Test Report issued under the responsibility of:

TEST REPORT
IEC 61010-1
Safety requirements for electrical equipment for measurement, control, and laboratory use
Part 1: General requirements

Report Reference No ..... :	E164178-A5-CB-2
Date of issue ..... :	2016-07-26
Total number of pages ..... :	16
CB Testing Laboratory ..... :	UL Melville
Address ..... :	1285 Walt Whitman Road, Melville, NY, 11747, USA
Applicant's name ..... :	BITRONICS L L C
Address ..... :	261 BRODHEAD RD BETHLEHEM PA 18017-8938 UNITED STATES
Test specification:	
Standard ..... :	IEC 61010-1:2010, 3rd Edition
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC61010_1H
Test Report Form originator ..... :	VDE Testing and Certification Institute
Master TRF ..... :	2011-11

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	PowerPlex II (PPX II)
Trade Mark ..... :	Bitronics
Manufacturer ..... :	BITRONICS L L C 261 BRODHEAD RD BETHLEHEM PA 18017-8938 UNITED STATES
Model/Type reference ..... :	MTWDN7CD, where additional alphanumeric suffixes may be provided. MTWDN7CP, where additional alphanumeric suffixes may be provided.
Ratings ..... :	MTWDN7CD - Power Supply Input (AUX PWR or DC PWR): Option 1, Low Voltage (Vdc Power supply) - 12-40Vdc (Maximum operating range 8-40Vdc), Maximum 5W. MTWDN7CP - Power Supply Input (AUX PWR): Option 2 - Universal (Hi Range) AC/DC power supply 69-240 Vac, 50/60 Hz, maximum 24VA, 48-250 Vdc, Maximum 8W. (Maximum operating range 37-300 Vdc, 55-275 Vac, 45-65 Hz) Measurement Input (VT inputs) for MTWDN7CD & MTWDN7CP: 8 inputs 0-600Vrms line-to-neutral, 20-75 Hz, CAT III, Impedance >12M ohms input-to-ground (Maximum 50uA); Measurement Input (CT inputs): 3 inputs, 0-10Arms continuous; Withstands 30Arms continuous and under fault condition can withstand 400Arms for 2 seconds

Testing procedure and testing location:		
[x]	**CB Testing Laboratory**	
	Testing location / address .....:	UL Melville 1285 Walt Whitman Road, Melville, NY, 11747, USA
[ ]	**Associated CB Test Laboratory**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	David V. Alma/Project Handler
	Approved by (name + signature)....:	Max S. Rodguez/Project Reviewer
[ ]	**Testing Procedure: TMP/CTF Stage 1**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: WMT/CTF Stage 2**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Witnessed by (name + signature) ..:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	
[ ]	**Testing Procedure: RMT**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	

List of Attachments

National Differences (0 pages)

Enclosures (21 pages)

Summary of Testing:

No tests were conducted

Summary of Compliance with National Differences:

Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AT, BE, CA, CH, CZ, DE, DK, FI, FR, GB, IL, IT, JP, NO, SE, SG, SI, SK, US

The product fulfills the requirements of: The product additionally fulfills the requirements of: IEC 61010-2-30 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits, Edition 1.0 2010-06; UL 61010-2-30 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits, First Edition, Dated May 11, 2012 and CAN/CSA-C22.2 No. 61010-2-030-12 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits, First Edition.

Copy of Marking Plate - Refer to Enclosure titled Marking Plate for copy.

Test item particulars :	
Type of item tested .....:	Measurement
Description of equipment function .....:	Synchronizing Ethernet Transducer
Connections to mains supply .....:	Permanent
Overvoltage category .....:	N/A for Model MTWDN7CD, Class II for Model MTWDN7CP, Class III for measuring circuits (Models MTWDN7CD & MTWDN7CP)
Pollution degree .....:	2
Means of Protection .....:	Class I (PE connected)
Environmental conditions .....:	Extended from normal: Operating Temperature -40 to 70°C; Ambient Humidity 0 to 95%.
For use in wet locations .....:	No
Equipment mobility .....:	Fixed
Operating conditions .....:	continuous
Overall size of the equipment: (W X D X H) (mm) :	5.28"H x 5.60"W x 5.75”D (134mm H x 142 mm W x 146mm D) – overall depth including handle
Mass of the equipment (kg) .....:	2.3 lbs (1.04 kg)
Marked degree of protection to IEC 60529 .....:	N/A
Possible test case verdicts:	
- test case does not apply to the test object .....:	N / A
- test object does meet the requirement .....:	P(Pass)
- test object does not meet the requirement .....:	F(Fail)
Testing:	
Date(s) of receipt of test item .....:	N/A
Date(s) of Performance of tests .....:	N/A

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.

"(see Form A.xx)" refers to a table appended to the report.

Bottom lines for measurement tables Form A.xx are optional if used as record.

Throughout this report a point is used as the decimal separator.

Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	Not Applicable
When differences exist, they shall be identified in the General Product Information section.	

Name and address of Factory(ies): BITRONICS L L C
261 BRODHEAD RD
BETHLEHEM PA 18017-8938

UNITED STATES

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2016-10-31 to include the following changes/additions:
Corrections - inlcude updated marking plates, insulation diagrms, signal board trace layouts and minor CCL corrections not affecting safety. GPI reference to an IEC 60127 supplementary fuse corrected from 3A to 3.15A .

The changes does not affect the particular report IEC 61010-2-030(ed.1)

Product Description

The PowerPlex II (PPX II) model MTWDN7CD (where the 8th character is D) is a synchronizing Ethernet transducer powered by either a 12-40Vdc power source (where Low Voltage DC, referred to as option 1) with the following measurements inputs:
- 8 voltage inputs, measure 2 buses, 3 phases 3 or 4 wires, line-to-neutral voltage up to 600Vrms;
- 3 current inputs, measure 3 phases, continuous current 10Arms. Also withstands 30Arms continuous and under fault condition can withstand 400Arms for 2 seconds.
The product provides two RJ-45 Ethernet ports as output. Display port IRIG-B time input port and energy pulse are options.
The product is considered as an open-type panel mount meter intended to be installed in an industrial control panel or similar type of enclosure. Only the front panel is evaluated to the applicable enclosure requirements.

The PowerPlex II (PPX II) Model MTWDN7CP (where 8th character is P) is a synchronizing Ethernet transducer powered by a 69-240 Vac, 48-250 Vdc power source (where Hi Range Universal power supply is referred to as option 2) with the following measurements inputs:
-8 voltage inputs, measure 2 buses, 3 phases 3 or 4 wires, line-to-neutral voltage up to 600Vrms;
-3 current inputs, measure 3 phases, continuous current 10Arms. Also withstands 30Arms continuous and under fault condition can withstand 400Arms for 2 seconds.
The product provides two RJ-45 Ethernet ports as output. Display port, IRIG-B time input port and energy pulse are options.
The product is considered as open-type panel mount meter intended to be installed in an industrial control panel or similar type of enclosure. Only the front panel is evaluated to the applicable enclosure requirements.

User Manual specifies external overcurrent devices:
"VT inputs should only be connected to voltage systems with nominal Line to Neutral voltages of 600Vac or less. If the nominal Line to Neutral voltage will be greater than 300Vac, external fuses shall be provided at the input to the VT terminal for all live conductors. Bitronics recommends UL 248 certified fuses, rated 600V, 3A, fast acting (F), no time-delay fuses, or fuses certified to IEC 60269, rated 690V, 3A, fast acting (F), high-breaking capacity. The fuses shall additionally be enclosed in an appropriate fuse holder to prevent the possibility of a fuse shattering and spraying metal pieces. The fuse and holder must carry a voltage rating appropriate for the power system on which it is to be used. A fast acting fuse with a current rating lower than 3 Ampere is permitted."

For Input option 2 a branch circuit 3A time delay fuse shall be used in conformance with UL/CSA overcurrent protection requirements for the United States and Canada. An IEC 60127 supplementary 3.15A time delay fuse may be acceptable rather than an IEC 60269 branch circuit 3A time delay fuse for locations outside of

the United States and Canada as long as the equipment is not installed as part of the building, but resides in a panel in an separate equipment cabinet or enclosure.

Model Differences

Model name is MTWDN7C, which is the base model number for PowerPlex II. Two options are available on the power supply. MTWDN7CD is made as option 1 with LO Vdc input power source and MTWDN7CP is made as option 2 with Universal AC/DC (Hi Range) input power supply, where additional alphanumeric suffixes may be provided. The suffixes are variable and may represent differences in function as determined by software or non-hazardous low voltage circuitry, client branding of front panel, current measurement range or external Current Transformer measurement, and numbers of RJ45 ports, as well as options for Display port, IRIG-B time input port, and energy pulse.

The 8th position or character determines the type of power supply.
When the base model number MTWDN7C is followed by D the power supply type is 12-40 V dc range with monitoring (Lo VDC, 24Vdc nominal);
when MTWDN7C is followed by P the power supply type is the Universal (Hi Range) power supply 48-250 V dc/69-240 V ac, with monitoring.

The 15th position or character determines the front panel branding.

Accessory model name is PPXIITD, which refers to the optional accessory identified as Tethered Display, where the 8th position or character determines the display front branding.

Additional Information

Because there is no foreseeable hazard which not fully addressed under Clause 6 to 16, clause 17 Risk Management requirements were not considered applicable.

NOTE: We recognize that the TRF used in this file may not be the latest version. However we have reviewed the newest TRF and there are no technical changes from the one that was used for this report. All changes involve formatting only.

Correction 1 of CBTR Ref. No. E164178-A5-CB-1 - This report correction was necessary to update the Critical Components Table component "terminal block" rating to 600V, 30A, 95°C. The values were previously entered incorrectly by mistake. Also, the Corrected DataSheet was included to include the VT Terminal Blocks temperature rating of 95°C. Therefore, the corrections necessary have no influences on any of the previous tests and particulars associated with the main test report.

Amendment 1 of CBTR Ref. No. E164178-A5-CB-1 - Model MTWDN7C was modified, Ratings and CCT were modified. Addition of model with Option 2 - Hi Range Universal input did not affect the measuring circuits and so no changes or testing to IEC 61010-2-030 was deemed necessary. The changes for this amendment have no influences on test conducted under all of the part 2s or Collateral standard test reports.

This CB Report is a reissue of CBTR Ref. No. E164178-A5-CB-1 with CB Test Certificate Ref. No.CA-10239-A1-UL. Based on previously conducted testing and the review of product technical documentation including schematics and actual sample at the client's site, it was determined that the product continues to comply with the standard. No tests conducted under this investigation. All tests were carried out under the original investigation.

Corrections - inlcude updated marking plates, insualtion diagrams, signal board trace layouts and minor CCL corrections not affecting safety. GPI reference to an IEC 60127 supplementary fuse corrected from 3A to 3.15A .
The changes for this correction have no influences on test conducted under all of the part 2s or Collateral

standard test reports noted.

Technical Considerations

- Equipment classification: Measurement equipment
- Equipment class: Class I
- Equipment type: Permanently connected, Fixed
- The product was submitted and tested for use at the maximum recommended ambient temperature (Tmra) of: -40°C to 70°C
- Measurement Category: III

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

INSULATION DIAGRAM

Refer to Diagram 04 for Model MTWDN7CD and Diagram 05 for Model MTWDN7CP Insulation Diagrams

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.6.2	Specified in manufacturer's instructions	User Manual specifies "VT inputs should only be connected to voltage systems with nominal Line to Neutral voltages of 600Vac or less. If the nominal Line to Neutral voltage will be greater than 300Vac, external fuses shall be provided at the input to the VT terminal for all live conductors. Bitronics recommends UL 248 certified fuses, rated 600V, 3A, fast acting (F), no time-delay fuses, or fuses certified to IEC 60269, rated 690V, 3A, fast acting (F), high-breaking capacity. The fuses shall additionally be enclosed in an appropriate fuse holder to prevent the possibility of a fuse shattering and spraying metal pieces. The fuse and holder must carry a voltage rating appropriate for the power system on which it is to be used. A fast acting fuse with a current rating lower than 3 Ampere is permitted." User Manual specifies "To maintain the safety features of this product an external fuse shall be provided at the input to the positive (+) AUX PWR terminal. Bitronics recommends UL 248 certified fuse rated 32Vdc (min or greater), 10A fast acting (F), no time delay fuse or fuse certified to IEC 60127 rated 32Vdc (min or greater), 6.3 Ampere fast acting (F) no time delay fuse. The fuse shall additionally be enclosed in an appropriate fuse holder to	Pass

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
		prevent the possibility of a fuse shattering and spraying metal pieces. The fuse and holder must carry a voltage rating that is appropriate for the dc circuit on which it is being used. " User Manual specifies "To maintain the safety features of this product an external fuse shall be provided AUX PWR supply input and must be connected in series with the ungrounded/non-earthed (hot) side of the supply input terminals prior to installation. For UL/CSA, Bitronics recommends UL 248-4 certified fuse, Class CC rated 600Vac/300Vdc, 3 Ampere time delay (T) fuse (such as Littelfuse CCMR003 or Mersen ATDR3) or For CE, Bitronics recommends a fuse certified to IEC 60127-2 Sheet 3 rated 250Vac (min or greater), 3.15 Ampere time delay (T) fuse. The fuse shall additionally be enclosed in an appropriate fuse holder to prevent the possibility of a fuse shattering and spraying metal pieces. The fuse and fuse holder must carry a voltage rating that is appropriate for the power supply system on which it is being used. "	

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

14.1	**TABLE: List of components and circuits relied on for safety**				Pass
object/part or Description	manufacturer/ trademark (NOTE 1)	type/model	technical data (NOTE 2)	standard (Edition/ year)	mark(s) of conformity[1]) (NOTE 3 and 4)
Aluminum Case	Interchangeable	Interchangeable	Minimum thickness 1.8mm. Approximately 14.5 x 11.5 x 10.5 mm	Additionally tested in the end-product	--, --
Label	Datamax-O'Neil Corp.	Type Fantastock or Fantastock White, or Fantastock Silver or FANTA 2WH/TC/2MIL	150°C, for application to Aluminum	UL969 Additionally tested in the end-product	UR, --
PCB – Front panel (considered as final enclosure)	Interchangeable	Interchangeable	3 mm thick, Rated V-0 or better, 130°C or higher (See Enc 3-01, Enc 3-19)	UL796, CSA C22.2 No. 0.17 Additionally tested in the end-product	UR, cUR or CSA, --
Terminal Blocks	COOPER BUSSMANN LLC	A38 series: 3 position (A38220304) and 8 position (A38220804)	Suitable for field wiring, Rated minimum 600V, 30A, 10-22AWG CU, 95°C	UL1059, UL 486, CSA-C22.2 No. 158-1987, Additionally tested in the end-product – Ball Pressure Test	UR, cUR or CSA, Evaluated for this application
PCB – other than front panel	Interchangeable	Interchangeable	Rated V-0 or better, 130°C or higher	UL796, CSA C22.2 No. 0.17 Additionally tested in the end-product	UR, cUR or CSA, --
Protective impedance – HV divider on PCA 781	EBG Austria,	HVT 7 (Dwg# 195158)	rated 7 KV, 12M/60.3Kohms, 0.5W See Enc 4-02	Additionally tested in the end-product	--, --
Current Transformers on PCA 781	Tinicum Magnetics	TRNCTWVAR (Dwg# 330021)	30Arms CT 50155 Tape Core, Torroid, 1000T secondary winding. CT construction details: Primary 10-32 studs	UL94 Additionally tested in the end-product	UR, --

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

14.1	**TABLE: List of components and circuits relied on for safety**				Pass
object/part or Description	manufacturer/ trademark (NOTE 1)	type/model	technical data (NOTE 2)	standard (Edition/ year)	mark(s) of conformity[1]) (NOTE 3 and 4)
			(provided with phenolic tube spacer, made by Industrial Laminates, type Norplex NP603, which is not relied on for insulation). toroidal coil (Secondary) utilizes nylon bushing as insulator through center of coil, The Nylon bushing is positioned over phenolic spacer, made by E.I.Dupont, type Zytel 101F rated 94V-2, RTI 75°C, which is Relied on for insulation. (See Enc 4-01)		
Model MTWDN7CD (Low Voltage DC Power supply)	-	-	-	-	-, -
PCA 780	Interchangeable	Interchangeable	Rated V-0 or better, 130°C or higher See Enc 3-08, Enc 5-02	UL796, CSA C22.2 No. 0.17 Additionally tested in the end-product	UR, cUR or CSA, --
Planer Transformer T1	Bitronics (PWB) Ferroxcube (core)	Planar transformer etched as Part of PWB. Core is 2 piece ferrite 22616E & 22616I	Provide functional insulation	Additionally tested in the end-product	--, --
Transient voltage surge	Littelfuse	SMDJ40A	Rated maximum peak pulse	UL 497B Additionally	UR, --

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

14.1	**TABLE: List of components and circuits relied on for safety**				Pass
object/part or Description	manufacturer/ trademark (NOTE 1)	type/model	technical data (NOTE 2)	standard (Edition/ year)	mark(s) of conformity[1]) (NOTE 3 and 4)
suppressor			current 46.5A	tested in the end-product	
Model MTWDN7CP (Hi Range AC/DC Universal Power supply)	-	-	See Enc 3-18, Enc 5-06,	--	--, --
PCB797	Interchangeable	Interchangeable	Rated V-0 or better, 130°C or higher See Enc 3-17, Enc 3-18	UL796, CSA C22.2 No. 0.17 Additionally tested in the end-product	UR, cUR or CSA, --
Across the Line (X) Capacitor (C1)	EPCOS Electronic Components S A	32923C3474M (B3292 series, MKP X2)	0.47uF, min 250VAC 50/60 Hz,	IEC 60384-14 Additionally tested in the end-product	UR, cUR or CSA, VDE Certif. Ref. No. 40010694 or ENEC
Metal Oxide Varistor (MOV1)	Panasonic Corporation	ERZ-V07D511 (Marked V7511U)	320V AC (@2ms), 410V DC	UL1449 Additionally tested in the end-product	UR, cUR, VDE Certi. Ref. No. 005912 or CENELEC
Tranzorb (TZB1)	Vishay	1.5KE440CA	418-462 VBR, @ 1mA	Additionally tested in the end-product	--, -
Tranzorb (TZB1)	Interchangeable	Interchangeable	418-462 VBR, @ 1mA	UL497B Additionally tested in the end-product	UR, cUR, -
Rectifier FW Bridge (U2)	Interchangeable (Vishay)	Interchangeable (DF1506S)	1.5A max average forward output current, 420Vrms (600 Vdc)	UL1012 Additionally tested in the end-product	UR, cUR, -
Capacitor C2A	Interchangeable	Interchangeable	Electrolytic, rated 68uF, 400Vdc	Additionally tested in the end-product	-, -
Capacitor, (Polyester) Film (C2) (Alternate to C2A)	Interchangeable	Interchangeable	15uF, 400Vdc	Additionally tested in the end-product.	--, --
AC Capacitor (C4, C24,C26) (C3 optional)	Murata	GA355DR7GF472KW01L,	4700PF, 250Vac,	UL1414 IEC60384-14 Additionally tested in the	UR, cUR, VDE Ceritf. Ref. No. 40024096 or CENELEC

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

14.1	**TABLE: List of components and circuits relied on for safety**				Pass
object/part or Description	manufacturer/ trademark (NOTE 1)	type/model	technical data (NOTE 2)	standard (Edition/ year)	mark(s) of conformity[1]) (NOTE 3 and 4)
				end-product	
IC, Optocoupler U1	Vishay	VOL617A	Isolation 5kv	UL1577 IEC 60747-5 Additionally tested in the end-product	UR, cUR, VDE Certif. Ref. No. 132473
IC, Optocoupler U1 (Alternate)	Vishay	VOL628A	Isolation 5kv	UL1577 IEC 60747-5 Additionally tested in the end-product	UR, cUR, VDE Certif. Ref. No. 132473
MOSFET (Q1)	Interchangeable (Vishay)	Interchangeable (IRFS9N60A)	Vdss 600V; Id 9.2A; Rds (on) 0.75 OHM max	Additionally tested in the end-product	--, --
Planar Transformer Flyback power (T1)	Interchangeable (Ferroxcube)	--	Core: consists of 2 pieces 22616 E 22616 I Windings and insulation: provided by PCB797	Additionally tested in the end-product	--, --
PCA 789 (Host Board)	Interchangeable	Interchangeable	Rated V-0 or better, 130°C or higher See Enclosure 3-10	UL796, CSA C22.2 No. 0.17 Additionally tested in the end-product	UR, cUR or CSA, --
Optional - External protective fuse to be provided in the end use application only - for AUX/DC PWR (Option 1 - MTWDN7CD, as specified in User Manual for Low Voltage DC power supply)	Interchangeable	Interchangeable	Rated 32 Vdc min, 10A fast acting (F) type UL 248 certified fuse Or Rated 32 Vdc min, 6.3A fast acting (F) type IEC 60127 fuse	UL 248 or, IEC 60127 Additionally tested in the end-product	UL, cUL or CSA, VDE or CENELEC
Optional - External protective fuse to be provided in	Interchangeable	Interchangeable	Rated 600 Vac/300 Vdc, 3A time delay (T) type UL 248-4	UL 248 or, IEC 60127 [or IEC60269] Additionally	UL, cUL or CSA, VDE or CENELEC

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

14.1	**TABLE: List of components and circuits relied on for safety**				Pass
object/part or Description	manufacturer/ trademark (NOTE 1)	type/model	technical data (NOTE 2)	standard (Edition/ year)	mark(s) of conformity[1]) (NOTE 3 and 4)
the end use application only - for AUX PWR (Option 2 - MTWDN7CP, as specified in User Manual for Hi Range Universal AC/DC power supply) [Refer to the Report Product Description for the Option 2 advisory concerning IEC 60127 vs IEC 60269 fuse type to determine whether Rating may be superseded by Rating in brackets]			certified fuse, Class CC Or Rated 250Vac, supplementary 3.15A time delay (T) type IEC 60127 certified fuse [or Rated 690Vac, 3A time delay (T) type IEC 60269 certified fuse]	tested in the end-product	
Optional - External protective fuse to be provided in the end use application only - for VT input (as specified in User Manual)	Interchangeable	Interchangeable	Rated 600Vac, 3A fast acting (F) type UL 248 certified fuse Or Rated 690Vac, 3A fast acting (F) type IEC 60269 certified fuse	UL 248 or, IEC 60269 Additionally tested in the end-product	UL, cUL or CSA, VDE or CENELEC
Supplementary information: 1. List all different manufacturers of the above components 2. May include electrical, mechanical values s 3. List license no or method of acceptance 4. asterisk indicates mark assuring agreed level of surveillance					
The CBTL has verified the component information.					

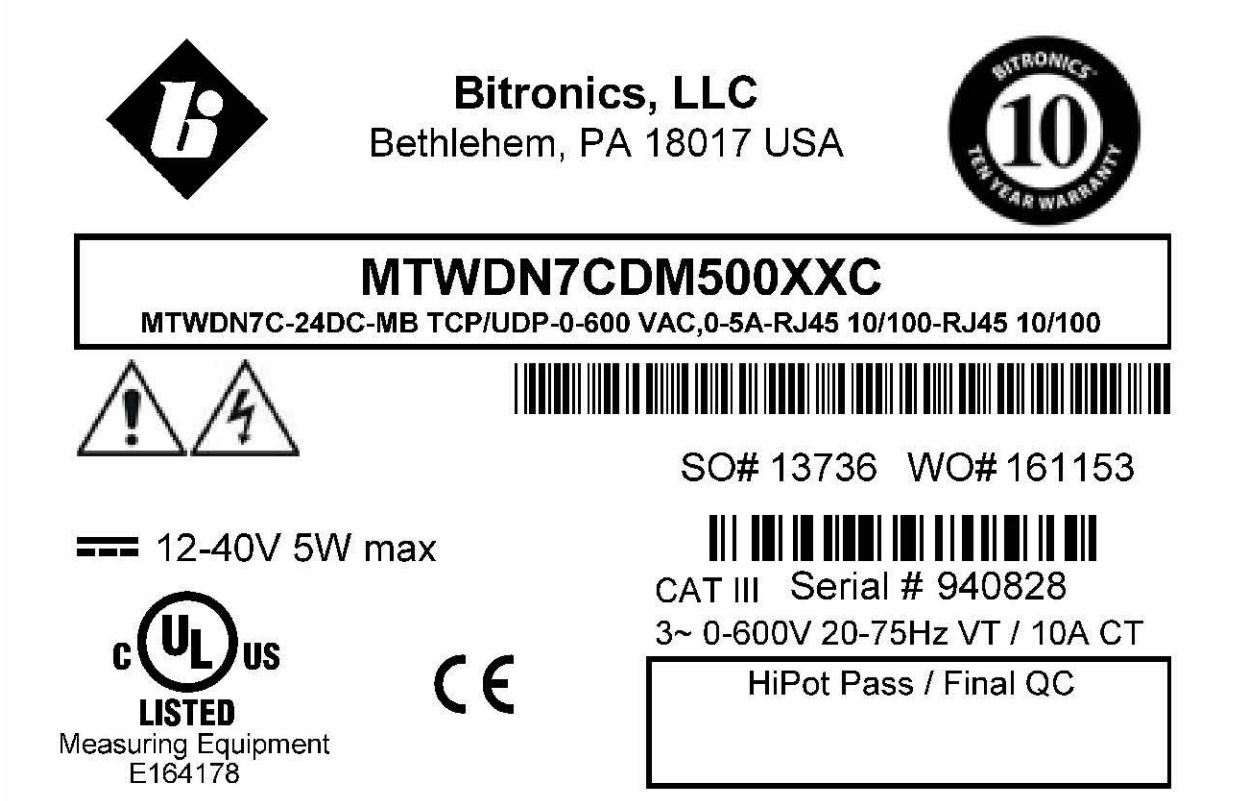
Enclosures

Type	Supplement Id	Description
Marking Plate	13-02	Model MTWDN7CP Marking Plate
Marking Plate	13-03	Model MTWDN7CD Marking Plate
Particular	12-01	IEC 61010-2-030 TRF
Photographs	3-01	Front Panel
Photographs	3-02	Side aluminum case
Photographs	3-03	Rear aluminum case
Photographs	3-04	PCB assembly
Photographs	3-05	PCB 1 Front Panel Board - reverse side
Photographs	3-06	PCB 2 Protective Impedance board - top (SIgnal Input Board)
Photographs	3-07	PCB 2 Protective Impedance board - bottom (Signal Input Board)
Photographs	3-08	PCB 3 Planar transformer board - top (DC Power Supply)
Photographs	3-09	PCB 3 Planar transformer board - bottom (DC Power Supply)
Photographs	3-10	PCB 4 Output board - front (Host)
Photographs	3-11	PCB 4 Output board - rear (Host)
Photographs	3-12	Current Transformers
Photographs	3-13	Display-front
Photographs	3-14	Display-rear
Photographs	3-15	Grounding plane
Photographs	3-16	Grounding Plane screw connection
Photographs	3-17	PCB - 797 Bottom (Hi Range AC/DC Power Supply)
Photographs	3-18	PCB - 797 Top (Hi Range AC/DC Power Supply)
Photographs	3-19	Front Panel (Non - Specific)
Diagrams	4-01	Current Transformer construction
Diagrams	4-04	Insulation Diagram Model MTWDN7CD
Diagrams	4-05	Insulation Diagram MTWDN7CP
Schematics + PWB	5-01	PowerPlex II block diagram
Schematics + PWB	5-02	MTWDN7CD - Schematic AUX PWR (DC Power Supply)
Schematics + PWB	5-03	Schematic VT, CT inputs
Schematics + PWB	5-04	Front panel PCB Top & Bottom layers silkscreen & trace
Schematics + PWB	5-05	Signal Board Top & Bottom layers silkscreen & trace
Schematics + PWB	5-06	MTWDN7CP - Schematic AUX PWR - 797 PCB for Hi Range AC/DC Input
Schematics + PWB	5-07	Signal Board layers silkscreen & trace 781 Rev 3

Manuals	6-01	User Manual
Manuals	6-02	User Manual
Miscellaneous	7-02	Front Panel Markings

MarkingPlate ID 13-02

MarkingPlate ID 13-03



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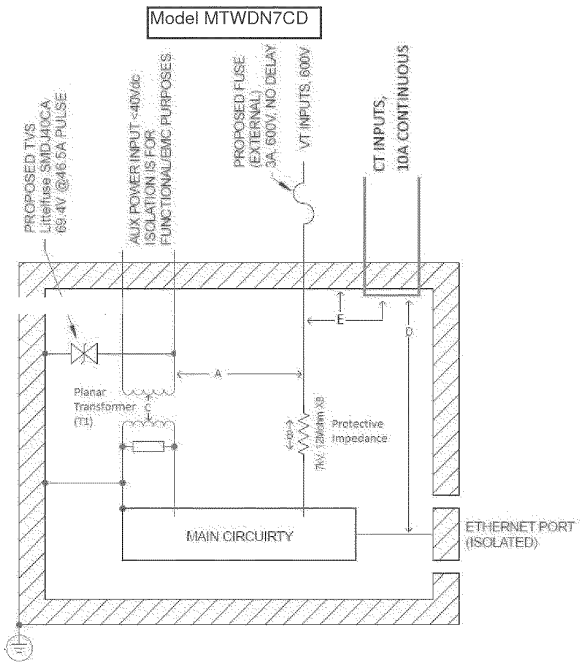
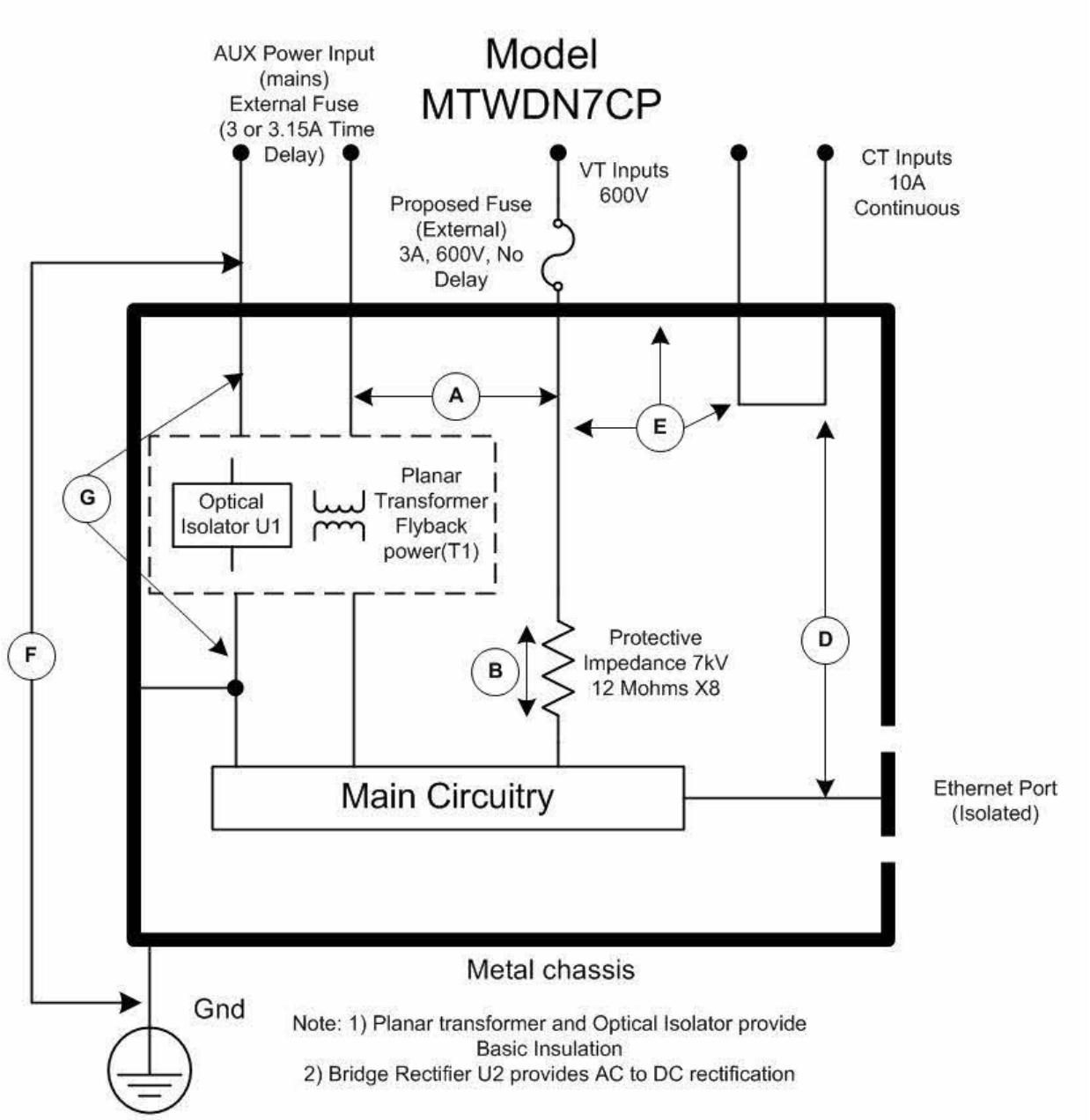


Diagrams ID 4-05



Schematics ID 5-07

Bitronics
A NovaTech Company

Specifications for PCB781R3

Please contact Bill Adams at bill.adams@novatechweb.com (610-997-5128) for quote info.

Date	25Feb2016
Board Number	781R3
Bitronics P/N	PCB781R3
Layers	6
Finished Thickness	62mil +/- 6
Copper Thickness	1oz Finished
Material	FR4/24 (thru-hole) or FR4/26 (SMT), UL 94 V-0 (all)
SMOBC?	Yes
Mask Type	LPI
Finish Type	HASL both sides
Mask Color	**Blue**
Blind/Buried Via	No
Top Silk Screen?	Yes
Bottom Silk Screen?	Yes
Silk Color	White
Dielectric	4,5
Panel / Frame?	No
Frame Type	
Inner Layer Pads	Remove unconnected inner layer pads as needed
IPC Rules	ANSI/IPC-6012 Class 3
Special instructions:	Do not change copper layer artwork (pads and via, etc) without approval from Bitronics LLC engineering.
	Silk Legends right reading
	Do not place company logos or other marks in copper as this may violate creepage or clearance distances – place these marks in Silk Screen only!

Bitronics 781R3 Build-up		
62mil 6 Layer		**Spacing**
Top Silk		
Top Solder Mask		
Top (1oz)	**L1**	
		Prepreg 9mil
Plane1 (1oz)	**L2**	
		Core 14mil 1/1 Clad
Mid1 (1oz)	**L3**	
		Prepreg 9mil
Mid2 (1oz)	**L4**	
		Core 14mil 1/1 Clad
Plane2 (1oz)	**L5**	
		Prepreg 9mil
Bot (1oz)	**L6**	
Bot Solder Mask		
Bottom Silk		

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Schematics ID 5-07

File list:

781R3.APR	Aperture File
781R3.DRR	Drill File
781R3.G1	Mid Layer 1
781R3.G2	Mid Layer 2
781R3.GBL	Bottom Layer
781R3.GBO	Bottom Overlay (Silk Screen)
781R3.GBP	Bottom Paste
781R3.GBS	Bottom Layer Solder Mask
781R3.GD1	Drill Drawing
781R3.GG1	Drill Guide
781R3.GM3	Mech 3
781R3.GM4	Mech 4
781R3.GP1	Internal Plane 1
781R3.GP2	Internal Plane 2
781R3.GPB	Bottom Paste
781R3.GPT	Top Paste
781R3.GTL	Top Layer
781R3.GTO	Top Overlay (Silk Screen)
781R3.GTP	Paste Mask
781R3.GTS	Top Layer Solder Mask
781R3.REP	
781R3.TXT	NCD

Regards,
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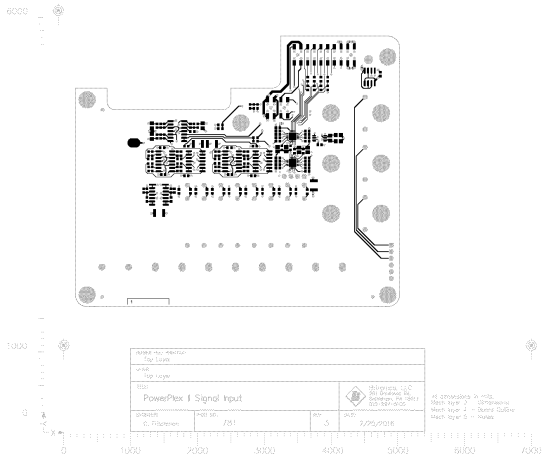

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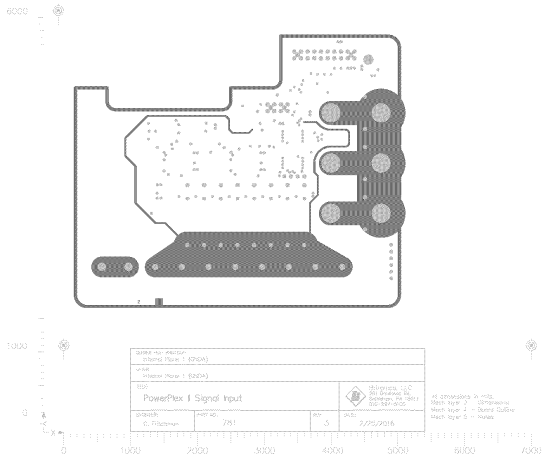

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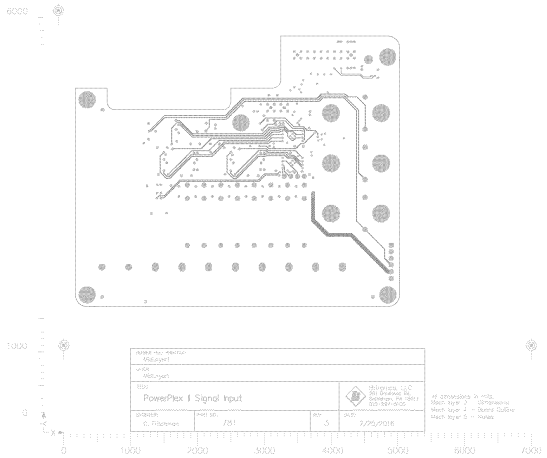

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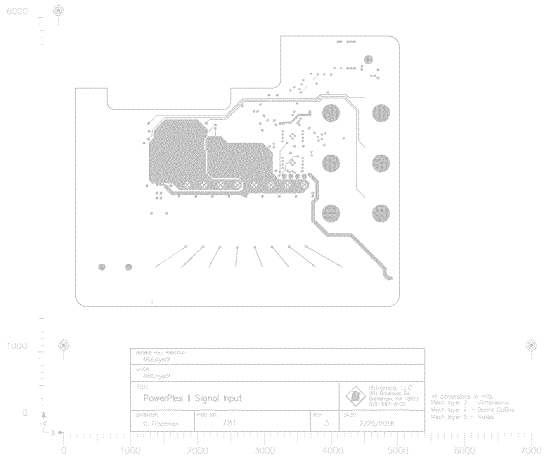

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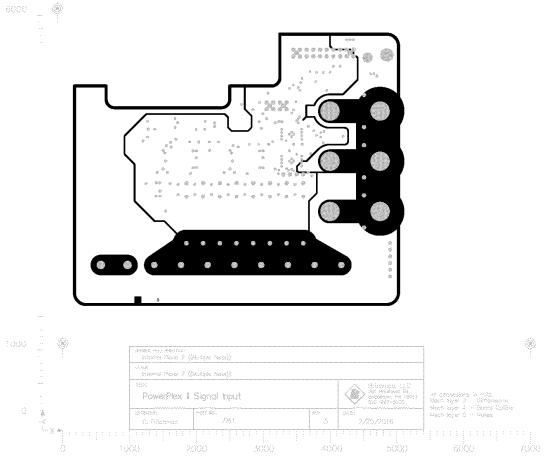

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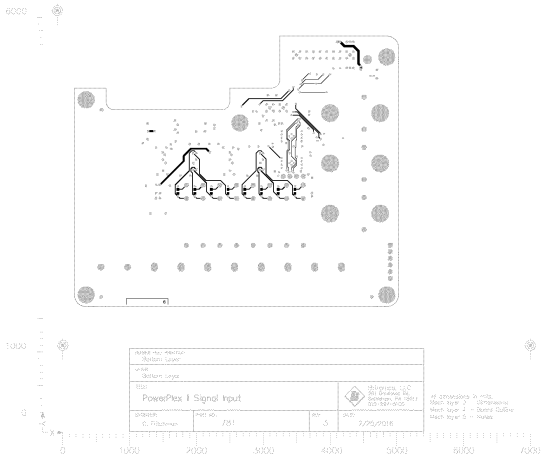

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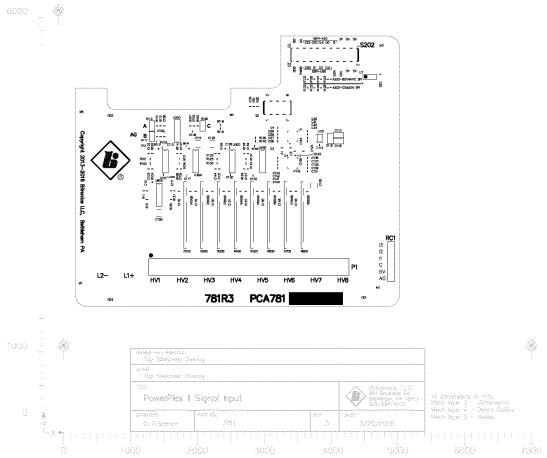

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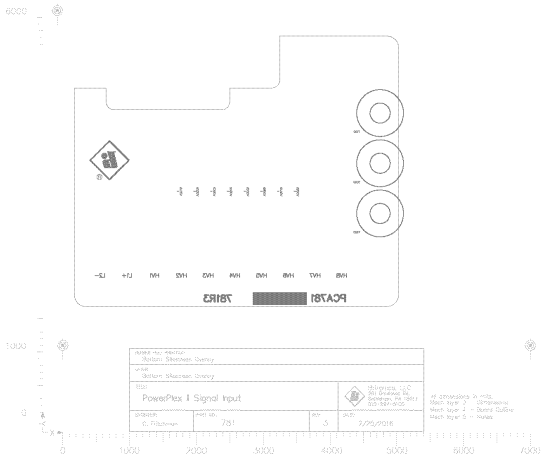

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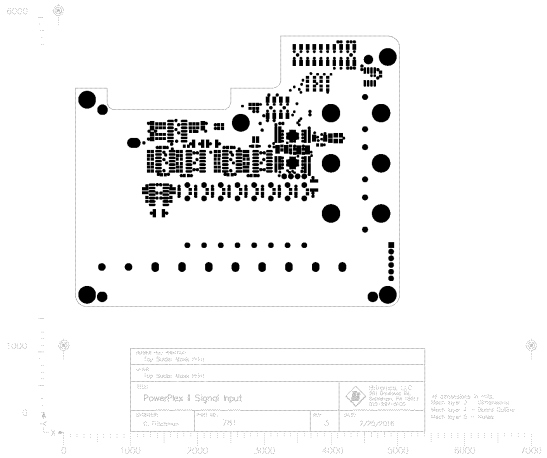

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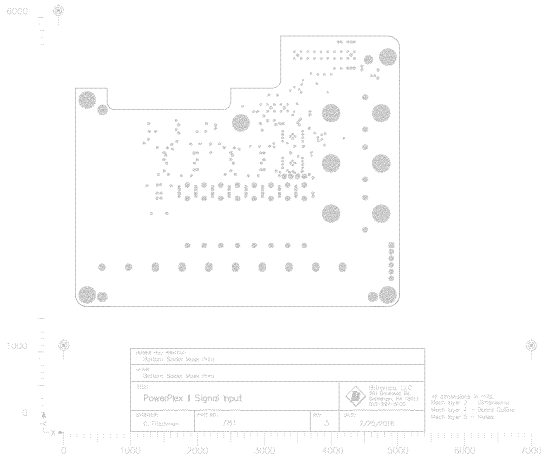

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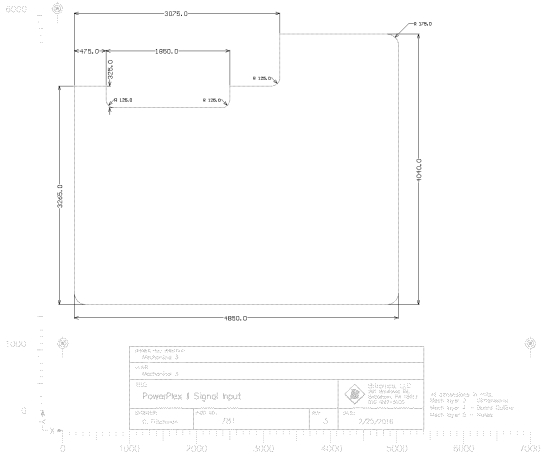

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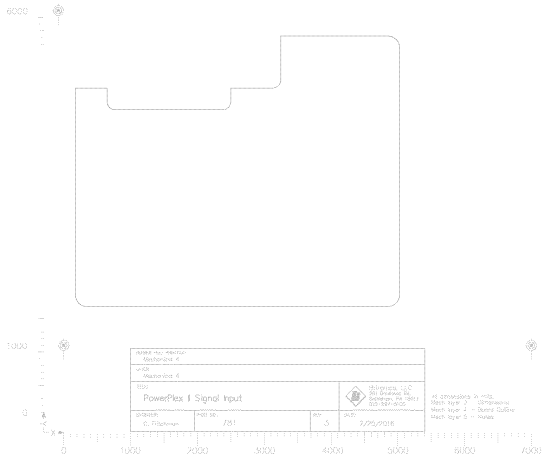

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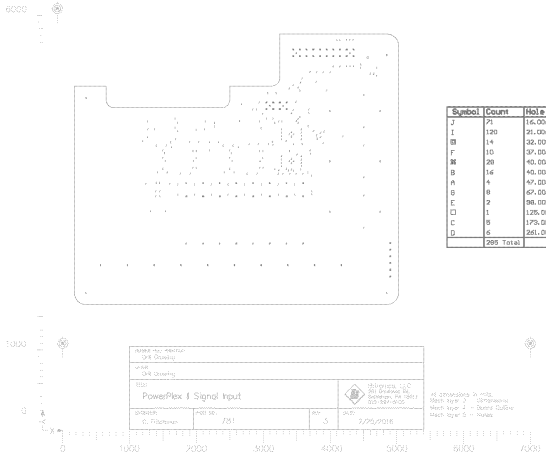

Symbol	Count	Hole Size	Plated	Hole Type	Drill Layer Pair	Via/Pad	Hole Tolerance
J	71	16.00mil (0.406mm)	PTH	Round	Top Layer - Bottom Layer	Via	
I	120	21.00mil (0.533mm)	PTH	Round	Top Layer - Bottom Layer	Via	
H	14	32.00mil (0.813mm)	PTH	Round	Top Layer - Bottom Layer	Pad	
F	10	37.00mil (0.940mm)	PTH	Round	Top Layer - Bottom Layer	Pad	
M	20	40.00mil (1.016mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	
B	16	40.00mil (1.016mm)	PTH	Round	Top Layer - Bottom Layer	Pad	
A	4	47.00mil (1.194mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	
G	8	67.00mil (1.702mm)	PTH	Round	Top Layer - Bottom Layer	Pad	
E	2	98.00mil (2.489mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	
K	1	125.00mil (3.175mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	
C	5	173.00mil (4.394mm)	PTH	Round	Top Layer - Bottom Layer	Pad	
D	6	261.00mil (6.629mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	
	295 Total						