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Acousto Optical Deflectors

An AO Deflector is a device that will scan an optical beam over a range of angles or accurately control the output angle of the beam. By altering the RF drive frequency to the Deflector, the deflection angle, i.e. the angle through which the diffracted beam is deviated, can be varied.

Effective AO Deflector design is complex, and involves choices of acousto-optic materials and the appropriate acoustic-mode depending upon the application. Commonly, resolution is the most important parameter for a deflector. However, high resolution generally comes at the expense of other parameters such as access time and efficiency. Thus it is important to effectively trade off the various performance requirements.

Gooch & Housego's strong team of scientists and engineers are available to assist you in selecting one of our standard products or providing a custom solution.

Typical applications include; Photolithography, laser tweezers, optical scanning, optical inspection and digital imaging.

	Model	Brief Description	Recommended Driver
1.	45035-3-6.5DEG-1.06	TeO2, 1064nm wavelength, 25-45MHz, 3mm aperture, 32mrad deflection, 90 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 64025-45-2ASVCO-1 64025-45-2AMVCO
2.	45035-3-6.5DEG-1.06-XY	TeO2, 1064nm, 25-45MHz, 3mm aperture, 32mrad deflection, 90 spots resolution, 2W RF	64020-200-2ADSDFS-A-2 64020-200-2ADMDFS-A (2X) 64025-45-2ASVCO-2 64025-45-2AMVCO (2X)
3.	45035-5-6.5DEG-1.06	TeO2, 1064nm, 25-45MHz, 5mm aperture, 56mrad deflection, 150 spots resolution, 4W RF	64020-200-4ADSDFS-A 64020-200-4ADMDFS-A 64025-45-4ASVCO-1 64025-45-4AMVCO
4.	45035-5-6.5DEG-1.06-XY	TeO2, 1064nm, 25-45MHz, 5mm aperture, 56mrad deflection, 150 spots resolution, 4W RF	64020-200-4ADSDFS-A-2 64020-200-4ADMDFS-A (x2) 64025-45-4ASVCO-2 64025-45-4AMVCO (x2)
5.	45050-5-6.5DEG-.8	TeO2, 780-850nm, 35-65MHz, 5mm aperture, 65mrad deflection, 225 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21035-65-2ASVCO-1 21035-65-2AMVCO
6.	45050-5-6.5DEG-.8-XY	TeO2, 780-850nm, 35-65MHz, 5mm aperture, 65mrad deflection, 225 spots resolution, 2W RF	64020-200-2ADSDFS-A-2 64020-200-2ADMDFS-A (x2) 21035-65-2ASVCO-2 21035-65-2AMVCO (x2)
7.	45050-6-.83	TeO2, 780-850nm, 35-65MHz, 6mm aperture, 68mrad deflection, 291 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 64035-65-2ASVCO-1 64035-65-2AMVCO
8.	45070-5-6.5DEG-.63-XY	TeO2, 633nm, 50-90MHz, 5mm aperture, 67mrad deflection, 300 spots resolution, 2W RF	64020-200-2ADSDFS-A-2 64020-200-2ADMDFS-A (2x) 64050-90-2ASVCO-2 64050-90-2AMVCO (2x)
9.	45070-6	TeO2, 633-850nm, 50-90MHz, 6mm aperture, 72mrad deflection, 388 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 64050-90-2ASVCO-1 64040-90-2AMVCO

10.	45100-5-6.5DEG-.51	TeO2, 440-530nm, 75-125MHz, 5mm aperture, 78mrad deflection, 375 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 64075-125-2ASVCO-1 64075-125-2AMVCO
11.	45100-5-6.5DEG-.51-XY	TeO2, 440-530nm, 75-125MHz, 5mm aperture, 78mrad deflection, 375 spots resolution, 2W RF	64020-200-2ADSDFS-A-2 64020-200-2ADMDFS-A (X2) 64075-125-2ASVCO-2 64075-125-2AMVCO (x2)
12.	45100-6	TeO2, 440-530nm, 75-125MHz, 6mm aperture, 87mrad deflection, 485 spots resolution, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 64075-125-2ASVCO-1 64075-125-2AMVCO
13.	46080-1-1.06-LTD	TeO2, 1064nm, 70-90MHz, 1mm aperture, 20mrad deflection, 1.5W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21065-95-2ASVCO 21065-95-2AMVCO
14.	46080-1-.85-LTD	TeO2, 700-1100nm, 70-90MHz, 1mm aperture, 16mrad deflection, 1W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21065-95-1ASVCO 21065-95-1AMVCO
15.	46080-1-LTD	TeO2, 450-800nm, 60-100MHz, 1x4mm aperture, 14.6mrad deflection, 1W RF	64020-200-1ADSDFS-A 64020-200-1ADMDFS-A 21060-100-1ASVCO 21060-100-1AMVCO
16.	46080-2-1.06-LTD	TeO2, 1064nm, 70-90MHz, 2mm aperture, 20mrad deflection, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21065-95-2ASVCO 21065-95-2AMVCO
17.	46080-2-.85-LTD	TeO2, 700-1100nm, 65-95MHz, 2mm aperture, 16mrad deflection, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21065-95-1ASVCO 21065-95-1AMVCO
18.	46080-2-LTD	TeO2, 450-800nm, 60-100MHz, 2mm aperture, 14.6mrad deflection, 1.25W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21060-100-2ASVCO 21060-100-2AMVCO
19.	46080-3-.85-LTD	TeO2, 700-1100nm, 65-95MHz, 3mm aperture, 16mrad deflection, 2W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21065-95-2ASVCO 21065-95-2AMVCO
20.	46080-3-LTD	TeO2, 450-800nm, 60-100MHz, 3x4mm aperture, 14.6mrad deflection, 1.5W RF	64020-200-2ADSDFS-A 64020-200-2ADMDFS-A 21060-100-2ASVCO 21060-100-2AMVCO
21.	46300-0.2/2-.36	Fused silica, 360nm, 225-375MHz, 0.2x2mm aperture, 18mrad deflection, 50 spots resolution, 3W RF	64200-380-5ASVCO 64200-380-5AMVCO
22.	451000-GaP	GaP, 800-850nm, 750-1250MHz, 0.15x2mm aperture, 124mrad deflection, 0.25W RF	
23.	451000L	LiNbO3, 820nm, 750-1250MHz, 0.1x2.6mm aperture, 200 spots resolution, 124mrad deflection, 0.5mW RF	
24.	451500G	GaP, 820nm, 1500MHz, 0.07x1.33mm aperture, 112 spots resolution, 184mrad deflection, 100mW RF	
25.	D225-1B-OI1	Lead Molybdate, 488nm, 150-300MHz, 0.5mm x 28mm aperture, 1160 spots resolution, 20mrad deflection, 1.5W RF	

Drivers for the Standard AO Deflection Systems / 1D and 2 D

Select the driver, which corresponds to the required frequency and RF drive power for the AO Deflector or Bragg Cell selected. Then select the method of control: VCO (Voltage Controlled Oscillator) or DFS (Digital frequency Synthesizer) and the type of package (Rack Mount System Box or OEM Module). The system box typically require power of 100 to 240 Volts, 47 to 63 Hz AC. The OEM module requires you to supply DC power, + 15 Volts, and -5 Volts typically, at the required current to power the unit.

The new 64040-150-0.8ADSDFS-8X1 is an eight channel, frequency synthesized driver with the signals combined as one output for use with an Acousto-Optic Beam Deflector (AOBD). The Driver allows independent analog and digital (blanking) control of up to eight beams of light. The frequency and power for each channel can be selected from presets stored in internal memory or setup through the top panel keypad, the RS-232, or the USB. Internal memory contains a factory default setup and up to 16 user stored configurations.

45035-3-6.5DEG-1.06

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	1064 nm
Window Configuration	AR Coated
Static Transmission	> 97 %
Operating Frequency	25 to 45 MHz
Intensity Variation	< 2 dB
Diffraction Efficiency	> 65 % Midband with Linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	3 mm
Process Time	4.5 µs
Resolution (T.BW product)	90 spots with no less than 50 µs scan time and full illumination of the aperture
Δ Deflection Angle	32 mrad
Deflection Angle	56 mrad @ 35 MHz
RF Power Level	2 watts
Impedance	50 ohms
VSWR	< 2:1 across band
Package	53B2024
Recommended Drivers	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 64025-45-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 64025-45-2AMVCO

45035-3-6.5DEG-1.06-XY

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	1064 nm
Window Configuration	AR Coated
Static Transmission	> 97 %
Operating Frequency	25 to 45 MHz
Intensity Variation	< 2 dB
Diffraction Efficiency	> 65 % mid-band per device with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	3 mm
Process Time	4.5 µs
Resolution (T.BW product)	90 spots with no less than 50 µs scan time and full illumination of the aperture
Δ Deflection Angle	32 mrad
Deflection Angle	56 mrad @ 35 MHz
RF Power Level	< 2 watts
Impedance	50 ohms
VSWR	< 2:1 across band
Package 72003	53D1970
Recommended Drivers	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A-2

	Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A (2X) Analog System Voltage Controlled Oscillator: 64025-45-2ASVCO-2 Analog Module Voltage Controlled Oscillator: 64025-45-2AMVCO (2X)

45035-5-6.5DEG-1.06

Interactive Material	TeO2
Acoustic Mode	Shear wave
Operating Wavelength	1064 nm
Window Configuration	AR Coated
Static Transmission	> 97 %
Operating Frequency	25-45 MHz
Intensity Variation	< 2 dB
Diffraction Efficiency	> 60 % Midband with linear polarization, parallel to acoustic propagation
Active Aperture	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	150 spots with no less than 60 µs scan time and full illumination of the aperture
Δ Deflection Angle	32 mrad (25 - 45 MHz)
Deflection angle	56 mrad @ 35 MHz
RF power level	4 watts
Impedance	50 ohms nominal
VSWR	< 2:1 across band
Package	53B2024
Recommended Drivers	Analog System Digital Frequency Synthesizer: 64020-200-4ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-4ADMDFS-A Analog System Voltage Controlled Oscillator: 64025-45-4ASVCO-1 Analog Module Voltage Controlled Oscillator: 64025-45-4AMVCO

45035-5-6.5DEG-1.06-XY

Interaction Material	TeO2
Acoustic Mode	Shear
Operating Wavelength	1064 nm
Window Configuration	AR Coated
Static Transmission	> 98%
Operating Frequency	25-45 MHz
Intensity Variation	2 dB
Diffraction Efficiency	≥ 65 % mid-band per device with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	150 spots with no less than 60µs scan time and full illumination of the aperture
Acoustic Velocity	66 mm / µs
Δ Deflection Angle	32 mrad
Deflection Angle	56 mrad @ 35 MHz
RF Power Level	4 watt max
Impedance	50 ohms
VSWR	< 2:1
Package	53D1970
Recommended Drivers	Analog synthesized driver system: 64020-200-4ADSDFS-A-2 Analog synthesized driver modules: 64020-200-4ADMDFS-A (x2) Analog System Voltage Controlled Oscillator: 64025-45-4ASVCO-2 Analog Module Voltage Controlled Oscillator: 64025-45-4AMVCO (x2)

45050-5-6.5DEG-.8

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	780 to 850 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	35 to 65 MHz.

Intensity Variation	2 dB
Diffraction Efficiency	> 70 % Midband with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	5mm
Process Time	7.5 µs
Resolution (T.BW product)	225 spots with no less than 60 µs scan time and full illumination of the aperture
Δ Deflection Angle	39 mrad @ 850 nm
Deflection Angle	65 mrad @ 50MHz, 850 nm
RF Power Level	2 watts maximum
Impedance	50 ohms
VSWR	< 2:1 across band
Package	53B2024
Recommended Driver	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21035-65-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 21035-65-2AMVCO

45050-5-6.5DEG-.8-XY

Interactive Material	TeO2
Acoustic Mode	Shear
Operating Wavelength	780 to 850 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	35 to 65 MHz.
Intensity Variation	2 dB
Diffraction Efficiency	> 70 % mid-band per device with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	225 spots with no less than 60 µs scan time and full illumination of the aperture
Acoustic Velocity	0.66 mm/µs
Δ Deflection Angle	39 mrad @ 850 nm
Deflection Angle	5 mrad @ 50 MHz, 850 nm
RF Power Level	2 watts max
Impedance	50 ohms
VSWR	< 2:1
Package	53D1970
Recommended Drivers	Analog synthesized driver system: 64020-200-2ADSDFS-A-2 Analog synthesized driver modules: 64020-200-2ADMDFS-A (x2) Analog System Voltage Controlled Oscillator: 21035-65-2ASVCO-2 Analog Module Voltage Controlled Oscillator: 21035-65-2AMVCO (x2)

45050-6-.83

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	780 to 850 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	35 to 65 MHz.
Diffraction Efficiency	> 60 % Midband with polarization circular or linear
Intensity Variation	< 2.5 dB
Acoustic Aperture Size	6 mm
Processing Time	9.7 µs
Resolution (T.BW. product)	291 spots with no less than 70 µs scan time and full illumination of the aperture
Δ Deflection Angle	41 mrad @ 850 nm
Deflection Angle	68 mrad @ 50MHz, 850 nm
RF Power Level	2 watts
Impedance	50 ohms
VSWR	<2.5:1 Across Bandwidth

Package:	53B2024
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 64035-65-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 64035-65-2AMVCO

45070-5-6.5DEG-.63-XY

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	633 nm
Window Configuration	AR Coated
Static Transmission	> 98 %
Operating Frequency	50 to 90 MHz.
Intensity Variation	2 dB
Diffraction Efficiency	> 55 % Midband per Device with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	300 spots with no less than 60 µs scan time and full illumination of the aperture
Δ Deflection Angle	38 mrad @ 633 nm
Deflection Angle	67 mrad @ 633 nm
RF Power Level	2 watt maximum per Device
Impedance	50 ohms
VSWR	< 2:1 across band
Package:	53B2024
Recommended Driver:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A-2 Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A (2x) Analog System Voltage Controlled Oscillator: 64050-90-2ASVCO-2 Analog Module Voltage Controlled Oscillator: 64050-90-2AMVCO (2x)

45070-6

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	633 to 850 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	50 to 90 MHz
Diffraction Efficiency	> 60 % Midband with polarization circular or linear
Intensity Variation	< 2.5 dB
Acoustic Aperture Size	6 mm
Processing Time	9.7 µs
Resolution (T.BW. product)	388 spots with no less than 70 µs scan time and full illumination of the aperture
Deflection Angle	72 mrad @ 633 nm
Δ Deflection Angle	41 mrad @ 633 nm
RF Power Level	2 watts
Impedance	50 ohms
VSWR	< 2.5:1 Across Bandwidth
Package:	53B2024
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 64050-90-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 64040-90-2AMVCO

45100-5-6.5DEG-.51

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	440 to 530 nm
Window Configuration	AR Coated

Static Transmission	> 95 %
Operating Frequency	75 to 125 MHz.
Intensity Variation	2 dB
Diffraction Efficiency	> 70 % Midband with linear polarization, parallel to acoustic propagation
Acoustic Aperture Size	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	375 spots with no less than 60 µs scan time and full illumination of the aperture
Δ Deflection Angle	39 mrad @ 514 nm
Deflection Angle	78 mrad @ 100 MHz, 514 nm
RF Power Level	2 watt maximum
Impedance	50 ohms
VSWR	< 2:1 across band
Package:	53B2024
Recommended Driver:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 64075-125-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 64075-125-2AMVCO

45100-5-6.5DEG-.51-XY

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	440 to 530 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	75 to 125 MHz.
Intensity Variation	2 dB
Diffraction Efficiency	>70 % Midband per Device
Light Polarization	Linear, parallel to acoustic propagation
Acoustic Aperture Size	5 mm
Process Time	7.5 µs
Resolution (T.BW product)	375 spots with no less than 60 µs scan time and full illumination of the aperture
Δ Deflection Angle	39 mrad @ 514 nm
Deflection Angle	78 mrad @ 100 MHz, 514 nm
RF Power Level	2 watt maximum per Device
Impedance	50 ohms
VSWR	< 2:1 across band
Package:	53D1970
Recommended Driver:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A-2 Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A (X2) Analog System Voltage Controlled Oscillator: 64075-125-2ASVCO-2 Analog Module Voltage Controlled Oscillator: 64075-125-2AMVCO (x2)

45100-6

Interactive Material	TeO2
Acoustic Mode	Shear Wave
Operating Wavelength	440 to 530 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	75 to 125 MHz
Intensity Variation	3 dB
Diffraction Efficiency	> 60 % Midband with polarization circular or linear
Acoustic Aperture Size	6 mm
Processing Time	9.7 µs
Resolution (T.BW. product)	485 spots with no less than 70 µs scan time and full illumination of the aperture
Deflection Angle	87 mrad @ 530 nm, @ 100 MHz
Δ Deflection Angle	41 mrad @ 530 nm
RF Power Leve	2 watts

Impedance	50 ohms
VSWR	< 2.5:1 Across Bandwidth
Package:	53B2024
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 64075-125-2ASVCO-1 Analog Module Voltage Controlled Oscillator: 64075-125-2AMVCO

46080-1-1.06-LTD

Interaction Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	1.06 µm
Window Configuration	AR coated
Static Transmission	>97%
Operating Frequency	70-90 MHz
Intensity Variation	< 2.5 dB across bandwidth
Diffraction Efficiency (midband)	> 75 % midband with linear polarization, perpendicular to acoustic propagation, > 70 % midband with random polarization.
Acoustic Aperture Size	1.0 mm
Rise Time	150 nsec/mm beam diameter
Δ Deflection Angle	7.5 mrad
Deflection Angle	20 mrad @ 80 MHz
RF Power Level	< 1.5 watts
Impedance	50 ohms nominal
VSWR	< 1.5:1 across bandwidth
Package	53B0624 T01
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21065-95-2ASVCO Analog Module Voltage Controlled Oscillator: 21065-95-2AMVCO

46080-1-.85-LTD

Interactive Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	700 to 1100 nm
Window Configuration	AR Coated
Static Transmission	>95 %
Operating Frequency	65–95 MHz
Intensity Variation	< 1.5 dB @ 780 nm
Diffraction Efficiency (midband)	> 70 % midband with linear polarization, perpendicular to acoustic propagation, > 65 % midband with random polarization.
Acoustic Aperture Size	1 mm
Rise Time	150 nsec/mm beam dia.
Δ Deflection Angle	4 mrad @
Deflection Angle	16 mrad @ 80 MHz and 850 nm
RF Power Level	< 1 watt @ 850 nm
Impedance	50 ohms nominal
VSWR	< 1.5:1 over bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21065-95-1ASVCO Analog Module Voltage Controlled Oscillator: 21065-95-1AMVCO

46080-1-LTD

Interaction Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	450-800 nm
Window Configuration	AR coated
Static Transmission	>95 %
Operating Frequency	60-100 MHz

Intensity Variation	< 2 dB
Diffraction Efficiency	>80 % midband with linear polarized light perpendicular to acoustic propagation or with random polarized light
Acoustic Aperture Size	1 x 4mm
Rise Time	150 ns / mm beam dia.
Δ Deflection Angle	7.3 mrad @ 780 nm; 4.5 mrad @ 488 nm
Deflection Angle	14.6 mrad @ 780 nm @ 80 MHz; 9.1 mrad @ 488 nm @ 80 MHz
RF Power Level	< 1 watt @ 780 nm
Impedance	50 Ω nominal
VSWR	<2:1 across bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-1ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-1ADMDFS-A Analog System Voltage Controlled Oscillator: 21060-100-1ASVCO Analog Module Voltage Controlled Oscillator: 21060-100-1AMVCO

46080-2-1.06-LTD

Interaction Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	1064 nm
Static Transmission	> 97 %
Window Configuration	AR coated
Operating Frequency	70-90 MHz
Intensity Variation	< 2.5 dB across bandwidth
Diffraction Efficiency (midband)	> 75 % midband with linear polarization, perpendicular to acoustic propagation, > 70 % midband with random polarization.
Acoustic Aperture Size	2 mm
Rise Time	150 ns/mm beam dia.
Δ Deflection Angle	7.5 mrad
Deflection Angle	20 mrad
RF Power Level	< 2 watts
Impedance	50 ohms nominal
VSWR	<1.5:1 across bandwidth
Package	53B0624 TO2
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21065-95-2ASVCO Analog Module Voltage Controlled Oscillator: 21065-95-2AMVCO

46080-2-.85-LTD

Interactive Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	700 to 1100 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	65–95 MHz
Intensity Variation	< 1.5 dB @ 780 nm
Diffraction Efficiency (midband)	> 70 % midband with linear polarization, perpendicular to acoustic propagation, > 65 % midband with random polarization.
Acoustic Aperture Size	2 mm
Rise Time	150 nsec/mm beam dia.
Δ Deflection Angle	4 mrad @ 850 nm
Deflection Angle	16 mrad @ 80 MHz and 850 nm
RF Power Level	< 2 watts @ 850 nm
Impedance	50 ohms nominal
VSWR	< 1.5:1 over bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21065-95-1ASVCO Analog Module Voltage Controlled Oscillator: 21065-95-1AMVCO

46080-2-LTD

Interaction Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	450-800 nm
Window Configuration	AR coated
Static Transmission	>95 %
Operating Frequency	60-100 MHz
Intensity Variation	< 2 dB
Diffraction Efficiency	>80 % midband with linear polarized light perpendicular to acoustic propagation or with random polarized light
Acoustic Aperture Size	2 mm
Rise Time	150 ns / mm beam dia.
Δ Deflection Angle	7.3 mrad @ 780 nm; 4.5 mrad @ 488 nm
Deflection Angle	14.6 mrad @ 780 nm @ 80 MHz; 9.1 mrad @ 488 nm @ 80 MHz
RF Power Level	< 1.25 watt @ 780 nm
Impedance	50 Ω nominal
VSWR	<2:1 across bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21060-100-2ASVCO Analog Module Voltage Controlled Oscillator: 21060-100-2AMVCO

46080-3-.85-LTD

Interactive Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	700 to 1100 nm
Window Configuration	AR Coated
Static Transmission	> 95 %
Operating Frequency	65–95 MHz
Intensity Variation	< 1.5 dB @ 780 nm
Diffraction Efficiency (midband)	> 70 % midband with linear polarization, perpendicular to acoustic propagation, > 65 % midband with random polarization.
Acoustic Aperture Size	3 mm
Rise Time	150 nsec/mm beam dia.
Δ Deflection Angle	4 mrad @ 850 nm
Deflection Angle	16 mrad @ 80 MHz and 850 nm
RF Power Level	2 watts @ 850 nm
Impedance	50 ohms nominal
VSWR	< 1.5:1 over bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21065-95-2ASVCO Analog Module Voltage Controlled Oscillator: 21065-95-2AMVCO

46080-3-LTD

Interaction Material	TeO2
Acoustic Mode	Longitudinal
Operating Wavelength	450-800 nm
Window Configuration	AR coated
Static Transmission	>95 %
Operating Frequency	60-100 MHz
Intensity Variation	< 2 dB
Diffraction Efficiency	>80 % midband with linear polarized light perpendicular to acoustic propagation or with random polarized light
Acoustic Aperture Size	3 x 4 mm
Rise Time	150 ns / mm beam dia.
Δ Deflection Angle	7.3 mrad @ 780 nm; 4.5 mrad @ 488 nm
Deflection Angle	14.6 mrad @ 780 nm @ 80 MHz; 9.1 mrad @ 488 nm @ 80 MHz

RF Power Level	< 1.5 watt @ 780 nm
Impedance	50 Ω nominal
VSWR	<2:1 across bandwidth
Package	53B0624
Recommended Drivers:	Analog System Digital Frequency Synthesizer: 64020-200-2ADSDFS-A Analog Module Digital Frequency Synthesizer: 64020-200-2ADMDFS-A Analog System Voltage Controlled Oscillator: 21060-100-2ASVCO Analog Module Voltage Controlled Oscillator: 21060-100-2AMVCO

46300-0.2/2-.36

Interactive Material	Fused Silica
Acoustic Mode	Longitudinal
Operating Wavelength	360 nm
Window Configuration	AR coated
Static Transmission	>97%
Operating Frequency	225-375 MHz
Intensity Variation	<1 dB
Diffraction Efficiency	>70%, midband next to transducer, with linear polarized light perpendicular to acoustic propagation
Acoustic Aperture Size	0.2mm (H) x 2mm (near field distance along acoustic propagation direction)
Process Time	0.33 µs with 2mm beam size in acoustic direction
Resolution (T.BW product)	50 spots
Δ Deflection Angle	9 mrad
Deflection Angle	18 mrad @ 300 MHz
RF Power Level	<3 watts
Impedance	50 ohms
VSWR	<2:1 across bandwidth
Package	53B1354
Recommended Drivers:	Analog System Voltage Controlled Oscillator: 64200-380-5ASVCO Analog Module Voltage Controlled Oscillator: 64200-380-5AMVCO

451000-GaP

Interaction Material	GaP
Acoustic Mode	Longitudinal
Operating Wavelength	800-850 nm
Window Configuration	AR coated
Static Transmission	80%
Operating Frequency	750-1250 MHz
Intensity Variation	3 dB
Diffraction Efficiency	5% per watt minimum midband with linear polarized light parallel to acoustic propagation
Acoustic Aperture Size	150 µm x 2mm
Aperture Time	300 nsec
Optical Waist Height	80 µm
Δ Deflection Angle	62 mrad @ 830 nm
Deflection Angle	124 mrad @ 830 nm
RF Power Level	<.25 Watts nominal can withstand 1 watt maximum
Impedance	50 Ohms nominal
VSWR	<3:1 across bandwidth
Package	53B0504

451000L

Interactive Material	LiNbO3
Acoustic Mode	Longitudinal
Operating Wavelength	820 nm
Window Configuration	AR Coated
Static Transmission	>95 %
Operating Frequency	750 to 1250 MHz
Diffraction Efficiency	1% / Watt minimum with light linear polarized, perpendicular to acoustic propagation.

Acoustic Aperture Size	100 um x 2.6 mm
Process Time	400 ns
Resolution (T.BW product)	200 spots
Deflection Angle	124 mrad @ 1000 MHz
∆ Deflection Angle	62 mrad
RF Power Level	< 0.5 mW average, 1 Watt peak with duty cycle of 5 % with pulse width , <1 ms.
Impedance	50 Ohms
VSWR	3:1 across band maximum
Package:	53B0504

451500G

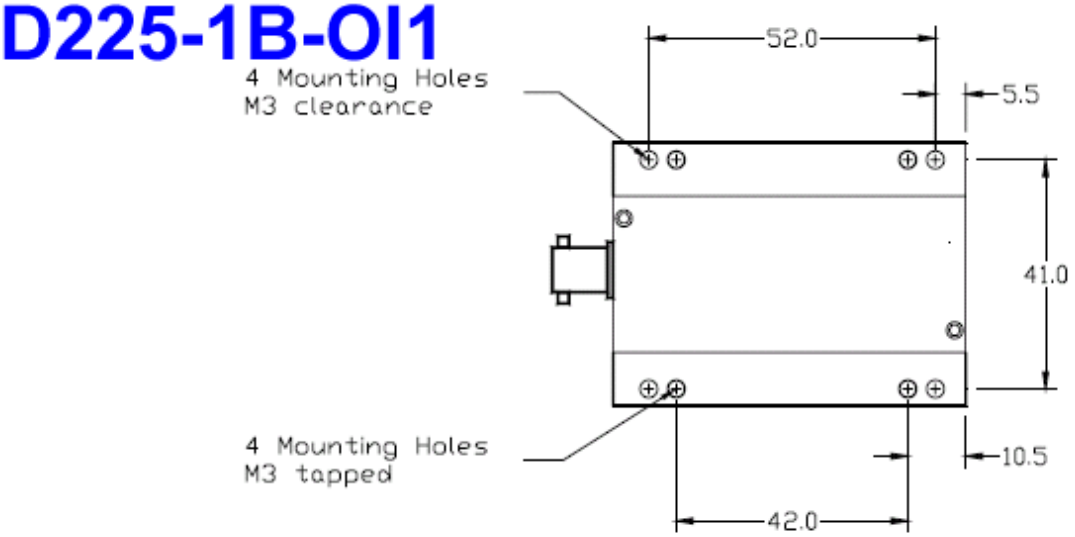
Interactive Material	GaP
Acoustic Mode	Longitudinal
Operating Wavelength	820 nm
Window Configuration	AR Coated
Static Transmission	>95 %
Center Frequency	1500 MHz
Bandwidth	560 MHz
Diffraction Efficiency	5 % / Watt minimum with light polarized Linear parallel to acoustic propagation.
Acoustic Aperture Size	70 _m X 1.33 mm
Process Time	0.2 us
Resolution (T.BW product)	112 spots
∆ Deflection Angle	69 mrad @ 820 nm
Deflection Angle	184 nm @ 820 nm
RF Power Level	<100 mW ave,1 Watt peak @10 % duty < 1 ms pulse width.
Impedance	50 Ohms
VSWR	< 3 :1
Package:	53B0504

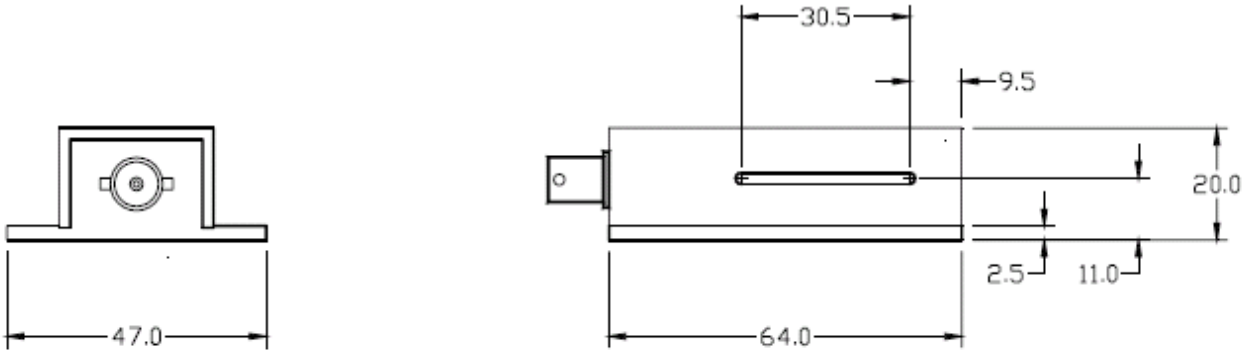
AO DeflectorD225-1B-OI1

A high performance AO Deflector operating at 488nm, manufactured with superior flatness and parallelism of optical faces to yield minimal wavefront distortion. A scan angle of 20mrad with 1160 spots resolution (Rayleigh criteria) and 7.7µs access time make this device ideally suited for high resolution imaging and reprographic applications.

Interaction Material	Lead Molybdate
Acoustic Mode	Isotropic
Wavelength	488nm
Polarisation	Any
Anti-Reflection Coating	< 0.2% per surface
Transmission	> 93%
Frequency	150MHz to 300MHz
Active Aperture	0.5mm x 28mm
Scan Angle	20mrad
Access Time	7.7µs
Acoustic Velocity	3630m/s
Resolution (Rayleigh Criteria)	1160 spots
Diffraction Efficiency	> 50% (at centre of aperture)
RF Power	< 1.5W

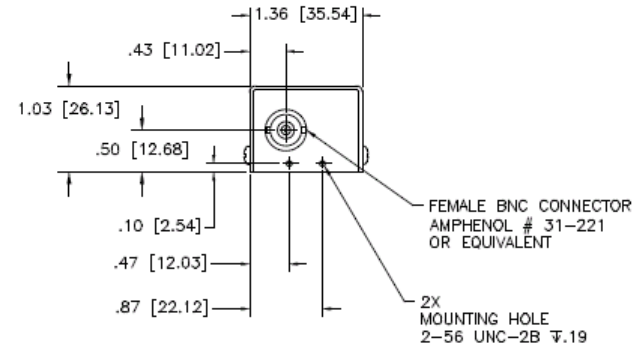
D225-1B-OI1

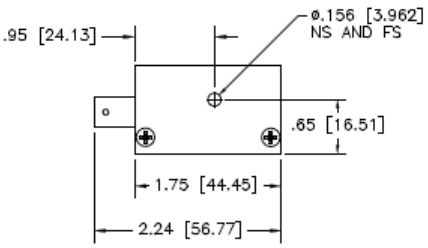


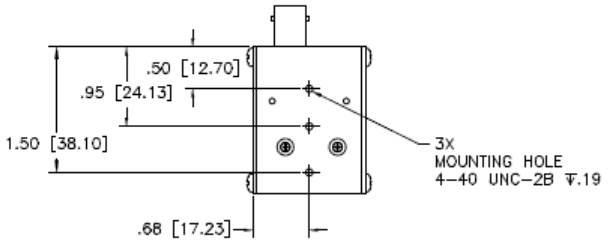


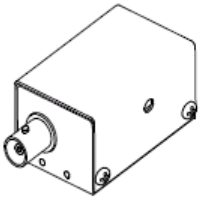
NOTES: UNLESS OTHERWISE SPECIFIED

REVISIONS				
ZONE	REV.	DESCRIPTION	CHNG / DATE	APVD / DATE
	A	CHANGE PER ECO 58A15051	CR 2/04/03	PS 2/07/03

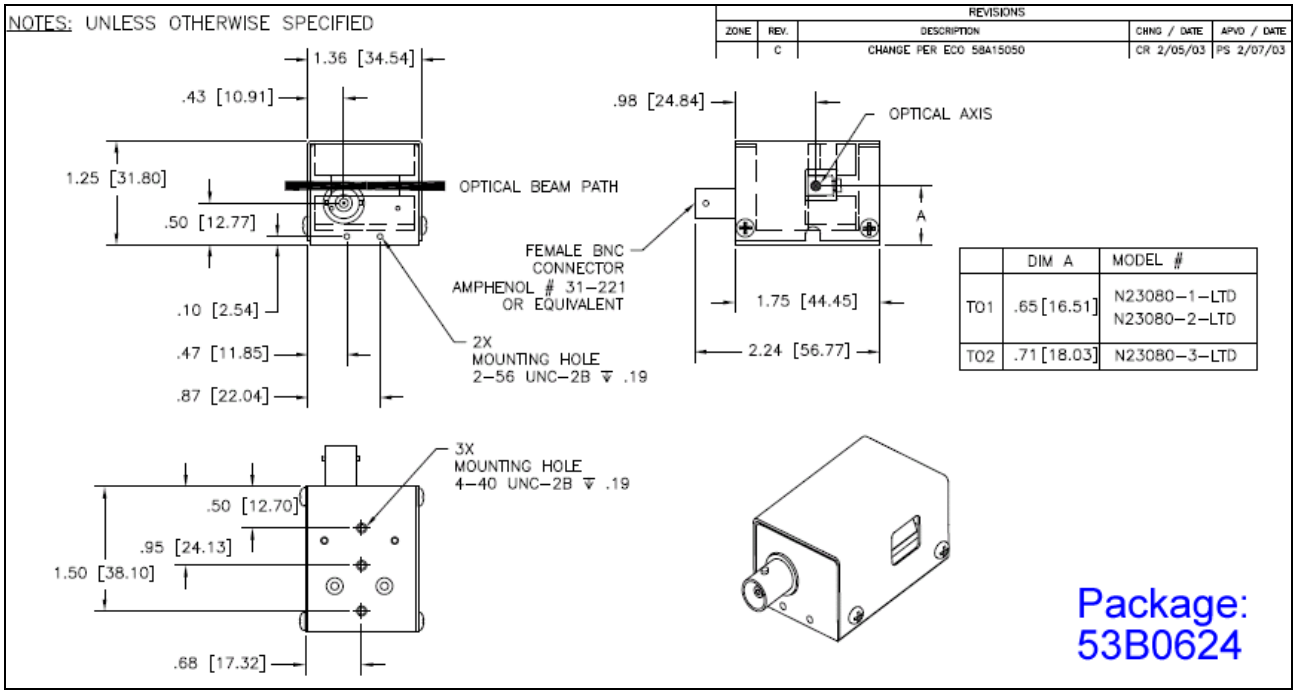


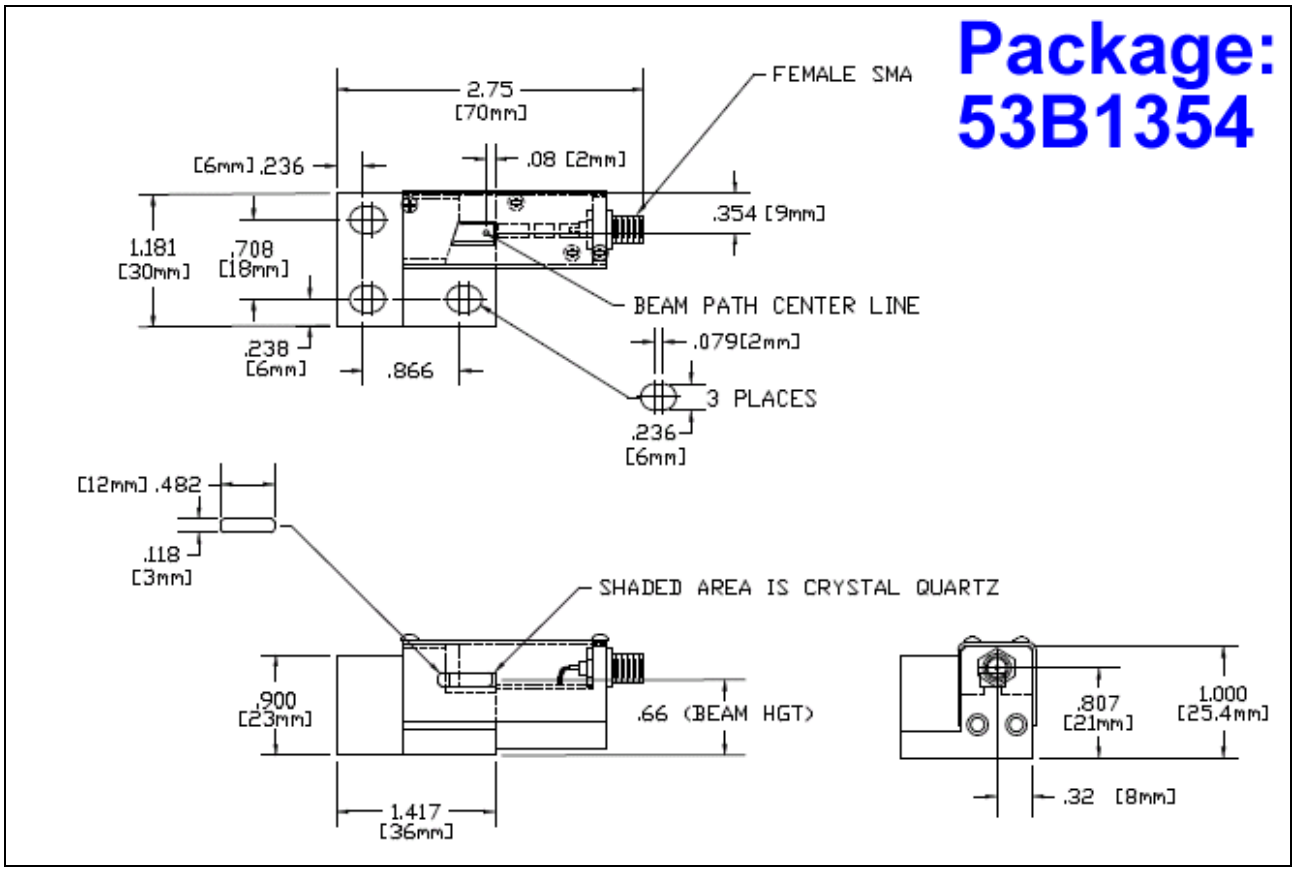


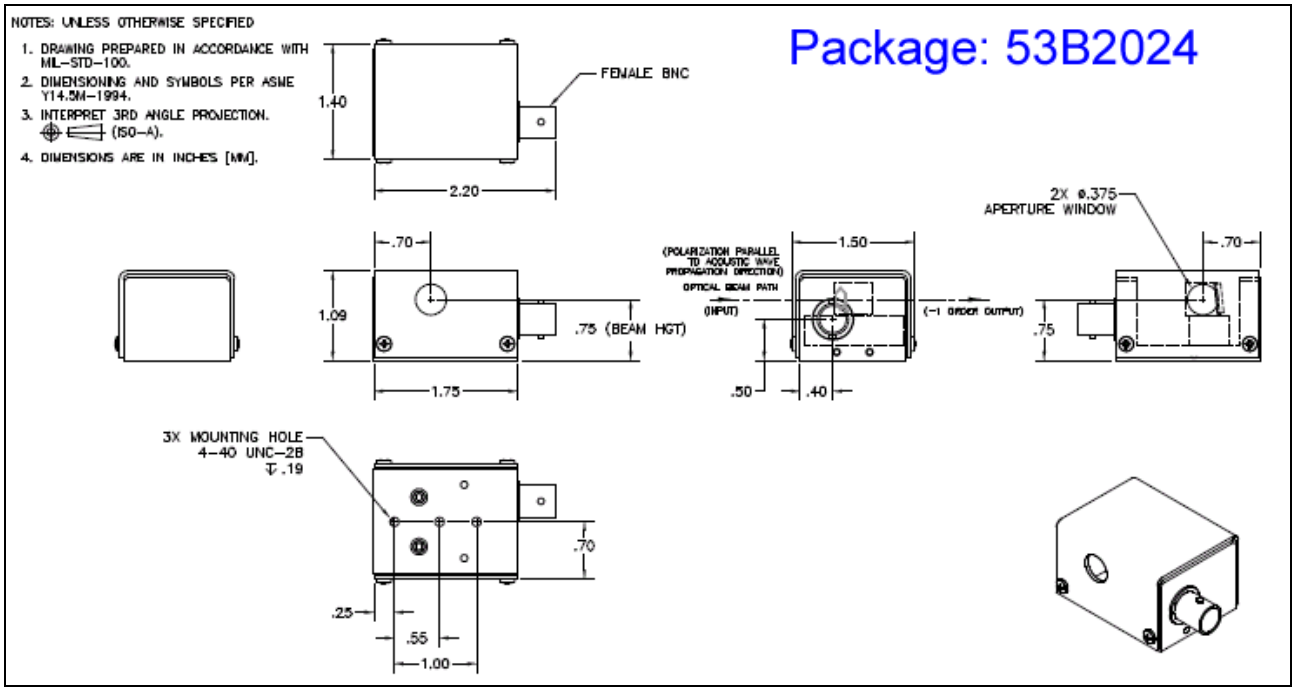


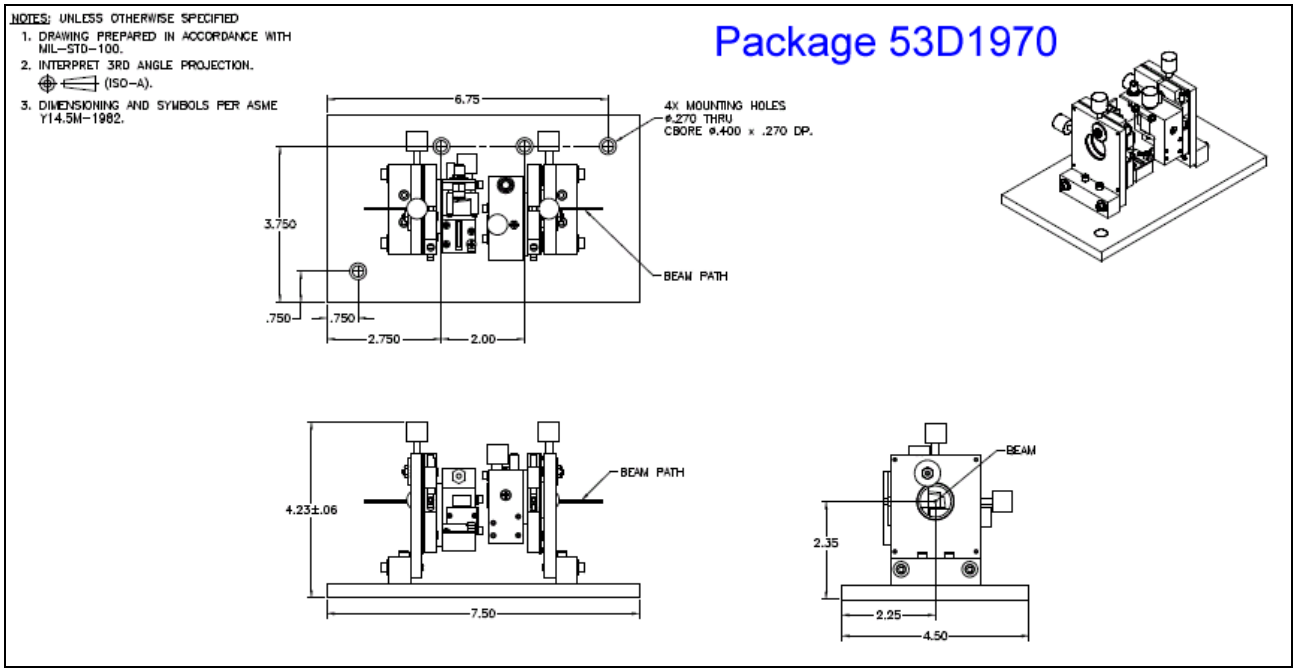


Package: 53B0504


NOTES: UNLESS OTHERWISE SPECIFIED
REVISIONS
ZONE | REV. | DESCRIPTION | CHNG / DATE | APVD / DATE
C | CHANGE PER ECO 58A15050 | CR 2/05/03 | PS 2/07/03
1.36 [34.54]
.43 [10.91]
1.25 [31.80]
.50 [12.77]
.10 [2.54]
.47 [11.85]
.87 [22.04]
OPTICAL BEAM PATH
FEMALE BNC CONNECTOR AMPHENOL # 31-221 OR EQUIVALENT
2X MOUNTING HOLE 2-56 UNC-2B ↧ .19
.98 [24.84]
OPTICAL AXIS
A
1.75 [44.45]
2.24 [56.77]
DIM A | MODEL #
TO1 | .65 [16.51] | N23080-1-LTD N23080-2-LTD
TO2 | .71 [18.03] | N23080-3-LTD
3X MOUNTING HOLE 4-40 UNC-2B ↧ .19
.50 [12.70]
.95 [24.13]
1.50 [38.10]
.68 [17.32]
Package: 53B0624


Package: 53B1354
2.75 [70mm]
FEMALE SMA
[6mm] .236
.08 [2mm]
.354 [9mm]
1.181 [30mm]
.708 [18mm]
BEAM PATH CENTER LINE
.238 [6mm]
.866
.079[2mm]
3 PLACES
.236 [6mm]
[12mm] .482
.118 [3mm]
SHADED AREA IS CRYSTAL QUARTZ
.900 [23mm]
.66 (BEAM HGT)
1.417 [36mm]
.807 [21mm]
1.000 [25.4mm]
.32 [8mm]


NOTES: UNLESS OTHERWISE SPECIFIED
1. DRAWING PREPARED IN ACCORDANCE WITH MIL-STD-100.
2. DIMENSIONING AND SYMBOLS PER ASME Y14.5M-1994.
3. INTERPRET 3RD ANGLE PROJECTION. (ISO-A).
4. DIMENSIONS ARE IN INCHES [MM].
Package: 53B2024
FEMALE BNC
1.40
2.20
.70
1.09
.75 (BEAM HGT)
1.75
(POLARIZATION PARALLEL TO ACOUSTIC WAVE PROPAGATION DIRECTION)
OPTICAL BEAM PATH
(INPUT)
1.50
(-1 ORDER OUTPUT)
.50
.40
2X ø.375 APERTURE WINDOW
.70
.75
3X MOUNTING HOLE 4-40 UNC-2B ↧.19
.70
.25
.55
1.00


NOTES: UNLESS OTHERWISE SPECIFIED
1. DRAWING PREPARED IN ACCORDANCE WITH MIL-STD-100.
2. INTERPRET 3RD ANGLE PROJECTION. (ISO-A).
3. DIMENSIONING AND SYMBOLS PER ASME Y14.5M-1982.
Package 53D1970
6.75
4X MOUNTING HOLES ø.270 THRU CBORE ø.400 x .270 DP.
3.750
BEAM PATH
.750
.750
2.750
2.00
BEAM PATH
4.23±.06
7.50
BEAM
2.35
2.25
4.50