



Transmit Power Signature

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Introduction

Previous task forces working on 802.3 power have included a minimum current waveform that a powered device must draw to ensure the powered device continues receiving power, while allowing the powered device to minimize power consumption.

- Maintain Power Signature (MPS)
 - PoE - Clauses 33 and 145
- Maintain Full Voltage Signature (MFVS)
 - PoDL - Clause 104

Motivation

Clause 169 power delivery should use a similar minimum-current mechanism to remove power once all MPDs have been disconnected

- MPSEs should remove power and re-discover the mixing segment once all loads have been disconnected
 - Typical human behavior dictates that users will disconnect / reconnect the mixing segment when there are issues
 - We want the MPSE to rediscover the mixing segment after a disconnection
 - Post log messages or flash indicators depending on results.
 - Type 0 and Type 1 MPDs may be mixed on the mixing segment
 - MPSEs log discovery results when mixed type MPDs are connected
 - Incompatible MPDs may have been connected while power was already applied
 - Incompatible MPDs are unpowerable and undiscoverable if they were hot-added to an already powered mixing segment
 - MPSEs may change their power type (30V / 50V) during idle state
 - Enable voltage agile MPSEs to automatically change between system types

Nomenclature

- **MPSE** (Multidrop Power Sourcing Equipment) and **MPS** (Maintain Power Signature) are too similar
 - Creates confusion while reading, searching, and editing Clause 169
- Suggest a new unique name - “Transmit Power Signature” (TPS)
 - The TPS is a minimum current waveform
 - TPS is a signal that the MPSE that power should continue transmitting power on the mixing segment
- The MPSE shall remove power when measured current no longer meets TPS limits

MPSE Transmit Power Signature (TPS) Text

Adapted from subclause 145.2.12

169.4.11.1 MPSE Transmit Power Signature (TPS) requirements

The transmit power signature (TPS) is a minimum current waveform reported by an MPD which allows an MPD to minimize its power consumption while signaling the MPSE to continue transmitting power.

TPS shall be defined as being present in the POWER_ON state when $I_{\{MPSE\}}$ is greater than or equal to $I_{\{Hold\}} \text{ max}$ for a minimum of $T_{\{TPS\}}$. TPS may be defined as present or absent in the POWER_ON state if $I_{\{MPSE\}}$ is in the range of $I_{\{Hold\}}$. TPS shall be defined as absent in the POWER_ON state if $I_{\{MPSE\}}$ is less than or equal to $I_{\{Hold\}} \text{ min}$. Power shall be removed from the TCI when TPS is absent for a duration greater than $T_{\{TPSDO\}}$. The MPSE shall not remove power from the port when $I_{\{MPSE\}}$ is greater than or equal to $I_{\{Hold\}} \text{ max}$ continuously for at least $T_{\{TPS\}}$ in any duration $T_{\{TPS\}} + T_{\{TPSDO\}}$, as defined in Table 169-6.

Table 169-6 -- MSPE Output Requirements

| Item | Parameter | Symbol | Unit | Min | Max | Type | Additional Information |
|------|---|-----------------|------|-----|-----|------|------------------------|
| 7 | MPD Transmit Power Signature dropout time limit | $T_{\{TPSDO\}}$ | ms | 320 | 400 | All | |
| 8 | MPD TPS Time | $T_{\{TPS\}}$ | ms | 6 | - | All | |
| 9 | TPS Current | $I_{\{HOLD\}}$ | mA | 4 | 9 | All | |

MPD Transmit Power Signature (TPS) Text

Adapted from PoE subclause 145.3.9:

169.5.5.3 MPD Transmit Power Signature

The transmit power signature (TPS) is a minimum current waveform reported by an MPD which allows an MPD to minimize its power consumption while signaling the MPSE to continue transmitting power.

An MPD that requires power from the TCI shall report a valid TPS at the TCI. An MPD that does not report TPS may have its power removed within the limits of $T_{\{TPSD0\}}$ as defined in Table 169-6. $I_{\{TCI_TPS\}}$, $T_{\{TPS_PD\}}$, and $T_{\{TPSD0_PD\}}$, are defined in Table 169-XX.

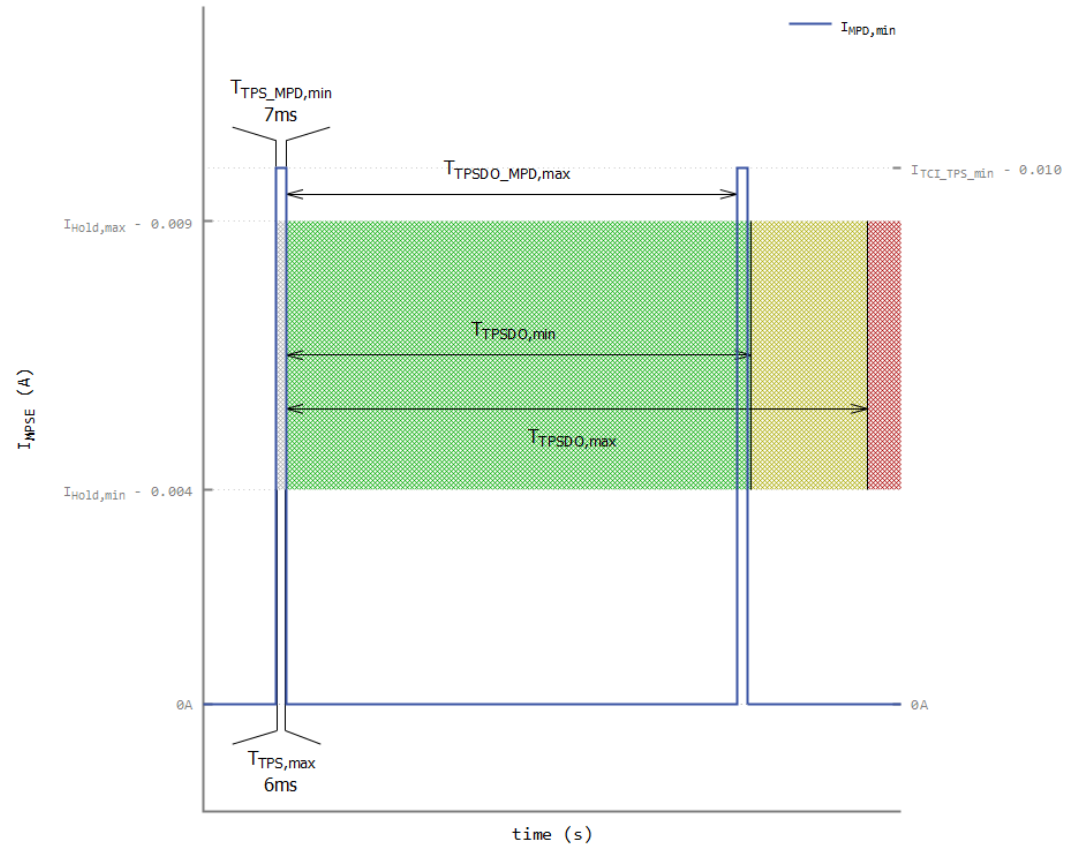
TPS shall consist of current draw equal to or above $I_{\{TCI_TPS\}}$ for a minimum duration of $T_{\{TPS_PD\}}$ followed by an optional TPS dropout for no longer than $T_{\{TPS_PD\}}$.

Table 169-XX -- MPD Transmit Power Signature

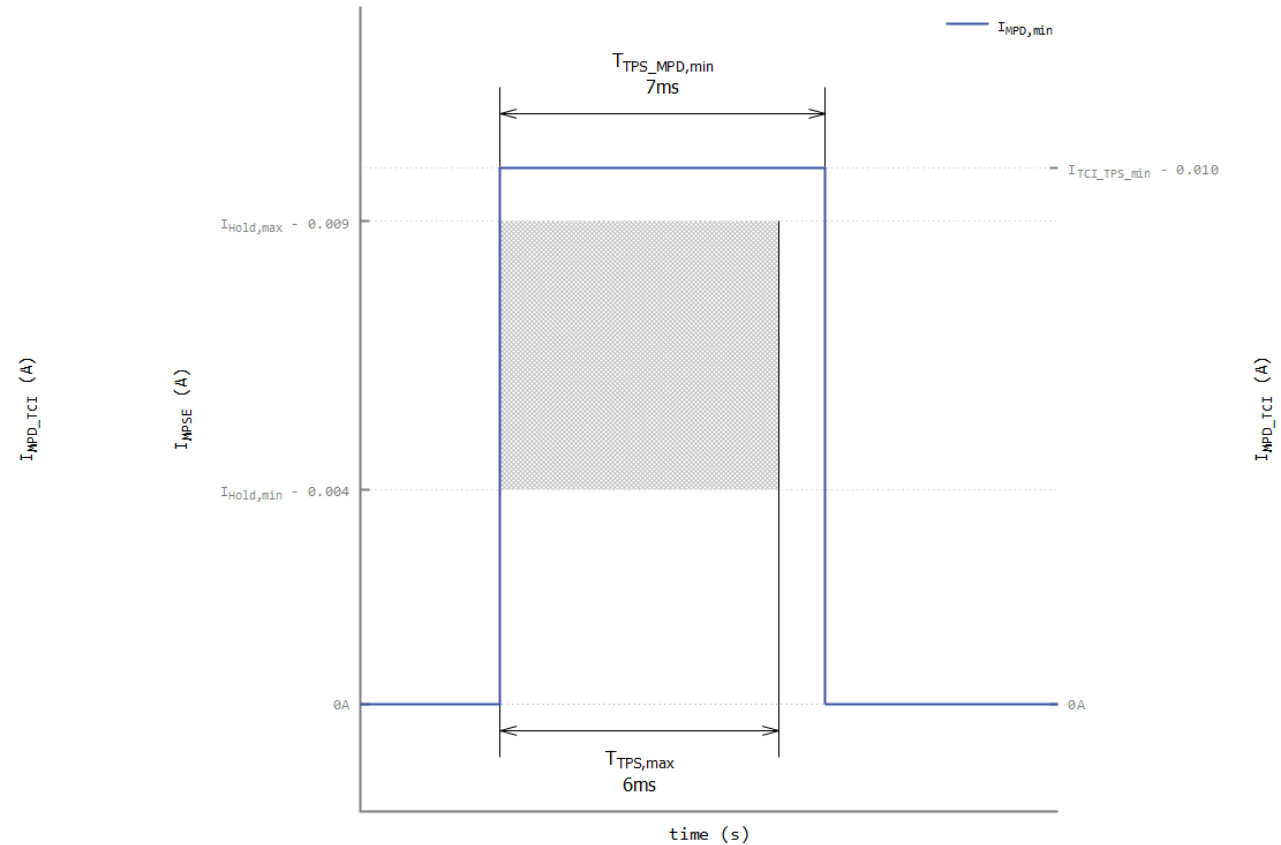
| Item | Parameter | Symbol | Unit | Min | Max | Type | Additional Information |
|------|------------------------|----------------------|------|-----|-----|------|------------------------|
| 1 | MPD TCI current | $I_{\{TCI_TPS\}}$ | mA | 10 | - | All | |
| 2 | MPD TPS Time | $T_{\{TPS_MPD\}}$ | ms | 7 | - | All | |
| 3 | MPD TPS Dropout Period | $T_{\{TPSD0_MPD\}}$ | ms | - | 310 | All | |

TPS Timing

TPS Dropout



TPS Pulse



Conclusion

To address comment 149 – Adopt text / table from slide 6

To address comment 158 – Adopt text / table from slide 5