

CoolMOS™ SJ MOSFETs selection guide

Common CoolMOS™ applications and topologies



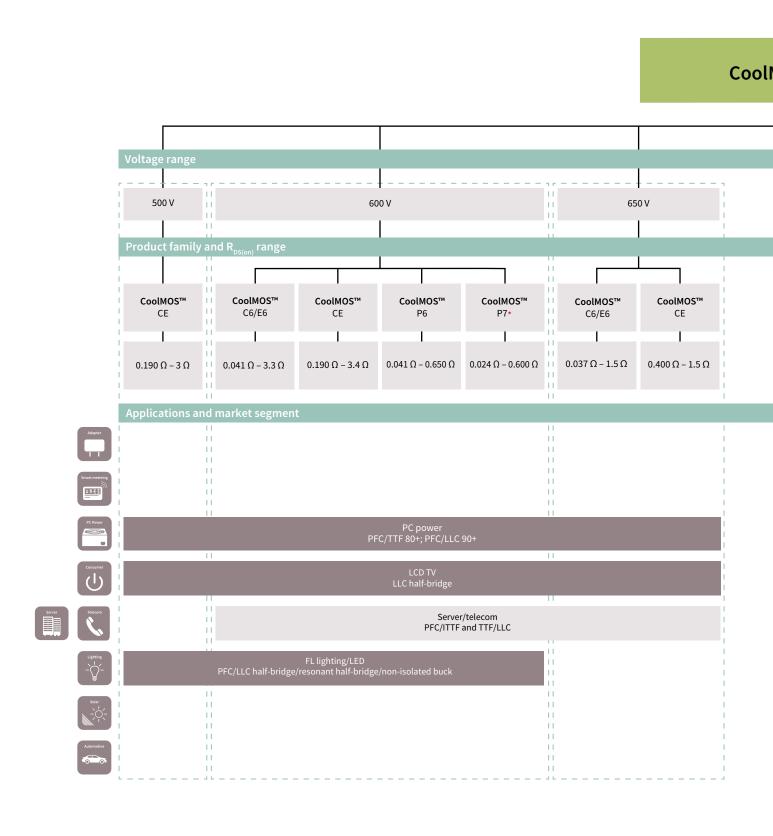


Content

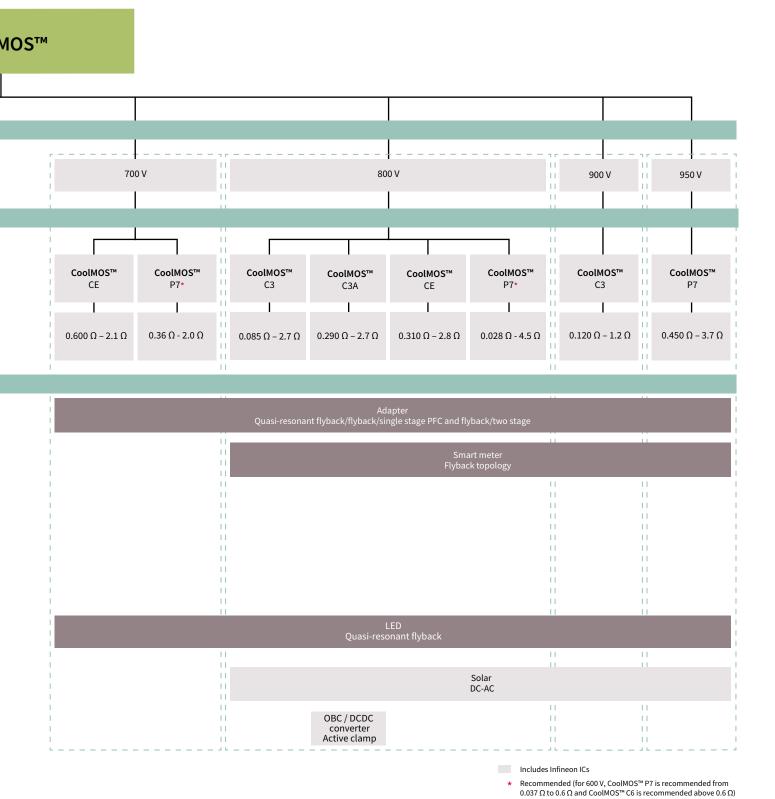
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Price/performance

Optimum performance in the following more cost-sensitive applications and topologies



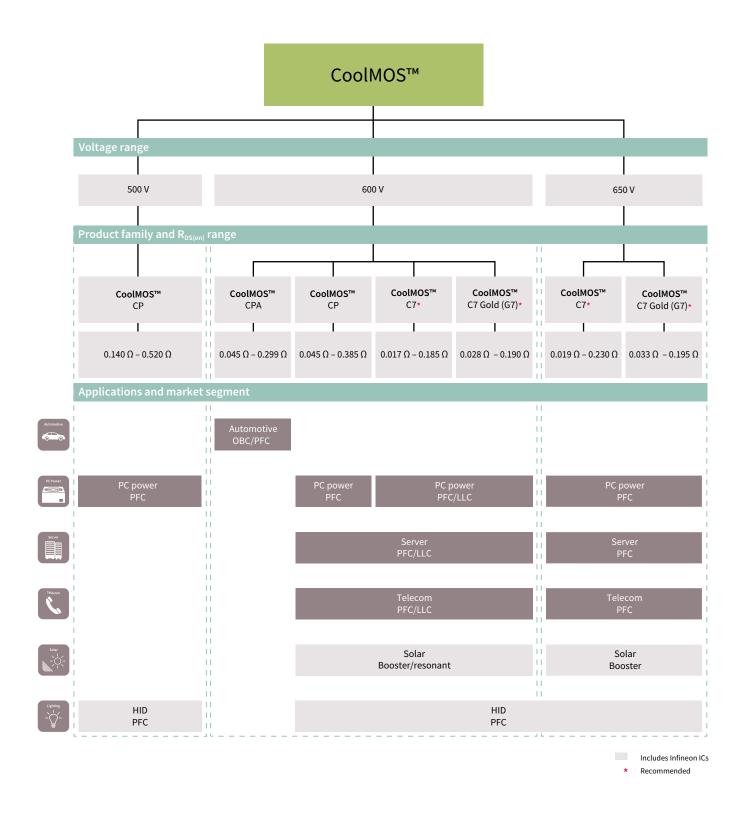
Drive your CoolMOS™ to best performance with a cool EiceDRIVER™
For complete product portfolio, check our homepage: www.infineon.com/coolmos



Best-in-class efficiency and fast body diode series

Best-in-class efficiency

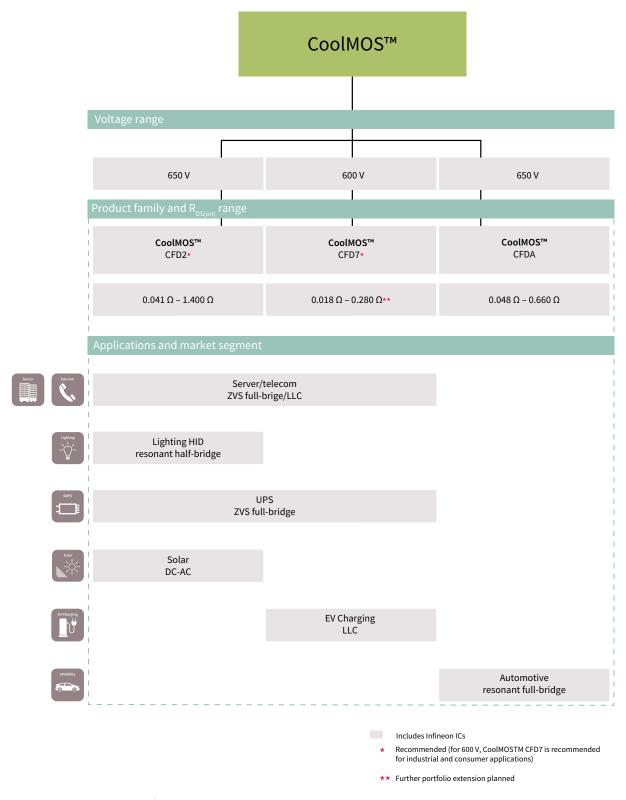
Highest performance CoolMOS™ recommended for the following applications and topologies



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Fast body diode series

Optimum CoolMOS[™] for resonant switching topologies in the following applications

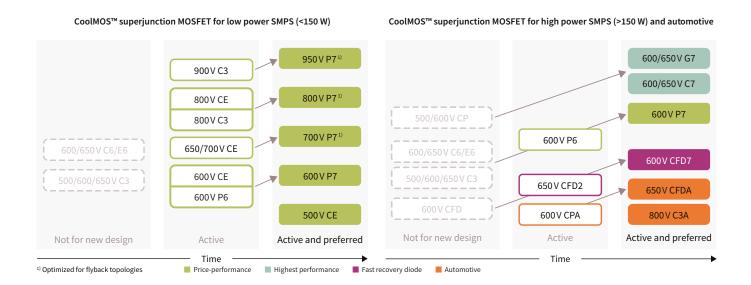


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CoolMOS™ SJ MOSFETs

Trusted leader in high voltage MOSFETs

The revolutionary CoolMOS™ power MOSFET family 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 low power SMPS, high voltage superjunction MOSFETs address applications, such as smartphone/tablet chargers, notebook adapters, LED lighting, as well as audio and TV power supplies. Increasingly, customers replace standard MOSFETs with superjunction MOSFETs to benefit from higher efficiency and less power consumption for the end-users. CoolMOS™ P7 sets a new benchmark by offering high performance and competitive price all at once.

Also for high power applications such as server, telecom, PC power, solar, UPS or industrial, Infineon's latest CoolMOS™ 7 superjunction MOSFET series with C7, G7, CFD7 and P7 product families offer what you need - from highest efficiency to best price performance.

Infineon's CoolMOS™ superjunction MOSFET offering is complemented by the automotive qualified series 600 V CPA, 650 V CFDA and 800 V C3A. Gain your momentum in the rapidly growing on-board charger and DC-DC converter markets with our excellent performing automotive series with proven outstanding quality standards that go well beyond AEC Q101.

CoolMOS™ product list

	CoolMOS™ series	Launch date	Position/characteristics	Applications		
	С3	2001	General purpose, easy-to-use series	Cost/performance PFC, PWM hard switching topologies and soft switching resonant topologies		
ce	P6	2012	Price/performance technology with highest efficiency	Price/performance PFC PWM hard switching and soft switching resonant topologies		
Price/performance	CE	2012	Cost optimized platform conceived for price sensitive applications such as consumer (LCD, LED, PDP TV), lighting and PC power	Price/performance PFC and PWM stage in LLC topologies (resonant switching) and TTF topologies (hard switching)		
rice/p	600 V P7	2017	Price/performance technology with highest efficiency	Price/performance PFC PWM hard switching and soft switching resonant topologies		
<u> </u>	700 V P7	2017	Best-in-class performance, state-of-the-art in			
	800 V P7	2017	ease-of-use and designed for consumer	Price/performance technology for low power SMPS market optimized for flyback topologies		
	950 V P7 2		applications			
Fast body diodes series	CFD2	2011	Replacement for CFD series Improved cost performance, light load efficiency and ease-of-use in EMI and low voltage overshoot	Soft switching resonant topologies with hard commutation requirements requiring a fast body diode		
body di series	CFD7	2017	Successor to CFD2 offering improved efficiency, BiC Q_{rr} and enabling highest power density.	Soft switching resonant topologies with hard commutation requirements requiring a fast body diode		
Fast	CFDA	2012	Automotive qualified fast body diode part. Same performance as CFD2	Unidirectional and bidirectional DC-DC converter, battery charger, HID lighting		
	СР	2005	Aimed at high efficiency hard switching topologies	High efficiency PFC		
	650 V C7	2012	Best-in-class R _{DS(on)} /package, for hard switching topologies such as PFC with highest efficiency	Best-in-class efficiency SMPS PFC and solar boost		
class	600 V C7	2015	Best-in-class R _{DS(on)} /packages, for hard and soft switching topologies such as PFC and high-end LLC	Best-in-class efficiency SMPS PFC/ LLC and solar boost/resonant		
Best-in-class	650 V G7	2016	Benefits in efficiency, power density and manufacturing cost reduction with high quality and easy to use part	High quality and easy to use for hard switching topologies		
	600 V G7	2017	Benefits in efficiency, power density and manufacturing cost reduction with high quality and easy to use part	High quality and easy to use for hard switching topologies and excellent performance in resonant topologies such as LLC		

CoolMOS™ portfolio

500 V CoolMOS™ CP					Adapter Lighting Continuer Continuer Lighting Continuer Lighting Continuer Lighting			
$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-220 FullPAK	TO-247	TO-252 (DPAK)	TO-262 (I²PAK)	TO-263 (D²PAK)	TO-251 (IPAK Short Lead)	
140	IPP50R140CP	IPA50R140CP	IPW50R140CP			IPB50R140CP		
199	IPP50R199CP	IPA50R199CP				IPB50R199CP		
250	IPP50R250CP	IPA50R250CP	IPW50R250CP					
299	IPP50R299CP							
350	IPP50R350CP	IPA50R350CP			IPI50R350CP			
399	IPP50R399CP			IPD50R399CP	IPI50R399CP			
520	IPP50R520CP			IPD50R520CP			IPS50R520CP	

3000

500 V CoolMOS™ CE ACTIVE & PREFERRED TO-251 (IPAK) TO-251 SOT-223 TO-220 FullPAK $R_{DS(on)}$ $[m\Omega]$ TO-220 TO-220 FullPAK TO-247 TO-252 (DPAK) (IPAK Short Lead) Narrow Lead IPP50R190CE IPA50R190CE 190 IPP50R280CE IPA50R280CE IPD50R280CE 280 IPP50R380CE IPA50R380CE IPD50R380CE 380 IPA50R500CE IPD50R500CE IPAN50R500CE 500 IPN50R650CE IPD50R650CE 650 IPA50R800CE IPD50R800CE IPN50R800CE 800 IPA50R950CE IPD50R950CE IPN50R950CE 950 IPD50R1K4CE IPN50R1K4CE 1400 IPD50R2K0CE IPN50R2K0CE 2000

IPN50R3K0CE

IPD50R3K0CE

600 V	CoolMOS™	CE					BLDC Motor	Mapter Charger PC Power	
$R_{DS(on)}$ $[m\Omega]$	TO-220 FullPAK	TO-220 FullPAK Wide creepage	TO-247	TO-252 (DPAK)	TO-251 (IPAK)	TO-251 (IPAK Short Lead)	SOT-223	TO-220 FullPAK Narrow Lead	
190		IPAW60R190CE							
280		IPAW60R280CE							
380		IPAW60R380CE							
400	IPA60R400CE			IPD60R400CE		IPS60R400CE			
460	IPA60R460CE			IPD60R460CE		IPS60R460CE			
600		IPAW60R600CE							
650	IPA60R650CE			IPD60R650CE		IPS60R650CE		IPAN60R650CE	
800				IPD60R800CE		IPS60R800CE		IPAN60R800CE	
1000	IPA60R1K0CE			IPD60R1K0CE	IPU60R1K0CE	IPS60R1K0CE	IPN60R1K0CE		
1500	IPA60R1K5CE			IPD60R1K5CE	IPU60R1K5CE	IPS60R1K5CE	IPN60R1K5CE		
2100				IPD60R2K1CE	IPU60R2K1CE	IPS60R2K1CE	IPN60R2K1CE		
3400				IPD60R3K4CE		IPS60R3K4CE	IPN60R3K4CE		

600 V	CoolMOS™	P6				Consumer	Lighting PC Power	Tolecom SMPS SMPS
$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-263 (D²PAK)	TO-220 FullPAK	TO-247	TO-247 4pin	TO-252 (DPAK)	ThinPAK 5x6	ThinPAK 8x8
41				IPW60R041P6				
70				IPW60R070P6	IPZ60R070P6			
99	IPP60R099P6		IPA60R099P6	IPW60R099P6	IPZ60R099P6			
125	IPP60R125P6		IPA60R125P6	IPW60R125P6				
160	IPP60R160P6	IPB60R160P6	IPA60R160P6	IPW60R160P6				
180								IPL60R180P6
190	IPP60R190P6		IPA60R190P6	IPW60R190P6				
210								IPL60R210P6
230		IPB60R230P6	IPA60R230P6					
255								
280	IPP60R280P6	IPB60R280P6	IPA60R280P6	IPW60R280P6				
330/360		IPB60R330P6					IPL60R360P6S	
380			IPA60R380P6			IPD60R380P6		
600		IPB60R600P6	IPA60R600P6			IPD60R600P6		
650							IPL60R650P6S	

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600 V CoolMOS™ C7 ACTIVE & PREFERRED TO-252 TO-220 FullPAK TO-247 TO-247 4pin ThinPAK 8x8 TO-220 TO-263 $\begin{array}{l} R_{DS(on)} \\ [m\Omega] \end{array}$ (D²PAK) (DPAK) 17 IPW60R017C7 IPZ60R017C7 IPB60R040C7 40 IPP60R040C7 IPW60R040C7 IPZ60R040C7 60 IPP60R060C7 IPB60R060C7 IPA60R060C7 IPW60R060C7 IPZ60R060C7 IPL60R065C7 65 99 IPP60R099C7 IPB60R099C7 IPA60R099C7 IPW60R099C7 IPZ60R099C7 104 IPL60R104C7 120 IPP60R120C7 IPB60R120C7 IPA60R120C7 IPW60R120C7 125 IPL60R125C7 180 IPP60R180C7 IPB60R180C7 IPA60R180C7 IPW60R180C7 IPD60R180C7 185 IPL60R185C7

600 V	CoolMOS™ C	7 Gold (G-serie	ACTIVE & PREFE	RRED		Telecom	Soler Soler Indutrial Soler Soler
$R_{DS(on)}$ $[m\Omega]$	TO -220	TO-Leadless (TOLL)	TO-220 FullPAK	TO-247	TO-247 4 pin	TO-252 (Double DPAK)	ThinPAK 8x8
28		IPT60R028G7					
50		IPT60R050G7				IPDD60R050G7	
80		IPT60R080G7				IPDD60R080G7	
102		IPT60R102G7				IPDD60R102G7	
125		IPT60R125G7				IPDD60R125G7	
150		IPT60R150G7				IPDD60R150G7	
190						IPDD60R190G7	

	CoolMOS™ ial grade	P7 ACTIVE & PRE	FERRED				PC Power	Solar Telecom
$R_{DS(on)}$ $[m\Omega]$	TO -220	TO-220 FullPAK	TO-247	TO-247 4pin asymmetric leads	TO-252 (DPAK)	TO-220 FullPAK Wide creepage	ThinPAK 8x8	D ² PAK
24			IPW60R024P7*	IPZA60R024P7*				
37			IPW60R037P7	IPZA60R037P7				
45			IPW60R045P7*	IPZA60R045P7*				IPB60R045P7*
60	IPP60R060P7	IPA60R060P7	IPW60R060P7	IPZA60R060P7				IPB60R060P7
65							IPL60R065P7	
80	IPP60R080P7	IPA60R080P7	IPW60R080P7	IPZA60R080P7			IPL60R085P7	IPB60R080P7
99	IPP60R099P7	IPA60R099P7	IPW60R099P7	IPZA60R099P7				IPB60R099P7
105							IPL60R105P7	
120	IPP60R120P7	IPA60R120P7	IPW60R120P7	IPZA60R120P7				IPB60R120P7
125							IPL60R125P7	
160	IPP60R160P7*	IPA60R160P7*						
180	IPP60R180P7	IPA60R180P7	IPW60R180P7	IPZA60R180P7	IPD60R180P7			IPB60R180P7
185							IPL60R185P7	
280	IPP60R280P7	IPA60R280P7			IPD60R280P7			IPB60R280P7
285							IPL60R285P7	
360	IPP60R360P7	IPA60R360P7			IPD60R360P7			IPB60R360P7
365							IPL60R365P7	
600	IPP60R600P7	IPA60R600P7			IPD60R600P7			

^{*}Coming Q1 2019

	CoolMOS™ rd grade	P7 ACTIVE & PRE	FERRED				Charger	Lighting
$R_{DS(on)}$ $[m\Omega]$	TO -220	TO-220 FullPAK	TO-220 FullPAK Narrow lead	TO-247 4pin	TO-252 (DPAK)	TO-220 FullPAK Wide creepage	ThinPAK 8x8	SOT-223
180		IPA60R180P7S			IPD60R180P7S	IPAW60R180P7S		
280		IPA60R280P7S	IPAN60R280P7S*		IPD60R280P7S	IPAW60R280P7S		
360		IPA60R360P7S	IPAN60R280P7S*		IPD60R360P7S	IPAW60R360P7S		IPN60R360P7S
600		IPA60R600P7S	IPAN60R600P7S*		IPD60R600P7S	IPAW60R600P7S		IPN60R600P7S

^{*}Coming Q1 2019

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600 V CoolMOS™ CFD7 ACTIVE & PREFERRED









$\begin{array}{c} R_{DS(on)} \\ [m\Omega] \end{array}$	TO-220	TO-263 (D²PAK)	TO-220 FullPAK	TO-247	TO-247 4pin	TO-252 (DPAK)	ThinPAK 8x8
18				IPW60R018CFD7			
24							
31				IPW60R31CFD7			
40				IPW60R40CFD7			
55				IPW60R55CFD7			
60							IPL60R060CFD7
70	IPP60R70CFD7			IPW60R70CFD7			
75							IPL60R75CFD7
90/95	IPP60R90CFD7			IPW60R90CFD7			IPL60R095CFD7
105/115	IPP60R105CFD7			IPW60R105CFD7			IPL60R115CFD7
125/140	IPP60R125CFD7		IPA60R125CFD7	IPW60R125CFD7			IPL60R140CFD7
145/160	IPP60R145CFD7		IPA60R145CFD7	IPW60R145CFD7		IPD60R145CFD7	IPL60R160CFD7
170	IPP60R170CFD7		IPA60R170CFD7	IPW60R170CFD7		IPD60R170CFD7	
185							IPL60R185CFD7
210/225	IPP60R210CFD7		IPA60R210CFD7			IPD60R210CFD7	
280	IPP60R280CFD7		IPA60R280CFD7			IPD60R280CFD7	













650 V	CoolMOS™ CI	FD2					
$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-262 (I ² PAK)	TO-263 (D²PAK)	TO-220 FullPAK	TO-247	TO-252 (DPAK)	ThinPAK 8x8
41					IPW65R041CFD		
80					IPW65R080CFD		
110	IPP65R110CFD		IPB65R110CFD	IPA65R110CFD	IPW65R110CFD		
150	IPP65R150CFD	IPI65R150CFD	IPB65R150CFD	IPA65R150CFD	IPW65R150CFD		
165							IPL65R165CFD
190	IPP65R190CFD	IPI65R190CFD	IPB65R190CFD	IPA65R190CFD	IPW65R190CFD		
210							IPL65R210CFD
310	IPP65R310CFD	IPI65R310CFD	IPB65R310CFD	IPA65R310CFD			
340							IPL65R340CFD
420	IPP65R420CFD			IPA65R420CFD	IPW65R420CFD	IPD65R420CFD	
460							IPL65R460CFD
660				IPA65R660CFD		IPD65R660CFD	
950						IPD65R950CFD	
1400						IPD65R1K4CFD	

650 V CoolMOS™ CE ACTIVE & PREFERRED











$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-220 FullPAK	TO-247	TO-252 (DPAK)	TO-251 (IPAK)	TO-251 (IPAK Short Lead)	SOT-223	TO-220 FullPAK Narrow Lead
400		IPA65R400CE		IPD65R400CE		IPS65R400CE		
650		IPA65R650CE		IPD65R650CE		IPS65R650CE		IPAN65R650CE
1000		IPA65R1K0CE		IPD65R1K0CE		IPS65R1K0CE		
1500		IPA65R1K5CE		IPD65R1K5CE			IPN65R1K5CE	

650 V CoolMOS™ C7 ACTIVE & PREFERRED













$\begin{array}{c} R_{DS(on)} \\ [m\Omega] \end{array}$	TO-220	TO-263 (D ² PAK)	TO-220 FullPAK	TO-247	TO-247 4pin	TO-252 (DPAK)	ThinPAK 8x8
19				IPW65R019C7	IPZ65R019C7		
45	IPP65R045C7	IPB65R045C7	IPA65R045C7	IPW65R045C7	IPZ65R045C7		
65	IPP65R065C7	IPB65R065C7	IPA65R065C7	IPW65R065C7	IPZ65R065C7		
70							IPL65R070C7
95	IPP65R095C7	IPB65R095C7	IPA65R095C7	IPW65R095C7	IPZ65R095C7		
99							IPL65R099C7
125	IPP65R125C7	IPB65R125C7	IPA65R125C7	IPW65R125C7			
130							IPL65R130C7
190	IPP65R190C7	IPB65R190C7	IPA65R190C7	IPW65R190C7		IPD65R190C7	
195							IPL65R195C7
225	IPP65R225C7	IPB65R225C7	IPA65R225C7			IPD65R225C7	
230							IPL65R230C7

650 V CoolMOS™ C7 Gold (G-series) ACTIVE & PREFERRED









		na (0 501105)						
$R_{DS(on)}$ $[m\Omega]$	TO -220	TO -220 TO-Leadless (TOLL)		TO-220 FullPAK	TO-247	TO -252 (DPAK)		
33		IPT65R033G7						
105		IPT65R105G7						
195		IPT65R195G7						



Charger Adapter LCD TV Lighting Audio AUX power

IPSA70R2K0P7S

IPN70R2K0P7S





700 V	COOLINIOS	CE						
R _{DS(on)} [mΩ]	TO-220	TO-220 FullPAK Wide creepage	TO-262 (I ² PAK)	TO-251 (IPAK Short Lead with ISO Standoff)	TO-252 (DPAK)	TO-251 (IPAK)	TO-251 (IPAK Short Lead)	SOT-223
600		IPAW70R600CE		IPSA70R600CE	IPD70R600CE			
950		IPAW70R950CE	IPI70R950CE	IPSA70R950CE	IPD70R950CE		IPS70R950CE	
1000								IPN70R1K0CE
1400				IPSA70R1K4CE	IPD70R1K4CE		IPS70R1K4CE	
1500								IPN70R1K5CE
2000				IPSA70R2K0CE	IPD70R2K0CE		IPS70R2K0CE	IPN70R2K1CE
2100								

700 V	CoolMOS™	P7 ACTIVE &	PREFERRED						
$R_{DS(on)}$ $[m\Omega]$	TO -220	TO – 262 (I ² PAK)	TO-251 (IPAK Short Lead)	TO-220 FullPAK	ThinPAK 5x6	TO-252 (DPAK)	TO-220 FullPAK narrow lead	TO-251 (IPAK Short Lead w/ ISO Standoff)	SOT-223
360			IPS70R360P7S	IPA70R360P7S		IPD70R360P7S	IPAN70R360P7S	IPSA70R360P7S	IPN70R360P7S
450				IPA70R450P7S			IPAN70R450P7S	IPSA70R450P7S	IPN70R450P7S
600			IPS70R600P7S	IPA70R600P7S	IPLK70R600P7	IPD70R600P7S	IPAN70R600P7S	IPSA70R600P7S	IPN70R600P7S
750				IPA70R750P7S	IPLK70R750P7		IPAN70R750P7S	IPSA70R750P7S	IPN70R750P7S
900			IPS70R900P7S	IPA70R900P7S	IPLK70R900P7	IPD70R900P7S	IPAN70R900P7S	IPSA70R900P7S	IPN70R900P7S
1200					IPLK70R1K2P7			IPSA70R1K2P7S	IPN70R1K2P7S
1400			IPS70R1K4P7S		IPLK70R1K4P7	IPD70R1K4P7S		IPSA70R1K4P7S	IPN70R1K4P7S

IPLK70R2K0P7

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2000

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800 V CoolMOS™ C3











$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-262 (I ² PAK)	TO-263 (D²PAK)	TO-220 FullPAK	TO-247	TO-252 (DPAK)
85					SPW55N80C3	
290	SPP17N80C3		SPB17N80C3	SPA17N80C3	SPW17N80C3	
450	SPP11N80C3			SPA11N80C3	SPW11N80C3	
650	SPP08N80C3			SPA08N80C3		
900	SPP06N80C3			SPA06N80C3		SPD06N80C3
1300	SPP04N80C3			SPA04N80C3		SPD04N80C3
2700				SPA02N80C3		SPD02N80C3

800 V CoolMOS™ CE







$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-220 FullPAK	TO-247	TO-252 (DPAK)	TO-251 (IPAK)	TO-251 (IPAK Short Lead)
310		IPA80R310CE				
460		IPA80R460CE				
650		IPA80R650CE				
1000		IPA80R1K0CE		IPD80R1K0CE	IPU80R1K0CE	
1400		IPA80R1K4CE		IPD80R1K4CE		
2800				IPD80R2K8CE		

800 V CoolMOS™ P7 ACTIVE & PREFERRED









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$R_{DS(on)}$ $[m\Omega]$	TO -220	TO-220 FullPAK	TO-247	TO-252 (DPAK)	TO-251 (IPAK)	TO-251 (IPAK Short Lead)	SOT-223	TO-220 FullPAK narrow lead	ThinPAK 5x6
280	IPP80R280P7	IPA80R280P7	IPW80R280P7	IPD80R280P7				IPAN80R280P7	
360	IPP80R360P7	IPA80R360P7	IPW80R360P7	IPD80R360P7				IPAN80R360P7	
450	IPP80R450P7	IPA80R450P7		IPD80R450P7				IPAN80R450P7	
600	IPP80R600P7	IPA80R600P7		IPD80R600P7	IPU80R600P7	IPS80R600P7	IPN80R600P7		IPLK80R600P7
750	IPP80R750P7	IPA80R750P7		IPD80R750P7	IPU80R750P7	IPS80R750P7	IPN80R750P7		IPLK80R750P7
900	IPP80R900P7	IPA80R900P7		IPD80R900P7	IPU80R900P7	IPS80R900P7	IPN80R900P7		IPLK80R900P7
1200	IPP80R1K2P7	IPA80R1K2P7		IPD80R1K2P7	IPU80R1K2P7	IPS80R1K2P7	IPN80R1K2P7		IPLK80R1K2P7
1400	IPP80R1K4P7	IPA80R1K4P7		IPD80R1K4P7	IPU80R1K4P7	IPS80R1K4P7	IPN80R1K4P7		IPLK80R1K4P7
2000				IPD80R2K0P7	IPU80R2K0P7	IPS80R2K0P7	IPN80R2K0P7		IPLK80R2K0P7
2400				IPD80R2K4P7	IPU80R2K4P7	IPS80R2K4P7	IPN80R2K4P7		
3300				IPD80R3K3P7	IPU80R3K3P7		IPN80R3K3P7		
4500				IPD80R4K5P7	IPU80R4K5P7		IPN80R4K5P7		

900 V CoolMOS™ C3











$R_{DS(on)}$ $[m\Omega]$	TO-220	TO-262 (I²PAK)	TO-263 (D²PAK)	TO-220 FullPAK	TO-247	TO-252 (DPAK)
120					IPW90R120C3	
340	IPP90R340C3	IPI90R340C3	IPB90R340C3	IPA90R340C3	IPW90R340C3	
500		IPI90R500C3		IPA90R500C3	IPW90R500C3	
800	IPP90R800C3			IPA90R800C3		
1000	IPP90R1K0C3			IPA90R1K0C3		
1200	IPP90R1K2C3	IPI90R1K2C3		IPA90R1K2C3		IPD90R1K2C3

950 V CoolMOS™ P7 ACTIVE & PREFERRED











R _{DS(on)} [mΩ]	TO-220	TO-220 FullPAK	SOT-223	TO-251 Long lead	TO-252 (DPAK)	TO-220 Wide creepage	ThinPAK 8x8	D ² PAK
450		IPA95R450P7		IPU95R450P7	IPD95R450P7			
750		IPA95R750P7		IPU95R750P7	IPD95R750P7			
1200		IPA95R1K2P7	IPN95R1K2P7	IPU95R1K2P7	IPD95R1K2P7			
2000			IPN95R2K0P7	IPU95R2K0P7	IPD95R2K0P7			
3700			IPN95R3K7P7	IPU95R3K7P7				

CoolMOS™ automotive

650 V CoolMOS™ CFDA ACTIVE & PREFERRED $R_{DS(on)}$ @ $T_J = 25$ °C $V_{GS} = 10 \text{ V}$ $[m\Omega]$ $V_{GS(th),min.-max.}$ [V] Package Product type $I_{D,max.}$ @ $T_J = 25$ °C $\begin{array}{c} Q_{G,typ.} \\ [nC] \end{array}$ R_{thJC,max} [K/W] [A] 1.5 TO-252 3.5...4.5 32 8.7 27 IPD65R420CFDA 420 6 17 3.5...4.5 20 2 TO-252 IPD65R660CFDA 660 31.2 3.5...4.5 11 0.45 TO-263 99.6 IPB65R110CFDA 110 22.4 72 3.5...4.5 86 0.64 TO-263 IPB65R150CFDA 150 17.5 57.2 3.5...4.5 68 0.83 TO-263 IPB65R190CFDA 190 IPB65R310CFDA 11.4 34.4 3.5...4.5 41 1.2 TO-263 310 6 17 20 2 TO-263 IPB65R660CFDA 660 3.5...4.5 31.2 99.6 3.5...4.5 11 0.45 TO-220 IPP65R110CFDA 110 TO-220 IPP65R150CFDA 150 22.4 72 3.5...4.5 86 0.64 IPP65R190CFDA 17.5 57.2 3.5...4.5 68 0.83 TO-220 190 11.4 34.4 3.5...4.5 41 1.2 TO-220 IPP65R310CFDA 310 6 17 3.5...4.5 20 2 TO-220 IPP65R660CFDA 660 63.3 228 3.5...4.5 27 0.25 TO-247 IPW65R048CFDA 48 43.3 16 0.32 TO-247 127 3.5...4.5 IPW65R080CFDA 80 IPW65R110CFDA 110 31.2 99.6 3.5...4.5 11 0.45 TO-247 IPW65R150CFDA 150 22.4 3.5...4.5 86 0.64 TO-247

600 V Cool	MOS™ CPA	ACTIVE & PREFERRED			Automatics Automa		
Product type	$R_{DS(on)} @ T_J = 25^{\circ}C$ $V_{GS} = 10 V$ $[m\Omega]$	I _{D,max.} @ T _J = 25°C [A]	I _{D_puls,max.} [A]	V _{GS(th),minmax} . [V]	Q _{G,typ.} [nC]	R _{thJC,max.} [K/W]	Package
IPB60R099CPA	99	31	93	2.5 3.5	60	0.5	TO-263
IPB60R199CPA	199	16	51	2.5 3.5	32	0.9	TO-263
IPB60R299CPA	299	11	34	2.5 3.5	22	1.3	TO-263
IPP60R099CPA	99	31	93	2.5 3.5	60	0.5	TO-220
IPW60R045CPA	45	60	230	2.5 3.5	150	0.29	TO-247
IPW60R075CPA	75	39	130	2.5 3.5	87	0.4	TO-247
IPW60R099CPA	99	31	93	2.5 3.5	60	0.5	TO-247
IPI60R099CPA	99	31	93	2.5 3.5	60	0.5	TO-262

3.5...4.5

68

0.83

TO-247

800 V CoolM	IOS™ C3A	CTIVE & PREFERRED			Automatic		
Product type	$R_{DS(on)} @ T_J = 25^{\circ}C$ $V_{GS} = 10 V$ $[m\Omega]$	I _{D,max.} @ T _J = 25°C [A]	I _{D_puls,max} . [A]	V _{GS(th),minmax} . [V]	Q _{G,typ.} [nC]	R _{thJC,max.} [K/W]	Package
IPD80R2K7C3A	2700	2	6	2.1 3.9	12	3	TO-252
IPB80R290C3A	290	17	51	2.1 3.9	91	0.55	TO-263
IPW80R290C3A	290	17	51	2.1 3.9	91	0.55	TO-247

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IPW65R190CFDA

190

17.5

57.2

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EiceDRIVER™ application guide

				Indus	trial, server and teleco	com SMPS and inverters					
				PFC		High voltage DC-DC					
Function	nality		Primary side controlled			Primary side controlled	Secondary side controlled			400 V DC-link	
Topology		Boost PFC ("classic": diode + FET)	Interleaved boost-PFC ("classic": diode + FET)	Bridgeless-PFC (Vienna)		LLC	LLC	ZVS	(i)TTF	Full-bridge	
Switching	High-side	SiC diode Gen5	SiC diode Gen5		olMOS™ 7/G7, P7	CoolMOS™ CFD7, P7	CoolMOS™ CFD7, P7	CoolMOS™ CFD7	CoolMOS™ C7/G7, P7	CoolMOS [™] C7 ²⁾ /G7, P7 ³⁾	
device	Low-side	CoolMOS™ C7/G7, P7	CoolMOS™ C7/G7, P7		olMOS™ 7/G7, P7	CoolMOS™ CFD7, P7	CoolMOS™ CFD7, P7	CoolMOS™ CFD7	CoolMOS™ C7/G7, P7	CoolMOS TM C7 ²⁾ /G7, P7 ³⁾	
Cata driver IC	High-side	n.	ā.	EiceDRIVER™	EiceDRIVER™ 1EDI	IR(S)21834		EiceDRIV	/ER™ 2EDN¹)		
Gate driver IC	Low-side		EiceDRIVER™ 2EDN EiceDRIVER™ 1EDN		EiceDRIVER™ 2EDN EiceDRIVER™ 1EDN	IR(S)2183 IR(S)2184	EiceDRIVER™ 1EDN¹				

¹⁾ Requires pulse-transformer 2) 600 V for soft and hard switching high performance, 650 V for hard switching 3 Rugged hard and soft switching

		EV charging stations						
			PFC		High voltage DC-DC			
Functionality								
Topology		Interleaved boost PFC	Vienn	a PFC	Phase-shift ZVS full-bridge			
Cuitabia a da ian	High-side	CoolSiC™ Schottky diode G6"	Cooli C7/G	MOS™ 17, P7	CoolMOS™ CFD7			
Switching device	Low-side	CoolMOS™ C7/G7		MOS™ .7, P7	CoolMOS™ CFD7			
Gate driver IC	High-side	n.a.	EiceDRIVER™ 2EDL	1EDICompact	EiceDRIVER™ 2EDN¹¹ EiceDRIVER™ 1EDN¹¹			
Gate univeric	Low-side	EiceDRIVER™ 2EDN EiceDRIVER™ 1EDN	EIGEDNIVER ZEDL	EiceDRIVER™ 2EDN EiceDRIVER™ 1EDN	EiceDRIVER™ 2EDN¹) EiceDRIVER™ 1EDN¹)			

¹⁾ Requires pulse-transformer

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EiceDRIVER™ 1EDN family

Rugged, cool and fast, single-channel low-side 4/8 A gate driver ICs

EiceDRIVER™ 1EDN family overview

Single-channel gate driver ICs are the crucial link between control ICs and powerful MOSFET and GaN switching devices. Gate driver ICs enable high system level efficiencies, excellent power density and consistent system robustness.

EiceDRIVER™ 1EDN family: fast, precise, strong and compatible

- > Highly efficient SMPS enabled by 5 ns short slew rates and ±5 ns propagation delay precision for fast MOSFET and GaN switching
- > Separate source and sink outputs simplify the application design
- > Industry standard packages and pinout ease system design upgrades

EiceDRIVER™ 1EDN family: the new reference in ruggedness and low power dissipation

- > -10 V robustness of control and enable inputs provides crucial safety margin when driving pulse transformers
- > 5 A reverse output current robustness eliminates the need for Schottky switching diodes when driving MOSFETs in TO-220 and TO-247 packages
- > Cool driver ICs thanks to true rail-to-rail low impedance output stages
- > 4 V and 8 V UVLO (Under Voltage Lock Out) options for instant MOSFET protection during start-up and under abnormal conditions

Applications

- > PFC
- > Synchronous rectification
- > DC-DC converters
- > Telecom bricks
- > Power tools
- > Industrial SMPS
- > Motor control
- > Wireless charging

Product features
> 4 A source/8 A sink current > 6 ns rise/5 ns fall times > ±5 ns propagation delay precision
> True rail-to-rail low impedance output stages
> 4 V and 8 V UVLO options > 19 ns propagation delay
> -10 V robustness of inputs
> 5 A reverse output current robustness
› Industry standard pinout and packages

Р	Product benefits					
	> Fast Miller plateau transition > Precise timing					
>	Low power dissipation in driver IC					
>	Fast and reliable MOSFET turn-off, independent of control IC					
>	Increased GND-bounce robustness					
>	Saves switching diodes					
>	Straight forward design upgrades					



	High power efficiency in hard switching PFC with SiC diode in half-bridges and synchronous rectifications					
	Cooler driver IC operation Higher MOSFET drive capability					
)	Instant MOSFET protection during start-up and under abnormal operation					
	> Crucial safety margin to drive pulse transformer					





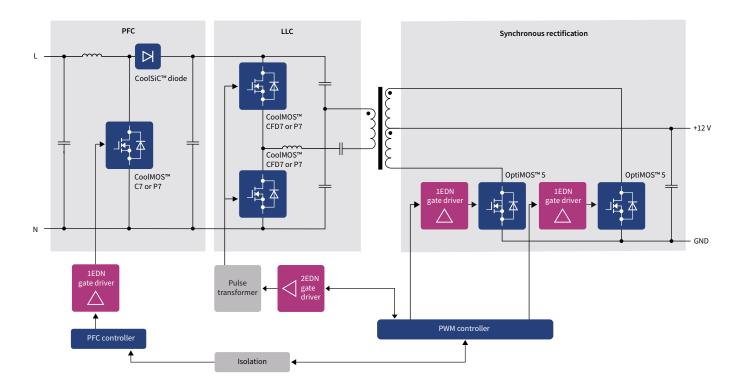
Increases power density

Short time-to-market





Application overview 800 W switched mode power supply



EiceDRIVER™ 1EDN7550 and 1EDN8550

Single-channel low-side gate driver family with truly differential inputs prevents false triggering of power MOSFETs

Overview

The input signal levels of conventional low-side gate driver ICs are referenced to the ground potential of the gate driver IC. If in the application the ground potential of the gate driver IC shifts excessively false triggering of the gate driver IC can occur.

The 1EDN7550/1EDN8550 gate driver ICs have truly differential inputs. Their control signal inputs are largely independent from the ground potential. Only the voltage difference between its input contacts is relevant. This prevents false triggering of power MOSFETs.

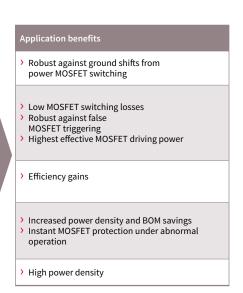
Applications

- > Server
- > Telecom
- > DC-DC converters
- > Telecom bricks
- > Power tools
- > Industrial SMPS
- > Wireless charging
- > Solar micro inverter



Product features	
> Truly differential inputs	
 4 A source current 8 A sink current Separate source/sink outputs Low-ohmic output stage 	
 29 ns input minimum pulse width 7 ns propagation delay accuracy 	
 5 A reverse current robustness of the outputs 4 V and 8 V UVLO versions 	
> SOT-23 package, 6 pins	

Product benefits
> Control inputs independent from gate driver GND
 > Fast Miller plateau transition > Fast shut-off > No diode voltage drop → Near zero gate voltage at turn-off > Low power dissipation within gate driver IC
> Up to 15 MHz switching speed > Precise
 No schottky clamping diodes required Fast and reliable MOSFET turn-off
> Small







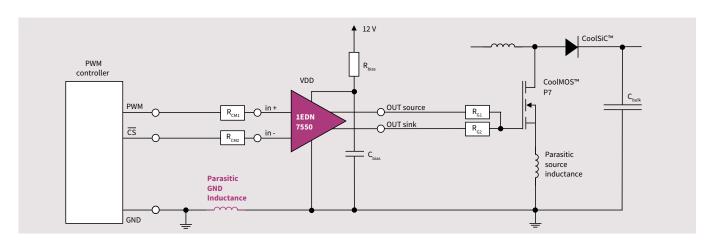




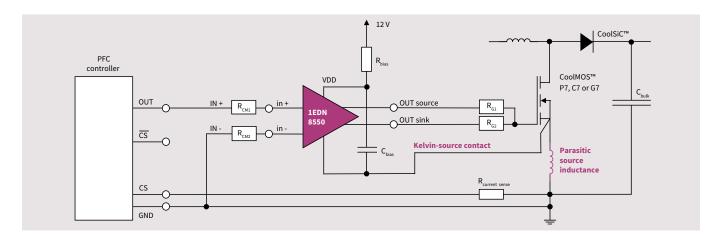




1EDN7550 driving CoolMOS™ SJ MOSFET on 1-layer PCB



1EDN8550 driving Kelvin source CoolMOS™ SJ MOSFET in boost PFC



EiceDRIVER™ 2EDN family

Rugged, cool and fast, dual-channel low-side 5 A driver ICs

EiceDRIVER™ 2EDN family overview

Dual-channel driver ICs are the crucial link between control ICs and powerful MOSFET and GaN switching devices. Driver ICs enable high system level efficiencies, excellent power density and consistent system robustness.

EiceDRIVER™ 2EDN family: fast, precise, strong and compatible

- > Highly efficient SMPS enabled by 5 ns short slew rates and 10 ns propagation delay precision for fast MOSFET and GaN switching
- > Numerous deployment options due to two 5 A channels. 1 ns channel-to-channel accuracy to use two channels in parallel
- > Industry standard packages and pinout ease system design upgrades

EiceDRIVER™ 2EDN family: the new reference in ruggedness and low power dissipation

- > 4 V and 8 V UVLO (Under Voltage Lock Out) options for instant MOSFET protection under abnormal conditions
- > -10 V robustness of control and enable inputs provides crucial safety margin when driving pulse transformers or driving MOSFETs in TO-220 and TO-247 packages
- > 5 A reverse output current robustness eliminates the need for Schottky switching
- > Diodes and reduces bill-of-material
- > Cool driver ICs from true rail-to-rail low impedance output stages

Applications

- > Server
- > Telecom
- > DC-DC converters
-) Bricks
- > Power tools
- > Industrial SMPS
- > Motor control
- > Solar



Product features
 5 A souce/sink current 5 ns rise/fall times <10 ns propagation delay precision
> True rail-to-rail low impedance output stages
 4 V and 8 V UVLO options 19 ns propagation delay for both control and enable inputs
> -10 V robustness of control and enable inputs
> 5 A reverse output current robustness
 2 independent channels Excellent 1 ns channel-to-channel accuracy
› Industry standard pinout and packages

	Product benefits
	Fast Miller plateau transition Precise timing
	› Low power dissipation in Driver IC
)	 Fast and reliable MOSFET turn-off, independent of control IC
	> Increased GND-bounce robustness
	> Saves switching diodes
	 Option to increase drive current by truly ncurrent switching of 2 channels
	> Straight forward design upgrades

	System benefits
	High power efficiency in hard switching PFC with SiC Diode in half-bridges and synchronous rectifications
	Cooler driver IC operationHigher MOSFET drive capability
	 Instant MOSFET protection under abnormal operation
,	> Crucial safety margin to drive pulse transformer
	Increases power densityBOM savings
	› One IC covering many applications
	> Short time-to-market



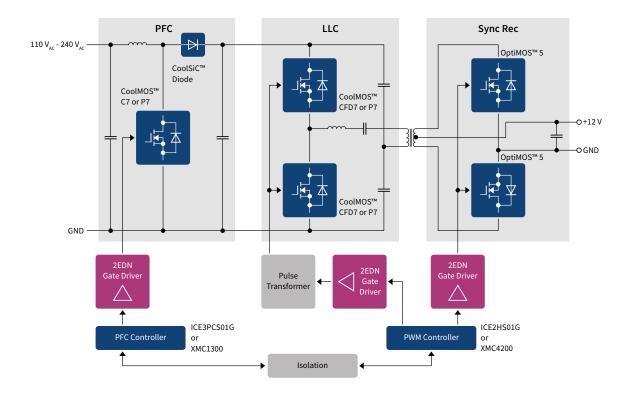








Application overview 800 W 130 kHz switched mode power supply



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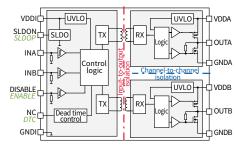
EiceDRIVER™ 2EDi product family

Fast, robust, dual-channel, functional and reinforced isolated MOSFET gate drivers with accurate and stable timing

Overview

The EiceDRIVER™ 2EDi product family is designed for use in high-performance power conversion applications. Very strong 4 A/8 A source/sink dual-channel gate drivers increase efficiency in CoolMOS™ and OptiMOS™ MOSFET half-bridges. The low propagation delay of 37 ns, combined with highly accurate and stable timing overtemperature and production, enables further efficiency gains within and across galvanically isolated power stages or in multi-phase/multi-level topologies. The availability of functional and reinforced isolated drivers in different packages makes these a perfect fit for both primary side and (safe) secondary side control. Gate driver outputs come with a high 5 A reverse current capability and 150 V/ns CMTI robustness for high dv/dt power loops. For slower switching or driving smaller MOSFETs, 1 A/2 A peak current product variants are available as well.

Device overview



EiceDRIVER™ 2EDi product familiy device diagram

Product key features

Fast power switching with accurate timing

- Available with 4 A/8 A and 1 A/2 A source/sink currents
- Propagation delay typ. 37 ns with 3 ns channel-to-channel mismatch
- > Max. delay variation ~14 ns

Optimized for area and system BOM

- > Isolation and driver in one package
- Low power dissipation due to low on-resistance
- > Output stages with 5A reverse current capability

Robust design against switching noise

- Floating drivers are able to handle large inductive voltage over- and undershoots
- Very good common mode transient immunity CMTI >150 V/ns
- Undervoltage lockout function for switch protection

Output- to -output channel isolation

> Functional level galvanic isolation

Input- to output channel isolation

> Functional and reinforced galvanic isolation

Product benefit

Efficiency gain and lower losses

- Lower switching losses in half-bridges due to fast and accurate turn on/off
- Perfect for new digital, fast high resolution PWM control including light load optimization

Improved thermal behavior at smaller form factor

- LGA with 1 mm, DSO with 2.3 mm package height versus volume > 1 cm3 for pulse transformers
- Eliminates two costly protection diodes on the gate driver outputs

Protection and safe operation

- Ideal for use in high power designs with fast switching transients
 Reliable CT coreless transformer PWM signal
- Reliable CT coreless transformer PWM signal chain to turn on high side MOSFETs

Flexible configurations

> HS+LS, HS+HS, LS+LS or 2x Imax on 1xHS

Regulatory safety

- > Functional for primary-side control
- Reinforced for secondary-side control

System benefits

Enabling higher system efficiency and higher power density designs

Improving long term competitive cost position, integration and mass manufacturability

Extending end-product lifetime

by improving safe operation of power switches in normal and abnormal field (grid) conditions

Lower EMI by ground isolation, driver proximity to MOSFETs or the use of 4-pin Kelvin source MOSFETs

Simplified safety approval through component (VDE884-x, UL1577) and system (IEC60950, IEC62386) certificates









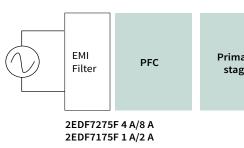


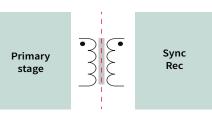


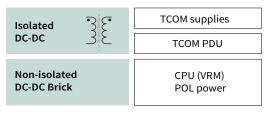




System application diagram











2EDS8265H 4 A/8 A **2EDS8165H** 1 A/2 A

Reinforced isolation 8 mm DSO16 pin Wide body 1.27 mm lead pitch

2EDF7275K 4 A/8 A **2EDF7235K** 4 A/8 A w. DTC

Functional isolation



LGA 13 5x5 mm 0.65 mm lead pitch

EiceDRIVER™ 1EDN product portfolio

Packag	ge	UVLO	Product name	Orderable part number	Pinout
	SOT-23 6pin	4 V	1EDN7511B	1EDN7511BXUSA1	VDD 1 6 IN+ OUT_SRC 2 1EDN 5 IN-
		8 V	1EDN8511B	1EDN8511BXUSA1	OUT_SNK 3 4 GND
	SOT-23 5pin	4 V	1EDN7512B	1EDN7512BXTSA1	VDD 1 5 OUT GND 2 1EDN IN+ 3 4 IN-
	WSON 6pin	4 V	1EDN7512G	1EDN7512GXTMA1	IN- 1 6 IN+ GND 2 1EDN 5 OUT GND 3 4 VDD

EiceDRIVER™ 1EDN7550 and 1EDN8550 product portfolio

Туре	Ground shift robustness		UVLO	Package	Pinout	
Туре	dynamic	static	0010	rackage	rillout	
1EDN7550B	+/- 150 V	+/- 70 V	4 V	6pin SOT-23	IN- 1 6 OUT_SNK	
1EDN8550B	+/- 150 V	+/- 70 V	8 V	6pin SOT-23	GND 2 1EDN8511B 5 OUT_SRC	

EiceDRIVER™ 2EDN product portfolio

Package		Current	UVLO	Inputs	Product name	Orderable part number	Pinout
		5 A	4 V	Direct	2EDN7524F	2EDN7524FXTMA1	
222				Inverted	2EDN7523F	2EDN7523FXTMA1	
Solution on	DSO 8pin	4 A	4 V	Direct	2EDN7424F	2EDN7424FXTMA1	
" # F		5 A 4 4 8 5 A	8 V	Direct	2EDN8524F	2EDN8524FXTMA1	
				Inverted	2EDN8523F	2EDN8523FXTMA1	ENA 1 8 ENB INA 2 2EDN7524 7 OUTA GND 3 6 VDD INB 4 5 OUTB
			4 V	Direct	2EDN7524R	2EDN7524RXUMA1	
de Ale				Inverted	2EDN7523R	2EDN7523RXUMA1	
Parling To	TSSOP 8pin		4 V	Direct	2EDN7424R	2EDN7424RXUMA1	
11707			8 V	Direct	2EDN8524R	2EDN8524RXUMA1	
				Inverted	2EDN8523R	2EDN8523RXUMA1	
G hills				Direct	2EDN7524G	2EDN7524GXTMA1	
	WSON 8pin		4 V	Inverted	2EDN7523G	2EDN7523GXTMA1	

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EiceDRIVER™ 2EDi product portfolio

Part number	Orderable part number (OPN)	Package	PWM Input type	Driver source/ Sink current	Gate driver UVLO	Input to output isolation				Dead-
						Isolation class	Rating	Surge testing	Safety certification*	time control
2EDF7275F	2EDF7275FXUMA1	NB- DSO16 10 x 6 mm LGA13 5.0 x 5.0 mm	Dual Mode (IN_A, IN_B)	4 A/8 A	4 V	Functional	VIO =1.5 kVDC	n.a.	n.a.	no
2EDF7175F	2EDF7175FXUMA1			1 A/2 A						
2EDF7275K	2EDF7275KXU- MA1			4 A/8 A						
2EDF7235K	2EDF7235KXU- MA1									yes
2EDS8265H	2EDS8265HX- UMA1				8 V					
2EDS8165H	2EDS8165HX- UMA1			1 A/2 A		Reinforced*	VIOTM = 8 kVpeak (VDE0884-1x) VISO = 5.7 kVrms (UL1577)	VIOSM = 10 kVpeak (IEC60065)	VDE0884-10 UL1577 IEC60950 IEC62368 CQC	no

^{*}Certification pending (expected Q3/2018)



Infineon support for high voltage MOSFETs and industrial gate driver ICs

Useful links and helpful information

Further information, datasheets and documents

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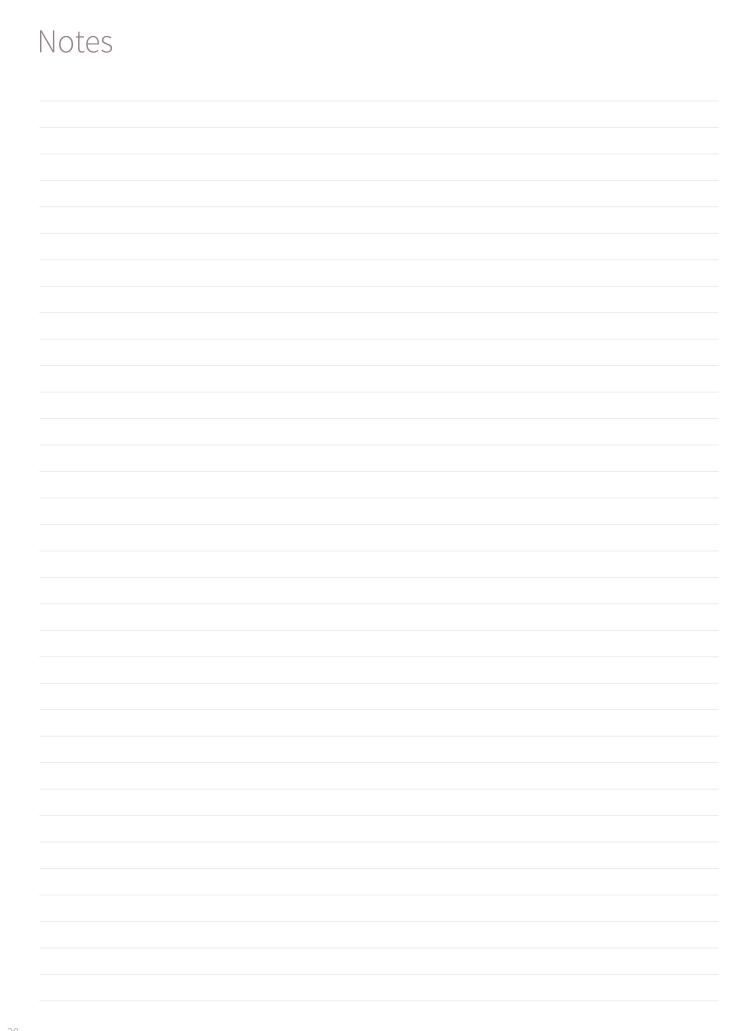




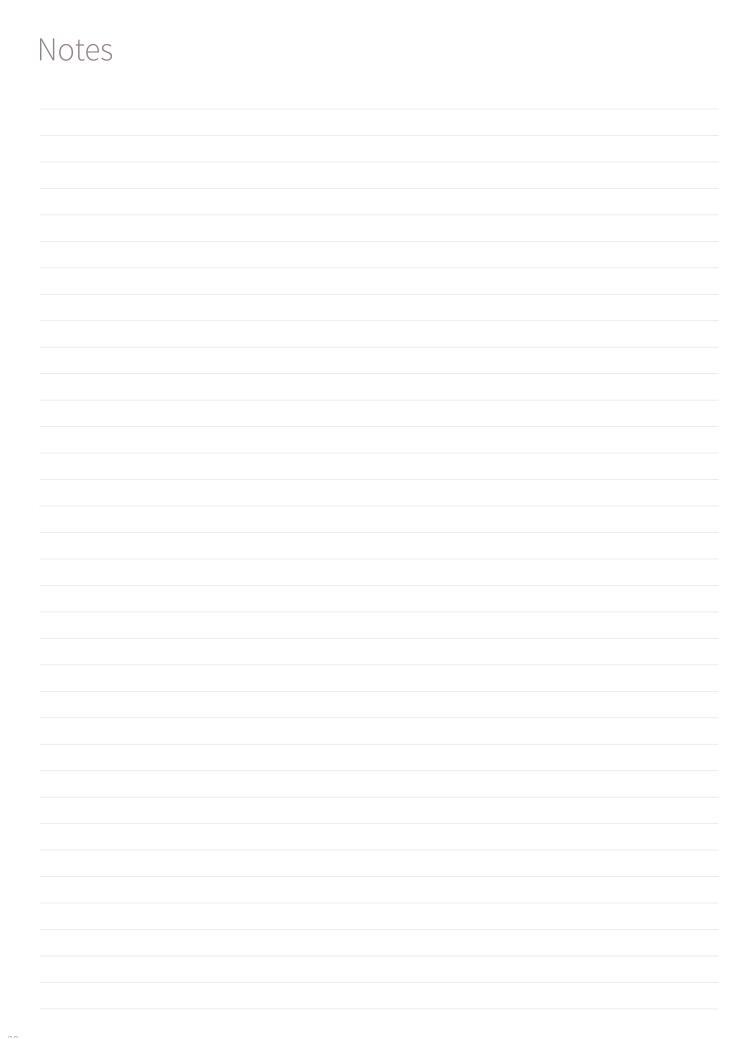








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