

# Smart power solutions for car body applications



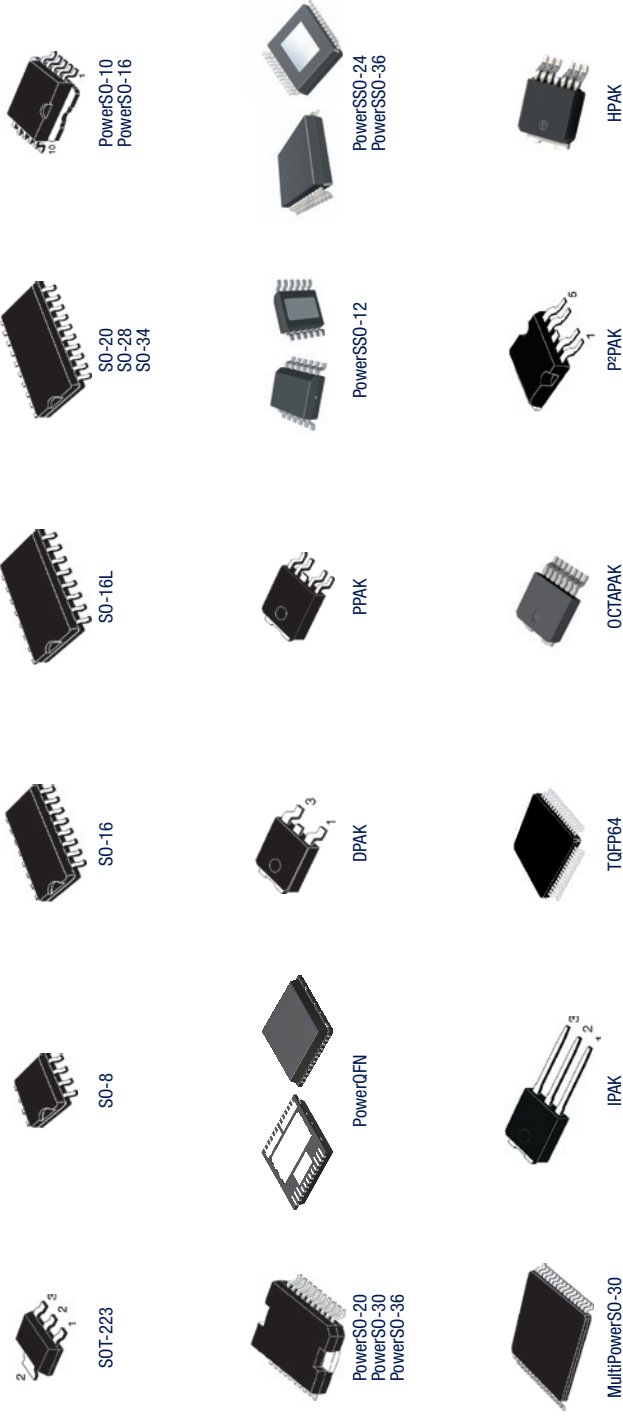
© STMicroelectronics - October 2013 - Printed in United Kingdom - All rights reserved  
The STMicroelectronics corporate logo is a registered trademark  
of the STMicroelectronics group of companies  
All other names are the property of their respective owners

# 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 (mΩ)	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 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	PowerSS0-16	M0-7	4	28	38	140	12			•
VNQ7050AJ-E (**)	PowerSS0-16	M0-7	4	28	38	50	27		•	
VNQ7040AY-E (*)	PowerSS0-36	M0-7	4	28	38	40	34			•
VNQ5E160MK-E	PowerSS0-24	M0-5Enhanced (M vers.)	4.5	28	41	160	10		•	
VNQ5E050MK-E	PowerSS0-24	M0-5Enhanced (M vers.)	4.5	28	41	50	27		•	
VNQ5E250AJ-E	PowerSS0-16	M0-5Enhanced	4.5	28	41	250	5		•	
VNQ5E160AK-E	PowerSS0-24	M0-5Enhanced	4.5	28	41	160	10		•	
VNQ5E160K-E	PowerSS0-24	M0-5Enhanced	4.5	28	41	160	10	•		
VNQ5E050AK-E	PowerSS0-24	M0-5Enhanced	4.5	28	41	50	27		•	
VNQ5E050K-E	PowerSS0-24	M0-5Enhanced	4.5	28	41	50	27	•		
VNQ5160K-E	PowerSS0-24	M0-5	4.5	36	41	160	5	•		
VNQ5050AK-E	PowerSS0-24	M0-5	4.5	36	41	50	18		•	
VNQ5050K-E	PowerSS0-24	M0-5	4.5	36	41	50	18	•		
VNQ5027AK-E	PowerSS0-24	M0-5	4.5	36	41	27	40		•	
VNQ500PEP-E	PowerSS0-12	M0-3	5.5	36	41	500	0.6	•		
VNQ810P-E	SO-28	M0-3	5.5	36	41	160	5	•		
VNQ810PEP-E	PowerSS0-24	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	PowerSS0-24	M0-3	5.5	36	41	60	18	•		
VNQ660SP-E	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 2x30	50 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 ( $I_{DS(on)}$ ) 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 ( $I_{lim}$ ) typ (A)	Max on-state resistance $R_{DS(on)}$ max (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> <b>L9950XP</b>	PowerSO-36 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> <b>L9951XP</b>	PowerSO-36 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> <b>L9953XP</b>	PowerSO-36 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> <b>L9954XP</b>	PowerSO-36 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 $R_{DS(on)}$ max (mΩ)	Current limitation ( $I_{lim}$ ) 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 $R_{DS(on)}$ max (m $\Omega$ )	Current limitation ( $I_{lim}$ ) 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 $V_{cc}$ (V)	Max supply voltage $V_{cc}$ (V)	Accuracy		Highlights	Description
					Oscillating frequency	Low load detection		
<b>L99LD01</b>	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
<b>L99CL01XP</b>	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
<b>L99MC6</b>	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 H-bridge configuration
		3 low-side switches						
<b>VN1160-E</b>	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
<b>VN1160-1-E</b>	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
<b>VN1160C-E</b>	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
<b>VN1160C-1-E</b>	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
<b>VN5MB02-E (*)</b>	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 $V_{cc}$ (V)	Max supply voltage $V_{cc}$ (V)	Max on-state resistance $R_{DS(on)}$ (max) (m $\Omega$ )	Description
<b>VN5R003H-E</b>	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 $V_{cc}$ (V)	Max supply voltage $V_{cc}$ (V)	Max on-state resistance $R_{DS(on)}$ (mΩ)		Ipeak (A)	Clamp voltage (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 clamp ( $V_{cl}$ ) typ (V)	Current limitation ( $I_{lim}$ ) max (A)	Power stage saturation voltage ( $V_{CE(sat)}$ )		Supply voltage ( $V_{cc}$ ) min (V)	Supply voltage ( $V_{cc}$ ) max (V)	Supply current on state ( $I_{cc}$ ) max (mA)	Description
					(@ 6 A) max (V)	(@ 15 A) max (V)				
VB525SP-E	PowerSO-10	M1	380	11	2		4.5	5.5	40	Quasi proportional current driving Current flag
VB526SP-E	PowerSO-10	M1	360	11	2		4.5	5.5	40	Quasi proportional current driving Current flag
VBG08H-E	OCTAPAK	BCD5S + IGBT	360	10.5	1.8 @ 6.5 A		6	28	-	Slow turn-on Soft shutdown Coil current limiter 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

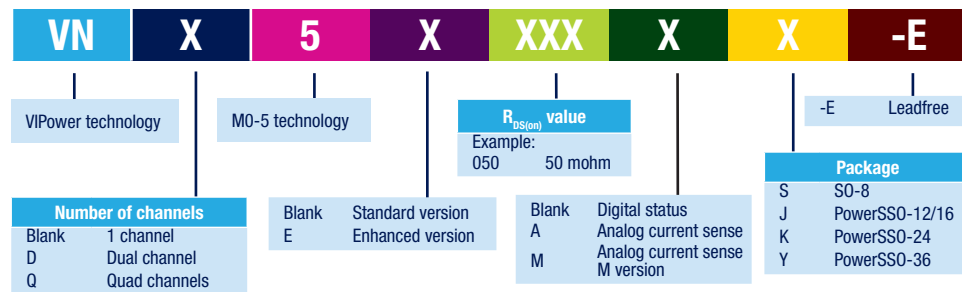
#### MO-5Enhanced M version

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.

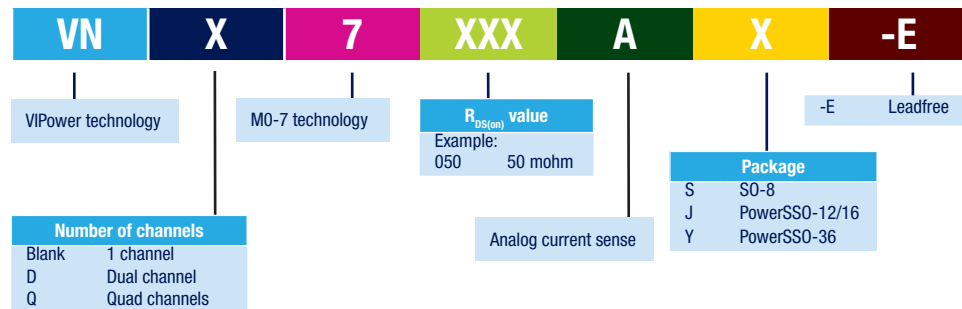
#### MO-7 version

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.

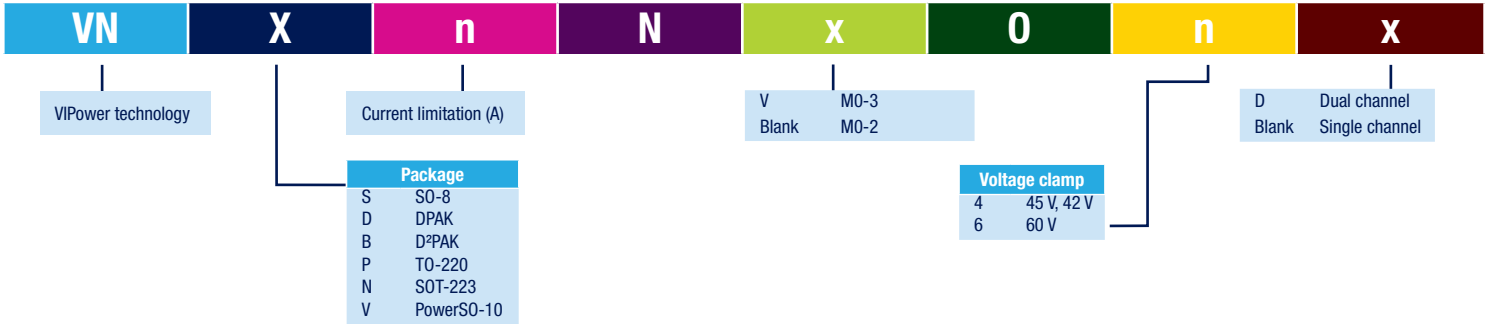
### MO-5/MO-5ENHANCED/M VERSION PART NUMBERING SCHEME



### MO-7 PART NUMBERING SCHEME



OMNIFET PART NUMBERING SCHEME



OMNIFET III PART NUMBERING SCHEME

