

- SONET/SDH optical modules
- SFP/SFF optical modules
- Optical transmission equipment
- XENPAK, XFP, XPAK and X2 optical modules

output swing for input signals as low as $3 \text{ mV}_{(PP)}$. The high-input-signal dynamic range ensures low-jitter output signals even when overdriven with input signal swings as high as $1200 \text{ mV}_{(PP)}$. The post amplifiers have loss-of-signal (LOS) detection as well as a received-signal-strength indicator (RSSI). The devices are available in small-footprint, $3 \times 3\text{-mm}$, 16-pin QFN packages and require a single 3.3-V supply. They are very power-efficient and are characterized for operation from -40°C to 85°C .*

*ONET99x1PA and ONET99x1TA, 0°C to 85°C

Post Amplifiers

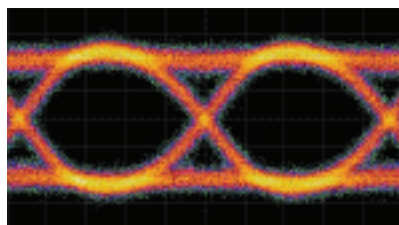
Device	Data-Rate Range, f_B	f_{3dB} (GHz)	A (dB)	$V_{IN, \text{min}}$ ($\text{mV}_{(PP)}$)	$V_{OUT, \text{min}}$ ($\text{mV}_{(PP)}$)	Power, typ (mW)	LOS	RSSI	Package
ONET2501PA	150 Mbps to 2.5 Gbps		50	3	780	106	Yes	Yes	$3 \times 3\text{-mm}$, 16-pin QFN
ONET2511PA	150 Mbps to 2.5 Gbps		50	3	780	72	No	No	$3 \times 3\text{-mm}$, 16-pin QFN
ONET3301PA	150 Mbps to 3.3 Gbps		50	3	780	106	Yes	Yes	$3 \times 3\text{-mm}$, 16-pin QFN
ONET3311PA	Up to 3.3 Gbps		50	3	780	106	No	No	$3 \times 3\text{-mm}$, 16-pin QFN
ONET4201PA	150 Mbps to 4.2 Gbps		50	3	760	106	Yes	Yes	$3 \times 3\text{-mm}$, 16-pin QFN
ONET4211PA	Up to 4.25 Gbps		50	3	760	106	No	No	$3 \times 3\text{-mm}$, 16-pin QFN
ONET9901PA	Up to 10.7 Gbps	10.0	42	2 to 6	240	116	Yes	No	RGT: $3 \times 3\text{-mm}$, 16-pin QFN RGP: $4 \times 4\text{-mm}$, 20-pin QFN
ONET9911PA	Up to 10.7 Gbps	10.0	42	2 to 6	240	116	No	No	$3 \times 3\text{-mm}$, 16-pin QFN

Transimpedance Amplifiers

**ONET12x1TA, ONET25x1TA,
ONET4201TA, ONET9901TA**

The ONET high-speed transimpedance amplifiers are targeted for use in data communications and in SDH/SONET systems with data rates of up to 10.7 Gbps. They feature low input-referred noise bandwidth of up to 10 GHz and transimpedance between 3.8 and 8 k Ω . The devices are available in die form and require a single 3.3-V supply. They are characterized for operation from -40°C to 85°C.*

*ONET99x1PA and ONET99x1TA, 0°C to 85°C



**ONET9901TA differential output signal at
 $I_{IN} = 20 \mu A_{(PP)}$ and 10.7 Gbps**

Transimpedance Amplifiers Key Features

- Data rates of up to 10.7 Gbps
- Transimpedance between 3.8 and 8 k Ω
- Single 3.3-V supply
- Available in die form

Applications

- SONET/SDH optical modules
- SFP/SFF optical modules
- Receive optical sub-assembly (ROSA)

Laser Drivers

ONET4201LD, ONET4211LD

The ONET4201LD and ONET4211LD are laser drivers for multiple fiber optic applications with data rates ranging from 155 Mbps up to 4.25 Gbps. The devices accept current mode logic (CML) input data and provide bias and modulation currents for driving a laser diode. Also provided are automatic power control (APC), temperature compensation of modulation

current, fault detection and current monitor features. Both devices are available in a small-footprint, 4 x 4-mm, 24-pin QFN package and in die form. These very power-efficient laser drivers are characterized for operation from -40°C to 85°C.

Laser Drivers

Key Features

- Bias current programmable from 1 to 100 mA
- Modulation current programmable from 5 to 85 mA
- APC and fault detection
- Bias and photodiode current monitors
- Temperature compensation of modulation current
- Single 3.3-V supply
- ONET4201LD provides active back termination at the output

Applications

- SONET/SDH optical modules
- SFP/SFF optical modules
- Optical amplification
- Transmit optical sub-assembly (TOSA)

Transimpedance Amplifiers

Device	Max Data Rate, f_B (Gbps)	f_{3dB} (GHz)	$Z_{TIS, D}$ (k Ω)	J_N (pA/ $\sqrt{Hz}$)	I_{OVL} (mA $_{(PP)}$)	Power, typ (mW)	RFIL (Ω)	RSSI	Package
ONET1201TA	1.25	1.0	8.0	6	2	66	1500	No	Die
ONET1211TA	1.25	1.0	8.0	6	2	73	1500	Yes	Die
ONET2501TA	2.50	2.1	3.8	10	2	76	750	No	Die
ONET2511TA	2.50	2.1	3.8	10	2	83	750	Yes	Die
ONET4201TA	4.25	3.3	5.0	7	2	92	750	Yes	Die
ONET9901TA	10.7	10.0	5.0	10	2	99	410	Yes	Die

Laser Drivers

Device	Data-Rate Range, f_B	Modulation Current (mA)	Bias (mA)	Back Termination	Package
ONET4201LD ¹	150 Mbps to 4.25 Gbps	5 to 85	1 to 100	Yes	4 x 4-mm, 24-lead QFN or die
ONET4211LD ¹	150 Mbps to 4.25 Gbps	5 to 85	1 to 100	No	4 x 4-mm, 24-lead QFN or die

¹Available in 3Q 2004

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