

GENERAL DESCRIPTION

This user's guide explains how to quickly obtain the push-pull converter performance results with the MX6501T evaluation module (EVM). This EVM provides three push-pull converters for various input-to-output voltage conversions. All push-pull converters use low-power, center-tapped transformers from Maxin Micro whose designs have been optimized in form-factor, turns ratio, and saturation product to operate in combination with the MX6501T transformer driver. The following table lists the push-pull converter configurations with their associated transformers.

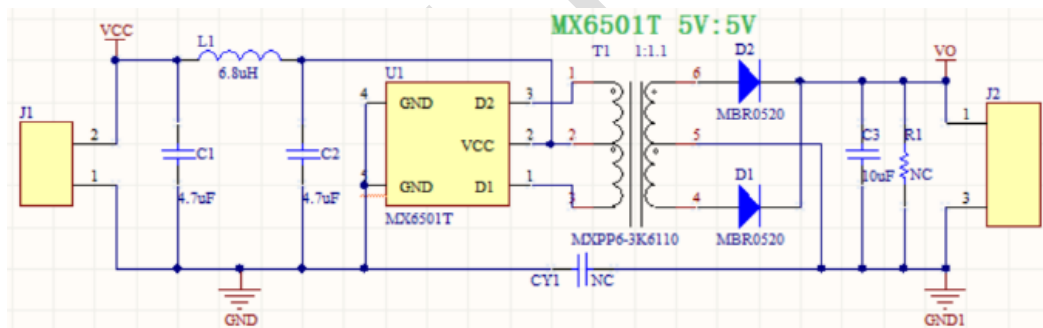
这为用户手册能够帮助迅速的了解无锡明芯微电子的推挽驱动 MX6501 和其对应的变压器实现的隔离效果和隔离效率 无锡明芯微的 MX6501 采用内置 36VLD MOS 的工艺 0.2 欧姆的内阻, 配合提供的不同变压器, 能够实现 12V 转 12V 输出, 5V 转 12V 输出和 5V 转 5V 以及 3.3V 转 3.3V 等不同的隔离输出, 该几款组合采用的是无 LDO 的方案, 由于是开路无反馈在输出端加了一个假负载 13kohm 能够实现 10% 以内的电压误差变动, 客户也可以加 LDO, 如果客户想实现小的低功耗可以选用 MX6505T 的产品, MX6505T 的产品有使能控制脚, 如果不用可以让该推挽输出停止工作达到节能目的

PNs	VIN: VOUT	Transformer	Turns Ratio	V-T(Vus)	隔离
MX6501T 5V-5V EVM	5V 转 5V 最大 0.6A 输出	MXPP6-3K6110	1:1.10	11	3kv
MX6501T 12V-12V EVM	12V 转 12V 最大 0.6A 输出	MXPP8-30-1103	1:1.03	30	3kv
NA	5V:12V 最大 0.3A 输出	MXPP8-30-1250	1:2.50	10	3kv

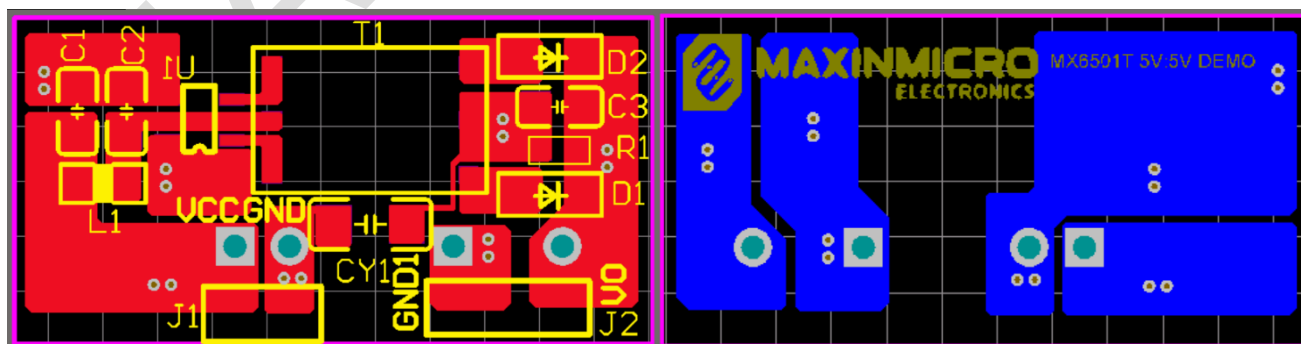
Schematic and Board Layout

The following figure shows the Schematic of the EVM board.

下面是 5V 转 5V 的评估电路板线路图 采用的是 MX6501T+MXPP6-3K110 组合

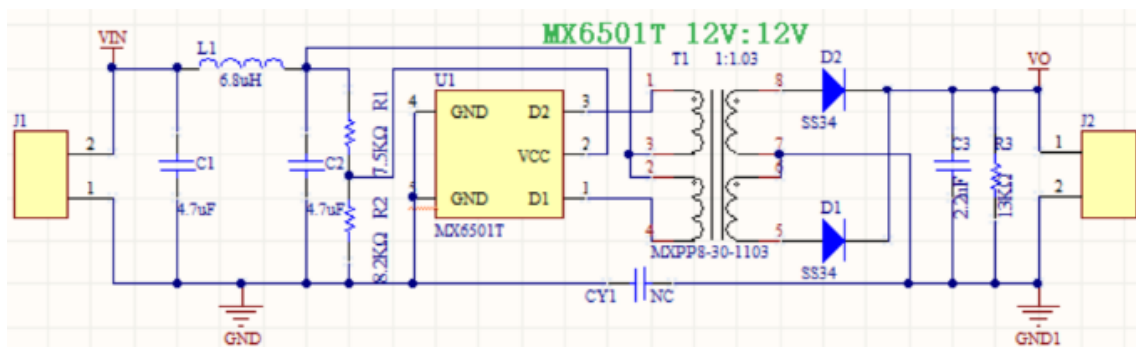


MX6501T 5V:5V EVM Schematic

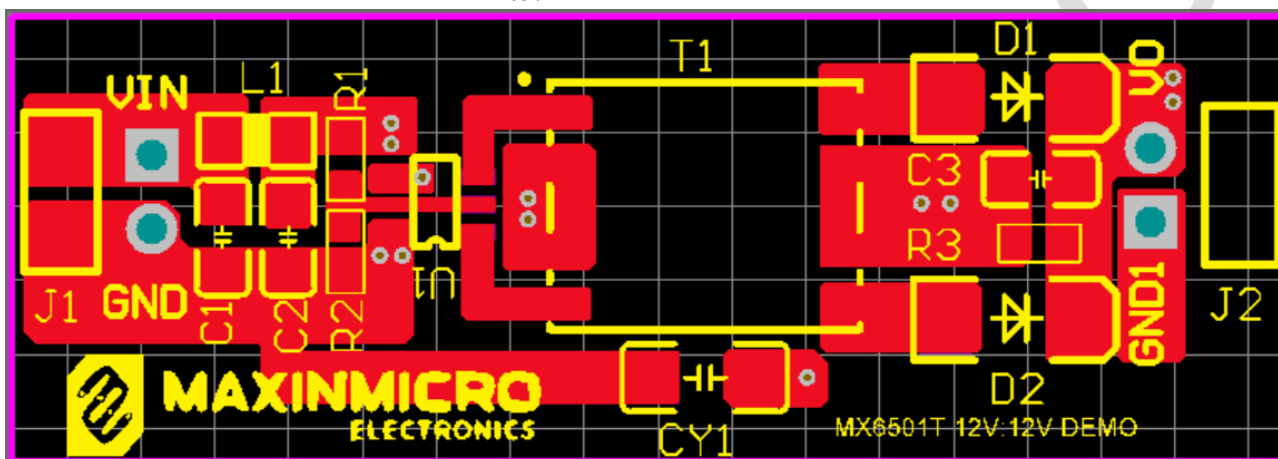


MX6501T 5V:5V EVM PCB Top Layer and Bottom Layer

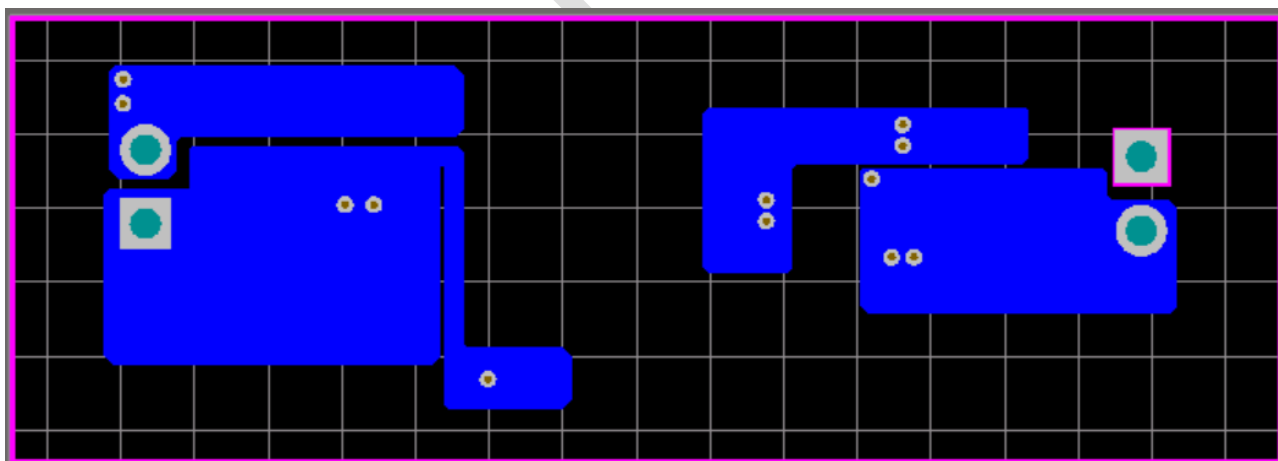
下面是 MX6501T+MXPP8-30-1103 组合实现的是最大 12V 转 12V0.5A 的输出功率，效率如下图



MX6501T 12V:12V EVM Schematic

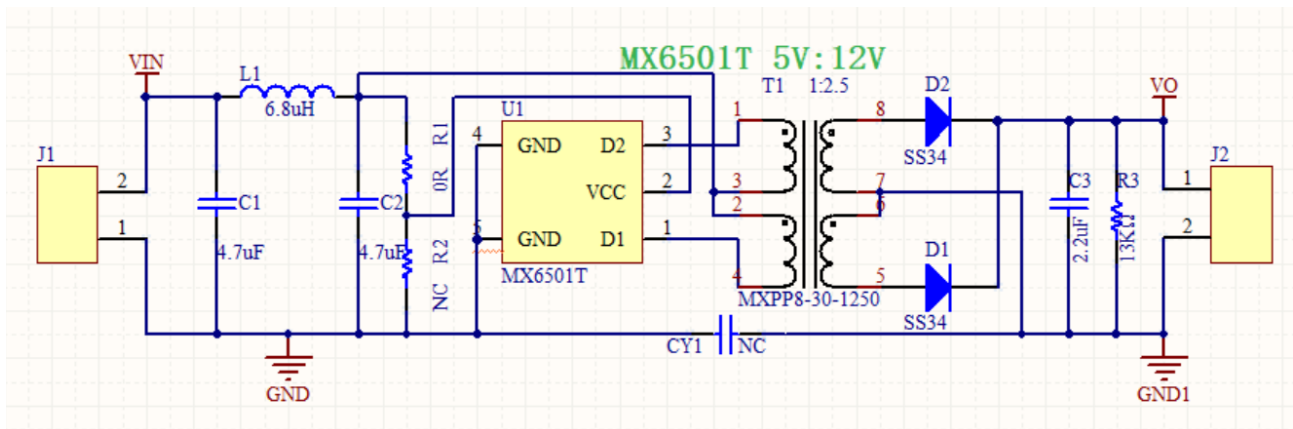


MX6501T 12V:12V EVM PCB Top Layer

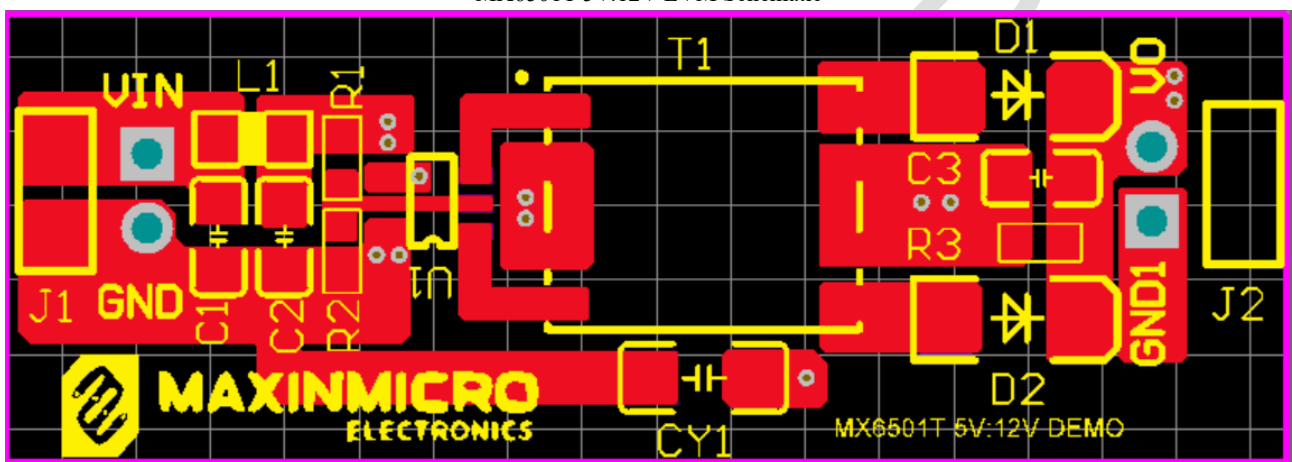


MX6501T 12V:12V EVM PCB Bottom Layer

如下是 MX6051T+MXPP8-30-1250 组合实现的是 5V 转 12V 最大 0.3A 的输出功率



MX6501T 5V:12V EVM Schematic



MX6501T 5V:12V EVM PCB Top Layer

Bill of Materials

The following table lists the bill of materials for the MX6501T-5V:5V DEMO.

serial number	Comment	Designator	Footprint	Quantity	Manufacturer
1	4.7uF/25V	C1, C2	C-0805	2	
2	10uF/25V	C3	C-0805	1	
3	NC	CY1	C-1206	1	
4	MBR0520	D1, D2	D-SOD-123	2	
5	2.54mm 2pin Header	J1	HDR-TH_2P-P2.54-H-M-W10.4	1	
6	2.54mm3pin Header	J2	HDR-TH_3P-P2.54-H-M-W10.4	1	
7	6.8uH	L1	R-0805	1	
8	NC	R1	R-0603	1	
9	MXPP6-3K6110	T1	变压器 10.05*6.73mm	1	MAXIN MICRO
10	MX6501T	U1	SOT23-6	1	MAXIN MICRO

The following table lists the bill of materials for the MX6501T-12V:12V DEMO.

serial number	Comment	Designator	Footprint	Quantity	Manufacturer
1	4.7uF/25V	C1, C2	C-0805	2	
2	2.2uF/50V	C3	C-0805	1	
3	NC	CY1	C-1206	1	
4	SS34	D1, D2	D-SMA	2	
5	NC	J1, J2	HDR-TH_2P-P2.54-H-M-W10.4	2	
6	6.8uH	L1	R-0805	1	
7	7.5KΩ	R1	R-0603	1	
8	8.2KΩ	R2	R-0603	1	
9	13KΩ	R3	R-0603	1	
10	MXPP8-30-1103	T1	变压器-SMD	1	MAXIN MICRO
11	MX6501T	U1	SOT23-6	1	MAXIN MICRO

The following table lists the bill of materials for the MX6501T-5V:12V DEMO.

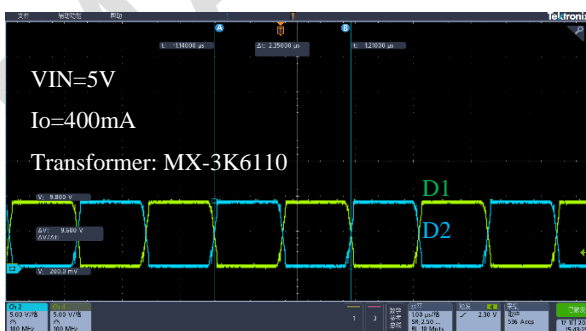
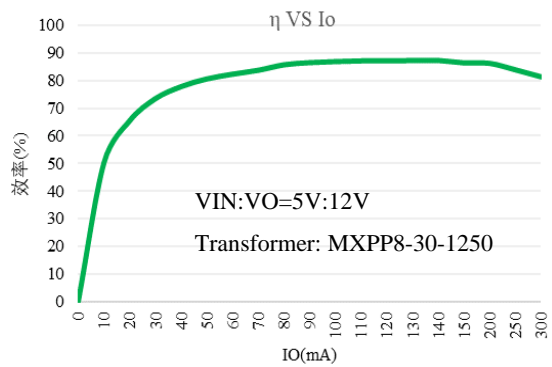
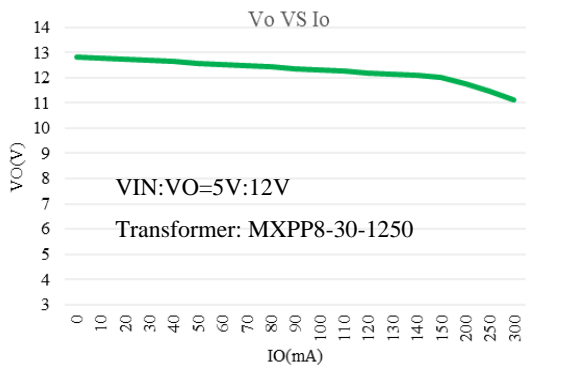
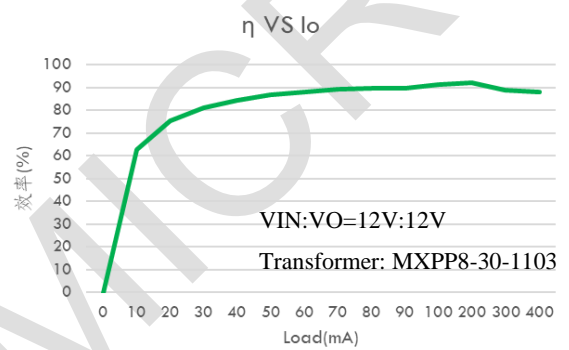
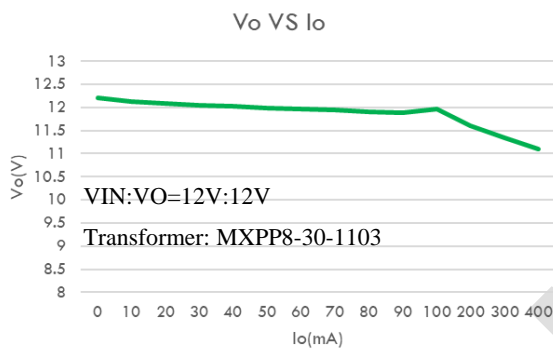
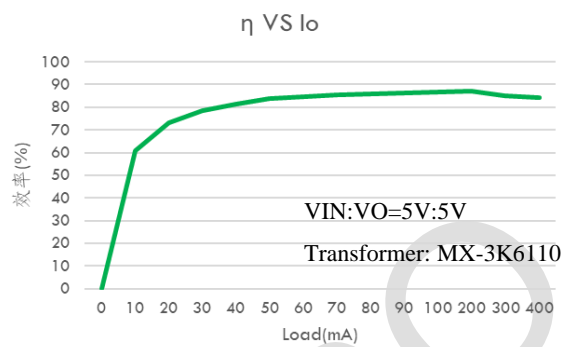
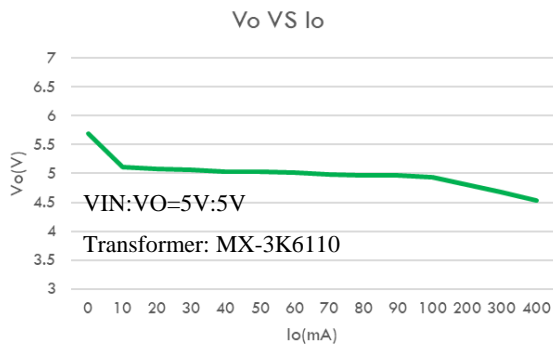
serial number	Comment	Designator	Footprint	Quantity	Manufacturer
1	4.7uF/25V	C1, C2	C-0805	2	
2	2.2uF/50V	C3	C-0805	1	
3	NC	CY1	C-1206	1	
4	SS34	D1, D2	D-SMA	2	
5	NC	J1, J2	HDR-TH_2P-P2.54-H-M-W10.4	2	
6	6.8uH	L1	R-0805	1	
7	0Ω	R1	R-0603	1	
8	NC	R2	R-0603	1	
9	13KΩ	R3	R-0603	1	
10	MXPP8-30-1250	T1	变压器-SMD	1	MAXIN MICRO
11	MX6501T	U1	SOT23-6	1	MAXIN MICRO

Efficiency test data/效率数据搞到 90%

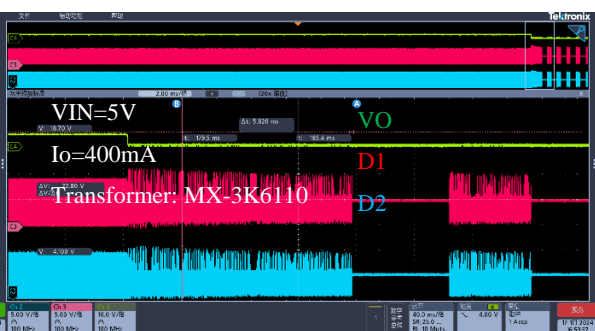
MX6501T 5V:5V efficiency														
IO(mA)	0	10	20	30	40	50	60	70	80	90	100	200	300	400
η(%)	0	60.84	73.09	78.45	81.29	83.83	84.8	85.4	85.97	86.18	86.82	87.27	84.91	84.28
MX6501T 12V:12V efficiency														
IO(mA)	0	10	20	30	40	50	60	70	80	90	100	200	300	400
η(%)	0	62.86	75.41	81.2	84.35	86.88	87.94	89.29	89.41	89.71	91.27	92.06	88.67	88.02

MX6501T 5V:12V efficiency																			
IO(mA)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	200	250	300
η(%)	0.00	50.22	65.44	73.43	77.80	80.56	82.30	83.71	85.68	86.47	86.86	87.10	87.12	87.23	87.24	86.38	86.20	83.85	81.33

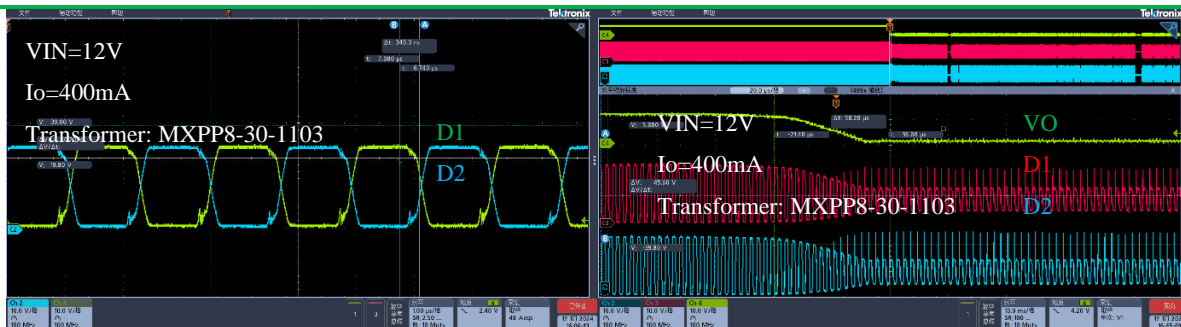
Characteristic plots and waveforms



D1, D2 with Normal operation



Output short protection



D1, D2 with Normal operation

Output short protection

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Version update record:

V10 The original version (preliminary)

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