

# FlatPower schottky rectifiers

## Small on size - big on power



Nexperia's FlatPower packages with clip-bond technology meet the demand for thinner products with high power capabilities. Today a range of more than 40 medium power schottky rectifiers are housed in CFP3 (SOD123W) and CFP5 (SOD128). They offer high power ratings similar to standard SMA/SMB packages but occupy only half of the PCB area.

### Key features

- › Very low forward voltage drop  $V_F$
- › High forward current capability  $I_F$
- › High power capability  $P_{tot}$  due to new clip-bonding technology and optimized die design
- › Junction temperature up to 175 °C

### Key benefits

- › Highest values for power capability
- › Highly energy efficient
- › Very small dimensions/low profile for economical use of space
- › Pad layout compatible with SMA/SMB for easy drop-in replacement
- › Capable of automatic optical inspection (AOI)
- › AEC-Q101 qualified

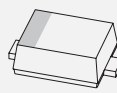
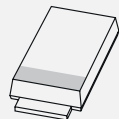
### Body dimensions

- › CFP3 (SOD123W): 2.6 x 1.7 x 1.0 mm
- › CFP5 (SOD128): 3.8 x 2.5 x 1.0 mm

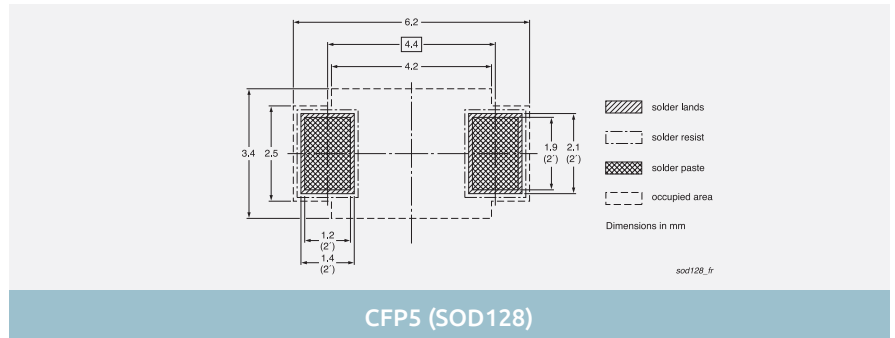
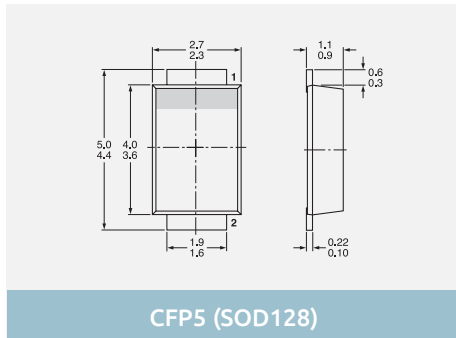
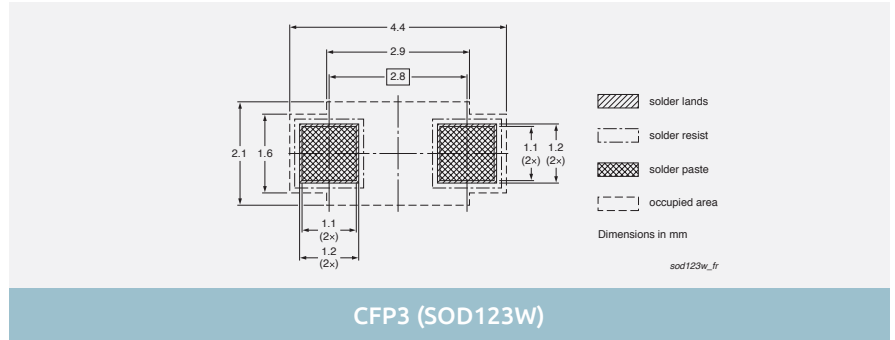
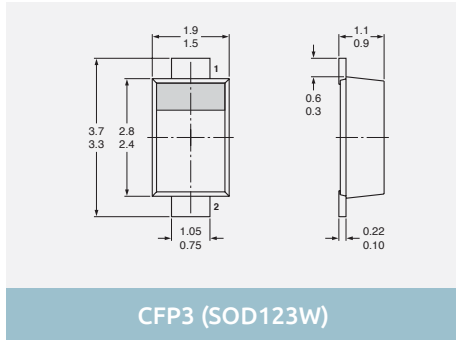
### Key applications

- › Power management circuits, especially DC/DC converters
- › Step-down and asynchronous converters
- › Free-wheeling diodes for inductive loads in motors and relays
- › High-temperature applications

## Medium power low $V_F$ (MEGA) schottky rectifiers single $\geq 1$ A - FlatPower packages

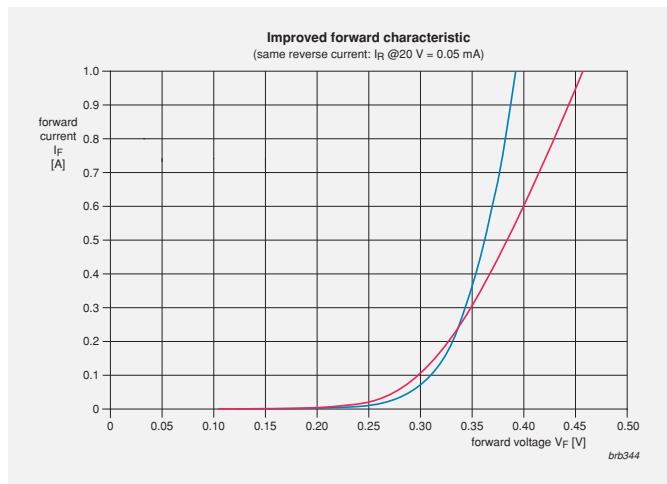
I <sub>F</sub> max (A)	V <sub>R</sub> max (V)	V <sub>F</sub> max (mV) @ I <sub>F</sub> max	I <sub>R</sub> max (mA) @ V <sub>R</sub> max	Package	CFP3 (SOD123W)	CFP5 (SOD128)
						
				Size (mm)	2.6 x 1.7 x 1.0	3.8 x 2.5 x 1.0
				P <sub>tot</sub> (mW) @ 1 cm <sup>2</sup>	950	1050
Optimization						
1	20	340	1	Low <sub>VF</sub>	PMEG2010ER	
		450	0.05	Low <sub>IR</sub>	PMEG2010ER	
	30	360	1.5	Low <sub>VF</sub>	PMEG3010ER	PMEG3010EP
		450	0.05	Low <sub>IR</sub>	PMEG3010BER	PMEG3010BEP
	40	490	0.05	Low <sub>VF</sub>	PMEG4010ER	PMEG4010EP
		490	0.05	Low <sub>VF</sub>	PMEG4010ETR	PMEG4010ETP
		505	0.01	Low <sub>VF</sub> /Low <sub>IR</sub>	PMEG40T10ER	
	60	530	0.06	Low <sub>VF</sub>	PMEG6010ER	PMEG6010EP
		530	0.06	Low <sub>VF</sub>	PMEG6010ETR	
		660	0.0003	Low <sub>IR</sub>	PMEG6010ELR	
100	770	0.00015	Low <sub>IR</sub>	PMEG10010ELR		
2	30	360	3	Low <sub>VF</sub>		PMEG3020EP
		420	1.5	Low <sub>VF</sub>	PMEG3020ER	PMEG3020CEP
		450	0.1	Low <sub>IR</sub>		PMEG3020BEP
		520	0.05	Low <sub>IR</sub>	PMEG3020BER	PMEG3020DEP
	40	490	0.1	Low <sub>VF</sub>	PMEG4020ER	PMEG4020EP
		490	0.1	Low <sub>VF</sub>	PMEG4020ETR	PMEG4020ETP
		535	0.014	Low <sub>VF</sub> /Low <sub>IR</sub>	PMEG40T20ER	PMEG40T20EP
	60	530	0.2	Low <sub>VF</sub>	PMEG6020ER	PMEG6020EP
		530	0.2	Low <sub>VF</sub>	PMEG6020ETR	PMEG6020ETP
		680	0.0007	Low <sub>IR</sub>	PMEG6020AELR	PMEG6020AELP
		760	0.0003	Low <sub>IR</sub>	PMEG6020ELR	
	100	770	0.0003	Low <sub>IR</sub>	PMEG10020AELR	PMEG10020AELP
		830	0.00015	Low <sub>IR</sub>	PMEG10020ELR	
3	30	360	5	Low <sub>VF</sub>		PMEG3030EP
		450	0.15	Low <sub>IR</sub>		PMEG3030BEP
	40	490	0.2	Low <sub>VF</sub>		PMEG4030EP
		490	0.2	Low <sub>VF</sub>		PMEG4030ETP
		535	0.02	Low <sub>VF</sub> /Low <sub>IR</sub>	PMEG40T30ER	PMEG40T30EP
		540	0.1	Low <sub>IR</sub>	PMEG4030ER	
	60	530	0.2	Low <sub>VF</sub>		PMEG6030EP
		475	0.4	Low <sub>VF</sub>		PMEG6030EVP
		530	0.2	Low <sub>VF</sub>		PMEG6030ETP
		690	0.001	Low <sub>IR</sub>		PMEG6030ELP
100	770	0.00045	Low <sub>VF</sub>		PMEG10030ELP	
4.5	60	530	0.4	Low <sub>VF</sub>		PMEG6045ETP
5	30	360	8	Low <sub>VF</sub>		PMEG3050EP
		450	0.25	Low <sub>IR</sub>		PMEG3050BEP
	40	490	0.3	Low <sub>VF</sub>		PMEG4050EP
		490	0.3	Low <sub>VF</sub>		PMEG4050ETP
		545	0.032	Low <sub>VF</sub> /Low <sub>IR</sub>		PMEG40T50EP

Minimized outline and reflow soldering footprint

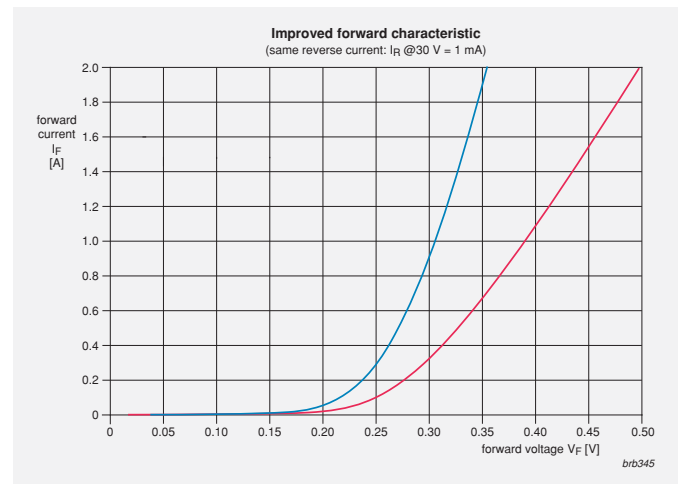


### Improved forward characteristics of low $V_F$ (MEGA) schottky rectifiers

Nexperia low  $V_F$  Maximum Efficiency General Applications (MEGA) schottky rectifiers in new FlatPower CFP3 compared to wire-bonded package.



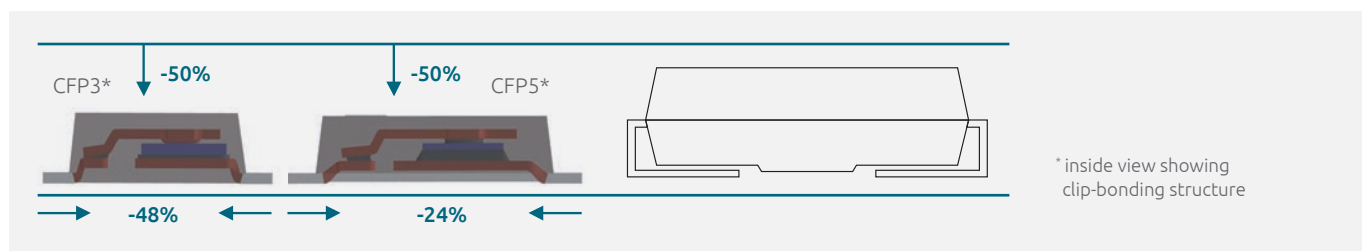
— PMEG2010BER with clip-bond technology  
— Equivalent type 20 V/1 A with wire-bond technology



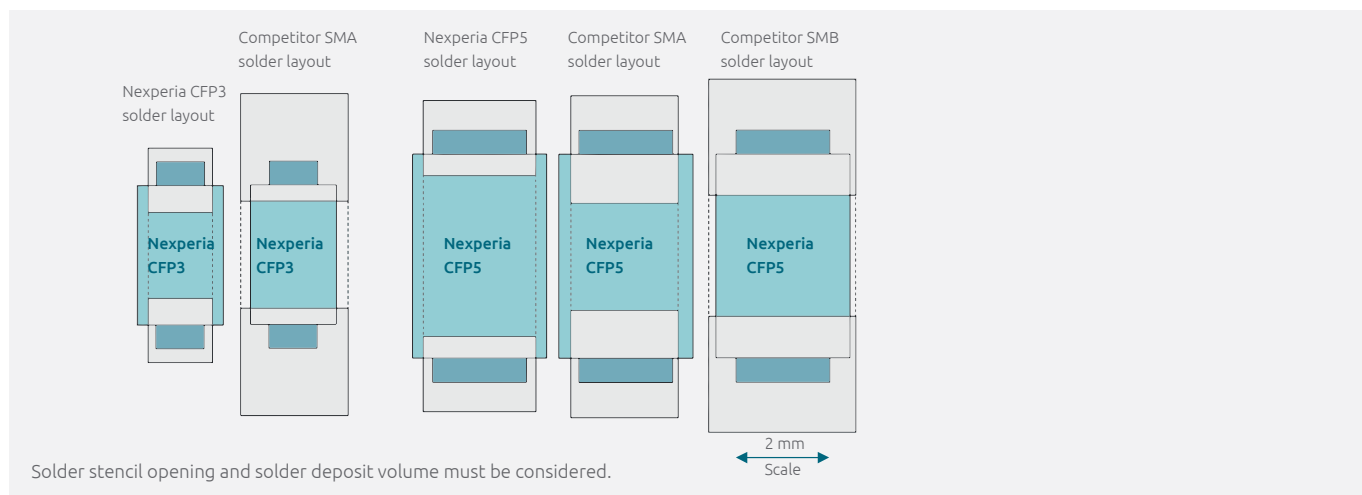
— PMEG3020ER with clip-bond technology  
— Equivalent type 30 V/2 A with wire-bond technology

## FlatPower versus SMA/SMB packages: easy drop-in replacements

Typical deviation from SMA/SMB



## Footprint comparison: Nexperia CFP3/CFP5 on recommended solder pad



## Market comparison

Nexperia low  $V_F$  (MEGA) schottky rectifier in CFP3/CFP5 compared with rectifiers in SMA/SMB packages

Supplier	Type range in CFP3/CFP5/SMA package	$I_R$ max (A)	$V_R$ max (V)	Body dimensions (mm)
Nexperia	PMEGxER/BER	1, 2, 3	20, 30, 40, 60	2.6 x 1.7 x 1.0
Nexperia	PMEGxEP/BEP	1, 2, 3, 5	30, 40, 60	3.8 x 2.5 x 1.0
Diodes Inc.	B1x/B2x0A/B3xA	1, 2, 3	20, 30, 40, 60	4.3 x 2.6 x 2.15
MCC	SSx-LT/SK3xA-LT			4.3 x 2.58 x 2.22
ON Semi	MBRA1x/SS16/BRAX			4.32 x 2.6 x 2.17
ROHM	RSXx/RBx			4.5 x 2.6 x 2.0
Vishay	Bx(L)A/SS(A)x			4.25 x 2.6 x 2.1
Diotec	SK1x/SK3xSMA			4.6 x 2.7 x 2.1
Fairchild	SS1x/FMKAx	1	30, 40, 60	4.38 x 2.73 x 2.05
KEC	SMAB3x	3		4.5 x 2.6 x 2.0

Supplier	Type range in CFP5/SMB package	$I_R$ max (A)	$V_R$ max (V)	Body dimensions (mm)
Nexperia	PMEGxEP/BEP	1, 2, 3, 5	30, 40, 60	3.8 x 2.5 x 1.0
Diodes Inc.	B340LB	3	40	4.32 x 3.62 x 2.31
ON Semi	MBRSx/SS26	1, 2	30, 40, 60	4.32 x 3.56 x 2.13
Vishay	SL23/SS2x/B3x(L)B	2, 3	30, 40, 60	4.32 x 3.62 x 2.29
Fairchild	SSx/MBRS140	1, 2	30, 40, 60	4.4 x 3.63 x 2.18

→ Nexperia advantage: Smallest package with competitive electrical characteristics. For CFP5 types, broadest forward-current range from 1 - 5 A.

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