

CoolSiC™ MOSFET 1700 V in SMD packages – "Less is the new more"







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가상부스에 오신 걸 환영합니다!



1200 V – 1700 V CoolSiC™ MOSFET portfolio and upcoming products



	$R_{DS(on)}$ [mΩ]	TO-247 3 	TO-247 4 	D ² PAK-7L  Coming Soon	D ² PAK-7L extended creepage  New
1200 V	30	IMW120R030M1H	IMZ120R030M1H	IMBG120R030M1H	
	45	IMW120R045M1	IMZ120R045M1	IMBG120R045M1H	
	60	IMW120R060M1H	IMZ120R060M1H	IMBG120R060M1H	
	90	IMW120R90M1H	IMZ120R090M1H	IMBG120R090M1H	
	140	IMW120R140M1H	IMZ120R140M1H	IMBG120R140M1H	
	220	IMW120R220M1H	IMZ120R220M1H	IMBG120R220M1H	
	350	IMW120R350M1H	IMZ120R350M1H	IMBG120R350M1H	
1700 V	450				IMBF170R450M1
	650				IMBF170R650M1
	1000				IMBF170R1K0M1

Available / In pipeline: samples Q4 CY 2019, release 2020

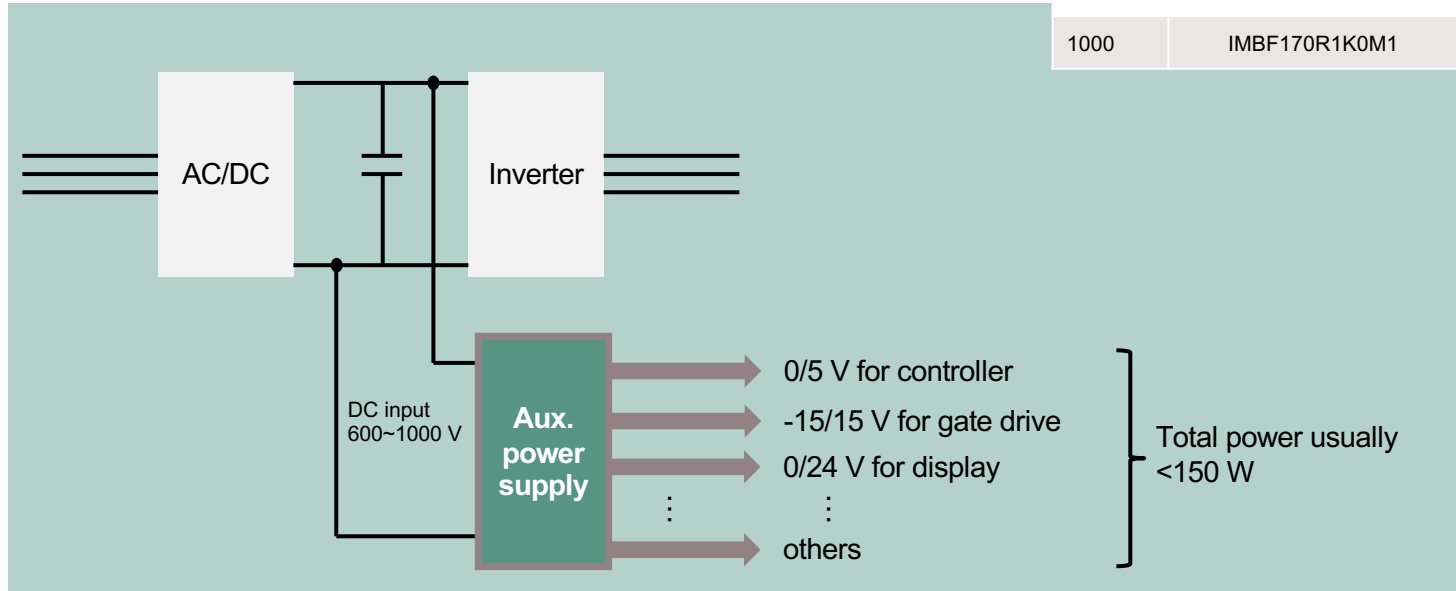
Infiniteon's first CoolSiC™ MOSFET portfolio in 1700 V class targets the auxiliary power supply



... and all kinds of 400 V_{AC} industrial equipment



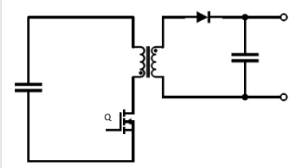
$R_{DS(on)}$ [mOhm]	1700 V CoolSiC™ MOSFET D ² PAK-7 extended creepage	Output power range
450	IMBF170R450M1	100 ~ 150 W
650	IMBF170R650M1	60 ~ 100 W
1000	IMBF170R1K0M1	< 70 W



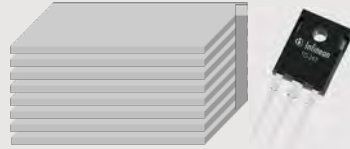
1700 V CoolSiC™ MOSFET is industry solution of choice for low-power auxiliary circuits



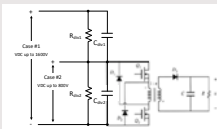
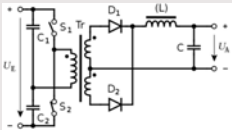
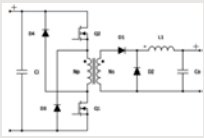
Reality with silicon devices



Low efficiency and challenges with V_{DS} derating margin limit the use



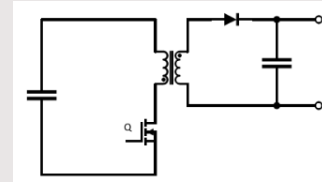
Main switch assembly:
Heatsink + TO-247



Main switch assembly: **Heatsink + 2 pcs TO-247 + 2 pcs TIM**

Complex work-around designs for efficiency
 V_{DS} derating margin limits the use to
 $V_{DC} \leq 800$ V systems

1700 V CoolSiC™ simplicity



Simple converter at high efficiency
Up to V_{DC} 1000 V systems
 V_{DS} derating margin up to 15%



Main switch assembly: **TO-263-7 SMD soldering, thermal vias in PCB**



Perfect fit gate-source voltage compatible with PWM controller

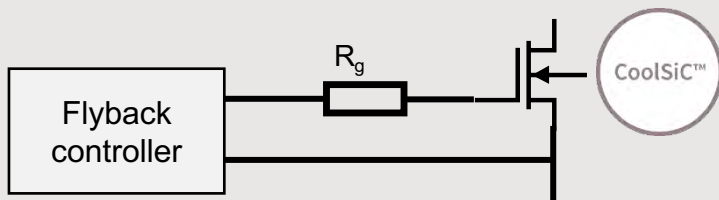
Best match



1700 V SiC MOSFETs	Recommended gate voltage
Infineon CoolSiC™	0/12 V~15 V

Available flyback controllers have 12 V-14.5 V gate voltage output

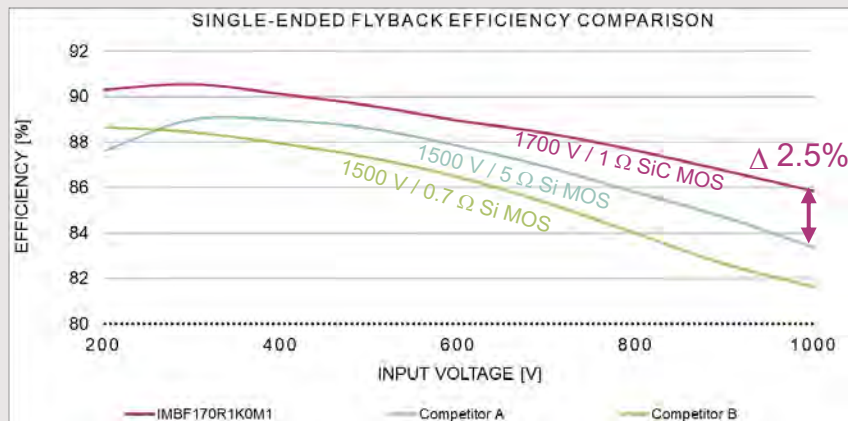
NCP1207	Increases with V_{cc}
NCP1339	0/12 V
NCP1379	0/13 V
FAN604H	0/14.5 V
L6565	$0/V_{cc} - 2$ V
UCC28600	0/13 V
UCC28C44	Change with V_{cc}
LM5023	0/12.9 V



- › Directly driven with flyback controller
- › No gate driver needed!

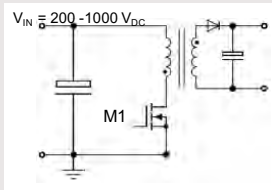
Combining the best of SiC in new Infineon SMD package: Low losses with extended creepage and clearance

Optimized switching performance 2.5% higher efficiency



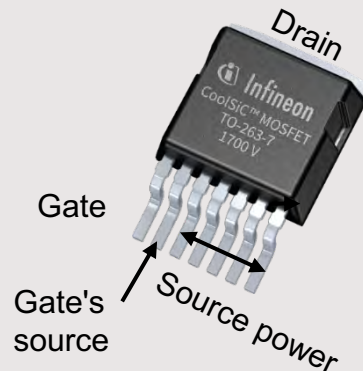
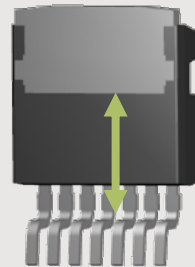
Test conditions:

- 62 W evaluation board:
"REF_62W_FLY_1700V_SiC"
- V_{in} : 200 – 1000 V_{DC}
- F_{sw} = 80 kHz, QR mode
- DUT M1, R_G : 47 Ω(SiC), 4.7 Ω(Si)



Reduced isolation effort on PCB due to extended creepage and clearance

Extended creepage
distance > 7 mm



1700 V D²PAK-7L

IMBF170RxxxM1

Creepage: >7.1 mm

Clearance: >7.1 mm

Key features	Benefits	Value
1700 V blocking voltage	<ul style="list-style-type: none"> › No concerns on voltage stress margins › Optimized for flyback topologies › Perfect fit gate-source voltage, compatible with common flyback controllers › 50% lower losses and 2.5% higher efficiency versus 1500 V Si MOSFETs › 0.6% higher efficiency compared to other 1700 V SiC MOSFETs › SMD assembly with natural convection cooling without the need for a heatsink › Reduced isolation effort 	Simple single-ended flyback even up to 1000 V _{DC}
0 V / +12...15 V gate source voltage		No gate driver needed
CoolSiC™ trench technology for lowest FOM $R_{DS(on)} * Q_g$		Reliable system
SMD package with enhanced creepage and clearance distances, >7 mm on PCB		Easy assembly with no heatsink

62.5 W auxiliary supply for three-phase power converter

What have we got for you?

Key features of the evaluation board

- › Wide input voltage range (200 – 1000 V)
- › Multiplexed output of +/-15 V and +24 V
- › Simple QR flyback topology with low EMI noise
- › Compact layout with high power density
- › Maximum efficiency up to 90.56% at full load
- › Optimized reference PCB layout with good thermal performance and reinforced insulation

Content

- › **Sales product name:**
REF_62W_FLY_1700V_SiC
- › **OPN:** REF62WFLY1700VSIC
- › **SP number:** SP005422632

See the benefits for yourself



Summary



CoolSiC™ MOSFET 1700 V in SMD packages – a new level of simplicity and safety in high-voltage auxiliary circuitry

Less losses enabled by CoolSiC™ trench technology

Less complicated designs – **Less** parts on your BOM

Less is the new more

For more product information, please visit

Webpage: www.infineon.com/coolbic-mosfet

Forum: [www.infineonforums.com/forums/34-silicon-carbide-\(SiC\)-forum](http://www.infineonforums.com/forums/34-silicon-carbide-(SiC)-forum)



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