

# Smart power solutions for car body applications

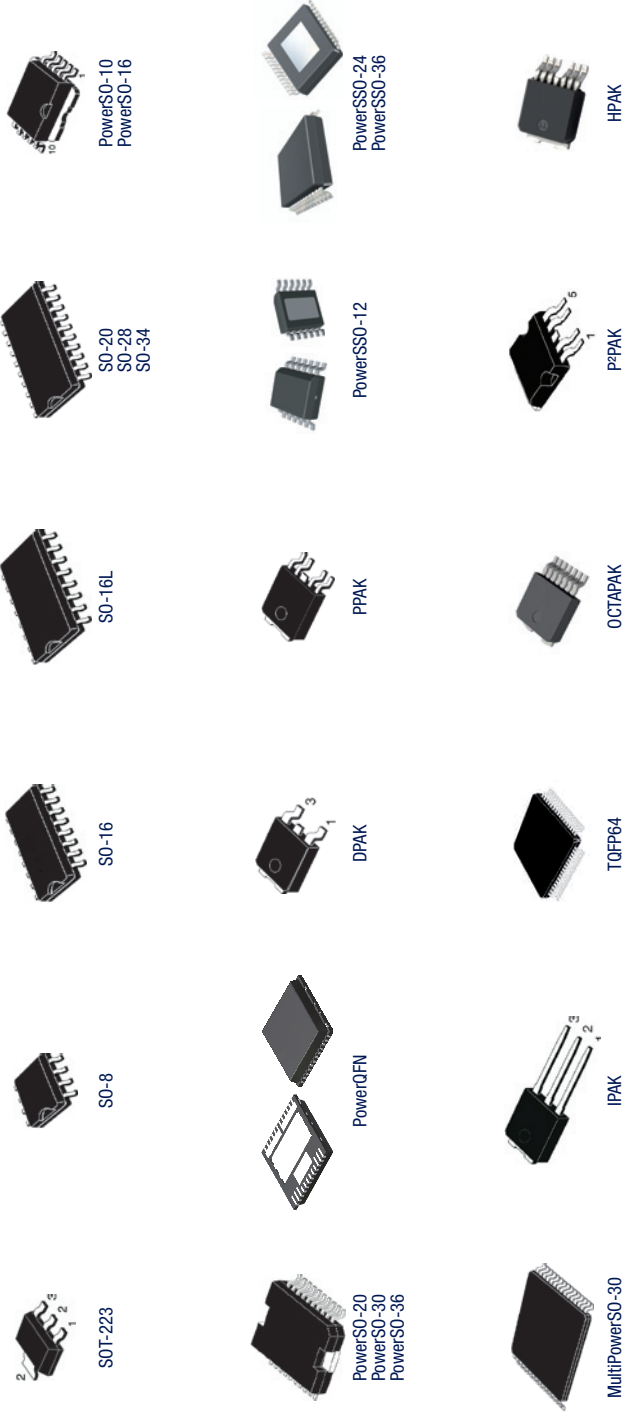


# Content



|                                                                          |    |
|--------------------------------------------------------------------------|----|
| High-side switches.....                                                  | 3  |
| High-side switches – Single channel.....                                 | 3  |
| High-side switches – Dual channel.....                                   | 5  |
| High-side switches – Quad channel.....                                   | 7  |
| High-side switches with SPI and asymmetrical output.....                 | 8  |
| High-side switches for 24 V applications – Truck devices.....            | 8  |
| OMNIFET™.....                                                            | 9  |
| Smart power low-side switches.....                                       | 9  |
| OMNIFET III™.....                                                        | 10 |
| Smart power low-side switches.....                                       | 10 |
| Voltage regulators.....                                                  | 11 |
| Door modules.....                                                        | 12 |
| Power management for automotive systems.....                             | 14 |
| Motor drivers.....                                                       | 16 |
| Special devices.....                                                     | 18 |
| Special devices – Reverse battery.....                                   | 18 |
| Special devices – Integrated solenoid driver - Injection gas system..... | 19 |

## Packages



Note: All packages are Lead Free compliant

Ignition drivers ..... 19

Part numbering scheme ..... 20

Get the right product for your needs ..... 20

M0-5/M0-5Enhanced/M version part numbering scheme ..... 20

M0-7 part numbering scheme ..... 20

OMNIFET part numbering scheme ..... 21

OMNIFET III part numbering scheme ..... 21

Packages ..... 22

Note: M0-7 High side switches and OMNIFET III are to be preferred for new design-in.



# High-side switches

## HIGH-SIDE SWITCHES – SINGLE CHANNEL

| Part number    | Package     | Technology             | Supply voltage ( $V_{CC}$ ) |         | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on) \max}$ (m $\Omega$ ) | Drain current limit ( $I_{lim}$ ) typ (A) | Digital status | Current sense | Multi-sense |
|----------------|-------------|------------------------|-----------------------------|---------|---------------------------------|---------------------------------------------------------|-------------------------------------------|----------------|---------------|-------------|
|                |             |                        | min (V)                     | max (V) |                                 |                                                         |                                           |                |               |             |
| VN7140AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 140                                                     | 12                                        |                | •             | •           |
| VN7140AS-E     | SO-8        | M0-7                   | 4                           | 28      | 38                              | 140                                                     | 12                                        |                | •             |             |
| VN7050AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 50                                                      | 30                                        |                |               | •           |
| VN7050AS-E     | SO-8        | M0-7                   | 4                           | 28      | 38                              | 50                                                      | 30                                        |                | •             |             |
| VN7040AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 40                                                      | 34                                        |                |               | •           |
| VN7040AS-E     | SO-8        | M0-7                   | 4                           | 28      | 38                              | 40                                                      | 34                                        |                | •             |             |
| VN7020AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 20                                                      | 63                                        |                |               | •           |
| VN7016AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 16                                                      | 77                                        |                |               | •           |
| VN7010AJ-E     | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 10                                                      | 91                                        |                |               | •           |
| VN7007AH-E (*) | Octapak     | M0-7                   | 4                           | 28      | 38                              | 7                                                       | 110                                       |                | •             |             |
| VN7004AH-E (*) | Octapak     | M0-7                   | 4                           | 28      | 38                              | 4.9                                                     | 140                                       |                | •             |             |
| VN5E160MS-E    | SO-8        | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 160                                                     | 10                                        |                | •             |             |
| VN5E050MJ-E    | PowerSSO-12 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 50                                                      | 27                                        |                | •             |             |
| VN5E025MJ-E    | PowerSSO-12 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 25                                                      | 60                                        |                | •             |             |
| VN5E016MH-E    | HPAK        | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 16                                                      | 73                                        |                | •             |             |
| VN5E010MH-E    | HPAK        | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 10                                                      | 85                                        |                | •             |             |
| VN5E160AS-E    | SO-8        | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                     | 10                                        |                | •             |             |
| VN5E160ASO-E   | SO-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                     | 10                                        |                | •             |             |
| VN5E160S-E     | SO-8        | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                     | 10                                        | •              |               |             |
| VN5E050AJ-E    | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                      | 27                                        |                | •             |             |
| VN5E050ASO-E   | SO-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                      | 27                                        |                | •             |             |
| VN5E050J-E     | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                      | 27                                        | •              |               |             |
| VN5E025AJ-E    | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                      | 60                                        |                | •             |             |
| VN5E025ASO-E   | SO-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                      | 60                                        |                | •             |             |
| VN5E016AH-E    | HPAK        | M0-5Enhanced           | 4.5                         | 28      | 41                              | 16                                                      | 73                                        |                | •             |             |
| VN5E010AH-E    | HPAK        | M0-5Enhanced           | 4.5                         | 28      | 41                              | 10                                                      | 85                                        |                | •             |             |
| VN5160S-E      | SO-8        | M0-5                   | 4.5                         | 36      | 41                              | 160                                                     | 5                                         | •              |               |             |
| VN5050AJ-E     | PowerSSO-12 | M0-5                   | 4.5                         | 36      | 41                              | 50                                                      | 18                                        |                | •             |             |
| VN5050J-E      | PowerSSO-12 | M0-5                   | 4.5                         | 36      | 41                              | 50                                                      | 18                                        | •              |               |             |

## HIGH-SIDE SWITCHES – SINGLE CHANNEL

| Part number  | Package            | Technology | Supply voltage ( $V_{CC}$ ) |         | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on)}$ max (mΩ) | Drain current limit ( $I_{lim}$ ) typ (A) | Digital status | Current sense | Multi-sense |
|--------------|--------------------|------------|-----------------------------|---------|---------------------------------|-----------------------------------------------|-------------------------------------------|----------------|---------------|-------------|
|              |                    |            | min (V)                     | max (V) |                                 |                                               |                                           |                |               |             |
| VN5025AJ-E   | PowerSSO-12        | M0-5       | 4.5                         | 36      | 41                              | 25                                            | 40                                        |                | •             |             |
| VN5016AJ-E   | PowerSSO-12        | M0-5       | 4.5                         | 36      | 41                              | 16                                            | 60                                        |                | •             |             |
| VN5012AK-E   | PowerSSO-24        | M0-5       | 4.5                         | 36      | 41                              | 12                                            | 65                                        |                | •             |             |
| VN5010AK-E   | PowerSSO-24        | M0-5       | 4.5                         | 36      | 41                              | 10                                            | 65                                        |                | •             |             |
| VN5E006ASP-E | PowerSO-10         | M0-5       | 4.5                         | 28      | 41                              | 6                                             | 100                                       |                | •             |             |
| VN800PS-E    | SO-8               | M0-3       | 5.5                         | 36      | 41                              | 135                                           | 1.3                                       | •              |               |             |
| VN800PT-E    | PPAK               | M0-3       | 5.5                         | 36      | 41                              | 135                                           | 1.3                                       | •              |               |             |
| VN750B5-E    | P <sup>2</sup> PAK | M0-3       | 5.5                         | 36      | 41                              | 60                                            | 9                                         | •              |               |             |
| VN750-E      | PENTAWATT          | M0-3       | 5.5                         | 36      | 41                              | 60                                            | 9                                         | •              |               |             |
| VN750PS-E    | SO-8               | M0-3       | 5.5                         | 36      | 41                              | 60                                            | 9                                         | •              |               |             |
| VN750PT-E    | PPAK               | M0-3       | 5.5                         | 36      | 41                              | 60                                            | 9                                         | •              |               |             |
| VN750SMP-E   | SO-8               | M0-3       | 5.5                         | 36      | 41                              | 55                                            | 9                                         | •              |               |             |
| VN820B5-E    | P <sup>2</sup> PAK | M0-3       | 5.5                         | 36      | 41                              | 40                                            | 13                                        | •              |               |             |
| VN820PT-E    | PPAK               | M0-3       | 5.5                         | 36      | 41                              | 40                                            | 13                                        | •              |               |             |
| VN820SP-E    | PowerSO-10         | M0-3       | 5.5                         | 36      | 41                              | 40                                            | 13                                        | •              |               |             |
| VN920DB5-E   | P <sup>2</sup> PAK | M0-3       | 5.5                         | 36      | 41                              | 18                                            | 45                                        | •              |               |             |
| VN920B5-E    | P <sup>2</sup> PAK | M0-3       | 5.5                         | 36      | 41                              | 16                                            | 45                                        |                | •             |             |
| VN920DSP-E   | PowerSO-10         | M0-3       | 5.5                         | 36      | 41                              | 16                                            | 45                                        | •              |               |             |
| VN920-E      | PENTAWATT          | M0-3       | 5.5                         | 36      | 41                              | 16                                            | 45                                        |                | •             |             |
| VN920PEP-E   | PowerSSO-24        | M0-3       | 5.5                         | 36      | 41                              | 15                                            | 45                                        |                | •             |             |
| VN920SP-E    | PowerSO-10         | M0-3       | 5.5                         | 36      | 41                              | 15                                            | 45                                        |                | •             |             |
| VN610SP-E    | PowerSO-10         | M0-3       | 5.5                         | 36      | 41                              | 10                                            | 75                                        |                | •             |             |

(\*) In development. Available in Q1/2014

## HIGH-SIDE SWITCHES – DUAL CHANNEL

| Part number      | Package     | Technology             | Supply voltage ( $V_{cc}$ ) |         | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on)}$ max (m $\Omega$ ) | Drain current limit ( $I_{DM}$ ) typ (A) | Digital status | Current sense | Multi-sense |
|------------------|-------------|------------------------|-----------------------------|---------|---------------------------------|--------------------------------------------------------|------------------------------------------|----------------|---------------|-------------|
|                  |             |                        | min (V)                     | max (V) |                                 |                                                        |                                          |                |               |             |
| VND7140AJ-E      | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 140                                                    | 12                                       |                |               | •           |
| VND7050AJ-E      | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 50                                                     | 30                                       |                |               | •           |
| VND7040AJ-E      | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 40                                                     | 34                                       |                |               | •           |
| VND7030AJ-E      | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 30                                                     | 56                                       |                |               | •           |
| VND7020AJ-E      | PowerSSO-16 | M0-7                   | 4                           | 28      | 38                              | 20                                                     | 63                                       |                |               | •           |
| VND7012AY-E (*)  | PowerSSO-36 | M0-7                   | 4                           | 28      | 38                              | 12                                                     | 75                                       |                |               | •           |
| VND7004AY-E (**) | PowerSSO-36 | M0-7                   | 4                           | 28      | 38                              | 4                                                      | 100                                      |                |               | •           |
| VND5E160MJ-E     | PowerSSO-12 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 160                                                    | 10                                       |                | •             |             |
| VND5E050MCJ-E    | PowerSSO-12 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050MCK-E    | PowerSSO-24 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050MJ-E     | PowerSSO-12 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050MK-E     | PowerSSO-24 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E025MK-E     | PowerSSO-24 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 25                                                     | 60                                       |                | •             |             |
| VND5E012MY-E     | PowerSSO-36 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 12                                                     | 74                                       |                | •             |             |
| VND5E008MY-E     | PowerSSO-36 | M0-5Enhanced (M vers.) | 4.5                         | 28      | 41                              | 8                                                      | 85                                       |                | •             |             |
| VND5E160AJ-E     | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                    | 10                                       |                | •             |             |
| VND5E160ASO-E    | S0-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                    | 10                                       |                | •             |             |
| VND5E160J-E      | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 160                                                    | 10                                       | •              |               |             |
| VND5E050ACJ-E    | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050ACK-E    | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050AJ-E     | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050AK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050ASO-E    | S0-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       |                | •             |             |
| VND5E050J-E      | PowerSSO-12 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       | •              |               |             |
| VND5E050K-E      | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 50                                                     | 27                                       | •              |               |             |
| VND5E025AK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 60                                       |                | •             |             |
| VND5E025AY-E     | PowerSSO-36 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 47                                       |                | •             |             |
| VND5E025AS-E     | S0-16L      | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 60                                       |                | •             |             |
| VND5E025BK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 60                                       |                | •             |             |
| VND5E025LK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 40                                       |                | •             |             |
| VND5E025NAY-E    | PowerSSO-36 | M0-5Enhanced           | 4.5                         | 28      | 41                              | 25                                                     | 60                                       |                | •             |             |

## HIGH-SIDE SWITCHES – DUAL CHANNEL

| Part number   | Package         | Technology   | Supply voltage ( $V_{cc}$ ) |         | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on)}$ max (mΩ) | Drain current limit ( $I_{DM}$ ) typ (A) | Digital status | Current sense | Multi-sense |
|---------------|-----------------|--------------|-----------------------------|---------|---------------------------------|-----------------------------------------------|------------------------------------------|----------------|---------------|-------------|
|               |                 |              | min (V)                     | max (V) |                                 |                                               |                                          |                |               |             |
| VND5E012AY-E  | PowerSSO-36     | M0-5Enhanced | 4.5                         | 28      | 41                              | 12                                            | 74                                       |                | •             |             |
| VND5E008ASP-E | PowerSO-16      | M0-5Enhanced | 4.5                         | 28      | 41                              | 8                                             | 85                                       |                | •             |             |
| VND5E008AY-E  | PowerSSO-36     | M0-5Enhanced | 4.5                         | 28      | 41                              | 8                                             | 85                                       |                | •             |             |
| VND5E006ASP-E | PowerSO-16      | M0-5Enhanced | 4.5                         | 28      | 41                              | 6                                             | 100                                      |                | •             |             |
| VND5E004A-E   | PQFN            | M0-5Enhanced | 4.5                         | 28      | 41                              | 4                                             | 100                                      |                | •             |             |
| VND5E004A30-E | MultiPowerSO-30 | M0-5Enhanced | 4.5                         | 28      | 41                              | 4                                             | 100                                      |                | •             |             |
| VND5160AJ-E   | PowerSSO-12     | M0-5         | 4.5                         | 36      | 41                              | 160                                           | 5                                        |                | •             |             |
| VND5160J-E    | PowerSSO-12     | M0-5         | 4.5                         | 36      | 41                              | 160                                           | 5                                        | •              |               |             |
| VND5050AJ-E   | PowerSSO-12     | M0-5         | 4.5                         | 36      | 41                              | 50                                            | 18                                       |                | •             |             |
| VND5050AK-E   | PowerSSO-24     | M0-5         | 4.5                         | 36      | 41                              | 50                                            | 18                                       |                | •             |             |
| VND5050J-E    | PowerSSO-12     | M0-5         | 4.5                         | 36      | 41                              | 50                                            | 18                                       | •              |               |             |
| VND5050K-E    | PowerSSO-24     | M0-5         | 4.5                         | 36      | 41                              | 50                                            | 18                                       | •              |               |             |
| VND5025AK-E   | PowerSSO-24     | M0-5         | 4.5                         | 36      | 41                              | 25                                            | 40                                       |                | •             |             |
| VND5012AK-E   | PowerSSO-24     | M0-5         | 4.5                         | 36      | 41                              | 12                                            | 60                                       |                | •             |             |
| VND810P-E     | SO-16           | M0-3         | 5.5                         | 36      | 41                              | 160                                           | 5                                        | •              |               |             |
| VND810PEP-E   | PowerSSO-12     | M0-3         | 5.5                         | 36      | 41                              | 160                                           | 5                                        | •              |               |             |
| VND810SP-E    | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 160                                           | 5                                        | •              |               |             |
| VND810MSP-E   | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 150                                           | 0.9                                      | •              |               |             |
| VND830AEP-E   | PowerSSO-24     | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 10                                       |                | •             |             |
| VND830ASP-E   | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 9                                        |                | •             |             |
| VND830LSP-E   | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 23                                       | •              |               |             |
| VND830P-E     | SO-16L          | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 9                                        | •              |               |             |
| VND830MSP-E   | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 9                                        | •              |               |             |
| VND830PEP-E   | PowerSSO-24     | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 9                                        | •              |               |             |
| VND830SP-E    | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 60                                            | 9                                        | •              |               |             |
| VND600P-E     | SO-16L          | M0-3         | 5.5                         | 36      | 41                              | 35                                            | 40                                       |                | •             |             |
| VND600PEP-E   | PowerSSO-24     | M0-3         | 5.5                         | 36      | 41                              | 30                                            | 40                                       |                | •             |             |
| VND600SP-E    | PowerSO-10      | M0-3         | 5.5                         | 36      | 41                              | 30                                            | 40                                       |                | •             |             |
| VND920P-E     | SO-28           | M0-3         | 5.5                         | 36      | 41                              | 16                                            | 45                                       |                | •             |             |

(\*) In development. Available in Q1/2014

(\*\*) In development. Available in Q4/2014

## HIGH-SIDE SWITCHES – QUAD CHANNEL

| Part number      | Package     | Technology             | Supply voltage (V <sub>cc</sub> ) |         | Absolute max supply voltage (V) | Max on-state resistance<br>R <sub>DS(on)</sub> max (mΩ) | Drain current limit (I <sub>lim</sub> ) typ (A) | Digital status | Current sense | Multi-sense |
|------------------|-------------|------------------------|-----------------------------------|---------|---------------------------------|---------------------------------------------------------|-------------------------------------------------|----------------|---------------|-------------|
|                  |             |                        | min (V)                           | max (V) |                                 |                                                         |                                                 |                |               |             |
| VNQ7140AJ-E      | PowerSSO-16 | M0-7                   | 4                                 | 28      | 38                              | 140                                                     | 12                                              |                |               | •           |
| VNQ7050AJ-E (**) | PowerSSO-16 | M0-7                   | 4                                 | 28      | 38                              | 50                                                      | 27                                              |                | •             |             |
| VNQ7040AY-E (*)  | PowerSSO-36 | M0-7                   | 4                                 | 28      | 38                              | 40                                                      | 34                                              |                |               | •           |
| VNQ5E160MK-E     | PowerSSO-24 | M0-5Enhanced (M vers.) | 4.5                               | 28      | 41                              | 160                                                     | 10                                              |                | •             |             |
| VNQ5E050MK-E     | PowerSSO-24 | M0-5Enhanced (M vers.) | 4.5                               | 28      | 41                              | 50                                                      | 27                                              |                | •             |             |
| VNQ5E250AJ-E     | PowerSSO 16 | M0-5Enhanced           | 4.5                               | 28      | 41                              | 250                                                     | 5                                               |                | •             |             |
| VNQ5E160AK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                               | 28      | 41                              | 160                                                     | 10                                              |                | •             |             |
| VNQ5E160K-E      | PowerSSO-24 | M0-5Enhanced           | 4.5                               | 28      | 41                              | 160                                                     | 10                                              | •              |               |             |
| VNQ5E050AK-E     | PowerSSO-24 | M0-5Enhanced           | 4.5                               | 28      | 41                              | 50                                                      | 27                                              |                | •             |             |
| VNQ5E050K-E      | PowerSSO-24 | M0-5Enhanced           | 4.5                               | 28      | 41                              | 50                                                      | 27                                              | •              |               |             |
| VNQ5160K-E       | PowerSSO-24 | M0-5                   | 4.5                               | 36      | 41                              | 160                                                     | 5                                               | •              |               |             |
| VNQ5050AK-E      | PowerSSO-24 | M0-5                   | 4.5                               | 36      | 41                              | 50                                                      | 18                                              |                | •             |             |
| VNQ5050K-E       | PowerSSO-24 | M0-5                   | 4.5                               | 36      | 41                              | 50                                                      | 18                                              | •              |               |             |
| VNQ5027AK-E      | PowerSSO-24 | M0-5                   | 4.5                               | 36      | 41                              | 27                                                      | 40                                              |                | •             |             |
| VNQ500PEP-E      | PowerSSO-12 | M0-3                   | 5.5                               | 36      | 41                              | 500                                                     | 0.6                                             | •              |               |             |
| VNQ810P-E        | SO-28       | M0-3                   | 5.5                               | 36      | 41                              | 160                                                     | 5                                               | •              |               |             |
| VNQ810PEP-E      | PowerSSO-24 | M0-3                   | 5.5                               | 36      | 41                              | 160                                                     | 7.5                                             | •              |               |             |
| VNQ05XSP16-E     | PowerSO-16  | M0-3                   | 5.5                               | 36      | 41                              | 110                                                     | 7.5                                             |                | •             |             |
| VNQ690SP-E       | PowerSO-10  | M0-3                   | 6                                 | 36      | 41                              | 90                                                      | 14                                              | •              |               |             |
| VNQ830P-E        | SO-28       | M0-3                   | 5.5                               | 36      | 41                              | 65                                                      | 9                                               | •              |               |             |
| VNQ830PEP-E      | PowerSSO-24 | M0-3                   | 5.5                               | 36      | 41                              | 60                                                      | 18                                              | •              |               |             |
| VNQ660SP         | PowerSO-10  | M0-3                   | 6                                 | 36      | 41                              | 50                                                      | 10                                              | •              |               |             |
| VNQ600AP-E       | SO-28       | M0-3                   | 5.5                               | 36      | 41                              | 35                                                      | 40                                              |                | •             |             |
| VNQ600P-E        | SO-28       | M0-3                   | 5.5                               | 36      | 41                              | 35                                                      | 40                                              |                | •             |             |

(\*) In development. Available in Q1/2014

(\*\*) In development. Available in Q4/2014

## HIGH-SIDE SWITCHES WITH SPI AND ASYMMETRICAL OUTPUT

| Part number | Package     | Technology | Supply voltage ( $V_{CC}$ ) |         | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on)}$ max (m $\Omega$ ) | Drain current limit ( $I_{lim}$ ) typ (A) | Current sense | SPI | Description         |
|-------------|-------------|------------|-----------------------------|---------|---------------------------------|--------------------------------------------------------|-------------------------------------------|---------------|-----|---------------------|
|             |             |            | min (V)                     | max (V) |                                 |                                                        |                                           |               |     |                     |
| VNQ6040S-E  | PowerSS0-36 | M0-6       | 4.5                         | 28      | 40                              | 4x40                                                   | 25                                        | •             | •   | Rear corner lights  |
| VNQ6004SA-E | PowerSS0-36 | M0-6       | 4.5                         | 28      | 40                              | 2x10<br>2x30                                           | 50<br>25                                  | •             | •   | Front corner lights |

## HIGH-SIDE SWITCHES FOR 24 V APPLICATIONS – TRUCK DEVICES

| Part number     | Package     | Technology | Supply voltage ( $V_{CC}$ ) min (V) | Supply voltage ( $V_{DD}$ ) max (V) | Absolute max supply voltage (V) | Max on-state resistance $R_{DS(on)}$ max (m $\Omega$ ) | Drain current limit ( $I_{lim}$ ) typ (A) | Current sense                  |
|-----------------|-------------|------------|-------------------------------------|-------------------------------------|---------------------------------|--------------------------------------------------------|-------------------------------------------|--------------------------------|
| VND5T100A-E (*) | SO-16N      | M0-5T      | 8                                   | 36                                  | 58                              | 100                                                    | 22                                        | •                              |
| VND5T100AJ-E    | PowerSS0-12 | M0-5T      | 8                                   | 36                                  | 58                              | 100                                                    | 22                                        | •                              |
| VND5T100LAJ-E   | PowerSS0-12 | M0-5T      | 8                                   | 36                                  | 58                              | 100                                                    | 22                                        | Optimized for LED applications |
| VND5T050AK-E    | PowerSS0-24 | M0-5T      | 8                                   | 36                                  | 58                              | 50                                                     | 34                                        | •                              |
| VND5T035AK-E    | PowerSS0-24 | M0-5T      | 8                                   | 36                                  | 58                              | 35                                                     | 42                                        | •                              |
| VND5T035LAK-E   | PowerSS0-24 | M0-5T      | 8                                   | 36                                  | 58                              | 35                                                     | 42                                        | Optimized for LED applications |
| VN5T016AH-E     | HPAK        | M0-5T      | 8                                   | 36                                  | 58                              | 16                                                     | 67                                        | •                              |
| VND5T016ASP-E   | PowerSO-16  | M0-5T      | 8                                   | 36                                  | 58                              | 16                                                     | 60                                        | •                              |
| VN5T006ASP-E    | PowerSO-10  | M0-5T      | 8                                   | 36                                  | 58                              | 6                                                      | 84                                        | •                              |

(\*) In development. Available in Q4/2013

## SMART POWER LOW-SIDE SWITCHES

| Part number   | Package       | Technology | Number of Channels | Clamp Voltage typ (V) | Drain Current limit ( $I_{DM}$ ) typ [A] | Max on-state resistance $R_{DS(on)}$ (max) [mΩ] |
|---------------|---------------|------------|--------------------|-----------------------|------------------------------------------|-------------------------------------------------|
| VND1NV04-E    | DPAK          | M0-3       | 1                  | 45                    | 2.6                                      | 250                                             |
| VND1NV04-1-E  | IPAK          | M0-3       | 1                  | 45                    | 2.6                                      | 250                                             |
| VNN1NV04P-E   | SOT-223       | M0-3       | 1                  | 45                    | 2.6                                      | 250                                             |
| VNS1NV04P-E   | SO-8          | M0-3       | 1                  | 45                    | 2.6                                      | 250                                             |
| VND3NV04-E    | DPAK          | M0-3       | 1                  | 45                    | 5                                        | 120                                             |
| VNN3NV04P-E   | SO-8; SOT-223 | M0-3       | 1                  | 45                    | 5                                        | 120                                             |
| VNS3NV04P-E   | SO-8          | M0-3       | 1                  | 45                    | 5                                        | 120                                             |
| VNN7NV04P-E   | SOT-223       | M0-3       | 1                  | 45                    | 9                                        | 65                                              |
| VNS7NV04P-E   | SO-8          | M0-3       | 1                  | 45                    | 9                                        | 65                                              |
| VND7NV04-E    | DPAK          | M0-3       | 1                  | 45                    | 9                                        | 60                                              |
| VNB14NV04-E   | D2PAK         | M0-3       | 1                  | 45                    | 18                                       | 35                                              |
| VND14NV04-E   | DPAK          | M0-3       | 1                  | 45                    | 18                                       | 35                                              |
| VND14NV04-1-E | IPAK          | M0-3       | 1                  | 45                    | 18                                       | 35                                              |
| VNS14NV04P-E  | SO-8          | M0-3       | 1                  | 45                    | 18                                       | 35                                              |
| VNB35NV04-E   | D2PAK         | M0-3       | 1                  | 45                    | 45                                       | 10                                              |
| VNV35NV04-E   | PowerSO-10    | M0-3       | 1                  | 45                    | 45                                       | 10                                              |
| VNS1NV04DP-E  | SO-8          | M0-3       | 2                  | 45                    | 2.6                                      | 250                                             |
| VNS3NV04DP-E  | SO-8          | M0-3       | 2                  | 45                    | 5                                        | 120                                             |

# SMART POWER LOW-SIDE SWITCHES

| Part number | Package     | Number of channels | Technology | Clamp voltage typ (V) | Drain current limit<br>( $I_{lim}$ ) typ (A) | Max on-state<br>resistance $R_{DS(on)}$ max<br>(m $\Omega$ ) | Digital status |
|-------------|-------------|--------------------|------------|-----------------------|----------------------------------------------|--------------------------------------------------------------|----------------|
| VNL5300S5-E | S0-8        | 1                  | M0-5       | 46                    | 2                                            | 300                                                          | •              |
| VNL5160N3-E | SOT-223     | 1                  | M0-5       | 46                    | 5                                            | 160                                                          |                |
| VNL5160S5-E | S0-8        | 1                  | M0-5       | 46                    | 5                                            | 160                                                          | •              |
| VNL5090N3-E | SOT-223     | 1                  | M0-5       | 46                    | 18                                           | 90                                                           |                |
| VNL5090S5-E | S0-8        | 1                  | M0-5       | 46                    | 18                                           | 90                                                           | •              |
| VNL5090S5-E | S0-8        | 1                  | M0-5       | 46                    | 18                                           | 90                                                           | •              |
| VNL5050N3-E | SOT-223     | 1                  | M0-5       | 46                    | 27                                           | 50                                                           |                |
| VNL5050S5-E | S0-8        | 1                  | M0-5       | 46                    | 27                                           | 50                                                           | •              |
| VNL5030J-E  | PowerSS0-12 | 1                  | M0-5       | 46                    | 35                                           | 30                                                           | •              |
| VNL5030S5-E | S0-8        | 1                  | M0-5       | 46                    | 35                                           | 30                                                           | •              |
| VNLD5300-E  | S0-8        | 2                  | M0-5       | 46                    | 2                                            | 300                                                          | •              |
| VNLD5160-E  | S0-8        | 2                  | M0-5       | 46                    | 5                                            | 160                                                          | •              |
| VNLD5090-E  | S0-8        | 2                  | M0-5       | 46                    | 18                                           | 90                                                           | •              |

# Voltage regulators

| Part number | Package     | Number of outputs | Regulated output voltage (V) | Output current ( $I_{out}$ ) (mA) | Output tolerance (%) | Dropout voltage ( $V_{dp}$ ) |          | Reset output | Enable pin | Early warning | Watchdog timer | Watchdog enable | Supply current (standby) typ ( $\mu$ A) | Quiescent current at low load typ ( $\mu$ A) |
|-------------|-------------|-------------------|------------------------------|-----------------------------------|----------------------|------------------------------|----------|--------------|------------|---------------|----------------|-----------------|-----------------------------------------|----------------------------------------------|
|             |             |                   |                              |                                   |                      | typ (mV)                     | max (mV) |              |            |               |                |                 |                                         |                                              |
| L4925PD     | PowerSO-20  | 1                 | 5                            | 500                               | $\pm 2$              | 300                          |          | •            |            |               |                |                 |                                         | 190                                          |
| L4938ED-E   | SO-20       | 2                 | 5 Adj                        | 100                               | $\pm 2$              | 300                          |          | •            | •          | •             |                |                 |                                         | 210                                          |
| L4938EPD    | PowerSO-20  | 2                 | 5 Adj                        | 400                               | $\pm 2$              | 300                          |          | •            | •          | •             |                |                 |                                         | 210                                          |
| L4949ED-E   | SO-8        | 1                 | 5                            | 100                               | $\pm 1$              | 300                          |          | •            |            | •             |                |                 |                                         | 200                                          |
| L4949EP-E   | SO-20       | 1                 | 5                            | 100                               | $\pm 1$              | 300                          |          | •            |            | •             |                |                 |                                         | 200                                          |
| L4979D-E    | SO-8        | 1                 | 5                            | 150                               | $\pm 2$              | 200                          |          | •            | •          |               | •              |                 | 6                                       | 200                                          |
| L4979MD     | SO-20       | 1                 | 5                            | 150                               | $\pm 2$              | 200                          |          | •            | •          |               | •              |                 | 6                                       | 100                                          |
| L4988D      | SO-8        | 1                 | 5                            | 200                               | $\pm 2$              | 270                          |          | •            |            |               | •              | •               |                                         | 130                                          |
| L4988MD     | SO-20       | 1                 | 5                            | 200                               | $\pm 2$              | 270                          |          | •            |            |               | •              | •               |                                         | 130                                          |
| L4989D      | SO-8        | 1                 | 5                            | 150                               | $\pm 3$              | 180                          |          | •            |            |               | •              | •               |                                         | 110                                          |
| L4989MD     | SO-20       | 1                 | 5                            | 150                               | $\pm 3$              | 180                          |          | •            |            |               | •              | •               |                                         | 110                                          |
| L4993D      | SO-8        | 1                 | 5                            | 150                               | $\pm 2$              | 200                          |          | •            |            |               | •              | •               |                                         | 100                                          |
| L4993MD     | SO-20       | 1                 | 5                            | 150                               | $\pm 2$              | 200                          |          | •            |            |               | •              | •               |                                         | 100                                          |
| L4995RJ     | PowerSSO-12 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            |            |               |                |                 |                                         | 90                                           |
| L4995RK     | PowerSSO-24 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            |            |               |                |                 |                                         | 90                                           |
| L4995AJ     | PowerSSO-12 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            | •          |               |                |                 | 3                                       | 90                                           |
| L4995AK     | PowerSSO-24 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            | •          |               |                |                 | 3                                       | 90                                           |
| L4995J      | PowerSSO-12 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            | •          |               | •              |                 | 3                                       | 90                                           |
| L4995K      | PowerSSO-24 | 1                 | 5                            | 500                               | $\pm 2$              | 270                          |          | •            | •          |               | •              |                 | 3                                       | 90                                           |
| L5150BNTR   | SOT-223     | 1                 | 5                            | 150                               | $\pm 2$              |                              |          |              |            |               |                |                 |                                         | 38                                           |
| L5150CJ     | PowerSSO-12 | 1                 | 5                            | 150                               | $\pm 2$              |                              | 500      | • (1)        |            | •             |                |                 |                                         | 55                                           |
| L5150CS     | SO-8        | 1                 | 5                            | 150                               | $\pm 2$              |                              | 500      | • (1)        |            | •             |                |                 |                                         | 55                                           |
| L5150GJ     | PowerSSO-12 | 1                 | 5                            | 150                               | $\pm 2$              |                              | 500      | • (1)        |            | •             |                |                 | 5                                       | 55                                           |
| L5300AH7    | HPAK        | 1                 | 5                            | 300                               | $\pm 2$              |                              | 500      | •            | •          |               |                |                 | 5                                       | 55                                           |
| L5300GJ     | PowerSSO-12 | 1                 | 5                            | 300                               | $\pm 2$              |                              | 500      | •            | •          | •             |                |                 | 5                                       | 55                                           |
| L5300EPT    | PPAK        | 1                 | 5                            | 300                               | $\pm 2$              |                              | 500      |              | •          |               |                |                 | 5                                       | 55                                           |
| L5300RPT    | PPAK        | 1                 | 5                            | 300                               | $\pm 2$              |                              | 500      | •            |            |               |                |                 | 5                                       | 55                                           |

(1) Adjustable threshold

## Door modules

| Part number                    | Package                   | Driver stages        | Max on-state resistance $R_{DS(on)}$ (mΩ) | Current limitation $I_{lim}$ (A) | Operating range $V_s$ (V) | PWM control | Short-circuit protection | Current sense | Thermal shutdown | Reverse battery protection | Diagnostics and programming | EC control | LED mode | H-bridge control | Description                                                            |
|--------------------------------|---------------------------|----------------------|-------------------------------------------|----------------------------------|---------------------------|-------------|--------------------------|---------------|------------------|----------------------------|-----------------------------|------------|----------|------------------|------------------------------------------------------------------------|
| <b>L9949</b>                   | PowerSO-20                | 1 full bridge        | 150                                       | 6                                | 7 to 28                   |             | •                        | •             | •                |                            | SPI                         | -          |          |                  | Mid-end front-door module                                              |
|                                |                           | 3 half bridges       | 800                                       | 1.6                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 1 high-side switch   | 100                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9950</b><br><b>L9950XP</b> | PowerSO-36<br>PowerSSO-36 | 2 half bridges       | 300                                       | 3                                | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          |          |                  | High-end front-door module                                             |
|                                |                           | 2 half bridges       | 800                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 1 full bridge        | 150                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 4 high-side switches | 800                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9951</b><br><b>L9951XP</b> | PowerSO-36<br>PowerSSO-36 | 1 high-side switch   | 100                                       | 6                                | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          |          |                  | Rear-door module                                                       |
|                                |                           | 1 half bridge        | 150                                       | 7.4                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 2 half bridges       | 200                                       | 5                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 2 high-side switches | 800                                       | 1.25                             |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9953</b><br><b>L9953XP</b> | PowerSO-36<br>PowerSSO-36 | 3 half bridges       | 800                                       | 1.5                              | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          |          |                  | Mid-end front-door module                                              |
|                                |                           | 1 full bridge        | 150                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 2 high-side switches | 500                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 1 high-side switch   | 100                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9953LXP</b>                | PowerSSO-36               | 3 half bridges       | 800                                       | 1.5                              | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          | 2x       |                  | Mid-end front-door module compatible with bulbs/LEDs                   |
|                                |                           | 1 full bridge        | 150                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 2 high-side switches | 500/1800                                  | 1.5/0.35                         |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 1 high-side switch   | 100                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9954</b><br><b>L9954XP</b> | PowerSO-36<br>PowerSSO-36 | 3 half bridges       | 800                                       | 1.5                              | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          |          |                  | Mid-end front-door module without door lock                            |
|                                |                           | 2 high-side switches | 500                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 1 high-side switch   | 100                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 3 half bridges       | 800                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
| <b>L9954LXP</b>                | PowerSSO-36               | 2 high-side switches | 500/1800                                  | 1.5/0.35                         | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -          | 2x       |                  | Mid-end front-door module without door lock compatible with bulbs/LEDs |
|                                |                           | 1 high-side switch   | 100                                       | 6                                |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |
|                                |                           | 3 half bridges       | 800                                       | 1.5                              |                           |             |                          |               |                  |                            |                             |            |          |                  |                                                                        |

| Part number | Package     | Driver stages                     | Max on-state resistance $R_{DS(on)}$ (mΩ) | Current limitation $I_{lim}$ (A) | Operating range $V_s$ (V) | PWM control | Short-circuit protection | Current sense | Thermal shutdown | Reverse battery protection | Diagnostics and programming | EC control                                    | LED mode | H-bridge control | Description                                                                                                                                                                                                        |
|-------------|-------------|-----------------------------------|-------------------------------------------|----------------------------------|---------------------------|-------------|--------------------------|---------------|------------------|----------------------------|-----------------------------|-----------------------------------------------|----------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| L99DZ70XP   | PowerSS0-36 | 1 full bridge                     | 150                                       | 6                                | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | 6-bit resolution 1.2 V/1.5 V                  | 4x       |                  | High-end front-door module compatible with bulbs/LEDs. Control circuitry for electrochromic mirror glass.                                                                                                          |
|             |             | 2 half bridges                    | 300                                       | 3                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 2 half bridges                    | 1600                                      | 0.75                             |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 high-side switch                | 90                                        | 6                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 2 configurable high-side switches | 500/1800                                  | 1.5/0.4                          |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
| L99DZ80EP   | TQFP64      | 2 high-side switches              | 1600                                      | 0.5                              | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | 6-bit resolution 1.2V/1.5V Negative Discharge | 4x       | •                | High-end front door module compatible with bulbs/LEDs. Control circuitry for electrochromic mirror glass with possibility to negative discharge. H-Bridge control, for external MOSFETs, with adjustable slew-rate |
|             |             | 1 full bridge                     | 150                                       | 6                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 2 half bridges                    | 300                                       | 3                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 2 half bridges                    | 1600                                      | 0.5                              |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 high-side switch                | 100                                       | 5                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 configurable high-side switch   | 500/1600                                  | 1.5/0.35                         |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
| L99DZ81EP   | TQFP64      | 1 configurable high-side switch   | 800/1600                                  | 0.7/0.35                         | 7 to 28                   | •           | •                        | •             | •                | •                          | SPI                         | -                                             | 4x       | •                | High-end front door module compatible with bulbs/LEDs. H-Bridge control, for external MOSFETs, with adjustable slew-rate                                                                                           |
|             |             | 2 high-side switches              | 1600                                      | 0.5                              |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 full bridge                     | 150                                       | 6                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 half bridge                     | 300                                       | 3                                |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |
|             |             | 1 configurable high-side switch   | 500/1600                                  | 1.5/0.35                         |                           |             |                          |               |                  |                            |                             |                                               |          |                  |                                                                                                                                                                                                                    |

# Power management for automotive systems

| Part number       | Package     | Transceiver       |                                          | Voltage regulators |                        |                                   |       |          | Driver stages |                             | On-board features                                                                                                                                                                                                                                                                                              | Description                                     |
|-------------------|-------------|-------------------|------------------------------------------|--------------------|------------------------|-----------------------------------|-------|----------|---------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|                   |             | Transmission rate | Transceiver description                  | Outputs            | Accuracy               | Drop voltage $V_{DS}$ (typ) (mV)  | Reset | Watchdog | Outputs       | Driver description          |                                                                                                                                                                                                                                                                                                                |                                                 |
| <b>L4969URD-E</b> | S0-20       | 125 kbaud         | Fault tolerant low-speed CAN transceiver | 5 V @ 200 mA       | $\pm 2\%$              | $250 @ I_{LOAD} = 100 \text{ mA}$ | •     | •        |               |                             |                                                                                                                                                                                                                                                                                                                | Basic system chip                               |
| <b>L4969UR-E</b>  | PowerS0-20  | 125 kbaud         | Fault tolerant low-speed CAN transceiver | 5 V @ 200 mA       | $\pm 2\%$              | $400 @ I_{LOAD} = 150 \text{ mA}$ | •     | •        |               |                             |                                                                                                                                                                                                                                                                                                                | Basic system chip                               |
| <b>L9952GXP</b>   | PowerSS0-36 | 20 kbaud          | LIN transceiver                          | 5 V @ 250 mA       | $\pm 2\%$              | $300 @ I_{LOAD} = 100 \text{ mA}$ | •     | •        | 4             | HSD 1 $\Omega$ @ 120 mA     | <ul style="list-style-type: none"> <li>4 wake-up inputs for contact monitoring</li> <li>Fail-safe output</li> <li>Two op-amps for current sense interfacing</li> <li>Inhibit input for wake-up from external CAN</li> </ul>                                                                                    | Power management IC with LIN                    |
|                   |             |                   |                                          | 5 V @ 100 mA       | $\pm 4\%$              | $400 @ I_{LOAD} = 50 \text{ mA}$  |       |          | 1             | HSD 1 $\Omega$ @ 400 mA     |                                                                                                                                                                                                                                                                                                                |                                                 |
|                   |             |                   |                                          |                    |                        |                                   |       |          | 2             | Relay drivers (2 $\Omega$ ) |                                                                                                                                                                                                                                                                                                                |                                                 |
| <b>L99PM62GXP</b> | PowerSS0-36 | 20 kbaud          | LIN and HS CAN transceivers              | 5 V @ 250 mA       | $\pm 2\%$              | $300 @ I_{LOAD} = 100 \text{ mA}$ | •     | •        | 4             | HSD 1 $\Omega$ @ 120 mA     | <ul style="list-style-type: none"> <li>Complete 3-channel contact monitoring interface with programmable cyclic sense functionality</li> <li>4 internal PWM timers</li> <li>Two op-amps with rail-to-rail outputs (VS) and low-voltage inputs</li> <li>Programmable periodic system wake-up feature</li> </ul> | Power management IC with LIN and high-speed CAN |
|                   |             |                   |                                          |                    |                        |                                   |       |          | 1             | HSD 1 $\Omega$ @ 400 mA     |                                                                                                                                                                                                                                                                                                                |                                                 |
|                   |             |                   |                                          | 5 V @ 100 mA       | $\pm 4\%$ (3% @ 50 mA) | $400 @ I_{LOAD} = 50 \text{ mA}$  |       |          | 2             | Relay drivers (2 $\Omega$ ) |                                                                                                                                                                                                                                                                                                                |                                                 |
| <b>L99PM60J</b>   | PowerSS0-16 | 20 kbaud          | LIN transceiver                          | 5 V @ 100 mA       | $\pm 2\%$              | $300 @ I_{LOAD} = 100 \text{ mA}$ | •     | •        | 2             | HSD 7 $\Omega$ @ 60 mA      | <ul style="list-style-type: none"> <li>Configurable fail-safe output</li> <li>ST SPI interface for mode control and diagnostics</li> <li>Direct drive feature for HSD</li> </ul>                                                                                                                               | Power management IC with LIN                    |
|                   |             |                   |                                          |                    |                        |                                   |       |          | 2             | Relay drivers (2 $\Omega$ ) |                                                                                                                                                                                                                                                                                                                |                                                 |

| Part number  | Package     | Transceiver       |                             | Voltage regulators  |                        |                                   |       |          | Driver stages |                                           | On-board features                                                                                                                                                                                                                                                                                                          | Description                                                                                                         |
|--------------|-------------|-------------------|-----------------------------|---------------------|------------------------|-----------------------------------|-------|----------|---------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|              |             | Transmission rate | Transceiver description     | Outputs             | Accuracy               | Drop voltage $V_{DP}$ (typ) (mV)  | Reset | Watchdog | Outputs       | Driver description                        |                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
| L99PM72PXP   | PowerSS0-36 | 20 kbaud          | LIN and HS CAN transceivers | 5 V @ 250 mA        | $\pm 2\%$              | $300 @ I_{LOAD} = 100 \text{ mA}$ | •     | •        | 4             | HSD 1 $\Omega$ @ 120 mA                   | <ul style="list-style-type: none"><li>• Complete 3-channel contact monitoring interface with programmable cyclic sense functionality</li><li>• 4 internal PWM timers</li><li>• Two operational amps with rail-to-rail outputs (VS) and low-voltage inputs</li><li>• Programmable periodic system wake-up feature</li></ul> | Power management IC with LIN and high-speed CAN supporting selective wake-up functionality according to ISO 11898-6 |
|              |             |                   |                             |                     |                        |                                   |       |          | 1             | HSD 1 $\Omega$ @ 400 mA                   |                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
|              |             |                   |                             | 5 V @ 100 mA        | $\pm 4\%$ (3% @ 50 mA) | $400 @ I_{LOAD} = 50 \text{ mA}$  |       |          | 2             | Relay drivers (2 $\Omega$ )               |                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
| L99PM80EP(*) | TQFP 48     | 20 kbaud          | LIN and HS CAN Transceivers | 5 or 3.3 V @ 400 mA | $\pm 2\%$              | $300 @ I_{LOAD} = 200 \text{ mA}$ | •     | •        | 1             | HSD 7 $\Omega$ @ 60 mA                    | <ul style="list-style-type: none"><li>• Integrated Boost controller for sustaining low-power conditions</li><li>• Integrated Buck converter for preregulated supply of low drop voltage regulators</li><li>• Programmable periodic system wake-up feature</li><li>• Direct drive feature for HSD</li></ul>                 | Power management IC with 4 LIN and high-speed CAN according to ISO 11898-5                                          |
|              |             |                   |                             | 5 V @ 50 mA         | $\pm 2\%$              | $300 @ I_{LOAD} = 25 \text{ mA}$  |       |          | 3             | Fail safe outputs (7 $\Omega$ , low side) |                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
|              |             |                   |                             | 5 V @ 80 mA         | $\pm 2\%$              | $300 @ I_{LOAD} = 40 \text{ mA}$  |       |          |               |                                           |                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |

(\*) In development. Available in Q2/2014

| Part number        | Package       | Technology | Output mode            | Max on-state resistance<br>$R_{DS(on)}$ max (mΩ) | Current limitation<br>( $I_{lim}$ ) typ (A) | Supply voltage ( $V_{CC}$ ) |         | Absolute max supply voltage (V) | Highlights                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------|------------|------------------------|--------------------------------------------------|---------------------------------------------|-----------------------------|---------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |               |            |                        |                                                  |                                             | min (V)                     | max (V) |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>L9997ND</b>     | SO-20         | BCD        | 2 half bridge          | 700                                              | 1.6                                         | 7                           | 16.5    | 26                              | <ul style="list-style-type: none"> <li>Short-circuit and over-temperature protected</li> </ul>                                                                                                                                                                                                                                                                                                                       |
| <b>L99ASC03</b>    | TQFP-48 ExPad | BCD6       | 3x half-bridges driver | -                                                | -                                           | 6                           | 28      | 40                              | <ul style="list-style-type: none"> <li>3 half-bridges driver to control external MOSFET</li> <li>5 V voltage regulator (200 mA continuous)</li> <li>Watchdog and fail-safe functionality</li> <li>PWM up to 80 kHz</li> <li>Configurable current sense amplifier</li> <li>Advanced BEMF detection IP</li> <li>Programmable overcurrent protection</li> <li>Drain-source monitoring and openload detection</li> </ul> |
| <b>L99H01XP</b>    | PowerSSO-36   | BCD5       | H-bridge               | 280                                              | -                                           | 6                           | 28      | 35                              | <ul style="list-style-type: none"> <li>Programmable free wheeling</li> <li>Current-sense amplifier/free configuration</li> <li>Sensing circuitry of external MOSFET with embedded thermal sensor</li> </ul>                                                                                                                                                                                                          |
| <b>L99H01QF</b>    | LQFP-32       | BCD5       | H-bridge               | 280                                              | -                                           | 6                           | 28      | 35                              | <ul style="list-style-type: none"> <li>Programmable free wheeling</li> <li>Current-sense amplifier/free configuration</li> <li>Sensing circuitry of external MOSFET with embedded thermal sensor</li> </ul>                                                                                                                                                                                                          |
| <b>L99MD01XP</b>   | PowerSSO-36   | BCD5       | Half bridge            | 1600                                             | 1.1                                         | 6                           | 28      | 40                              | <ul style="list-style-type: none"> <li>Optimized for H-VAC flaps</li> <li>DC-stepper motor driver</li> <li>8 H-bridge driver</li> <li>Intrinsic DC-DC step-up converter</li> <li>2 current monitor outputs</li> <li>All outputs short-circuit protected</li> </ul>                                                                                                                                                   |
| <b>L99MD02XP</b>   | PowerSSO-36   | BCD5       | Half bridge            | 1600                                             | 1.1                                         | 6                           | 28      | 40                              | <ul style="list-style-type: none"> <li>Optimized for H-VAC flaps</li> <li>DC-motor driver</li> <li>6 H-bridge driver</li> <li>2 current monitor outputs</li> <li>All outputs short-circuit protected</li> </ul>                                                                                                                                                                                                      |
| <b>VN5770AKP-E</b> | SO-28         | M0-5, M0-3 | 2 HSD and 2 LSD        | 280                                              | 8.5                                         | 4.5                         | 36      | 41                              | <ul style="list-style-type: none"> <li>Active power limitation (patent IP) on high side</li> <li>Thermal shutdown</li> </ul>                                                                                                                                                                                                                                                                                         |
| <b>VN5772AK-E</b>  | SO-28         | M0-5       | 2 HSD and 2 LSD        | 100                                              | 18                                          | 4.5                         | 36      | 41                              | <ul style="list-style-type: none"> <li>Active power limitation (patent IP) on both high and low side</li> <li>Thermal shutdown</li> </ul>                                                                                                                                                                                                                                                                            |
| <b>VN770KP-E</b>   | SO-28         | M0-3       | 2 HSD and 2 LSD        | 225                                              | 9                                           | 5.5                         | 36      | 41                              | <ul style="list-style-type: none"> <li>Short-circuit and over-temperature protected</li> </ul>                                                                                                                                                                                                                                                                                                                       |

| Part number            | Package         | Technology | Output mode     | Max on-state resistance<br>$R_{DS(on)}$ max (m $\Omega$ ) | Current limitation<br>( $I_{lim}$ ) typ (A) | Supply voltage ( $V_{cc}$ ) |         | Absolute max supply voltage (V) | Highlights                                                                                                                                                                                                                   |
|------------------------|-----------------|------------|-----------------|-----------------------------------------------------------|---------------------------------------------|-----------------------------|---------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                 |            |                 |                                                           |                                             | min (V)                     | max (V) |                                 |                                                                                                                                                                                                                              |
| <b>VN771KP-E</b>       | S0-28           | M0-3       | 2 HSD and 2 LSD | 95                                                        | 9                                           | 5.5                         | 36      | 41                              | <ul style="list-style-type: none"> <li>Short-circuit and over-temperature protected</li> </ul>                                                                                                                               |
| <b>VN772KP-E</b>       | S0-28           | M0-3       | 2 HSD and 2 LSD | 125                                                       | 9                                           | 5.5                         | 36      | 41                              | <ul style="list-style-type: none"> <li>Short-circuit and over-temperature protected</li> </ul>                                                                                                                               |
| <b>VNH2SP30-E</b>      | MultiPowerS0-30 | M0-4       | Full bridge     | 19                                                        | 50                                          | 5.5                         | 16      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 20 kHz</li> <li>Current sense</li> </ul>                                                                                    |
| <b>VNH3ASP30-E</b>     | MultiPowerS0-30 | M0-4       | Full bridge     | 42                                                        | 50                                          | 5.5                         | 16      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 20 kHz</li> <li>Current sense</li> </ul>                                                                                    |
| <b>VNH3SP30-E</b>      | MultiPowerS0-30 | M0-3       | Full bridge     | 45                                                        | 50                                          | 5.5                         | 36      | 40                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 10 kHz</li> <li>Current sense</li> </ul>                                                                                    |
| <b>VNH5019A-E</b>      | MultiPowerS0-30 | M0-5       | Full bridge     | 18                                                        | 50                                          | 5.5                         | 24      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 20 kHz</li> <li>Current sense</li> <li>Charge pump output for reverse-polarity protection</li> </ul>                        |
| <b>VNH5050A-E</b>      | PowerSS0-36     | M0-5       | Full bridge     | 50                                                        | 42                                          | 5.5                         | 18      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 20 kHz</li> <li>Current sense</li> <li>Output protected against short-to-ground and short-to-<math>V_{cc}</math></li> </ul> |
| <b>VNH5180A-E</b>      | PowerSS0-36     | M0-5       | Full bridge     | 180                                                       | 12                                          | 5.5                         | 18      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>PWM operations up to 20 kHz</li> <li>Current sense</li> <li>Output protected against short-to-ground and short-to-<math>V_{cc}</math></li> </ul> |
| <b>VNH5200AS-E (*)</b> | S0-16           | M0-5       | Full bridge     | 200                                                       | 12                                          | 5.5                         | 18      | 41                              | <ul style="list-style-type: none"> <li>Cross-conduction protection</li> <li>Current sense</li> <li>Output protected against short-to-ground and short-to-<math>V_{cc}</math></li> </ul>                                      |

(\*) In development. Available in Q1/2014

| Part number   | Package     | Driver stages                                        | Operating range<br>$V_{cc}$ (V) | Max supply voltage<br>$V_{cc}$ (V) | Accuracy              |                    | Highlights                                                                                                                                                                                                           | Description                                    |
|---------------|-------------|------------------------------------------------------|---------------------------------|------------------------------------|-----------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|               |             |                                                      |                                 |                                    | Oscillating frequency | Low load detection |                                                                                                                                                                                                                      |                                                |
| L99LD01       | LQFP-32     | High efficiency constant current LED driver          | 5.6 to 24                       | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• SPI interface</li> <li>• Programmable LED current</li> <li>• Dithering</li> </ul>                                                                                           | LED driver                                     |
| L99CL01XP     | PowerSS0-36 | 8 Channels high-side LED driver                      | 6 to 24                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• Programmable over-current</li> <li>• SPI interface</li> <li>• Configurable <math>R_{DS(on)}</math></li> </ul>                                                               | LED driver                                     |
| L99MC6        | PowerSS0-16 | 3 configurable HSD/LSD                               | 6 to 28                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• <math>R_{DS(on)} = 0.7 \Omega</math> at <math>T_j = 25^\circ C</math></li> </ul>                                                                                            | Various loads driver<br>H-bridge configuration |
|               |             | 3 low-side switches                                  |                                 |                                    |                       |                    |                                                                                                                                                                                                                      |                                                |
| VN1160-E      | DPAK        | Power switch for motorbike direction indicator       | 9 to 16                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• Lamp-failure detection</li> <li>• Indicator reverse-battery protected</li> </ul>                                                                                            | Motorbike indicator driver                     |
| VN1160-1-E    | IPAK        | Power switch for motorbike direction indicator       | 9 to 16                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• Lamp-failure detection</li> <li>• Indicator reverse-battery protected</li> </ul>                                                                                            | Motorbike indicator driver                     |
| VN1160C-E     | DPAK        | Power switch for motorbike direction indicator       | 9 to 16                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• Lamp-failure detection</li> <li>• Indicator reverse-battery protected</li> </ul>                                                                                            | Motorbike indicator driver                     |
| VN1160C-1-E   | IPAK        | Power switch for motorbike direction indicator       | 9 to 16                         | 40                                 |                       |                    | <ul style="list-style-type: none"> <li>• Lamp-failure detection</li> <li>• Indicator reverse-battery protected</li> </ul>                                                                                            | Motorbike indicator driver                     |
| VN5MB02-E (*) | SO-16       | Smart power driver for motorbike direction indicator | 9 to 16                         | 40                                 | +/- 5%                | +/- 8%             | <ul style="list-style-type: none"> <li>• High accuracy in setting operating frequency and low-load detection</li> <li>• Maximum current detection with latch</li> <li>• Cycle by cycle thermal limitation</li> </ul> | Motorbike indicator driver                     |

(\*) In development. Available in Q1/2014

## SPECIAL DEVICES – REVERSE BATTERY

| Part number | Package | Operating range<br>$V_{cc}$ (V) | Max supply voltage<br>$V_{cc}$ (V) | Max on-state resistance $R_{DS(on)}$<br>(max) (m $\Omega$ ) | Description                                               |
|-------------|---------|---------------------------------|------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|
| VN5R003H-E  | HPAK    | 4.5 to 28                       | 41                                 | 3                                                           | Reverse-battery protection for an electronic control unit |

SPECIAL DEVICES – INTEGRATED SOLENOID DRIVER - INJECTION GAS SYSTEM

| Part number | Package     | Operating range<br>$V_{cc}$ (V) | Max supply<br>voltage $V_{cc}$ (V) | Max on-state resistance $R_{DS(on)}$ (mΩ) |                    | $I_{peak}$ (A) | Clamp voltage<br>(min) (V) | Description                                          |
|-------------|-------------|---------------------------------|------------------------------------|-------------------------------------------|--------------------|----------------|----------------------------|------------------------------------------------------|
|             |             |                                 |                                    | Excitation path                           | Recirculation path |                |                            |                                                      |
| L99SD01-E   | PowerSS0-36 | 6 to 28                         | 40                                 | 60                                        | 60                 | 14             | 44                         | Current-sense amplifier with internal sense resistor |

Ignition drivers

| Part number | Package    | Technology   | High voltage<br>clamp ( $V_{cl}$ )<br>typ (V) | Current<br>limitation ( $I_{lim}$ )<br>max (A) | Power stage<br>saturation voltage<br>( $V_{CE(sat)}$ ) |                     | Supply voltage<br>( $V_{cc}$ ) min (V) | Supply voltage<br>( $V_{cc}$ ) max (V) | Supply current<br>on state ( $I_{cc}$ )<br>max (mA) | Description                                                           |
|-------------|------------|--------------|-----------------------------------------------|------------------------------------------------|--------------------------------------------------------|---------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------|
|             |            |              |                                               |                                                | (@ 6 A)<br>max (V)                                     | (@ 15 A)<br>max (V) |                                        |                                        |                                                     |                                                                       |
| VB525SP-E   | PowerSO-10 | M1           | 380                                           | 11                                             | 2                                                      |                     | 4.5                                    | 5.5                                    | 40                                                  | Quasi proportional current driving<br>Current flag                    |
| VB526SP-E   | PowerSO-10 | M1           | 360                                           | 11                                             | 2                                                      |                     | 4.5                                    | 5.5                                    | 40                                                  | Quasi proportional current driving<br>Current flag                    |
| VBG08H-E    | OCTAPAK    | BCD5S + IGBT | 360                                           | 10.5                                           | 1.8 @<br>6.5 A                                         |                     | 6                                      | 28                                     | -                                                   | Slow turn-on<br>Soft shutdown<br>Coil current limiter<br>Current flag |

# Part numbering scheme

## GET THE RIGHT PRODUCT FOR YOUR NEEDS

### MO-5 standard version

MO-5 standard series is a complete product portfolio intended for typical loads in automotive applications, such as a high beam, low beam, turn indicator, interior lighting. For each  $R_{DS(on)}$  rating, single-, dual- and quad-channel options are available. Moreover, the devices are equipped with digital diagnostics or with analog current sense.

### MO-5Enhanced version

In addition to the standard protection and diagnostic features, MO-5Enhanced products offer:

- Extended load compatibility due to higher current limitation
- Immediate diagnosis reaction over short-to-ground or overload (power limitation detection)
- Open-load/short-to- $V_{CC}$  detection in off-state for the analog current sense option as well

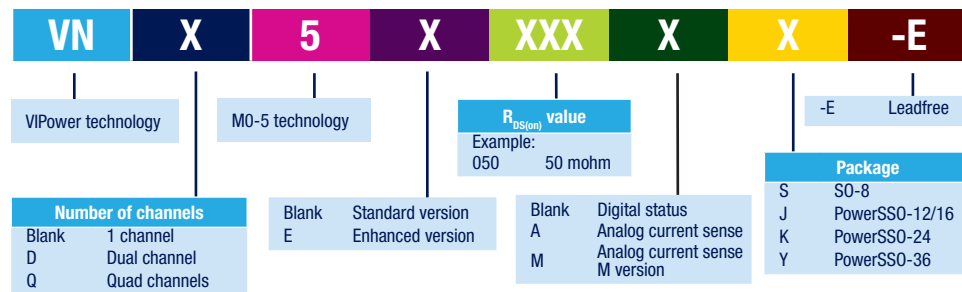
### MO-5Enhanced M version

The M versions complete the product portfolio with devices having the same specification as MO-5Enhanced except for the open-load detection in off-state.

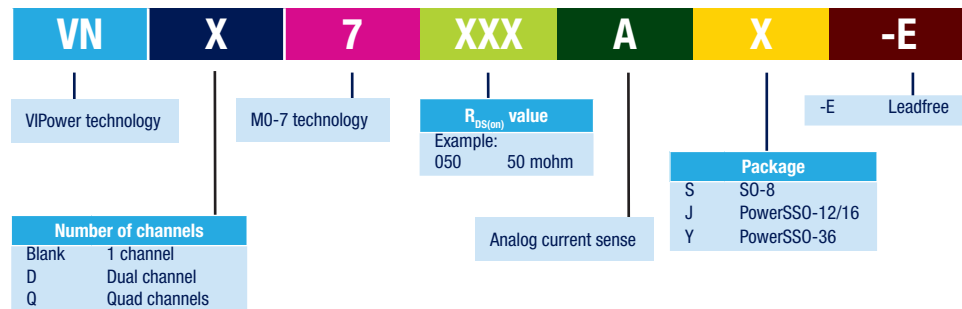
### MO-7 version

The brand new MO-7 Product Family further extends the wide range of  $R_{DS(on)}$  for optimal device-load pairing in smaller packages and with full pin-to-pin compatibility.

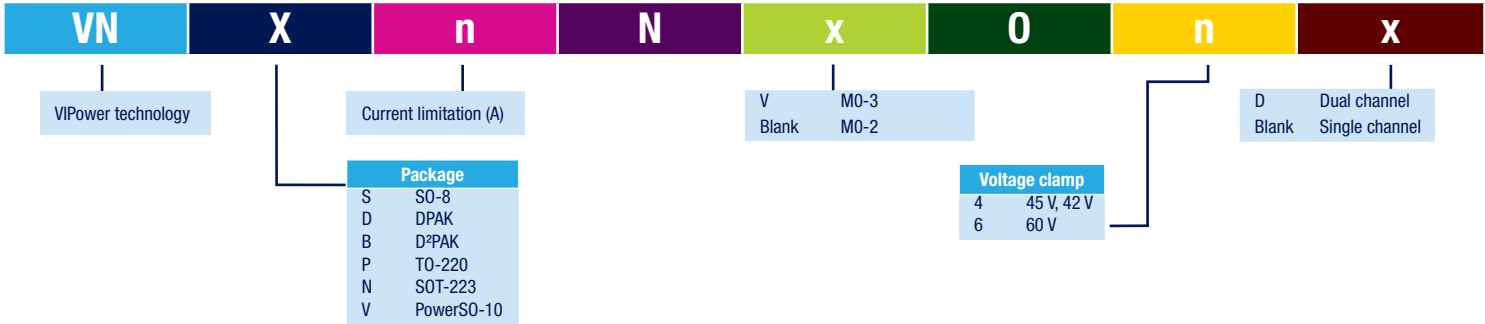
## MO-5/MO-5ENHANCED/M VERSION PART NUMBERING SCHEME



## MO-7 PART NUMBERING SCHEME



OMNIFET PART NUMBERING SCHEME



OMNIFET III PART NUMBERING SCHEME

