

Thin Type Fully Integrated Embedded PoE PD Module SPD Series Module

1. Description

The SPD series of modules are designed as embedded isolated PoE PD solutions. SPD modules are fully integrated, thin type and high DC/DC converting efficiency PD modules.

The SPD modules are compliant with IEEE 802.3af power classification, Class 0 to Class 3, signature and support PSE Alternative A and Alternative B connections. Maximum power output can reach 12W (SPD-12, 89% DC/DC efficiency @ full load). Tiny size, 60mm (L) x 16.9mm (W) X16mm (H), wide input voltage range, 37Vdc to 55Vdc and less external components needed one output decoupling capacitor. The operating temperature is from -15°C to 55°C @ Full load.

SPD modules support two different output voltage modules - 5Vdc and 12Vdc. SPD modules follow the design concept of TPD and THPD modules, using multi-layer ceramic capacitor (MLCC) only, to avoid instability even malfunction issue within long-time operation or higher temperature condition. And SPD modules are also pin to pin compatible with TPD modules.

2. Feature

- IEEE802.3af compliant.
- Low cost.
- Support PoE applications in both of Fast / Gigabit Ethernet environments.
- Support wide input voltage range - 37Vdc to 55Vdc.
- Thermal cut off.
- Short circuit protection.
- Over current protection
- High DC/DC converting efficiency.
- Less external component – one output decoupling capacitor.
- Isolation level 1.5KVrms.
- Enhanced surge protection
- Internal build in 2 channel bridge rectifiers

3. Applications

- Wireless Access Point (AP)
- VoIP Phone
- Surveillance System
- IP Camera
- PTZ Camera
- Security System
- Fingerprint Identification
- WiMAX Base Station
- PoE Clock
- Network Attached Storage (NAS)
- Remote Display Board
- Point of Sale (POS) System
- Media Converter
- Stand Alone PoE Splitter
- Isolated DC/DC Converter

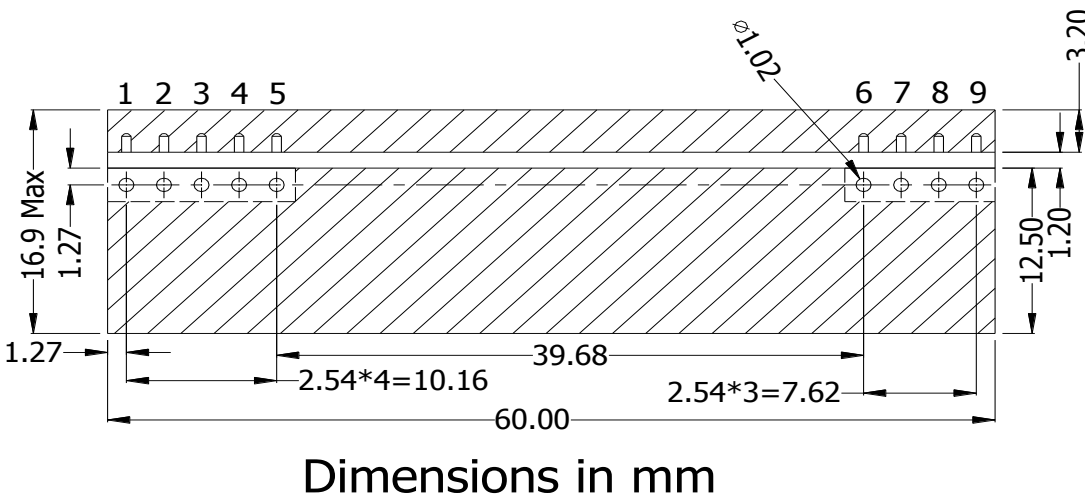
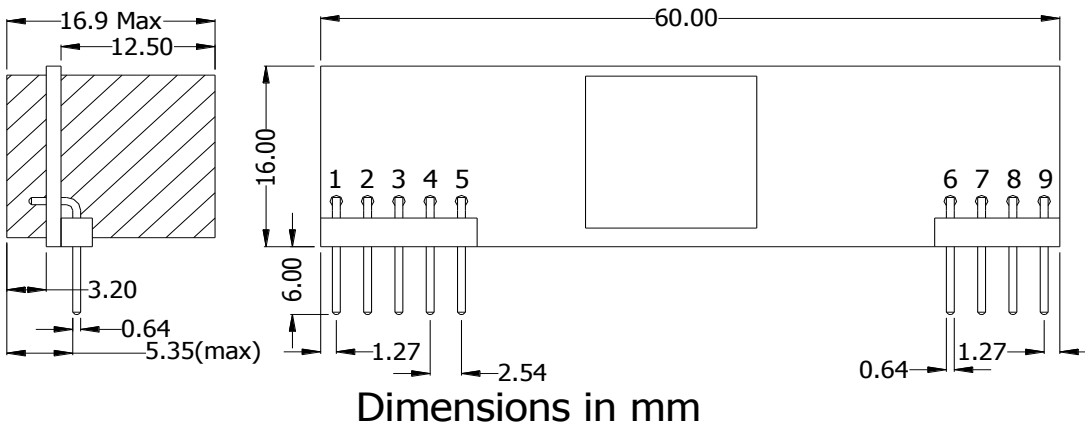


support end-point and mid-span mode.

4. SPD Series Product List

| Part Number | Nominal Output Voltage / Current | Maximum Output Power | Nominal Input Voltage | Marking |
|-------------|----------------------------------|----------------------|-----------------------|---------|
| SPD-50 | 5.1Vdc / 2.35A | 12W @ 25°C | 48Vdc | SPD-50 |
| SPD-12 | 12Vdc / 1.0A | 12W @ 25°C | 48Vdc | SPD-12 |

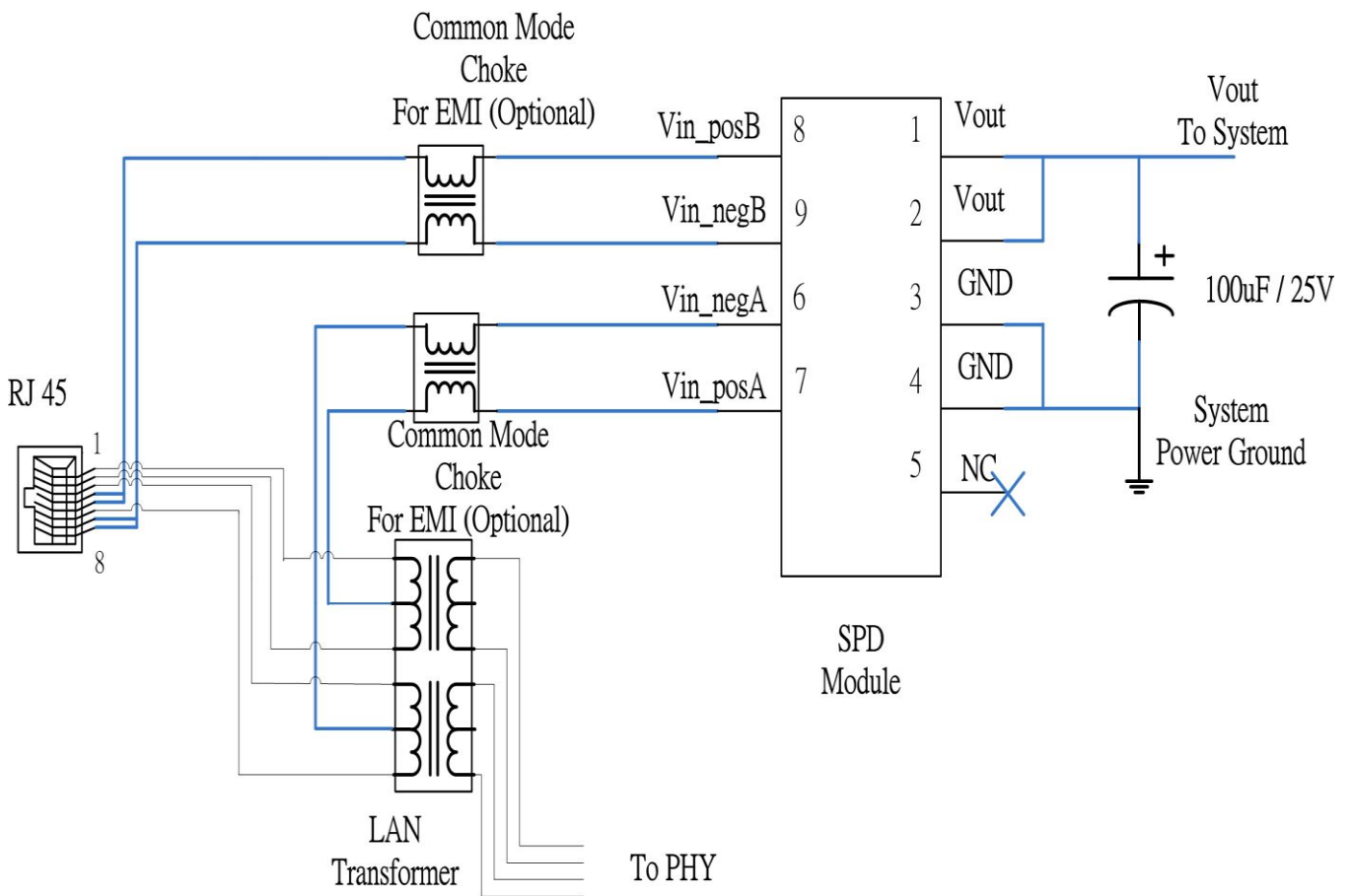
5. Package



6. Pin Definition

| Pin Number | Symbol | Description |
|------------|----------|---|
| 1 | Vout | Regulated DC Output. SPD (secondary side) DC power output pin (5Vdc /12Vdc). Connect to system positive power input. |
| 2 | Vout | Regulated DC Output. SPD (secondary side) DC power output pin (5Vdc /12Vdc). Connect to system positive power input. |
| 3 | GND | SPD Power Ground. SPD (secondary side) power ground. Connect to system power ground. |
| 4 | GND | SPD Power Ground. SPD (secondary side) power ground. Connect to system power ground. |
| 5 | NC | No Connection. Left it floating, do not connect to this pin |
| 6 | Vin_negA | Power Interface Negative Input A (Alternative A mode). SPD High voltage (primary side) negative voltage input A. Connect to central tap (primary side) of LAN transformer which is connected to pin 3 & 6 of the RJ45 connector. Vin_negA and Vin_posA are not polarity sensitive. |
| 7 | Vin_posA | Power Interface Positive Input A (Alternative A mode). SPD High voltage (primary side) positive voltage input A. Connect to central tap (primary side) of LAN transformer which is connected to pin 1 & 2 of the RJ45 connector. Vin_negA and Vin_posA are not polarity sensitive. |
| 8 | Vin_posB | Power Interface Positive Input B (Alternative B mode). SPD High voltage (primary side) positive voltage input B. Connect to pin 4 & 5 of the RJ45 connector. Vin_negB and Vin_posB are not polarity sensitive. |
| 9 | Vin_negB | Power Interface Negative Input B (Alternative B mode). SPD High voltage (primary side) negative voltage input B. Connect to pin 7 & 8 of the RJ45. Vin_negB and Vin_posB are not polarity sensitive. |

7. Fast Ethernet Typical Application



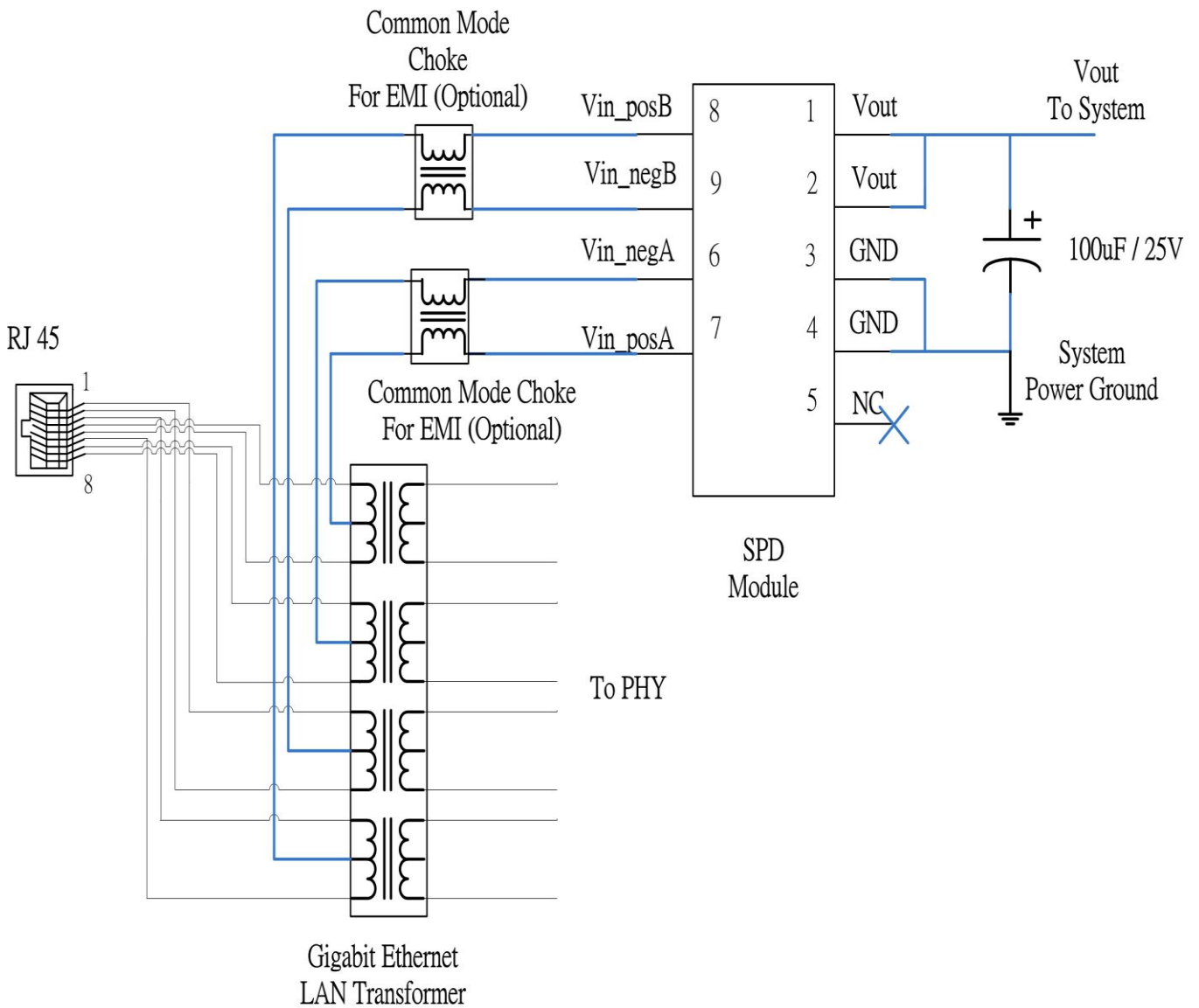
— POE Path

— Ethernet Path

Note

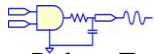
Common mode choke can eliminate EMI effect which is optional component.

8. Gigabit Ethernet Typical Application



Note

Common mode choke can eliminate EMI effect which is optional component.

**9. Electrical Characteristics**

| Item | DC Characteristic | Symbol | Min. | Typ. | Max. | Unit | Comment |
|------|---|--|--------------|------------|--------------|--------|---|
| 1 | Power Interface input Voltage | V _{in_pos} – V _{in_neg} | 37 | 48 | 55 | V | |
| 2 | Under Voltage Lockout | V _{Lock out} | 33 | | 37 | V | |
| 3 | Output Voltage | V _{out} | 4.85 11.4 | 5.1 12 | 5.35 12.6 | V V | SPD-50 SPD-12 (V _{rms}) |
| 4 | Maximum Output Power (V _{in} = 48Vdc) | P _{out} | | | 12 12 | W W | SPD-50 SPD-12 |
| 5 | Maximum Output Current (V _{in} = 48Vdc) | I _{out} | | | 2.35 1.0 | A A | SPD-50 SPD-12 |
| 6 | Maximum Input Current Consumption (V _{in} = 48Vdc) | I _{in_max} | | | 350 | mA | @Full Load |
| 7 | V _{out} Reverse Voltage | V _r | | | 20 | V | |
| 8 | DC/DC Converter Efficiency | EFF | | 85% 89% | | | SPD-50 SPD-12 @Full Load |
| 9 | Isolation Level | ISO | | 1.5 | | KV | |
| 10 | Primary Side Soft Start Delay | t _{ss} | | 800 | | us | |
| 11 | Operating Temperature | T _{OP} | -15 | | 55 | °C | @Full Load |
| 12 | Storage Temperature | T _{Storage} | -20 | 25 | 60 | °C | |

Note

1. Test ambient condition is 25°C.
2. Maximum output power and efficiency depends on ambient temperature. Maximum output power and efficiency maybe decay in high ambient temperature environment.