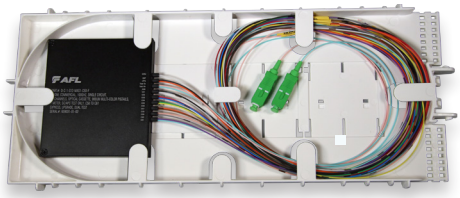


DWDM Module in Apex X-2 Splice Tray

DWDM Module in Apex X-2S Splice Tray

Dense Wave Division Multiplexing (DWDM) *Apex® WDM Splice Trays*

AFL's WDM Apex splice trays provide scalable wavelength management for new deployments and network upgrades, providing increased bandwidth over a single common fiber. Passive circuit design utilizes proven thin-film filter technology featuring low insertion loss, high isolation and superior environmental stability. Standard Apex X-2 and X-2S splice trays allow for installation in Apex closures. The WDM module is factory installed via a secure plug-and-play module holder with pre-routed 900 µm tails available in configurations from 4 to 20 channels. Test ports can be factory terminated with SC connectors for plug-and-play field optical testing and include an Apex adapter kit for securing test connectors in any open splice tray module location.

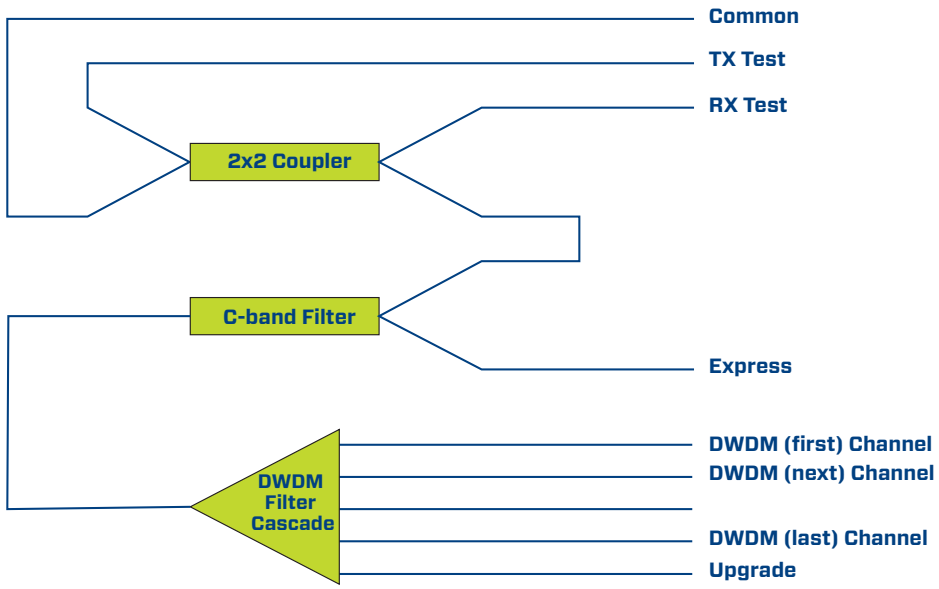
Features

- 50 GHz and 100 GHz ITU-T channel spacing
- Low insertion loss/high isolation
- Epoxy-free optical path
- Express, upgrade and Tx/Rx test ports
- Test port adapter kit
- Secure WDM filter attachment

Applications

- CATV Systems
- Carrier Infrastructure
- Access Networks
- Small Cell

Diagram



Ordering Information

Model	Specification	ITU Channel Plan	Channel Count	Package Size & 900 µm Fiber Color	Fiber Length & Connector Type*	Channel	Network & Test Options**
D	C	1	S08	2LM	ASC1	Cxx	F

- **Model:** D = Dense WDM
- **Specification:** C = Commercial
- **ITU Channel Plan:** 5 = 50 GHz; 1 = 100 GHz
- **Channel Count:** S04 = Single Circuit, 4 Channels; S08 = Single Circuit, 8 Channels; S10 = Single Circuit, 10 Channels; S12 = Single Circuit, 12 Channels; S16 = Single Circuit, 16 Channels; S20 = Single Circuit, 20 Channels
- **Package Size & 900 µm Fiber Color:** 2LM = Apex X-2 Tray/Color; 2SM = Apex X-2S Tray/Color
- **Fiber Length & Connector Type*:** ASC1=1M, SC/APC Test Conn.; USC1=1M, SC/APC Test Conn.; XXX1=1M, NoTest Conn.
- **Channel:** Replace **xx** with Channel Number listed in DWDM ITU Channels table on last page of spec sheet. C19 = Channel 19 with 191, 900 GHz and 1562.23 nm center wavelength
- **Network & Test Options:** F = Express, Upgrade, & Dual Test

* Connector type selection only for Rx and/or Tx port fibers (if applicable), all other port tails without connectors.

** Additional options available, contact AFL for details.

continued

Dense Wave Division Multiplexing (DWDM) *Apex® WDM Splice Trays*

Optical Specifications *
ITU-T G.694.1 Configuration F (Express, Upgrade and Dual Test Ports)

PARAMETER	REQUIREMENT											COMMENT/COMMERCIAL SPEC VARIATION
	100 GHz						50 GHz					
Temperature and Input Power												
Operating Temperature/Humidity	-40°C to 85°C; 5 to 95% RH											
Storage Temperature/Humidity	-40°C to 85°C; 5 to 95% RH											
Max. Input Power Rating	300 mW											
Optical Passband												
DWDM Channel Center Wavelength	per ITU 100 GHz Grid						per ITU 50 GHz Grid					
DWDM Channel Passband @ 0.5 dB	± 0.125 nm (ITU Channel Center Wavelength)						± 0.06 nm (ITU Channel Center Wavelength)					
DWDM Channel Passband Ripple	< 0.5											
Upgrade Port Optical Passband	1528.65 nm to 1566.44 nm											
Express Port Optical Passband	1260 nm to 1520 nm and 1570 nm to 1635 nm											
RX Test Optical Passband	1260 nm to 1635 nm											
TX Test Optical Passband	± 0.125 nm (ITU Channel Center Wavelength)						± 0.06 nm (ITU Channel Center Wavelength)					
Insertion Loss (New Product, 20°C to 25°C)												
Max IL (dB) – Common to DWDM Ch.	4 Ch	8 Ch	10 Ch	12 Ch	16 Ch	20 Ch	4 Ch	8 Ch	10 Ch	12 Ch	16 Ch	
	2.0	3.0	3.5	3.5	4.0	4.0	2.0	3.0	3.5	4.0	4.0	
Max DWDM Channel Uniformity	2.0 dB											
Max IL (dB) – Common to Upgrade	1.5	2.5	3.0	3.5	3.5	3.5	1.5	2.5	3.0	3.5	3.5	3.0 dB
Max IL – Common to Express	1.0 dB											
Common to RX Test	≤21.0 dB **											
Express to TX Test	≤22.0 dB **											
Isolation												
Min DWDM Adjacent Channel Isolation	30 dB						25 dB					
Min DWDM Non-Adjacent Ch. Isolation	45 dB						35 dB					
Min Express Isolation	12 dB											
Max Polarization Dependent Loss (PDL)	0.3 dB											0.25 dB
Max Polarization Mode Dispersion (PMD)	0.3 dB											0.15 dB
Directivity												
DWDM Port Min Directivity	50 dB											55 dB
Express Port Min Directivity	45 dB											
Test Port Min Directivity	50 dB											
Min Return Loss (all ports)	45 dB											
Insertion Loss Thermal Stability												
Insertion Loss Thermal Stability – New Prod.	≤0.005 dB/C											
Insertion Loss Thermal Stability – Service Life	≤0.010 dB/C											< 0.005 dB/C
Wavelength Thermal Stability	≤0.001 mm/C											

Splice Tray Size Compatibility	4 Ch	8 Ch	10 Ch	12 Ch	16 Ch	20 Ch	
Apex X-2S Splice Tray	X	X					
Apex X-2 Splice Tray	X	X	X	X	X	X	

NOTES:

* Unless otherwise noted, optical specification applies across operating temperature and optical bandpass.

** Unless noted, 0.40 dB per mated connector loss is EXCLUDED.

continued

Dense Wave Division Multiplexing (DWDM) *Apex® WDM Splice Trays*

DWDM ITU Channels

CHANNEL NO.	FREQUENCY (GHz)	CENTER WAVELENGTH (nm)	CHANNEL NO.	FREQUENCY (GHz)	CENTER WAVELENGTH (nm)	CHANNEL NO.	FREQUENCY (GHz)	CENTER WAVELENGTH (nm)	CHANNEL NO.	FREQUENCY (GHz)	CENTER WAVELENGTH (nm)
C1	190,100	1577.03	C19	191,900	1562.23	C37	193,700	1547.72	C55	195,500	1533.47
H1	190,150	1576.61	H19	191,950	1561.83	H37	193,750	1547.32	H55	195,550	1533.07
C2	190,200	1576.20	C20	192,000	1561.42	C38	193,800	1546.92	C56	195,600	1532.68
H2	190,250	1575.78	H20	192,050	1561.01	H38	193,850	1546.52	H56	195,650	1532.29
C3	190,300	1575.37	C21	192,100	1560.61	C39	193,900	1546.12	C57	195,700	1531.90
H3	190,350	1574.95	H21	192,150	1560.20	H39	193,950	1545.72	H57	195,750	1531.51
C4	190,400	1574.54	C22	192,200	1559.79	C40	194,000	1545.32	C58	195,800	1531.12
H4	190,450	1574.13	H22	192,250	1559.39	H40	194,050	1544.92	H58	195,850	1530.72
C5	190,500	1573.71	C23	192,300	1558.98	C41	194,100	1544.53	C59	195,900	1530.33
H5	190,550	1573.30	H23	192,350	1558.58	H41	194,150	1544.13	H59	195,950	1529.94
C6	190,600	1572.89	C24	192,400	1558.17	C42	194,200	1543.73	C60	196,000	1529.55
H6	190,650	1572.48	H24	192,450	1557.77	H42	194,250	1543.33	H60	196,050	1529.16
C7	190,700	1572.06	C25	192,500	1557.36	C43	194,300	1542.94	C61	196,100	1528.77
H7	190,750	1571.65	H25	192,550	1556.96	H43	194,350	1542.54	H61	196,150	1528.38
C8	190,800	1571.24	C26	192,600	1556.56	C44	194,400	1542.14	C62	196,200	1527.99
H8	190,850	1570.83	H26	192,650	1556.15	H44	194,450	1541.75	H62	196,250	1527.60
C9	190,900	1570.42	C27	192,700	1555.75	C45	194,500	1541.35	C63	196,300	1527.22
H9	190,950	1570.01	H27	192,750	1555.34	H45	194,550	1540.95	H63	196,350	1526.83
C10	191,000	1569.59	C28	192,800	1554.94	C46	194,600	1540.56	C64	196,400	1526.44
H10	191,050	1569.18	H28	192,850	1554.54	H46	194,650	1540.16	H64	196,450	1526.05
C11	191,100	1568.11	C29	192,900	1554.13	C47	194,700	1539.77	C65	196,500	1525.66
H11	191,150	1568.36	H29	192,950	1553.73	H47	194,750	1539.37	H65	196,550	1525.27
C12	191,200	1567.95	C30	193,000	1553.33	C48	194,800	1538.98	C66	196,600	1524.89
H12	191,250	1567.54	H30	193,050	1552.93	H48	194,850	1538.58	H66	196,650	1524.50
C13	191,300	1567.13	C31	193,100	1552.52	C49	194,900	1538.19	C67	196,700	1524.11
H13	191,350	1566.72	H31	193,150	1552.12	H49	194,950	1537.79	H67	196,750	1523.72
C14	191,400	1566.31	C32	193,200	1551.72	C50	195,000	1537.40	C68	196,800	1523.34
H14	191,450	1565.90	H32	193,250	1551.32	H50	195,050	1537.00	H68	196,850	1522.95
C15	191,500	1565.50	C33	193,300	1550.92	C51	195,100	1536.61	C69	196,900	1522.56
H15	191,550	1565.09	H33	193,350	1550.52	H51	195,150	1536.22	H69	196,950	1522.18
C16	191,600	1564.68	C34	193,400	1550.12	C52	195,200	1535.82	C70	197,000	1521.79
H16	191,650	1564.27	H34	193,450	1549.72	H52	195,250	1535.43	H70	197,050	1521.40
C17	191,700	1563.86	C35	193,500	1549.32	C53	195,300	1535.04	C71	197,100	1521.02
H17	191,750	1563.45	H35	193,550	1548.91	H53	195,350	1534.64	H71	197,150	1520.63
C18	191,800	1563.05	C36	193,600	1548.52	C54	195,400	1534.25	C72	197,200	1520.25
H18	191,850	1562.64	H36	193,650	1548.11	H54	195,450	1533.86	H72	197,250	1519.86

NOTES:

1. See Channel column to determine frequency and center wavelength values.
2. 100 GHz channels begin Cxx and 50 GHz channels begin with Cxx or Hxx.
3. Channels C16 (1564.68 nm) through C63 (1527.22 nm) reference C-BAND filter passband.

Temperature Specifications *

Contact AFL for further details.

	50 GHz & 100 GHz DWDM
Operation Temperature, Relative Humidity	-40°C to 85°C; 5 to 95% RH
Storage Temperature, Relative Humidity	-40°C to 85°C; 5 to 95% RH

* Unless otherwise noted, optical specification applies across operating temperature and optical bandpass.