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EV1541DJ-TFT-00A

MP1541 TFT Applications Evaluation Board

GENERAL DESCRIPTION

The EV1541DJ-TFT-00A is the evaluation board for TFT applications using the MP1541. The MP1541 is a 5-pin thin SOT23 current mode step up converter intended for small, low power applications. The MP1541 switches at 1.3MHz and allows the use of tiny, low cost capacitors and inductors 2mm or less in height. Internal soft start results in small inrush current and extends battery life. The MP1541 operates from an input voltage as low as 2.5V and can generate 12V at up to 200mA from a 5V supply.

The EV1541DJ-TFT-00A provides V_{OUT} from the boost output and also derives V_P (positive) and V_N (negative) from the charge pumps off of the boost switching node.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	3 – 3.6	V
Output Voltage 1	V_{OUT}	5	V
Output Current 1	I_{OUT}	200	mA
Output Voltage 2	V_N	-10	V
Output Current 2	I_N	10	mA
Output Voltage 3	V_P	15	V
Output Current 3	I_P	20	mA

FEATURES

- 3V to 3.6V Operating Input Range
- Uses Tiny Capacitors and Inductors
- 1.3MHz Fixed Switching Frequency
- Internally Compensated
- Internal Soft Start
- 3 Outputs in a Single Package: Boost Converter for 5V, Charge Pump for 15V, and Negative Charge Pump for -10V
- UVLO, Thermal Shutdown
- Internal Current Limit
- Available in a TSOT23-5 Package

APPLICATIONS

- Handheld Computers and PDAs
- Digital Still and Video Cameras
- Small LCD Displays

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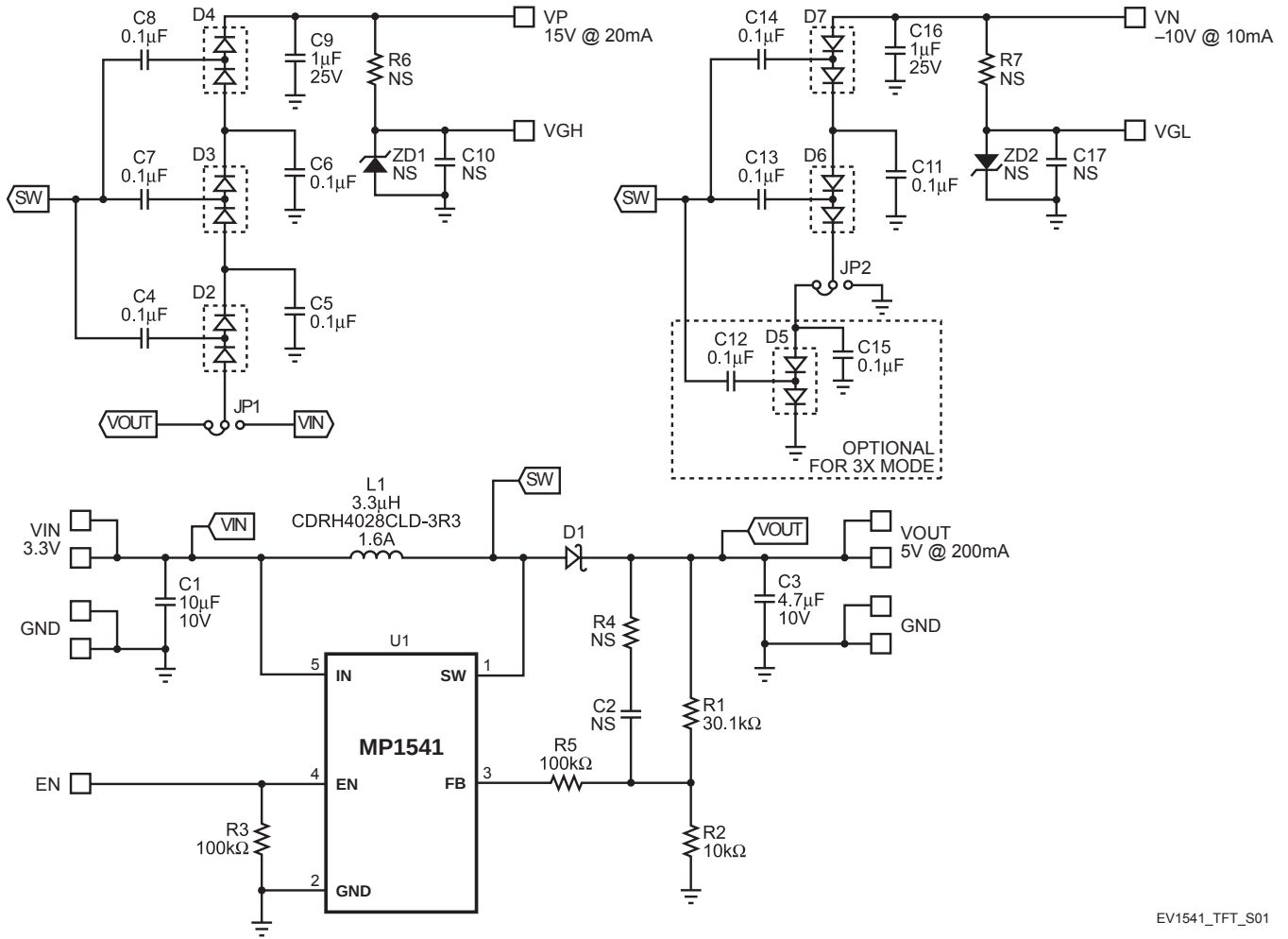
EV1541DJ-TFT-00A EVALUATION BOARD



Dimensions (2.0"X x 2.0"Y x 0.4"Z)

Board Number	MPS IC Number
EV1541DJ-TFT-00A	MP1541DJ

EVALUATION BOARD SCHEMATIC



EV1541_TFT_S01

EV1541DJ-TFT-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	10µF	Ceramic Cap, 10V, X5R	1210	TDK	C3225X5R1A106K
3	C2, C10, C17	NS	Not Stuffed			
1	C3	4.7µF	Ceramic Cap, 10V, X5R	1210	Taiyo Yuden	LMK325BJ475KD
10	C4, C5, C6, C7, C8, C11, C12, C13, C14, C15	0.1µF	Ceramic Cap, 50V, X7R	0805	TDK	C2012X7R1H1 04K
2	C9, C16	1µF	Ceramic Cap, 25V, X5R	0805	TDK	C2012X5R1E105K
1	D1		Schottky Diodes, 40V, 1A	SOD-123	Diodes Inc	1N5819HW-7
6	D2, D3, D4, D5, D6, D7		Diode Rectifier, Dual, 30V, 200mA	SOT-123	Fairchild	BAT54S
2	JP1, JP2		3-Pin Connector Header, 0.100		Sullins	PTC03SAAN
1	L1	3.3µH	1.6A		Sumida	CDRH4D28CLD-3R3
1	R1	30.1kΩ	Metal Film Res, 1%	0805	Panasonic	ERJ-6ENF3012V
1	R2	10kΩ	Metal Film Res, 1%	0805	Panasonic	ERJ-6ENF1002V
2	R3, R5	100kΩ	Metal Film Res, 5%	0805	Panasonic	ERJ-6GEYJ104V
3	R4, R6, R7	NS	Not Stuffed			
1	U1		DC-DC Converter	TSOT23-5	MPS	MP1541DJ
2	ZD1, ZD2	NS	Not Stuffed			

PRINTED CIRCUIT BOARD LAYOUT

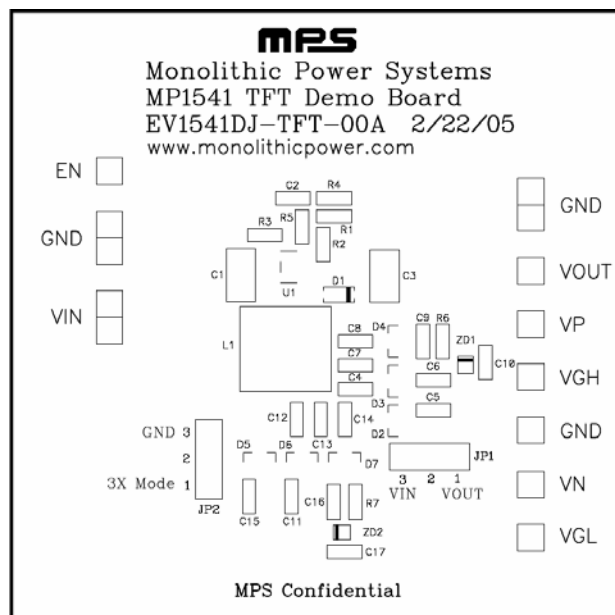


Figure 1—Top Silk Layer

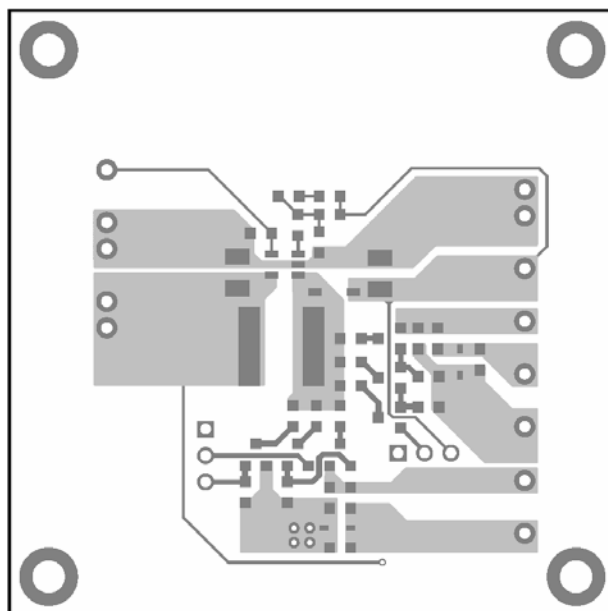


Figure 2—Top Layer

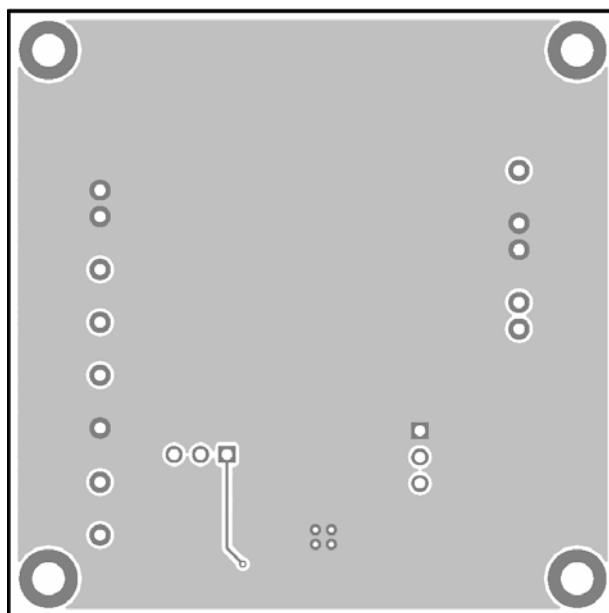


Figure 3—Bottom Layer

QUICK START GUIDE

The output voltage of this board is set to 5V, –10V and 15V on VOUT, VN and VP, respectively. The board layout accommodates most commonly used inductors and output capacitors.

1. Preset the power supply to $3V \leq V_{IN} \leq 3.6V$.
2. Turn off the power supply.
3. Connect the power supply terminals to:
 - a. Positive (+): VIN, EN
 - b. Negative (–): GND
4. Connect the load to:
 - a. Positive (+): VOUT, VP, GND (for the negative output)
 - b. Negative (–): GND, VN (for the negative output)
5. Turn on the power supply after making the connections.
6. The MP1541 is disabled on the evaluation board if only VIN is applied. To enable the MP1541, EN needs to be pulled HIGH.
7. 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 $V_{OUT} = 7.5V$

$$R1 = \left(\frac{7.5V}{1.25V} - 1 \right) \times 10k\Omega = 50k\Omega$$

Therefore use a 49.9k Ω standard 1% value resistor.

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