PoDL SCCP

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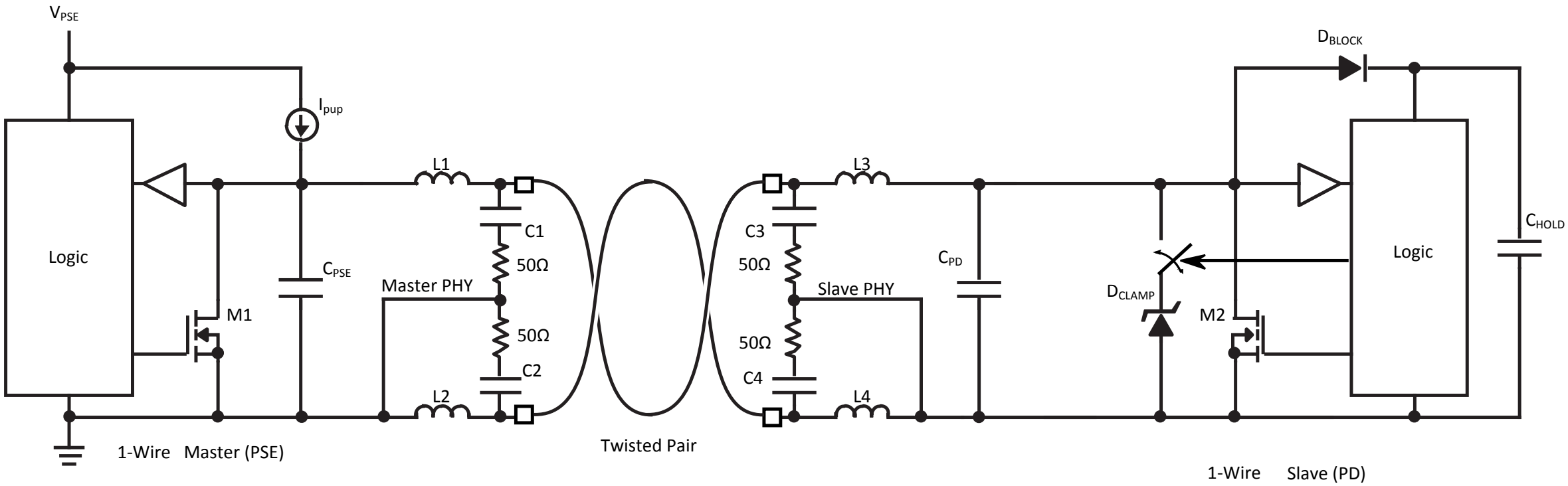
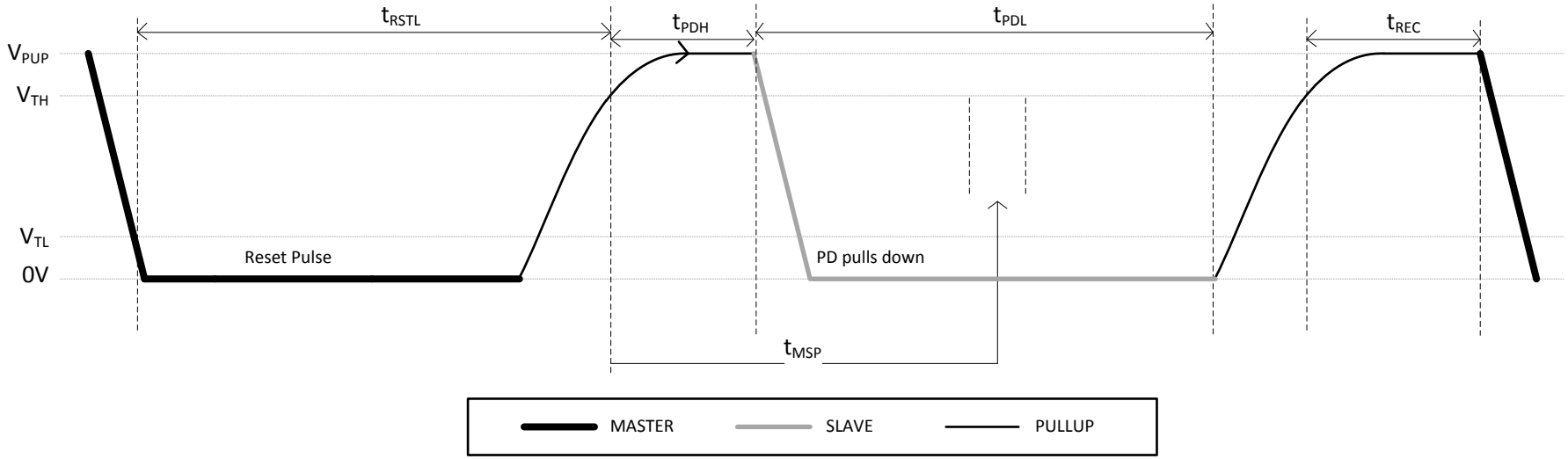
Presentation Objectives

- Revise SCCP timing diagrams and electrical requirements to account for channel parameters
- Modify SCCP address commands to eliminate multi-drop support
- Add a single SCCP function command to allow for interrogation of PD class
- Define CRC-8 polynomial and usage
- Adapted from 1-Wire™

SCCP Schematic

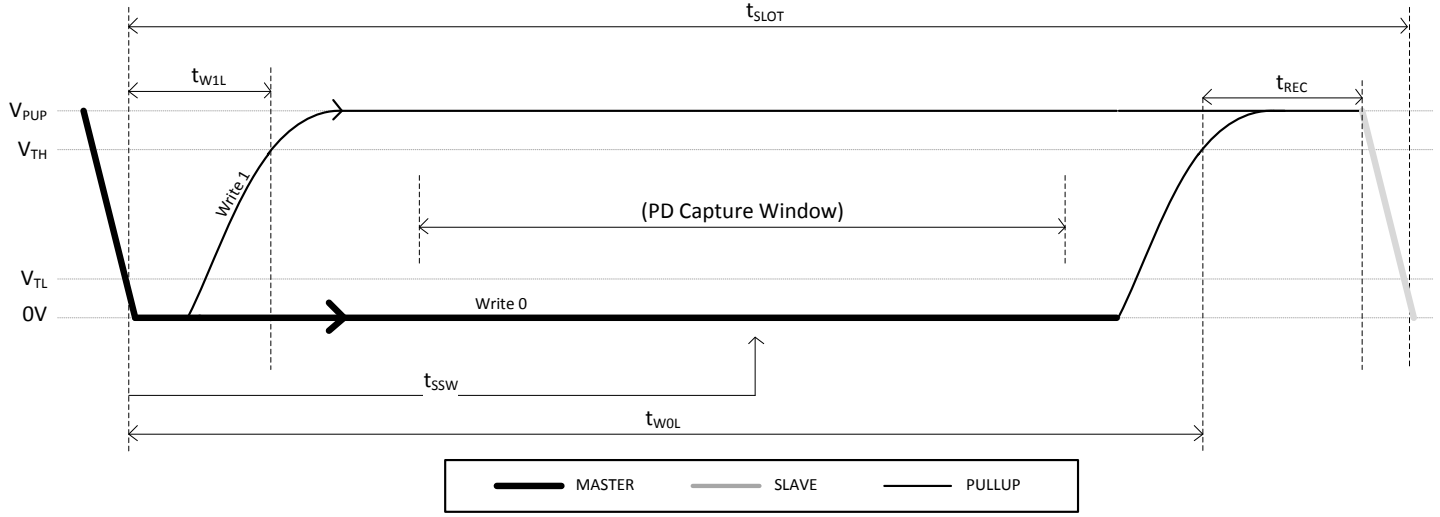


Replace Figure 104-9 Reset command timing diagram

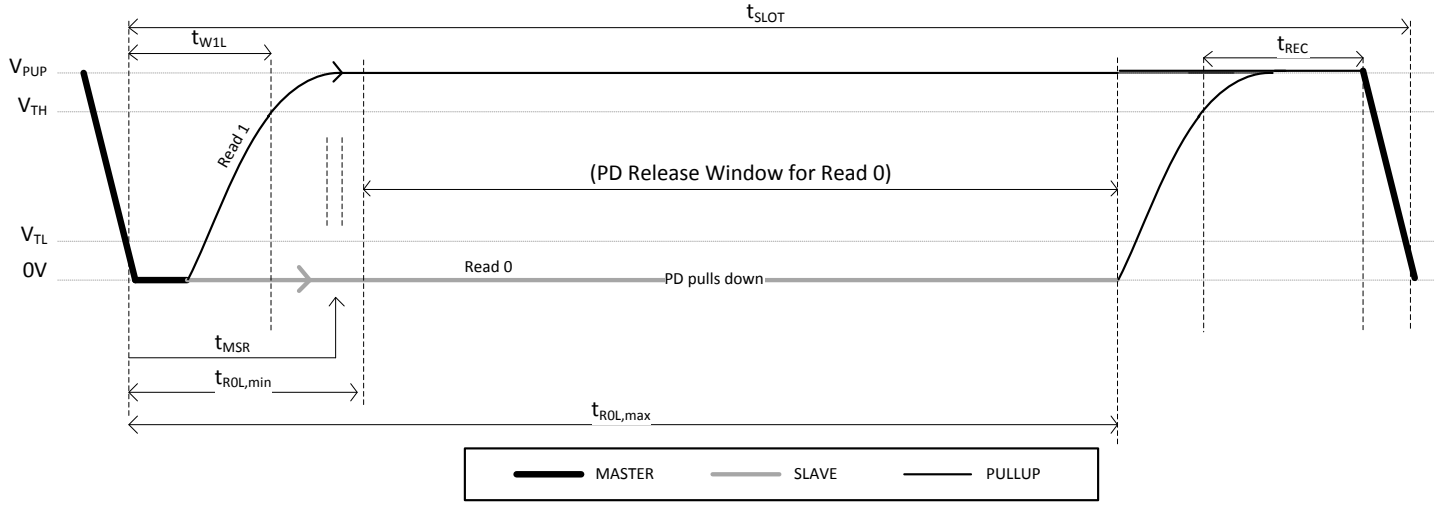


Replace Figure 104-10 Write 0/1 slot and read 1/0 timing diagrams

Write 0/1



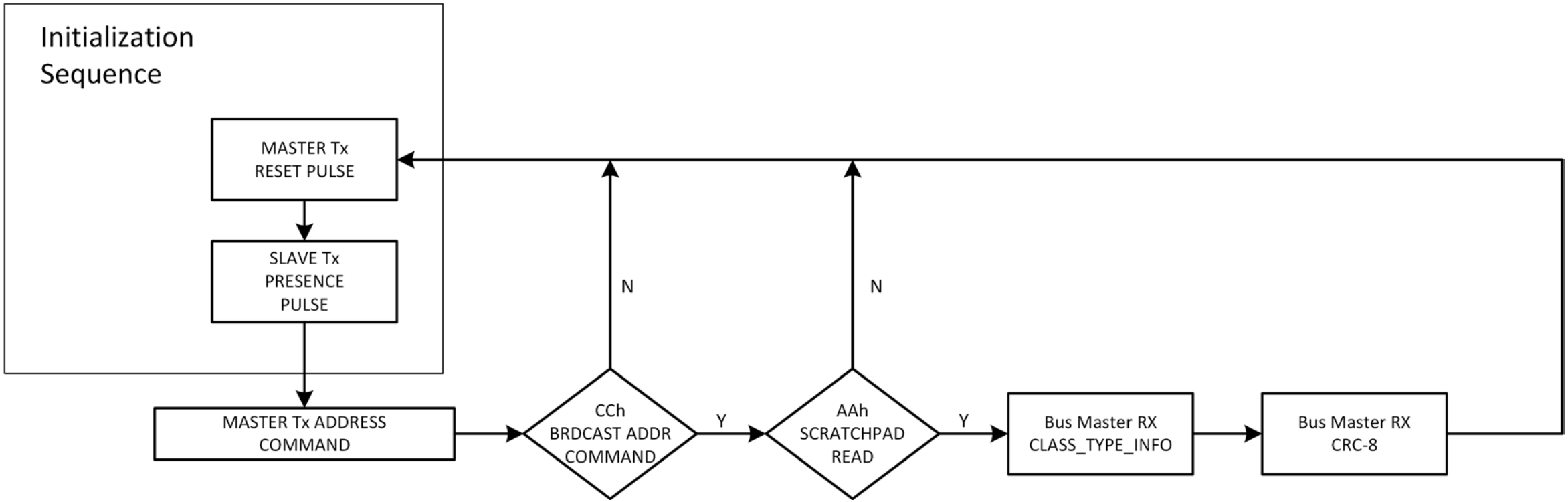
Read 0/1



Modify Table 104-7 SCCP electrical requirements

Item	Parameter	Symbol	Unit	Min	Max	
1	PSE Pullup	V_{PUP}	V	$V_{good\_PSE,max}$		at $I_{probe,min}$
2	Input Logic High	V_{TH}	V	3		
3	Input Logic Low	V_{TL}	V		1	
4	Sink Current	I_L	mA	10		V_{PORT}=0.8V
5	Time Slot	t_{SLOT}	ms	2.7	3.3	
6	Recovery Time	t_{REC}	us	270	330	
7	Reset Time Low	t_{RSTL}	ms	9	11	
8	Presence-Detect High	t_{PDH}	ms	0.5	1.5	
9	Presence-Detect Low	t_{PDL}	ms	2	6	
10	Master Sample Presence	t_{MSP}	ms	1.6	2.0	
11	Write 1 Low Time	t_{W1L}	us	90	330	
12	Write 0 Low Time	t_{W0L}	ms	1.8	2.2	
13	Master Sample Read	T_{MSR}	us	270	330	
14	Read 0 Low Time	t_{R0L}	ms	0.5	1.5	

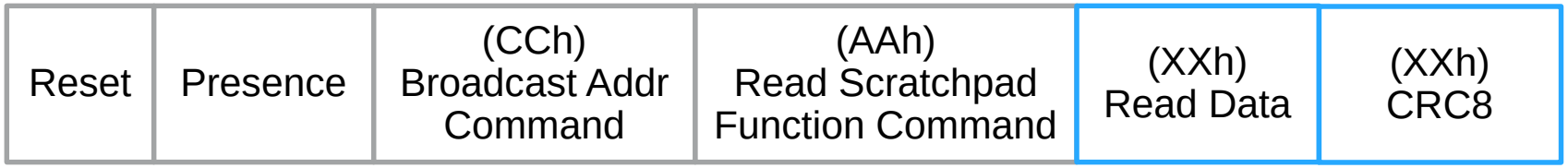
Modify Figure 104-12 Address/Function commands flowchart



Modify and Redact Sections

- Replace 104.6.4.3 Text
  - All SCCP-capable slaves shall support the Broadcast Address command. The master shall issue an appropriate address command before issuing a function command. A flowchart for operation of the address and function commands is shown in Figure 104-12.
- Remove sections
  - 104.6.4.3.1 Enumerate address [F0h]
  - 104.6.4.3.2 Read address [33h]
  - 104.6.4.3.3 Write address [55h]
  - 104.6.4.3.5 Alarm search [ECh]
  - Table 104-8
  - Figure 104-11
- Timing subscripts need to be changed in the existing draft

Read Scratchpad Frame Format



Add Read Scratchpad Function Command

- Add 104.6.4.4 Read Scratchpad Function Command [AAh]
  - All SCCP-capable slaves shall support the 8-bit Read Scratchpad command. After receiving a Read Scratchpad function command the slave shall respond with a 16-bit CLASS_TYPE_INFO read payload followed by an 8-bit CRC8 field.

Add CRC8 field

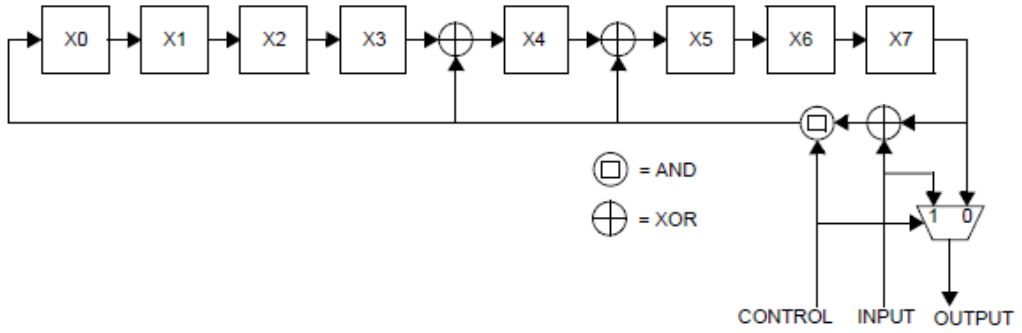
- Add 104.6.4.5 CRC8 field

  The CRC8 field is an 8-bit cyclic redundancy check value. This value is computed as a function of the contents of the 16-bit Scratchpad Read payload.

  The encoding is defined by the generating polynomial shown in Equation (104-X):

  $$G(x) = x^8 + x^5 + x^4 + 1$$

  This CRC8 calculation shall produce the same result as the serial implementation shown in Figure 104-X. Before calculation begins, the shift register shall be initialized to the value 0x00. The content of the shift register is transmitted without inversions.



CONTROL = 1 when shifting the modified preamble and calculating the CRC
CONTROL = 0 when transmitting the CRC field

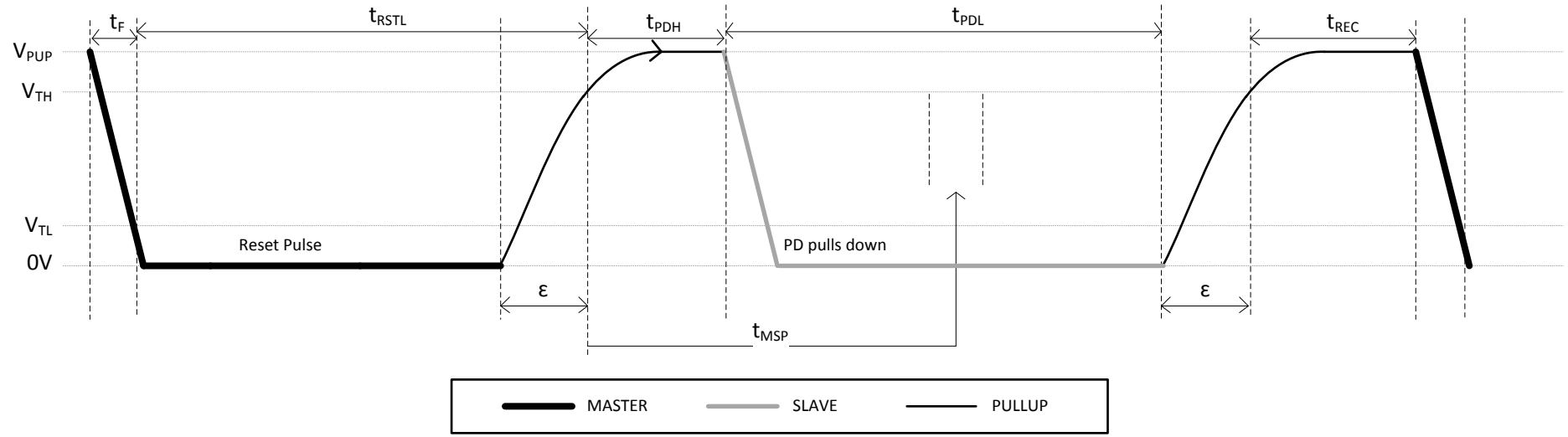
Figure 104-X – CRC8 field generation

Add CLASS_TYPE_INFO Register Table

Bit(s)	Name	Description	R/W
b[15:11]	Reserved (0)		
b[10:7]	Type	Type: 1110b – Type A 1101b – Type B Other – Reserved	RO
b[6:5]	Subclass	Subclass: 10b – Subclass i 01b – Subclass ii Other – Reserved	RO
b[4:0]	Class	Class: 11110 – Class 0 or 1 11101 – Class 2 or 3 11011 – Class 4 or 5 10111 – Class 6 or 7 01111 – Class 8 or 9 Other – Reserved	RO

ANNEX

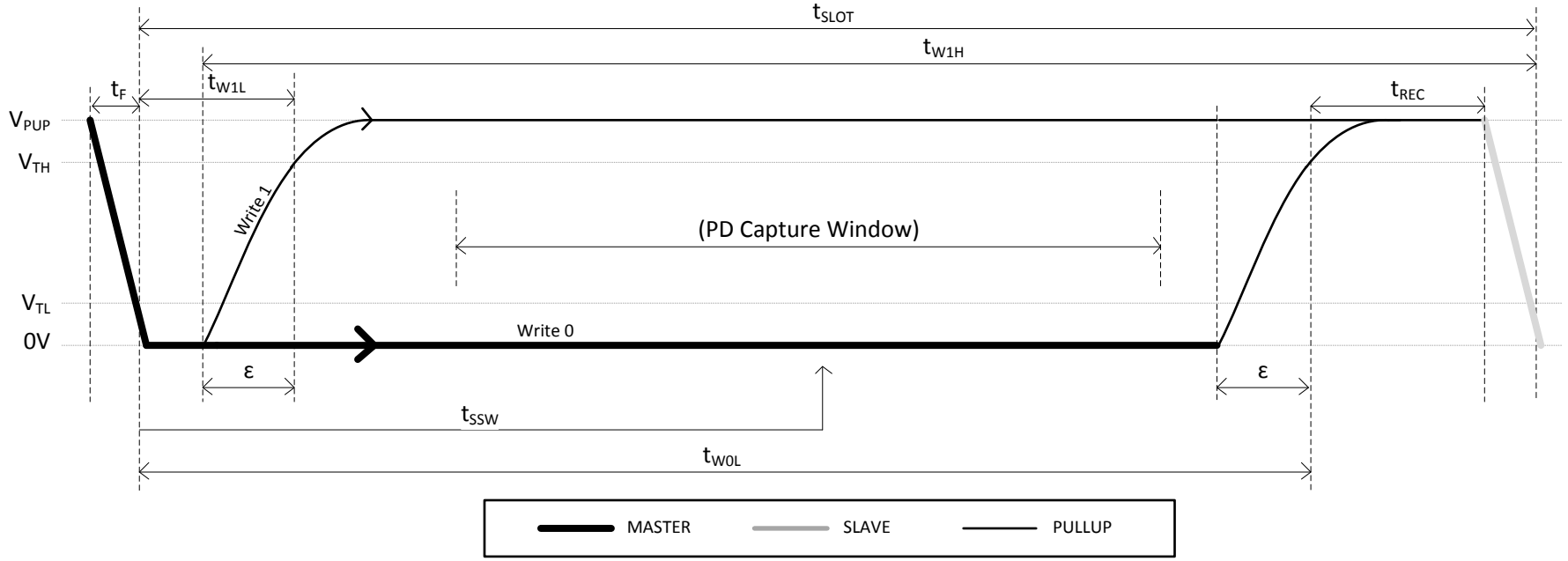
Reset command timing proof



Symbol	Min	Typ	Max	Unit	Note
t_F	0		100	us	5V pu vs 100Ohm pd
ε			230	us	4mA PSE pu / 0.2uF C_{chan} to 4.6V
t_{RSTL}	9	10	11	ms	PSE LO time for Reset pulse
t_{PDH}	0.5	1.0	1.5	ms	PD HI, measured from rising edge V_{TH}
t_{PDL}	2.0	4.0	6.0	ms	PD LO, presence pulse, measured from rising edge V_{TH}
t_{MSP}	1.6	1.8	2.0	ms	PSE presence capture, measured from rising edge V_{TH}
t_{REC}	270	300	330	us	Must charge PD SCCP reservoir capacitor
$t_{SLOT,RST}$			18.1	ms	
t_{LO}			10	ms	PD must maintain state

Red indicates parameters captured in SCCP electrical requirements

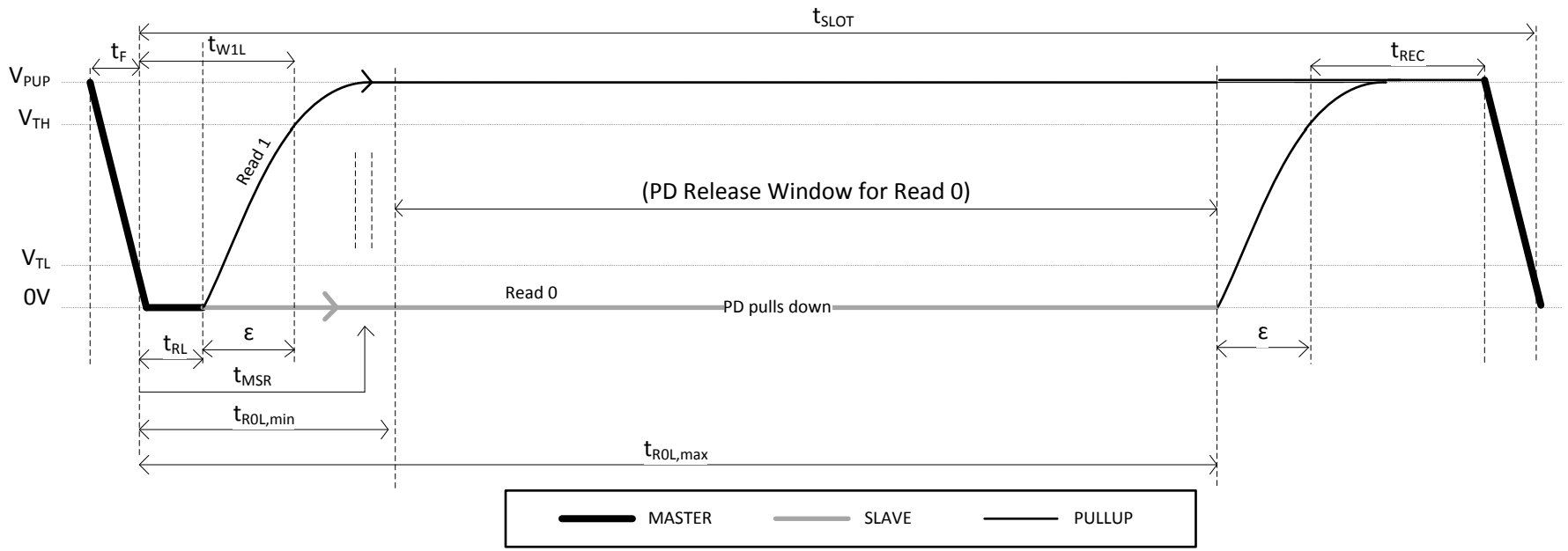
Write 0/1 slot timing proof



Symbol	Min	Typ	Max	Unit	Note
t_F	0		100	us	5V pu vs 100Ohm pd
ε			230	us	4mA PSE pu / 0.2uF C_{chan} to 4.6V
t_{W1L}	90		330	us	PSE LO time for Write 1 symbol
t_{W1H}	1.6	1.8	2.0	ms	PSE HI time for Write 1 symbol
t_{SSW}	0.5	1.0	1.5	ms	PD capture measured from falling edge V_{TL}
t_{W0L}	1.8	2.0	2.2	ms	PSE hold time for Write 0 symbol
t_{REC}	270	300	330	us	Charge PD SCCP reservoir capacitor
t_{SLOT}	2.7	3.0	3.3	us	

Red indicates parameters captured in SCCP electrical requirements

Read 0/1 slot timing proof



Symbol	Min	Typ	Max	Unit	Note
t_F	0		100	us	5V pu vs 100Ohm pd
ε			230	us	4mA PSE pu / 0.2uF C_{chan} to 4.6V
t_{W1L}	90		330	us	
t_{RL}		T_{W1L} - ε		us	
t_{MSR}	270	300	330	us	PSE capture, from falling edge V_{TL}
t_{R0L}	0.5	1.0	1.5	ms	PD release, measured from falling edge V_{TL}
t_{REC}	270	300	330	us	Must charge PD SCCP reservoir capacitor
t_{SLOT}	2.7	3.0	3.3	us	

Red indicates parameters captured in SCCP electrical requirements