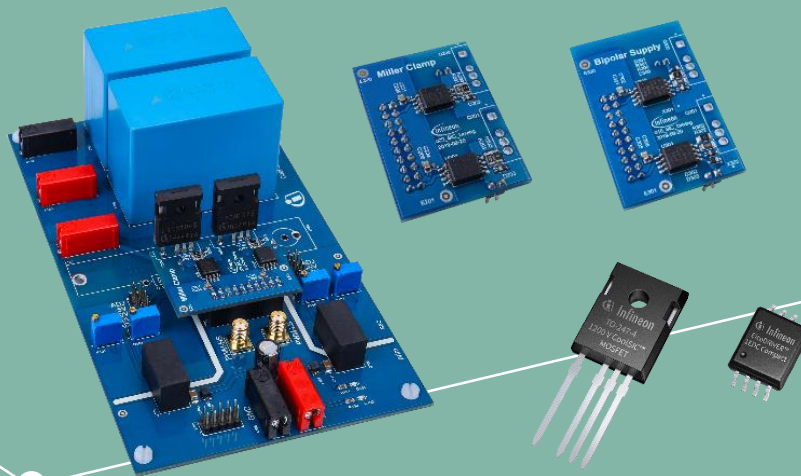


Operation Manual for CoolSiC™ MOSFET 1200 V evaluation platform including EiceDRIVER™ gate driver IC



December 2019



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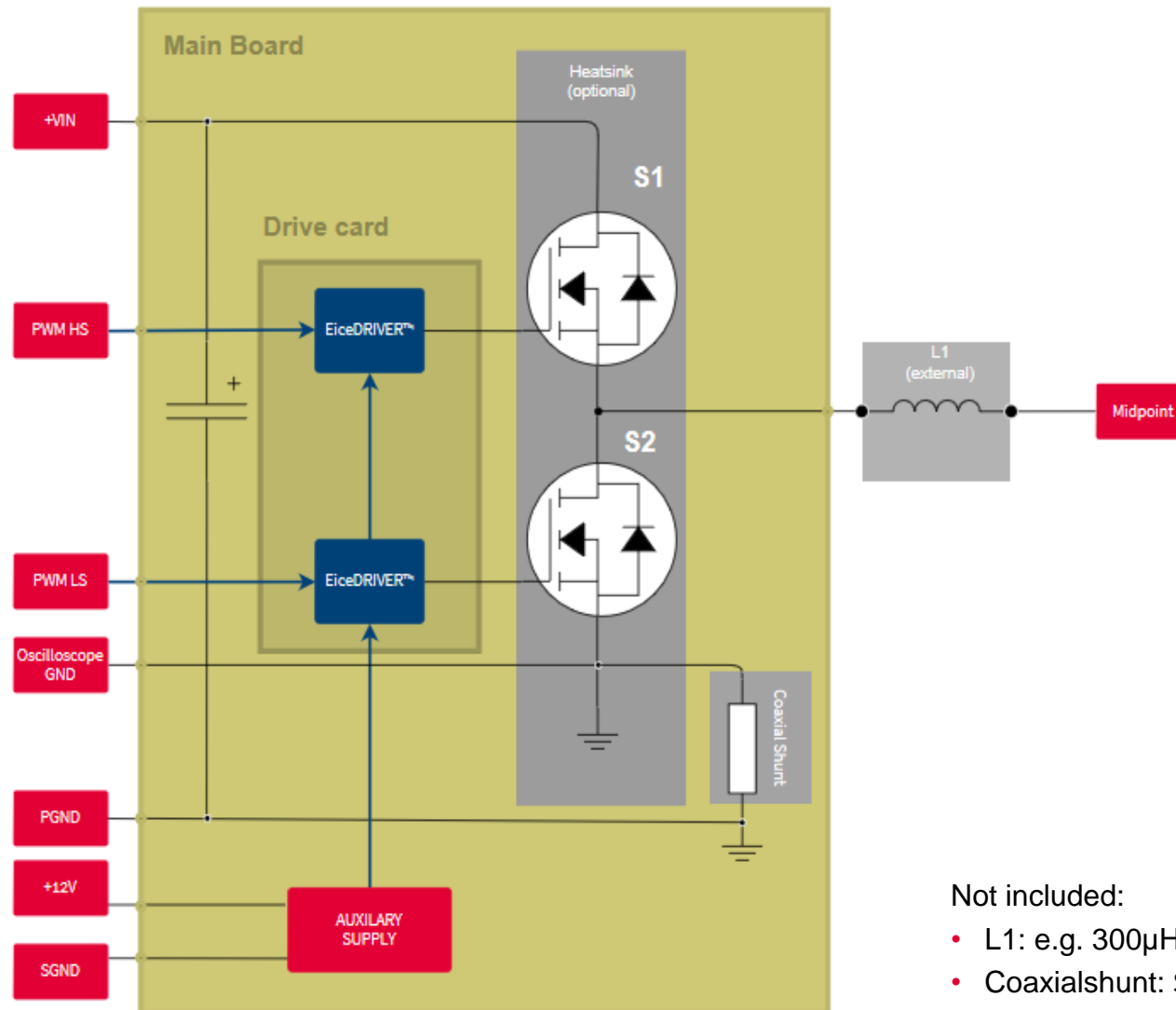
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A 3D exploded view diagram of the EiceDRIVER™ power module assembly. The diagram shows the following components and their labels:

- Heatsink**: A large grey metal heatsink with two cooling fins.
- S1**: A small component, likely a sense resistor, located on the top of the heatsink.
- S2**: Another small component, likely a sense resistor, located on the top of the heatsink.
- EiceDRIVER™**: Two integrated circuit chips mounted on the heatsink.
- Main Board**: A blue printed circuit board (PCB) that serves as the base for the assembly.
- +12V**: A red rectangular component, likely a 12VDC input filter capacitor, mounted on the main board.
- Coaxial Shunt**: A cylindrical component used for current sensing, mounted on the main board.
- Drive Card**: A green printed circuit board (PCB) mounted on the main board, containing the EiceDRIVER™ chips.
- PWM LS**: A small component, likely a low-side MOSFET, mounted on the main board.
- PWM HS**: A small component, likely a high-side MOSFET, mounted on the main board.



Block diagram



Not included:

- L1: e.g. 300µH, Core Material: Mega Flux
- Coaxialshunt: SDN-414-xxx

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Key features of mother board and two daughter boards

CoolSiC™ MOSFET 1200 V evaluation platform

- › V_{CC2} gate drive voltage supply from -5 V to +20 V
- › V_{CC1} supply fixed at +5 V
- › Gate connection via SMA-BNC connector
- › Current measurement via optional Coaxialshunt
- › Optimized commutation loop
- › External load inductor connection

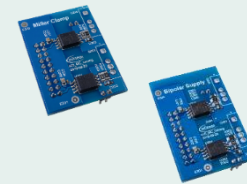


Miller clamp board

- › Wide body package (300 mil)
- › Minimal gate drive loop
- › Rg-ON and Rg-OFF changeable
- › V_{CC2} +15 V to 0V GND
- › Active miller clamp function

Bipolar supply board

- › Wide body package (300 mil)
- › Minimal gate drive loop
- › Rg-ON and Rg-OFF changeable
- › V_{CC2} +15 V to -5 V GND2
- › Possibility for negative power supply



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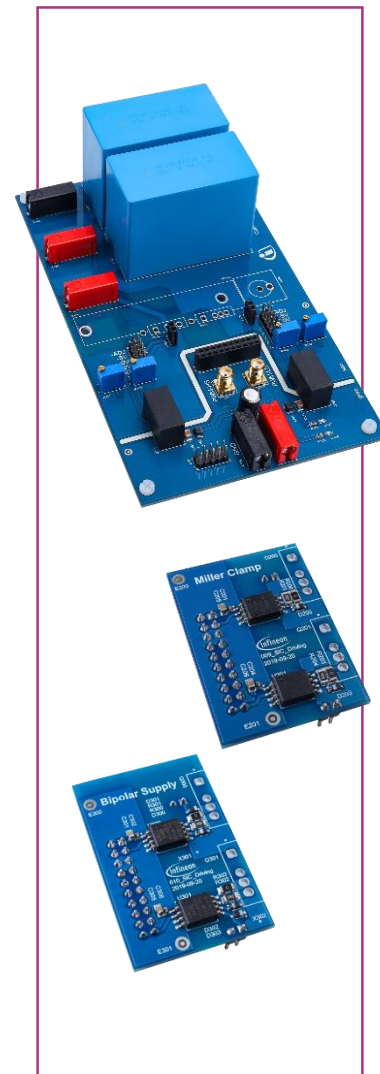
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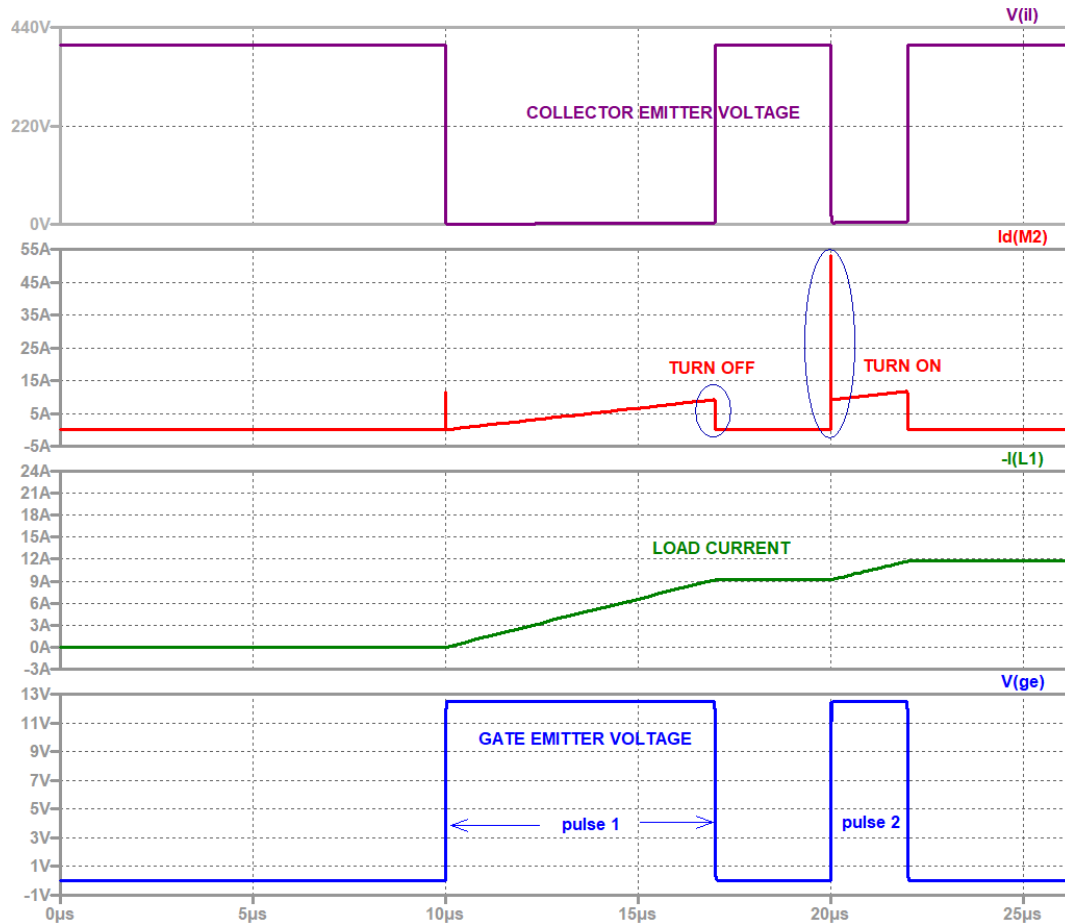
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- 1 Mount drive card on motherboard and set the jumpers for the needed supply voltage
- 2 Solder the DUTs and the Coaxial shunt on the platform. For other current measurements bridge Id150
- 3 Connect Power source (VDC up to 800V), Auxiliary supply 12V, function generator (for double pulse)
- 4 Connect the load inductor, either HS or LS
- 5 Plug the wanted probes (voltage, current)
- 6-1 To turn on:
Apply 12V and double pulse, then apply high voltage stepwise until wanted level. Start the measurement.
- 6-2 To turn off:
Switch off the high voltage source, then switch off Aux supply and function generator.

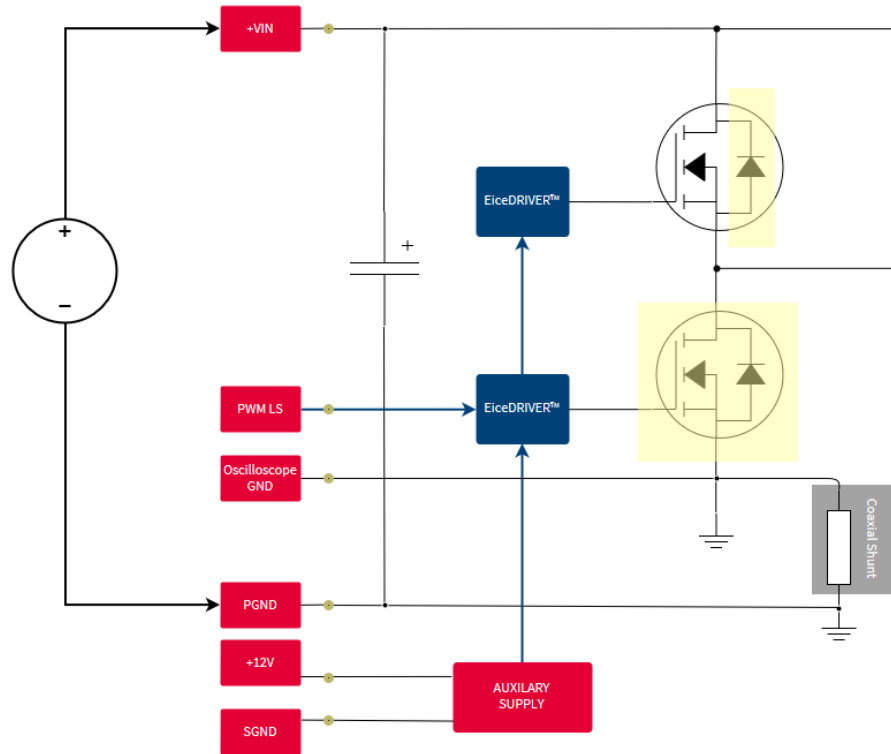


Double Pulse principle

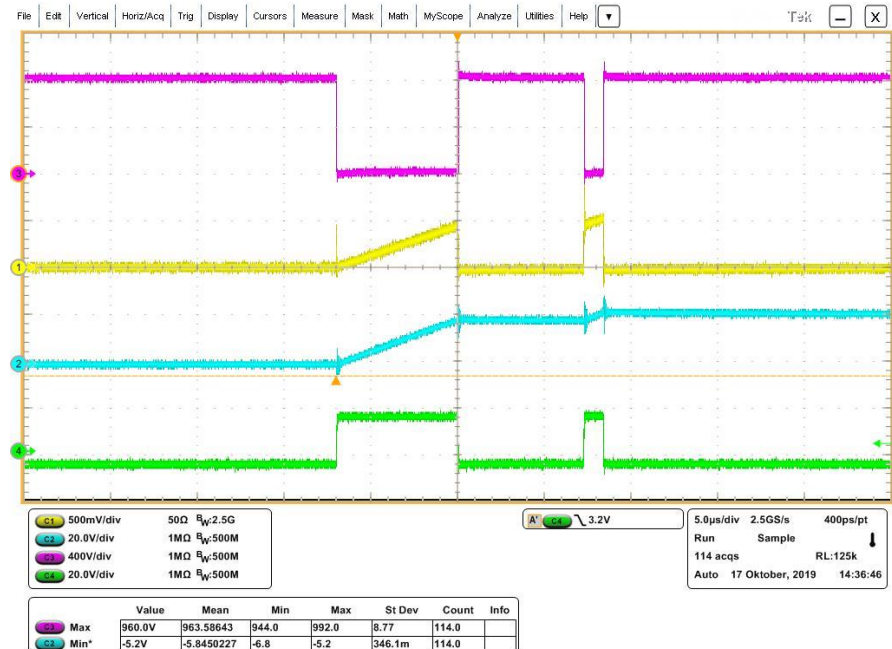


The pulse 1 width defines the desired current in the inductive load. The turn-off event of pulse 1 leads to a constant current through the body diode of S1, which can be also replaced by a discrete diode. Turn-on of pulse 2 shows the reverse recovery charge of S1 or the respective diode.

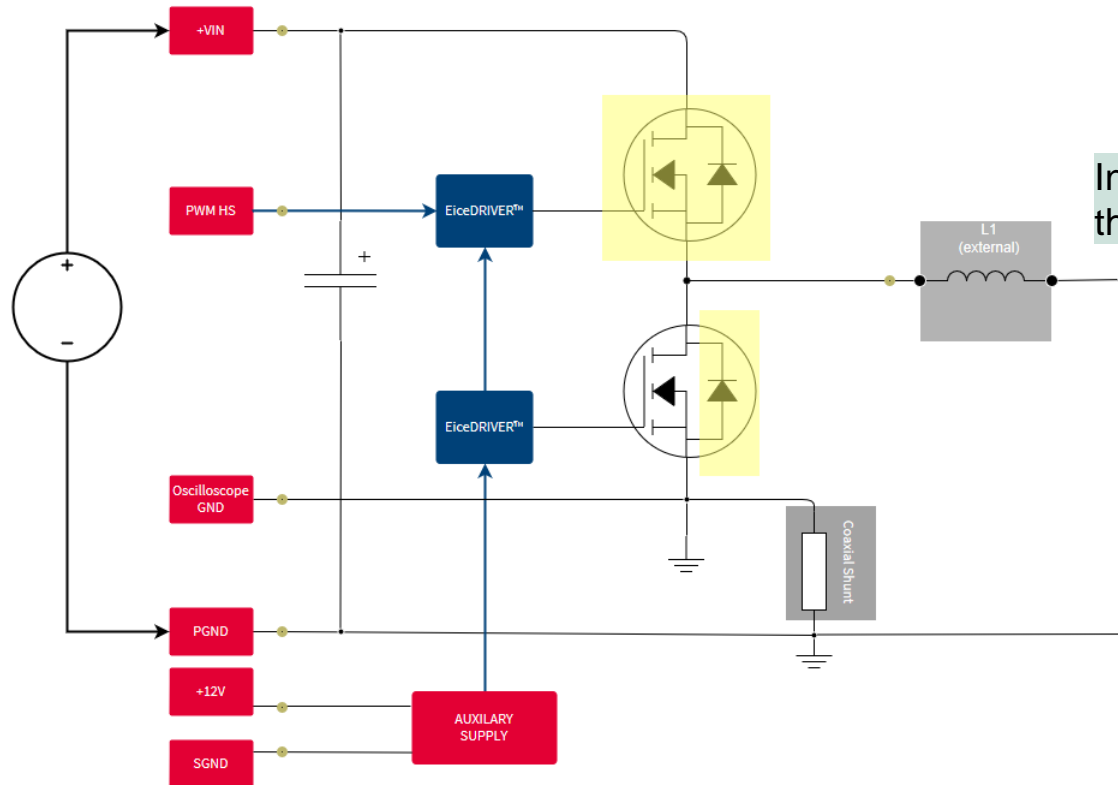
Half Bridge configuration for LS MOSFET or HS Diode testing



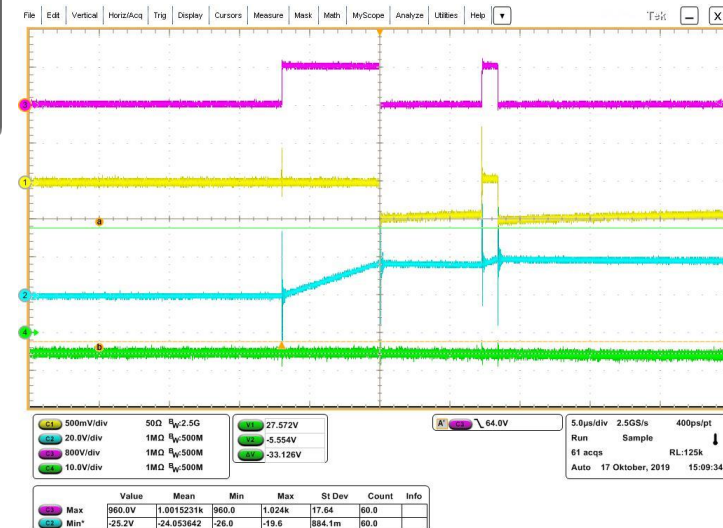
Inductor L1 connected from the Midpoint to +Vin



Half Bridge configuration for HS MOSFET or LS Diode testing



Inductor L1 connected from the Midpoint to PGND



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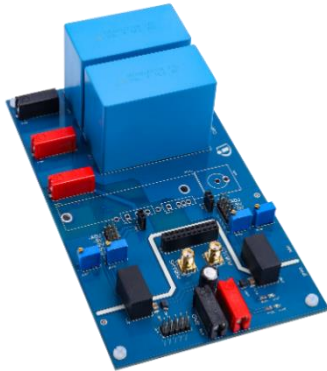
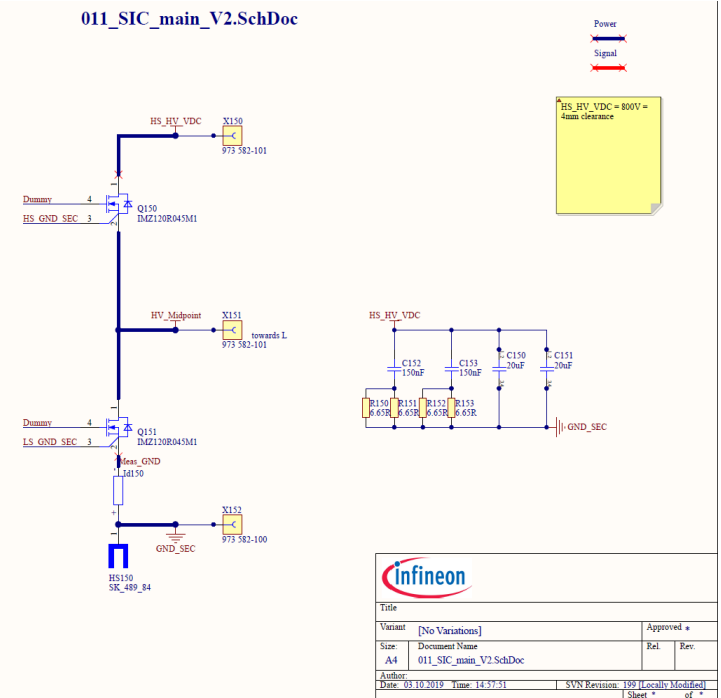
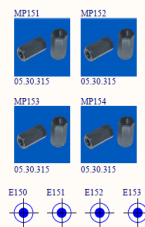
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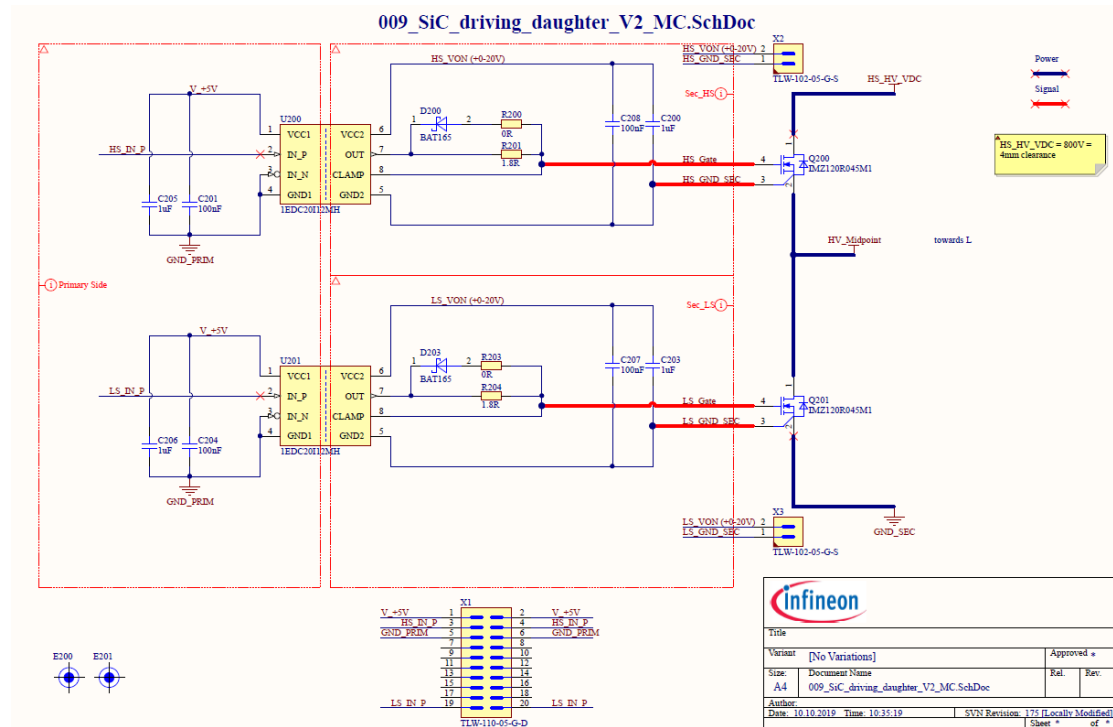
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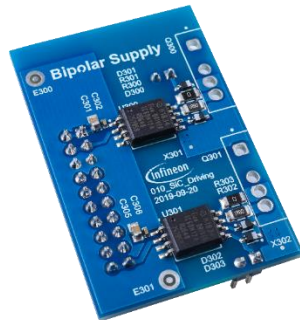
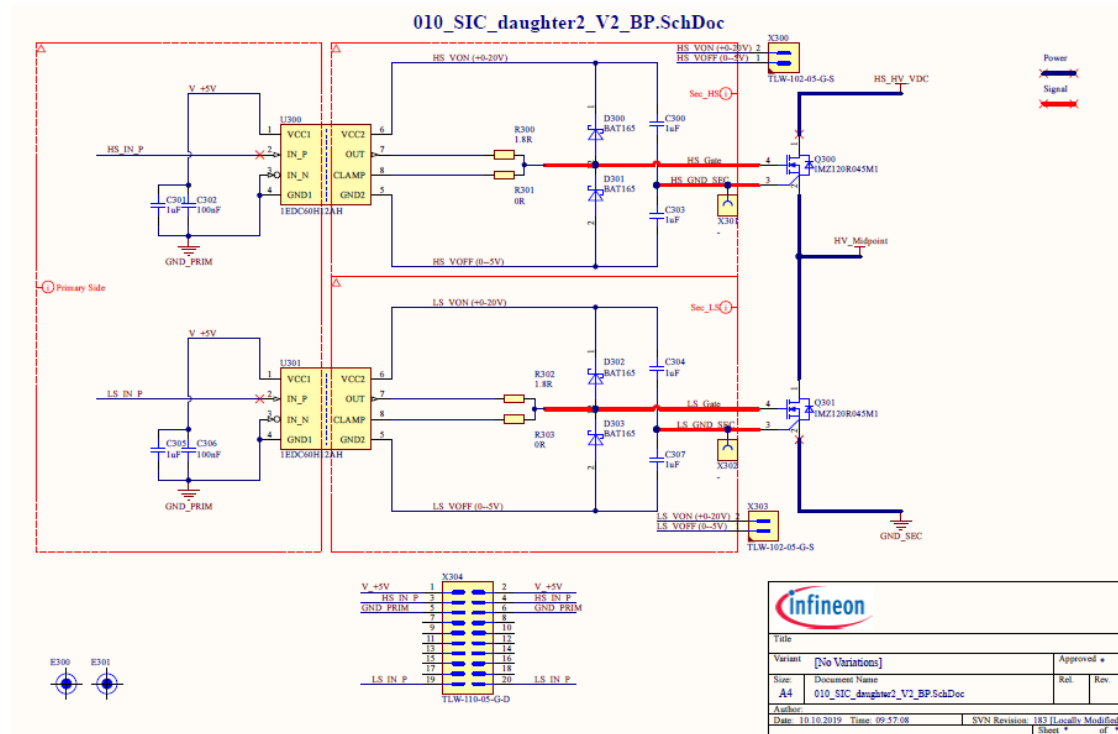
Schematic of Miller clamp function board



Jumper Settings on the Main board

Case	+ADJ	+20V	0V	-5V	-ADJ
1	X		X		
2		X	X		

Schematic of Bipolar supply function board



Jumper Settings on the Main board

Case	+ADJ	+20V	0V	-5V	-ADJ
1	X			X	
2	X				X
3		X		X	
4		X			X

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Product description name	CoolSiC™ MOSFET 1200 V evaluation platform including EiceDRIVER™ gate driver IC	Miller clamp function board for CoolSiC™ MOSFET 1200 V evaluation platform	Bipolar supply function board for CoolSiC™ MOSFET 1200 V evaluation platform
Sales product name	EVAL_PS_SIC_DP_MAIN	REF_PS_SIC_DP1	REF_PS_SIC_DP2
OPN	EVALPSSICDPMAINTOBO1	REFPSSICDP1TOBO1	REFPSSICDP2TOBO1
SP number	SP005412616	SP005412618	SP005412619
Content	<ul style="list-style-type: none"> • Mother board (CoolSiC™ MOSFET 1200 V evaluation platform) – 1pc • Daughter boards (Miller clamp and bipolar supply boards) – 1pc each (total 2pcs) • IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – 4pcs 	<ul style="list-style-type: none"> • Daughter board (Miller clamp function board) – 1pc • IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – 2pcs 	<ul style="list-style-type: none"> • Daughter board (Bipolar supply function board) – 1pc • IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – 2pcs •

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Datasheet -

- [IMZ120R045M1](#) [1EDC60H12AH](#) [1EDC20I12MH](#)

Technical -

- **Application note**
 - User Manual for CoolSiC™ MOSFET 1200 V evaluation platform including EiceDRIVER™ gate driver IC – coming soon
 - [Guide for CoolSiC™ MOSFET gate drive voltage window](#)
 - [Introduction to CoolSiC™ 1200 V SiC MOSFET](#)
 - [Advanced gate drive options for silicon carbide \(SiC\) MOSFETs](#)
- **Application Brochure**
 - [Gate driver application matrix - Every switch needs a driver](#)
- **Fighting guide**
 - CoolSiC™ 1200 V discrete MOSFET fighting guide – coming soon
- **Articles**
 - [SiC MOSFETs for Bridge Topologies in Three-Phase Power Conversion](#)
 - [CoolSiC™ MOSFET technology: a revolution for power conversion systems](#)
 - [A SiC MOSFET for Mainstream Adoption](#)

Online support -

- [Infineon CoolSiC™ forum](#)
- [Infineon CoolSiC™ MOSFET discretes webpage](#)



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