



60W (24V 2.5A) Peak 180W (24V 7.5A) LD5762P

By : Jess Lu

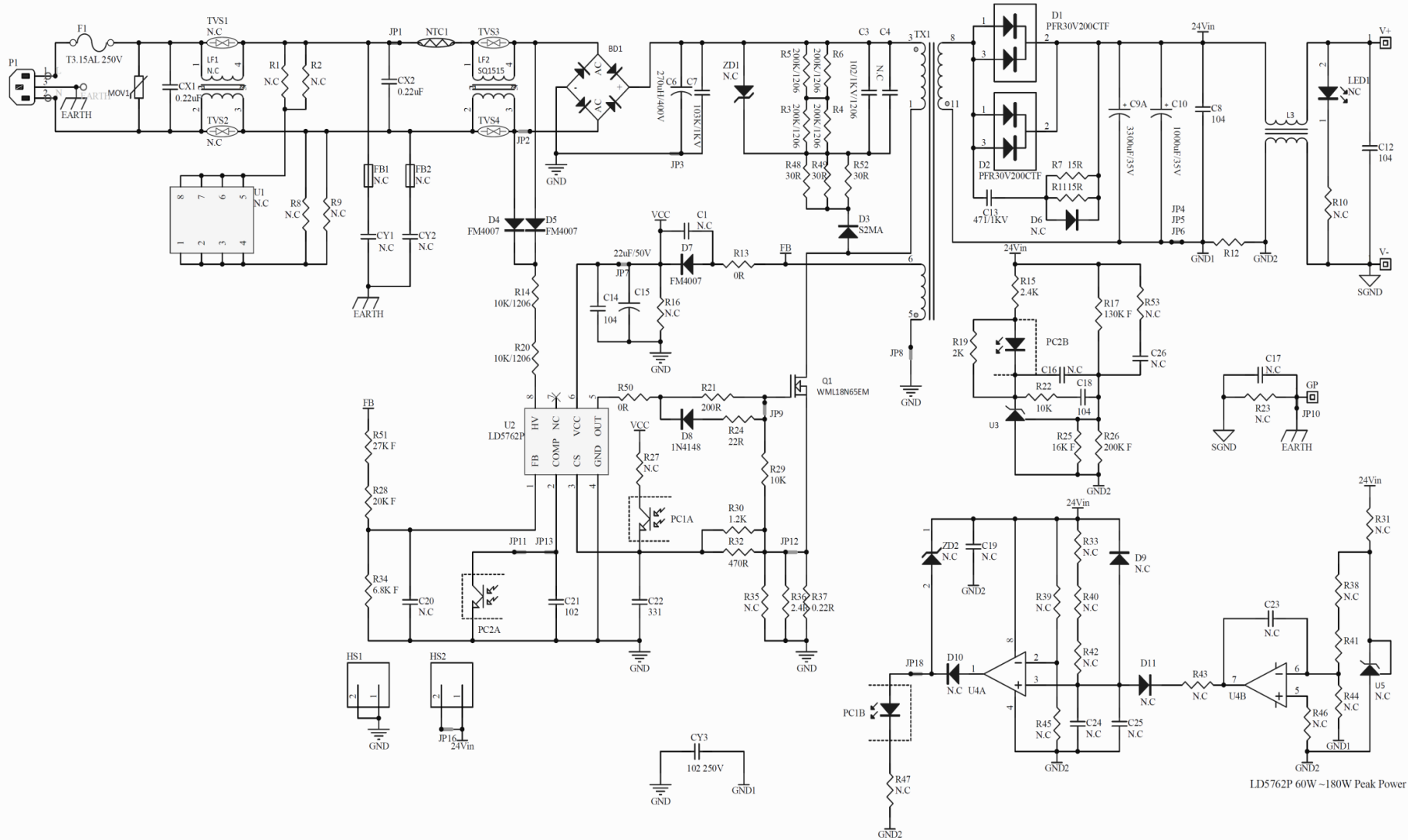
Date : 2020/06/17

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1. Specification

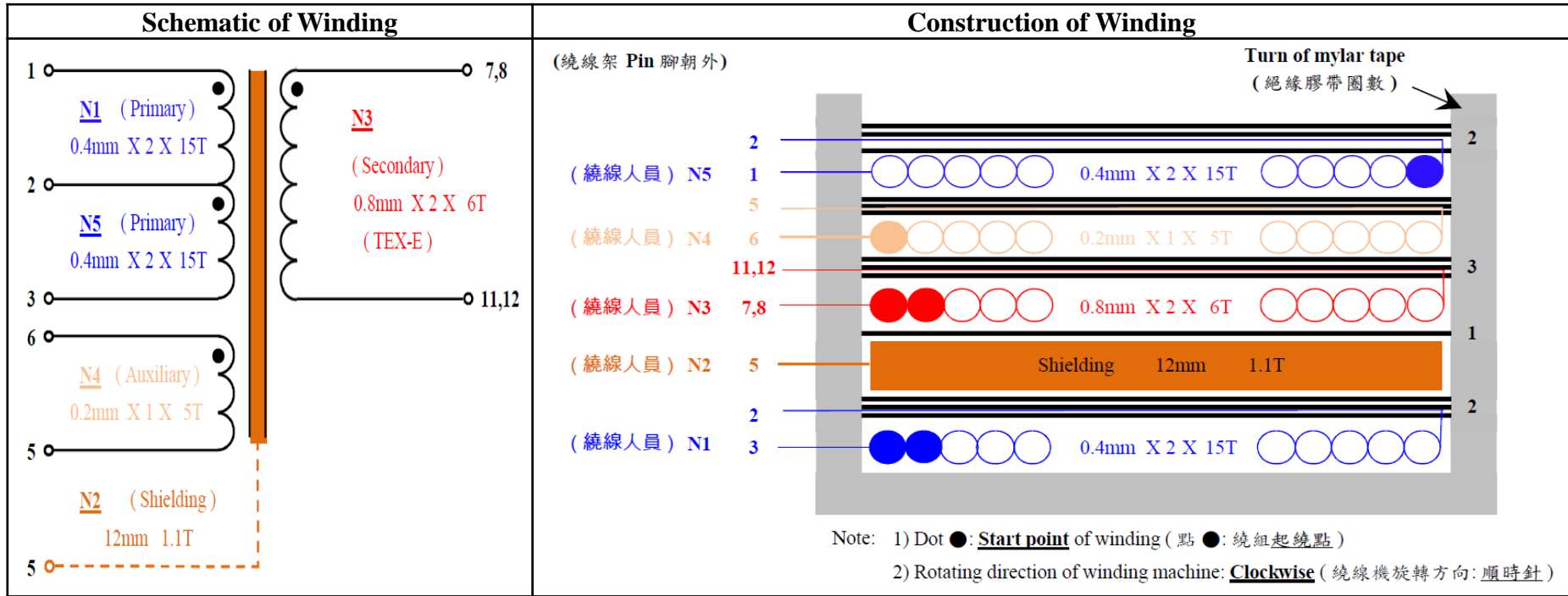
Item	Min.	Typ.		Max.	Test Result
Input Voltage (V_{AC})	90	115	230	264	—
Input Frequency (Hz)	47	60	50	63	—
Output Voltage & Current (V / A)	24V / 2.5A Peak load 7.5A (2.5 ms low / 200 us Hight) (5 ms low / 2.5 ms Hight)				—
Efficiency	Level VI				Pass
Standby Power (W)	< 0.21				Pass
Output Voltage Accuracy (%)	Typical load	< ± 5			Pass
	Peak load	< ± 10			Pass
Over Current Protection (A)	< 5				Pass
Over Voltage Protection (V)	< 30				Pass
Ripple & Noise Voltage (mV)	< 200				Pass
Dynamic Load (%)	< ± 10 of V _{BUS,SET}				Pass
Turn-on Delay Time (S)	< 3				Pass
Rise Time (mS)	< 40				Pass
Overshoot (%)	< 10				Pass
EMI (Conduction)	EN55032 Class B				Pass
Component stress(%)	Continue <90 ; instant <95				Pass

2. Schematic



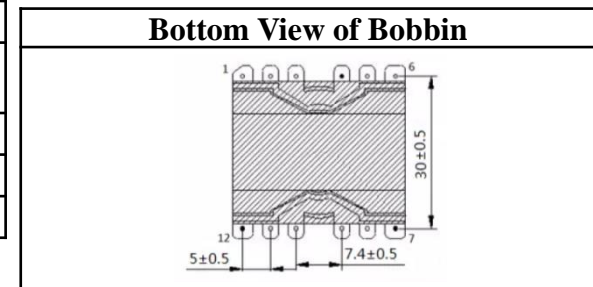
LD5762P 60W ~180W Peak Power

5. Transformer Design



Winding No.	Pin No.		Winding Types	Number of Turns		Remarks	
	Start	Finish		Winding	Tape		
N1	1	2	0.4 mm X 2	15	2	N_{P1}	Pin 朝外順繞
N2	5	X	12 mm X 1mil	1.1	3	Shielding	Pin 朝外順繞
N3	7,8	11,12	0.8 mm X 2	6	3	N_{S1}	Pin 朝外順繞
N4	6	5	0.2 mm X 1	4	2	N_{aux}	Pin 朝外順繞(疏繞)
N5	2	3	0.4 mm X 2	15	2	N_{P2}	Pin 朝外順繞
Foil	5		5 mm X 10 mm X 1 mil	-	-	Core 底部貼銅下地 Pin 5	

Bobbin Shape	Core Material	A_e (mm ²)	L_p (μH)
PQ3225	P47	161	360 ± 5 % @ 1 kHz / 1 V



6. Efficiency

Input Voltage	115 V_{AC} / 60 Hz	230 V_{AC} / 50 Hz
Output Current	100 %, 75 %, 50 %, 25 % of Full Load	
Measured Point of Output Voltage	Cable end	
Duration of Burn-in	30 Minutes	
Requirement	Level VI	

6. Efficiency

$V_{IN,AC}$ (V / Hz)	$V_{BUS,SET}$ (V)	V_{OUT} (V)	I_{OUT} (A)	P_{OUT} (W)	P_{IN} (W)	η (%)	$\eta_{AV,4-Points}$ (%)	Requirement (%)
115 / 60	24	24.079	2.5003	60.20472	67.79	88.81063	89.059	> 88
		24.152	1.8747	45.27775	50.85	89.0418		
		24.218	1.2503	30.27977	33.92	89.26818		
		24.287	0.626	15.20366	17.06	89.11877		
		24.346	0.2501	6.088	6.94	87.72	—	—
230 / 50	24	24.076	2.5001	60.19241	66.88	90.00061	89.976	> 88
		24.147	1.8757	45.29253	50.24	90.15232		
		24.211	1.2504	30.27343	33.59	90.12633		
		24.282	0.626	15.20053	16.96	89.62578		
		24.343	0.2502	6.09	6.91	88.133	—	—

7. No Load Power Consumption

Input Voltage	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz
Output Current	24V / 0 A	
Requirement	Level VI	

V_{IN,AC} (V / Hz)	P_{IN} (W)	Requirement (W)
115 / 60	0.04	< 0.21
230 / 50	0.058	

8. Line / Load / Cross Regulation

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V: 0A / 2.5A	
Measured Point of Output Voltage	Cable end	
Requirement	< ± 5 %	

Mode	V_{BUS,SET} (V)	V_{IN,AC} (V / Hz)	V_{BUS,PCB} (V)		Requirement (V)
			0 A	2.5 A / 20V	
Typical	24	90 / 47	24.389	24.111	22.8 ~ 25.2
		264 / 63	24.389	24.104	

9. Over Current Protection

Input Voltage		90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Requirement	Protection Mode	Latch			
	OCP Trigger Point	< 5A			

V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	I _{OUT,OCP} (A)	Requirement	
			Protection Mode	OCP Trigger Point (A)
24	90 / 47	4.08	Latch	< 5
	115 / 60	4.20	Latch	
	230 / 50	4.08	Latch	
	264 / 63	4.19	Latch	

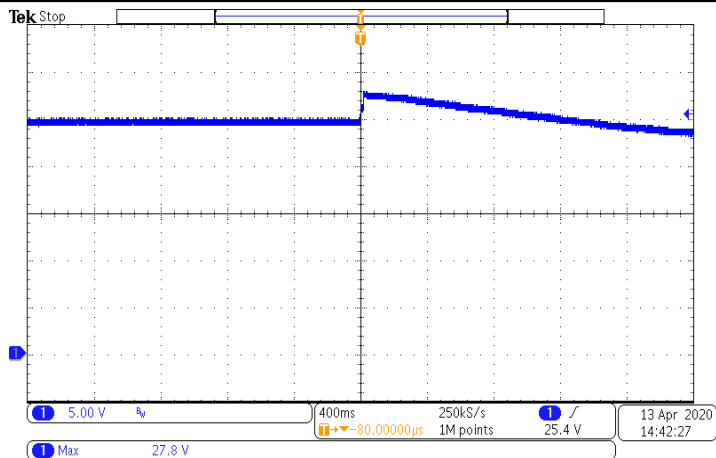
10. Over Voltage Protection

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V : 0A / 2.5A	
Measured Point of Output Voltage	End of Cable	
Requirement	< 30	

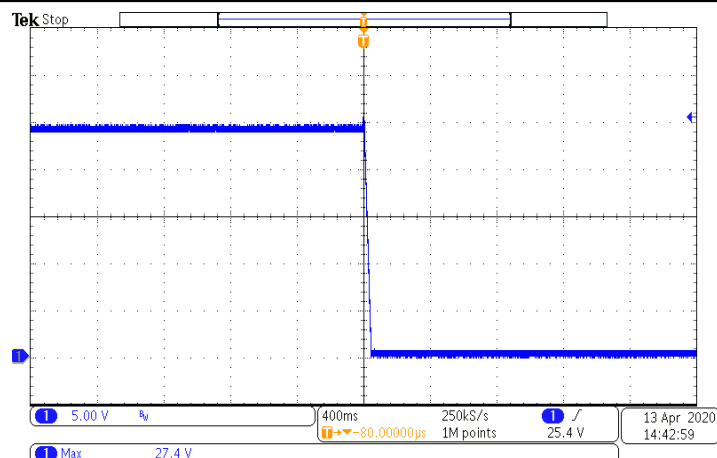
V_{BUS,SET} (V)	V_{IN,AC} (V / Hz)	V_{BUS,OVP} (V)		Requirement (V)
		No Load	Full Load	
24	90 / 47	27.8	27.4	< 30
	264 / 63	27.8	27.4	

10. Over Voltage Protection

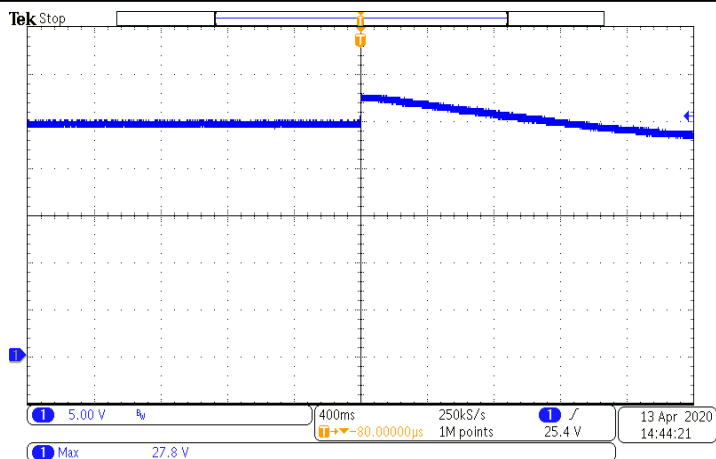
90 V_{AC} / 47 Hz / 24V / 0A



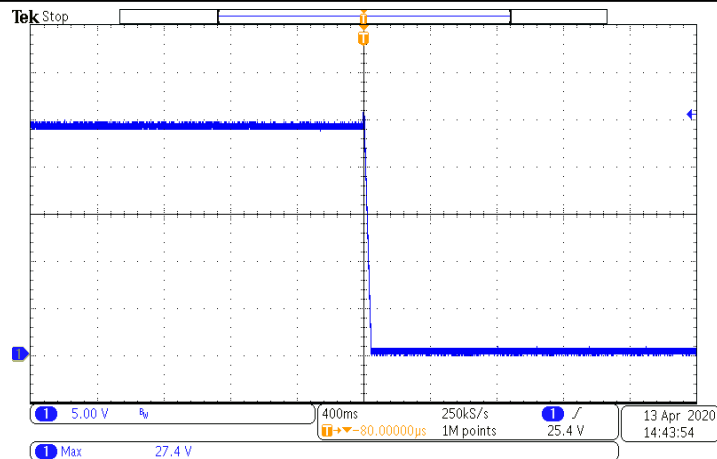
90 V_{AC} / 47 Hz / 24V / 2.5A



264 V_{AC} / 63Hz / 24V / 0A



264 V_{AC} / 63 Hz / 24V / 2.5A



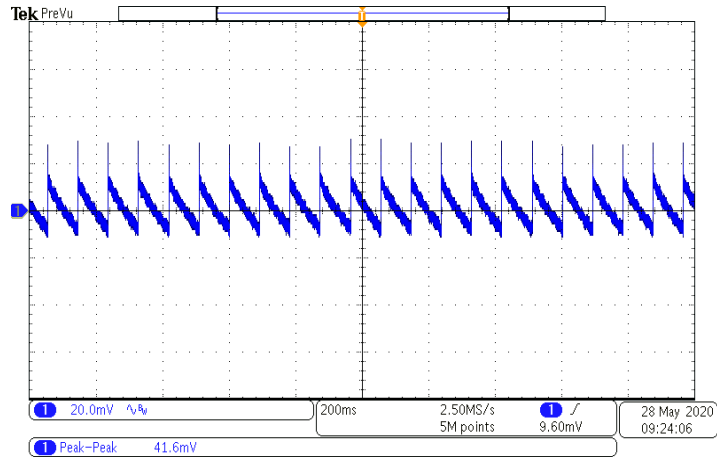
11. Ripple & Noise Voltage

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V : 0A / 2.5A	
Measured Point of Output Voltage	End of Cable	
Bandwidth	20 MHz (with 10 μF E-cap & 0.1 μF MLCC)	
Requirement	24V < 200 m V	

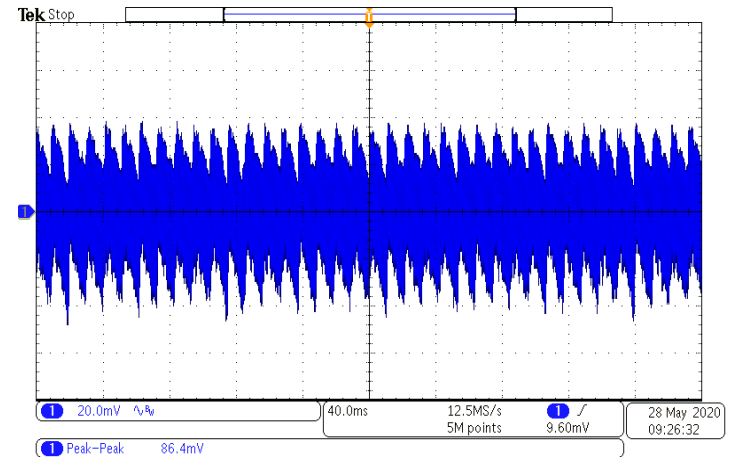
V_{BUS,SET} (V)	V_{IN,AC} (V / Hz)	V_{BUS,PK-PK} (mV)		Requirement (mV)
		No Load	Full Load	
24	90 / 47	41.6	86.4	< 200
	264 / 63	60	80	

11. Ripple & Noise Voltage

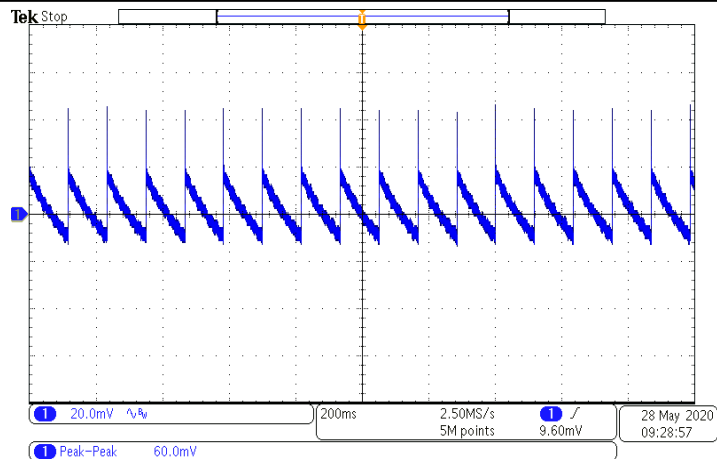
90 V_{AC} / 47 Hz / 24V / 0A



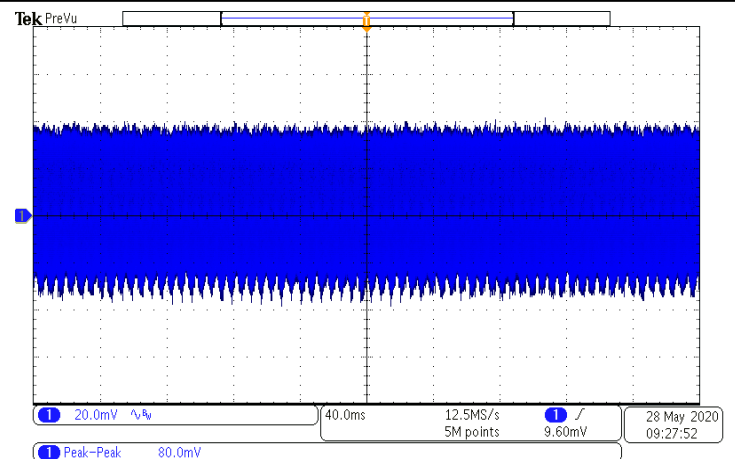
90 V_{AC} / 47 Hz / 24V / 2.5A



264 V_{AC} / 63Hz / 24V / 0A



264 V_{AC} / 63 Hz / 24V / 2.5A



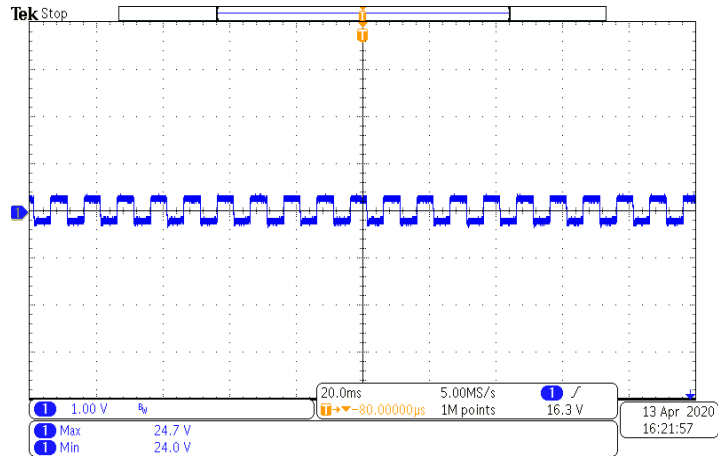
12. Dynamic Load

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V : 0A ~ 2.5A	
Frequency of Load	100 Hz (5 ms High / 5 ms Low)	
Slew Rate of Load	1 A / μ S	
Measured Point of Output Voltage	End of Cable	
Requirement	< \pm 10 % of V _{BUS,SET}	

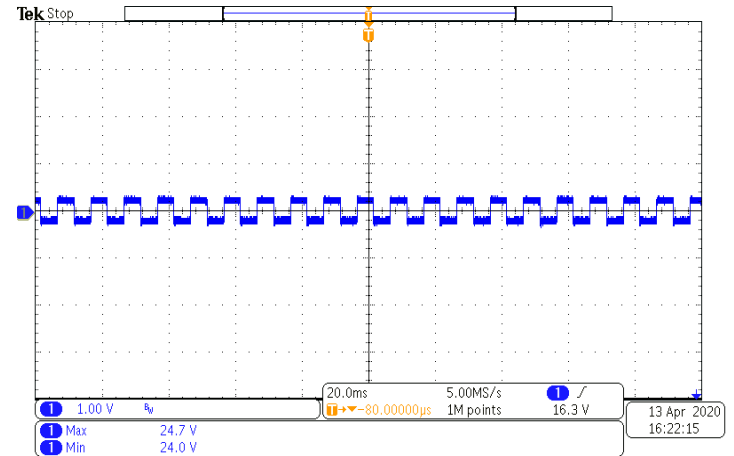
V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	V _{BUS,PCB} (V)		Requirement (V)
		Min.	Max.	
24	90 / 47	24	24.7	21.6~26.4
	264 / 63	24	24.7	

12. Dynamic Load

90 V_{AC} / 47 Hz / 24V



264 V_{AC} / 63 Hz / 24V



13. Peak Power Load

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V : 2.5A ~ 7.5A	
Frequency of Load	(2.5 ms Low / 200 us High) (5 ms Low / 2.5 ms High)	
Slew Rate of Load	0.1 A / μS	
Measured Point of Output Voltage	End of Cable	
Requirement	< ± 10 % of V _{BUS,SET}	

2.5 ms Low / 200 us High

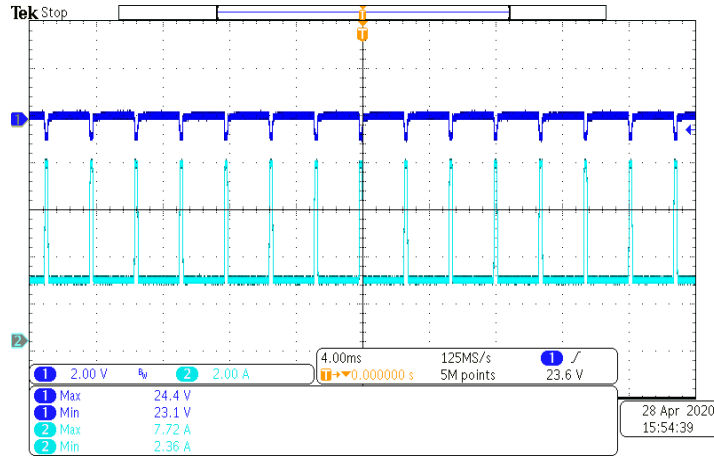
V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	V _{BUS,PCB} (V)		Requirement (V)
		Min.	Max.	
24	90 / 47	23.1	24.4	21.6~26.4
	264 / 63	23.1	24.4	

5 ms Low / 2.5 ms High

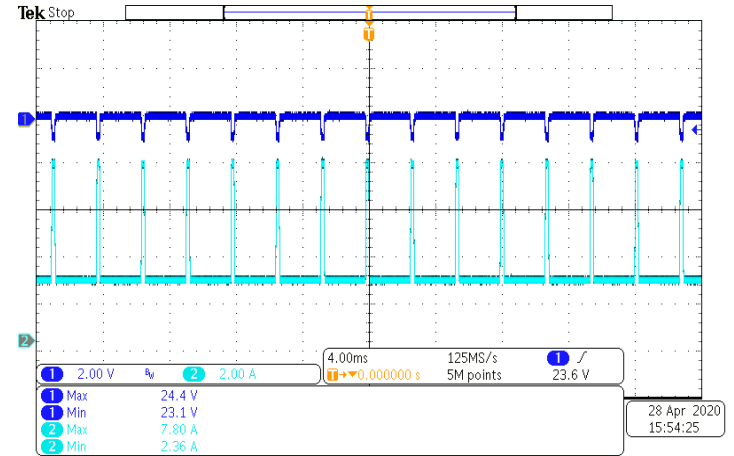
V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	V _{BUS,PCB} (V)		Requirement (V)
		Min.	Max.	
24	90 / 47	23	24.5	21.6~26.4
	264 / 63	23	24.5	

13. Peak Power Load

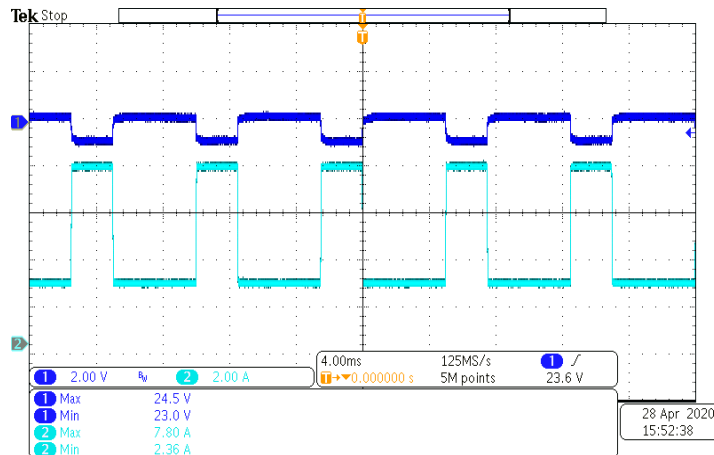
90 V_{AC} / 47 Hz / 24V (2.5 ms low / 200 us Hight)



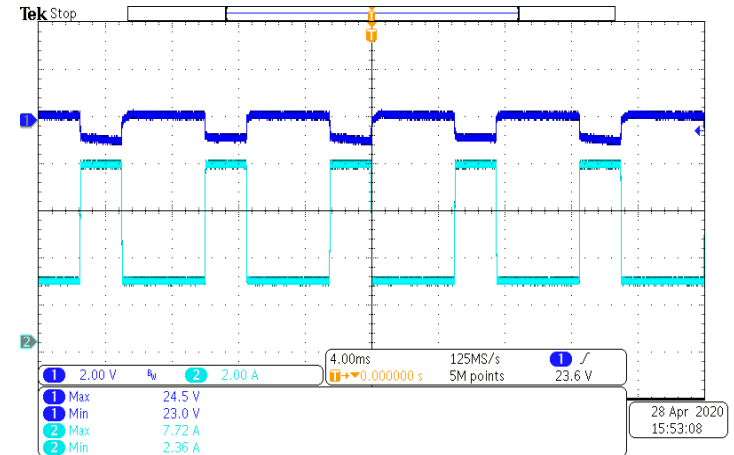
264 V_{AC} / 63 Hz / 24V (2.5 ms low / 200 us Hight)



90 V_{AC} / 47 Hz / 24V (5ms low / 2.5 ms Hight)



264 V_{AC} / 63 Hz / 24V (5 ms low / 2.5 ms Hight)



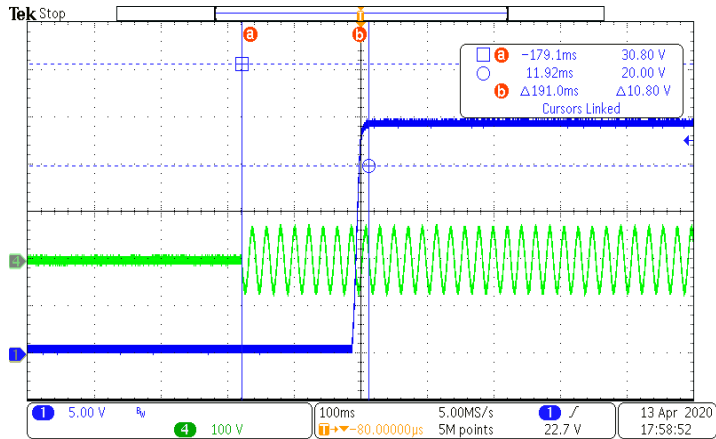
14. Turn-on Delay Time

Input Voltage	90 V _{AC} / 47 Hz
Output Current	24V : 0 A / 2.5 A
Measured Point of Output Voltage	End of Cable
Requirement	< 3 S

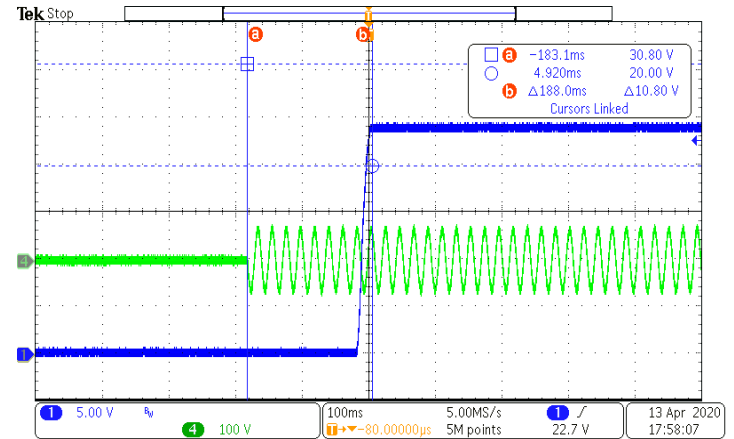
V_{BUS,SET} (V)	V_{IN,AC} (V / Hz)	T_{ON} (ms)		Requirement (S)
		0 A	2.5 A	
24	90 / 47	191	188	< 3

14. Turn-on Delay Time

90 V_{AC} / 47 Hz / 0A



90 V_{AC} / 47 Hz / 2.5A



15. Rise Time & Overshoot

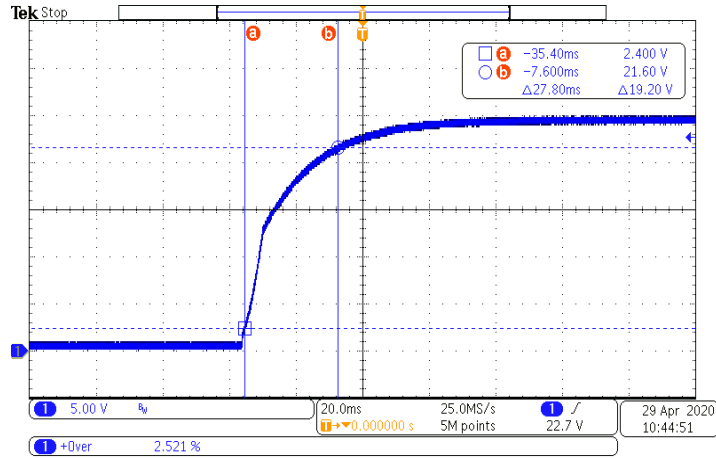
Input Voltage		90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current		24V : 0 A	
Measured Point of Output Voltage		End of Cable	
Requirement	Rise Time	< 40 mS	
	Overshoot	< 10 %	

V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	T _{RISE} (mS)	Requirement (ms)
24	90 / 47	27.8	< 40
	264 / 63	27.8	

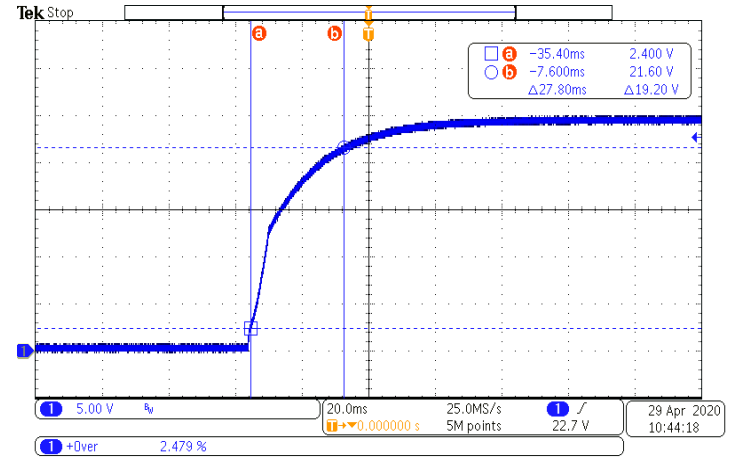
V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	Overshoot (%)	Requirement (%)
24	90 / 47	2.521	< 10
	264 / 63	2.479	

15. Rise Time & Overshoot

90 V_{AC} / 47 Hz / 0 A



264 V_{AC} / 63 Hz / 0 A



15. Rise Time & Overshoot

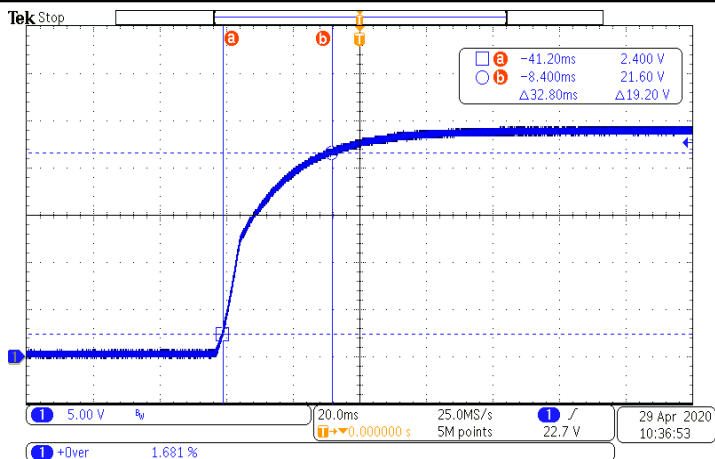
Input Voltage		90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current		24 V : 2.5 A	
Measured Point of Output Voltage		End of Cable	
Requirement	Rise Time	< 40 mS	
	Overshoot	< 10 %	

V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	T _{RISE} (mS)	Requirement (ms)
24	90 / 47	32.8	< 40
	264 / 63	32.8	

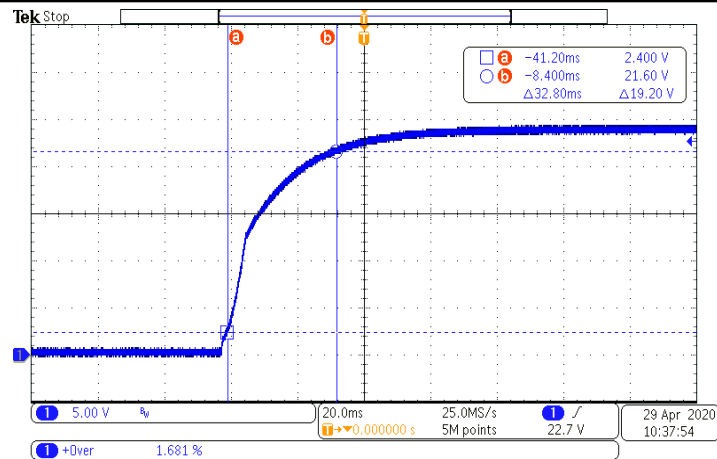
V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	Overshoot (%)	Requirement (%)
24	90 / 47	1.681	< 10
	264 / 63	1.681	

15. Rise Time & Overshoot

90 V_{AC} / 47 Hz / 2.5 A



264 V_{AC} / 63 Hz / 2.5 A



16. Supply Voltage of IC

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	24V : 0 A / 2.5 A	
Requirement	> V _{CC_OFF} & < V _{CC_OVP}	

V _{BUS,SET} (V)	V _{IN,AC} (V / Hz)	V _{CC,U1} (V)				Requirement (V)
		No Load		Full Load		
		Min.	Max.	Min.	Max.	
24	90 / 47	14.9	18.3	19.1	20.9	6.5 < V _{CC} < 31
	264 / 63	14.5	18.3	19.1	20.9	

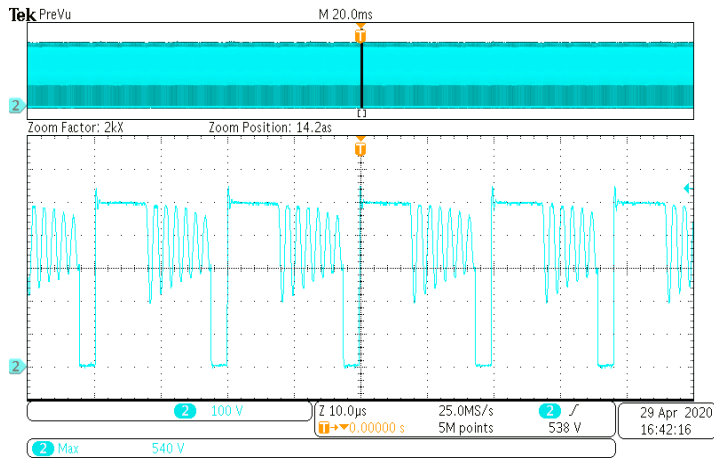
17. Stress on Switching Parts

Input Voltage	264 V _{AC} / 63 Hz
Output Current	Full Load & Peak Load (24 V : 2.5 A / 7.5 A)
Requirement	Defined by Different Parts

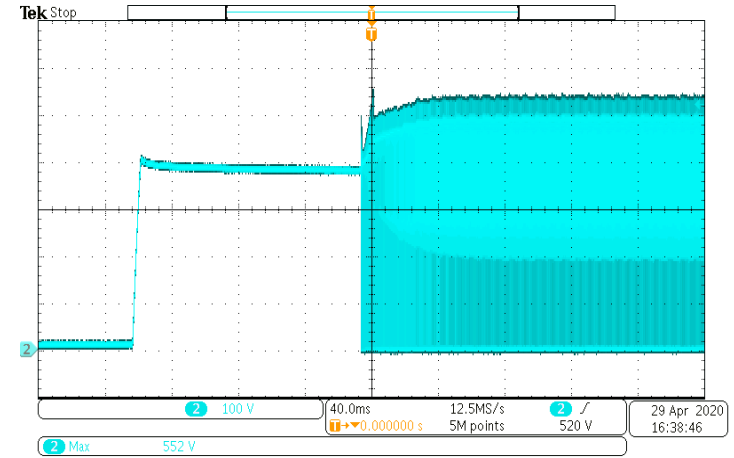
Location	Part No.	Condition	V _{BUS,SET} (V)	I _{OUT} (A)	V _{DS} (V)	Requirement (V)
Q1	WML18N6 5	Normal	24	2.5	540	< 585 (650 * 0.90)
		Turn-on	24	2.5	552	< 617.5 (650 * 0.95)
		Peak load (2.5ms low / 200 us Hight)	24	7.5	572	
		Peak load (5ms low / 2.5 ms Hight)	24	7.5	592	
D1	MBR30200 F	Normal	24	2.5	132	< 180 (200 * 0.90)
		Turn-on	24	2.5	174	< 190 (200 * 0.95)
		Peak load (2.5ms low / 200 us Hight)	24	7.5	134	
		Peak load (5ms low / 2.5 ms Hight)	24	7.5	154	

17. Stress on Switching Parts

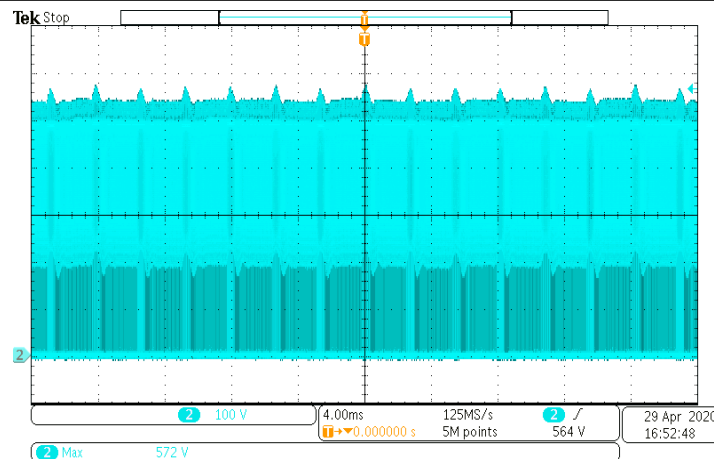
Q1_24 V / 2.5 A_Normal



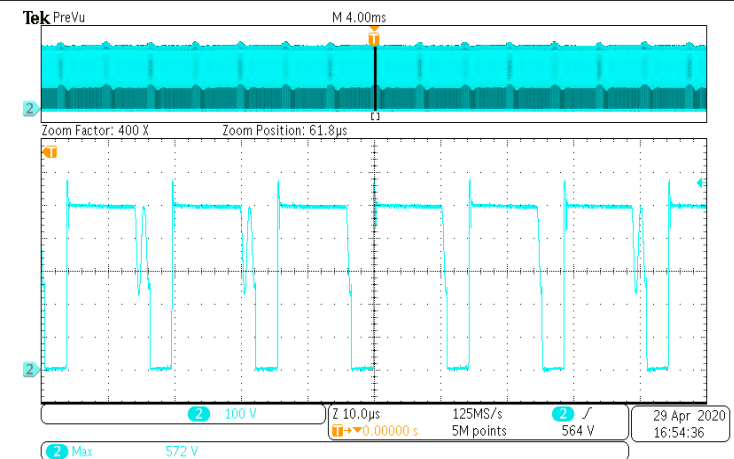
Q1_24V / 2.5A_Turn-on



Q1_24 V / 7.5 A_Peak load (2.5 ms low / 200 us Hight)

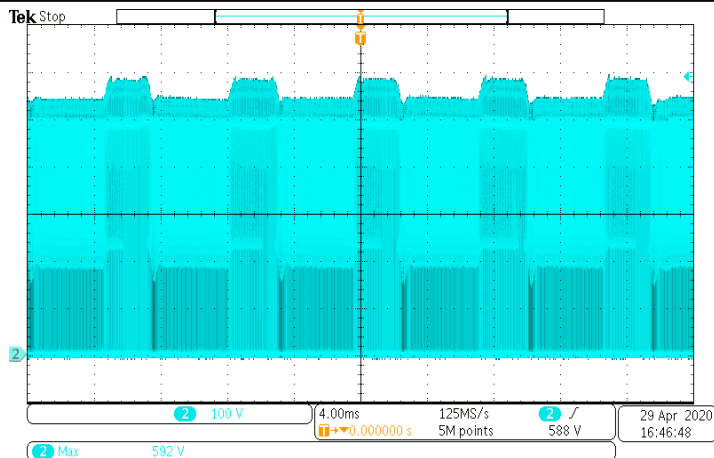


Q1_24V / 7.5 A_Peak load (2.5 ms low / 200 us Hight)

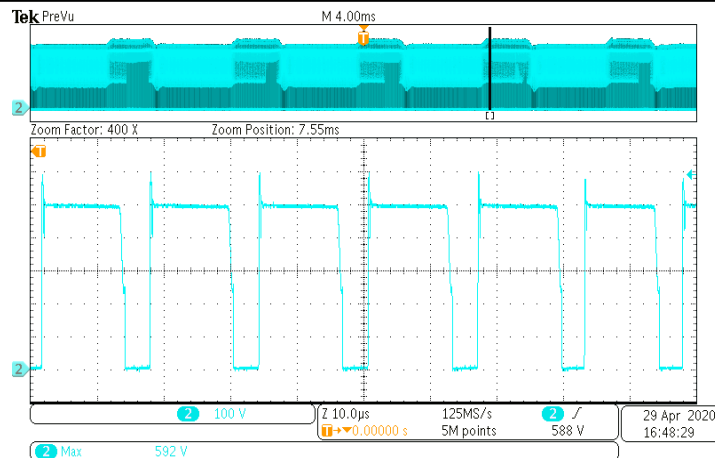


17. Stress on Switching Parts

Q1_24 V / 2.5 A_Peak load (5 ms low / 2.5 ms Hight)

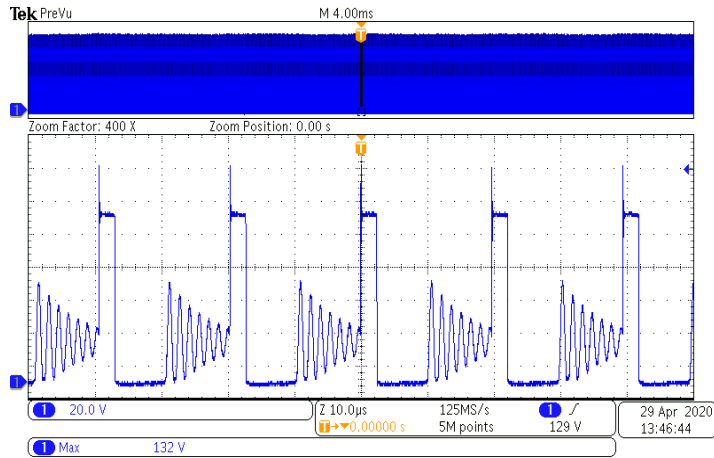


Q1_24V / 2.5A_Peak load (5 ms low / 2.5 ms Hight)

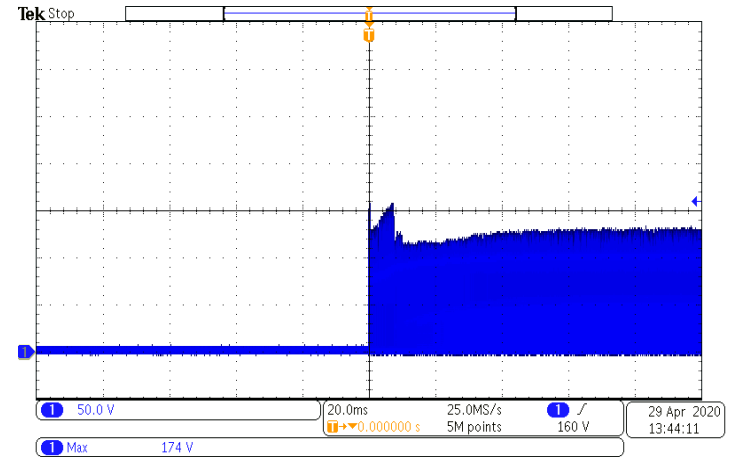


17. Stress on Switching Parts

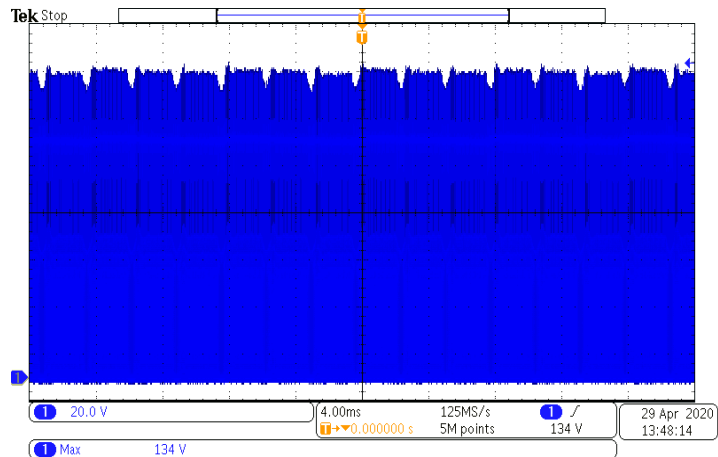
D1_24 V / 2.5 A_Normal



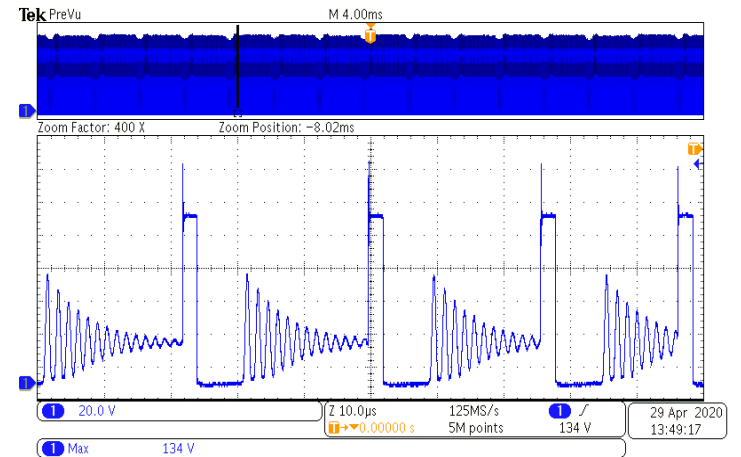
D1_24 V / 2.5 A_Turn-on



D1_24 V / 2.5~7.5 A_Peak load (2.5 ms low / 200 us Hight)

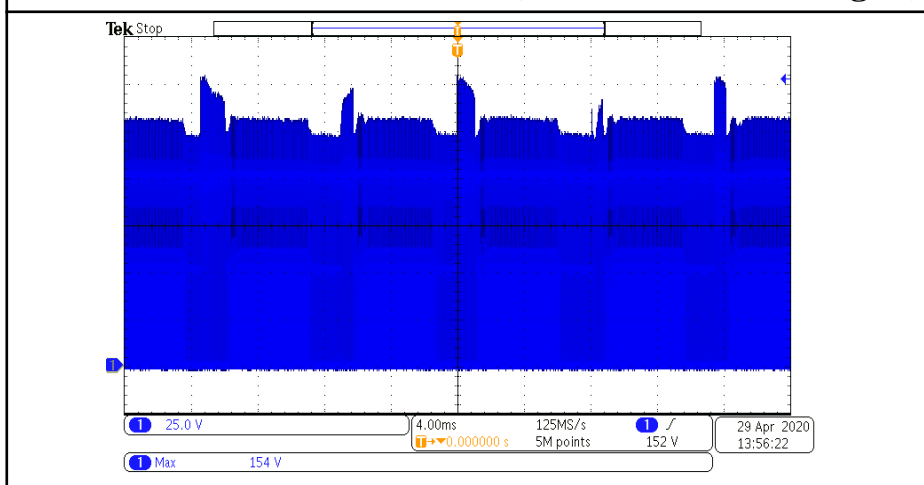


D1_24 V / 2.5~7.5 A_Peak load (2.5 ms low / 200 us Hight)

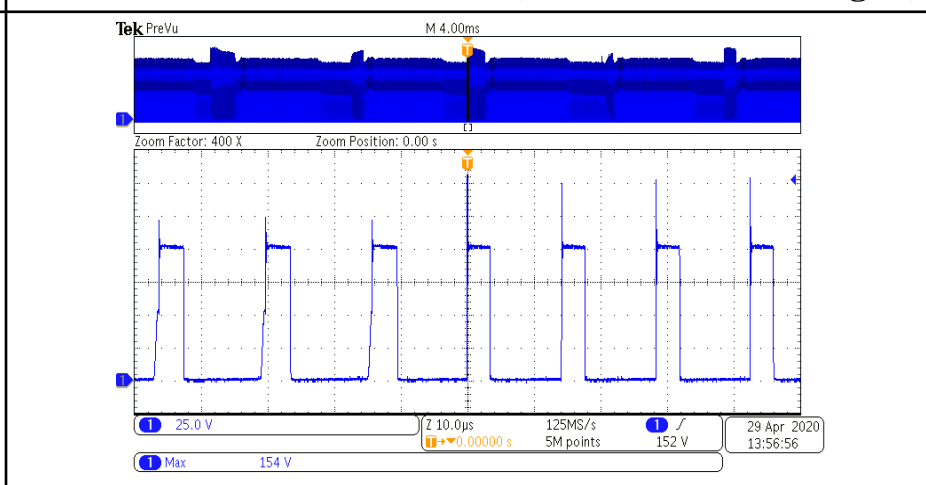


17. Stress on Switching Parts

D1_24 V / 2.5~7.5 A_Peak load (5 ms low / 2.5 ms Hight)



D1_24 V / 2.5~7.5 A_Peak load (5 ms low / 2.5 ms Hight)



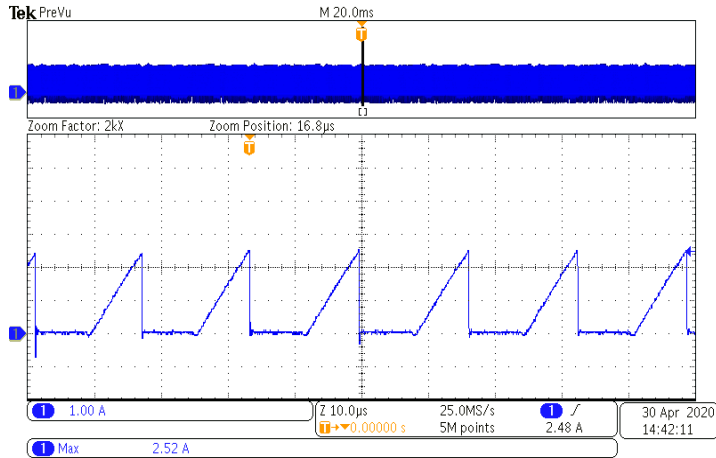
18. Flux Density of Transformer

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	Full Load & Maximum Power	
Requirement	90 % of Rating	

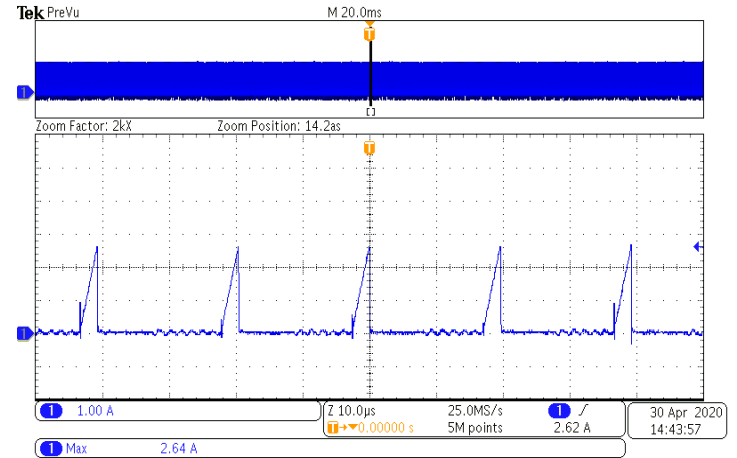
Mode	V_{BUS,SET} (V)	I_{OUT} (A)	V_{IN,AC} (V / Hz)	I_{PRI,MAX} (A)	B_{MAX} (G)	Requirement (G)
Normal	24	2.5	90 / 47	2.52	1878	< 3,780 (4,200 * 0.9)
		2.5	264 / 63	2.64	1968	
Turn-on	24	2.5	90 / 47	4.48	3339	
		2.5	264 / 63	4.52	3369	
OCP	24	4.08	90 / 47	3.24	2415	
		4.19	264 / 63	3.08	2296	
Peak Load (2.5 ms low / 200 us Hight)	24	2.5~7.5	90 / 47	3.64	2713	
		2.5~7.5	264 / 63	3.76	2802	
Peak Load (5 ms low / 2.5 ms Hight)	24	2.5~7.5	90 / 47	4.56	3399	
		2.5~7.5	264 / 63	4.34	3235	

18. Flux Density of Transformer

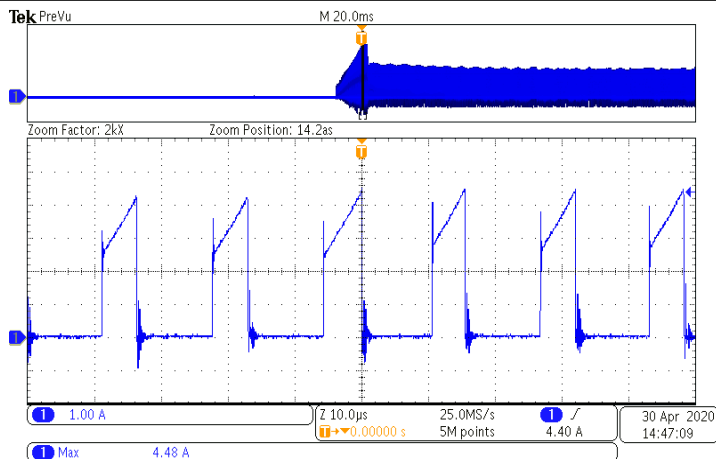
24 V / 2.5 A _90 V_{AC} / 47 Hz_Normal



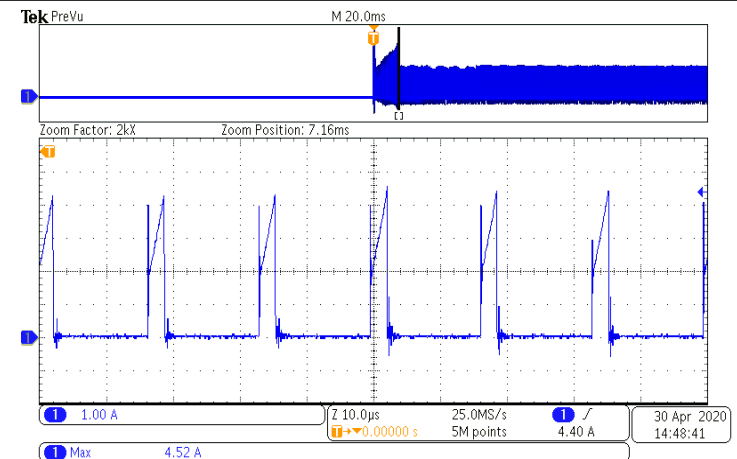
24 V / 2.5A _264 V_{AC} / 63 Hz_Normal



24 V / 2.5 A _90 V_{AC} / 47 Hz_Turn on

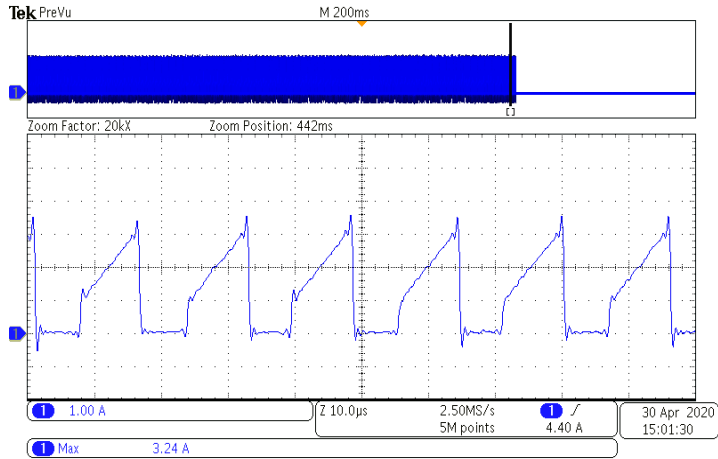


24 V / 2.5 A _264 V_{AC} / 63 Hz_Turn on

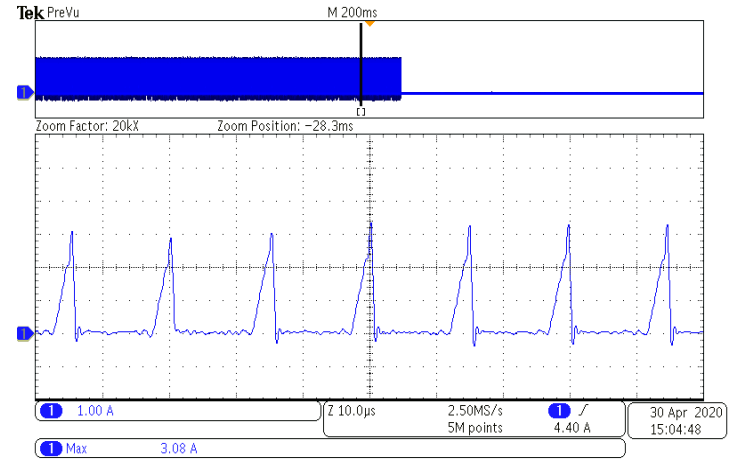


18. Flux Density of Transformer

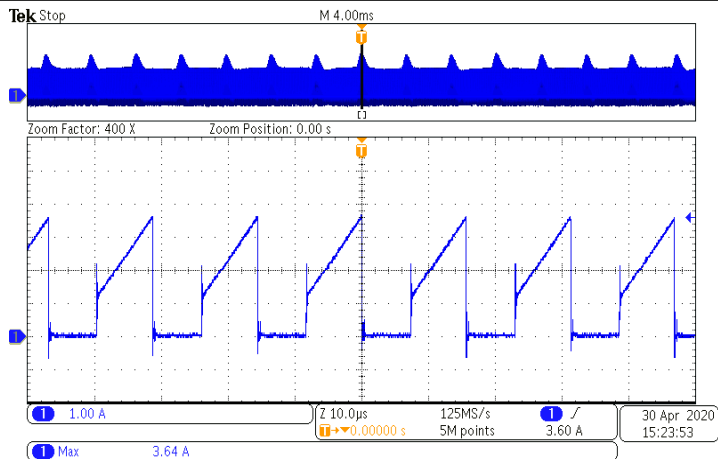
24 V / 4.08 A _90 V_{AC} / 47 Hz_OCP



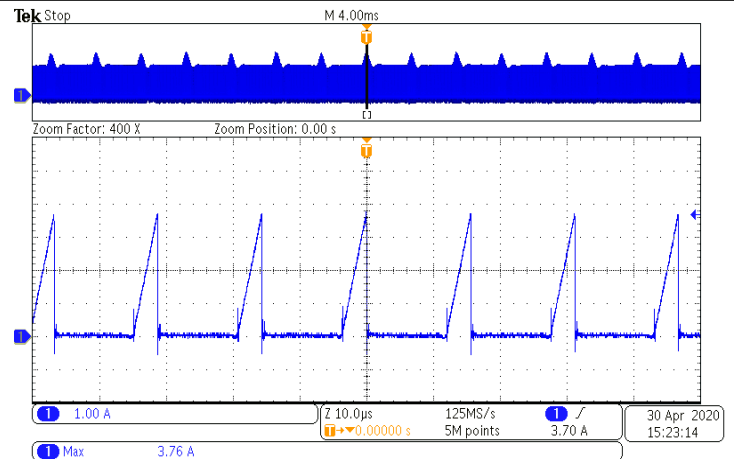
24 V / 4.19A _264 V_{AC} / 63 Hz_OCP



90V_{AC} / 47 Hz_Peak load_ (2.5 ms low / 200 us Hight)

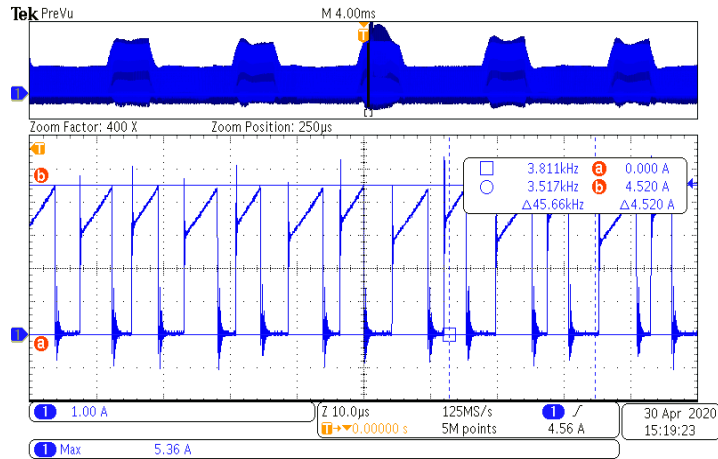


264 V_{AC} / 63 Hz _Peak load_ (2.5 ms low / 200 us Hight)

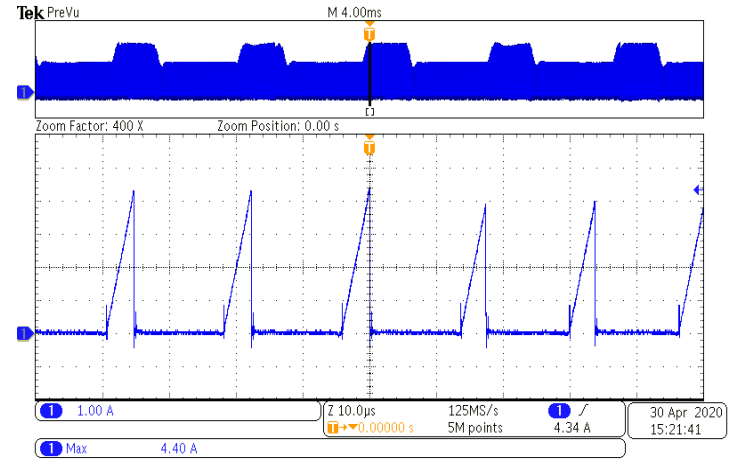


18. Flux Density of Transformer (Cont.)

90V_{AC} / 47 Hz_Peak load_(5 ms low / 2.5 ms Hight)



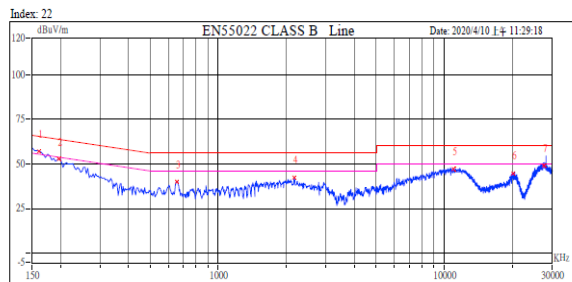
264 V_{AC} / 63 Hz_Peak load_(5 ms low / 2.5 ms Hight)



Conduction:

220 V_{AC} / 50 Hz / Line

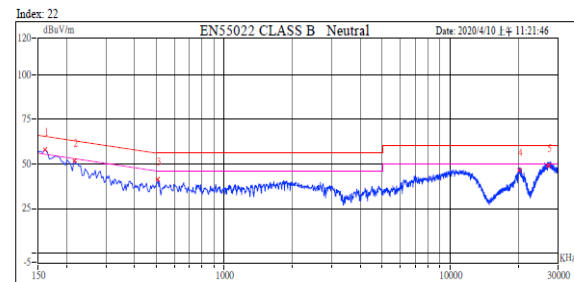
Leadtrend Technology Corp.
通嘉科技股份有限公司 Site C
 Customer Name: Leadtrend
 Project No.: 24V/2.5A
 Model Name: LD5762P
 Test Mode: 220VL
 Engineer Name: jason



	Freq(KHz)	Peak Amptd(dBuV)	QP Amptd(dBuV)	Avg Amptd(dBuV)	QP Limit(dBuV)	Avg Limit(dBuV)	Margin(dB)	Factor(dB)
1	161.1222	57.13	48.22	33.99	65.68	55.68	-17.47	10.38
2	198.1964	52.73	41.29	26.53	64.62	54.62	-23.33	10.36
3	657.9158	40.13	36.46	32.71	56.00	46.00	-13.29	10.41
4	2176.3527	42.32	35.89	27.63	56.00	46.00	-18.37	10.52
5	11018.0361	47.36	41.44	33.38	60.00	50.00	-16.62	11.33
6	20268.5371	44.79	37.34	29.47	60.00	50.00	-20.53	12.30
7	27675.3507	49.17	43.42	36.92	60.00	50.00	-13.08	13.13

220 V_{AC} / 50 Hz / Neutral

Leadtrend Technology Corp.
通嘉科技股份有限公司 Site C
 Customer Name: Leadtrend
 Project No.: 24V/2.5A
 Model Name: LD5762P
 Test Mode: 220VN
 Engineer Name: jason



	Freq(KHz)	Peak Amptd(dBuV)	QP Amptd(dBuV)	Avg Amptd(dBuV)	QP Limit(dBuV)	Avg Limit(dBuV)	Margin(dB)	Factor(dB)
1	161.1222	58.07	49.28	32.67	65.68	55.68	-16.40	10.41
2	216.7335	51.83	40.12	28.77	64.09	54.09	-23.97	10.39
3	509.6192	41.30	29.39	22.10	56.00	46.00	-23.90	10.39
4	20268.5371	46.85	39.47	31.92	60.00	50.00	-18.08	12.65
5	27178.3567	49.02	43.40	36.96	60.00	50.00	-13.04	13.60

ACDC中大功率 最佳完整解决方案公司



THANK YOU

