NTS Evaluation of Bantam Technology

Attributes Tested: Insertion Loss and Harmonic Suppression

NTS (National Test Services) Plano Texas. www.nts.com
Test Report No. PR043871-01 PLA-TR Rev 1. Total 36 Pages
Issue Date: 3/12/2018.
For Full Report: www.Bantamcleanpower.com/ntspr043871

Executive Summary

The primary purpose of this test program was to determine if the Equipment Under Test (EUT), a Bantam surge protection device (SPD), that uses a unique patented Leveler Technology also provides additional features such as power factor correction, low or high frequency noise suppression and bi-directional filtering. The primary objective was to perform investigative testing on this Electrical Protective Technology Device. The Bantam SPD device, herein referred to as the test item or EUT, was provided by Digilant/Lodestone.

The Bantam products meet UL1449 3rd Edition for surge protection. In a separate NTS evaluation, (PR070961-01 PLA-TR Rev 1) the patented Leveler Technology provided significant bi-directional electromagnetic interference filtering (EMI/RFI) as tested to MIL-STD-461. (www.bantamcleanpower.com/pr070961)

The DPU4 version of the Bantam product line has been approved for DOD Internet power and security applications and meets requirements of 2.95 Red-Black Engineering Guide for protection of classified and unclassified infrastructure. This product is designed for use with unclassified and/or classified networks with Protected Distribution Systems (PDS).

Insertion Loss

The purpose of this test was to measure the common and differential mode Insertion Loss characteristics of the leveler device from 60 Hz to 30 MHz.

Test Equipment, Calibration, Test Setup, Test Procedure and Test Results details are described in the full report;
www.Bantamcleanpower.com/ntspr043871

Analysis: The common mode insertion loss measurement revealed a broad resonance at 1 MHz providing approximately 18 dB of insertion loss, with no attenuating effects observed below 10 kHz.

The differential mode insertion Loss measurements revealed a very similar characteristic response at 1 MHz, as well as continued RF attenuation averaging approximately 25 dB to 30 MHz.

Current Harmonic Suppression 30Hz to 10kHz.

This test is intended to characterize the Leveler SPD's ability to suppress current harmonics produced by load equipment. Test methods have been loosely based on the current harmonics emissions tests described in MIL-STD-1399 section 300B as well as Test method CE101 in MIL-STD-461. Line (L) and Neutral (N) will be evaluated during this test.

Test Equipment, Calibration, Test Setup, Test Procedure and Test Results details are described in the full report;
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Analysis: It has been observed that the amount of current harmonic suppression varies based on the load impedance (current draw). In all cases, no suppression of the 60 Hz fundamental current was observed (as expected).

While under a 2 amp load, the current harmonic suppression appeared the greatest above 1 kHz. However, the suppression performance appears to decay as the current draw increases. At a 5 amp draw, harmonic suppression is reduced to a decibel at 1 kHz, and no suppression is observed at a current draw of 10 amps until around 6 kHz.

Commercial Model PP4004, DOD Model DPU415

NTS Evaluation of Bantam Technology

Attributes Tested: Conducted Immunity, (EMI/RFI)

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Executive Summary

The primary purpose of this test program was to determine if the Equipment Under Test (EUT), a DPU4 surge protection device (SPD), also has the ability to suppress externally coupled RF signals injected onto the input power lines. The test will determine if this suppression is bi-directional on Line, Neutral and Ground. The DPU4 device, herein referred to as the test item or EUT, was provided by Digilant/Lodestone.

The DPU4 is a single phase 115VAC 3 Amp power outlet surge protector device manufactured by Digilant/Lodestone, but is branded by DPPS. The DPU4 uses a unique patented Leveler Technology to provide unsurpassed transient spike and surge suppression as well as bi-directional electromagnetic interference filtering.

The Bantam and DPU products meet UL1449 3rd Edition for surge protection. In separate NTS evaluations, (PR043871-01 PLA-TR Rev 1 and PR043871-01TR Rev 1) the patented Leveler Technology provided significant improvement in Power Factor, Current Harmonic Suppression, Common and Differential Mode Insertion Loss. (www.Bantamcleanpower.com/ntspr043871)

The DPU4 has been approved for DOD Internet power and security applications and meets requirements of 2.95 Red-Black Engineering Guide for protection of classified and unclassified infrastructure. This product is designed for use with unclassified and/or classified networks with Protected Distribution Systems (PDS).

Conducted Immunity Test Measurements (EMI/RFI)

The purpose of this test was to characterize the Bantam's ability to suppress externally coupled RF signals onto the input power lines of a product. The CS114

Conducted Immunity test method specified by MIL-STD-461 (Requirements for the control of electromagnetic interference characteristics of subsystems and equipment) for military platforms was used as guidance. This test is intended to represent the typical or expected unwanted RF noise characteristics coupled onto power and signal lines from external sources present at the installation environment.

Products undergoing the CS114 test are generally monitored for degraded performance and are required to pass the test without damage or need for manual intervention. The CS114 threat level (in terms of induced RF current) will vary dependent on the platform location. Therefore, a susceptibility risk can exist where a product was tested to a lesser threat level than actually installed and operated in. In these cases, supplemental RF protection may be required. However, the amount of protection needed is dependent on the delta between the level tested, and the actual platform threat plus a reliability factor. This modified test was intended to show the amount of coupled RF suppression the Bantam SPD will provide an inline product.

Test Equipment, Calibration, Test Setup, Test Procedure and Test Results details are described in the full report; www.bantamcleanpower.com/pr070961

Analysis: The Bantam SPD demonstrated significant suppression characteristics in the 1 MHz to 20 MHz frequency spectrum, which is commonly known to contain the majority of problematic EMI noise sources in nearly every industry platform.

The Bantam's ability to provide 20 dB of common mode noise suppression will reduce an interfering signal amplitude by a factor of 10 times, not only improving a product's RF susceptibility threshold, but potentially extending product life expectancy.

Commercial Model PP4004, DOD Model DPU415