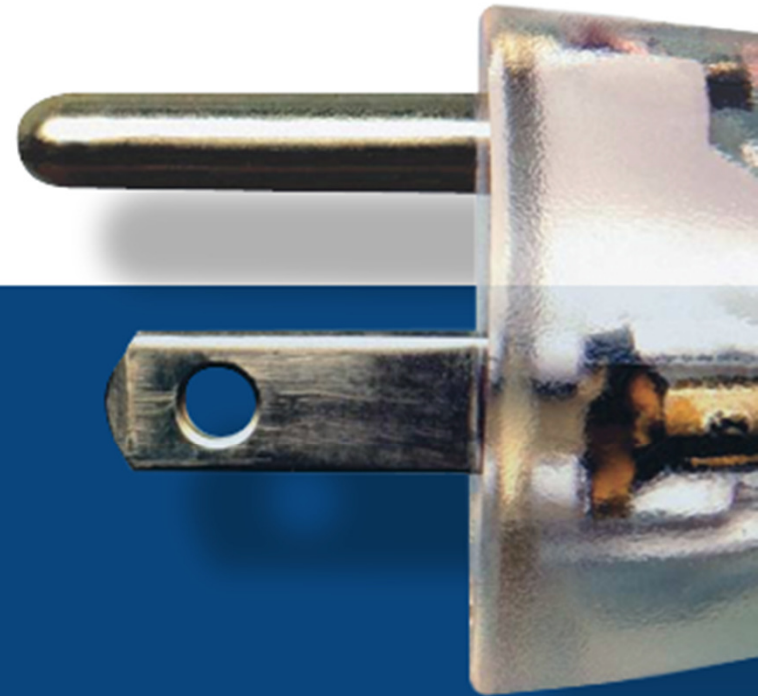




LNK-III (SC1161K0) for 5V@2A Charger (Rev-1)

Features

- Meet DOE with > 81% Efficiency on PCB;
- 85kHz operating frequency for small transformer size;
- Low component counts for easy working with small sized casing design

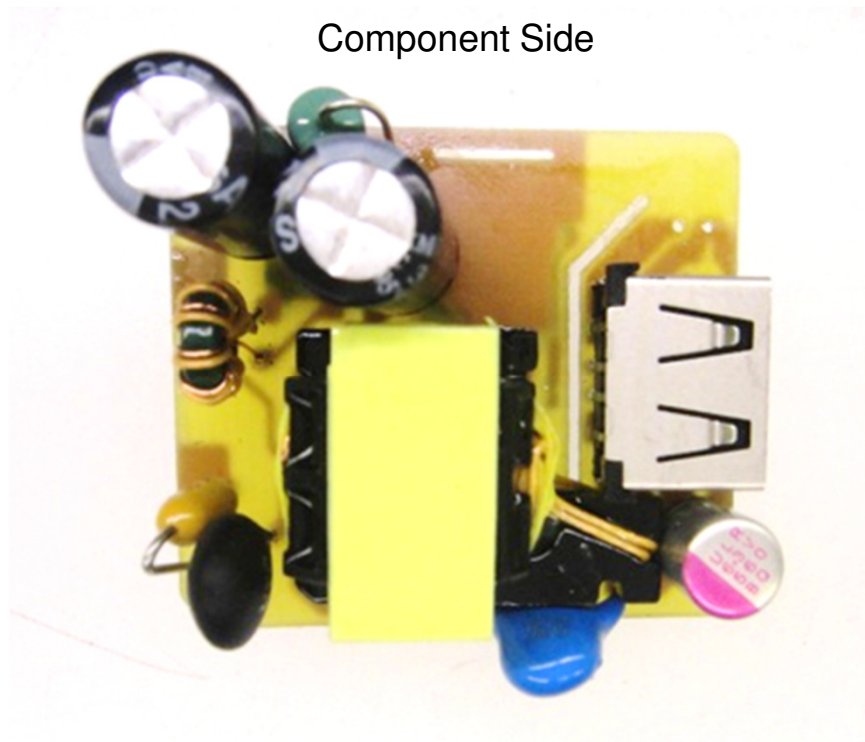


12-Oct , 2013
RL(PI-Shenzhen)

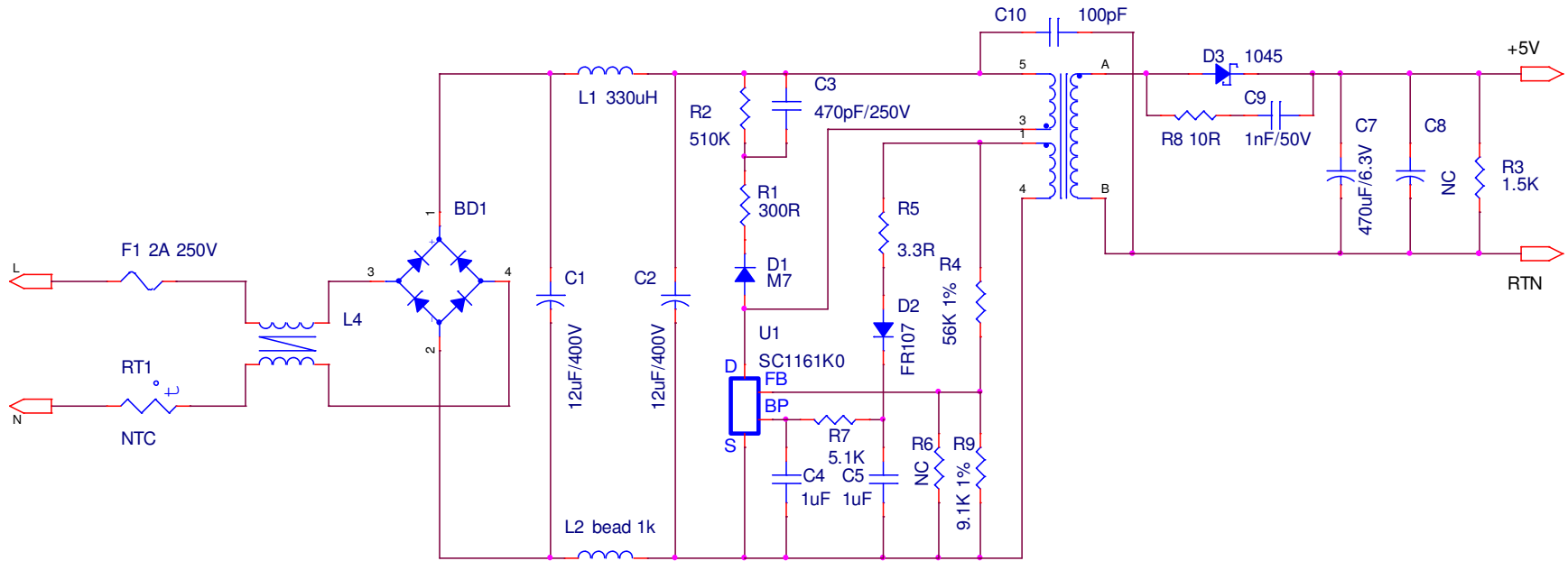
1. Power Supply Specification

Description	Symbol	Min	Typ	Max	Units	Comment/Conditions
INPUT						
Voltage	V_{IN}	90		265	V_{AC}	2 Wire no P.E
Frequency	f_{LINE}	47	50/60	63	Hz	
No-load Input Power	P_{IN}			150	mW	Input 230 V_{AC}
OUTPUT						
Output Voltage	V_{OUT}	4.75	5.0	5.25	V	Measured at the End of USB
Output Current	I_{OUT}	2			A	
Output Ripple Voltage	V_{RIPPLE}			200	mV _{P-P}	Measured at the End of USB cord 1.0m, 20 MHz Bandwidth
Total Output Power						
Continuous Output Power	P_{OUT}		10		W	
Peak Output Power	P_{OUT_PK}				W	
Conducted EMI Margin		6			dB	CISPR22B/EN55022 class B
Average Efficiency	η	78.2			%	115 and 230 V_{AC}
Ambient Temperature	T_{AMB}	0		40	°C	Free convection, sea level
Surge Test		1			kV	Differential Mode:2Ω
ESD(Air Discharge)		15			kV	On each output terminals; +/-
Safety		Designed to meet IEC950, UL1950 Class II				

2. Circuit Board



3. Schematic



4. BOM

Item	Qty	Part Reference	Value	Description
1	2	C1, C2	12 uF	12uF, 400 V, Electrolytic, (10X12),
2	1	C3	470pF	470pF, 250 V, Ceramic, X7R, 0805
3	2	C4,C6	1 uF	1 uF, 25V, Ceramic, X7R, 0805
4	1	C7	820uF	820uF, 6.3V,Solid Capacitor(8X8)
5	1	C7	1nF	1nF, 50V, Ceramic, X7R, 0805
6	1	CY	100pF	100pF, Y cap
7	1	D1	M7	1000 V, 1 A, Rectifier, SMA
8	1	D2	FR107	1000 V, Fast Recovery
9	1	D3	SBR10U45S	45 V, 10A, Schottky,Low VF, SMD, TO-277
10	1	BD1	MB6S	1000 V, 1 A, Bridge Rectifier, SMD, MBS
11	1	L3	330 uH	330 uH,Color inductor,0510
12	1	L2	bead	1.5K @ 100Mhz,0805
13	1	R1	300R	300R, 5%, 1/4 W, Thick Film, 1206
14	1	R2	510K	510K, 5%, 1/4 W, Thick Film, 1206
15	1	R3	1.5K	1.5K, 5%, 1/8 W, Thick Film,0805
16	1	R4	56K	56K, 1%, 1/10 W, Thick Film, 0603
17	1	R5	3.3R	10R, 5%, 1/10 W, Thick Film, 0603
18	1	R7	5.1K	5.1K, 1%, 1/8 W, Thick Film, 0805
19	1	R8	10R	10R, 5%, 1/8 W, Thick Film, 0805
20	1	R9	9.1K	9.1K, 1%, 1/10 W, Thick Film, 0603
21	1	R1	2A 250V	1A 250V,Time-lag Fuse
22	1	RT1	5D-7	NTC,5D-7
23	1	T1	ELPD16	ELPD16 Vertical (5+5pin)
24	1	U1	SC1161K0	LinkSwitch-III,SC1161K0,eSOP-12
25	1	PCB	PCB	
Total	27			

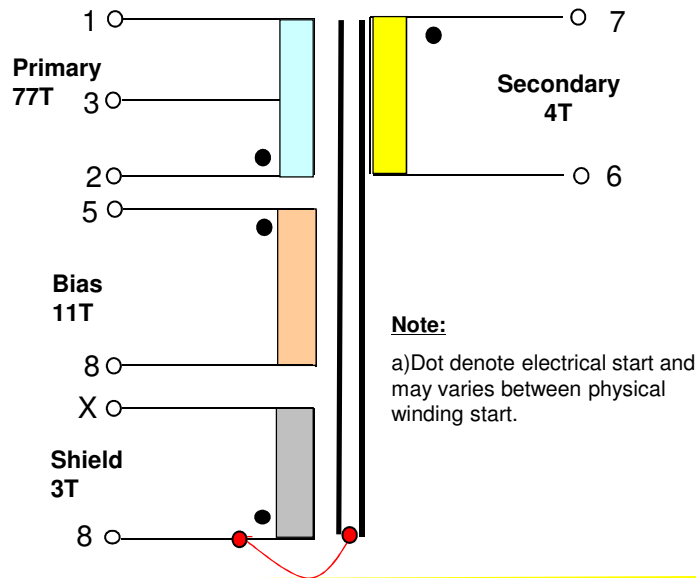
5. Regulation, Ripple & Efficiency Measurement

- Note: Output voltage is measured on PCB end and Transformer Varnished, test ripple at 1 meter line end in parallel with caps (47uF and 100nF)

V _{IN} (V _{AC})	P _{IN} (W)	V _{OUT} on PCB(V)	I _{OUT} (mA)	V _{RIPPLE} (mV _{P-P})	P _{OUT} (W)	η (%)	Average η(%)	DOE η (%) 10W
90	0.043	5.04	0	30			81.18	78.20
	3.041	4.98	500	70	2.49	81.82		
	6.123	5.00	1000	90	5.00	81.61		
	9.278	5.01	1500	110	7.51	80.95		
	12.510	5.03	2000	130	10.05	80.35		
115	0.044	5.03	0	25			82.15	
	3.022	4.99	500	60	2.49	82.48		
	6.039	4.99	1000	80	4.99	82.63		
	9.153	5.01	1500	80	7.51	82.09		
	12.340	5.02	2000	120	10.05	81.41		
230	0.055	5.06	0	30			82.45	
	3.080	4.99	500	60	2.50	81.06		
	6.030	4.99	1000	90	4.99	82.70		
	9.030	5.00	1500	90	7.51	83.12		
	12.090	5.01	2000	120	10.02	82.91		
264	0.060	5.05	0	30			81.96	
	3.125	4.99	500	60	2.50	79.84		
	6.060	4.99	1000	80	4.99	82.33		
	9.050	5.00	1500	90	7.50	82.87		
	12.090	5.01	2000	120	10.01	82.80		

6. Transformer information

SCHEMATIC



ELECTRICAL SPECIFICATIONS:

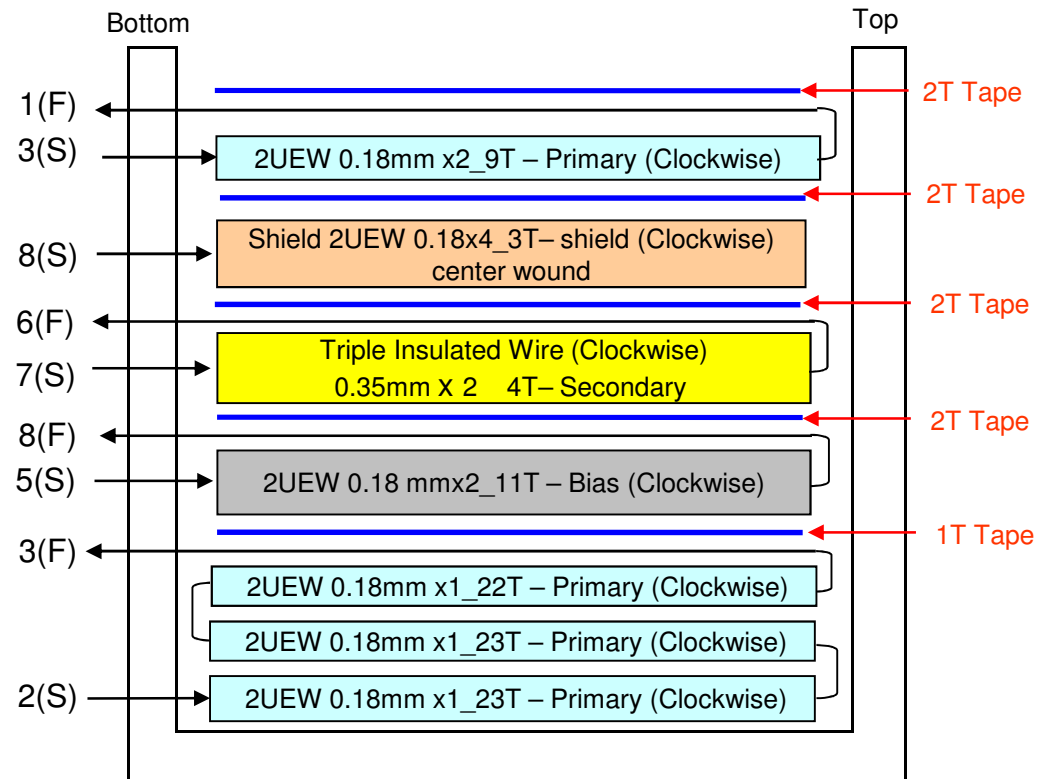
1. Primary Inductance (L_p) = $1.4mH \pm 10\%$ @70KHz
2. Primary Leakage Inductance 60uH
3. Electrical Strength = 3KV, 50/60Hz, 1Min

MATERIALS:

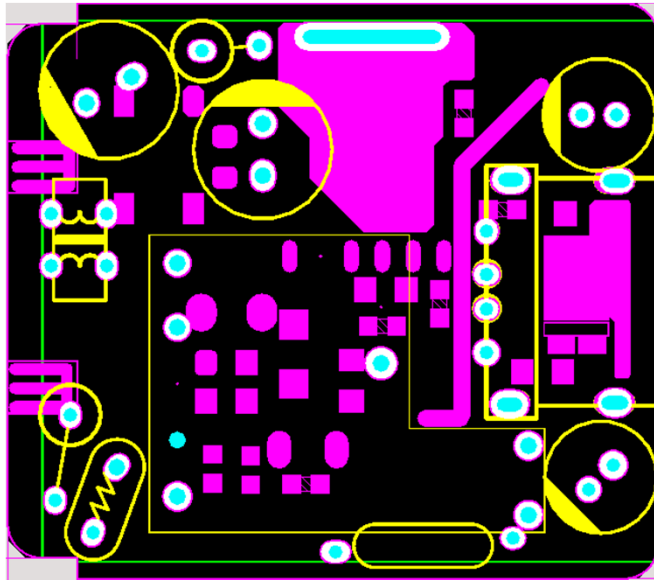
1. Core : ELPD16 (Ferrite Material TDK PC40 or equivalent)
2. Bobbin : ELPD16(Vertical)
3. Magnet Wires (Pri) : Type 2-UEW
4. Magnet Wire (Sec) : Triple Insulated Wires

FINISHED :

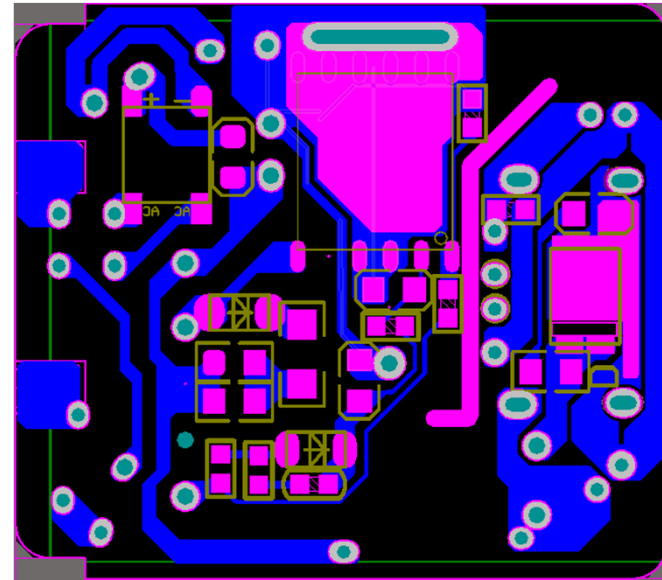
1. Varnish the complete assembly
2. Ferrite core electrically connected to Pin-8.



7. PCB Layout



Top side
(Component side)

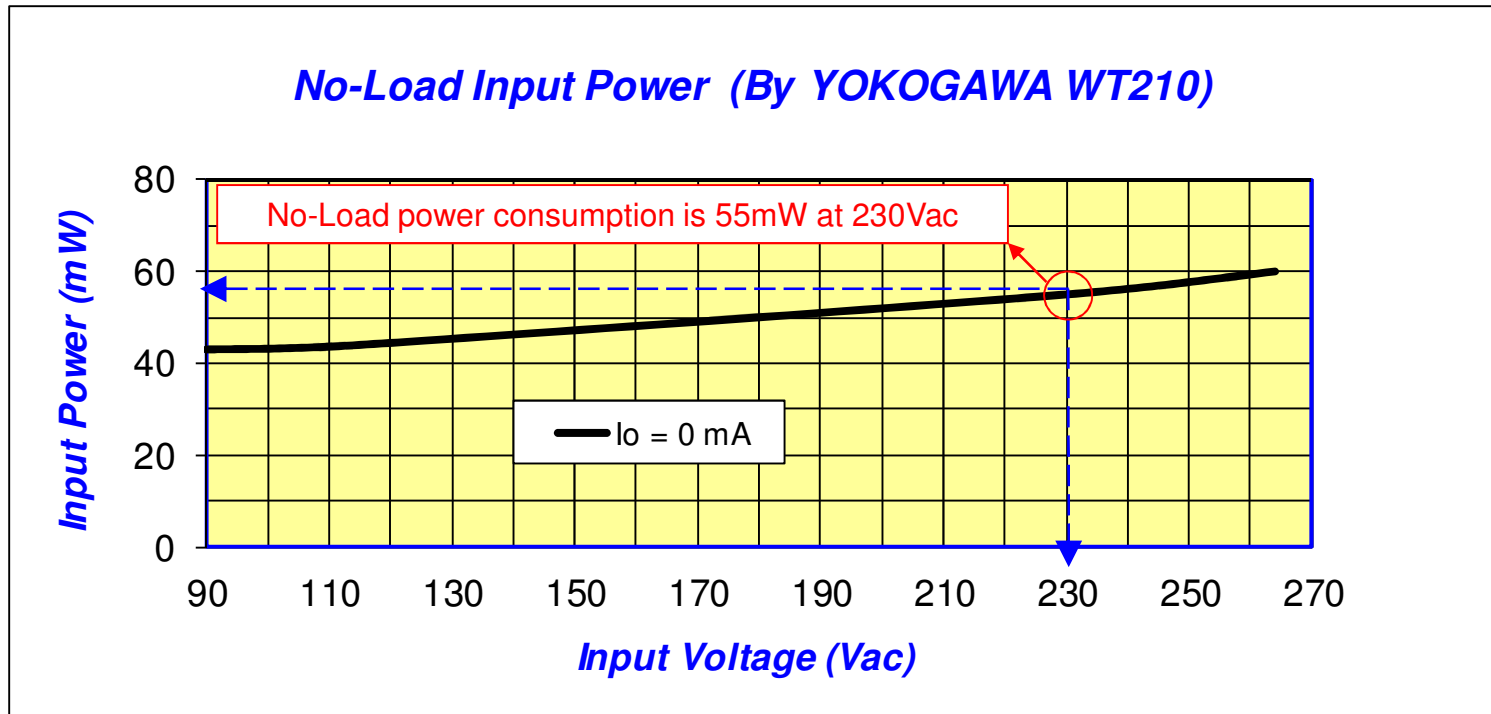


Bottom side
(Solder side)

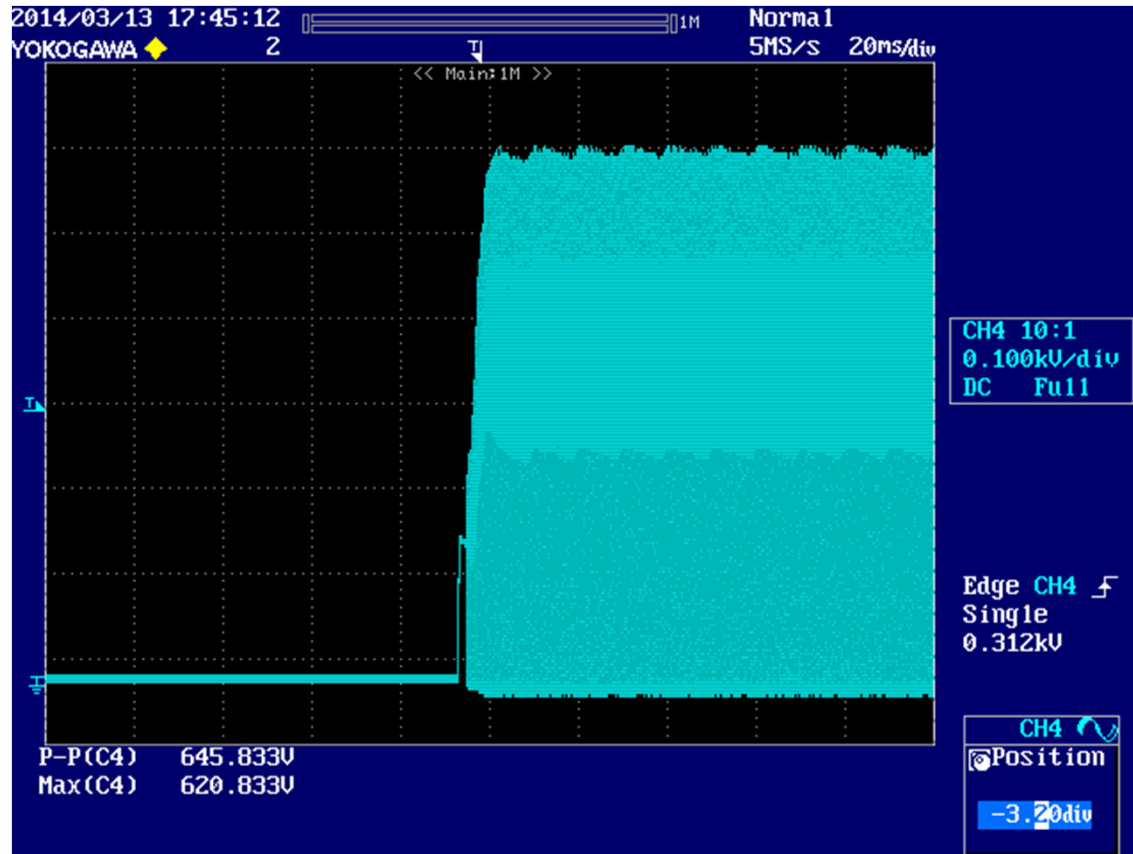
Note:

- a) Single sided PCB;
- b) PCB Thickness 1mm

8. No Load Power Consumption



9. Maximum Drain Voltage



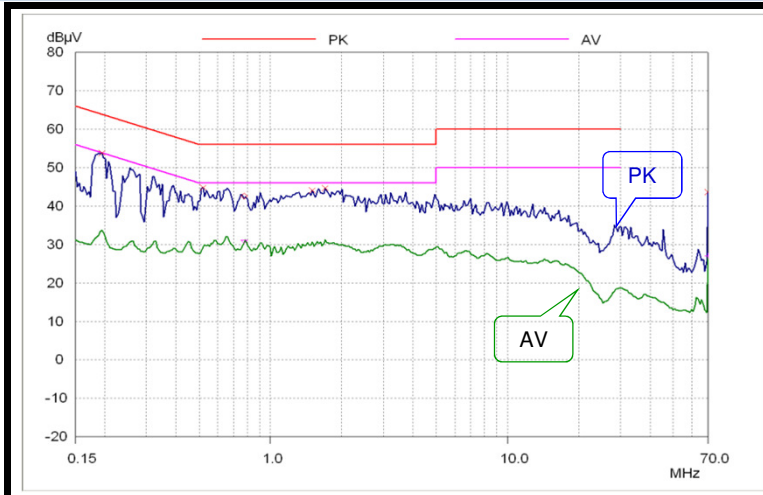
Test Condition:

$V_{IN}=264V_{AC}$, $I_{out}=2A$

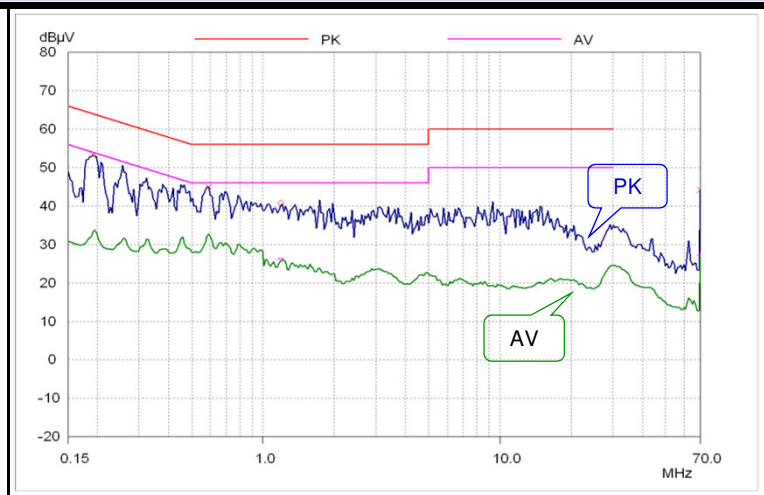
RESULT: $V_{drain_max} = 645.8V$

10. Conduction EMI

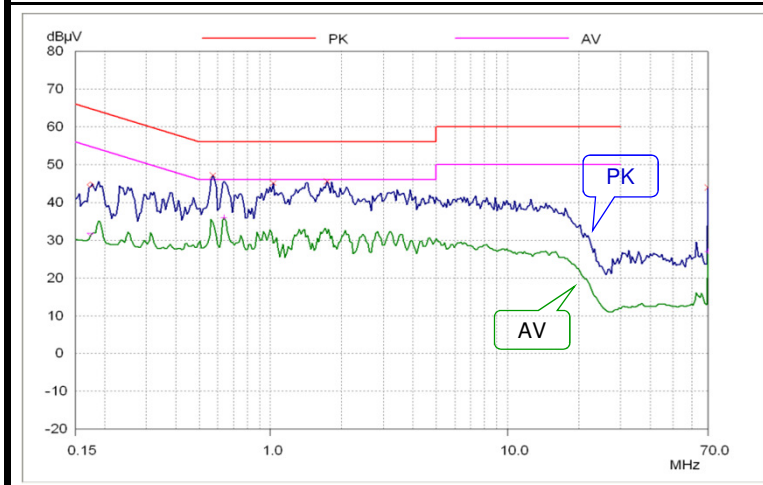
*** Note: Output Floating, Resistive Load**



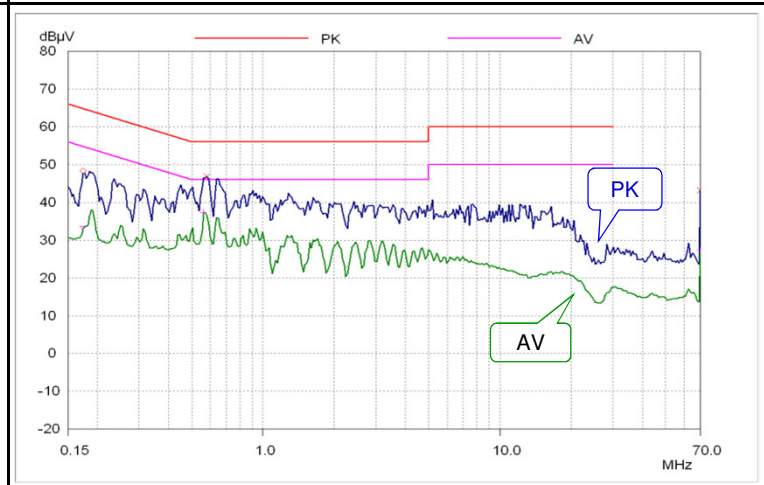
115VAC, Live



115VAC, Neutral



230VAC, Live



230VAC, Neutral

11. Change Revision History

Revision History				
Date	Author	Revision	Description & changes	Reviewed
12-Mar-2014	RL	Rev-1	Initial release	EH

China Sale Contacts and Important Note

Page 13

SC1161K0 for 5V@2A Charger with ELPD16

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