

# MCQ40-A1.5-L1064-Z32

AO MODULATOR/SHIFTER

## Product Overview

These modulators are made of Quartz and due to their hard coating with low reflectivity, they have got a high damage threshold. They are designed for short cavities with an optical length of 32 mm and their fast rise time makes them a fast modulator for high power applications.

Additionally, they can be used as frequency shifter at +/- 40 MHz.

## Features

- 1.06  $\mu\text{m}$  design
- Linear polarization
- Air Cooled
- High Damage threshold



Access to your operating manual

## Technical Specifications

Parameter	Specification
Material-Acoustic mode-Velocity	Crystal QUARTZ - 5740 m/s
Optical Wavelength range	1030-1080 nm
Transmission	>99% with hard V-coating
Input / Output Polarization	Linear perpendicular to baseplate
Active Aperture	1.5 x 1.5 mm <sup>2</sup>
Carrier Frequency / Frequency shift	+/- 40.68 MHz (other on request)
Operating mode	Bragg
Separation Angle (0-1)	7.54 mrd @ 1064 nm
Rise / Fall time	115 ns / mm
Diffraction Efficiency	>80%, Nom 85 % with TEM00 laser beam, M <sup>2</sup> ≤ 1.1
Analog Amplitude modulation bandwidth (-3 dB)	4.2 MHz @ 1 mm beam diameter
Max optical power density	> 500 MW/cm <sup>2</sup>
Input impedance	Nom 50 $\Omega$
V.S.W.R.	Nom < 1.2:1
RF Power / Connector	nom 15 W / SMA
Optical length	32 mm
Heat Exchange	Conduction through baseplate
Size / Weight	(LxHxh) 33 x 36.5 x 25.8 mm <sup>3</sup> / 30g IN PRO 181
Operating Temperature	+10 to +40 Non condensing
Storage Temperature	-40 to +50 Non condensing

## On request

Carrier frequency                      Aperture

Rise Time ( $T_r$ ) is beam diameter ( $\Phi$ ) sensitive:

$$T_r = 0.66 \frac{\Phi}{V}$$

Amplitude modulation bandwidth ( $F_{-3dB}$ ) is rise time ( $T_r$ ) sensitive:

$$F_{-3dB} = \frac{0.48}{T_r}$$

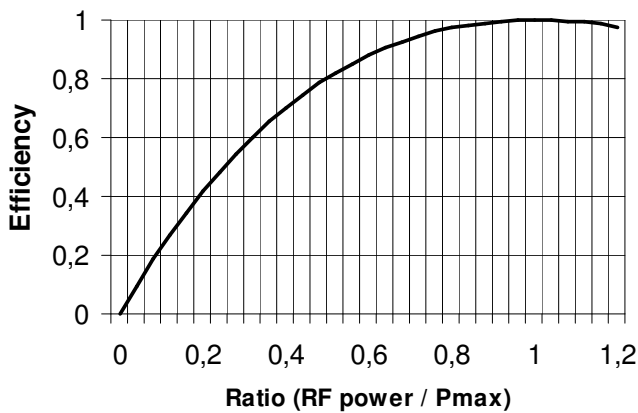
Separation angle ( $\Delta\theta$ ) is wavelength ( $\lambda$ ) sensitive:

$$\Delta\theta = \frac{\lambda F}{V}$$

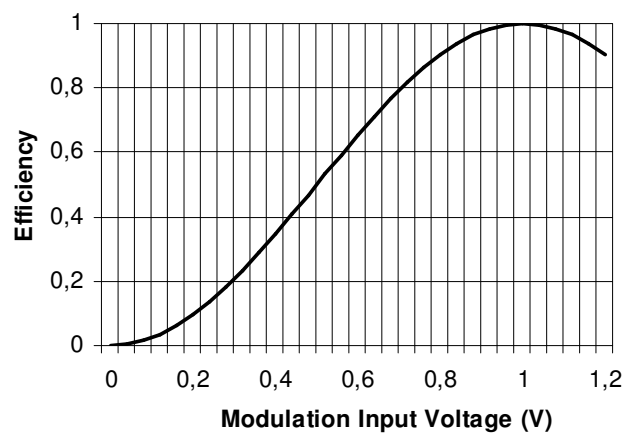
RF power ( $P$ ) is wavelength ( $\lambda$ ) sensitive:

$$\frac{P_1}{P_2} = \frac{\lambda_1^2}{\lambda_2^2}$$

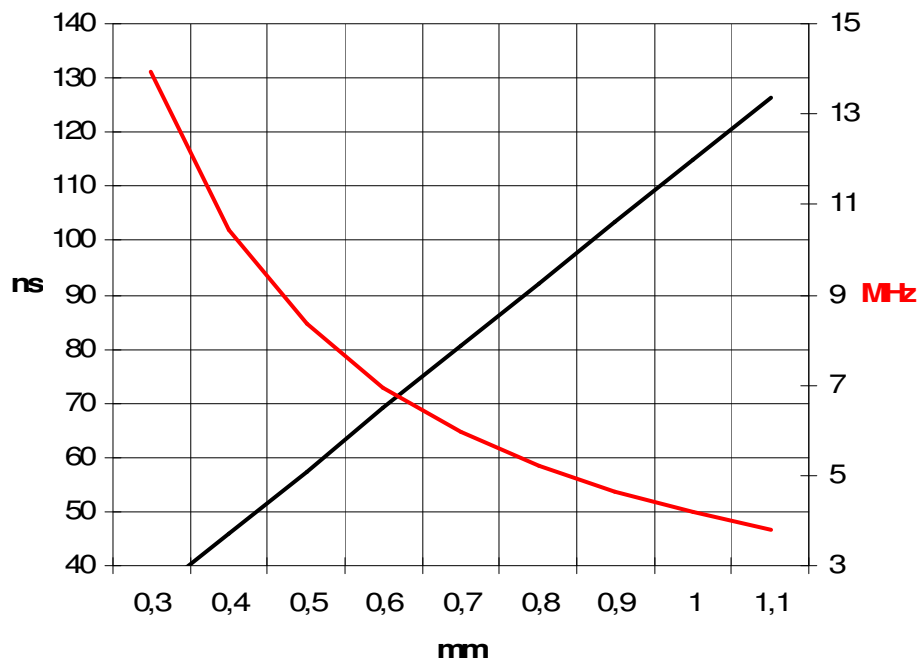
Relative Efficiency versus RF power



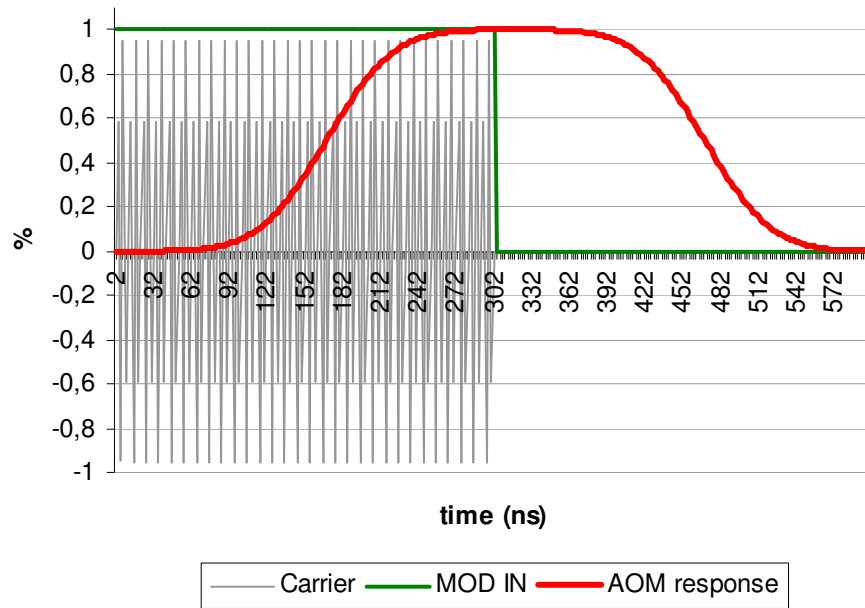
AO relative Efficiency vs driver MOD IN



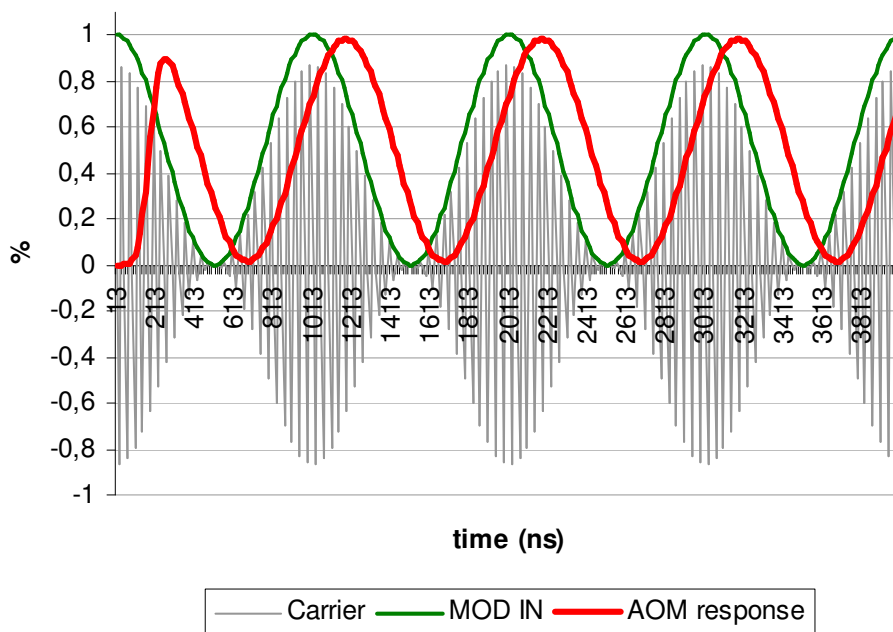
Rise Time (black) / Analog Modulation BW (-3dB) vs Beam diameter

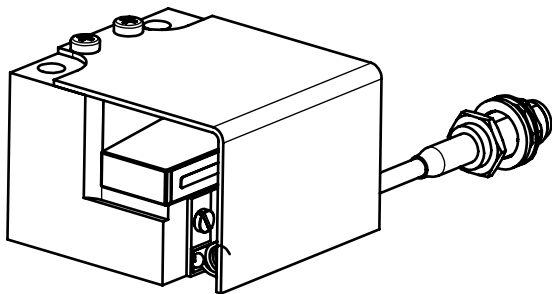
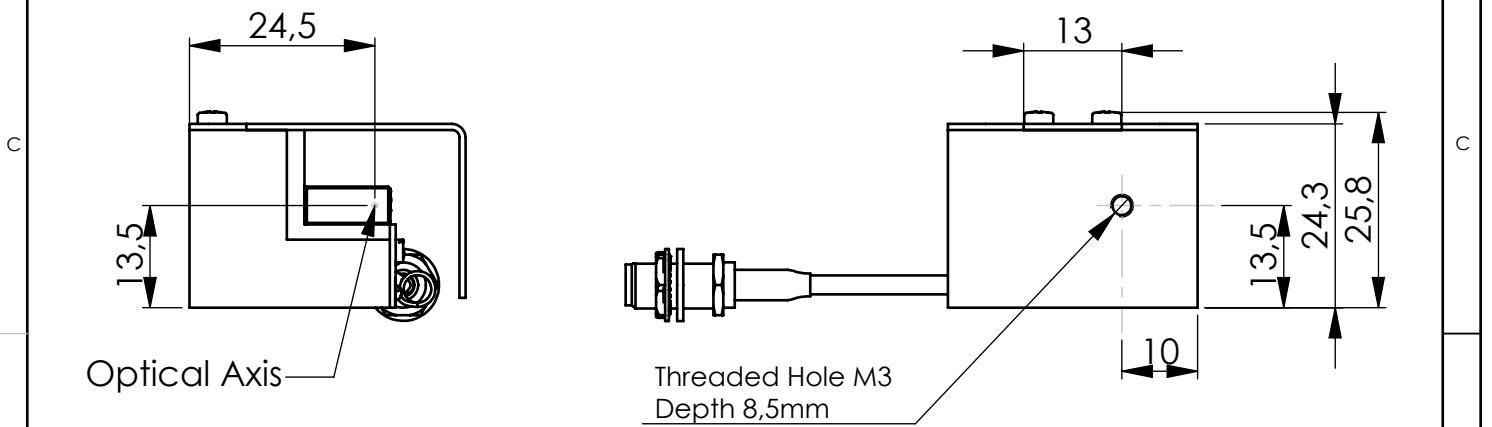
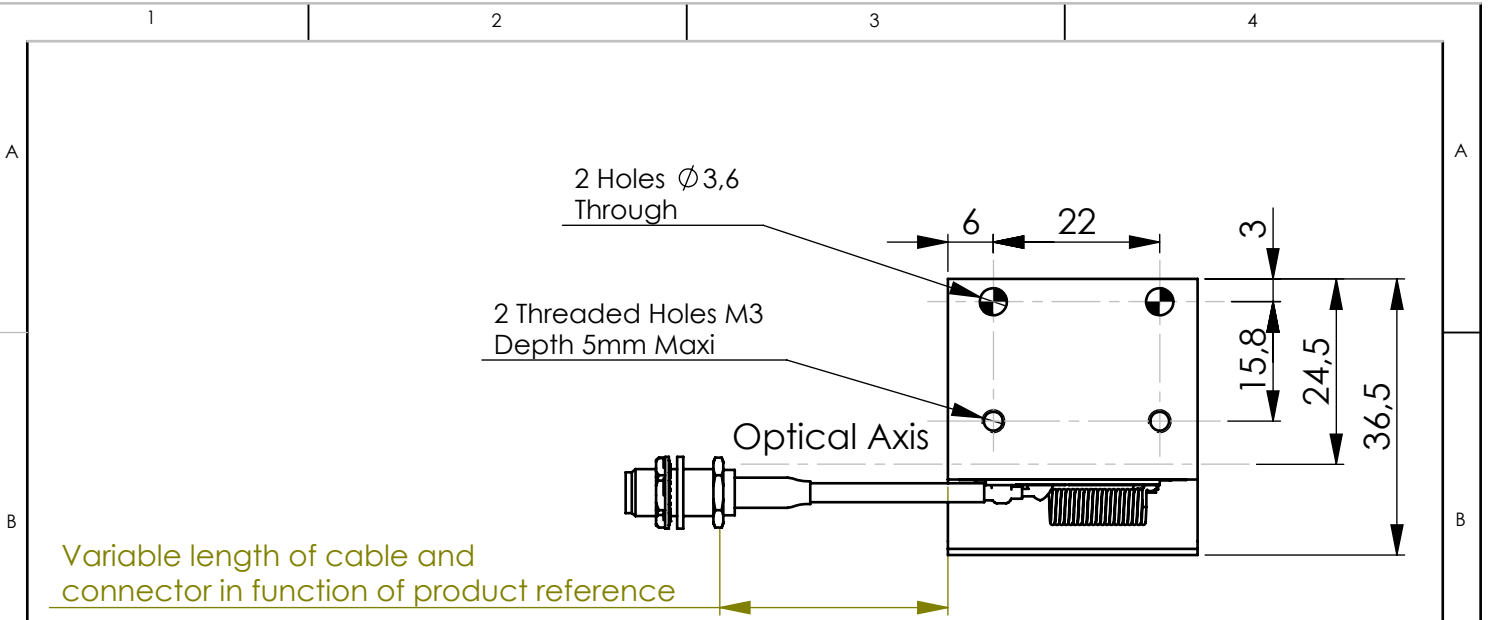


### Relative Efficiency / AOM temporal response



### Relative Efficiency / AOM temporal response (1MHz)





Product reference + "-Cxx" + Connector  
 \*"-Cxx" = length of cable in cm  
 ex : "-C35" = Cable 35cm  
 \*Rf connector:  
 "Sa" = SMA Bulkhead Crimp  
 "Sap" = SMA Straight Plug  
 "Sc" = SMC  
 "Scc" = SMC Angle Plug  
 "Bc" = BNC  
 ex: QCQ...-C6Sa = QCQ with 6cm cable and SMA connector.

The cap can be removed

C	24/01/11	G.M	Modification forme capot.
B	13/10/09	E.V	Modification référence cable
A	19/07/07	E.D	Plan initial / Initial Drawing

Indice Index	Date	Auteur Author	Modifications
Conception Design	E.D	<b>PLAN D'INTERFACE / OUTLINE DRAWING</b>  Référence / Reference  <b>IN-PRO-181</b>	
Vérification Checking	L.F		
Tolérance Tolerance	ISO 2768mK		
Echelle Scale	1:1		

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