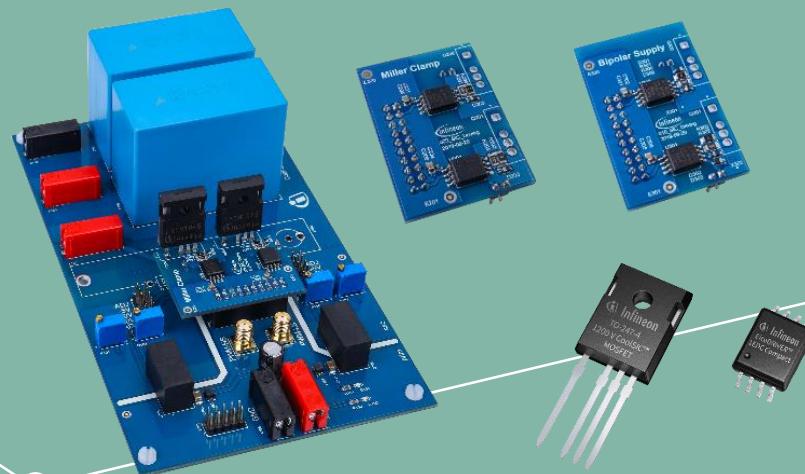


# Operation Manual for CoolSiC™ MOSFET 1200 V evaluation platform including EiceDRIVER™ gate driver IC



December 2019

**infineon**

# Agenda

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1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

Order information

6

Support materials

# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

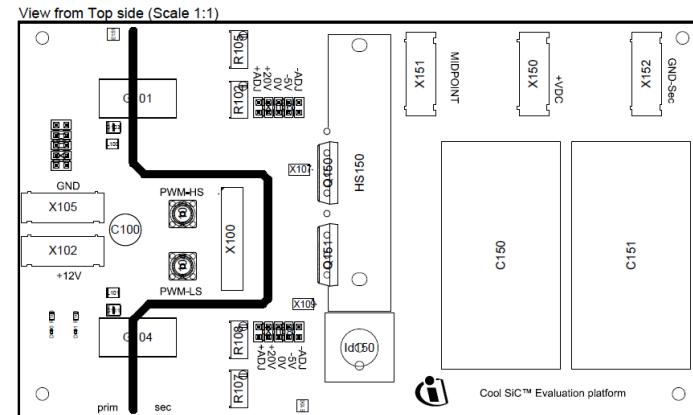
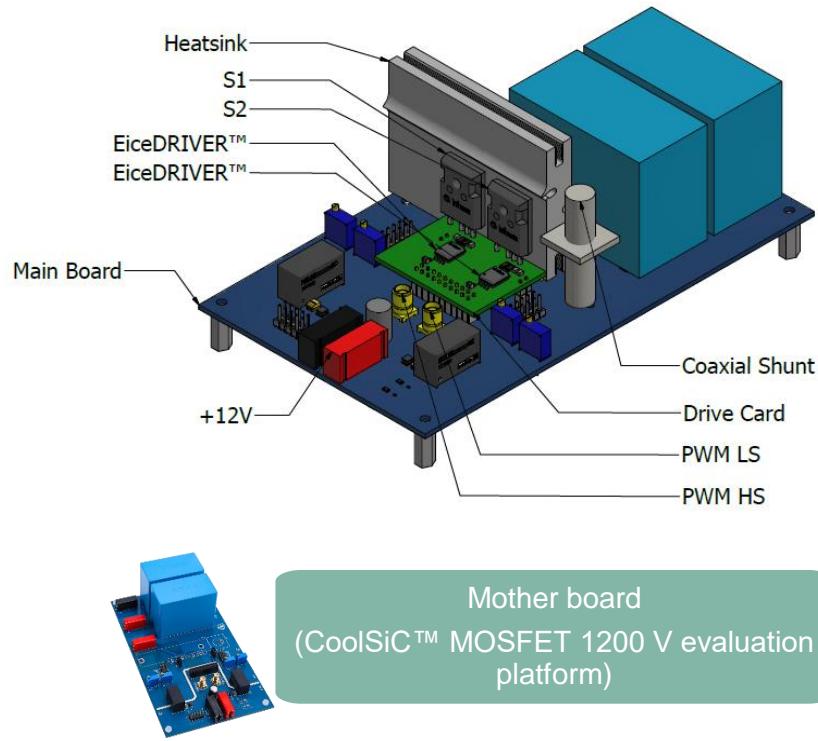
Order information

6

Support materials

# Introduction

The kit “**CoolSiC™ MOSFET 1200 V evaluation platform including EiceDRIVER™ gate driver IC**” consists of **1x mother board** (a modular characterization platform), **2x daughter boards** (drive cards/function boards), **4x IMZ120R045M1** (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4)



Mother board  
(CoolSiC™ MOSFET 1200 V evaluation platform)

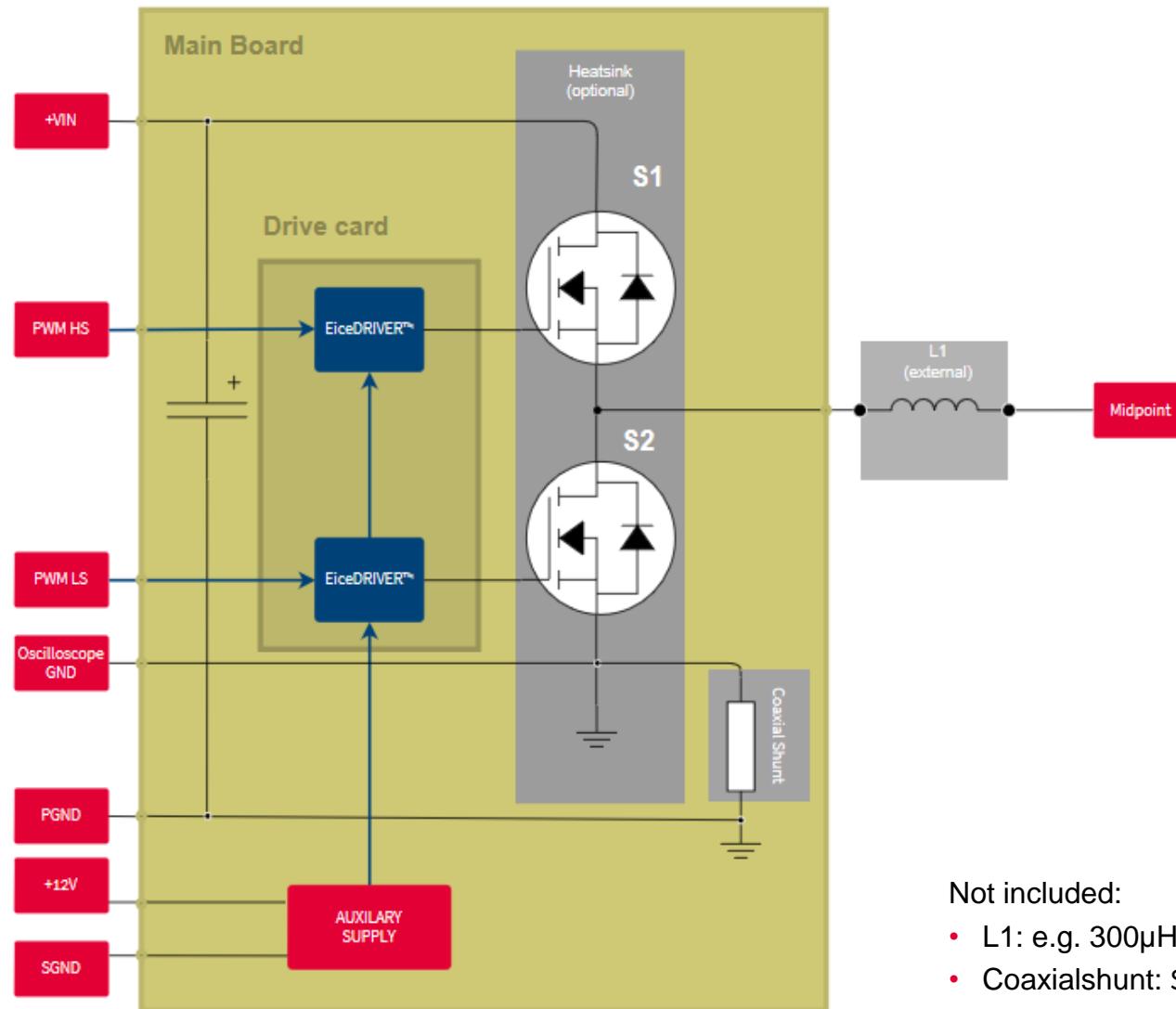
Daughter board  
(Miller clamp function board)

Daughter board  
(Bipolar supply function board)

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# Block diagram



# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

Order information

6

Support materials

# 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

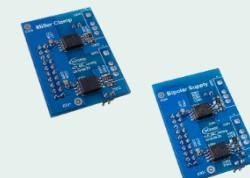


## Miller clamp board

- › 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



# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

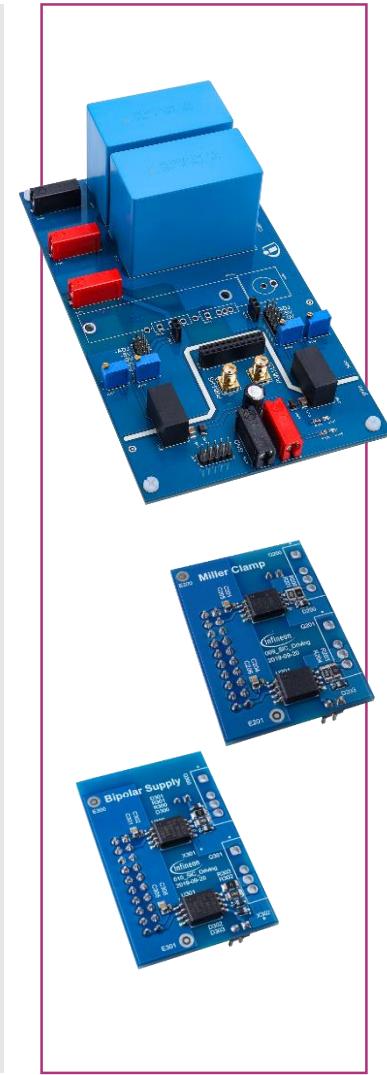
Order information

6

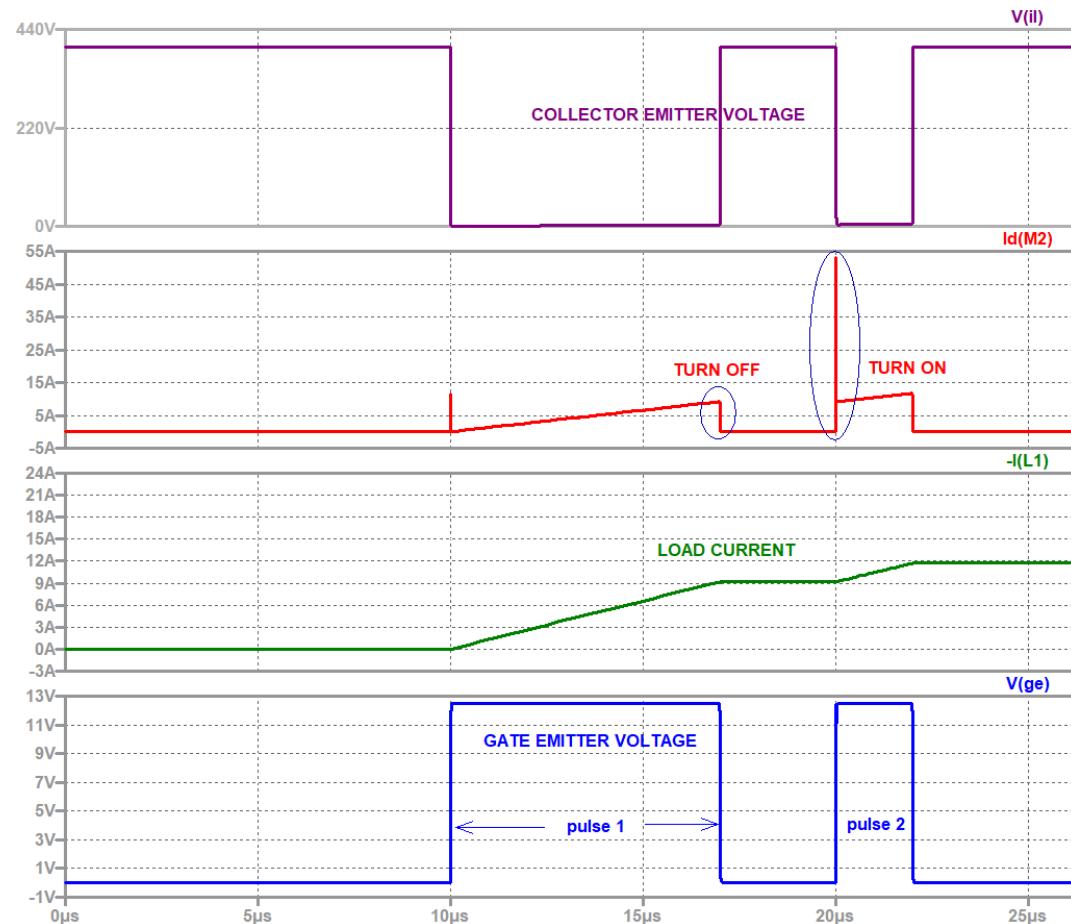
Support materials

# Let's get started – operation manual

- 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.

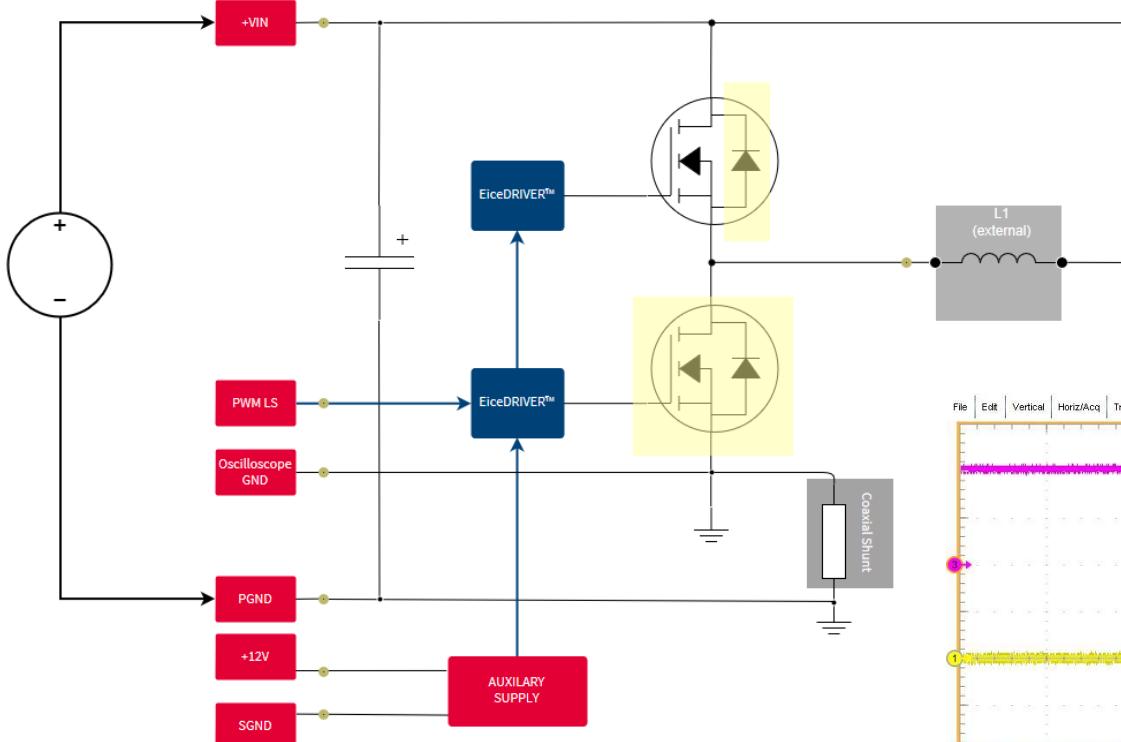


# Double Pulse principle

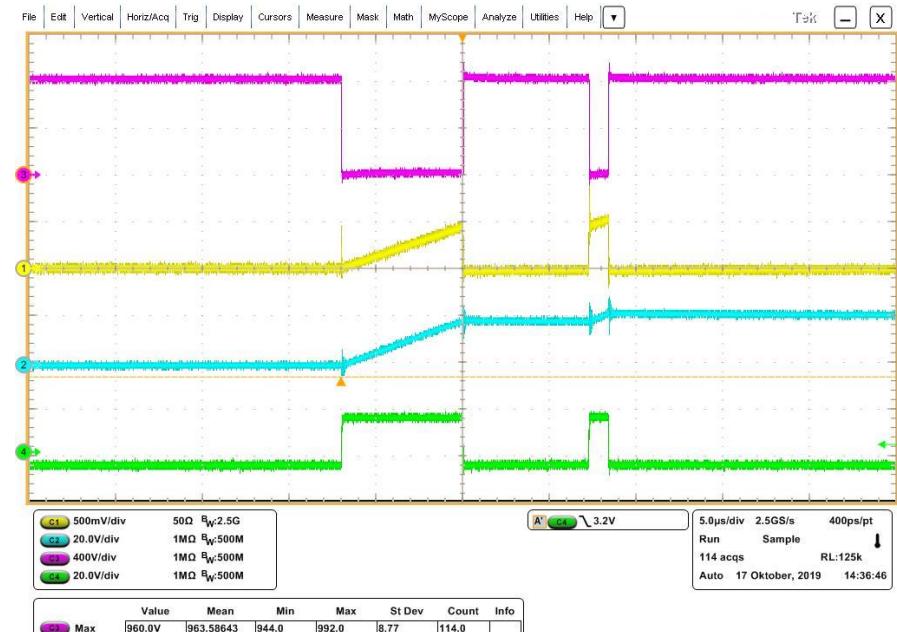


The pulse 1 width defines the desired current in the inductive load. The turn-off event of pulse 1 leads to a constant current through the body diode of S1, which can be also replaced by a discrete diode. Turn-on of pulse 2 shows the reverse recovery charge of S1 or the respective diode.

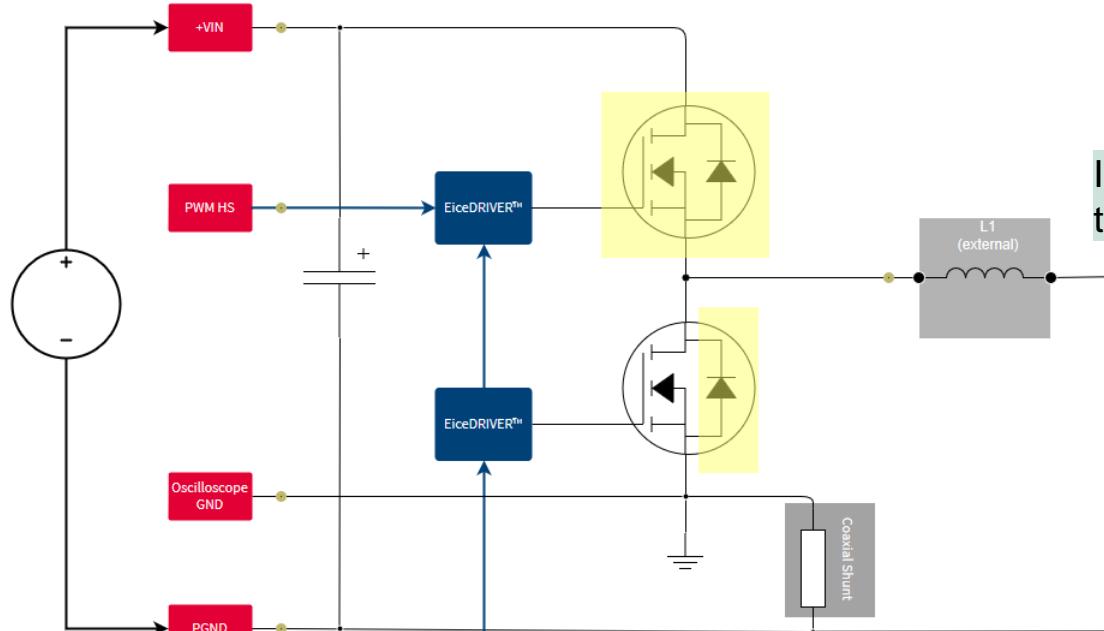
# Half Bridge configuration for LS MOSFET or HS Diode testing



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



# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

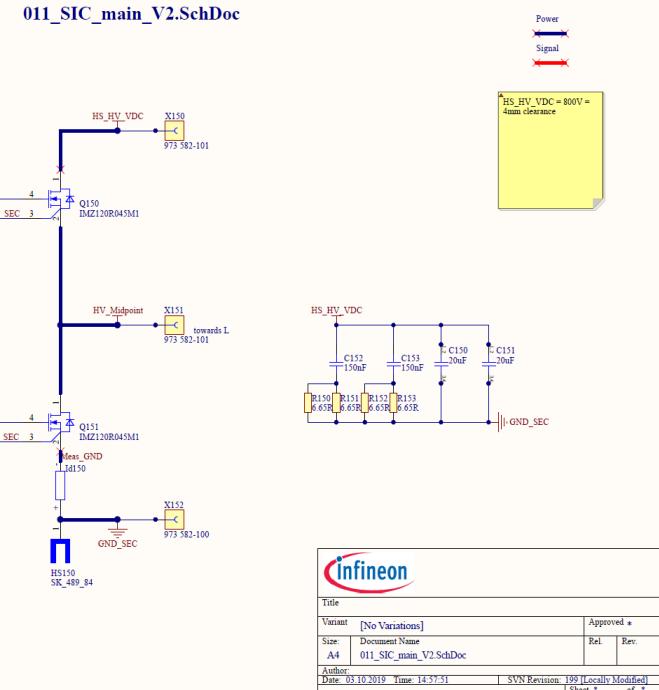
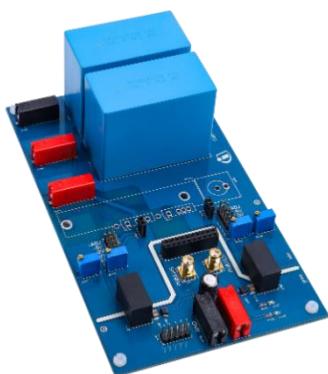
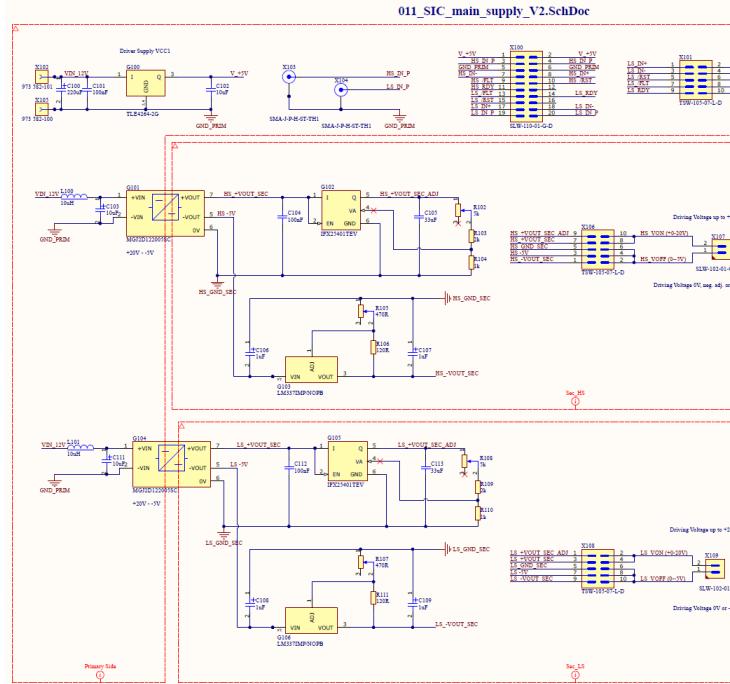
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Order information

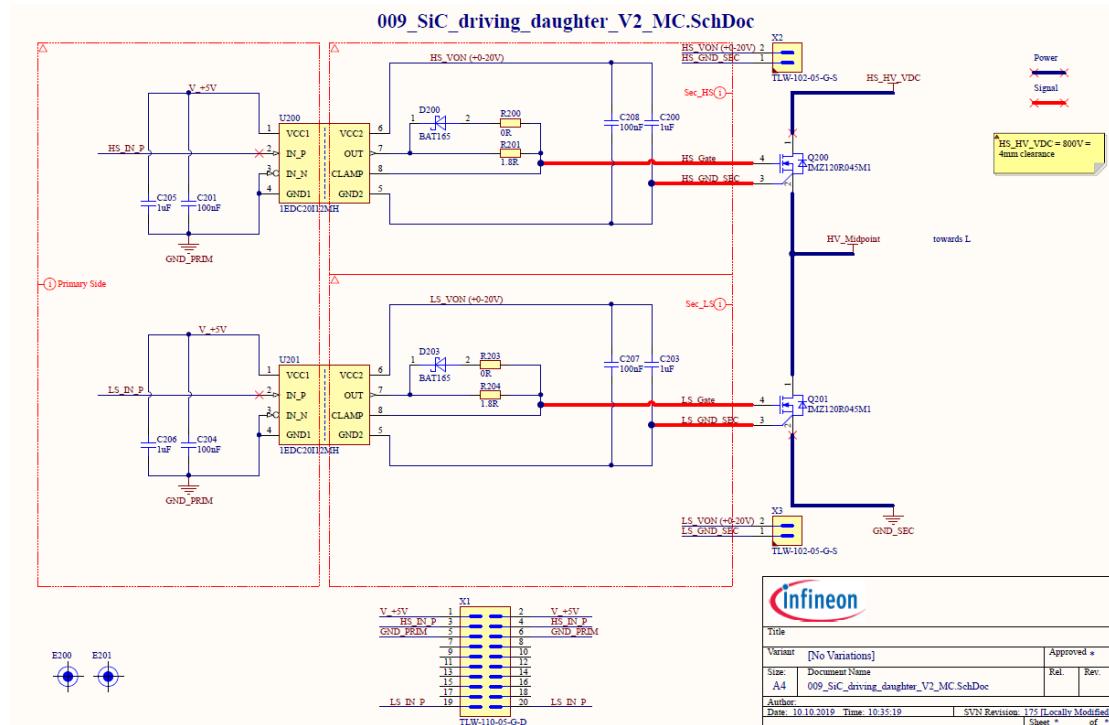
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Support materials

# Schematic of CoolSiC™ MOSFET 1200 V evaluation platform



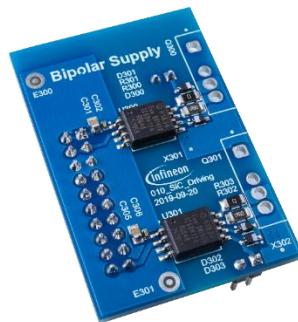
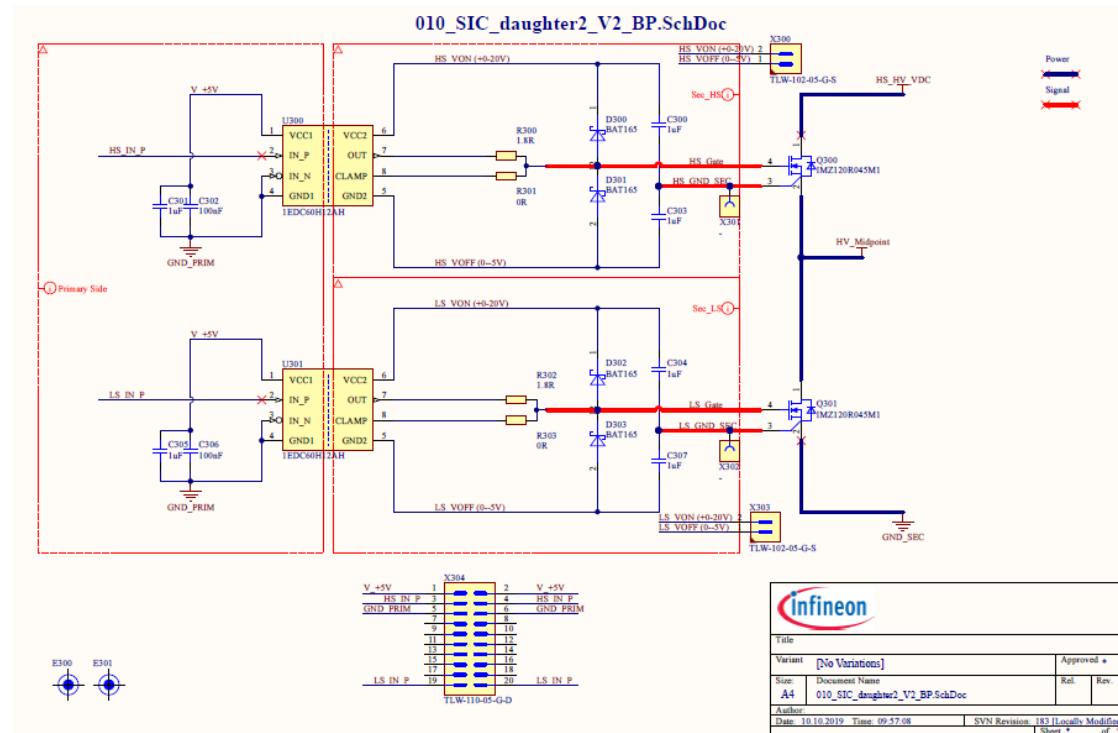
# Schematic of Miller clamp function board



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

# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

Order information

6

Support materials

# Order information

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"> <li>Mother board (CoolSiC™ MOSFET 1200 V evaluation platform) – <b>1pc</b></li> <li>Daughter boards (Miller clamp and bipolar supply boards) – <b>1pc each (total 2pcs)</b></li> <li>IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – <b>4pcs</b></li> </ul>	<ul style="list-style-type: none"> <li>Daughter board (Miller clamp function board) – <b>1pc</b></li> <li>IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – <b>2pcs</b></li> </ul>	<ul style="list-style-type: none"> <li>Daughter board (Bipolar supply function board) – <b>1pc</b></li> <li>IMZ120R045M1 (CoolSiC™ MOSFET 1200 V 45mΩ in TO-247-4) – <b>2pcs</b></li> <li>•</li> </ul>

# Agenda

---

1

Introduction

2

Key features of mother board and two daughter boards

3

Let's get started – operation manual

4

Schematics

5

Order information

6

Support materials

# Support materials

## 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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