WÜRTH ELEKTRONIK
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QUICK START GUIDE

MagI³C Power Module Evaluation Board for 171936001 LGA-12

Evaluation Board 178936001

Version 1.0

SCHEMATIC

Features


EN55032 Class B

FIX SS


ADJ. Freq.

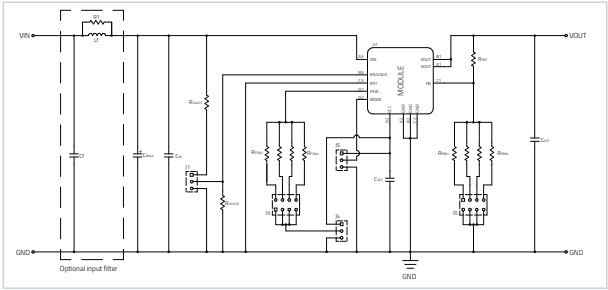

Sync.


UVLO


OCP


OTP


T_a 105 °C



The additional aluminum polymer capacitor C_{BULK} is only for evaluation board protection purposes. It is mounted at the termination of the supply line and provides slight damping of possible oscillations of the series resonance circuit represented by the inductance of the supply line and the input capacitance. It is not essential for operation.

For accurate V_{IN} and V_{OUT} voltage measurements it is recommended to measure directly at the test pins placed beside the input and output capacitors C_{IN} and C_{OUT}. It is **not** recommended to use this evaluation board with input and output wire lengths longer than 1 m.

To optimize the EMI performance connect the R_{FSW} resistor to VCC to enable spead spectrum behavior.

For the datasheet of the power module visit us at: **https://www.we-online.com/catalog/en/MAGIC-VDMM**

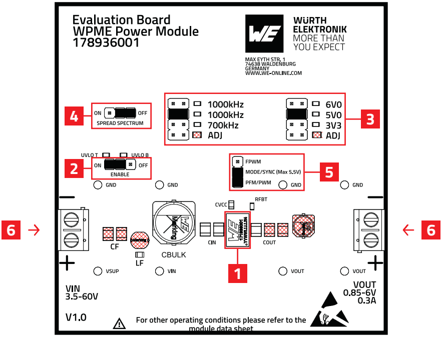
This product is highly sensitive to electrostatic discharge (ESD). As such, always use proper ESD precautions when handling. Failing to follow the aforementioned recommendations can result in severe damage to the part.

WARNING! – Before operating read the attached important notice document!

Ref. Des.	Description Order Code	
U1	MagI³C Power Module (171936001)	
C_{BULK}	Aluminum Polymer Capacitor 12 µF / 100 V (875115957002)	
C_{IN}	2 x Ceramic Chip Capacitor 1µF / 100V / X7R, 1210 (885012209069)	
C_{VCC}	Ceramic Chip Capacitor 470 nF / 16 V / X7R, 0805 (885012207049)	
C_{OUT}	Ceramic Chip Capacitor 4.7 µF / 16 V / X7R, 1210 (885012209013) + 2 x Ceramic Chip Capacitor 4.7 µF / 16 V / X7R, 1210 (885012209013) (optional) + Aluminum Polymer Capacitor 15 uF / 16 V, V-Chip (875105359002) (optional)	
Cf	2 x Ceramic Chip Capacitor 1 µF / 100 V / X7R, 1210 (optional) (885012209069)	
Lf	Filter inductor, 2.2 µH, PD2 (optional) (744773022)	
R_{FBT}	510 kΩ	
R_{FBB}	Set by jumper	84.5 kΩ for V_{OUT} = 6 V
		105 kΩ for V_{OUT} = 5 V
		178 kΩ for V_{OUT} = 3.3 V
		To be soldered for adjustable output voltage $V_{OUT} = V_{REF}\left(\frac{R_{FBT}}{R_{FBB}} + 1\right)$
R_{FSW}	Set by jumper	0 Ω for FSW = 1000 kHz for 5 V_{OUT} & 6 V_{OUT}
		10 kΩ for FSW = 700 kHz for 3.3 V_{OUT}
		To be soldered for adjustable frequency
J1	Jumper for EN connection to either V_{IN} (device enabled) or GND (device disabled) (61300311121)	
J2	Jumper for switching frequency selection. Only one resistor should be selected at a time (61300821121)	
J3	Jumper for output voltage selection. Only one resistor should be selected at a time (61300821121)	
J4	Jumper to enable & disable spread spectrum behavior (61300311121)	
J5	Jumper for MODE connection to either VCC (FPWM) or GND (PFM/PWM) (61300311121)	

For Layout and Step files visit us on www.we-online.com/catalog/en/MAGIC-VDMM

OVERVIEW



Description

V_{IN} 3.5 – 60 V

V_{OUT} 0.85 V to 6 V

I_{OUT} 0.3 V

1. VDMM Variable Step Down MicroModule LGA12
2. Jumpers (J1) for ENABLE & shut off the Module
3. Jumpers to set predefined output voltage V_{OUT} and fsw
4. Jumpers to enable & disable spread spectrum behavior
5. Jumpers to change between FPWM and PFM/PWM. The Mode/Sync can be used to synchronise the power module to an external clock
6. Terminal block screw connectors for V_{IN} and V_{OUT}

Absolute maximum ratings

Caution: Exceeding the abs. max. values given in the datasheet may affect the device negatively and may cause permanent damage.

This evaluation board is intended to be operated in a research and development environment under the supervision of qualified technicians and engineers who are trained and experienced in the safe use of electronics. This evaluation board was designed and tested according to CISPR32 Class B standards under Würth Elektronik laboratory test conditions, as indicated in the data sheet of the corresponding power module. Operation in other test setups may cause unintended electrical behavior and exceed the stated performance and limits imposed by the CISPR32 Class B standards. This evaluation board is not intended for usage in final applications. This evaluation board is not intended for resale.

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