

Raman Pump Module with embedded EDFA



Applications

- Ultra long haul, long haul networks
- Metro networks
- DWDM networks

Descriptions

- ErFA 40000 series are Raman Pump Module (RPM) embedded EDFA gain block of the signal wavelength band of 1529nm to 1562.5 nm. High power raman pump unit is suitable for long distance transmission, and also 100G network application to maintain high OSNR. Integration of Raman & EDFA hybrid units realize low price by sharing of electrical interface, enclosure, and some optical components.
- The module can be controlled flexibly by fully software using RS232 communication interface.

Features

- Raman section: 500mW total pump power / 2 pump wavelengths
- EDFA section: 15dB gain / 18 dBm output power
- Mid stage access for DC units
- VOA for DC input power control
- Fast gain control for transient suppression
- "Low-FIT" hardware managed optical laser safety
- Optical service channel add filter
- RS232 command interface with monitoring, alarms and safety shut-down
- In-service firmware upgrade

Environmental conditions

Items	Symbol	Specification		Unit	Note
		min.	max.		
Operating case temperature	Top	5	70	°C	-
Operating humidity	RHop	5	85	%RH	No dew condensation
Storage temperature	Tstg	-40	70	°C	-
Storage humidity	RHstg	-	85	%RH	No dew condensation

Optical specifications

RPM FUNCTION

Items	Symbol	Specification		Unit	Note
		min.	max.		
Pump 1 wavelength	λ_1	1425		nm	-
Pump 2 wavelength	λ_2	1452		nm	-
Total raman pump power	Ptr	-	500	mW	-
Max output power of pump1	P1	260	-	mW	-
Max output power of pump2	P2	260	-	mW	-
Operating range raman pump power	Pr	100	450	mW	-
Average raman gain	Gr	9.0		dB	-
Pump degree of polarization	DOP	15		%	-
Raman pump laser class	-	3B		-	-

EDFA FUNCTION

Items	Symbol	Specification		Unit	Note
		min.	max.		
Signal wavelength range	λ	1529	1562.5	nm	-
Input power range	Pin	-40	8	dBm	-
Gain(nominal)	G	15		dB	-
Maximum output power	Pout	-	18	dBm	-
Gain ripple	-	-	1.0	dB	at Target gain tilt=0dB
Noise figure	NF	-	7.0	dB	at nominal gain
Polarization dependent gain	PDG	-	0.5	dB	LINE-RX to DC-TX
Polarization mode dispersion	PMD	-	0.5	ps	LINE-RX to DC-TX

Control and Electrical specifications

Items	Symbol	Specification		Unit	Note
		min.	max.		
Transient settling time	t_{sett}	-	700	μs	15dB Add/Drop
Transient overshoot	-	-	3.5	dB	15dB Add/Drop
Transient undershoot	-	-	3.5	dB	15dB Add/Drop
Power supply voltage	-	4.75	5.25	VDC	-
Power consumption	-	-	40	W	-

Software Function, Monitors and Alarms

The software interface of the ErFA 40000 series is based on IEC 61291-6-1.

• Functions

- Gain control mode
- Output power control mode
- Pump current control mode
- In-service firmware upgrade
- Automatic laser shutdown
- Automatic power reduction
- Auto restart
- Manual restart

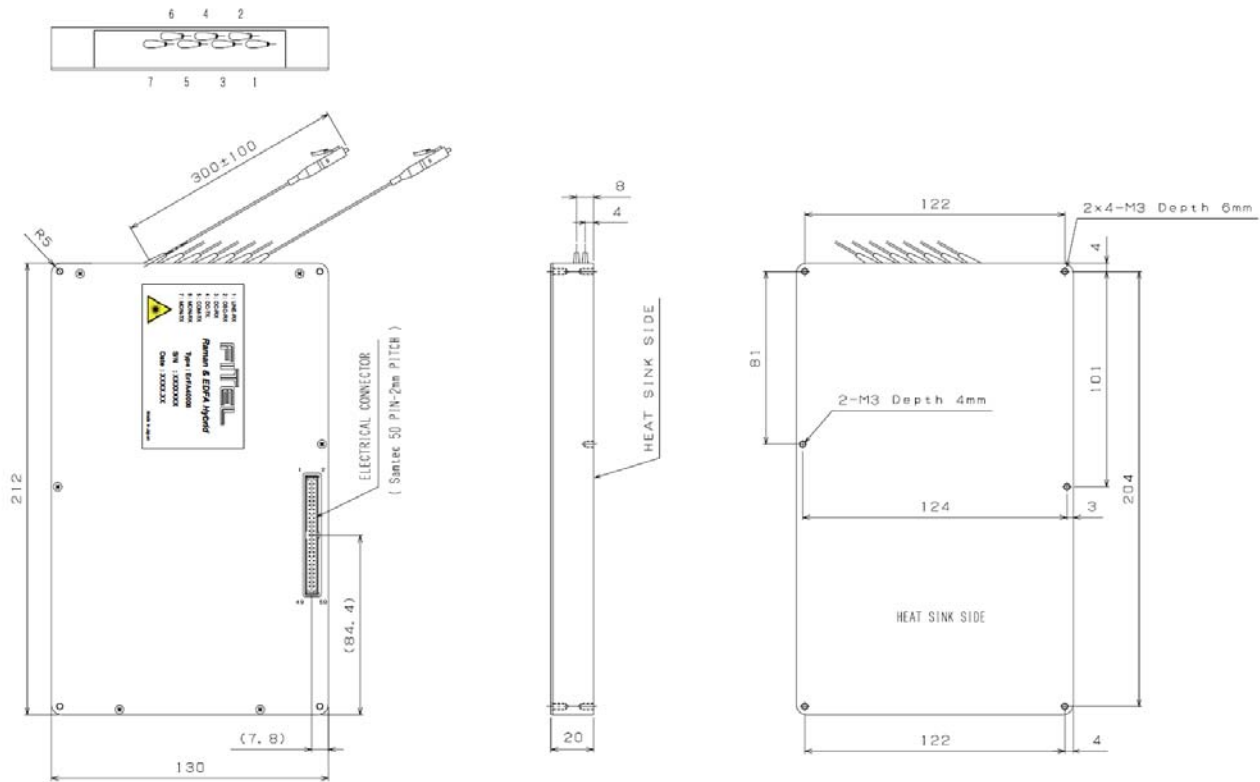
• Monitors

- Module status
- Total input power
- Total output power
- Signal output power (ASE compensated)
- EDF temperature
- VOA attenuation
- Pump status

• Alarms

- Loss of signal alarm
- Low output power alarm
- Pump temperature alarm
- Pump current alarm
- EDF temperature alarm

Mechanical drawing



Optical interface

Item	Specification
Fiber Type	Corning SMF-28™ or equivalent
Pigtail buffer diameter	0.9mm
Fiber length	300 ± 100 mm
Connector Type	SC, MU, LC, None

Electrical pin configuration

The electrical interface is through one 2-millimeter pitch, 50-pin male header connector (Samtec ZLTMM-125-74-G-D-585)

Pin No.	Description	Pin No.	Description
1	Power supply(5VDC)	2	Power supply(5VDC)
3	Power supply(5VDC)	4	Power supply(5VDC)
5	Power supply(5VDC)	6	Power supply(5VDC)
7	Power supply(5VDC)	8	Power supply(5VDC)
9	Power ground	10	Power ground
11	Power ground	12	Power ground
13	Power ground	14	Power ground
15	Power ground	16	Power ground
17	Input (PD5) alarm output, active low	18	Signal ground
19	Not connected	20	Signal ground
21	Not connected	22	Signal ground
23	Common alarm output, active low	24	Signal ground
25	Signal ground	26	Signal ground
27	NTA * reset, active low	28	Signal ground
29	Reset monitor, active low	30	Signal ground
31	HW * disable, active high	32	Signal ground
33	HW * disable, active high	34	Signal ground
35	OSC (PD 6) alarm output, active low	36	Raman (PD 12) alarm output, active low
37	Signal ground	38	TA * reset, active low
39	AC tone positive output	40	AC tone negative output
41	Reserved	42	Reserved
43	Input (PD1 & PD4) alarm output, active low	44	Reserved
45	Signal ground	46	Signal ground
47	RS232 output	48	RS232 input
49	Reserved	50	Reserved

*NTA : Non Traffic Affecting

TA : Traffic Affecting

HW : Hardware

Ordering information

ErFA 40000 - X

Optical connector

S SC super PC
M MU super PC
L LC super PC
N No connector

Notice



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FURUKAWA ELECTRIC CO., LTD.

Japan
Head Office
2-2-3, Marunouchi
Chiyoda-ku
Tokyo 100-8322, JAPAN
Tel: +81-3-3286-3253
Fax: +81-3-3286-3978
<http://www.furukawa.co.jp>
Email: comsales@ho.furukawa.co.jp

North America
OFS Fitel, LLC
Specialty Photonics Division
25 Schoolhouse Road
Somerset, NJ 08873 USA
Tel: +1-732-748-7402
Fax: +1-732-748-7436
<http://www.SpecialtyPhotonics.com>
E-mail: info@SpecialtyPhotonics.com

Europe
Furukawa Electric Europe Ltd.
3rd Floor, Newcombe House
43-45 Notting Hill Gate
London W11 3FE, UK
Tel: +44-20-7221-6000
Fax: +44-20-7313-5310
<http://www.furukawa-fitel.co.uk>
E-mail: sales@furukawa-fitel.co.uk

ASIA
Furukawa Electric Hong Kong Ltd.
Suite 2606, Shell Tower,
Times Square, 1 Matheson Street,
Causeway Bay, Hong Kong
Tel: 852-2512-8938
Fax: 852-2512-9717
<http://www.fehk.com.hk/>
E-mail: guest@fehk.cn