FITEL

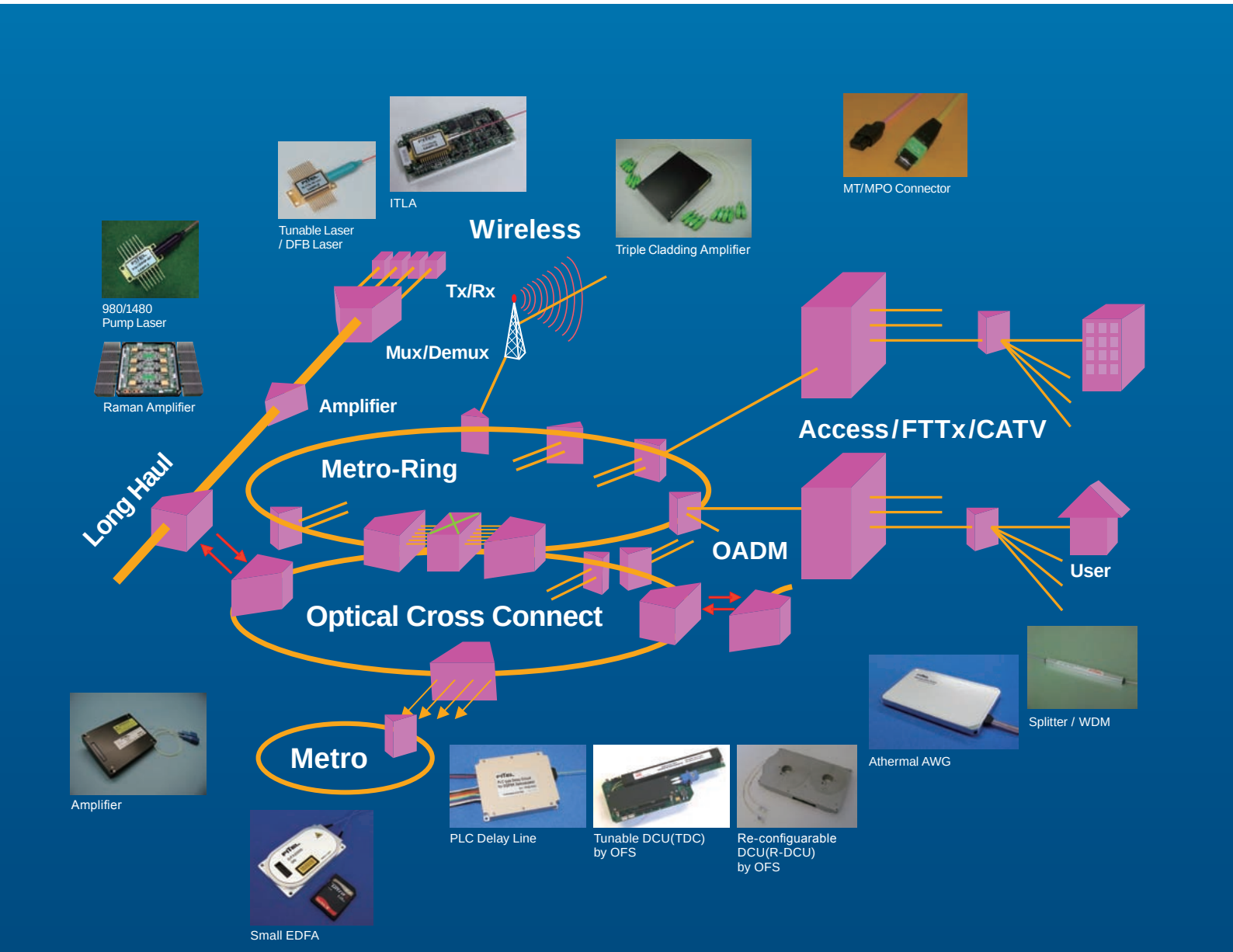
Bound to Innovate

Optical Components

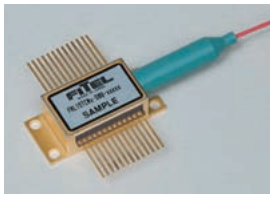
FURUKAWA ELECTRIC

Optical Network is dramatically growing!

FURUKAWA group products support this Environmental beneficial concept!



The rapid growth of the optical network systems such as WDM, CATV and FTTx have attracted a great deal of attention, and optical components play a critical role in these systems. Furukawa Electric supplies a full suite of optical components such as Tunable LD, Amplifier and Athermal-AWG module and subsystems based on our outstanding optical fiber manufacturing technique.



Full Band Tunable Laser

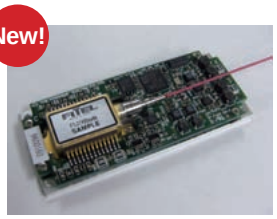
- Full-C or Full-L coverage
- ITU-Grid, 50G-88ch (35nm)
- Built-in wavelength locker
- RoHS-6 compliant

Part Number	Form Factor	Optical Output
FRL15TCWx-D86	26pin Butterfly	CW-10 / 20 mW

Furukawa's tunable-laser is the single monolithic-chip, integrated with arrayed-DFBs, passive-combiner, and semiconductor amplifier. This provides robust reliability performances in solid-state.

Simple "thermal-tuning scheme" is friendly to any customers' own design-needs for TRx-ponder-cards, just like the legacy narrow-band DFBs.

New!

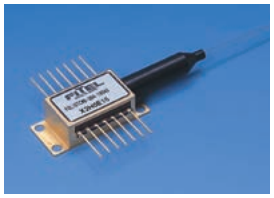


ITLA (Integrable Tunable Laser Assembly)

- Full-C or Full-L coverage
- ITU-Grid, 50G-88ch (35nm)
- Built-in wavelength locker
- Compliance with OIF-ITLA-MSA-01.2
- RoHS5-compliant

Preliminary

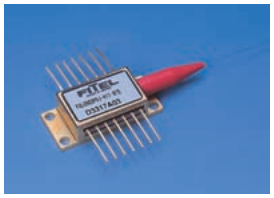
Part Number	Optical Output	Wavelength
FTLC1F10FS8A	10mW	C-band
FTLL1F10FS8A	10mW	L-band
FTLC1F20FS8A	20mW	C-band



Fixed-wavelength DFB Laser

- DWDM fixed wavelength(C/L-band)
- 40mW-CW or 10mW-OC48
- Standard 14-pin butterfly form / factor
- RoHS-6 compliant

Part Number	Modulation & Grids	Optical Output
FRL15DCWx-A8x-xxxxx	CW, ITU-grid 1530~1610nm	10 - 40 mW
FRL15DCWx-A8x-Wxxxx	CW, supervisory, 1510/1625nm	10 - 20 mW
FRL15DDBx-A31-xxxxx	2.5Gbps (OC48), ITU-grid	5 - 10 mW (peak)

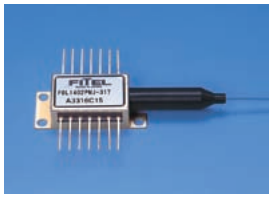


980 Pump Laser

- 980nm-Fiber-Bragg Grating (FBG)
- Standard 14-pin butterfly form / factor
- High-power EDFA application
- RoHS-5 compliant

Part Number	Optical Output (Operating)	Pigtails
FOL0907Axx	100 - 220 mW	Single Mode Fiber
FOL0906Axx	230 - 300 mW	PMF (*)
FOL0908Axx	310 - 450 mW	PMF (*)
New! FOL0909Axx	Preliminary 460 - 550 mW	PMF (*)

(* PMF = Polarization Maintained Fiber)



1480/14xx Pump Laser

- High-power EDFA and Raman
- 14XXnm, FBG (Raman)
- 1480nm, built-in isolator (EDFA)
- Standard 14-pin butterfly form/ factor
- RoHS-5 compliant

Part Number	Optical Output (Operating)
FOL1402Pxx	120 - 250 mW
FOL1404Qxx	210 - 270 mW
FOL1405Rxx	250 - 320 mW
FOL1425Rxx	340 - 400mW (EDFA, 1460 - 1490nm) 340/ 360mW (Raman, 1420 - 1510nm)

Furukawa has been shipping the pumps in high-volume (- 600k units) for the last decade, and the devices are operating in the field without failures. This is the real proof of FIT figures below 5.

Raman and high-power EDF amplifiers (ex. L-band applications) rely on the benefits of efficient photon to photon conversion at 14XXnm pump-wavelength.

New!

Small EDFA

- Ultra compact size (70×40×7.5mm)
- High saturated output power (more than +15dBm)
- Low power consumption (1.25W)
- Low noise figure (Max 6.5dB)

ErFA22000 Preliminary

Items	Specification	Comments
Wavelength range (nm)	1530 - 1565	
Input power (dBm)	Max. 0	
Total Output power (dBm)	Min. 12	Input power -20dBm
	Min. 15	Input power 0dBm
Noise Figure (dB)	Max. 5.5	Input power -20dBm
	Max. 6.5	Input power 0dBm
PDG (dB)	Max. 0.5	
Return Loss (dB)	40	
Size (mm)	70(L) × 40(W) × 7.5(H)mm	

Fast AGC Amplifier

- Compact Size for DWDM application
- High Performance
- Fast AGC (Auto Gain Control)

ErFA36000

Items	Specification	Comments
Wavelength range (nm)	1530 - 1560	
Input power (dBm)	Typ. -15	
Output power (dBm)	Min. 13	
Noise figure (dB)	Max. 6	Pin= -15dBm
PDG (dB)	Max. 0.3	
Return Loss (dB)	Min. 40	
Size (mm)	90(L) × 70(W) × 20(H)	

Triple Cladding Amplifier

- Ultra Gain
- Analog CATV application
- 16 ports output
- Total output power; +34dBm

ErFA35000

Items	Specification	Comments
Wavelength range (nm)	1550 - 1560	
Output Port Number	16	
Input power (dBm)	Min. -5	
Output power	Typ. +20dBm/port	
Total Output power (dBm)	+34	
Noise figure (dB)	Max. 5.5	Pin=-5dBm
PDG (dB)	Max. 0.3	
Return Loss (dB)	Min. 50	
Size (mm)	160(L) × 121.5(W) × 29.5(H)	

Furukawa Electric is one of the leading suppliers of amplifier modules and Raman Amplifier with internal pump laser, Er-doped fiber and passive components in the world. By utilizing our proven capabilities in design, manufacturing, and technical services, we support the increasing demands of DWDM systems through rapid product development and production. Talk to our worldwide sales teams now, and find out which solutions can help you.

PLC-Splitter

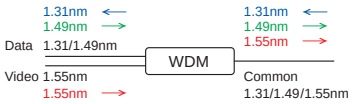
- FTTH and CATV application
- Low Insertion Loss
- Compact Size for Installation
- High Reliability for outside use

PS202

Configuration	1×8	1×16	1×32	1×64	Comments
Wavelength Range (nm)	1260 - 1360 / 1480 - 1580				
Standard					
Insertion Loss (dB)	11	14.5	17.8	21.0	Without connectors
Uniformity (dB)	1	1.5	2	2.5	
Premium					
Insertion Loss (dB)	10.4	13.8	16.8	-	Without connectors
Uniformity (dB)	0.8	1.3	1.5	-	
Common specification					
PDL (dB)	0.3			0.4	
Return Loss (dB)	50				

Triple Play WDM Filter Array

- 8ch WDM for Triple Play
- High Reliability with PLC



PS601

Parameter	Port	Specification
Configuration	-	8ch
Wavelength Range (nm)	-	1260 - 1360, 1480 - 1500, 1550 - 1560
Insertion Loss (dB)	C->D (1310)	1.2 (Typ. 0.7)
	D->C (1490)	1.4 (Typ. 1.0)
	V->C (1555)	1.2 (Typ. 0.8)
Isolation (dB)	C->V (1310)	10 (Typ. 19)
	C->V (1490)	7.0 (Typ. 11)
	C->D (1555)	10 (Typ. 12.5)
	V->D (1555)	50
	D->V (1310)	
	D->V (1490)	
PDL (dB)	All port	0.5 (Typ. 0.2)
Return Loss (dB)	All port	50
Size (mm)	-	116(L) × 6.4(W) × 8.0(H)

※ PS602 is also available for PS601 with 1×8.

Athermal-AWG Module

- DWDM and WDM-PON application
- Power supply free
- High Performance for cascadability
- High Reliability for outside use

PS701

Type	Gaussian	Flattop		Comments
Channel Spacing (GHz)	100		50	C-Band / L-Band
Passband (nm)	+/-0.1		+/-0.08	+/-0.1(+/-12.5GHz)
1dB Bandwidth (nm)	0.2	0.4	0.2	
Insertion Loss (dB)	3.5	6.0	6.7	Including PDL
Adjacent Crosstalk (dB)	-25		Typ. -23	Within Passband for All Channels including PDL
Non-Adjacent Crosstalk (dB)	-30			
PDL (dB)	0.6		1.0	Within Passband
Return Loss (dB)	40			
Optical Input Power(dBm)	24			
Size (mm)	130(L) × 65(W) × 8.5(H)			

Athermal-AWG is one of the key components for next generation network, mesh-network, optical crossconnect and WDM-PON. It has electrical power free and highly reliable performance based on PLC technique.

New!

PLC-Delay Line for DQPSK

- Full-C or Full-L coverage
- Suitable for Mass production
- For 40Gbps DQPSK transmission

PS901 Preliminary

Item	Min.	Max.	Comments
Wavelenght Range (nm)	1528	1568	
FSR (GHz)	Typ. 22		Other FSR available
FSR Error (GHz)		0.2	
Insertion Loss (dB)		6.5	
Extinction Ratio (dB)	16		
PDL (dB)		0.5	
Return Loss (dB)	40		
Size (mm)	65(L) × 50(W) × 15(H)		

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