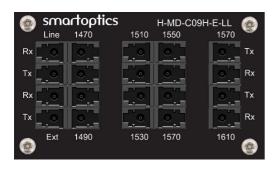
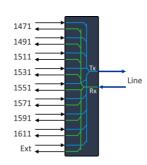
DATASHEET 5.0

H-MD-C09H-E-LL

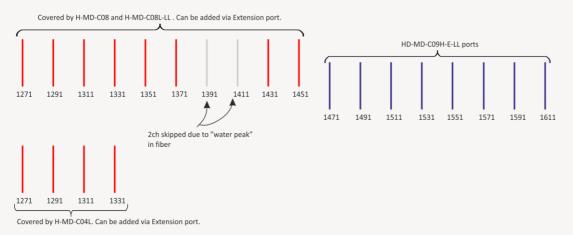
Low-loss 8-channel CWDM High Band Mux/Demux with Extension port





OVERVIEW

The H-MD-C09H-E-LL is an 8ch CWDM low-loss Mux/Demux operating on the high CWDM channels. The filter has an Extension port where additional channels can be added. This filter is best used to fully utilize the upper CWDM channels in the region where the SM fiber attenuation is the lowest.



The table below lists H-Series filters that can be connected to the Extension port.

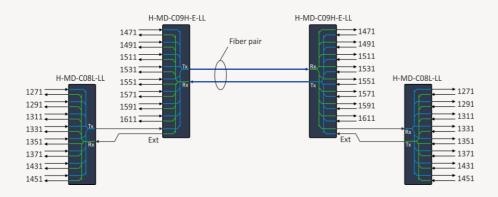
Parameter	
Extension port wavelength band	1264 – 1458nm
Filters matching Ext port	H-MD-C04L (CWDM channels 1271 – 1331nm)
	H-MD-C08 (CWDM channels 1271 – 1451nm)
	H-MD-C08L-LL (CWDM channels 1271 – 1451nm)

The H-MD-C09H-E-LL filter supports the industrial temperature (I-temp) range of -40°C to +85°C (-40°F to +185°F) which gives an extended application range into sites without temperature control.

The H-Series filters are mounted in a 1 RU mounting bracket solution, and the filter module sizes vary depending on type of filter.

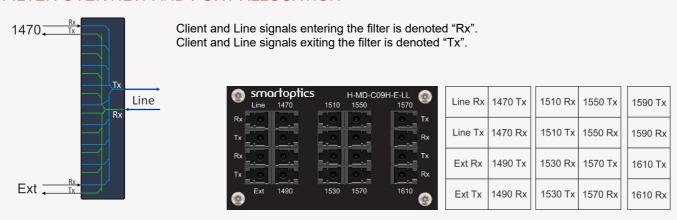
The H-MD-C09H-E-LL is compliant with ITU-T G.694.2

DATASHEET 5.0



H-MD-C09H-E-LL combined with the H-MD-C08L-LL filters to provide an 8+8 channel configuration.

FILTER OVERVIEW AND PORT ALLOCATION



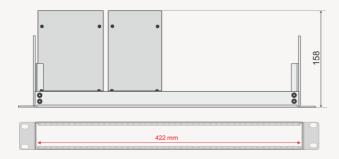
Note: The channel labels "1470", "1490" etc on the overlay are not representing the actual center wavelengths. The actual center wavelengths are at 1471nm, 1491nm etc. as listed in the table below. Note column dependent location of Tx and Rx ports.

DATASHEET 5.0

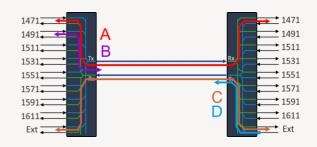
TECHNICAL SPECIFICATIONS

Channels 1471, 1491, 1511, 1531, 1591, 1611nm ⊂ Channel spacing 20mm ⊂ Channel passband ITU±7nm ⊂ Passband Extension port 1264-1458nm ⊂ Insertion loss, channels (B) Typical 2.4dB Max 2.6dB Typical 2.6dB Max 2.8dB Link loss, channels (A) Typical 2.6dB Max 3.2dB Typical 2.8dB Max 3.4dB Link loss, thannels (A) Typical 1.8dB Max 2.0dB Typical 2.0dB Max 2.2dB Insertion loss, extension port (D) Typical 1.7dB Max 0.8dB Typical 1.7dB Max 1.8dB Insertion loss, extension ports (C) Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB ⊂ Isolation, non-adjacent channel Min 40dB ⊂ Return loss Min 40dB ⊂ Return loss Min 40dB ⊂ Polarization dependent loss Max 0.2dB ⊂ Polarization mode dispersion Max 0.2dB ⊂ Max optical power Max 500mW ⊂ Operating temperature 40°C to +85°C ← Connector type <td< th=""><th>Parameter</th><th>C-temp conditions</th><th>I-temp Conditions</th></td<>	Parameter	C-temp conditions	I-temp Conditions
Channel passband ITU±7nm ⊆ Passband Extension port 1264-1458nm ⊆ Insertion loss, channels (B) Typical 2.4dB Max 2.6dB Typical 2.6dB Max 2.8dB Link loss, channels (A) Typical 2.6dB Max 3.2dB Typical 2.8dB Max 3.4dB Link loss, 1551nm Typical 1.8dB Max 2.0dB Typical 2.0dB Max 2.2dB Insertion loss, extension port (D) Typical 0.7dB Max 0.8dB Typical 0.9dB Max 1.0dB Link loss, extension ports (C) Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB ⊆ Isolation, non-adjacent channel Min 40dB ⊆ Ripple, passband Max 0.5dB ⊆ Return loss Min 45dB ⊆ Return loss Min 40dB ⊆ Polarization dependent loss Max 0.2dB ⊆ Polarization mode dispersion Max 0.2dB ⊆ Max optical power Max 500mW ⊆ Operating temperature o°C to +8°C -40°C to +8°C G Storage temperature LC/UPC -40°C to +8°C G	Channels		←
Passband Extension port 1264-1458nm ⇐ Insertion loss, channels (B) Typical 2.4dB Max 2.6dB Typical 2.6dB Max 2.8dB Link loss, channels (A) Typical 2.6dB Max 3.2dB Typical 2.8dB Max 3.4dB Link loss, 1551nm Typical 1.8dB Max 2.0dB Typical 2.0dB Max 2.2dB Insertion loss, extension port (D) Typical 0.7dB Max 0.8dB Typical 0.9dB Max 1.0dB Link loss, extension ports (C) Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB ⇐ Isolation, non-adjacent channel Min 40dB ⇐ Ripple, passband Max 0.5dB ⇐ Return loss Min 45dB ⇐ Return loss Min 40dB ⇐ Polarization dependent loss Max 0.2dB ⇐ Polarization mode dispersion Max 0.20ps ⇐ Max optical power Max 500mW ⇐ Operating temperature -40°C to +85°C ← Storage temperature -40°C to +85°C ⇐ Connector type LC/UPC ⇐	Channel spacing	20nm	⇐
Insertion loss, channels (B) Typical 2.4dB Max 2.6dB Typical 2.6dB Max 2.8dB Typical 2.6dB Max 2.8dB Typical 2.8dB Max 3.4dB Typical 2.0dB Max 2.2dB Insertion loss, extension port (D) Typical 0.7dB Max 0.8dB Typical 0.9dB Max 1.0dB Typical 0.7dB Max 1.8dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB Elisolation, non-adjacent channel Min 40dB Elisolation, non-adjacent channel Min 45dB Elisolation, non-adjacent channel Min 45dB Elisolation, non-adjacent channel Min 45dB Elisolation, non-adjacent channel Min 40dB Elisolation, non-adjacent channel Min 45dB Elisolation, non-adjacent channel Min 40dB Elisolation, non-adjacent channel M	Channel passband	ITU±7nm	←
Link loss, channels (A) Typical 2.6dB Max 3.2dB Typical 2.8dB Max 3.4dB Link loss, 1551nm Typical 1.8dB Max 2.0dB Typical 2.0dB Max 2.2dB Typical 2.0dB Max 2.2dB Typical 2.0dB Max 2.2dB Typical 0.9dB Max 1.0dB Typical 0.9dB Max 1.0dB Typical 0.9dB Max 1.8dB Typical 0.9dB Max 1.8dB Typical 0.9dB Max 1.8dB Typical 1.7dB Max 1.8dB Typical 2.8dB Max 2.2dB Typical 2.8dB Max 1.8dB Ty	Passband Extension port	1264-1458nm	←
Link loss, 1551nm Typical 1.8dB Max 2.0dB Typical 2.0dB Max 2.2dB Insertion loss, extension port (D) Typical 0.7dB Max 0.8dB Typical 0.9dB Max 1.0dB Typical 1.7dB Max 1.8dB Link loss, extension ports (C) Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB c Isolation, non-adjacent channel Min 40dB Ripple, passband Max 0.5dB Return loss Min 45dB Return loss Min 40dB C Return loss Min 40dB C Return loss Max 0.2dB C Return loss Max 0.2dB C C Rolarization mode dispersion Max 0.20ps C C Derating temperature O°C to +70°C -40°C to +85°C C Connector type LC/UPC Typical 1.8dB Max 2.2dB Typical 2.0dB Max 2.2dB Typical 0.9dB Max 1.8dB Typical	Insertion loss, channels (B)	Typical 2.4dB Max 2.6dB	Typical 2.6dB Max 2.8dB
Insertion loss, extension port (D) Typical 0.7dB Max 0.8dB Typical 0.9dB Max 1.0dB Typical 0.9dB Max 1.0dB Typical 0.9dB Max 1.0dB Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Solation, adjacent channel Min 35dB c Isolation, non-adjacent channel Min 40dB Ripple, passband Max 0.5dB C Return loss Min 45dB C Return loss Min 40dB C Polarization dependent loss Max 0.2dB C Polarization mode dispersion Max 0.20ps C Max 500mW C Operating temperature O°C to +70°C -40°C to +85°C Connector type LC/UPC C Typical 0.9dB Max 1.0dB Typical 0.9dB Max 1.0dB Ax 1.0dB	Link loss, channels (A)	Typical 2.6dB Max 3.2dB	Typical 2.8dB Max 3.4dB
Link loss, extension ports (C) Typical 1.5dB Max 1.6dB Typical 1.7dB Max 1.8dB Isolation, adjacent channel Min 35dB Elsolation, non-adjacent channel Min 40dB Elsolation, non-adjacent channel Max 0.5dB Elsolation, non-adjacent channel Min 40dB Elsolation, non-adjacent channel Max 0.5dB Elsolation, non-adjacent channel Elsolation, adjacent channel Max 0.5dB Elsolation, non-adjacent channel Elsolation, adjacent channel Max 0.5dB Elsolation, non-adjacent channel Elsolation, adjacent channel Elsolation, adjacet channel Elsolation, a	Link loss, 1551nm	Typical 1.8dB Max 2.0dB	Typical 2.0dB Max 2.2dB
Isolation, adjacent channel Min 35dB Isolation, non-adjacent channel Min 40dB Ripple, passband Max 0.5dB Return loss Min 45dB Return loss Min 40dB Return loss Min 40dB C Polarization dependent loss Max 0.2dB Polarization mode dispersion Max 0.20ps Max 0.20ps C Max optical power Max 500mW C Storage temperature Connector type LC/UPC C Min 45dB C C C C C C C C C C C C C	Insertion loss, extension port (D)	Typical 0.7dB Max 0.8dB	Typical 0.9dB Max 1.0dB
Isolation, non-adjacent channel Min 40dB Ripple, passband Max 0.5dB C Return loss Min 45dB C Return loss Min 40dB C Polarization dependent loss Max 0.2dB C Polarization mode dispersion Max 0.20ps Max 0.20ps C Max optical power Max 500mW C Storage temperature Connector type LC/UPC C Min 40dB C C C C C C C C C C C C C	Link loss, extension ports (C)	Typical 1.5dB Max 1.6dB	Typical 1.7dB Max 1.8dB
Ripple, passband Max 0.5dB Cirectivity Min 45dB Return loss Min 40dB Carectivity Max 0.2dB Carectivity Max 0.20ps Carectivity Max 0.20ps Carectivity Coperating temperature Connector type Max 0.5dB Carectivity Min 45dB Carectivity Min 40dB Carectivity Max 0.2dB Carectivity Carectivity Max 0.2dB Carectivity Carectivity Carectivity Carectivity Max 0.2dB Carectivity	Isolation, adjacent channel	Min 35dB	←
Directivity Min 45dB ⊆ Return loss Min 40dB ⊆ Polarization dependent loss Max 0.2dB ⊆ Polarization mode dispersion Max 0.20ps ⊆ Max optical power Max 500mW ⊆ Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature -40°C to +85°C ⊆ Connector type LC/UPC ∈	Isolation, non-adjacent channel	Min 40dB	←
Return loss Min 40dB ⇐ Polarization dependent loss Max 0.2dB ⇐ Polarization mode dispersion Max 0.20ps ⇐ Max optical power Max 500mW ⇐ Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature -40°C to +85°C ⇐ Connector type LC/UPC ⇐	Ripple, passband	Max 0.5dB	←
Polarization dependent loss Max 0.2dB ← Polarization mode dispersion Max 0.20ps ← Max optical power Max 500mW ← Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature LC/UPC ← Connector type LC/UPC ←	Directivity	Min 45dB	←
Polarization mode dispersion Max 0.20ps ⇐ Max optical power Max 500mW ⇐ Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature -40°C to +85°C ⇐ Connector type LC/UPC ⇐	Return loss	Min 40dB	←
Max optical power Max 500mW ← Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature -40°C to +85°C ← Connector type LC/UPC ←	Polarization dependent loss	Max 0.2dB	←
Operating temperature 0°C to +70°C -40°C to +85°C Storage temperature -40°C to +85°C Connector type LC/UPC -40°C to +85°C	Polarization mode dispersion	Max 0.20ps	←
Storage temperature -40°C to +85°C Connector type LC/UPC Connector type	Max optical power	Max 500mW	←
Connector type LC/UPC Connector type	Operating temperature	0°C to +70°C	-40°C to +85°C
"	Storage temperature	-40°C to +85°C	←
Module width 75 mm ←	Connector type	LC/UPC	(
	Module width	75 mm	(=

Note! A typical loss value is to be seen as a value that ~90% of a population has at beginning of life and at room temperature. The max value is the guaranteed worst-case value over time and over temperature.



Mounting bracket dimensions with two example filters.



ORDER INFORMATION

Part number	Description
H-MD-C09H-E-LL H-Series: 8ch CWDM High band Low Loss Mux/Demux + Ext-port, 1471-1611nm, 75mm, LC/UPC	

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