

56 Sparta Avenue • Newton, New Jersey 07860  
 (973) 300-3000 Sales • (973) 300-3600 Fax  
 www.thorlabs.com

# THORLABS

## VT1 - APR 24, 2017

Item # VT1 was discontinued on APR 24, 2017 For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### BNC TERMINATORS

- ▶ Stub-Style or Feed-Through BNC Stub Terminators
- ▶ Resistance Values Ranging from 50  $\Omega$  to 250 k $\Omega$
- ▶ Fixed and Variable Designs
- ▶ Fixed Terminator Kit Available



#### OVERVIEW

#### Features

- 50  $\Omega$  Feed-Through Terminator
- 50  $\Omega$  to 50 k $\Omega$  Variable Feed-Through Terminator
- Stub-Style Terminators with Resistances Ranging from 50  $\Omega$  to 250 k $\Omega$
- Stub-Style Terminator Kit with Eight Terminators of Varying Resistances Available

Thorlabs' BNC terminators are available in both feed-through and stub styles. Our feed-through terminators provide an in-line solution while our stub-style terminators are a compact solution when the resistance value needs to be frequently changed.

When using a reverse biased photodiode, such as our packaged biased detectors, a photocurrent is produced when photons are absorbed. A load resistor is placed across the output of the detector, and the voltage drop across the resistor is measured by an oscilloscope or multimeter. A 50  $\Omega$  load is typically used to maximize the signal bandwidth, but higher voltages are produced by higher resistances at the expense of lower bandwidth. The image to the right shows a typical application with our DET100A biased detector and our FT502 5 k $\Omega$  stub-style terminator.

Thorlabs also includes our feed-through terminators in our electrical adapters kits, which also have a variety of BNC, SMA, and banana adapters.



[Click for Details](#)

A typical application for a stub-style BNC terminator is shown above. The FT502 5 k $\Omega$  terminator is connected via a T3285 BNC "T" adapter to an oscilloscope. A BNC cable connects the adapter to our DET100A biased detector. The biased detector outputs a current based on the incident photon flux; the oscilloscope can then measure the voltage across the BNC terminator.

## Feed-Through BNC Terminators

Thorlabs offers two feed-through (in-line) terminators: the T4119 fixed 50  $\Omega$  terminator and the VT1 variable resistance terminator.

The T4119 is a 50  $\Omega$  feed-through terminator, which maximizes the signal bandwidth observable with our biased detectors. It can dissipate signals with input powers of 2 W (average at 25  $^{\circ}$ C) and frequencies up to 500 MHz.



**T4119**  
BNC Feed-Through  
Terminator

A variable terminator allows the user to set a high resistance to increase the signal (e.g., during beam alignment) and then lower the resistance to achieve greater bandwidth. The VT1 Variable Terminator offers the user a choice of seven discrete resistance values, which can be easily selected from the outer rotary barrel. The VT1 provides the following options: 50  $\Omega$ , 100  $\Omega$ , 500  $\Omega$ , 1 k $\Omega$ , 5 k $\Omega$ , 10 k $\Omega$ , and 50 k $\Omega$ . Please note that as the resistance is increased above 50  $\Omega$  the bandwidth will be decreased due to back reflections; at these higher resistance values, as the cable becomes longer the bandwidth will decrease further.

VT1 Specifications				
Nominal Value	Max Power Rating <sup>a</sup>	Max DC Voltage	Value with 1 M $\Omega$ in Parallel	Value with 100 M $\Omega$ in Parallel
50 $\Omega$	1 W	5 V	50 $\Omega$	50 $\Omega$
100 $\Omega$	1 W	8 V	100 $\Omega$	100 $\Omega$
500 $\Omega$	0.25 W	8 V	500 $\Omega$	500 $\Omega$
1 k $\Omega$	0.25 W	12 V	999 $\Omega$	1 k $\Omega$
5 k $\Omega$	0.25 W	25 V	4.975 k $\Omega$	4.998 k $\Omega$
10 k $\Omega$	0.125 W	25 V	9.901 k $\Omega$	9.99 k $\Omega$
50 k $\Omega$	0.125 W	25 V	47.619 k $\Omega$	49.751 k $\Omega$
General VT1 Specifications				
Resistance Tolerance			±5%	
Storage Temperature			-30 to 60 $^{\circ}$ C	
Operating Temperature			10 to 40 $^{\circ}$ C	

- Unless DC voltage limited.

Part Number	Description	Price	Availability
<b>T4119</b>	<b>50 <math>\Omega</math> BNC Feed-Through Terminator</b>	<b>\$36.50</b>	<b>Today</b>
<b>VT1</b>	<b>Variable Terminator: 50 <math>\Omega</math> 100 <math>\Omega</math>, 500 <math>\Omega</math>, 1 k<math>\Omega</math>, 5 k<math>\Omega</math>, 10 k<math>\Omega</math>, and 50 k<math>\Omega</math></b>	<b>\$202.00</b>	<b>Today</b>

## Stub-Style BNC Terminators

Thorlabs' stub-style BNC terminators are compact and designed for switching between different resistors quickly. In addition, the resistors chosen have maximum power ratings that support the full 0 to 10 V output capability of our biased detectors. For measuring high-speed signals, it is best to use a 50  $\Omega$  terminator to maximize the bandwidth of the biased detector. The higher resistance values are ideal for measuring low bandwidth signals with our biased detectors, as the voltage across the resistor will be higher. Please note that as the resistance is increased above 50  $\Omega$  the bandwidth will be decreased; at these higher resistance values, as the cable becomes longer the bandwidth will decrease further.

When using these terminators, it is necessary to use a BNC "T" adapter, such as our T3285, to connect both the signal BNC cable and the terminator to the detector.

Item #	FT500	FT101	FT501	FT102	FT502	FT103	FT503	FT104	FT254
Nominal Resistance Value	50 $\Omega$	100 $\Omega$	500 $\Omega$	1 k $\Omega$	5 k $\Omega$	10 k $\Omega$	50 k $\Omega$	100 k $\Omega$	250 k $\Omega$
Color Code	White	Red	Orange	Yellow	Green	Blue	Gray	Purple	Light Blue
Maximum Power Rating <sup>a,b</sup>	2 W	2 W	0.75 W	0.75 W	0.1 W	0.1 W	0.1 W	0.1 W	0.1 W
Maximum DC Voltage <sup>b</sup>	10 V	14 V	10 V	25 V	23 V	25 V	25 V	25 V	25 V
Value with 1 M $\Omega$ in Parallel <sup>c</sup>	50 $\Omega$	100 $\Omega$	500 $\Omega$	999 $\Omega$	4.975 k $\Omega$	9.901 k $\Omega$	47.619 k $\Omega$	90.909 k $\Omega$	200 k $\Omega$
Value with 10 M $\Omega$ in Parallel <sup>c</sup>	50 $\Omega$	100 $\Omega$	500 $\Omega$	1 k $\Omega$	4.998 k $\Omega$	9.990 k $\Omega$	49.751 k $\Omega$	99.010 k $\Omega$	243.902 k $\Omega$
Resistance Tolerance	±5%								
Storage Temperature	-30 to 60 °C								
Operating Temperature	0 to 60 °C								

- Unless DC Voltage Limited
- At the maximum power and voltage ratings, the terminators may be too hot to touch.
- Calculated Based on Ohm's Law

Part Number	Description	Price	Availability
FT500	50 $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT101	100 $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT501	500 $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT102	1 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT502	5 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT103	10 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT503	50 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT104	100 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today
FT254	250 k $\Omega$ Fixed Stub-Style BNC Terminator	\$28.75	Today

## Stub-Style BNC Terminator Kit

The FTK01 Stub-Style BNC Terminator Kit contains eight terminators with resistance values ranging from 50  $\Omega$  to 250 k $\Omega$ . One T3285 BNC "T" Adapter (F-M-F) is also included in the terminator kit. When using these terminators, it is necessary to use a BNC "T" adapter to connect both the signal BNC cable and the terminator to the detector. The terminators and adapter are packaged in a 7.0" x 3.5" x 1.25" (177.8 mm x 88.9 mm x 31.8 mm) plastic box with nine labeled compartments. This kit offers added savings over individual resistor purchases. The table below provides specifications for each BNC terminator.

Resistor Item #	FT500	FT501	FT102	FT502	FT103	FT503	FT104	FT254
Nominal Resistance Value	50 $\Omega$	500 $\Omega$	1 k $\Omega$	5 k $\Omega$	10 k $\Omega$	50 k $\Omega$	100 k $\Omega$	250 k $\Omega$
Color Code	White	Orange	Yellow	Green	Blue	Gray	Purple	Light Blue
Maximum Power Rating <sup>a,b</sup>	2 W	0.75 W	0.75 W	0.1 W	0.1 W	0.1 W	0.1 W	0.1 W
Maximum DC Voltage <sup>b</sup>	10 V	19 V	25 V	22 V	25 V	25 V	25 V	25 V
Value with 1 M $\Omega$ in Parallel <sup>c</sup>	50 $\Omega$	500 $\Omega$	999 $\Omega$	4.975 k $\Omega$	9.901 k $\Omega$	47.619 k $\Omega$	90.909 k $\Omega$	200 k $\Omega$
Value with 10 M $\Omega$ in Parallel <sup>c</sup>	50 $\Omega$	500 $\Omega$	1 k $\Omega$	4.998 k $\Omega$	9.990 k $\Omega$	49.751 k $\Omega$	99.010 k $\Omega$	243.902 k $\Omega$
Resistance Tolerance	±5%							
Storage Temperature	-30 to 60 °C							
Operating Temperature	0 to 60 °C							

- Unless DC Voltage Limited
- At the maximum power and voltage ratings, the terminators may be too hot to touch.
- Calculated Based on Ohm's Law

Part Number	Description	Price	Availability
FTK01	Stub-Style BNC Terminator Kit, Set of 8	\$164.00	Today

Visit the *BNC Terminators* page for pricing and availability information:

[https://www.thorlabs.com/newgrouppage9.cfm?objectgroup\\_id=7312](https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=7312)