

Automotive power supply ICs

Product overview



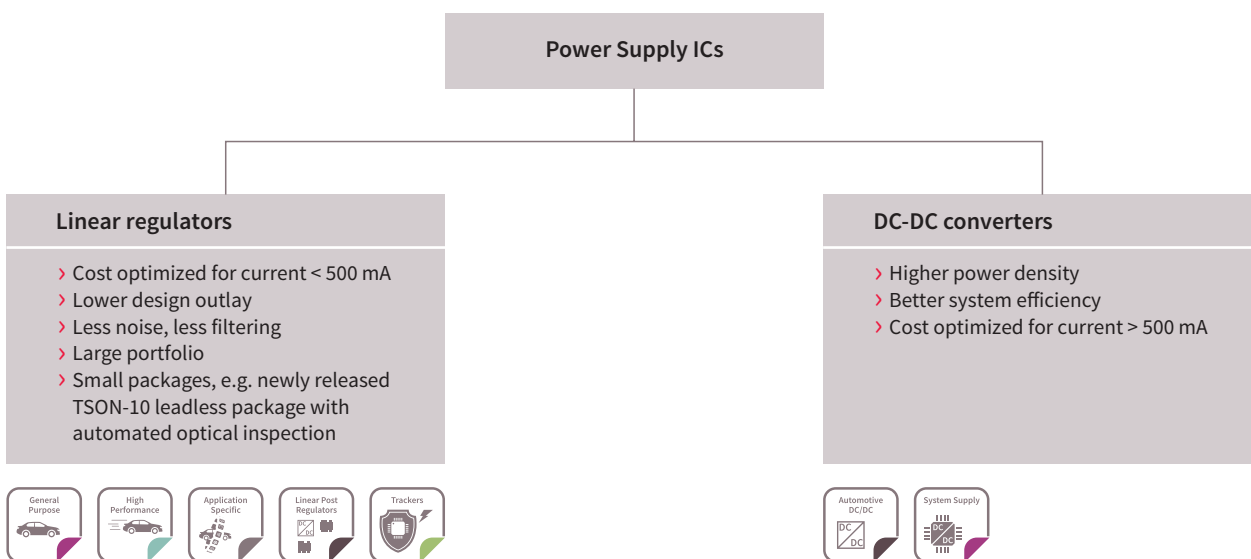


Power supply ICs

Linear voltage regulators and DC-DC converters

In automotive ECUs, microcontrollers and other electronic system components have to be supplied by a stable and reliable voltage that is lower than the battery voltage (e.g. 3.3 V or 5 V) and works over the entire temperature range (from -40°C to 150°C).






Depending on the application – i.e. the output current and the requested system efficiency – linear voltage regulators or DC-DC converters are ideal for use in the automotive world.







Linear voltage regulators



Linear voltage regulator families

-  **General Purpose**
Standard solution of linear voltage regulators, suitable for almost all automotive applications due to a wide range portfolio
-  **High Performance**
Best-in-class linear voltage regulators in relation to energy savings and stop-and-start systems (e.g. for cold cranking conditions)
-  **Trackers**
Supply ICs for sensor applications: robust and accurate voltage distribution
-  **Linear Post Regulators**
Linear voltage regulators not directly connected to the battery line (e.g. used after a DC-DC converter)
-  **Application Specific**
Linear voltage regulators for application-specific solutions (e.g. active antenna)

Main features

-  **Enable**
Enable function for main output. Low current consumption in stand-by.
-  **Reset**
Power-on reset sensing output voltage
-  **Watchdog**
Standard and window watchdog
-  **Early Warning**
Early warning comparator for sensing input undervoltage

Selection table for 12 V and 24 V battery applications

Output current	30 mA	100 mA	150 mA	180/200 mA	300 mA ultra low power	400/450 mA	> 500 mA
No feature	TLE4294 (5 V)	TLE42644 (5 V) TLE42344 (5 V)			TLE7274-2 (5 V)	TLE42744 (5 V, 3.3 V)	TLE4284 (adj., 1.5 V, 1.8 V, 2.6 V, 3.3 V, 5 V)
EN	TLE4296-2 (5 V, 3.3 V)	TLS710B TLE42364 TLE42664 (5 V)	TLS715B (5 V)		TLE7276-2 (5 V)	TLE42764 (adj., 5 V)	
RES	TLE4295 (5 V, 3.3 V)	TLF4949 (5 V)	TLE42694 (5 V)		TLE7270-2 (5 V)	TLE42754 (5 V, 3.3 V) TLE4675 (5 V)	
EN, RES			TLE42994E (5 V, 3.3 V)	TLE4699 (5 V)	TLE7272-2 (5 V)	TLE4267-2 (5 V)	
RES, WD				TLE4678(-2) (5 V)			
EN, RES, WD				TLE4263-2 (5 V) TLE7278-2 (5 V) TLE7273-2 (window WD) (2.6 V, 3.3 V, 5 V)		TLE4291 (5 V)	TLE4271-2 (5 V)

for 12 V battery applications

for 24 V battery applications

Key features

- > Standard features
 - Wide operation range up to 45 V
 - Low dropout voltage
 - Wide temperature range: -40°C up to +150°C
- > Standard protection
 - Short-circuit protection
 - Reverse polarity protection as option
 - Overload protection
 - Overtemperature protection

Key benefits

- > Broad portfolio: devices available for all types of applications
- > Best-in-class quality
- > Full 150°C automotive qualification
- > Long-term availability

Linear voltage regulators

Selection table for 12 V battery applications

Product name	I _Q [mA]	I _q [μA]	V _S range [V]	V _Q [V]	Drop voltage [V]	Accuracy [%]	Output capacitance (min) [μF]	Reset	Adjustable reset threshold	Enable	Watchdog	Early warning	Package
TLE4294	30	120	5.50–45.00	5.00	0.25	4	2.20						SCT595
TLE4295	30	120	3.50–45.00	3.30; 5.00	0.25	4	2.20	● ¹⁾²⁾					SCT595
TLE4296-2	30	130	4.00–45.00	3.30; 5.00	0.25	4	3.30			●			SCT595
TLS710	100	36	4.00–45.00	5.00	0.20	2	1.00			●			DSO-8 EP
TLF4949	100	180	3.50–45.00	5.00	0.30	2	4.70	● ²⁾				●	DSO-8, DSO-8 EP
TLE42344	120	300	5.50–45.00	5.00	0.25	2	10.00						SOT223
TLE42364	120	300	5.50–45.00	5.00	0.25	2	10.00			●			SOT223
TLS715	150	36	4.00–45.00	5.00	0.20	2	1.00			●			DSO-8 EP
TLE42644	150	40	5.50–45.00	5.00	0.22	2	10.00						SOT223
TLE42664	150	40	5.50–45.00	5.00	0.25	2	10.00			●			SOT223
TLE42694	150	210	5.50–45.00	5.00	0.25	2	10.00	●	●			●	DSO-8, DSO-14, SSOP-14 EP
TLE42694-2	150	210	5.50–45.00	5.00	0.25	2	4.70	●	●				SSOP-14 EP
TLE42794	150	150	5.50–45.00	5.00	0.25	2	10.00	●	●			●	DSO-8, DSO-14, SSOP-14 EP
TLE42994	150	65	4.40–45.00	3.30; 5.00	0.25	2	22.00	●	●	●		●	DSO-8, DSO-14, SSOP-14 EP
TLE4268	180	300	5.50–45.00	5.00	0.25	2	22.00	●	●		●		DSO-8, DSO-20
TLE7273-2	180	28	4.20–45.00	2.60; 3.30; 5.00	0.25	2	0.50	●		●	● ³⁾		DSO-14, SSOP-14 EP
TLE7278-2	180	28	4.20–45.00	5.00	0.25	2	0.50	●		●	●		DSO-14, SSOP-14 EP
TLE7279-2	180	28	4.20–45.00	2.60; 3.30; 5.00	0.25	2	0.50	●		●		●	DSO-14, SSOP-14 EP
TLE4263/-2	200	900	5.50–45.00	5.00	0.35	2	22.00	●	●	●	●		DSO-8, DSO-8 EP, DSO-14, DSO-20
TLE4278	200	180	5.50–45.00	5.00	0.25	2	10.00	●	●		●		DSO-14
TLE4678/-2	200	60	3.30–45.00	5.00	0.25	2	10.00	●	●		●		DSO-14, SSOP-14
TLE4699	200	70	3.30–45.00	5.00	0.16	2	10.00	●	●	●		●	DSO-14, SSOP-14
TLE7270-2	300	20	5.50–45.00	5.00	0.20	2	0.50	●					SSOP-14 EP, TO252-5 (DPAK 5-leg), TO263-5-1 (TO220-5 (SMD))
TLE7272-2	300	20	5.50–45.00	5.00	0.25	2	0.50	●		●			SSOP-14 EP, TO252-5 (DPAK 5-leg)
TLE7274-2	300	20	5.50–45.00	5.00	0.25	2	0.50						SSOP-14 EP, TO252-3 (DPAK), TO263-3-2 (TO220-3 (SMD))
TLE7276-2	300	20	5.50–45.00	5.00	0.25	2	0.50			●			SSOP-14 EP, TO252-5 (DPAK 5-leg)
TLE4267-2	400	1300	5.50–40.00 (60.00)	5.00	0.30	2	22.00	●		●			TO263-7-1 (TO220-7 (SMD))
TLE42744	400	100	3.30–45.00	3.30; 5.00	0.25	2	22.00						SOT223, SSOP-14 EP, TO252-3 (DPAK), TO263-3-1 (TO220-3 (SMD))
TLE42754	400	150	5.50–45.00	3.30; 5.00	0.25	2	22.00	●					SSOP-14 EP, TO252-5 (DPAK 5-leg), TO263-5-1 (TO220-5 (SMD))



Selection table for 12 V battery applications (cont'd)

Product name	I _Q [mA]	I _q [μA]	V _s range [V]	V _Q [V]	Drop voltage [V]	Accuracy [%]	Output capacitance (min) [μF]	Reset	Adjustable reset threshold	Enable	Watchdog	Early warning	Package
TLE42764	400	100	4.50–45.00	Adj.; 5.00	0.25	2	22.00			•			SSOP-14 EP, TO252-5 (DPAK 5-leg), TO263-5-1 (TO220-5 (SMD))
TLE4675	400	65	3.30–45.00	5.00	0.25	2	22.00	•					TO252-5 (DPAK 5-leg), TO263-5-1 (TO220-5 (SMD))
TLE4291	450	220	3.30–45.00	5.00	0.25	2	22.00	•	•	•	•		SSOP-14 EP
TLE4284	1000	1000	2.90–40.00	Adj.; 1.50; 1.80; 2.60; 3.30; 5.00	1.00	3	10.00						TO252-3 (DPAK)

Selection table for 24 V battery applications

Product name	I _Q [mA]	I _q [μA]	V _s range [V]	V _Q [V]	Drop voltage [V]	Accuracy [%]	Output capacitance (min) [μF]	Oversvoltage protection	Reset	Adjustable reset threshold	Enable	Watchdog	Early warning	Package
TLE4267-2	400	1300	5.50–40.00 (60.00)	5.00	0.30	2	22		•		•			TO263-7-1 (TO220-7 (SMD))
TLE4476	430	300 mA	5.70–42.00 (60.00)	3.30 or 5.00	0.30	4	10/10	•						TO252-5 (DPAK 5-leg)
TLE4471	450	1100 mA	5.50–40.00 (60.00)	3x 5.00	0.25	2	22/10/10	•	•	•		•		DSO-20 (Power-SO)
TLE4271-2	550	800	6.00–42.00 (60.00)	5.00	0.35	2	22		•		•	•		TO263-7-1 (TO220-7 (SMD)), TO220-7-11, TO220-7-12

Power supply multiple output regulators

Product name	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 [%]	Output capacitance (min) [μF]	Oversvoltage protection	Reset output	Adjustable reset threshold	Watchdog	Early warning	Package
TLE7469G	215	200	55	4.20–45.00	5.00	2.60 or 3.30	0.30	3	1/1	•	•		•	•	DSO-12
TLE4473/-2	300	180	200	5.60–45.00	5.00	3.30 or 5.00	0.30	2	10/22		•		•		DSO-12
TLE4470	350	180	180	5.60–45.00	5.00	Adj.	0.30	2	6/10		•	•		•	DSO-14, DSO-20
TLE4476	350	430	300	5.70–42.00 (60.00)	5.00	3.30	0.30	4	10/10	•					TO252-5 (DPAK 5-leg)
TLE4471	450	50 100	1100	5.50–40.00 (60.00)	5.00	2x 5.00	0.25	2	22/10/10	•	•		•		DSO-20 (Power-SO)

- 1) Power good
- 2) Power fail
- 3) Window watchdog

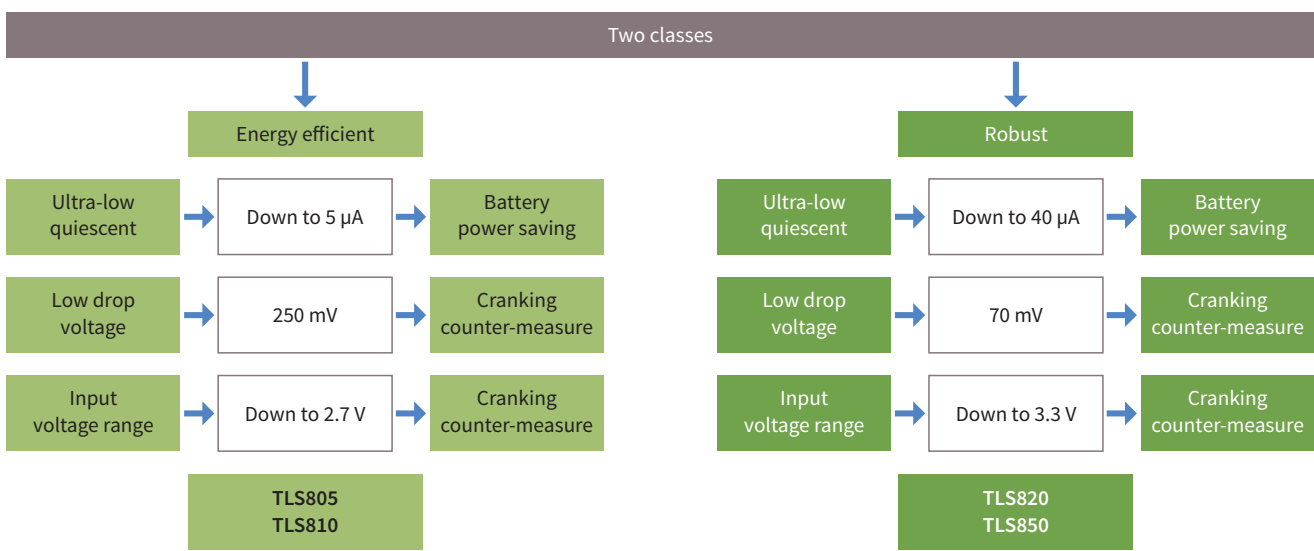
High-performance linear voltage regulators



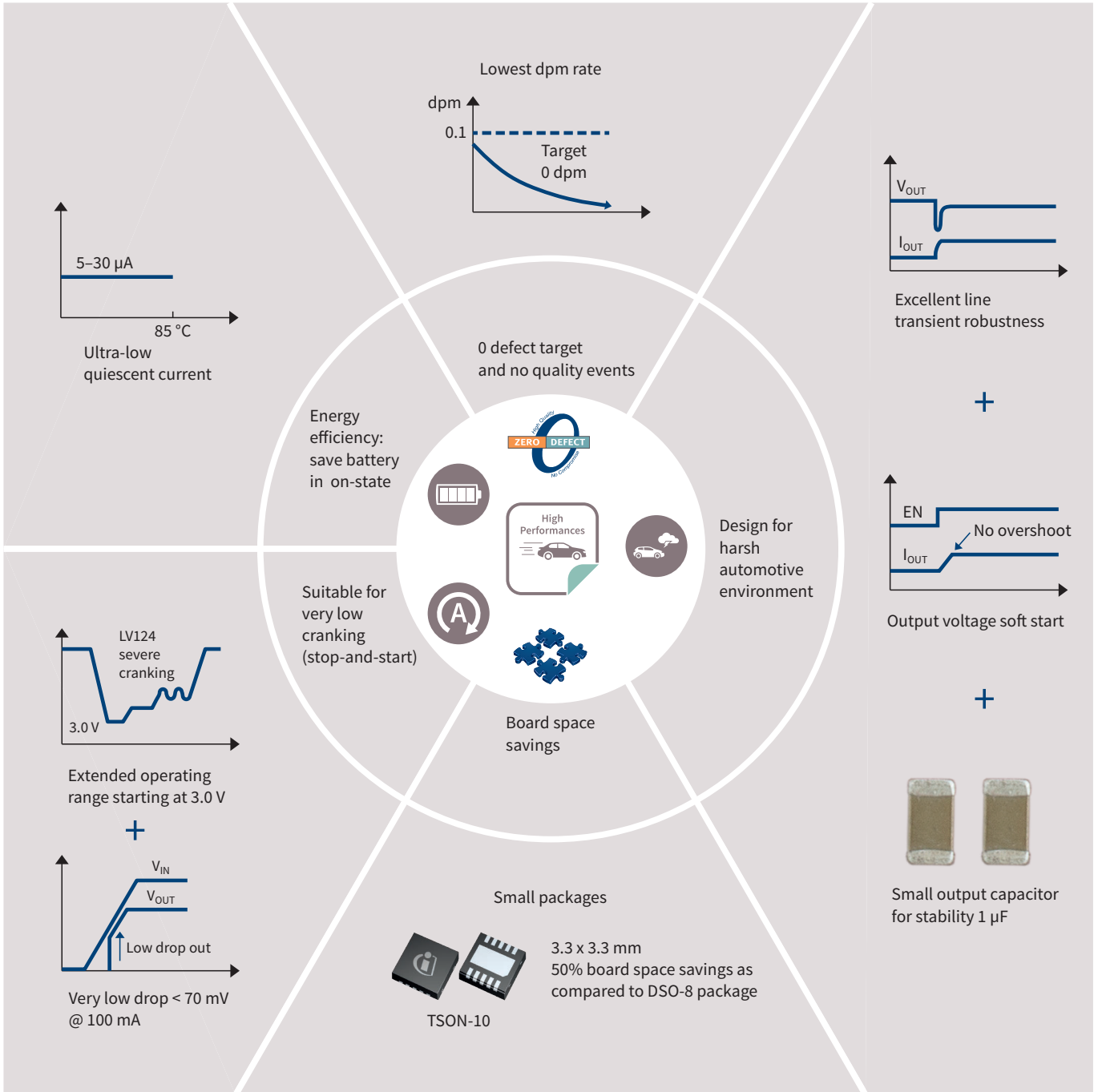
Selection table

Output current	50 mA	100 mA	200 mA	400 mA	500 mA
No feature		TLS810A1 (5 V, 3.3 V)		TLF80511 (5 V, 3.3 V)	
EN	TLS805B1 (5 V, 3.3 V, adj.)	TLS810B1 (5 V, 3.3 V)			TLS850B0 (5 V, 3.3 V)
RES		TLS810C1 (3.3 V)			
EN, RES	TLS805D1 (5 V)	TLS810D1 (5 V, 3.3 V)	TLS820D0 (5 V, 3.3 V)		TLS850D0 (5 V, 3.3 V)
EN, RES, WD			TLS820F0 (5 V, 3.3 V) TLS820F1 (5 V)		TLS850F0 (5 V, 3.3 V) TLD850F1 (5 V)

Energy efficient Robust



Key features and benefits

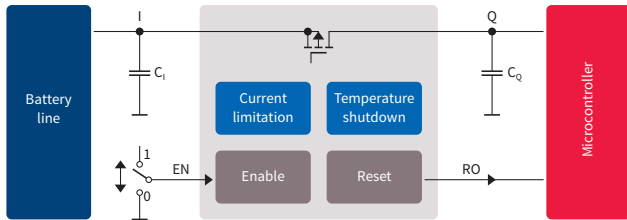


High-performance linear voltage regulators



Applications

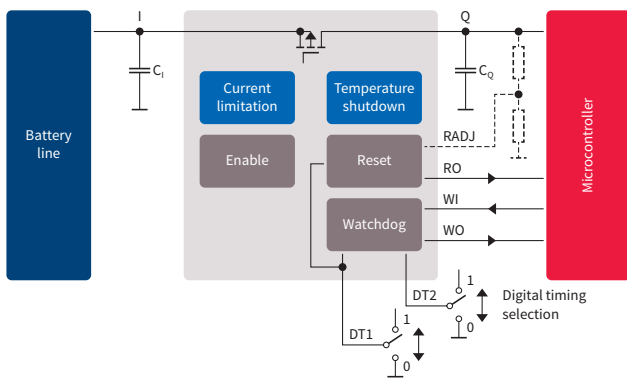
Energy efficient family



Applications

- > Application with direct battery connection
 - RKE, immobilizer, gateway
 - Infotainment, alarm, dashboard
- > General automotive ECUs

Robust family



Applications

- > BCM, RKE, trunk, dashboard, HVAC
- > Brake, EPS, TPMS, BMS
- > Transmission
- > General automotive ECUs

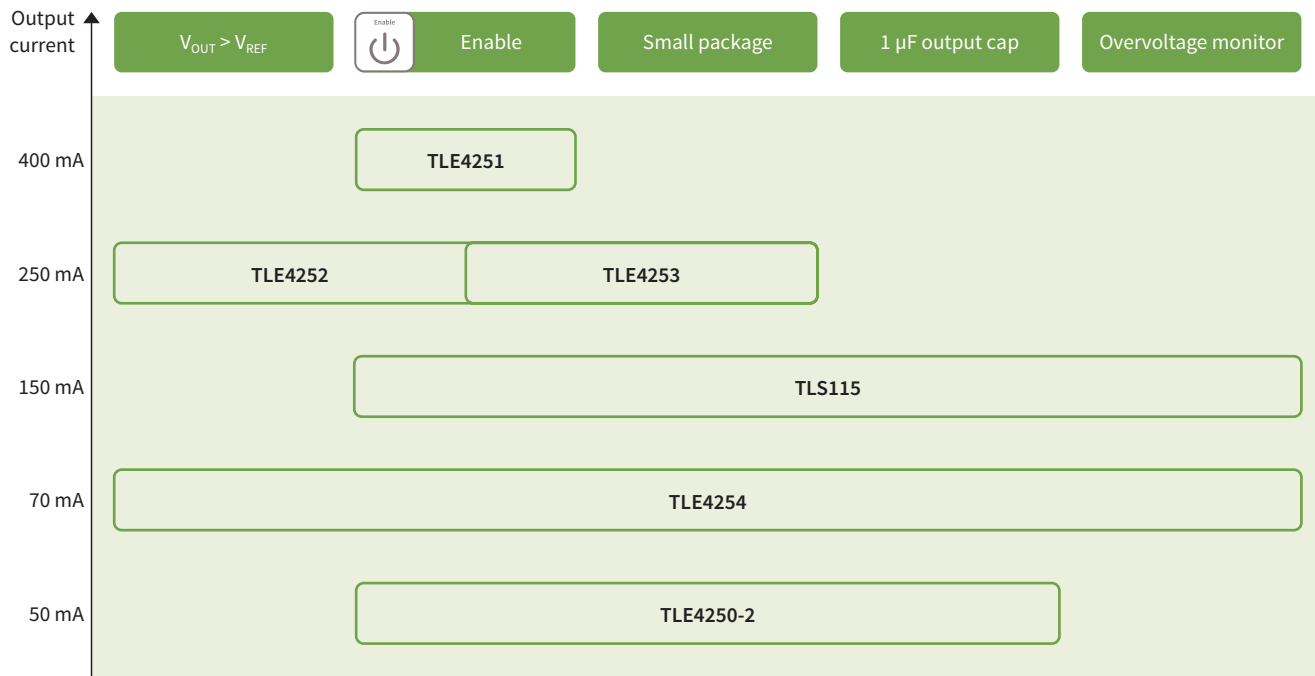
High-performance voltage regulators by output current

Product name	I_Q [mA]	I_q [μA]	V_S range [V]	V_Q [V]	Drop voltage [mV]	Accuracy [%]	C_Q [μF]	Reset	Enable (= Inhibit)	Watchdog	Package
TLS805B1	50	5.0	2.75-42.0	3.3, 5.0, Adj	100	2.0	1		•		TSON-10 DSO-8
TLS805D1	50	9.5	2.75-42.0	5.0	100	2.0	1	•	•		TSON-10
TLS810A1	100	5.0	2.75-42.0	3.3, 5.0	250	2.0	1				TSON-10
TLS810B1	100	5.5	2.75-42.0	3.3, 5.0	250	2.0	1		•		TSON-10 DSO-8 EP
TLS810C1	100	9.0	2.75-42.0	3.3	250	2.0	1	•			DSO-8 EP
TLS810D1	100	9.5	2.75-42.0	3.3, 5.0	250	2.0	1	•	•		TSON-10 DSO-8 EP
TLS820D0	200	40.0	3.0-40.0	3.3, 5.0	70	2.0	1	•	•		SSOP-14
TLS820F0	200	40.0	3.0-40.0	3.3, 5.0	70	2.0	1	•	•	•	SSOP-14
TLS820F1	200	40.0	3.0-40.0	5.0	70	2.0	1	•	•	•	SSOP-14
TLF80511	400	38.0	3.3-40.0	3.3, 5.0	100	2.0	1				DSO-8 EP TO263-3-1 (TO220-3 (SMD)) TO252-3 (DPAK)
TLS850B0	500	23.0	3.0-40.0	3.3, 5.0	100	2.0	1		•		TO263-5-1 (TO220-5 (SMD)) TO252-5
TLS850D0	500	40.0	3.0-40.0	3.3, 5.0	70	2.0	1	•	•		TO263-7-1 (TO220-7 (SMD)) TO252-5 (DPAK 5-leg)
TLS850F0	500	40.0	3.0-40.0	3.3, 5.0	70	2.0	1	•	•	•	TO263-7-1 (TO220-7 (SMD))
TLS850F1	500	40.0	3.0-40.0	5.0	70	2.0	1	•	•	•	TO263-7-1 (TO220-7 (SMD))





Selection table



Challenges of powering sensors

- › Sensor supply requires various protection features due to the harsh environment
 - Overvoltage (typ. ~26 V)
 - Overcurrent
 - Reverse polarity
 - Supply accuracy

Key features

- › Designed for automotive @ 150°C
- › Short-to-GND and BAT protected
- › Accurate current limitation
- › High accuracy
- › Advanced feature set

Key benefits

- › Reliable protection for ECU/sensor
- › Easy and accurate voltage replication
- › High flexibility/scalability
- › Lower design outlay → design cost savings



- › Enable function to main output
- › Low quiescent current consumption in stand-by mode



- › Indicates an error condition at the tracker's output

Trackers



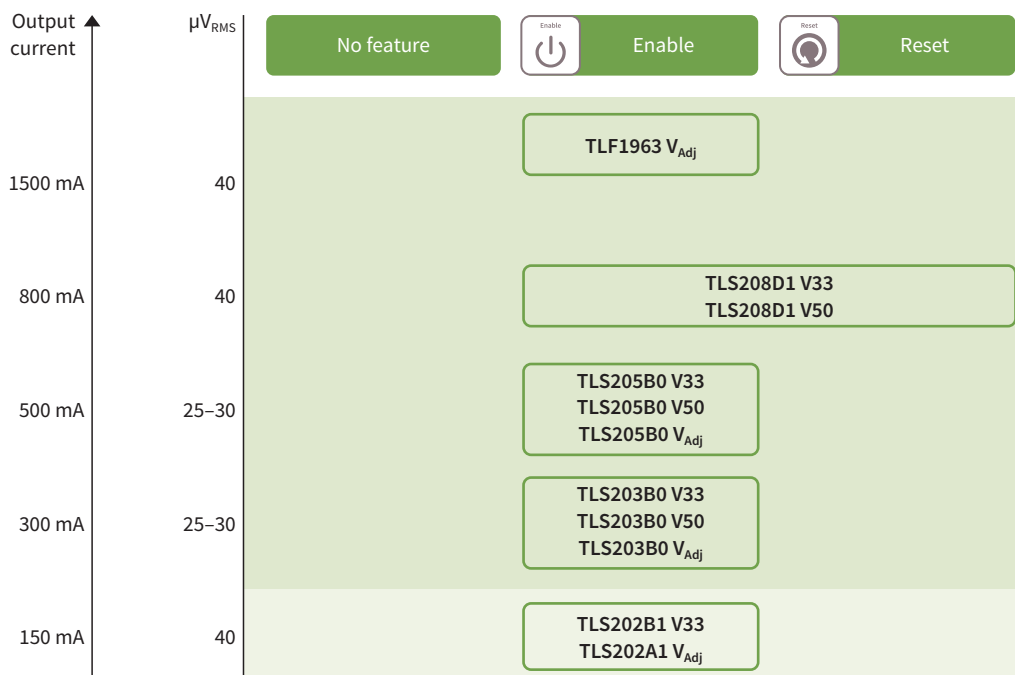
Trackers by output current

Product name	I_Q [mA]	Adjust voltage (min) [V]	Accuracy [%]	Independent EN pin	Status pin	Package
TLE4250-2	50	2.5	±0.5			SCT595
TLE4254	70	2.0	±0.1		•	DSO-8 DSO-8-EP
NEW! TLS115B0	150	2.0	±0.1	•	No	DSO-8 EP TSON-10
NEW! TSL115D0	150	2.0	±0.1	•	•	DSO-8 EP TSON-10
TLE4252	250	1.5	±0.2	•		TO252
TLE4253	250	2.0	±0.2			DSO-8 DSO-8-EP
TLE4251	400	2.5	±0.2	•		TO252-5 (DPAK 5-leg) TO263-5-1 (TO220-5 (SMD)))

Linear post regulators



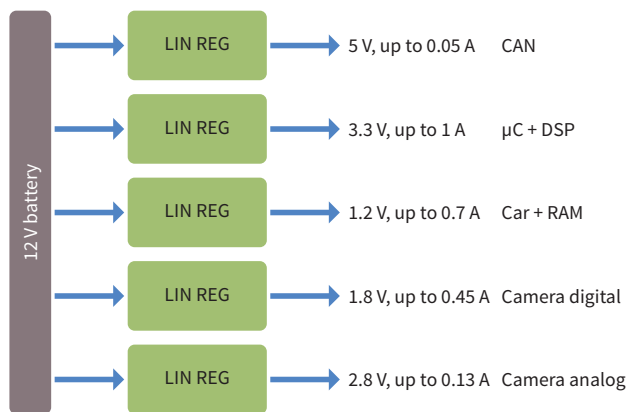
Selection table



Applications

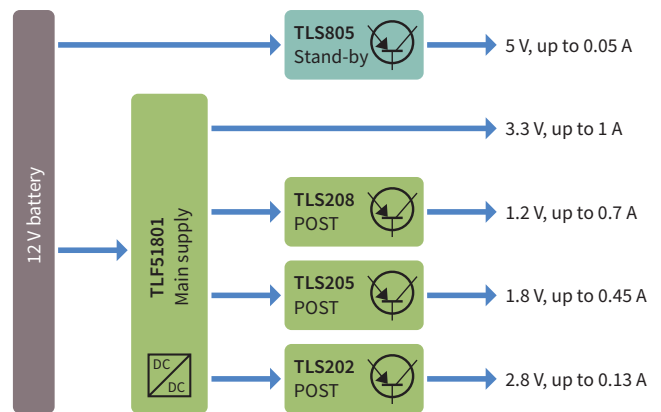
- > ADAS: radars and cameras
- > ADAS: MMIC (low noise)
- > Infotainment, displays, cluster
- > CPU supplies (FPGA, DSP), memory
- > Post regulation after DCDC converter
- > EMS

Linear solution



Low system efficiency
High power losses

Post regulation DC-DC and linear



High efficiency-cost ratio

Maximum efficiency and optimal flexibility

System benefits	TLF51801 controller	Linear post regulator
<ul style="list-style-type: none"> > Higher efficiency > Higher flexibility > Lower system cost > Higher reliability 	<ul style="list-style-type: none"> > Adjustable voltage > Max current up to 10 A > Current limitation > Advanced feature set 	<ul style="list-style-type: none"> > Higher V_{in} range than CMOS ($V_{in} = 20$ V max) > Adjustable voltage > Max current up to 1.5 A > Low noise
Automotive-qualified T_j up to 150°C		

Linear post regulators by output current

	Product name	I_Q [mA]	I_q [μA]	V_S range [V]	V_Q [V]	Drop voltage [V]	Accuracy [%]	Output capacitance (min) [μF]	Reset	Adjustable reset threshold	Enable	Package
NEW!	TLS202B1	150	50	2.70–20.00	3.30	0.50	3	1.00			●	SCT595
NEW!	TLS202A1	150	50	2.70–20.00	Adj.	0.50	3	1.00				SCT595
NEW!	TLS203B0	300	30	2.30–20.00	Adj.; 3.30 5.00	0.30	3	3.30			●	DSO-8 EP, TSON-10
NEW!	TLS205B0	500	30	2.30–20.00	Adj.; 3.30 5.00	0.30	3	3.30			●	DSO-8 EP, TSON-10
NEW!	TLS208D1	800	90	–	Adj.; 3.30	–	2	–	●	●		DSO-8 EP, TSON-10
	TLF1963	1500	1100	2.50–20.00	Adj.	0.34	3	10.00			●	TO263-5-1 (TO220-5 (SMD)), TO252-5 (DPAK 5-leg)

Application specific



TLF4277

Key applications

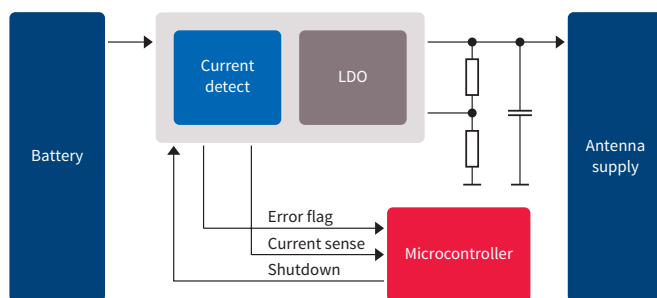
- > Active antennas
- > Battery charger
- > Microphones

Key features

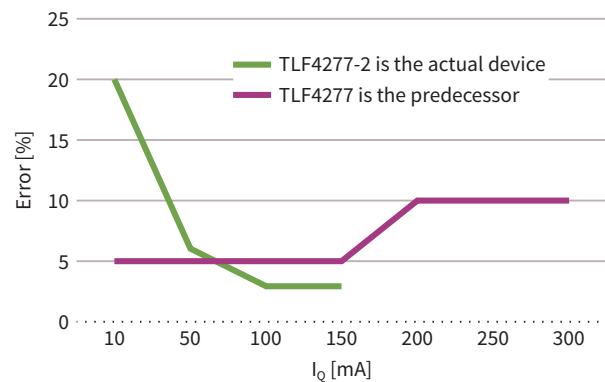
- > Current monitor functionality
- > Adjustable current limitation
- > Adjustable output voltage
- > Short-circuit detection to GND and battery voltage level
- > SSOP-14 EP package
- > TSON-10 package, leadless and capable of automatic optical inspection
- > Overtemperature detection/protection

Key benefits

- > Diagnosis of antenna system status (linear current detection)
- > Flexible protection of sensitive components
- > Easy adjustment to the application requirements
- > Fast identification of short-circuit failures
- > Enhances thermal characteristics



Current sense performance



Active antenna family

Product name	I_q [mA]	I_q [μ A]	V_s range [V]	V_o [V]	Drop voltage [V]	Accuracy [%]	Output capacitance (min) [μ F]	Enable	Package
TLF4277 ¹⁾	200	140	5.00–45.00	Adj.	0.25	2	10	•	SSOP-14 EP
TLF4277-2 ¹⁾	300	150	5.00–45.00	Adj.	0.20	2	1	•	SSOP-14 EP TSON-10

1) LDO with current monitor and status output

DC-DC converters

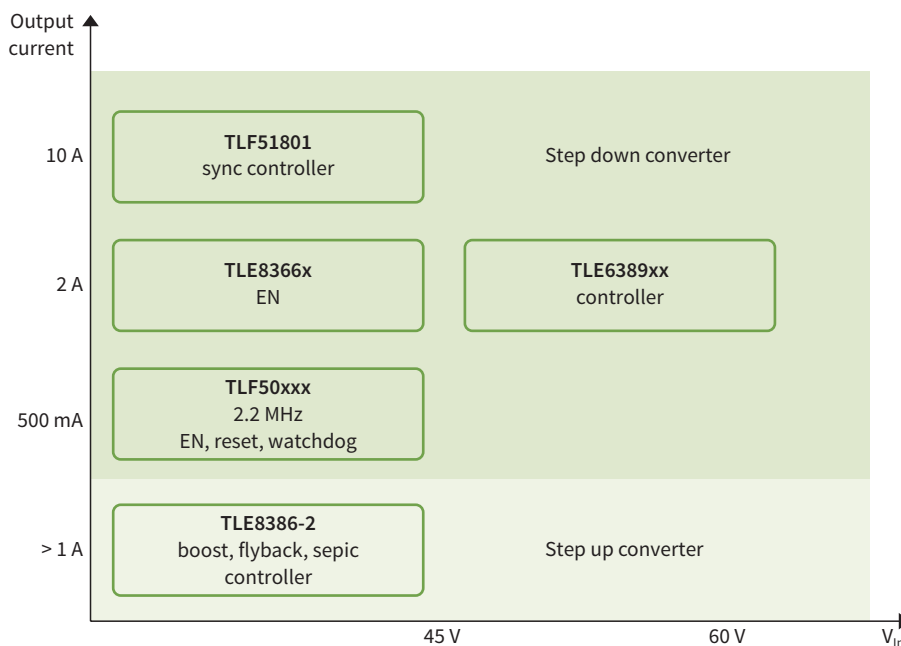


Infiniteon Technologies offers several switching converters serving applications with extended requirements like supply for 32-bit μC and airbag applications.

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

- > Step-up and step-down converters
- > High-efficiency regulators
- > Wide supply voltage operation range
- > Very low current consumption operation
- > Suitable for standard 12 V/24 V PowerNets
- > Disable function for main output

- > Output undervoltage reset with delay
- > Short-circuit protection
- > Overtemperature protection
- > Wide ambient operation range: -40°C up to 150°C



Applications

TLE6365

- > General purpose

TLE6389-2GV/-3GV

- > Commercial, construction and agricultural vehicles (CAV)
- > 24V ECUs

TLE8366

- > General purpose buck
- > BCM, cashboard, cluster
- > Telematics

TLE8386-2EL

- > General purpose boost controller
- > Suitable for SEPIC/buck-boost applications
- > Suitable for start-stop

TLF51801

- > ADAS, camera, radar ECU's
- > Wireless charger, USB supply for mobile phone charger
- > Telematic and eCall applications

TLF502x1

- > General use DC-DC with low quiescent current
- > Body ECUs, decentralized lighting modules
- > Sensor cluster, telematics, infotainment, camera

DC-DC converters



Single-rail DC-DC converters

Product name	$V_{S(OIP)}$ [V]	V_O [V]	Accuracy 1 [%]	I_Q [mA]	I_q [mA]	f_{sw} [kHz]	PFM operation	Reset	Watchdog	Enable/disable possibility	Early warning	Package
Buck												
TLE6365	8.00 ... 40.00	5.00	2	400	1.500	100		●				DSO-8
TLE6389-2GV	5.00 ... 60.00	Adj.	3	2300	0.120	250 ... 530	●	●		●	●	DSO-14
TLE6389-2GV50	5.00 ... 60.00	5.00	3	2300	0.120	250 ... 530	●	●		●	●	DSO-14
TLE6389-3GV50	5.00 ... 60.00	5.00	3	2300	0.120	250 ... 530	●	● ¹⁾		●	●	DSO-14
TLE8366	4.75 ... 45.00	Adj., 3.30, 5.00	2(4)	1800	7.000	200 ... 530				●		DSO-8 EP
TLF50281	4.75 ... 45.00	5.00	2	500	0.045	800 ... 2200	●	●	STD	●		SSOP-14 EP
TLF50251	4.75 ... 45.00	5.00	2	500	0.045	800 ... 2200	●	●		●		SSOP-14 EP
TLF50241	4.75 ... 45.00	5.00	2	500	0.045	800 ... 2200	●	●				SSOP-14 EP
TLF50211	4.75 ... 45.00	5.00	2	500	0.045	800 ... 2200	●			●		SSOP-14 EP
TLF50201	4.75 ... 45.00	5.00	2	500	0.045	800 ... 2200	●					SSOP-14 EP
TLF51801	4.75 ... 45.00	1.20– $D_{max} \cdot V_S$	2	Adj. max 10,000	< 2.000 μ A	100 ... 700				●		SSOP-14 EP
Boost												
TLE8386 ²⁾	4.75 ... 45.00	Adj. (max 9-times of V_S)	4	dep.on V_Q	7000	100 ... 500				●		SSOP-14 EP
TLE8386-2 ³⁾	4.75 ... 45.00	Adj. (max 9-times of V_S)	4		7000	100 ... 500				●		SSOP-14 EP

- 1) Different voltage reset hysteresis
- 2) HS-sense-booster (preferably as current source)
- 3) LS-sense-booster

Featured product: TLF51801 synchronous 10 A flexible pre-regulator

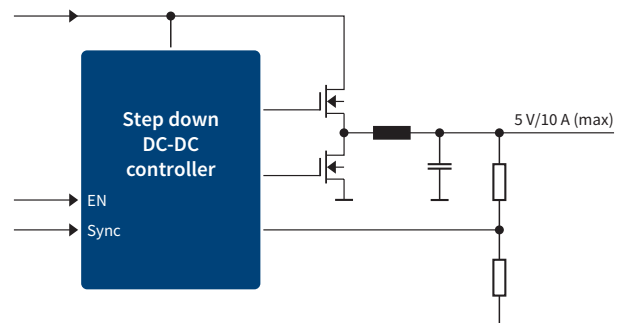
Key features

- › Driving FETs for loads up to 10 A
- › Adjustable switching frequency can be synchronized to an external clock
- › Very low shut-down current
- › Internal soft-start
- › Protection functions
- › SSOP-14EP small thermally enhanced package

Key benefits

- › Flexibility in current limitation to reduce external components
- › Integrated soft-start limits the current peak as well as voltage overshoot at startup

Application diagram



Key applications

- › ADAS, camera, radar ECU's
- › Wireless charger, USB Supply for mobile phone charger
- › Telematic and eCall applications

Featured product family: TLF502x1 low quiescent current DC-DC

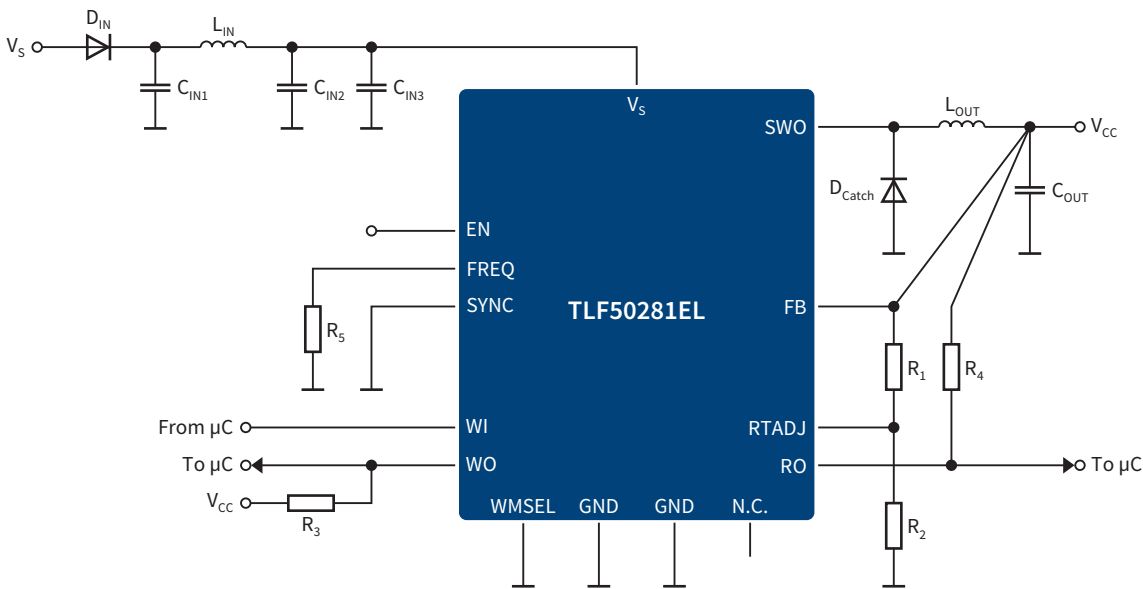
Key features

- > High input voltage range up to 45 V
- > Output: 500 mA/5 V ($\pm 2\%$)
- > Low quiescent current < 45 μA
- > High operating frequency: up to 2.2 MHz
- > Synch-in and adjust. switching frequency
- > Integrated compensation and soft-start
- > Family approach with dedicated feature set
 - Enable: ultra-low shutdown current
 - Reset with adjust. RES-thresholds
 - Watchdog with adjust. timing
- > SSOP-14EP (thermally enhanced)

Key benefits

- > Suitable for permanently V_{Batt} -connected ECUs
- > Optimized costs and board space
 - Smaller coils and caps
 - No external components needed for compensation and soft-start
- > Flexibility
 - Reset management
 - μC -supervision
- > Ultra-low shutdown current
- > Reduced design outlay

Application diagram



L_{IN} , C_{IN1} and C_{IN3} recommended for suppression of EME
 D_{IN} depending on application

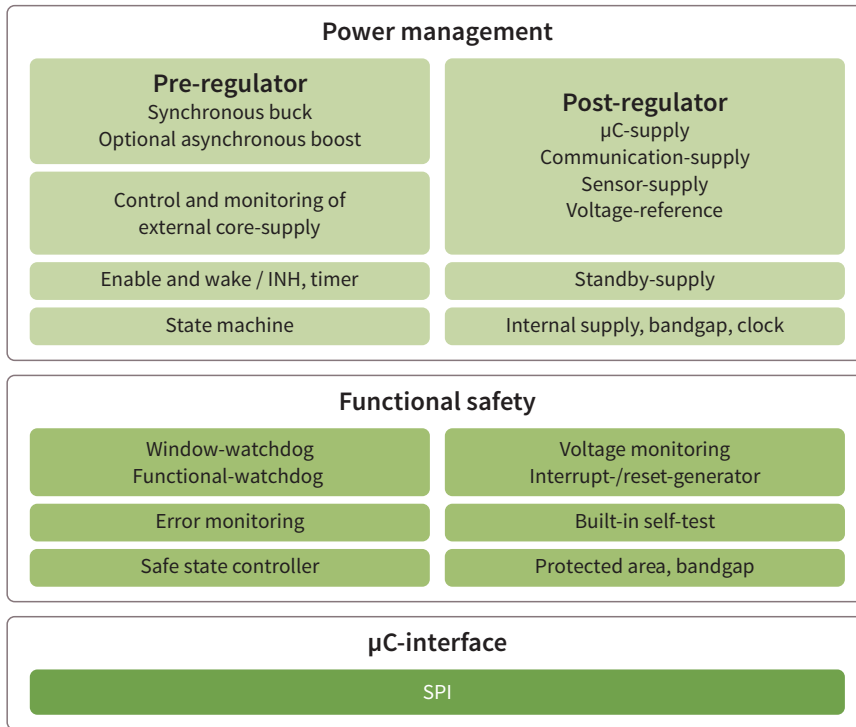
Family members			
	EN	RES	WD
TLF50201			
TLF50211	•		
TLF50241		•	
TLF50251	•	•	
TLF50281	•	•	•

System supply



TLF35584 – system supply for safety-relevant applications

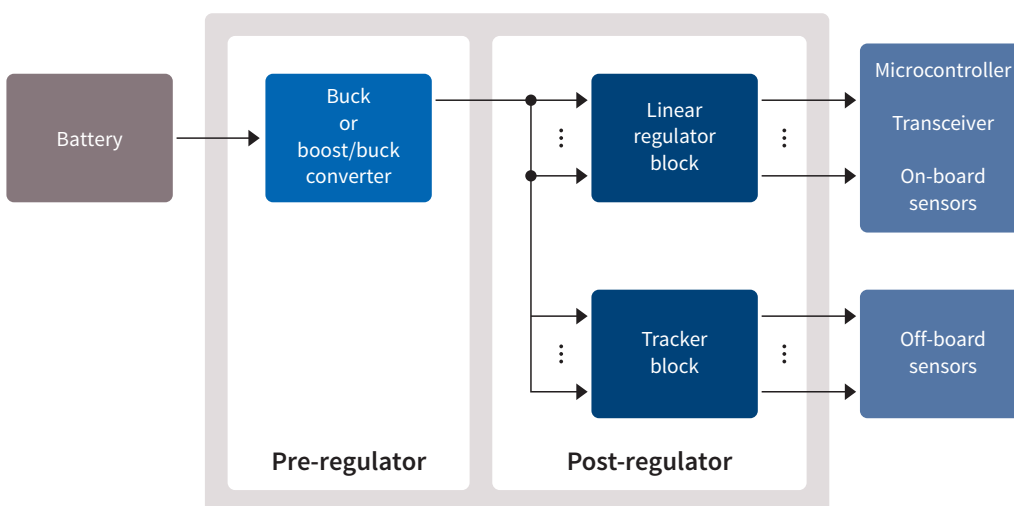
Functional block diagram



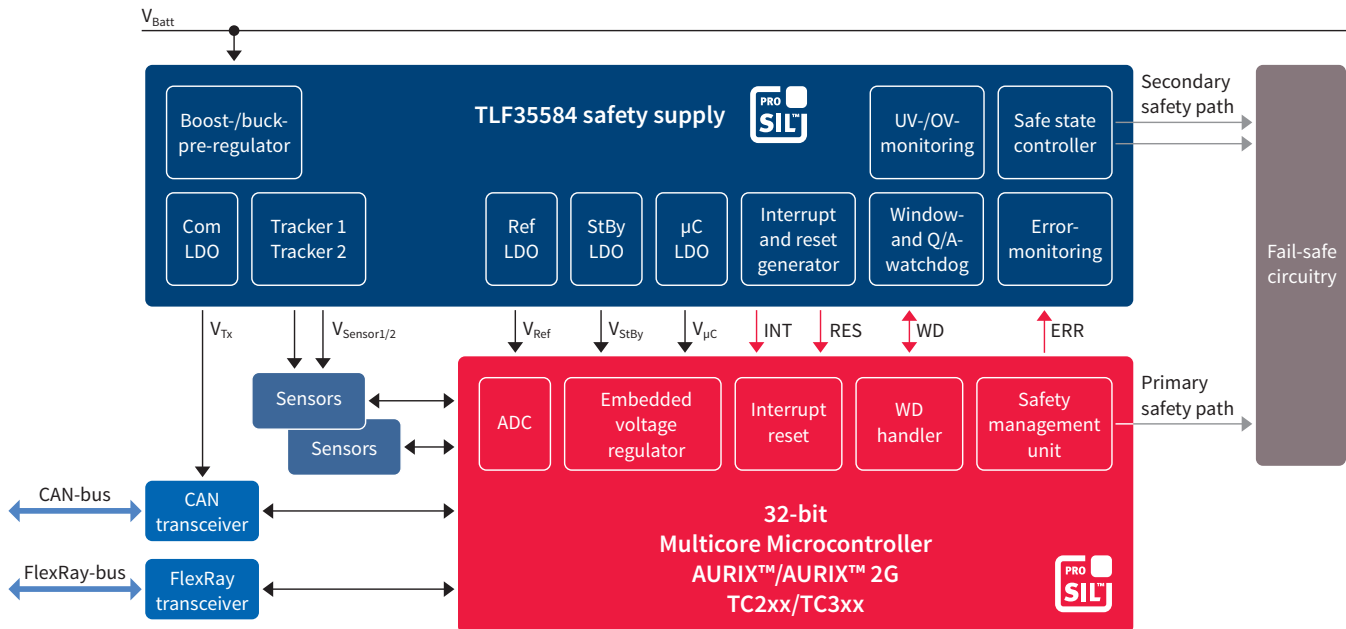
Applications

- > Safety: EPS, braking, suspension, domain control, ADAS fusion box
- > Powertrain: engine management, transmission
- > Electrical drive train: battery management, inverter, DC-DC, charger

Pre-/post-regulator architecture for high efficiency



Application schematic



Key features

- > V_{IN} : 3 V ... 40 V
- > Buck/boost-pre-regulator
 - $I_Q = 1.3$ A; f: 300 kHz – 2.5 MHz
- > Post-regulators
 - μC -supply: 3.3 V/5 V @ 600 mA
 - Reference-LDO: 5 V @ 150 mA ($\pm 1\%$)
 - 2x tracker: 5 V @ 150 mA
 - Communication-supply: 5 V @ 200 mA
- > Standby-LDO: 3.3 V/5 V @ 10 mA
- > EN/wake (T15 and CAN/FlexRay)
- > Extended state machine
- > SPI
- > Safety features
 - Development acc. to ISO 26262
 - Multiple bandgap (supply versus V-monitoring)
 - UV/OV-monitoring of all rails
 - ERR-monitoring of μC 's safety management unit
 - Functional-WD and window-WD with dedicated error-counters
 - Safe state control/secondary safety paths
 - Protected safety area/HV interconnects
 - Built-in self-test
- > VQFN-48 EP and LQFP-64 EP (both thermally enhanced)

Key benefits

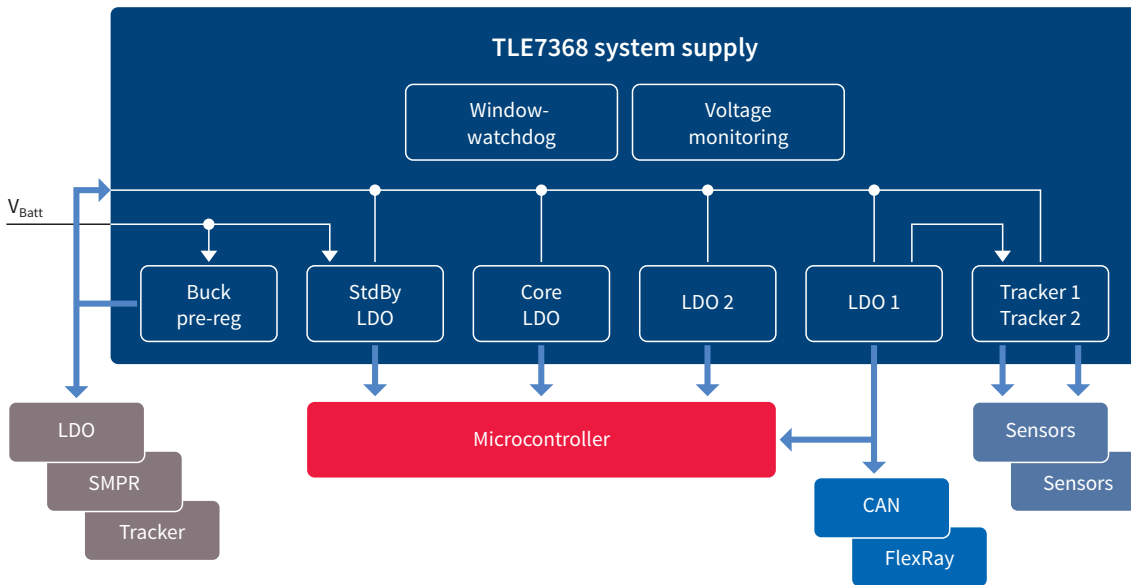
- > Ensures operation during cold cranking
- > High efficiency
- > ADC-supply regardless of μC -load
- > Precise sensor supply
- > Flexible wake-up management
- > Usage in applications with ASIL-requirements (up to ASIL-D)
- > Avoids common cause failures thanks to independence and protection
- > Application adaptable
 - Flexible monitoring concept
 - Flexible watchdog concept
 - Flexible safe state control and safety paths
- > All safety features testable on demand
- > Small footprint package (VQFN-48)
- > Good thermal behavior

System supply



TLE7368/-2/-3 – optimized system supply for 32-bit μC

Application diagram



Key features

- > Input voltage range from 4.5 to 45 V
- > DC-DC buck pre-regulator to 5.5 V/2.5 A
 - Integrated slew-rate control
- > Post-regulators for μC and on-board
 - LDO1: 5 V ($\pm 2\%$), 700 mA
 - LDO2: 3.3 V or 2.6 V ($\pm 2\%$), 500 mA
 - LDO3: control for ext. NPN
 - LDO3: 1.5 V, 1.2 V and 1.3 V ($\pm 2\%$)
 - 2 trackers for off-board supply: 5 V, 105 mA/50 mA
- > Stand-by regulator for lowest current consumption
- > 2 enable inputs
- > Reset for all LDOs with adj. reset delay time
- > Window watchdog with adj. timing
- > Monitoring circuit for stand-by supply
- > Power sequencing on contributing supplies
- > Overcurrent protection for all regulators
- > Overtemperature shutdown
- > DSO-36 EP (thermally enhanced)

Key benefits

- > Maintains operation under sensor short-circuit condition
- > EME reduction (high frequency content)
- > Power sequencing for proper start-up/ramp-down

Applications

- > Powertrain: transmission, engine management
- > Safety: EPS

DC-DC system supplies

Product name	$V_{S(EP)}$ [V]	V_O [V]	V_{O2} [V]	V_{O3} [V]	V_{O4} [V]	V_O additional [V]	Accuracy 1 [%]	Accuracy 2 [%]	Accuracy 3 [%]	Accuracy 4 [%]	Additional output accuracy	I_Q [mA]	I_{Q2} [mA]	I_{Q3} [mA]	I_{Q4} [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	
Buck plus linear																											
TLE7368	4.50 ... 45.00	5.50	5.00	2.60 or 3.30	1.50	2 x 5	-2.00 ... +9.00	2	2	2	1.50	2500	800	700	Adj.	105 and 50	120	280 ... 425	1.00/2.60-30.00		•	WWD		•		DSO-36 EP, DSO-36 (Power-SO)	
TLE7368-2	4.50 ... 45.00	5.50	5.00	2.60 or 3.30	1.20	2 x 5	-2.00 ... +9.00	2	2	2	1.50	2500	800	700	Adj.	105 and 50	120	280 ... 425	1.00/2.60-30.00		•	WWD		•		DSO-36 EP	
TLE7368-3	4.50 ... 45.00	5.50	5.00	2.60 or 3.30	1.30	2 x 5	-2.00 ... +9.00	2	2	2	1.50	2500	800	700	Adj.	105 and 50	120	280 ... 425	1.00/2.60-30.00		•	WWD		•		DSO-36 EP	
TLE6368	5.50 ... 60.00	5.50	5.00	2.60 or 3.30	2.60 or 3.30	6 x 5	10.00	5	5	5	1.00	1500	800	500	350	6 x 17	30	280 ... 425	2.40-1.00		•	WWD	•	•		DSO-36 (Power-SO)	
TLF35584	3.00 ... 40.00	5.80	5.00 or 3.30	5.00	5.00	2 x 5	2.50	2	2	1	-	1300	600	200	150	2 x 150	50	400 ... 2500	5.00 or 3.30/10.00	•	•	WWD/FWD	•	•		LQFP-64, VQFN-48	
Boost plus buck																											
TLE6711	4.50 ... 45.00	27.50	5.00	-	-	-	12.00	2	-	-	-	1000	700	-	-	-	4	95			•	WWD				DSO-14, DSO-20	

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