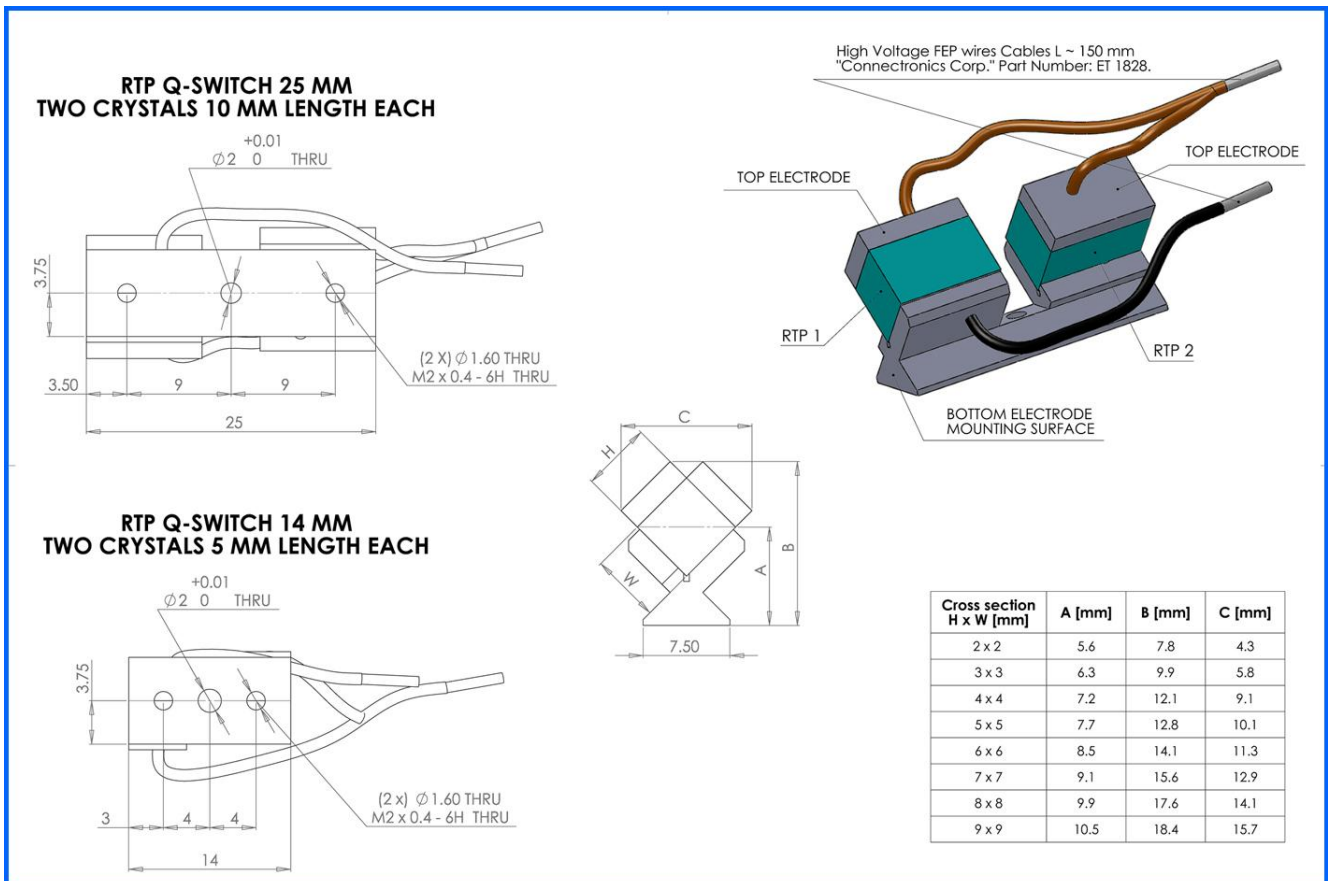


# RTP Crystal Based EO Devices

RTP (Rubidium Titanyl Phosphate) is a robust electro-optic crystal suitable for a wide variety of applications (such as Q-Switches, Amplitude & Phase Modulators, Pulse Pickers, etc.) and operation in industrial, medical, and defense products. The crystal is transparent at most common visible and near infrared laser wavelengths. It performs well over a wide temperature range (from  $-50^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ ) and at high repetition rates. RTP based Q-switch devices are offered in matched pair configurations, in a temperature-compensating design. When used for applications such as Q-Switches and Amplitude Modulators, the input beam must be polarized along the diagonal of the crystals faces.

## Features:

- Low half-wave voltage
- High damage threshold
- Non hygroscopic; surface not sensitive to humidity
- Can operate a high repetition rates with minimal ringing
- operates well over wide temperature range



## Technical Specifications:

### Single Crystal:

Length (L): +/- 0.5 mm  
Aperture (A): +/- 0.05 mm  
Perpendicularity: < 20 arc min  
Parallelism: < 10 arc sec  
Scratch/dig: 10/5 in the clear aperture  
Chamfers: < 0.2 mm x 45° +/- 5°  
Electrodes: Ti on Z-sides  
AR/AR coatings: R<0.1%  
Damage threshold: >600 MW/cm<sup>2</sup> @1064 nm, 10ns  
Side surfaces fine ground < 30 μm  
Transmission: > 98.5%

Crystal Volume: no inclusions by visual inspection  
Marking: polarity of Z-axis (+) on the side surface  
Extinction ratio is the transmission ratio of crystals between parallel/crossed polarizers measured at operating wavelength. Crystals are placed in V-groove. Light polarization vertical or horizontal.  
Static Half Wave Voltage at wavelength ( $\lambda$ , nm) according to following formulas:  
**X-cut:**  $V_x = A/L \times [(9.35 \times \lambda) - 2000] [V] \pm 15\%$   
**Y-cut:**  $V_y = A/L \times [(8 \times \lambda) - 1900] [V] \pm 15\%$   
Capacitance: 0.7-1.0 pF (crystal length 5 mm)  
1.4-2.0 pF (crystal length 10 mm)

### Matched Pair:

Lengths matched to within +/- 0.002 mm  
Scratch/dig: 10-5 in the clear aperture  
Extinction ratio is transmission ratio of matched pair of crystals between parallel/crossed polarizers measured at operating wavelength. Crystals are placed in V-groove with the angle of 90° between Z-axes (+) and (-) on the top. Light polarization vertical or horizontal

Angular adjustment tolerance: 1.5 degree  
Transmission: > 98.5%  
Static Half Wave Voltage at wavelength ( $\lambda$ , nm) accordingly to following formulas:  
**X-cut:**  $V_x = A/2L \times [(9.35 \times \lambda) - 2000] [V] \pm 15\%$   
**Y-cut:**  $V_y = A/2L \times [(8 \times \lambda) - 1900] [V] \pm 15\%$

### EO-Cell:

Scratch/dig: 10-5 in the clear aperture of crystals  
Transmission: > 98.5%  
Extinction ratio is transmission ratio of EO cell between parallel/crossed polarizers measured at operating wavelength. Light polarization vertical or horizontal.  
Angular adjustment tolerance: 1.5 degree

Static Half Wave Voltage at wavelength ( $\lambda$ , nm) accordingly to following formulas:  
**X-cut:**  $V_x = A/2L \times [(9.35 \times \lambda) - 2000] [V] \pm 15\%$   
**Y-cut:**  $V_y = A/2L \times [(8 \times \lambda) - 1900] [V] \pm 15\%$   
Wire type: ET1828, Connectronics Corp.  
Wires length: 150 mm Connectronics Corp.  
Capacitance: 2.0-3.0 pF (crystal length 5 mm) and 3.0-4.0 pF (crystal length 10 mm)  
Interface and overall sizes - Please see drawing.

## Part Numbering System

Ty - D - O - Cr - L - E - W



**Ty** - Crystal Type: **R** (RTP)  
**D** - Device: **Q** (EO Cell) / **M** (Matched Pair) / **S** (Single Crystal)  
**O** - Orientation: **X / Y / Z**  
**Cr** - Cross Section [mm]  
**L** - Crystal Length [mm]  
**E** - Extinction Ratio [dB] 20/23/25/30  
**W** - Operation Wavelength [nm]