REF-MHA50WIMI111T user guide

iMOTION™ fan driver reference design kit

About this document

Scope and purpose

This user guide provides an overview of the reference design board including its main features, key technical data, pin assignments, and mechanical dimensions.

REF-MHA50WIMI111T is a complete reference design board targeted for fan drives that includes the IMI111T iMOTION™ IPM.

The REF-MHA50WIMI111T board is developed to support customers in designing fan applications with IMI111T iMOTION™ IPM.

The available board ordering information is listed in Table 1.

Table 1 REF-MHA50WIMI111T board

Sales name	Orderable part number	iMOTION™ device	DC rating	$V_{CE(sat)}$ Typ at 25°C
REF-MHA50WIMI111T	REFMHA50WIMI111TOBO1	IMI111T-026H	600V / 2A	1.5 V

Intended audience

This user guide is intended for all technical specialists familiar with motor control and high power electronic converters. The REF-MHA50WIMI111T reference board is intended to be used under laboratory conditions only by trained specialists.

Reference board

This board is used during design in for evaluation and measurement of characteristics, and proof of data sheet specifications.

Note: PCB and auxiliary circuits are NOT optimized for final customer design.

Important notice

"Evaluation Boards and Reference Boards" shall mean products embedded on a printed circuit board (PCB) for demonstration and/or evaluation purposes, which include, without limitation, demonstration, reference and evaluation boards, kits and design (collectively referred to as "Reference Board").

Environmental conditions have been considered in the design of the Evaluation Boards and Reference Boards provided by Infineon Technologies. The design of the Evaluation Boards and Reference Boards has been tested by Infineon Technologies only as described in this document. The design is not qualified in terms of safety requirements, manufacturing and operation over the entire operating temperature range or lifetime.

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Evaluation Boards and Reference Boards are not commercialized products, and are solely intended for evaluation and testing purposes. In particular, they shall not be used for reliability testing or production. The Evaluation Boards and Reference Boards may therefore not comply with CE or similar standards (including but not limited to the EMC Directive 2004/EC/108 and the EMC Act) and may not fulfill other requirements of the country in which they are operated by the customer. The customer shall ensure that all Evaluation Boards and Reference Boards will be handled in a way which is compliant with the relevant requirements and standards of the country in which they are operated.

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Safety precautions

Note: *Please note the following warnings regarding the hazards associated with development systems.*

Table 2 Safety precautions

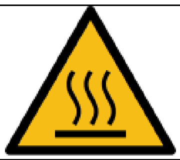
	**Warning:** *The DC link potential of this board is up to 1000 VDC. When measuring voltage waveforms by oscilloscope, high voltage differential probes must be used. Failure to do so may result in personal injury or death.*
	**Warning**: *The evaluation or reference board contains DC bus capacitors which take time to discharge after removal of the main supply. Before working on the drive system, wait five minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication that capacitors have discharged to safe voltage levels.*
	**Warning:** *The evaluation or reference board is connected to the grid input during testing. Hence, high-voltage differential probes must be used when measuring voltage waveforms by oscilloscope. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication that capacitors have discharged to safe voltage levels.*
	**Warning:** *Remove or disconnect power from the drive before you disconnect or reconnect wires, or perform maintenance work. Wait five minutes after removing power to discharge the bus capacitors. Do not attempt to service the drive until the bus capacitors have discharged to zero. Failure to do so may result in personal injury or death.*
	**Caution:** *The heat sink and device surfaces of the evaluation or reference board may become hot during testing. Hence, necessary precautions are required while handling the board. Failure to comply may cause injury.*
	**Caution:** *Only personnel familiar with the drive, power electronics and associated machinery should plan, install, commission and subsequently service the system. Failure to comply may result in personal injury and/or equipment damage.*
	**Caution:** *The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.*
	**Caution:** *A drive that is incorrectly applied or installed can lead to component damage or reduction in product lifetime. Wiring or application errors such as undersizing the motor, supplying an incorrect or inadequate AC supply, or excessive ambient temperatures may result in system malfunction.*
	**Caution:** *The evaluation or reference board is shipped with packing materials that need to be removed prior to installation. Failure to remove all packing materials that are unnecessary for system installation may result in overheating or abnormal operating conditions.*

Table of contents

1 Introduction

The REF-MHA50WIMI111T reference kit provides an easy-to-use motor drive solution based on Infineon's IMI111T iMOTION™ IPMs. The board is equipped with all assembly groups for sensor-less field-oriented control (FOC). It contains a typical fan driver connector, and a 3-phase motor connector. The power stage also contains DC shunt for current sensing and a voltage divider for measuring the DC-link voltage.

Features of this board are described in Chapter 2 of this user guide. The other chapters provide information to help users copy, modify, and qualify the design for production according to their specific requirements.

Environmental conditions were considered in the design of the REF-MHA50WIMI111T. The design was tested as described in this document but it is not qualified with regard to safety requirements or manufacturing and operating over the whole operating temperature range or lifetime. The boards provided by Infineon are only subject to functional testing.

Reference boards are not subject to the same procedures as regular products with regard to returned material analysis (RMA), process change notification (PCN), and product discontinuation (PD). Reference boards are intended to be used under laboratory conditions and only by trained specialists.

The iMOTION™ motion control engine (MCE) integrated into IMI111T devices, together with the gate driver and six IGBTs offers a complete motor drive system in a compact DSO22 surface mount package, minimizing the external components count and PCB area.

The block diagram of REF-MHA50WIMI111T is shown in Figure 1.

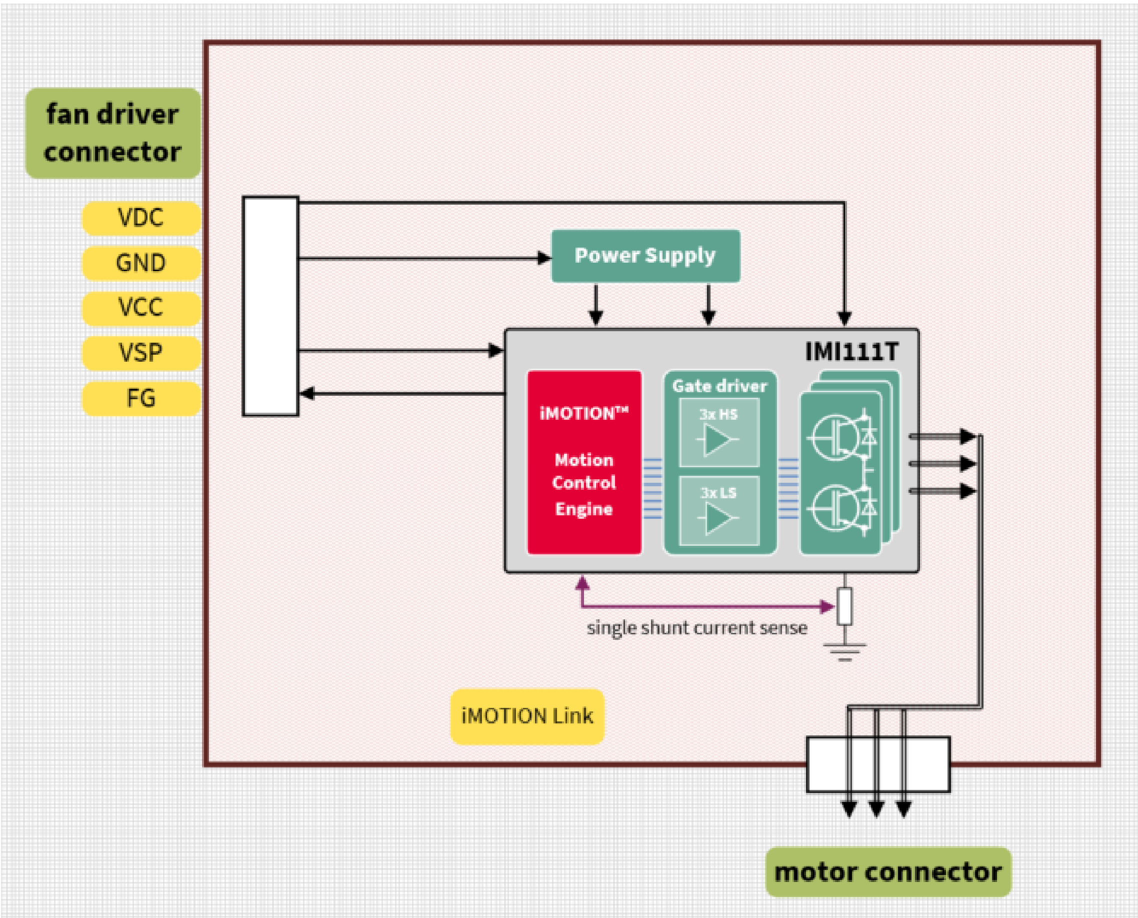


Figure 1 Block diagram of REF-MHA50WIMI111T

2 Main features

REF-MHA50WIMI111T reference design kits are intended for evaluating the IMI111T series of iMOTION™ IPMs. The main features [1] of IMI111T series are:

- Motion control engine (MCE) as ready-to-use controller solution for variable speed drives
- Field oriented control (FOC) for permanent magnet synchronous motor (PMSM)
- Space vector pulse width modulation (SVPWM) with sinusoidal commutation and integrated protection features
- Single-shunt current sensing through direct interface
- Sensor-less operation
- Integrated analog comparators for overcurrent protection
- Overvoltage and undervoltage protection
- Rotor lock protection
- Built-in temperature sensor (Overtemperature protection)
- Undervoltage lockout
- Integrated minimum deadtime
- Shoot-through prevention
- Two different power IGBT options: 2 A/600 V, 4 A/600 V
- Two different supply voltage options for controller: 3.3 V, 5 V
- 15 V supply voltage for gate driver
- Integrated bootstrap diode structure
- Flexible host interface options for speed commands: UART, SPI, PWM, or analog signal
- Class B pre-certification for MCE 2.0 firmware
- Isolation 1500 V_{RMS} 1 min
- Very compact DSO22 package

The main characteristics of the reference board are:

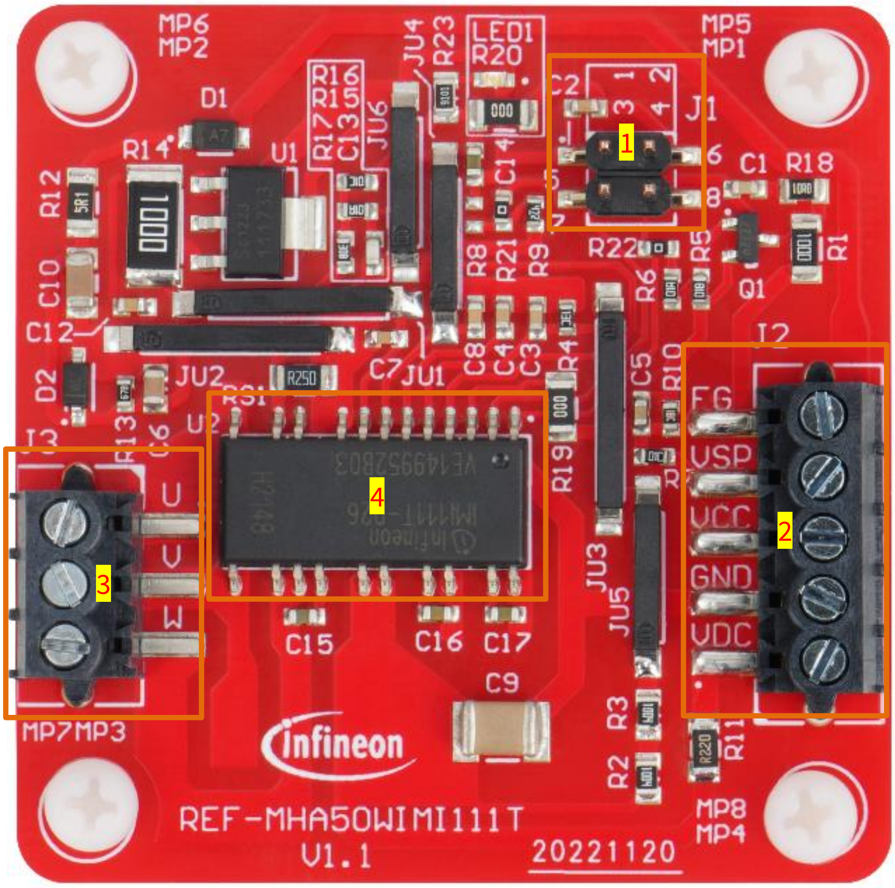
- Typical fan driver 5-pin connector including VDC/GND/VCC/VSP/FG
- Single-shunt current sensing configuration
- Voltage divider for DC-link voltage sensing
- PCB dimensions: 52.0 mm x 52.0 mm, single layer, 1 oz copper
- RoHS compliant

Table 3 lists all the important specifications of the REF-MHA50WIMI111T reference board.

Table 3 REF-MHA50WIMI111T specifications

Parameters	Device	Values	Conditions
Output motor current			
Current per phase	IMI111T-026	416 mA_{rms}	t_{amb} = 25°C, t_{case} = 100°C, V_{DC} = 300 V, 2-phase modulation, 6 kHz PWM
DC bus voltage			
Maximum DC bus voltage	IMI111T-026	380 V	
Minimum DC bus voltage	IMI111T-026	120 V	
Current feedback			
Current sensing resistor	IMI111T-026	250 mΩ	The current sensing configuration is single-shunt
DC power supply			
VCC	IMI111T-026	15V ± 1.5V	Used for iMOTION™ IPMs gate driver
3.3 V	IMI111T-026	3.3 V ±2%, max. 20 mA	Supplying 3.3 V to the controller
PCB characteristics			
Material	IMI111T-026	FR4, 1 layer, 1 oz copper	
Dimension	IMI111T-026	52.0 mm x 52.0 mm	
System environment			
Ambient temperature	IMI111T-026	From 0 to 60°C	Non-condensing, maximum RH of 95%

Figure 2 shows the top side of the REF-MHA50WIMI111T reference board.



1	J1 UART connector
2	J2 Fan driver connector
3	J3 Motor connector
4	IMI111T-026H

Figure 2 Top side of REF-MHA50WIMI111T

3 Pin assignments

Table 4 Pinout description for IMI111T [1]

Pin	Name	Type	Description
1	TX0	O	Serial port transmit output
2	RX0	I	Serial port receive input
3	VSP	AIN	Analog speed reference input
4	ISS	AIN	Single-shunt current sense input
5	VDC	AIN	DC bus sensing input
6	IREF	O	Overcurrent reference DAC output
7	VDD	P	Digital controller supply
8	VCC	P	Low side gate driver supply
9	VSS	P	Control signal ground
10	GLV	NC	Gate of low side IGBT of phase V (do not connect on PCB)
11	VR	P	3-phase low side IGBT common emitter return
12	UN	P	U phase low side IGBT collector (needs PCB connection to UP)
13	VN	P	V phase low side IGBT collector (needs PCB connection to VP)
14	W/VSW	P	W phase output (bootstrap capacitor connection -)
15	W/VSW	P	W phase output (bootstrap capacitor connection -)
16	VBW	P	W phase high side floating supply (bootstrap capacitor connection +)
17	V+	P	DC bus voltage positive
18	V+	P	DC bus voltage positive
19	VBV	P	V phase high side floating supply (bootstrap capacitor connection +)
20	VP	P	V phase high side IGBT emitter (needs PCB connection to VN)
21	VBU	P	U phase high side floating supply (bootstrap capacitor connection +)
22	UP	P	U phase high side IGBT emitter (needs PCB connection to UN)

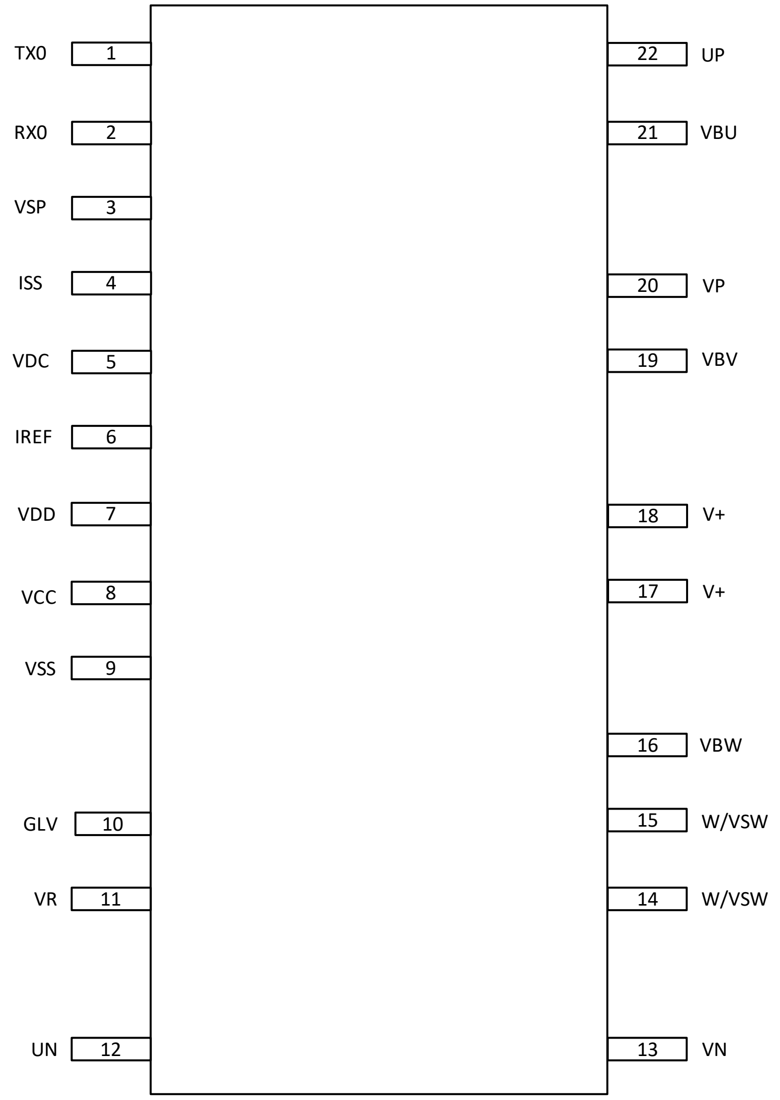


Figure 3 IMI111T pinout

General information about the connectors of the REF-MHA50WIMI111T reference board is provided in the following tables:

Table 5 J1 connector description

Pin	Name	Details
5	GND	Ground
6	3.3 V	Onboard 3.3 V supply
7	RXD0	RXD0 for UART communication
8	TXD0	TXD0 for UART communication

Table 6 J2 connector description

Pin	Name	Details
1	VDC	DC bus voltage input
2	GND	Ground

Pin	Name	Details
3	VCC	15V supply input
4	VSP	Input for analog Vsp control
5	FG	Pulses per revolution, open drain output 15 V tolerant

Table 7 J3 connector description

Pin	Name	Details
1	U	Connected to motor phase U
2	V	Connected to motor phase V
3	W	Connected to motor phase W

4 System performance

To meet individual customer requirements and to help them make the REF-MHA50WIMI111T reference board a basis for development or modification of their own boards, all necessary technical data such as schematics, layout, and components are included in this chapter. Figure 4 provides an overview of the different parts of REF-MHA50WIMI111T. The details are analyzed in subsequent chapters.

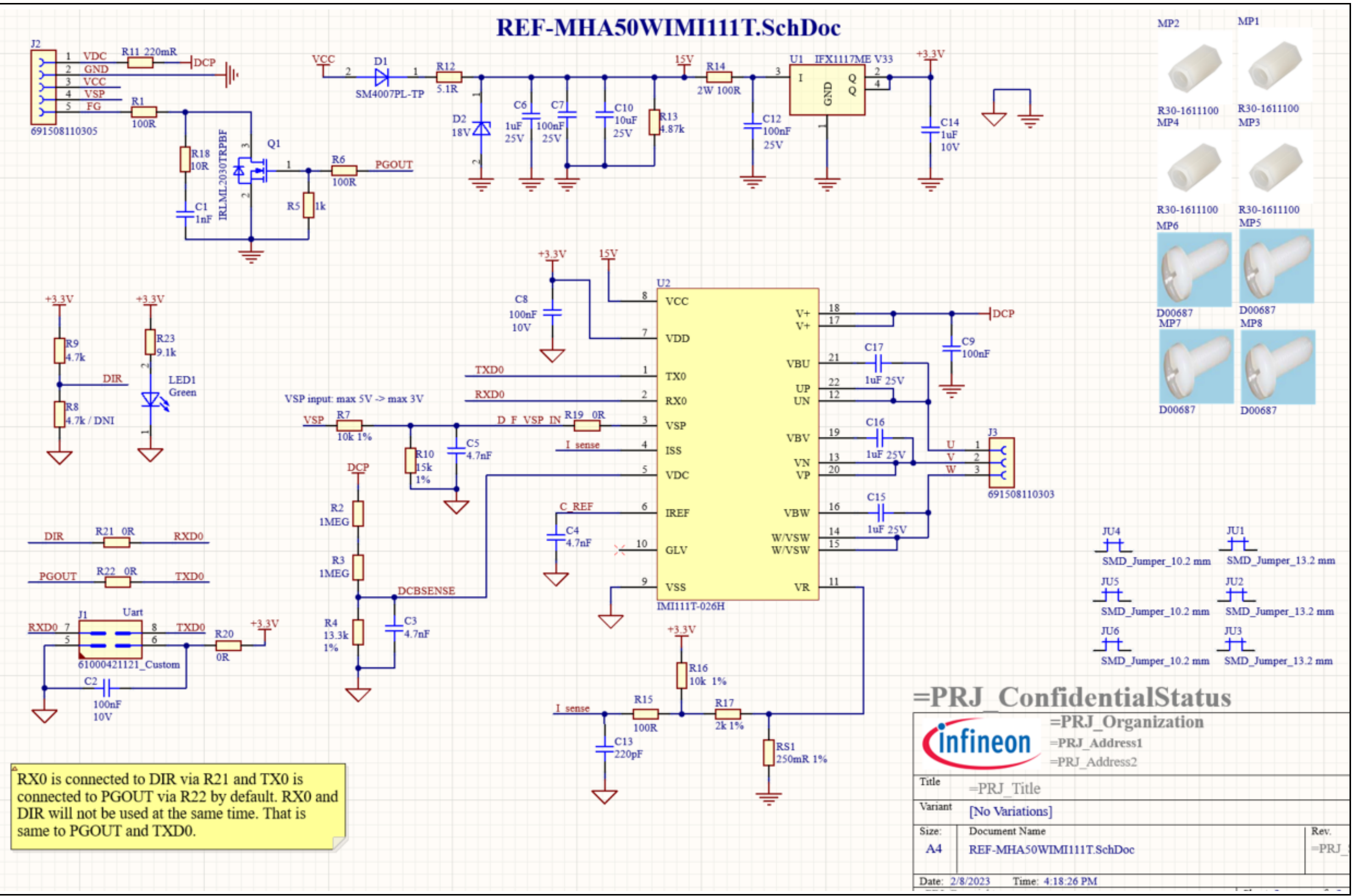


Figure 4 Overview of the schmatics

4.1 DC bus voltage measurement

Figure 5 shows the details of the DC bus sense resistor.

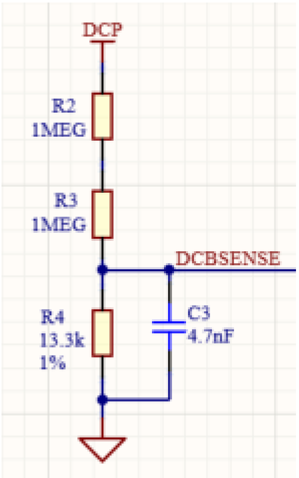


Figure 5 DC bus sense resistor on the REF-MHA50WIMI111T reference board

The DCBSENSE voltage is read by the VDC pin of the controller. With 13.3 kΩ as pull-down resistor, the DCBSENSE voltage causes a range of 0 to 3.3 V on the pin reflecting a DC bus voltage range of 0 to 500 V.

4.2 Inverter section using iMOTION™ IPM

The inverter section is implemented as shown in Figure 6. The 3-phase inverter consist of six IGBTs with the following blocking voltages and current capability:

- IMI111T - 026H - DC rating: 600 V/2 A

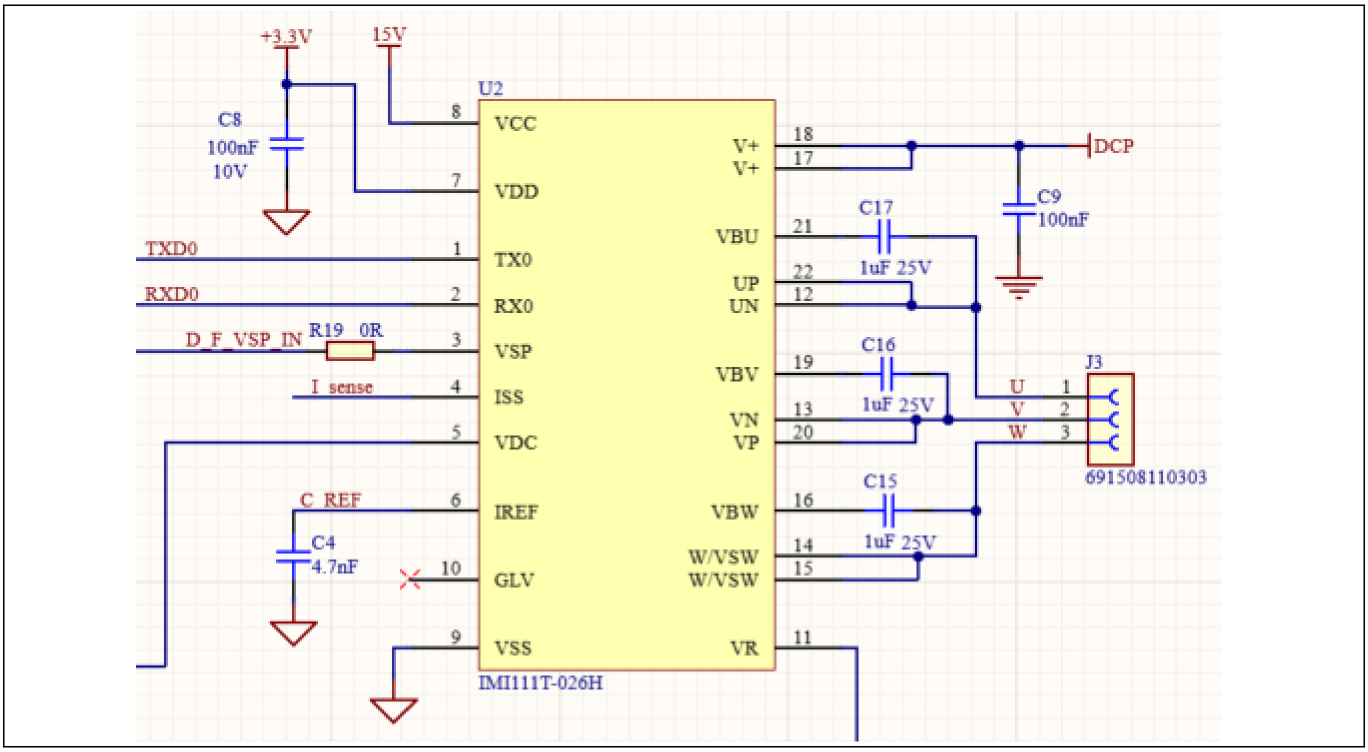


Figure 6 Schematic of the 3-phase inverter section using iMOTION™ IPM IMI111T

4.3 Auxiliary power supply

Figure 7 shows the schematic of the auxiliary power supply available on the REF-MHA50WIMI111T board. The linear voltage regulator IFX1117MEV33 generates 3.3 V from a 15 V power supply VCC. The 3.3 V supplies the control IC inside the iMOTION™ IPM.

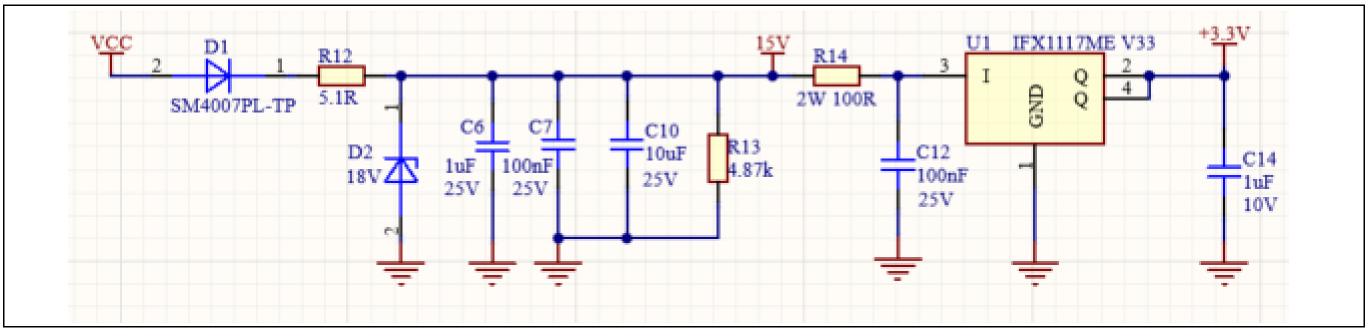


Figure 7 Power supply section of the REF-MHA50WIMI111T evaluation board

4.4 Current measurement shift stage and overcurrent threshold

Figure 8 shows the details of the current measurement shift stage.

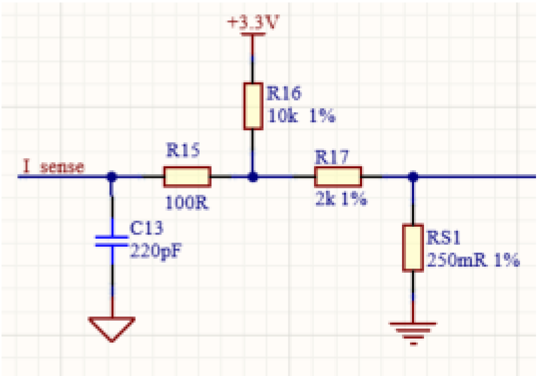


Figure 8 Current measurement shift stage

In a single-shunt configuration, resistor RS1 is purposed to generate a voltage proportional to the sum of the source currents of the low side power IGBTs. This voltage is shifted using the shift stage shown in Figure 8 and is measured at pin ISS.

The shift stage is made of a voltage divider and a low pass filter. Using the superposition theorem, it is possible to calculate the input current scaling and the shift stage offset. The input current scaling can be calculated using the following formula:

$$Input\ Current\ Scaling = RS_1 \frac{R_{16}}{R_{16} + R_{17}}\ V/A$$

The ADC dynamic range can be calculated using the following formula:

$$ADC\ range = \frac{Input\ Current\ Scaling}{3.3\ V} \times Internal\ Gain\ \times (2^{12} - 1)\ counts/A$$

Internal gain can be set via the iMOTION™ Solution Designer and the default value for REF-MHA50WIMI111T is equal to 3. Particular attention has to be paid when setting the internal gain to avoid saturating the ADC; it can cause a continuous GateKill fault status.

The shift stage offset can be calculated using the following formula:

$$Shift\ Stage\ Offset = \frac{R_{17}}{R_{16} + R_{17}} \times 3.3\ V$$

The overcurrent comparator reference voltage can be calculate using the following formula:

$$OVC\ Threshold = \left(I_{MAX\ peak} \times Input\ Current\ Scaling\ +\ Shift\ Stage\ Offest\right) V$$

5 Thermal characterization

Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, and Figure 14 show the thermal characterizations of the reference board. The tests were performed under the following conditions:

T_{amb} = 25°C, input voltage V_{DC} = 300 V, two different PWM modulation types (3-phase PWM modulation and 2-phase PWM flat bottom modulation).

Figure 9, Figure 10, Figure 11, and Figure 12 show results of tests performed under two PWM frequencies (6 kHz and 16 kHz) and different motor phase current values or different input powers. Figure 13 and Figure 14 show results of tests performed under different PWM frequencies (4 kHz to 20 kHz) till T_{case} = 100°C was reached. A 2-phase PWM flat bottom modulation enabled the reduction in switching losses compared to a 3-phase SVPWM (symmetrical placement of zero vectors).

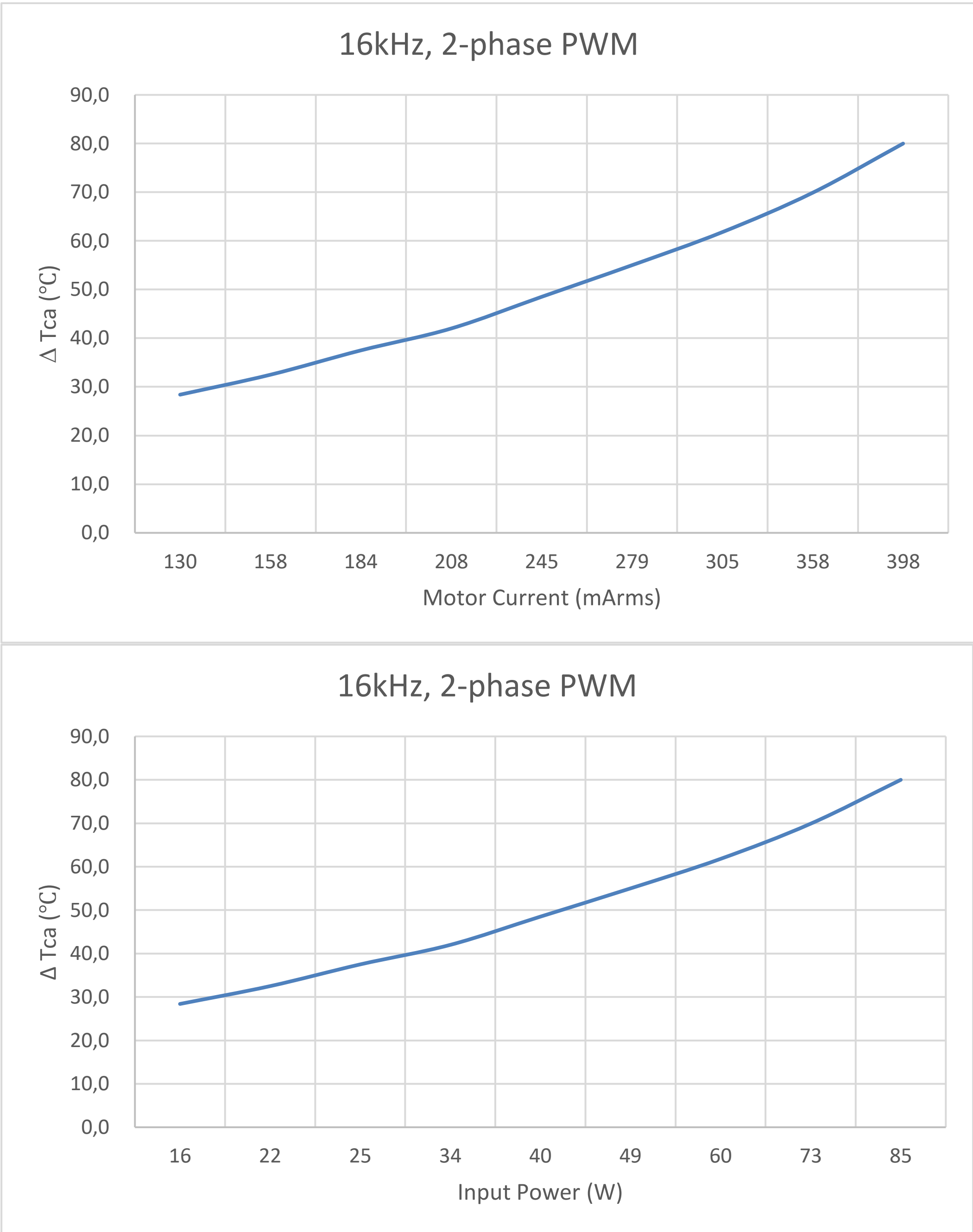


Figure 9 Thermal characterization of IMI111T-026H, 2-phase PWM, 16 kHz, FR4 PCB with 1 oz copper

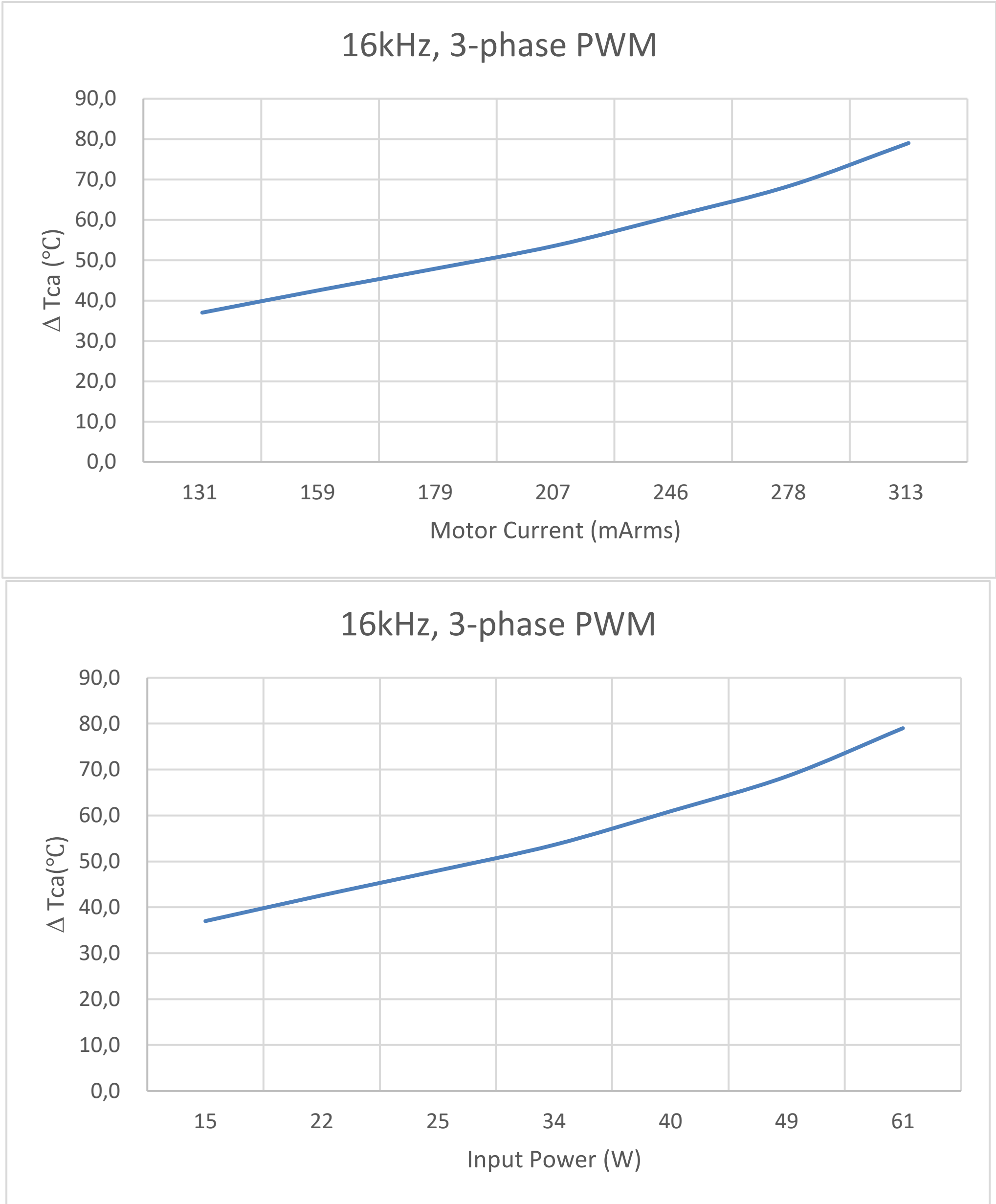


Figure 10 **Thermal Characterization of IMI111T-026H, 3-phase PWM, 16 kHz, FR4 PCB with 1 oz copper**

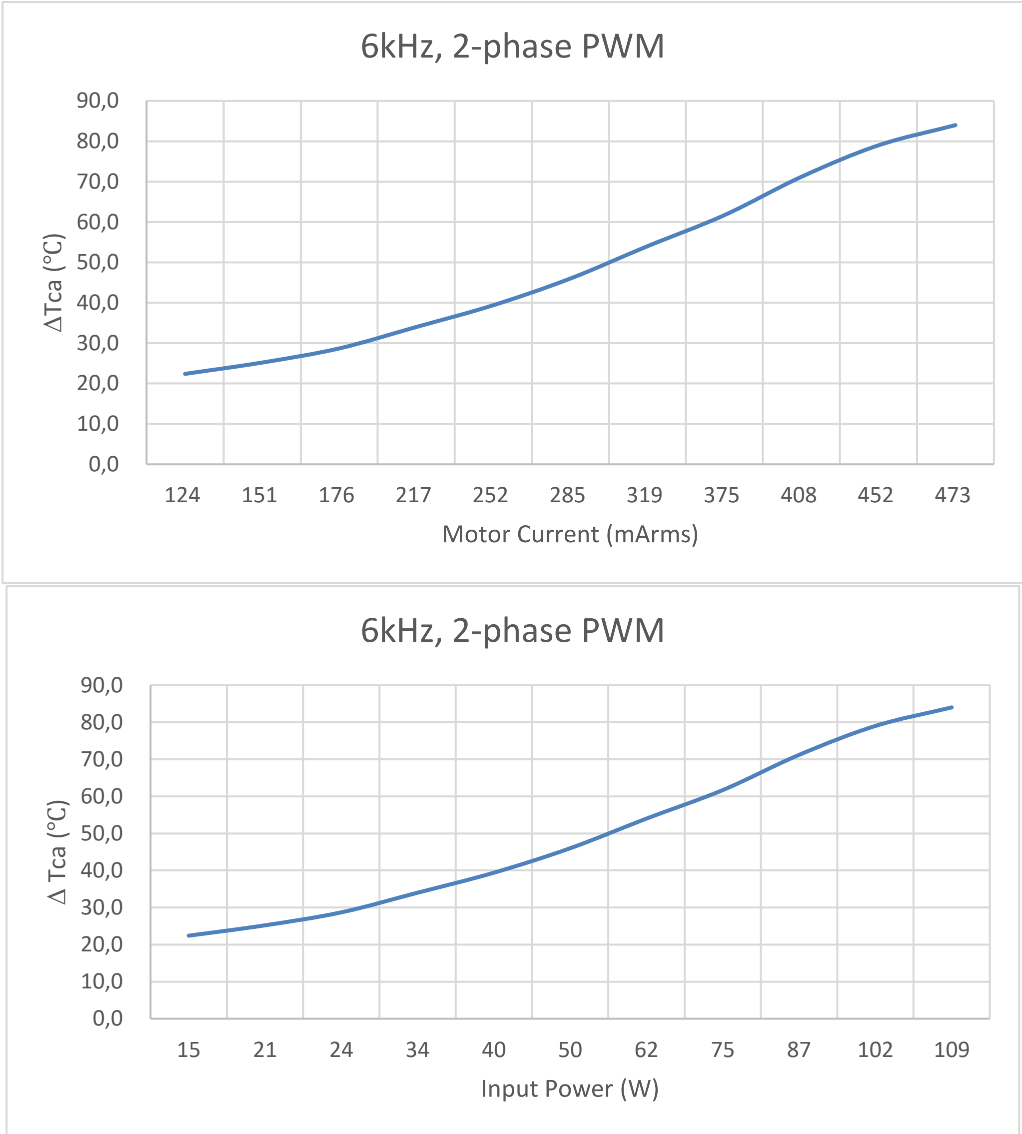


Figure 11 Thermal Characterization of IMI111T-026H, 2-phase PWM, 6 kHz, FR4 PCB with 1 oz copper

Figure 12 Thermal Characterization of IMI111T-026H, 3-phase PWM, 6 kHz, FR4 PCB with 1 oz copper

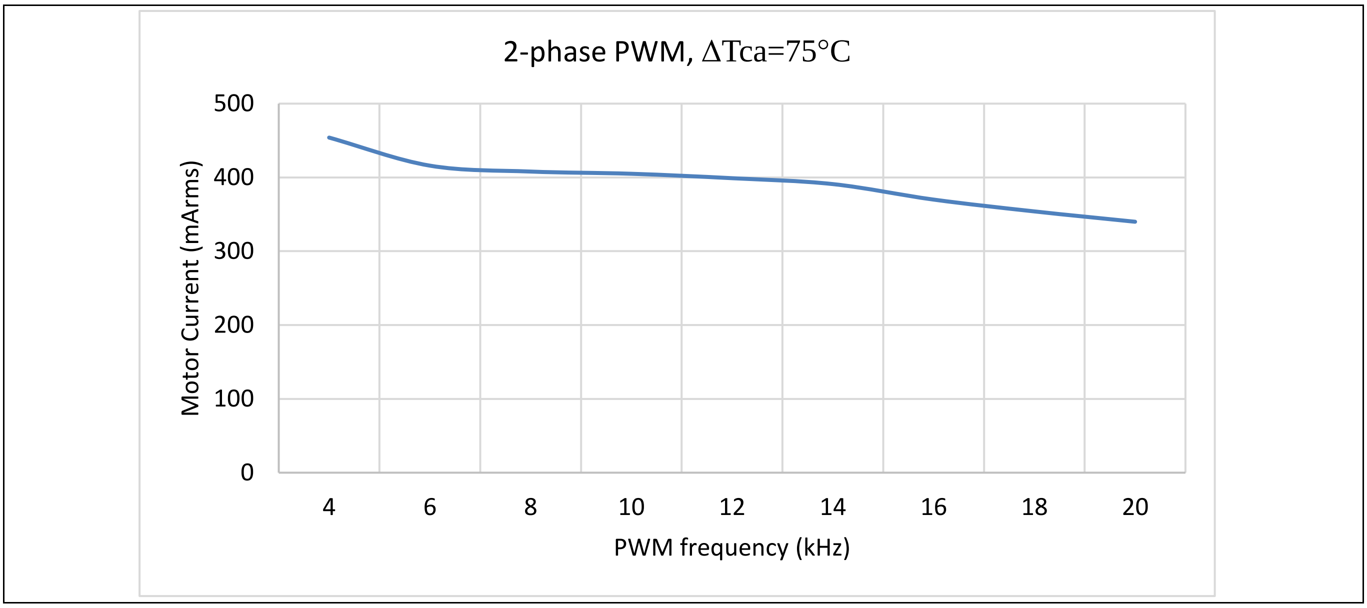


Figure 13 **Thermal Characterization of IMI111T-026H, 2-phase PWM, ΔTca = 75°C, FR4 PCB with 1 oz copper**

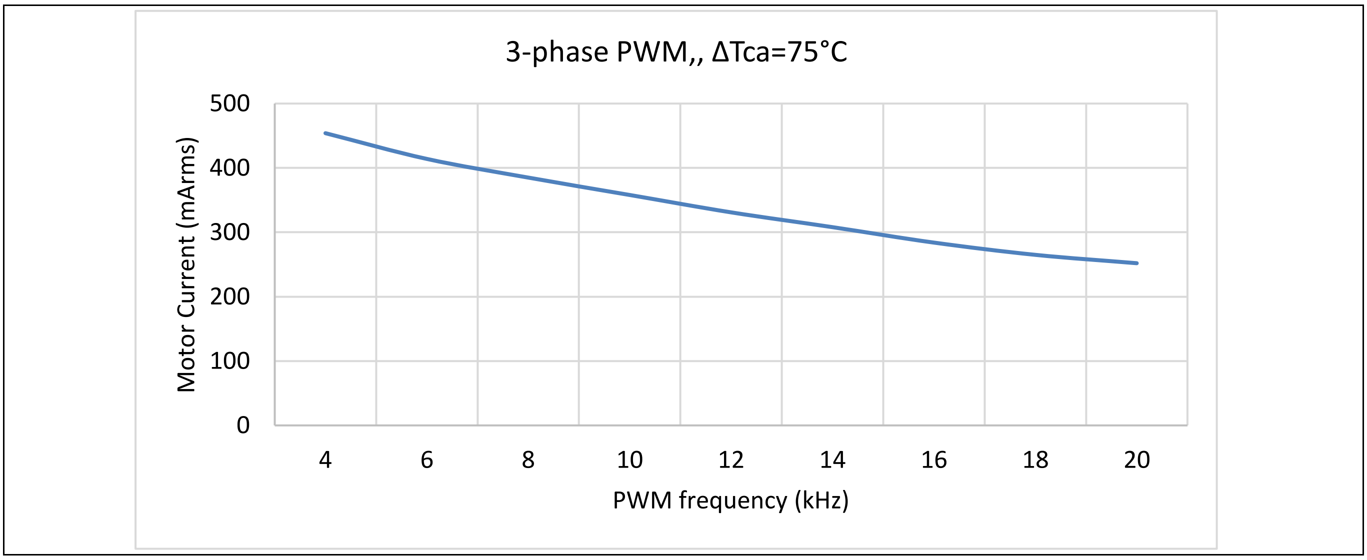


Figure 14 **Thermal Characterization of IMI111T-026H, 3-phase PWM, ΔTca = 75°C, FR4 PCB with 1 oz copper**

5.1 Thermal characteristic

Table 11 Thermal Characteristics

Symbol	Description	Min	Typ	Max	Units
$R_{th(C\text{-}A)\ IMI111T\text{-}026H}$	Thermal resistance Case to ambient	---	33	---	°C/W

The value of $R_{th(C\text{-}A)}$ was obtained using a dissipated power of 2 W in the module and a FR4 PCB with 1 oz copper. The PCB layout is shown in Figure 15.

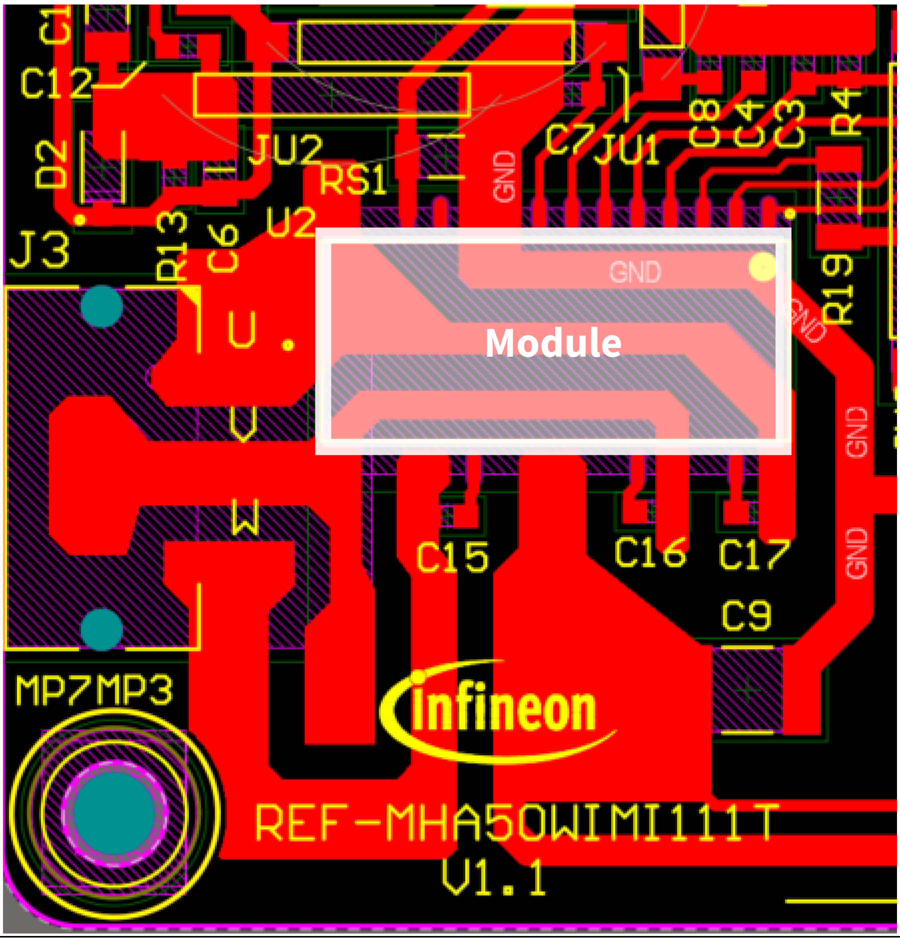


Figure 15 PCB layout used for thermal characterization: 1 oz copper, 1 layer

5.2 Thermal PCB design

IMI111T relies on the leads to transfer thermal dissipation from the power devices to the PCB. There are several critical pins that need attention to achieve improved thermal performance of the module. Figure 16 shows the pins critical for thermal dissipation. These include V+ (17, 18), UN (12), VN (13), and W (14, 15). Copper areas connected to the critical pins have to be optimized as much as possible to provide more thermal transfer capability, and this is especially important for single layer PCB design. In this reference design, the motor connector J3 is placed very close to the critical pins UN and VN, and it helps acting like an external heatsink to extract the heat more effectively. Figure 17 shows the PCB design with respect to the critical pins.

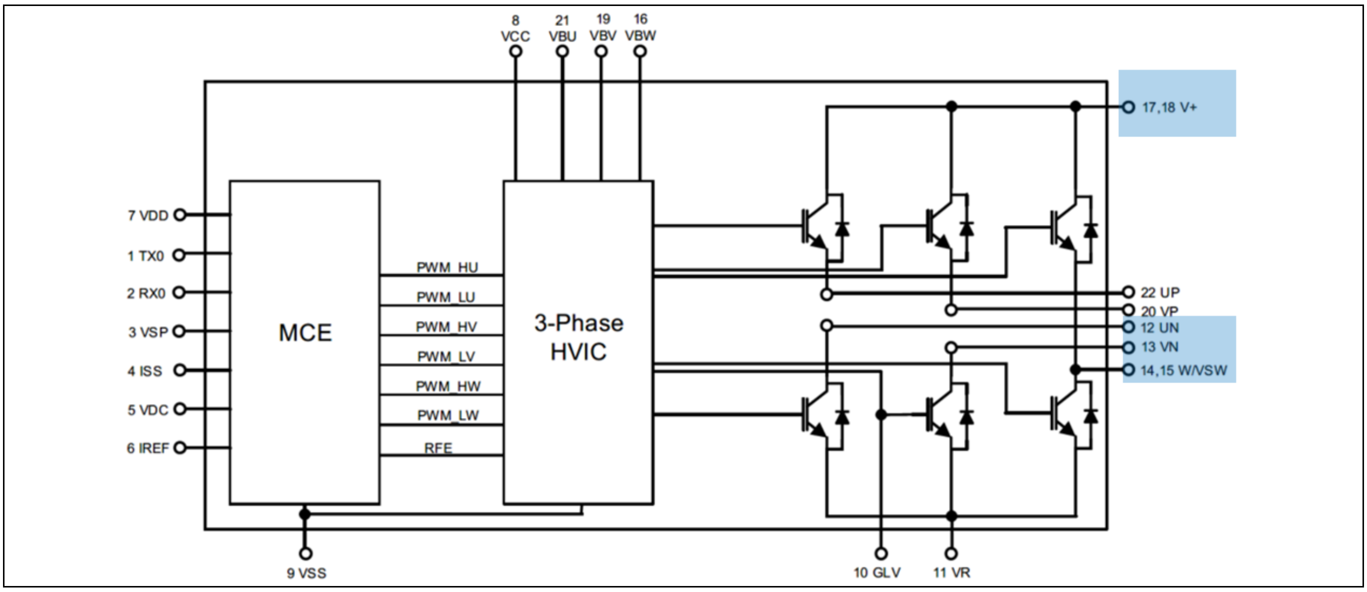


Figure 16 Critical pins for thermal PCB design

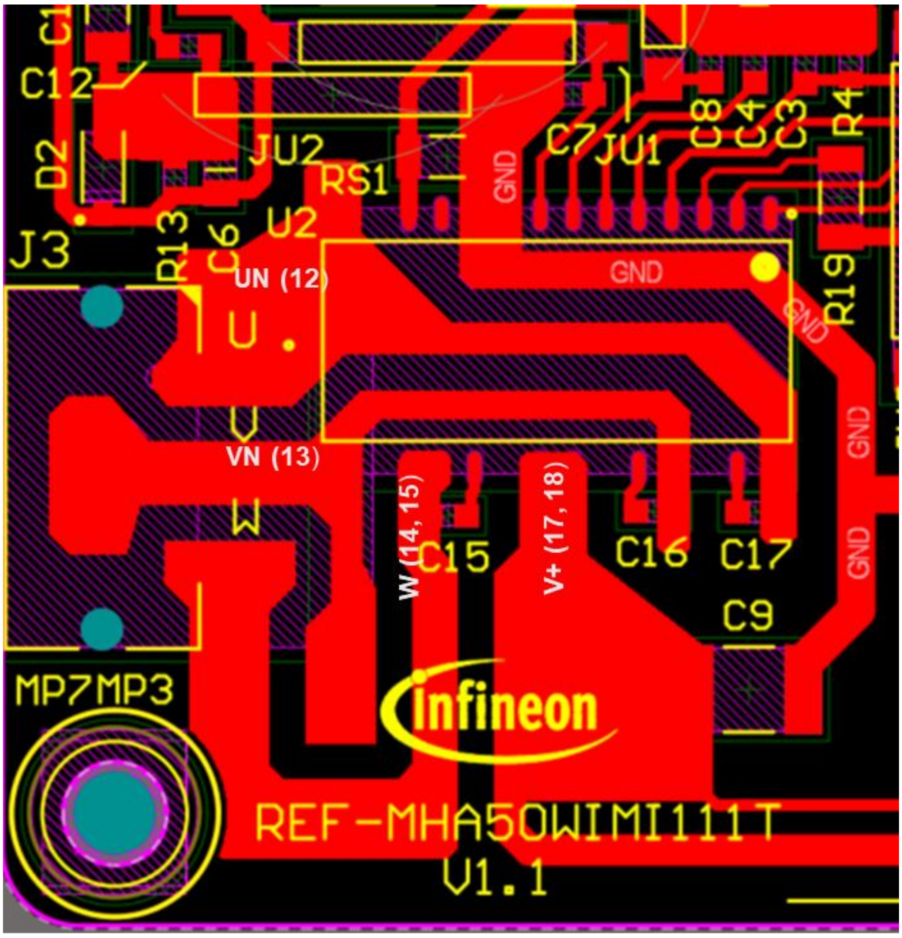


Figure 17 Reference board PCB design regarding critical pins

6 Thermal protection

The IMI111T devices feature an integrated temperature sensor that helps in monitoring the internal temperature of the module. The device temperature can be accessed using script engine language. The particular register name for this functionality is “InternalDieTemp [2]” in iMOTION™ Solution Designer dashboard variables list and the register value is in Kelvin [K].

To enable overtemperature protection for the REF-MHA50WIMI111T starter kit, a corresponding script file (.mgs) has been pre-loaded into the IMI111T mounted on the REF-MHA50WIMI111T starter kit, along with the latest IMI111T software package and parameters.

To activate the overtemperature protection, the script project needs to be set up, built, and programmed in iMOTION™ Solution Designer script editor window during system setup. Please refer to the application note How to use iMOTION™ Script Language [2][3]for more details about the iMOTION™ script functionality. Chapter 7 of this user guide provides the operative method for script application.

The script that is used for overtemperature protection in REF-MHA50WIMI111T is shown in Code Listing 1, Code Listing 2 and Code Listing 3. The script has been implemented to stop the motor when the sensed temperature reaches 101°C (shutdown temperature) and to restart the motor when the sensed temperature goes below 60°C (restart temperature). Please note that the sensed temperature is the controller temperature, whereas, overtemperature is generally triggered by the case temperature of the module. Based on experimental results, Figure 18 shows the relationship between the case temperature and the internal sense temperature. Customers can use this curve to determine their internal sense temperature for thermal shutdown.

Code Listing 1 Globales.mcs

```
/*********************************************************************************************************************/
/*Global variables*/
/*********************************************************************************************************************/
int Inter_temperature;
```

Code Listing 2 Script_Task0.mcs

```
/*Task0 init function*/
Script_Task0_init()
{
  /*Local variables declaration*/
  int t_hyst, t_shutdown, flag;

  /*Global variable initialization*/
  Inter_temperature = 0;

  /*Local variables initialization*/
  t_hyst = 333;
  /*60 centigrade, please insert the value in Kelvin*/

  t_shutdown = 364;
      /*The IC control part internal shutdown die  temperature is 101 centigrade when IMI package
      temperature is 100 centigrade. Please insert the value in Kelvin */

  flag = 0;
```

```
}
/*****************************************************************************************************************/
/*Task0 init function*/
Script_Task0()
{
  Inter_temperature=MCEOS.InternalDieTemp;
  if((Inter_temperature < t_hyst)&&(flag == 1))
      /*If t_hyst <   temperature < t_shutdown, motor is still in stop  condition and it is not able to restart */
  {
          flag = 0;
          APP_MOTOR0.Command = 1;
  }

  if(Inter_temperature > t_shutdown)
  /*If temperature>t_shutdown, motor is stopped*/
  {
          APP_MOTOR0.Command = 0;
          flag = 1;
  }

  if(flag == 1)
  {
          APP_MOTOR0.Command = 0;
  }
}
```

Code Listing 3 Script_Task1.mcs

```
/*Task1 init function*/
Script_Task1_init()
{

}
/**********************************************************************/
/*Task1 init function*/
Script_Task1()
{

}
```

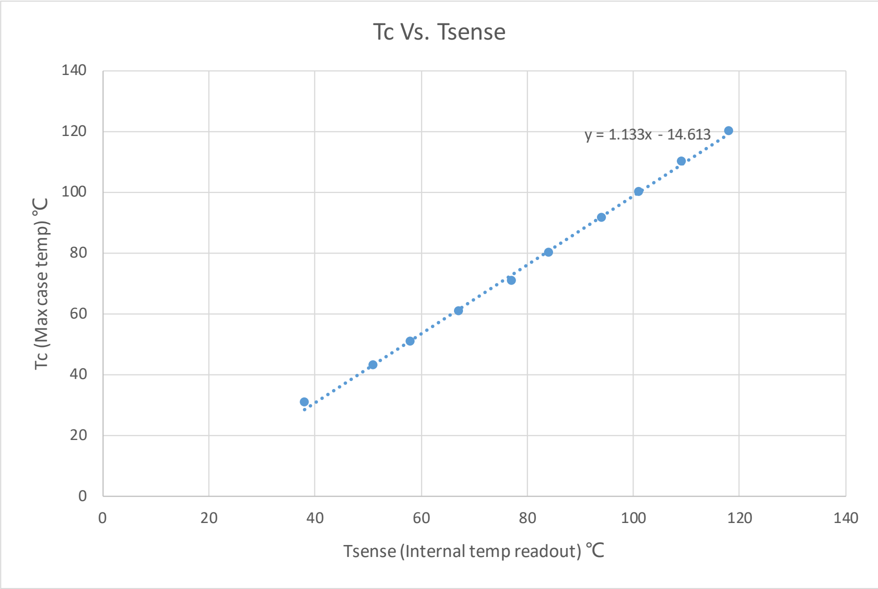


Figure 18 Correlation between the case temperature and the internal temperature readout

7 Getting started with REF-MHA50WIMI111T

This chapter provides details on setting up the system and getting started with the iMOTION™ development platform.

The iMOTION™ development tool, iMOTION™ Solution Designer is required to set up the system, and to control and fine-tune the system performance to match a user's actual needs. This tool is available for download from Infineon's website (http://www.infineon.com/imotion-software).

This board provides the external debugger interface for iMOTION™ Link. iMOTION™ Link is isolated. For more information about iMOTION™ Link, please visit the iMOTION™ Link page on Infineon's website.

7.1 Hardware connection

There is one method to debug the board which is using the external debugger, iMOTION™ Link. Before debugging, the board needs to be connected to PC.

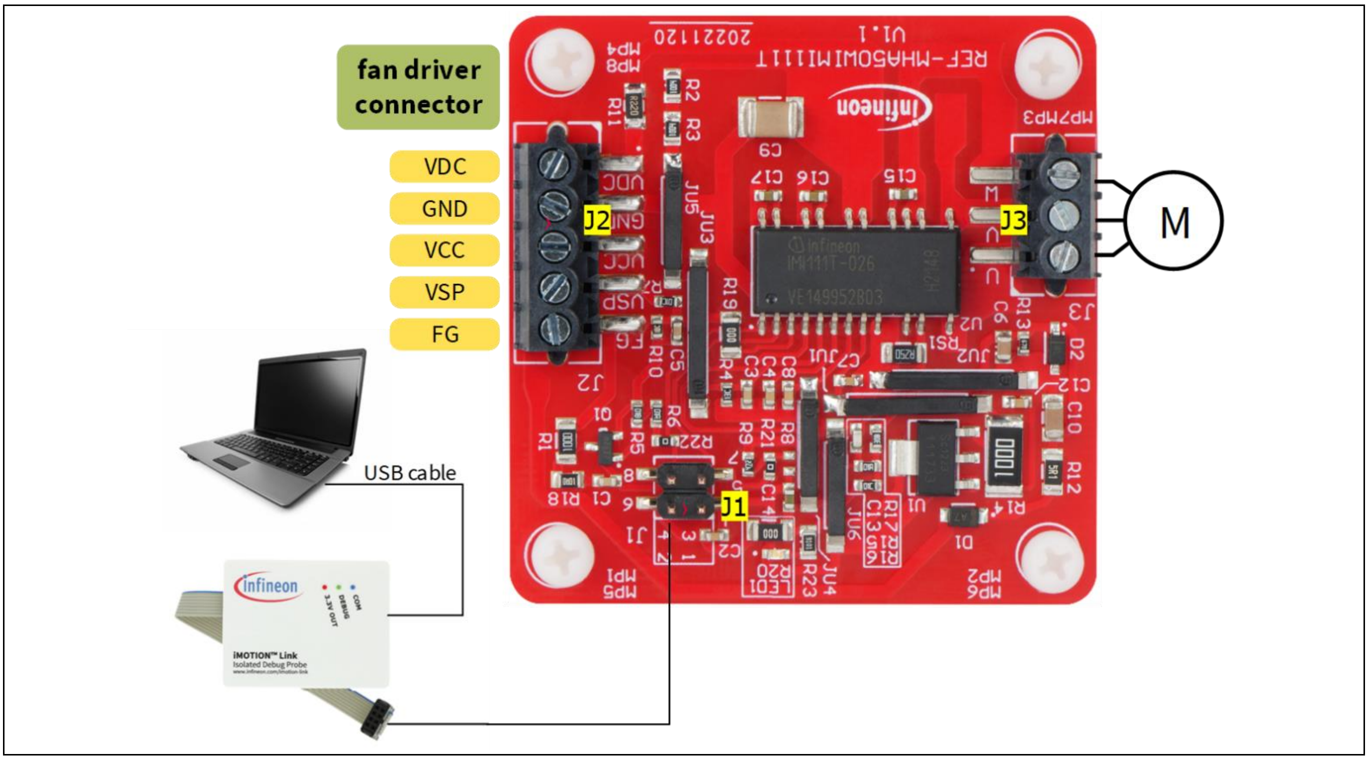


Figure 19 Using an external debugger iMOTION™ Link

Follow these steps:

1. Connect PC-USB connector to iMOTION™ Link via the USB cable.
2. Connect iMOTION™ Link to J1.
3. Connect VDC, VCC and GND to J2.
4. Connect motor to J3. Please note the sequence of U, V, and W phases sequence and change the sequence of any two phases if the motor's running direction needs to be altered.

7.2 Getting started with iMOTION™

Please refer to the document iMOTION™ Solution Designer [4] for information on how to use the iMOTION™ Solution Designer tuning tool.

7.3 UART function switching

To use Pin1 as PGOUT and Pin2 as DIR, please refer to the document How to Use UART Interface of IMM101T and IMI111T [5] for information on how to configure this function.

8 PCB layout

The layout of this board can be used for different voltage or power classes. The power PCB is a single-layer PCB. Get in touch with Infineon's technical support team to get detailed information and the latest gerber files.

Figure 21 shows the top assembly print of the reference board.

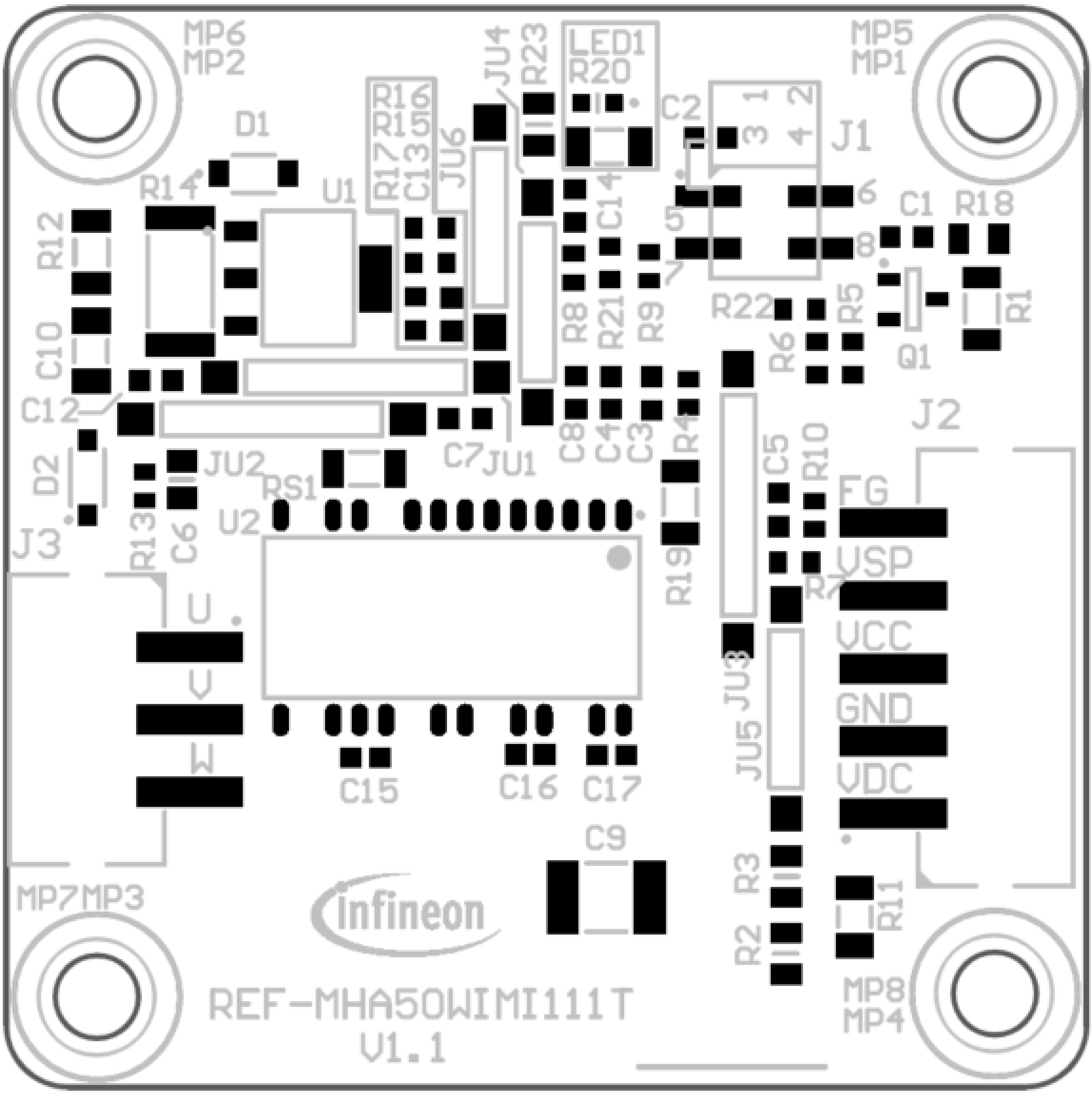


Figure 21 Top assembly print of the REF-MHA50WIMI111T reference board

The top layer routing of the PCB is shown in Figure 22.

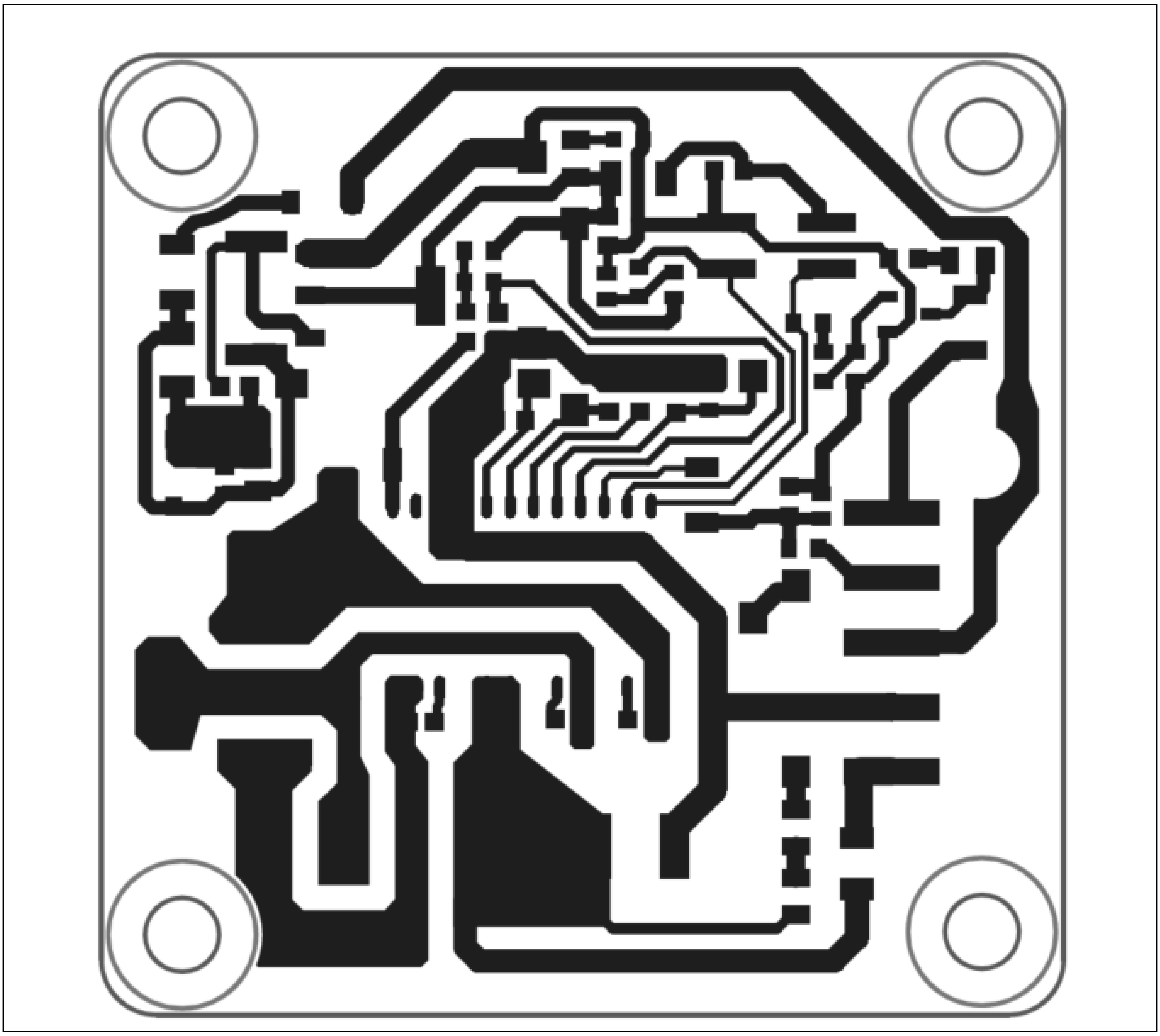


Figure 22 Top layer of REF-MHA50WIMI111T

9 Bill of materials

The complete bill of material (BOM) is available in the download section of Infineon's homepage. A log in is required to download this material.

Table 8 BOM of the most important/critical parts

#	Quantity	Designator	Value	Description	Manufacturer
1	1	C1	1nF	Chip Monolithic Ceramic Capacitor	MuRata
2	2	C2, C8	100nF	Surface Mount Multilayer Ceramic Chip Capacitor	Kemet
3	3	C3, C4, C5	4.7nF	Chip Monolithic Ceramic Capacitor	MuRata
4	1	C6	1uF	Chip Monolithic Ceramic Capacitor	MuRata
5	2	C7, C12	100nF	Chip Monolithic Ceramic Capacitor	MuRata
7	1	C10	10uF	Chip Monolithic Ceramic Capacitor	MuRata
8	1	C13	220pF	Chip Monolithic Ceramic Capacitor	MuRata
9	1	C14	1uF	Chip Monolithic Ceramic Capacitor	MuRata
10	3	C15, C16, C17	1uF	Multilayer Ceramic Chip Capacitor, C Series, Commercial Grade, General	TDK Corporation
11	1	D1	SM4007PL-TP	Silicon Rectifier	Micro Commercial Components
12	1	D2	18V	Zener Voltage Regulator	ON Semiconductor
13	1	LED1	Green	WL-SMCW SMT Mono-color Chip LED Waterclear, Green, 515nm	Wurth Elektronik
14	4	MP1, MP2, MP3, MP4	R30-1611100	M3 Hexagonal Threaded Spacer, Length 11mm	Harwin
15	1	Q1	IRLML2030TRPBF	HEXFET Power MOSFET, VDS 30V	Infineon Technologies
16	1	R1	100R	Automotive Grade Thick Film Chip Resistor	Yageo
17	2	R2, R3	1MEG	Standard Thick Film Chip Resistor	Vishay

#	Quantity	Designator	Value	Description	Manufacturer
18	1	R4	13.3k	Standard Thick Film Chip Resistor	Vishay
19	1	R5	1k	General Purpose Chip Resistor	Yageo
20	2	R6, R15	100R	General Purpose Chip Resistor	Yageo
21	2	R7, R16	10k	General Purpose Chip Resistor	Yageo
22	1	R17	2k	RES / - / 2k / 100mW / 1% / 100ppm/K / - / 0603 / SMD / -	Panasonic
23	1	R23	9.1k	Standard Thick Film Chip Resistor	Vishay
24	1	U1	IFX1117ME V33	Voltage Regulator, 3.3 V Output	Infineon Technologies
25	1	U2	IMI111T-026H	IMI111T-026H Smart IPM for motor control	Infineon Technologies

10 References and appendices

10.1 Abbreviations and definitions

Table 9 Abbreviations

Abbreviation	Meaning
CE	Conformité Européenne
EMI	Electromagnetic interference
UL	Underwriters Laboratories

10.2 Additional information

To initiate testing, customers can order the iMOTION™ link. Details are provided in Table 10.

Infineon components on the board are also listed in Table 10. Customers can visit the corresponding webpage for more information.

Table 10 Additional information on tools and Infineon components

Base part number	Package	Standard pack		Orderable part number
		Form	Quantity	
iMOTION™ Link		Container	1	IMOTIONLINK
IMI111T-026H	PG-DSO-22-1	Tape and reel	1500	IMI111T026HXUMA1

10.3 References

[1] Infineon Technologies AG. Datasheet of IMI111T-026H/-046H v1.1

[2] Infineon Technologies AG. iMOTION™ – MCE – Software Reference Manual v1.3

[3] Infineon Technologies AG. Functional Reference Manual iMOTION™ Motion Control Engine v1.1

[4] Infineon Technologies AG. iMOTION™ Solution Designer v1.1

[5] Infineon Technologies AG. How to Use UART Interface on IMM101T and IMI111T v1.0

11 Revision history

Document version	Date of release	Description of changes
V 1.0	2022/02/09	Initial version

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