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# EV3213DH-00A

## 700KHz/1.3MHz Boost Converter with a 3.5A Switch Evaluation Board

### DESCRIPTION

The EV3213DH-00A is an evaluation board for the MP3213. It is configured to provide a regulated 12V output at up to 0.5A from a 5V input. The output is adjustable from  $V_{IN}$  up to 22V by changing resistors on the evaluation board. For an even higher output voltage, the input voltage needs to be extended higher.

The high switching frequency (700KHz or 1.3MHz) of the MP3213 allows for smaller external components, producing a compact solution for a wide range of load currents. Two user-selectable frequency options offer flexibility for easy filtering and low noise. The PCB heatsink with the exposed pad improves thermal performance and efficiency at medium to heavy loads.

### ELECTRICAL SPECIFICATIONS

| Parameter        | Symbol    | Value    | Units |
|------------------|-----------|----------|-------|
| Input Voltage    | $V_{IN}$  | 2.5 - 10 | V     |
| Frequency Select | $f_{SEL}$ | 1.3      | MHz   |
| Output Current   | $I_{OUT}$ | 0.5      | A     |
| Output Voltage   | $V_{OUT}$ | 12       | V     |

### FEATURES

- Pin Selectable 700KHz or 1.3MHz Fixed Switching Frequency
- Operates with Input Voltage as Low as 2.5V
- 12V at 500mA from 5V Input
- Fully Assembled and Tested

### APPLICATIONS

- LCD Displays
- Portable Applications
- Handheld Computers and PDAs
- Digital Still and Video Cameras

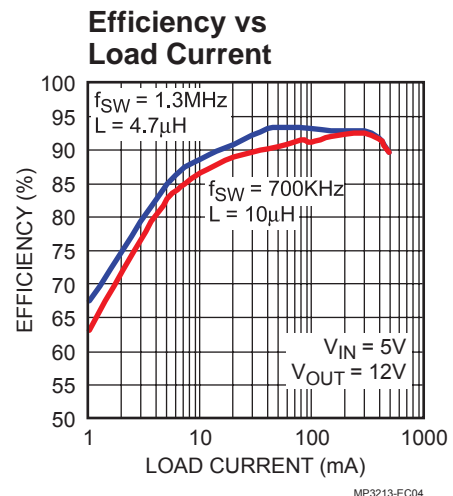
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## EV3213DH-00A EVALUATION BOARD

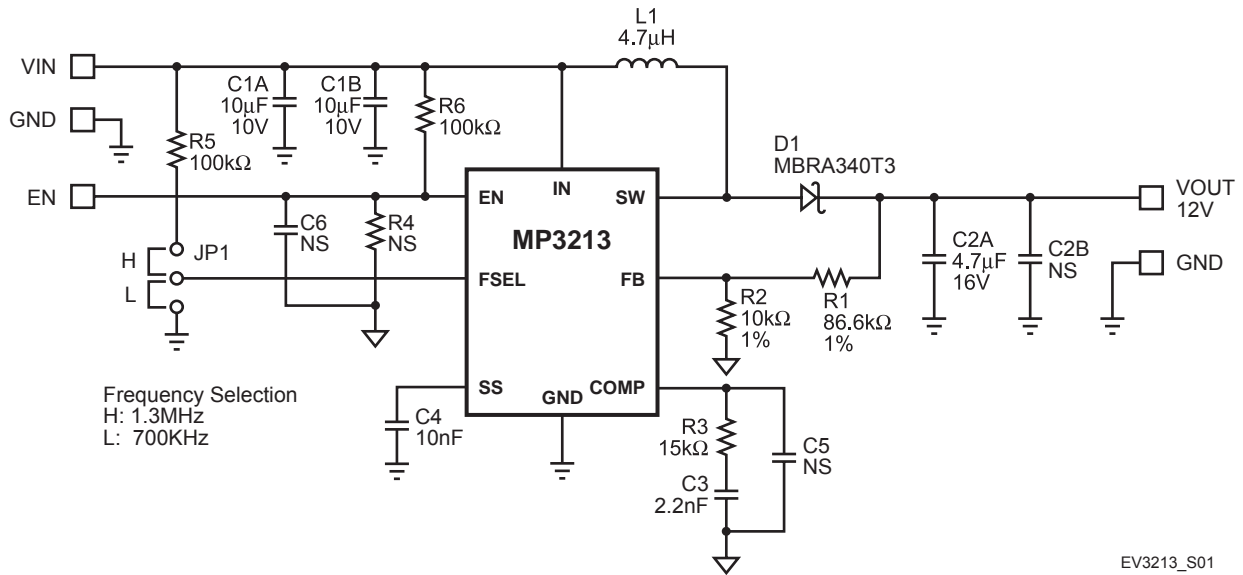


(L x W x H) 2.1" x 2.1" x 0.5"  
(5.4cm x 5.4cm x 1.1cm)

| Board Number | MPS IC Number |
|--------------|---------------|
| EV3213DH-00A | MP3213DH      |



## EVALUATION BOARD SCHEMATIC



## EV3213DH-00A BILL OF MATERIALS

| Qty | Ref         | Value  | Description                   | Package | Manufacturer P/N            |
|-----|-------------|--------|-------------------------------|---------|-----------------------------|
| 2   | C1A, C1B    | 10µF   | Ceramic Capacitor, 10V, X7R   | 1210    | TDK:<br>C3225X5R1A106K      |
| 1   | C2A         | 4.7µF  | Ceramic Capacitor, 16V, X7R   | 1210    | TDK:<br>C3225X7R1C475K      |
| 1   | C3          | 2.2nF  | Ceramic Capacitor, 50V, X7R   | 0603    | TDK:<br>C1608X7R1H222K      |
| 1   | C4          | 10nF   | Ceramic Capacitor, 50V, X7R   | 0603    | TDK:<br>C1608X7R1H103K      |
| 3   | C5, C6, C2B |        | Not Stuffed                   |         |                             |
| 1   | D1          |        | Schottky Diode, 40V, 3A       | SMA     | Diodes Inc.<br>MBRA340T3    |
| 1   | JP1         |        | 3-Pin Connector Header, 0.100 |         | Sullins:<br>PTC03SAAN       |
| 1   | L1          | 4.7µH  | Inductor, 3.3A, DS84LC        | SMD     | Toko:<br>B1015AS-4R7N       |
|     |             |        | Inductor, 4.1A                | SMD     | Sumida:<br>CDRH8D43-4R7NC   |
| 1   | R1          | 86.6kΩ | Resistor, 1%                  | 0603    | Panasonic:<br>ERJ-3EKF8662V |
| 1   | R2          | 10kΩ   | Resistor, 1%                  | 0603    | Panasonic:<br>ERJ-3EKF1002V |
| 1   | R3          | 15kΩ   | Resistor, 5%                  | 0603    | Panasonic:<br>ERJ-3GEYJ153V |
| 1   | R4          |        | Not Stuffed                   |         |                             |
| 2   | R5, R6      | 100kΩ  | Resistor, 5%                  | 0603    | Panasonic:<br>ERJ-3GEYJ104V |
| 1   | U1          |        | DC-DC Converter               | MSOP8   | MPS:<br>MP3213DH            |

### PRINTED CIRCUIT BOARD LAYOUT

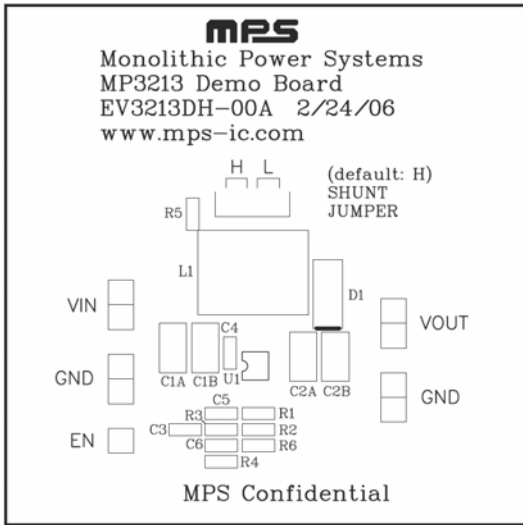


Figure 1—Top Silk Layer

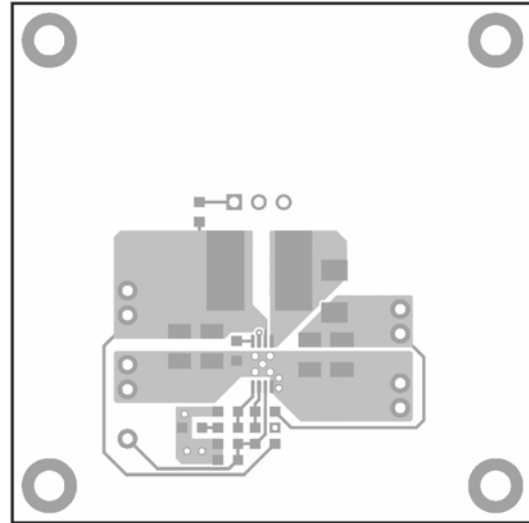


Figure 2—Top Layer

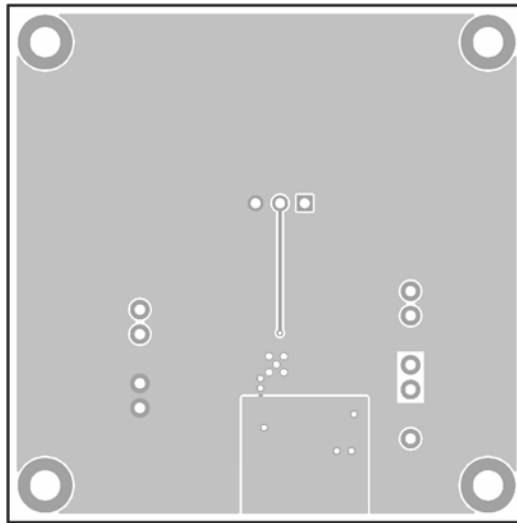


Figure 3—Bottom Silk Layer

## QUICK START GUIDE

The output voltage of this board is set to 12V. The board layout accommodates most commonly used inductors and output capacitors.

1. Preset Power Supply to  $2.5V \leq V_{IN} \leq 10V$ .
2. Turn Power Supply off.
3. Place jumper J1 at the H position for 1.3MHz operation, or at the L position for 700KHz operation (the inductor may need to be adjusted accordingly).
4. Connect the power supply terminals to:
  - Positive (+): VIN
  - Negative (-): GND
5. Connect the load to:
  - Positive (+): VOUT
  - Negative (-): GND
6. Turn on the power supply after making connections.
7. The MP3213 is enabled automatically on the evaluation board once  $V_{IN}$  is applied. To disable the MP3213, pull EN low.
8. The output voltage  $V_{OUT}$  can be changed by varying R1. Calculate the new value using the formula:

$$R1 = \left( \frac{V_{OUT}}{V_{FB}} - 1 \right) R2$$

Where  $V_{FB} = 1.25V$  and  $R2 = 10k\Omega$

For example, for  $V_{OUT} = 15V$

$$R1 = \left( \frac{15V}{1.25V} - 1 \right) \times 10k\Omega = 110k\Omega$$

Therefore use a 110k $\Omega$  standard 1% value.

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