DESCRIPTION

PD (Powered Device) Integrated Module (Isolation Type)



FEATURES

- Fully supports IEEE802.3af/at/bt
- Input Voltage Range 40V to 57V
- Small Single In-Line (SIL) package size – 70mm(L) x 35mm(W) x 18mm(H)
- Support PoE applications in both of Fast / Gigabit Ethernet environments.
- Short Circuit Protection
- Over-temperature Protection
- Programmable Classification (DP5800 Default:Class 8)
- 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 DP5800 Product Selector

Part Number	Nominal Output Voltage	Maximum Output Power *
DP5800	12.0V/24.0V	85 Watts

*At 25°C with V_{IN} = 57V

Table 1: Ordering Information

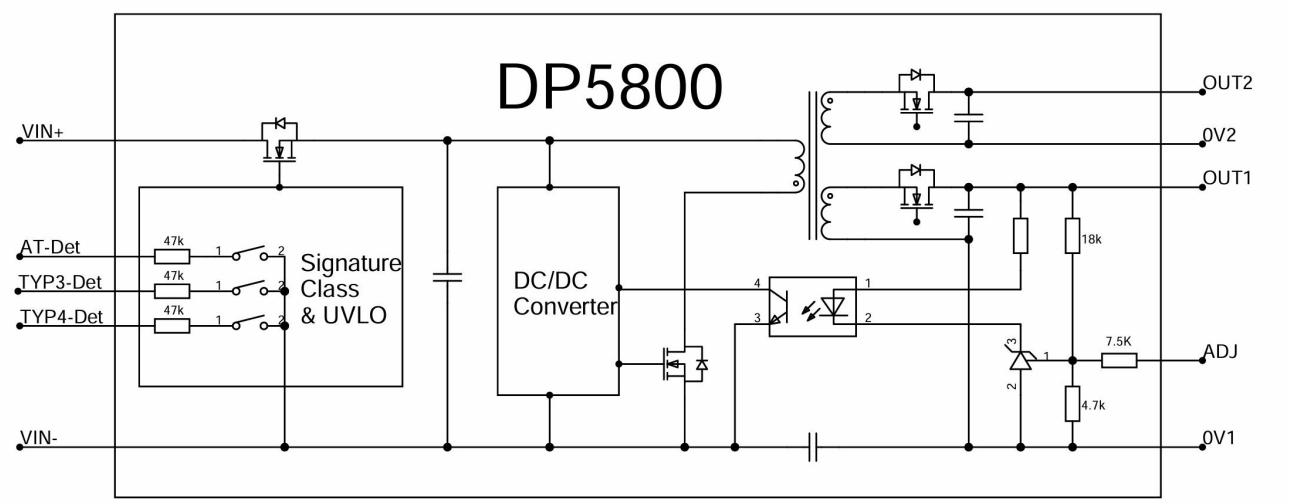


Figure 1: Block Diagram



Figure 2: DP5800 Package Format

1.2 Pin Description

Input Connector Pins

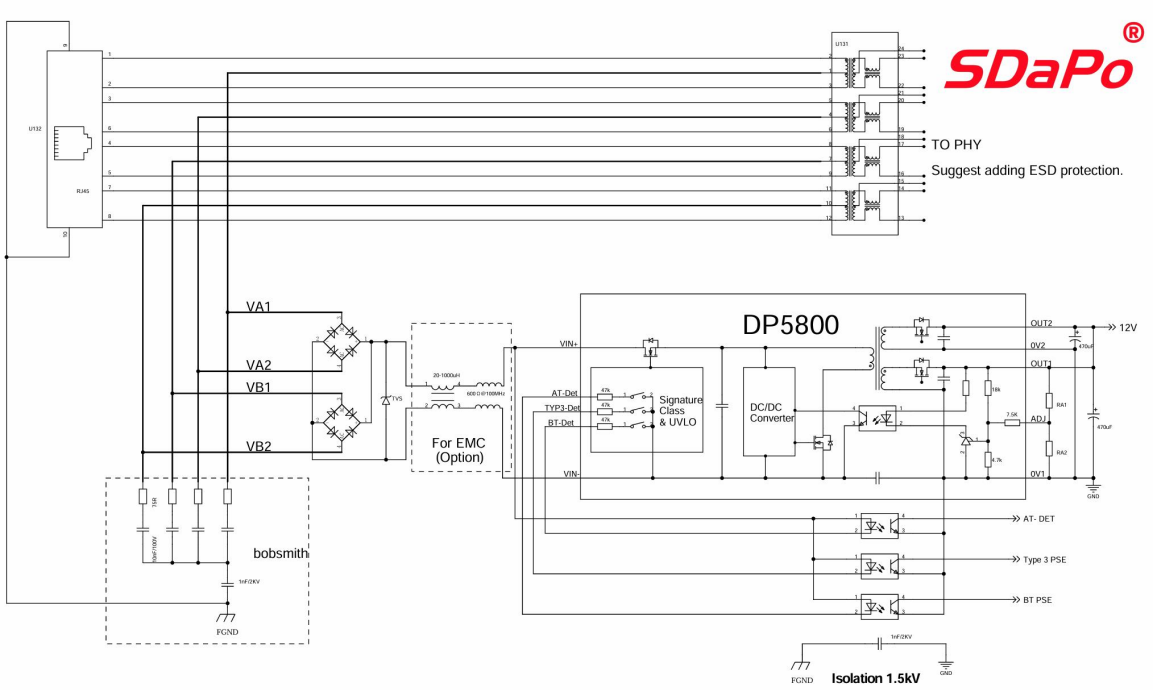
PIN#	Name	Description
1	NC	**NC**
2	NC	
3	AT-Det	**AT Detect Output** This pin indicates if an IEEE802.3at PSE is supplying power to its inputs
4	TYP3-Det	**TYPE 3 IEEE802.3bt Detect Output** This pin indicates if a Type 3 IEEE802.3bt PSE is supplying power to both inputs
5	BT-Det	**IEEE802.3bt Detect Output** This pin indicates if an IEEE802.3bt PSE is supplying power to both inputs
6	NC	**NC**
7	VIN-	**Direct Input -** This pin connects to the negative (-) output of the input bridge rectifier.
8	VIN+	**Direct Input +** This pin connects to the positive (+) output of the input bridge rectifier.

Output Connector Pins

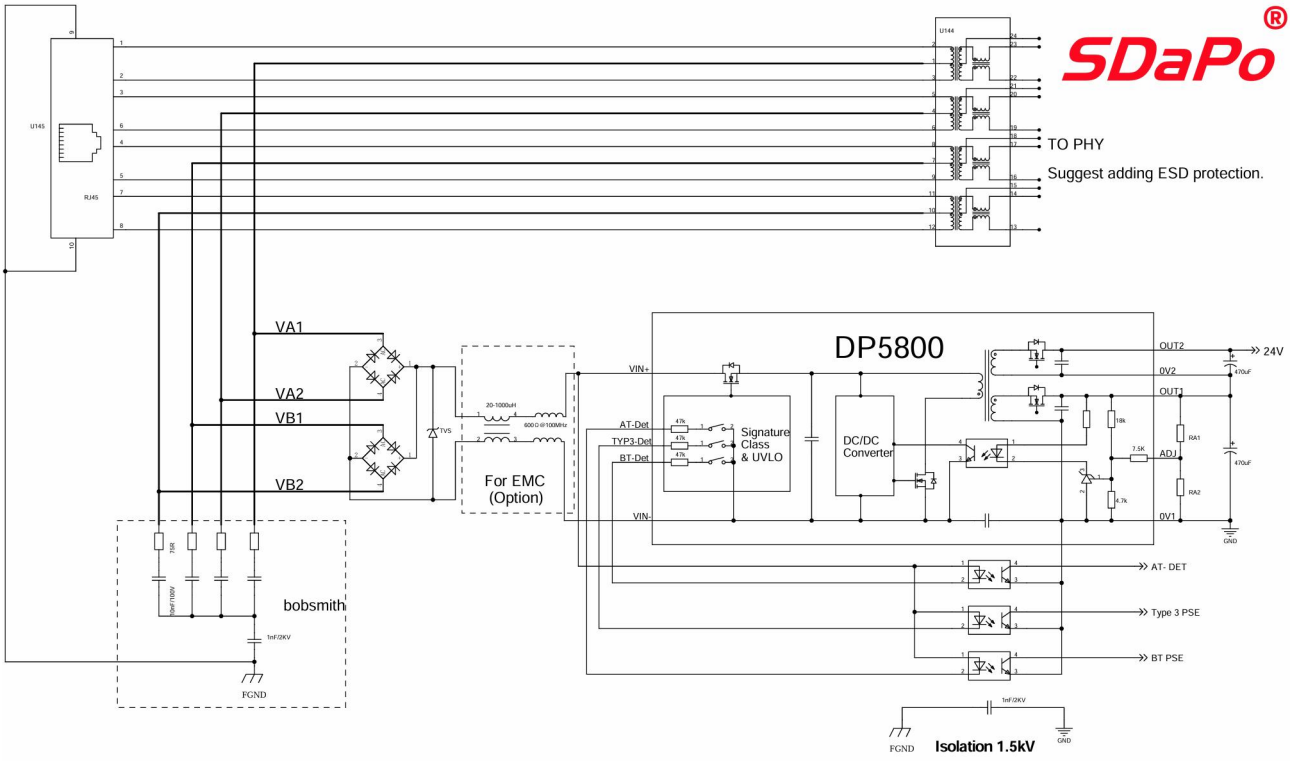
PIN#	Name	Description
9&10	VOUT2	**DC Output** This pin provides the secondary output from the DC/DC converter.
11&12	0V2	**Ground** The ground return for the VOUT2 output.
13&14	VOUT1	**TDC Output** This pin provides the main regulated output from the DC/DC converter.
15&16	0V1	**Ground** The ground return for the VOUT1 output.
17	ADJ	**Output Adjust** The output voltage can be adjusted from its nominal value, by connecting an external resistor from this pin to either the VOUT1 pin or the 0V1 pin.

2 Functional Description

2.1 Typical Connections



1G/2.5G/5G/10G 12V POE APPLICATION



1G/2.5G/5G/10G 24V POE APPLICATION

Figure 2: Typical System Diagram

*Note: Suitable bridge rectifier for BR1 & BR2 would be a " 8 x SS36 Schottky" or equivalent.

2.2 Output Voltage Adjustment

The DP5800 has an ADJ pin, which allows the output voltage to be increased or decreased from its nominal value.
The adjustment range allows the DP5800 to provide an output voltage from 10.6V up to 30.2V. Voltage must not be adjusted to less than 10.6V or permanent damage may be caused to the module.

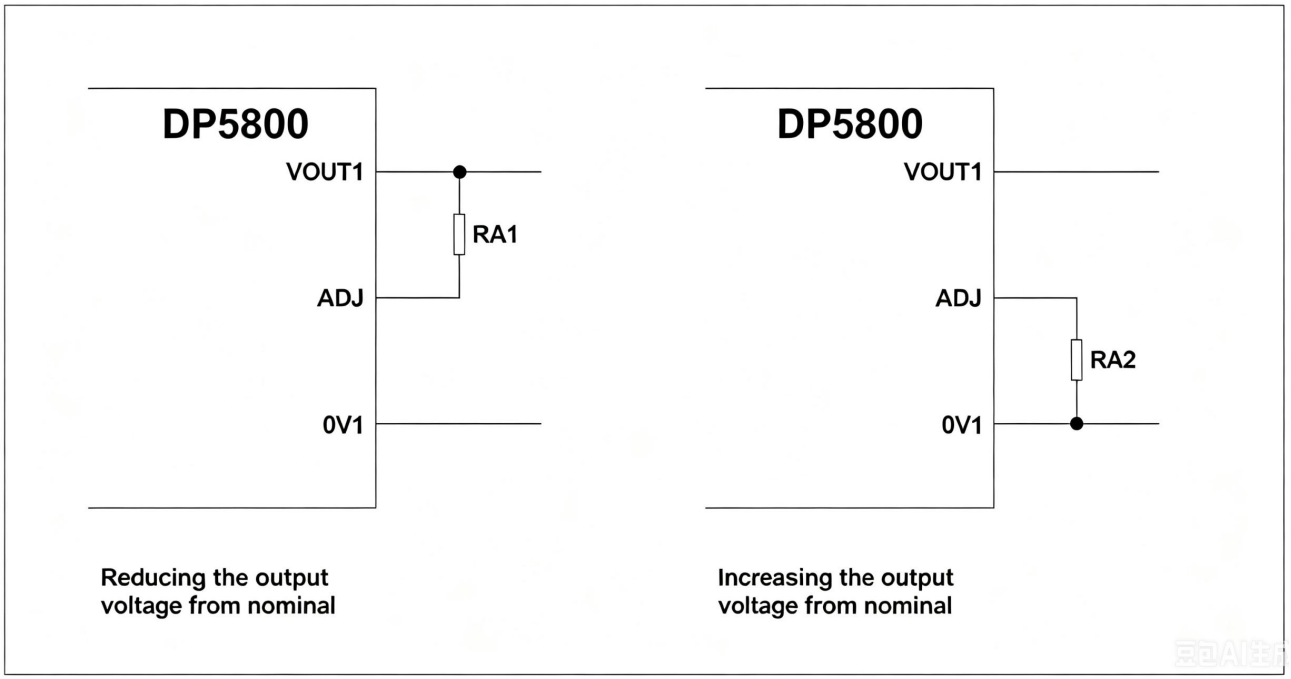


Figure 3: Output Adjustment

Reducing the output voltage, connect R between ADJ and VOUT1		
Value of RA1	**VOUT Parallel**	**VOUT Series**
Open Circuit	12V	24V
91K *	10.6V	21.2V
Increasing the output voltage, connect R between ADJ and OV1		
Value of RA2	**VOUT Parallel**	**VOUT Series**
Open Circuit	12V	24V
8.2k	14.9V	29.9V

RA1 must not be less than 91K. Adjusting Vout to less than 10.5V may cause permanent damage
Note: When used with a DC supply the output load current must be reduced to keep the maximum power output at 100W or below.

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

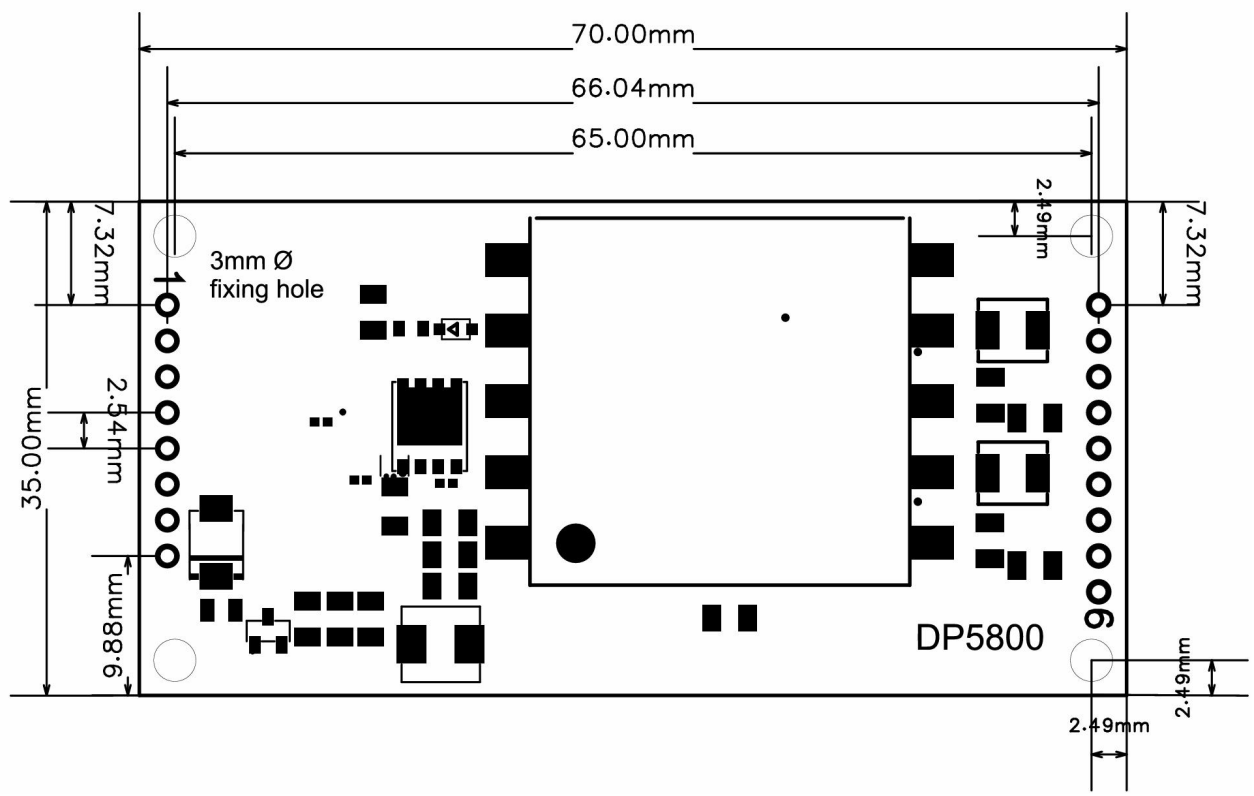
	Parameter	Min	Typ	Max	Units
1	Input Supply Voltage	40	52	57	V
2	Under Voltage Lockout	30		40	V
3	Operating Temperature	-40	25	85	℃

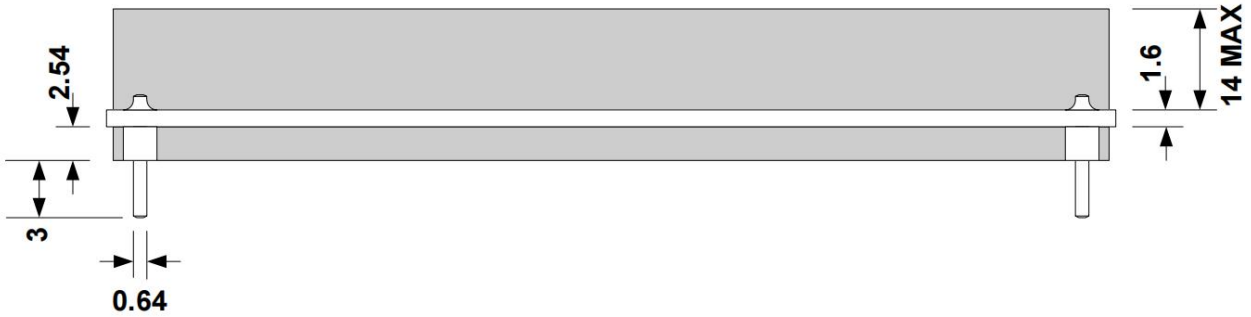
3.3 DC Electrical Characteristics

	DC Characteristic	Sym	Variant	Min	Typ1	Max	Units	Test Comments
1	Nominal Output Voltage	+VDC	12V	11	12	12.6	V	
			24V	23	24	25.2		
2	Voltage Adjust Range	V_{ADJ}	12V	10.6		14.9	V	See Output Adjustment
			24V	21.2		29.9		
3	Output Current (VIN = 48V)	I_{out}	12V			7.1	A	V_{IN} = 52V Min
			24V			3.6		
4	Line Regulation	V_{LINE}			0.1		%	@ 50W Load
5	Load Regulation	V_{LOAD}			0.1		%	@ V_{IN}=52V
6	Output Ripple	V_R	12V		65		mV_{p-p}	@ Max load
			24V		120			
7	Peak Efficiency	EFF				93.7	%	Vin = 50V @50W Load
8	Short-Circuit Duration[3]	T_{SC}				∞	sec	
9	Isolation Voltage (I/O)	V_{ISO}				1500	V_{PK}	Impulse Test

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

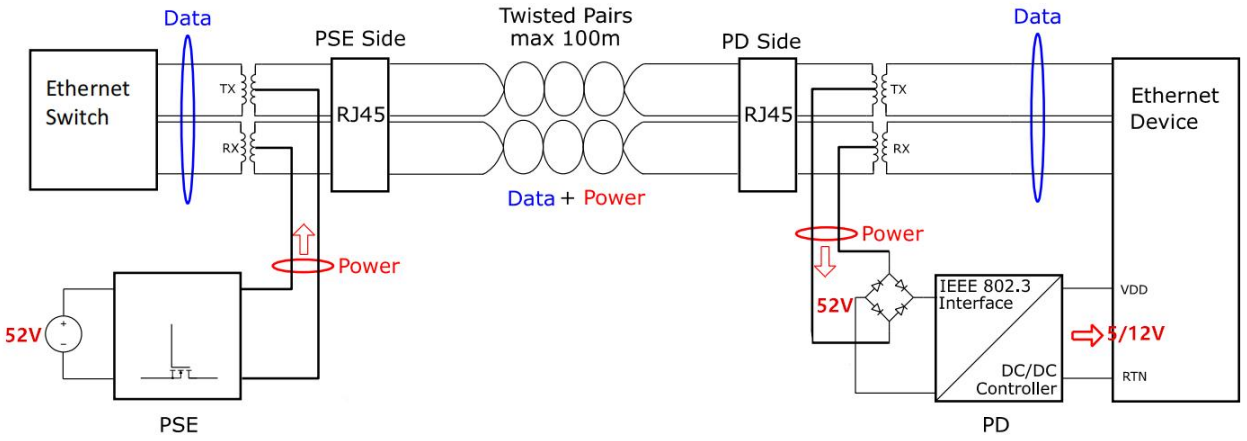
4 Package





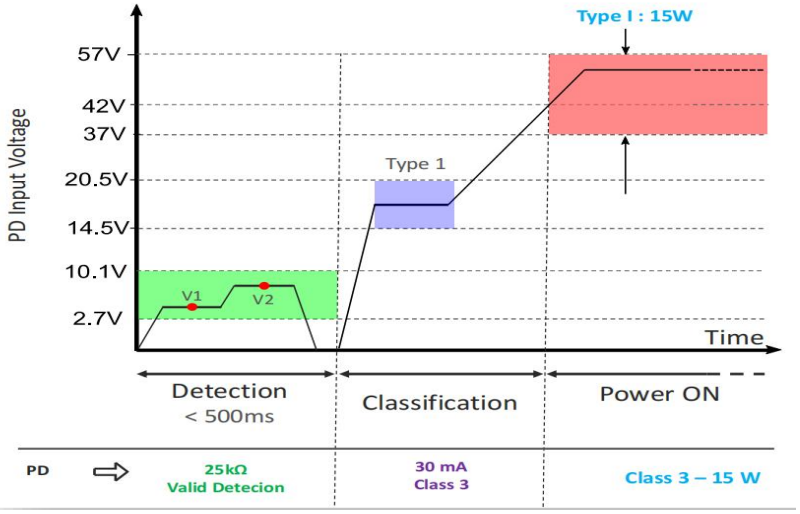
(Recommended PCB hole diameter = 1.1 ± 0.05)
Dimensions (in mm) are nominal +/- 0.25 unless otherwise stated

1. Power Delivery in PoE Systems

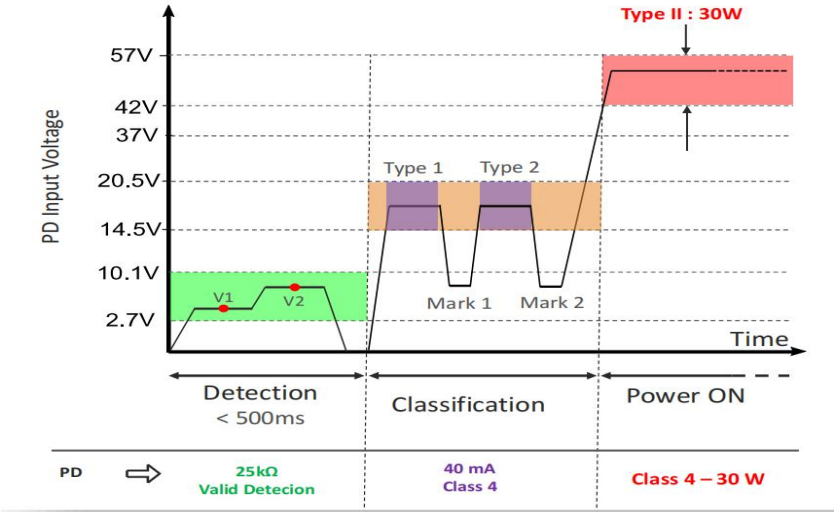


	Type 1 802.3af			Type 2 802.3at	Type 3 802.3bt		Type 4 802.3bt	
Power Class	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
Power from PSE	4 W	7 W	15.4 W	30 W	45 W	60 W	75 W	90 W
Power delivered to PD	3.84 W	6.49 W	13 W	25.5 W	40 W	51 W	62 W	71.3 W

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)

