



QUANTUM TECHNOLOGY, INC.

108 Commerce St., Suite 101, Lake Mary, Florida, 32746-6212, USA
FAX 407-333-9352 PHONE 407-333-9348 TOLL FREE 877-913 4904
EMAIL: staff@QuantumTech.com WEB: www.QuantumTech.com

SERIES 10 HIGH SPEED IR EO MODULATORS

DATA SHEET 741-1

HIGH SPEED IR MODULATORS MODEL SERIES 10

QUANTUM TECHNOLOGY designs and manufactures a wide variety of E-O modulation systems for modulating laser beams with the highest degree of efficiency. These systems are available with full accessories. These include wideband E-O driver electronics, auto-bias controls, feedback networks, polarizing optics and modulators with bandwidths up to 1000 MHz. These systems offer the widest selection of integrated drivers and E-O modulators for optical bandwidths from UV (Crystal BBO down to 200 nm) through to the mid IR (4500 nm). BBO is an excellent crystal for use in the UV, KD*P in the visible (300 nm to 1100 nm) and Lithium Tantalate (LTA) in the mid IR region (600 nm to 4500 nm). These LTA modulators are transverse devices in which the electrodes are applied along Z direction and beam passes along Y direction of the crystal. Quantum Technology designs and manufactures custom modulation systems with BBO modulators in the UV or special band widths DC to 100 MHz or 1 MHz to 1000 MHz. CW power density should be limited to 200 W/cm² at 1064 nm and about 0.1 W/cm² at 633 nm for 0.8 mm beam (LTA crystals).



Figure 1: Models 12, 13, 14 and 15 series Modulators

Modulators of the transverse type require E-O crystals of good optical transmission, excellent dielectric properties, low strain, availability of large sizes, and ultimately, a low drive power. These qualifications are met by these three E-O materials. Performance parameters for these modulators are listed in the table below. Please refer to the data sheets on Pockels cells and Modulators: 718, 719, 720, 722, 729, 738 and 752. Please also refer to data sheet 724, 725 and 747 on modulator drivers for desired bandwidths from DC to 100 MHz.

LTA HIGH SPEED MODULATOR SPECIFICATIONS

Modulator Type	Amplitude Modulator						Phase Modulator	
Modulator Model	10	11	12	13	14	15	10P-3-40	10P-3-80
Crystal Material	LTA - Lithium Tantalate						Mg-O LiNbO3	
Transmission (%)	85	85	85	85	85	85	>90	>90
Half-wave Voltage @633nm	72	110	58	116	79	158	210	105
@1064nm	121	186	98	195	133	266	353	177
Aperture (mm)	1	1	3.2	3.2	4.5	4.5	3	3
Capacitance	N/A	N/A	80 pF	40 pF	84 pF	42 pF	22	44
Impedances Available	N/A	N/A	100 ohm	100 ohm	100 ohm	N/A	N/A*	N/A*
	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	N/A	N/A	N/A
Differential Propagation Delay	0.4 ns	0.26 ns	3.8 ns	1.9 ns	4.0 ns	N/A	N/A	N/A
Bandwidth (DC to)	500 MHz	1 GHz	60 MHz	100 MHz	70 MHz	100 MHz	50 MHz	25 MHz
Phase Sensitivity - mrad/V @633 nm	44	29	56	28	30	15	15	30

Contrast Ratio Typical	100:1 @ 800 nm	N/A	N/A
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* Fitted with single 50 ohm SMA connector



Figure 2: Models 10, 11 and 10P series Modulators

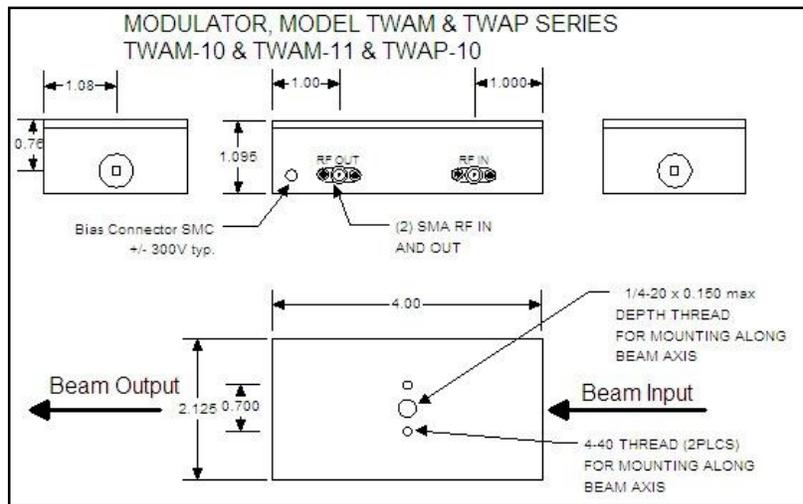


Figure 3: Models 10, 11 and 10P series Modulators.