

#### Product Overview

AA proposes a novel generation of fiber-coupled phase shifter in combination with the adapted MPDS driver. This tandem provides a new way of optical phase control by means of RF phase-shifted signals. This is called Direct Phase Shifting, for e.g. the optical phase is directly controlled by the relative phase shift of the RF signals.

These products allow precise optical phase control with unparallel accuracy and can be used for wavelength in the visible and the infra-red spectral range.

#### Features

- High precision phase control.
- Achromatic phase control.
- High thermal stability.
- No need for calibration.
- Fast intensity modulation.



MPDS1C2X with  
Phase control



AO PHASE SHIFTER

#### Applications

- Coherent beam combining.
- Phase noise reduction.
- Quantum technology systems.
- Interferometry based systems.
- Phase array optics.

#### DUAL INPUTS FIBER PIGTAILES AO PHASE SHIFTER

Parameters	Units	Min	Nom	Max
Material			TeO2 [L]	
*Optical Wavelength range ( $\lambda$ )	nm		670 780 1550	
Frequency shift			none	
*RF inputs	MHz		200 @ 670& 780 nm 110 @ 1550 nm	
Phase Shift range / resolution	°		360 / 0.022 (14 bits)	
Insertion losses (IL)	dB			4 @670&780 nm 5 @1550 nm
Input / Output Polarization			Linear (PM fibers)	
Rise/Fall time	ns			30
Analog Amplitude modulation bandwidth (F <sub>-3 dB</sub> )	MHz			16
Static Extinction Ratio	dB	45		
Optical power CW	W			0.5
Jacket type			900 $\mu$ m Hytrel tubing	
Fiber type			PM	
Fiber connectors			FC/APC	
Pigtailed length IN/OUT	m		1	
Input impedance	$\Omega$		50	
V.S.W.R			1.2/1	
RF Power (P) for both RF input 1&2	W			2
2 x RF Connector			SMA	
Footprint	mm <sup>3</sup>		83 x 45 x 32	
Weight	g		300	

\* other specifications on request



# MT110X2 /MT200X2 + MPDS1C2X

AO FIBER PIGTAILED PHASE SHIFTER  
MPDS1C2X PHASE CONTROL

## PRELIMINARY

*The MPDS1C2X is a dual outputs driver based on DDS (Direct Digital Synthesizers) which offers high accuracy and stability. Each DDS operates with a common clock reference with an additional feature to tune the phase between the two outputs with a nom resolution of 0.022 °. The frequency/RF power/Phase can be adjusted through USB/RS232 communication. External control signals allow user for fast AM control of the outputs. These drivers are embedded with the necessary amplifier to driver the aforementioned AO Phase Shifters*

### DUAL OUTPUTS MPDS1C2X, PHASE CONTROLLABLE

Parameter	Units	
Number of outputs		2
Reference clock		Internal Common Reference
Frequency range	MHz	Adapted to AO device
Frequency Stability	ppm/°C	Nom +/- 1
Phase range	°	Nom 360
Phase resolution – 14 bits	°	Nom 0.022 (14 bits)
Phase/Frequency/Amplitude adjustments		USB/RS232
Output RF Power (@1dB compression)	W	Adapted to AO device
Power Supply OEM version	VDC	24
External Modulation Input Controls (AM)	V	Analog 0-5/10kΩ (1 control per output)
External Blanking input Control (AM)	V	Digital TTL/1 KΩ (1 control per output)
Rise Time/Fall time (10-90%) < 4 watts	ns	<10 @100MHz
Output Impedance	Ω	50
VSWR		< 1.5/1
Extinction Ratio	dB	>45
Input / Output Connectors		DB15, USB / SMA
Size / Weight	mm <sup>3</sup>	83x120x27.7 (1MODD20005)
Heat Exchange		Conduction through baseplate for OEM versions
Operating Temperature	°C	10 to 40 (max Tcase 50°C)
Storage Temperature	°C	-40 to +70 Non condensing