

DESCRIPTION

EV3416-J-00A evaluation board is designed to demonstrate the capability of MP3416. The MP3416 is a 1.1A switching current, low quiescent current, step-up converter with output disconnect.

The MP3416 works in peak current control mode, providing good transient response. The integrated P-channel synchronous rectifier improves efficiency and eliminates the need for an external schottky diode.

The device enters pulse skip mode to save power loss in light load condition. When the part shuts down, the output is disconnected from input, allowing the part to draw less than 0.65µA in shutdown mode. The MP3416 is available in a small 8-pin TSOT23 package.

Electrical Specification

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	0.86-5.5	V
Startup Voltage	V_{START}	1.25-5.5	V
Output Voltage	V_{OUT}	3.3	V

FEATURES

- Input voltage range: 0.86V to 5.5V
- Startup voltage range: 1.25V to 5.5V
- Output voltage range: 1.8V to 5.5V
- 9.5µA quiescent current
- < 650nA shutdown current
- Up to 80% efficiency at 100µA-200µA light load condition
- Output disconnect in shutdown
- Down mode when $V_{IN} > V_{OUT}$
- Adjustable low battery detection
- Internal synchronous rectifier
- Over-temperature protection with thermal shutdown at 155°C
- TSOT23-8 Package

APPLICATIONS

- Medical Devices
- Digital Retail Displays
- Gaming Controllers
- Remote Controls
- Battery-Powered Products
- Handheld Computers and Smart phones

All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

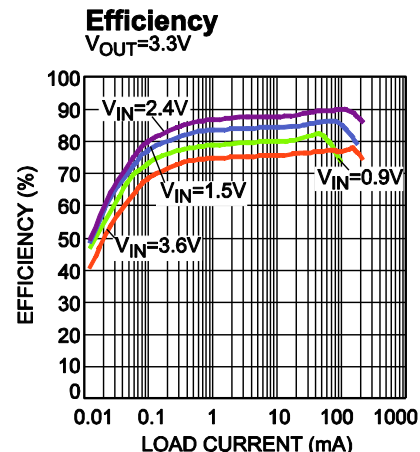
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EV3416-J-00A EVALUATION BOARD

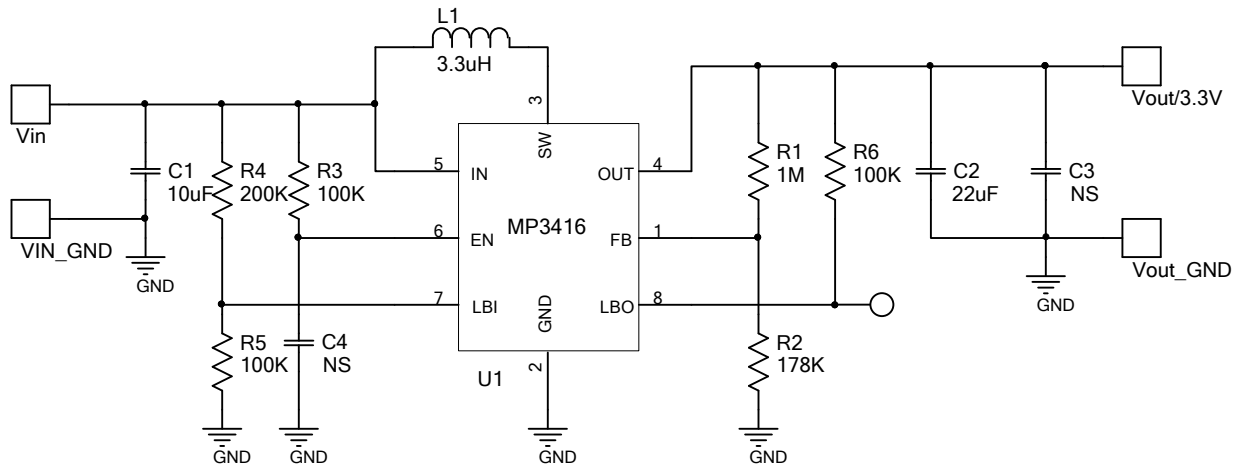


(L x W x H) 6.35cm x 6.35cm x XXX cm

Board Number	MPS IC Number
EV3416-J-00A	MP3416GJ



EVALUATION BOARD SCHEMATIC

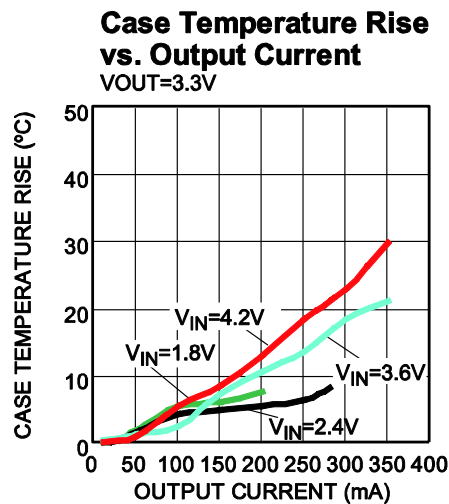
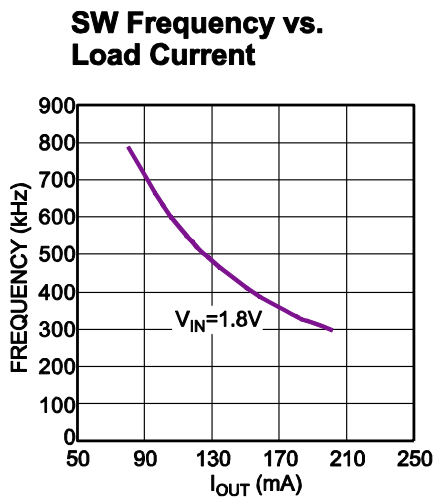
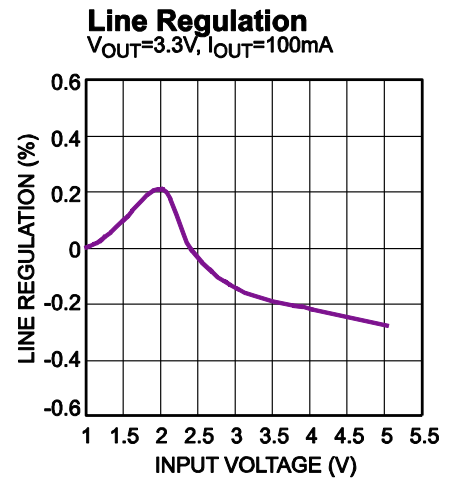
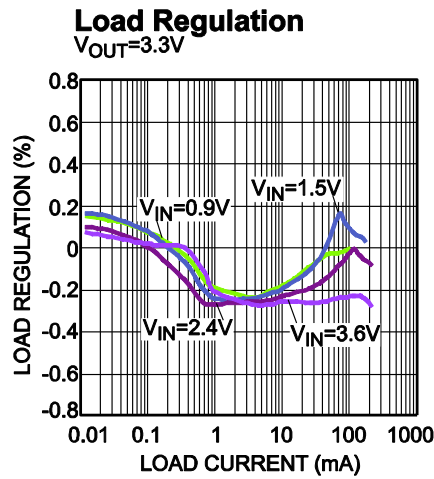
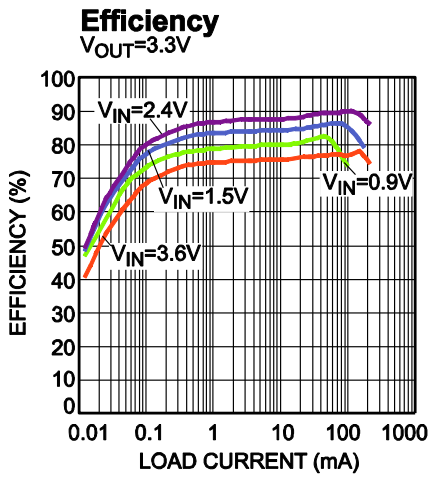


EV3416-J-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1	10µF	10V, Ceramic Capacitor	0805	muRata	GRM219R61A106KE44D
1	C2	22µF	6.3V, Ceramic Capacitor	0805	muRata	GRM21BR60J226ME39L
2	C3,C4	NS				
1	L1	3.3µH	$I_{SAT}=1.8A$, $RDC=65m\Omega$		Würth	744042003
1	R1	1M	Film resistor, 1%	0603	Yageo	RC0603FR-071ML
1	R2	178k	Film resistor, 1%	0603	Yageo	RC0603FR-07178KL
3	R3, R5, R6	100k	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
1	R4	200k	Film resistor, 1%	0603	Yageo	RC0603FR-07200KL
1	U1	MP3416	Boost Converter	TSOT23-8	MPS	MP3416GJ-Z

EV BOARD TEST RESULTS

$V_{IN} = 1.8V$, $V_{OUT} = 3.3V$, $L = 3.3 \mu H$, $T_A = 25^\circ C$, unless otherwise noted.

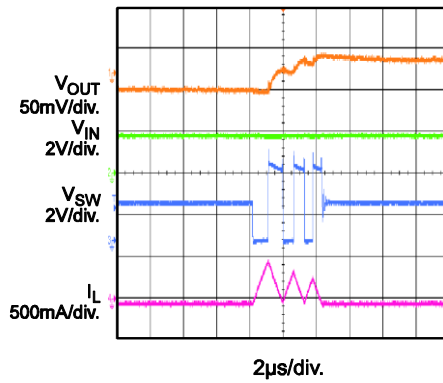


EVB TEST RESULTS *(continued)*

$V_{IN} = 1.8V$, $V_{OUT} = 3.3V$, $L = 3.3\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

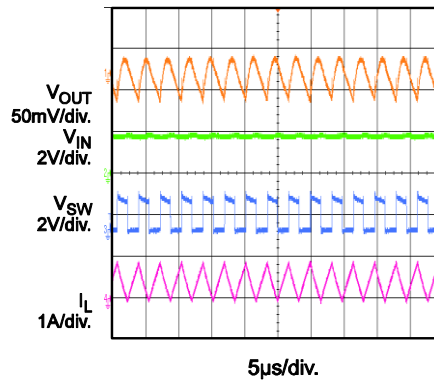
Output Ripple

$I_{OUT} = 0A$



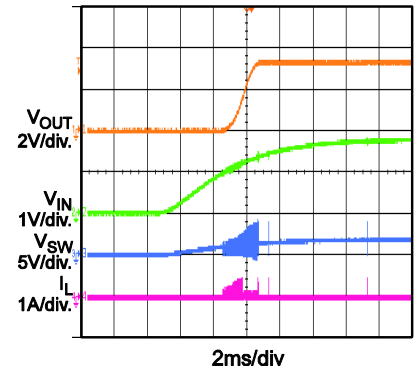
Output Ripple

$I_{OUT} = 0.2A$



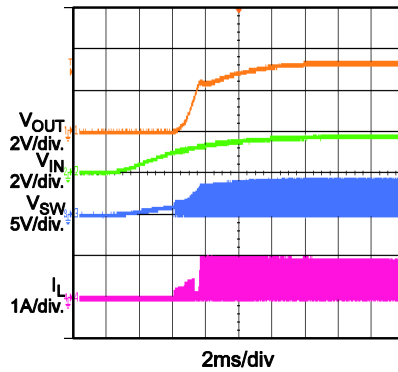
V_{IN} Startup

$I_{OUT} = 0A$



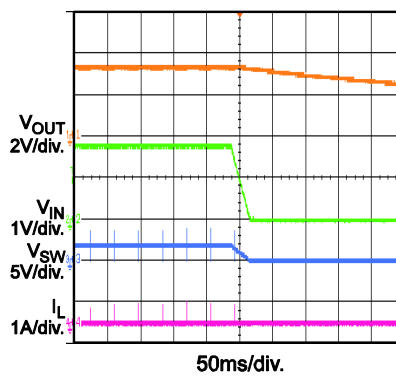
V_{IN} Startup

$I_{OUT} = 0.2A$



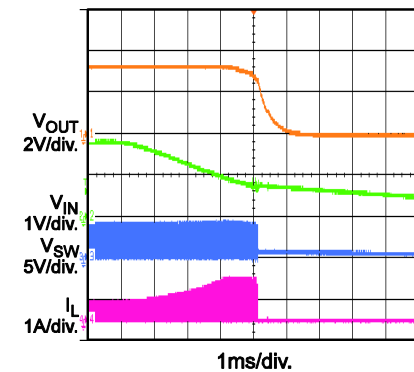
V_{IN} Shutdown

$I_{OUT} = 0A$



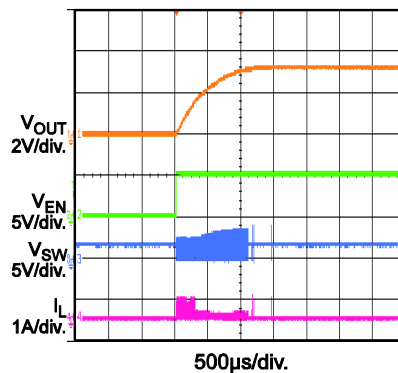
V_{IN} Shutdown

$I_{OUT} = 0.2A$



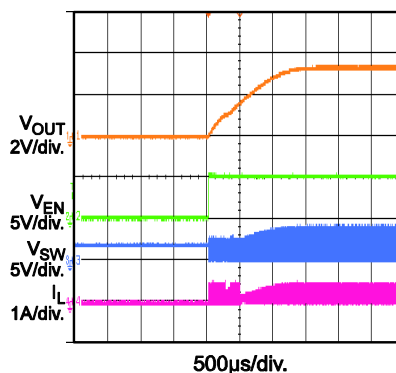
EN Startup

$I_{OUT} = 0A$



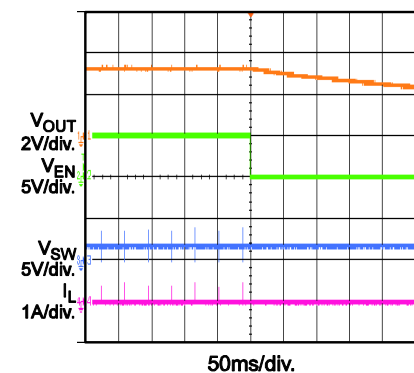
EN Startup

$I_{OUT} = 0.2A$



EN Shutdown

$I_{OUT} = 0A$

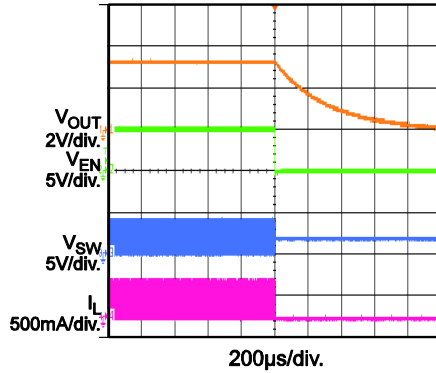


EVB TEST RESULTS *(continued)*

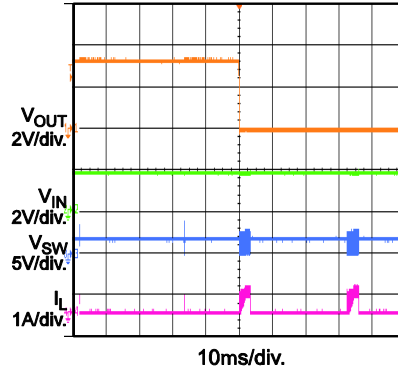
$V_{IN} = 1.8\text{ V}$, $V_{OUT} = 3.3\text{ V}$, $L = 3.3\mu\text{H}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

EN Shutdown

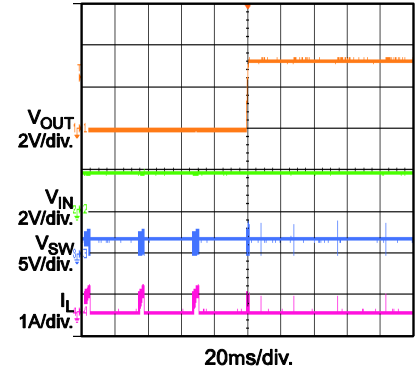
$I_{OUT} = 0.2\text{ A}$



SCP Enter

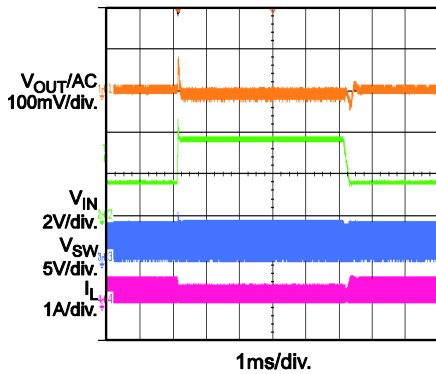


SCP Recover



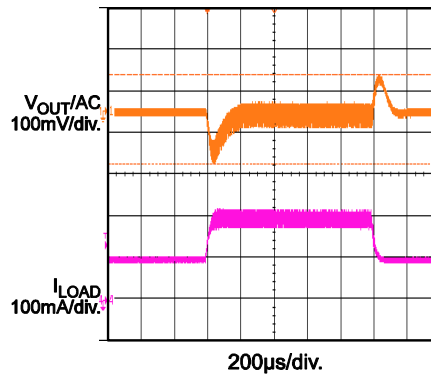
Line Transient

$V_{IN} = 1.8\text{ V to } 3.6\text{ V}$, $I_{OUT} = 0.1\text{ A}$



Load Transient

$I_{OUT} = 0.1\text{ A to } 0.2\text{ A}$



PRINTED CIRCUIT BOARD LAYOUT

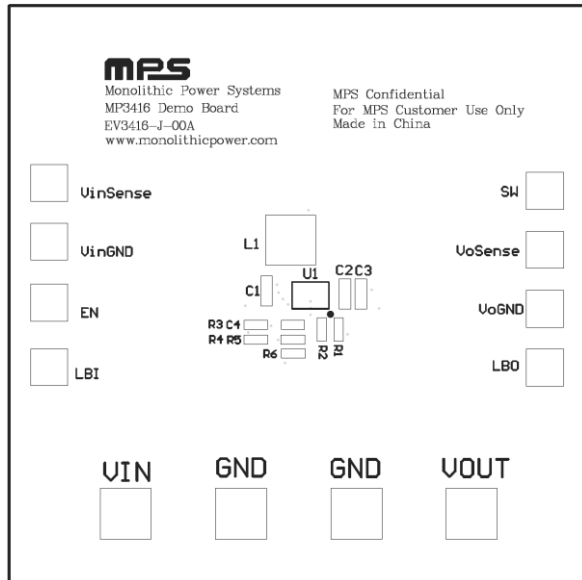


Figure 1—Top Silk Layer

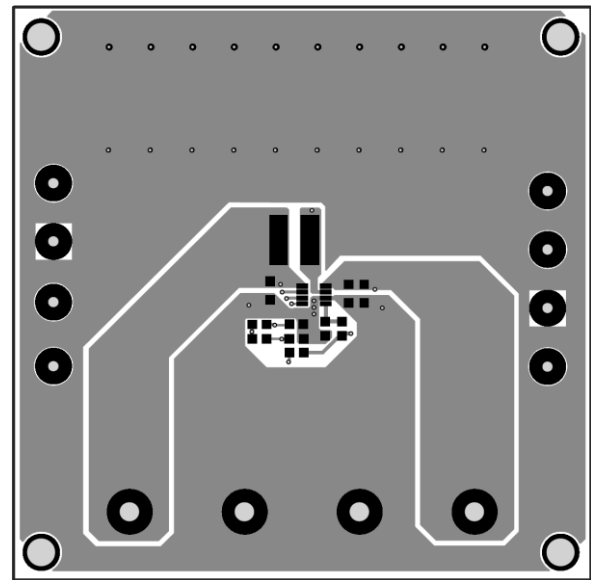


Figure 2—Top Layer

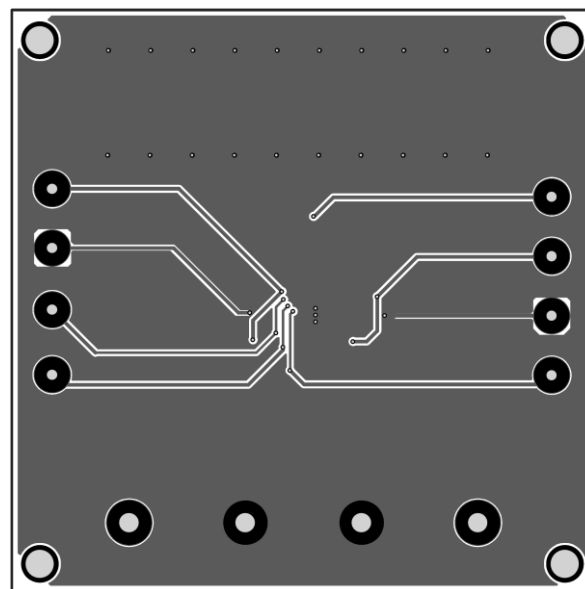


Figure 3—Bottom Layer