

# CWDM PLUS/MAX Series

## OVERVIEW

CWDM PLUS/MAX series are SOLiD's passive WDM solutions that support two or six wavelengths, respectively, within a single conventional CWDM wavelength window. With this technology, maximum available number of wavelengths will be 36 or 108, compared to 18 of conventional CWDM.

CWDM PLUS/MAX are composed with SFP transceiver modules and passive optical filter modules preparing for the various kinds of network configuration and modular capacity expansion. The solutions give the merit of CAPEX and OPEX savings with the increased wavelength density and configuration flexibility both for the greenfield and existing brownfield CWDM transmission plants with appropriate combination of transceivers and filter modules.

As there is no requirement of network equipment or CWDM plant replacement, carriers' network capacity can be expanded with easy installation method of just adding appropriate passive optical filter modules and replacing SFP.

The SFP transceiver modules comply SFF-8472 MSA requirement and support up to 6 Gbps modulation. The filter modules are designed with LGX form factor but can be customized according to the request.

## KEY FEATURES AND BENEFITS

### Scalability & Capacity

SFP transceiver modules

- 36 wavelengths for 18 CWDM bands with CWDM PLUS (32 wavelengths considering two waterpeak bands)
- 108 wavelengths for 18 CWDM bands with CWDM MAX (96 wavelengths considering two waterpeak bands)

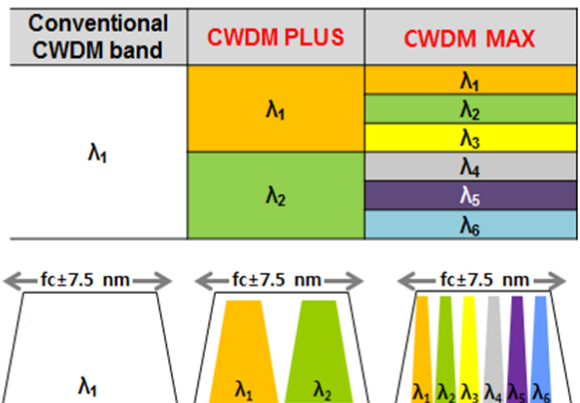
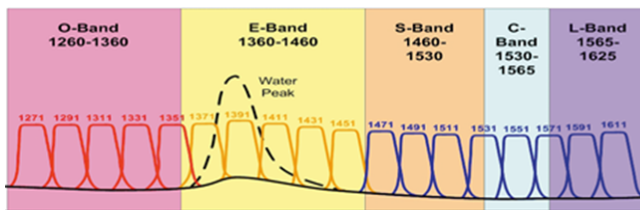
Filter modules (CWDM PLUS/MAX Filter PAK)

- Scalabilities of 3, 6, 12 channels
- Cascading with express port for future expansion

### Flexible and Easy Implementation

- No additional equipment required, simply placing CWDM PLUS/MAX will work
- Using our mounting shelf, the Mux/Demux cards can be mounted in a 19 inch standard rack
- SFP supports IEEE802.3, SFF-8472, INF8074 and used in standard SFP port

## TECHNOLOGY



## PRODUCTS

### CWDM PLUS SFP

- Form factor: Bi-directional
- Greenfield application: with CWDM PLUS Greenfield PAK
- Expansion application: with conventional CWDM filters
- Wavelength Plan ( $\lambda_c$ : CWDM center wavelength)
  - ✓  $\lambda_L = \lambda_c - 7.5 \text{ nm} \sim \lambda_c - 1.5 \text{ nm}$
  - ✓  $\lambda_H = \lambda_c + 2.0 \text{ nm} \sim \lambda_c + 7.5 \text{ nm}$
- Operating Temperature:  $-40 \text{ }^\circ\text{C} \sim +85 \text{ }^\circ\text{C}$  (Case)



### CWDM MAX SFP

- Form factor: Bi-directional, Duplex
- Greenfield and Expansion applications with CWDM MAX Greenfield and Expansion PAK
- Wavelength Plan ( $\lambda_c$ : CWDM center wavelength)
  - ✓  $\lambda_1 = \lambda_c - 3.05 \text{ nm}$ ,  $\lambda_2 = \lambda_c - 1.45 \text{ nm}$ ,  $\lambda_3 = \lambda_c + 1.05 \text{ nm}$
  - ✓  $\lambda_4 = \lambda_c + 1.75 \text{ nm}$ ,  $\lambda_5 = \lambda_c + 3.35 \text{ nm}$ ,  $\lambda_6 = \lambda_c + 4.95 \text{ nm}$
- Operating Temperature:  $-40 \text{ }^\circ\text{C} \sim +85 \text{ }^\circ\text{C}$  (Case)



### CWDM PLUS Greenfield PAK

- ITU G.694.2 CWDM wavelength grid with 20 nm spacing
- Support for up to 8 different channels
- LC/PC connectors
- BIDI SFP interface are available on all channels
- Optional 19-inch rack mounting hardware available
- Operating Temperature:  $-30 \text{ }^\circ\text{C} \sim +70 \text{ }^\circ\text{C}$

### CWDM MAX Greenfield PAK

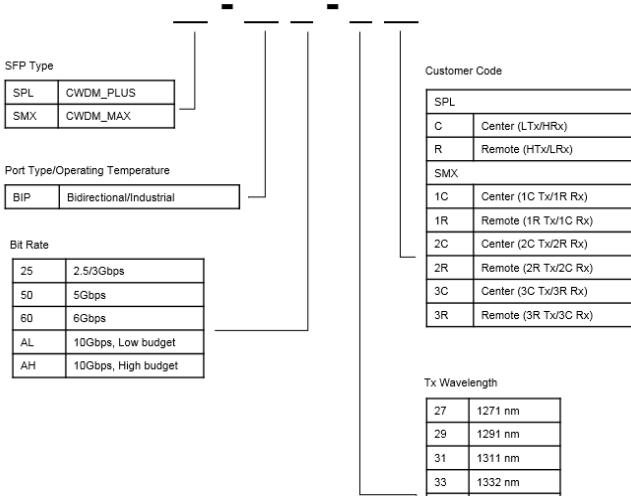
- Support for up to 24 different channels
- LC/PC connectors
- Duplex SFP interface and BIDI SFP interface are available on all channels
- Optional 19-inch rack mounting hardware available
- Operating Temperature:  $-30 \text{ }^\circ\text{C} \sim +70 \text{ }^\circ\text{C}$

### CWDM MAX Expansion PAK

- Support for up to 24 different channels
- Expansion port on all 8-channel mux/demux modules
- LC/PC connectors
- Duplex SFP interface and BIDI SFP interface are available on all channels
- Optional 19-inch rack mounting hardware available
- Operating Temperature:  $-30 \text{ }^\circ\text{C} \sim +70 \text{ }^\circ\text{C}$

## ORDERING INFORMATION

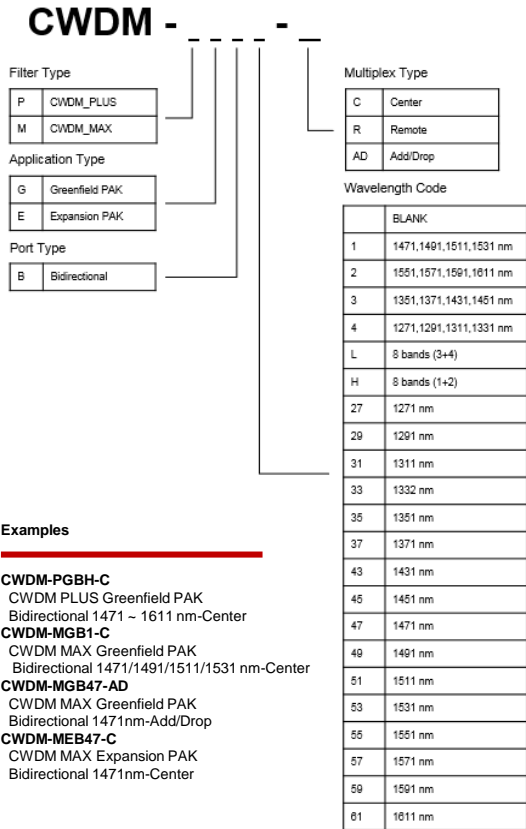
### CWDM PLUS/MAX SFP



**Examples**

- SPL-BIP25-47C**  
CWDM PLUS Bidirectional SFP, Industrial 2.5/3Gbps, 1471 nm, Center (LTx/HRx)
- SPL-BIP25-47R**  
CWDM PLUS Bidirectional SFP, Industrial 2.5/3Gbps, 1471 nm, Remote (HTx/LRx)
- SMX-BIP50-511R**  
CWDM MAX Bidirectional SFP, Industrial 5Gbps, 1511 nm, Remote (1R Tx/1C Rx)
- SMX-BIPAH-513C**  
CWDM MAX Bidirectional SFP, Industrial 10Gbps, High power budget 1511 nm, Center (3C Tx/3R Rx)

### CWDM PLUS/MAX Filter PAK

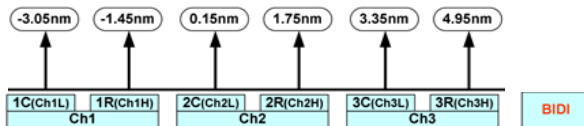


**Examples**

- CWDM-PGBH-C**  
CWDM PLUS Greenfield PAK Bidirectional 1471 ~ 1611 nm-Center
- CWDM-MGB1-C**  
CWDM MAX Greenfield PAK Bidirectional 1471/1491/1511/1531 nm-Center
- CWDM-MGB47-AD**  
CWDM MAX Greenfield PAK Bidirectional 1471nm-Add/Drop
- CWDM-MEB47-C**  
CWDM MAX Expansion PAK Bidirectional 1471nm-Center

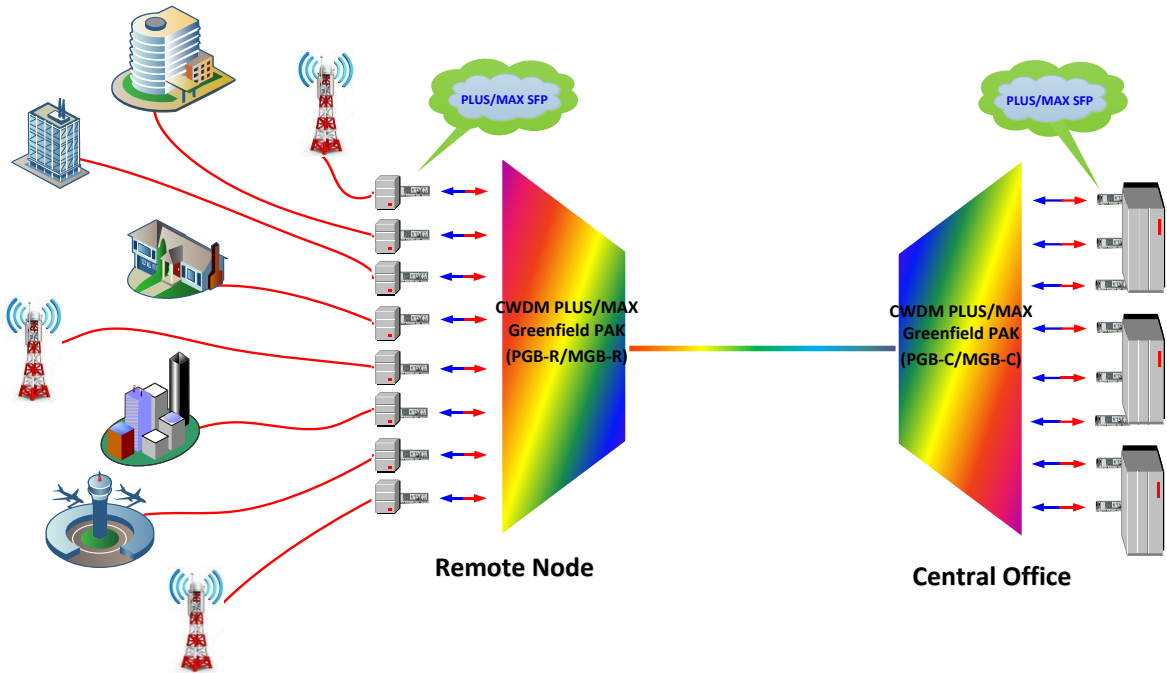
### CWDM MAX Wavelength Reference Table

Channel Number				Peak Wavelength (Typical)																
No	BIDI	Duplex	Wavelength	1471	1491	1511	1531	1551	1571	1591	1611									
Ch1	Ch1L	1C	1	Ac-3.05	1468 L/H	1467.95	1488 L/H	1487.95	1508 L/H	1507.95	1528 L/H	1527.95	1548 L/H	1547.95	1568 L/H	1567.95	1588 L/H	1587.95	1608 L/H	1607.95
	Ch1H	1R	2	Ac-1.45	1469.55	1489.55	1509.55	1529.55	1549.55	1569.55	1589.55	1609.55								
Ch2	Ch2L	2C	3	Ac+0.15	1471 L/H	1471.15	1491 L/H	1491.15	1511 L/H	1511.15	1531 L/H	1531.15	1551 L/H	1551.15	1571 L/H	1571.15	1591 L/H	1591.15	1611 L/H	1611.15
	Ch2H	2R	4	Ac+1.75	1472.75	1492.75	1512.75	1532.75	1552.75	1572.75	1592.75	1612.75								
Ch3	Ch3L	3C	5	Ac+3.35	1474 L/H	1474.35	1494 L/H	1494.35	1514 L/H	1514.35	1534 L/H	1534.35	1554 L/H	1554.35	1574 L/H	1574.35	1594 L/H	1594.35	1614 L/H	1614.35
	Ch3H	3R	6	Ac+4.95	1475.95	1495.95	1515.95	1535.95	1555.95	1575.95	1595.95	1615.95								
Ch4	Ch4L	4C	7	Ac-6.25	1465 L/H	1464.75	1485 L/H	1484.75	1505 L/H	1504.75	1525 L/H	1524.75	1545 L/H	1544.75	1565 L/H	1564.75	1585 L/H	1584.75	1605 L/H	1604.75
	Ch4H	4R	8	Ac-4.65	1466.35	1486.35	1506.35	1526.35	1546.35	1566.35	1586.35	1606.35								

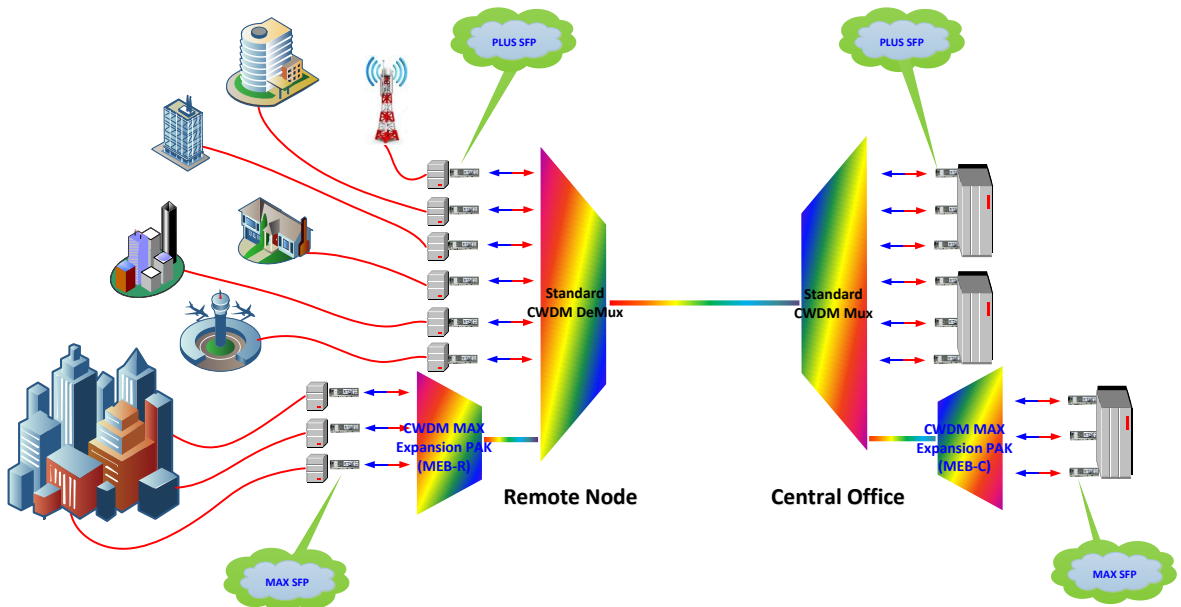


## NETWORK TOPOLOGY

### Point-To-Point Configuration (Greenfield PAK)



### Point-To-Point Configuration (Expansion PAK)



### Linear Configuration (Greenfield/Expansion PAK)

