ROJONE®
PTY. LTD.

# *Lightning and Surge Protection*

*Military, Industrial and Commercial Solutions*

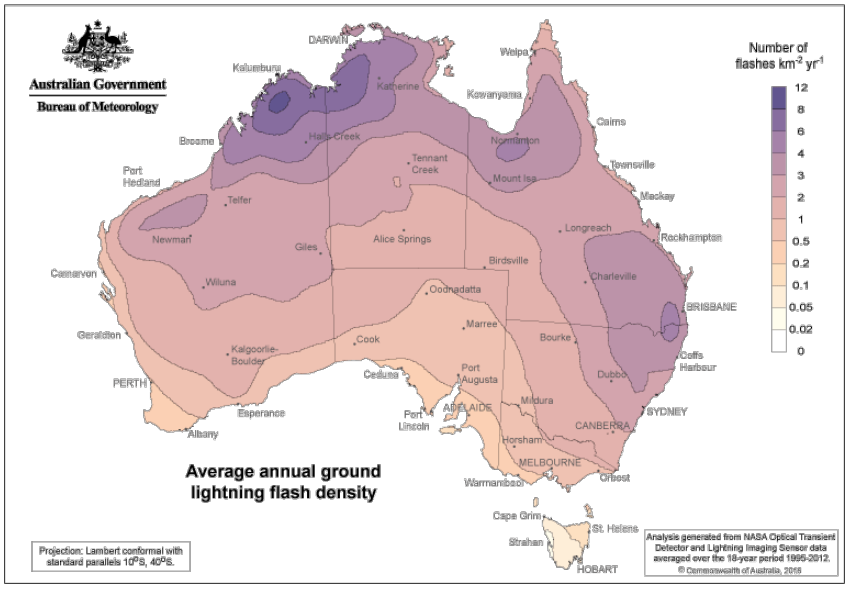
# Lightning Protection

Welcome to our Lightning & Surge Protection catalogue; we hope you will find this catalogue both informative and easy to use and that you can find a product that meets your exact needs. However, if you need more assistance or more information, please contact our experienced sales team to assist you: sales@rojone.com.au.

Through our partners Times Microwave Systems and L-com, Rojone has put together a comprehensive catalogue of products that will assist you in protecting your network and equipment.

## Frequency

Lightning is a highly variable phenomenon, with Australia suffering multiple millions of strikes hitting it each year. In 2020, more than 2.24 million lightning strikes hit the Australian east coast in 48 hours. This constant and unpredictable risk jeopardises a range of electrical equipment and networks that have exposure to the elements. Engineers must ensure that their equipment and networks are protected with highly reliable lightning and surge protectors.




*Source: Bureau of Meteorology*

| Item No. | Min (MHz) | Max (MHz) | DC Blocked | DC Block. (Uni.) | DC Pass | Gas Tube | DC Block. (S/Sate) | Impedence (Ω) | PIM | Insertion Loss (< dB) | Avg Power (Watts) | VSWR (Max) | Connector (Surge) | Gender (Surge) | Connector (Prot.) | Gender (Prot.) | Square Shape | Round Shape | IP Rating | Bulkhead Design | Bracket Supplied | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-LP-GTR-DFF | DC | 2500 | | | ● | | | 50 | | 0.1 | 50 | 1.1 | 7/16 | F | 7/16 | F | ● | | IP67 | ● | ● | 16 |
| TC-LP-GTR-DFM | DC | 2500 | | | ● | | | 50 | | 0.1 | 50 | 1.1 | 7/16 | M | 7/16 | M | ● | | IP67 | ● | ● | 16 |
| TC-LP-GTR-DFF-23 | DC | 2500 | | | ● | | | 50 | | 0.1 | 210 | 1.08 | 7/16 | F | 7/16 | F | ● | | IP67 | ● | ● | 17 |
| TC-LP-GTR-DFM-23 | DC | 2500 | | | ● | | | 50 | | 0.1 | 210 | 1.08 | 7/16 | M | 7/16 | M | ● | | IP67 | ● | ● | 17 |
| TC-LP-GTR-DFF-35 | DC | 2500 | | | ● | | | 50 | | 0.1 | 550 | 1.1 | | F | 7/16 | F | ● | | IP67 | ● | ● | 18 |
| TC-LP-GTR-DFM-35 | DC | 2500 | | | ● | | | 50 | | 0.1 | 550 | 1.1 | 7/16 | M | 7/16 | M | ● | | IP67 | ● | ● | 18 |
| TC-LP-GTR-NFF | DC | 3000 | | | ● | | | 50 | | 0.1 | 50 | 1.1 | N | F | N | F | | ● | IP67 | ● | ● | 13 |
| TC-LP-GTR-NFM | DC | 3000 | | | ● | | | 50 | | 0.1 | 50 | 1.1 | N | F | N | M | | ● | IP67 | ● | ● | 13 |
| TC-LP-GTR-NFF-23 | DC | 3000 | | | ● | | | 50 | | 0.1 | 210 | 1.1 | N | F | N | F | | ● | IP67 | ● | ● | 14 |
| TC-LP-GTR-NFM-23 | DC | 3000 | | | ● | | | 50 | | 0.1 | 210 | 1.1 | N | F | N | M | | ● | IP67 | ● | ● | 14 |
| TC-LP-GTR-NFF-35 | DC | 3000 | | | ● | | | 50 | | 0.1 | 550 | 1.1 | N | F | N | F | | ● | IP67 | ● | ● | 15 |
| TC-LP-GTR-NFM-35 | DC | 3000 | | | ● | | | 50 | | 0.1 | 550 | 1.1 | N | F | N | M | | ● | IP67 | ● | ● | 15 |
| TC-LP-18-195-NF-X | DC | 6000 | | | ● | | | 50 | | 0.6 | 150 | 1.3 | N | F | EZ-195-X | | | ● | IP67 | ● | | 26 |
| TC-LP-18-195-NMH-X | DC | 6000 | | | ● | | | 50 | | 0.6 | 150 | 1.3 | N | M | EZ-195-X | | | ● | IP67 | | | 26 |
| TC-LP-18-240-NF-X | DC | 6000 | | | ● | | | 50 | | 0.6 | 150 | 1.3 | N | F | EZ-240-X | | | ● | IP67 | ● | | 27 |
| TC-LP-18-240-NMH-X | DC | 6000 | | | ● | | | 50 | | 0.6 | 150 | 1.3 | N | M | EZ-240-X | | | ● | IP67 | | | 27 |
| TC-LP-18-400-NF-X | DC | 6000 | | | ● | | | 50 | | 0.15 | 150 | 1.15 | N | F | EZ-400-X | | | ● | IP67 | ● | | 28 |
| TC-LP-18-400-NMH-X | DC | 6000 | | | ● | | | 50 | | 0.15 | 150 | 1.15 | N | M | EZ-400-X | | | ● | IP67 | | | 28 |
| TC-LP-GTV-NFF | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | N | F | N | F | | ● | IP67 | ● | | 19 |
| TC-LP-GTV-NFM | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | N | F | N | M | | ● | IP67 | ● | | 19 |
| TC-LP-GTV-SFF | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | SMA | F | SMA | F | | ● | IP67 | ● | | 20 |
| TC-LP-GTV-SFM | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | SMA | F | SMA | M | | ● | IP67 | ● | | 20 |
| TC-LP-GTV-TFF | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | TNC | F | TNC | F | | ● | IP67 | ● | | 21 |
| TC-LP-GTV-TFM | DC | 7000 | | | ● | | | 50 | | 0.2 | 150 | 1.2 | TNC | F | TNC | M | | ● | IP67 | ● | | 21 |

| Item No. | Min (MHz) | Max (MHz) | DC Blocked | DC Block. (Uni.) | DC Pass | Gas Tube | DC Block. (S/Sate) | Impedence (Ω) | PIM | Insertion Loss (< dB) | Avg Power (Watts) | VSWR (Max) | Connector (Surge) | Gender (Surge) | Connector (Prot.) | Gender (Prot.) | Square Shape | Round Shape | IP Rating | Bulkhead Design | Bracket Supplied | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-LP-HBR-NFF | 1.8 | 100 | | ● | | | | 50 | | 0.1 | 2000 | 1.06 | N | F | N | F | | ● | | ● | | 4 |
| TC-LP-HBR-NMP | 1.8 | 100 | | ● | | | | 50 | | 0.1 | 2000 | 1.06 | N | F | N | M | | ● | | ● | | 4 |
| TC-LP-HBR-NMS | 1.8 | 100 | | ● | | | | 50 | | 0.1 | 2000 | 1.06 | N | M | N | F | | ● | | ● | | 4 |
| TC-LP-HBR-UFF | 1.8 | 100 | | | | ● | | 50 | | 0.1 | 200 | 1.06 | N | F | N | F | | ● | | ● | | 5 |
| TC-LP-HBR-UMP | 1.8 | 100 | | | | ● | | 50 | | 0.1 | 200 | 1.06 | N | F | N | M | | ● | | ● | | 5 |
| TC-LP-HBR-UMS | 1.8 | 100 | | | | ● | | 50 | | 0.1 | 200 | 1.06 | N | M | N | F | | ● | | ● | | 5 |
| TC-LP-BTR-NFF | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | F | N | F | ● | | | ● | ● | 1 |
| TC-LP-BTR-NMP | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | F | N | M | ● | | | ● | ● | 1 |
| TC-LP-BTR-NMS | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | M | N | F | ● | | | ● | ● | 1 |
| TC-LP-BTRW-NFF | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | F | N | F | | ● | IP67 | ● | ● | 2 |
| TC-LP-BTRW-NMP | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | F | N | M | | ● | IP67 | ● | ● | 2 |
| TC-LP-BTRW-NMS | 20 | 1000 | ● | | | | | 50 | | 0.1 | 375 | 1.1 | N | M | N | F | | ● | IP67 | ● | ● | 2 |
| TC-LP-HBX-NFF | 100 | 700 | ● | | | | | 50 | | 0.1 | 750 | 1.15 | N | F | N | F | | ● | | ● | | 3 |
| TC-LP-HBX-NMP | 100 | 700 | ● | | | | | 50 | | 0.1 | 750 | 1.15 | N | F | N | F | | ● | | ● | | 3 |
| TC-LP-HBX-NMS | 100 | 700 | ● | | | | | 50 | | 0.1 | 750 | 1.15 | N | M | N | F | | ● | | ● | | 3 |
| TC-LP-STRL-NFF | 680 | 2200 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | F | ● | | IP67 | ● | | 8 |
| TC-LP-STRL-NMP | 680 | 2200 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | M | ● | | IP67 | ● | | 8 |
| TC-LP-STRL-NMS | 680 | 2200 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | M | N | F | ● | | IP67 | ● | | 8 |
| TC-LP-STRL-NMS | 680 | 2200 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | F | 7/16 | F | ● | | IP67 | ● | | 8 |
| TC-LP-STRL-DFP | 680 | 2200 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | F | 7/16 | M | ● | | IP67 | ● | | 9 |
| TC-LP-STRL-DFS | 680 | 2200 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | M | 7/16 | F | ● | | IP67 | ● | | 9 |
| LCSP1000 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 500 | 1.1 | N | F | N | F | | ● | IP67 | ● | | 32 |
| LCSP1001 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 500 | 1.1 | N | F | N | M | | ● | IP67 | ● | | 32 |
| LCSP1002 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 500 | 1.1 | N | F | N | M | | ● | IP67 | ● | ● | 32 |
| LCSP1003 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | M | | ● | IP67 | ● | | 32 |

| Item No. | Min (MHz) | Max (MHz) | DC Blocked | DC Block. (Uni.) | DC Pass | Gas Tube | DC Block. (S/Sate) | Impedence (Ω) | PIM | Insertion Loss (< dB) | Avg Power (Watts) | VSWR (Max) | Connector (Surge) | Gender (Surge) | Connector (Prot.) | Gender (Prot.) | Square Shape | Round Shape | IP Rating | Bulkhead Design | Bracket Supplied | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LCSP1004 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 1000 | 1.1 | 7/16 | F | 7/16 | F | | ● | IP67 | ● | | 33 |
| LCSP1005 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 1000 | 1.1 | 7/16 | F | 7/16 | M | | ● | IP67 | ● | | 33 |
| LCSP1006 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 1000 | 1.1 | 7/16 | F | 7/16 | M | | ● | IP67 | ● | ● | 33 |
| LCSP1007 | 698 | 2700 | ● | | | | | 50 | | 0.1 | 1000 | 1.1 | 7/16 | F | 7/16 | M | | ● | IP67 | ● | ● | 33 |
| LCSP1008 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 1000 | 1.1 | 7/16 | F | 7/16 | M | | ● | IP67 | ● | | 33 |
| LCSP1051 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 4.3-10 | F | 4.3-10 | F | | ● | IP67 | ● | | 34 |
| LCSP1060 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 4.3-10 | M | 4.3-10 | F | | ● | IP67 | ● | | 34 |
| LCSP1061 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 4.3-10 | F | 4.3-10 | F | | ● | IP67 | ● | | 34 |
| LCSP1062 | 698 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 4.3-10 | F | 4.3-10 | M | | ● | IP67 | ● | | 34 |
| TC-LP-STRH-NFF | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | F | ● | | IP67 | ● | | 10 |
| TC-LP-STRH-NMP | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | M | ● | | IP67 | ● | | 10 |
| TC-LP-STRH-NMS | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | N | M | N | F | ● | | IP67 | ● | | 10 |
| TC-LP-STRH-DFF | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | F | 7/16 | F | ● | | IP67 | ● | | 11 |
| TC-LP-STRH-DMP | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | M | 7/16 | F | ● | | IP67 | ● | | 11 |
| TC-LP-STRH-DMS | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | M | 7/16 | F | ● | | IP67 | ● | | 11 |
| TC-LP-STRH-43FF | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 4.3-10 | F | 4.3-10 | F | ● | | IP67 | ● | | 12 |
| TC-LP-STRH-43MP | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 4.3-10 | F | 4.3-10 | M | ● | | IP67 | ● | | 12 |
| TC-LP-STRH-43MS | 700 | 2700 | ● | | | | | 50 | ● | 0.1 | 700 | 1.1 | 4.3-10 | M | 4.3-10 | F | ● | | IP67 | ● | | 12 |
| ALQP-DFDFB | 800 | 2250 | ● | | | | | 50 | | 0.1 | 500 | 1.1 | 7/16 | F | 7/16 | F | ● | | | ● | | 35 |
| ALQP-DMDFB | 800 | 2250 | ● | | | | | 50 | | 0.1 | 500 | 1.1 | 7/16 | M | 7/16 | F | ● | | | ● | | 35 |
| ALQP-NFNFB | 800 | 2250 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 7/16 | F | 7/16 | F | ● | | | ● | | 35 |
| ALQP-NMNFB | 800 | 2250 | ● | | | | | 50 | ● | 0.1 | 500 | 1.1 | 7/16 | M | 7/16 | F | ● | | | ● | | 35 |
| TC-LP-STR-NFF | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | F | ● | | IP67 | ● | | 6 |
| TC-LP-STR-NMP | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | F | N | M | ● | | IP67 | ● | | 6 |

| Item No. | Min (MHz) | Max (MHz) | DC Blocked | DC Block. (Uni.) | DC Pass | Gas Tube | DC Block. (S/Sate) | Impedence (Ω) | PIM | Insertion Loss (< dB) | Avg Power (Watts) | VSWR (Max) | Connector (Surge) | Gender (Surge) | Connector (Prot.) | Gender (Prot.) | Square Shape | Round Shape | IP Rating | Bulkhead Design | Bracket Supplied | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-LP-STR-NMS | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 500 | 1.1 | N | M | N | F | ● | | IP67 | ● | | 6 |
| TC-LP-STR-DFF | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | F | 7/16 | F | ● | | IP67 | ● | | 7 |
| TC-LP-STR-DMP | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | F | 7/16 | M | ● | | IP67 | ● | | 7 |
| TC-LP-STR-DMS | 800 | 2500 | ● | | | ● | | 50 | ● | 0.1 | 700 | 1.1 | 7/16 | M | 7/16 | F | ● | | IP67 | ● | | 7 |
| TC-LP-GPX-05-NFF | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | N | F | N | F | | ● | IP65 | ● | | 22 |
| TC-LP-GPX-05-NFM | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | N | F | N | M | | ● | IP66 | ● | | 22 |
| TC-LP-GPX-05-SFF | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | SMA | F | SMA | F | | ● | IP65 | ● | | 23 |
| TC-LP-GPX-05-SFM | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | SMA | F | SMA | M | | ● | IP65 | ● | | 23 |
| TC-LP-GPX-05-TFF | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | TNC | F | TNC | F | | ● | IP65 | ● | | 24 |
| TC-LP-GPX-05-TFM | 1000 | 2000 | | | | | ● | 50 | | 0.1 | 50 | 1.2 | TNC | F | TNC | M | | ● | IP65 | ● | | 24 |
| TC-LP-WBX-NFF | 2000 | 6000 | ● | | | | | 50 | | 0.2 | 50 | 1.2 | N | F | N | F | | ● | IP65 | ● | | 25 |
| TC-LP-WBX-NMP | 2000 | 6000 | ● | | | | | 50 | | 0.2 | 50 | 1.2 | N | F | N | M | | ● | IP65 | ● | | 25 |
| TC-LP-WBX-NMS | 2000 | 6000 | ● | | | | | 50 | | 0.2 | 50 | 1.2 | N | M | N | F | | ● | IP65 | ● | | 25 |

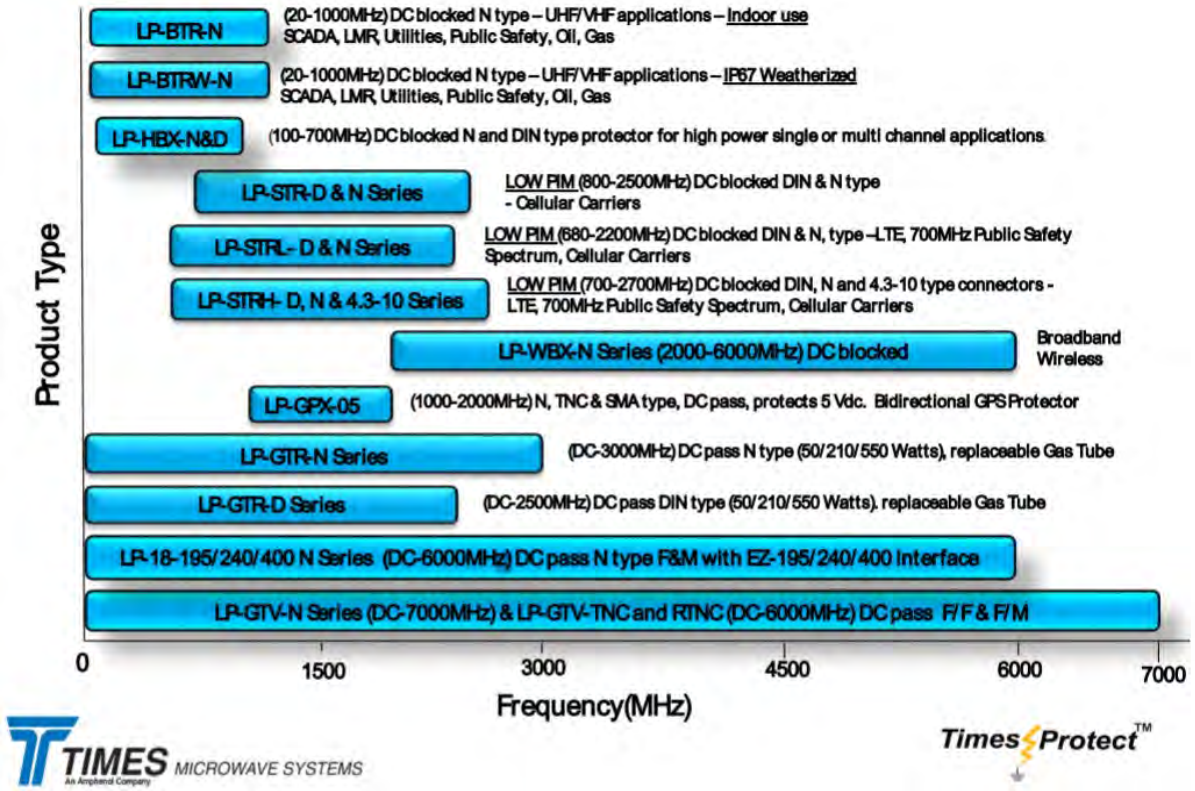
# Times Microwave

Times Microwave Systems is an established and trusted brand within the wireless communications, Military and Aerospace industries. Their engineering expertise and range of manufacturing capabilities are unmatched in the industry. With production facilities in the US and China, they address specialised applications with extremely demanding performance requirements and high-volume commercial applications.

The company's innovative Times-Protect™ line of surge and lightning protection products address a range of applications throughout the entire RF frequency range from DC to 6GHz.

The Times Microwave range of lightning protection devices has been designed in the same form factor as other competitive company ranges. This same form factor enables customers to purchase the Times product as a direct replacement at a competitive price and is readily available.

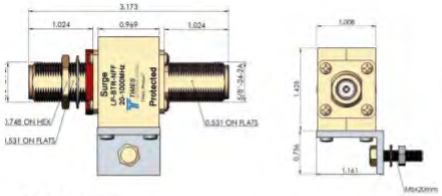
The advantage you will immediately notice is the quality build. The Times Microwave range of lightning protection is constructed with white bronze plated solid brass bodies vs aluminium seen in competing products. This range has superior PIM characteristics, broader bandwidths, higher power, lower loss, IP67 weatherproofing and engraved markings that will not degrade outdoors.



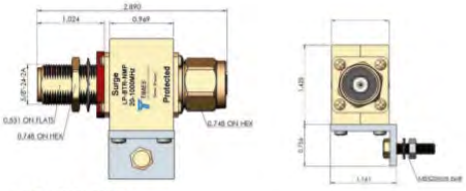
# TC-LP-BTR-N

Times Microwave LP-BTR-N series high-performance surge arrestors address applications in the 20-1000MHz spectrum. The unique DC blocking technology employed in this design provides optimum isolation of the antenna port from the protected equipment port for maximum surge protection. LP-BTR-N surge protectors have exceptional RF performance and are constructed from the highest quality materials for unsurpassed durability and longevity. These units meet and surpass all applicable industry standards. The LP-BTR-N product family is available with N connector configurations to satisfy various installation requirements.

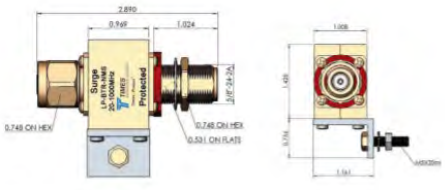
| | |
|---|---|
| **Part Number** | **TC-LP-BTR-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-BTR-NMP** |
| **Connector** | N Male on protected, N Female on Surge |
| **Part Number** | **TC-LP-BTR-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 20-1000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB |
| **Insertion Loss** | <0.1dB |
| **Impulse Discharge** | 10kA multiple (8□20µs wave-form) |
| **Turn-On Voltage** | 600VDC ± 20% |
| **Energy Throughput** | <200µj (4kV/2kA 1.2□50/8□20µs wave-form) |
| **Power Handling at Frequency** | 375W (20-220MHz)<br>125W (220-700Mhz)<br>50W (700-1000Mhz) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 250 grams |



• LP-BTR-NFF
20-1000MHz DC Blocked N Type F/F



• LP-BTR-NMP
20-1000MHz DC Blocked N Type M on Protected

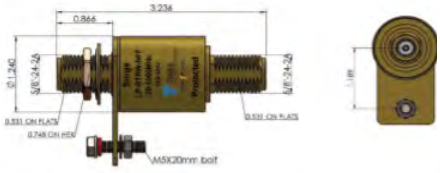


• LP-BTR-NMS
20-1000MHz DC Blocked N Type M on Surge

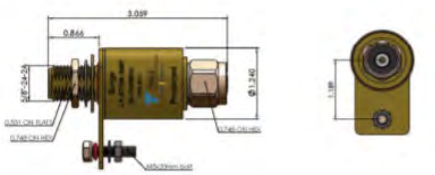
# TC-LP-BTRW


Times Microwave LP-BTRW series high-performance surge arrestors address applications in the 20MHz-1000MHz spectrum. Impedance DC blocking technology employed in this design provides optimum isolation of the antenna port from the protected equipment port for maximum surge protection. LP-BTRW surge protectors have exceptional RF performance and are constructed from the highest quality materials for unsurpassed durability and longevity. These units meet and surpass all applicable industry standards. The LP-BTRW product family is available with N connector configurations and fully weatherized to the IP67 standard for outdoor use.

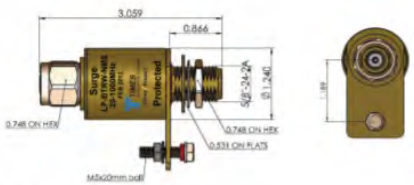
| | |
|---|---|
| **Part Number** | **TC-LP-BTRW-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-BTRW-NMP** |
| **Connector** | N Male on protected, N Female on Surge |
| **Part Number** | **TC-LP-BTRW-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 20-1000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB |
| **Insertion Loss** | <0.1dB |
| **Impulse Discharge** | 10kA multiple (8x20µs wave-form) |
| **Turn-On Voltage** | 600VDC ± 20% |
| **Energy Throughput** | <200µj (6kV/2kA 1.2x50/8x20µs wave-form) |
| **Power Handling at Frequency** | 375W (20-220MHz)<br>125W (220-700MHz)<br>50W (700-1000MHz) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 250 grams |



• LP-BTRW-NFF
20-1000MHz DC Blocked N Type F/F



• LP-BTRW-NMP
20-1000MHz DC Blocked N Type M on Protected

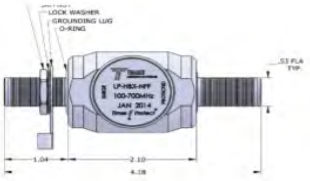


• LP-BTRW-NMS
20-1000MHz DC Blocked N Type M on Surge

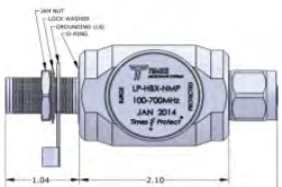
# TC-LP-HBX-N

Times Microwave LP-HBX-N series high-performance surge arrestors address applications in the 100MHz-700MHz spectrum. The unique DC blocking technology employed in this design provides optimum isolation of the antenna port from the protected equipment port for maximum surge protection. LP-HBX-N surge protectors have exceptional RF performance and are constructed from the highest quality materials for unsurpassed durability and longevity. These units meet and surpass all applicable industry standards. The LP-HBX-N product family is available with N connector configurations to satisfy various installation requirements.

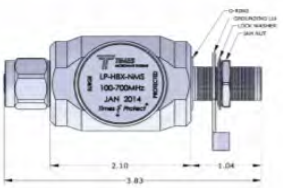
| | |
|---|---|
| **Part Number** | **TC-LP-HBX-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-HBX-NMP** |
| **Connector** | N Male on protected, N Female on Surge |
| **Part Number** | **TC-LP-HBX-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 100-700MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.15:1 / <-23dB |
| **Insertion Loss** | <0.1dB |
| **Power Handling** | 750W |
| **Max Surge Current** | 20kA multiple (8x20µs wave-form) |
| **Residual Pulse Current** | <5V@6kV/3kA (8x20µs wave-form) |
| **Energy Throughput** | <1.4µJ (6kV/3kA 1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 250 grams |



• LP-HBX-NFF
100-700MHz DC Blocked N Type F/F



• LP-HBX-NMP
100-700MHz DC Blocked N Type M on Protected

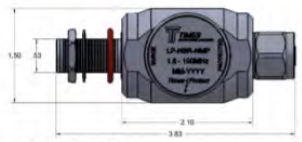


• LP-HBX-NMS
100-700MHz DC Blocked N Type M on Surge

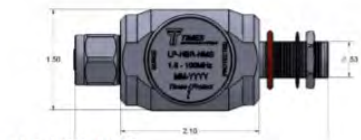
# TC-LP-HBR-N

Times Microwave LP-HBR-N series high performance surge arrestor series addresses applications in the 1.8–100MHz spectrum that includes the 160-6 Metre Amateur Radio Bands. Our DC blocking technology employed in this gas tube design provides optimum isolation of the antenna port from the protected equipment port for maximum surge protection. LP-HBR-N series surge protectors have exceptional RF performance and are constructed from the highest quality materials for unsurpasses durability and longevity. They equal or surpass all applicable industry standards.

| | |
|---|---|
| **Part Number** | **TC-LP-HBR-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-HBR-NMP** |
| **Connector** | N Male on protected, N Female on Surge |
| **Part Number** | **TC-LP-HBR-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 1.8–100MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.06:1 / <-30dB |
| **Insertion Loss** | <0.1dB |
| **Power Handling** | 2000W |
| **Max Surge Current** | 20kA Single Strike<br>10kA (8x20µs wave-form) Multiple Strikes |
| **Residual Pulse Current** | <5V@6kV/3kA (8x20µs wave-form) |
| **Energy Throughput** | <12mJ |
| **Protection Circuit** | DC Blocked, Uni Directional |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 227 grams |



• LP-HBR-NMP
1.8-100 MHz DC blocked N Male on Protected Side



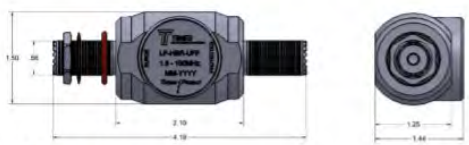
• LP-HBR-NMS
1.8-100 MHz Blocked N Male on Surge Side

• LP-HBR-NFF
1.8-100 MHz DC Blocked N Type F/F

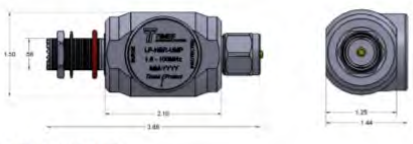
# TC-LP-HBR-U

Times Microwave LP-HBR-U series high performance surge arrestor series addresses applications in the 1.8-100MHz spectrum that includes the 160-6 meter amateur radio bands. Our unique DC blocking technology employed in this gas tube design provides optimum isolation of the antenna port from the protected equipment port for maximum surge protection. LP-HBR-U series surge protectors have exceptional RF performance and are constructed from the highest quality materials for unsurpassed durability and longevity. The equal or surpass all applicable industry standards.

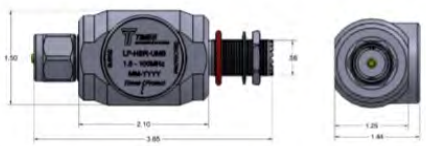
| | |
|---|---|
| **Part Number** | **TC-LP-HBR-UFF** |
| **Connector** | UHF Female on both sides |
| **Part Number** | **TC-LP-HBR-UMP** |
| **Connector** | UHF Male on Protected, UHF Female on Surge |
| **Part Number** | **TC-LP-HBR-UMS** |
| **Connector** | UHF Male on Surge, UHF Female on Protected |
| **Frequency** | 1.8–100MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.06:1 / <-30dB |
| **Insertion Loss** | <0.1dB |
| **Power Handling** | 2000W |
| **Max Surge Current** | 20kA Single Strike |
| **Energy Throughput** | <12mJ |
| **Impulse Spark Over Voltage** | 2000 Volts Nominal |
| **DC Turn On Voltage** | 1400 Volts Nominal |
| **Protection Circuit** | DC Blocked, Uni Directional |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 227 grams |



• LP-HBR-UFF
1.8 - 100MHz DC Blocked UHF Type F/F



• LP-HBR-UMP
1.8 - 100MHz DC Blocked UHF Male on Protected Side



• LP-HBR-UMS
1.8 - 100MHz DC Blocked UHF Male on Surge Side



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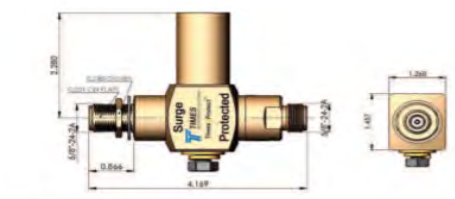
# TC-LP-STR-N

Times Microwave LP-STR-N high-performance series is an exceptional DC blocked design for outstanding surge performance, capable of withstanding multiple lightning strikes. The operating bandwidth of 680-2200MHz makes the LP-STR-N series suitable for a broad range of applications. This series has excellent passive intermodulation performance, outstanding RF performance over the entire operating band and superior power handling capability, the LP-STR-N product family is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

| | |
|---|---|
| **Part Number** | **TC-LP-STR-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-STR-NMP** |
| **Connector** | N Male on protected, N Female on Surge |
| **Part Number** | **TC-LP-STR-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 800-2500MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.13:1 / <-24dB (800-840MHz)<br><1.1:1 / <-26dB (840-2500MHz) |
| **Insertion Loss** | <0.1dB |
| **Power Handling** | 500W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <1nJ(4kV/2kA 1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 530 grams |



• LP-STR-NFF
800-2500MHz DC Blocked N Type F/F

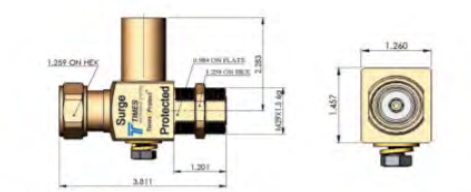
• LP-STR-NMP
800-2500MHz DC Blocked N Type M on Protecte

• LP-STR-NMS
800-2500MHz DC Blocked N Type M on Surge

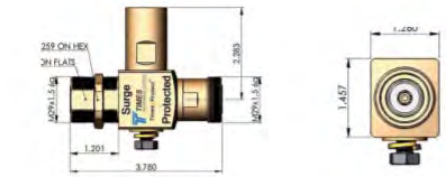
# TC-LP-STR-D

Times Microwave LP-STR-D high-performance series is an exceptional DC blocked design for outstanding surge performance. The operating bandwidth of 800-2500MHz makes the LP-STR-D series suitable for a broad range of applications. This series has excellent passive intermodulation performance, outstanding RF performance over the entire operating band and superior power handling capability, the LP-STR-D product family is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

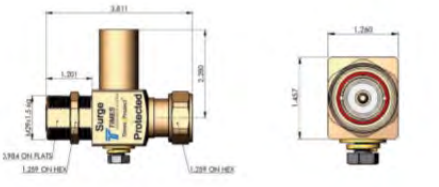
| | |
|---|---|
| **Part Number** | **TC-LP-STR-DFF** |
| **Connector** | 7/16 DIN Female on both sides |
| **Part Number** | **TC-LP-STR-DMP** |
| **Connector** | 7/16 DIN Male on Protected, 7/16 DIN Female on Surge |
| **Part Number** | **TC-LP-STR-DMS** |
| **Connector** | 7/16 DIN Male on Surge, 7/16 DIN Female on Protected |
| **Frequency** | 800-2500MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.13:1 / <-24dB (800-840MHz)<br><1.1:1 / <-26dB (840-2500MHz) |
| **Insertion Loss** | <0.1dB |
| **Power Handling** | 700W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <1nJ (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40˚C to +85˚C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 600 grams |



• LP-STR-DMS
800-2500MHz DC Blocked DIN Type M on Surge



• LP-STR-DFF
800-2500MHz DC Blocked DIN Type F/F

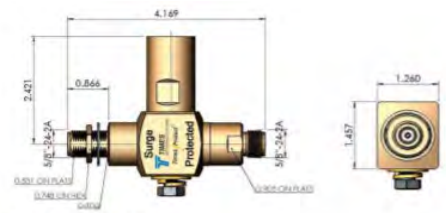


• LP-STR-DMP
800-2500MHz DC Blocked DIN Type M on Protected

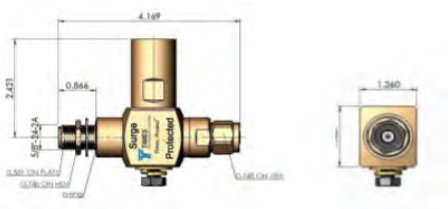
# TC-LP-STRL-N

Times Microwave LP-STRL-N high-performance series is an exceptional DC blocked design for outstanding surge performance, capable of withstanding multiple lightning strikes. The operating bandwidth of 680-2200MHz makes the LP-STRL-N series suitable for a broad range of applications. This design covers the 700MHz band for Public Safety Services as well as LTE (Long Term Evolution) applications. This series has excellent passive intermodulation performance, outstanding RF performance over the entire operating band and superior power handling capability. The LP-STRL-N product family is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

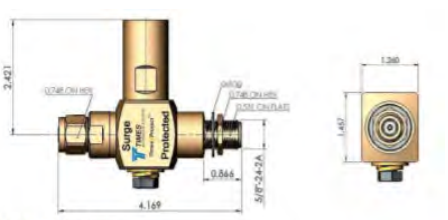
| | |
|---|---|
| **Part Number** | **TC-LP-STRL-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-STRL-NMP** |
| **Connector** | N Male on Protected, N Female on Surge |
| **Part Number** | **TC-LP-STRL-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 680-2200MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.13:1 / <-24dB (680-700MHz)<br><1.1:1 / <-26dB (700-2200MHz) |
| **Insertion Loss** | < 0.1dB |
| **PIM** | <-160dBc |
| **Average Power** | 500W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Max Surge Current** | 50kA (8x20µs wave-form) |
| **Energy Throughput** | <1nJ (4kV/2kA (1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 530 grams |



• LP-STRL-NFF
680-2200MHz DC Blocked N Type F/F



• LP-STRL-NMP
680-2200MHz DC Blocked N Type M on Protected

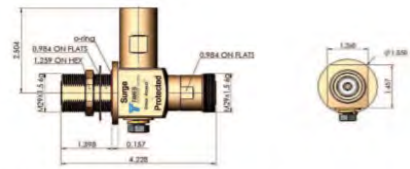


• LP-STRL-NMS
680-2200MHz DC Blocked N Type M on Surge

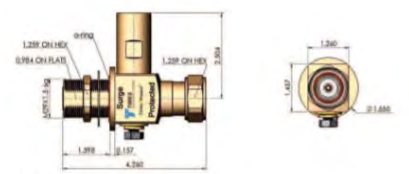
# TC-LP-STRL-D

Times Microwave LP-STRL-D high-performance series is an exceptional DC blocked designed protector. It has outstanding surge performance and is capable of withstanding multiple lightning strikes. The operating bandwidth of 680-2200MHz makes the LP-STRL-D series suitable for a broad range of applications. This design covers the 700MHZ band for Public Safety Services as well as LTE (Long Term Evolution) applications. The LP-STRL-D series has excellent passive intermodulation performance. As well as outstanding RF performance over the entire operating band and superior power handling capability, the LP-STRL-D product family is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

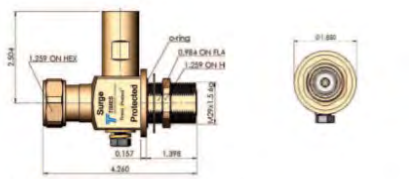
| | |
|---|---|
| **Part Number** | **TC-LP-STRL-DFF** |
| **Connector** | 7/16 DIN Female on both sides |
| **Part Number** | **TC-LP-STRL-DFP** |
| **Connector** | 7/16 DIN Male on Protected, 7/16 DIN Female on Surge |
| **Part Number** | **TC-LP-STRL-DFS** |
| **Connector** | 7/16 DIN Male on Surge, 7/16 DIN Female on Protected |
| **Frequency** | 680-2200MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.13:1 / <-24dB (680-700MHz)<br><1.1:1 / <-26dB (700-2200MHz) |
| **Insertion Loss** | < 0.1dB |
| **PIM** | <-160dBc |
| **Average Power** | 700W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Max Surge Current** | 50kA (8x20µs wave-form) |
| **Energy Throughput** | < 1nJ (4kV/2kA (1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 600 grams |



• LP-STRL-DFF
680-2200MHz DC Blocked DIN Type F/F



• LP-STRL-DMP
680-2200MHz DC Blocked DIN Type M on Protected

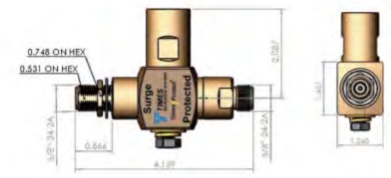


• LP-STRL-DMS
680-2200MHz DC Blocked DIN Type M on Surge

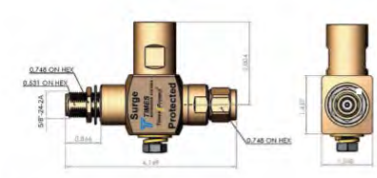
# TC-LP-STRH-N

Times Microwave LP-STRH-N is an exceptional DC blocked design for superior surge performance, capable of withstanding multiple lightning strikes. The operating band width of 700–2700MHz makes the LP-STRH-N suitable for a broad range of applications. With its excellent passive intermodulation performance, outstanding RF performance over the entire operating band and excellent power handling capability, the LP-STRH-N product is unequalled. Its fully wetherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

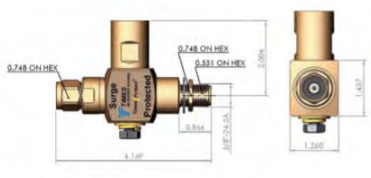
| | |
|---|---|
| **Part Number** | **TC-LP-STRH-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-STRH-NMP** |
| **Connector** | N Male on Protected, N Female on Surge |
| **Part Number** | **TC-LP-STRH-NMS** |
| **Connector** | N Male on Surge, N Female on Protected |
| **Frequency** | 700-2700MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.12:1 / <-24dB (700-840MHz)<br><1.1:1 / <-26dB (840-2700MHz) |
| **Insertion Loss** | < 0.1dB |
| **PIM** | <-160dBc |
| **Average Power** | 500W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Max Surge Current** | 50kA (8x20µs wave-form) |
| **Energy Throughput** | < 1nJ (4kV/2kA (1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 530 grams |



• LP-STRH-NFF
700-2700MHz DC Blocked N Type F/F



• LP-STRH-NMP
700-2700MHz DC Blocked N Type M on Protected



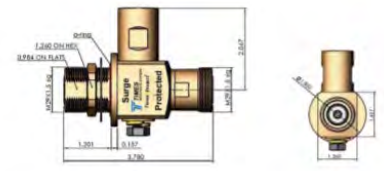
• LP-STRH-NMS
700-2700MHz DC Blocked N Type M on Surge

*All dimensions shown in inches

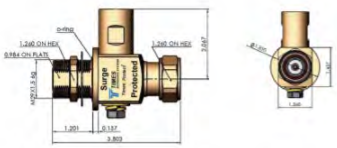
# TC-LP-STRH-D

Times Microwave LP-STRH-D is an exceptional DC blocked design for outstanding surge performance, capable of withstanding multiple lightning strikes. The operating band width of 700–2700MHz makes the LP-STRH-D series suitable for a broad range of applications. This design covers the 700MHz Band for Public Safety Services as well as LTE (Long Term Evolution) applications. With its excellent passive intermodulation performance, outstanding RF performance over the entire operating band and superior power handling capability the LP-STRH-D product family is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

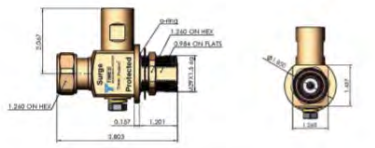
| | |
|---|---|
| **Part Number** | **TC-LP-STRH-DFF** |
| **Connector** | 7/16 DIN Female on both sides |
| **Part Number** | **TC-LP-STRH-DMP** |
| **Connector** | 7/16 DIN Male on protected, 7/16 DIN Female on Surge |
| **Part Number** | **TC-LP-STRH-DMS** |
| **Connector** | 7/16 DIN Male on Surge, 7/16 DIN Female on Protected |
| **Frequency** | 700-2700MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB (700-2700MHz) |
| **Insertion Loss** | < 0.1dB |
| **PIM** | <-160dBc |
| **Average Power** | 700W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Max Surge Current** | 50kA (8x20µs wave-form) |
| **Energy Throughput** | < 1nJ (4kV/2kA (1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 600 grams |



• LP-STRH-DFF
700-2700MHz DC Blocked DIN Type F/F



• LP-STRH-DMP
700-2700MHz DC Blocked DIN Type M on Protected

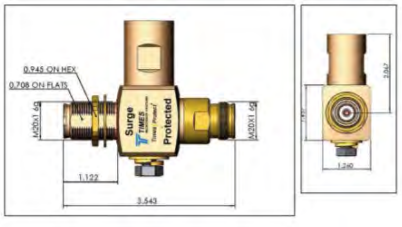


• LP-STRH-DMS
700-2700MHz DC Blocked DIN Type M on Surge

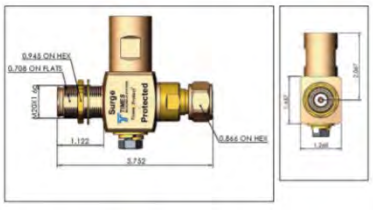
# TC-LP-STRH-4.3-10

Times Microwave LP-STRH-4.3-10 series is an exceptional DC blocked design for superior surge performance, capable of withstanding multiple lightning strikes. The operating band width of 700-2700MHz makes the LP-STRH-4.3-10 suitable for a broad range of applications. With is excellent passive intermodulation performance, outstanding RF performance over the entire operating band and excellent power handling capability, the LP-STRH-4.3-10 product is unequalled. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation.

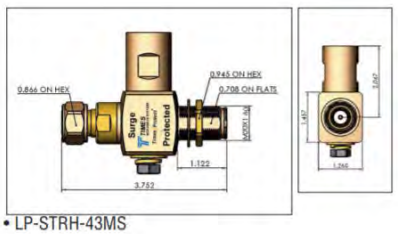
| | |
|---|---|
| **Part Number** | **TC-LP-STRH-43FF** |
| **Connector** | 4.3-10 Female on both sides |
| **Part Number** | **TC-LP-STRH-43MP** |
| **Connector** | 4.3-10 Male on Protected, 4.3-10 Female on Surge |
| **Part Number** | **TC-LP-STRH-43MS** |
| **Connector** | 4.3-10 Male on Surge,<br>4.3-10 Female on Protected |
| **Frequency** | 700-2700MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB (700-2700MHz) |
| **Insertion Loss** | < 0.1dB |
| **PIM** | <-160dBc |
| **Average Power** | 700W |
| **Residual Pulse Volt** | <100V (50kA 8x20µs wave-form)<br><1V (4kV/2kA 1.2x50/8x20µs wave-form) |
| **Max Surge Current** | 50kA (8x20µs wave-form) |
| **Energy Throughput** | < 1nJ (4kV/2kA (1.2x50/8x20µs wave-form) |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 600 grams |



• LP-STRH-43FF



• LP-STRH-43MP

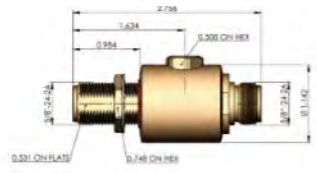


• LP-STRH-43MS

# TC-LP-GTR-N

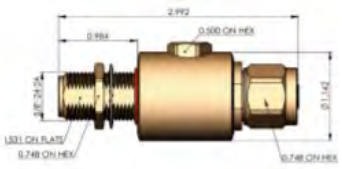
Times Microwave LP-GTR-N high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. LP-GTR-N series offers outstanding surge performance, and is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad rand of power handling requirements from 50-550 Watts. Its fully weatherized housing meeting IP67 standard allowing for outdoor as well as indoor installation. The N connector designs cover the entire frequency spectrum from DC – 3000MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTR-NFF** |
| **Connector** | N Female on both sides - bidirectional |
| **Part Number** | **TC-LP-GTR-NFM** |
| **Connector** | N Male on one side, N Female on the other – bidirectional |
| **Frequency** | DC–3000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB (DC-2800MHz)<br><1.13:1 <-25cB (2800-3000MHz) |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-3000MHz) |
| **Impulse Sparkover** | 500V (1kV/µs) |
| **Average Power** | 50W |
| **Turn On Voltage** | 90Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 200 grams |



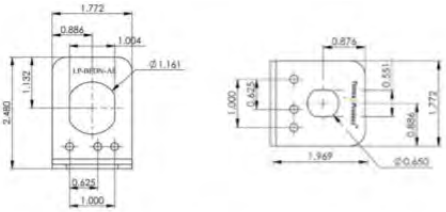
- LP-GTR-NFF
- LP-GTR-NFF-23
- LP-GTR-NFF-35

DC Pass N Type F/F



- LP-GTR-NFM
- LP-GTR-NFM-23
- LP-GTR-NFM-35

DC Pass N Type F/M

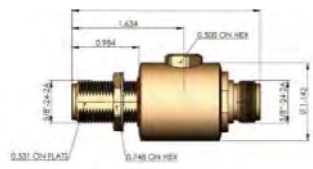


- Universal Right Angle Bracket Adaptor

# TC-LP-GTR-N-23

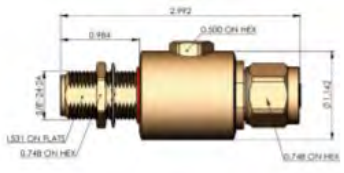
Times Microwave LP-GTR-N high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. The LP-GTR-N series offers outstanding surge performance and is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad rand of power handling requirements from 50-550 Watts. Its fully weatherized housing meeting IP67 standard allowing for outdoor as well as indoor installation. The N connector designs cover the entire frequency spectrum from DC – 3000MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTR-NFF-23** |
| **Connector** | N Female on both sides - bidirectional |
| **Part Number** | **TC-LP-GTR-NFM-23** |
| **Connector** | N Male on one side, N Female on the other – bidirectional |
| **Frequency** | DC – 3000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB (DC-2800MHz)<br><1.13:1 <-25dB (2800-3000MHz) |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-3000MHz) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Average Power** | 210W |
| **Turn On Voltage** | 230Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 200 grams |



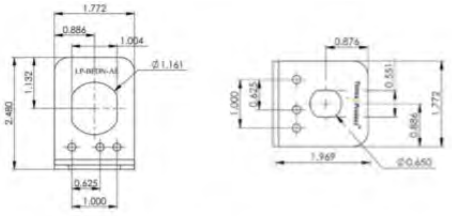
- LP-GTR-NFF
- LP-GTR-NFF-23
- LP-GTR-NFF-35

DC Pass N Type F/F



- LP-GTR-NFM
- LP-GTR-NFM-23
- LP-GTR-NFM-35

DC Pass N Type F/M

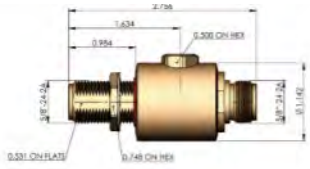


- Universal Right Angle Bracket Adaptor

# TC-LP-GTR-N-35

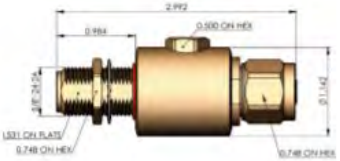
Times Microwave LP-GTR-N high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. The LP-GTR-N series offers outstanding surge performance and is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad rand of power handling requirements from 50-550 watts. Its fully weatherized housing meeting IP67 standard allowing for outdoor as well as indoor installation. The N connector designs cover the entire frequency spectrum from DC – 3000MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTR-NFF-35** |
| **Connector** | N Female on both sides - bidirectional |
| **Part Number** | **TC-LP-GTR-NFM-35** |
| **Connector** | N Male on one side, N Female on the other – bidirectional |
| **Frequency** | DC – 3000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB (DC-2800MHz)<br><1.13:1 <-25cB (2800-3000MHz) |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-3000MHz) |
| **Impulse Sparkover** | 800V (1kV/µs) |
| **Average Power** | 550W |
| **Turn On Voltage** | 350Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 200 grams |



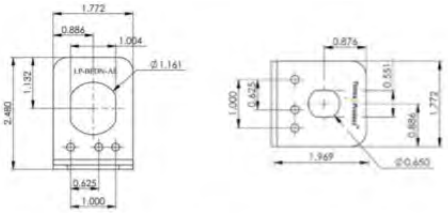
- LP-GTR-NFF
- LP-GTR-NFF-23
- LP-GTR-NFF-35

DC Pass N Type F/F



- LP-GTR-NFM
- LP-GTR-NFM-23
- LP-GTR-NFM-35

DC Pass N Type F/M

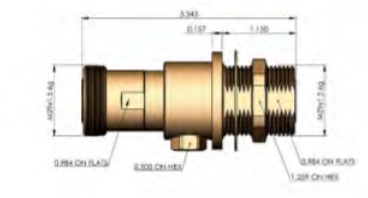


- Universal Right Angle Bracket Adaptor

# TC-LP-GTR-D

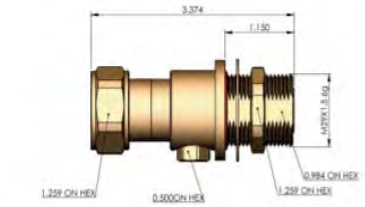
Times Microwave LP-GTR-D high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. The LP-GTR-D series offers outstanding surge performance and is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of power handling requirements from 50 to 550 watts. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The 7/16 DIN connector types can be used from DC – 2500MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTR-DFF** |
| **Connector** | 7/16 DIN Female on both sides - bidirectional |
| **Part Number** | **TC-LP-GTR-DFM** |
| **Connector** | 7/16 DIN Male on one side, 7/16 DIN Female on the other side - bidirectional |
| **Frequency** | DC-2500MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.08:1 <-26dB (DC-1000MHz)<br><1.1:1 <-24dB (1000-2500MHz) |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-2500MHz) |
| **Average Power** | 50W |
| **Max Surge Current** | 20kA multiple (8x20µs wave-form) |
| **Impulse Sparkover** | 500V (1kV/µs) |
| **Turn On Voltage** | 90Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 400 grams |



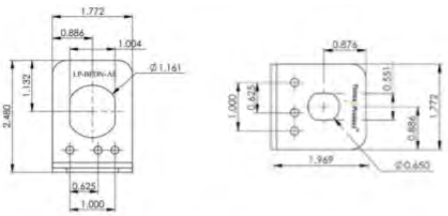
- LP-GTR-DFF
- LP-GTR-DFF-23
- LP-GTR-DFF-35

DC Pass DIN Type F/F



- LP-GTR-DFM
- LP-GTR-DFM-23
- LP-GTR-DFM-35

DC Pass DIN Type F/M

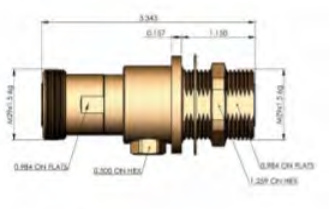


- Universal Right Angle Bracket Adaptor

# TC-LP-GTR-D-23

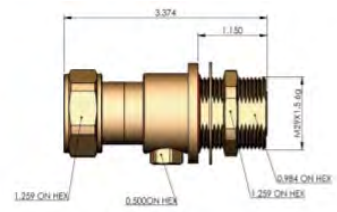
Times Microwave LP-GTR-D high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. Offering outstanding surge performance, the LP-GTR-D series is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of power handling requirements from 50 to 550 watts. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The 7/16 DIN connector types can be used from DC – 2500MHz.

| | |
|---|---|
| **Part Number**<br>**Connector** | **TC-LP-GTR-DFF-23**<br>7/16 DIN Female on both sides – bidirectional |
| **Part Number**<br>**Connector** | **TC-LP-GTR-DFM-23**<br>7/16 DIN Male on one side, 7/16 DIN Female on the other side – bidirectional |
| **Frequency** | DC-2500MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.08:1 <-26dB (DC-1000MHz)<br><1.1:1 <-24dB (1000-2500MHz) |
| **Turn -on Voltage** | 230Vdc |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-2500MHz) |
| **Average Power** | 210W |
| **Max Surge Current** | 20kA (8x20µs wave-form) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 400 grams |



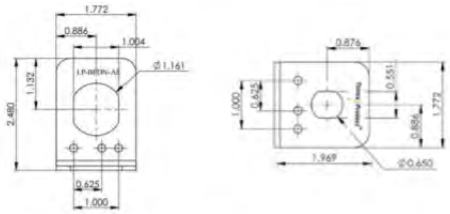
- LP-GTR-DFF
- LP-GTR-DFF-23
- LP-GTR-DFF-35

DC Pass DIN Type F/F



- LP-GTR-DFM
- LP-GTR-DFM-23
- LP-GTR-DFM-35

DC Pass DIN Type F/M

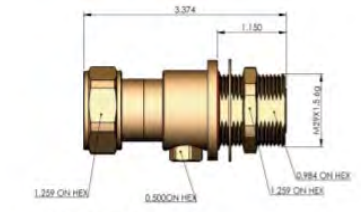


- Universal Right Angle Bracket Adaptor

# TC-LP-GTR-D-35

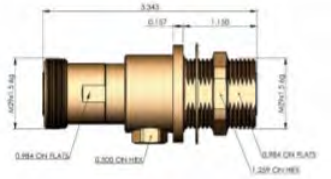
Times Microwave LP-GTR-D high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. Offering outstanding surge performance, the LP-GTR-D series is the perfect protection solution for Distributed Antenna Systems, Tower Mounted Amplifiers, GPS systems and other applications requiring DC pass circuitry. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of power handling requirements from 50 to 550 watts. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The 7/16 DIN connector types can be used from DC – 2500MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTR-DFF-35** |
| **Connector** | 7/16 DIN Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GTR-DFM-35** |
| **Connector** | 7/16 DIN Male on one side, 7/16 DIN Female on the other side – bidirectional |
| **Frequency** | DC-2500MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.08:1 <-26dB (DC-1000MHz)<br><1.1:1 <-24dB (1000-2500MHz) |
| **Turn -on Voltage** | 350Vdc |
| **Insertion Loss** | < 0.1dB (DC-1000MHz)<br><0.2dB (1000-2500MHz) |
| **Average Power** | 550W |
| **Max Surge Current** | 20kA (8x20µs wave-form) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 220-300lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 400 grams |



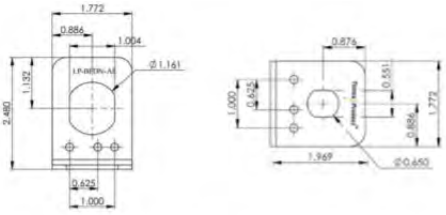
- LP-GTR-DFM
- LP-GTR-DFM-23
- LP-GTR-DFM-35

DC Pass DIN Type F/M



- LP-GTR-DFF
- LP-GTR-DFF-23
- LP-GTR-DFF-35

DC Pass DIN Type F/F

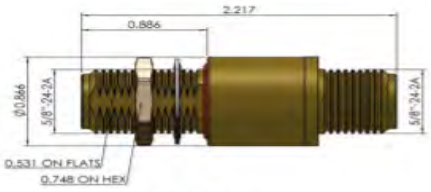


- Universal Right Angle Bracket Adaptor

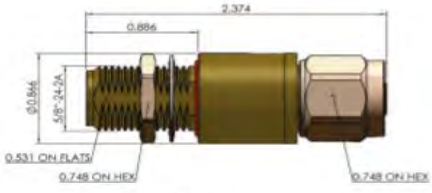
# TC-LP-GTV-N

Times Microwave LP-GTV-N high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of applications requiring up to 150W of RF power handling. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The N connector designs cover the entire frequency spectrum from DC - 7000MHz.

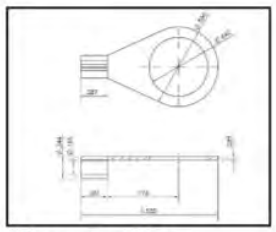
| | |
|---|---|
| **Part Number** | **TC-LP-GTV-NFF** |
| **Connector** | N Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GTV-NFM** |
| **Connector** | N Male on one side, N Female on the other – bidirectional |
| **Frequency** | DC – 7000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 <-20dB (DC-6700MHz)<br><1.3:1 <-17dB (6700-7000MHz) |
| **Insertion Loss** | < 0.2dB (DC-6700MHz)<br><0.3dB (6700-7000MHz) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Maximum Surge Current** | 10kA multiple (8x20 µs wave-form) |
| **Average Power** | 150W |
| **Turn On Voltage** | 180Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 40 grams |




• LP-GTV-NFF
DC Pass N Type F/F




• LP-GTV-NFM
DC Pass N Type F/M

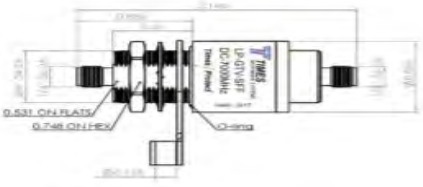


• Grounding Ring

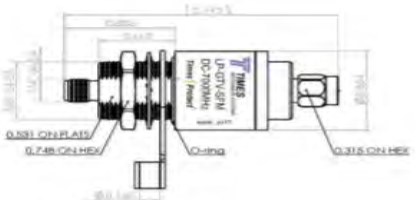
# TC-LP-GTV-S

Times Microwave LP-GTV-S high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of applications requiring up to 150W of RF power handling. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The SMA connector designs cover the entire frequency spectrum from DC - 7000MHz.

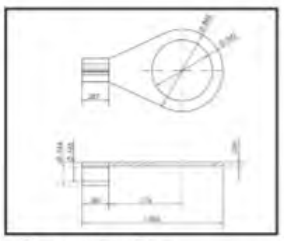
| | |
|---|---|
| **Part Number** | **TC-LP-GTV-SFF** |
| **Connector** | SMA Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GTV-SFM** |
| **Connector** | SMA Male on one side, SMA Female on the other – b-idirectional |
| **Frequency** | DC – 7000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 <-20dB (DC-6700MHz)<br><1.3:1 <-17dB (6700-7000MHz) |
| **Insertion Loss** | < 0.2dB (DC-6700MHz)<br><0.3dB (6700-7000MHz) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Maximum Surge Current** | 10kA multiple (8x20µs wave-form) |
| **Average Power** | 150W |
| **Turn On Voltage** | 180Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 3-5 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 40 grams |



• LP-GTV-SFF
DC Pass SMA Type F/F



• LP-GTV-SFM
DC Pass SMA Type F/M

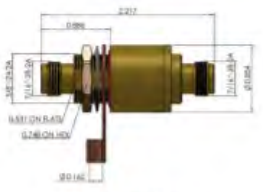


• Grounding Ring

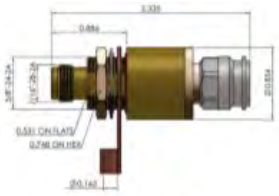
# TC-LP-GTV-T

Times Microwave LP-GTV-T high-performance series is an exceptional DC pass design for lightning protection applications requiring DC power to be supplied to the electronics. These devices exhibit outstanding RF performance with high surge current handling characteristics and cover a broad range of applications requiring up to 150W of RF power handling. Its fully weatherized housing meeting IP67 standard allows for outdoor as well as indoor installation. The TNC connector designs cover the entire frequency spectrum from DC - 7000MHz.

| | |
|---|---|
| **Part Number** | **TC-LP-GTV-TFF** |
| **Connector** | TNC Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GTV-TFM** |
| **Connector** | TNC Male on one side, TNC Female on the other – bidirectional |
| **Frequency** | DC – 7000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 <-20dB (DC-6700MHz)<br><1.3:1 <-17dB (6700-7000MHz) |
| **Insertion Loss** | < 0.2dB (DC-6700MHz)<br><0.3dB (6700-7000MHz) |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Maximum Surge Current** | 10kA multiple (8x20µs wave-form) |
| **Average Power** | 150W |
| **Turn On Voltage** | 180Vdc |
| **Protection Circuit** | DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 3-5 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plated |
| **Weight** | 40 grams |



• LP-GTV-TFF
DC Pass TNC Type F/F

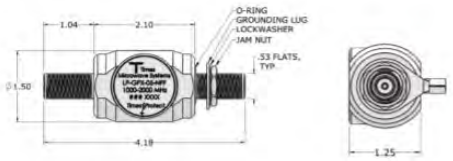


• LP-GTV-TFM
DC Pass TNC Type F/M

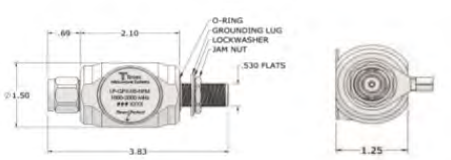
# TC-LP-GPX-05-N

Times Microwave LP-GPX-05-N high-performance series is an exceptional DC pass design for protecting GPS receivers requiring up to 5Vdc power to be supplied on the centre pin. While the RF path is DC blocked, the biased DC voltage protection circuit uses Solid State protection technology to provide unsurpassed surge performance. The LP-GPX-05-N series offers outstanding insertion loss and return loss characteristics over the 1000-2000MHz band, making it suitable for protecting commercial and military GPS and other applications in this band. Unlike competitive protectors, the white bronze plated construction of the LP-GPX-05-N series eliminates potential galvanic corrosion issues and provides long life in hostile environments. The fully weatherized housing is sealed to IP65, allowing for outdoor as well as indoor installation.

| | |
|---|---|
| **Part Number** | **TC-LP-GPX-05-NFF** |
| **Connector** | N Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GPX-05-NFM** |
| **Connector** | N Male on one side, N Female on the other – bidirectional |
| **Frequency** | 1000-2000 MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 / <-20dB |
| **Insertion Loss** | < 0.1dB |
| **Maximum Surge Current** | 10kA multiple (1.2x50/8x20µs wave-form) |
| **Residual Pulse Voltage** | <12V (6kV/3kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <110µJ |
| **Average Power** | 50W |
| **Turn On Voltage** | 6Vdc |
| **Protection Circuit** | DC Blocked RF Path/Solid Stage DC Pass |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |




• LP-GPX-05-NFF
1000 - 2000MHz N Type F/F

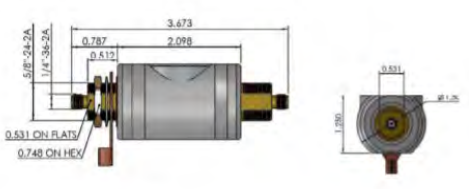



• LP-GPX-05-NFM
1000 - 2000MHz N Type F/M

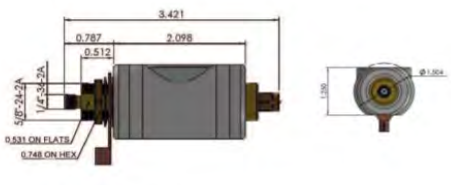
# TC-LP-GPX-05-S

Times Microwave LP-GPX-05-S high-performance series is an exceptional DC pass design for protecting GPS receivers requiring up to 5Vdc power to be supplied on the centre pin. While the RF path is DC blocked, the biased DC voltage protection circuit uses Solid State protection technology to provide unsurpassed surge performance. The LP-GPX-05-S series offers outstanding insertion loss and return loss characteristics over the 1000-2000MHz band, making it suitable for the protection of commercial and military GPS and other application in this band. Unlike competitive protectors, the white bronze plated construction of the LP-GPX-05-S series eliminates potential galvanic corrosion issues and provides long life in hostile environments. The fully weatherized housing is sealed to IP65, allowing for outdoor as well as indoor installation.

| | |
|---|---|
| **Part Number** | **TC-LP-GPX-05-SFF** |
| **Connector** | SMA Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GPX-05-SFM** |
| **Connector** | SMA Male on one side, N Female on the other – bidirectional |
| **Frequency** | 1000-2000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 / <-20dB |
| **Insertion Loss** | < 0.1dB |
| **Maximum Surge Current** | 10kA multiple (1.2x50/8x20µs wave-form) |
| **Average Power** | 50W |
| **Turn On Voltage** | 6Vdc |
| **Protection Circuit** | DC Blocked RF Path/Solid Stage DC Pass |
| **Residual Pulse Voltage** | <12V (6kV/3kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <110µJ |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 3-5 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |




• LP-GPX-05-SFF
1000 - 2000MHz SMA Type F/F

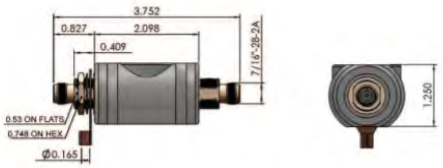



• LP-GPX-05-SFM
1000 - 2000MHz SMA Type F/M

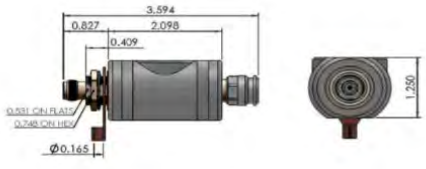
# TC-LP-GPX-05-T

Times Microwave LP-GPX-05-T high-performance series is an exceptional DC pass design for protecting GPS receivers requiring up to 5Vdc power to be supplied on the centre pin. While the RF path is DC blocked, the biased DC voltage protection circuit uses Solid State protection technology to provide unsurpassed surge performance. The LP-GPX-05-T series offers outstanding insertion and return loss characteristics over the 1000-2000MHz band, making it suitable for protecting commercial and military GPS and other application in this band. Unlike competitive protectors, the white bronze plated construction of the LP-GPX-05-T series eliminates potential galvanic corrosion issues and provides long life in hostile environments. The fully weatherized housing is sealed to IP65, allowing for outdoor as well as indoor installation.

| | |
|---|---|
| **Part Number** | **TC-LP-GPX-05-TFF** |
| **Connector** | TNC Female on both sides – bidirectional |
| **Part Number** | **TC-LP-GPX-05-TFM** |
| **Connector** | TNC Male on one side, TNC Female on the other – bidirectional |
| **Frequency** | 1000-2000MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 / <-20dB |
| **Insertion Loss** | < 0.1dB |
| **Maximum Surge Current** | 10kA multiple (1.2x50/8x20µs wave-form) |
| **Average Power** | 50W |
| **Turn On Voltage** | 6Vdc |
| **Protection Circuit** | DC Blocked RF Path/Solid Stage DC Pass |
| **Residual Pulse Voltage** | <12V (6kV/3kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <110µJ |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 4-6 lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |




• LP-GPX-05-TFF
1000 - 2000MHz TNC Type F/F

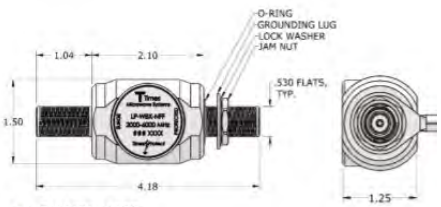



• LP-GPX-05-TFM
1000 - 2000MHz TNC Type F/M

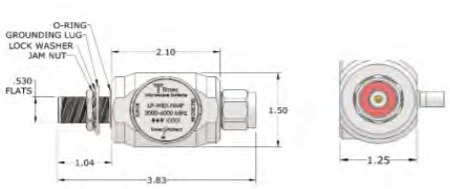
# TC-LP-WBX-N

Times Microwave LP-WBX-N high-performance series uses a filter circuit to provide exceptional lightning protection over the 2000-6000MHz frequency band, covering both the unlicensed WIFI bands and several licensed operating bands. Unlike competitive protectors, the white bronze plated construction of the LP-WBX-N series eliminates potential galvanic corrosion issues and provides long life in hostile environments. The fully weatherized housing is sealed to IP65, allowing for outdoor as well as indoor installation.

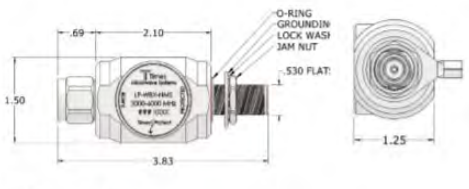
| | |
|---|---|
| **Part Number** | **TC-LP-WBX-NFF** |
| **Connector** | N Female on both sides |
| **Part Number** | **TC-LP-WBX-NMP** |
| **Connector** | N Male on Protected, N Female on Surge |
| **Part Number** | **TC-LP-WBX-NMS** |
| **Connector** | N Male on Surge side, N Female on Protected |
| **Frequency** | 2000-6000 MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.2:1 / <-20dB |
| **Insertion Loss** | < 0.2dB |
| **Maximum Surge Current** | 20kA max/10kA multiple (8x20µs wave-form) |
| **Average Power** | 50W |
| **Protection Circuit** | DC Blocked |
| **Residual Pulse Voltage** | <3V (6kV/3kA 1.2x50/8x20µs wave-form) |
| **Energy Throughput** | <150µJ |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |




• LP-WBX-NFF
2000 - 6000MHz N Type F/F




• LP-WBX-NMP
2000 - 6000MHz N Type M on Protected




• LP-WBX-NMS
2000 - 6000MHz N Type M on Surge

# TC-LP-18-195-N

Times Microwave LP-18-195-N series is an exceptional in-line broadband DC pass surge protection design incorporating lightning protection circuitry and the EZ-195-X crimp style connector. This combination allowing the in-line surge protector to be attached directly to the LMR-195 cable eliminates the cable connector needed when using conventional lightning protectors. The LP-18-195-N series protectors exhibit outstanding RF performance over the entire frequency spectrum from DC–6000MHz, and the elimination of the extra connector further reduces return loss, insertion loss and lowers cost. Its fully weatherized housing meets the IP67 standard for outdoor as well as indoor installation.

LP-18-195-N series protectors install easily onto LMR-195 cable using the standard CST-195/200 prep tool and either the CT-240/200/195 or CT-U tool with the Y197 hex die.

| | |
|---|---|
| **Part Number** | **TC-LP-18-195-NF-X** |
| **Connector** | N Female on one side, EZ-195-X on the other – bidirectional |
| **Part Number** | **TC-LP-18-195-NMH-X** |
| **Connector** | N Male on one side, EZ-195-X on the other – b-idirectional |
| **Frequency** | DC-6000 MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.3:1 / <-18dB |
| **Insertion Loss** | < 0.6dB |
| **Maximum Surge Current** | 10kA multiple (8x20µs wave-form) |
| **Average Power** | 150W |
| **Protection Circuit** | DC Pass |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Turn On Voltage** | 180Vdc |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |
| **Weight** | 95 grams |

• LP-18-195-NF-X
DC Pass N Type Female

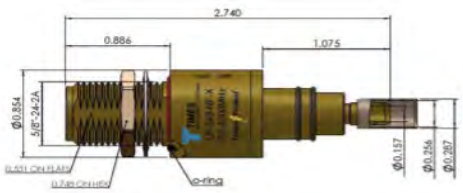
• LP-18-195-NMH-X
DC Pass N Type Male

# TC-LP-18-240-N

Times Microwave LP-18-240-N series is an exceptional in-line broadband DC pass surge protection design incorporating lightning protection circuitry and the EZ-240-X series crimp style connector. This combination allowing the in-line surge protector to be attached directly to the LMR-240 cable eliminates the cable connector needed when using conventional lightning protectors. The LP-18-240-N series protectors exhibit outstanding RF performance over the entire frequency spectrum from DC–6000MHz, and the elimination of the extra connector further reduces return loss, insertion loss and lowers cost. Its fully weatherized housing meets the IP67 standard for outdoor as well as indoor installation.

The LP-18-240-N series protectors install easily onto LMR-240 cable using the standard CST-240A prep tool and either the CT-240/200/195/100 crimp tool or the HX-4 crimp handle with the Y375 hex die.

| | |
|---|---|
| **Part Number** | **TC-LP-18-240-NF-X** |
| **Connector** | N Female on one side, EZ-240-X on the other – bidirectional |
| **Part Number** | **TC-LP-18-240-NMH-X** |
| **Connector** | N Male on one side, EZ-240-X on the other – bidirectional |
| **Frequency** | DC-6000 MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.3:1 / <-18dB |
| **Insertion Loss** | < 0.6dB |
| **Maximum Surge Current** | 10kA multiple (8x20µs wave-form) |
| **Average Power** | 150W |
| **Protection Circuit** | DC Pass |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Turn On Voltage** | 180Vdc |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |
| **Weight** | 95 grams |




• LP-18-240-NF-X
DC Pass N Type Female

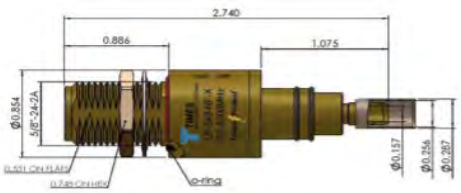

• LP-18-240-NMH-X
DC Pass N Type Male

# TC-LP-18-400-N

Times Microwave LP-18-400-N series is an exceptional in-line broadband DC pass surge protection design incorporating lightning protection circuitry and the EZ-400-X series crimp style connector. This combination allowing the in-line surge protector to be attached directly to the LMR-400 cable eliminates the cable connector needed when using conventional lightning protectors. The LP-18-400-N series protectors exhibit outstanding RF performance over the entire frequency spectrum from DC–6000MHz, and the elimination of the extra connector further reduces return loss, insertion loss and lowers cost. Its fully weatherized housing that meets the IP67 standard for outdoor as well as indoor installation.

The LP-18-400-N series protectors install easily onto LMR-240 cable using the standard CST-400 prep tool and either the CT-400/300 crimp tool or the HX-4 crimp handle with the Y1719 hex die.

| | |
|---|---|
| **Part Number** | **TC-LP-18-400-NF-X** |
| **Connector** | N Female on one side, EZ-400-X on the other - bidirectional |
| **Part Number** | **TC-LP-18-400-NMH-X** |
| **Connector** | N Male on one side, EZ-400-X on the other - bidirectional |
| **Frequency** | DC-6000 MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.15:1 / <-23dB |
| **Insertion Loss** | < 0.15dB |
| **Maximum Surge Current** | 10kA multiple (8x20µs wave-form) |
| **Average Power** | 150W |
| **Protection Circuit** | DC Pass |
| **Impulse Sparkover** | 700V (1kV/µs) |
| **Turn On Voltage** | 180Vdc |
| **Operating Temp.** | -40°C to +85°C |
| **Torque** | 7-10lb-in recommended coupling nut |
| **Body/Washer/Nut** | Brass, White Bronze plate |
| **Weight** | 95 grams |




• LP-18-240-NF-X
DC Pass N Type Female


• LP-18-240-NMH-X
DC Pass N Type Male

# TC-SPT Surge Protection Tester

The innovative LP-SPT RF surge protection tester can test any lightning protection device or component to ensure its proper functioning and capability to protect critical and expensive RF equipment. Weighing only 450 grams and powered by two 9-volt batteries, the ruggedized hand-held unit is completely portable, making it ideal for field use. The LP-SPT unit is fitted with one N male and one N female connector. The LP-SPT supports testing for the most popular in line RF surge protection devices and easily test surge protectors with any other interfaces using commonly available RF adapters. The slim LP-SPT unit comes complete with a heavy-duty nylon carrying case, batteries, easy-to-follow instructions and a set of alligator clips to allow testing of other surge protection components such as MOV's, diodes and gas tubes.

| | |
|---|---|
| **Size** | 9.0” x 4.0” x 15” / 22.86cm x 10.16cm x 38.1cm |
| **Weight** | 16 ounces/450 grams |
| **Power** | 2 x 9 Volt batteries |
| **Display** | 3.5” LCD, 2kV max scale |
| **Test Output** | 1kV min, 1mA min, 1.5mA max. |
| **Terminal** | N Female & N Male |
| **Included items** | Alligator clip adapter (LP-NF-AC)<br>Rugged black nylon carrying case<br>Batteries<br>Operating instructions |
| **Special Features** | Automatic shut-off after 10 minutes of non-use.<br><br>Auto disable of High Voltage output if the test button is depressed more than 10 seconds (must press again to reactivate)<br><br>ON/OFF and TEST switches resist unintentional activation<br><br>Fast discharge time between test measurements<br><br>Battery management prevents excessive battery drain |

# Times Microwave Cross-Reference Guide

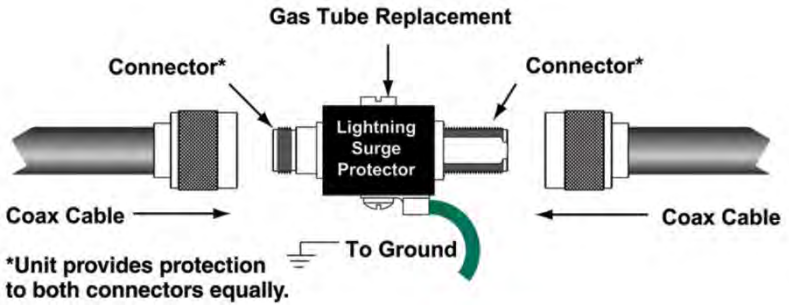
| | Times Microwave | | | |
|---|---|---|---|---|
| **7/16 DIN** | *LP-GTR-DFF* | APG-BDFDF-090 | GT-DFF-AL | |
| | *LP-GTR-DFF-35* | APG-BDFDF-350 | | |
| | *LP-GTR-DFM* | APG-BDFDM-090 | GT-DFM-AL | |
| | *LP-GTR-DFM-35* | APG-BDFDM-350 | | |
| | *LP-STRL-DFF* | APT-BDFDF-DB | | |
| | *LP-STRL-DMS* | APT-DBFDM-DB | | |
| | *LP-STR-DFF* | DSxL-D | 3407.41.0042 | 3400.41.0216 |
| | *LP-STR-DMS* | DSxL-D-MA | 3407.41.0039 | 3400.41.0204 |
| | *LP-STR-DMP* | DSxL-D-ME | | |
| **N-Type** | *LP-BTR-50NFF* | IS-B50LN-C1 & C2 | IS-B50Mx-C2 | IS-NEMP-C2 |
| | *LP-BTR-50NMS* | IS-B50LN-C2-MA | IS-B50Nx-C2MA | IS-NEMP-C2-ME |
| | *LP-BTR-50NMP* | IS-B50LN-C2-ME | IS-50Nx-C2-ME | IS-NEMP-C2-ME |
| | *LP-GPx-05-NFF* | 3403.17.0060**/**B | | |
| | *LP-GPx-05-NFM* | 3403.17.0063**/**B | | |
| | *LP-GTR-NFF* | APG-BNFNF-090 | RGT | |
| | *LP-GTR-NFF-35* | APG-BNFNF-350 | | |
| | *LP-GTR-NFM* | APG-BNFNM-090 | RGT-ME | |
| | *LP-GTR-NFM-35* | APG-BNFNM-350 | | |
| | *LP-STR-NFF* | DSxL | 3407.17.0067 | |
| | *LP-STR-NMS* | DSxLMA | 3401.17.0068 | 3400.17.0377 |
| | *LP-STR-NMP* | DSxLME | | |
| | *LP-WBx-NMS* | 3407.17.0085 | | |

# L-com Lighting Arrestors

L-com's surge protector and lightning arrestor range of products feature both coaxial and data line lightning and surge protection suitable for every application. Products in the lightning arrestor range include coaxial protection from 0-3GHz and 0-6GHz surge protectors and data line protection for Cat5, Cat6, T1, ISDN and RS232/422/485. The L-com range has various connector options, including RP-SMA, RP-TNC, N-type, RJ45 jacks and screw terminals. Other network surge protector styles include Load Cell, rack mount Cat 5/6, USB surge protectors and grounding kits.

L-com's HyperLink® coaxial lightning arrestor and surge protector products are available in two types, Quarter Wave and Gas Discharge models. Quarter Wave coaxial surge protectors are designed to pass the desired frequency while suppressing lightning surges, much like a signal filter. Lightning strike electrical surges which operate at low frequencies are diverted through the protector's short-circuit to the ground. L-com's Gas Discharge coaxial protectors are a type of lightning arrestor that employs a replaceable gas discharge tube, a component containing a small amount of gas. The gas tube dumps extremely high amounts of surge energy directly to the ground of the protector. HyperLink® coaxial lightning arrestors are available for 0-3 GHz operation or 0-6 GHz operation.

L-com's Gas Discharge Coaxial Protectors




Data Line Lightning and Surge Protectors

# High-Performance RF Broadband N-type Series

L-com's High-Performance RF Broadband N-type series utilises a patented spiral ir enables an almost instantaneous response to a lightning surge to protect critical hardw the RF performance. This RF surge protector series is manufactured in a coaxial in-lir operating frequency range. This series is fully weatherized to the IP67 standard for out installation.

LCSP1000

| | |
|---|---|
| **Part Number** | **LCSP1000** |
| **Connector** | N Female both sides, bulkhead |
| **Part Number** | **LCSP1001** |
| **Connector** | N Female on Surge side, N male on Protected side, bulkhead |
| **Part Number** | **LCSP1002** |
| **Connector** | N Female on Surge side, N male on Protected side, bulkhead + bracket |
| **Part Number** | **LCSP1003** |
| **Connector** | N Female on Surge side, N male on Protected side, bulkhead, Low PIM |
| **Frequency** | 698MHz-2.7GHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB |
| **Insertion Loss** | < 0.1dB |
| **Surge Current** | IEC 61000-4-5 8/20µs wave-form |
| **Average Power** | 500W |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -50°C to +85°C |

LCSP1001

LCSP1002

LCSP1003

# High-Performance RF Broadband 7/16 DIN Series

L-com's High-Performance RF Broadband 7/16 DIN series utilises a patented spiral inductor design which enables an almost instantaneous response to a lightning surge to protect critical hardware while maintaining the RF performance. This RF surge protector series is manufactured in a coaxial in-line design with wide operating frequency range. This series is fully weatherized to the IP67 standard for outdoor as well as indoor installation.

LCSP1004

| | |
|---|---|
| **Part Number** | **LCSP1004** |
| **Connector** | 7/16 DIN Female both sides, bulkhead, Low PIM -155dBc |

LCSP1005

| | |
|---|---|
| **Part Number** | **LCSP1005** |
| **Connector** | 7/16 DIN Female on Surge side, 7/16 DIN Male on Protected side, bulkhead, Low PIM -155dBc |

LCSP1006

| | |
|---|---|
| **Part Number** | **LCSP1006** |
| **Connector** | 7/16 DIN Female on Surge side, 7/16 DIN Male on Protected side, bulkhead + bracket, Low PIM -155dBc |

| | |
|---|---|
| **Part Number** | **LCSP1007** |
| **Connector** | 7/16 DIN Female on Surge side, 7/16 DIN Male on protected side, bulkhead |

LCSP1007

| | |
|---|---|
| **Part Number** | **LCSP1008** |
| **Connector** | 7/16 DIN Female on Surge side, 7/16 DIN Male on Protected side, bulkhead, Low PIM -163dBc |

| | |
|---|---|
| **Frequency** | 698MHz-2.7GHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1 |
| **Insertion Loss** | < 0.1dB |
| **Surge Current** | IEC 61000-4-5 8/20µs wave-form |
| **Average Power** | 1000W |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -50°C to +85°C |

LCSP1008

# High-Performance RF Broadband 4.3-10 Series

L-com's High-Performance RF Broadband 4.3-10 series utilises a patented spiral inductor design which enables an almost instantaneous response to a lightning surge to protect critical hardware while maintaining the RF performance. This RF surge protector series is manufactured in a coaxial in-line design with wide operating frequency range. This series is fully weatherized to the IP67 standard for outdoor as well as indoor installation.

LCSP1051

| | |
|---|---|
| **Part Number** | **LCSP1051** |
| **Connector** | 4.3-10 Female both sides, bulkhead<br>Low PIM -173dBc, 40kA surge filter |
| **Part Number** | **LCSP1060** |
| **Connector** | 4.3-10 Male on Surge side, 4.3-10 Female on protected side, bulkhead, Low PIM -173dBc |
| **Part Number** | **LCSP1061** |
| **Connector** | 4.3-10 Female on Surge side, 4.3-10 Female on Protected side, bulkhead,<br>Low PIM -173dBc |
| **Part Number** | **LCSP1062** |
| **Connector** | 4.3-10 Female on Surge side, 4.3-10 male on Protected side, bulkhead, Low PIM |
| **Frequency** | 698MHz-2.7GHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB |
| **Insertion Loss** | < 0.1dB |
| **Surge Current** | IEC 61000-4-5 8/20µs wave-form |
| **Average Power** | 500W |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -50°C to +85°C |

LCSP1060

LCSP1061

LCSP1062

# Low PIM ¼ Wave Coax Lightning Surge Protectors

L-com's ALQP series are Low PIM Quarter Wave DC-Block surge protectors design applications. This series is designed to pass the desired frequency while suppressing functioning like a signal filter, operating within 800-2250MHz. Lightning strike electrica at low frequencies (outside the operating range) are diverted through the protector unique design provides equal protection no matter which way it is installed. The non-g strike capability and fast response time make the series suitable for a wide range of apl

ALQP-DFDFB

| | |
|---|---|
| **Part Number** | **ALQP-DFDFB** |
| **Connector** | 7/16 DIN Female both sides, bulkhead |
| **Part Number** | **ALQP-DMDFB** |
| **Connector** | 7/16 DIN Male on Surge side, 7/16 DIN Female on Protected side, bulkhead |
| **Part Number** | **ALQP-NFNFB** |
| **Connector** | Low PIM N Female on Surge side, N Female bulkhead on Protected side |
| **Part Number** | **ALQP-NMNFB** |
| **Connector** | Low PIM N Male on Surge side, N Female bulkhead on Protected side |
| **Frequency** | 800–2250MHz |
| **Impedance** | 50 Ω |
| **VSWR/Return Loss** | <1.1:1 / <-26dB |
| **Insertion Loss** | < 0.1dB |
| **Surge Current** | IEC 61000-4-5 8/20µs wave-form |
| **Average Power** | 500W |
| **Protection Circuit** | DC Blocked |
| **Operating Temp.** | -50°C to +85°C |

ALQP-DMDFB

ALQP-NFNFB

ALQP-NMNFB

# Times Advantages

| POLYPHASER (PPC) | Times Protect™ | Advantages |
|---|---|---|
| AL-LSXM<br>AL-LSXM-MA<br>AL-LSXM-ME | LP-WBX-NFF<br>LP-WBX-NMP<br>LP-WBX-NFF | ✓ White Bronze plated body vs. aluminium housing<br>✓ Brass connectors vs. aluminium connectors<br>✓ 20kA maximum surge current rating vs. PPC 10kA<br>✓ Lower energy and voltage throughput<br>✓ Higher RF power, 50W vs. 10W<br>✓ Larger ground surface area for bulkhead mounting and grounding<br>✓ Weatherization gasket provided for bulkhead mounting<br>✓ Accommodates LP-BFDN-CW bracket for flange installation |
| AL-LSXM-RT-ME | LP-GTV-RTFM | ✓ GTV is bidirectional with DC pass and turn on voltage of 180V<br>✓ White bronze plated vs. PPC Aluminium<br>✓ 150 Watts |
| BFD<br>BFN | LP-BFDN-CW<br>LP-BFDN-CW | ✓ Brass, White Bronze plated LP-BFDN-CW vs. Aluminium on PPC<br>✓ The BFD and BFN have different mounting hole patterns<br>✓ LP-BFDN-CW having identical hole pattern for N and DIN fit |
| DSXL (OBS)<br>DSXL-MA (OBS)<br>DSXL-ME (OBS)<br><br>DSXL-NS<br><br>DSXL-T-MA | LP-STRH-NFF<br>LP-STRH-NMS<br>LP-STRH-NMP<br><br>LP-STRH-NFF<br>+ N/SMA adapt<br><br>LP-STRH-NFF<br>+ N/TNC adapt | ✓ Broader frequency range (700-2700MHz vs. 800-2300MHz)<br>✓ Lower energy throughput (700pJ vs. <0.5uJ)<br>✓ Better PIM <-160dBc at 900/1800/2100MHz vs. non rated<br>✓ Much higher surge current rating 50kA (as tested) vs. 20kA for PPC<br>✓ Much higher RF power @ 500W vs. 300W for PPC<br>✓ Weatherization (body) to IP67 vs. IP65 for PPC |
| DSXL-D (OBS)<br>DSXL-D-MA (OBS)<br>DSXL-D-ME (OBS) | LP-STRH-DFF<br>LP-STRH-DMS<br>LP-STRH-DMP | ✓ Broader frequency range (700-2700MHz vs. 800-2300MHz)<br>✓ Lower energy throughput (700pJ vs. <0.5uJ)<br>✓ Better PIM <-160dBc at 900/1800/2100MHz vs. non-published<br>✓ Much higher surge current rating 50kA (as tested) vs. 30KA for PPC<br>✓ Higher RF power @ 700W vs. 500W for PPC<br>✓ Weatherization (body) to IP67 vs. IP65 for PPC |
| DT-NFF | LP-GTR-NFF-23 | ✓ 150V PPC vs. 230V TMS LP-GTR-NFF<br>✓ Higher power handling<br>✓ Better IL and RL than PPC<br>✓ Both N Female connectors elongated vs. PPC<br>✓ Max surge 20kA vs. PPC 4kA |
| DGXZ+06-NFNF-A, and -B<br>DGXZ+06-NFNM-A and -B<br>DGXZ+06-NMNF-A and -B<br>DGXZ+06TFTF-A<br>No equivalent<br>No equivalent<br>No equivalent | LP-GPX-05-NFF<br>LP-GPX-05-NFM<br>LP-GPX-05-NFM<br>LP-GPX-05-TFF<br>LP-GPX-05-TFM<br>LP-GPX-05-SFF<br>LP-GPX-05-SFM | ✓ Smaller foot print with lower weight<br>✓ Lower energy throughput<br>✓ Better Insertion Loss and Return Loss<br>✓ Extra grounding ring supplied for suspended installation<br>✓ Accommodates LP-BFDN-CW bracket for flange installation<br>✓ Times Protect™ units furnished with N, TNC and SMA connector options |
| GTH-NFM-AL | LP-GTR-NFM-35 | ✓ Higher RF power of 550W vs 300W PPC<br>✓ 20kA multiple for TMS vs 20kA single shot for PPC.<br><br>**Note**: Customer to verify operating Frequency of network. TMS Frequency range (DC-3GHz). |
| GT-DFF-AL (Spike Guard) (OBS) | LP-GTR-DFF | ✓ Weatherization (body) to IP67 vs. IP65 for PPC |

| POLYPHASER (PPC) | Times Protect™ | Advantages |
|---|---|---|
| GT-DFM-AL (Spike Guard) (OBS) | LP-GTR-DFM | ✓ Solid brass body vs. aluminium for PPC<br>✓ White bronze plating vs. aluminium for PPC<br>✓ Replaceable protection component vs. non-replaceable with PPC<br>✓ Universal mounting/grounding bracket included vs. sold separately by PPC |
| GT-NFF-AL (Spike Guard)<br>GT-NFM-AL (Spike Guard)<br>GT-NFSF-AL<br><br>GT-TFF-AL (OBS)<br>GT-TFM-AL (OBS) | LP-GTV-NFF<br>LP-GTV-NFM<br>LP-GTV-NFF<br>+ N/SMA adaptor<br>LP-GTV-TFF<br>LP-GTV-TFM | ✓ Broader frequency range coverage<br>✓ White Bronze Plated body vs. Aluminium PPC<br>✓ Elongated female connectors |
| IS-B50LN-C0, -C1 and -C2<br>IS-50NX-C0, -C1 and -C2<br>IS-NEMP-C0, -C1 and -C2<br>IS-B50LN-C0-MA, -C1-MA and -C2-MA<br>IS-50NX-C0, -C1 and C2-MA<br>IS-NEMP-C0-MA, -C1-MA and -C2-MA<br>IS-B50LN-C0-ME, -C1-ME and -C2-ME<br>IS-50NX-C0-ME, C1- and -C2-ME<br>IS-NEMP-C0-ME, -C1-ME and -C2-ME<br><br>No weatherized versions available | LP-BTR-NFF<br>LP-BTR-NFF<br>LP-BTR-NFF<br>LP-BTR-NMS<br>LP-BTR-NMS<br>LP-BTR-NMS<br>LP-BTR-NMP<br>LP-BTR-NMP<br>LP-BTR-NMP<br><br>LP-BTRW-NFF<br>LP-BTRW-NMS<br>LP-BTRW-NMP | ✓ All LP-BTR-N models for user frequencies over 20MHz would replace the IS models with designation of "C0" (10-700MHz)<br>✓ Lower Insertion Loss and Return Loss<br>✓ Brass, White bronze body plating vs. PPC aluminium<br>✓ Bulkhead and flange universal adaptor with weatherization gasket included for feed-through installations. PPC devices need to be ordered with bulkhead or flange bracket orientation increasing the number of parts to satisfy various installation requirements<br>✓ All female connectors elongated for bulkheads up to ¼" thick vs PPC only<br>✓ One Female connector elongated<br><br>**Note**: Universal mounting bracket for bulkhead and flange included in the LP-BTR-N series. Self-captivated screws in the bracket. This design feature allows for any installation (flange, bulkhead and suspended). |
| LSXL<br>LSXL-ME<br>LSXM-NS | LP-WBX-NFF<br>LP-WBX-NMP<br>LP-WBX-NFF<br>+ NM to SMA adaptor | ✓ The LP-WBx return loss 1.2:1, vs. PPC 1.3:1<br>✓ WBx frequency (2-6GHz) while PPC 1.6-3.8GHz than 4.2-6GHz not continuous |
| RGT<br>RGT-ME<br>RGT-DFM | LP-GTR-NFF-23<br>LP-GTR-NFM-23<br>LP-GTR-DFM-35 | ✓ Broader frequency range (DC-3000MHz vs. DC-2400MHz) for PPC<br>✓ Weatherization (body) to IP67 vs. IP65 for PPC<br>✓ Solid brass body with White Bronze plating vs. Aluminium body for PPC<br>✓ Universal mounting/grounding bracket included vs. sold separately by PPC<br>✓ Three different voltages and power ratings on TMS GTR series.<br>✓ TMS much better RL and IL than PPC<br>**Note**: This comparison is for the replaceable GT design from PPC, not the aluminium N type. |
| TSX-4310FF<br>TSX-4310FM (bidirectional)<br>TSX-4310FM (bidirectional) | LP-STRH-43FF<br>LP-STRH-43MS<br>LP-STRH-43MP | ✓ Better surge performance<br>✓ 100% PIM tested<br>✓ Bulkhead to Flange adaptor included with each protector<br><br>**Note**: Times designs are not bidirectional and customer needs to define connector on the surge and protected side. |
| TSX-DFF<br>TSX-DFM (bidirectional)<br>TSX-DFM (bidirectional)<br>TSX-DFF-BF | LP-STRH-DFF<br>LP-STRH-DMS<br>LP-STRH-DMP<br>LP-STRH-DFF | ✓ Coverage for LTE and Public Safety frequencies (700-2700MHz)<br>✓ Lower energy throughput (700µJ vs. 5µJ) |

| POLYPHASER (PPC) | Times Protect™ | Advantages |
|---|---|---|
| TSX-DFM-BF | + LP-BFDN-CW<br>LP-STRH-DMP/DMS<br>+ LP-BFDN-CW | ✓ Better PIM <-160dBc at 900/1p00/2100MHz vs. -155dBc<br>✓ Higher surge current rating 50kA (as tested) vs. 30kA single shot for PPC<br>✓ Weatherization (body) to IP67<br>✓ PPC TSx-D series IL/RL/VSWR performance frequency dependent<br><br>**Note**: Times designs are not bidirectional and customer needs to define connector on the surge and protected side. |
| TSX-NFF<br>TSX-NFM (bidirectional)<br>TSX-NFM (bidirectional)<br>TSX-NFF-P<br>TSX-NFM-P (bidirectional)<br>TSX-NFM-BF (bidirectional) | LP-STRH-NFF<br>LP-STRH-NMS<br>LP-STRH-NMP<br>LP-STRH-NFF<br>+ LP-BFDN-CW<br>LP-STRH-NMP/NMS<br>+ LP-BFDN-CW<br>LP-STRH-NMS<br>+ AL-BFDN-CW<br>LP-STRH-NMP<br>+ LP-BFDN-CW | ✓ Coverage for LTE and Public Safety frequencies (700-2700MHz)<br>✓ Lower energy throughput (700µJ vs. 5µJ)<br>✓ Better PIM <-160dBc at 900/1800/2100MHz vs. -155dBc<br>✓ Higher surge current rating 50kA (as tested) vs. 40A single shot for PPC<br>✓ Weatherization (body) to IP67<br>✓ TSx-NFF and TSx-NFM are not PIM rated<br>✓ PIM applies to the TSx-NFF-P and TSx-NFM-P<br><br>**Note**: Times designs are not bidirectional and customer needs to define connector on the surge and protected side. |
| TUSX-DFF<br>TUSX-DFM (bidirectional)<br><br>TUSX-DFM (bidirectional)<br><br>TUSX-NFF<br>TUSX-NFM (bidirectional)<br><br>TUSX-NFM (bidirectional) | LP-HBX-DFF<br>LP-HBX-DMS (M on Surge)<br>LP-HBX-DMP (Male on Equip.)<br>LP-HBX-NFF<br>LP-HBX-NMS (Male on Surge)<br>LP-HBX-NMP (Male on Prot.) | ✓ White Bronze plated body<br>✓ HBx frequency coverage 100-700MHz<br><br>**Note**: Times designs are not bidirectional and customer needs to define connector on the surge and protected side. |
| UHF50HN (OBS)<br>VHF50HN<br>UHF50HN-MA (OBS)<br>VHF50HN-MA<br>UHF50HN-ME (OBS)<br>VHF50-HN-ME | LP-HBX-NFF<br>LP-HBX-NFF<br>LP-HBX-NMS<br>LP-HBX-NMS<br>LP-HBX-NMP<br>LP-HBX-NMP | ✓ Three Times Protect units replace six PPC parts<br>✓ Frequency (100-700MHz)<br>✓ White Bronze plated brass bodies vs. Aluminium<br>✓ Hardware kit could be moved to either side of device in the F/F configuration<br>✓ Energy throughput 1.4uJ vs. 10uJ for PPC |
| VHF50D-PGR<br>VHF50D-MA-PGR | LP-HBX-DFF<br>LP-HBX-DMS | ✓ Verify PIP (peak instantaneous power) requirements |
| VHF50-HD<br>VHF50-HD-MA<br>No equivalent | LP-HBX-DFF<br>LP-HBX-DMS<br>LP-HBX-DMP | ✓ Frequency coverage extended to 700MHz (PPC 100-512MHz)<br>✓ White Bronze plated brass body vs. Aluminium<br>✓ Hardware kit can be moved to either side of the device with F/F configuration<br>✓ Lower energy throughput than PPC<br><br>**Note:** Bulkhead to Flange adaptor Included with protector. |

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