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## **GPS and GNSS**

# Protection for the NexT Generation™

## **Critical Components. Critical Protection.** Decades of experience providing GNSS solutions across a variety of industries around the world.

GPS and other Global Navigation Systems are used worldwide to provide extremely accurate positioning and timing information. When these systems are installed permanently on a building, tower, or other structure, surge protection should always be installed on the cable run between Antenna and Receiver.

Most GPS Receivers tend to be extremely sensitive to surge/over-voltage energy, and at the same time they are often uptime-critical components. The best way to ensure your equipment is safe and your system is running properly is to use a high-quality coaxial surge arrestor which will protect the receiver from harmful energy.

### GNSS and NexTek

Global Navigation Satellite System (GNSS) is a general term describing a satellite constellation that provides Positioning, Navigation, and Timing (PNT) services on a global or regional basis. While Global Positioning System (GPS) is the most well-known GNSS, other countries are rapidly developing and deploying, or have already deployed, their own systems to provide autonomous or complementary PNT capability.

One of the largest threats to Global Navigation Satellite Systems are transient pulses. These threats can get into the equipment either by power or data lines or directly through space from a strong electromagnetic field change — an electromagnetic pulse (EMP). EMP pulses can be from Lightning (LEMP), High-Altitude (HEMP), and Nuclear (NEMP) events. Surge Protection Devices (SPDs) are commonly used to prevent and reduce the detrimental energy spikes that may enter the equipment, and it is critical to eliminate this energy to protect sensitive systems, particularly in GNSS applications.

GPS electronic devices are designed to operate at a certain voltage, and considerable damage can be caused by transient voltages that are greater than that for which the device is rated. Refer to the image below for a pictorial overview of the GNSS L-bands and where the major systems fall on the spectrum.



With the ongoing proliferation of wireless communication devices across all types of GPS/GNSS systems, surge protection devices are required for a growing amount of applications. NexTek has the broadest range of SPDs to protect your sensitive GPS/GNSS equipment from harmful over voltages.

NexTek's GNSS SPDs operate at industry standard frequencies within the range of DC - 18 GHz (sub-bands vary) and are available with  $50\Omega$  and  $75\Omega$  RF interfaces such as N-Type, F-Type, TNC, SMA, BNC, and 7/16 DIN connectors. Coaxial RF lightning surge suppressor interfaces are available in standard male and female genders, and reverse polarity combinations are available depending on the model. Bulkhead mount available on most arrestors; bracket and optional grounding accessories are available, too. The table below offers an overview of our standard GPS/GNSS product series..

	FPL Series	PTC G Series	PTR Series	QWSNFNx0500	QWSNFNx0600
pro co freq	Provides Maximum tection for GNSS multi- onstellation and multi- uency receivers as well as SBAS signals	A compact arrestor for custom integration (Drop-In replacement, ease of retrofitting) receiver/antenna or stand alone for all GNSS, SBAS & RTK applications where size and location are critical.	A great protector for all GNSS, SBAS, WIFI 802.11, ISM & RTK applications where serviceability and long-life are critical. GDTs are field replaceable.	A High Performance ¼ wave stub lightning protector. Ideally suited for C, X & Ku band applications.	A High Performance ½ wave stub lightning protector. Ideally suited for WIFI, 802.11, ISM, S & C band applications
	Features	Features	Features	Features	Features
• • • • •	400 to 2700 MHz Low Let-through voltage DC Pass 20kA Multiple Strike Surge Protection IP68 Rated (Dust and Waterproof) Bulkhead Design Connectors: N-Type, TNC, SMA	<ul> <li>DC to 12.5 GHz</li> <li>Ultra-Compact</li> <li>DC Pass</li> <li>10kA Multiple Strike (10x) Surge Protection</li> <li>IP68 Rated (Dust and Waterproof)</li> <li>Bulkhead Design</li> <li>Connectors: N-Type, SMA, TNC, MMCX, Wire Pigtail &amp; Crimp Termination</li> </ul>	<ul> <li>DC to 3.2 GHz</li> <li>Extremely Rugged</li> <li>DC Pass</li> <li>20kA Multiple Strike Capability,</li> <li>50kA Surge Protection, (40kA SMA)</li> <li>IP68 Rated (Dust and Waterproof)</li> <li>Bulkhead Design</li> <li>Connectors: N- Type, TNC, SMA</li> </ul>	<ul> <li>5.2 to 18.0 GHz</li> <li>Extremely Rugged</li> <li>DC Block</li> <li>60kA Strike Capability</li> <li>Low VSWR &amp; IL</li> <li>IP68 Rated (Dust and Waterproof)</li> <li>Bulkhead Design</li> <li>Connectors: N- Type</li> </ul>	<ul> <li>2.2 to 7.6 GHz</li> <li>Extremely Rugged</li> <li>DC Block</li> <li>60kA Strike Capability</li> <li>Low VSWR &amp; IL</li> <li>IP68 Rated (Dust and Waterproot)</li> <li>Bulkhead Design</li> <li>Connectors: N- Type</li> </ul>
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### FPL-Series Lightning Arrestors 1100 – 1700 MHz

The FPL-series is our flagship series of GPS/GNSS surge arrestor. These fast-response arrestors are designed to protect especially sensitive equipment, such as GPS receivers. All of our FPLseries arrestors operate within the L-Band, 1100 - 1700 MHz. A variety of connector options, connector genders, and operating voltages are available as well. The table on the bottom of this page shows a list of standard FPL-Series 1100 - 1700 MHz part numbers.

- RF Power: 5 Wcw
- Maximum Transient (Imax): 30kA (1x)
- Multiple Strike (IN): 20 kA (10x)
- Rugged and Waterproof IP68 Rated when Mated
- Very Low Let-Through Voltage
- Excellent RF Performance
- DC Pass or DC Block options
- Bulkhead Grounding
- L-Bracket and Wire Lug Available



<u>Part Number</u>	<u>Surge</u>	Protected	<u>Voltage</u>	Frequency (MHz)	<u>Type</u>
FPLNFNFD000	N-F	N-F	00	1100 - 1700	DC Block
FPLNFNFDPxx	N-F	N-F	+5, +12, +24, ±48	1100 - 1700	DC Pass
FPLNFNMDPxx	N-F	N-M	+5, +12, +24, ±48	1100 - 1700	DC Pass
FPLTFTFD000	TNC-F	TNC-F	00	1100 - 1700	DC Block
FPLTFTFDPxx	TNC-F	TNC-F	+5, +12, +24, ±48	1100 - 1700	DC Pass
FPLTFTMDPxx	TNC-F	TNC-M	+5, +12, +24, ±48	1100 - 1700	DC Pass
FPLNFSFDPxx	N-F	SMA-F	+5, +12, +24, ±48	1100 - 1700	DC Pass

### FPL-Series Lightning Arrestors 400 – 2700 MHz

The 400 - 2700 MHz FPL series are RF broadband devices designed for surge and lightning protection applications where DC Pass is required to power the electronics. The FPL units offers excellent surge / lightning suppression for distributed antenna systems (DAS), tower top amplifiers, GPS applications requiring a DC Pass design, and more. The FPL series demonstrates excellent RF characteristics while offering outstanding surge protection.

- Max RF Power: 300 W RMS
- Maximum Transient (Imax): 25kA (1x)
- Multiple Strike (IN): 15 kA (10x)
- Rugged and Waterproof IP67 Rated
- Very Low Let-Through Voltage
- Excellent RF Performance
- DC Pass
- Bulkhead Mounting
- Broadband Design



<u>Part Number</u>	<u>Surge</u>	<b>Protected</b>	<u>Voltage</u>	Freqeuncy (MHz)	Туре
FPLNFNFAP06	N-F	N-F	±6	400 - 2700	DC Pass
FPLNFNMAP06	N-F	N-M	±6	400 - 2700	DC Pass
FPLNMNFAP06	N-M	N-F	±6	400 - 2700	DC Pass
FPLTFTFAP06	TNC-F	TNC-F	±6	400 - 2700	DC Pass
FPLTFTMAP06	TNC-F	TNC-M	±6	400 - 2700	DC Pass
FPLTFSFAP06	TNC-F	SMA-F	±6	400 - 2700	DC Pass
FPLNFSFAP06	N-F	SMA-F	±6	400 - 2700	DC Pass
FPLNFNFAP36	N-F	N-F	±36	400 - 2700	DC Pass
FPLNFNMAP36	N-F	N-M	±36	400 - 2700	DC Pass
FPLNMNFAP36	N-M	N-F	±36	400 - 2700	DC Pass

### Gas Discharge Tube Arrestors PTC G-Series

Our PTC G-Series is a popular line of Gas Discharge Tube (GDT) arrestor solutions for GPS/GNSS applications. The G-Series has N-Type and TNC connector options available, as well as SMA Normal and Reverse Polarity options. A complete list of standard PTC G-Series offered by NexTek can be found in the table below.

#### Features:

- RF Power: 100 W Maximum (frequency dependent)
- Through Current: 65 Vdc / 5A Maximum
- Maximum Transient (Imax): 20kA (1x)
- Multiple Strike (IN): 5 kA (10x)
- Rugged and Waterproof IP68 Rated when Mated
- Bi-Directional Protection
- DC Pass
- Bulkhead Grounding
- L-Bracket and Wire Lug Available



PTCTNFSAF20G

Part Number	Mounting Side Conn.	Flange Side Conn.	Frequency (GHz)	Protection Voltage	<u>Polarity</u>
PTCONFONF20G	N-F	N-F	DC - 12.5	200	Normal
PTCONMONF20G	N-F	N-M	DC - 12.5	200	Normal
PTCTNFSAF20G	TNC-F	SMA-F	DC - 11	200	Normal
PTCTNFSAF40G	TNC-F	SMA-F	DC - 11	400	Normal
PTCSAFSAF20G	SMA-F	SMA-F	DC - 12.5	200	Normal
PTCSAMSAF20G	SMA-F	SMA-M	DC - 12.5	200	Normal
PTCSJMSJM20G	RP SMA-Jack	RP SMA-Jack	DC - 12.5	200	Reverse
PTCSPFSJM20G	RP SMA-Jack	RP SMA-Plug	DC - 12.5	200	Reverse
PTCSAFSJM20G	RP SMA-Jack	SMA-F	DC - 12.5	200	Mixed Normal & Reverse
PTCSJMSAF20G	SMA-F	RP SMA-Jack	DC - 12.5	200	Mixed Normal & Reverse
PTCSPFSAF20G	SMA-F	RP SMA-Plug	DC - 12.5	200	Mixed Normal & Reverse
PTCSAMSJM20G	RP SMA-Jack	SMA-M	DC - 12.5	200	Mixed Normal & Reverse

### Gas Discharge Tube Arrestors PTC S-Series

The PTC S-series GDT arrestors are ideal for small form factor or radio installations where space or costs are more important than actual surge protection. We also offer PTC-series arrestors with integrated coax cables with MMCX or other connector terminations that take lower voltage units with TNC to MMCX connectors to another level. In using a GDT solution, we suggest the use of the lowest voltage GDT available in the PTC product series.

#### Features:

- Protection Voltages: 90V, 150V, 230V higher protection voltages are available
- RF Power @ 90V: 37 W
- Bi-Directional Protection
- DC Pass
- IP68 Rated when Mated



PTCTNFMMF09S

Part Number	Mounting Side Conn.	Flange Side Conn.	Frequency (GHz)	Protection Voltage	Max Transient 8x20µs	Multiple Strike
PTCONFSAF09S	N-F	SMA-F	DC - 2.5	90V	40 kA	20 kA (10x)
PTCONFONF095	N-F	N-F	DC - 3.2	90V	50 kA	20 kA (10x)
PTCONMONF095	N-M	N-F	DC - 3.2	90V	50 kA	20 kA (10x)
PTCSAMSAF09S	SMA-M	SMA-F	DC - 2.5	90V	10 kA	7.5 kA (10x)
PTCTNFMMF095	TNC-F	MMCX-F	DC - 6	90V	3 kA	2 kA (10x)
PTCTNFTNF09S	TNC-F	TNC-F	DC - 2.5	90V	40 kA	20 kA (10x)
PTCTNMTNF095	TNC-M	TNC-F	DC - 2.5	90V	40 kA	20 kA (10x)

### Gas Discharge Tube Arrestors PTR-Series

Replaceable GDT arrestors provide wideband performance and excellent all-around protection from lightning and other transient sources. These arrestors will pass DC current, and their RF Power rating is defined by the GDT Operating Voltage. Arrestors that use a single-stage GDT design general have extremely wide RF pass bands, and can cover the DC to 3GHz+ range within a single device. The difference as compared to the PTC series is the ability to replace the Gas Tube itself in the field, to extend the product lifetime.

- Frequency: DC 3.2 GHz (Slight variance between models)
- Connector options: N-Type, TNC, SMA
- Replaceable Gas Discharge Tube
- Multiple Strike Capability
- Bi-directional Protection
- Rugged and Waterproof
- High RF Power and Low PIM



<u>Part Number</u>	Mounting Side Conn.	Flange Side Conn.	Frequency (GHz)	Protection Voltage	Max Transient 8x20µs	<u>Multiple Strike</u>
PTRONFONF095	N-F	N-F	DC - 3.2	90V	50 kA	20 kA
PTRONMONF095	N-M	N-F	DC - 3.2	90V	50 kA	20 kA
PTRONFSAF09S	N-F	SMA-F	DC - 2.5	90V	40 kA	20 kA
PTRTNFTNF09S	TNC-F	TNC-F	DC - 2.5	90V	40 kA	20 kA
PTRTNMTNF09S	TNC-M	TNC-F	DC - 2.5	90V	40 kA	20 kA
PTRT7FT7F09S	TNC-F 75Ω	TNC-F 75Ω	DC - 0.750	90V	40 kA	20 kA
PTRT7MT7F09S	TNC-M 75Ω	TNC-F 75Ω	DC - 0.750	90V	40 kA	20 kA

### Quarter-Wave Stub Arrestors QWS-Series

Quarter Wavelength Shorted Stub arrestors provide excellent response and transient handling characteristics, do not age or wear out over time, and are DC-blocked by design. Because they use an internal dead short, there is no "turn-on" or "response" time. Quarter wavelength stubs are "always-on" and limiting energy that is outside of the rated RF Pass Band(s). QWS Models use a traditional T-style form factor in their designs for maximum retrofit/replacement capabilities. Some of the QWS designs exhibit extremely wideband characteristics.

- QWSNFNx0500 Ideal for C, X, and Ku Band
- QWSNFNx0600 Ideal for 802.11, UNII, ISM, Satellite, and LTE Applications
- N-Type Female-Female or N-Type Female-Male options
- Maximum Transient (Imax): 60kA (1x)
- RF Power: See table below
- DC Block
- Normal and Reverse Polarity
- IP68 Rated when Mated



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Part Number	<u>Surge</u>	<u>Protected</u>	Frequency (GHz)	<u>RF Power</u>	<u>Max Transient</u> <sup>8x20µs</sup>	<u>Let-Through</u>
QWSNFNF0500	N-F	N-F	5.2 - 18.0	375 Wcw @ 5GHz 200 Wcw @ 12 GHz 150 Wcw @ 18 GHz	60 kA	1.2 V <sub>pk</sub> / 250 nJ
QWSNFNM0500	N-F	N-M	5.2 - 18.0	375 Wcw @ 5GHz 200 Wcw @ 12 GHz 150 Wcw @ 18 GHz	60 kA	1.2 V <sub>pk</sub> / 250 nJ
QWSNFNF0600	N-F	N-F	2.2 - 7.6	$0.5 \text{ kW}_{\text{avg}} / 4 \text{ kW}_{\text{pk}}$	60 kA	3 V <sub>pk</sub> / 500 nJ
QWSNFNM0600	N-F	N-M	2.2 - 7.6	0.5 kW <sub>avg</sub> / 4 kW <sub>pk</sub>	60 kA	3 V <sub>pk</sub> / 500 nJ

### Accessories

NexTek, LLC. has developed an array of Grounding Plate, Ground Strap, Lightning/Surge Arrestor Mounting Brackets, Handheld Voltage Testers, Grounding Kits, and more to provide professionally engineered mounting and grounding solutions for our entire line of RF Coaxial Lightning Arrestors and Power/LAN Suppressors. These solutions provide a means to ground and mount a single arrestor to a mounting bracket and mechanically affix a cable and cable lug assembly kit or mount direct bulkhead-style. Or provide grounding multiple lightning protectors and applications with a common, single-point ground system by using



Part Number	Туре	Description	For Use With
400-0001-01	Replacement GDT	Replacement Gas Discharge Tube (GDT), 90V	Replacement GDT for 90V PTR Series arrestors
504-0045-01	Ground Lug	10 AWG, Medium Duty TNC Ground Lug	TNC-F Bulkhead (0.440") Mount
504-0045-03	Ground Lug	6 AWG, Heavy Duty Ground Lug	N-F Bulkhead (0.540") Mount
504-0045-06	Ground Lug	8 AWG, Medium Duty Ground Lug	FPL series arrestors w/ 0.750" Bulkhead Mount
750-0088-01	L-Brackets	Mounting L-Bracket with Type N Connectors	Any arrestor w/ N-F Bulkhead Mount
750-0088-02	L-Brackets	Mounting L-Bracket with BNC/TNC Connectors	Any arrestor w/ TNC-F Bulkhead Mount
750-0632-00	L-Brackets	Mounting L-Bracket for FPL Series - Single Unit	FPL Series exclusive L-Bracket
782-0009-00	L-Brackets	Mounting L-Bracket for PTC G Series	PTC G Series exclusive L-Bracket
CUSPGN	Single Point Grounding System	Single Point Grounding Kit	Single Point Grounding Panel w/ Straps
KIT0010	Grounding Wire & Lug Kit	3-ft., 8 AWG Insulated Ground Wire with Ground & Compression Lug	FPL Series arrestors w/ 3/4" Bulkhead Mount
KIT0011	Grounding Wire & Lug Kit	3-ft., 8 AWG Insulated Ground Wire with L-Bracket, Ground, & Compression Lug	FPL Series arrestors w/ 3/4" Bulkhead Mount
KIT0020	Grounding Wire & Lug Kit	3-ft., 6 AWG Insulated Ground Wire with Ground & Compression Lug	Any arrestor w/ N-F Bulkhead Mount
PVT-HH	Handheld Tester	Protection Voltage Tester, Hand Held	Test any surge arrestor's voltage level

#### Who we are and what we do

**Since 1986,** NexTek is recognized as a World-Class leading supplier of innovative, high-quality coaxial RF surge protection devices (SPD's) and EMI/EMC/EMP Filters and capacitor products that protect critical and sensitive electronic equipment. NexTek is a proven innovative supplier with an extensive coaxial product offering covering a vast range from DC to 18 GHz. NexTek designs and manufactures these products from its Billerica, Massachusetts USA headquarters, approximately 30 minutes from Boston.

All NexTek Coaxial and EMI Filter products feature field proven designs and construction. Products come with a Ten (10) year factory warranty. These SPD and EMI Filter products are designed to withstand harsh environmental conditions. With hundreds of thousands of products installed and operational on all seven (7) continents and in many space applications, NexTek has built an exceptional reputation for quality and service.

NexTek is continually expanding its product offering, so please visit our website for the latest news and product releases. www.nextek.com

Other Filter and Surge Arrestor Products from NexTek:

- RF Coaxial Surge Protector Devices
- DC/AC Power Line Surge Suppressors DCL Series and ACL Series
- Apapters and Custom Connectors
- Coaxial HIRF Limiters
- Data Line Surge Suppressors DLP Series
- Grounding Kits and Hardware

The information contained in the brochure is accurate and representative of the parts described herein. NexTek reserves the right to make necessary modifications to the part without notice to implement improvements as required.



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