Autoclass Text (part 2 – V150): 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 (TBD 5%), with a maximum of the value in Table 33-7 of the corresponding PD class and a minimum of 4.0 Watts.

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

33.2.6.3 (TBD) Autoclass

Type 3 and type 4 PSEs 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.

PSEs implementing Autoclass 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–TBD—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

33.2.6.2 PSE Multiple-Event Physical Layer classification

When Multiple-Event Physical Layer classification is implemented, classification consists of the application of V_{Class} and the measurement of I_{Class} in a series of classification and mark events—CLASS_EV1, MARK_EV1, CLASS_EV2, MARK_EV2, CLASS_EV3, MARK_EV3, CLASS_EV4, MARK_EV4, CLASS_EV5, and MARK_EV_LAST—as defined in the state diagram in Figure 33–9.

Type 2 PSEs shall provide a maximum of 2 class and 2 mark events. Type 3 PSEs shall provide a maximum of 4 class and 4 mark events. Type 4 PSEs shall provide a maximum of 5 class and 5 mark events.

A PSE in the state CLASS_EV1 shall provide to the PI V_{Class} as defined in Table 33–10. The timing specification shall be as defined by T_{CLE1} in Table 33–10 The PSE shall measure I_{Class} and classify the PD based on the observed current according to Table 33–TBDA1.

A PSE in the state CLASS_EV1_LCF shall provide to the PI V_{Class} as defined in Table 33–10. The timing specification shall be as defined by T_{LCF} in Table 33–10. The PSE shall measure I_{Class} and classify the PD based on the observed current according to Table 33–TBDA1 between 6ms and 75ms after transitioning into the state CLASS_EV1_LCF. The PSE may continue to monitor the current past 75ms. If the PSE did not measure I_{Class} in the range of Class 0 before T_{ACS} min and the the PSE measures I_{Class} in the range of Class 0 after T_{ACS} max this indicates the PD will perform Autoclass.

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