



## Power Gallium Nitride (GaN) FETs

### Efficient and effective power FETs

Whether for low- or high-power conversion applications, power Gallium Nitride FETs (GaN FETs) are increasingly making their way into mainstream markets. For a variety of 650 V and 150 V applications GaN FETs deliver the fastest transition / switching capability (highest  $dv/dt$  and  $di/dt$ ), and best power efficiency. Additionally, Nexperia power GaN FETs bring enhanced power density through reduced conduction and switching losses.

Nexperia GaN FETs are available in 2 configurations:

#### Enhancement mode (e-mode)

(for  $\leq 150$  V high-power & 650 V low-power applications)

- › Enhancement mode transistor-normally off power switch
- › Ultra-high switching frequency
- › Leading soft-switching performance
- › No reverse-recovery charge
- › Low gate charge, low output charge
- › High performance (>99% efficiency)
- › Tight dynamic characteristics
- › Easy to drive, 0 to 5 V gate drive
- › Qualified for industrial applications according to JEDEC standard

#### Key applications $\leq 150$ V high-power

- › 400 V-48 V LLC converter for datacenters
- › 48 V to POL direct conversion
- › Power supply (AC/DC) fast-charging for e-mobility
- › USB-C power delivery fast-charging for portables
- › LiDAR (non-automotive)
- › Class D audio amplifiers

#### Key applications 650 V low-power

- › Datacom and telecom (AC/DC and DC/DC)
- › Photovoltaic (PV) micro inverter (DC/AC)
- › Industrial (DC/AC)
- › BLDC / micro servo motor drives
- › LED driver
- › TV power supply unit (PSU)

#### Cascode mode

(for 650 V high-power applications)

- › 3 times lower inductances than industry-standard packages for lowest switching losses & EMI
- › Higher reliability compared to wire-bonded solutions
- › 99% power conversion efficiency
- › Up to 1 MHz in soft-switching (high power density)
- › Easy to design gate drive, 0 to 12 V
- › Low  $R_{th(j-mb)}$  typ for optimal cooling & 175 °C rated
- › Virtually no  $Q_{rr}$
- › Flexible gull winged leads for temperature cycling & board level reliability
- › Plans for AEC-Q101, MSL1 & Halogen free qualifications

#### Key applications 650 V high-power

- › On-board charging
- › Industrial vehicle charging
- › DC/DC converters
- › Traction converters
- › Telecom and server titanium grade power supplies
- › Solar (PV) inverter
- › AC servo drive/frequency inverters
- › Battery storage/UPS inverters



**nexperia**

EFFICIENCY WINS.

Automotive (AEC-Q101) 650 V SMD GaN FETs

Package	Type name	Configuration	V <sub>DS</sub> [max] (V)	R <sub>DS(on)</sub> [max] @ V <sub>GS</sub> = 10 V (mΩ)	I <sub>D</sub> (max) (A)	Q <sub>G</sub> (nC)	Q <sub>oss</sub> (nC)
CCPAK1212 (SMD)	<b>GAN039-650NBBA</b>	Cascode	650	39	60		150
CCPAK1212i (SMD)	<b>GAN039-650NTBA</b>			39	60		150

Industrial 650 V SMD and through-hole GaN FETs

Package	Type name	Configuration	V <sub>DS</sub> [max] (V)	R <sub>DS(on)</sub> [max] @ V <sub>GS</sub> = 10 V (mΩ)	I <sub>D</sub> (max) (A)	Q <sub>G</sub> (nC)	Q <sub>oss</sub> (nC)
CCPAK1212 (SMD)	<b>GAN039-650NBB</b>	Cascode	650	39	59		150
CCPAK1212i (SMD)	<b>GAN039-650NTB</b>			39	60		150
TO-247 (Through-hole)	GAN063-650WSA			60	35		125
	GAN041-650WSB			41	47		150
DFN8080 (SMD)	<b>GAN080-650EBE</b>	E-mode	650	111			
	<b>GAN140-650FBE</b>			80	29	6.2	60
	<b>GAN190-650FBE</b>			140	17	3.5	33
DFN5060 (SMD)	<b>GAN140-650EBE</b>			190	11.5	2.8	24.5
	<b>GAN190-650EBE</b>			140	17	3.5	33
	<b>GAN190-650EBE</b>			190	11.5	2.8	25

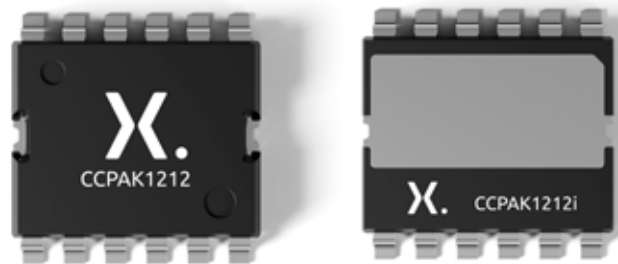
Industrial 100 - 150 V WLCSP & LGA GaN FETs

Package	Type name	Configuration	V <sub>DS</sub> [max] (V)	R <sub>DS(on)</sub> [max] @ V <sub>GS</sub> = 10 V (mΩ)	I <sub>D</sub> (max) (A)	Q <sub>G</sub> (nC)	Q <sub>oss</sub> (nC)
WLCSP8 (SMD)	<b>GAN3R2-100CBE</b>	E-mode	100	3.2	60	9.2	50
FCLGA3 (SMD)	<b>GAN7R0-150LBE</b>		150	7	28	7.6	46.8

The innovators of copper-clip package technology

Nexperia brings 20 years' experience of producing high-quality, highly robust, copper-clip SMD packaging to the power GaN FET portfolio.

For added flexibility in designs and to further improve heat dissipation, CCPAK is available in both top-side cooling (CCPAK1212) and bottom-side cooling package designs (CCPAK1212i).



For more information on Nexperia GaN FETs, including datasheets, application notes, videos, blogs, news and more. Visit [nexperia.com/gan-fets](https://nexperia.com/gan-fets)

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