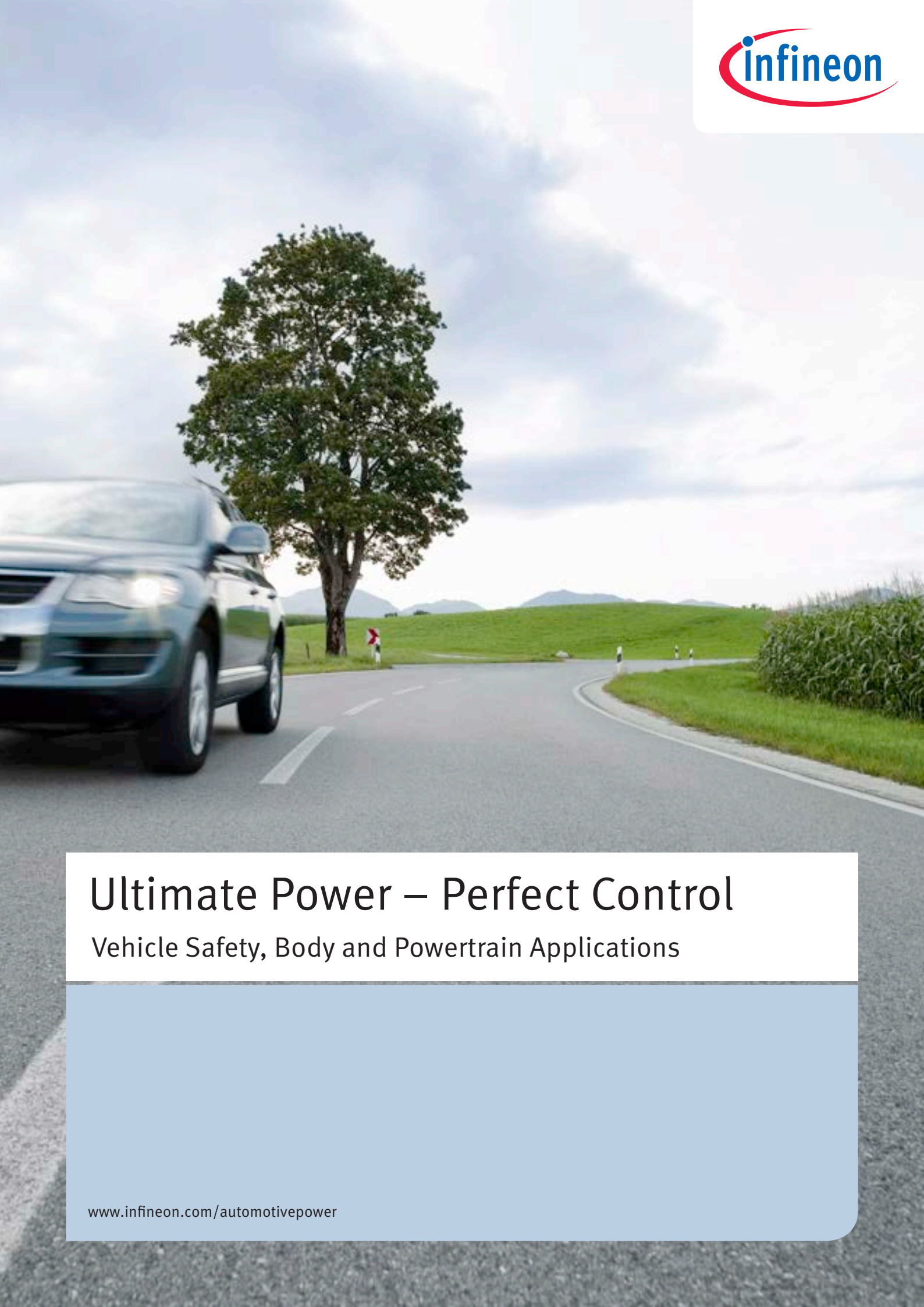


Ultimate Power – Perfect Control

Vehicle Safety, Body and Powertrain Applications

www.infineon.com/automotivepower

For a comprehensive and reliable portfolio of products for automotive and other applications, look no further than the product range from Infineon. We have used our 40 years of experience of developing and producing products to meet the demands of the automotive market, and our innovative technologies to design and produce a large number of power products that meet all requirements of the automotive industry and also the transportation, lighting and motor-drive industries.

Our commitment to quality is demonstrated through our focus on Automotive Excellence, the most rigorous zero defect program in the industry.

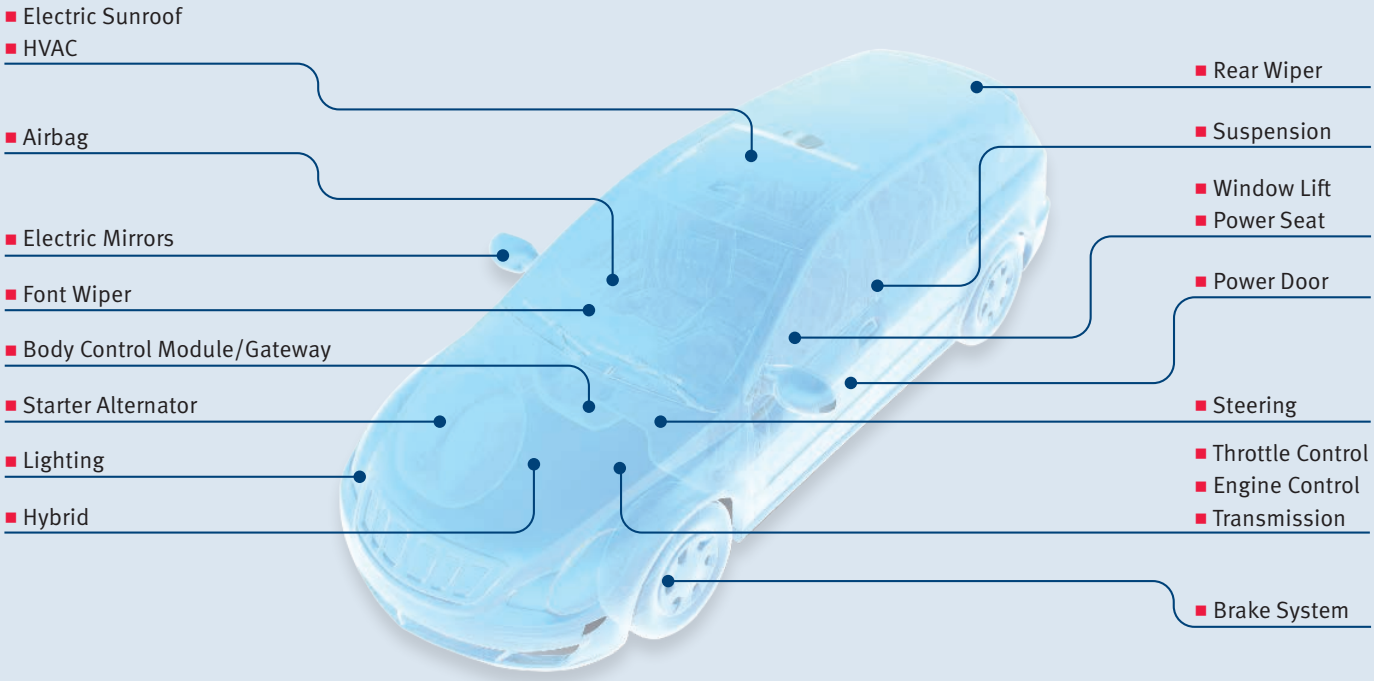
This Selection Guide provides an overview of our ICs and their packages, which are automotive qualified and available for your current and future electronic system designs.

The ultimate power to control your applications including automotive, transportation, industrial, lighting and motor control.

Symbols

I_D	DC Drain Current
$I_{GS(TH)}$	Gate Source Threshold Voltage
I_{IS}	Current Sense Output Current
$I_{L(lim)}$	Load Current Limit
$I_{L(NOM)}$	Load Current (T_a = 85°C, specified PCB)
$I_{L(sat)}$	Saturation Load Current
I_q	Quiescent Current
I_Q	Output Current
Q_G	Total Gate Charge
R_{IS}	Current Sense Resistor
$R_{DS(on)}$	Typical Drain Source Resistance in ON-State @ 25°C (multiply by 2 for Max @ 150°C)
$R_{DS(on)}$ path	Typical Drain Source Resistance in ON-State @ 25°C of both High-Side and Low-Side
R_{thJC}	Thermal Resistance Junction to Case
V_{CE}	Collector Emitter Voltage
$V_{CE(sat)}$	Saturation Collector Emitter Voltage
V_{DS}	Drain Source Voltage
$V_{DS(AZ)}$	Drain Source Voltage (Active Zener)
$V_{GS(th)}$	Gate Threshold Voltage
V_Q	Output Voltage
V_S	Supply Voltage
$V_{S(AZ)}$	Supply Voltage (Active Zener)
$V_{S(op.)}$	Operation Supply Voltage
Inverse	Normal V_S Polarity and Inverse Load Current
PWM	Pulse Width Modulation
Reverse	Reverse V_S Polarity and Reverse Load Current

Automotive Applications



Automotive Power Components Used in Other Applications

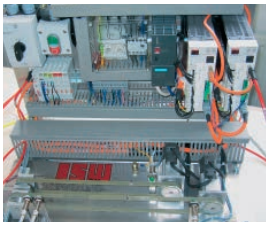
Agriculture

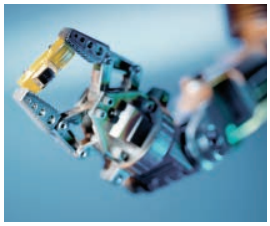
Transportation/Navigation

2–4 Wheeler

Lighting

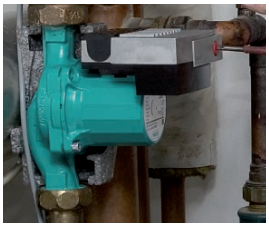
Automation/Industrial



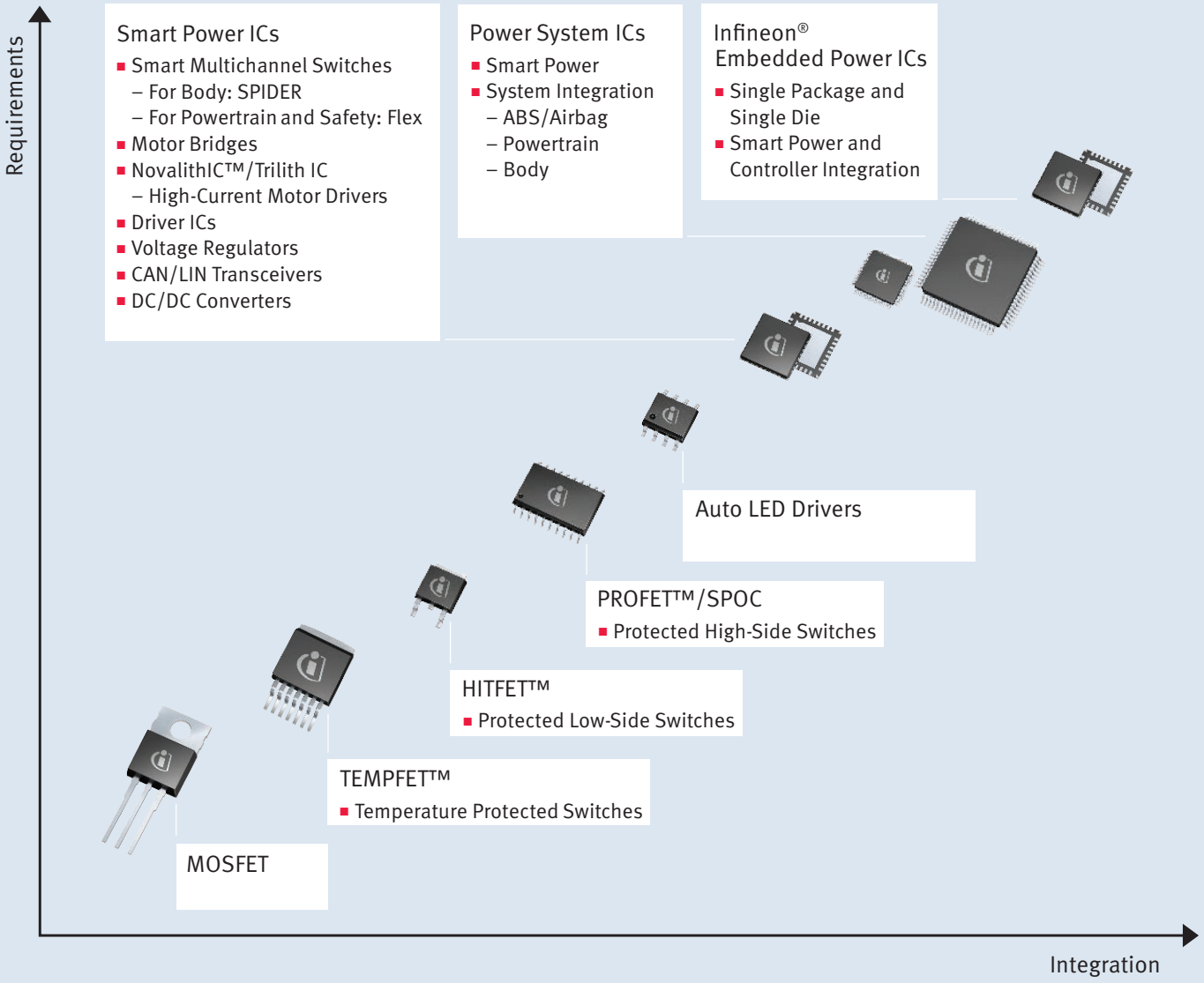


Toys/Games

Electric Tools/Home Appliance/Heating Pump



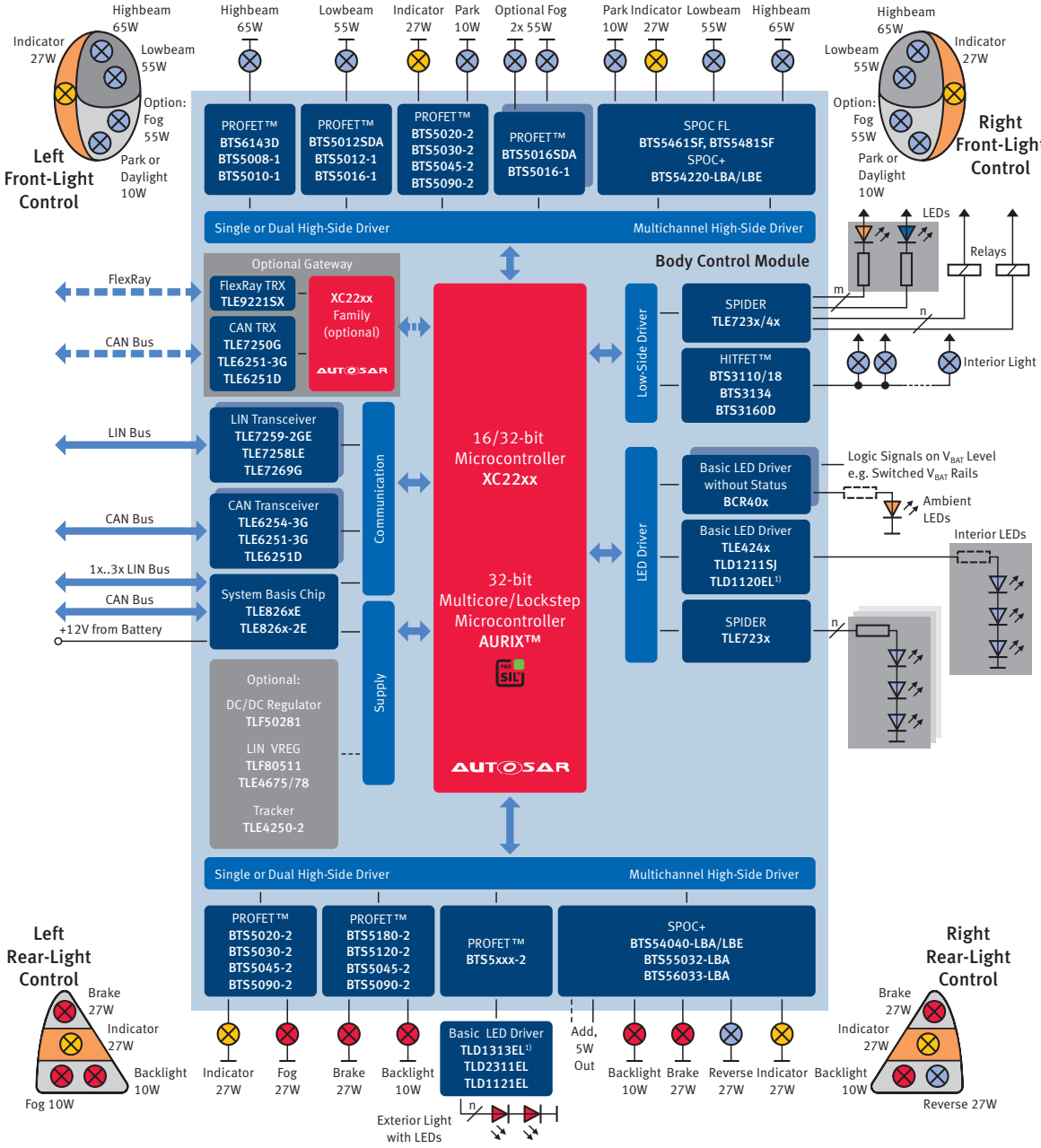
We meet all requirements for cost-effective application solutions



Content

Body Applications

Body Control Module

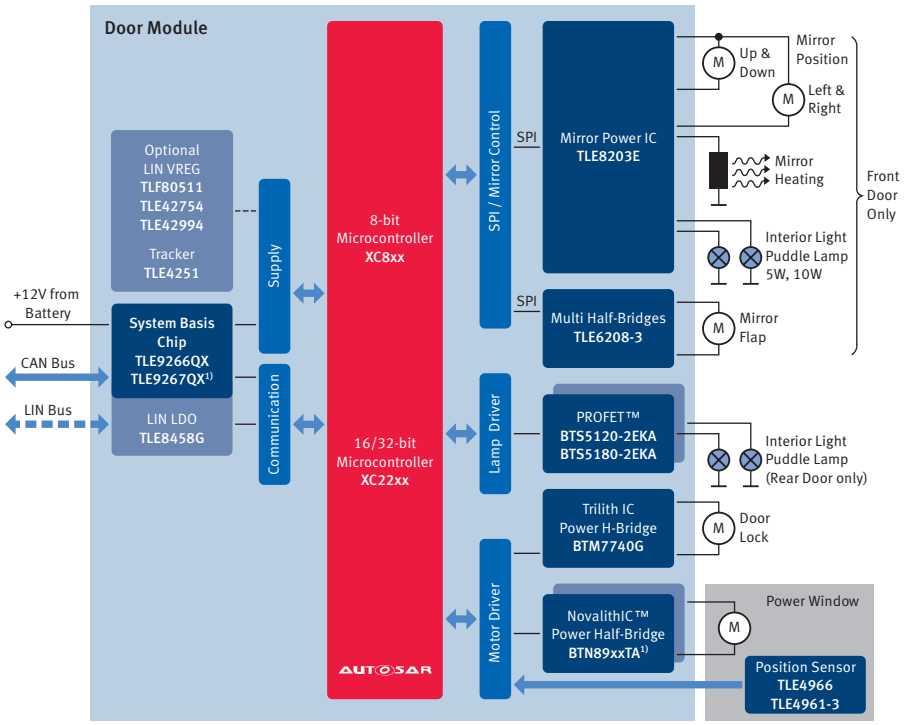


System Benefits

- Reduced board space due to integrated functionality
- Protected load control with sophisticated diagnostic features
- Supports the “Limp Home” functional safety concept
- High scalability and benchmark short-circuit robustness of power semiconductors (PROFET™)
- Supports a smooth transition to LEDs for interior and exterior lighting

1) Coming soon, Q1/2014

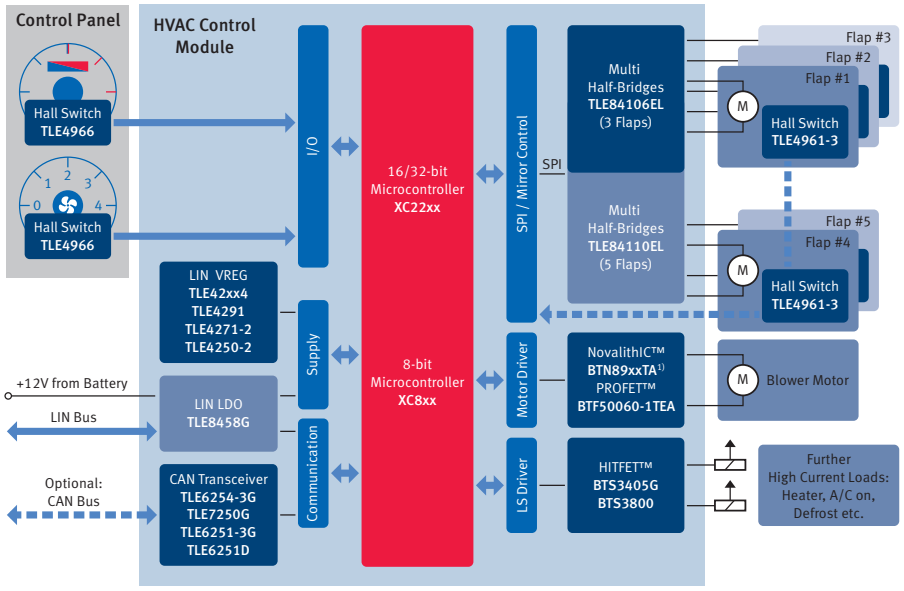
Full Featured Door Module including Door Lock and Mirror Control



System Benefits

- Energy-saving mode with second power domain for cyclic wake-up
- Motor drive modules CCU6
- Highly flexible serial interfaces (USIC), suitable as LIN, SPI, IIC, UART, IIS
- Fully scalable over package and memory
- High-performance CPU for ripple count algorithm
- High-speed ADC: 650ns conversion cycle

HVAC Control Module Low to Mid-End/Manual + Semi-Automatic



System Benefits

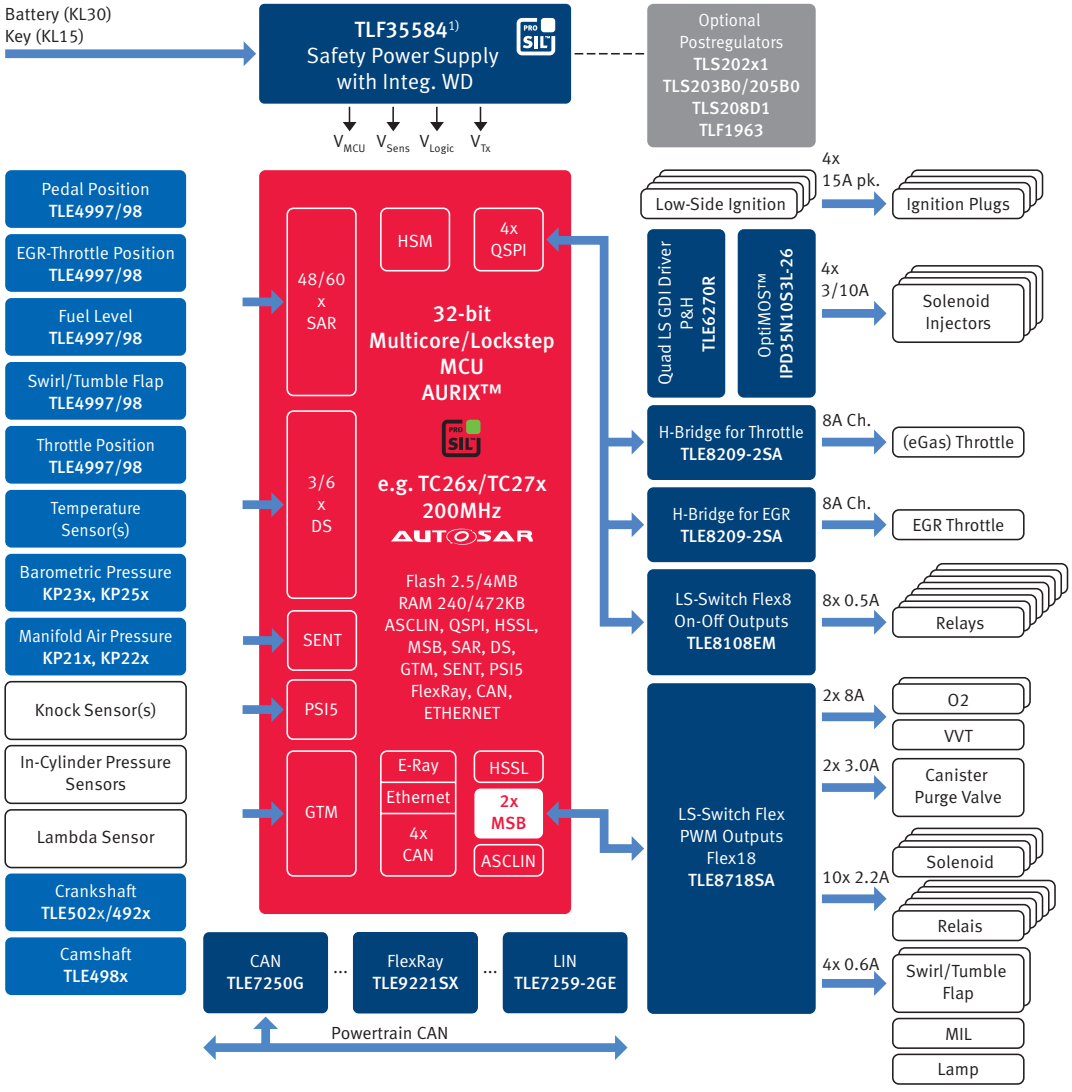
- High-performance, scalable microcontroller family for various classes of HVAC control algorithms
- Dedicated multi half-bridge devices for flap motor control with potentiometer feedback
- Powerful half-bridge devices (NovalithIC™) with high-frequency PWM capability for the blower control

1) In development

Powertrain Applications

Gasoline Engine Management

Engine Management – Typical Partitioning for GDI Discrete & Solenoid

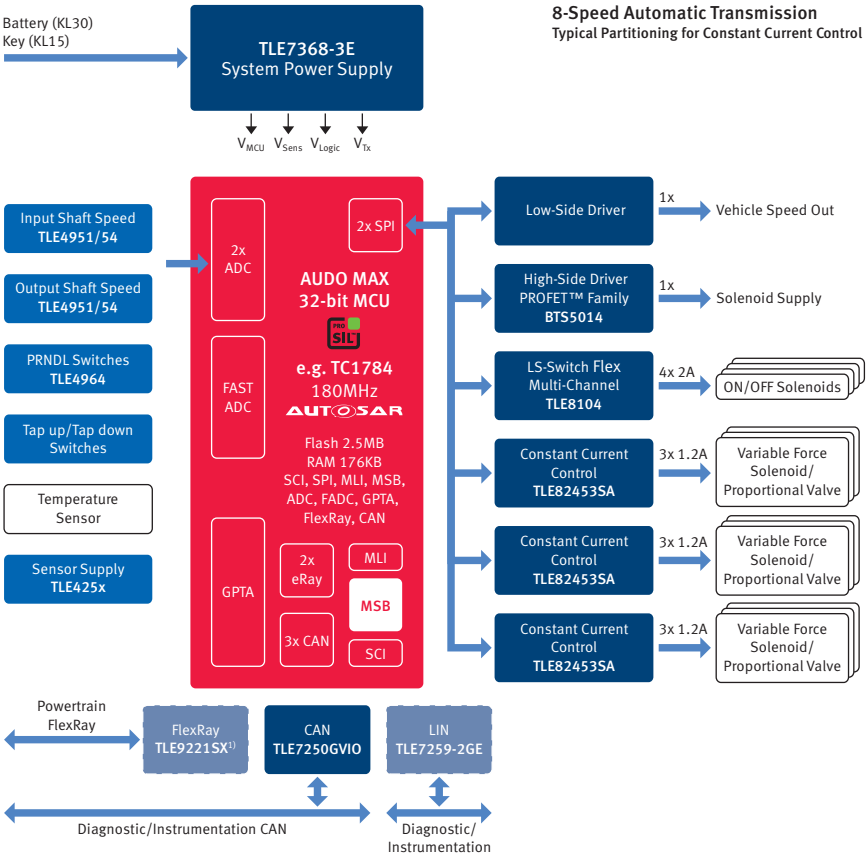


System Benefits

- Flexible and scalable product portfolio tailored to the performance and real-time needs of the premium and value segment
- Conforming with the latest emission legislation at the highest possible fuel efficiency and maximum driving pleasure (e.g. reduces fuel consumption by 20% from 160g to 128g CO_2/km)
- Benchmark-setting real-time performance facilitates down-sizing, direct injection, turbo charging and highly-efficient after-treatment
- New sensor families provide enhanced measurement precision (e.g. ignition control, misfire detection)

1) In development

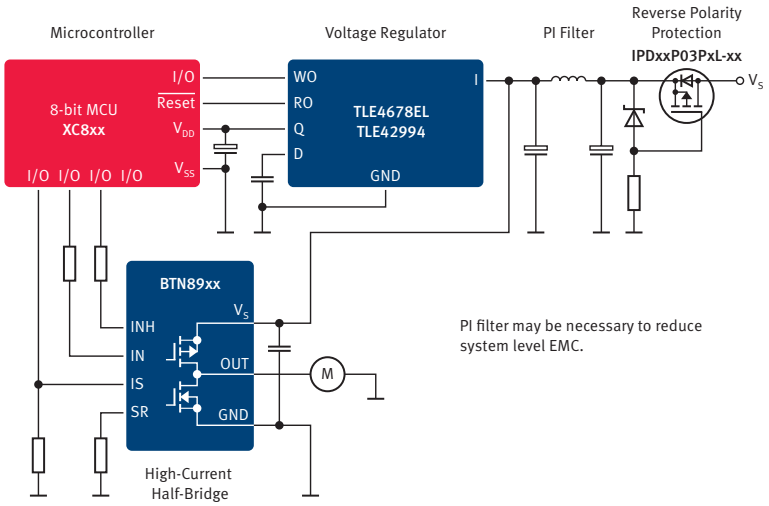
Automatic Transmission – Hydraulic Control



System Benefits

- Full range of products ranging from voltage regulators, transceivers, sensors, microcontrollers and smart power drivers
- Valve actuator ICs supporting highest precision current control
- Optimized sensors providing enhanced disturbance immunity (e.g. vibration) and direction detection
- High-temperature bare die IC supporting integrated transmission control up to the highest torque rates
- Reduces fuel consumption compared to manual transmission (e.g. by 2% from 160g to 156.8g CO_2/km)

Fuel Pump

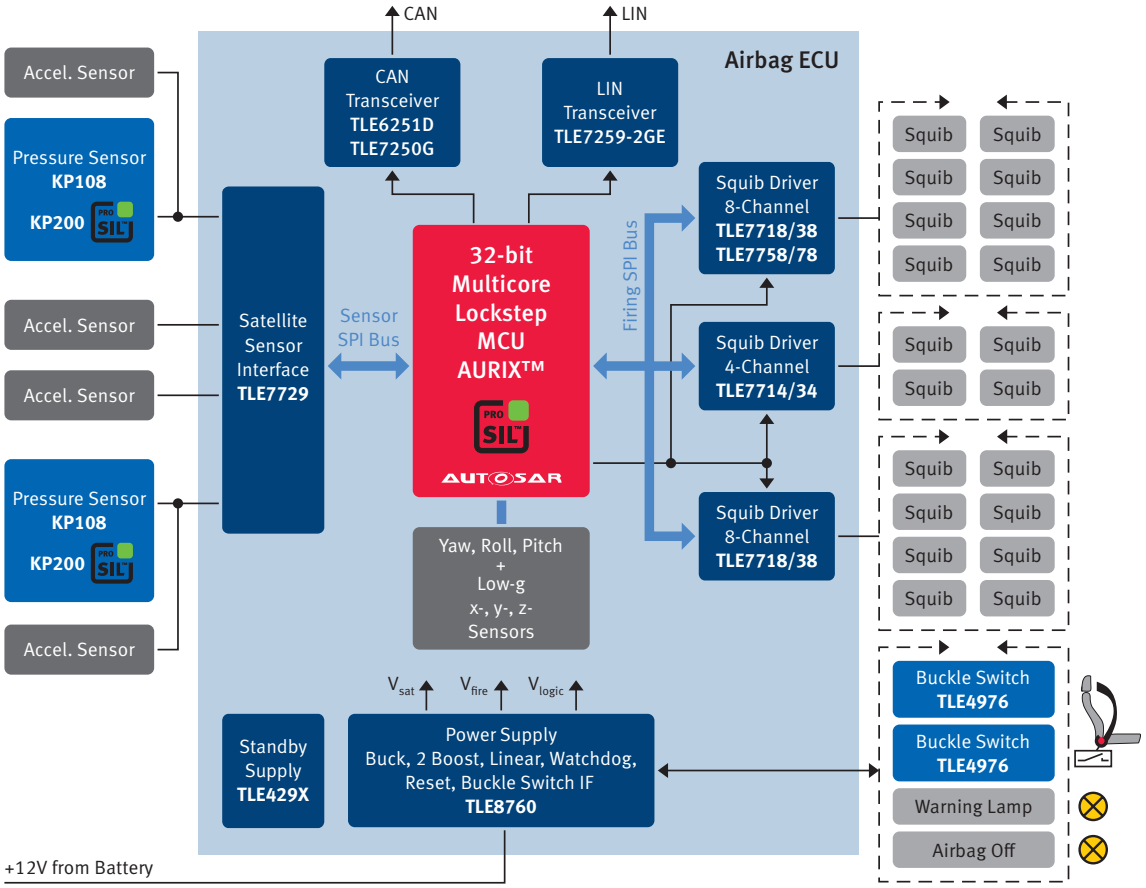


System Benefits

- Runs at full speed only when necessary
- Power consumption reduced by 40% on average
- Lower hydrocarbon emissions
- Increased lifetime

Safety Applications

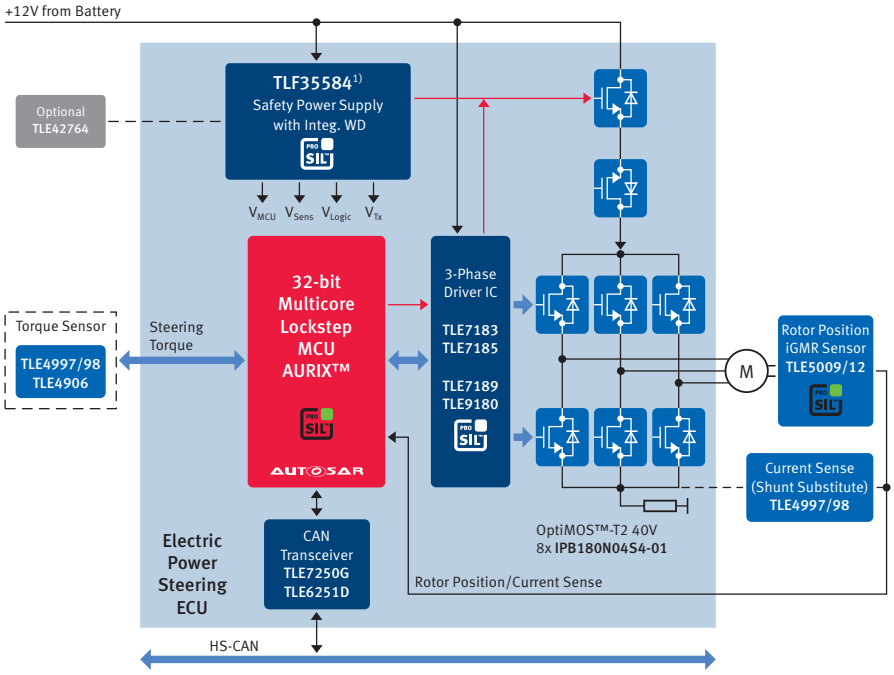
Airbag System (Advanced)



System Benefits

- Infineon's broad product spectrum supports scalability and flexibility for building systems with 4 up to more than 20 firing loops
- Full range of airbag ASSPs ranging from pressure sensors for side crash detection to driver and transceiver ICs
- 16/32-bit microcontrollers with dedicated safety functions
- The parts are optimized in terms of system interoperability as well as best price/performance in this extremely price-sensitive application

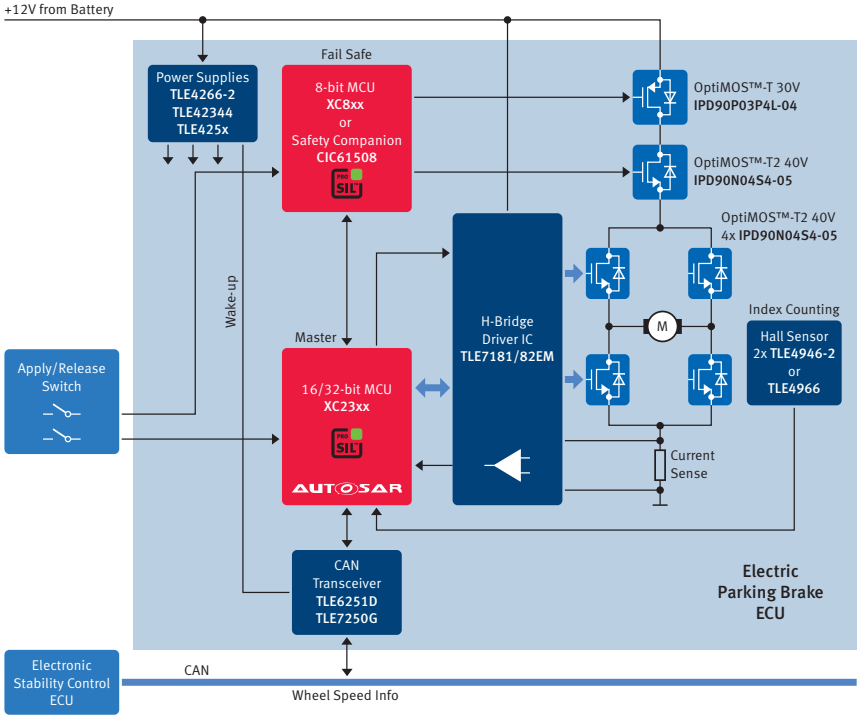
Electric Power Steering (EPS)



System Benefits

- EPS increases fuel efficiency by approximately 3% while improving car handling and the driving experience
- These EPS systems combine a compact design and reduced mounting costs with the ability to be adapted by software to suit diverse car models as well as dedicated driving modes
- EPS is the steering technology needed to enable advanced driver assist systems such as side-wind compensation, lane assist/keeping and parking aid assist systems
- Infineon has over ten years of experience in this exciting application and provides the full range of ICs, from sensor to microcontroller, from bridge driver to world-class MOSFETs

Electric Parking Brake



System Benefits

- The electric parking brake provides much more comfort and convenience features to drivers than the standard mechanical system
- Hill hold, launch control, roll-away prevention
- These convenience features are also safety-relevant, so they must be implemented using safety-capable hardware (according ISO26262)
- With its CIC61508 safety watchdog IC, Infineon offers a broad range of SIL-supporting functions to enable system designs that have to meet the new SIL and ASIL challenges

1) In development

Automotive MOSFETs

Infineon OptiMOS™ – Benchmark for Automotive MOSFETs

OptiMOS™ Products are Best in Class

OptiMOS™ superior performance is based on Infineon's leading MOSFET technology combined with the unsurpassed quality of robust package:

- Best in class $R_{DS(on)}$ performance for increased system efficiency
- Lowest switching and conduction power losses for increased thermal system reliability
- Robust green package for easy process handling

OptiMOS™-T2 Product Family

OptiMOS™-T2 trench technology is the benchmark for applications in energy efficiency, CO_2 reduction, electric drives, etc.. The OptiMOS™-T2 product family extends the existing families of OptiMOS™-T and OptiMOS™.

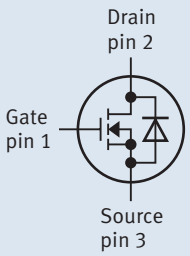
OptiMOS™ Robust Green Package

OptiMOS™ robust package is the benchmark for quality and reliability. Robust package sustains 260°C GREEN reflow processes at MSL1 combined with automotive qualification. No special handling or dry-pack is needed. All green packages are in compliance with RoHS/WEEE guidelines.

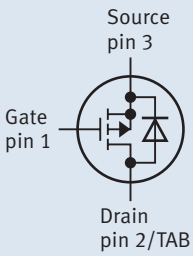
AEC Qualified

RoHS

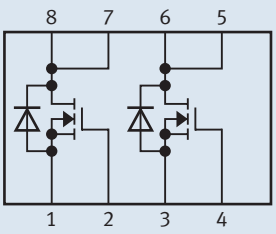
N-Channel



P-Channel



Dual Channel



	Voltage Class [V]	OptiMOS™-T2 (Trench)	OptiMOS™-T (Trench)	OptiMOS™ (Planar)
Single MOSFET				
N-Channel	30	●		●
N-Channel	40	●	●	●
N-Channel	55			●
N-Channel	60	●		
N-Channel	75			●
N-Channel	100		●	
P-Channel	30	●		
P-Channel	40	●		
Dual MOSFET				
Dual N-Channel *NEW!*	2 x 40	●		
Dual N-Channel	2 x 55			●
Dual N-Channel *NEW!*	2 x 60	●		
Dual N-Channel *NEW!*	2 x 100	●		

www.infineon.com/automotivemosfet

Naming System

I	P	B	180	N	03	S4	L	–	01

Company:
- I for Green Products
- S for Non-Green Products

Device:
- P for Power-MOSFET

Package Type:
- G for Dual SuperSO8
- P for TO220
- B for D²PAK (TO263)
- D for DPAK (TO252)
- I for I²PAK (TO262)

Continuous Drain Current/$I_{D(max.)}$

- P for P-Channel
- N for N-Channel

Breakdown Voltage Divided by 10

- S for SIPMOS™ Planar N-Channel
- S2 for OptiMOS™ Planar N-Channel
- S3 for OptiMOS™-T Trench N-Channel
- S4 for OptiMOS™-T2 Trench N-Channel
- P4 for OptiMOS™-T2 Trench P-Channel

- L for Logic Level

$R_{DS(on)}$ in mΩ

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Automotive N-Channel MOSFETs

OptiMOS™ 30V (Planar)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD50N03S2L-06	6.4	50	1.1	1.2 ... 2.0	50	㉝
IPD30N03S2L-07	6.7	30	1.1	1.2 ... 2.0	51	㉝
IPD50N03S2-07	7.3	50	1.1	2.1 ... 4.0	52	㉝
IPD30N03S2L-10	10.0	30	1.5	1.2 ... 2.0	31	㉝
IPD30N03S2L-20	20.0	30	2.5	1.2 ... 2.0	14	㉝

OptiMOS™ 40V (Planar)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPB160N04S2L-03	2.7	160	0.5	1.2 ... 2.0	230	㊴
IPB160N04S2-03	2.9	160	0.5	2.1 ... 4.0	123	㊴
IPB100N04S2L-03	3.0	100	0.5	1.2 ... 2.0	170	㉟
IPB100N04S2-04	3.3	100	0.5	2.1 ... 4.0	172	㉟
IPB80N04S2L-03	3.4	80	0.5	1.2 ... 2.0	170	㉟
IPB80N04S2-04	3.4	80	0.5	2.1 ... 4.0	127	㉟
IPB80N04S2-H4	3.7	80	0.5	2.1 ... 4.0	103	㉟
IPI80N04S2-04	3.7	80	0.5	2.1 ... 4.0	170	㊾
IPI80N04S2-H4	4.0	80	0.5	2.1 ... 4.0	148	㊾
IPP100N04S2L-03	3.3	100	0.5	1.2 ... 2.0	163	㊶
IPP80N04S2L-03	3.4	80	0.5	1.2 ... 2.0	163	㊶
IPP100N04S2-04	3.6	100	0.5	2.1 ... 4.0	172	㊶
IPP80N04S2-04	3.7	80	0.5	2.1 ... 4.0	127	㊶
IPP80N04S2-H4	4.0	80	0.5	2.1 ... 4.0	103	㊶

OptiMOS™ 55V (Planar)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD50N06S2L-13	12.7	50	1.1	1.2 ... 2.0	52	㉝
IPD30N06S2L-13	13.0	30	1.1	1.2 ... 2.0	52	㉝
IPD50N06S2-14	14.4	50	1.1	2.1 ... 4.0	39	㉝
IPD30N06S2-15	14.7	30	1.1	1.2 ... 2.0	39	㉝
IPD30N06S2L-23	23.0	30	1.5	1.2 ... 2.0	33	㉝
IPD30N06S2-23	23.0	30	1.5	2.1 ... 4.0	25	㉝
IPD26N06S2L-35	35.0	30	2.2	1.2 ... 2.0	10	㉝
IPD25N06S2-40	40.0	29	2.2	2.1 ... 4.0	14	㉝
IPD15N06S2L-64	64.0	19	3.2	1.2 ... 2.0	11	㉝
IPD14N06S2-80	80.0	17	3.2	2.1 ... 4.0	8	㉝
IPB100N06S2L-05	4.4	100	0.5	1.2 ... 2.0	170	㉟
IPB80N06S2L-05	4.5	80	0.5	1.2 ... 2.0	170	㉟
IPB100N06S2-05	4.7	100	0.5	2.1 ... 4.0	130	㉟
IPB80N06S2L-H5	4.7	80	0.5	1.2 ... 2.0	145	㉟
IPB80N06S2-05	4.8	80	0.5	2.1 ... 4.0	130	㉟
IPB80N06S2-H5	5.2	80	0.5	2.1 ... 4.0	116	㉟
IPB80N06S2L-06	6.0	80	0.6	1.2 ... 2.0	114	㉟
IPB80N06S2-07	6.3	80	0.6	2.1 ... 4.0	86	㉟
IPB80N06S2L-07	6.7	80	0.7	1.2 ... 2.0	95	㉟
IPB80N06S2-08	7.7	80	0.7	2.1 ... 4.0	72	㉟

1) See packages on page 100

OptiMOS™ 55V (Planar) (cont'd)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPB80N06S2L-09	8.2	80	0.8	1.2 ... 2.0	82	35
IPB80N06S2-09	8.8	80	0.8	2.1 ... 4.0	60	35
IPB80N06S2L-11	10.7	80	0.95	1.2 ... 2.0	62	35
IPB77N06S2-12	11.7	77	0.95	2.1 ... 4.0	45	35
IPI80N06S2L-05	4.8	80	0.5	1.2 ... 2.0	170	59
IPI80N06S2-07	6.6	80	0.6	2.1 ... 4.0	86	59
IPI80N06S2-08	8.0	80	0.7	2.1 ... 4.0	72	59
IPI80N06S2L-11	11.0	80	0.95	1.2 ... 2.0	62	59
BSP603S2L	33.0	5.2	20.0	1.2 ... 2.0	31	24
IPP100N06S2L-05	4.7	100	0.5	1.2 ... 2.0	170	51
IPP80N06S2L-05	4.8	80	0.5	1.2 ... 2.0	170	51
IPP100N06S2-05	5.0	100	0.5	2.1 ... 4.0	130	51
IPP80N06S2L-H5	5.0	80	0.5	1.2 ... 2.0	145	51
IPP80N06S2-05	5.1	80	0.5	2.1 ... 4.0	130	51
IPP80N06S2-H5	5.5	80	0.5	2.1 ... 4.0	116	51
IPP80N06S2L-06	6.3	80	0.6	1.2 ... 2.0	114	51
IPP80N06S2-07	6.6	80	0.6	2.1 ... 4.0	86	51
IPP80N06S2L-07	7.0	80	0.7	1.2 ... 2.0	95	51
IPP80N06S2-08	8.0	80	0.7	2.1 ... 4.0	72	51
IPP80N06S2L-09	8.5	80	0.8	1.2 ... 2.0	82	51
IPP80N06S2-09	9.1	80	0.8	2.1 ... 4.0	60	51
IPP80N06S2L-11	11.0	80	0.95	1.2 ... 2.0	62	51
IPP77N06S2-12	12.0	77	0.95	2.1 ... 4.0	45	51

OptiMOS™ 75V (Planar)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPD30N08S2L-21	20.5	30	1.1	2.1 ... 4.0	43	33
IPD30N08S2-22	21.5	30	1.1	2.1 ... 4.0	44	33
IPD22N08S2L-50	50.0	22	2.0	1.2 ... 2.0	21	33
IPB100N08S2L-07	6.5	100	0.5	1.2 ... 2.0	185	35
IPB100N08S2-07	6.8	100	0.5	2.1 ... 4.0	153	35
IPB80N08S2L-07	6.8	80	0.5	1.2 ... 2.0	186	35
IPB80N08S2-07	7.1	80	0.5	2.1 ... 4.0	182	35
IPI100N08S2-07	7.1	100	0.5	2.1 ... 4.0	144	59
IPI80N08S2-07	7.4	80	0.5	2.1 ... 4.0	144	59
IPP100N08S2L-07	6.8	100	0.5	1.2 ... 2.0	182	51
IPP100N08S2-07	7.1	100	0.5	2.1 ... 4.0	144	59
IPP80N08S2L-07	7.1	80	0.5	1.2 ... 2.0	183	51
IPP80N08S2-07	7.4	80	0.5	2.1 ... 4.0	144	59

1) See packages on page 100

Automotive N-Channel MOSFETs

OptiMOS™-T 100V (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPB100N10S3-05	4.8	100	0.5	2.0 ... 4.0	135	㉟
IPB70N10S3-12	11.3	70	1.2	2.0 ... 4.0	51	㉟
IPB70N10S3L-12	11.8	70	1.2	1.2 ... 2.4	60	㉟
IPB50N10S3L-16	15.4	70	1.5	1.2 ... 2.4	49	㉟
IPD70N10S3-12	11.1	70	1.2	2.0 ... 4.0	51	㉝
IPD70N10S3L-12	11.5	70	1.2	1.2 ... 2.4	60	㉝
IPD50N10S3L-16	15.0	50	1.5	1.2 ... 2.4	49	㉝
IPD35N10S3L-26	24.0	35	2.1	1.2 ... 2.4	39	㉝
IPD30N10S3L-34	31.0	30	2.6	1.2 ... 2.4	24	㉝
IPI100N10S3-05	5.1	100	0.5	2.0 ... 4.0	135	㊾
IPI70N10S3-12	11.6	70	1.2	2.0 ... 4.0	51	㊾
IPI70N10S3L-12	12.1	70	1.2	1.2 ... 2.4	60	㊾
IPI50N10S3L-16	15.7	50	1.5	1.2 ... 2.4	49	㊾
IPP100N10S3-05	5.1	100	0.5	2.0 ... 4.0	135	㊶
IPP70N10S3-12	12.1	70	1.2	2.0 ... 4.0	51	㊶
IPP70N10S3L-12	12.1	70	1.2	1.2 ... 2.4	60	㊶
IPP50N10S3L-16	15.7	50	1.5	1.2 ... 2.4	49	㊶

OptiMOS™-T2 30V (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPD90N03S4L-02	2.2	90	1.1	1.0 ... 2.2	110	㉝
IPD90N03S4L-03	3.3	90	1.6	1.0 ... 2.2	60	㉝
IPD70N03S4L-04	4.3	70	2.2	1.0 ... 2.2	37	㉝
IPD50N03S4L-06	5.5	50	2.7	1.0 ... 2.2	24	㉝
IPD40N03S4L-08	8.0	40	3.6	1.0 ... 2.2	15	㉝
IPD30N03S4L-09	9.0	30	3.6	1.0 ... 2.2	15	㉝
IPD30N03S4L-14	13.6	30	4.9	1.0 ... 2.2	11	㉝
IPB180N03S4L-H0	0.95	180	0.6	1.0 ... 2.2	230	㊴
IPB180N03S4L-01	1.05	180	0.8	1.0 ... 2.2	187	㊴
IPB80N03S4L-02	2.4	80	1.1	1.0 ... 2.2	110	㉟
IPB80N03S4L-03	3.4	80	1.6	1.0 ... 2.2	60	㉟
IPB22N03S4L-15	14.6	22	4.9	1.0 ... 2.2	11	㉟
IPI80N03S4L-03	2.7	80	1.1	1.0 ... 2.2	110	㊾
IPI80N03S4L-04	3.6	80	1.6	1.0 ... 2.2	60	㊾
IPI22N03S4L-15	14.9	22	4.9	1.0 ... 2.2	11	㊾
IPP80N03S4L-03	2.7	80	1.1	1.0 ... 2.2	110	㊶
IPP80N03S4L-04	3.7	80	1.6	1.0 ... 2.2	60	㊶
IPP22N03S4L-15	14.9	22	4.9	1.0 ... 2.2	11	㊶

1) See packages on page 100

OptiMOS™-T2 40V (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD100N04S4-02	2.0	100	1.0	2.0 ... 4.0	91.0	㉝
IPD90N04S4-02	2.4	90	1.0	2.0 ... 4.0	91.0	㉝
IPD90N04S4-03	3.2	90	1.6	2.0 ... 4.0	51.0	㉝
IPD90N04S4L-04	3.8	90	2.1	1.2 ... 2.0	46.0	㉝
IPD90N04S4-04	4.1	90	2.1	2.0 ... 4.0	33.0	㉝
IPD90N04S4-05	5.2	90	2.3	2.0 ... 4.0	33.0	㉝
IPD75N04S4-06	5.9	75	2.6	2.0 ... 4.0	24.5	㉝
IPD50N04S4L-08	7.3	50	3.3	1.2 ... 2.0	23.0	㉝
IPD50N04S4-08	7.9	50	3.3	2.0 ... 4.0	17.2	㉝
IPD50N04S4-10	9.3	50	3.7	2.0 ... 4.0	14.0	㉝
IPB180N04S4-00	0.98	180	0.5	2.0 ... 4.0	220.0	㊴
IPB180N04S4-H0	1.1	180	0.6	2.0 ... 4.0	173.0	㊴
IPB180N04S4-01	1.3	180	0.8	2.0 ... 4.0	135.0	㊴
IPB120N04S4-01	1.5	120	0.8	2.0 ... 4.0	135.0	㉟
IPB160N04S4-H1	1.6	160	0.9	2.0 ... 4.0	105.0	㊴
IPB120N04S4-02	1.8	120	0.95	2.0 ... 4.0	103.0	㉟
IPB90N04S4-02	2.1	90	1.0	2.0 ... 4.0	91.0	㉟
IPB100N04S4-H2	2.4	100	1.3	2.0 ... 4.0	70.0	㉟
IPB80N04S4-03	3.3	80	1.6	2.0 ... 4.0	51.0	㉟
IPB80N04S4L-04	4.0	80	2.1	1.2 ... 2.0	46.0	㉟
IPB80N04S4-04	4.2	80	2.1	2.0 ... 4.0	33.0	㉟
IPB70N04S4-06	6.2	70	2.6	2.0 ... 4.0	24.5	㉟
IPB45N04S4L-08	7.6	45	3.3	1.2 ... 2.0	23.0	㉟
IPI120N04S4-01	1.9	120	0.8	2.0 ... 4.0	135.0	㊾
IPI120N04S4-02	2.1	120	0.95	2.0 ... 4.0	103.0	㊾
IPI90N04S4-02	2.5	90	1.0	2.0 ... 4.0	91.0	㊾
IPI100N04S4-H2	2.7	100	1.3	2.0 ... 4.0	70.0	㊾
IPI80N04S4-03	3.7	80	1.6	2.0 ... 4.0	51.0	㊾
IPI80N04S4L-04	4.3	80	2.1	1.2 ... 2.0	46.0	㊾
IPI80N04S4-04	4.6	80	2.1	2.0 ... 4.0	33.0	㊾
IPI70N04S4-06	6.5	70	2.6	2.0 ... 4.0	24.5	㊾
IPP120N04S4-01	1.9	120	0.8	2.0 ... 4.0	135.0	㊶
IPP120N04S4-02	2.1	120	0.95	2.0 ... 4.0	103.0	㊶
IPP90N04S4-02	2.5	90	1.0	2.0 ... 4.0	91.0	㊶
IPP100N04S4-H2	2.7	100	1.3	2.0 ... 4.0	70.0	㊶
IPP80N04S4-03	3.7	80	1.6	2.0 ... 4.0	51.0	㊶
IPP80N04S4L-04	4.3	80	2.1	1.2 ... 2.0	46.0	㊶
IPP80N04S4-04	4.6	80	2.1	2.0 ... 4.0	33.0	㊶
IPP70N04S4-06	6.5	70	2.6	2.0 ... 4.0	24.5	㊶

1) See packages on page 100

Automotive N-Channel MOSFETs

OptiMOS™-T2 60V (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD100N06S4-03	3.5	100	1.0	2.0 ... 4.0	99.0	㉝
IPD90N06S4L-03	3.5	90	1.0	1.2 ... 2.0	133.0	㉝
IPD90N06S4-04	3.8	90	1.0	2.0 ... 4.0	99.0	㉝
IPD90N06S4L-05	4.6	90	1.4	1.2 ... 2.0	83.0	㉝
IPD90N06S4-05	5.1	90	1.4	2.0 ... 4.0	62.0	㉝
IPD90N06S4L-06	6.3	90	1.9	1.2 ... 2.0	58.0	㉝
IPD90N06S4-07	6.9	90	1.9	2.0 ... 4.0	43.0	㉝
IPD50N06S4L-08	7.8	50	2.1	1.2 ... 2.0	49.0	㉝
IPD50N06S4-09	9.0	50	2.1	2.0 ... 4.0	36.0	㉝
IPD50N06S4L-12	12.0	50	3.0	1.2 ... 2.0	30.0	㉝
IPD30N06S4L-23	23.0	30	4.2	1.2 ... 2.0	16.1	㉝
IPD25N06S4L-30	30.0	25	5.1	1.2 ... 2.0	12.5	㉝
IPB180N06S4-H1	1.7	180	0.6	2.0 ... 4.0	208	㊴
IPB120N06S4-H1	2.0	120	0.6	2.0 ... 4.0	208	㉟
IPB120N06S4-02	2.4	120	0.8	2.0 ... 4.0	150	㉟
IPB120N06S4-03	2.8	120	0.9	2.0 ... 4.0	125	㉟
IPB90N06S4L-04	3.4	90	1.0	1.2 ... 2.0	133	㉟
IPB90N06S4-04	3.7	90	1.0	2.0 ... 4.0	99	㉟
IPB80N06S4L-05	4.8	80	1.4	1.2 ... 2.0	83	㉟
IPB80N06S4-05	5.4	80	1.4	2.0 ... 4.0	62	㉟
IPB80N06S4-07	5.4	80	1.4	2.0 ... 4.0	62	㉟
IPB80N06S4L-07	6.4	80	1.9	1.2 ... 2.0	58	㉟
IPB45N06S4L-08	7.9	45	2.1	1.2 ... 2.0	49	㉟
IPB45N06S4-09	9.1	45	2.1	2.0 ... 4.0	36	㉟
IPI120N06S4-H1	2.4	120	0.6	2.0 ... 4.0	208	㊾
IPI120N06S4-02	2.8	120	0.8	2.0 ... 4.0	150	㊾
IPI120N06S4-03	3.2	120	0.9	2.0 ... 4.0	125	㊾
IPI90N06S4L-04	3.4	90	1.0	1.2 ... 2.0	133	㊾
IPI90N06S4-04	4.0	90	1.0	2.0 ... 4.0	99	㊾
IPI80N06S4L-05	4.8	80	1.4	1.2 ... 2.0	83	㊾
IPI80N06S4-05	5.4	80	1.4	2.0 ... 4.0	62	㊾
IPI80N06S4L-07	6.4	80	1.9	1.2 ... 2.0	58	㊾
IPI80N06S4-07	7.1	80	1.9	2.0 ... 4.0	43	㊾
IPI45N06S4L-08	8.2	45	2.1	1.2 ... 2.0	49	㊾
IPI45N06S4-09	9.1	45	2.1	2.0 ... 4.0	36	㊾
IPP120N06S4-H1	2.4	120	0.6	2.0 ... 4.0	208	㊶
IPP120N06S4-02	2.8	120	0.8	2.0 ... 4.0	150	㊶
IPP120N06S4-03	3.2	120	0.9	2.0 ... 4.0	125	㊶
IPP90N06S4L-04	3.4	90	1.0	1.2 ... 2.0	133	㊶
IPP90N06S4-04	3.7	90	1.0	2.0 ... 4.0	99	㊶
IPP80N06S4L-05	4.8	80	1.4	1.2 ... 2.0	83	㊶
IPP80N06S4-05	5.4	80	1.4	2.0 ... 4.0	62	㊶
IPP80N06S4L-07	6.4	80	1.9	1.2 ... 2.0	58	㊶
IPP80N06S4-07	7.1	80	1.9	2.0 ... 4.0	43	㊶
IPP45N06S4L-08	8.2	45	2.1	1.2 ... 2.0	49	㊶
IPP45N06S4-09	9.1	45	2.1	2.0 ... 4.0	36	㊶

1) See packages on page 100

OptiMOS™-T2 100V (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD90N10S4L-06	6.6	90	1.1	1.1 ... 2.1	75	㉝
IPD60N10S4L-12	12.0	60	1.6	1.1 ... 2.1	38	㉝
IPB180N10S4-02	2.5	180	0.5	2.0 ... 3.5	156	㊴

Automotive P-Channel MOSFETs

OptiMOS™-T2 30V P-Channel (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPD90P03P4L-04	4.5	-90	1.1	-2.0 ... -1.0	100	㉝
IPD90P03P4-04	4.5	-90	1.1	-4.0 ... -2.0	100	㉝
IPD80P03P4L-07	6.8	-80	1.7	-2.0 ... -1.0	80	㉝
IPD50P03P4L-11	10.5	-50	2.6	-2.0 ... -1.0	42	㉝
IPB80P03P4L-04	4.1	-80	1.1	-2.0 ... -1.0	125	㉟
IPB80P03P4-05	4.7	-80	1.1	-4.0 ... -2.0	100	㉟
IPB80P03P4L-07	6.9	-80	1.7	-2.0 ... -1.0	63	㉟
IPB45P03P4L-11	10.8	-45	2.6	-2.0 ... -1.0	42	㉟
IPI80P03P4L-04	4.4	-80	1.1	-2.0 ... -1.0	125	㊾
IPI80P03P4L-07	7.2	-80	1.7	-2.0 ... -1.0	63	㊾
IPI45P03P4L-11	11.1	-45	2.6	-2.0 ... -1.0	42	㊾
IPP80P03P4L-04	4.4	-80	1.1	-2.0 ... -1.0	125	㊶
IPP80P03P4L-07	7.2	-80	1.7	-2.0 ... -1.0	63	㊶
IPP45P03P4L-11	11.1	-45	2.6	-2.0 ... -1.0	42	㊶

1) See packages on page 100

Automotive P-Channel MOSFETs

OptiMOS™-P2 40V P-Channel (Trench)

Product Type	$R_{DS(on)}$ [mΩ]	I_D [A]	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1)]
IPB180P04P4L-02	2.4	-100	1.0	-2.2 ... -1.7	220	㊴
IPB180P04P4-03	2.8	-100	1.0	-4.0 ... -2.0	190	㉟
IPB120P04P4L-03	3.0	-120	1.1	-2.2 ... -1.7	180	㉟
IPB120P04P4-04	3.6	-120	1.1	-4.0 ... -2.0	158	㉟
IPB80P04P4L-04	4.2	-90	1.2	-2.2 ... -1.7	135	㉟
IPB80P04P4-05	4.9	-80	1.2	-4.0 ... -2.0	118	㉟
IPB80P04P4L-06	6.4	-80	1.7	-2.2 ... -1.7	71	㉟
IPB80P04P4-07	7.3	-80	1.7	-4.0 ... -2.0	71	㉟
IPB70P04P4L-08	7.5	-70	2.0	-2.2 ... -1.7	63	㉟
IPB70P04P4-09	9.3	-70	2.0	-4.0 ... -2.0	54	㉟
IPD90P04P4L-04	4.3	-90	1.2	-2.2 ... -1.7	135	㉝
IPD90P04P4-05	4.7	-90	1.2	-4.0 ... -2.0	118	㉝
IPD85P04P4L-06	6.4	-85	1.7	-2.2 ... -1.7	80	㉝
IPD85P04P4-07	7.3	-85	1.7	-4.0 ... -2.0	69	㉝
IPD70P04P4L-08	7.8	-70	2.0	-2.2 ... -1.7	63	㉝
IPD70P04P4-09	8.9	-70	2.0	-4.0 ... -2.0	54	㉝
IPD50P04P4L-11	10.6	-50	2.6	-2.2 ... -1.7	45	㉝
IPD50P04P4-13	12.7	-50	2.6	-4.0 ... -2.0	39	㉝
IPP120P04P4L-03	3.4	-120	1.1	-2.2 ... -1.7	180	㊶
IPP120P04P4-04	3.9	-120	1.1	-4.0 ... -2.0	158	㊶
IPP80P04P4L-04	4.7	-80	1.2	-2.2 ... -1.7	16	㊶
IPP80P04P4-05	5.2	-80	1.2	-4.0 ... -2.0	14	㊶
IPP80P04P4L-06	6.7	-80	1.7	-2.2 ... -1.7	71	㊶
IPP80P04P4-07	7.6	-80	1.7	-4.0 ... -2.0	71	㊶
IPP70P04P4L-08	8.2	-70	2.0	-2.2 ... -1.7	63	㊶
IPP70P04P4-09	9.4	-70	2.0	-4.0 ... -2.0	54	㊶
IPI120P04P4L-03	3.4	-120	1.1	-2.2 ... -1.7	180	㊾
IPI120P04P4-04	3.9	-120	1.1	-4.0 ... -2.0	135	㊾
IPI80P04P4L-04	4.7	-80	1.2	-2.2 ... -1.7	16	㊾
IPI80P04P4-05	5.2	-80	1.2	-4.0 ... -2.0	14	㊾
IPI80P04P4L-06	6.7	-80	1.7	-2.2 ... -1.7	71	㊾
IPI80P04P4-07	7.6	-80	1.7	-4.0 ... -2.0	71	㊾
IPI70P04P4L-08	8.2	-70	2.0	-2.2 ... -1.7	63	㊾
IPI70P04P4-09	9.4	-70	2.0	-4.0 ... -2.0	54	㊾

1) See packages on page 100

Automotive Dual MOSFETs

OptiMOS™ Dual N-Channel 55V

Automotive MOSFETs in Dual SuperS08

Product Type	$R_{DS(on)}$ (max) @ 10V [mΩ]/channel	I_D [A]/channel	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Package[1]
IPG20N06S2L-35	2 x 35.0	20	2.3	1.2 ... 2.2	18.0	㉜
IPG20N06S2L-50	2 x 50.0	20	2.9	1.2 ... 2.2	12.4	㉜
IPG20N06S2L-65	2 x 65.0	20	3.5	1.2 ... 2.2	10.0	㉜

OptiMOS™-T2 Dual N-Channel 40V

Automotive MOSFETs in Dual SuperS08

Product Type	$R_{DS(on)}$ (max) @ 10V [mΩ]/channel	I_D [A]/channel	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Package[1]
IPG20N04S4-08	2 x 7.5	20	2.3	2.0 ... 4.0	28.0	㉜
IPG20N04S4-09	2 x 8.6	20	2.8	2.0 ... 4.0	21.7	㉜
IPG20N04S4-12	2 x 12.2	20	3.7	2.0 ... 4.0	14.0	㉜
IPG20N04S4L-07	2 x 7.2	20	2.3	1.2 ... 2.2	39.0	㉜
IPG20N04S4L-08	2 x 8.1	20	2.8	1.2 ... 2.2	30.0	㉜
IPG20N04S4L-11	2 x 11.6	20	3.7	1.2 ... 2.2	20.0	㉜

OptiMOS™-T2 Dual N-Channel 60V

Automotive MOSFETs in Dual SuperS08

Product Type	$R_{DS(on)}$ (max) @ 10V [mΩ]/channel	I_D [A]/channel	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPG20N06S4-15	2 x 15.5	20	3.0	2.0 ... 4.0	22	㉜
IPG20N06S4L-11	2 x 11.1	20	2.3	1.2 ... 2.2	41	㉜
IPG20N06S4L-14	2 x 13.7	20	3.0	1.2 ... 2.2	30	㉜
IPG20N06S4L-26	2 x 26.0	20	4.5	1.2 ... 2.2	20	㉜

OptiMOS™-T2 Dual N-Channel 100V

Automotive MOSFETs in Dual SuperS08

Product Type	$R_{DS(on)}$ (max) @ 10V [mΩ]/channel	I_D [A]/channel	R_{thJC} (max) [K/W]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
IPG20N10S4L-22	2 x 22.0	20	2.5	1.1 ... 2.1	21.0	㉜
IPG20N10S4L-35	2 x 35.0	20	3.5	1.1 ... 2.1	13.4	㉜
IPG16N10S4-61	2 x 61.0	16	5.2	2.0 ... 3.5	5.4	㉜

1) See packages on page 100

Small Signal MOSFETs

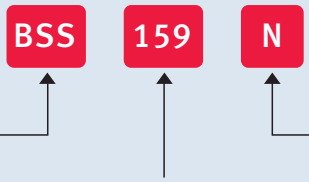
Infineon offers a full range of Small Signal MOSFETs qualified according AEC Q101.

The portfolio includes:

- Polarity: N-Channel enhancement, N-Channel depletion and P-Channel MOSFETs
- Voltage classes: -250 ... 800V
- V_{GS} rating: 10V(Normal Level), 4.5V (Logic Level), 2.5V (Super Logic Level), 1.8V (Ultra Logic Level)
- Packages: SOT-223, SOT-89, TSOP-6 (single and dual), SC-59, SOT-23, SOT-323, SOT-363 (single and dual)
- Configuration: single, dual, complementary (n+p pairs)
- Additional features: the products with names ending by "E" have an integrated ESD protection

SC-59 is and enhanced version of the SOT-23: it's footprint compatible with SOT-23, but allows a bigger chip inside, therefore a lower $R_{DS(on)}$.

Naming System



Package Type
BSD/V for SOT-363
BSL for TSOP-6
BSP for SOT-223
BSR for SC-59
BSS for SOT-23, SOT-89
BSS...W for SOT-323
SN for SOT-23, SOT-323

Sequential Number
3 or 4 digits

Additional Information
0 – 3 digits
N = N-Channel
P = P-Channel
C = Complementary
W = SOT-323
S = Single
S2L = OptiMOS™
E = ESD Protection

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www.infineon.com/pchannel
www.infineon.com/depletion

N-Channel MOSFETs

Voltage	Product Type	$R_{DS(on)}$ (max) [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Technology	Package[1]
20V	BSL802SN	–	7.5	0.3 ... 0.75	4.7	OptiMOS™2	㊻
	BSL202SN	–	7.5	0.7 ... 1.2	5.8	OptiMOS™2	㊻
	BSL205N	–	2.5	0.7 ... 1.2	2.1	OptiMOS™2	㊻ (dual)
	BSL214N	–	1.5	0.7 ... 1.2	0.8	OptiMOS™2	㊻ (dual)
	BSL207N	–	2.1	0.7 ... 1.2	2.1	OptiMOS™2	㊻ (dual)
	BSL806N	–	2.3	0.3 ... 0.75	1.7	OptiMOS™2	㊻ (dual)
	BSR202N	–	3.8	0.7 ... 1.2	5.8	OptiMOS™2	⑱
	BSR802N	–	3.7	0.3 ... 0.75	4.7	OptiMOS™2	⑱
	BSS205N	–	2.5	0.7 ... 1.2	2.1	OptiMOS™2	㉑
	BSS214N	–	1.5	0.7 ... 1.2	0.8	OptiMOS™2	㉑
	BSS806N	–	2.3	0.3 ... 0.75	1.7	OptiMOS™2	㉑
	BSS816NW	–	1.4	0.3 ... 0.75	0.6	OptiMOS™2	㉕
	BSS214NW	–	1.5	0.7 ... 1.2	0.8	OptiMOS™2	㉕
	BSD214NW	–	1.5	0.7 ... 1.2	0.8	OptiMOS™2	㉗
	BSD816SN	–	1.4	0.3 ... 0.75	0.6	OptiMOS™2	㉗
	BSD235N	–	0.95	0.7 ... 1.2	0.32	OptiMOS™2	㉗ (dual)
	BSD840N	–	0.88	0.3 ... 0.75	0.26	OptiMOS™2	㉗ (dual)
30V	BSR302N	23	3.7	1.2 ... 2.0	4.4	OptiMOS™2	⑱
	BSL302SN	25	7.1	1.2 ... 2.0	4.4	OptiMOS™2	㊻
	BSL306N	57	2.3	1.2 ... 2.0	1.6	OptiMOS™2	㊻ (dual)
	BSS306	57	2.3	1.2 ... 2.0	1.5	OptiMOS™2	㉑
	BSS316N	160	1.4	1.2 ... 2.0	0.6	OptiMOS™2	㉑
	BSD316SN	160	1.4	1.2 ... 2.0	0.6	OptiMOS™2	㉗
55V	BSS670S2L	650	0.54	1.2 ... 2.0	1.7	OptiMOS™	㉑
60V	BSS606N	60	3.2	1.3 ... 2.3	6.1	OptiMOS™3	㉒
	BSL606SN	60	4.5	1.3 ... 2.3	6.1	OptiMOS™3	㊻
	BSR606N	60	2.4	1.3 ... 2.3	6.1	OptiMOS™3	⑱
	BSP318S	90	2.6	1.2 ... 2.0	14.0	SIPMOS™	㉔
	BSP320S	120	2.9	2.1 ... 4.0	9.7	SIPMOS™	㉔
	BSP295	300	1.8	0.8 ... 1.8	14.0	SIPMOS™	㉔
	2N7002DW	3,000	0.3	1.5 ... 2.5	0.4	OptiMOS™	㉗ (dual)
	BSS138N	3,500	0.23	0.6 ... 1.4	1.0	SIPMOS™	㉑
	BSS138W	3,500	0.28	0.6 ... 1.4	1.0	SIPMOS™	㉔
	SN7002N	5,000	0.2	0.8 ... 1.8	1.0	SIPMOS™	㉑
	BSS7728N	5,000	0.2	1.3 ... 2.3	1.0	SIPMOS™	㉑
	SN7002W	5,000	0.23	0.8 ... 1.8	1.0	SIPMOS™	㉕
100V	BSL372SN[2]	220	2.0	4.5	9.5	SIPMOS™	㊻
	BSP372N	230	1.8	0.8 ... 2.0	9.5	SIPMOS™	㉔
	BSL373SN[2]	230	2.0	10.0	6.2	SIPMOS™	㊻
	BSP373N	240	1.8	2.1 ... 4.0	6.2	SIPMOS™	㉔
	BSL296SN[2]	460	1.4	4.5	4.5	SIPMOS™	㊻
	BSP296N	600	1.2	0.8 ... 1.8	4.5	SIPMOS™	㉔
	BSS123N	6,000	0.19	0.8 ... 1.8	0.6	SIPMOS™	㉑
	BSS119N	6,000	0.19	1.8 ... 2.3	0.6	SIPMOS™	㉑
200V	BSP297	1,800	0.66	0.8 ... 1.8	12.9	SIPMOS™	㉔
240V	BSP89	6,000	0.35	0.8 ... 1.8	4.3	SIPMOS™	㉔
	BSP88	6,000	0.35	0.6 ... 1.4	4.5	SIPMOS™	㉔
	BSS87	6,000	0.26	0.8 ... 1.8	3.7	SIPMOS™	㉒
	BSS131	14,000	0.11	0.8 ... 1.8	2.1	SIPMOS™	㉑

1) See packages on page 100
2) Coming Q4/2013

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Small Signal MOSFETs

N-Channel MOSFETs (cont'd)

Voltage	Product Type	$R_{DS(on)}$ (max) [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Technology	Package[1]
400V	BSP298	3,000	0.5	2.1 ... 4.0	–	SIPMOS™	㉔
	BSP324	25,000	0.17	1.3 ... 2.3	4.5	SIPMOS™	㉔
500V	BSP299	4,000	0.4	2.1 ... 4.0	–	SIPMOS™	㉔
600V	BSP125	45,000	0.12	1.3 ... 2.3	4.4	SIPMOS™	㉔
	BSS225	45,000	0.09	1.3 ... 2.3	3.9	SIPMOS™	㉒
	BSS127	500,000	0.023	1.4 ... 2.6	1.4	SIPMOS™	㉑
800V	BSP300	20	0.19	2.1 ... 4.0	–	SIPMOS™	㉔

P-Channel MOSFETs

Voltage	Product Type	$R_{DS(on)}$ (max) @ V_{GS} = -10V [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Technology	Package[1]
-20V	BSL207SP	–	-6.0	-1.2 ... -0.6	-13.3	OptiMOS™2 P	㊻
	BSL211SP	–	-4.7	-1.2 ... -0.6	-8.3	OptiMOS™2 P	㊻
	BSL215P	–	-1.5	-1.2 ... -0.6	-3.55	OptiMOS™2 P	㊻ (dual)
	BSS215P	–	-1.5	-1.2 ... -0.5	-3.6	OptiMOS™2 P	㉑
	BSS209PW	–	-0.58	-1.2 ... -0.6	-0.92	OptiMOS™2 P	㉕
	BSS223PW	–	-0.39	-1.2 ... -0.6	-0.5	OptiMOS™2 P	㉕
	BSV236SP	–	-1.5	-1.2 ... -0.6	-3.8	OptiMOS™ P	㉗
	BSD223P	–	-0.39	-1.2 ... -0.6	-0.5	OptiMOS™2 P	㉗ (dual)
-30V	BSL307SP	43	-5.5	-2.0 ... -1.0	-23.4	OptiMOS™2 P	㊻
	BSL308PE	80	-2.1	-2.0 ... -1.0	-2.9	OptiMOS™3 P + integrated ESD diode	㊻ (dual)
	BSL314PE	140	-1.5	-2.0 ... -1.0	-2.3	OptiMOS™3 P + integrated ESD diode	㊻ (dual)
	BSL315P	150	-1.5	-2.0 ... -1.0	-2.3	OptiMOS™2 P	㊻ (dual)
	BSS308PE	80	-2.1	-2.0 ... -1.0	-5.2	OptiMOS™3 P + integrated ESD diode	㉑
	BSS314PE	140	-1.5	-2.0 ... -1.0	-2.9	OptiMOS™3 P + integrated ESD diode	㉑
	BSS315P	150	-1.5	-2.0 ... -1.0	-2.3	OptiMOS™2 P	㉑
	BSD314SPE	140	-1.5	-2.0 ... -1.0	-2.9	OptiMOS™3 P + integrated ESD diode	㉗
	BSL303SPE[2]	30	-6.6	4.5	–	OptiMOS™ P + integrated ESD diode	㊻
	BSL305SPE[2]	50	-5.3	4.5	–		㊻
	BSS356PWE[2]	560	-0.73	4.5	–		㉕
	BSD356PE[2]	560	-0.73	4.5	–		㉗
-60V	BSP613P	130	-2.9	-4.0 ... -2.1	-22.0	SIPMOS™	㉔
	BSP170P	300	-1.9	-4.0 ... -2.1	-10.0	SIPMOS™	㉔
-60V	BSP171P	300	-1.9	-2.0 ... -1.0	-13.0	SIPMOS™	㉔
	BSP315P	800	-1.17	-2.0 ... -1.0	-5.2	SIPMOS™	㉔
	BSR315P	800	-0.62	-2.0 ... -1.0	-4.0	SIPMOS™	⑱
	BSS83P	2,000	-0.33	-2.0 ... -1.0	-2.38	SIPMOS™	㉑
	BSS84P	8,000	-0.17	-2.0 ... -1.0	-1.0	SIPMOS™	㉑
	BSS84PW	8,000	-0.15	-2.0 ... -1.0	-1.0	SIPMOS™	㉕

1) See packages on page 100
2) Coming Q2/2014

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P-Channel MOSFETs (cont'd)

Voltage	Product Type	$R_{DS(on)}$ (max) @ V_{GS} = -10V [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Technology	Package[1]
-100V	BSP322P	800	-1.0	-2.0 ... -1.0	-12.4	SIPMOS™	㉔
	BSP321P	900	-0.98	-4.0 ... -2.1	-9.0	SIPMOS™	㉔
	BSP316P	1,800	-0.68	-2.0 ... -1.0	-5.1	SIPMOS™	㉔
	BSR316P	1,800	-0.36	-2.0 ... -1.0	-3.0	SIPMOS™	⑱
-250V	BSP317P	4,000	-0.43	-2.0 ... -1.0	-11.6	SIPMOS™	㉔
	BSP92P	12,000	-0.26	-2.0 ... -1.0	-4.3	SIPMOS™	㉔
	BSS192P	12,000	-0.19	-2.0 ... -1.0	-4.9	SIPMOS™	㉒
	BSR92P	11,000	-0.14	-2.0 ... -1.0	-3.6	SIPMOS™	⑱

Complementary MOSFETs

Voltage	Product Type	$R_{DS(on)}$ (max) @ V_{GS} = -10V [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	Technology	Package[1]
20V	BSL215C/n-ch	–	1.5	0.7 ... 1.2	0.73	OptiMOS™2	㊻ (dual)
-20V	BSL215C/p-ch	–	-1.5	-1.2 ... -0.6	-3.0	OptiMOS™2 P	㊻ (dual)
20V	BSD235C/n-ch	–	0.95	-1.2 ... -0.6	0.34	OptiMOS™2	㉗ (dual)
-20V	BSD235C/p-ch	–	-0.53	0.7 ... 1.2	-0.4	OptiMOS™2 P	㉗ (dual)
30V	BSL316C/n-ch	160	1.4	-2.0 ... -1.0	0.6	OptiMOS™2	㊻ (dual)
-30V	BSL316C/p-ch	150	-1.5	1.2 ... 2.0	-2.4	OptiMOS™2 P	㊻ (dual)
30V	BSL308C/n-ch	57	2.3	1.2 ... 2.0	1.5	OptiMOS™2	㊻ (dual)
-30V	BSL308C/p-ch	80	-2.1	-2.0 ... -1.0	-2.9	OptiMOS™3 P	㊻ (dual)
30V	BSD356C/n-ch[2]	350	0.95	4.5	–	OptiMOS™2	㉗ (dual)
-30V	BSD356C/p-ch[2]	560	-0.73	4.5	–	OptiMOS™2 P	㉗ (dual)

Depletion MOSFETs

Voltage	Product Type	$R_{DS(on)}$ (max) @ V_{GS} = 0V [mΩ]	I_D [A]	Q_G (typ) [nC]	Technology	Package[1]
60V	BSS159N	8.0	0.13	2.2	SIPMOS™	㉑
100V	BSS169	12.0	0.09	2.1	SIPMOS™	㉑
200V	BSP149	3.5	0.14	11.0	SIPMOS™	㉔
240V	BSP129	20.0	0.05	3.8	SIPMOS™	㉔
250V	BSS139	30.0	0.03	2.3	SIPMOS™	㉑
600V	BSP135	60.0	0.02	3.7	SIPMOS™	㉔
	BSS126	700.0	0.007	1.4	SIPMOS™	㉑

1) See packages on page 100
2) Coming Q1/2014

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Power MOSFETs

650V CoolMOS™ CFDA

With the new 650V CoolMOS™ CFDA, Infineon launches its second generation of market leading Automotive qualified high voltage CoolMOS™ MOSFET. In addition to the well-known attributes of high quality and reliability required by the automotive industry, the new CoolMOS™ CFDA series provides now also an integrated Fast Body Diode.

This Fast Body Diode is the key for addressing resonant switching topologies resulting in lower switching losses due to the low gate charge. The softer commutation behavior and consequent reduced EMI appearance gives the CoolMOS™ CFDA series a clear advantage in comparison with competitor parts. Furthermore, limited voltage overshoot during hard commutation of the body diode enables easier implementation of layout and design.

The broad 650V CoolMOS™ CFDA portfolio provides all benefits of fast switching Superjunction MOSFET fulfilling the enhanced reliability requirements for automotive applications realized with special screening measures in Front End and Back End as well as the qualification compliant to AEC Q100.

Therefore, the new 650V CoolMOS™ CFDA technology is the best choice for switching topologies in Automotive applications.

Key Features

- First 650V automotive qualified technology with integrated fast body diode on the market
- Limited voltage overshoot during hard commutation – self limiting di/dt and dv/dt
- Low gate charge value Q_g
- Low Q_{rr} at repetitive commutation on body diode & low Q_{oss}
- Reduced turn on and turn off delay times
- Compliant to AEC Q100 standard

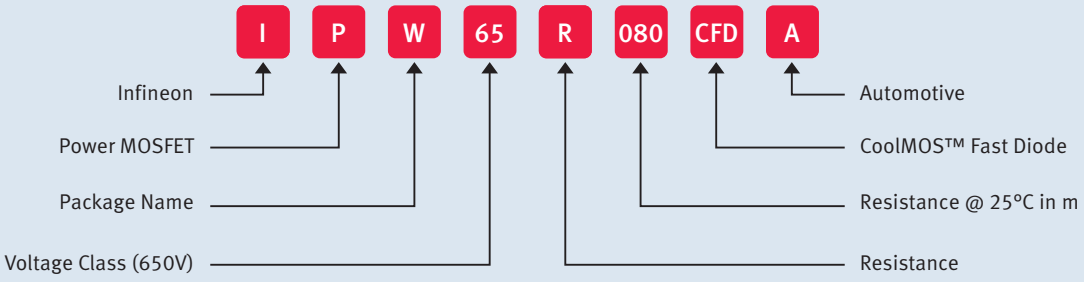
Applications

- Unidirectional and bidirectional DC/DC converter
- Battery charge
- HID lighting

AEC Qualified

RoHS

Naming System



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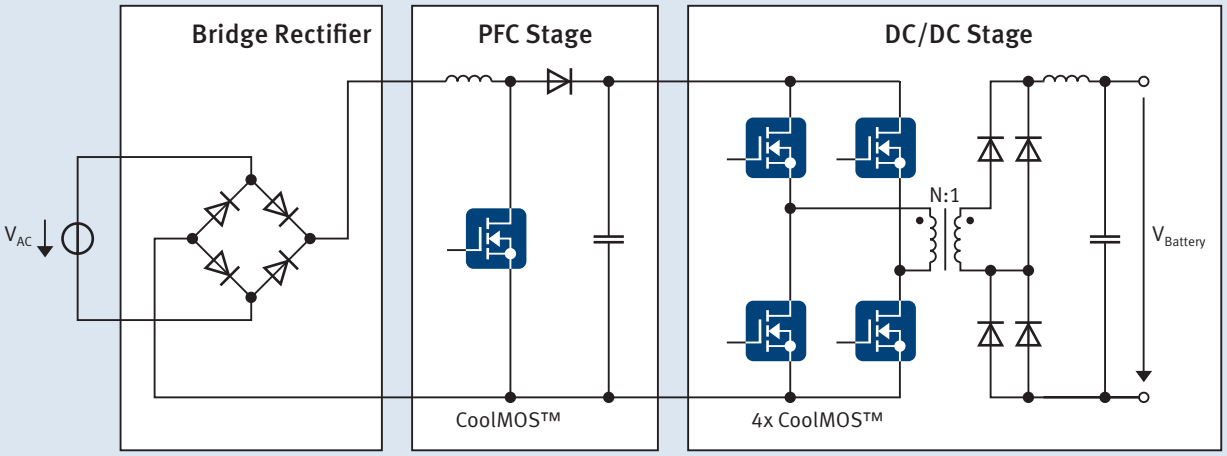
Example for Automotive Topology using CoolMOS™ CFDA



On-board battery charger with ZVS phase shifted topology

650V CoolMOS™ CFDA Product Portfolio

Product Type	$R_{DS(on)}$ @ T_J = 25°C V_{GS} = 10V [mΩ]	I_D (max) @ T_J = 25°C [A]	I_{Dpuls} (max) [A]	$V_{GS(th)}$ (min-max) [V]	Q_G (typ) [nC]	R_{thJC} (max) [K/W]	Package[1]
IPD65R420CFDA	420	8.7	27.0	3.5 ... 4.5	32	1.5	㉝
IPD65R660CFDA	660	6.0	17.0	3.5 ... 4.5	20	2.0	㉝
IPB65R110CFDA	110	31.2	99.6	3.5 ... 4.5	118	0.45	㉟
IPB65R150CFDA	150	22.4	72.0	3.5 ... 4.5	86	0.64	㉟
IPB65R190CFDA	190	17.5	57.2	3.5 ... 4.5	68	0.83	㉟
IPB65R310CFDA	310	11.4	34.4	3.5 ... 4.5	41	1.2	㉟
IPB65R660CFDA	660	6.0	17.0	3.5 ... 4.5	20	2.0	㉟
IPP65R110CFDA	110	31.2	99.6	3.5 ... 4.5	118	0.45	㊶
IPP65R150CFDA	150	22.4	72.0	3.5 ... 4.5	86	0.64	㊶
IPP65R190CFDA	190	17.5	57.2	3.5 ... 4.5	68	0.83	㊶
IPP65R310CFDA	310	11.4	34.4	3.5 ... 4.5	41	1.2	㊶
IPP65R660CFDA	660	6.0	17.0	3.5 ... 4.5	20	2.0	㊶
IPW65R048CFDA	48	63.3	228.0	3.5 ... 4.5	270	0.25	㊽
IPW65R080CFDA	80	43.3	127.0	3.5 ... 4.5	161	0.32	㊽
IPW65R110CFDA	110	31.2	99.6	3.5 ... 4.5	118	0.45	㊽
IPW65R150CFDA	150	22.4	72.0	3.5 ... 4.5	86	0.64	㊽
IPW65R190CFDA	190	17.5	57.2	3.5 ... 4.5	68	0.83	㊽

1) See packages on page 100

TEMPFET™: Temperature Protected Switches

TEMPFET™ provides the first level of temperature and current protection via its temperature sensor.
TEMPFET™ is divided in 2 families:

- The Classic TEMPFET™ with a temperature sensor which is internally connected between the gate and the source of the power chip and offers an autonomous protection behavior.
- The Speed TEMPFET™ with a temperature sensor which is available on external pins and enables direct gate access and flexible temperature response control.

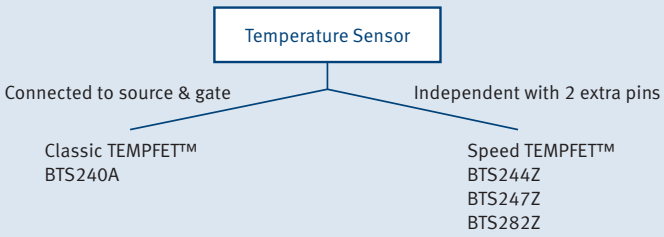
Features

- Logic level input
- Analog driving capability
- Potential-free temperature sensor
- High-speed switching (100kHz)
- Overload protection and thermal shutdown with external circuit
- Avalanche rated

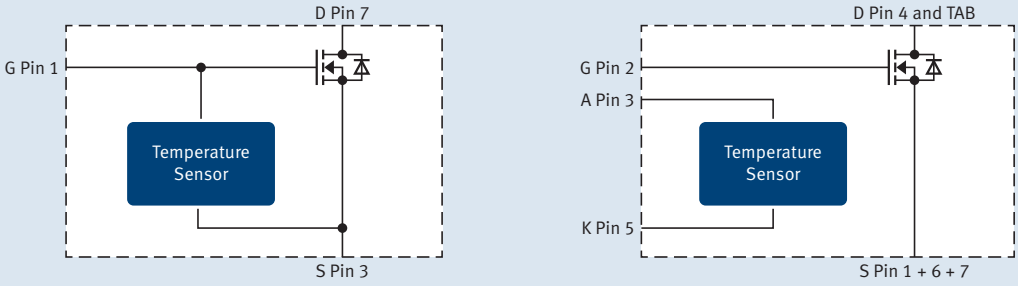
AEC Qualified

RoHS

Selection Tree TEMPFET™



Block Diagram



Product Table TEMPFET™: Temperature Protected Switches

Product Type	V_{DS} [V]	$R_{DS(on)}$ [mΩ]	I_D [A]	$V_{GS(th)}$ (min-max) [V]	Q_G(typ) [nC]	Package[1]
BTS282Z	49	6.5	80	1.2 ... 2.0	155	(40) (55)
BTS244Z	55	12.0	35	1.2 ... 2.0	85	(38) (52) (53)
BTS247Z	55	18.0	33	1.2 ... 2.0	60	(38) (52) (53)
BTS240A	50	18.0	58	2.5 ... 3.5	N/A	(50)

1) See packages on page 100

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HITFET™: Low-Side Protected Switches

HITFET™ provides a high level of protection for overtemperature, short-circuit, overcurrent, overvoltage, open-load and ESD-sensitive circuits. HITFET™ combines all these protection features in one easy-to-use device.

Infineon has recently expanded its HITFET™ portfolio into low range $R_{DS(on)}$ (BTS3160D and BTS3256D) and into 24V parts (BTS3xxxSDx).

Features

- Overtemperature protection
- Overload protection
- Current limitation
- Short-circuit protection
- Open-load detection (only on BTS3408G)
- Thermal shutdown with auto-restart or latch behavior
- Overvoltage protection
- Logic level input
- Electrostatic Discharge (ESD) protection
- Linear drive capability
- Status feedback
  - Digital flag or with external resistor
  - Analogous with external resistor at input

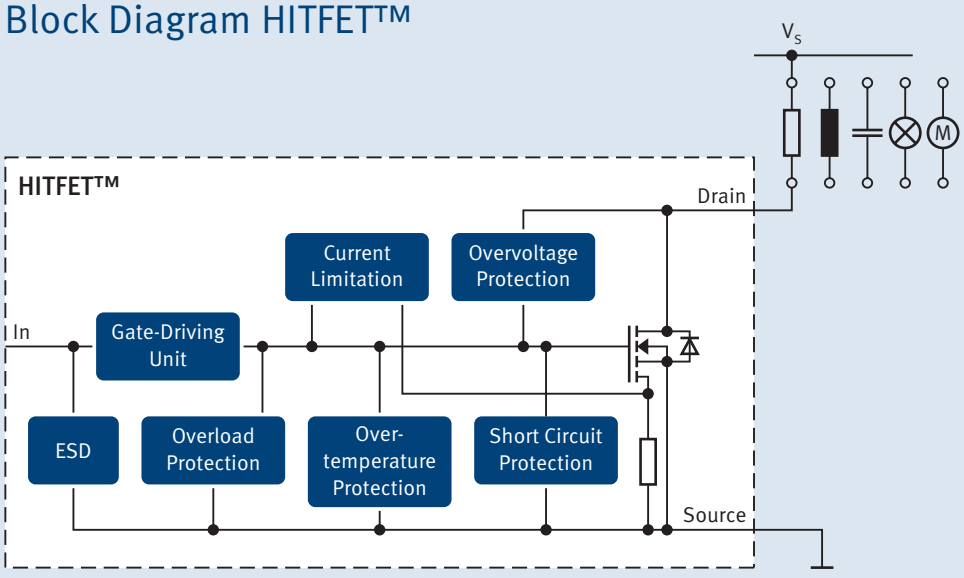
Automotive and Industrial Applications

- Relays
- Fans and pumps
- Solenoids
- Valves
- Heating element
- Bulbs and LEDs
- Fuses
- Line drivers and supply switches

AEC Qualified

RoHS

Block Diagram HITFET™



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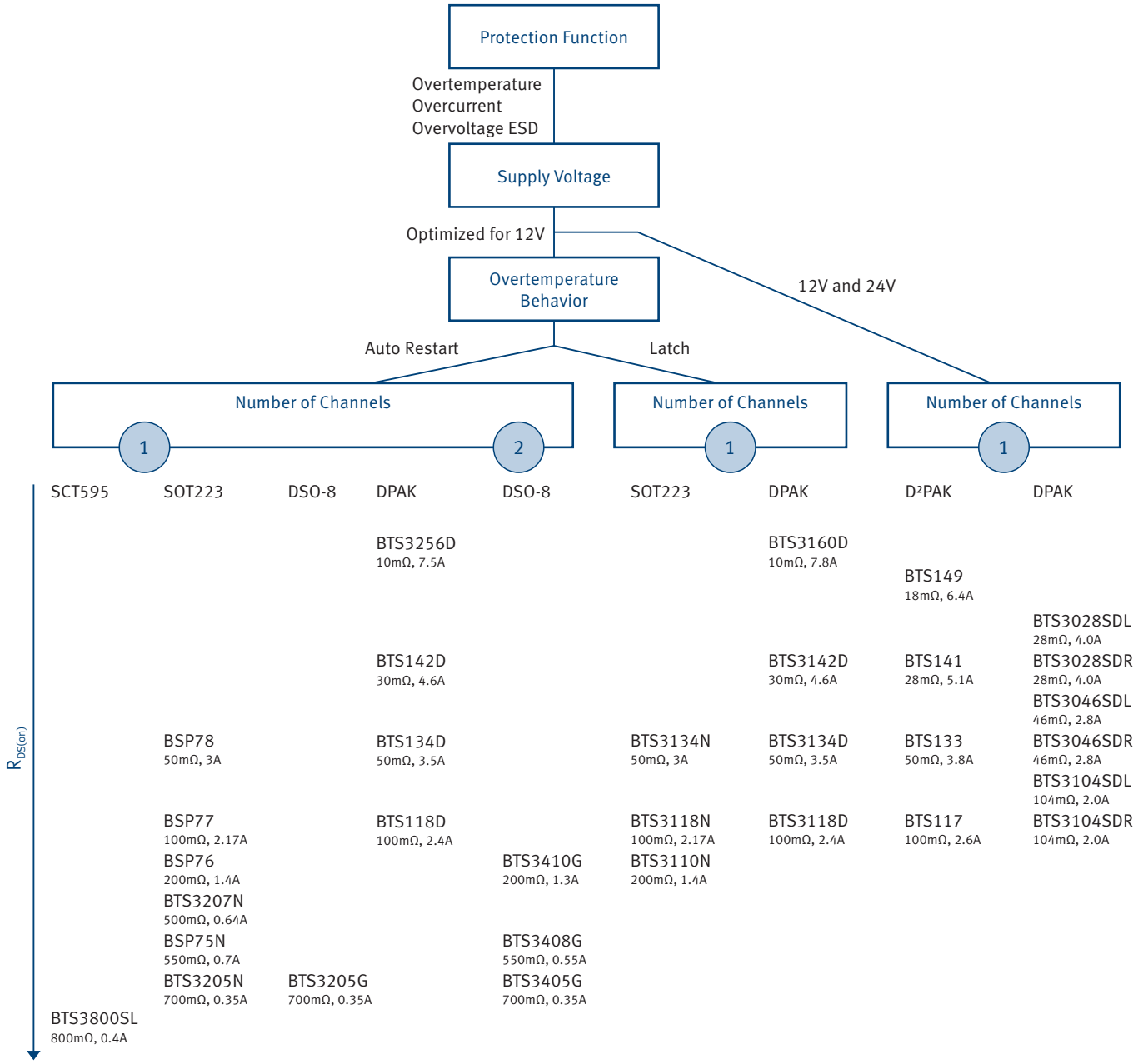
HITFET™: Low-Side Protected Switches

Selection Tree HITFET™



Product Table HITFET™: Low-Side Protected Switches

Product Type	$R_{DS(on)}$ [mΩ]	Channels	$V_{DS(AZ)}$ [V]	$I_{L(nom)}$ [A]	$I_{L(lim)}$ [A]	PWM [kHz]	Diagnostic	Package[1]
BTS3160D	10	1	40	7.8	70.0	1	digital	㉞
BTS3256D	10	1	40	7.5	42.0	10	digital	㉞
BTS3142D	28	1	42	4.6	30.0	1	through input pin	㉝
BTS142D	28	1	42	4.6	30.0	1	through input pin	㉝
BTS3134N	50	1	42	3.0	18.0	1	through input pin	㉔
BTS3134D	50	1	42	3.5	18.0	1	through input pin	㉝
BSP78	50	1	42	3.0	18.0	1	through input pin	㉔
BTS134D	50	1	42	3.5	18.0	1	through input pin	㊶
BTS3118D	100	1	42	2.4	10.0	1	through input pin	㉝
BTS3118N	100	1	42	2.2	10.0	1	through input pin	㉔
BSP77	100	1	42	2.2	10.0	1	through input pin	㉔
BTS118D	100	1	42	2.4	10.0	1	through input pin	㉝
BSP76	200	1	42	1.4	5.0	1	through input pin	㉔
BTS3410G	200	2	42	1.3	5.0	1	through input pin	①
BTS3110N	200	1	42	1.4	5.0	1	through input pin	㉔
BTS3207N	500	1	42	0.7	5.0	1	through input pin	㉔
BTS3205G	700	1	42	0.35	0.6	1	through input pin	①
BTS3405G	700	2	42	0.35	0.6	1	through input pin	①
BTS3205N	700	1	42	0.35	0.6	1	through input pin	㉔
BTS3800SL	800	1	42	0.35	0.6	10		⑳
BTS149[2]	20	1	60	6.4	30.0	1	through input pin	㊶
BTS141TC	30	1	60	5.1	25.0	1	through input pin	㉟
BTS3028SDL	30	1	60	5.0	18.0	1	through input pin	㉝
BTS3028SDR	30	1	60	5.0	18.0	1	through input pin	㉝
BTS123TC	50	1	60	3.8	21.0	1	through input pin	㉟
BTS3046SDL	50	1	60	3.6	10.0	1	through input pin	㉝
BTS3046SDR	50	1	60	3.6	10.0	1	through input pin	㉝
BTS117TC	100	1	60	3.5	7.0	1	through input pin	㉟
BTS3104SDL	104	1	60	2.0	6.0	1	through input pin	㉝
BTS3104SDR	104	1	60	2.0	6.0	1	through input pin	㉝
BSP75N	550	1	60	0.7	1.0	5	through input pin	㉔
BTS3408G	550	2	60	0.55	1.0	1	through input pin	①

1) See packages on page 100
2) Non green

Smart Multichannel Switches for Body: SPIDER – SPI Driver for Enhanced Relay Control

SPIDER stands for SPI Driver for Enhanced Relay control. SPIDER products are the smallest relay drivers in the market with innovative features and packages.

With the SPIDER family Infineon offers a wide choice of integrated Multichannel switches specially designed for the control of small loads like relays, LEDs and small motors.

The modular family is scaled by $R_{DS(on)}$, packages and add-on features. They come in 4- and 8-channel low-side configurations (SPIDER Low-Side), as well as configurable 8-channel high-/low-side configurations (SPIDER High-/Low-Side).

It offers not only the scalability through the number of channels and the current density, but also flexibility regarding enhanced features like parallel inputs for PWM, limp home and low-voltage cranking.

A variety of packages is available in order to serve different applications.

Applications

- Relays
- Small LEDs
- Valves
- Solenoids
- DC and stepper motors

Features

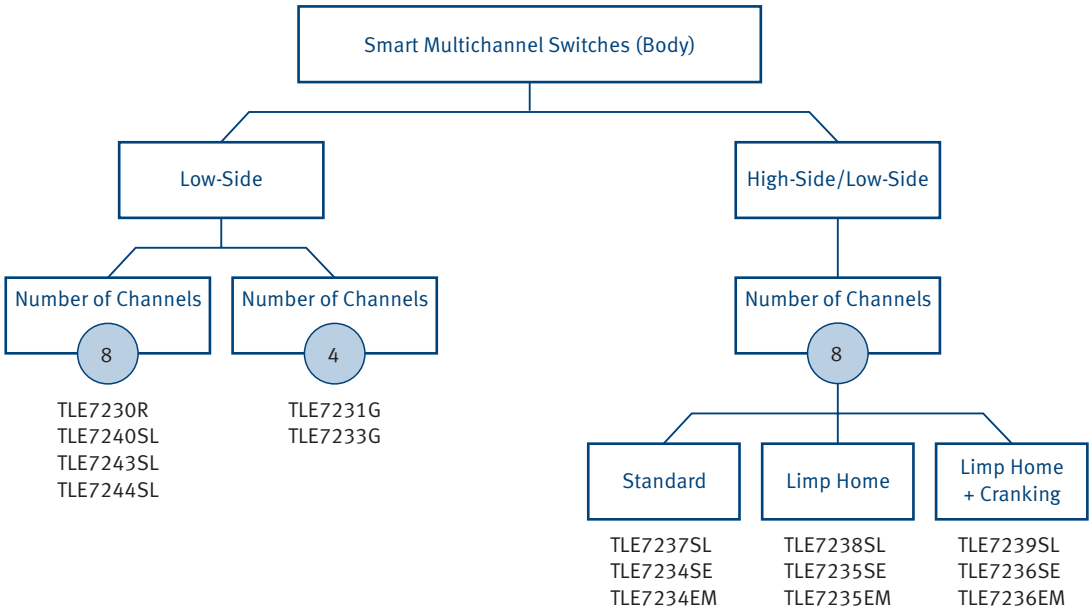
- SPI (Serial Peripheral Interface)
- Daisy-chain and detailed diagnostics via SPI
- Small package
- Four different packages
- Short-circuit, overload protection configurable behavior (limitation or shutdown), thermal shutdown configurable behavior (latch or restart)
- Fail safe mode (limp home)
- Low battery voltage operation (cranking)
- AEC-qualified green robust product (RoHS-compliant)
- Undervoltage shutdown
- Overload shutdown
- Short to GND detection
- Open-load detection
- Stand-by mode
- Daisy-chain capability

AEC Qualified

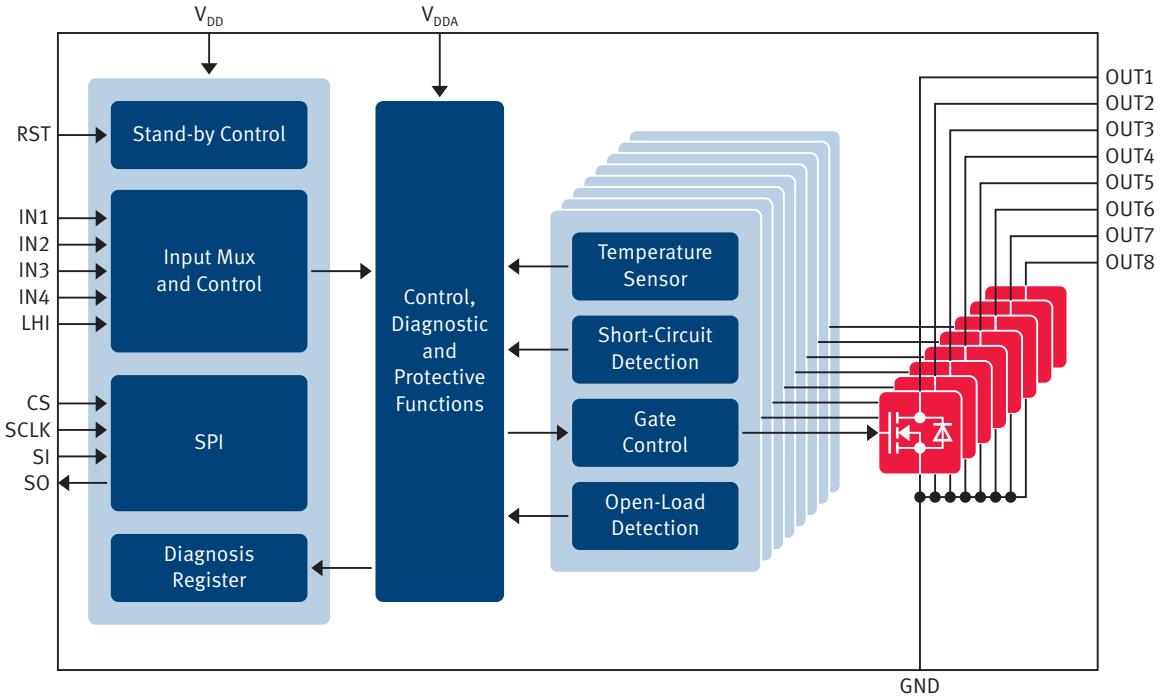
RoHS

www.infineon.com/spider

Selection Tree SPIDER



Block Diagram TLE7244SL



Smart Multichannel Switches for Body: SPIDER – SPI Driver for Enhanced Relay Control

SPIDER Product Table

	Product Type	High-Side	Small High-Side	Low-Side	Configurable
SPIDER LS	TLE7230R	–	–	8	–
	TLE7240SL	–	–	8	–
	TLE7243SL	–	–	8	–
	TLE7244SL	–	–	8	–
	TLE7231G	–	–	4	–
	TLE7233G	–	–	4	–
SPIDER HS/LS	TLE7237SL	2	2	2	2
	TLE7238SL	2	2	2	2
	TLE7239SL	2	2	2	2
	TLE7234SE	2	2	2	2
	TLE7235SE	2	2	2	2
	TLE7236SE	2	2	2	2
	TLE7234EM	2	2	2	2
	TLE7235EM	2	2	2	2
	TLE7236EM	2	2	2	2

1) See packages on page 100

$R_{DS(on)}$ (typ) @25°C [Ω]	Cranking Mode [V]	$V_{DS(AZ)}$ [V]	Limp Home	$I_{L(nom)}$ [mA]	Number of Direct Inputs	Package[1]
0.8	–	48		500	4	⑭
1.5	–	41	●	210	4	㉚
1.2	–	41	●	260	4	㉚
0.8	–	41	●	290	4	㉚
1.0	–	41		320	1	④
1.0	–	41	●	390	4	㉚
6 x 0.9; 2 x 1.6	–	41		6 x 260; 2 x 120	3	㉚
6 x 0.9; 2 x 1.6	–	41	●	6 x 260; 2 x 120	2	㉚
6 x 0.9; 2 x 1.6	4	41	●	6 x 260; 2 x 120	2	㉚
6 x 0.85; 2 x 1.6	–	41		6 x 280; 2 x 140	3	⑦
6 x 0.85; 2 x 1.6	–	41	●	6 x 280; 2 x 140	2	⑦
6 x 0.85; 2 x 1.6	4	41	●	6 x 280; 2 x 140	2	⑦
6 x 0.9; 2 x 1.6	–	41		6 x 350; 2 x 175	3	㉛
6 x 0.9; 2 x 1.6	–	41	●	6 x 350; 2 x 175	2	㉛
6 x 0.9; 2 x 1.6	4	41	●	6 x 350; 2 x 175	2	㉛

Smart Multichannel Switches for Powertrain and Safety: Flex

The Flex Multichannel Low-Side Switches family for powertrain, safety and industrial applications is specially designed to drive a various range of loads from relays, injector valves, oxygen probe heaters and general purpose solenoids, through to unipolar stepper motors.

We offer a complete family concept with full scalability from 2 to 18 channels and leading edge technology. All Flex Multichannel Switches have full certification and are equipped with embedded protection functions and enhanced diagnosis which are used in numerous industry platforms.

Application

- Engine management systems
- Diesel direct injection
- Gasoline direct injection
- Multi port injection
- Industrial applications

Features

- Overvoltage protection
  - Active clamping for inductive loads
- Undervoltage protection
  - Power-on reset
  - Undervoltage shutdown
- Overcurrent protection
  - Current limitation
  - Overcurrent switch-off
- Overtemperature protection
  - Thermal shutdown
- Electrostatic Discharge (ESD) protection
- Direct input control (for PWM)
- Communication interface (control/diagnosis)
  - Serial Peripheral Interface (SPI)
  - Micro Second Channel (MSC)
- 5V and 3.3V µC compatibility
- Status flag
- 2-bit diagnosis feedback for:
  - Short-to-GND
  - Open-load
  - Short-to-battery
  - Normal operation

Benefits

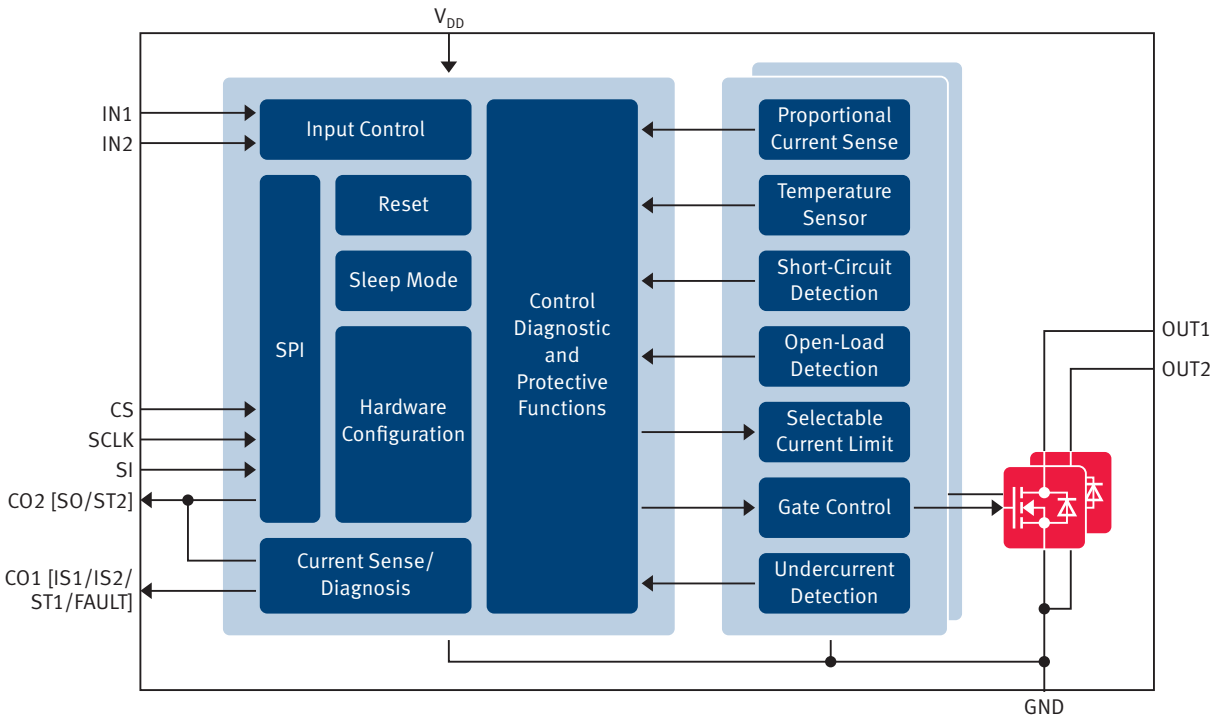
- One family concept
- Designed for dedicated applications, but also available for off-the-shelf use as standard products
- Integrated self-protection and diagnosis
- Enhanced error detection for improved system reliability
- Control via standard SPI Bus or MicroSecond Channel (TLE6244X, TLE8718SA) or direct inputs
- Suitable for daisy-chain configuration to save I/O ports
- Support of safety-critical applications by overvoltage protection on all pins (TLE6244X, TLE8718SA)
- High quality ensured with automotive excellence program on Zero Defect strategy

AEC Qualified

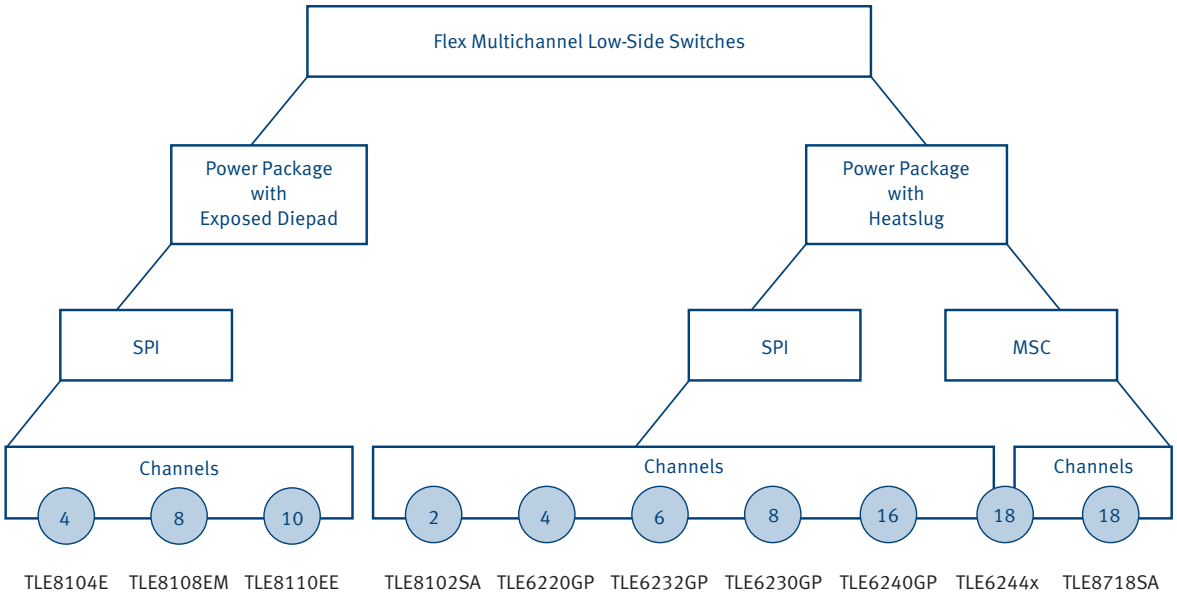
RoHS

www.infineon.com/flex

Block Diagram Flex (TLE8102SG)



Selection Tree Flex Multichannel Low-Side Switches



Smart Multichannel Switches for Powertrain and Safety: Flex

Product Table

	Target Loads[2]	Channels	Electrical Specification			
			#	R_{DS} (max) @ 25°C [mΩ]	$I_{L(lim)}$ (max) [A]	V_{CL} (typ) [V]
TLE8102SG	High-Current-Solenoids, O2-Heater	2	2x	0.18	5.0 (9.0)	54
TLE6217G	High-Current-solenoids	4	2x 2x	0.20 0.35	5.0 3.0	53
TLE6220GP	Injectors, High-Current-Solenoids, Stepper-Motor	4	4x	0.32	3.0	53
TLE8104E	Injectors, High-Current-Solenoids, Stepper-Motor	4	4x	0.32	3.0	53
TLE6232GP	High-Current-Relays, Injectors, High-Current-Solenoids	6	4x 2x	0.25 0.45	3.0 1.5	53
TLE6230GP	Relays, High-Current-Relays	8	8x	0.80	1.0	43
TLE8108EM	LEDs, Relays	8	8x	0.80	0.5	45
TLE8110EE	LEDs, High-Current-Relays, Injectors, High-Current-Solenoinds, Stepper-Motor	10	4x 2x 4x	0.30 0.25 0.60	2.6 3.7 1.7	55
TLE6240GP	High-Current-Relays, Injectors, High-Current-Solenoids	16	8x 4x 4x	1.00 0.35 0.30	1.0 3.0 3.0	50 53 53
TLE8718SA	LEDs, Relays, Injectors, High-Current-Solenoids, O2-Heater	18	2x 2x 8x 2x 2x 2x	0.15 0.26 0.53 0.35 1.78 0.96	8.0 3.0 2.2 2.2 0.6 0.6	55
TLE6244X	High-Current-Relays, Injectors, High-Current-*Solenoids	18	6x 6x 2x 4x	0.32 0.30 0.22 0.62	2.2 2.2 3.0 1.1	70 45 45 45

1) See packages on page 100
2) Indication only. Devices can drive any kind of inductive/resistive load according to spec
3) Refer to Application Note: TLE8110 – SPI and daisy-chain
4) 1st generation MSC, High-speed down-stream + SPI up-stream

Interface				Overcurrent Protection		Status Flag	Package[1]
Direct Input Pins	SPI	MSC	Daisy-Chain	I-limit	Switch-Off		
2	8-bit		●	●	●	●	③
4					●	●	⑨
4	8-bit		●	●		●	⑨
4	8-bit		●	●		●	⑦
6	16-bit			●		●	⑭
4	16-bit			●		●	⑭
4	16-bit		●		●		㉛
10	16-bit		● [3]		●		⑬
8	16-bit		●	●		●	⑭
		LVDS + LVTTL		●	●		⑭
16	16-bit	● [4]		●	●		⑰

PROFET™: Smart High-Side Switches

The highly integrated PROFET™ family (PROtected FET) incorporates a broad range of smart features, like diagnosis and protection. PROFET™ intelligent power switches consist of DMOS power transistor and CMOS logic circuitry for complete built-in protection.

The PROFET™ family offers protection against overload, overvoltage, short-circuit, excessive temperature, ground loss, power supply loss and Electrostatic Discharge (ESD). The PROFET™ family products are also capable of protecting against dynamic overvoltage such as load dump and inductive load turn-off. For the benefits and the functionality of the protection features, please refer to www.infineon.com/profet.

The PROFET™ diagnostics offer the choice of either status or current sense features, or a combination of both. In the event of a malfunction, the status feature is able to diagnose overtemperature or open-load. The PROFET™ diagnostic features also provide the user with precise information about switch and load. Diagnostic feedback and load current sensing minimize risks by eliminating the need for additional discrete circuitry and assembly.

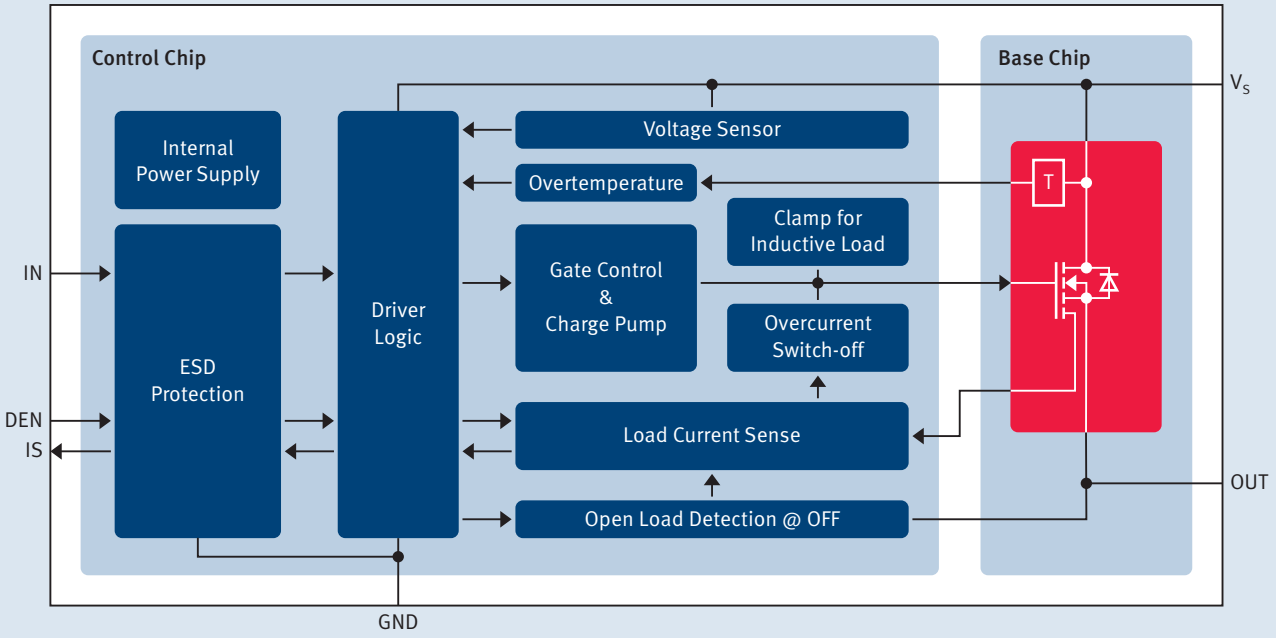
This vast range of smart features makes the PROFET™ ideal for a variety of automotive (12V), trucks & agriculture (24V) and industrial applications.

AEC Qualified

RoHS

www.infineon.com/profet

Block Diagram BTS500x0-1EGA



Application Examples
- Lighting
- Heating
- Power distribution
- Motor control

Application Ranges
- Automotive (12V)
- Transportation (24V)
- Industrial

Load
- Capacitive like lamps and glow plugs
- Resistive like seat heating
- Inductive like solenoids
- Electronic like ECU

Basic Features
- High-side switches (0.5 ... 45A load current)
- RoHS compliant & AEC qualified
- Very low stand-by current
- ESD protection, optimized EMC
- PWM capability
- Very low power DMOS leakage current in OFF
- 3.3V and 5V compatible logic inputs

Protection Features
- Load dump
- Current limitation
- Thermal shutdown
- Loss of ground/battery protection
- Stable behavior at undervoltage
- Overvoltage protection (ext. components)
- Reverse polarity compliant

Diagnostic Features
- Proportional load current sense
- Open-load in ON- and OFF-State
- Short-circuit to battery and ground
- Overtemperature sense

PROFET™: Smart High-Side Switches

No Diagnosis

Basic Features

- 12V or 24V capable
- Single channel

Protection Features

- Short circuit protection
- Current limitation
- Overvoltage protection
- Overtemperature protection

Product Type	$R_{DS(on)}$ (typ) [mΩ]	$R_{DS(on)}$ (max.) @ T_j = 150°C [mΩ]	Nominal Load Current [A]	E_{AS} [mJ]
Automotive Grade				
BTS4140N[2)]	1000	3000	0.2	1000
BSP742T	350	700	1.1	100
BSP452	200	400	0.7	500
BTS452T	200	380	2.2	150
BSP752T	200	380	1.2	125
BTS4141N	200	320	0.7	700
BTS4142N	200	320	1.4	160
BSP762T	100	200	2.4	870
BTS462T	100	200	4.4	4400
BTS730	70	140	3.0	N/A
BSP772T	60	120	3.1	900
BTS441T	20	37	21.0	700
Industrial				
ITS41K0S	1000	3000[3)]	0.2	1000
ITS4200S-ME-N	200	400[3)]	0.7	500
ISP752T	200	380	1.1	125
ITS4141D	200	320	0.5	12000
ITS4200S-ME-O	200	320[3)]	0.7	700
ITS4200S-ME-P	200	320[3)]	1.4	160
ITS4100S	100	200[3)]	2.4	870
ITS4060S	60	120[3)]	3.1	900

1) See packages on page 100
2) Current controlled input
3) at T_j = 125°C

Recommended Operating Voltage Range [V]	$I_{L(SC)}$ (typ) [A]	24V Capable	Package[1)]
4.9 ... 60.0	0.9	●	㉔
5.0 ... 34.0	4.0		①
5.0 ... 34.0	1.5		㉔
6.0 ... 52.0	6.5	●	㉞
6.0 ... 52.0	6.5	●	①
12.0 ... 45.0	2.1	●	㉔
12.0 ... 45.0	3.0	●	㉔
5.0 ... 34.0	10.0		①
5.0 ... 34.0	14.0		㉞
5.9 ... 16.9	20.0		⑦
5.0 ... 34.0	17.0		①
4.75 ... 41.0	65.0	●	㊲
4.9 ... 60.0	0.9	●	㉔
5.0 ... 34.0	1.5		㉔
6.0 ... 52.0	6.5	●	①
12.0 ... 45.0	2.1	●	㉞
11.0 ... 45.0	3.0	●	㉔
11.0 ... 45.0	3.0	●	㉔
5.0 ... 34.0	10.0		①
5.0 ... 34.0	17.0		①

PROFET™: Smart High-Side Switches

Digital Diagnosis

Basic Features
- 12V or 24V capable
- Single or multi channel

Protection Features
- Overload protection
- Loss of battery / GND
- Short circuit protection
- Overvoltage protection

Diagnosis Features
- Open drain status feedback
- Overtemperature
- Open load
- Current limitation

Product Type	$R_{DS(on)}$ (typ) [mΩ]	$R_{DS(on)}$ (max.) @ T_j = 150°C [mΩ]	Nominal Load Current [A]	E_{AS} [mJ]	Recommended Operating Voltage Range [V]	$I_{L(SC)}$ (typ) [A]	Number of Channels
Automotive Grade							
BTS42K5D-EL[4]	2500	8000	0.25	n.a.[5]	4.5 ... 45.0	0.4	2
BTS42K5D-LD[4]	2500	8000	0.25	n.a.[5]	4.5 ... 45.0	0.4	2
BSP742R	350	700	0.4	800	5.0 ... 34.0	1.2	1
BSP742RI[2]	350	700	0.4	800	5.0 ... 34.0	1.2	1
BTS4300SGA	300	600	0.4	800	5.0 ... 34.0	1.2	1
BSP752R	200	380	1.7	125	6.0 ... 52.0	6.5	1
BTS712N1	200	400	1.0	150 @ 1.9A	5.0 ... 34.0	7.5	4
BTS711L1	200	400	1.0	150 @ 1.9A	5.0 ... 35.0	7.5	4
BTS4880-R	200	400	0.6	10000	11.0 ... 45.0	1.4	8
BTS4175SGA	175	350	1.3	125	6.0 ... 52.0	6.5	1
BTS4160DGA	160	320	1.0	65 @ 2.9A	5.5 ... 20.0	9.0	2
BTS452R	150	270	2.2	150	6.0 ... 52.0	6.5	1
BTS5210G	140	280	1.0	65 @ 2.9A	5.5 ... 40.0	9.0	2
BTS5210L	140	280	1.0	84 @ 2.9A	5.5 ... 40.0	9.0	2
BTS716G	140	280	1.0	76 @ 2.3A	5.5 ... 40.0	9.0	4
BTS716GB	140	280	1.0	76 @ 2.3A	5.5 ... 40.0	9.0	4
BTS4130QGA	130	260	1.0	76 @ 2.3A	5.5 ... 20.0	9.0	4
BTS723GW	105	210	2.0	110 @ 2.5A	7.0 ... 58.0	9.0	2
BTS721L1	100	200	2.0	300 @ 2.9A	5.0 ... 34.0	14.0	4
BTS5215L	90	180	2.0	178 @ 3.5A	5.5 ... 40.0	15.0	2
BTS724G	90	180	2.0	120 @ 3.3A	5.5 ... 40.0	15.0	4
BTS428L2	60	120	7.0	190 @ 7A	4.75 ... 41.0	22.0	1
BTS432E2	38	70	11.0	1700	4.5 ... 42.0	44.0	1
BTS441R	20	37	21.0	700	4.75 ... 41.0	65.0	1
BTS442E2	18	35	21.0	2100	4.5 ... 42.0	95.0	1
Industrial							
ITS42K5D-EL[4]	2500	8000	0.25	n.a.[5]	4.5 ... 45.0	0.4	2
ITS42K5D-LD[4]	2500	8000	0.25	n.a.[5]	4.5 ... 45.0	0.4	2
ISP742RI[2]	350	700	0.4	800	5.0 ... 34.0	1.2	1
ITS4300-SJ-D	300	480[3]	0.4	800	5.0 ... 34.0	1.2	1
ITS4200S-SJ-D	200	350[3]	1.2	125	6.0 ... 52.0	6.5	1
ITS42008-SB-D	200	320[3]	0.6	10000	11.0 ... 45.0	1.4	8
ITS711L1	200	400	1.0	150	5.0 ... 35.0	7.5	4
ITS716G	140	280	1.0	76	5.5 ... 40.0	9.0	4
ITS724G	90	180	2.0	120	5.5 ... 40.0	15.0	4
ITS5215L	90	180	2.0	178	5.5 ... 40.0	15.0	2
ITS428L2	60	120	7.0	190	4.75 ... 41.0	22.0	1

1) See packages on page 100
2) Inversed logic for diagnosis
3) at T_j = 125°C
4) Available in Q1/2014
5) Having freewheeling diode built in

24V Capable	High Current Limit	Low Current Limit	Overvoltage Shutdown	Short Circuit Diagnosis			Packages[1)]
				to GND	to battery	Open Load in ON-State	
	●			●	●	●	㉘
	●			●	●	●	㊹
		●		●	●		①
		●		●	●		①
		●		●	●		①
●	●			●	●		①
	●		●		●		⑦
	●		●	●		●	⑦
●				●			⑫
●	●			●	●		①
	●				●		④
●		●		●	●		㉞
	●				●		④
	●				●		③
	●				●		⑦
	●				●		⑦
	●				●		⑦
●		●		●	●		④
	●		●		●		⑦
	●				●		③
	●				●		⑦
	●			●		●	㉞
●	●		●	●		●	㊲, ㊷
	●				●		㊲
●	●		●	●		●	㊲, ㊷
	●			●	●	●	㉘
	●			●	●	●	㊹
●		●		●	●		①
		●		●	●		①
●	●			●	●		①
●				●			⑫
	●		●	●		●	⑦
	●				●		⑦
	●				●		⑦
	●				●		③
	●			●		●	㉞

[1)] Green packages

PROFET™: Smart High-Side Switches

Current Sense, Current Input

Basic Features

- 12V or 24V capable
- Single channel

Protection Features

- Current limitation
- Overload protection
- Short circuit shutdown
- ReverSave™
- Loss of GND

Diagnosis Features

- Analog signal proportional to load current
- Overload detection
- Short circuit detection

Product Type	$R_{DS(on)}$ (typ) [mΩ]	$R_{DS(on)}$ (max.) @ T_j = 150°C [mΩ]	Nominal Load Current [A]	E_{AS} @ 20A [mJ]	Recommended Operating Voltage Range [V]	$I_{L(SC)}$ (typ) [A]
BTS6163D	20.0	40	6.5	250	5.5 ... 62.0	70
BTS443P	16.0	32	6.5	150	5.0 ... 36.0	65
BTS5016SDA	16.0	32	6.5	120	5.5 ... 20.0	75
BTS5014SDA	14.0	28	7.0	150	5.5 ... 20.0	80
BTS5012SDA	12.0	24	8.0	200	5.5 ... 20.0	90
BTS6142D	12.0	22	8.0	250	5.5 ... 24.0	100
BTS6143D	10.0	18	10.0	300	5.5 ... 38.0	105
BTS6133D	10.0	18	10.0	300	5.5 ... 38.0	105
BTS50085-1TMA	9.0	17	11.0	1200	5.5 ... 58.0	90
BTS50085-1TMB	9.0	17	11.0	1200	5.0 ... 58.0	90
BTS50080-1TMA	8.0	16	12.0	400	5.5 ... 38.0	130
BTS50080-1TMB	8.0	16	12.0	400	5.5 ... 38.0	130
BTS50080-1TMC	8.0	16	12.0	400	5.5 ... 38.0	130
BTS50080-1TEA	8.0	16	10.0	300	5.5 ... 30.0	125
BTS50080-1TEB	8.0	16	10.0	300	5.5 ... 30.0	125
BTS50070-1TMA	7.0	14	12.0	400	5.5 ... 30.0	95
BTS50070-1TMB	7.0	14	12.0	400	5.5 ... 30.0	95
BTS50055-1TMA	6.0	11	17.0	1500	5.0 ... 34.0	130
BTS50055-1TMB	6.0	11	17.0	1500	5.0 ... 34.0	130
BTS50055-1TMC	6.0	11	17.0	1500	5.5 ... 34.0	130
BTS550P	3.5	7	35.0	3000	5.0 ... 34.0	220
BTS555	2.5	4	45.0	3000	5.0 ... 34.0	400

1) See packages on page 100

24V Capable	Short-circuit to GND Protection		Overtemperature Protection		Inverse Current Operation Capability	Open-load in ON Detection	Packages[1)]
	Latch	Restart	Latch	Restart			
●	●			●		●	㉞
		●		●		●	㉞
	●			●		●	㉞
	●			●		●	㉞
	●			●		●	㉞
	●			●		●	㉞
	●			●		●	㉞
	●			●	●	●	㉞
●	●			●	●		㊵
●	●			●	●		㊺
	●			●		●	㊵
	●			●		●	㊻
	●			●		●	㊵
	●			●		●	㉞
	●			●	●	●	㉞
	●			●		●	㊵
	●			●		●	㊻
	●			●	●		㊵
	●			●	●		㊺
		●		●	●		㊵
	●			●	●		㊿
	●		●		●		㊿

PROFET™: Smart High-Side Switches

Current Sense, Voltage Input

Basic Features

- 12V or 24V capable
- Single or multi channel

Protection Features

- Short circuit shutdown with auto-restart or latch
- Overtemperature shutdown with auto-restart or latch
- Reverse polarity protection by ReverSave™ or with external components
- Loss of GND

Diagnosis Features

- Analog signal proportional to load current
- Overload
- Open-load in ON
- Overtemperature
- Short-circuit to GND

Product Type	$R_{DS(on)}$ (typ) [mΩ]	$R_{DS(on)}$ (max) @ T_j = 150°C [mΩ]	Nominal Load Current [A]	E_{AS} [mJ]	Recommended Operating Voltage Range [V]	$I_{L(SC)}$ (typ) [A]
Automotive Grade						
BTS5200-4EKA[2]	200.0	400.0	0.5	30 @ 0.5A	5.0 ... 28.0	7.5
BTS5180-2EKA	180.0	360.0	1.0	30 @ 1A	5.0 ... 28.0	12
BTS5120-2EKA	120.0	240.0	2 x 1.0	15 @ 2A	5.0 ... 28.0	12
BTS5090-2EKA	90.0	180.0	2.5	42 @ 3A	5.0 ... 28.0	32
BTS5090-1EJA	90.0	180.0	2.5	42 @ 3A	5.0 ... 28.0	32
BTT6050-1EKA	50.0	105.0	4.5	55 @ 4A	5.0 ... 48.0	47
BTT6050-2EKA	50.0	100.0	2 x 3.0	55 @ 4A	5.0 ... 48.0	47
BTS5045-2EKA	45.0	90.0	2 x 2.5	35 @ 4A	5.0 ... 28.0	32
BTS5045-1EJA	45.0	90.0	3.0	35 @ 4A	5.0 ... 28.0	32
BTS740S2	30.0	60.0	4.0	370 @ 5.5A	5.0 ... 34.0	50
BTS640S2G	30.0	60.0	4.5	410 @ 12.6A	5.0 ... 34.0	50
BTT6030-2EKA	30.0	64.0	2 x 4.0	50 @ 4A	5.0 ... 48.0	70
BTT6030-1EKA	30.0	64.0	6.0	50 @ 6A	5.0 ... 48.0	70
BTT6020-1EKA	20.0	42.0	7.0	100 @ 7A	5.0 ... 48.0	88
BTS5030-2EKA	30.0	60.0	2 x 3.0	50 @ 6A	5.0 ... 28.0	47
BTS5030-1EJA	30.0	60.0	4.0	50 @ 6A	5.0 ... 28.0	47
BTS5020-2EKA	20.0	40.0	2 x 4.0	75 @ 6A	5.0 ... 28.0	65
BTS5020-1EKA	20.0	40.0	5.0	74 @ 6A	5.0 ... 28.0	65
BTS5016-2EKA[2]	16.0	32.0	2 x 5.0	95 @ 7A	5.0 ... 28.0	65
BTS5016-1EKB	16.0	32.0	6.0	95 @ 7A	5.0 ... 28.0	65
BTS5012-1EKB	12.0	24.0	8.0	110 @ 10A	5.0 ... 28.0	65
BTS5010-1EKB	10.0	20.0	9.0	155 @ 10A	5.0 ... 28.0	65
BTS5008-1EKB	8.0	16.0	10.0	160 @ 11A	5.0 ... 28.1	65
BTS50080-1EGA	8.0	16.0	13.0	125 @ 50A	6.0 ... 28.0	150
BTS50070-1EGA	7.0	14.0	14.0	145 @ 50A	6.0 ... 28.0	150
BTS50060-1EGA	6.0	12.0	15.0	170 @ 50A	6.0 ... 28.0	150
BTS50060-1TEA	6.0	12.0	13.5	280 @ 20A	4.7 ... 28.0	75
BTF50060-1TEA[3]	6.0	12.0	13.5	280 @ 20A	4.7 ... 28.0	75
BTS50050-1EGA	5.0	10.0	16.0	200 @ 50A	6.0 ... 28.0	150
BTS50040-2SFA	4.0	8.2	2 x 11.0	411 @ 20A	6.0 ...28.0	160
BTS50015-1TAC	1.5	3.0	39.0	550 @ 33A	5.3 ... 28.0	135

1) See packages on page 100
2) Available in Q4/2013
3) Speed PROFET™, capable for PWM up to 25kHz

Number of channels	Load Current		Over voltage Shutdown	Sense Enable	Open-load in OFF	Latch	24V	ReverSave™	Packages[1)]
	Limit	Trip							
4	●			●	●				⑤
2	●			●	●				⑤
2	●			●	●				⑤
2	●			●	●				⑤
1	●			●	●				②
1	●			●	●	●	●		⑤
2	●			●	●	●	●		⑤
2	●			●	●				⑤
1	●			●	●				②
2	●		●						⑦
1	●		●						㊴
2	●			●	●	●	●		⑤
1	●			●	●	●	●		⑤
1	●			●	●	●	●		⑤
2	●			●	●				⑤
1	●			●	●				②
2	●			●	●				⑤
1	●			●	●				⑤
2	●			●	●				⑤
1	●			●	●				⑤
1	●			●	●				⑤
1	●			●	●				⑤
1	●			●	●				⑤
1		●		●	●	●		●	③
1		●		●	●	●		●	③
1		●		●	●	●		●	③
1		●			●	●			㉞
1		●			●	●			㉞
1		●		●	●	●		●	③
2		●		●		●		●	⑫
1		●				●		●	㊴

SPOC™: SPI Power Controller

SPOC™ devices are high-side smart power Multichannel switches providing embedded protection diagnosis and intelligence. They are specially designed for standard exterior lighting in automotive applications, but can be used for further automotive and industrial applications such as heating, motor driving or power distribution.

Integration helps reducing the complexity of the electronics, allowing board space reduction and decreasing the need for external components. Control, configuration and diagnosis are carried out via a Serial Peripheral Interface (SPI), which saves I/Os on the microcontroller and provides flexibility for the solution. Furthermore, Fail Safe modes are supported, which enhances safety in operation.

Re-use and design flexibility is supported through the pin, function and package compatibility of the devices within each SPOC™ family.

SPOC™ provides decisive advantages on system level and for a wide range of applications.

Basic Features

- Serial Peripheral Interface (SPI) (daisy-chain capable) for control and diagnosis
- CMOS-compatible parallel input pins provide straightforward PWM operation and FailSafe
- Very low stand-by current
- Optimized electromagnetic compatibility
- Suitable for bulbs as well as LEDs

Diagnosis Functions

- Multiplexed proportional load current sense signals
- High accuracy of current sense signal at wide load current range
- Latching feedback on overtemperature and overload via SPI
- Diagnosis PWM with small duty cycle possible
- LED mode
- Fail-safe activation via LHI pin and configuration via input pins

Protective Functions

- Reverse battery protection
- Short-circuit and overload protection
- Multistep current or tripping (SPOC™ FL)
- Thermal shutdown with latch
- Overvoltage protection
- Reverse polarity protection (SPOC™ FL)
- Loss of ground protection

Options

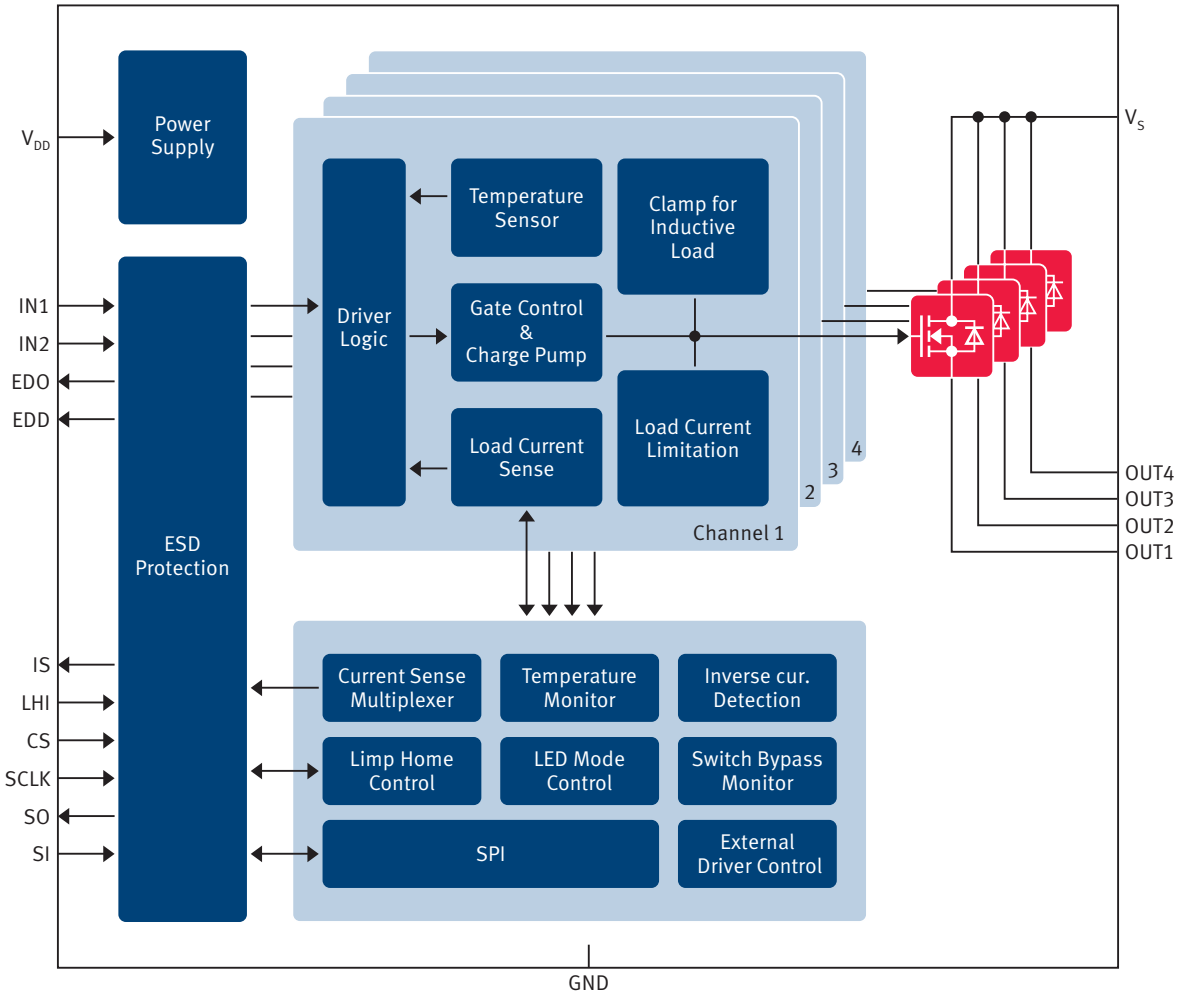
- **LED mode (SPOC™+, SPOC™ FL):** Load type configuration between bulbs and LEDs for products featuring the LED mode option (current sense ratio configurable, very fast diagnosis in LED mode)
- **PWM engine (SPOC™ FL):** autonomous PWM generator to reduce micro controller loading
- **External drive capability (SPOC™+, SPOC™ FL):** ability to control one or two smart power drivers to reduce the I/O usage of the micro controller

AEC Qualified

RoHS

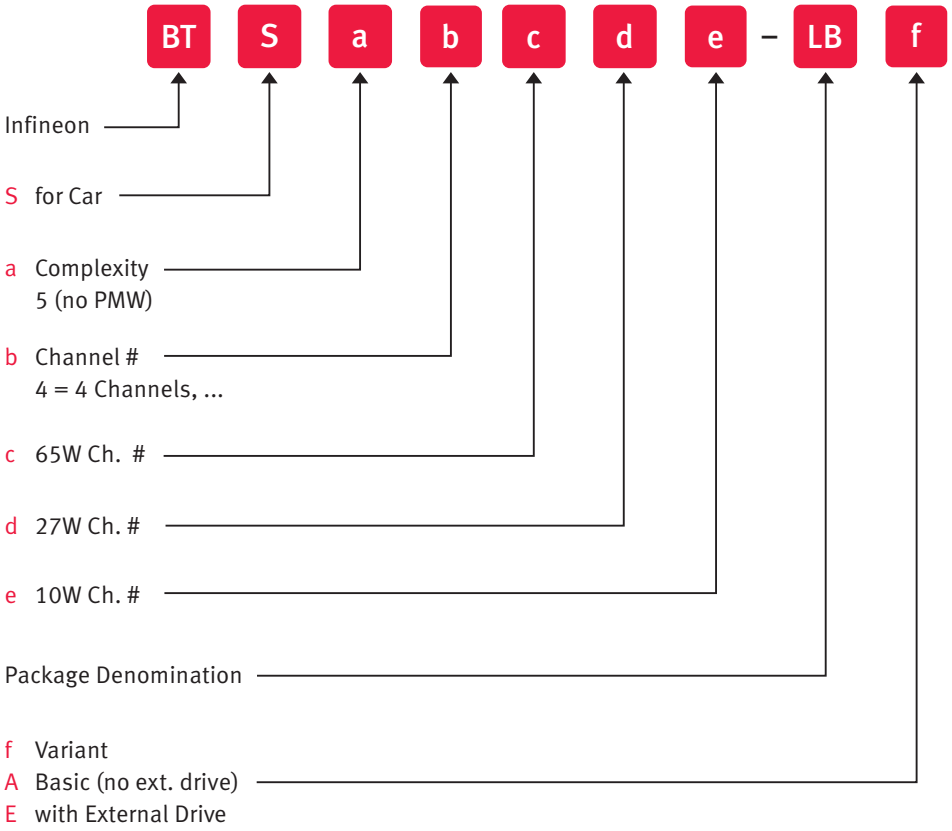
www.infineon.com/spoc

Block Diagramm (SPOC™+ Example): BTS54220-LBE



SPI Power Controller (SPOC™) for Advanced Light Control

SPOC™+ Family Naming System



Product Table

Product Type	Channel mix [mΩ]			LED mode (27W channels)	PWM engine integrated	External drive capability	Package[1)]
	65W	27W	10W				
SPOC™ FL (Front Light)							
BTS5482SF	2 x 4.5	2 x 14	–	●		●	⑫
BTS6480SF	2 x 4.5	2 x 14	–	●	●	●	⑫
SPOC™+							
BTS54220-LBA	2 x 9.0	2 x 27	–	●			㊺
BTS54220-LBE	2 x 9.0	2 x 27	–	●		●	㊺
BTS54040-LBA	–	4 x 39	–	●			㊺
BTS54040-LBE	–	4 x 39	–	●		●	㊺
BTS55032-LBA	–	3 x 39	2 x 110	●			㊺
BTS56033-LBA	–	3 x 39	3 x 110	●			㊺

1) See packages on page 100

www.infineon.com/spoc

Infineon® Auto LED Driver

Infineon® Auto LED Driver are an enabler of protected and high performing lighting applications in automotive.
In particular the constant current regulation secures the stable brightness of the LED over the whole automotive temperature and voltage range.

The driver as well as the LED are protected against overstress e.g. caused by voltage spikes or overtemperature.
Any kind of load conditions are detected by its diagnostic features such as open load or shorted LED.
All features are required to drive LEDs in harsh automotive environment conditions.

Features

- Constant output current, therefore constant brightness and extended LED lifetime
- Wide input voltage range
- Low drop voltage
- Open-load detection
- Overtemperature protection
- Short-circuit proof
- Reverse polarity proof
- Wide temperature range
- Very small SMD packages

Infineon® Auto LED drivers are divided in four sub-families

Infineon® Linear LED Driver

- BCR400 series is the most cost effective solution to drive low power LED
- Linear Current Sources for Low to Medium Power Applications

Infineon® Basic LED Driver

- Flexible linear current source family with scalable feature set

Infineon® LIN LED Driver

- LIN controlled LED driver for multicolor ambient lighting

Infineon® Power LED Driver

- DC/DC converter & controller for high power applications

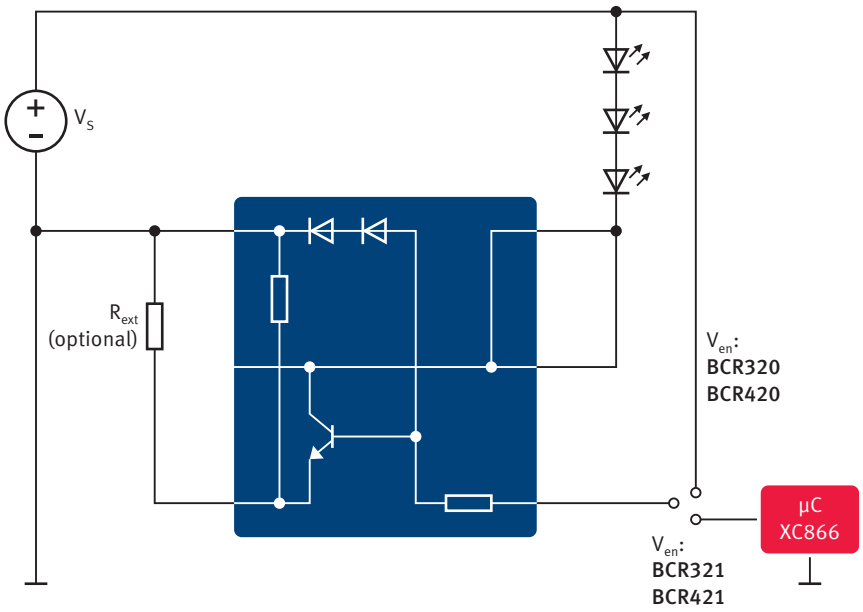
AEC Qualified RoHS

www.infineon.com/led-driver

Infineon® Linear LED Driver

BCR400 series is the most cost effective solution to drive low power LED

Block Diagram BCR42x-U



Product Table

Product Type	Output Current (max) [mA]	Adjustable Output Current	Supply Voltage (max) [V]	Inhibit	PWM enable	P_{tot} [mW]	Package[1]
BCR401U	65	●	40			750	⑲
BCR401W	65	●	18			500	㉖
BCR402U	65	●	40			750	⑲
BCR402W	65	●	18			500	㉖
BCR405U	65	●	40			750	⑲
BCR320U	250	●	27			1,000	⑲
BCR321U	250	●	27	●	●	1,000	⑲
BCR420U	150	●	40			1,000	⑲
BCR421U	150	●	40	●	●	1,000	⑲

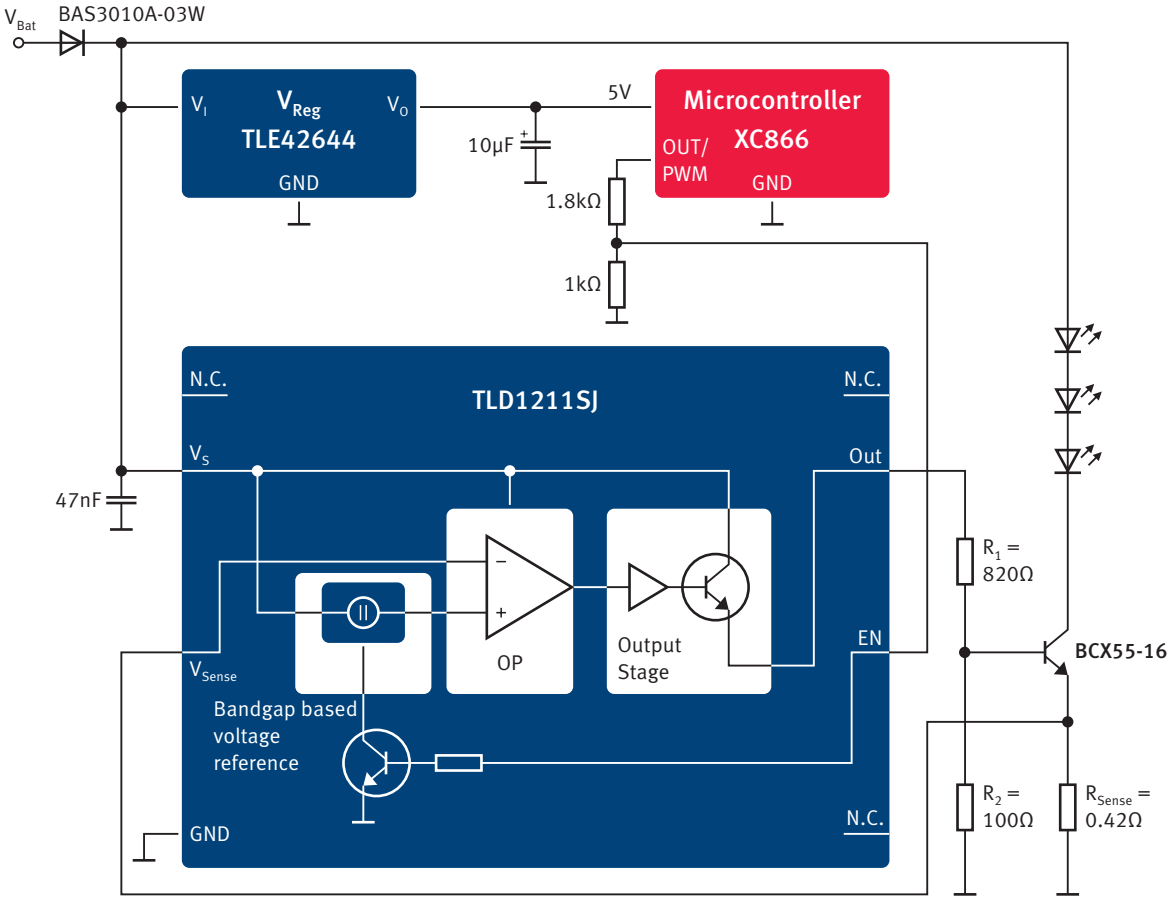
1) See packages on page 100

Infineon® Linear LED Driver

Linear Current Sources for Low to Medium Power Applications

LED drivers designed to supply constant current up to 500mA, which enables constant LED brightness and ensures extended LED lifetime, independently from supply voltage or LED forward voltage class.

Block Diagram TLD1211SJ



Product Table

Product Type	Output Current (typ) [mA]	Adjustable	Driver for External Transistor	Open-load detection	PWM/Enable input	High-Low Current Switch	Package[1)]
TLD1211SJ	85	●	●		●		①
TLE4240-2M	58						⑳
TLE4240-3M	58			●			⑳
TLE4241GM	60	●		●	●	●	①
TLE4242G	450	●		●	●		㊵

1) See packages on page 100

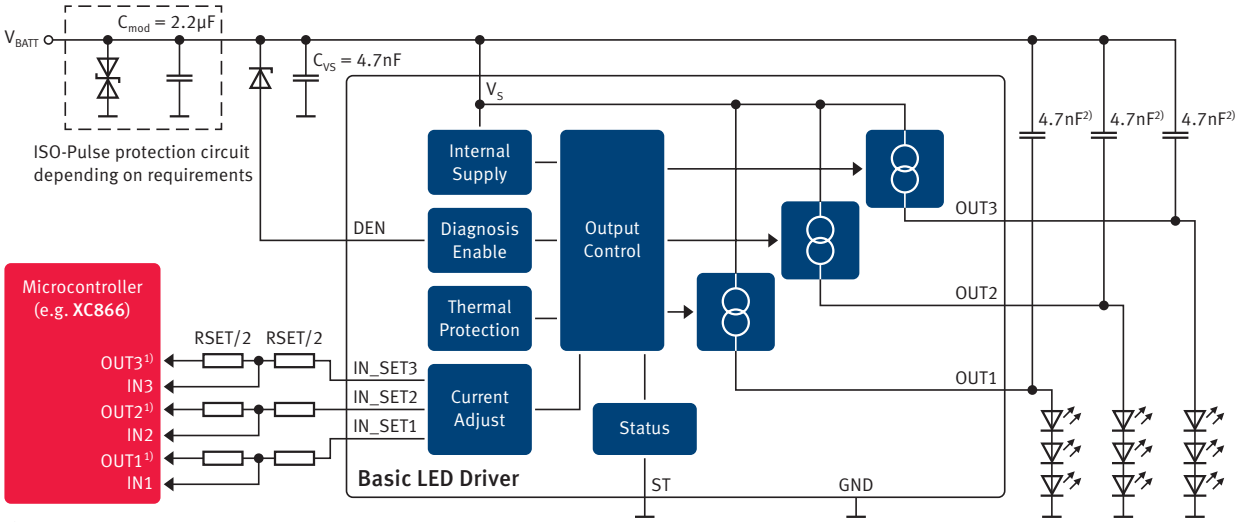
Infineon® Basic LED Driver

Flexible linear current source family with scalable feature set

Infineon's new Basic LED driver are optimized for the control of low to medium power LEDs in automotive applications. The whole family of linear constant current sources offers footprint compatibility ranging from 1 to 3 output channels and 60-180mA and enables stable and reliable LED brightness by precise current control.

Its diagnostics and logic feature set enables improved system reliability by significant component reduction on board level, improved system protection (e.g. against ISO pulses), as well as an energy optimized system solution (DCDC control).

Application Diagram TLD2314EL



1) Open Drain
2) For EMI improvement, if required

Product Table

Product Type	1 IN 1 OUT	1 IN 3 OUT	3 IN 3 OUT	Output Current (typ.) mA per Channel	PWMI	N - 1	OL & SC Detection	OL & SC with Double Fault Detection	DEN	Matrix	Package[1]
TLD1120EL[2]	●			180							㉘
TLD1310EL[2]		●		60							㉘
TLD2310EL[2]			●	60							㉘
TLD1312EL[2]		●		60	●						㉘
TLD1311EL[2]		●		60		●					㉘
TLD1121EL	●			180			●				㉘
TLD2311EL			●	60			●				㉘
TLD1313EL[2]		●		60				●			㉘
TLD1124EL	●			180			●		●		㉘
TLD1314EL		●		60			●		●		㉘
TLD2314EL			●	60			●		●		㉘
TLD1125EL	●			180	●		●				㉘
TLD1315EL		●		60	●	●	●				㉘
TLD1326EL[2]		●		60	●	●	●			●	㉘
TLD2326EL[2]			●	60	●	●	●			●	㉘

1) See packages on page 100
2) Coming soon, Q1/2014

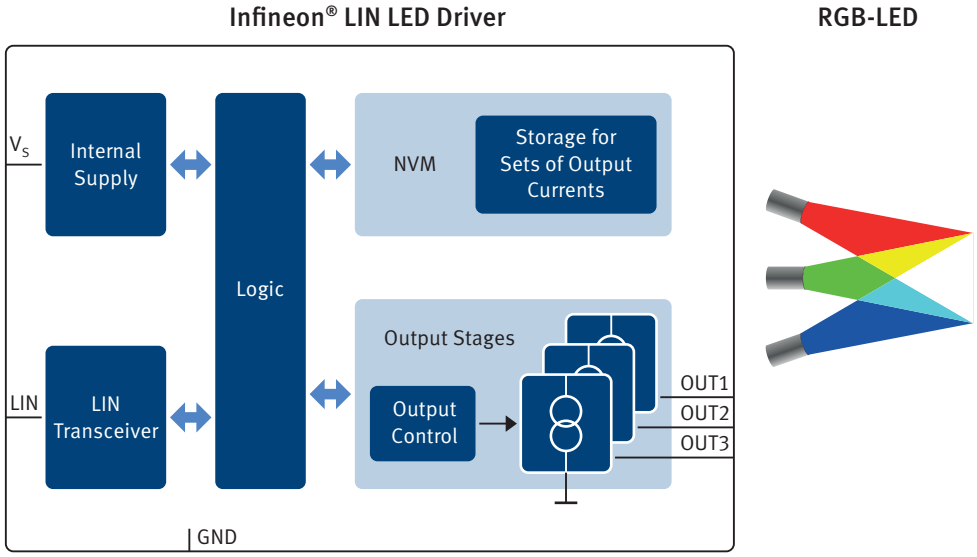
www.infineon.com/led-driver

Infineon® LIN LED Driver

LIN Controlled LED Driver for Multicolor Ambient Lighting

The Infineon® LIN LED Driver family is the enabler for multicolor and especially for the challenging RGB (Red-Green-Blue) Ambient Lighting. The device family members combine logic, memory, LIN interface and a three channel linear current source in one device.
By using the integrated memory to store calibration points of the used LED a stable color point can be achieved. The integrated memory is big enough to store up to 16 color points. Additionally a smart color theater dimming and color transitioning is already integrated in the device to allow smooth color changes and up- and down dimming.

Block Diagram TLD7306EK



Product Table

Product Type	LIN Interface	Output Current (max) Capability	External Driver Capability	Package[1)]
TLD7305EK	SAE-J2602	48mA		⑤
TLD7306EK	LIN 2.1	48mA		⑤
TLD7395EK	SAE-J2602	dependend on external Bipolar Transistor	●	⑤
TLD7396EK	LIN 2.1		●	⑤

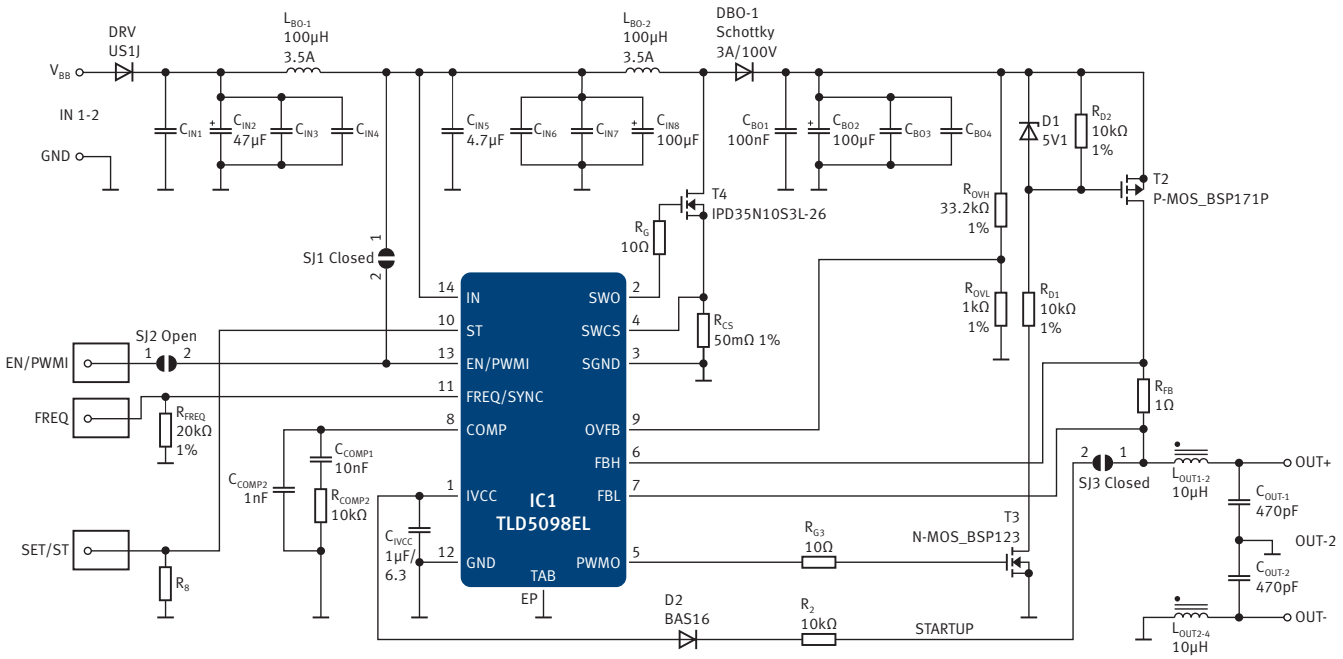
1) See packages on page 100

Infineon® Power LED Driver

DC/DC Converter & Controller for High Power Applications

Increasingly, LED lighting solutions are used in the front area of the car, especially in the Premium segment. LED Frontlight solutions are usually implemented using several discrete LEDs in one chain which leads to a string voltage of up to 60V or using less LEDs with high forward current up to 1.5A. Both implementations are requiring DC/DC solutions either boost, buck or buck-boost architectures are needed. The Infineon® Power LED Driver Family consists of DC/DC devices which are perfectly fulfilling these requirements.

Application Diagram TLD5098EL in Boost Mode with Short to Ground Protection



Product Table

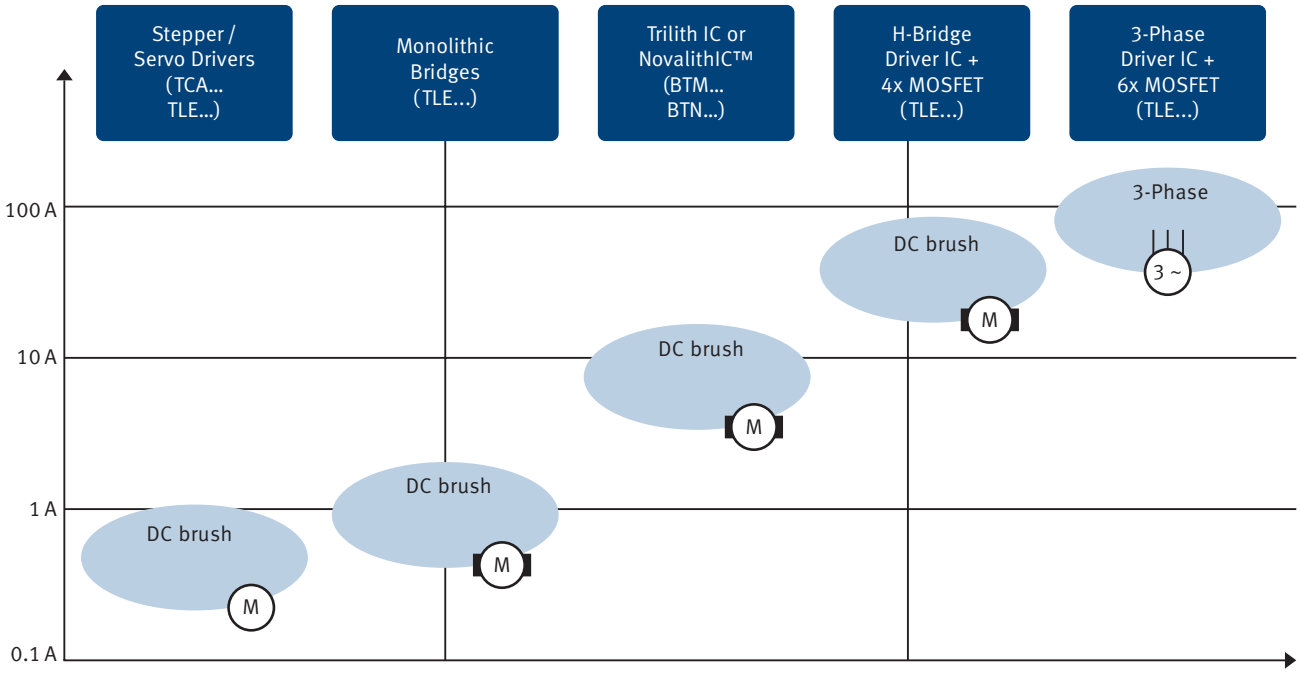
Product Type	Topology	Power Stage	Current (max) [A]	V_{IN} Range [V]	V_{OUT} (max) [V]	LED Current Dimming		Package[1]
						Digital (PWM)	Analogue	
TLD5045EJ	Buck Converter	Internal	0.7	5 ... 40	40	Yes	Yes	②
TLD5085EJ	Buck Converter	Internal	1.8	4.75 ... 45	45	Yes	No	②
TLD5095EL	Multitopology Controller IC Buck, Boost, Buck-Boost, SEPIC, Flyback	External	dependant on External MOSFET	4.75 ... 45	45	Yes	No	㉘
TLD5097EL[2]	Multitopology Controller IC Buck, Boost, Buck-Boost, SEPIC, Flyback	External	dependant on External MOSFET	4.5 ... 45	60	Yes[3]	Yes	㉘
TLD5098EL	Multitopology Controller IC Buck, Boost, Buck-Boost, SEPIC, Flyback	External	dependant on External MOSFET	4.5 ... 45	60	Yes	Yes	㉘

1) See packages on page 100
2) Coming soon, Q1/2014
3) No dedicated gate driver. Digital dimming done via main switch.

www.infineon.com/led-driver

Motor Drivers
The Right Driver for Every Motor

The search for a solution to drive applications powered by low-voltage motors ends with Infineon. From 0.1 to 100A, and from steppers to 3-Phase drivers, we offer the right solution for every current range and application requirement.



AEC Qualified

RoHS

www.infineon.com/bridges

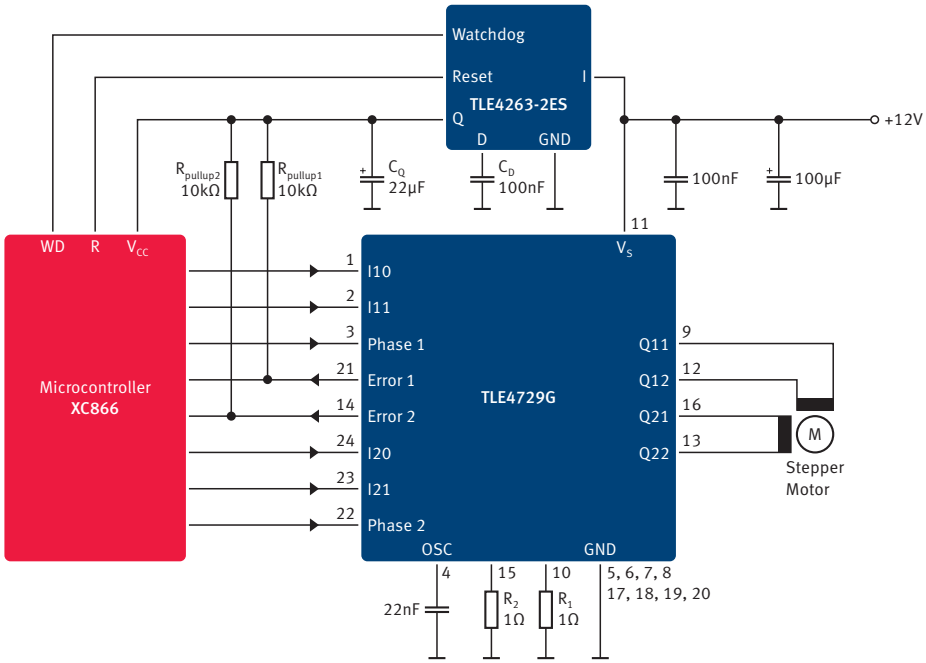
Integrated Smart Power Motor Drivers

The Infineon low-current DC motor bridge family consists of a broad variety of bridges for stepper and DC brush motors including servo motors. They are designed for use in automotive and industrial applications. Typical applications are light leveling, HVAC flap control, and mirror adjustment.

The products are offered with protection features as well as diagnosis. Depending on the product type the protection ranges from basic protection against overtemperature to a full set of protection against open-load, overvoltage, undervoltage, overtemperature and short-circuit. The diagnosis capabilities range from a simple status flag to communication via a 16-bit SPI.

Stepper Motor Drivers

The TCA3727 and TLE4726 et seqq. cover a broad range of applications from automotive to industry. The TLE4726 can be used in 24V applications. All types are produced in DOPL, Infineon's robust bipolar technology.



Product Table

Product Type	$I_{L(NOM)}$ [A]	$I_{L(lim)}$ [A]	I_q [µA]	$V_{S(op)}$ [V]	Step Operations	Protection	Diagnostic Interface	Highlights	Package[1)]
Current controlled									
TCA3727G	2 x 0.75	2 x 1.5	200	5–50	Full to mini step	OT	–	High operating voltage, low quiescent current with inhibit	⑩
TLE4726G	2 x 0.75	2 x 1.5	200	5–50	Full to mini step	OT	–		⑩
TLE4729G	2 x 0.7	2 x 1.5	50	6–16	Full to mini step	OL, OT, SC	Status flag	Very low quiescent current with inhibit	⑩
Voltage controlled									
TLE4208G	4 x 0.8	4 x 1.5	20	8–18	Full to half-step	SC, OT, OV, UV	Status flag	Dual Full Bridge	⑪
TLE8444SL	4 x 0.5	4 x 0.9	1	8–18	Full to half-step	SC, OT, OV, UV, OL	Status flag	Open-load detection in ON-State	㉚

1) See packages on page 100

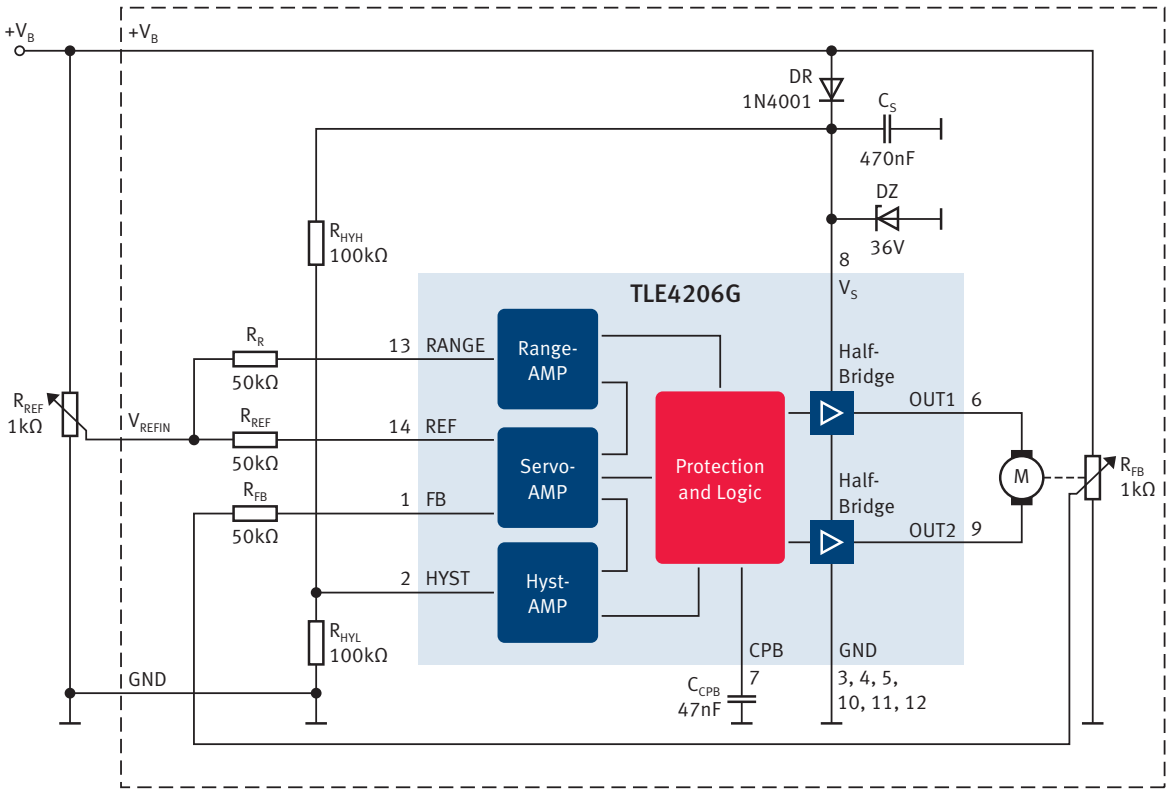
LO = Lockout
OL = Open-Load
OV = Overvoltage
UV = Undervoltage
OT = Overtemperature
SC = Short-Circuit

www.infineon.com/dc-motor-bridges

Integrated Smart Power Motor Drivers

Servo Drivers

The TLE4205, TLE4206 and TLE4209 are protected H-Bridge drivers for automotive applications like headlight beam control and industrial servo control applications. The part is built using DOPL, Infineon's robust bipolar technology.



Product Type	$I_{L(NOM)}$ [A]	$I_{L(lim)}$ [A]	I_q [µA]	$V_{S(op)}$ [V]	Protection	Inhibit	Highlights	$V_{sat\ path}$	Package[1]
TLE4205G[3]	0.6	1.0	0.01	6 ... 32	SC	•	Dual power comparator for higher voltage	2.1V at 0.6A[2] supply voltage	⑦
TLE4206G	0.8	1.5	12.0	8 ... 18	OT, OV, UV, LO, SC		Servo driver with current peak blanking	1.2V at 0.4A[2]	④
TLE4206-2G	0.8	1.5	12.0	8 ... 18			Switching hysteresis on range input	1.2V at 0.4A[2]	④
TLE4206-4G	0.9	1.6	12.0	8 ... 19			Adapted range input	1.2V at 0.4A[2]	④
TLE4209A	0.8	1.5	12.0	8 ... 18			Servo driver	1.2V at 0.4A[2]	㊾
TLE4209G	0.8	1.5	12.0	8 ... 18			Servo driver	1.2V at 0.3A[2]	④

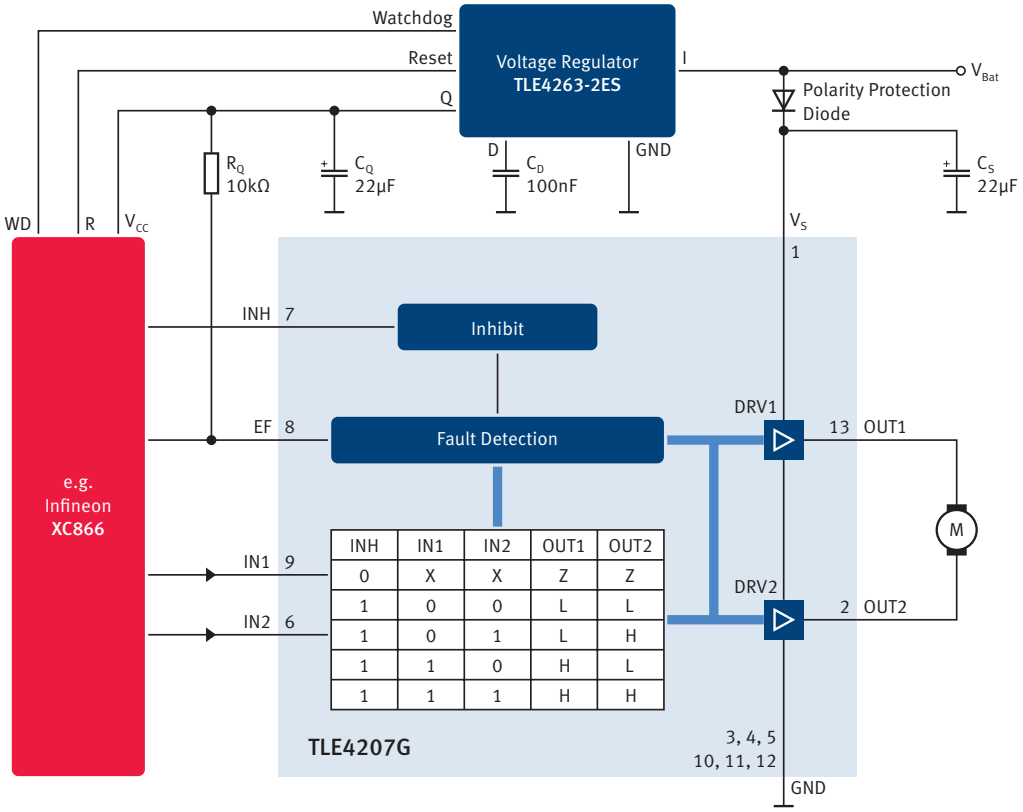
1) See packages on page 100
2) Total drop saturation voltage typ. value @ 25°C and 0.4A
3) $R_{DS(on)}$ is typical and specified @ T_j = 25°C

LO = Lockout
OL = Open-Load
OV = Overvoltage

UV = Undervoltage
OT = Overtemperature
SC = Short-Circuit

Motor Control ICs

The TLE4207, TLE4208, TLE6208-3/-6 are multipurpose bridges designed to drive DC brush motors with nominal load currents < 1A for automotive and industrial applications. The TLE4207 and TLE4208 parts are built using Infineon's robust bipolar technology DOPL. TLE6208-3/-6 and TLE84xxx use SPT, a technology combining bipolar, CMOS and DMOS cells.



Basic Features

- OV = Overvoltage
- UV = Undervoltage
- OT = Overtemperature
- SC = Short-Circuit

Product Type	Config.	$I_{L(NOM)}$ [A]	$I_{L(LIM)}$ [A]	I_q	$V_{S(op)}$ [V]	Protection	Diagnostic Interface	Highlights	$V_{CE(sat)}$ / $R_{DS(on)}$	Package[1]
TLE4207G	2x Half-bridge	2 x 0.8	2 x 1.5	20	8 ... 18	LO	Status flag	Error det.	1.2V[2]	④
TLE4208G	4x Half-bridge	4 x 0.8	4 x 1.5	20	8 ... 18	LO	Status flag	Error det.	1.2V[2]	⑪
TLE8444SL	4x Half-bridge	4 x 0.5	4 x 0.9	1	8 ... 18	OL	Status flag	Open-load detection in ON-State	600mΩ/switch	㉚
TLE6208-3G	3x Half-bridge	3 x 0.8	3 x 1.0	10	8 ... 40	LO	16-bit SPI	Detailed diagnosis via SPI	800mΩ[3]/switch	④
TLE6208-6G	6x Half-bridge	6 x 0.8	6 x 1.0	12	8 ... 40	LO	16-bit SPI	Single switch usage possible	800mΩ[3]/switch	⑪
TLE84106EL	6x Half-bridge	6 x 0.3	6 x 0.5	2	7 ... 18	OL	16-bit SPI	Pin compatible to TLE84110EL	800mΩ[3]/switch	㉛
TLE84110EL	10x Half-bridge	10 x 0.3	10 x 0.5	2	7 ... 18	OL	16-bit SPI	Pin compatible to TLE84106EL	800mΩ[3]/switch	㉛

1) See packages on page 100
2) Total drop saturation voltage typ. value @ 25°C and 0.4A
3) $R_{DS(on)}$ is typical and specified @ T_j = 25°C

LO = Lockout
OL = Open-Load

www.infineon.com/dc-motor-bridges

Integrated Smart Power Motor Drivers

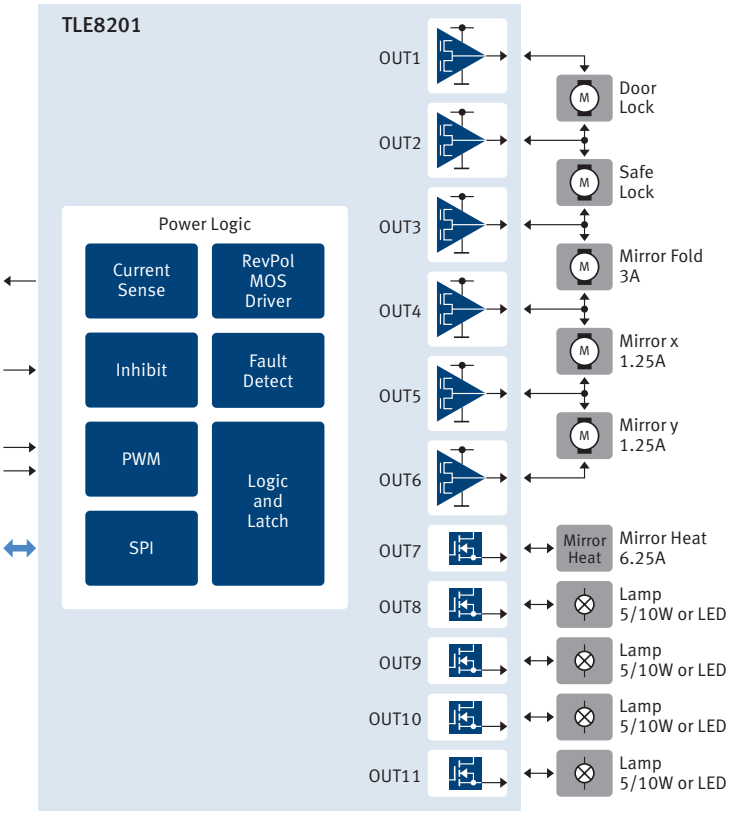
Door Module ICs

The TLE8201R is an ASSP for door-module applications. It includes those power stages necessary to drive the following loads in a typical front door: Central lock, mirror fold, mirror position, mirror defrost plus 5 and 10W lamps. It is designed as a monolithic circuit in a SPT technology which combines bipolar and CMOS control circuit with DMOS power devices.

The TLE8203E is a derivative of the TLE8201R for automotive mirror control applications. The following output stages are included in this monolithic device, mirror position, mirror defrost and one lamp driver for 5 or 10W.

Standard Features

- SPI Interface
- I_Q = 3µA
- Operating Range: 8–20VS



Product Type	Outputs	$I_{L(lim)}$ [A]	$R_{DS(on)}$ [mΩ]	Driver Stage	Operating Range [V]	Protect	Diagnosis	Target Load	Package[1]
TLE8201R[2]	1, 2	8.0	120	Half-bridge	8–20	OC, OT, OV, UV	CS	Central lock	⑭
	3, 4	3.0	350	Half-bridge			CS	Mirror folding	
	5, 6	1.25	650	Half-bridge			OC, OT	Mirror X-Y	
	7	6.25	85	High-side switch (mirror defrost)			CS	Mirror defrost	
	8–11	1.8	400	Lamp driver			OC, OT	Repeater	
TLE8203E	4	3.0	350	Half-bridge	8–20	OC, OT, OV, UV	CS	Mirror folding	⑬
	5, 6	1.25	650	Half-bridge			OC, OT	Mirror X-Y	
	7	6.25	85	High-side switch (mirror defrost)			CS	Mirror defrost	
	8, 10	1.8	400	Lamp driver			OC, OT	Repeater	

1) See packages on page 100
2) Product not intended for new design

LO = Lockout
OL = Open-Load
OV = Overvoltage
OC = Overcurrent
UV = Undervoltage
OT = Overtemperature
SC = Short-Circuit

www.infineon.com/dc-motor-bridges

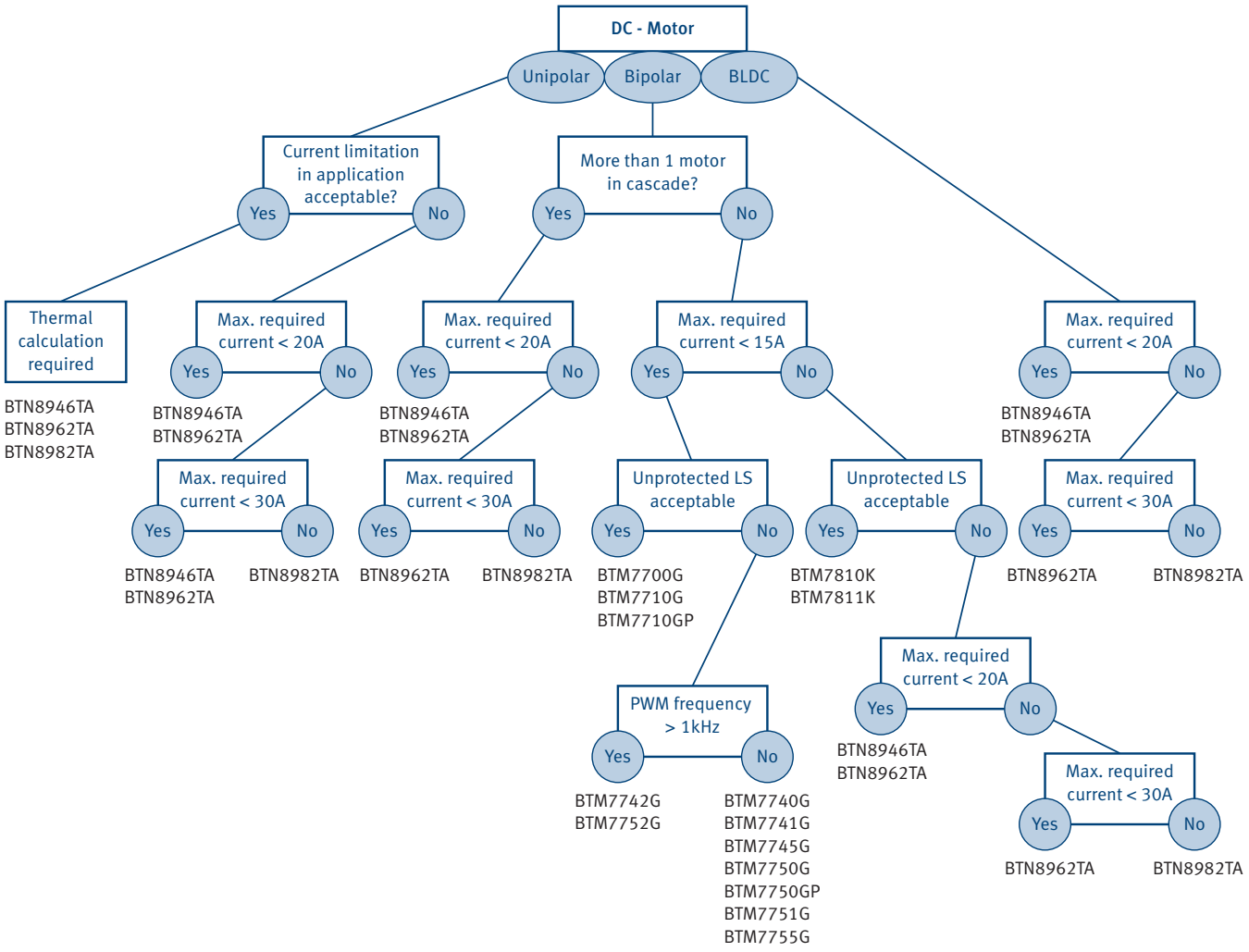
Integrated High-Current Motor Drivers

NovalithIC™/Trilith IC

A NovalithIC™ provides a complete low-ohmic-protected half-bridge in a single package. It can be combined with an additional NovalithIC™ to create an H-Bridge or 3-phase bridge as well. The NovalithIC™ family has the capability to switch to up to 25kHz while providing overcurrent, overvoltage and overtemperature protection. Current sense is optionally available to monitor load current. The NovalithIC™ family offers cost-optimized solutions for protected high-current PWM motor drives with very low board-space consumption–scaled to your needs.

The Trilith IC family members combine two high-side and two low-side switches in one package. They are geared to driving high-current DC motors in an H-Bridge configuration but can also be used as single independent switches. All Trilith ICs include overcurrent and overtemperature protection for the high-side switches. For the low-side switches the user can choose between unprotected switches as well as protected switches.

Selection Tree NovalithIC™ (BTNxxxx)/Trilith IC (BTMxxxx)



www.infineon.com/trilithic
www.infineon.com/novalithic

Integrated High-Current Motor Drivers

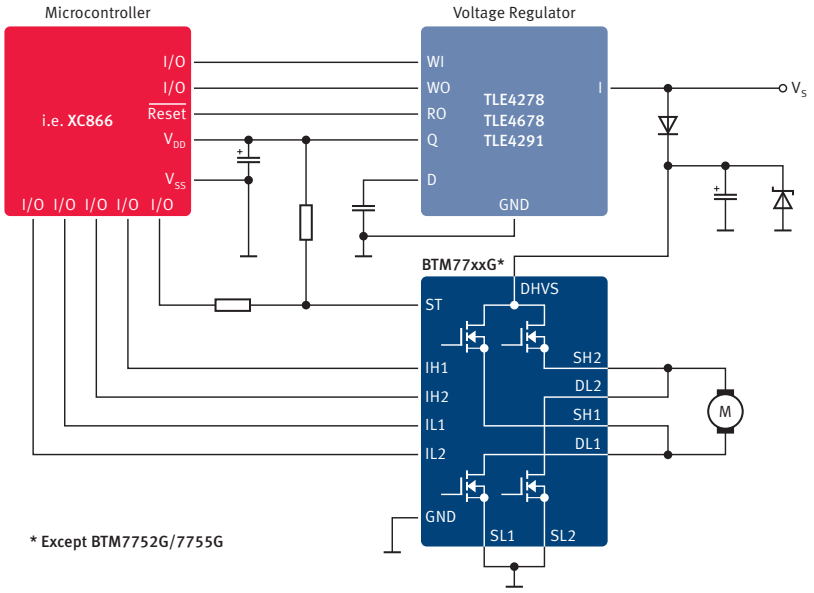
Trilith IC – Integrated H-Bridge

Basic Features
- Low quiescent current
- Capable for high PWM frequency

Diagnostic Features
- Overvoltage
- Overtemperature
- Short-circuit/overcurrent
- Current sense/status
- Open-load

Protection Features
- Overvoltage
- Undervoltage
- Overtemperature
- Short-circuit/overcurrent

Application Example Trilith IC



* Except BTM7752G/7755G

Trilith IC Product Overview

Product Type	Operating Range [V]	$R_{DS(on)}$ path (typ) @25°C [mΩ]	$I_{D(lim)}$ (typ) [A]	I_q (typ) [µA]	Switch freq. (typ) [kHz]	Diagnosis	Protect	Package[1]
BTM7740G	4.8 ... 42.0	210	8.0	5	1	OT	OT, SC	⑪
BTM7741G	4.8 ... 42.0	210	8.0	5	1	OT, OL	OT, SC	⑪
BTM7700G	4.8 ... 42.0	190	9.5	5	1	OT	OT, SC	⑪
BTM7750G	4.8 ... 42.0	115	12.0	5	1	OT	OT, SC	⑪
BTM7750GP[2]	4.8 ... 42.0	115	12.0	5	1	OT	OT, SC	㊶
BTM7751G	4.8 ... 42.0	115	14.0	5	1	OT, OL	OT, SC	⑪
BTM7710GP[2]	4.8 ... 42.0	110	15.0	5	1	OT	OT, SC	㊶
BTM7710G	4.8 ... 42.0	110	15.0	5	1	OT	OT, SC	⑪
BTM7810K[2]	5.0 ... 42.0	40	42.0	4	1	OT, OL	OT, SC	㊶
BTM7811K[2]	5.0 ... 42.0	40	42.0	4	20	OT, OL	OT, SC	㊶
BTM7742G	5.5 ... 28.0	250	12.0	5	25	OV, OT, SC/OC, CS	OV, UV, OT, SC/OC	⑫
BTM7745G	5.5 ... 28.0	250	12.0	5	1	OV, OT, SC/OC	OV, UV, OT, SC/OC	⑫
BTM7752G	5.5 ... 28.0	150	12.0	5	25	OV, OT, SC/OC, CS	OV, UV, OT, SC/OC	⑫
BTM7755G	5.5 ... 28.0	150	12.0	5	1	OV, OT, SC/OC	OV, UV, OT, SC/OC	⑫

1) See packages on page 100
2) AEC std. grade 3, T_j(max) = 110°C

CS = Current Sense
OL = Open-Load
OV = Overvoltage

UV = Undervoltage
OT = Overtemperature
SC = Short-Circuit
OC = Overcurrent

www.infineon.com/trilithic

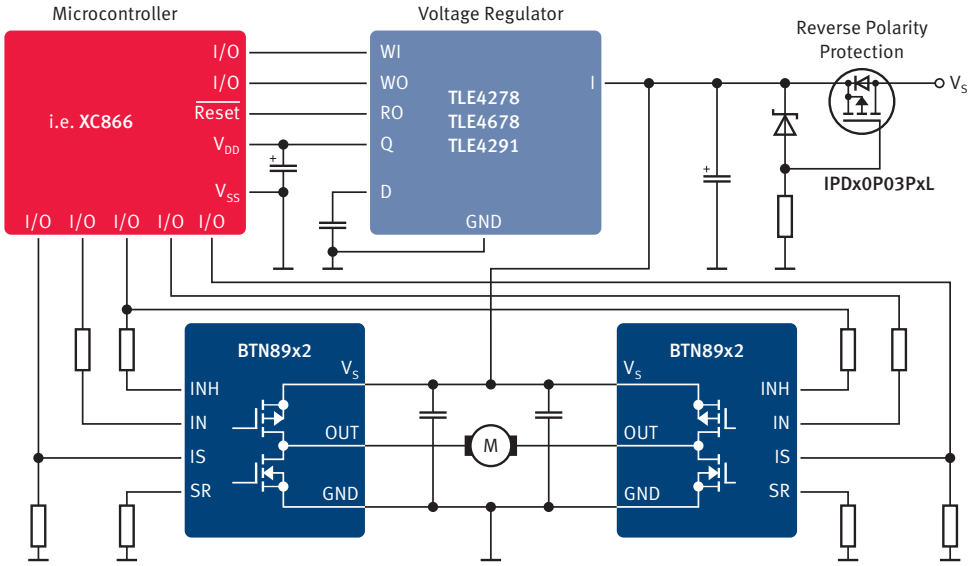
NovalithIC™ – Integrated Half Bridge

Basic Features
- Low quiescent current
- Capable for high PWM frequency (e.g. 25kHz)
- Logic level input
- Adjustable slew rate
- Cross current protection

Diagnostic Features
- Overtemperature
- Overvoltage
- Overcurrent
- Current sense and status

Protection Features
- Overtemperature shutdown
- Overvoltage (lockout or smart clamp)
- Undervoltage
- Overcurrent

Application Example NovalithIC™



NovalithIC™ Product Overview

Product Type	Operating Range [V]	$R_{DS(on)}$ path (typ) [mΩ]	$I_{D(lim)}$ [A]	I_q(typ) [µA]	Switch time (typ) [µs]	Diagnosis	Protect	Package[1]
BTN8946TA	5.5 ... 40.0	6.7[2]	42	7.0	0.25	OT, OC, CS	UV, OT, OC	(40)
BTN8962TA	5.5 ... 40.0	14.2	42	7.0	0.25	OT, OC, CS	UV, OT, OC	(40)
BTN8982TA	5.5 ... 40.0	10.0	70	7.0	0.25	OT, OC, CS	UV, OT, OC	(40)

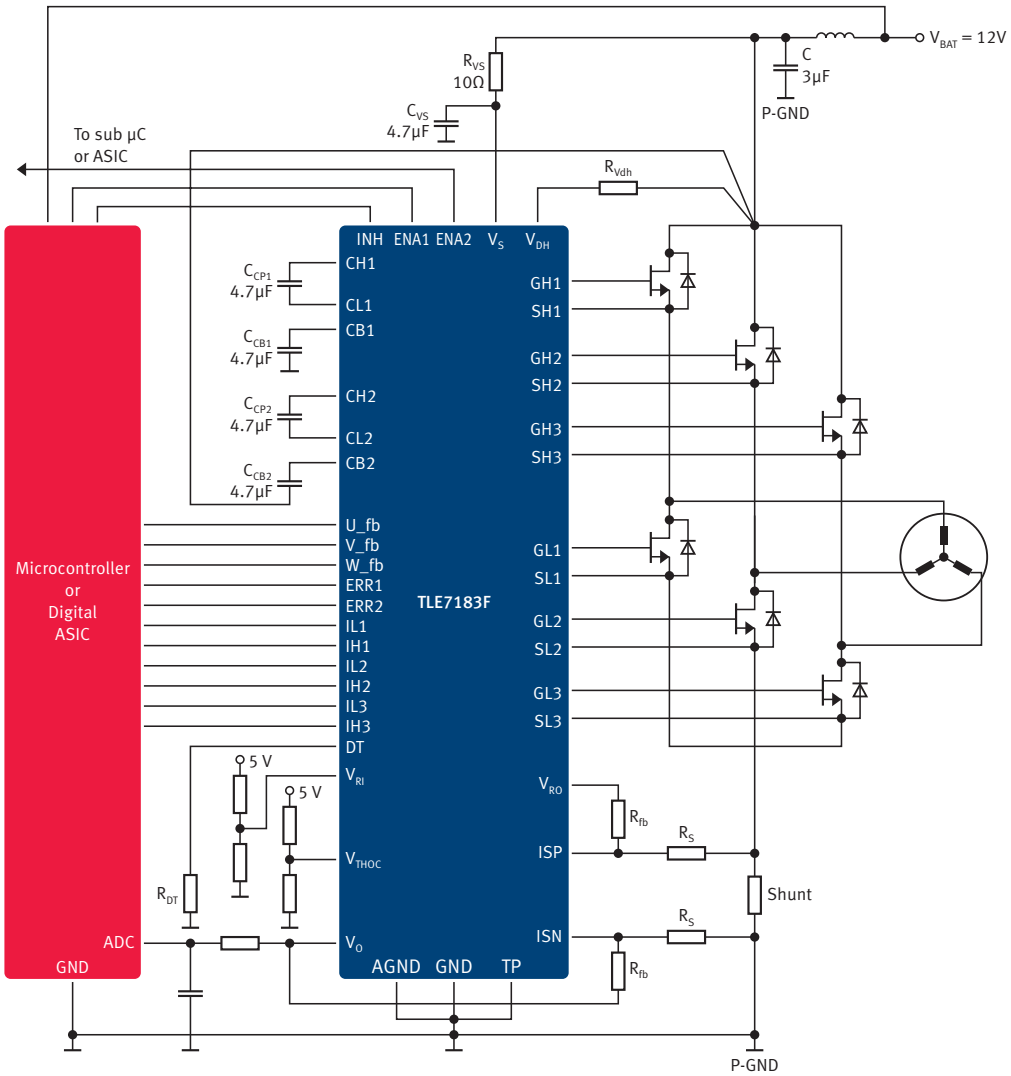
1) See packages on page 100
2) HS switch only

OC = Overcurrent
CS = Current Sense

UV = Undervoltage
OT = Overtemperature

Gate Driver ICs for External MOSFETs

The trend towards greater efficiency in automotive applications also applies to electric motors. Applications such as power steering, HVAC compressors and engine cooling fans will be controlled by electronic motors in the future. Infineon's family of configurable, H-Bridge and 3-phase gate driver ICs can be combined with MOSFETs to provide the power and efficiency these systems demand.



Applications

- Power steering
- Fan and pump control
- Starter alternator
- Seat belt pretentioner
- VVT
- Electric park brake
- ECMT

Basic Features

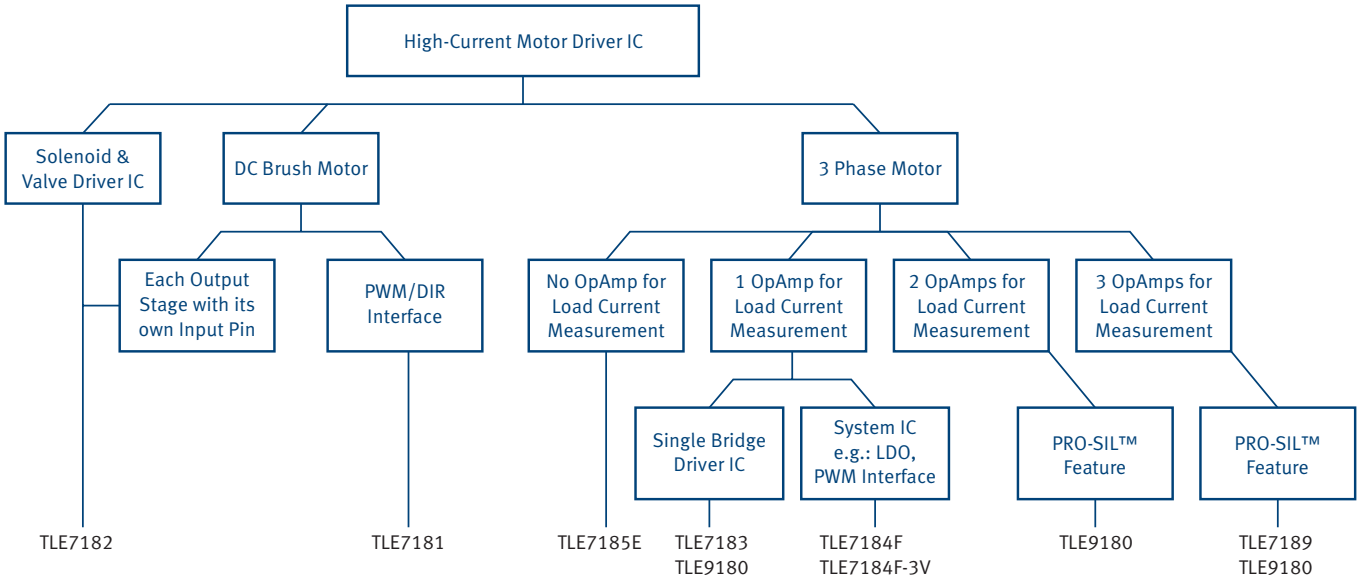
- Strong output stage up to 1.5A
- Precise OpAmp for current shut monitoring
- Operation down to 5.5V
- Duty cycle adjustable up to 100%

Diagnostic Features

- Undervoltage
- Short-circuit
- Overtemperature
- Overvoltage

www.infineon.com/driver-ic

Selection Tree Gate Drivers



H-Bridge/ Dual Half-Bridge Drivers Family

Product Type	Operating Range [V]	OpAmp	PWM/DIR Input	Reverse Polarity Protection	Diagnostic	Package[1]
TLE7181EM	7.0 ... 34.0	1	●	●	UV, OV, OC, SCD, OT	㉚
TLE7182EM	7.0 ... 34.0	1		●	UV, OV, OC, SCD, OT	㉚

3-Phase Bridge Driver IC

Product Type	Operating Range [V]	Drives Stage	D.C.-Range @ 20kHz [%]	Numbers of integrated OpAmps for load current measurement	Adjustable dead time	SIL3 features	Diagnosis	Package[1]
TLE7183F	5.5 ... 28.0	1.5/1.5A	0 ... 100	1	●		OT, UV, OV, OC, OCD	㊽
TLE7183QU	5.5 ... 28.0	1.5/1.5A	0 ... 100	1	●		OT, UV, OV, OC, SCD	㊷
TLE7184F TLE7184F-3V[2]	7.0 ... 32.0	12.5/9.0Ω 12.5Ω	0 ... 95	1	●		UV, OV, OC, SCD, OT, VDD supervision	㊽
TLE7185E	5.5 ... 32.0	12.5/9.0Ω	0 ... 95	0	●		UV, OV, SCD, OT	⑬
TLE7188F	5.5 ... 28.0	1.5/1.5A	0 ... 100	3			UV, OV, OC, SCD, OT	㊽
TLE7189F	5.5 ... 28.0	1.5/1.5A	0 ... 100	3		●	UV, OV, SCD, OT, VDD supervision	㊽
TLE7189QK	5.5 ... 28.0	1.5/1.5A	0 ... 100	3		●	UV, OV, SCD, OT, VDD supervision	⑯
TLE9180-xxQK	5.5 ... 60.0	2.0/2.0A	0 ... 100	1, 2 or 3	SPI	●	UV, OV, OC, SCD OT + others	⑯

1) See packages on page 100
2) System IC for fans and pumps with integrated LDO and PWM interface

LO = Lockout
OL = Open-Load
OV = Overvoltage
OC = Overcurrent

UV = Undervoltage
OT = Overtemperature
SCD = Short-Circuit Detection

Gate Driver ICs for External MOSFETs

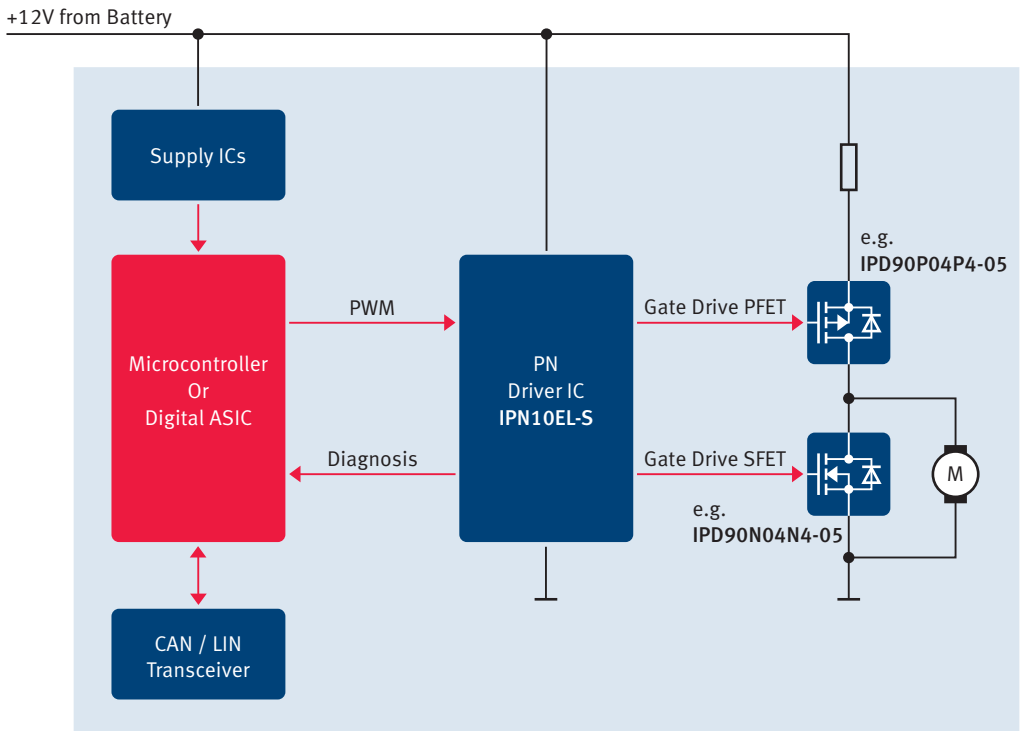
PN Driver IC

Additionally to the well established H-Bridge and 3-phase gate driver ICs, Infineon recently released a PN Driver IC. It is designed to drive one high-side p-channel MOSFET and one low-side n-channel MOSFET. With that approach, new cost optimized drive solutions can be achieved.

Applications
- Fan and pump control
- Wiper
- Electric park brake

Basic Features
- PWM interface drives 1P and 1N Channel Power MOSFETs
- Separate control input for each MOSFET
- 0 ... 100% Duty cycle of High and Low Side MOSFETs
- Adjustable dead time

Diagnostic Features
- One Error output to µC
- Over temperature protection
- Under voltage lock out
- Short circuit protection



Product Type	Operating Range [V]	OpAmp	Adjustable dead time	Reverse Polarity Protection	Diagnostic	Package[1)]
IPN10EL-S	4.0 ... 40	0	Yes	No	UV, OT, SCD	㉘

1) See packages on page 100

Power Supply

Linear Voltage Regulators, Post Regulators, Voltage Trackers and DC/DC Converters

Infineon Technologies offers a comprehensive portfolio of linear voltage regulators, DCDC, post regulators and voltage trackers fitting a broad range of automotive applications. We are the global market leader with over 15 years of experience in the automotive regulator segment. We are continuously expanding our portfolio to meet our customers' present and future application requirements.

Our devices are especially designed for use in harsh automotive environments and are offered in the highest quality level. Our robust design approach ensures delamination-free ICs and long-term reliability.

Basic Features

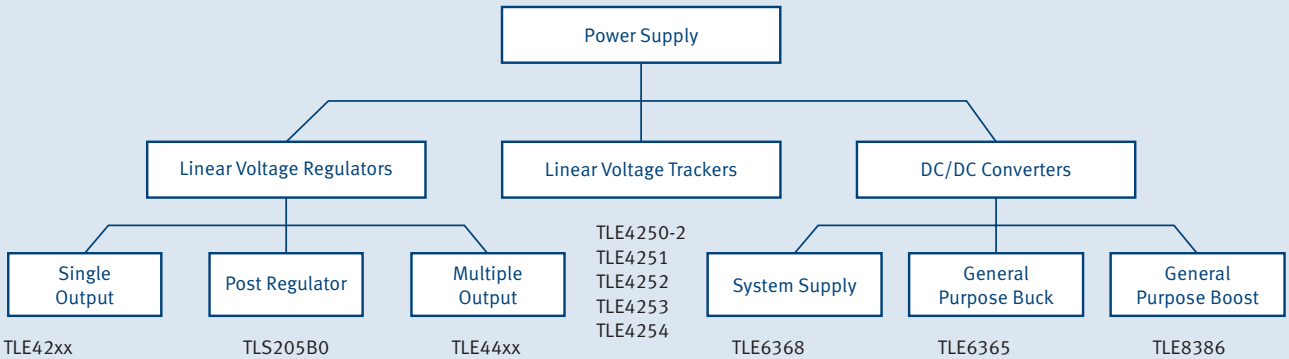
- Very low dropout
- Very low quiescent current
- Short-circuit protection
- Reverse polarity protection
- Overtemperature protection
- Overload protection
- Wide operation range: Up to 45V
- Wide temperature range: -40°C up to +150°C

AEC Qualified

RoHS

www.infineon.com/voltage-regulators

Infineon's Power Supplies Address a Broad Range of Applications



TLE42xx
TLE42xx-2
TLE42xx4
TLE46xx
TLF4277
TLF4949

Low Quiescent Current
TLE426x-2
TLE426x4
TLE46xx
TLE72xx-2
TLF80511

TLS205B0
TLS203B0
TLS202x1
TLF1963

TLE44xx
TLE7469

TLE4250-2
TLE4251
TLE4252
TLE4253
TLE4254

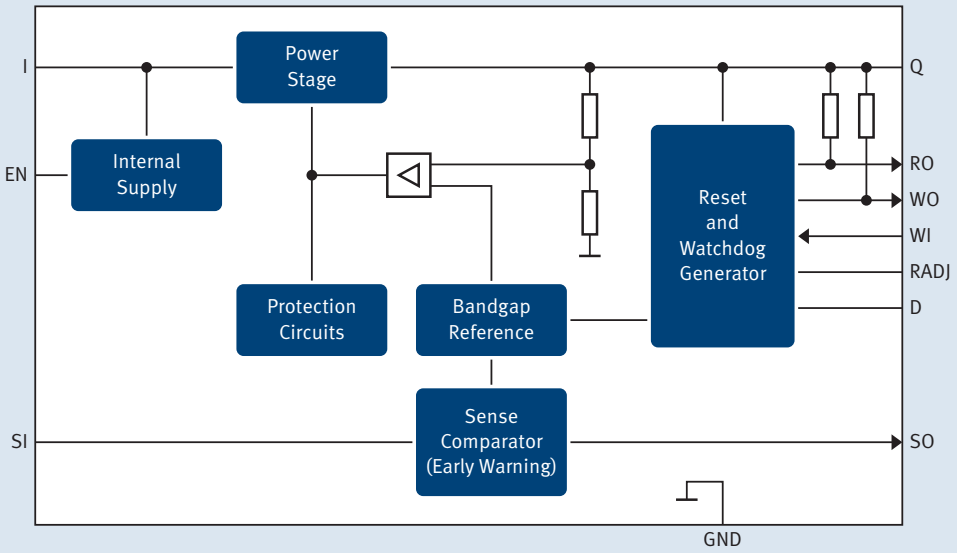
TLE6368
TLE7368/-2/-3

TLE6365
TLE6389-2/-3
TLE8366
TLF502xx

TLE8386
TLE8386-2

Linear Voltage Regulators, Post Regulators, Voltage Trackers and DC/DC Converters

Block Diagram Single Linear Voltage Regulators



Additional Features

- Low quiescent current consumption in stand-by mode
- Enable function for main output
- Adjustable reset threshold
- Standard and window watchdog
- Power-on reset circuit sensing the stand-by voltage
- Early warning comparator for supply undervoltage

www.infineon.com/voltage-regulators

Linear Voltage Regulators, Post Regulators, Voltage Trackers and DC/DC Converters

Linear Voltage Regulators by Output Current

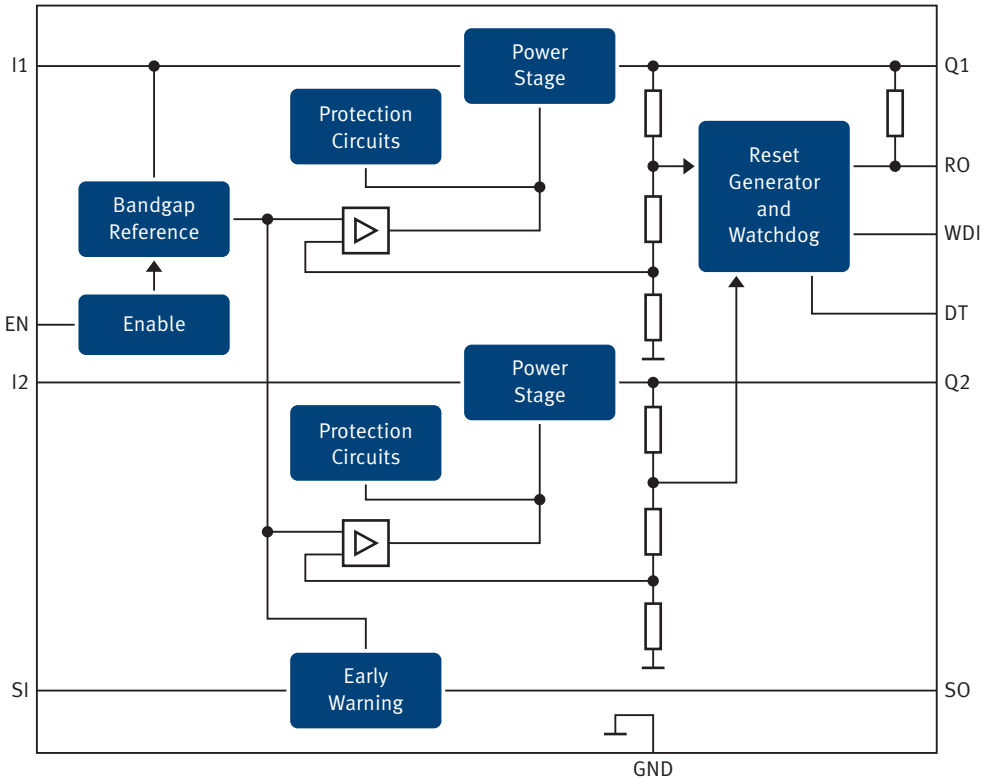
Product Type	I_Q [mA]	I_q [µA]	V_S Range [V]	V_Q [V]	Drop Voltage [V]	Accuracy (%)
TLE4285	15	100	6.0–42	5.0	0.8	4
TLE4286	15	60	6.0–42	5.0	0.8	2
TLE4294	30	120	5.5–45	5.0	0.25	4
TLE4295	30	120	3.5–45	2.6; 3.0; 3.3; 5.0	0.25	4
TLE4296	30	110	4.0–45	3.0; 3.3; 5.0	0.25	4
TLE4296-2	30	130	4.0–45	3.3; 5.0	0.25	4
TLF4949	100	180	3.5–40	5.0	0.3	2
TLE42344	120	300	5.5–45	5.0	0.25	2
TLE42364	120	300	5.5–45	5.0; 10.0	0.25	2
TLE4264-2	150	40	5.5–45	5.0	0.22	2
TLE42644	150	40	5.5–45	5.0	0.22	2
TLE4266-2	150	40	6.0–45	3.3; 5.0	0.25	2
TLE42664	150	40	5.5–45	5.0	0.25	2
TLS202B1 *NEW!*	150	50	2.7–18	3.3V	0.5	3
TLS202A1 *NEW!*	150	50	2.7–18	adj.	0.5	3
TLE42694	150	210	5.5–45	5.0	0.25	2
TLE42694-2	150	210	5.5–45	5.0	0.25	2
TLE42794	150	150	5.5–45	5.0	0.25	2
TLE42994	150	65	4.4–45	3.3; 5.0	0.25	2
TLE4268	180	300	5.5–45	5.0	0.25	2
TLE7273-2	180	28	4.2–45	2.6; 3.3; 5.0	0.25	2
TLE7278-2	180	28	4.2–45	5.0	0.25	2
TLE7279-2	180	28	4.2–45	2.6; 3.3; 5.0	0.25	2
TLE4262	200	900	6.0–45	5.0	0.35	2
TLE4263/-2	200	900	5.5–45	5.0	0.35	2
TLE4278	200	180	5.5–45	5.0	0.25	2
TLE4678	200	60	3.3–45	5.0	0.25	2
TLE4699	200	70	3.3–45	5.0	0.16	2
TLF4277[4)]	200	150	5.0–40	adj.	0.25	2
TLE4287	250	1,000	7.5–42	5.0	1.8	2
TLE7270-2	300	20	5.5–42	5.0	0.2	2
TLE7272-2	300	20	5.5–42	5.0	0.25	2
TLE7274-2	300	20	5.5–42	5.0	0.25	2
TLE7276-2	300	20	5.5–42	5.0	0.25	2
TLS203B0 *NEW!*	300	30	1.8–26	adj.; 3.3V	0.3	2
TLE4267	400	1,300	5.5–40(60)	5.0	0.3	2
TLE42744	400	100	4.7–40	3.3; 5.0	0.25	2
TLE42754	400	150	5.5–42	3.3; 5.0	0.25	2
TLE42764	400	100	4.5–40	adj.; 5.0	0.25	2
TLE4675	400	65	3.3–45	5.0	0.25	2
TLF80511	400	38	3.3–40	5.0	0.25	2
TLE4290	450	200	5.5–42	5.0	0.25	2
TLE4291	450	220	3.3–42	5.0	0.25	2
TLS205B0 *NEW!*	500	30	1.8–26	adj.; 3.3V	0.3	2
TLE4270-2	550	1,000	5.5–42(60)	5.0	0.35	2
TLE4271-2	550	800	6.0–40(60)	5.0	0.35	2
TLE4284	1,000	1,000	2.9–40	adj.; 1.5; 1.8; 2.6; 3.3; 5.0	1.0	3
TLF1963 *NEW!*	1,500	1,000	2.5–20	adj.	0.3	2

1) See packages on page 100
2) Power Good
3) Power Fail
4) LDO with current monitor and status output

Output Capacitance (min) [µF]	Reset	Adjustable Reset Threshold	Enable	Watchdog	Early Warning	Package[1]
1.0	●[3]					⑳
1.0			●			⑳
2.2						⑳
2.2	●[3]					⑳
2.2			●			⑳
3.3			●			⑳
4.7	●				●	① ②
10.0						㉔
10.0			●			㉔
10.0						㉔
10.0						㉔
10.0			●			㉔
10.0			●			㉔
1.0			●			⑳
1.0						⑳
10.0	●	●			●	① ④ ㉘
4.7	●	●				㉘
10.0	●	●			●	① ④ ㉘
22.0	●	●	●		●	① ④ ㉘
22.0	●	●		●		① ⑦
0.5	●		●	●		④ ㉘
0.5	●		●	●		④ ㉘
0.5	●		●		●	④ ㉘
22.0	●	●	●			④ ⑦
22.0	●	●	●	●		① ② ④ ⑦
10.0	●	●		●		④
10.0	●	●		●		④ ㉘
10.0	●	●	●		●	④ ㉘
10.0			●			㉘
0.1	●		●			④
0.5	●					㉘ ㉞ ㊳
0.5	●		●			㉘ ㉞
0.5						㉘ ㉝ ㊱
0.5			●			㉘ ㉞
3.3			●			① ㊹
22.0	●		●			④ ㊵ ㊺ ㊻
22.0						㉔ ㉘ ㉝ ㊱
22.0	●					㉘ ㉞ ㊳
22.0			●			㉞ ㊳
22.0	●					㉞ ㊳
1.0						㊱
22.0					●[2]	㉞ ㊳ ㊷
22.0	●	●	●	●		㉘
3.3			●			① ㊹
22.0	●					㉞ ㊳ ㊷ ㊹
22.0	●		●	●		㊵ ㊺ ㊼
10.0						㉝
1.0						㉞ ㊳

Linear Voltage Regulators, Post Regulators, Voltage Trackers and DC/DC Converters

Block Diagram Multiple Output Regulators



Power Supply Multiple Output Regulators

Product Type	I_Q1 [mA]	I_Q2/3 [mA]	I_q [mA]	V_S Range [V]	V_Q1 [V]	V_Q2/3 [V]	Drop Voltage [V]	Accuracy (%)
TLE4470	350	180	180	5.6–45	5	adj.	0.3	2
TLE4471	450	100/50	1,100	5.5–40(60)	5	5.0 and 5.0	0.25	2
TLE4473	300	180	200	5.6–42	5	3.3 or 2.6 or 5.0	0.3	2
TLE4476	430	350	300	5.7–42(60)	5	3.3	0.3	4
TLE7469	215	215	55	5.6–45	5	3.3 or 2.6	0.3	2

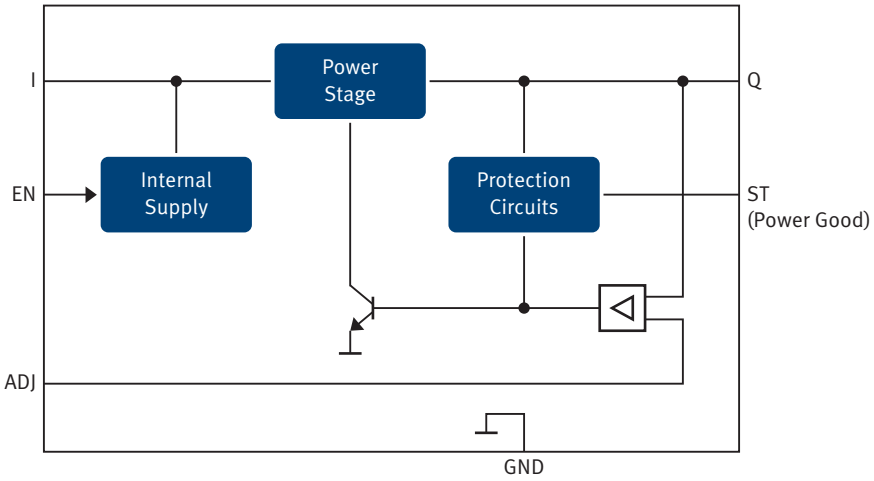
Trackers

Product Type	I_Q [mA]	I_q [mA]	V_S Range [V]	V_Q [V]
TLE4250-2	50	140	4.0–40	adj.
TLE4251	400	230	4.0–40	adj.
TLE4252	250	100	3.5–40	adj.
TLE4253	250	100	3.5–40	adj.[2]
TLE4254	70	50	4.0–45	adj.[2]

1) See packages on page 100

2) $V_Q > V_{ref\ possible}$

Block Diagram Trackers



Output Capacitance (min) [µF]	Overvoltage Protection	Reset Output	Adjustable Reset Threshold	Watchdog	Early warning	Package[1)]
6/10		●	●		●	④ ⑦
22/10/10	●	●	●	●		⑨
10/22		●		●		③
10/10	●					㉞
1/1		●		●		③

Drop Voltage [V]	Accuracy (%)	Output Capacitance (min) [µF]	$V_Q > V_{ref}$ Possible	Package[1)]
0.1	0.5	1		⑳
0.28	0.2	22		㉞ ㊳
0.28	0.2	10		㉞ ㊳
0.28	0.1	10	●	① ②
0.28	0.1	1	●	① ②

DC/DC Converters

Infineon Technologies offers standard switching converters and several switching converters serving applications with extended requirements like supply for 32-bit microcontrollers and airbag applications.

In our portfolio you can find step-up (Boost) and step-down (Buck) converters as well as converters cascaded internally with linear regulators and trackers.

Features

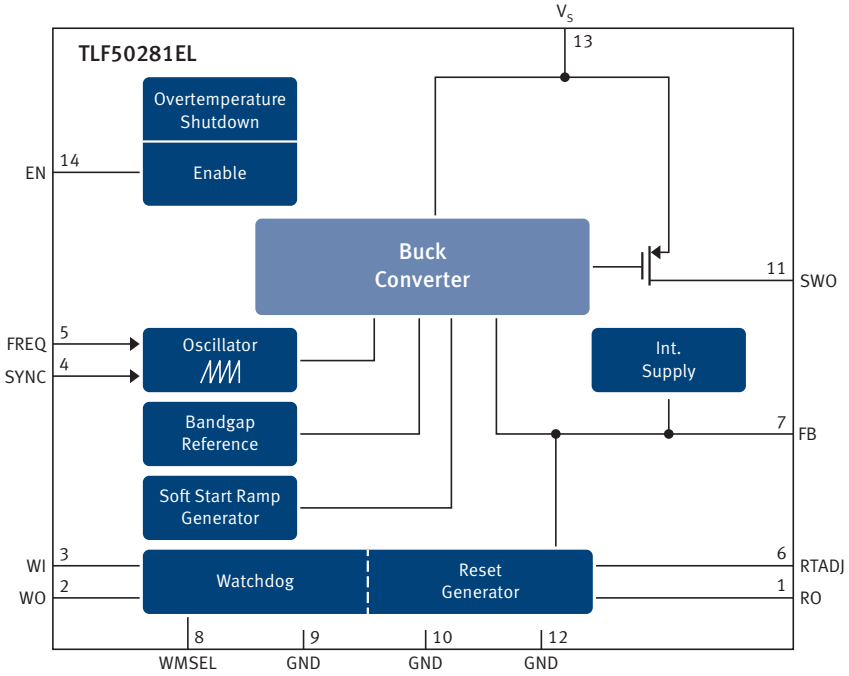
- Step-up and step-down converters
- High-efficiency regulators
- Wide supply voltage operation range
- Very low current consumption operation
- Suitable for standard 12V/24V PowerNets
- Output undervoltage reset with delay
- Overtemperature shutdown
- Wide ambient operation range -40°C up to +125°C
- Short-circuit protection
- Overtemperature protection

Product Type	$V_{S(op)}$ [V]	V_Q [V]	V_Q 2 [V]	V_Q 3 [V]	V_Q 4 [V]	V_Q Additional [V]	Accuracy 1 (%)	Accuracy 2 (%)	Accuracy 3 (%)	Accuracy 4 (%)	Additional Output Accuracy	I_Q [mA]
Buck												
TLE6365	8.0 ... 40.0	5.0					2					400
TLE6389-2GV	5.0 ... 60.0	adj.					3					2,300
TLE6389-2GV50	5.0 ... 60.0	5.0					3					2,300
TLE6389-3GV50	5.0 ... 60.0	5.0					3					2,300
TLE8366	4.75 ... 45.0	adj., 3.3, 5.0					2(4)					1,800
TLF50281	4.75 ... 45.0	5.0					2					500
TLF50251	4.75 ... 45.0	5.0					2					500
TLF50241	4.75 ... 45.0	5.0					2					500
TLF50211	4.75 ... 45.0	5.0					2					500
TLF50201	4.75 ... 45.0	5.0					2					500
TLF51801	4.75 ... 45.0	1.20– D_{max}*V_S					2					adj. max 10,000
Buck plus linear												
TLE7368	4.5 ... 45.0	5.5	5	2.6 or 3.3	1.5	2 x 5	-2 ... +9	2	2	2	1.5	2,500
TLE7368-2	4.5 ... 45.0	5.5	5	2.6 or 3.3	1.2	2 x 5	-2 ... +9	2	2	2	1.5	2,500
TLE7368-3	4.5 ... 45.0	5.5	5	2.6 or 3.3	1.3	2 x 5	-2 ... +9	2	2	2	1.5	2,500
TLE6368	5.5 ... 60.0	5.5	5	2.6 or 3.3	2.6 or 3.3	6 x 5	10	5	5	5	1.0	1,500
Boost												
TLE8386[3]	4.75 ... 45.0	adj. (max 9-times of V_S)					4					dep.on VQ
TLE8386-2[4]	4.75 ... 45.0	adj (max 9-times of V_S)					4					
Boost plus buck												
TLE6711	4.0 ... 40.0	adj. up to 33	5				10	2				1,000

1) See packages on page 100
2) Different voltage reset hysteresis
3) HS-sense-booster (prefered as current source)
4) LS-sense-booster

www.infineon.com/dcdc-converter

Block Diagram TLF50281



I_Q 2 [mA]	I_Q 3 [mA]	I_Q 4 [mA]	I_Q Additional [mA]	I_q [mA]	f_{sw} [kHz]	Stand-by Regulator [V–mA]	PFM Operation	Reset	Watchdog	SPI and Add. Logic	Enable/ Disable Possibility	Early Warning	Package[1]
				1.5	100			●					①
				0.120	250 ... 530		●	●			●	●	④
				0.120	250 ... 530		●	●			●	●	④
				0.120	250 ... 530		●	●[2]			●	●	④
				7.0	200 ... 530						●		②
				0.045	800 ... 2200		●	●	STD		●		㉘
				0.045	800 ... 2200		●	●			●		㉘
				0.045	800 ... 2200		●	●					㉘
				0.045	800 ... 2200		●				●		㉘
				0.045	800 ... 2200		●						㉘
				< 2µA	100 ... 700						●		㉘
800	700	adj.	105 and 50	120	280 ... 425	1.0/2.6–30		●	WWD		●		⑬ ⑭
800	700	adj.	105 and 50	120	280 ... 425	1.0/2.6–30		●	WWD		●		⑬
800	700	adj.	105 and 50	120	280 ... 425	1.0/2.6–30		●	WWD		●		⑬
800	500	350	6 x 17	30	280 ... 425	2.4–1.0		●	WWD	●	●		⑭
				7,000	100 ... 500						●		㉘
				7,000	100 ... 500						●		㉘
250				1,500				●	●				④ ⑦

Automotive Transceivers

Because of the ever-increasing demand for information exchange in modern vehicles, the automotive industry implemented in vehicle networks (IVN) using the CAN (Controller Area Network), LIN (Local Interconnect Network) and FlexRay protocol-based bus systems.

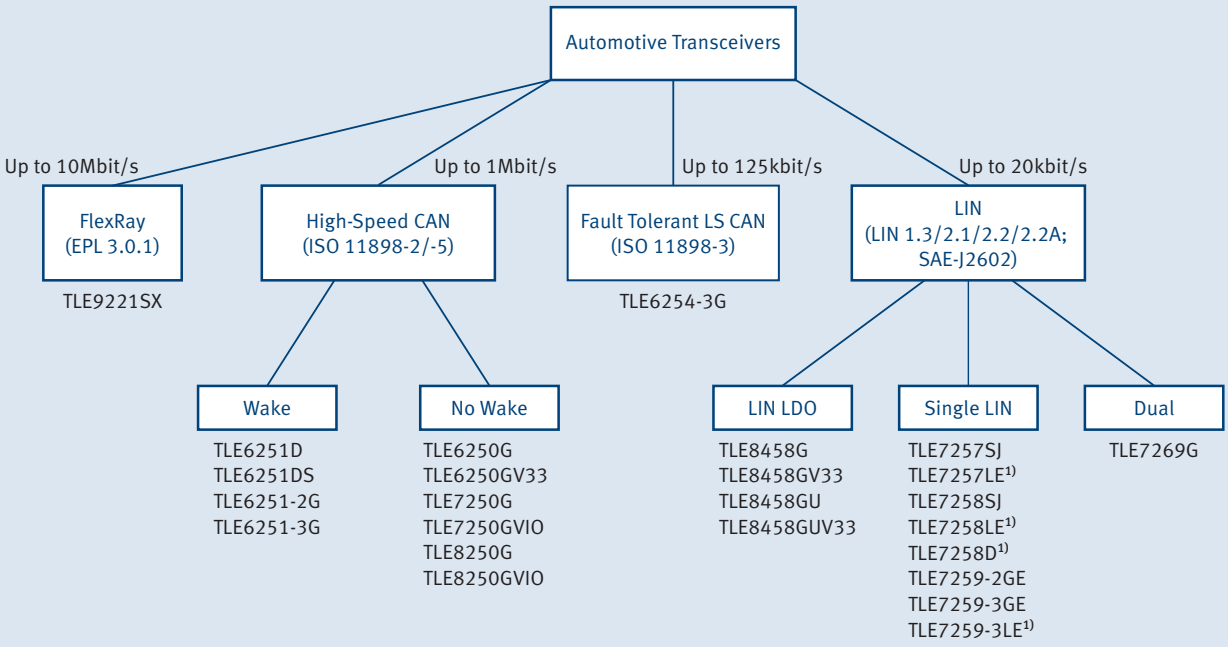
Transceivers are the link between the protocol unit (the controller) and the physical transmission medium (bus cable). In addition to their driving function (reception/ transmission of signals from the bus to ECU) the transceivers also provide a wide range of protective and fault-diagnosis functions.

Features

- Excellent EMC
- Outstanding ESD robustness
- Worldwide OEM approval
- Highest quality standard
- Family concept
- Broad product portfolio

www.infineon.com/transceiver

Selection Tree Automotive Transceivers

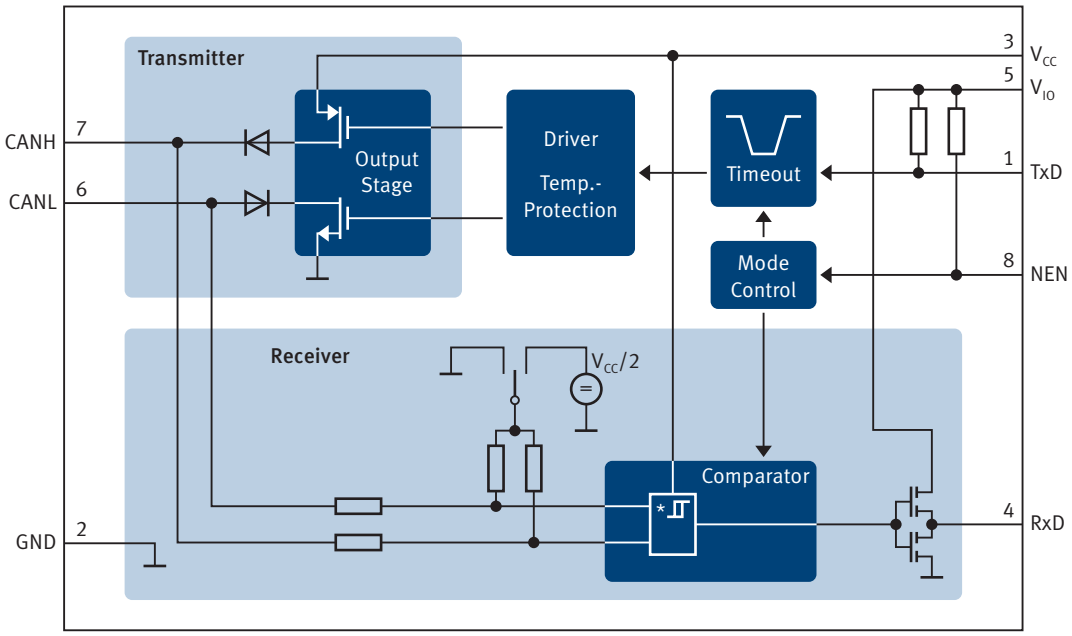


1) In development

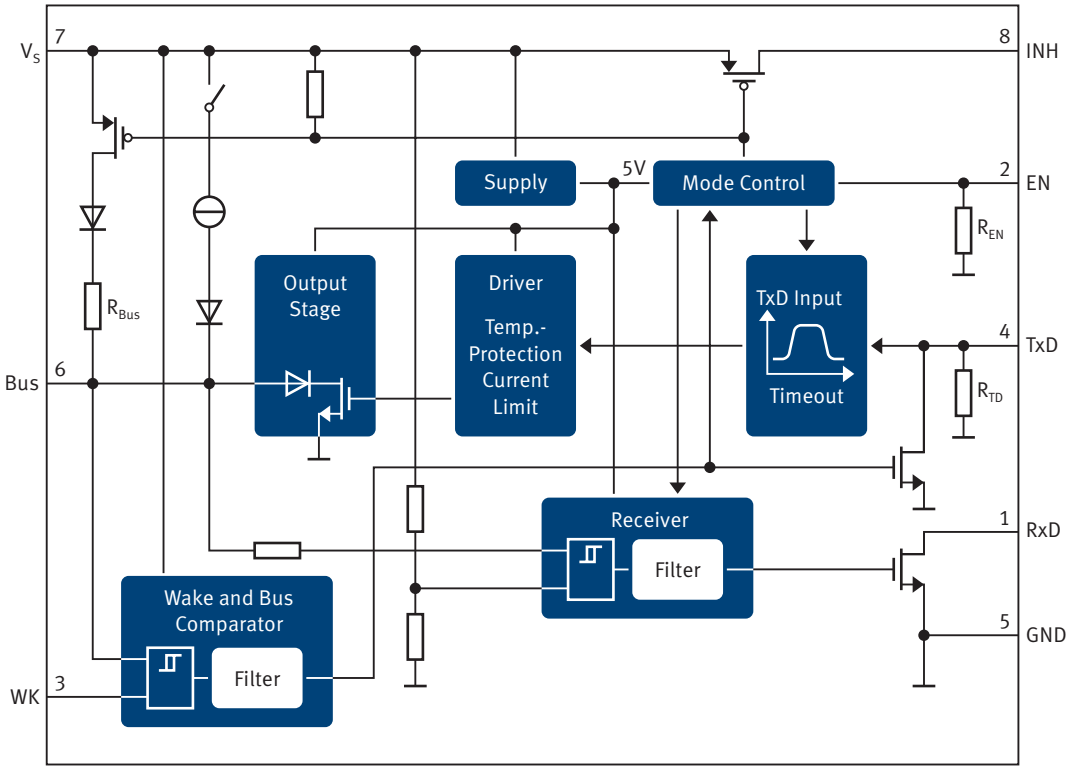
www.infineon.com/transceiver

Automotive Transceivers

Block Diagram Example High-Speed CAN: TLE7250GVIO



Block Diagram Example LIN: TLE7259-3GE



Product Table

Product Type	Transmission Rate (max)	I_q [µA]	Bus Wake-up Capability	Wake-up Inputs	Number of Channel	Bus Failure Management	Package[1]
High-speed CAN ISO 11898-2							
TLE6250G	1Mbit/s	< 10 @ 5V stand-by			1		①
TLE6250GV33	1Mbit/s	< 10 @ 5V stand-by			1		①
TLE7250G *NEW!*	1Mbit/s	< 10 @ 5V stand-by			1		①
TLE7250GVIO *NEW!*	1Mbit/s	< 10 @ 5V stand-by			1		①
TLE8250G	1Mbit/s	< 10 @ 5V stand-by			1		①
TLE8250GVIO	1Mbit/s	< 10 @ 5V stand-by			1		①
High-speed CAN ISO 11898-5							
TLE6251-2G	1Mbit/s	< 30 sleep mode	●	●	1	●	④
TLE6251-3G	1Mbit/s	< 30 sleep mode	●	●	1	●	④
TLE6251DS	1Mbit/s	< 30 @ 5V stand-by	●		1		①
TLE6251D *NEW!*	1Mbit/s	< 30 @5V stand-by	●		1		①
Fault-tolerant CAN ISO 11898-3							
TLE6254-3G	125kbit/s	< 65 sleep mode	●	●	1	●	④
LIN/SAE J2602/k-line							
TLE6258-2G	20kbit/s	< 40 stand-by mode			1		①
TLE7257SJ *NEW!* TLE7257LE *NEW!*	20kbit/s	< 10 sleep mode	●		1	●	① ㊸
TLE7258SJ *NEW!* TLE7258LE *NEW!*	20kbit/s	< 10 sleep mode	●		1	●	① ㊸
TLE7259-2GE	20kbit/s	< 10 sleep mode	●	●	1	●	①
TLE7259-3GE *NEW!* TLE7259-3LE *NEW!*	20kbit/s	< 10 sleep mode	●	●	1	●	① ㊸
TLE7269G	20kbit/s	< 10 sleep mode	●	●	2	●	④
TLE8458	20kbit/s	< 10 sleep mode	●	●	1	●	①
FLexRay							
TLE9221SX *NEW!*	10Mbit/s	< 45 sleep mode	●	●	1	●	㉙

1) See packages on page 100

System Basis Chips (SBCs)

The Driver SBC is the first family of the new generation of Infineon SBC in an exposed pad VQFN-48 (7mm x 7mm) power package. The family offers several variants to meet the different application requirements. The devices are designed for various CAN-LIN automotive body applications as a main supply for the micro controller and as an interface for a CAN and LIN bus network (optional CAN partial networking).

To support these applications, the Driver SBC provides the main functions, such as a 5V low dropout voltage regulator (LDO) for micro controller supply, a 5V low-dropout voltage regulator with short circuit protection against supply voltage VS for e.g. sensor supply, HS-CAN transceiver and LIN transceiver for data transmission, fully protected Low- and High-Side Switches, and a 16-bit Serial Peripheral Interface (SPI) to control and monitor the device.

Also implemented are a Window Watchdog circuit with a reset feature, a Fail Output and an under voltage reset feature. The device offers low-power modes in order to support applications that are connected permanently to the battery.

A wake up from the low-power mode is possible via a message on the buses, via the bi-level sensitive monitoring/wake-up inputs as well as via cyclic wake. The device is designed to withstand the severe conditions of automotive applications.

Features

- Low-Drop Voltage Regulator 5V, 250mA
- Low-Drop Voltage Regulator 5V, 100mA, robust against short to VS
- High-Speed CAN Transceiver ISO 11898-2/5
- LIN Transceiver LIN 2.2, J2602-2
- Two Low-Side Outputs and Six High-Side Outputs
- Four Wake Inputs, Reset Output and Fail Output
- Over temperature and short circuit protection feature

Applications

- Door Control Units
- Central Body Computer
- Low Cost Body Control
- HVAC Control Module
- Trunk Control Module
- Seat Control
- Roof Module

AEC Qualified RoHS

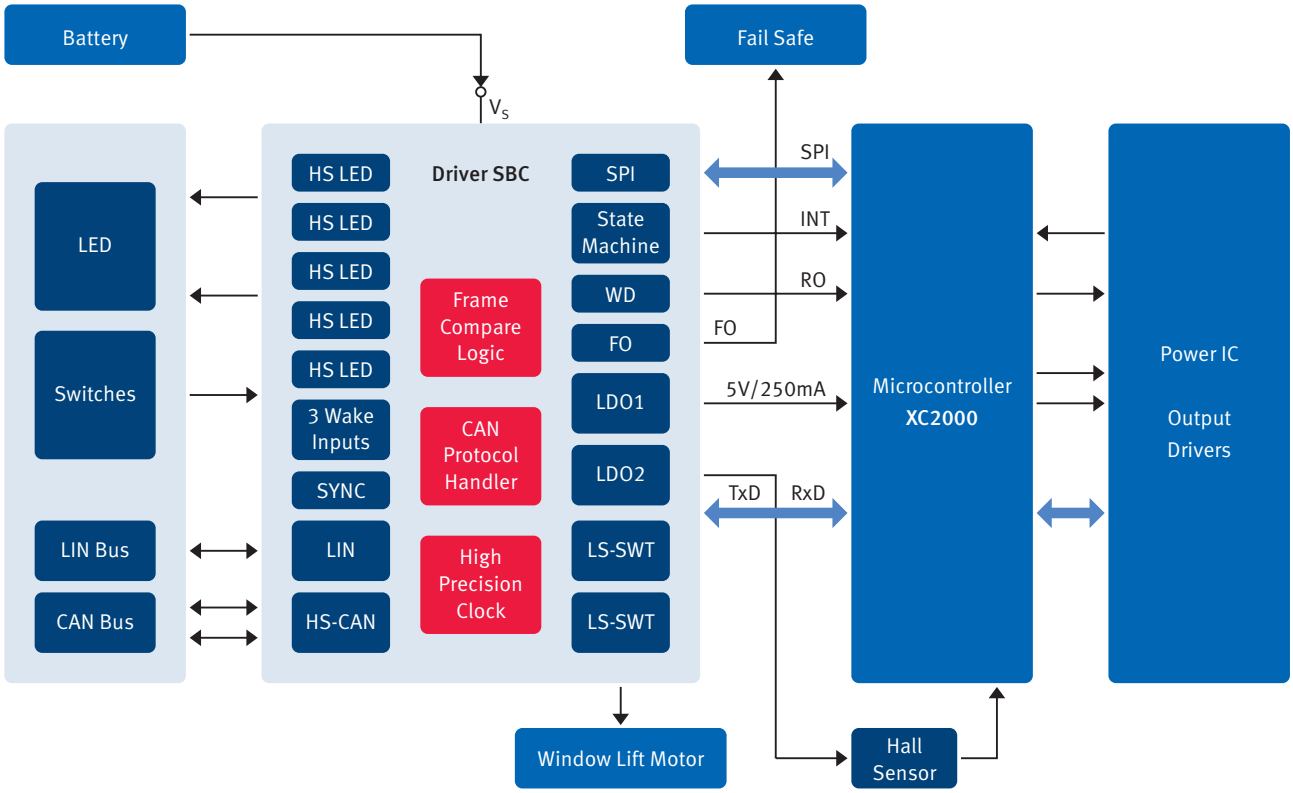
Body System ICs – System Basis Chips Product Overview

Product Type	Transmission Rate [kbit/s]	I_q [µA]	I_Q [µA]	V_{reg} 1 [V]	V_{reg} 2 [V]
Fault-tolerant CAN ISO 11898-3					
TLE6263-3G	125kbit/s	< 85 sleep mode	< 500, @ 5V stand-by	120mA, @ 5V	
TLE6266G	125kbit/s	–	< 85, @ 5V stand-by	45mA, @ 5V	
High-speed CAN ISO 11898-5/LIN 2.x and SAE J2602					
TLE7263E	1Mbit/s (CAN) 20kbit/s 10.4kbit/s (LIN)	49 (typ) sleep mode (5V Off)	68 (typ) stop mode (5V On)	200mA, @ 5V	200mA, @ 5V
TLE826x	1Mbit/s (CAN) 20kbit/s 10.4kbit/s (LIN)	28 (typ) sleep mode (5V Off)	58 (typ) stop mode (5V On)	200mA, @ 5V	200mA, @ 5V
TLE9266QX *NEW!*	1Mbit/s (CAN) 20kbit/s 10.4kbit/s (LIN)	25 (typ) sleep mode (5V Off)	53 (typ) stop mode (5V On)	250mA, @ 5V	100mA, @ 5V
TLE9266-2QX *NEW!*	1Mbit/s (CAN) 20kbit/s 10.4kbit/s (LIN)	25 (typ) sleep mode (5V Off)	53 (typ) stop mode (5V On)	250mA, @ 5V	100mA, @ 5V
LIN 2.1 and SAE J2602/k-line					
TLE8458	20kbit/s 10.4kbit/s	< 10 sleep mode	40	50mA, @ 5V/3.3V	

1) See packages on page 100

www.infineon.com/sbc

Block Diagram



V_{reg} 3 [V]	Wake-up inputs	Watchdog	Output Drivers	Package[1]
	2	●	1 high-side switch 150mA	⑪
	1	●	2 low-side relay drivers 3 high-side drivers	⑪
	4	●	1 high-side switch 150mA	⑬
400mA, @ 5V	1	●		⑬
	3 High-Voltage and 1 Low-Voltage Wake Inputs (cyclic sense)	●	2x Low-Side Switch 250 mA, 2x High-Side Switch 250 mA, 4x High-Side Switch 150 mA	㊽
	3 High-Voltage and 1 Low-Voltage Wake Inputs (cyclic sense)	●	2x Low-Side Switch 250 mA with inverted logic, 2x High-Side Switch 250 mA, 4x High-Side Switch 150 mA	㊽
	1			①

Powertrain System ICs

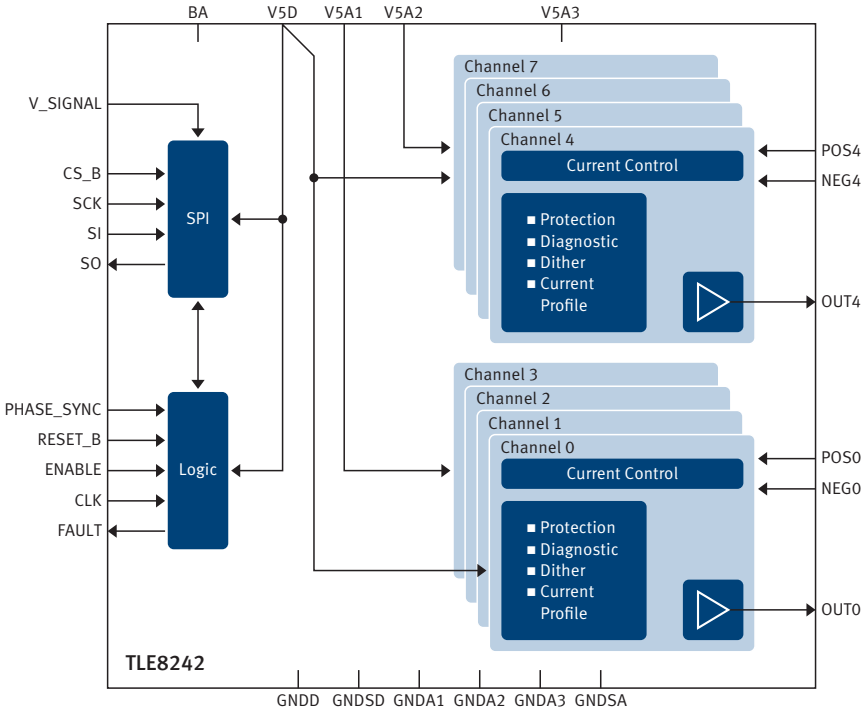
Constant Current Control ICs

Infineon's solution for variable force or constant current controlled solenoids typically used in automatic transmissions, idle speed-/valve-/suspension control or Exhaust Gas Recirculation (EGR) applications

Features

- Four integrated low-side switches, control logic and outputs for external high-side switches
- Shorted load detection
- Open-load detection in ON-/OFF-State
- Short to ground detection
- Max. output average current approx. 1.2A

Block Diagram TLE8242L



Product Type	Number of Channels	Output Current [A]	$R_{DS(on)}$ [mΩ]	Quiescent Current [mA]	Operational Range V_S [V]	SPI	Comment	Package[1]
TLE6288R[2]	6	2	150	0.05	6.0 ... 16.0	16-bit	Smart 6 Channel Peak & Hold Switch	⑭
TLE6288R	6	2	150	0.05	6.0 ... 16.0	16-bit	Smart 6 Channel Peak & Hold Switch	⑭
TLE7241E	2	1.2	240	1.0	9.0 ... 18.0	16-bit	Dual Channel Constant Current Control Solenoid Driver	⑦
TLE7242-2G	4	NA	NA	0.005	5.5 ... 42.0	32-bit	4 Channel Fixed Frequency Constant Current Control IC	⑪
TLE8242-2L	8	NA	NA	0.005	5.5 ... 42.0	32-bit	8 Channel Fixed Frequency Constant Current Control IC	⑯
TLE82543[3]	3	1.6	250 (max)	0.01	5.5 ... 17.0	32-bit	3 Channel Constant Current Control IC	⑬

1) See packages on page 100
2) Non green
3) In development

H-Bridges for Powertrain Applications

The Infineon H-Bridge portfolio addresses a broad range of DC brush motor applications. Originally designed and optimized for Electronic Throttle Control (ETC), the H-Bridges can also be used for applications like Exhaust Gas Recirculation (EGR) valve control, idle control, swirl and tumble flaps, variable intake manifold, turbo charger waste gate, variable turbo geometry or industrial DC brush motor applications.

Product Type	$R_{DS(on)}$ HS [mΩ]	$R_{DS(on)}$ LS [mΩ]	I_{LIM} min. [A]	I_Q max. [mA]	$V_{S(OP)}$ [V]	Diagnostic IF	V_{DD} Mon.	Package[1]
TLE5205-2	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑮
TLE5205-2G	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑩
TLE5205-2GP	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑨
TLE5205-2S	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑰
TLE5206-2	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑮
TLE5206-2G	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑩
TLE5206-2GP	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑨
TLE5206-2S	220	220	6.0	10	6.0 ... 40.0	Status Flag		⑰
TLE6209R	140	130	3.4 ... 5.95	0.05	5.2 ... 40.0	SPI		⑨
TLE7209-2R	150	150	5.5	20	5.0 ... 28.0	SPI & Status Flag		⑨
TLE7209-3R	150	150	5.5	20	5.0 ... 28.0	SPI & Status Flag		⑨
TLE8209-2SA	115	125	1.0 ... 7.7	0.02	4.5 ... 28.0	SPI & Status Flag	●	⑨
TLE8209-2E	115	125	1.0 ... 7.7	0.02	4.5 ... 28.0	SPI & Status Flag	●	⑧
TLE8209-4SA	115	125	1.0 ... 9.0	0.02	4.5 ... 28.0	SPI & Status Flag	●	⑨
TLE9201SG[2]	100	100	5.0	0.03	5.0 ... 28.0	SPI & Status Flag		③

1) See packages on page 100
2) Coming soon, Q1/2014

Flex Multichannel Low-Side Switches (Powertrain & Safety)

Multi channel low-side switches are designed for multi purpose loads (solenoids, relays and resistive loads). The so-called Flex products serve in a flexible way the engine requirements with a different number of low-side drivers.

Please refer to page 38 for the product table.

Airbag System ICs

Infineon, a world leading supplier of Airbag ICs with more than 15 years experience, offers several complete solutions, enabling cost efficiency over the entire range from basic up to high end airbag systems. With a product portfolio ranging from high content integrated System ICs, over Smart Firing ICs and Power Supplies to Satellite Receiver ICs, Infineon is well positioned to meet the market's requirements for cost efficiency, high quality and flexibility.

Features

- 16-bit Serial Peripheral Interface (SPI)
- Squib diagnosis via resistance measurement

AEC Qualified

RoHS

Airbag Firing ICs

Product Type	Channels	Warning Lamp Output Driver	Digital Output for Firing Current Detection	3.3V Compatible I/O	Buckle Switch Detection	Number of Analog Output for Signal Monitoring	Firing Loop Enable Inputs	Firing Current (max)	Programmable Deployment Firing Timer	Buck/ Boost	Package[1]
TLE6710[2]	4	2	●			4	0	0	0	●	⑰
TLE6712[2]	2	0	●		●	1	2	2	0		⑩
TLE6714[2]	4	0	●	●	●	1	2	4	0		⑪
TLE7714	4	0				1	1	0	4		⑮
TLE7718	8	0		●		1	1	0	8		⑮
TLE7734	4	0		●		1	1	0	4		⑮
TLE7738	8	0		●		1	1	0	8		⑮

Satellite Receiver IC

Product Type	Channels	Independent Channel	Number of Digital Output	3.3V compatible I/O	Data Rate	Number of Supply	Package[1]
TLE7729	4	4	4	●	125kbit/s	4	㊼

1) See packages on page 100
2) Non green

www.infineon.com/airbag-system-ic

Infineon® Embedded Power ICs

The latest generation of Infineon embedded power ICs integrates on a single die all the necessary functions to sense, control and actuate a motor. The TLE983x product family integrates a high performance 8-bit microcontroller derived from the established XC800 microcontroller family with application specific power drivers, control and communication modules in an automotive qualified new Smart-Power Technology.

TLE983x product family improves the microcontroller performance and the product feature set over the existing first generation (TLE78xx) product offering.

The TLE983x product family is offered in a space saving VQFN-48 package, while the first product generation is realized as a Multi-Chip-Module (MCM) in a DSO-28 package.

The devices are designed for LIN based motor control applications such as window lifts, wipers, sun roofs, power seats, fan/blower control.

General Characteristics

- Operating voltage V_{Bat}: 3.0V to 27V, maximum rating 40V
- Stop mode 85µA & sleep mode 25µA
- ESD performance :
  - up to 2kV / handling on all pins
  - 4kV @ HV inputs
  - 6kV @ LIN pin
  - ECU/car handling ruggedness (gun model for pins directly connected to ECU plug/socket)
- Overvoltage device clamp (load dump ruggedness): ≥ 40V
- Wide operating temperature range:
  T_j:-40°C up to 150°C

Features of 8-bit Microcontroller, XC8xx

- 8051 compatible, up 40MHz Frequency
- 256byte RAM and 3072byte XRAM
- 36KB to 64KB flash memory for code and data
- 10-bit ADC (5V max.), 8 channels including battery and supply supervision
- Five 16-bit timers
- Capture/compare unit for PWM signal generation (CCU6) with 2 x 16-bits timers

TLE983x Product Family Offers

- LIN transceiver (single wire), compliant with LIN Spec. 2.1, 2.0/SAE J2602 and compatible with LIN 1.3
- Two protected low-side switches (250mA)
- Up to two protected high-side switches (150mA)
- Five high-voltage inputs with wake up functionality
- Full duplex serial interface (UART) with LIN support
- Synchronous serial channel (SSC)
- Two watchdog timers
- Programmable window watchdog
- Measurement unit with 10 channels, 8-bit A/D Converter and data post processing
- Voltage regulator with undervoltage reset
- Power saving modes
  - MCU slow-down mode
  - Stop mode
  - Sleep mode
  - Cyclic wake-up and cyclic sense during stop mode and sleep mode

Applications

- Window lift
- Sun roof
- Fan control
- Seat control
- Key pad interface
- Switch panel interface

AEC Qualified

RoHS

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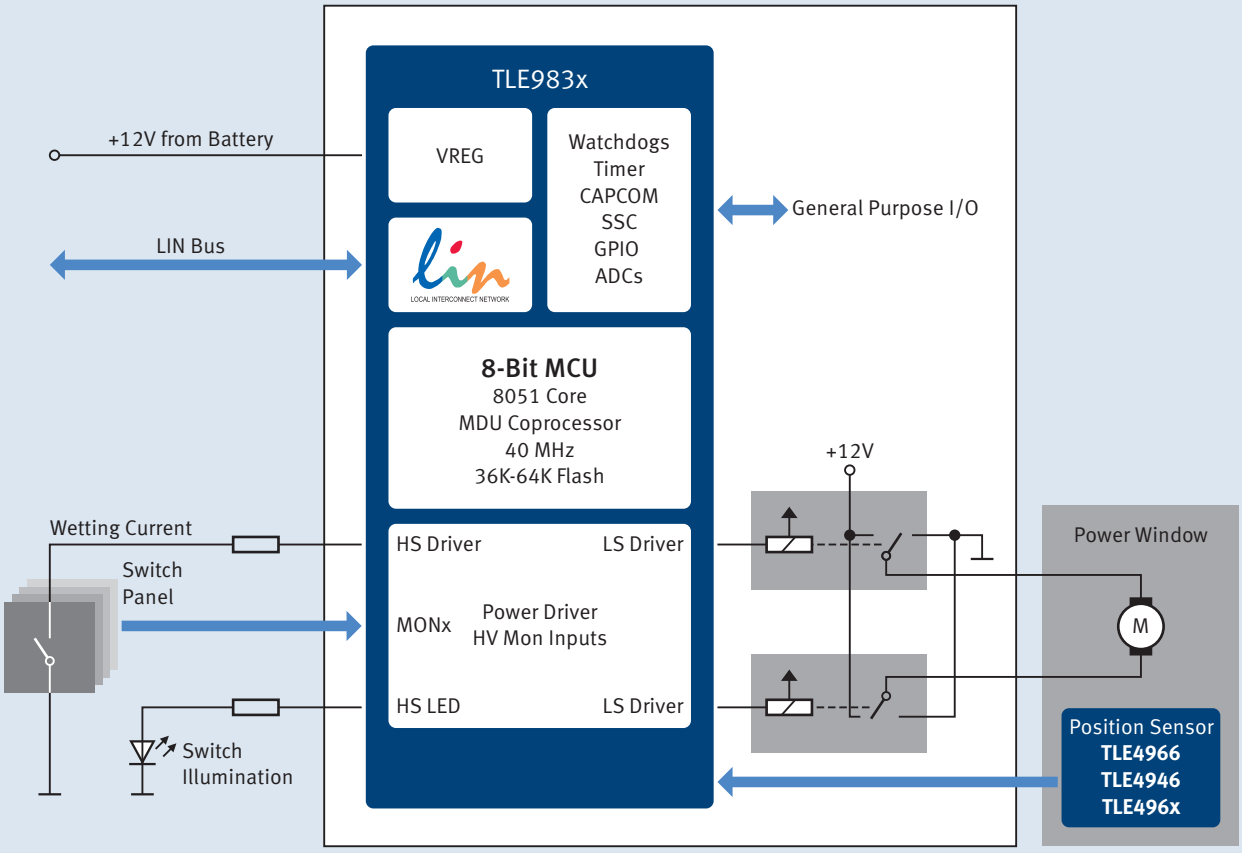
Product Name	Core	Flash [KB]	Freq [MHz]	High-Side Switch	High Voltage Monitor Input	16-bit Timer	GPIO	OP-AMP	PN MOS Driver	Package[1)]
TLE983x Product Family										
TLE9835QX	XC800	64	40	2	5	5	11	Yes	Yes	PG-TSDSO-38
TLE9834QX	XC800	64	40	2	5	5	11	No	No	PG-TSDSO-38
TLE9833QX	XC800	48	40	2	5	5	11	No	No	PG-TSDSO-38
TLE9832-2QX	XC800	36	40	2	5	5	11	No	No	PG-TSDSO-38
TLE9832QX	XC800	36	40	1	5	5	11	No	No	PG-TSDSO-38
TLE9832QV	XC800	36	40	1	5	5	11	No	No	PG-TSDSO-38

1) See packages on page 100

Smart LIN-based Relay Driver IC & Switch Panel Interface with Integrated 8-bit Microcontroller



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BCR321U	Linear LED Driver of BCR400 Series	55
BCR401U	Linear LED Driver of BCR400 Series	55
BCR401W	Linear LED Driver of BCR400 Series	55
BCR402U	Linear LED Driver of BCR400 Series	55
BCR402W	Linear LED Driver of BCR400 Series	55
BCR405U	Linear LED Driver of BCR400 Series	55
BCR420U	Linear LED Driver of BCR400 Series	55
BCR421U	Linear LED Driver of BCR400 Series	55
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BSD223P	Small Signal OptiMOS™2 P-Channel -20V	24
BSD235C/n-ch	Small Signal OPTIMOS™2 N-Channel 20V Complementary MOSFETs	25
BSD235C/p-ch	Small Signal OPTIMOS™2 P-Channel -20V Complementary MOSFETs	25
BSD235N	Small Signal OptiMOS™2 N-Channel 20V	23
BSD314SPE	Small Signal OptiMOS™3 P-Channel -30V + integrated ESD diode	24
BSD316SN	Small Signal OptiMOS™2 N-Channel 30V	23
BSD356C/n-ch	Small Signal OPTIMOS™2 N-Channel 30V Complementary MOSFETs	25
BSD356C/p-ch	Small Signal OPTIMOS™2 P-Channel -30V Complementary MOSFETs	25
BSD356PE	Small Signal OptiMOS™ P-Channel -30V + integrated ESD diode	24
BSD816SN	Small Signal OptiMOS™2 N-Channel 20V	23
BSD840N	Small Signal OptiMOS™2 N-Channel 20V	23
BSL202SN	Small Signal OptiMOS™2 N-Channel 20V	23
BSL205N	Small Signal OptiMOS™2 N-Channel 20V	23
BSL207N	Small Signal OptiMOS™2 N-Channel 20V	23
BSL207SP	Small Signal OptiMOS™2 P-Channel -20V	24
BSL211SP	Small Signal OptiMOS™2 P-Channel -20V	24
BSL214N	Small Signal OptiMOS™2 N-Channel 20V	23
BSL215C/n-ch	Small Signal OPTIMOS™2 N-Channel 20V Complementary MOSFETs	25
BSL215C/p-ch	Small Signal OPTIMOS™2 P-Channel -20V Complementary MOSFETs	25
BSL215P	Small Signal OptiMOS™2 P-Channel -20V	24
BSL296SN	Small Signal SIPMOS™ N-Channel 100V	23
BSL302SN	Small Signal OptiMOS™2 N-Channel 30V	23
BSL303SPE	Small Signal OptiMOS™ P-Channel -30V + integrated ESD diode	24
BSL305SPE	Small Signal OptiMOS™ P-Channel -30V + integrated ESD diode	24
BSL306N	Small Signal OptiMOS™2 N-Channel 30V	23
BSL307SP	Small Signal OptiMOS™2 P-Channel -30V	24
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BSL806N	Small Signal OptiMOS™2 N-Channel 20V	23
BSP125	Small Signal SIPMOS™ N-Channel 600V	24
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BSP135	Small Signal SIPMOS™ 600V Depletion MOSFETs	25
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Infineon's Next Level of Zero Defect Program

On the Way to Zero Defect Products and Services

The most valuable aspect of cars is the people they carry. Therefore, safety should never be compromised. This is the most important consideration for everybody involved in making automobiles – from the smallest suppliers to the manufacturers themselves. As car components become more and more complex, and as the number of control units in vehicles increases, the likelihood of a product failure becomes greater. Quality performance is a key differentiator for automotive market success. Our target of Zero Defect means:

- No quality events and no deviations
- Defect-free product launches
- All processes are under control
- Highest quality image in the market and more business due to satisfied customers

No compromise when it comes to quality

Infineon established the most comprehensive quality program called "AUTOMOTIVE EXCELLENCE" in the semiconductor industry in 2003. The continuation of the successful "Automotive Excellence" program is "NEXT LEVEL of ZERO DEFECT" in 2011. The Program is founded on four pillars: people, products, processes and production. Due to our "no compromise" policy in all four pillars our program really works. Our employees truly live the credos of Zero Defect, considering the highest quality requirements and understanding the importance of prevention. They are trained to deeply understand the tools and methods used to avoid deviations and to solve problems by addressing both technical and systemic root causes.

On the way to zero defect products

On the way to zero defect products, some examples:

- BEAR (BackEnd Automation Roadmap) project reduces manual handling
- "Top5 Defects Reduction in Backend" deeply addresses technical and systemic root causes
- Quality Firewall project "ensures highest outgoing product quality by intelligent outlier screening"
- Extend "Next Level of Zero Defect" into supplier base

"Next Level of Zero Defect" is your competitive advantage

Many of our partners have expressed their satisfaction with the quality of our products and the way we execute "Next Level of Zero Defect".

- "Honor Quality Award Toyota Hirose" received in 2010 for zero defect quality for last four years. Infineon is the First non- Japanese company that received this honour in this highest level category.
- 7 quality awards in 2004, 2006, 2007, 2008, 2009, 2010 and 2011 from Toyota's Hirose plant
- "Supplier Performance Award" for the year 2008 and "Automotive Supplier of the Year 2009, 2010 and 2011" from Continental
- "Technical Development Award 2011" from Denso for quality, pricing, technical development and global collaboration. Infineon is the first non-Japanese component supplier that received this award.

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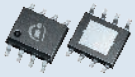
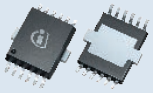
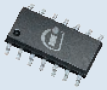
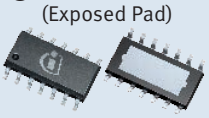
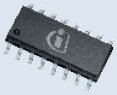
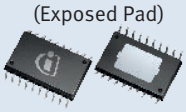
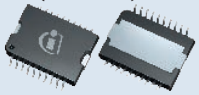
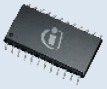
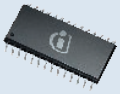
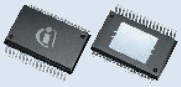
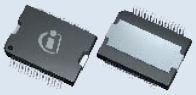
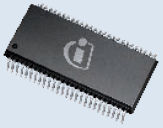
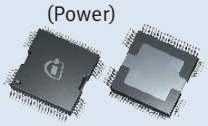
① PG-DSO-8 	② PG-DSO-8 (Exposed Pad) 	③ PG-DSO-12 	④ PG-DSO-14 	⑤ PG-DSO-14 (Exposed Pad) 	⑥ PG-DSO-16 
⑦ PG-DSO-20 	⑧ PG-DSO-20 (Exposed Pad) 	⑨ PG-DSO-20 (Power-SO) 	⑩ PG-DSO-24 	⑪ PG-DSO-28 	⑫ PG-DSO-36 
⑬ PG-DSO-36 (Exposed Pad) 	⑭ PG-DSO-36 (Power-SO) 	⑮ PG-DSO-52 	⑯ PG-LQFP-64 	⑰ PG-MQFP-64 (Power) 	⑱ SC-59 
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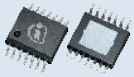
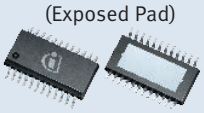
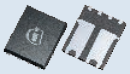
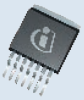
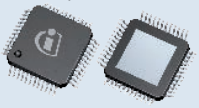
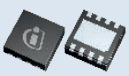
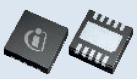
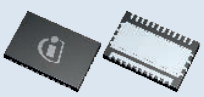
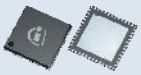
㉕ SOT-323 	㉖ SOT-343 	㉗ SOT-363 	㉘ PG-SSOP-14EP 	㉙ PG-SSOP-16 	㉚ PG-SSOP-24 
㉛ PG-SSOP-24 (Exposed Pad) 	㉜ PG-TDSON-8 dual 	㉝ PG-TO252-3 (DPAK) 	㉞ PG-TO252-5 (DPAK 5-leg) 	㉟ PG-TO263-3 (TO220-3 (SMD)) 	㊱ PG-TO263-3 (TO220-3 (SMD)) 
㊲ PG-TO263-5 (TO220-5 (SMD)) 	㊳ PG-TO263-5 (TO220-5 (SMD)) 	㊴ PG-TO263-7 (TO220-7 (SMD)) 	㊵ PG-TO263-7 (TO220-7 (SMD)) 	㊶ PG-TO263-15 	㊷ PG-TQFP-48 (Exposed Pad) 
㊸ TSON-8 	㊹ TSON-10 	㊺ TSON-24 	㊻ TSOP-6/6 dual 	㊼ PG-TSSOP-28 	㊽ PG-VQFN-48 
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