



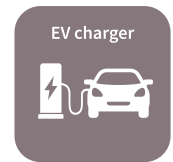
Fast EV charging

Comprehensive solutions for fast EV charging design

www.infineon.com/ev-charging



Comprehensive solutions for fast EV charging design



What speaks for off-board DC EV charging?

With the growing number of electric vehicles (EVs), which are in some markets becoming viable alternatives to traditional internal combustion engine vehicles, the demand for enhanced semiconductor solutions for charging stations increases too. Currently, all eyes are on China where EVs have gained traction in the rapidly expanding middle class, while Europe and the United States are expected to follow suit soon. However, to truly welcome EVs on a large scale, these markets need to provide widespread availability of DC charging infrastructure so that drivers can quickly charge their vehicles. DC Charging systems are an attractive choice because they offer much faster charging than a standard AC EV charger which many EV drivers possess. Today a DC charger with e.g. 150 kW can put a 200 km charge on an EV battery in around just 15 minutes. The improvement of charging technologies is expected to even further lower the charging time. Consequently, off-board charging is becoming more and more attractive.

Challenges on the horizon

Reaching the next level in designing DC EV chargers confronts engineers with many new challenges. For a DC charging design to be a long term success, you must:

- > Enhance output power to shorten the charging time
- > Improve power density within the set dimensions of the charging station
- > Increase efficiency by boosting the load and decreasing power dissipation
- > Reduce design cost per watt

Overcoming all of the mentioned issues is possible – with the right partner.

The right partner for successful DC EV Charger designs

As a market leader and the global frontrunner in power electronics, Infineon enables you to bring energy-efficient DC EV charger designs to life, with our highly efficient components and in-depth technical support. We cover power ranges from kilowatt to megawatt in our broad portfolio of high-quality power semiconductors, microcontrollers, gate drivers and security, and safety authentication solutions. Our CoolMOS™ and CoolSiC™ MOSFETs, for example, are ideal in a wide range of DC EV charging designs. Their matchless advantages include high frequency operation, high power density and reduced switching losses, allowing you to reach high levels of efficiency in any battery charging system.

We provide a comprehensive offering from power and control to sensor and security

Highly efficient power conversion

- > Infineon power semiconductor solutions

Safe driving and control

- > Infineon gate driver and microcontroller solutions

Secured authentication and protection

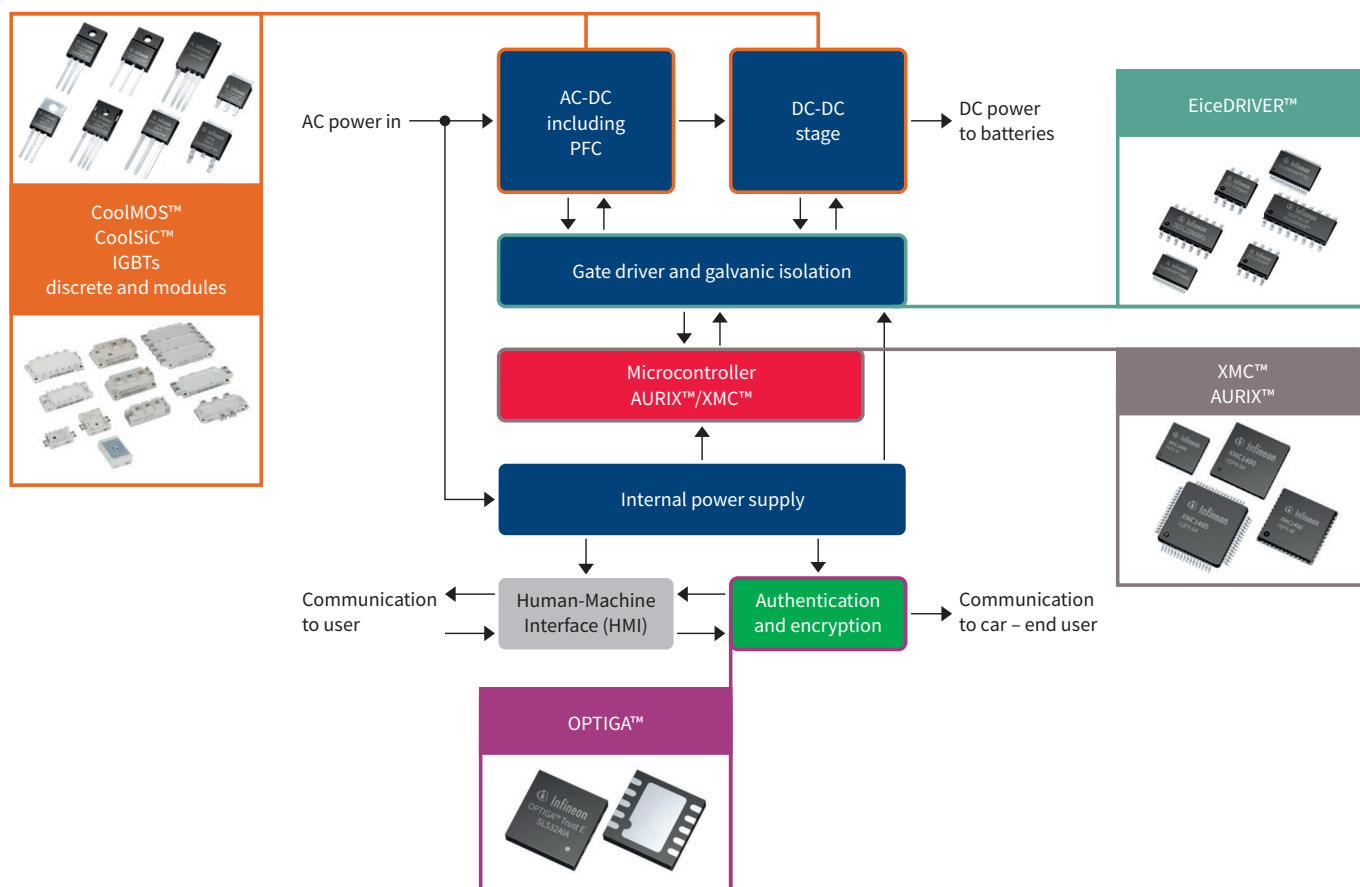
- > Infineon authentication solutions

Secured communication for billing and roaming

- > Infineon encryption solutions



Key portfolio for DC EV charging designs



Infinion’s solution recommendation for DC EV charging systems blocks

Our solutions that are designed for harsh environmental conditions and long life time as we have a strong understanding of quality requirements. Take the next step by exploring our product portfolio for DC EV charging systems.

AC-DC including PFC

Product category	Product family	Product	Additional information
High voltage MOSFET/ SiC MOSFET/IGBT	650 V CoolMOS™ C7	IPW65R019C7	650 V, 19 mΩ, TO-247
	600 V CoolMOS™ C7	IPW60R017C7	600 V, 17 mΩ, TO-247
	600 V CoolMOS™ P7	IPW60R024P7	600 V, 24 mΩ, TO-247
		IPW60R037P7	600 V, 37 mΩ, TO-247
		IPW60R060P7	600 V, 60 mΩ, TO-247
	650 V TRENCHSTOP™ 5 H5	IKW50N65EH5/IKZ50N65EH5	650 V, 50 A, TO-247-3/4
		IKW75N65EH5/IKZ75N65EH5	650 V, 75 A, TO-247-3/4
	1200 V CoolSiC™ MOSFETs	IMW120R045M1 ¹⁾ /IMZ120R045M1 ¹⁾	1200 V, 45 mΩ, TO-247-3/4
	1200 V CoolSiC™ Easy modules	F3L15MR12W2M1_B69 ¹⁾	1200 V, 15 mΩ, Easy 2B, Vienna rectifier phase leg
		FS45MR12W1M1_B11	1200 V, 45 mΩ, Easy 1B, sixpack
SiC diodes	1200 V CoolSiC™ Schottky diodes generation 5	IDW15G120C5B/IDWD15G120C5	1200 V, 15 A, TO-247-3/2
		IDW20G120C5B/IDWD20G120C5	1200 V, 20 A, TO-247-3/2
		IDW30G120C5B/IDWD30G120C5	1200 V, 30 A, TO-247-3/2
		IDW40G120C5B/IDWD40G120C5	1200 V, 40 A, TO-247-3/2

1) Coming soon

DC-DC stage

Product category	Product family	Product	Additional information		
High voltage MOSFET/ SiC MOSFET	600 V CoolMOS™ CFD7/CSFD	IPW60R018CFD7	600 V, 18 mΩ, TO-247		
		IPW60R024CFD7	600 V, 24 mΩ, TO-247		
		IPW60R037CSFD	600 V, 37 mΩ, TO-247		
		IPW60R040CFD7	600 V, 40 mΩ, TO-247		
		IPW60R055CFD7	600 V, 55 mΩ, TO-247		
		IPW60R070CFD7	600 V, 70 mΩ, TO-247		
	1200 V CoolSiC™ SiC MOSFET	1200 V CoolSiC™ Easy module	IMW120R045M1 ¹⁾ /IMZ120R045M1 ¹⁾	1200 V, 45 mΩ, TO-247-3/4	
			FF6MR12W2M1_B11	1200 V, 6 mΩ, Easy 2B, half-bridge	
			FF8MR12W2M1_B11	1200 V, 8 mΩ, Easy 2B, half-bridge	
			FF11MR12W1M1_B11	1200 V, 11 mΩ, Easy 1B, half-bridge	
			FF23MR12W1M1_B11	1200 V, 23 mΩ, Easy 1B, half-bridge	
			F4-23MR12W1M1_B11 ¹⁾	1200 V, 23 mΩ, Easy 1B, fourpack	
			FS45MR12W1M1_B11	1200 V, 45 mΩ, Easy 1B, sixpack	
			1200 V CoolSiC™ Schottky diode generation 5	IDW15G120C5B/IDWD15G120C5	1200 V, 15 A, TO-247-3/2
				IDW20G120C5B/IDWD20G120C5	1200 V, 20 A, TO-247-3/2
				IDW30G120C5B/IDWD30G120C5	1200 V, 30 A, TO-247-3/2
IDW40G120C5B/IDWD40G120C5	1200 V, 40 A, TO-247-3/2				
650 V CoolSiC™ Schottky diode generation 5	IDW12G65C5	650 V, 12 A, TO-247			
	IDW16G65C5	650 V, 16 A, TO-247			
	IDW20G65C5	650 V, 20 A, TO-247			
	IDW20G65C5B	650 V, 10 A, TO-247			
	IDW24G65C5B	650 V, 24 A, TO-247			
	IDW30G65C5	650 V, 30 A, TO-247			
	IDW32G65C5B	650 V, 32 A, TO-247			
	IDW40G65C5	650 V, 40 A, TO-247			
SiC diodes Output rectification diodes	650 V CoolSiC™ Schottky diode generation 6	IDW40G65C5B	650 V, 40 A, TO-247		
		IDH20G65C6	650 V, 20 A, TO-220		
		IDH16G65C6	650 V, 16 A, TO-220 real 2pin		
		IDH12G65C6	650 V, 12 A, TO-220 real 2pin		
		IDH10G65C6	650 V, 10 A, TO-220 real 2pin		
		IDH08G65C6	650 V, 8 A, TO-220 real 2pin		
		IDH06G65C6	650 V, 6 A, TO-220 real 2pin		
		IDH04G65C6	650 V, 4 A, TO-220 real 2pin		
		IDDD20G65C6	650 V, 20 A, double DPAK		
		IDDD16G65C6	650 V, 16 A, double DPAK		
		IDDD12G65C6	650 V, 12 A, double DPAK		
		IDDD10G65C6	650 V, 10 A, double DPAK		
		IDDD08G65C6	650 V, 8 A, double DPAK		
		IDDD06G65C6	650 V, 6 A, double DPAK		
IDDD04G65C6	650 V, 4 A, double DPAK				

1) Coming soon

Gate driver and galvanic isolation

Product category	Product family	Product	Additional information
Gate driver ICs	EiceDRIVER™ (non-isolated)	1EDN family, 2EDN family	Single-channel/dual-channel, non-isolated low-side gate driver ICs
	EiceDRIVER™ 1200 V level shift gate driver	IR2214SS	1200 V half-bridge gate driver for IGBTs and MOSFETs with level-shift technology
	EiceDRIVER™ (galvanic isolation)	2EDF7175F, 2EDF7275F	Dual-channel functional isolated (1.5 kV)
		2EDS8265H, 2EDS8165H	Dual-channel reinforced (safe) isolated (6 kV)
		1EDI40I12AF/H, 1EDI60I12AF/H, 1EDC40I12AH, 1EDC60I12AH	1200 V, single-channel, galvanic isolated driver with separate source and sink outputs to drive CoolMOS™ SJ MOSFETs in floating mode as in Vienna rectifier variants
		1EDC20H12AH, 1EDC60H12AH, 1ED020I12-F2, 2ED020I12-F2	1200 V, single-channel/dual-channel, galvanic isolated driver recommended to drive CoolSiC™ MOSFETs and CoolSiC™ EasyPack™ power modules
1EDI30I12MF/H, 1EDC30I12H, 1EDI10I12MF/H, 1EDC10I12MH	1200 V, single-channel, galvanic isolated driver with integrated Miller clamp to drive TRENCHSTOP™ 5 H5 IGBTs		

Microcontroller

Product category	Product family	Product	Additional information
Microcontroller	XMC™	XMC1400 family (PFC stage)	ARM® Cortex®-M0 based microcontroller
		XMC4500/4700 (HV DC-DC/PWM stage)	ARM® Cortex®-M4F based microcontroller
	AURIX™	TC26X/TC27X TC36X/TC37X	TriCore™ AURIX™ 32-bit microcontroller HSM (Hardware Secure Module) full EVITA compliance

Internal power supply

Product category	Product family	Product	Additional information
AC-DC power conversion	CoolSET™ 5 QR/FF flyback	ICE5QR0680AG	800 V, 42 W, 710 mΩ, DSO-12
		ICE5AR0680AG	800 V, 42 W, 710 mΩ, DSO-12
	5 th generation PWM controllers and CoolMOS™ P7	ICE5QSAG + IPP80R360P7	800 V, 360 mΩ, TO-220
		ICE5QSAG + IPA95R450P7	950 V, 450 mΩ, TO-220 FP
	CoolMOS™ HV SJ MOSFETs	IPN95R1K2P7	950 V, 450 mΩ, SOT-223
		IPN80R1K4P7	800 V, 1.4 Ω, SOT223

Authentication and encryption

As embedded systems are increasingly gaining attention of attackers, Infineon offers OPTIGA™ – a turnkey security solutions.

Product category	Product family	Product	Additional information
Security	OPTIGA™ Trust B	SLE952500000XTSA1	Assymmetric ECC authentication with individual certificate key pair and an extended temperature range of -40 to 110°C
	OPTIGA™ TPM	SLB9670XQ2.0	Fully TCG TPM 2.0 standard compliant module with the SPI interface
	SLC37	SLC37ESA2M0, SLI97CSIFX1M00PE	New class performance controller to IoT CC/EAL6+ (high) and EMVCo for payment and eSIM applications

Where to buy

Infiniteon distribution partners and sales offices:

www.infineon.com/WhereToBuy

Service hotline

Infiniteon offers its toll-free 0800/4001 service hotline as one central number, available 24/7 in English, Mandarin and German.

- > Germany 0800 951 951 951 (German/English)
- > China, mainland 4001 200 951 (Mandarin/English)
- > India 000 800 4402 951 (English)
- > USA 1-866 951 9519 (English/German)
- > Other countries 00* 800 951 951 951 (English/German)
- > Direct access +49 89 234-0 (interconnection fee, German/English)

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