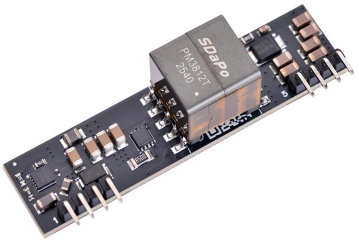
DESCRIPTION

PD (Powered Device) -PSE（Power Sourcing Equipment） Integrated Module (Isolation Type)



FEATURES

- PD Fully supports IEEE802.3af/at
- PSE Fully supports IEEE802.3af/at
- Small Single In-Line (SIL) package size –57.3mm (L) x 14mm (H)
- Input Voltage Range 44V to 57V
- Support PoE applications in both of Fast / Gigabit Ethernet environments.
- Short Circuit Protection
- Over-temperature Protection
- Programmable Classification Default:Class 4
- High Efficiency
- Isolation level 1.5KVrms.
- Easy Installation and Low Cost (Isolation Type, Minimum External Devices required)
- Low Output Ripple and Noise
- Adjustable Output Voltage
- 1500Vrms Isolation (Input-Output)

APPLICATION AREAS

- Security and alarm systems
- Voice over IP phones
- Access control systems
- IP Cameras
- Displays, Net Monitors
- Public address systems
- Wireless access points
- Environmental control
- Telemetry
- Remote environmental monitoring

1 Product Overview

1.1 DP5300 Product Selector

Part Number	Nominal Output Voltage	Maximum Output Power *
DP5312-PSE	12.0V	14 Watts Peak 12 Watts Continuous

*At 25°C with V_{IN} = 52V

Table 1: Ordering Information

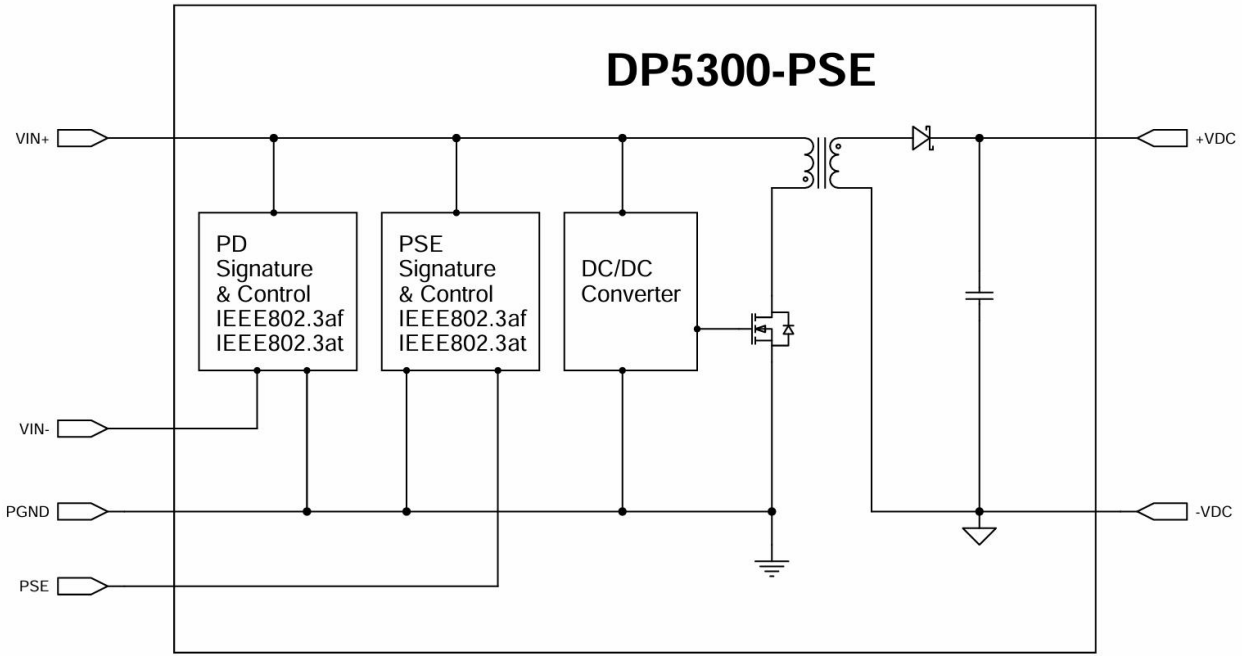


Figure 1: Block Diagram

1.2 Pin Description

1	VIN+	**POE Direct Input +**. This pin connects to the positive (+) output of the POE input bridge rectifiers.
2	VIN-	**POE Direct Input -**. This pin connects to the negative (-) output of the POE input bridge rectifiers.
3	PGND	**PGND.** This pin is the return path for the isolated VIN+ power supply.
4	PSE	**Port Output Return.** This pin is the return path for VIN+.
5	-VDC	**Negative DC Output.** This pin provides the negative regulated output from the Ag5300 and is internally connected to pin 8.
6	+VDC	**Positive DC Output.** This pin provides the positive regulated output from the DP5300.
7	ADJ	**Output Adjust.** The output voltage can be adjusted from its nominal value, by connecting an external resistor from this pin to either the +VDC pin or the -VDC pin.
8	-VDC	**Negative DC Output.** This pin provides the negative regulated output from the Ag5300 and is internally connected to pin 5.

2 Functional Description

2.1 Typical Connections

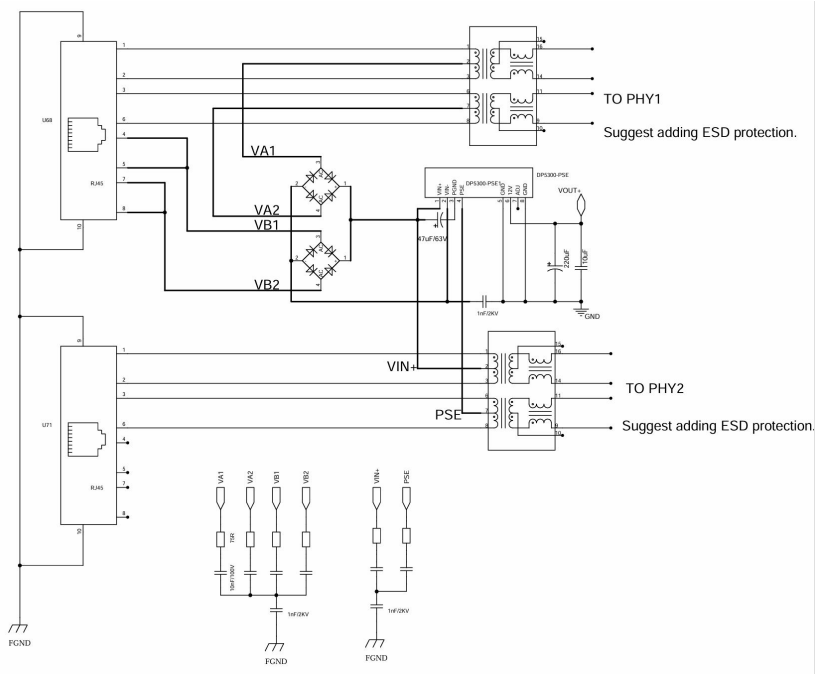


Figure 2: Typical System Diagram

*Note: Suitable bridge rectifier for BR1 & BR2 would be a “MB210S” or equivalent.

2.2 Output Voltage Adjustment

The DP5300 series has an ADJ pin, which allows the output voltage to be increased or decreased.
Figure 3 shows how the ADJ pin is connected.

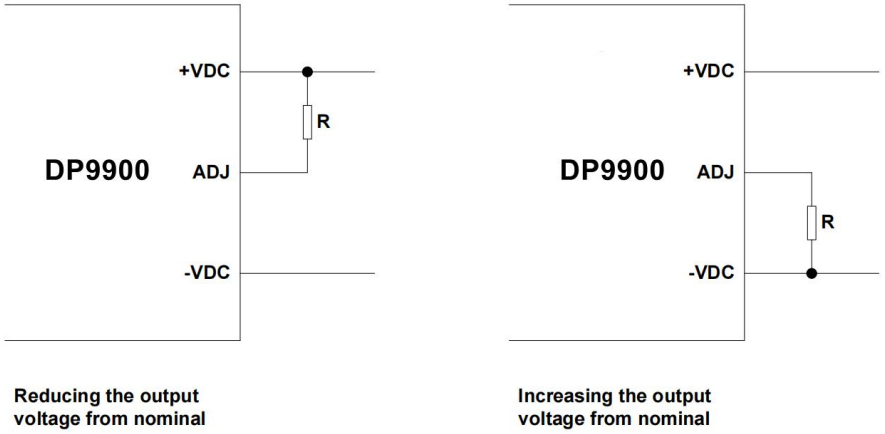


Figure 3: Output Adjustment

Reducing the output voltage, connect R between ADJ and +VDC			
Value of R	**DP5305-PSE output**	**DP5312-PSE Output**	**DP5324-PSE Output**
Open Circuit	5.00V	12.07V	23.93V
0 Ohms	4.48V	10.0V	19.85V
100K	4.76V	11.15V	21.85V
470k	4.92V	11.76V	23.23V
Increasing the output voltage, connect R between ADJ and -VDC			
Value of R	**DP5305-PSE output**	**DP5312-PSE output**	**DP5324-PSE Output**
Open Circuit	5.00V	12.07V	23.93V
0 Ohms	5.66V	12.75V	24.6V
100K	5.27V	12.34V	24.2V
470k	5.08V	12.16V	24.01V

Table 3: Output Adjustment Resistor (R) Value

3 Electrical Characteristics

3.1Absolute Maximum Ratings

	Parameter	Symbol	Min	Max	Units
1	DC Supply Voltage	V_{CC}	-0.3	60	V
2	DC Supply Voltage Surge for 1ms	V_{SURGE}	-0.6	80	V
3	Storage Temperature	T_S	-40	+100	˚C

3.2 Recommended Operating Conditions

	Parameter	Min	Typ	Max	Units
1	Input Supply Voltage	36	52	57	V
2	Under Voltage Lockout	30		36	V
3	Operating Temperature	−40	25	85	℃
4	IEEE 802.3at	Class 4			

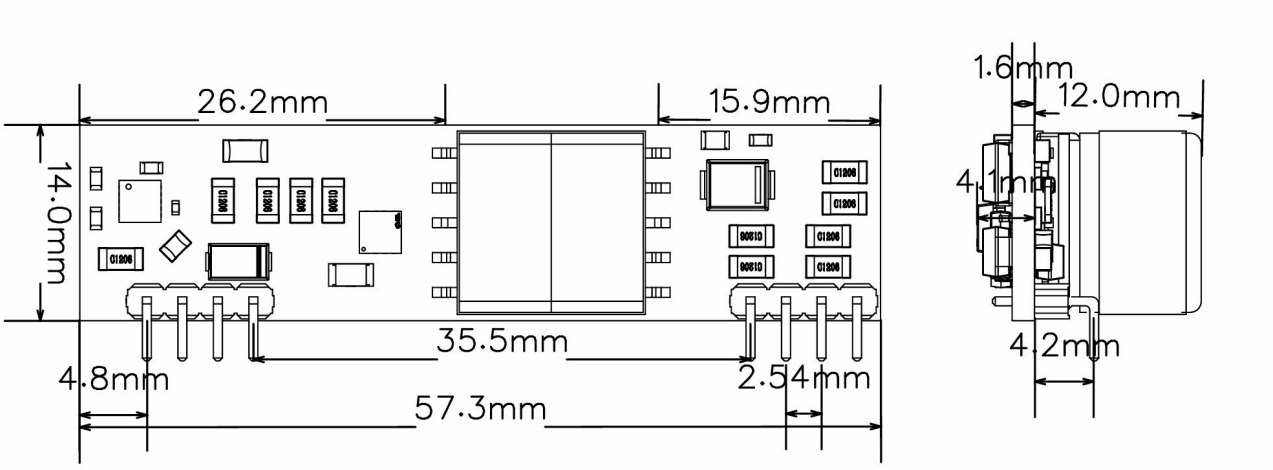
3.3 DC Electrical Characteristics

	DC Characteristic	Variant	Sym	Min	Typ[1]	Max	Units
1	Nominal Output Voltage	DP5324-PSE	+VDC	23.5	23.9	24.3	V
		DP5312-PSE		11.6	12	12.4	
		DP5305-PSE		4.75	5	5.25	
2	Minimum Load[2]	DP5324-PSE	I_{LOAD}	10			mA
		DP5312-PSE		20			
		DP5305-PSE		40			
3	Output Current (VIN = 48V)	DP5324-PSE	I_{out}		0.5		A
		DP5312-PSE			1		
		DP5305-PSE			2		
4	Line Regulation	DP5324-PSE	V_{LINE}		0.15		%
		DP5312-PSE			0.05		
		DP5305-PSE			0.05		
5	Load Regulation – Min to Max (VIN = 48V)	DP5324-PSE	V_{LOAD}		0.15		%
		DP5312-PSE			0.1		
		DP5305-PSE			0.1		
6	Output Ripple and Noise[4]	DP5324-PSE	V_{RN}		TBD		mV_{p-p}
		DP5312-PSE			100	@1A	
		DP5305-PSE			TBD		

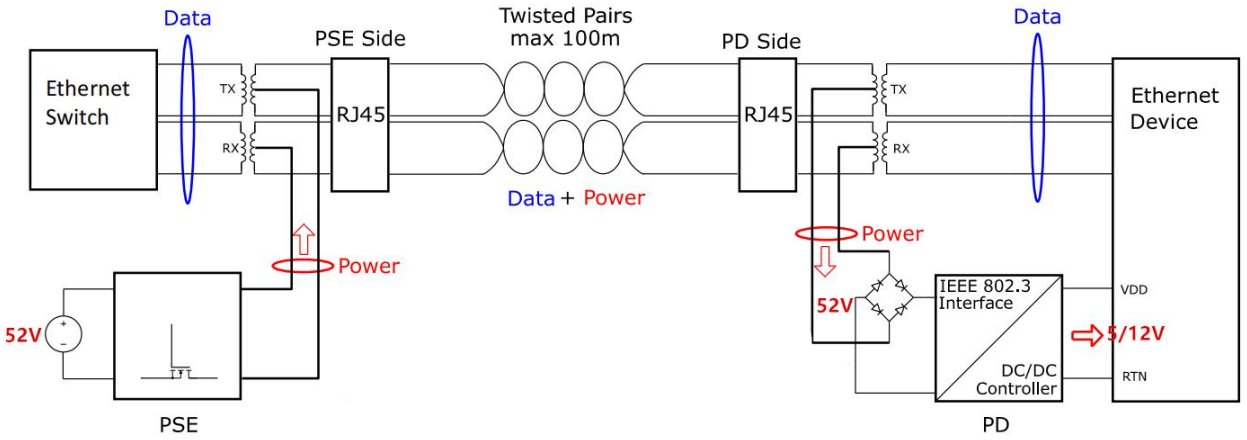
7	Peak Efficiency	DP5324-PSE	EFF		TBD		%
		DP5312-PSE			89	@1A	
		DP5305-PSE			TBD		
8	Short-Circuit Duration[3]		T_{SC}			∞	sec
9	Isolation Voltage (I/O) - Impulse Test		V_{ISO}			1500	V_{PK}

Note 1: Typical figures are at 25°C with a nominal 52V supply and are for design aid only. Not Guaranteed
Note 2: The module can emit an audible noise, if operated at less than the stated minimum I_{LOAD} and cause the PSE to fail its MPS.
Note 3: >200mohm short due to thermal limitation.
Note 4 : The output ripple and noise can be reduced with an external filter

4 Package

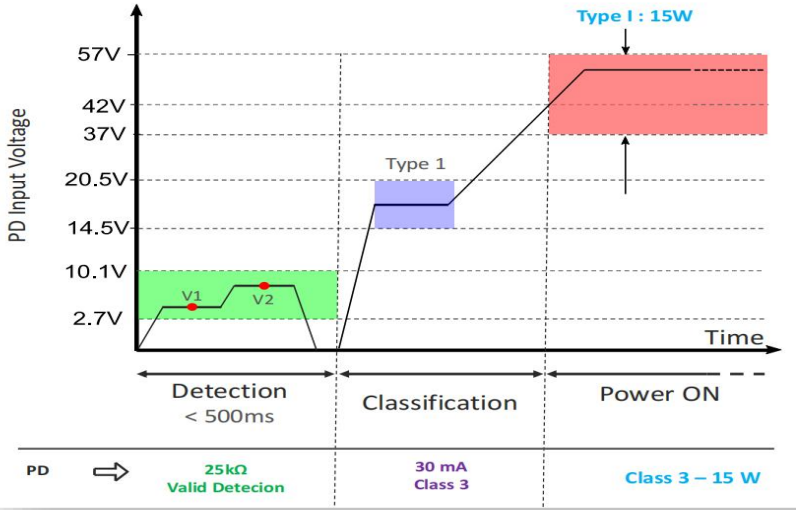


1. Power Delivery in PoE Systems

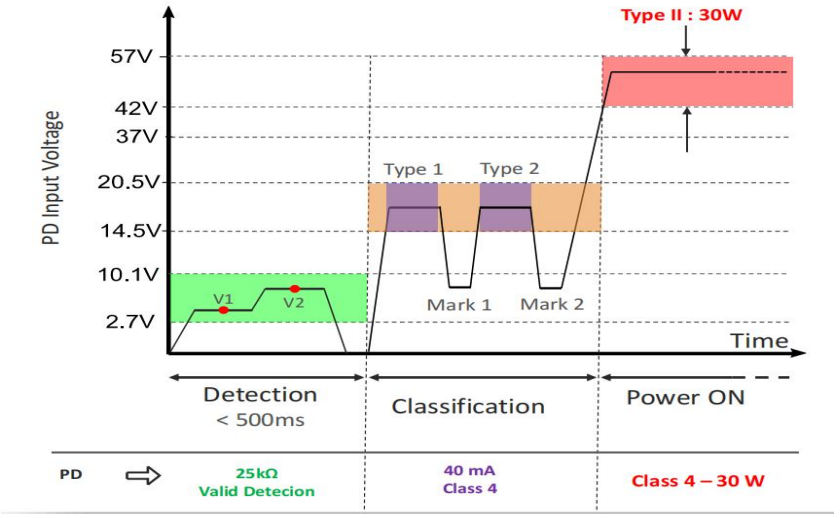


	Type 1 802.3af			Type 2 802.3at	Type 3 802.3bt		Type 4 802.3bt	
Power Class	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
Power from PSE	4 W	7 W	15.4 W	30 W	45 W	60 W	75 W	90 W
Power delivered to PD	3.84 W	6.49 W	13 W	25.5 W	40 W	51 W	62 W	71.3 W

2. Establishing PoE Connection – Type 1 (IEEE 802.3af/PoE)



3. Establishing PoE Connection – Type 2 (IEEE 802.3at/PoE+)



4. Establishing PoE Connection – Type 3 and 4 (IEEE 802.3bt)

