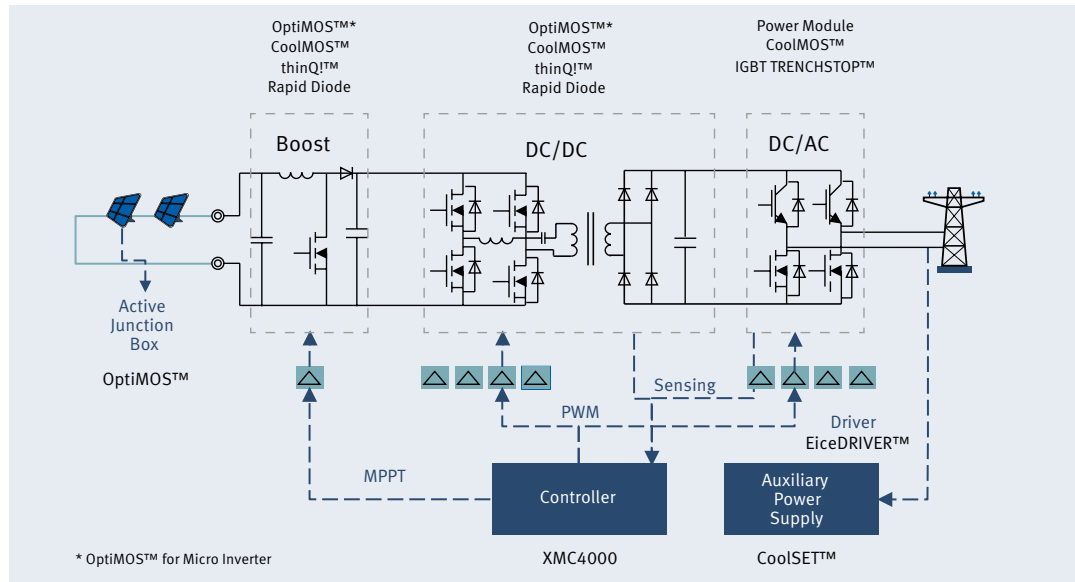




## Infineon Solar Power Solutions

# Infineon leading products for Complete Solar Power Solution



Infineon provides a comprehensive portfolio to deliver the best efficiency and reliability for solar applications. Infineon's leading edge technology like Superjunction MOSFET, Trench + Fieldstop IGBT, Coreless transformer driver, etc, combined with rich experience and highest quality, ensured our No.1 position in solar application. The newest add ARM® Cortex™-M4 based MCU enables easy and high efficiency design.

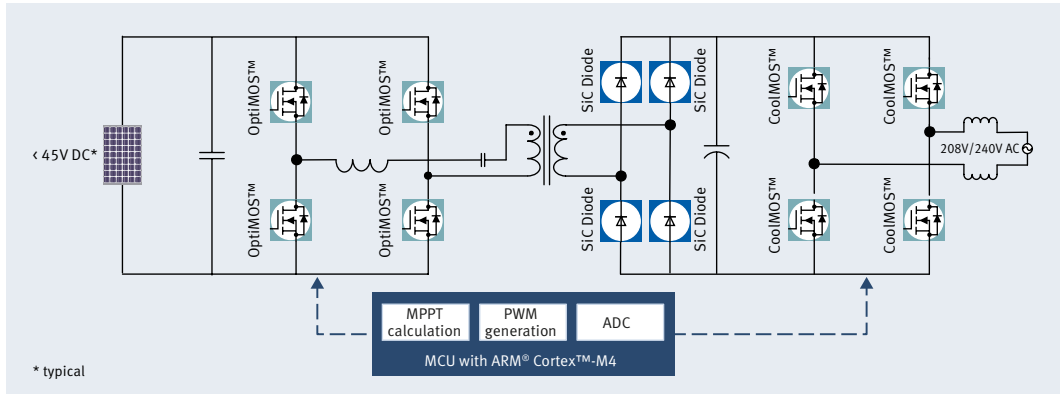
Solar power conversion has three distinctive requirements:

- **System cost down:** Inverters manufacturers will continuously optimize \$/w on system level.
- **System efficiency:** Efficiency is key for return of investment.
- **Reliability:** 5+years warranty for string inverters and 25 years for micro inverter and optimizer.

Infineon addresses above solar requirements with the best semiconductor solutions.

- **System cost down**
  - Increasing switching frequency enables cost reduction on magnetic, housing, cooling, etc.  
Infineon next generation CoolMOST™ C7 and IGBT TRENCHSTOP™5 provide high frequency possibility.
  - Infineon CoolMOST™ P6 and TRENCHSTOP™5 offer superior price performance balance.
- **Efficiency**
  - Infineon CoolMOST™ C7 offers industry highest efficiency at hard switching, CoolMOST™ CFD2 and upcoming Infineon CoolMOST™ P6 offer optimized efficiency across whole load for soft switching.
  - Infineon New OptiMOST™ has lowest  $R_{DS(on)}$  in same package, 50% less gate drive charge than competitor, offers the highest efficiency across the whole load condition.
- **Reliability**
  - Infineon has long industry experience in Si & SiC devices and power module production with highest reliability record
  - Infineon EiceDRIVER™ with coreless transformer technology offers isolation safety and stable life time performance
  - Infineon PressFIT for highest contact reliability

# Infineon Micro Inverter Solution



Micro inverter performs panel level DC-AC conversion, monitoring and communication to increase system efficiency and drive down system maintenance cost.

Infineon OptiMOS™ in SS08 package provides the highest power conversion efficiency and compact design, Infineon CoolMOS™ series provide highest efficiency and ThinPAK 8x8 offers compact design. Infineon Microcontroller has built-in high resolution PWM and high accuracy ADC, which enables precise digital control.

## Infineon OptiMOS™ for Micro Inverter<sup>1)</sup>

$V_{in}$	Topology	$V_{ds}$	OptiMOS™
Up to 48V	Half-Bridge	60V	BSC016N06NS
Up to 48V	Full-Bridge	60V	BSC028N06NS
Up to 64V	Full-Bridge	80V	BSC047N08NS3 G
Up to 60V	Flyback	150V	BSC190N15NS3 G

- Highest conduction efficiency in same package
- Highest switching efficiency with low gate charge
- Compact design and low EMI



## Infineon CoolMOS™ for Micro Inverter<sup>1)</sup>

Topology	Package	$V_{ds}$	CoolMOS™
Current Source	D <sup>2</sup> Pak	800V	SPB17N80C3
Current / Voltage Source	D <sup>2</sup> PAK	650V	IPB65R190C6
	ThinPAK	600V	IPL60R210P6 <sup>2)</sup>

- Highest efficiency with robust body diode
- Compact design and low EMI



## Infineon thinQ!™ SiC Diode for Micro Inverter<sup>1)</sup>

Topology	Package	$V_{ds}$	thinQ!™
Rectification	DPAK	600V	IDD05SG60C

- Zero reverse recovery charge

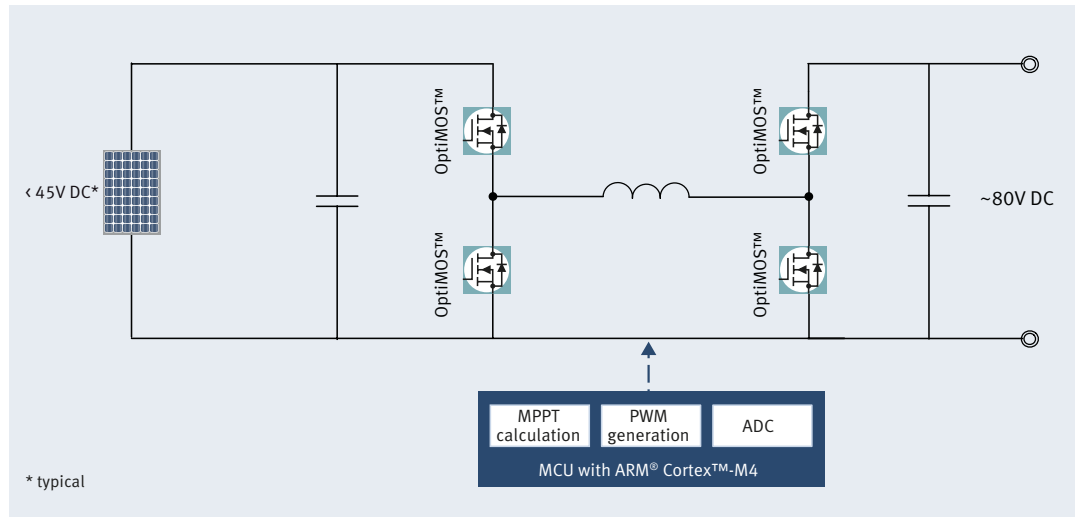
## InfineonXMC4000 for Maximum Power Point Tracking and PWM control

- ARM® Cortex™-M4 with floating point unit (FPU), single-cycle DSP MAC, 80-120 MHz CPU frequency
- 4-channel high-resolution, PWM (150 ps) (XMC4400, XMC4200, XMC4100)
- Up to 4x 12-bit ADC achieving 4 Mega samples per second (interleaved mode)
- DAVE3™ – Free Development Platform

<sup>1)</sup> Most common used part numbers. Other voltage / current rating / package available at  
[www.infineon.com/optimos](http://www.infineon.com/optimos)  
[www.infineon.com/coolmos](http://www.infineon.com/coolmos)  
[www.infineon.com/sic](http://www.infineon.com/sic)

<sup>2)</sup> Available in Q4 2013

# Infineon Optimizer Solution



Optimizer performs panel level maximum power point tracking, monitoring and communication to increase system efficiency and drive down system maintenance cost.

Infineon OptiMOS™ in SS08 package for optimizer and DrMOS for nano optimizer provide the highest power conversion efficiency and compact design, ARM® Cortex™-M4 based XMC4000 series of Microcontroller provides high resolution PWM control and high accuracy integrated ADC.

## Infineon OptiMOS™ for Optimizer DC-DC Power Conversion<sup>1)</sup>

$V_{in}$	Topology	$V_{ds}$	OptiMOS™
up to 48V	Buck-Boost	60V	BSC028N06NS
up to 60V		75V	BSC042NE7NS3 G
up to 64V		80V	BSC047N08NS3 G
			BSC057N08NS3 G
up to 80V		100V	BSC060N10NS3 G

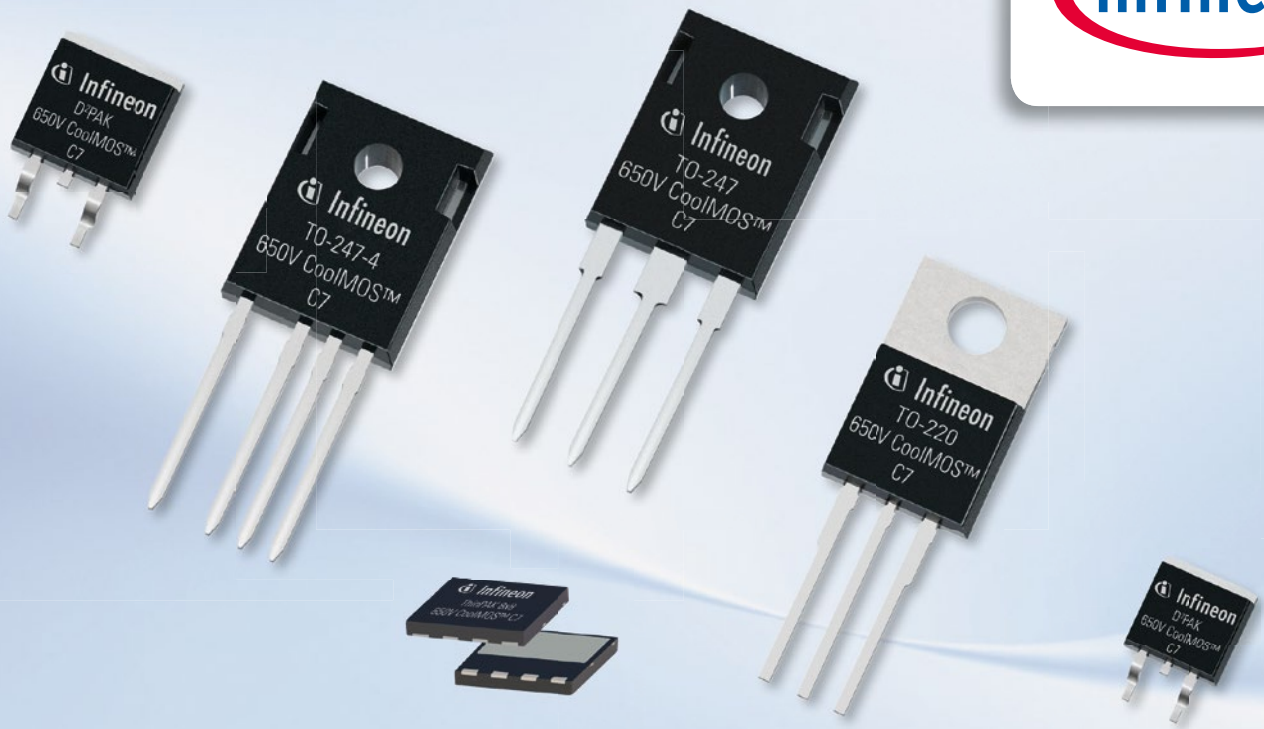
- Highest conduction efficiency in same package
- Highest switching efficiency with low gate charge and low output capacitance
- Compact design and low EMI



## InfineonXMC4000 for Maximum Power Point Tracking and PWM control

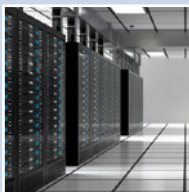
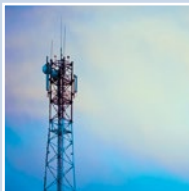
- ARM® Cortex™-M4 with floating point unit (FPU), single-cycle DSP MAC, 80-120 MHz CPU frequency
- 4-channel high-resolution, PWM (150 ps) (XMC4400, XMC4200, XMC4100)
- Up to 4x 12-bit ADC achieving 4 Mega samples per second (interleaved mode)
- DAVE3™ – Free Development Platform

<sup>1)</sup> Most common used part numbers. Other voltage / current rating / package available at [www.infineon.com/optimos](http://www.infineon.com/optimos)



# 650V CoolMOS™ C7

Get in Touch with World Leading Performance



Infineon's new CoolMOS™ C7 series is a revolutionary step forward in technology, providing the world's lowest  $R_{DS(on)}$ /package to hard switching applications. The fast switching performance of C7 now enables switching frequencies greater than 100kHz whilst achieving titanium levels of efficiency in Server PFC stages. This opens new ways for higher power density.

### Key features and benefits of new 650V CoolMOS™ C7

- Increased power density due to higher frequency operation
- Revolutionary Best-in-Class  $R_{DS(on)}$ /package
  - Enabling the world's lowest  $R_{DS(on)}$  of 19mΩ in a TO-247 and 45mΩ in TO-220 and D²PAK
- Low switching and conduction losses (improved  $Q_g$ ,  $E_{oss}$ ,  $Q_{oss}$ )
  - Leads to Efficiency improvements over full load range
- 650V makes it suitable for both SMPS and Solar



For further information please visit our website:  
[www.infineon.com/c7](http://www.infineon.com/c7)



# Infineon Solar Solution Selection Tree

Showing only solar dedicated devices. For complete po





Portfolio, check [www.infineon.com](http://www.infineon.com)

## Micro Inverter 200W - 300W

OptiMOS™  
SS08 | 60V-200V

CoolMOS™  
D<sup>2</sup>PAK/ThinPAK  
600V-800V

thinQ!™  
ThinPAK/DPAK | 650V/1200V

MCU: XMC4100/4200

## Stri 1

C  
TO247 | 600

TO-220/TO

Rap

EasyPAC

MCU: XM



## Power Inverter

10kW - 30kW

CoolMOS™

600V/650V | 19mΩ-99mΩ

thinQ!™

TO-247 | 650V/1200V

TRENCHSTOP™5/TRENCHSTOP™/HighSpeed 3  
600V/650V/1200V | TO-247 Single/DuoPack

Power Diode 1/2

TO247

Power MOSFET 1B/2B Press FIT

PrimePACK™/PrimeSTACK™/IHM-B  
EconoPACK™ 4/EconoDUAL™ 3, 62mm

IGBT Driver: 1ED020I12-F2, 2ED020I12-F2

BAT165 Schottky Diode

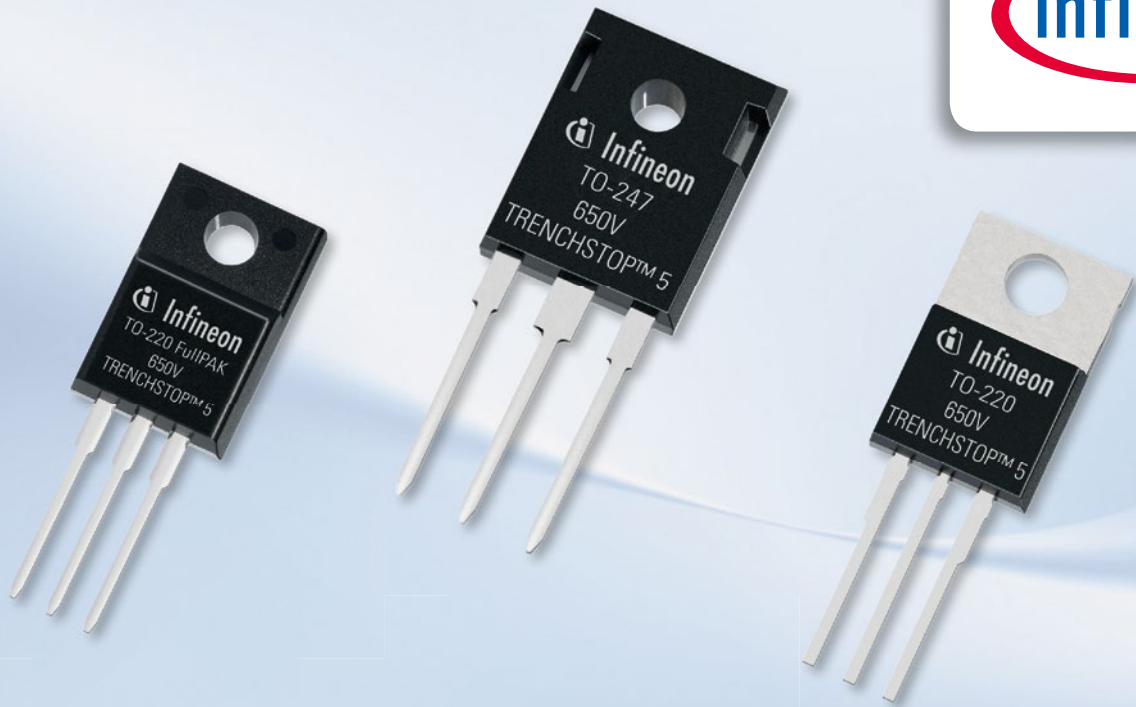
CoolSET™

800V

MC4400-XMC4500

MCU: XMC4700





## 650V TRENCHSTOP™5

Introducing a Technology to Match Tomorrow's High Efficiency Demands



The new TRENCHSTOP™5 IGBT technology from Infineon redefines the “Best-in-Class IGBT” by providing unmatched performance in terms of efficiency. When high efficiency, lower system costs and increased reliability are demanded, TRENCHSTOP™5 is the only option. The new TRENCHSTOP™5 IGBTs deliver a dramatic reduction in switching and conduction losses – for example in application measurement 1.7% efficiency improvement – whilst also offering a 650V breakthrough voltage. Can you afford to wait for the competition to catch up?

### Key features and benefits of the brand new 650V TRENCHSTOP™5 IGBT technology

- New benchmark in terms of Best-in-Class efficiency
- Lowest ever switching losses
- $V_{CE(sat)}$  more than 10% lower than previous generation
- 650V breakthrough voltage
- Temperature stable  $V_f$  value of Infineon's free-wheeling Rapid diode
- 2.5 factor lower  $Q_g$  compared to HighSpeed 3



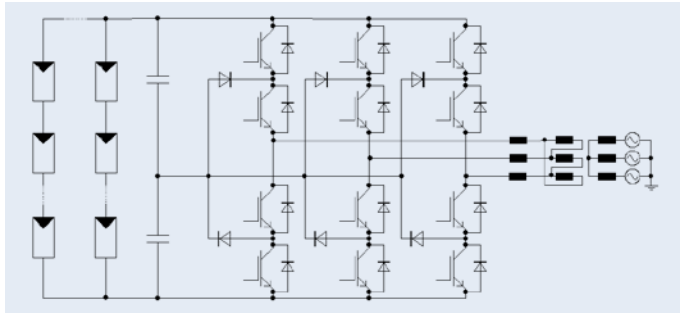
For further information please visit our website:

[www.infineon.com/trenchstop5](http://www.infineon.com/trenchstop5)

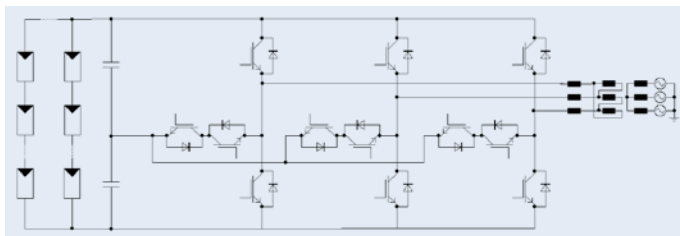


# Infinion Central Inverter Solution

Infinion provides modules and stacks for central inverters from several tenth of kVA up to MVA of output power. These include a broad portfolio of different packages with the relevant voltage classes, current ratings and topologies. Infineon's modules and stacks are designed to cope with the requirements regarding reliability and efficiency.<sup>1)</sup>



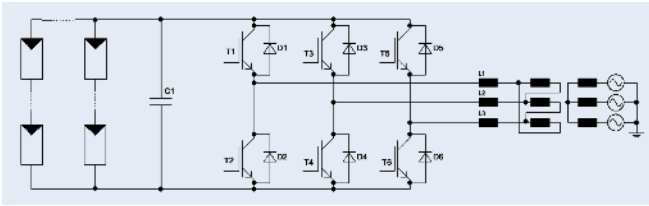
Sales Name	Sales Product Number	Package	Description
F3L200R07PE4	SP000711886	EconoPACK™ 4	3-Level NPC1, 650V, 200A
F3L300R07PE4	SP000711882	EconoPACK™ 4	3-Level NPC1, 650V, 300A
F3L400R07ME4_B22	SP000893966	EconoDUAL™ 3	Upper half of NPC1, 650V, 400A
F3L400R07ME4_B23	SP000893970	EconoDUAL™ 3	Lower half of NPC1, 650V, 400A
F3L300R12ME4_B22	SP000931254	EconoDUAL™ 3	Upper half of NPC1, 1200V, 300A
F3L300R12ME4_B23	SP000931258	EconoDUAL™ 3	Lower half of NPC1, 1200V, 300A



Sales Name	Sales Product Number	Package	Description
FF200R12KE4	SP000370604	62mm	Half-Bridge, 1200V, 200A
FF300R12KE4	SP000370620	62mm	Half-Bridge, 1200V, 300A
FF450R12KE4	SP000370610	62mm	Half-Bridge, 1200V, 450A
FF200R17KE4	SP000713374	62mm	Half-Bridge, 1700V, 200A
FF300R17KE4	SP000713528	62mm	Half-Bridge, 1700V, 300A
FF200R12KT3_E	SP000251629	62mm	Neutral branch of NPC2, 1200V, 200A
FF300R12KT3_E	SP000357408	62mm	Neutral branch of NPC2, 1200V, 300A
FF400R12KT3_E	SP000314729	62mm	Neutral branch of NPC2, 1200V, 400A
F3L400R07PE4_B26	SP000929978	EconoPACK™ 4	3-Level NPC2, 650V, 400A
F3L300R12PT4_B26	SP000929996	EconoPACK™ 4	3-Level NPC2, 1200V, 300A
F3L400R12PT4_B26	SP000929974	EconoPACK™ 4	3-Level NPC2, 1200V, 400A

<sup>1)</sup> For complete portfolio, check [www.infineon.com/powermodules](http://www.infineon.com/powermodules)

# Infinion Central Inverter Solution

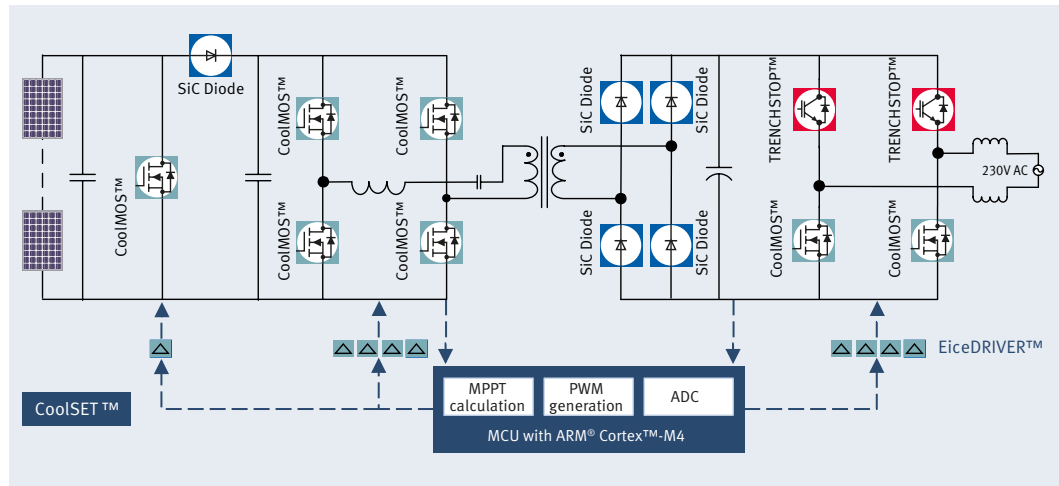


Sales Name	Sales Product Number	Package	Description
FF450R12IE4	SP000609746	PrimePACK™2	Half-Bridge, 1200V, 450A
FF600R12IE4	SP000614706	PrimePACK™2	Half-Bridge, 1200V, 600A
FF600R12IP4	SP000609754	PrimePACK™2	Half-Bridge, 1200V, 600A
FF900R12IE4	SP000614712	PrimePACK™2	Half-Bridge, 1200V, 900A
FF900R12IP4	SP000609750	PrimePACK™2	Half-Bridge, 1200V, 900A
FF1400R12IP4	SP000609758	PrimePACK™2	Half-Bridge, 1200V, 1400A
FF450R17IE4	SP000609596	PrimePACK™2	Half-Bridge, 1700V, 450A
FF650R17IE4	SP000614664	PrimePACK™2	Half-Bridge, 1700V, 650A
FF1000R17IE4	SP000609592	PrimePACK™2	Half-Bridge, 1700V, 1000A
FF1400R17IP4	SP000726974	PrimePACK™2	Half-Bridge, 1700V, 1400A
FZ1200R12HE4	SP000989586	IHM-B	Single-Switch, 1200V, 1200A
FZ1600R12HP4	SP000989532	IHM-B	Single-Switch, 1200V, 1600A
FZ2400R12HP4	SP000989472	IHM-B	Single-Switch, 1200V, 2400A
FZ3600R17HP4_B2	SP000478036	IHM-B	Single-Switch, 1700V, 3600A



Sales Name	Sales Product Number	Package	Description
2PS12012E33G27261	SP000235457	PS C3 air	Single phase stack, 1200V, 1200A
2PS18012E44G34421	SP000951714	PS C3 air	Single phase stack, 1200V, 1800A
2PS18012E44G37090	SP000957326	PS C3 air	Single phase stack, 1200V, 1800A
2PS18012E44G37576	SP000992676	PS C3 air	Single phase stack, 1200V, 1800A, cap box
2PS18012E44F34383	SP000763336	PS C3 air	Single phase stack, 1200V, 1800A, cap box, fan
2LS20017E42W36702	SP000934308	MS_C liquid	Single phase stack, 1700V, 2000A
6PS03012E33G34160	SP000724336	PS C3 air	3 phase inverter, 1200V, 300A, cap box
6PS04512E43G36013	SP000901000	PS C3 air	3 phase inverter, 1200V, 450A
6PS04512E43W38482	SP001059448	PS C3 liquid	3 phase inverter, 1200V, 450A
6PS09012E4DG35566	SP000878514	PS CD air	3 phase inverter, 1200V, 900A, cap box
6PS18012E4FG34676	SP000796402	PS CF air	3 phase inverter, 1200V, 1800A, cap box
6PS18012E4FG35689	SP000885246	PS CF air	3 phase inverter, 1200V, 1800A, cap box, fan

# Infinion String Inverter Solution



## Infinion Discrete Power Device for String Inverter<sup>1)</sup>

Inverter Type	Function	Product Series	Typical part number
single phase	Boost	CoolMOS™ CP/C7	IPW65R045C7
		thinQ!™ SiC Diode	IDW20G65C5
	DC-DC	CoolMOS™ C6	IPW65R041C6
		thinQ!™ SiC Diode	IDW20G65C5
		Rapid Diode	IDW15E65D2
	Inverter	TRENCHSTOP™	IKW50N60T
TRENCHSTOP™ 5		IKW40N65H5	
CoolMOS™ C6		IPW65R041C6	
three phase	Boost	TRENCHSTOP™	IKW40N120H3
		thinQ!™ SiC Diode	IDW30S120
	Inverter	TRENCHSTOP™	IKW40N120H3

- High efficiency power conversion
- Complete product portfolio for high performance and system cost optimization
- High reliability

## Infinion EiceDRIVER™ for String Inverter<sup>1)</sup>

Power Device	Driving Method	Voltage class	Typical part number
IGBT	Single channel	1200V	1ED020112-F2/B2
IGBT	Half Bridge	1200V	2ED020112-FI

- Enables high efficiency design
- Coreless transformer technology offers longer lifetime reliability

## Infinion CoolSET™ for String Inverter<sup>1)</sup>

$V_{ds}$	Typical part number
800V	ICE3AR2280JZ
650V	ICE3BR1765JZ

- Lowest standby consumption

<sup>1)</sup> Most common used part numbers. Other voltage / current rating/ package available at  
[www.infineon.com/coolmos](http://www.infineon.com/coolmos)  
[www.infineon.com/sic](http://www.infineon.com/sic)  
[www.infineon.com/igbt](http://www.infineon.com/igbt)  
[www.infineon.com/eicedriver](http://www.infineon.com/eicedriver)  
[www.infineon.com/coolset](http://www.infineon.com/coolset)

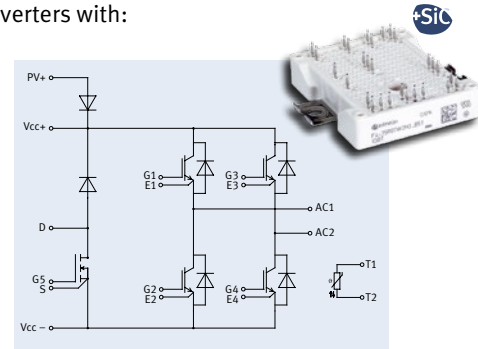
# Infineon String Inverter Solution

## Single-phase Photo-voltaic Inverter Modules <sup>1)</sup>

An entire PV inverter can be realized by using a single Easy 2B module. The modules incorporate an H-bridge as well as a booster and a bypass diode. These modules are applicable for PV Inverters with:

- High max. DC voltages, as 650 V chips are used
- Wide input voltage range, as booster is included
- Efficiency: approx. 97 %
- Reactive power capability
- Excellent price performance ratio
- Single standard topology
- 650V IGBTs / Diodes / MOSFET / SiC Schottky Diode

Sales Name	Sales Product Number	Package	Description
F4-50R07W2H3_B51	SP000908430	Easy2B PressFIT	Integrated Booster / Inverter Module (1–4 kVA)
F4-75R07W2H3_B51	SP000908422	Easy2B PressFIT	Integrated Booster / Inverter Module (3–8 kVA)



## Three-phase Photo-voltaic Inverter Modules <sup>1)</sup>

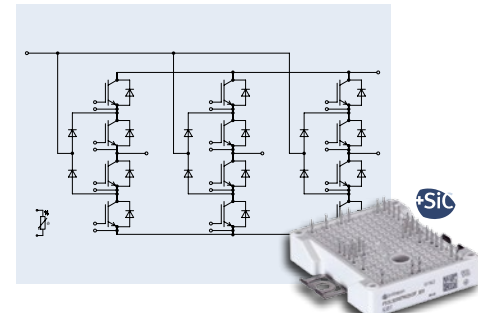
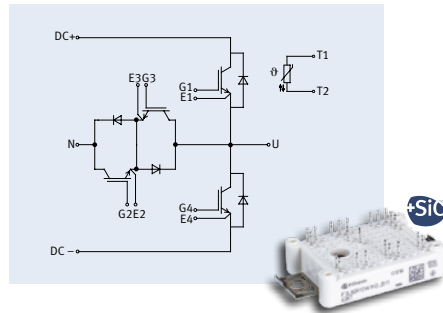
Booster modules and inverter modules are available. These modules are applicable for PV Inverters with:

- Max. DC Input Voltage: 1.000 V
- Max. Efficiency: 98 % + x
- Output power up to: 25 kVA

### Inverter Modules

Advantages:

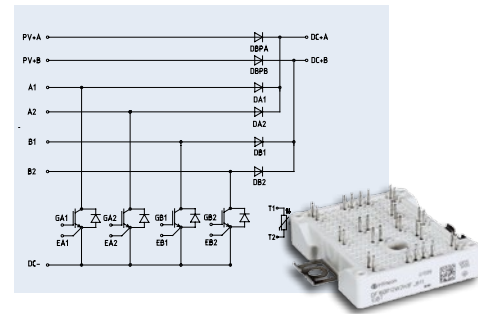
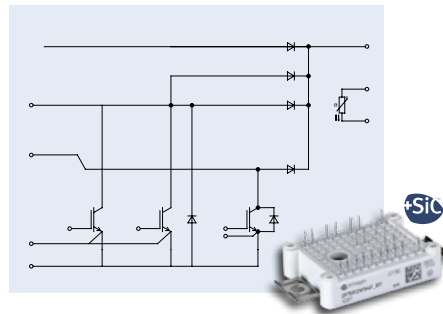
- Excellent efficiency and performance
- Full reactive power capability of PV inverter is supported
- Fully integrated module for 3-phase applications up to 9 kVA
- Phase leg module for applications up to 25 kVA



### Booster Modules

Advantages:

- 3 module types with SiC diodes available (F version)
- Up to four MPP-Trackers possible using one module



Sales Name	Sales Product Number	Package	Pin	Description	
Inverter Modules	FS3L30R07W2H3F_B11	SP000944592	Easy 2B PressFIT	PressFIT	Inverter Module (7 kVA)
	FS3L50R07W2H3F_B11	SP000944582	Easy 2B PressFIT	PressFIT	Inverter Module (9 kVA)
	F3L80R12W1H3_B11	SP000908418	Easy 1B PressFIT	PressFIT	Inverter Phase Leg Module (25 kVA)
Booster Modules	DF75R12W1H4F_B11	SP001080544	Easy 1B PressFIT	PressFIT	Booster Module (10 kVA fast)
	DF80R12W2H3_B11	SP000948772	Easy 2B PressFIT	PressFIT	Booster Module (10 kVA)
	DF80R12W2H3F_B11	SP000908732	Easy 2B PressFIT	PressFIT	Booster Module (10 kVA fast)
	DF160R12W2H3_B11	SP000944548	Easy 2B PressFIT	PressFIT	Booster Module (20 kVA)
	DF160R12W2H3F_B11	SP000908738	Easy 2B PressFIT	PressFIT	Booster Module (20 kVA fast)

<sup>1)</sup> for complete portfolio, check [www.infineon.com/string](http://www.infineon.com/string)

## Ask Infineon. Get connected with the answers.

Where you need it. When you need it.

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

Our global connection service goes way beyond standard switchboard services by offering qualified support on the phone. Call us!

- 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)

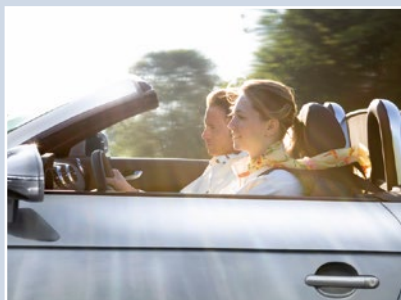
\* Please note: Some countries may require you to dial a code other than "00" to access this international number, please visit [www.infineon.com/service](http://www.infineon.com/service) for your country!

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Please use our location finder to get in contact with your nearest Infineon distributor or sales office.

[www.infineon.com/WhereToBuy](http://www.infineon.com/WhereToBuy)

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Order Number: B152-H9805-X-X-7600-DB2012-0020  
Date: 04 / 2013

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For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

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