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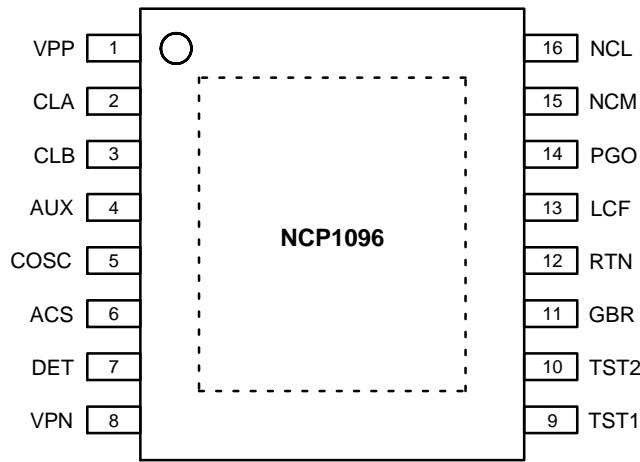
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# NCP1096



**Figure 1. Pin-out NCP1096 in 16-pin TSSOP EP (Top View)**

## PIN DESCRIPTION

| Signal Name | Pin No. | Type               | Description   |
|-------------|---------|--------------------|---|
| VPP         | 1       | Power              | Positive input power.<br>Connect to the positive terminal of the rectifier bridge   |
| CLA         | 2       | Output             | Connect a class signature programming resistor to VPN.<br>See classification section for recommended values   |
| CLB         | 3       | Output             |   |
| AUX         | 4       | Input              | Auxiliary supply detection input. Referenced to VPN   |
| COSC        | 5       | Analog             | Connect a 1 nF capacitor between COSC and VPN.<br>This pin is pulled to VPP during the detection phase  |
| ACS         | 6       | Input              | Autoclass enable/disable input.<br>Pull to VPN to disable Autoclass; leave floating to enable Autoclass   |
| DET         | 7       | Output             | Connect a 26.1 kΩ detection resistor between DET and COSC.<br>This pin is pulled to VPN during the detection phase  |
| VPN         | 8       | Power, Ground      | Negative input power.<br>Connect to the negative terminal of the rectifier bridge   |
| TST1        | 9       | Input              | Positive side of the internal sense resistor (and the source of the internal pass transistor). Leave floating   |
| TST2        | 10      | Output             | Gate of the internal pass transistor. Leave floating  |
| GBR         | 11      | Output, Open Drain | Control output to disable the active rectifier bridge.<br>This pin is referenced to VPN   |
| RTN         | 12      | Power              | Return connection of the PGO, NCM, NCL and LCF outputs.<br>Connect to the DC/DC controller power return.  |
|             | EP      | Power              | Exposed pad (thermal contact). Drain of the internal pass transistor.<br>Connect to the DC/DC controller power return plane.  |
| LCF         | 13      | Output, Open Drain | Long Classification Finger Indicator. This pin is referenced to RTN.<br>Connect with a pull-up resistor to the logic supply   |
| PGO         | 14      | Output, Open Drain | Power Good Indicator. This pin is left floating when the power good signal is active. Referenced to RTN. Must be used to enable/disable the main DC/DC converter adjacent to NCP1096. |
| NCM         | 15      | Output, Open Drain | Class result MSB output. This pin is referenced to RTN.<br>Connect with a pull-up resistor to the logic supply  |
| NCL         | 16      | Output, Open Drain | Class result LSB output. This pin is referenced to RTN.<br>Connect with a pull-up resistor to the logic supply  |

# NCP1096

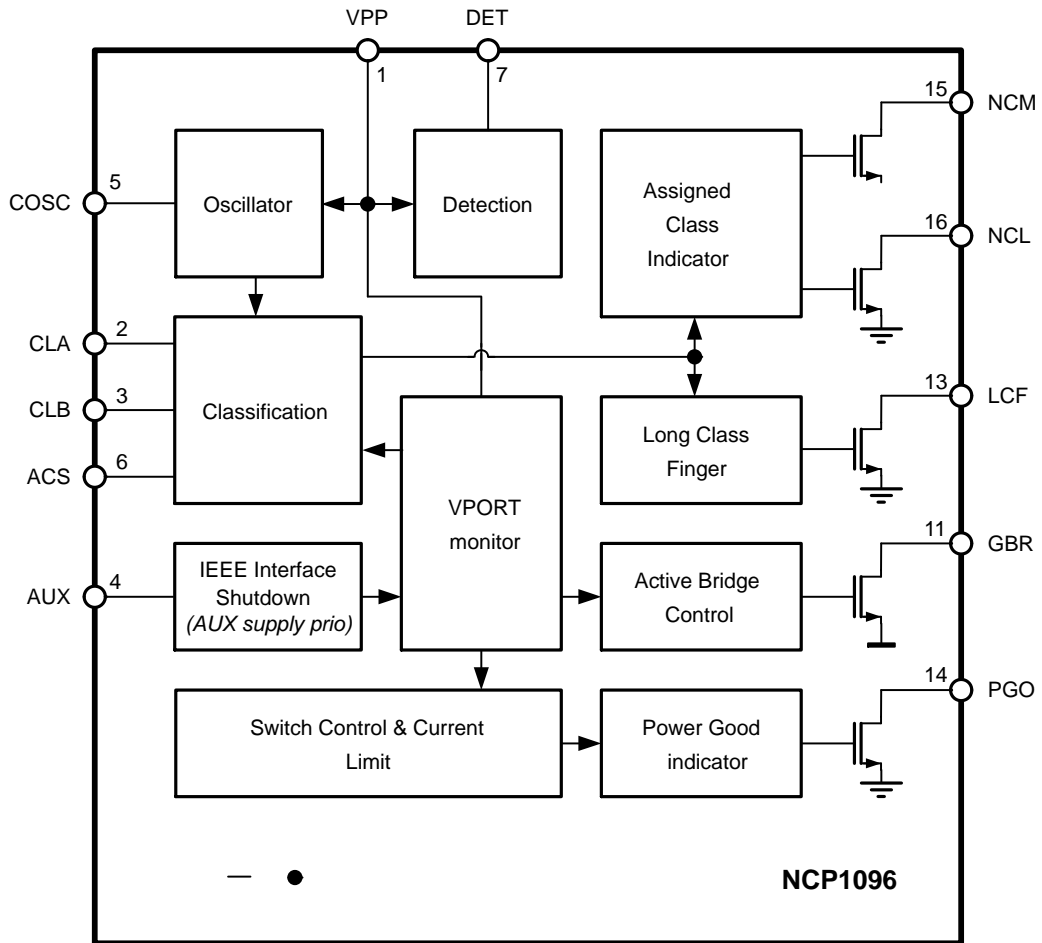


Figure 2. NCP1096 Block Diagram



# NCP1096

## ELECTRICAL CHARACTERISTICS

(All parameters are guaranteed for the recommended operating conditions unless otherwise noted)

| Symbol | Parameter | Min | Typ | Max | Unit | Condition |
|--------|-----------|-----|-----|-----|------|-----------|
|--------|-----------|-----|-----|-----|------|-----------|

### DETECTION CHARACTERISTICS

|           |                                    |      |  |      |    |   |
|-----------|------------------------------------|------|--|------|----|---|
| Rdetect   | Equivalent detection resistance    | 23.7 |  | 26.3 | kΩ | R <sub>DET</sub> = 26.1 kΩ ±1%;<br>1 V ≤ V <sub>PORT</sub> ≤ 10.1 V |
| VoffsetIC | Detection offset voltage (IC part) | 0    |  | 0.2  | V  |   |

### CLASSIFICATION CHARACTERISTICS

|         |   |      |     |      |    |                                     |
|---------|---|------|-----|------|----|-------------------------------------|
| Vcl_th  | Class/Mark current switchover threshold (Note 5)  | 10.1 |     | 12.5 | V  | V <sub>PORT</sub> rising or falling |
| Vcldis  | Classification current disable threshold (Note 5) | 20.5 |     | 24.5 | V  | V <sub>PORT</sub> rising or falling |
| IcIsigq | Quiescent current during classification           | 207  | 327 | 484  | μA | V <sub>PORT</sub> = 12.5 V          |
| Vcsr    |   |      |     |      |    |                                     |

# NCP1096

## ELECTRICAL CHARACTERISTICS (continued)

(All parameters are guaranteed for the recommended operating conditions unless otherwise noted)

| Symbol | Parameter | Min | Typ | Max | Unit | Condition |
|--------|-----------|-----|-----|-----|------|-----------|
|--------|-----------|-----|-----|-----|------|-----------|

### RESET CHARACTERISTICS

|      |
|------|
| Vrst |
|------|





# NCP1096

## APPLICATION INFORMATION



NCM and NCL Indicators

Table 4. MPS CURRENT

| Assigned Class | I <sub>Port_MPS,Min</sub> |
|----------------|---------------------------|
| ≤ 4            | 10 mA                     |
| ≥ 5            | 16 mA                     |

μ

μ

Autoclass

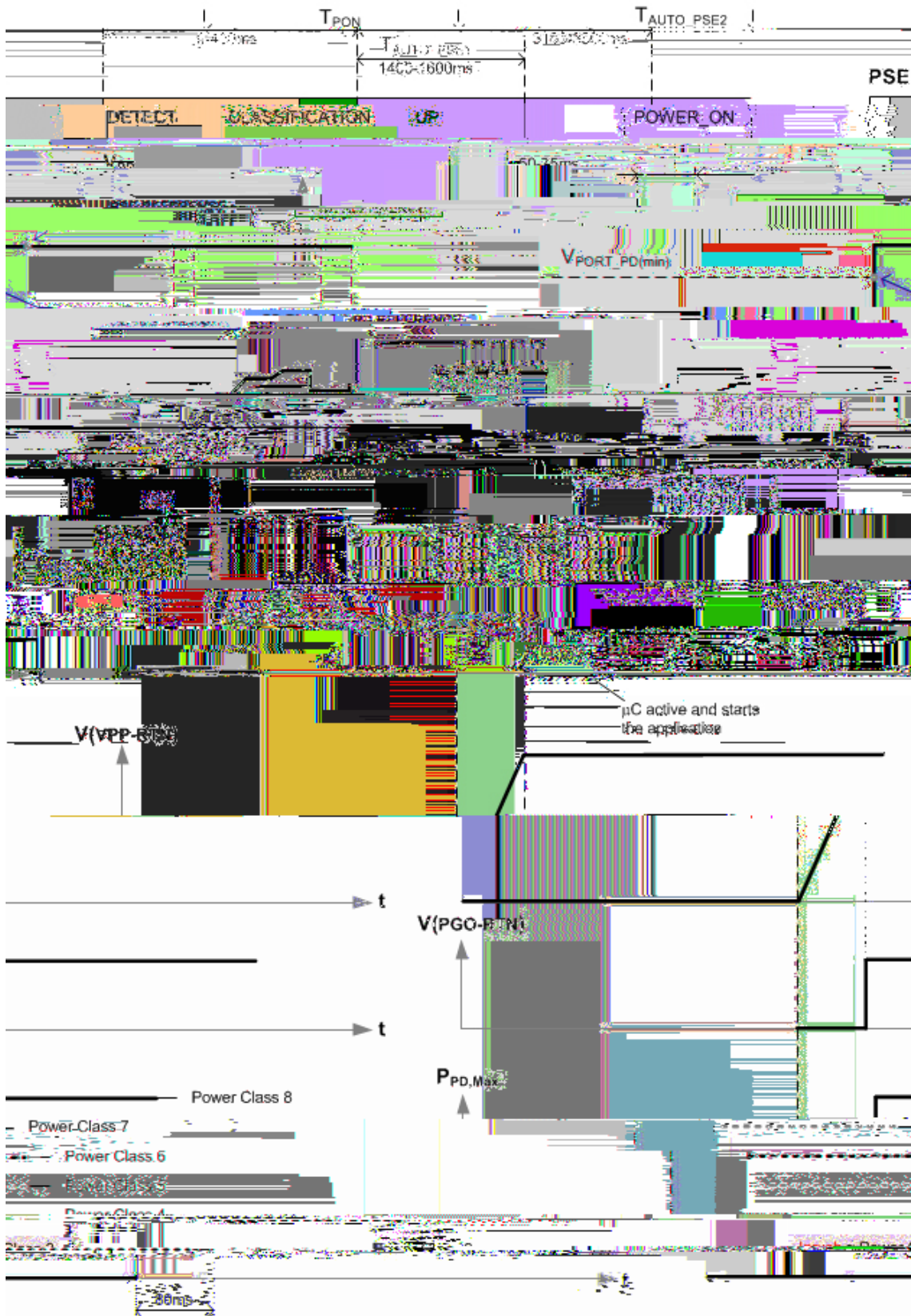


Figure 7. Complete Start-up Diagram of a Class 8 PD with Autoclass

PoE System Overview

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- 
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Table 5. SYSTEM PARAMETERS OVERVIEW

| Assigned Class | PSE Type | Minimum Cabling Type |
|----------------|----------|----------------------|
|----------------|----------|----------------------|

Auxiliary Supply

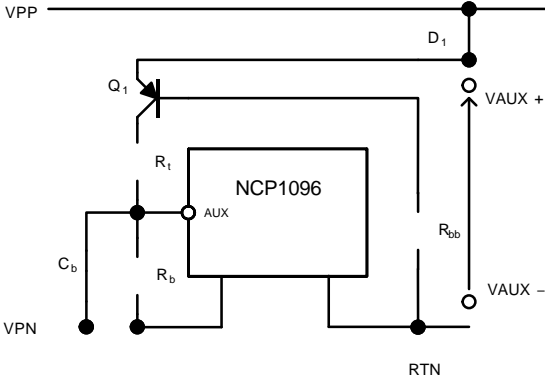


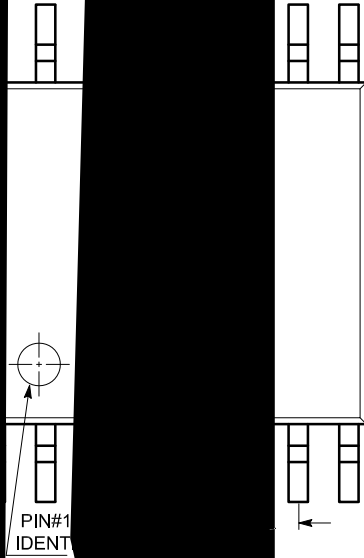
Figure 8. AUX Pin Interfacing





TSSOP16, 4.4x5 EXPOSED PAD  
CASE 948BV  
ISSUE O

DATE 22 JUN 2017



END VIEW

BOTTOM VIEW

| SYMBOL | MIN  | TYP | MAX  |
|--------|------|-----|------|
| A      |      |     | 1.10 |
| A1     | 0.00 |     | 0.15 |
| A2     | 0.85 |     | 0.95 |
| b      | 0.19 |     | 0.30 |
| c      | 0.13 |     | 0.20 |
| D      | 4.90 |     | 5.10 |
| E      | 6.30 |     | 6.50 |
| E1     | 4.30 |     | 4.50 |
| e      |      | SC  |      |
| L      |      | REF |      |
| L1     | 0.45 |     | 0.75 |
| N      | 0.90 |     | 1.00 |
| P      | 6.50 |     | 6.70 |
| R      | 4.60 |     | 4.80 |
| G      | 0.37 |     | 0.47 |

LAND PATTERN

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