Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

LED lighting

Semiconductors for power conversion & smart lighting

www.infineon.com/lighting

Contents

Addressing the key needs and value drivers for LED lighting

Besides offering huge energy-saving potential, LED lighting is also getting smarter and more human-centric. Some companies are even going beyond human-centric lighting, using the lighting infrastructure to offer services that go far beyond lighting. It is likely that we will see lighting playing an essential part in what are commonly referred to as smart homes, smart buildings and smart cities.

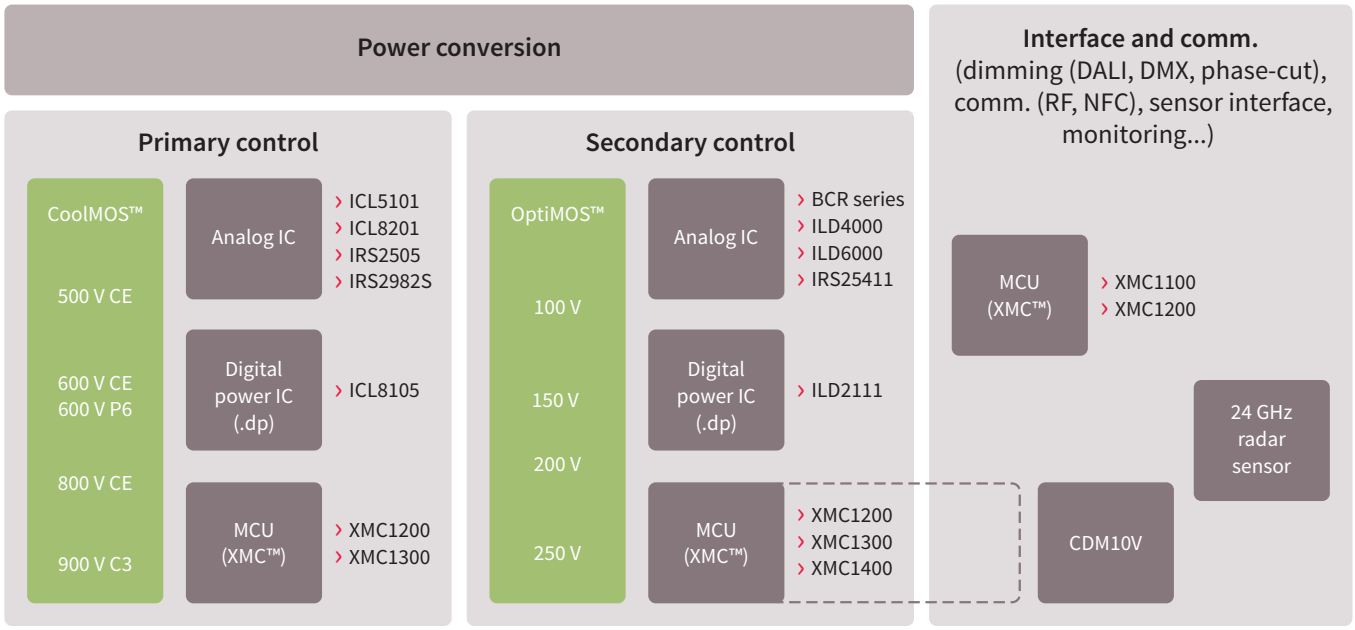
Our products and solutions range from LED driver ICs and MOSFETs suited for LED drivers, to microcontrollers, sensors and hardware that can be used to enable secure communication.

In addition to products with proven quality, a highly competent global lighting team – complemented by our channel partners – will provide you with the necessary support to design products and systems for LED lighting.

Our range of products & solutions stretches from

- LED driver ICs that support a platform approach for LED drivers in commercial indoor & outdoor lighting
- Comprehensive portfolio of high-voltage MOSFETs (CoolMOS™) & low-voltage MOSFETs (OptiMOS™)
- Benchmark for linear- & switch-mode LED driver ICs for multi-string LED applications
- Microcontrollers with dedicated peripherals for intelligent lighting allow full flexibility in design and product portfolio management by combining various aspects of intelligent lighting systems, such as power conversion, communication and dimming technologies as well as easy-to-use, fully flexible color mixing functionality
- Sensor solutions for presence detection to generate additional energy savings
- Low-cost LED driver ICs for LED retrofit lamps

Power conversion light management



LED drivers

LED drivers are used to provide a constant current to LED light engines for several applications, such as commercial indoor lighting, street lighting & high bay lighting.

The requirements of such applications in terms of efficiency, power factor, total harmonic distortion and system lifetime are usually much higher than for LED retrofit lamps.

For the power conversion in LED drivers, numerous topologies are deployed by different companies. For power ratings below 50 W, single-stage flyback topology including power factor correction is quite common. As the power rating increases, LED drivers with a dedicated stage for power factor correction and a dedicated stage for flyback or LLC become more common. Other common topologies include a single-stage flyback with a primary constant voltage and secondary buck with constant current output. Depending on the end applications, dual-stage non-isolated topologies, such as PFC and buck, are also used.

www.infineon.com/leddrivers

The type of topology used very often depends on the features that are implemented as well as the platform concept being used by the specific company. The company's particular expertise in the dedicated area is also an important factor.

Taking into account that there is no single dominant topology in the LED driver market, we offer LED driver ICs that support several different topologies, as well as features. Other important factors in the LED driver market include increasing cost pressure and time to market.
Cost is related to

- Bill of material
- Product variants involving additional costs due to stock-keeping and R&D

Our products for LED drivers range from analog LED driver ICs that are tailored for specific applications, to configurable digital ICs that can accelerate the time to market, and last but not least, to microcontrollers that offer the highest degree of flexibility.

LED driver ICs

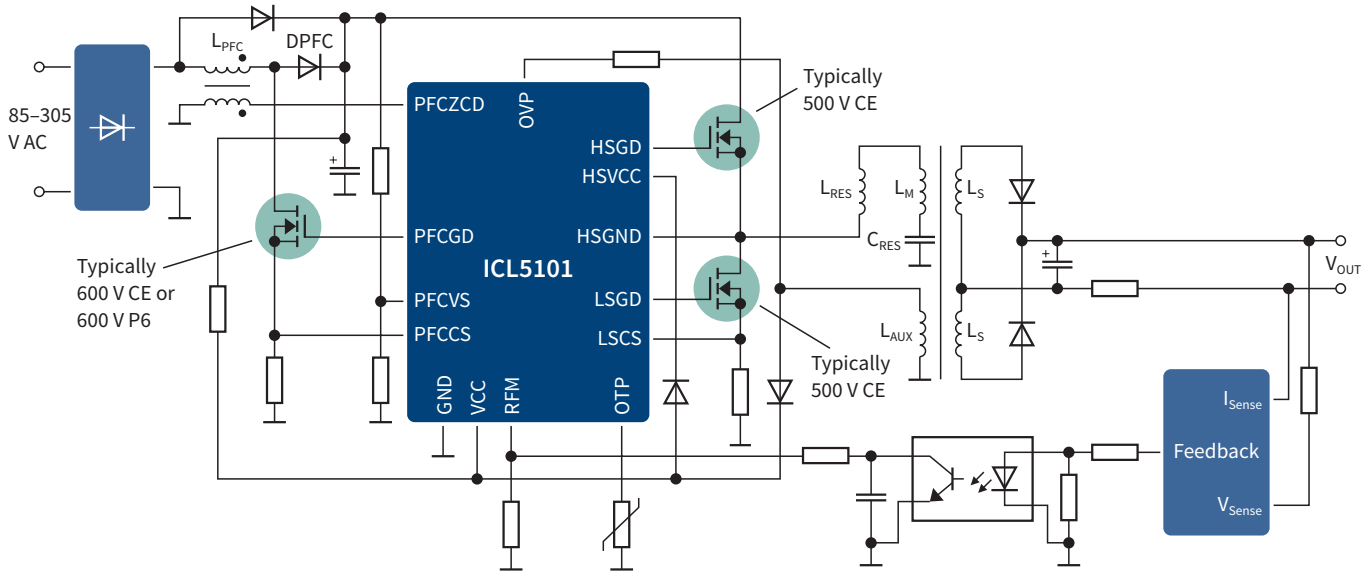
ICL5101 – PFC-LLC combo controller

The ICL5101 integrates a half-bridge controller with a PFC stage in a single package. The high level of integration assures a low number of external components, enabling small form factor designs ideal for compact power supplies in lighting applications, such as LED drivers. All operation parameters of the IC are adjustable via simple resistors, being the ideal choice for an affordable and reliable configuration. A comprehensive set of protection features, including an adjustable external overtemperature protection and capacitive load protection, ensures the detection of fault conditions to increase the system safety.

Features and benefits

- Constant voltage or constant current control
- PFC in CCM mode during nominal load and DCM mode in low-load condition down to 0.1% for operation without audible noise
- High-power quality with PF > 0.96, THD < 10%
- Allows secondary-side IC dimming down to 1%
- PFC/LLC combo IC allows the best matching of PFC stage and LLC stage timing control
- Supports a wide input voltage range from 90–305 V

ICL5101 – block diagram



Related application note

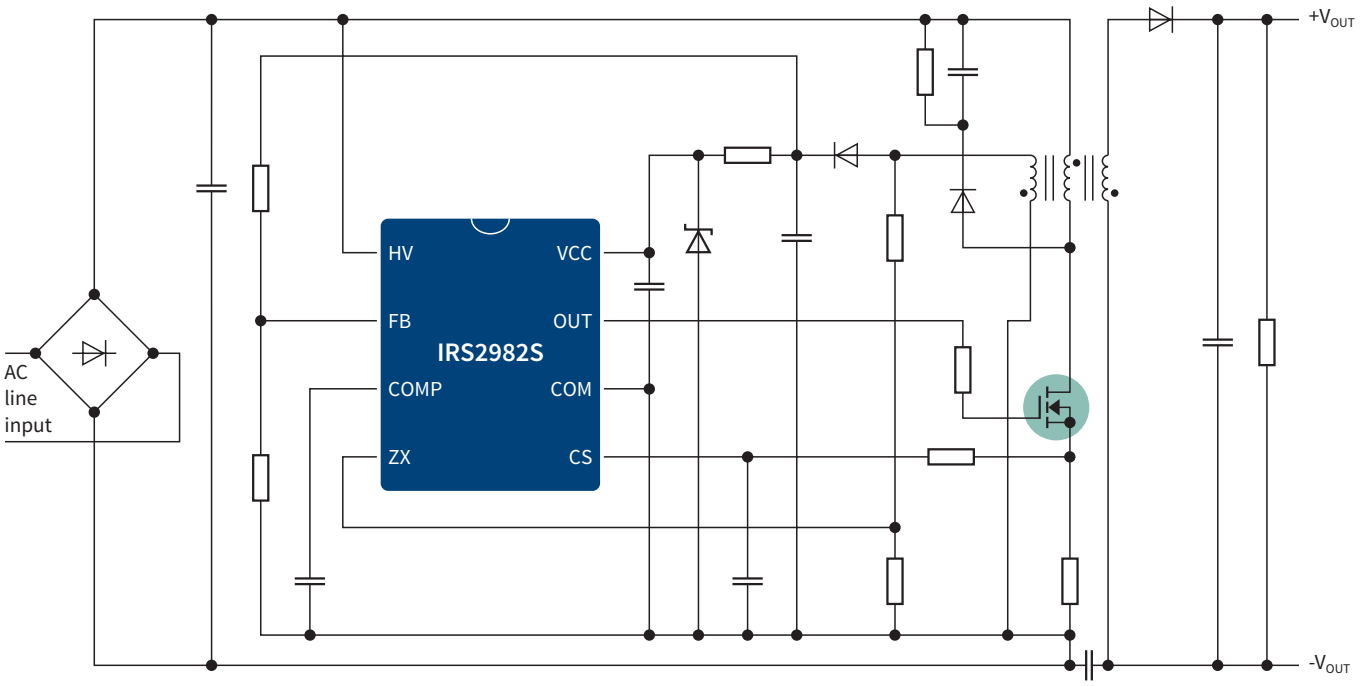
Info number	Description
ICL5101-AN-v02_02-EN	110 W / 54 V power supply demoboard using ICL5101 in PFC & LLC topology

Related evaluation board

Board name	Product	Description	Order number
Evaluation board ICL5101	ICL5101, CoolMOS™ MOSFET CE and E6	PFC/LLC evaluation board 110 W LED driver	EVALLEDICL5101E1

www.infineon.com/icl5101

IRS2982S – multimode PFC/flyback controller



Features and benefits

- 600 V high-voltage rapid startup-to-light within 0.5 s
- Direct feedback – highly accurate regulation
- High power factor and low THD
- Critical Conduction Mode (CrCM)
- DCM operation at light loads (minimum off-time)
- Burst-mode operation at very light loads or open-circuit output
- Overvoltage protection
- TRIAC dimming option
- Constant voltage in isolated flyback; constant current in non-isolated flyback

Related application note

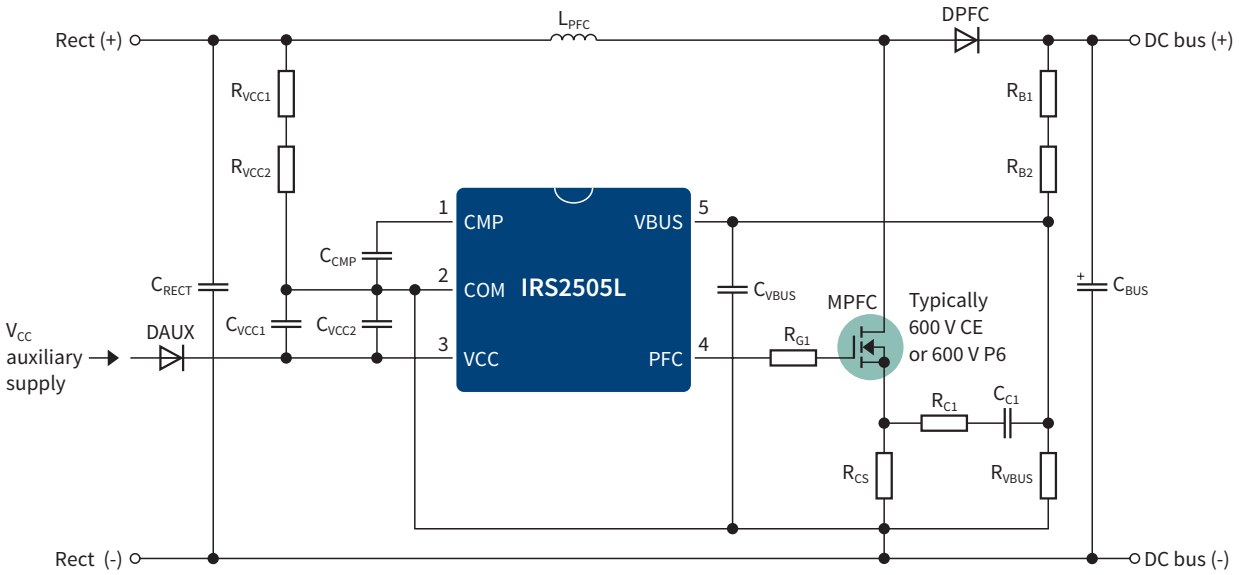
Description
50 W Flyback converter design using the IRS2982S controller

Related evaluation board

Board name	Product	Description
IRXLED04 50W Flyback eval board	IRS2982S, CoolMOS™ MOSFET 800 V CE	50 W Flyback converter design using the IRS2982S controller

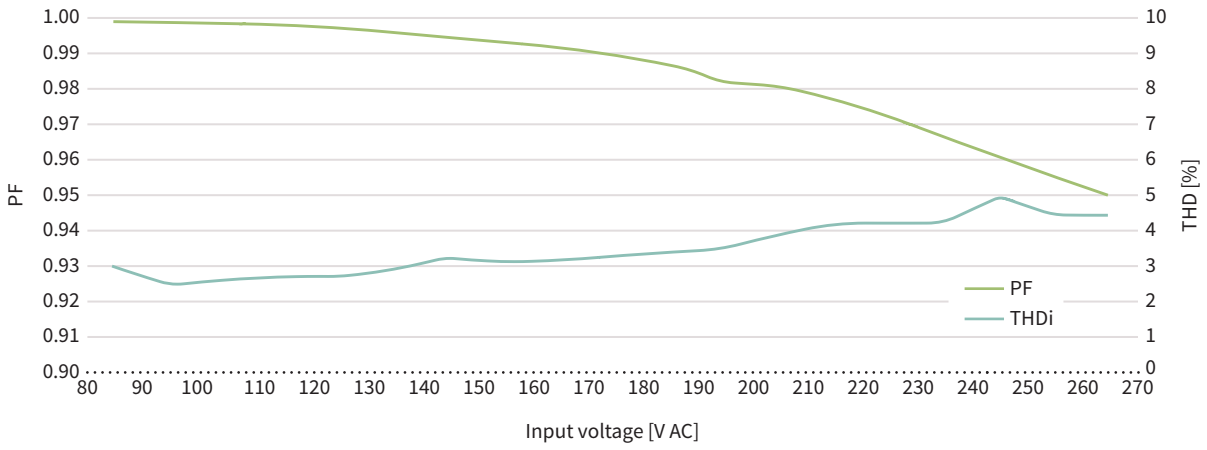
www.infineon.com/irs2982s

IRS2505L – low-cost PFC IC



Features and benefits

- SOT23-5 package, 70% smaller than a conventional SO8 package
- High power factor and ultra-low THD over a wide input range
- 5-pin boost PFC and SMPS driver controller
- PFC inductor auxiliary winding not necessary
- Critical Conduction Mode (CrCM) operation – low switching losses
- Output overvoltage protection
- Zero-crossing sensed via the gate drive
- Gate driver optimized to eliminate switch-off diode
- Cycle-by-cycle overcurrent protection
- Micro-power start-up – very low start-up losses



www.infineon.com/irs2505l

ILD2111 – digital DC/DC buck controller

The ILD2111 is a high-performance configurable buck controller, designed as a constant current source with hysteretic output current regulation. The IC supports output current setting by the end user with a simple resistor. Important parameters, such as current assignment and protection features, can be configured via a dedicated single-pin UART interface. The ILD2111 buck controller can be dimmed via an external PWM signal. The controller typically uses a low-side switch buck topology operating in a Continuous Conduction Mode (CCM). The device automatically selects an optimal operating window with respect to switching frequency and output current ripple. This ensures highest efficiency under various application conditions. This characteristic can be customized via several parameters. The controller provides protection features against overload, open- and short-load conditions, as well as intelligent overtemperature protection.

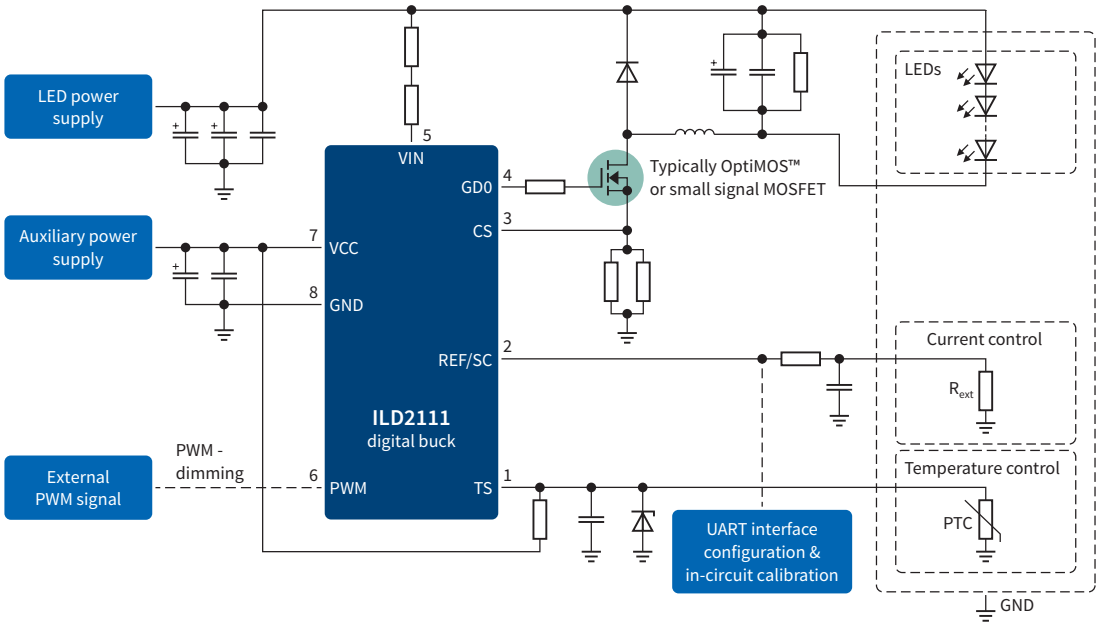
Applications

- LED drivers typically from 10–150 W, e.g. dual-stage professional lighting systems
- Integrated electronic control gear for LED luminaries

Features and benefits

- Scalable DC input voltage from 2.5 V to 1.6 kV
- Wide output range, e.g. 15–55 V DC
- The IC supports output current setting by the end user with a simple resistor
- Important parameters, such as output current assignment and protection features, can be configured digitally
- Flicker-free and phase-aligned PWM dimming to 1%
- The device automatically selects an optimal operating window with respect to switching frequency and output current ripple

ILD2111 – small BoM due to smart system partitioning



Related application note

Info number	Description
Infineon-ILD2111_Evaluation_System_Getting_Started_-AN-v01_00-EN	ILD2111 evaluation system getting started

Related evaluation board

Board name	Product	Description	Order number
Evaluation board ILD2111	ILD21111 .dp digital power 2.0	Evaluation board output current from 250–800 mA for LED driver	EVALLEDILD2111E1

www.infineon.com/ild2111

ICL8105 – multimode PFC/flyback controller for 0-10 V dimming

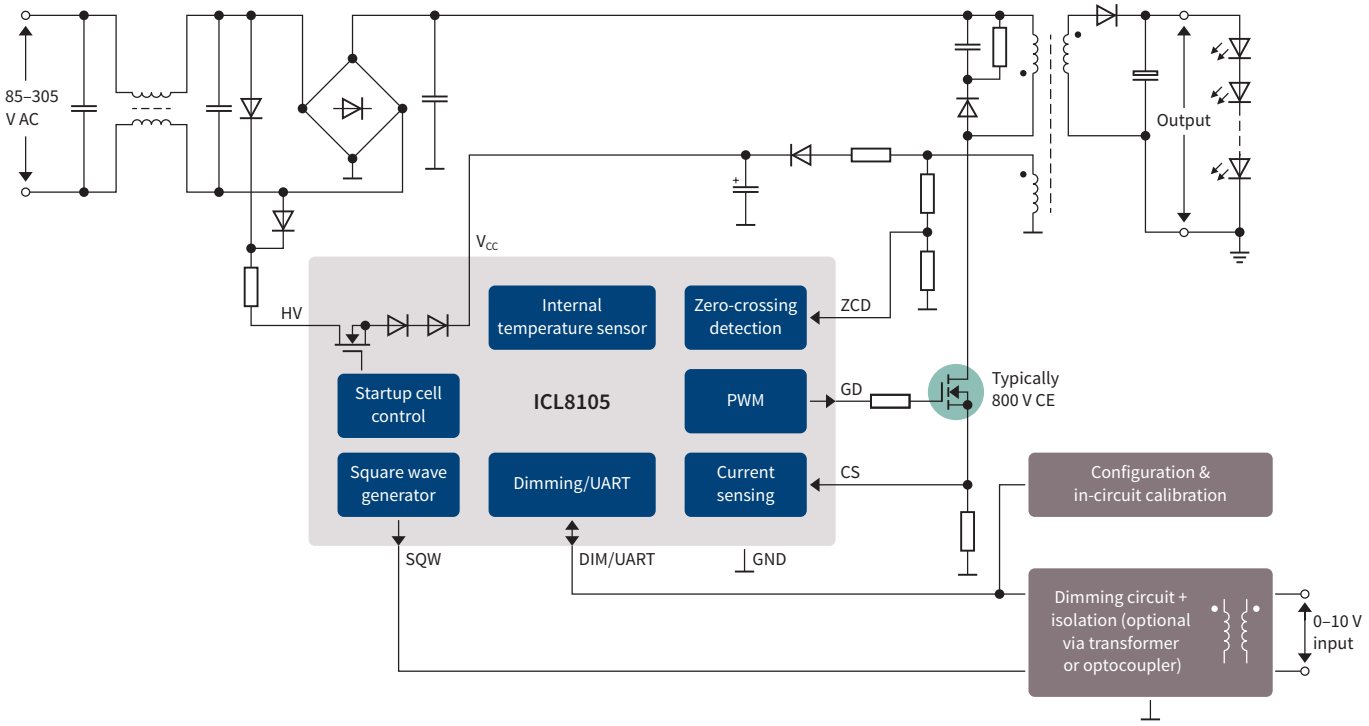
The ICL8105 is a high-performance configurable single-stage flyback controller with Power Factor Correction (PFC) for constant current output LED drivers. The digital core of the ICL8105, along with its advanced control algorithms, provide multi-operation modes, such as quasi-resonant mode, discontinuous conduction mode or active burst mode. Thanks to this functionality and a smooth transition between the operation modes, the controller delivers high efficiency, high power factor and low harmonic distortion through the entire load range. The optional active burst-mode control scheme significantly extends the dimming range and is aligned to the line frequency, thereby avoiding effects such as flicker or shimmer while also reducing the audible noise.

Applications

- LED drivers from 10–80 W

Features and benefits

- Wide input voltage, e.g. 90–305 V AC
- Wide output range, e.g. 15–55 V DC
- Smooth operation with extended dimming capability
- Fast engineering and simplified variant handling during production
- Isolated 0–10 V dimming with a configurable dimming curve
- Intelligent thermal management
- Small BoM due to primary-side control and high level of integration



Related application note

Info number	Description
Infineon-ICL8105_40W_Demoboard_Application-AN-v01_00-EN	40 W demoboard with isolated 0–10 V dimming interface
Infineon-ICL8105_Evaluation_System_Application_Note-AN-v01_00-EN	System application note

Related evaluation board

Board name	Product	Description	Order number
Evaluation board ICL8105	ICL8105 .dp digital power 2.0	Evaluation system board 20–80 W for LED driver	EVALLEDICL8105E1
Demoboard ICL8105	ICL8105 .dp digital power 2.0	Demoboard 40 W for LED driver	EVALLEDICL8105F2

www.infineon.com/icl8105

.dp Vision

This GUI simplifies your design

.dp Vision is a Graphical User Interface (GUI) for the parameter configuration and programming of Infineon .dp digital power 2.0 ICs for evaluation purposes. With .dp Vision software, the parameters of .dp products can be easily adapted to suit application requirements. .dp Vision supports configuration of the following parameters: hardware configuration, protections, temperature guard, startup & shutdown, control loop, dimming, multimode, enhanced PFC and fine-tuning. The .dp device is connected via USB to a computer using the .dp Interface Gen2 hardware, which is a galvanic isolated and certified interface board.

Features and benefits

- Set parameter and protection behavior for .dp products
- Test parameters temporarily
- Burn parameters permanently
- Automatic update of firmware on .dp Interface Gen2
- Online update functionality keeps .dp Vision up-to-date
- Assistant functionality for guiding a user through a typical parametrization flow

Further advantages

- Comfortable parameter setting without changing components on hardware
- Maximum flexibility for adapting application behavior via parameters
- Optimize system performance
- Reduced R&D efforts

.dp Vision and .dp Interface board available via
www.hitex.com/dp

0–10 V dimming interface IC

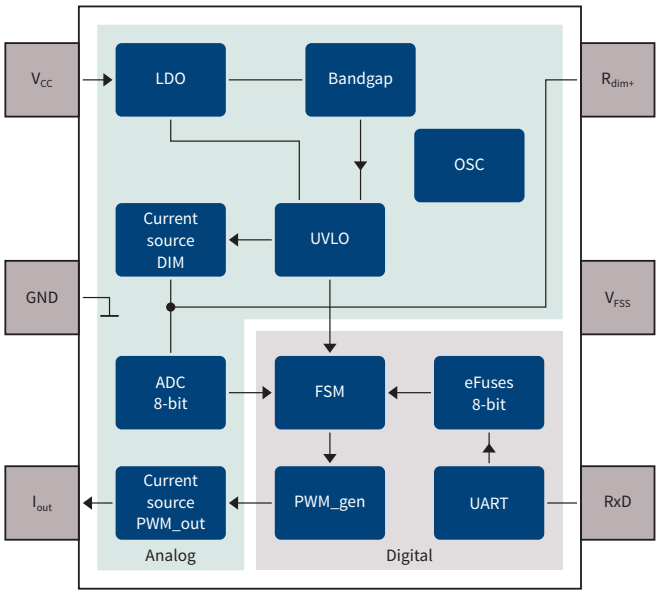
CDM10V – CoolestDiMming solution for 0–10 V

CDM10V is a fully integrated 0–10 V dimming interface IC and comes in a very small 6-pin SOT package to enable small form factor designs with LED drivers. The device is targeted at various dimming applications in the field of lighting. This IC can be used to transmit analog voltage-based signals from a 0–10 V dimmer or potentiometer to the dimming or PWM input of a lighting controller IC in the form of a current-based PWM signal to drive an external optocoupler. It's an ideal fit for Infineon's ICL8105. The CDM10V IC outputs a 0–100% PWM current signal at a configurable frequency with an amplitude of 5 mA. The duty cycle of the PWM signal can be limited to a defined minimum value (configurable). Embedded digital signal processing ensures minimum variations from device to device.

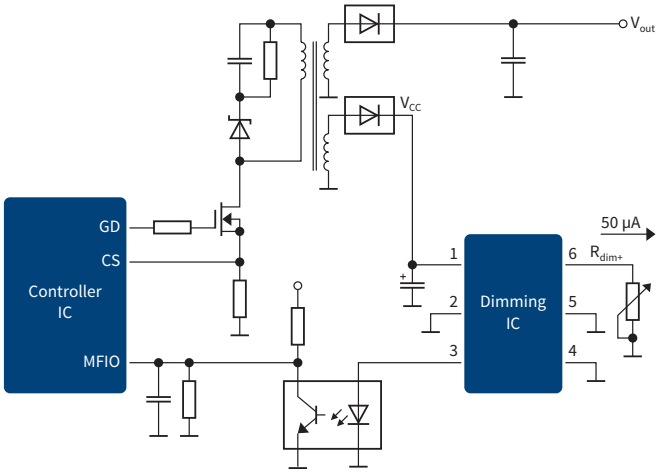
Features and benefits

- CDM10V replaces up to 25 discrete components in a traditional 0–10 V dimming solution
- Increases reliability and enables smaller designs due to high integration into a small SOT23-6 package
- Only integrated solution on the market
- Supports active and passive dimming
- Preset values for
  - Dimming range – 5%
  - PWM frequency – 1 kHz
  - Dimmer current – 200 µA
- All three parameters configurable in accordance with customer and application needs
- Optional Dim-to-Off capability (configurable), one solution for various applications. The one-time programming interface allows a wide range of configurations
- Transparent PWM mode allows the transmission of PWM signals from secondary to primary side

CDM10V – block diagram



Isolated interface dimming IC



Related evaluation board

Board name	Product	Description	Order number
CoolDim10V Demoboard	CDM10V, ICL8105	CoolDim10V demoboard	SP001493168

www.infineon.com/lighting-ics

XMC™ microcontrollers for Intelligent LED drivers

The XMC1000 family of ARM® Cortex®-M0-based industrial microcontrollers offers a broad portfolio of microcontrollers with dedicated peripherals for LED lighting which are designed to cover a range of use cases and different topologies for lighting applications requiring advanced features.

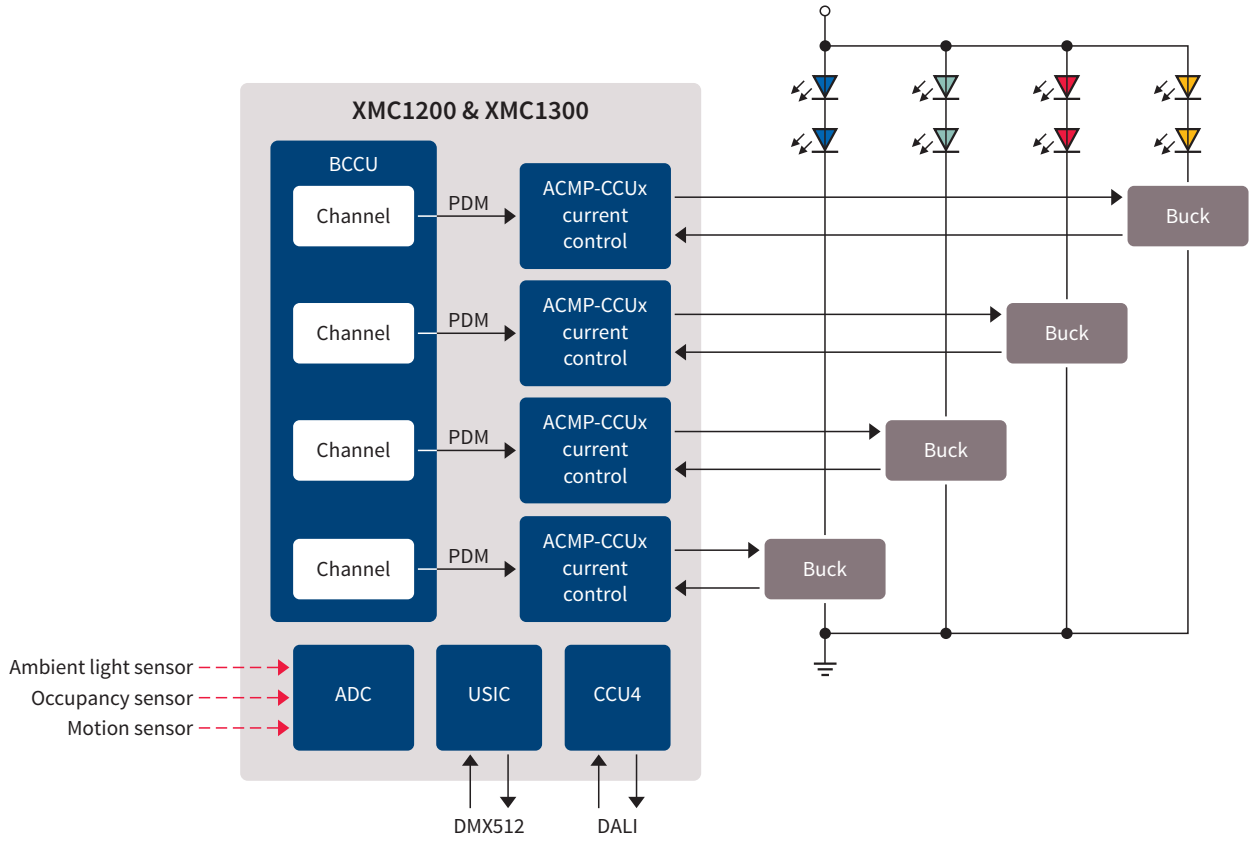
Applications

- Multichannel, connected DC/DC LED drivers with high-precision dimming (down to 0.1%) and advanced color mixing
- Intelligent and connected AC/DC LED driver stages, adding advanced communication, dimming and protection features

Features and benefits

- High quality of light
- Flexible and efficient power conversion using different control schemes (constant ON time, constant OFF time, quasi-resonance)
- Communication and sensing
- Software IP protection

DC/DC application example: 4-channel DC/DC RGBW LED driver with DALI, DMX512 communication and different sensing options

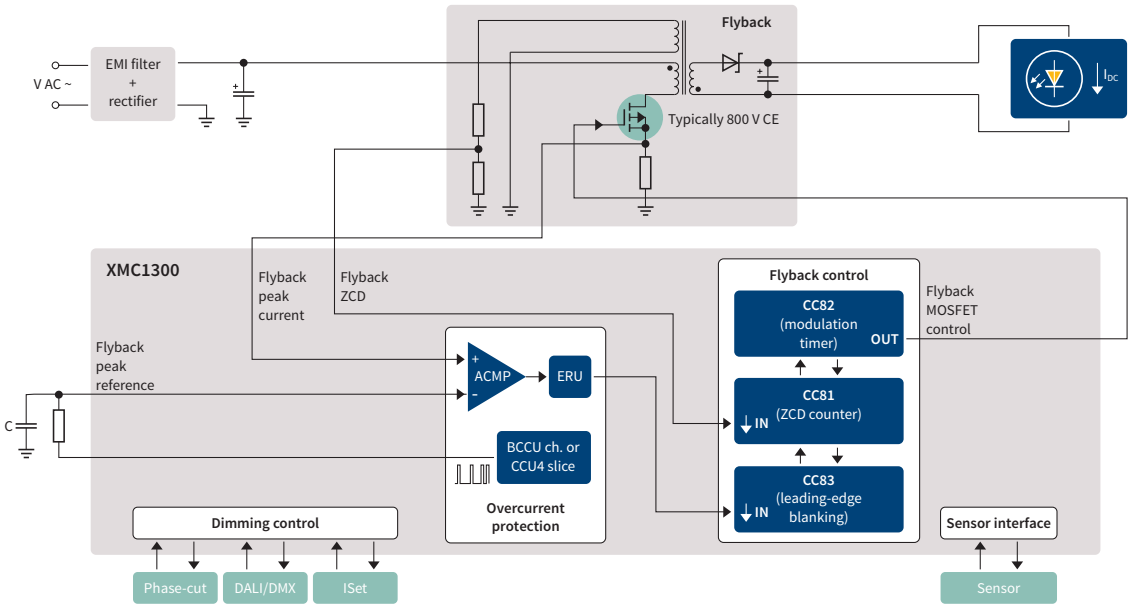


www.infineon.com/xmc1000

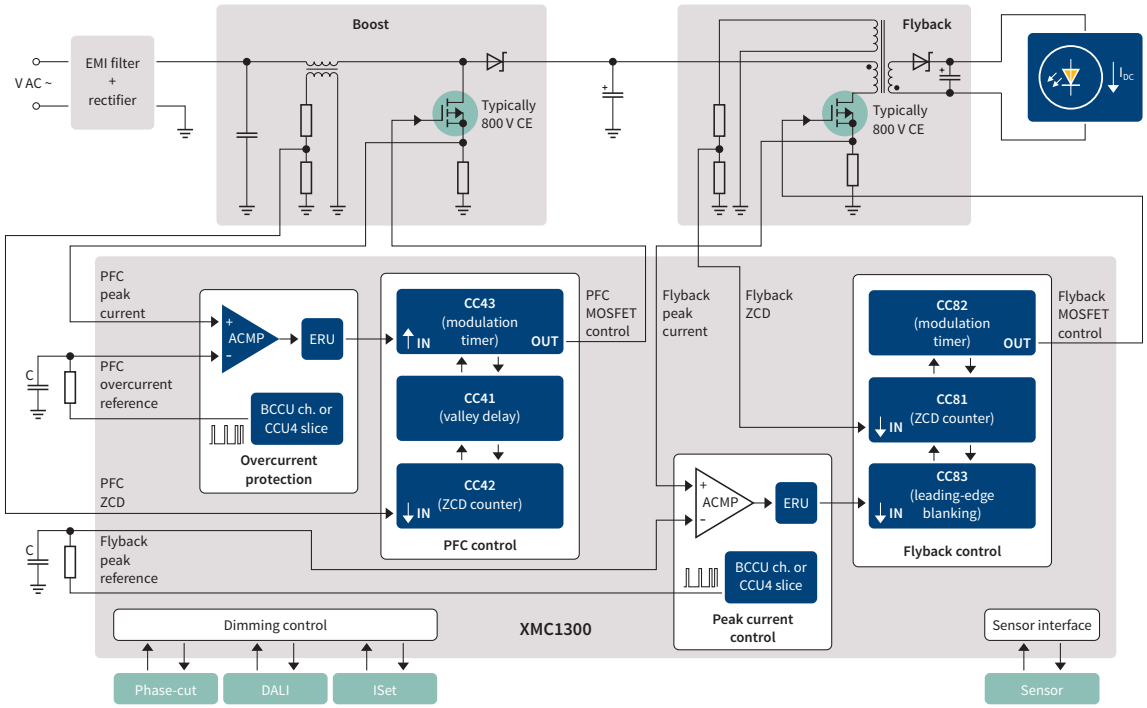
AC/DC application examples with XMC™

See below for an illustration of two examples of how XMC™ MCUs can enhance traditional lighting power supply topologies by adding additional features such as DALI or DMX512 communication, or phase-cut dimming.

AC/DC application example 1: single-channel flyback PFC constant current LED driver with DALI, 0–10 V and phase-cut dimming option



AC/DC application example 2: 2-channel flyback PFC constant current LED driver with DALI, 0–10 V and phase-cut dimming option



www.infineon.com/xmc1000

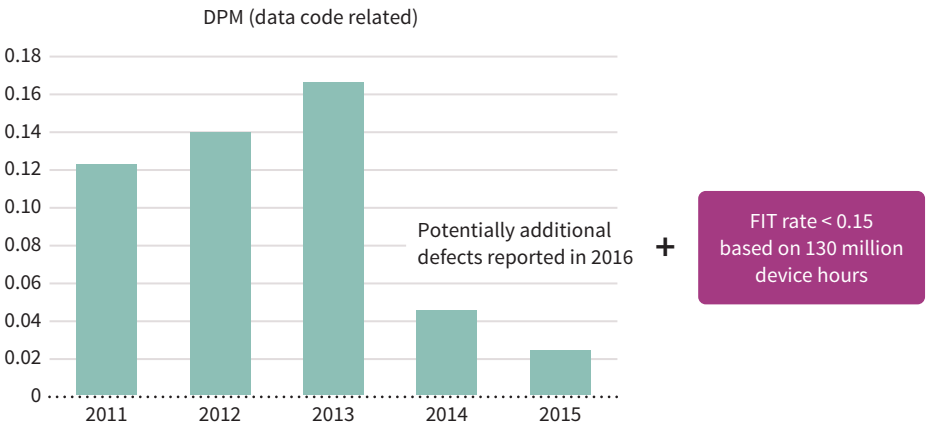
CoolMOS™ – high-voltage MOSFETs

Trusted leader in high-voltage MOSFETs

The CoolMOS™ power MOSFET family in superjunction technology sets new standards in the field of energy efficiency. Our CoolMOS™ products offer a significant reduction of conduction, switching and driving losses and enable high power density and efficiency for superior power conversion systems. In particular, the latest state-of-the-art generation of high-voltage power MOSFETs contributes to making LED drivers and LED power supplies more efficient, more compact, lighter and cooler than ever before. Each lighting subapplication has its own requirements and optimization criteria, which are reflected in the available technologies paired with innovative package solutions.

CoolMOS™ quality – benchmark in short-term and long-term reliability

CoolMOS™ technology is legendary in the semiconductor industry differentiated by high quality and reliability. Our quality has been proven through the years, as demonstrated by the billions of devices shipped with a continuously improving defects per million rate – now down to less than 0.10 DPM. With regard to reliability, the same performance has been proven down to less than 0.15 FIT measured across 130 million device hours. Infineon has implemented solid and proven measures from the very beginning, such as the design-for-quality program and continuous improvements in production. To achieve these remarkable results, the company promotes constant proactive collaboration between technology, design, quality, reliability and manufacturing teams. These efforts go well beyond the fact that all Infineon sites are ISO/TS 116949-certified.

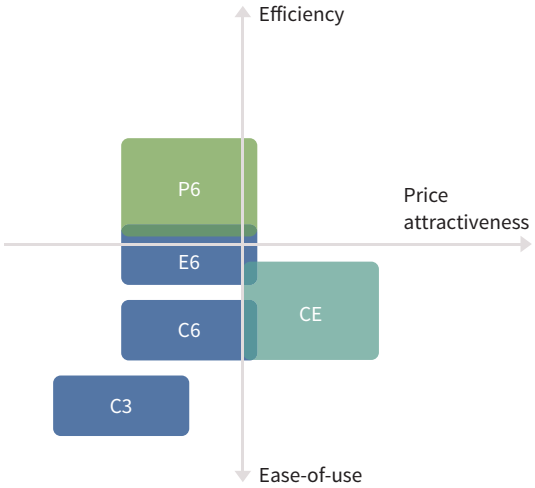


CoolMOS™ comes with a DPM of less than 0.1 and FIT rate of less than 0.15

www.infineon.com/coolmos

CoolMOS™ for lighting applications

Lighting applications create high demands on power supply designs in terms of efficiency, thermal management, surge protection, electromagnetic interference and cost. The most common requirements are addressed with the CoolMOS™ P6 and CE series:



› **CoolMOS™ CE** is a general-purpose series, available in 500 V, 600 V, 650 V, 700 V and 800 V, that is optimized for the best balance between cost, efficiency and ease-of-use. We recommend the CE series as the first choice for cost-sensitive LED lighting applications for diverse topologies.

› **CoolMOS™ P6** is a high-performance series available in 600 V and optimized for high-efficiency PFC and LLC designs in the mid to high power range. The P6 family is perfectly suited for outdoor and high bay lighting, along with office lighting where PFC and LLC topology is used.

› **CoolMOS™ C3** is primarily recommended for 900 V designs and for selected 800 V designs with high requirements in relation to reliability and ruggedness. Other parts of the C3 series, e.g. 500 V, 600 V and 650 V, will continue to be produced for an extended period of time, offering excellent ruggedness, ease-of-use and a low EMI. However, these parts have since been surpassed by newer generations in terms of efficiency and product cost.

› **CoolMOS™ C6/E6** is a general-purpose series that can be used in LED lighting in the unlikely event that the above-mentioned series do not fit or the desired part is not available in the portfolio.

Commercial LED lighting ballast			
Flyback topology	Buck topology	LLC topology	PFC
Standard line with focus on: **price/performance**			
› CE 800 V/(900 V) – 0.31 to 2.8 Ω	› CE 500/600 V – 0.19 to 2.1 Ω	› CE 500/600 V – 0.19 to 2.1 Ω	› CE 600 V 650/500 V – 0.19 to 1.0 Ω
Enhanced line with focus on: **performance**			
› C3 800 V/900 V – 0.31 to 2.8 Ω	› P6 600 V – 0.041 to 0.6 Ω – Individual design vs standard line	› P6 600 V – 0.041 to 0.6 Ω – High power – Individual design vs standard line	› P6 600 V – 0.041 to 0.6 Ω – Higher power

www.infineon.com/coolmos

CoolMOS™ CE – focus on efficiency, cost-effectiveness and part availability

Good efficiency, ease-of-use and EMI performance at an attractive cost position make the CoolMOS™ CE series the product of choice for LED drivers or LED tubes in buck, flyback, PFC and LLC topology. Its benefits include an improvement in efficiency and thermal behavior compared to standard MOSFETs.

CoolMOS™ products aimed at lighting bring the benefits of highest quality and delivery reliability as outlined in the overview section for the CoolMOS™ portfolio. However, the CoolMOS™ CE series has been defined with a particular focus on the customers' needs, for an attractive price and fastest supply availability: at any given time and for any product of the CoolMOS™ CE series, orders of up to 30 k units can be shipped from our distribution center within 5 days.

Further reasons to choose CoolMOS™ CE

Non-technical benefits provided by CoolMOS™	CE
Product portfolio	We own a broad portfolio covering five voltage classes in both through-hole and SMD packages.
Capacity	We own the world's largest capacity for power devices, with three dedicated frontends and four backends. Thanks to factors such as the continued investment in our production facilities, we ensure a secure supply during a market upswing.
Lead time	We understand consumer and lighting market dynamics and offer a lead time as short as 5 days.
Delivery performance	Our supply chain performance is constantly greater than or equal to 96 percent (adhering to the customer committed date).
Quality	Our field failure rates are as low as 0.1 PPM.
Design-in support	We have a large field application engineering team dedicated to providing professional and flexible support for your design.

CoolMOS™ CE in an SOT-223 package

With the rapid conversion from CFL to LED lighting, customer requirements are rapidly changing: on the one hand, power levels are further decreasing, while on the other hand, increasing cost pressure compels power designers to optimize designs to a fraction of a cent. The completion of the CoolMOS™ CE portfolio with the SOT-223 package is Infineon's answer to this challenge: it facilitates a further reduction in BOM cost – and additional footprint optimization in some designs – with only a minor compromise in terms of thermal behavior.

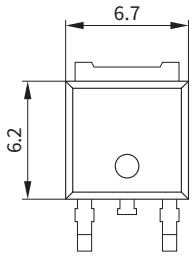
SOT-223 as drop-in replacement for DPAK at a lower cost

The SOT-223 package with a decapped middle pin is fully compatible with the footprint of a DPAK, therefore allowing one-on-one drop-in replacements and second sourcing.

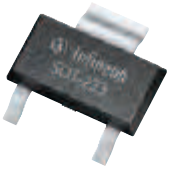
www.infineon.com/coolmosce

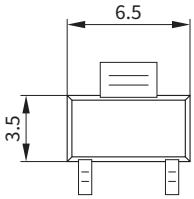
SOT-223 as drop-in replacement for DPAK at a lower cost

DPAK



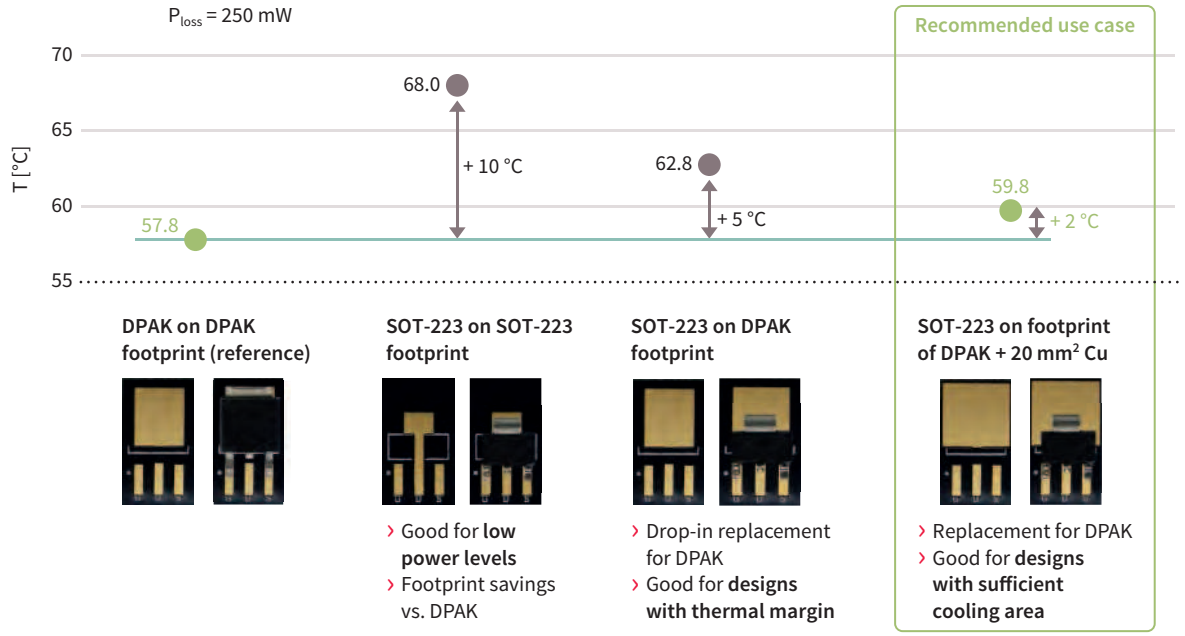
SOT-223





Thermal behavior – on a par with DPAK

The thermal behavior of the SOT-223 primarily depends on the layout of the board where the package is used and on the power consumed. We have measured the thermals in a test environment and compared them with a simulation. Compared to a DPAK positioned on a typical DPAK footprint, the SOT-223 displays the following thermal behavior:



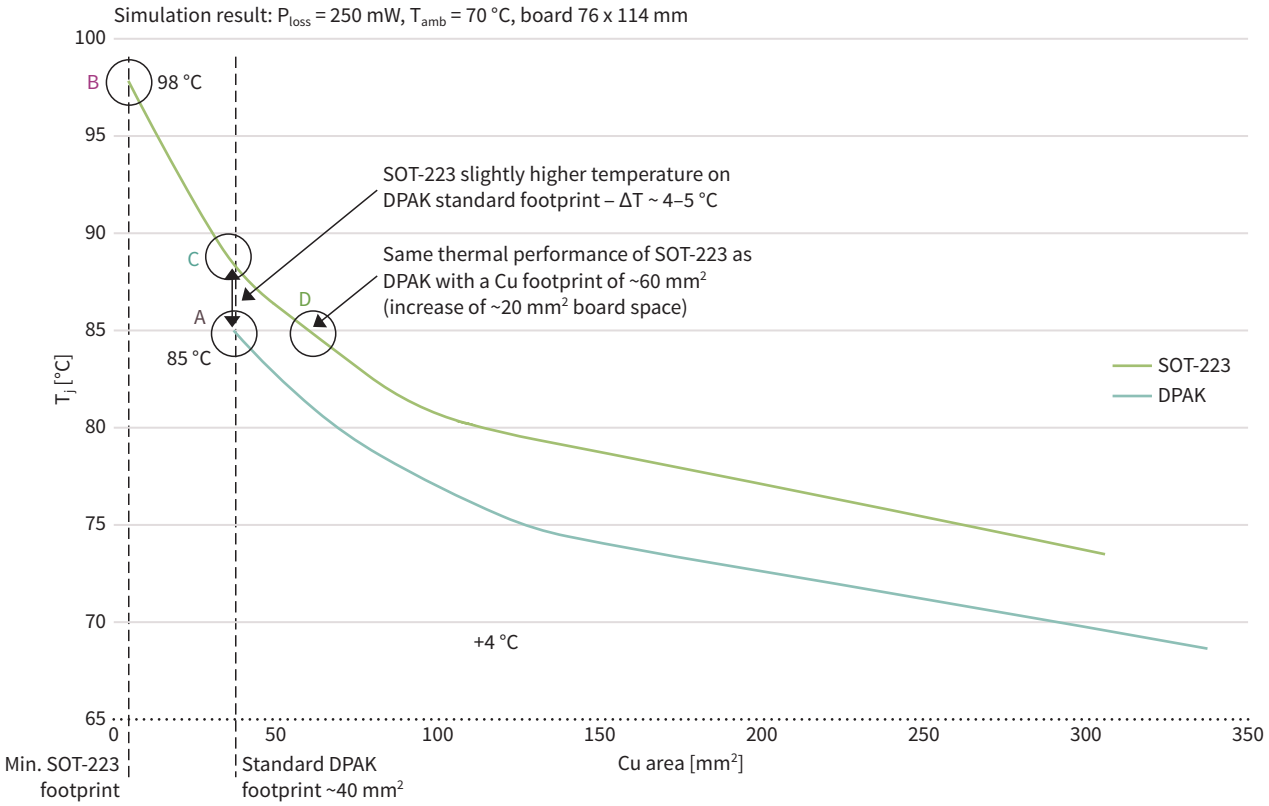
› **Same footprint as DPAK** – when mounted on a standard DPAK footprint, the SOT-223 package shows a temperature elevated by 4–5 K. This behavior makes the SOT-223 suitable for designs with a thermal margin

› **Footprint of DPAK plus ~20 mm² additional copper area** – in many designs, the MOSFET is mounted on a larger Cu area which serves as a heatsink embedded in the PCB. As soon as 20 mm² Cu or more is available in addition to the DPAK footprint, the temperature increase is no more than 2–3 K above DPAK and the SOT-223 can be used as a drop-in replacement

› **SOT-223 on SOT-223 footprint** – when mounted on the SOT-223 footprint without an additional surrounding Cu area, the package leads to a 10 °C temperature increase compared to a DPAK. This means that the option of space savings via the SOT-223 is only useful for very low power applications

www.infineon.com/sot223

Thermal behavior – on a par with DPAK



The laboratory findings on thermal behavior are confirmed by a thermal simulation with $T_{ambient}$ = 70 °C and P_{loss} = 250 mW. The size of the copper area in the footprint is shown on the x-axis, while the y-axis displays the temperature of the package top side. In the case of an SOT-223 on DPAK footprint, the 4–5 K temperature increase over DPAK is confirmed. But when used in conjunction with an enlarged copper area of ~20 mm², a temperature increase of 2–3 K is measured.

CoolMOS™ CE SOT-223 product portfolio

$R_{DS(ON)}$ [mΩ]	500 V	600 V	650 V	700 V
3400		IPN60R3K4CE		
3000	IPN50R3K0CE			
2000/2100	IPN50R2K0CE	IPN60R2K1CE		
1400/1500	IPN50R1K4CE	IPN60R1K5CE	IPN65R1K5CE	IPN70R1K5CE
950/1000	IPN50R950CE	IPN60R1K0CE		
800	IPN50R800CE			
650	IPN50R650CE			

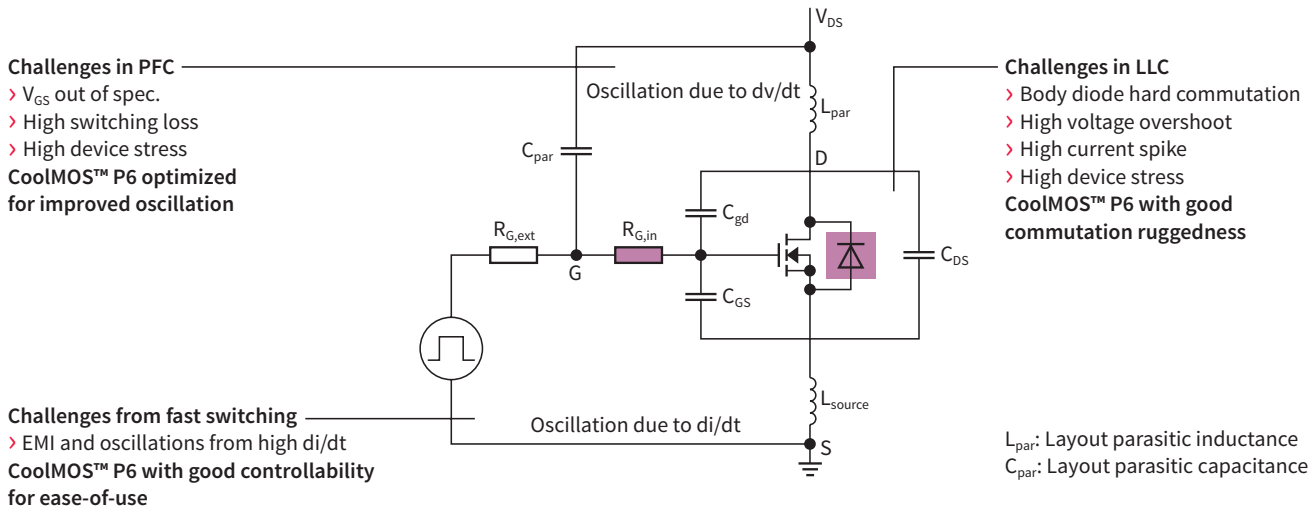
www.infineon.com/sot223

600 V CoolMOS™ P6 series

Superior efficiency combined with ease-of-use

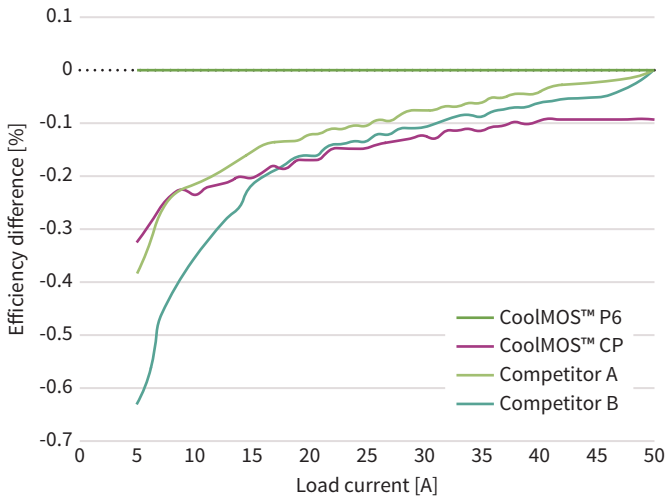
600 V CoolMOS™ P6 is a high-performance part suitable for high-power lighting applications which require excellent performance, yet also a high level of ease-of-use in the design-in process. CoolMOS™ P6 is suitable for both soft- and hard-switching applications due to its great body diode ruggedness. CoolMOS™ P6 achieves very low conduction and switching losses especially in light-load conditions, enabling switching applications to work more efficiently and be designed in a more compact manner.

CoolMOS™ P6 is optimized for ease-of-use and addresses typical design challenges



LLC – CoolMOS™ P6 with best-in-class performance

Efficiency comparison of 190 mΩ device tested on Infineon 600 W LLC board



CoolMOS™ P6 displays the best-in-class efficiency over the entire load range – especially under light-load conditions – thanks to its low Q_G and higher V_{th}. Main competitor products are at a level below CoolMOS™ P6 or lower than CoolMOS™ C6.

CoolMOS™ P6 sets the benchmark in LLC efficiency
› Low Q_G improves the light-load efficiency
› Higher V_{th} improves efficiency due to lower turn-off losses

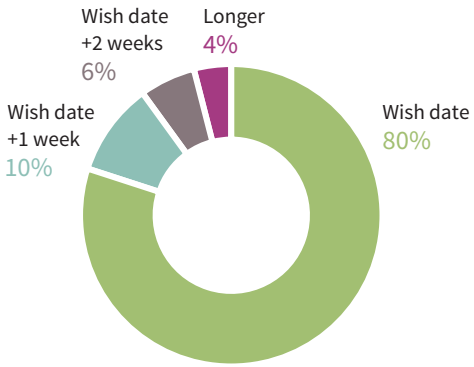
www.infineon.com/coolmosp6

CoolMOS™ supply chain – delivery reliability, flexibility and supply security

Our customers value CoolMOS™ not only for its technical merits but also for the outstanding delivery reliability: once a CoolMOS™ order date is committed, over 96 percent of orders are shipped on or before the actual committed date. In addition over 80 percent of CoolMOS™ orders are committed to the date the customer requests. Security of supply and the flexibility to react to demand fluctuations are objectives enabled by a well-balanced production network. Over 90 percent of our products, for example, are qualified for production in at least two backend locations and more than 80 percent of the volumes in two wafer fabs. This enables the CoolMOS™ supply chain to quickly react to changes in customer and market requirements.

Delivery reliability: ship date = committed date

Delivery capability: confirm customers' wish date



≥ 96% of CoolMOS™ orders are shipped by the committed date and ≥ 80% of wish dates can be met

600 V CoolMOS™ P6

I_D [A]	$R_{DS(on)}$ [mΩ]	TO220	TO263 (D^2PAK)	TO220 FullPAK	TO247	TO247 4 pin	TO252 (DPAK)	ThinPAK 5 x 6	ThinPAK 8 x 8
	41				IPW60R041P6	IPZ60R041P6[1)]			
53.5	70				IPW60R070P6	IPZ60R070P6[1)]			
37.9	99	IPP60R099P6		IPA60R099P6	IPW60R099P6	IPZ60R099P6[1)]			
30	125	IPP60R125P6		IPA60R125P6	IPW60R125P6	IPZ60R125P6[1)]			
10.4–23.8	160	IPP60R160P6	IPB60R160P6[1)]	IPA60R160P6	IPW60R160P6				
	180								IPL60R180P6
9.5–20.2	190	IPP60R190P6	IPB60R190P6[1)]	IPA60R190P6	IPW60R190P6				
19.2	210								IPL60R210P6
8.6-16.8	230	IPP60R230P6	IPB60R230P6[1)]	IPA60R230P6	IPW60R230P6				
15.9	255								IPL60R255P6
7.7–13.8	280	IPP60R280P6	IPB60R280P6[1)]	IPA60R280P6	IPW60R280P6				
7.0–12.0	330/360	IPP60R330P6	IPB60R330P6[1)]	IPA60R330P6	IPW60R330P6			IPL60R360P6S	
6.5–10.6	380	IPP60R380P6	IPB60R380P6[1)]	IPA60R380P6			IPD60R380P6		
4.9–7.3	600	IPP60R600P6	IPB60R600P6[1)]	IPA60R600P6			IPD60R600P6		
6.7	650							IPL60R650P6S	

1) Coming soon

www.infineon.com/coolmos

500 V CoolMOS™ CE

I_D [A]	$R_{DS(on)}$ [mΩ]	TO220	TO220 FullPAK	TO247	TO252 (DPAK)	TO251 (IPAK)	TO251 (IPAK SL)	SOT-223
18.5	190	IPP50R190CE	IPA50R190CE	IPW50R190CE				
7.5–13.0	280	IPP50R280CE	IPA50R280CE	IPW50R280CE	IPD50R280CE			
6.3–9.9	380	IPP50R380CE	IPA50R380CE		IPD50R380CE			
5.4–7.6	500	IPP50R500CE	IPA50R500CE		IPD50R500CE			
4.6–6.1	650		IPA50R650CE		IPD50R650CE			IPN50R650CE
4.1–5.0	800		IPA50R800CE		IPD50R800CE			IPN50R800CE
3.7–4.3	950		IPA50R950CE		IPD50R950CE	IPU50R950CE		IPN50R950CE
3.1	1400				IPD50R1K4CE	IPU50R1K4CE		IPN50R1K4CE
2.4	2000				IPD50R2K0CE	IPU50R2K0CE		IPN50R2K0CE
1.5	3000				IPD50R3K0CE	IPU50R3K0CE		IPN50R3K0CE

600 V CoolMOS™ CE

I_D [A]	$R_{DS(on)}$ [mΩ]	TO220 FullPAK	TO220 FullPAK wide creepage	TO252 (DPAK)	TO251 (IPAK)	TO251 (IPAK SL)	SOT-223
	190		IPAW60R190CE				
	280		IPAW60R280CE				
	380		IPAW60R380CE				
10.3	400	IPA60R400CE		IPD60R400CE		IPS60R400CE	
9.1	460	IPA60R460CE		IPD60R460CE		IPS60R460CE	
	600		IPAW60R600CE				
7.0	650	IPA60R650CE		IPD60R650CE		IPS60R650CE	
5.6	800	IPA60R800CE		IPD60R800CE		IPS60R800CE	
4.3	1000	IPA60R1K0CE		IPD60R1K0CE	IPU60R1K0CE	IPS60R1K0CE	IPN60R1K0CE
3.1	1500	IPA60R1K5CE		IPD60R1K5CE	IPU60R1K5CE	IPS60R1K5CE	IPN60R1K5CE
2.3	2100			IPD60R2K1CE	IPU60R2K1CE	IPS60R2K1CE	IPN60R2K1CE
	3400			IPD60R3K4CE	IPU60R3K4CE	IPS60R3K4CE	IPN60R3K4CE

650 V CoolMOS™ CE

I_D [A]	$R_{DS(on)}$ [mΩ]	TO220 FullPAK	TO252 (DPAK)	TO251 (IPAK SL)	SOT-223	ThinPAK 5 x 6
	400	IPA65R400CE	IPD65R400CE	IPS65R400CE		
	650	IPA65R650CE	IPD65R650CE	IPS65R650CE		
4.3	1000	IPA65R1K0CE	IPD65R1K0CE	IPS65R1K0CE		
3.1	1500	IPA65R1K5CE	IPD65R1K4CE	IPS65R1K5CE	IPN65R1K5CE	

700 V CoolMOS™ CE

I_D [A]	$R_{DS(on)}$ [mΩ]	TO262 (I^2PAK)	TO252 (DPAK)	TO251 (IPAK SL)	SOT-223	ThinPAK 5 x 6
	600		IPD70R600CE	IPS70R600CE		
	950	IPI70R950CE	IPD70R950CE	IPS70R950CE		
3.2	1400		IPD70R1K4CE	IPS70R1K4CE		
	1500				IPN70R1K5CE	
	2000		IPD70R2K0CE	IPS70R2K0CE		
	2100					IPL70R2K1CES

800 V CoolMOS™ CE

I_D [A]	$R_{DS(on)}$ [mΩ]	TO220	TO220 FullPAK	TO247	TO252 (DPAK)	TO251 (IPAK)	TO251 (IPAK SL)
6.8	310		IPA80R310CE				
5.0	460		IPA80R460CE				
4.5	650		IPA80R650CE				
3.6–5.7	1000		IPA80R1K0CE		IPD80R1K0CE	IPU80R1K0CE	
2.8–3.9	1400		IPA80R1K4CE		IPD80R1K4CE	IPU80R1K4CE	
1.9	2800				IPD80R2K8CE	IPU80R2K8CE	

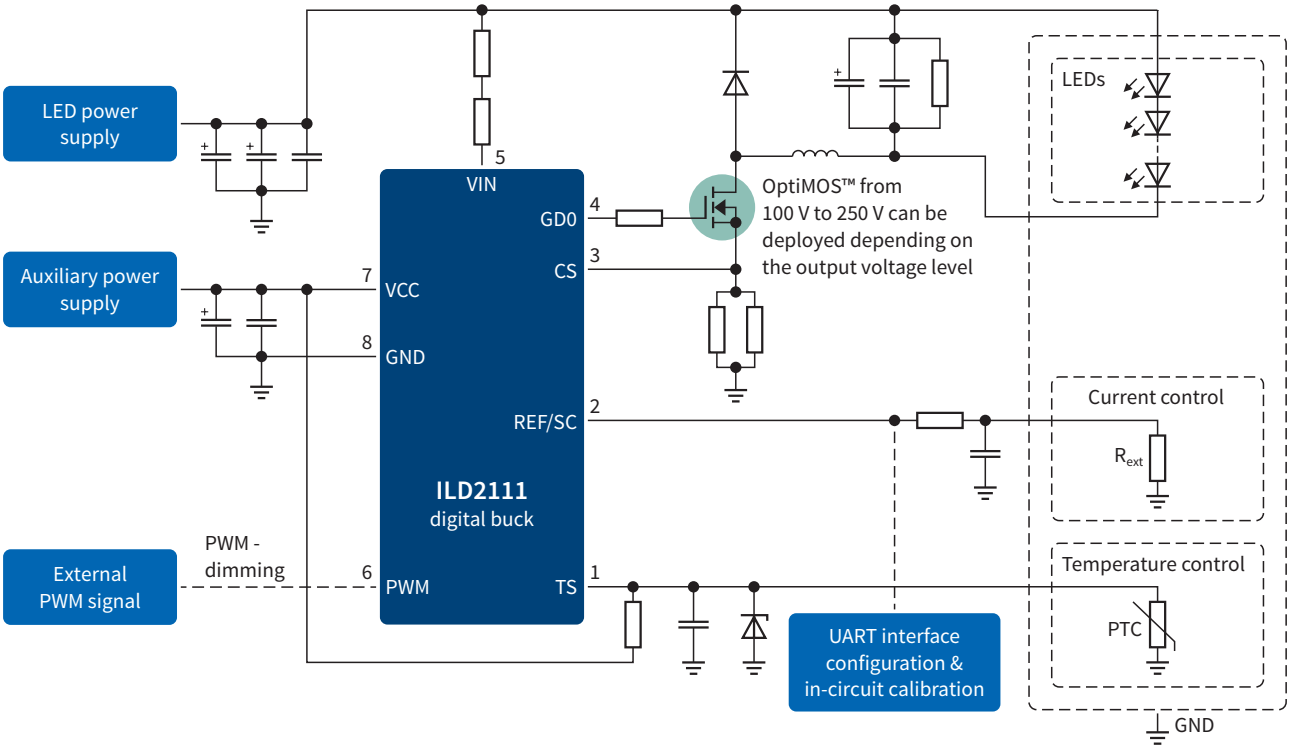
www.infineon.com/coolmos

OptiMOS™ – medium-voltage MOSFETs

OptiMOS™ portfolio for LED drivers

Low- and medium-voltage MOSFETs are mainly used as a power stage in combination with an LED controller or microcontrollers. We offer a wide portfolio of OptiMOS™ from 100 V to 250 V. OptiMOS™ consistently sets the benchmark in key specifications for power system design including ON-state resistance, leading to reduced power losses and improved overall efficiency.

Typical application diagram



OptiMOS™ 100 V normal level

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)		SuperSO8		SOT-223
12–18	IPD122N10N3 G	$R_{DS(on)}$ = 12.2 mΩ	BSC160N10NS3 G	$R_{DS(on)}$ = 16.0 mΩ	
2x 75			BSC750N10ND G	$R_{DS(on)}$ = 75.0 mΩ	

OptiMOS™ 150 V normal level

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)		SuperSO8		SOT-223
16–30	IPD200N15N3 G	$R_{DS(on)}$ = 20.0 mΩ	BSC190N15NS3 G	$R_{DS(on)}$ = 19.0 mΩ	
30–60	IPD530N15N3 G	$R_{DS(on)}$ = 53.0 mΩ	BSC360N15NS3 G	$R_{DS(on)}$ = 36.0 mΩ	
			BSC520N15NS3 G	$R_{DS(on)}$ = 52.0 mΩ	

OptiMOS™ 200 V normal level

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)		SuperSO8		SOT-223
30–40	IPD320N20N3 G	$R_{DS(on)}$ = 32.0 mΩ	BSC320N20NS3 G	$R_{DS(on)}$ = 32.0 mΩ	
40–50			BSC500N20NS3 G	$R_{DS(on)}$ = 50.0 mΩ	
80–100			BSC900N20NS3 G	$R_{DS(on)}$ = 90.0 mΩ	
100–200			BSC12DN20NS3 G	$R_{DS(on)}$ = 125.0 mΩ	
200–300			BSC22DN20NS3 G	$R_{DS(on)}$ = 225.0 mΩ	

OptiMOS™ 250 V normal level

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)		SuperSO8		SOT-223
60–70	IPD600N25N3 G	$R_{DS(on)}$ = 60.0 mΩ	BSC600N25NS3 G	$R_{DS(on)}$ = 60.0 mΩ	
100–200			BSC16DN25NS3 G	$R_{DS(on)}$ = 165.0 mΩ	

OptiMOS™ 100 V logic level

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)		SuperSO8		SOT-223
12–18			BSC123N10LS G	$R_{DS(on)}$ = 12.3 mΩ	
			BSC123N10LS G	$R_{DS(on)}$ = 12.3 mΩ	
20–40			BSC265N10LSF G	$R_{DS(on)}$ = 26.5 mΩ	

OptiMOS™ small signal 100 V

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)	SuperSO8	SOT-223	
23–27			BSP372N	$R_{DS(on)}$ = 230 mΩ

OptiMOS™ small signal 200 V

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)	SuperSO8	SOT-223	
1000–1800			BSP297	$R_{DS(on)}$ = 1800 mΩ

OptiMOS™ small signal 240 V

$R_{DS(on)}$ max @ V_{GS} = 10 V [mΩ]	TO252 (DPAK)	SuperSO8	SOT-223	
4200–6000			BSP89	$R_{DS(on)}$ = 6000 mΩ

www.infineon.com/optimos