

**PD70201EVB25FW-3**

**3.3V/25W Isolated Active Clamp Forward Converter PD**

**Evaluation Board User Guide**

Revision 1.02

## 1 About this guide

This user guide provides both description and operation procedures for Microsemi's PD70201EVB25FW-3 evaluating board. This board is used for evaluating the performance of PD70201A PD controller with integrated switching regulator, and PD70224 Dual MOSFET – Based Active Bridge Rectifier.

PD70201ILQ device supports both the standard IEEE802.3at PD application interface, and a PWM controller that is used to provide the PD operational voltage.

The evaluation board supports a 25 Watt, 3.3V output in its existing configuration, with no heat sink.

### 1.1 Audience

This user guide is intended for qualified personnel, meaning operators and technicians who have a background in basic concepts of electronics.

### 1.2 Organization

This guide is divided into several sections as follows:

|             |                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| • Chapter 1 | <b>About this Guide:</b> Describes the objectives, audience, and organization                                                                   |
| • Chapter 2 | <b>Introduction:</b> Provides an overview about evaluation board's main functions, features, physical characteristics and ordering information. |
| • Chapter 3 | <b>Physical Description:</b> Provides explanation related to the physical description (switches, jumpers, connectors).                          |
| • Chapter 4 | <b>Electrical Characteristics:</b> Provides electrical characteristics of the evaluation board.                                                 |
| • Chapter 5 | <b>Installation:</b> Provides description of the installation process.                                                                          |
| • Chapter 6 | <b>Test Data:</b> Provides board test data information                                                                                          |
| • Chapter 7 | <b>Schematic:</b> Provides board schematic diagram                                                                                              |
| • Chapter 8 | <b>List of Material:</b> Provides board's list of materials.                                                                                    |
| • Chapter 9 | <b>Board Layout:</b> Provides board Gerber files description for all layers.                                                                    |

### 1.3 Reference Documents

PD70201 datasheet, catalogue number DS\_PD70201

PD70224 datasheet, catalogue number DS\_PD70224

## 2 Introduction

Microsemi's PD70201ILQ device is part of a family of devices which are targeted for realizing the 802.3at standard PD interface.

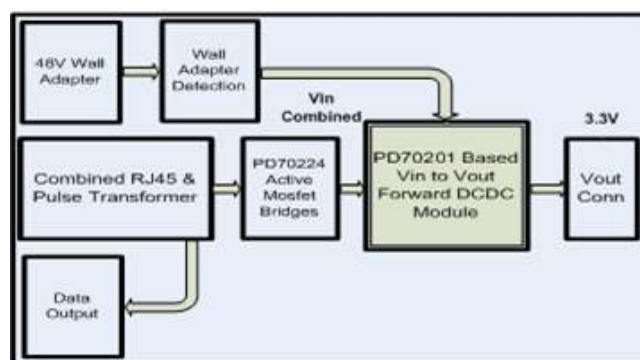
The PD interface family of devices includes the following:

| Device type | Power capability                                 | Integrates PWM controller |
|-------------|--------------------------------------------------|---------------------------|
| PD70100     | IEEE802.3at Type 1<br>(IEEE802.3 af level)       | No                        |
| PD70101     | IEEE802.3at Type 1<br>(IEEE802.3 af level)       | Yes                       |
| PD70200     | IEEE802.3at Type 2                               | No                        |
| PD70201     | IEEE802.3at Type 2                               | Yes                       |
| PD70210(A)  | 2 x IEEE802.3at Type 2 (4 pair)<br>HDBaseT (95W) | No                        |
| PD70211     | 2 x IEEE802.3at Type 2 (4 pair)<br>HDBaseT (95W) | Yes                       |

Microsemi's PD70201EVB25FW-3 Evaluation Board (see Figure 2) provides designers with an environment needed for evaluating the performance and implementation of PD applications based on PD70201 controller.

The board is using a single PD controller, PD70201ILQ, to support the Detection, Class, and Power Supplying phases on the 4 Pairs of the Cat5 cable. The board supports sync detection of the 4 pairs. PD70201ILQ supports the current of the HDBaseT over 4 Pairs, which is more than twice the power of a standard IEEE802.3AT Type 2 interface.

All necessary steps and connection instructions required to install and operate this board are provided within this document.



**Figure 1: PD70201EVB25FW-3 Block Diagram**



Figure 2: PD7201EVB25FW-3 Evaluation Board – General View

## Evaluation Boards Ordering Information

Microsemi supplies the following Evaluation Board as shown below:

| Ordering Number | Description                                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PD7201EVB25FW-3 | 2 x IEEE802.3at Type 2 (4 pair) PD based on PD7201 device having 4 pair supply, controlling an <b>isolated Forward converter</b> , having a <b>3.3V 7.5A</b> output. |

## 2.1 Evaluation Board Features

- Designed to support Data and Spare current by a single PD70201A device
- Power is supplied through the 4-pairs of the Cat5 cable
- Wall Adapter input – Standard Barrel Jack available for connecting to an external 48-54V Wall Adapter.
- Data pass-through connector
- On board AT detected LED indicator
- On board Power Good LED indicator
- $T_A = -40^{\circ}$  to  $+70^{\circ}\text{C}$
- RoHS compliant

## 2.2 Physical Characteristics

Table 1 lists evaluation board's physical characteristics.

**Table 1: Physical Characteristics**

| Parameter                   | Value                        |
|-----------------------------|------------------------------|
| Mechanical dimensions in mm | 165 x 57 x 20 mm (L x W x H) |

## 3 Physical Description

### 3.1 Package Contents

Upon opening the Evaluation Board package, verify the following part is included.

If it seems damaged, contact local representative or Microsemi's headquarters.

Package content for standard shipments is:

- PD70201EVB25FW-3 Evaluation Board.
- Wall Adapter Input Cable

### 3.2 Connectors

The following sections provide both general and detailed information regarding unit's connectors.

#### 3.2.1 Connectors Table

Table 2 lists the Evaluation Board's connectors.

**Table 2: Connectors List**

| # | Connector | Name               | Description                                                                                                                                           |
|---|-----------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | J1        | Magjack            | RJ45 port for Data + Power In for PSE connection                                                                                                      |
| 2 | J2        | Wall Adapter Input | Standard Barrel Jack used for 48V Wall Adapter. Wall adapter connection will be automatically sensed and will override the PSE power connected to J1. |
| 3 | J3        | Converter Output   | Screw terminals for easy connecting a load to 3.3V output.                                                                                            |
| 4 | J4        | RJ45 Connector     | An RJ45 port for Data pass – through output                                                                                                           |

#### 3.2.2 Connectors Detailed Explanation

(The numbering is in reference to the numbers listed in Table 2.)

##### 1. RJ45 Connectors.

See Figure 3.

**Table 3: RJ45 Connectors**

| J1 & J4 Pin No | Signal Name       | Description                                                            |
|----------------|-------------------|------------------------------------------------------------------------|
| J1 - 1, 2      | Data and Power In | Data and power input to powered device (PoE Master Negative data port) |
| J1 - 3, 6      | Data and Power In | Data and power input to powered device (PoE Master Positive data port) |
| J1 - 4, 5      | Data and Power In | Data and power input to powered device (PoE Master Positive data port) |
| J1 - 7, 8      | Data and Power In | Data and power input to powered device (PoE Master Negative data port) |

| J1 & J4 Pin No | Signal Name | Description                                               |
|----------------|-------------|-----------------------------------------------------------|
| J4 - 1, 2      | Data Output | Isolated data pass-through to external monitoring device. |
| J4 - 3, 6      | Data Output | Isolated data pass-through to external monitoring device. |
| J4 - 4, 5      | Data Output | Isolated data pass-through to external monitoring device. |
| J4 - 7, 8      | Data Output | Isolated data pass-through to external monitoring device. |

Wall Adapter Input →



→ Data Output

→ Data + Power Input

**Figure 3: Front RJ45 and Auxiliary 48V Wall Adapter Connectors**

## 2. Wall Adapter Connections

See Figure 3.

| J2 Pin No    | Signal Name | Description                         |
|--------------|-------------|-------------------------------------|
| Center Pin   | VIN (+)     | 42V to 57V input from wall adapter. |
| Outer Barrel | VIN (-)     | Wall Adapter Return                 |

## 3. V<sub>out</sub> Connections

See Figure 4.

**Table 4: Output Load Connections**

| Pin No. | Signal Name | Description                    |
|---------|-------------|--------------------------------|
| J3 - 2  | Vout (-)    | Return of DC-DC output voltage |
| J3 - 1  | Vout (+)    | Positive DC-DC output voltage  |



**Figure 4: V<sub>out</sub> Connections**

### 3.3 Indications

The following sections provide general information regarding unit's indications.

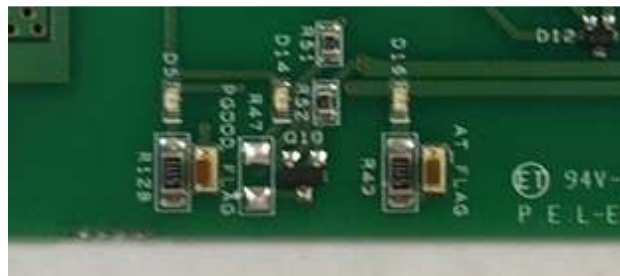
#### 3.3.1 LED Indication

See Figure 5.

D16 is the AT\_FLAG indication LED, a PD70201 device output signal indicating the device has detected a 2 finger class event from the PSE side in the class stage.

D5 is the Power Good indication, a PD70201 device output signal indicating presence of PoE power.

D14 is the input power indicator, indication power presence from either PoE or auxiliary source (wall adapter).



**Figure 5: LED Indications**

## 4 Electrical Characteristics

Evaluation board's electrical characteristics are described below:

**Table 5: Electrical Characteristics**

| Parameter                              |  | Min  | Max  |       |
|----------------------------------------|--|------|------|-------|
| Main DC Supply – J1, VIN+, VINRTN      |  | 42*  | 57   | V     |
| Wall Adapter Supply – J2, VIN+, VINRTN |  | 42   | 57   | V     |
| Output voltage                         |  | 3.25 | 3.40 | V     |
| Maximum Output Current                 |  |      | 7.5  | A     |
| Port Isolation to Chassis              |  | -    | 1.5  | kVrms |

\*After start-up, the minimum voltage is 37V with load  $\leq 13W$  per IEEE specification.

## 5 Installation

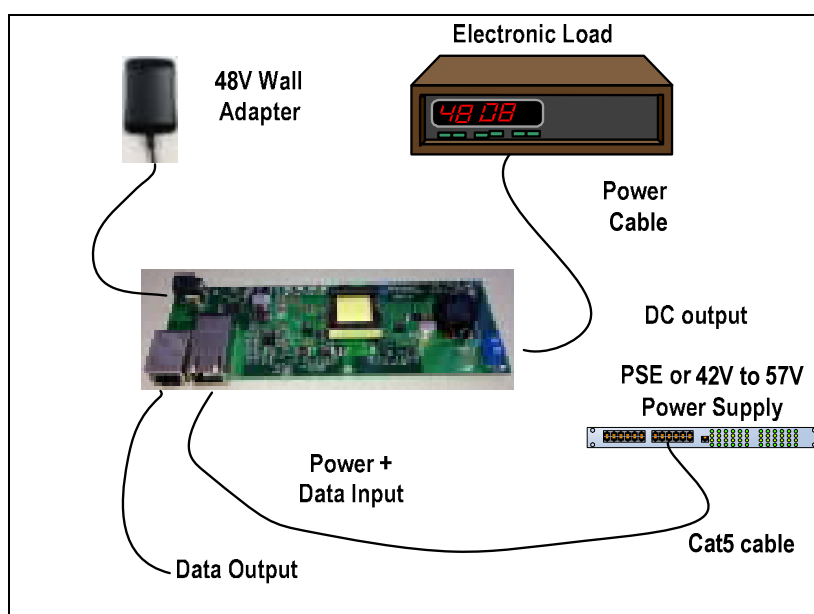
### 5.1 Preliminary Considerations and Safety Precautions

- If using an external supply in place of a PSE, verify the external power supply is turned “off” before all peripheral devices are connected. Insure the external supply is connected to the RJ45 input (J1) per Table 3.

### 5.2 Initial Configuration

**Note:** It is important to verify evaluation board is setup as shown in Figure 6 prior to starting any operation.

1. Connect load to evaluation board (J3 -1 (+) & J3 - 2 (-), or TP17 (+) & TP16 (-)).
  2. Connect a Cat5 cable from PSE to Evaluation Board (J1), or a 48V Wall Adapter to Evaluation Board (J2).
- Note: Wall Adapter will override power from PSE.



**Figure 6: Test Setup**

## 6 Test Data

This chapter describes typical EVB test data under various loads and POE input voltage levels.

The efficiency is indicated up to 15A output load current.

Overall efficiency is measured at the input to the bridge. It does not include system-level components (input/output connectors, data transformer, and EMI filter).

$$Eff = \frac{V_{out} * I_{out}}{V_{in} * I_{in}}$$

DC-DC efficiency is measured after the PD chip.

### 6.1 Efficiency vs. Input Voltage to the bridge at full load (7.5A)

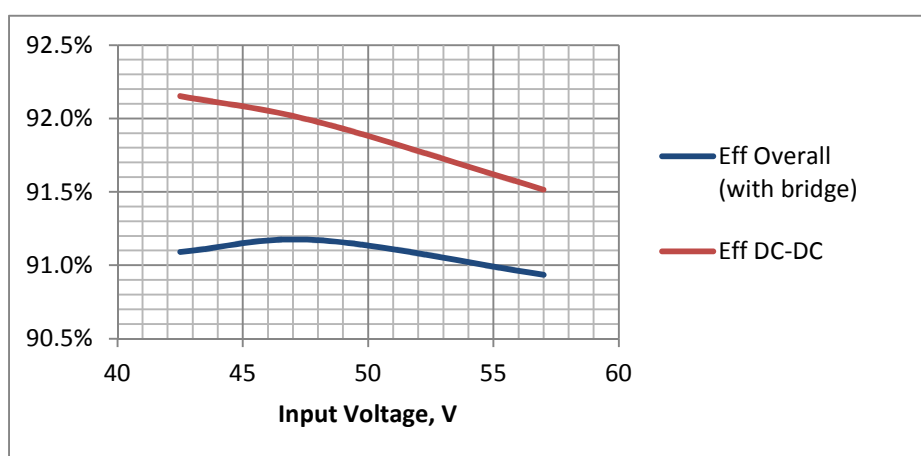


Figure 7: Efficiency vs. Input Voltage

### 6.2 Efficiency vs. Load Current at 48V Input to the bridge

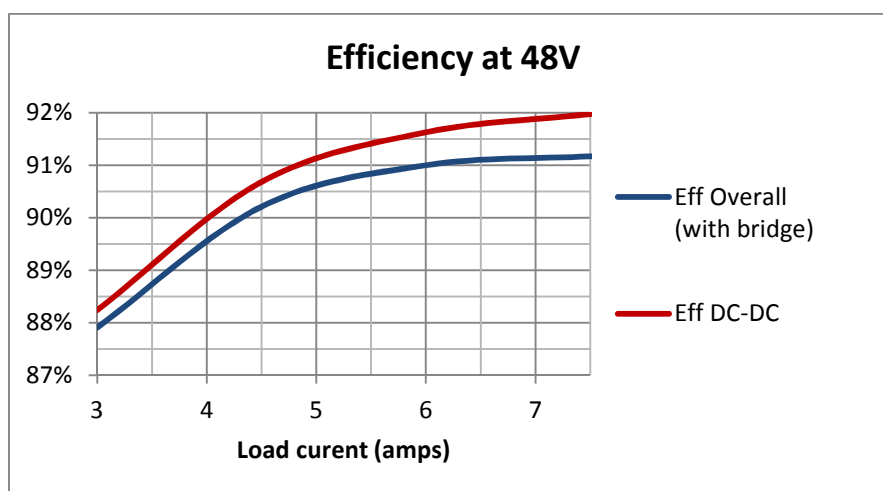


Figure 8: Efficiency at 48V Input

### 6.3 Efficiency vs. ambient temperature at 48V input to the bridge at full load

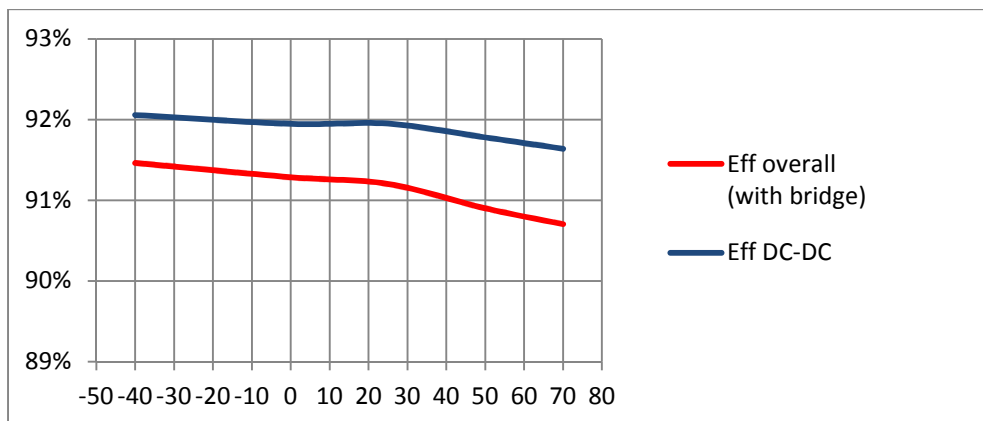


Figure 9: Efficiency vs. temperature at 48V Input

### 6.4 Output Ripple measured with 20 MHz bandwidth

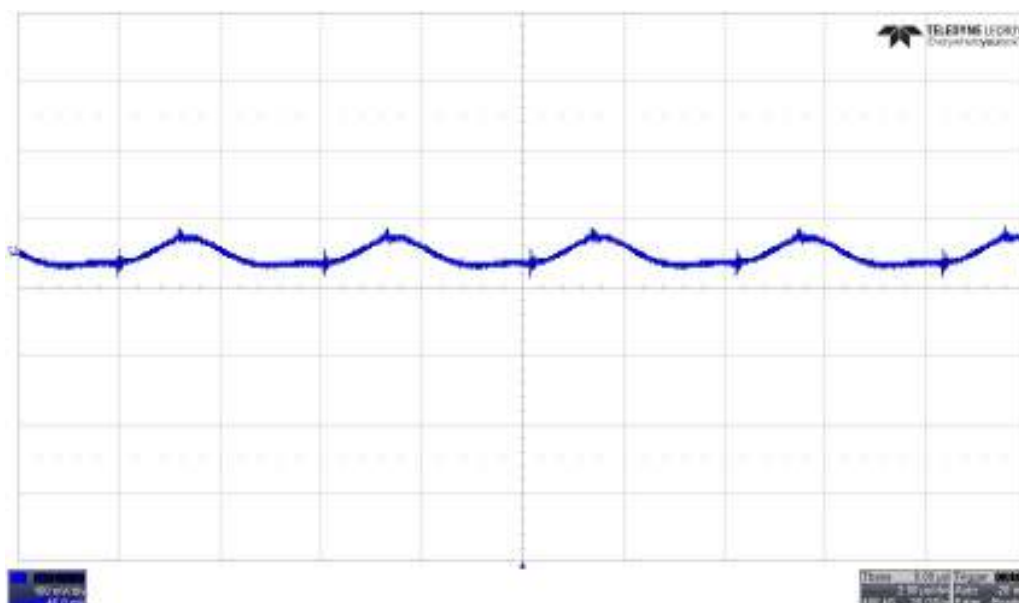
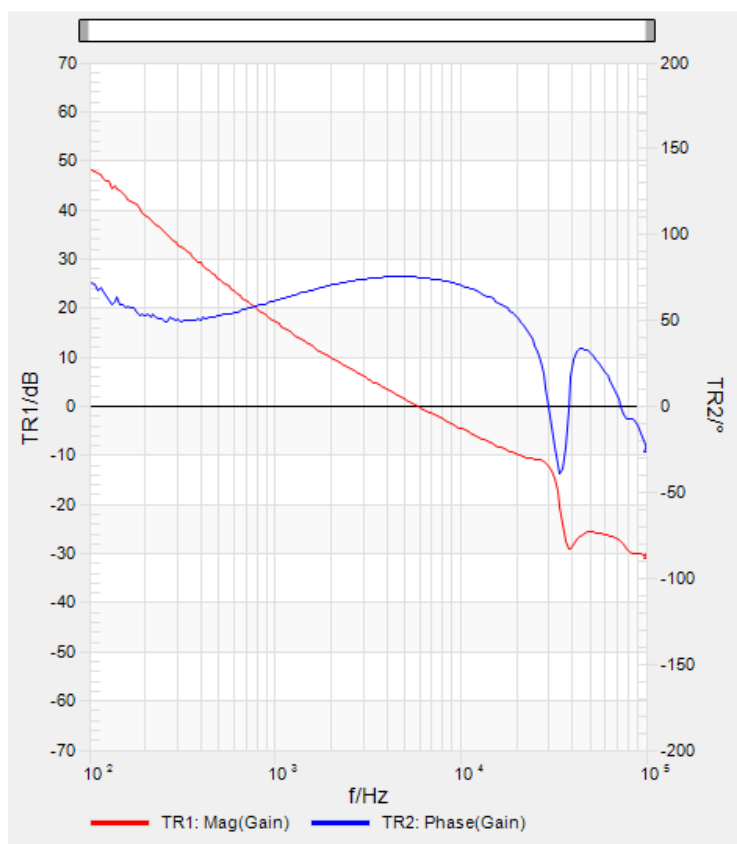


Figure 10: Full Load Voltage Ripple and Noise at 48V Input (100mV/div)



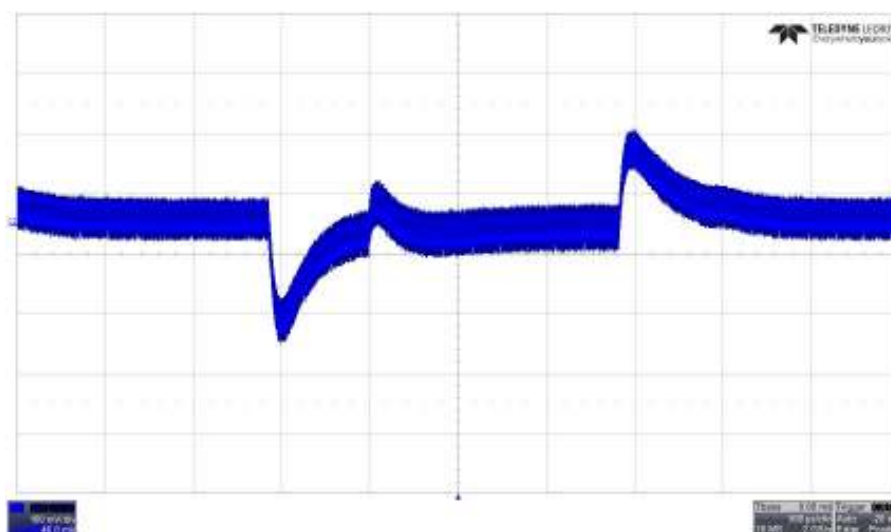
Figure 11. Proper ripple measurement

### 6.5 Bode Plots at full load at 48V input

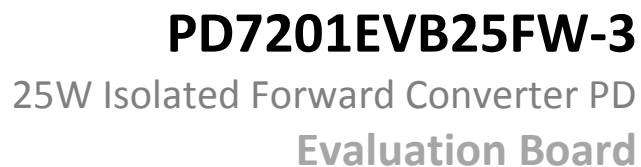


**Figure 12. Bode plots (gain and phase)**  
Phase margin: 70°, gain margin: -12dB.

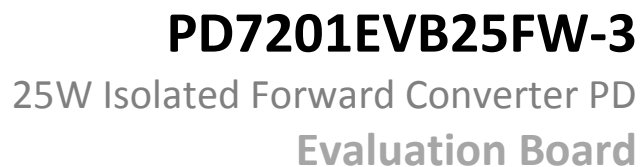
### 6.6 Step Load Response for transitions between 15% and 100% load at 48V input



**Figure 13: Load Step Response (100mV/div)**



**Microsemi**  
CPG – PoE BU  
One Enterprise Aliso Viejo, CA 92656 USA



## 8 List of Materials

| QTY | REFERENCE                     | Value  | Description                             | Mfr. Name | Mfr. Part Number   |
|-----|-------------------------------|--------|-----------------------------------------|-----------|--------------------|
| 3   | C2,C16, C158                  | 1nF    | Cap 1nF 100V 10% X7R 0603 SMT           | Samsung   | CL10B102KC8NNNC    |
| 2   | C3,C160                       | 2.2uF  | CAP CER 2.2uF 100V 10% X7R 1210 SMT     | Kemet     | C1210C225K1RACTU   |
| 1   | C8                            | 100n   | Capacitor, X7R, 100nF 100V 10% 0805     | TDK       | C2012X7R2A104K     |
| 1   | C9                            | 47uF   | CAP ALUM 47uF 100V 20% 105C RADIAL 8X15 | Samsung   | NHA100VB47M        |
| 1   | C10                           | 820uF  | CAP ALUM 820UF 6.3V 20% RADIAL TH       | Nichicon  | RL80J821MDN1KX     |
| 1   | C11                           | 22uF   | CAP CRM 22uF 10V 1206 X7R SMT           | TDK       | C3216X5R1A226M     |
| 1   | C12                           | 1uF    | Capacitor, X7R, 1uF, 10V, 10% 0603      | Kemet     | C0603C105K8RACTU   |
| 2   | C14,C40                       | 100n   | Capacitor, X7R, 100nF, 16V, 20% 0805    | Kemet     | C0805C104M4RACTU   |
| 1   | C15                           | 1uF    | Capacitor,X7R, 1uF, 25V, 10% 0603       | Murata    | GRM188R71E105KA12D |
| 1   | C17                           | 100n   | CAP CRM 100nF 100V 10%X7R 1206 SMT      | Kemet     | C1206C104K1RACTU   |
| 1   | C18                           | 1nF    | Capacitor, X7R, 1nF, 16V, 10% 0603      | Samsung   | CL10B102KANNNC     |
| 1   | C19                           | 1u     | CAP CRM 1uF 10V 10%X7R 0805 SMT         | TDK       | C2012X7R1C105K     |
| 2   | C20,C159                      | 1n     | CAP CRM 1nF/2000V 10%++X7R 1206 SMT     | AVX       | 1206GC102KAT1A     |
| 1   | C21                           | 22n    | Capacitor,0.1uF, X7R, 10V, 10% 0603     | Walsin    | 0603B223K250CT     |
| 1   | C22                           | 4.7NF  | CAP CRM 4.7nF 16V 10% X7R 0603 SMT      | Samsung   | CL10B472KB8NNNC    |
| 1   | C23                           | 47n    | Capacitor, X7R, 47nF, 50V, 10% 0603     | TDK       | C1608X7R1H473K     |
| 1   | C24                           | 0.1 uF | Capacitor,0.1uF, X7R, 10V, 10% 0603     | Kemet     | C0603C104K8RACTU   |
| 1   | C25                           | 1uF    | CAP CRM 1uF 16V 10%0805 X7R SMT         | Murata    | GRM21BR71C105KA01  |
| 6   | C27,C37, C39,C152, C153, C164 | 10n    | CAP CRM 10nF 100V 5% X7R 0805 SMT       | Kemet     | C0805C103J1RAC     |

**Microsemi****PD7211EVB25FW-3**

25W Isolated Forward Converter PD

**Evaluation Board**

| QTY | REFERENCE       | Value        | Description                                 | Mfr. Name   | Mfr. Part Number   |
|-----|-----------------|--------------|---------------------------------------------|-------------|--------------------|
| 3   | C28, C29, C30   | 22n          | CAP CRM 22nF 200V 10% X7R 0805 SMT          | Vishay      | VJ0805Y223KXCAT    |
| 1   | C31             | 1uF          | CAP CRM 1uF 25V 10% X7R 0805 SMT            | AVX         | 08053C105KAT2A     |
| 1   | C33             | 0.1uF        | CAP 100NF 25V X7R 10% 0603                  | Murata      | GRM188R71E104KA01D |
| 1   | C34             | 22uF         | CAP CRM 22uF 25V 20% 1210 X7R SMT           | Murata      | GRM32ER71E226ME15L |
| 1   | C51             | 4.7u         | Capacitor, X7R, 4.7uF, 25V, 10% 1210        | Taiyo Yuden | TMK325BJ475KN-T    |
| 1   | C154            | 10pF         | CAP CRM 10pF 50V 5%NPO 0805 SMT             | Samsung     | CL21C100JBANNNC    |
| 1   | C155            | 470p         | CAP CRM 470pF 50V 10% X7R 0805 SMT          | Walsin      | 0805B471K500CT     |
| 2   | C156, C157      | 2.2nF        | CAP CRM 2.2nF 2000V X5R 1206 SMT            | Walsin      | 1206B222K202CT     |
| 1   | D1              | SMAJ40A      | DIODE TVS 40V 400W 5uA 6.2 Amps Uni-Dir SMT | Bourns      | SMAJ40A            |
| 1   | D2              | ES1C-13-F    | DIODE SUPER FAST 150V 1A SMA SMT            | Diodes Inc. | ES1C-13-F          |
| 2   | D4,D24          | SMAJ58CA     | TVS DIODE 58VWM 93.6VC SMA                  | Diodes Inc. | SMAJ58CA-13-F      |
| 3   | D5,D14, D16     | SSC-GR101    | LED SuperGreen 16mcd h=0.8 0603 SMD         | SEOUL       | SSC-GR101          |
| 2   | D6,D21          | 1N4148W-7-F  | DIODE SW 100V 0.15A SOD123 SMT              | Diodes Inc. | 1N4148W-7-F        |
| 1   | D7              | BAT54SLT1G   | Diode Schottky Dual 200mA 30V SOT23 BAT54S  | ON Semi     | BAT54SLT1G         |
| 4   | D8,D17, D22,D25 | MBR0540T1G   | DIO SCHOTTKY 40V 500mASOD123 REC. SMT       | ON Semi     | MBR0540T1G         |
| 1   | D10             | B2100-13-F   | DIODE SCHOTTKY 100V 2A SMB                  | Diodes Inc. | B2100-13-F         |
| 1   | D12             | BAV99W       | Diode, Dual Switching BAV99W SOT323         | NXP         | BAV99W             |
| 1   | D23             | SMAJ20CA     | DIODE TVS 20VWM 32.4VC SMT                  | Diodes Inc. | SMAJ20CA-13-F      |
| 1   | D28             | SMAJ58A      | DIO TVS 58V 40A SRG400WPK SMA SMT           | Vishay      | SMAJ58A            |
| 1   | D29             | TLV431AIDBZR | IC PROG. SHUNT REGULATOR SOT23-3 1% SMT     | TI          | TLV431AIDBZR       |
| 1   | J1              | 08261X1TGH-F | CONN MAGJACK 1PORT 1000 BASE-T              | Bel Stewart | 08261X1TGH-F       |
| 1   | J2              | RAPC712X     | DC Power Jack 16V 5A TH Pin dia 2.5mm       | Switchcraft | RAPC712X           |

**Microsemi****PD7211EVB25FW-3**

25W Isolated Forward Converter PD

Evaluation Board

| QTY | REFERENCE | Value          | Description                               | Mfr. Name   | Mfr. Part Number   |
|-----|-----------|----------------|-------------------------------------------|-------------|--------------------|
| 1   | J3        | ED700/2        | TERMINAL BLOCK 20A 5mm 2POS PCB           | OnShore     | ED700/2            |
| 1   | J4        | RJ45           | CON RJ45 SINGLE 8 POS. SHIELDED           | Bel Stewart | SS71800-007F       |
| 2   | L1,L5     | 4.7uH          | FIXED IND 4.7uH 5.5A 40mOHM SMD           | Vishay      | IHLP2525CZER4R7M01 |
| 1   | L2        | 2.7uH          | Inductor 2.7uH 12A 2.6mOhm SMT            | Coilcraft   | SER1360-272KL      |
| 1   | L3        | 4.7MH[4700uH}  | FIXED IND 4700uH 40mA 48OHM SMD           | Bourns      | SDR0503-472JL      |
| 1   | L6        | 2uH            | Fixed Inductors 2 uH 20% 45A              | Coilcraft   | SER2010-202MLB     |
| 1   | Q1        | PSMN1R4-30YLDX | MOSFET N-CH with Schottky 30V 1.4mOhm 30V | NXP         | PSMN1R4-30YLDX     |
| 1   | Q2        | FDMS86250      | MOSFET PT5 150V 25mOhm Nch Power-56       | Fairchild   | FDMS86250          |
| 1   | Q3        | BSC0902NSI     | MOSFET N-Ch 30V 100A TDSO-N-8             | Infineon    | BSC0902NSI         |
| 1   | Q8        | ZVP3310FTA     | MOSFET P-CH 100V 75MA SOT23-3             | Diodes Inc. | ZVP3310FTA         |
| 1   | Q10       | BSS123         | FET NCH 100V 0.15A 6RLogic Level SOT23    | Infineon    | BSS123             |
| 1   | Q14       | IRF6216TRPBF   | MOSFET P-CH 150V 2.2A 8-SOIC              | I.R.        | IRF6216TRPBF       |
| 1   | Q15       | MMBT2222A_NL   | TRN NPN 40V 600mA SOT23 MMBT2222          | Fairchild   | MMBT2222A_NL       |
| 1   | R4        | 22.1           | RES TCK FLM 22.1R 62.5mW 1%0603 SMT       | Samsung     | RC1608F22R1CS      |
| 1   | R8        | 24.9K          | RES TK FLM 24.9K 100mW1% 0805             | Bourns      | CR0805-FX-2492-ELF |
| 1   | R9        | 0              | RES TCK FLM 0R 62.5mW 5% 0603 SMT         | Panasonic   | ERJ3GEY0R00V       |
| 2   | R11,R15   | 100            | RES TCK FLM 100R 62.5mW 1%0603 SMT        | Yageo       | RC0603FR-07100RL   |
| 1   | R12       | 62 mOhm        | RES .062 OHM 1/2W 1% 1206 SMT             | Panasonic   | ERJ8BWFR062V       |
| 1   | R14       | 20             | Resistor, 20 OHM 5% 1/10W 0603            | Rohm        | MCR03EZPJ200       |
| 1   | R16       | 510            | RES 510R 1% 1/10W 0603 SMD                | Yageo       | RC0603FR-07510RL   |
| 1   | R18       | 240K           | Resistor, 240K, 1%, 1/10W 0603            | Rohm        | MCR03EZPFX2403     |
| 2   | R19,R23   | 20K            | RES 20K 62.5mW 1%0603 SMT FLM             | Panasonic   | ERJ3EKF2002V       |
| 1   | R20       | 8.25K          | RES 8.25K 62.5mW 1% 0603 SMT              | Yageo       | RC0603FR-078K25-L  |

**Microsemi****PD7211EVB25FW-3**

25W Isolated Forward Converter PD

Evaluation Board

| QTY | REFERENCE                    | Value | Description                           | Mfr. Name | Mfr. Part Number  |
|-----|------------------------------|-------|---------------------------------------|-----------|-------------------|
| 1   | R21                          | 30.9  | Resistor, 30.9R 1%, 1/10W 0603        | Panasonic | ERJ3EKF30R9V      |
| 1   | R24                          | 1.2K  | Resistor, SMT 1.2K, 5%, 1/10W 0603    | Panasonic | ERJ3GEYJ122V      |
| 5   | R25,R26,<br>R69,R71,<br>R100 | 0     | RES TCK FLM OR 62.5mW 5% 0603 SMT     | Rohm      | MCR03EZPJ000      |
| 1   | R27                          | 100K  | RES 100K 62.5mW 1% 0603 SMT FLM       | Samsung   | RC1608F1003CS     |
| 1   | R28                          | 4.87k | Resistor, 4.87K 1% 1/10W 0603         | Yageo     | RC0603FR-074K87L  |
| 3   | R29,R52, R55                 | 100K  | Resistor, 100K, 5%, 1/16W             | ASJ       | CR16-104JL        |
| 1   | R30                          | 43.2K | RES 43.2K 100mW 0603 SMT 1%           | ASJ       | CR16-4322FL       |
| 2   | R33,R34                      | 562K  | RES 562K, 1%, 1/16W, 0603             | Vishay    | CRCW0603562KFKEA  |
| 1   | R36                          | 18.7K | Resistor, 18.7K, 1%, 1/16W 0603       | Rohm      | MCR03EZPFX1872    |
| 1   | R37                          | 2K    | RES 2K 62.5mW 1% 0603 SMT FLM         | Vishay    | CRCW06032KFKEA    |
| 1   | R38                          | 1K    | RES 1K 250mW 1%1206 SMT FLM           | Samsung   | RC3216F1001CS     |
| 1   | R47                          | 20K   | RES TK FLM 20K 250mW 1%1206           | Samsung   | RC3216F2002CS     |
| 2   | R49,R128                     | 5.11K | RES TCK FLM 5.11K 250mW1% 1206 SMT    | Samsung   | RC3216F5111CS     |
| 1   | R51                          | 100   | Resistor, 100 Ohm, 5%, 1/16W 0603     | Samsung   | RC1608J101CS      |
| 4   | R60,R61,<br>R62,R63          | 75    | RES 75R 125mW 1% 0805 SMT             | Yageo     | RC0805FK-0775RL   |
| 1   | R64                          | 1K    | RES TCK FLM 1K 125mW 1% 0805 SMT      | Rohm      | MCR10EZPF1001     |
| 1   | R65                          | 10K   | RES 10K 125mW 1%0805 SMT Thick Film   | Vishay    | D12 10K FCS-E3    |
| 1   | R66                          | 2.7   | Resistor, SMT 2.7 Ohm, 5%, 1/16W 0603 | ASJ       | CR16-2R7JL        |
| 1   | R67                          | 2.2   | RES TCK FLM 2.2R 0.5W 5% 1210 SMT     | KOA       | RK73B2ETTD2R2J    |
| 2   | R70,R101                     | 0     | RES TCK FLM OR 125mW 5% 0805 SMT      | Bourns    | CR0805-J/-000-ELF |
| 2   | R89,R92                      | 15K   | RES 15K 250mW 1%1206 SMT FLM          | Rohm      | MCR18EZPF1502     |
| 1   | R94                          | 620   | RES 620 OHM 1/10W 1% 0603 SMT         | KOA       | RK73H1JTDD6200F   |

**Microsemi****PD7211EVB25FW-3**

25W Isolated Forward Converter PD

**Evaluation Board**

| QTY | REFERENCE                                      | Value       | Description                                 | Mfr. Name | Mfr. Part Number |
|-----|------------------------------------------------|-------------|---------------------------------------------|-----------|------------------|
| 1   | R126                                           | 0           | RES OR 250mW 5%1206 SMT JUMPER<0.05R        | Samsung   | RC3216J000CS     |
| 1   | SC1                                            | SHORT       |                                             |           |                  |
| 1   | T1                                             | 95uH        | Transformer forward 3.3V 7.2A               | Tesla     | TX4015           |
|     |                                                |             |                                             | Coilcraft | TA-7861-AL       |
| 1   | T6                                             | 1.47mH      | Inductor common mode 1.47mH 2.8A SMD        | Pulse     | P0351NL          |
| 1   | U1                                             | PD70224     | Ideal Diode Bridge 6x8 SMT PD70224          | Microsemi | PD70224ILQ-TR    |
| 1   | U2                                             | PD70201     | AT POE PD controller for IEEE 802.3 PD70201 | Microsemi | PD70201ILQ-TR    |
| 1   | U3                                             | FOD817ASD   | OPTOISOLATOR 5KV TRANSISTOR 4 SMD           | Fairchild | FOD817ASD        |
| 1   | U5                                             | FAN3111CSX  | IC GATE DVR 1CH 1A LOW SOT23-5              | Fairchild | FAN3111CSX       |
| 2   | VR1,VR3                                        | MMSZ4702    | DIODE ZENER 15V 500MW SOD123_MMSZ4702       | Fairchild | MMSZ4702         |
| 1   | VR2                                            | MMSZ4705T1G | DIODE ZENER 18V 500MW SOD-123               | ON Semi   | MMSZ4705T1G      |
| 8   | TP1,TP2, TP3,TP4, VINRTN, VIN+, PGOOD, AT_FLAG | HK-2-G-S05  | TEST POINT TIN PLATED HEAD                  | MAC-8     | HK-2-G-S05       |

Parts may be replaced by approved equivalent.

## 9 Board Layout

This section presents the layout of the evaluation board.

The board is a 2 layer board. All layers are 2 Oz layers. Below figures present the 2 copper layers and the silk of the board for tracking devices placements.

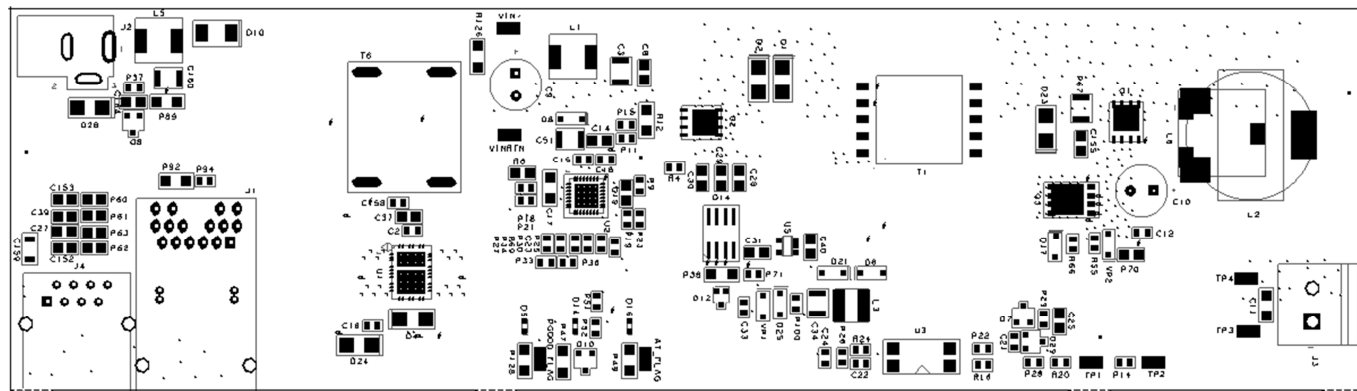


Figure 14: Top Silk and Solder Mask

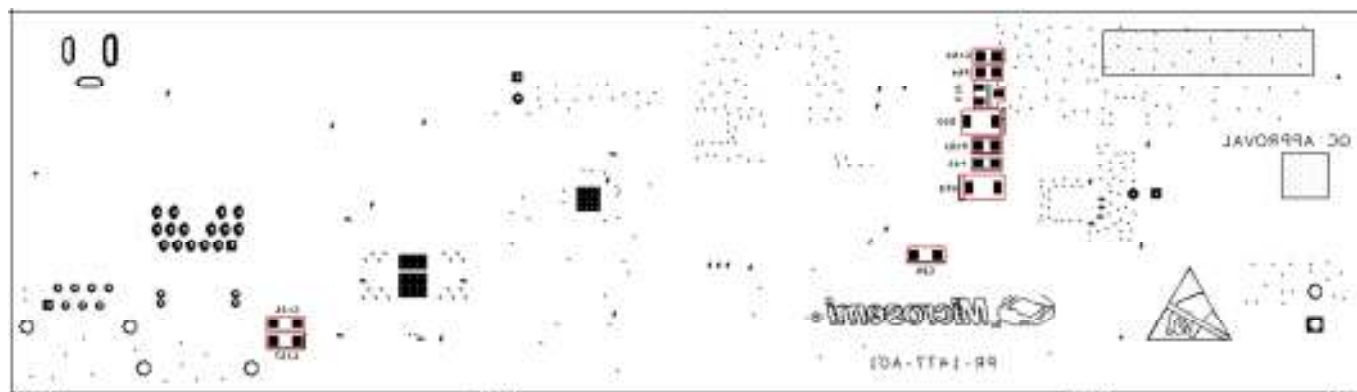


Figure 15: Bottom Silk and Solder Mask (Image Looking From Bottom)

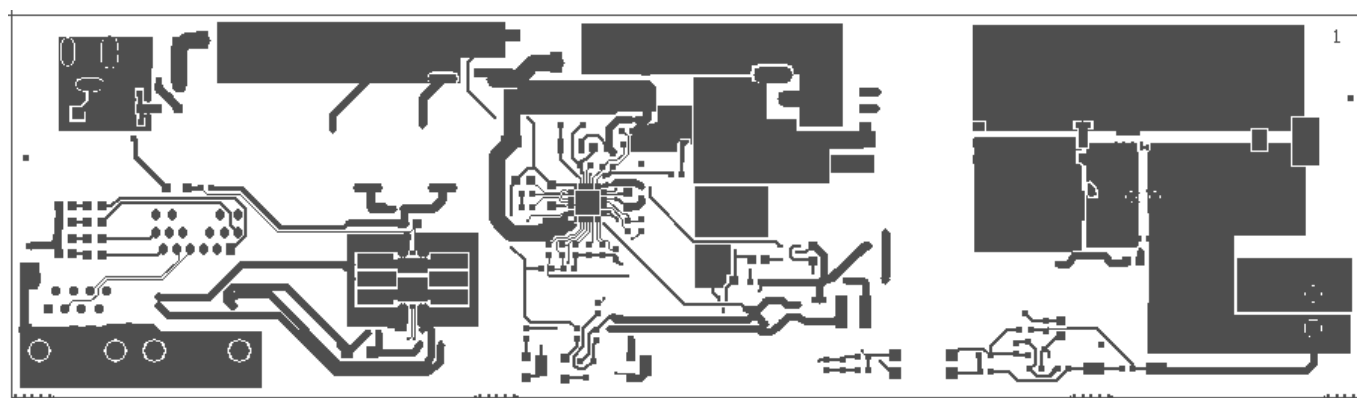
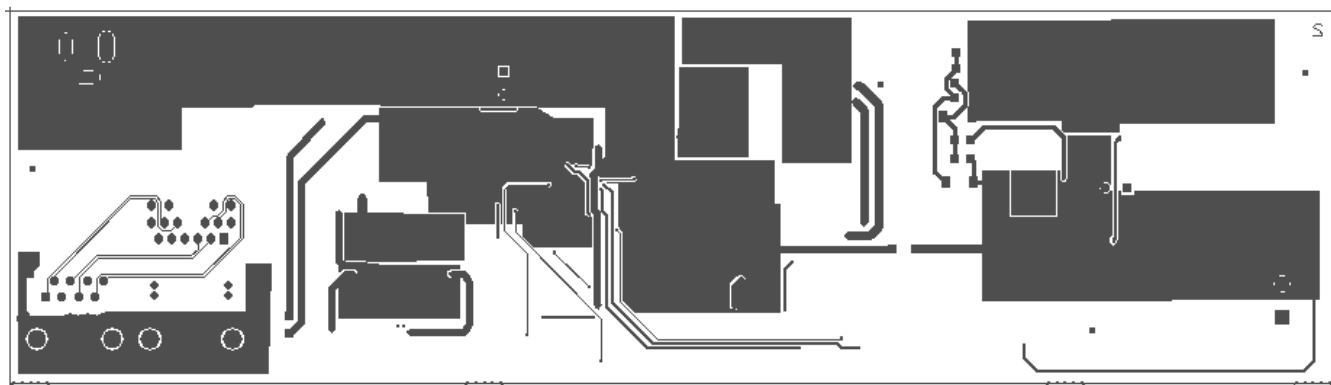


Figure 16: Top Layer



**Figure 17: Bottom Layer**

*The information contained in the document (unless it is publicly available on the Web without access restrictions) is PROPRIETARY AND CONFIDENTIAL information of Microsemi and cannot be copied, published, uploaded, posted, transmitted, distributed or disclosed or used without the express duly signed written consent of Microsemi. If the recipient of this document has entered into a disclosure agreement with Microsemi, then the terms of such Agreement will also apply. This document and the information contained herein may not be modified, by any person other than authorized personnel of Microsemi. No license under any patent, copyright, trade secret or other intellectual property right is granted to or conferred upon you by disclosure or delivery of the information, either expressly, by implication, inducement, estoppels or otherwise. Any license under such intellectual property rights must be approved by Microsemi in writing signed by an officer of Microsemi.*

*Microsemi reserves the right to change the configuration, functionality and performance of its products at any time without any notice. This product has been subject to limited testing and should not be used in conjunction with life-support or other mission-critical equipment or applications. Microsemi assumes no liability whatsoever, and Microsemi disclaims any express or implied warranty, relating to sale and/or use of Microsemi products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Any performance specifications believed to be reliable but are not verified and customer or user must conduct and complete all performance and other testing of this product as well as any user or customers final application. User or customer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the customer's and user's responsibility to independently determine suitability of any Microsemi product and to test and verify the same. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the User. Microsemi specifically disclaims any liability of any kind including for consequential, incidental and punitive damages as well as lost profit. The product is subject to other terms and conditions which can be located on the web at <http://www.microsemi.com/company/terms-and-conditions>*

## Revision History

| Revision Level / Date | Paragraph Affected/Page              | Description     |
|-----------------------|--------------------------------------|-----------------|
| 1.01 / 18-June-16     |                                      | Initial release |
| 1.02 / 24-August-16   | Page #2, 1.2 Organization, Chapter 1 | Chapter 1-Error |
|                       |                                      |                 |
|                       |                                      |                 |

© 2016 Microsemi Corp.

All rights reserved.

For support contact: [PoEsupport@microsemi.com](mailto:PoEsupport@microsemi.com)

Visit our web site at: [www.microsemi.com](http://www.microsemi.com)

Catalog Number: PD70201EVB25FW-3\_UG\_EVB