



## MUX/DeMux Application Parameter Details

### **PRELIMINARY**

#### Overview

This application note describes the details of dBm CSA DeMux Application parameter alternatives. In addition, it gives detail on the log data file contents related to each parameter.

#### Summary

The dBm Optics CSA MUX application is a comprehensive test for DeMultiplexers.

#### Input Parameters

Parameters input by user:

Parameter Name	Description/Use	Format	Default
Pick Model Number	Used to select which of the saved parameter definition files are used	12 character alphanumeric	Last used
Model Number	Model number printed on the top of the test report	12 character alphanumeric	"Model"
Device Name	Device name printed on the top of the test report	12 character alphanumeric	"Device"
Serial Number	Serial number printed on the top of the test report	12 character alphanumeric	"000000"
Operator Name	Operator name printed on the bottom of the test report	12 character alphanumeric	"Operator1"
Customer Name	printed on the top of the test report	15 character alphanumeric	"Customer"
Test DUT #	If there is more than one device connected to the CSA, determines which is tested	Numeric-integer 1<=n<=48	1
# of Channels	Number of physical output fibers on the device	Numeric-integer 1<=n<=1500	4
1 <sup>st</sup> channel Determination	Determines whether the 1 <sup>st</sup> channel frequency should be accessed from the 1 <sup>st</sup> channel Frequency parameter, or determined automatically from the device. This determination is done by doing a least-squares fit of the center of all the channels to the channel spacing, then reflected as the wavelength/frequency of the 1 <sup>st</sup> channel.	Auto or Manual	Auto
1 <sup>st</sup> channel Frequency	The center of the 1 <sup>st</sup> channel of the device; see 1 <sup>st</sup> channel Determination	Numeric-float (THz) 180<=n<=220	190 THz
Channel spacing	Expected spacing of channels	Numeric-float (GHz) 1<=n<=4000	100 GHz
Calculated Channel Center	Determines the method for determining the calculated channel center	"Peak Value" or "dB Down" or "Gaussian Center"	"dB Down"

Calculated Channel Center dB down point	If the Calculated Channel Center is set to “dB down”, this is the number of dB down used to find the span, from which the center is determined from the average.	Numeric-float (dB) 0.1<=n<=40	3 dB
CSA System State File	This is the saved measurement configuration which is used for the measurements for the data used to deriv the parameters	8.3 file name with extension .sst	muxdfit.sst initially, then last used
Logo File Name	A bitmap in ?? Pixel x ?? pixel format used at the top of the results report	8.3 file name, with extension .bmp	dbmoptic.bmp
Ripple Slope Reading spacing	When calculating ripple slope, it is useful to specify a range to determine the slope over, to minimize the effect of noise. Since ripple slope is ?IL/?WL or ?IL/?freq, then ripple slipe reading spacing is the ?freq that the slope is calcauted over	Numeric-integer (GHz) 1<=n<=100	5 GHz
ITU Passband	For results referenced to the ITU Passband, this determines the values to be utilized in the caluclations. Values outside the center frequency +/- ½ the passband are ignored	Numeric-integer (GHz) 1<=n<=1000	50 GHz
Valid Channel Definition	When calculating parameters, either all channels will be included, or only those meeting an insertion loss criteria. If a criteria is specified, then any channel that does not meet the criteria is ignored for the purpose of other parameter calculations.	“All Channels” or “Ignore Bad/Missing Chans”	“Ignore Bad/Missing Chans”
Valid Channel Max Loss	See Valid Channel Definition: if the minimum loss of a channel is higher than this value, it is ignored	Numeric-float (dB) 0.5<=n<=40	10 dB
Channel Order	When calculating the parameters, use either the order of channels in the Device Connection setup, or use the apparent channel order based on the measured channel centers. Note that measured order eliminates the need to make sure the right fiber os on the right channel, but it makes it impossible to identify an improperly marked fiber	“Specified Order” or “Measured Order”	“Measured Order”
Auto Dark Cal*	Determines whether a dark calibration is performed immediately prior to a measurement set being taken. This is only available if the Auto Dark Cal option is installed	“Auto” or “Off”	“Auto” if installed, “Off” if not

## Derived Parameter Definitions

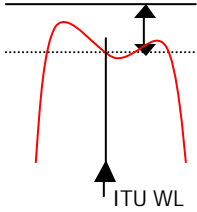
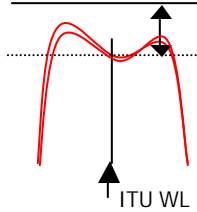
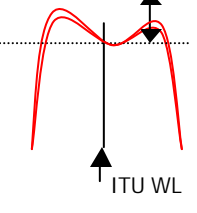
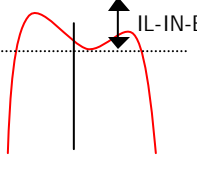
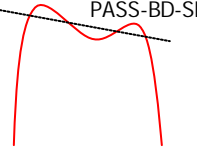
Note that all the parameters labelled PDL are only available if the PDL option is installed, and if the channels specified for the device have PDL turned on. Similarly, the ORL parameters are only available if the ORL option is installed, and the ORL function is turned on in Apps-ORL.

### SETUP PARAMETERS

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
CHAN-CTR-ITU	<b>Channel Centers: ITU</b>	? center = 1st chan ?] + [#of chans]*[Chan spacing]; math done in THz, GHz		On	Each channel center in THz and nm
PASS-WIDTH	<b>Pass-band Width (GHz)</b>	Input by User		On	None

*(Continued on next page)*

## INSERTION LOSS PARAMETERS

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
IL@ITU	<b>Insertion Loss @ ITU Centers (max, dB)</b>	Maximum value of insertion loss measurement closest to each channel center of all channels		Off	IL@ITU
IL@ITU-PSAVG	<b>Insertion Loss @ ITU Centers, Polarization Averaged (max, dB)</b>	Maximum value of insertion loss measurement closest to each channel center of all channels, measured at all polarization states and averaged		Off	IL@ITU-PSAVG
IL@ITU-PSMAX	<b>Insertion Loss @ ITU Centers, Polarization Maximized (max, dB)</b>	Maximum value of insertion loss measurement closest to each channel center of all channels, measured at the worst case polarization state		Off	IL@ITU-PSMAX
IL-IN-BND	<b>Insertion Loss in Band (max, dB)</b>	Maximum value of insertion loss for all measurements within channel center +/- 1/2 pass-band width inclusive.		On	? & Max IL for each channel
PASS-BD-SLOP	<b>Pass-band slope (dB/nm)</b>	Least squares line fit of insertion loss @ ITU centers			

**INSERTION LOSS PARAMETERS (cont.)**

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
UNIF-IN-CALC-PASS	<b>Uniformity in Calculated Pass-band</b>	The maximum maximum of all channels in Calculated Pass-band minus the minimum maximum of all channels			max IL in pass-band of each channels; Max max IL, Min Max IL
RIPL-ITU-PASS	<b>Ripple in ITU pass-band</b>	Maximum value of ripple for all channels. Ripple per chan defined as max IL minus min IL of all measurements within the pass-band inclusive			Max IL, Min IL and Ripple per channel
RIPL-CALC-PASS	<b>Ripple in Calculated pass-band</b>	Maximum value of ripple for all channels. Ripple per chan defined as max IL minus min IL of all measurements within the calculated pass-band inclusive			Max IL, Min IL and Ripple per channel
UNIF-@-CNTRS	<b>Uniformity @ ITU Centers</b>	The maximum center wavelength IL minus the minimum center IL of all channels		On	? & IL of each channel
CT-ADJ-ITU	<b>Adjacent Channel Crosstalk in ITU pass-band</b>	Max value of any channel of IL of adjacent channels in ITU pass-band minus minimum value of IL in pass-band		Off	For each channel, WL, IL Adjacent power with previous and subsequent channel

**INSERTION LOSS PARAMETERS (cont.)**

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
CT-ADJ-CHAN	<b>Adjacent Channel Crosstalk in calculated pass-band</b>	Max value of any channel of IL of adjacent channels in calculated pass-band minus minimum value of IL in pass-band		On	For each channel, WL, IL Adjacent power with previous and subsequent channel
CT-Non-ADJ-ITU	<b>Non-Adjacent Channel Crosstalk in ITU pass-band</b>	Max value of any channel of IL of non adjacent channels at edge of ITU pass-band minus minimum value of IL in pass-band	Same as CT-ADJ-ITU, except for worst case of all channels not adjacent		For each channel, WL, IL non Adjacent power with previous and subsequent channel
CT-Non-ADJ-CHAN	<b>Non-Adjacent Channel Crosstalk in calculated pass-band</b>	Max value of any channel of IL of non-adjacent channels at edge of calculated pass-band minus minimum value of IL in pass-band	Same as CT-ADJ-CHAN, except for worst case of all channels not adjacent		For each channel, WL, IL non-Adjacent power with previous and subsequent channel

**WAVELENGTH ACCURACY PARAMETERS**

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
CHAN-CNTR-ERR-NM	<b>Channel Center Offset (max, nm)</b>	The maximum difference between the ITU channel ? and the center channels as computed by [calculated chan method]		On	? error for each channel
CHAN-CNTR-ERR-GHZ	<b>Channel Center Offset (max, GHz)</b>	same as CHAN-CNTR-ERR-NM	SEE ABOVE		same as CHAN-CNTR-ERR-NM
PDCW-GHZ	<b>Polarization Dependent wavelength change (max, GHz)</b>	Max difference between calculated channel centers at different polarization states (1-4)			For each channel, the center wavelength for each polarization state

## WAVELENGTH ACCURACY PARAMETERS (cont.)

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
PDCW-NM	<b>Polarization Dependent wavelength change (max, nm)</b>	Same as PDCW-GHZ	SEE ABOVE		
PDBW-GHZ	<b>Polarization Dependent Bandwidth change (max, GHz)</b>	Max difference between calculated channel bandwidth at different polarization states (1-4)	<p>Extreme Channel width at diff Pol States</p> <p>PDBW-GHZ=BW2-BW1</p>		
PDBW-NM	<b>Polarization Dependent Bandwidth change (max, nm)</b>	Same as PDBW-GHZ	SEE ABOVE		
PASS-WIDTH-05-ITU	<b>Pass-band width-0.5dB from ITU (min,GHz)</b>	Minimum WL difference between -0.5db from ITU center IL peak points on any channel			-0.5dB wavelengths and pass-band width for each channel
PASS-WIDTH-05-PK	<b>Pass-band width-0.5dB from Peak</b>	Minimum WL difference between -1db from peak IL peak points on any channel			-0.5dB wavelengths and pass-band width for each channel
PASS-WIDTH-10-ITU	<b>Pass-band width-1dB from ITU (min,GHz)</b>	Minimum WL difference between -0.5db from ITU center IL peak points on any channel	SEE ABOVE		-1 dB wavelengths and pass-band width for each channel
PASS-WIDTH-10-PK	<b>Pass-band width-1dB from Peak</b>	Minimum WL difference between -1db from peak IL peak points on any channel	SEE ABOVE		-1 dB wavelengths and pass-band width for each channel
PASS-WIDTH-30-ITU	<b>Pass-band width-3dB from ITU (min,GHz)</b>	Minimum WL difference between -3db from ITU center IL peak points on any channel	SEE ABOVE		-3dB wavelengths and pass-band width for each channel
PASS-WIDTH-30-PK	<b>Pass-band width-3dB from Peak</b>	Minimum WL difference between -3db from peak IL peak points on any channel	SEE ABOVE		-3dB wavelengths and pass-band width for each channel

## PDL PARAMETERS

Parameter Code	Default Name	Definition	Diagram	Default	Log File Output
PDL-ITU	<b>PDL @ ITU</b>	Max PDL measurement at wavelength closest to the ITU center		On if PDL on	WL and PDL measurement at each channel
PDL-CW	<b>PDL @ Center Wavelength</b>	Max PDL measurement at wavelength closest to the calculated center wavelength			WL and PDL at each channel
PDL-ITU-Pass	<b>PDL in ITU pass-band (dB)</b>	Maximum PDL measurement of any channel in the pass-band of ITU +/- 1/2 of pass-band			Max PDL measurement of each channel, and WL of max PDL measurement for each channel
PDL-CHAN-PASS0.5	<b>PDL in Calculated Channel Pass-band (-0.5dB, MAX)</b>	Maximum PDL measurement of any channel in the calculated - 0.5 dB pass-band			Max PDL measurement of each channel, and WL of max PDL measurement for each channel
PDL-CHAN-PASS5-1	<b>PDL in Calculated Channel Pass-band (-1dB, MAX)</b>	Maximum PDL measurement of any channel in the calculated - 0.5 dB pass-band			Max PDL measurement of each channel, and WL of max PDL measurement for each channel

© 2001, 2002, 2003 dBm Optics, Inc.



dBm Optics, Inc.  
 300 South Public Road  
 Lafayette, CO 80026  
 303-464-1919  
[www.dbmoptics.com](http://www.dbmoptics.com)