



CERTIFICATE OF CONFORMANCE

MIL-STD-188-125-1A Acceptance PCI Testing

MPE HCS1-N#120 HEMP Non-Power Line PPD (N Lines, 1 A, 120 VAC)

MIL-STD-188-125-1A short (E1) pulse acceptance pulsed-current injection (APCI) testing of the MPE HCS1-N#120 (where N, the number of lines, is two, four, or eight) HEMP unrestricted non-power line filter / Point-of-Entry (PoE) Protective Device (PPD) has been performed by Jaxon Engineering and Maintenance. Based on the results of this testing, Jaxon Engineering and Maintenance hereby certifies that the two-, four-, and eight-line configurations of the MPE HCS1-N#120 meet the applicable short (E1) pulse APCI testing performance requirements published in MIL-STD-188-125-1A. As the HCS1-N#120 is intended for use on non-power lines with a HEMP-exposed length of less than 200 m, MIL-STD-188-125-1 intermediate (E2) pulse APCI testing is not required of this PPD. Additionally, MIL-STD-188-125-1A long (E3) pulse APCI testing was not performed; E3 protection is not typically provided by a non-power line PPD.

The MPE HCS1-N#120 is available as a two-, four-, or eight-line cabinet, with each line rated for 1 A at 120 VAC (line-to-ground). Line-to-ground surge suppression on each line is provided by an Epcos S20K150 metal oxide varistor (MOV), or equivalent.

MIL-STD-188-125-1A short pulse APCI testing of the HCS1-N#120 was performed by applying E1 transients up to a maximum short-circuit current (Isc) injection level of 3535 A onto the dirty side of the PPD in the wire-to-ground (WTG) mode. Short pulse APCI testing in the common mode (CM) configuration is not required by MIL-STD-188-125-1A for non-power PPDs. The 3535 A Isc injection level is the maximum injection level required in MIL-STD-188-125-1A for a two-line non-power PPD (derived from 5000 A / \sqrt{N} , where N = 2). As further detailed in MIL-STD-188-125-1A for E1 APCI testing of a non-power PPD, the clean side of the PPD was terminated into a 2 Ω resistive WTG load.

The MPE HCS1-N#120 met all applicable short pulse APCI performance requirements levied by MIL-STD-188-125-1A. The test samples exhibited no evidence of degradation or damage resulting from the application of the E1 transients. Furthermore, the worst-case (maximum) peak, peak derivative, and root action norms of the measured short pulse residual current waveforms in the WTG configuration were well below the applicable limits given in MIL-STD-188-125-1A as highlighted below. Note that the current version of MIL-STD-188-125-1A (01JUL2021) erroneously lists the residual current root action norm limit for an unrestricted high-voltage non-power line as 1.6E-3 A- \sqrt{s} ; the correct limit for this norm is 1.6E-2 A- \sqrt{s} . The Defense Threat Reduction Agency (DTRA), the DoD agency responsible for MIL-STD-188-125-1A, has confirmed that this error will be corrected in a forthcoming update to the standard.

SHORT PULSE NORM	WTG LIMIT	HCS1-N#120
Peak Current (A)	1.0	0.64
Peak di/dt (A/s)	1.0E+07	1.8E+04
Root Action (A \sqrt{s})	1.6E-02	7.4E-03

MPE HCS1-N#120

Worst Case MIL-STD-188-125-1A E1 APCI Residual Current Norms