Proposed Remedy for Comments Regarding V_{oc} Max Limit During Detection of Classifying Only PDs

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LINEAR TECHNOLOGY

Problem Summary

Table 104–3—PSE PI detection state electrical output requirements

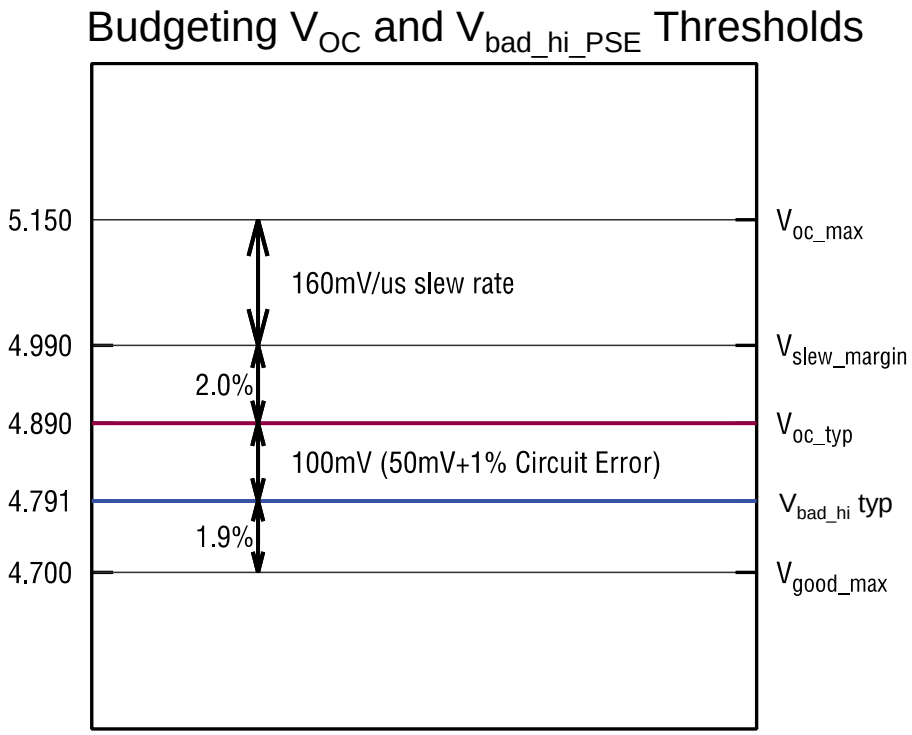
Item	Parameter	Symbol	Unit	Min	Max	Additional Information
1	Open circuit voltage	V_{OC}	V	4.75	5.15	
2	Short circuit current	I_{SC}	mA	—	24	
3	Valid test probe current	I_{valid}	mA	9	16	
4	Slew rate	I_{slew}	A/ms	—	1	
5	Output capacitance during detection	C_{out}	nF	—	200	
6	Maximum detection time	T_{det}	ms	—	3.11	See 104.4.4
7	Valid PD detection signature range measured at PSE PI	V_{good_PSE}	V	4.05	4.7	See 104.4.4.2
8	Invalid PD detection signature high range measured at PSE PI	$V_{bad\_hi\_PSE}$	V	V_{oc}- 0.05	—	See 104.4.4.3
9	Invalid PD detection signature low range measured at PSE PI	$V_{bad\_lo\_PSE}$	V	—	3.7	
10	Signature hold timer for validity	T_{sig_hold}	ms	1	—	See 104.4.4.2

Parameters changed for D3.1

- PSEs are now required to limit open-circuit voltage between 4.75V and 5.15V during detection
- Minimum input capacitance of a classifying PD that presents a bad-high signature is not constrained, and this can result in fast slew rates at the PSE when approaching V_{OC} during detection
- These requirements are forcing the detection over-voltage clamp circuit to be both **fast** and **accurate**

Example Threshold Design

Assumptions	
Ivalid_max (detection current)	16mA
Cout	100nF
Clamp circuit response time	1µs
Slew Rate	0.16V/µs



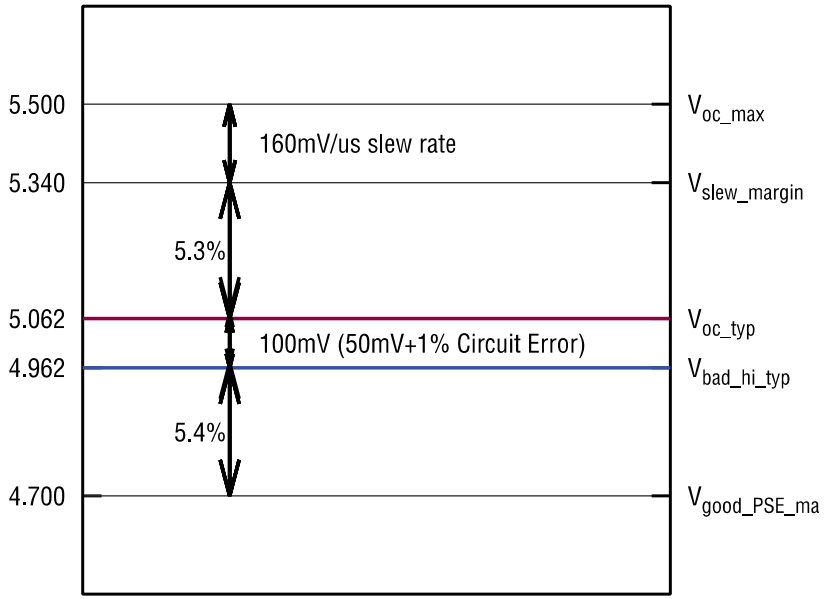
- **Only 3.9% Tolerance Remains for V_{OC} Threshold**

Proposed Remedy

- Relax V_{OC} max to what it was in draft 3.0 (5.5V)
- Relaxation of V_{OC} max to 5.5V will potentially interfere with V_{on} for the 12V unregulated classes, but…
- The 12V unregulated classes target automotive applications and do not require classification
  - ➢Add new footnote to Table 104-1 stating

"ePDs that require Classification for Classes 0 and 1 are not supported."

Design Example with Proposed V_{OC} max Threshold



Questions?

Thank you!