

|                                |                                                                                                                                                               |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Title of Change:</b>        | NCV7428 Datasheet Update (editorial changes)                                                                                                                  |
| <b>Effective date:</b>         | 19 Jul 2023                                                                                                                                                   |
| <b>Contact information:</b>    | Contact your local onsemi Sales Office or <a href="mailto:Jelle.Genne@onsemi.com">Jelle.Genne@onsemi.com</a>                                                  |
| <b>Type of notification:</b>   | This Product Bulletin is for notification purposes only.<br>onsemi will proceed with implementation of this change upon publication of this Product Bulletin. |
| <b>Change Category:</b>        | Datasheet Update (editorial changes)                                                                                                                          |
| <b>Change Sub-Category(s):</b> | Datasheet/Product Doc change                                                                                                                                  |

**Sites Affected:**

| onsemi Sites | External Foundry/Subcon Sites |
|--------------|-------------------------------|
| None         | None                          |

**Description and Purpose:**

Datasheet update from Rev. 7 to Rev. 8  
The change will not impact form, fit, or function of the products.

Correction of data sheet, issuance of errata and editorial changes:

Front page: Case code removed from the package reference section.

Info on the case code is at the back of the document.

Front page: Marking diagram updated, added decoding of the last two xy digits of the marking 1st line.

Table 3: Ambient temperature removed from Absolute Maximum Ratings table.

Table 4: VOUT5 and VOUT33 removed from Operating Ranges table.

Table 6: LIN Transmitter duty cycle parameters – Added Normal and Low slope clarification to Condition fields.

Case outline information: Updated from 506DG to 507AB as per FPCN22120ZC (switchover DC = 2311).

Throughout document: Minor editorial changes.

No impact on product performance, no impact on electrical characteristics.

|           | From              | To                |
|-----------|-------------------|-------------------|
| Datasheet | NCV7428/D, Rev. 7 | NCV7428/D, Rev. 8 |

Front page: Case code removed from the package reference section



Front page: Added decoding of the last two xy digits of the marking 1st line

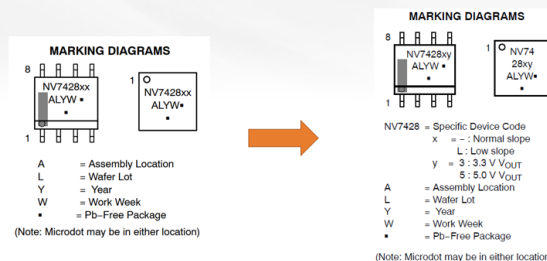


Table 3: Ambient temperature removed from Absolute Maximum Ratings table

Table 3. ABSOLUTE MAXIMUM RATINGS

| Symbol                      | Parameter                                                                                         | Min      | Max                   | Units |
|-----------------------------|---------------------------------------------------------------------------------------------------|----------|-----------------------|-------|
| V <sub>S</sub>              | Maximum DC voltage at V <sub>S</sub> pin                                                          | -0.3     | 45                    | V     |
| V <sub>OUT</sub>            | Maximum voltage at V <sub>OUT</sub> pin                                                           | -0.3     | 6                     | V     |
| V <sub>LIN</sub>            | Maximum voltage at LIN bus pin                                                                    | -45      | 45                    | V     |
| V <sub>Dig_IO_inputs</sub>  | Maximum voltage at digital input pins (Tx/D, EN)                                                  | -0.3     | 45                    | V     |
| V <sub>Dig_IO_outputs</sub> | Maximum voltage at digital output pins (Rx/D, RSTN)                                               | -0.3     | V <sub>OUT</sub> +0.3 | V     |
| T <sub>AMB</sub>            | Ambient temperature range                                                                         | -40      | +125                  | °C    |
| T <sub>J</sub>              | Junction temperature range                                                                        | -40      | +170                  | °C    |
| T <sub>STG</sub>            | Storage temperature range                                                                         | -55      | +150                  | °C    |
| V <sub>ESD</sub>            | System ESD at pins VS, LIN as per IEC 61000-4-2: 330 Ω / 150 pF (Verified by external test house) |          | ≥ ±14                 | kV    |
|                             | Human body model at pins VS, LIN stressed towards GND with 1500 Ω / 100 pF                        |          | ≥ ±8                  | kV    |
|                             | Human body model at all pins as per JESD22-A114 / AEC-Q100-002                                    |          | ≥ ±4                  | kV    |
|                             | Charge device model at all pins as per JESD22-C101 / AEC-Q100-011                                 |          | ≥ ±500                | V     |
|                             | Machine model, (200 pF, 0.75 μH, 10 Ω) as per JESD22-A115 / AEC-Q100-003                          |          | ≥200                  | V     |
| MSL                         | Moisture Sensitivity Level                                                                        | SOIC DFN | 2<br>1                | -     |
| T <sub>SLD</sub>            | Lead temperature Soldering - Reflow (SMD styles only), Pb-Free (Note 1)                           |          | 260                   | °C    |

Table 3. ABSOLUTE MAXIMUM RATINGS

| Symbol                      | Parameter                                                                                         | Min      | Max                   | Units |
|-----------------------------|---------------------------------------------------------------------------------------------------|----------|-----------------------|-------|
| V <sub>S</sub>              | Maximum DC voltage at V <sub>S</sub> pin                                                          | -0.3     | 45                    | V     |
| V <sub>OUT</sub>            | Maximum voltage at V <sub>OUT</sub> pin                                                           | -0.3     | 6                     | V     |
| V <sub>LIN</sub>            | Maximum voltage at LIN bus pin                                                                    | -45      | 45                    | V     |
| V <sub>Dig_IO_inputs</sub>  | Maximum voltage at digital input pins (Tx/D, EN)                                                  | -0.3     | 45                    | V     |
| V <sub>Dig_IO_outputs</sub> | Maximum voltage at digital output pins (Rx/D, RSTN)                                               | -0.3     | V <sub>OUT</sub> +0.3 | V     |
| T <sub>J</sub>              | Junction temperature range                                                                        | -40      | +170                  | °C    |
| T <sub>STG</sub>            | Storage temperature range                                                                         | -55      | +150                  | °C    |
| V <sub>ESD</sub>            | System ESD at pins VS, LIN as per IEC 61000-4-2: 330 Ω / 150 pF (Verified by external test house) |          | ≥ ±14                 | kV    |
|                             | Human body model at pins VS, LIN stressed towards GND with 1500 Ω / 100 pF                        |          | ≥ ±8                  | kV    |
|                             | Human body model at all pins as per JESD22-A114 / AEC-Q100-002                                    |          | ≥ ±4                  | kV    |
|                             | Charge device model at all pins as per JESD22-C101 / AEC-Q100-011                                 |          | ≥ ±500                | V     |
|                             | Machine model, (200 pF, 0.75 μH, 10 Ω) as per JESD22-A115 / AEC-Q100-003                          |          | ≥200                  | V     |
| MSL                         | Moisture Sensitivity Level                                                                        | SOIC DFN | 2<br>1                | -     |
| T <sub>SLD</sub>            | Lead temperature Soldering - Reflow (SMD styles only), Pb-Free (Note 1)                           |          | 260                   | °C    |

Table 4: VOUT5 and VOUT33 removed from Operating Ranges table

Table 4. OPERATING RANGES

| Symbol                      | Parameter                                                              | Min   | Max              | Units |
|-----------------------------|------------------------------------------------------------------------|-------|------------------|-------|
| V <sub>S</sub>              | VS operating voltage for parametric operation (Note 2)                 | 5.5   | 28               | V     |
|                             | VS operating voltage for limited operation (Note 2)                    | 4     | 28               | V     |
| V <sub>OUT5</sub>           | Regulated voltage at V <sub>OUT</sub> supply output for 5 V versions   | 4.9   | 5.1              | V     |
| V <sub>OUT33</sub>          | Regulated voltage at V <sub>OUT</sub> supply output for 3.3 V versions | 3.234 | 3.366            | V     |
| I <sub>VOUT</sub>           | Current delivered by the V <sub>OUT</sub> regulator                    | 70    | -                | mA    |
| V <sub>LIN</sub>            | Operating voltage at LIN bus pin                                       | 0     | V <sub>S</sub>   | V     |
| V <sub>Dig_IO_inputs</sub>  | Operating voltage at digital input pins (Tx/D, EN)                     | 0     | 5.5              | V     |
| V <sub>Dig_IO_outputs</sub> | Operating voltage at digital output pins (Rx/D, RSTN)                  | 0     | V <sub>OUT</sub> | V     |

Table 4. OPERATING RANGES

| Symbol                      | Parameter                                              | Min | Max              | Units |
|-----------------------------|--------------------------------------------------------|-----|------------------|-------|
| V <sub>S</sub>              | VS operating voltage for parametric operation (Note 2) | 5.5 | 28               | V     |
|                             | VS operating voltage for limited operation (Note 2)    | 4   | 28               | V     |
| I <sub>VOUT</sub>           | Current delivered by the V <sub>OUT</sub> regulator    | 70  | -                | mA    |
| V <sub>LIN</sub>            | Operating voltage at LIN bus pin                       | 0   | V <sub>S</sub>   | V     |
| V <sub>Dig_IO_inputs</sub>  | Operating voltage at digital input pins (Tx/D, EN)     | 0   | 5.5              | V     |
| V <sub>Dig_IO_outputs</sub> | Operating voltage at digital output pins (Rx/D, RSTN)  | 0   | V <sub>OUT</sub> | V     |

Table 7: LIN Transmitter duty cycle parameters – Added Normal and Low slope clarification to Condition fields

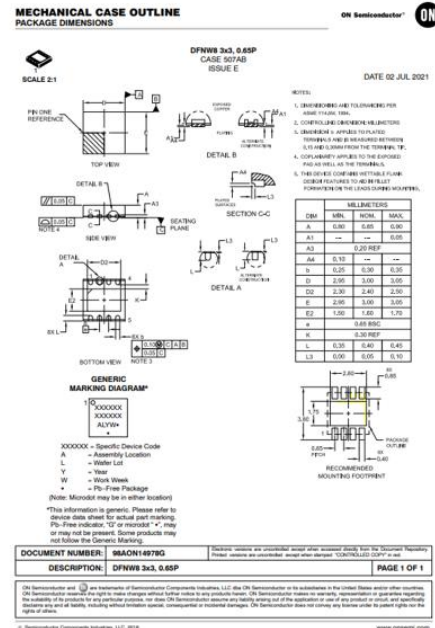
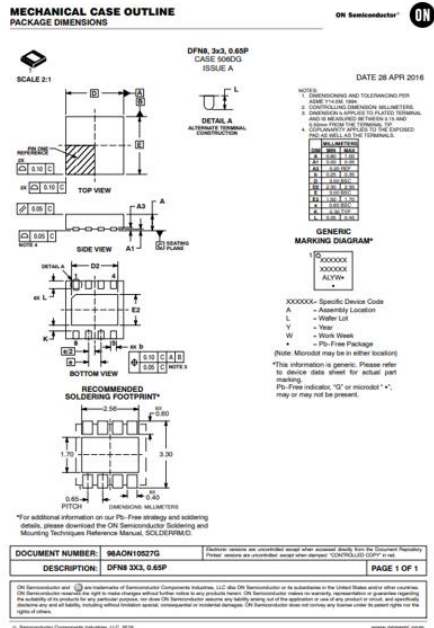
Table 7. AC CHARACTERISTICS (V<sub>S</sub> = 5.5 V to 28 V; T<sub>J</sub> = -40°C to +150°C; unless otherwise specified. For the transmitter parameters, the following bus loads are considered: L1 = 1 kΩ / 1 nF; L2 = 660 Ω / 6.8 nF; L3 = 500 Ω / 10 nF)

| Symbol                 | Parameter                                               | Conditions                                                                                                                                                       | Min   | Typ | Max   | Unit |
|------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-------|------|
| <b>LIN TRANSMITTER</b> |                                                         |                                                                                                                                                                  |       |     |       |      |
| D1                     | Duty Cycle 1 = $t_{BUS\_REC(min)} / (2 \times t_{BIT})$ | TH <sub>REC(max)</sub> = 0.744 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.581 x V <sub>S</sub><br>t <sub>BIT</sub> = 50 μs<br>V <sub>S</sub> = 7 V to 18 V   | 0.396 |     | 0.5   |      |
| D2                     | Duty Cycle 2 = $t_{BUS\_REC(max)} / (2 \times t_{BIT})$ | TH <sub>REC(min)</sub> = 0.422 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.284 x V <sub>S</sub><br>t <sub>BIT</sub> = 50 μs<br>V <sub>S</sub> = 7.6 V to 18 V | 0.5   |     | 0.581 |      |
| D3                     | Duty Cycle 3 = $t_{BUS\_REC(min)} / (2 \times t_{BIT})$ | TH <sub>REC(max)</sub> = 0.778 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.616 x V <sub>S</sub><br>t <sub>BIT</sub> = 96 μs<br>V <sub>S</sub> = 7 V to 18 V   | 0.417 |     | 0.5   |      |
| D4                     | Duty Cycle 4 = $t_{BUS\_REC(max)} / (2 \times t_{BIT})$ | TH <sub>REC(min)</sub> = 0.389 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.251 x V <sub>S</sub><br>t <sub>BIT</sub> = 96 μs<br>V <sub>S</sub> = 7.6 V to 18 V | 0.5   |     | 0.590 |      |
| t <sub>fallNS</sub>    | LIN falling edge normal slope                           | Normal Mode; V <sub>S</sub> = 12 V                                                                                                                               |       |     | 22.5  | μs   |

Table 7. AC CHARACTERISTICS (V<sub>S</sub> = 5.5 V to 28 V; T<sub>J</sub> = -40°C to +150°C; unless otherwise specified. For the transmitter parameters, the following bus loads are considered: L1 = 1 kΩ / 1 nF; L2 = 660 Ω / 6.8 nF; L3 = 500 Ω / 10 nF)

| Symbol                 | Parameter                                               | Conditions                                                                                                                                                                               | Min   | Typ | Max   | Unit |
|------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-------|------|
| <b>LIN TRANSMITTER</b> |                                                         |                                                                                                                                                                                          |       |     |       |      |
| D1                     | Duty Cycle 1 = $t_{BUS\_REC(min)} / (2 \times t_{BIT})$ | Normal slope<br>TH <sub>REC(max)</sub> = 0.744 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.581 x V <sub>S</sub><br>t <sub>BIT</sub> = 50 μs<br>V <sub>S</sub> = 7 V to 18 V           | 0.396 | -   | 0.5   | -    |
| D2                     | Duty Cycle 2 = $t_{BUS\_REC(max)} / (2 \times t_{BIT})$ | Normal slope<br>TH <sub>REC(min)</sub> = 0.422 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.284 x V <sub>S</sub><br>t <sub>BIT</sub> = 50 μs<br>V <sub>S</sub> = 7.6 V to 18 V         | 0.5   | -   | 0.581 | -    |
| D3                     | Duty Cycle 3 = $t_{BUS\_REC(min)} / (2 \times t_{BIT})$ | Normal and Low slope<br>TH <sub>REC(max)</sub> = 0.778 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.616 x V <sub>S</sub><br>t <sub>BIT</sub> = 96 μs<br>V <sub>S</sub> = 7 V to 18 V   | 0.417 | -   | 0.5   | -    |
| D4                     | Duty Cycle 4 = $t_{BUS\_REC(max)} / (2 \times t_{BIT})$ | Normal and Low slope<br>TH <sub>REC(min)</sub> = 0.389 x V <sub>S</sub><br>TH <sub>DOM(max)</sub> = 0.251 x V <sub>S</sub><br>t <sub>BIT</sub> = 96 μs<br>V <sub>S</sub> = 7.6 V to 18 V | 0.5   | -   | 0.590 | -    |

Case outline information page updated as per FPCN22120ZC



### List of Affected Standard Parts:

**Note:** Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the **PCN Customized Portal**.

|                |               |                |
|----------------|---------------|----------------|
| NCV7428D15R2G  | NCV7428D13R2G | NCV7428D1L5R2G |
| NCV7428D1L3R2G | NCV7428MW5R2G | NCV7428MWL3R2G |
| NCV7428MWL5R2G | NCV7428MW3R2G |                |

## Appendix A: Changed Products

PCN#: PB25635Z  
Issue Date: Jul 18, 2023

DIKG: DIGI-KEY

| Product        | Customer Part Number | Qualification Vehicle | New Part Number | Replacement Supplier |
|----------------|----------------------|-----------------------|-----------------|----------------------|
| NCV7428D15R2G  | 0N428-003-XTP        | N/A                   |                 |                      |
| NCV7428D1L5R2G |                      | N/A                   |                 |                      |
| NCV7428D1L3R2G |                      | N/A                   |                 |                      |
| NCV7428MW5R2G  |                      | N/A                   |                 |                      |
| NCV7428MWL3R2G |                      | N/A                   |                 |                      |
| NCV7428MWL5R2G |                      | N/A                   |                 |                      |
| NCV7428MW3R2G  |                      | N/A                   |                 |                      |
| NCV7428D13R2G  | 0N428-004-XTP        | N/A                   |                 |                      |