JWQ5102

36V/2A Low IQ Synchronous Step-Down Converter with Spread Spectrum AEC-Q100 Qualified

DESCRIPTION

The JWQ5102 is a 2A, high-efficiency, synchronous, step-down switching regulator, the advanced current mode control provides fast transient response and 30ns extremely low minimum on time.

The wide 3.1V to 36V input range is suitable for a variety of step-down ratios in automotive systems, and 1μA ultra-low shutdown current is ideal for battery-powered applications.

The 30ns extremely low minimum on time can maintain constant-frequency operation, even at high step-down ratios and high switching frequencies.

The built-in Frequency Spread Spectrum (FSS) operation reduces both radiated and conducted noises on the input and output supplies significantly, which makes it easier for EMC management.

The JWQ5102 guarantees robustness with input under voltage lockout (UVLO),output under-voltage protection(UVP), over current protection(OCP), current run-away protection and thermal protection(OTP).

The JWQ5102 is available in a QFN3*2*0.85-12 package, which provides a compact solutions with minimal external components.

FEATURES

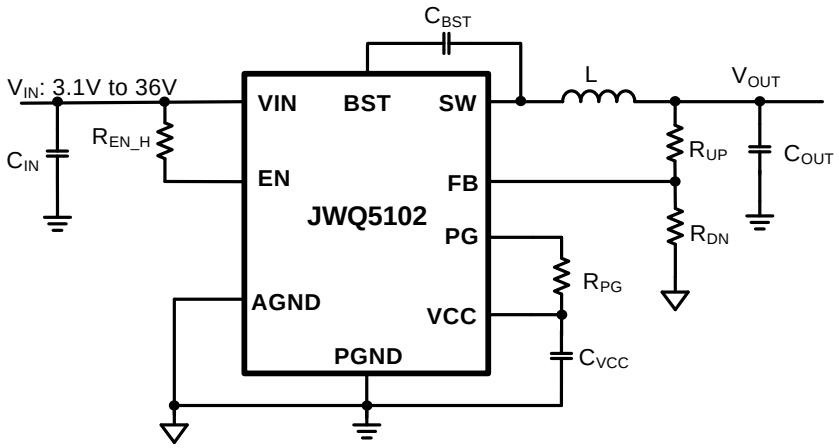
- AECQ100 Grade 1 Qualified
  - – Temperature Grade 1: T_A –40°C to +125°C
  - – HBM ESD Classification Level: H2
  - – CDM ESD Classification Level: C4B
- Wide Input Voltage Range
  - – 4V to 36V
  - – 3.1V to 36V (After Start-up)
- 2A Continuous Output Current
- 45μA Low Quiescent Current
- 1μA Ultra-low Shutdown Current
- 0.8V ±1.5% Internal Voltage Reference
- 30ns Minimum On Time
- Integrated 55mΩ/35mΩ High/Low Side Power MOSFETs
- Fixed 410kHz, 1MHz and 2.1MHz Frequency
- Power Saving Mode (PSM) and Forced Continuous Conduction Mode (FCCM) at Light Load
- Frequency Spread Spectrum (FSS) for Low EMI
- Low Dropout Mode
- Adjustable UVLO and Hysteresis
- Built-in UVLO, OCP, SCP, UVP, OTP
- Available in a QFN3*2*0.85-12 Package
- Available in a Wettable-flank Package

APPLICATIONS

- Automotive Systems: Infotainment and Navigations, Clusters, ECUs, Camera modules, Car cockpit, Etc
- Industrial Power Systems

TYPICAL APPLICATION

2A Step Down Regulator



ORDER INFORMATION

DEVICE[1)]	PACKAGE	TOP MARKING[2)]	ENVIRONMENTAL[3)]
JWQ5102ASQFNAT#TR	QFN3*2*0.85-12	JWSU□ YW□□□	Green
JWQ5102BSQFNAT#TR		JWSV□ YW□□□	
JWQ5102CSQFNAT#TR		JWTA□ YW□□□	
JWQ5102CSFQFNAT#TR		JWSW□ YW□□□	

Notes:

1) JW□□□#TR
- Tape and Reel (If TR is not shown, it means Tube)
- Package Code
- Part No.

2) Line1: JW □□□
- Lot number
- Product code
- JoulWatt LOGO

Line2: YW □□□
- Lot number
- Week code
- Year code

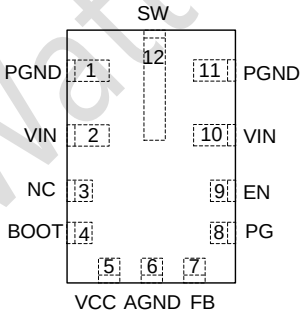
3) All JoulWatt products are packaged with Pb-free and Halogen-free materials and compliant to RoHS standards.

DEVICE COMPARISON TABLE

DEVICE NAME	PACKAGE	FREQUENCY	PSM/FCCM	FSS/NON-FSS	MSL
JWQ5102ASQFNAT#TR	QFN3*2*0.85-12	410kHz	PSM	FSS	3
JWQ5102BSQFNAT#TR		1MHz			
JWQ5102CSQFNAT#TR		2.1MHz			
JWQ5102CSFQFNAT#TR		2.1MHz	FCCM		

PIN CONFIGURATION

TOP VIEW



QFN3*2*0.85-12

PIN DESCRIPTION

QFN 3*2*0.85-12	Name	Description
1,11	PGND	**Power ground**. PGND is the reference ground of the power devices, internally connected to the low side power FET. Should be carefully considered during PCB layout, better connect it to system ground—ground pins of input and output capacitors with copper pours and vias, make sure the path to input capacitors as short as possible.
3	NC	**Not Connected.**
6	AGND	**Analog ground.** AGND is the reference ground of the logic circuits.
8	PG	**Power good indication**. Connect a 10kΩ resistor to VCC or other DC source. Once soft-start is finished, PG will be pulled to low if any internal fault is triggered.
7	FB	**Output feedback**. FB senses the output voltage and is regulated by the control loop to 800mV. Connect a resistive divider at FB to set up output voltage.
9	EN	**Enable**. Drive EN pin high to turn on the regulator and low to turn off the regulator.
5	VCC	**Internal bias supply**. VCC is the power supply for internal logic circuits and gate drivers. A 1μF decoupling capacitor as close as possible to VCC is required.
4	BOOT	**Bootstrap**. BST capacitor connection for high side driver. Connect a 0.1μF bypass capacitor to SW.
2,10	VIN	**Input supply**. VIN is the power supply for all the control logic blocks and SW drivers. Connect decoupling capacitors between this pin and PGND to reduce switching spikes.
12	SW	**SW node**. SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load.

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