

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 ≤ 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 ≤ 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
- › MSL1 & Halogen free qualifications

Key applications 650 V high-power

Industry 4.0

- › Servo motor drives/ frequency inverters
- › Telecom power supplies
- › Class-D Audio amplifiers
- › Welding machines

The path to Net Zero CO₂

- › Solar (PV) inverters
- › Server Titanium grade power supplies
- › Battery storage/ UPS inverters
- › Heat pumps



nexperia

EFFICIENCY WINS.

Industrial 650 V SMD and through-hole GaN FETs

Package	Type name	Configuration	V _{DS} [max] (V)	R _{DS(on)} [max] @ V _{GS} = 6 V or 10 V (mΩ)	I _D (max) (A)	Q _G (nC)	Q _{oss} (nC)
CCPAK1212 (SMD)	GAN039-650NBB	Cascode	650	39	59		150
CCPAK1212i (SMD)	GAN039-650NTB			39	60		150
TO-247 (Through-hole)	GAN063-650WSA			60	35		125
	GAN041-650WSB			41	47		150
	GAN111-650WSB			111			
DFN8080 (SMD)	GAN080-650EBE	E-mode		80	29	6.2	60
	GAN140-650FBE			140	17	3.5	33
	GAN190-650FBE			190	11.5	2.8	24.5
DFN5060 (SMD)	GAN140-650EBE			140	17	3.5	33
	GAN190-650EBE			190	11.5	2.8	25

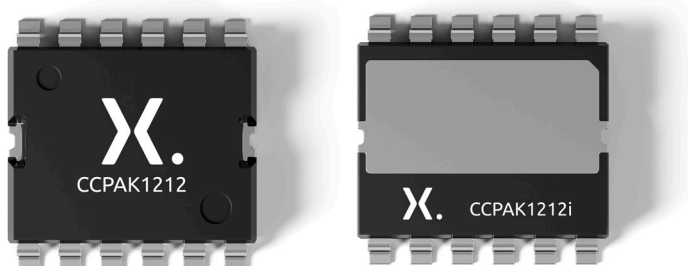
Industrial 100 - 150 V WLCSP & LGA GaN FETs

Package	Type name	Configuration	V_{DS} [max] (V)	$R_{DS(on)}$ [max] @ $V_{GS} = 5$ V (mΩ)	I_D (max) (A)	Q_G (nC)	Q_{oss} (nC)
WLCSP8 (SMD)	GAN3R2-100CBE	E-mode	100	3.2	60	9.2	50
FCLGA3 (SMD)	GAN7R0-150LBE		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://www.nexperia.com/gan-fets)

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