

Gate-driver ICs for GaN HEMTs

GaN HEMTs represent a key technology for modern power electronics systems, providing high efficiency and power density. Infineon's **CoolGaN™** HEMT families and **EiceDRIVER™** gate-driver ICs are designed to provide the best possible performance in GaN-based systems, minimizing R&D effort and cost. Infineon offers a broad range of **EiceDRIVER™** gate-driver ICs optimized for driving GaN GIT (gate injection transistor) and SG (Schottky gate) HEMTs.

Recommended drivers for GaN GIT HEMTs and 650 V GaN HEMTs

Infineon's **CoolGaN™** GIT technology is based on a hybrid-drain HEMT with p-GaN gate resulting in a robust normally-off power switch. To deal with the particularities of this concept, an innovative differential gate-drive concept has been implemented in tailor-made gate driver ICs of the **EiceDRIVER™** 1EDx56x3 product family optimized for **CoolGaN™** GIT HEMTs. These drivers ensure robust and highly efficient operation of the high-voltage GaN switch, and at the same time concurrently minimizing R&D efforts and shortening time-to-market. Infineon's **EiceDRIVER™** 1EDx56x3 provide negative V_{GS} voltage, which leads to safe off-states during switching transients. Additionally, it protects the GaN switch against spurious turn-on, even for the first pulse or after a burst mode operation. Thanks to the integrated galvanic isolation, Infineon's **EiceDRIVER™** GaN gate-driver ICs are best suited to drive high-voltage GaN HEMTs in hard-switching half-bridge applications, such as the totem-pole PFC topology. If the PWM signals have to cross the safe isolation barrier, such as in the resonant LLC with secondary-side control, the **1EDS5663H** with reinforced isolation is the right choice. Nevertheless, in many applications, standard gate-driver ICs with right fit UVLO protection can also be employed when coupled to an RC circuit to generate both the required small steady-state current and the turn-on/turn-off peak currents. Dual-channel drivers of the **EiceDRIVER™** 2EDxx259 product family feature dead-time control (DTC) and shoot-through protection (STP) to ensure safe operation in half-bridge topologies using a single IC. A hybrid gate driving configuration for half-bridge topologies, composed of two single-channel gate driver ICs of the **EiceDRIVER™** 1EDBx275F and 1EDNx550B, allows optimizing the driver IC placement on the PCB in order to minimize the gate loop parasitic inductances. This results in a PCB area saving (compared with a dual-channel gate-driver IC) and it comes with a highly competitive bill-of-material (BOM).

To summarize, the 1-channel and 2-channel gate-driver ICs of the **EiceDRIVER™** family are the best choices to match with Infineon's **CoolGaN™** GIT HEMTs and other 650 GaN HEMTs technologies (e.g., Schottky gate, Cascode) to achieve an optimum combination of efficiency, power density, and robustness in high-performance power conversion applications.

Product family	Part number	Current peak sink/source	VCC2 (-Vee2)	UVLO*	Prop delay	CMTI	Other features	Package
1EDi-G1	1EDF5673K	4 A / -8 A	20 V	5 V	37 ns	200 V/ns	Gate driver ICs for high-voltage GaN power switches (CoolGaN™ , GIT technology based products), functional isolation	LGA-13 5x5mm
	1EDF5673F						Gate driver ICs for high-voltage GaN power switches (CoolGaN™ , GIT technology based products), reinforced isolation, UL 1577	DSO-16 150 mil
	1EDS5663H							DSO-16 300 mil
1EDB	1EDB7275F	5 A / -9 A	20 V	4 V	45 ns	300 V/ns	Separate source/sink outputs, fast start-up times and fast recovery, basic isolation, UL 1577	DSO-8 150 mil
	1EDB8275F			8 V				
1EDN-TDI	1EDN7550B	5 A / -9 A	20 V	4 V	45 ns	n. a.	Truly differential inputs to provide high common-mode robustness	SOT23 6-pin
	1EDN8550B	5 A / -9 A		8 V				
2EDB	2EDB7259Y	5 A / -9 A	20 V	4 V	38 ns	150 V/ns	fast start-up times and fast output clamping, basic isolation, UL 1577	DSO-14 150 mil
	2EDB8259Y			8 V				
2EDR	2EDR7259X	5 A / -9 A	20 V	4 V	38 ns	150 V/ns	fast start-up times and fast output clamping, reinforced isolation, UL 1577, VDE 0884-17, IEC 60747-17	DSO-14 300 mil
	2EDR8259X			8 V				

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* 8 V UVLO parts recommended for bipolar driving or for unipolar driving with $V_{DD} \geq 10V$

For more details on the product, click on the part number, visit infineon.com or contact our [product support](#).



Evaluation boards with gate-driver ICs for GaN GIT HEMTs and 650 V GaN HEMTs

Our evaluation board helps you to set up and test GaN driving solutions quickly and easily.

EVAL_1EDF_G1B_HB_GAN	EVAL_2EDB_HB_GAN	KIT_1EDB_AUX_GAN
		
High-frequency half-bridge evaluation board featuring EiceDRIVER™ 1EDi-G1.	CoolGaN™ GIT HEMT half-bridge evaluation board with EiceDRIVER™ 2EDB.	Complete driving solution for GaN HEMTs including an isolated gate driver IC with a configurable floating auxiliary supply supporting unipolar and bipolar driving.
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Recommended drivers for GaN SG HEMTs

The 1EDN71x6Gx is a single-channel gate-driver IC product family optimized for driving Infineon CoolGaN™ SG HEMTs, as well as other GaN SG HEMTs and Si MOSFETs. This gate driver includes several key features that enable a high-performance system design with fast-switching transistors, including truly differential input (TDI), four driving strength options, active Miller clamp, bootstrap voltage clamp, and with or without adjustable charge pump in PG-SON-10 and PG-TSNP-7 package respectively.

Product family	PN	Current peak sink/source	CMR ^{static} / CMR ^{dynamic}	UVLO	Prop delay	CMTI	Other features	Package
1EDN71x6x	1EDN7116G	2.0A/2.0	150 V/200 V	4 V	55 ns	100 V/ ns	Negative charge pump, miller clamp	PG-VSON-10
	1EDN7126G	1.5A/1.5A			75 ns			
	1EDN7136G	1.0A/1.0A			105 ns			
	1EDN7146G	0.5A/0.5A			125 ns			
	1EDN7116U	2.0A/2.0	150 V/200 V	4 V	55 ns	100 V/ns	Miller clamp	PG-TSNP-7
	1EDN7126U	1.5A/1.5A			75 ns	100 V/ns		
	1EDN7136U	1.0A/1.0A			105 ns	100 V/ns		
	1EDN7146U	0.5A/0.5A			125 ns	100 V/ns		

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