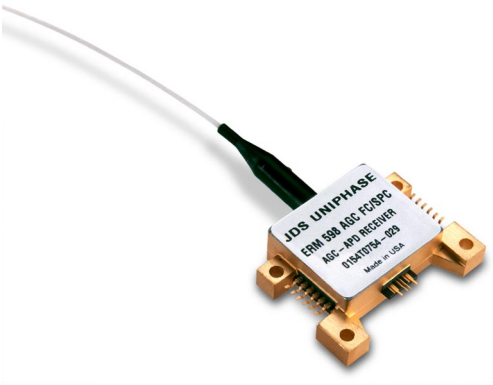
JDS Uniphase

Product Bulletin



ERM 588

10 Gb/s Automatic Gain Control (AGC) PIN Receiver Module

The ERM 588 is a 10 Gb/s PIN receiver with automatic gain control (AGC) for long-haul SONET/SDH, OC-192/STM-64, and DWDM applications. The receiver module integrates a PIN followed by a low-noise, high-gain transimpedance amplifier and secondary variable-gain amplifier. An integrated variable-gain amplifier and a peak-level-detector circuit are provided for AGC operation. AGC is accomplished with an external circuit to monitor the peak-level-detector output and to feedback a voltage to the variable-gain amplifier, maintaining a constant RF output voltage level. If AGC is not required, the variable gain amplifier can be set to a fixed gain by tying the AGCS input to a DC voltage.

The output buffer stage provides the ability to add an offset between the differential signal outputs. Corresponding to each RF output is a low frequency output used to monitor the offset level.

When the AGC loop is closed via an external circuit, the receiver exhibits a large linear dynamic range with high sensitivity not available with standard fiberoptic receiver modules.

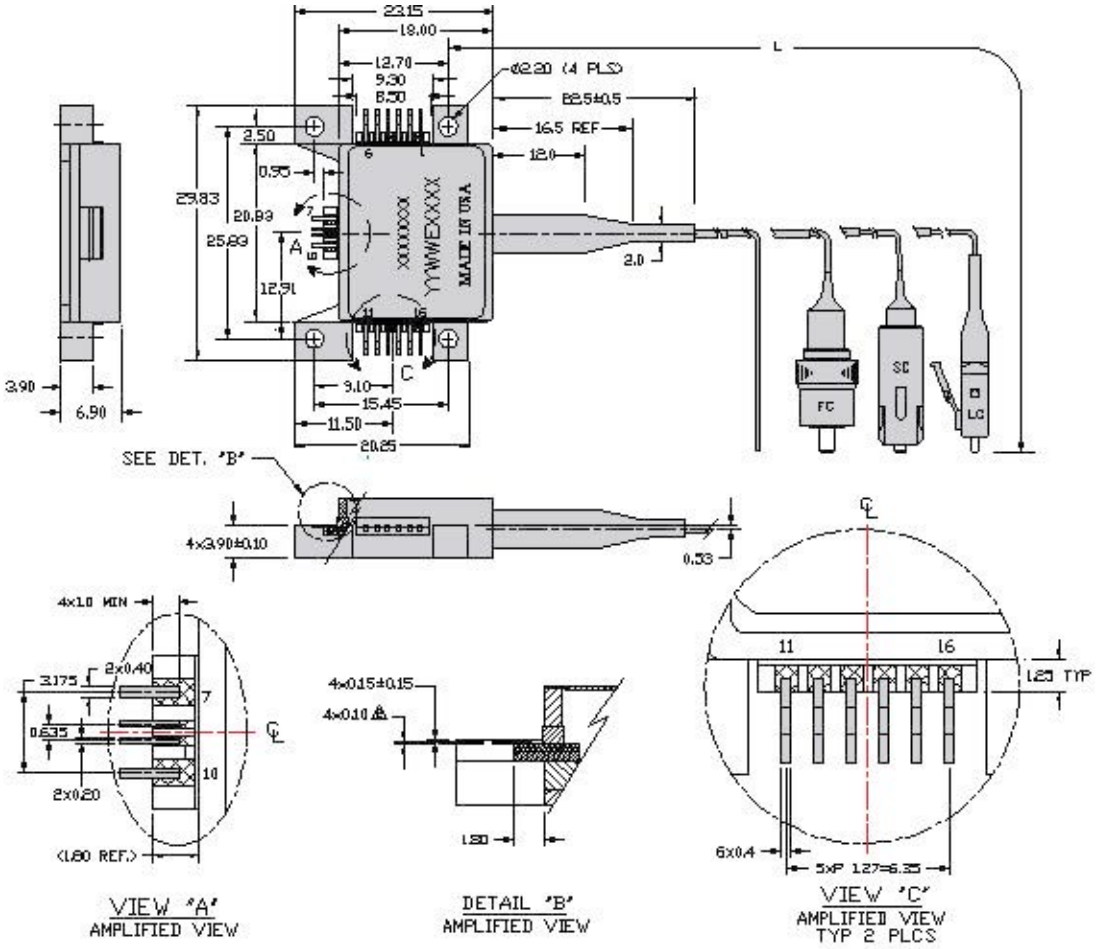
Key Features

- Integrated AGC provides improved threshold control
- High bandwidth
- Large linear dynamic range
- High gain output
- Low dark-current, low-capacitance, InGaAs PIN chip
- Coplanar package with single-mode 900 µm jacketed fiber pigtail

Applications

- Long haul and metro-core
- DWDM, SONET/SDH
- Optical crossconnects

ERM 588 Dimensions Diagram



Pigtail length	1.5 ±0.5 m standard	Dimensions in mm.
Optical connectors	FC, SC, LC, or open pigtail	

Pin	Configuration
1	V_{PD} (+)
2	GND
3	V_{ee} (-5.2 V)
4	RECT
5	NC
6	VREF
7	GND
8	(-) Output
9	(+) Output
10	GND
11	AGCS
12	(-) Offset
13	(+) Offset
14	Feedback In (FBIN)
15	GND
16	NC

Specifications

Parameter	Test Conditions	Minimum	Typical	Maximum
Preliminary Specifications				
PD responsivity[1]			0.8 A/W	
AC transimpedance (differential)	Without variable gain block		600 Ω	
Gain control	Variable gain amp only	-12 dB		15 dB
Total AC transimpedance (differential)	Transimpedance plus variable gain	150 Ω		3500 Ω
Bandwidth ($F_{-3\ dB}$)			8.5 GHz	
Low frequency cut-off (-3 dB)			40 kHz	
Sensitivity	10 Gb/s BER = 10^{-12} PRBS = 2^{31}-1 25 °C, l = 1550 nm 10 Gb/s (BOL)		-17 dBm	
Overload	10 Gb/s BER = 10^{-12} PRBS = 2^{31}-1		0 dBm	
Optical input power for AGC operation	Output voltage = 160 mV (differential)	-17 dBm		-3 dBm
Output clipping voltage (single ended)		300 mV_{pp}		400 mV_{pp}
Output return loss	130 kHz to 8 GHz		-10 dB	
Transfer function ripple	300 kHz to 5 GHz	-1.0 dB		1.0 dB
Group delay deviation	100 MHz to 8 GHz		40 ps_{pp}	
Optical return loss	1300 nm ≤λ≤ 1575 nm			-27 dB
Power dissipation			0.9 W	1.2 W
TIA supply current			173 mA	230 mA
Thermistor	T = 25 °C	9.9 kΩ		10.1 kΩ
Absolute Maximum Ratings				
Supply voltage (V_{ee})		-7 V		0.5 V
PD supply voltage (V_{pd})		4 V		12 V
Maximum optical input power				3 dBm
Storage temperature		-40 °C		85 °C
Operating temperature		0 °C		70 °C
Operating Conditions				
Supply voltage (V_{ee})		-5.5 V	-5.2 V	-4.9 V
PD supply voltage (V_b)		4.75 V	5.0 V	12.0 V
Operating wavelength[1]		1300 nm		1575 nm
Operating case temperature		0 °C		70 °C
AGC Characteristics				
V_{REFAGC}	AGCS reference level	-3.8 V	-3.5 V	-3.2 V
G_{AGCS}	Ratio of change in gain to change in voltage at AGCS input		7.5	
R_{T0}	Nominal transimpedance		3 kΩ	
BW_{AGC}	AGC gain control 3 dB bandwidth $V_{AGCS} = V_{REFAGC}$			10 MHz
V_{REF}	Peak level detector common mode output voltage		3.5 V	
BW_{PKDET}	Peak detector -3 dB bandwidth	800 kHz		

1. L-band performance (1575 to 1610 nm) and performance below 1300 nm are available. Please contact the factory for more information and specifications for operating in these wavelength ranges.

Ordering Information

Indicate your requirements by selecting one option from the configuration table. Please print the corresponding code in the available boxes to form your part number. For more information on this or other products and their availability, please contact your JDS Uniphase account manager, or call 1-877-550-JDSU toll free in North America or visit www.jdsuniphase.com.

Sample: ERM 588 LC

ERM 588 □□□

Code	Connector
LC	900 µm buffer with LC connector
FCS	900 µm buffer with FC/SPC connector
SCS	900 µm buffer with SC/SPC connector

Safety Information

ESD protection is imperative. Use of grounding straps, antistatic mats, and other standard ESD equipment is required when handling or testing an InGaAs PIN or any other junction photodiode. Soldering temperature of the leads should not exceed 260 °C for more than 10 seconds. Fiber feed through tube temperature should not exceed 120 °C. Fiber pigtails should be handled with less than 10 N pull and with a bending radius greater than 1 inch.

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