

Every switch needs a driver: Comprehensive gate driver solutions for a wide range of applications



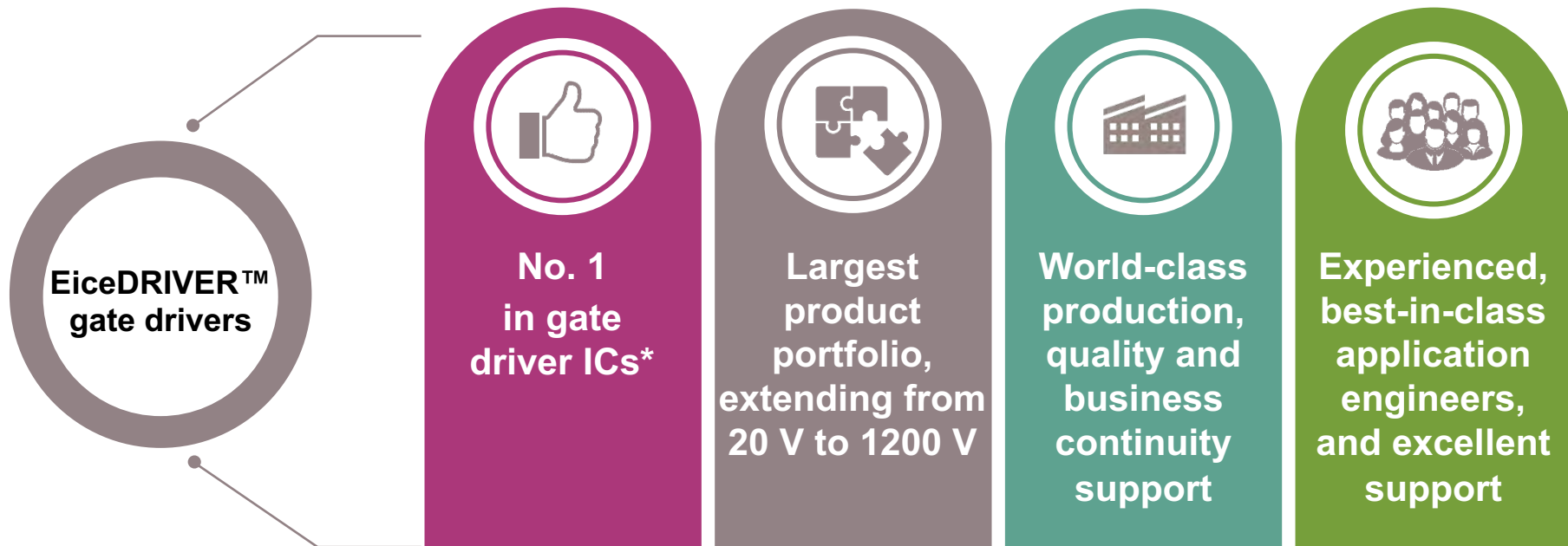
인피니언 전력반도체 솔루션
가상부스에 오신 걸 환영합니다!



Why EiceDRIVER™ gate drivers?

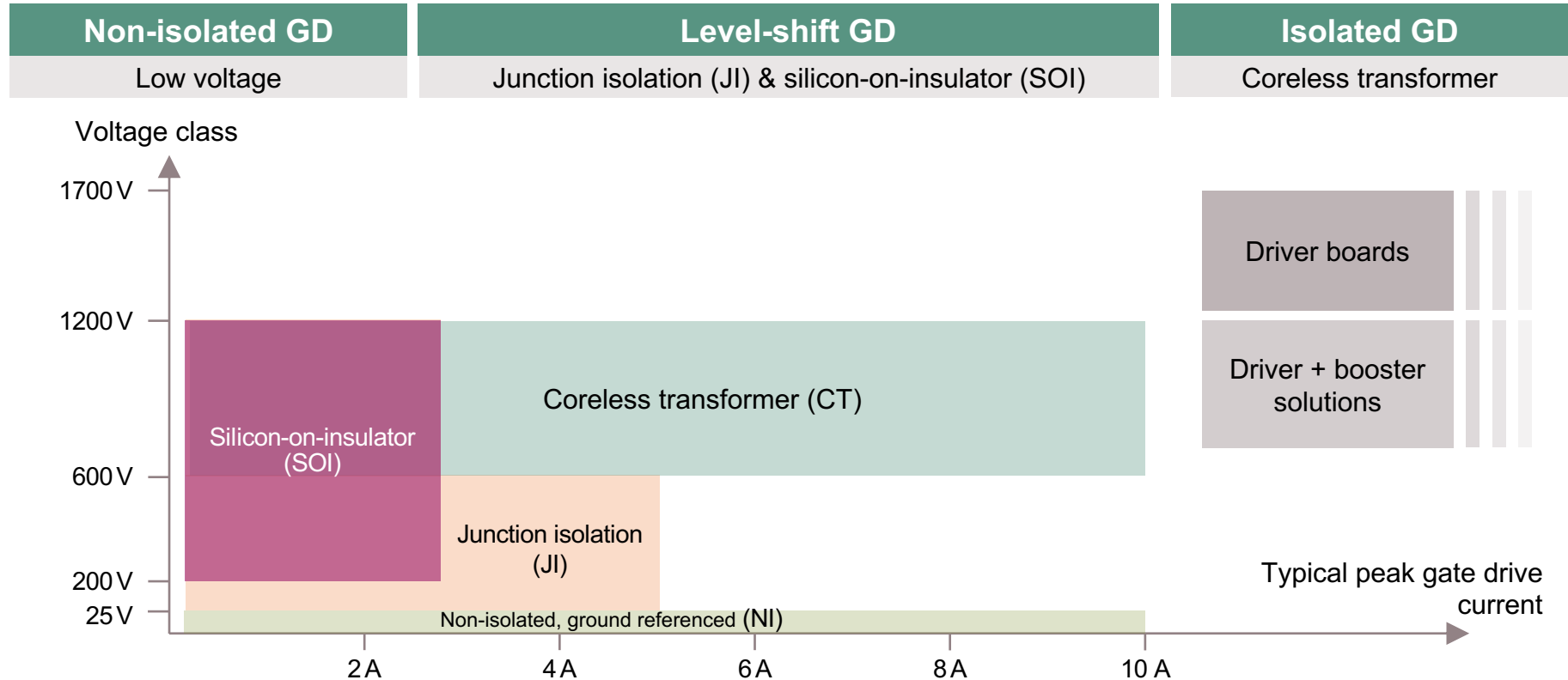


www.infineon.com/gatedriver



*IHS Markit report 2019

Infiniteon provides a comprehensive, market-leading portfolio of gate driver solutions



Infinion drivers are offered across a wide variety of configurations and voltage ranges

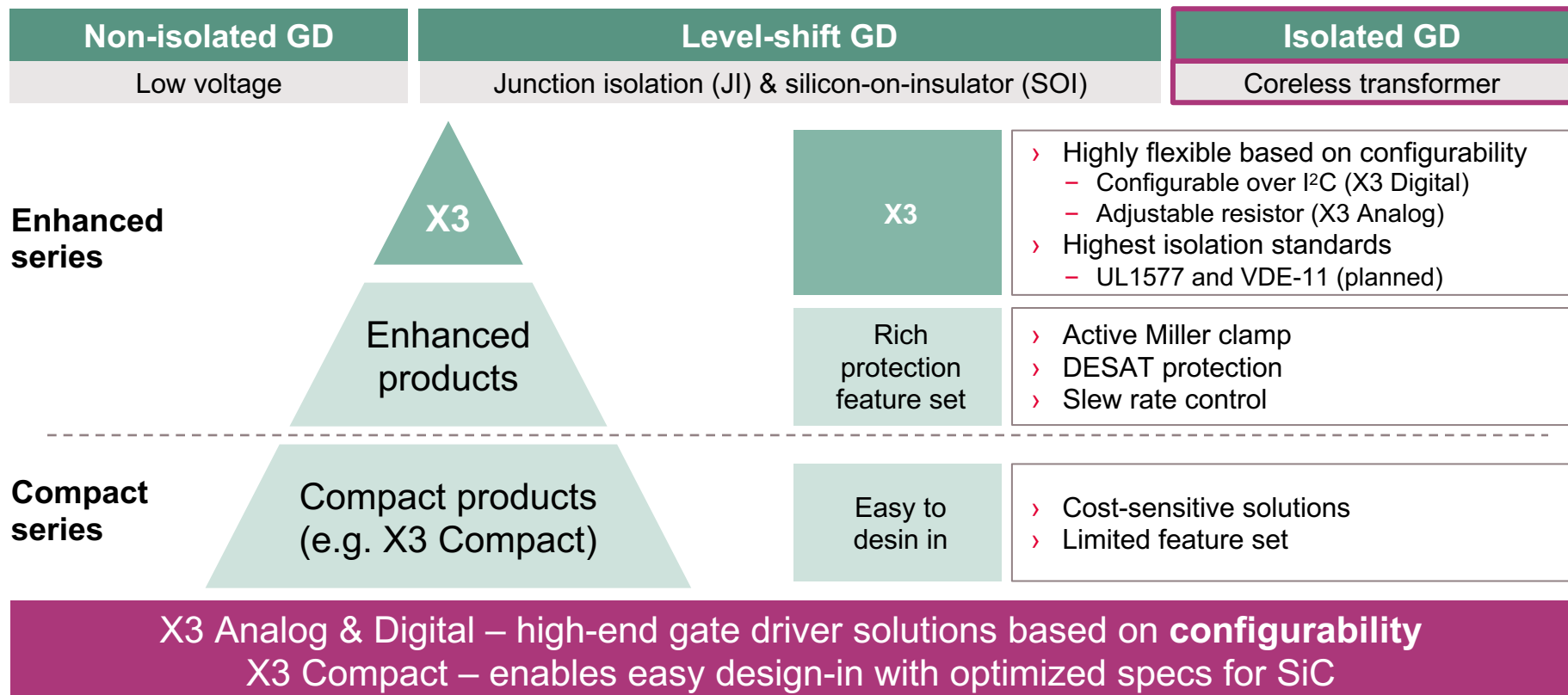


Non-isolated GD	Level-shift GD	Isolated GD
Low voltage	Junction isolation (JI) & silicon-on-insulator (SOI)	Coreless transformer

Gate driver configuration			5 V	25 V	100 V	200 V	500 V	600 V	650 V	1200 V
Gate drivers	1-channel	High-side			●	●	●	●	●	●
		Low-side	●	●						
	2-channel	High-side							●	●
		Low-side		●						
		High-side + low-side				●	●	● ●	●	●
		Half-bridge			●	●		● ●	● ●	● ●
	4-channel	Full bridge			●					
	6-channel	Three-phase				●		● ●		● ●
System building blocks		Current sense						●		●
		Start-up					●			

- Non-isolated (N-ISO)
- Junction isolation (JI)
- Silicon-on-insulator (SOI)
- Coreless transformer (CT)

EiceDRIVER™ isolated gate driver portfolio



EiceDRIVER™ enhanced X3 Analog (1ED34xx)

Product overview

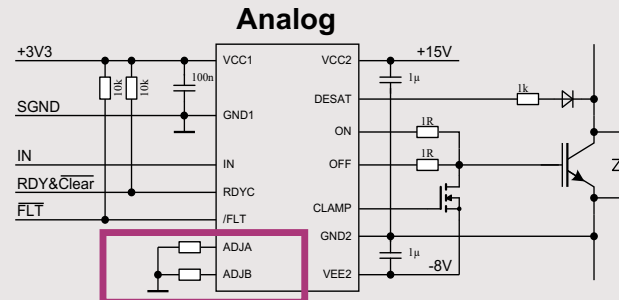


Product highlights

- › Single-channel isolated gate driver with **3 / 6 / 9 A**
- › Active Miller clamp (clamp driver), DESAT, soft-off
- › Exceptional CMTI robustness > **200 kV/μs**
- › Thermal shutdown
- › **X3 Analog configurability**
 - Adjustable **DESAT filter time & blanking time** and **soft-off current** with external resistor
- › Isolation capabilities & certification
 - 1ED34x1MU12M: **UL 1577-certified $V_{ISO}=5.7$ kV(rms)**
 - 1ED34x1MC12M: **UL 1577 & VDE 0884-11 (planned)**
- › **DSO-16 fine pitch, 300-mil wide-body package (8 mm creepage)**
- › For IGBTs, MOSFETs, CoolSiC™ SiC MOSFETs



Sample schematic



Value proposition

- › **Flexibility** due to **register-based configuration** adjustments
- › **Reduction in hardware complexity** with fewer variants
- › **Reduction in evaluation time** with adjustable parameters for **faster time-to-market**



EiceDRIVER™ enhanced X3 Digital (1ED38xx)

Product overview

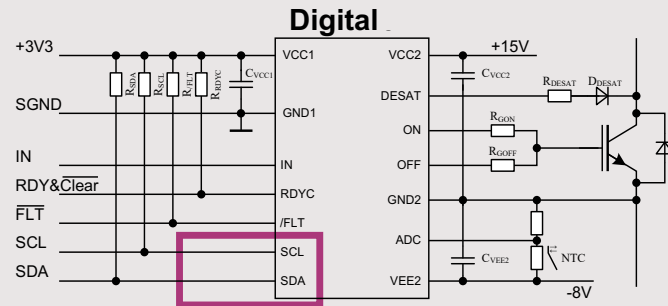


Product highlights

- › Single-channel isolated gate driver with **3 / 6 / 9 A**
- › Active Miller clamp (clamp driver), DESAT, soft-off
- › Exceptional CMTI robustness > **200 kV/μs**
- › Thermal **monitoring and** shutdown
- › **X3 Digital configurability**
 - **Fully adjustable via I²C bus**: 3-address configuration, 27-parameter configuration, 16 status
 - **Configurable** UVLO, **DESAT²**, TLTO, soft-off, Miller clamp
- › Isolation capabilities & certification
 - 1ED38x0MU12M: **UL 1577-certified** $V_{ISO}=5.7 \text{ kV(rms)}$
 - 1ED38x0MC12M: **UL 1577 & VDE 0884-11 (planned)**
- › **DSO-16 fine pitch, 300-mil wide-body package (8 mm creepage)**
- › For IGBTs, MOSFETs, CoolSiC™ SiC MOSFETs



Sample schematic



Value proposition

- › **Highest level of flexibility** introduced by **register-based adjustments via I²C**
- › **Reduction in hardware complexity** with fewer variants
- › **Reduction in evaluation time** with adjustable parameters for **faster time-to-market**



EiceDRIVER™ X3 Compact (1ED31xx)

Product overview

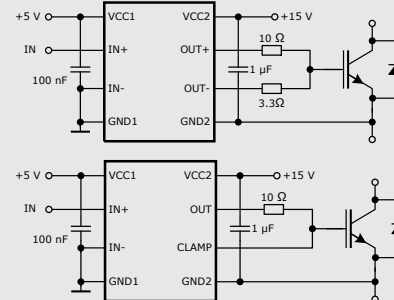


Product highlights

- › Single-channel isolated gate driver with **5.5 / 10 / 14 A** (no booster required)
- › **90 ns** propagation delay with **30 ns** input filter
- › **7 ns** propagation delay matching
- › **Active Miller clamp or separate outputs**
- › Exceptional CMTI robustness > **200 kV/μs**
- › **40 V absolute maximum** output supply voltage
- › Isolation capabilities & certification
 - 1ED34x1MU12M: **UL 1577-certified** $V_{ISO}=5.7$ kV(rms)
 - 1ED34x1MC12M: **UL 1577 & VDE 0884-11** (planned)
- › **DSO-8 150-mil (4 mm creepage) & 300-mil wide-body package (8 mm creepage)**
- › For IGBTs, MOSFETs, CoolSiC™ SiC MOSFETs

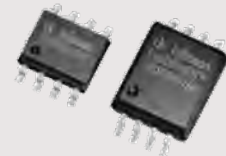


Sample schematic



Value proposition

- › **8-pin gate driver** (with **150-mil and 300-mil** bodies) enabling **easy design-in**
- › **Optimized specifications** for driving **SiC**
- › Fulfilling **highest isolation standards**
 - UL 1577 and VDE-11 (planned)



EiceDRIVER™ gate drivers are a perfect match to CoolSiC™ MOSFET portfolio 650 V and 1200 V

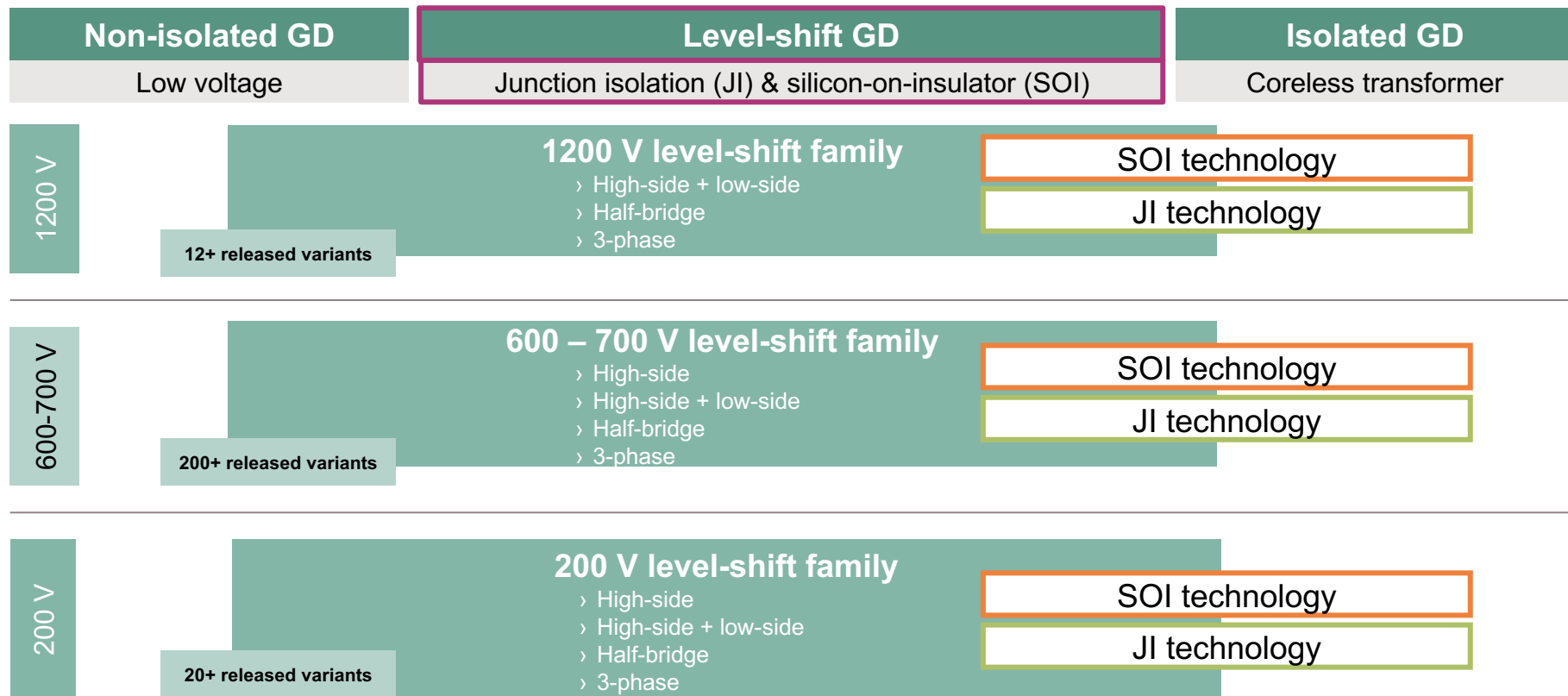


TO-247						
RDson [mΩ]	1200 V TO-247-3	1200 V TO-247-4	1200 V D ² PAK-7	Rdson [mΩ]	650 V TO-247-3	650 V TO-247-4
30	IMW120R030M1H	IMZ120R030M1H	IMBG120R030M1H	27	IMW65R027M1H	IMZA65R027M1H
45	IMW120R045M1	IMZ120R045M1	IMBG120R045M1H	48	IMW65R048M1H	IMZA65R048M1H
60	IMW120R060M1H	IMZ120R060M1H	IMBG120R060M1H	72	IMW65R072M1H	IMZA65R072M1H
90	IMW120R090M1H	IMZ120R090M1H	IMBG120R090M1H	107	IMW65R107M1H	IMZA65R107M1H
140	IMW120R140M1H	IMZ120R140M1H	IMBG120R140M1H			
220	IMW120R220M1H	IMZ120R220M1H	IMBG120R220M1H			
350	IMW120R350M1H	IMZ120R350M1H	IMBG120R350M1H			

Easy 1B and Easy 2B					
RDson [mΩ]	1200 V half-bridge	1200 V booster	1200 V H-Bridge	1200 V 3-level	1200 V SixPACK
45	FF45MR12W1M1_B11				FS45MR12W1M1_B11
23	FF23MR12W1M1(P)_B11	DF23MR12W1M1_B11	F4-23MR12W1M1(P)_B11		
15			F4-15MR12W2M1_B76	F3L15MR12W2M1_B69	
11	FF11MR12W1M1_B11 FF11MR12W1M1_B70	DF11MR12W1M1_B11	F4-11MR12W2M1_B76	F3L11MR12W2M1_B65	
8	FF8MR12W2M1(P)_B11				
6	FF6MR12W2M1(P)_B11 FF6MR12W2M1_B70				

In mass production / Coming soon - Samples available

EiceDRIVER™ level-shift gate driver portfolio



Product highlights

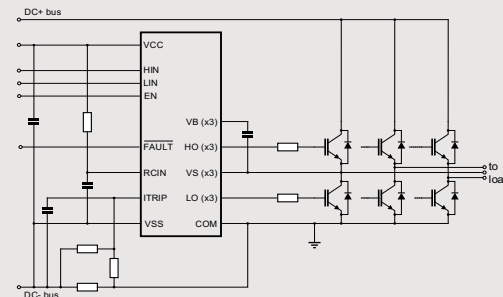
- › 6ED2230S12T (**1200 V** Infineon SOI technology)
- › Integrated, ultra-fast, low $R_{DS(ON)}$ bootstrap diode
- › Operational for transient negative VS voltages up to **-100 V** with a 700 ns pulse width
- › Overcurrent protection (ITRIP +/-5% reference)
- › Integrated **360 ns** dead-time
- › Output current: I_{O+} **350 mA**, I_{O-} **650 mA**
- › Independent undervoltage lockout for V_{CC} and V_{BS}
- › **3.3 V, 5 V, 15 V** input logic-compatible
- › Fault reporting, automatic fault clear and enable function on the same pin (RFE)
- › SOIC-28 package (with 4 pins removed for high clearance)

$I_{O+/-}$ (typ) [mA]	$T_{on/off}$ (typ) [ns]	DT (typ) [ns]	$T_{r/f}$ (typ) [ns]	Input filter (typ) (ns)	V_{CC}/V_{BS} UVLO typ.
350/650	600	360	40	300	10.4-11.4 / 9.4-10.4

Typical applications



Sample schematic



Value proposition

- › Integrated, fast and low $R_{DS(ON)}$ bootstrap diode
 - Simplified lower-cost driver for **1200 V** IGBTs
- › Industry-leading minus VS robustness
 - Increased reliability and noise immunity
- › Overcurrent protection with +/-5% reference
- › Independent UVLO for V_{CC} and V_{BS}
- › Matched propagation delay
- › Easy to use for fast time-to-market



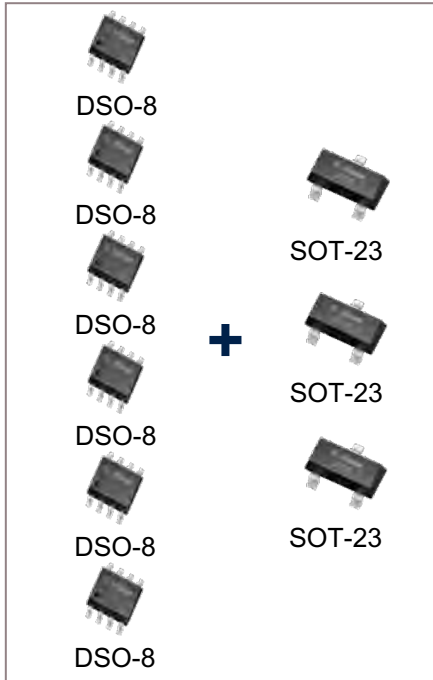
DSO-24

6ED2230S12T

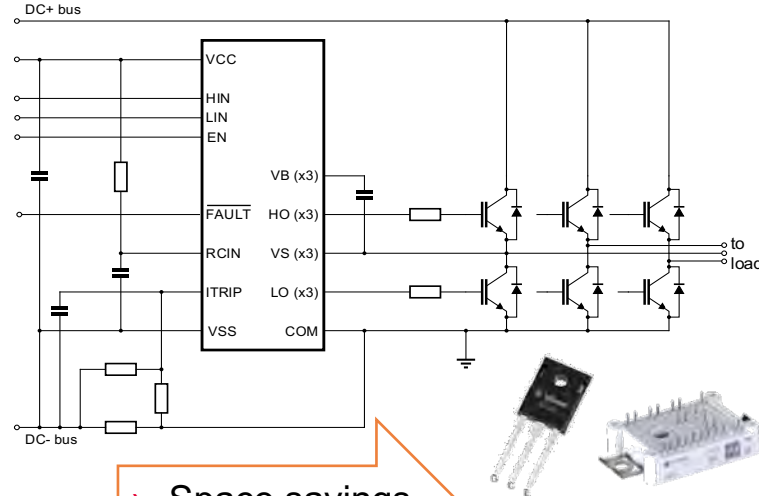
Cost-effective, space-saving, fast time-to-market



Current solution



New 6ED2230S12T integrates 6x gate drivers & 3x bootstrap diodes



- > Space savings
- > Cost savings
- > Easy to design



EiceDRIVER™ evaluation boards

Evaluation boards available for non-isolated, level-shift & isolated gate driver solutions



Examples, orderable via ISAR

Type	Mat No.	Description
EVAL-1ED3491MX12M	SP005411273	X3 Analog evaluation board
EVAL-1ED3121MX12H	SP005347597	X3 Compact evaluation boards
EVAL-1ED3122MX12H	SP005347593	
EVAL-1ED3124MX12H	SP005347599	
EVAL-M1-6ED2230-B1	SP003235932	6ED2230 evaluation board

Support materials

Support materials

- › Gate driver selection guide brochure (PDF)
- › Gate driver application selection matrix (PDF)/ 中文
- › Gate driver product portfolio presentation (PPT)
- › Gate driver application selection matrix (PPT)
- › Isolated gate driver selection guide (PDF)/ Chinese
- › Gate driver selection & support tools manual (PPT)
- › Solid-state relay product portfolio presentation (PPT)
- › Solid-state relay cross reference (Excel)
- › Solid-state relay simple selection tool (Excel)

- › www.infineon.com/gdbrochure
- › www.infineon.com/gdapplication / www.infineon.com/gdapplication-cn
- › www.infineon.com/gdpresentation
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