**Autoclass Text (PSE margin – V120): Only Sections with Changes are Included.**

### 33.2.6 PSE classification of PDs and mutual identification

The ability for the PSE to query the PD in order to determine the power requirements of that PD is called classification. The interrogation and power classification function is intended to establish mutual identification and is intended for use with advanced features such as power management.

Mutual identification is the mechanism that allows a Type 2, Type 3, or Type 4 PD to differentiate between Type 1, Type 2, Type3, and Type4 PSEs. Additionally, mutual identification allows a Type 2, Type 3, or Type 4 PSE to differentiate between Type 1, Type 2, Type 3, and Type 4 PDs. PDs or PSEs that do not implement classification will not be able to complete mutual identification and can only perform as Type 1 devices.

There are two forms of classification: Physical Layer classification and Data Link Layer classification.

Physical Layer classification occurs before a PSE supplies power to a PD when the PSE asserts a voltage onto the PI and the PD responds with a current representing a limited number of power classifications. Based on the response of the PD, the minimum power level at the output of the PSE is $P_{Class}$ as shown in Equation (33–3). Physical Layer classification encompasses two methods, known as 1-Event Physical Layer classification (see 33.2.6.1) and Multiple-Event Physical Layer classification (see 33.2.6.2).

The minimum power output by the PSE for a particular PD class is defined by Equation (33–3). Alternatively, PSE implementations may use $V_{PSE} = V_{Port\_PSE}$ min and $R_{Chan} = R_{Ch}$ max to arrive at over- margined values as shown in Table 33–7.

If the PD connected to the PSE performs Autoclass (see section 33.3.5.3 and Annex 33-TBD), the PSE may set its minimum power output based on the power drawn during Autoclass, increased by at least the margin associated with the PD class as listed in Table 33-10a, in order to account for potential increase in channel resistance due to temperature increase, with a maximum of the value in Table 33-7 of the corresponding PD class and a minimum of 4.0 Watts. PSEs that have additional information about the actual channel DC resistance may choose to use a lower Auto class margin than those listed in Table 33-10a.

$$P_{Class} = \left\{ V_{PSE} \times \left( \frac{V_{PSE} - \sqrt{V^2_{PSE} - 4 \times R_{Chan} \times P_{Class\_PD}}}{2 \times R_{Chan}} \right) \right\}_{W}$$

### 33.2.6.3 Autoclass

Type 3 and type 4 PSEs may choose to implement an extension of Physical Layer classification known as Auto class. The purpose of Auto class is to allow the PSE to determine the actual maximum power draw of the PD to which it is connected. Please see Annex 33-TBD for more information on Auto class.

PSEs implementing Auto class shall measure the power consumption of the connected PD throughout the period bounded by $T_{AUTO\_PSE1}$ and $T_{AUTO\_PSE2}$, measured from the transition of the POWER_UP or SET_PARAMETERS state to the POWER_ON state.

**Table 33–10a—Autoclass electrical requirements**

| Item | Parameter | Symbol | Units | Min | Max | Additional information |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Autoclass Power Measurement Start | $T_{AUTO\_PSE1}$ | s | 1.45 | | Measured from transition to state POWER_ON |
| 2 | Autoclass Power Measurement End | $T_{AUTO\_PSE2}$ | s | | 3.2 | Measured from transition to state POWER_ON |
| 3 | Autoclass margin, Class 1, 2P | | % | 0.5 | | |
| | Autoclass margin, Class 1, 4P | | | 0.5 | | |
| | Autoclass margin, Class 2, 2P | | | 1.0 | | |
| | Autoclass margin, Class 2, 4P | | | 0.5 | | |
| | Autoclass margin, Class 3, 2P | | | 1.5 | | |
| | Autoclass margin, Class 3, 4P | | | 1.0 | | |
| | Autoclass margin, Class 4, 2P | | | 4.0 | | |
| | Autoclass margin, Class 4, 4P | | | 1.5 | | |
| | Autoclass margin, Class 5 | | | 2.5 | | |
| | Autoclass margin, Class 6 | | | 4.0 | | |
| | Autoclass margin, Class 7 | | | 4.5 | | |
| | Autoclass margin, Class 8 | | | 6.0 | | |

**33.3.5.3 Autoclass**

Type 3 and type 4 PDs may choose to implement an extension of Physical Layer classification known as Autoclass. The purpose of Autoclass is to allow the PSE to determine the actual maximum power draw of the PD to which it is connected. Please see Annex 33-TBD for more information on Autoclass.

PDs implementing Autoclass shall not have a class_sig_A of '0'. In addition, PDs implementing Autoclass shall remove its classification current at $T_{ACS}$ resulting in a classification signature of '0' for the remainder of CLASS_EV1. PDs implementing Autoclass carry out the rest of the Physical Layer classification as described in sections 33.3.5.1 or 33.3.5.2.

After power up, PDs implementing Autoclass shall consume their maximum power draw throughout the period bounded by $T_{AUTO\_PD1}$ and $T_{AUTO\_PD2}$, measured from when $V_{Port\_PD}$ rises above $V_{Port\_PD}$ min. The PD shall not draw more power than the power consumed during the time from $T_{AUTO\_PD1}$ to $T_{AUTO\_PD2}$, ~~plus 2.5%~~ at any point until $V_{Port\_PD}$ falls below $V_{Reset\_th}$.

**Table 33–TBD—Autoclass electrical requirements**

| Item | Parameter | Symbol | Units | Min | Max | Additional information |
|---|---|---|---|---|---|---|
| 1 | Autoclass Signature Timing | $T_{ACS}$ | ms | 77.0 | 83.0 | Measured from transition to state CLASS_EV1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Autoclass Power Draw Start | $T_{AUTO\_PD1}$ | s | | 1.35 | Measured from when $V_{Port\_PD}$ rises above $V_{Port\_PD}$ min |
| 3 | Autoclass Power Draw End | $T_{AUTO\_PD2}$ | s | 3.28 | | Measured from when $V_{Port\_PD}$ rises above $V_{Port\_PD}$ min |