



# MP5413

2.7V-5.5V, Power Management IC with Four Buck Converters, Two LDOs, I<sup>2</sup>C Interface, and 2 GPO Pins

**PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE**

## DESCRIPTION

The MP5413 is a complete power management solution that integrates four high-efficiency, step-down, DC/DC converters, two low-dropout regulators, and two controllable GPO ports.

The constant-on-time (COT) control DC/DC converter provides fast transient response. The 1.5MHz, default, fixed switching frequency during continuous conduction mode (CCM) reduces the external inductor and capacitor values greatly. Four DC/DC converters work with 90-degree phase-shift mode. Full protection features include under-voltage lockout (UVLO), over-current protection (OCP), and thermal shutdown.

The output voltage is adjustable through the I<sup>2</sup>C bus or preset by the one-time programmable (OTP) function. The power-on/-off sequence is also programmable by the OTP or can be controlled through the I<sup>2</sup>C bus online. Two GPO pins can be used to expand the power rails needed for different applications.

The MP5413 requires a minimal number of external components and is available in a space-saving, 38-pin WLCSP-38 (2.7mmx3.1mm) package.

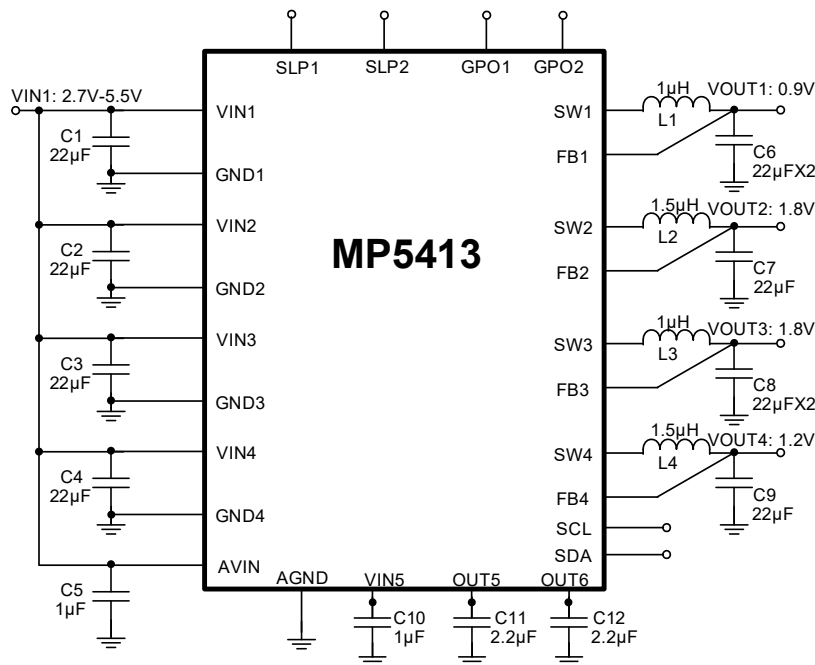
## FEATURES

- Four High-Efficiency Step-Down Converters
  - Buck1: 3A DC/DC Converter
  - Buck2: 2A DC/DC Converter
  - Buck3: 3A DC/DC Converter
  - Buck4: 2A DC/DC Converter
  - 2.7V to 5.5V Operating Input Range
  - Adjustable Switching Frequency
  - Programmable Forced PWM, Auto PFM/PWM Mode
  - Hiccup Over-Current Protection (OCP)
- Two Low-Dropout Regulators
  - Two 300mA Low Noise LDOs
  - 100mV Dropout at 300mA Load
- System
  - I<sup>2</sup>C Bus and OTP
  - Sleep Mode Control
  - Flexible Power On/Off Sequence via OTP
  - Flexible DC/DC, LDO On/Off Control
- Available in a Small WLCSP-38 (2.7mmx3.1mm) Package

## APPLICATIONS

- Solid-State Drives (SSDs)
- Smart TVs
- IP Cameras
- AP Access Points
- Set-Top Boxes

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**TYPICAL APPLICATION**

**OTP-EFUSE SELECTED TABLE BY DEFAULT (MP5413-0000)**

OTP ITEMS	BUCK 1	BUCK 2	BUCK 3	BUCK 4	GPO1	GPO2	LDO5	LDO6
Output voltage	0.9V	1.8V	1.8V	1.2V	N/A	N/A	1.8V	3.3V
Initial on/off	On	On	On	On	On	On	On	On
Mode	Auto PFM/PWM				N/A			
Power on delay/time slot #	1.6ms/2	0.8ms/1	3.2ms/4	4.8ms/6	2.4ms/3	0ms/0	4ms/5	0ms/0
Automatic turn-on	Yes							
Switching frequency	1.5MHz							
Buck1 current limit	6A							
Buck3 current limit	6A							
SS option	500µs							