



DB 75 W for TV/MNT LD961A

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Date : 2019/12/18

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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	60	50	63 / 50	—
Output Voltage (V)	18				—
Output Current (A)	4.2				—
Efficiency					--
Standby Power (mW)	< 75				Pass
Output Voltage Accuracy (%)	< ± 5 (17.1 ~ 18.9 V)				Pass
Over Current Protection (%)	< 150				Pass
Ripple & Noise Voltage (mV)	< 180				Pass
Dynamic Load (%)	< ± 5 % of V _{OUT} (10 ↔ 90 % Load)				Pass
Turn-on Delay Time (S)	< 1				Pass
Hold-up Time (mS)	> 10 @ Typical AC Input				Pass
Rise Time (mS)	< 20				Pass
Overshoot (%)	< 10				Pass
EMI	EN55032 Class B				Pass

2. Outline

Top View

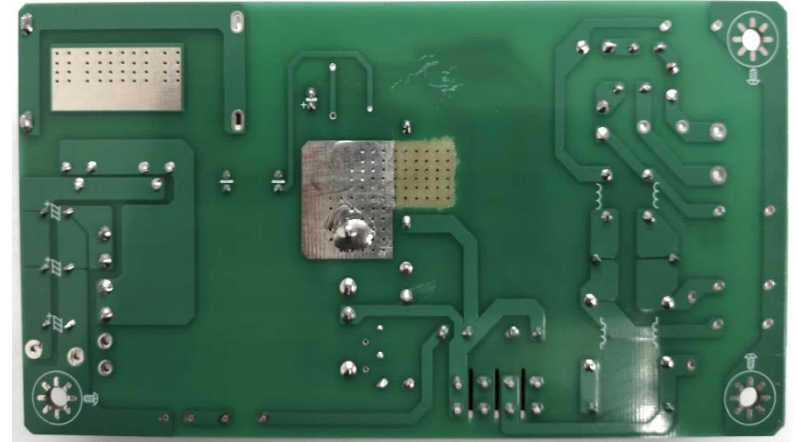


80 mm

150 mm

24.4 mm

Bottom View

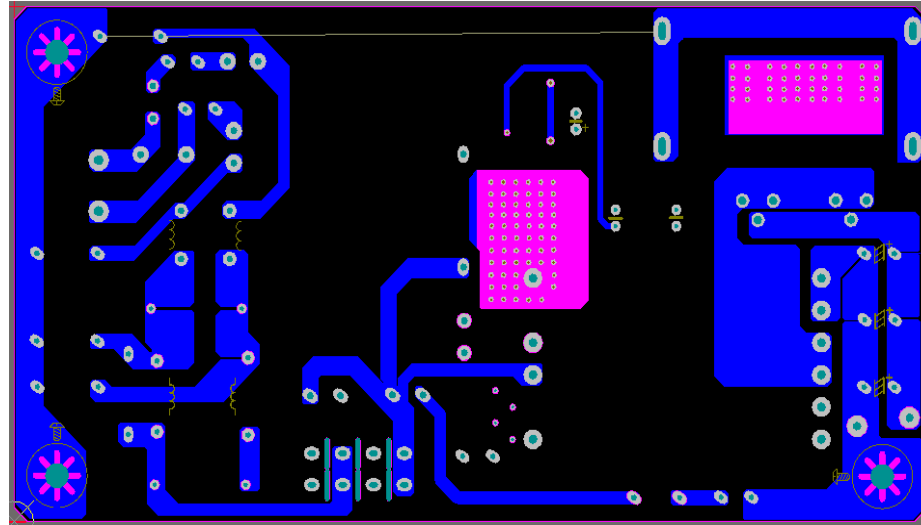


Side View

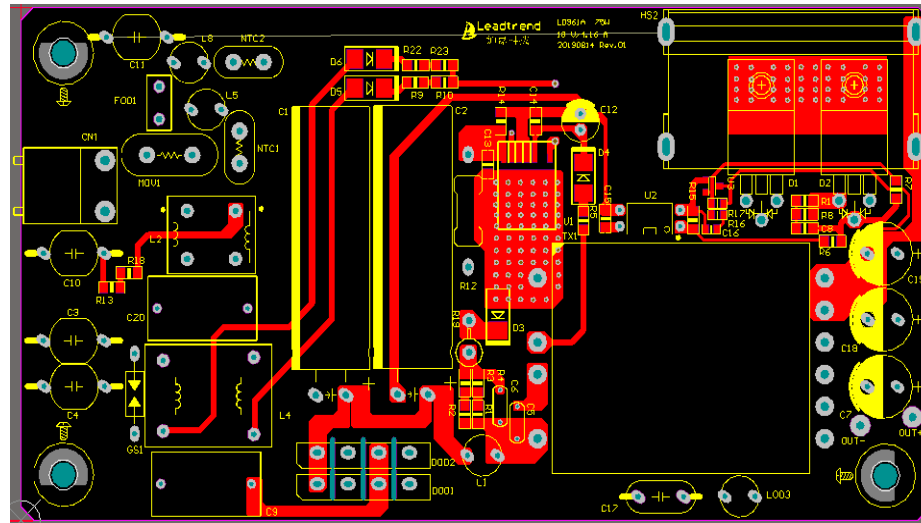


4. PCB Layout

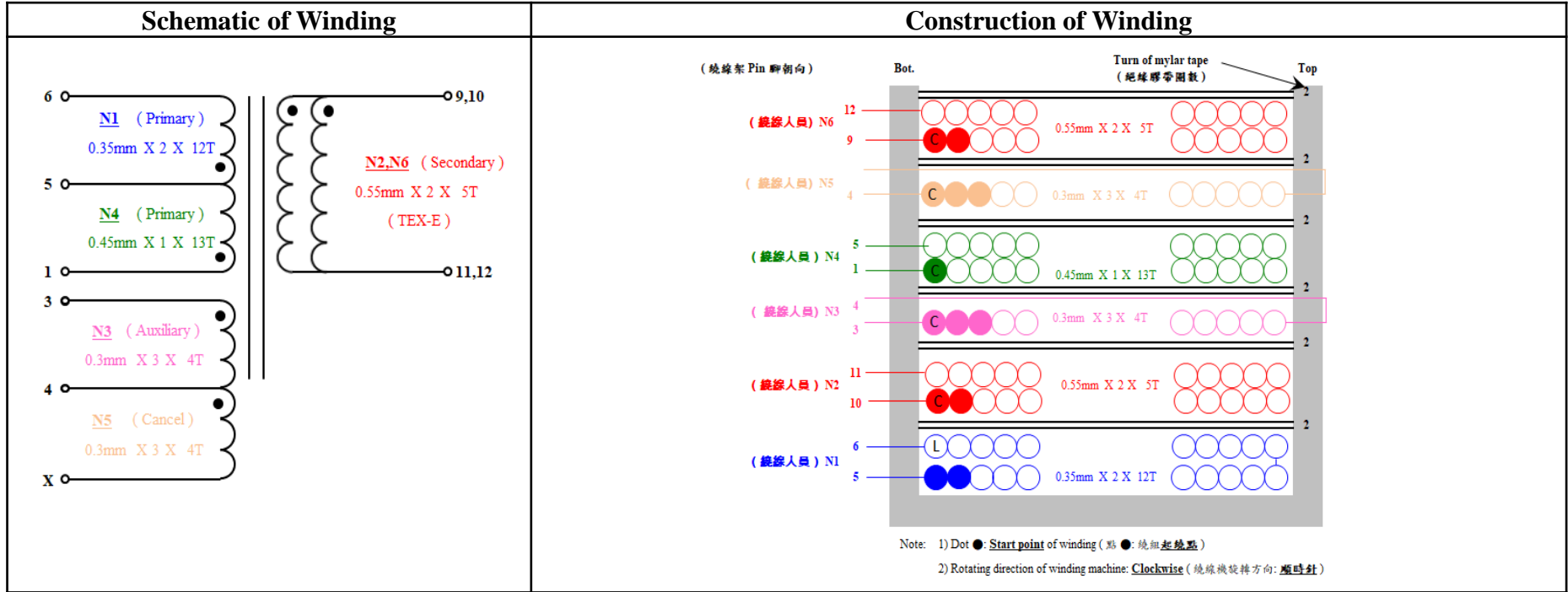
Top Side



Bottom Side

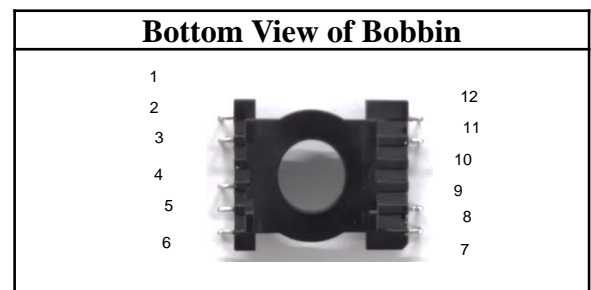


6. Transformer Design



Winding No.	Pin No.		Winding Types	Number of Turns		Remarks	
	Start	Finish		Winding	Tape		
N1	5	6	0.35mm X 2	12	2	Np1	Pin 朝人員
N2	10	11	0.55mm X 2	5	2	Ns1	Pin 朝人員
N3	3	4	0.3mm X 3	4	2	Na	Pin 朝人員
N4	1	5	0.45mm X1	13	2	Np2	Pin 朝人員
N5	4	X	0.3mm X 3	4	2	Cancel	Pin 朝人員
N6	9	12	0.55mm X 2	5	2	Ns2	Pin 朝人員

Bobbin Shape	Core Material	A _e (mm ²)	L _p (μH)
	KP44A	150	370 ± 7 % @ 100 kHz / 1 V



7. Efficiency

Input Voltage	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz
Output Current	Full Load	
Measured Point of Output Voltage	End of Cable (20AWG / 20 cm)	
Duration of Burn-in	30 Minutes (with Case)	
Requirement	CoC Tier 2	

V_{IN,AC} (V / Hz)	V_{OUT} (V)	I_{OUT} (A)	P_{OUT} (W)	P_{IN} (W)	η (%)	Requirement (%)
115 / 60	17.87	4.2	75.05	86.18	87.08	> 86
230 / 50	17.828	4.2	74.877	83.88	89.26	> 86

8. No Load Power Consumption

Input Voltage	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz
Output Current	0 A	
Requirement	< 75 mW (CoC Tier 2)	

V_{IN,AC} (V / Hz)	P_{IN} (mW)	Requirement (mW)
115 / 60	42	< 75
230 / 50	66	

9. Line / Load Regulation

Input Voltage	90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current	No Load & Full Load			
Measured Point of Output Voltage	End of Cable (20AWG / 20 cm)			
Requirement	< ± 5 %			

V_{IN,AC} (V / Hz)	V_{OUT} (V)		Requirement (V)
	0 A	4.2 A	
90 / 47	17.96	17.88	17.1 ~ 18.9
115 / 60	17.95	17.87	
230 / 50	17.95	17.84	
264 / 63	17.95	17.80	

10. 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	CC Point	< 150 % of Full Load			
V _{IN,AC} (V / Hz)		I _{OUT,CC} (A)		Requirement CC Point (A)	
90 / 47		5.1		< 6.3	
115 / 60		5.6			
230 / 50		5.1			
264 / 63		5			

11. Ripple & Noise Voltage

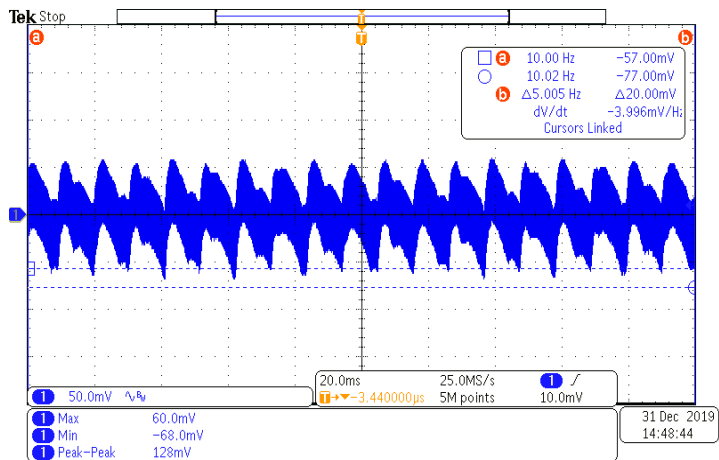
Input Voltage	90 V _{AC} / 60 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 50 Hz
Output Current	No Load & Full Load			
Measured Point of Output Voltage	End of Cable			
Bandwidth	20 MHz (with 10 μF E-cap & 0.1 μF MLCC)			
Requirement	< 180 mV			

V_{IN,AC} (V / Hz)	V_{OUT,PK-PK} (mV)		Requirement (mV)
	0 A	4.2A	
90 / 60	40	128	< 180
115 / 60	40	96	
230 / 50	44	90	
264 / 50	46	84	

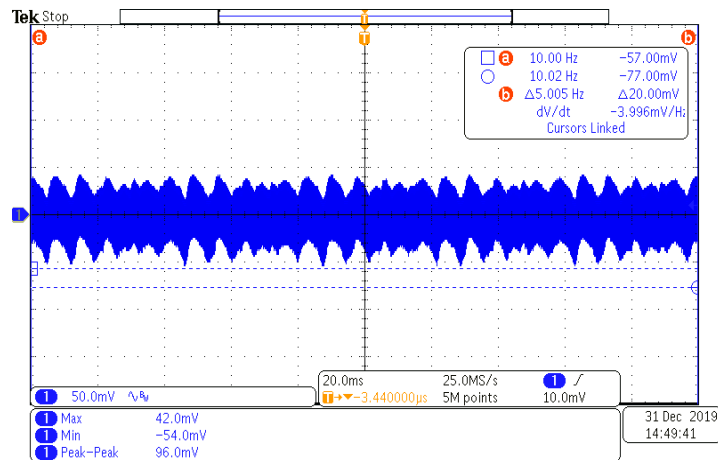
11. Ripple & Noise Voltage (Cont.)

18 V / 4.2 A

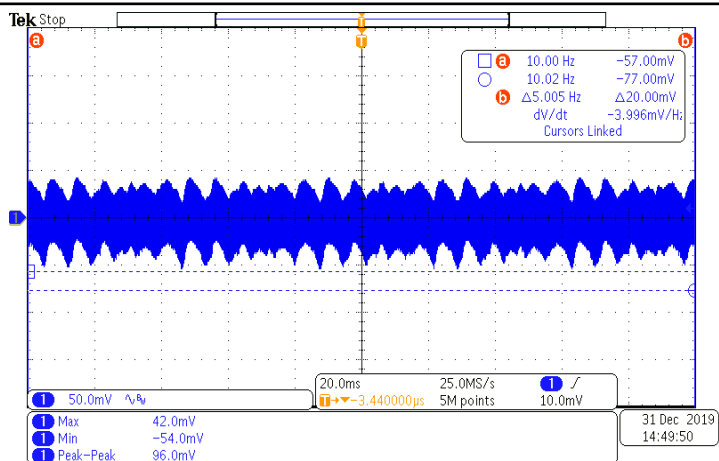
90 V_{AC} / 60 Hz



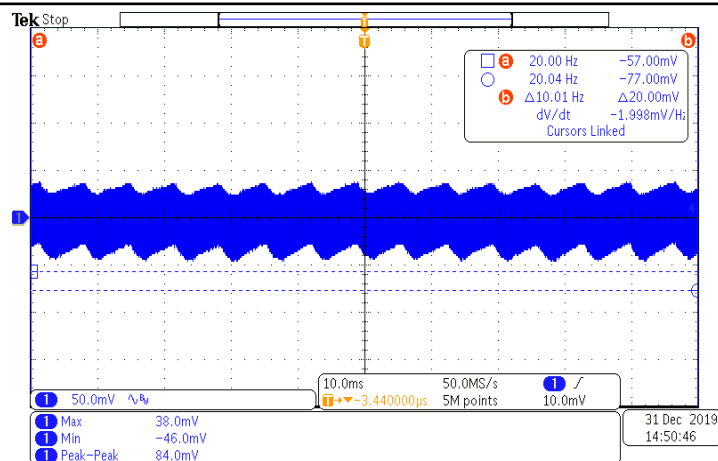
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



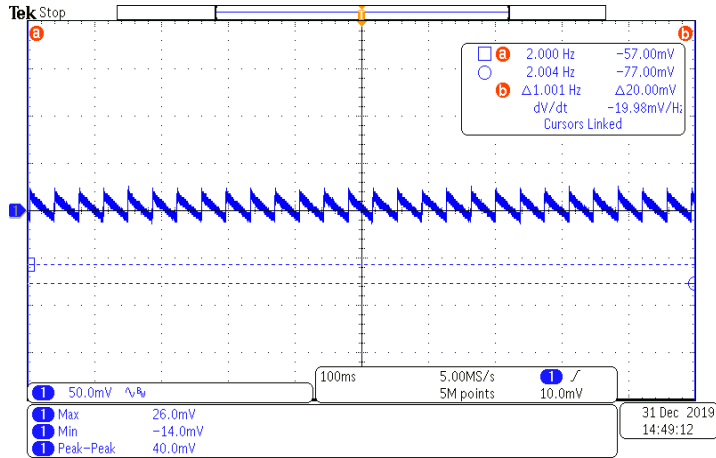
264 V_{AC} / 50 Hz



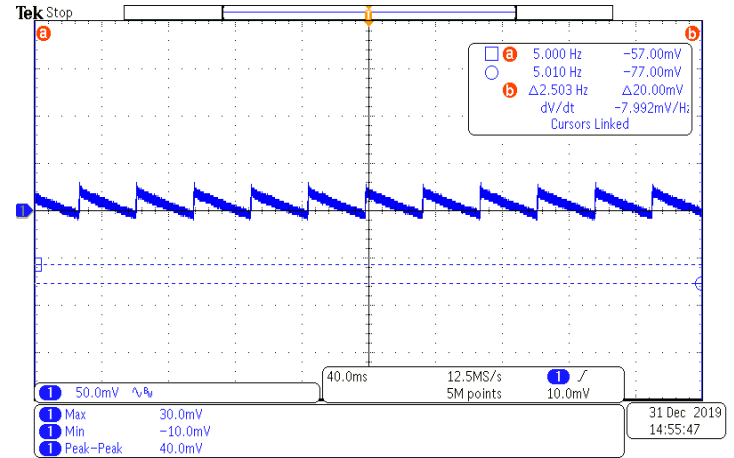
11. Ripple & Noise Voltage (Cont.)

18 V / 4.2 A

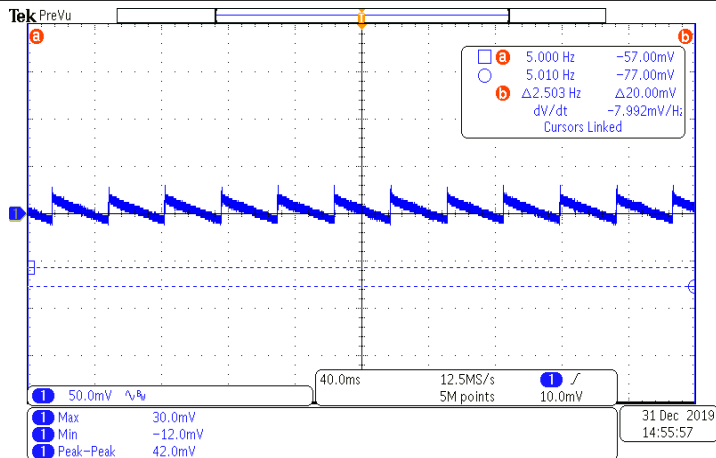
90 V_{AC} / 60 Hz



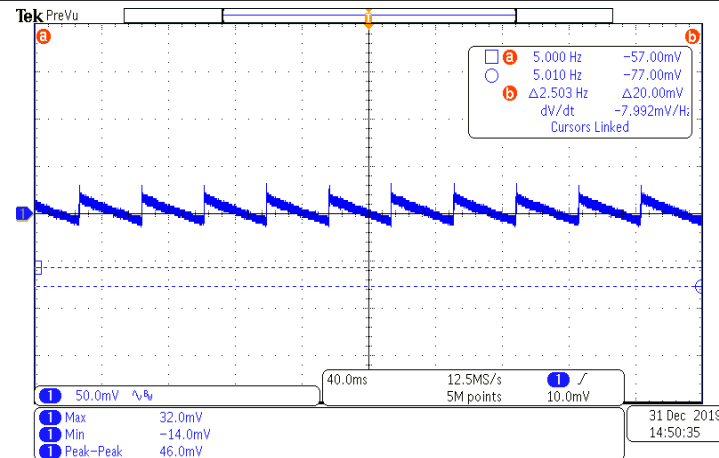
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



264 V_{AC} / 50 Hz



12. Dynamic Load

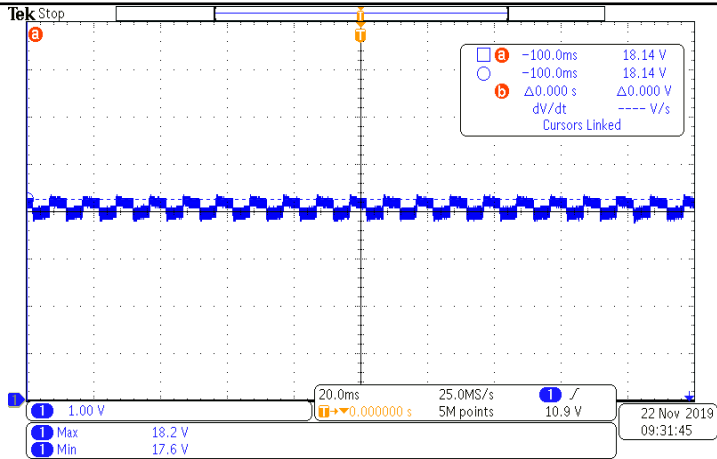
Input Voltage	90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current	10 ↔ 90 % of Full Load (0.42 ↔ 3.78 A)			
Frequency of Load	100 Hz (5 mS High / 5 mS Low)			
Slew Rate of Load	2.5 A / μS			
Measured Point of Output Voltage	End of Cable (20AWG / 20 cm)			
	< ± 5 % of V _{OUT} (10 ↔ 90 % Load)			

Load (%)	V _{IN,AC} (V / Hz)	V _{OUT} (V)		Requirement (V)
		Min.	Max.	
10 ↔ 90	90 / 47	17.6	18.2	17.1 ~ 18.9
	115 / 60	17.7	18.2	
	230 / 50	17.6	18.2	
	264 / 63	17.6	18.2	

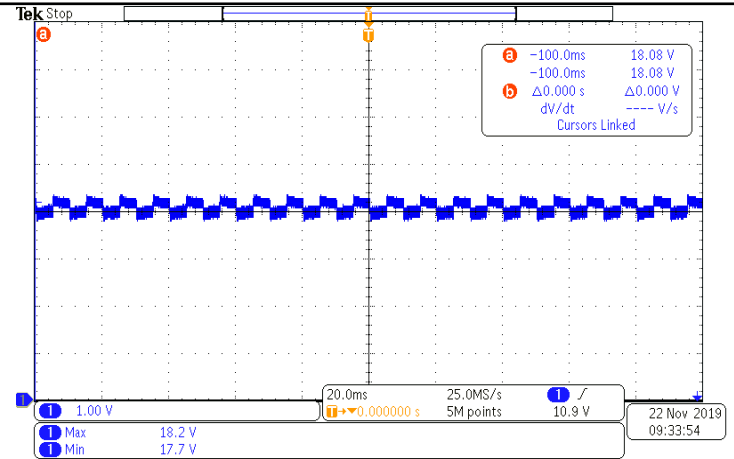
12. Dynamic Load (Cont.)

Load: 10 ↔ 90 %

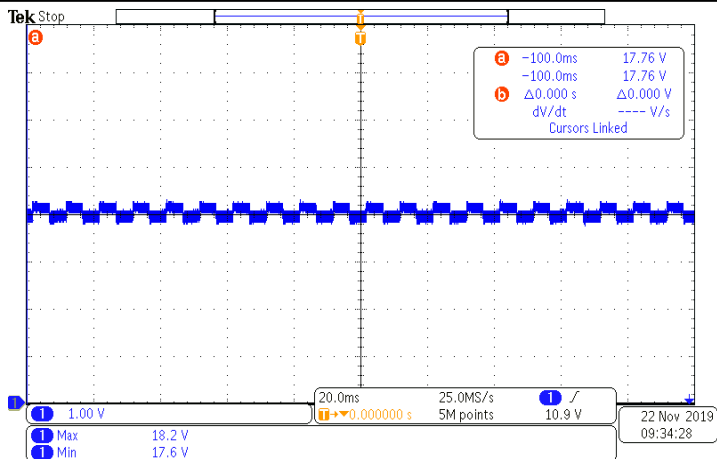
90 V_{AC} / 47 Hz



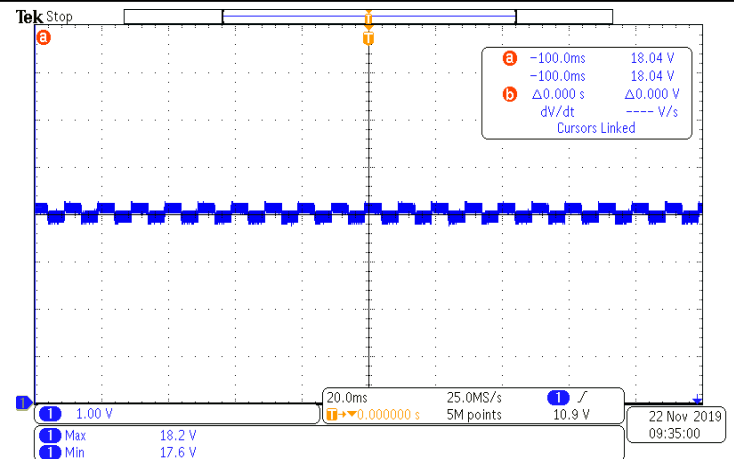
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



264 V_{AC} / 63 Hz



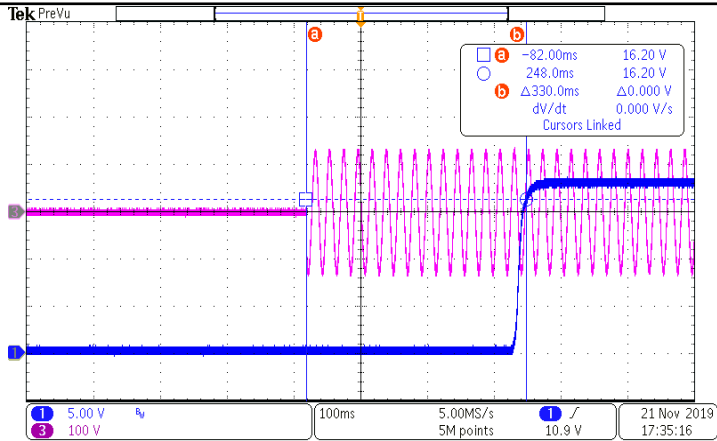
13. Turn-on Delay Time

Input Voltage	90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current	Full Load			
Measured Point of Output Voltage	End of Cable			
Requirement	< 1 S			

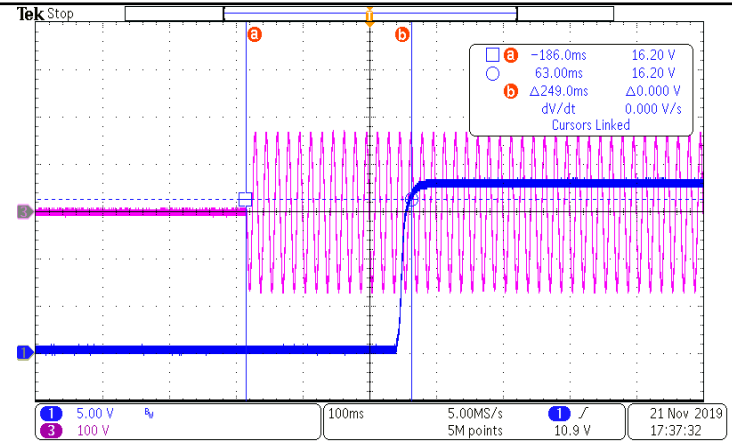
V_{IN,AC} (V / Hz)	T_{ON} (S)	Requirement (S)
90 / 47	0.33	< 1
115 / 60	0.249	
230 / 50	0.134	
264 / 63	0.122	

13. Turn-on Delay Time (Cont.)

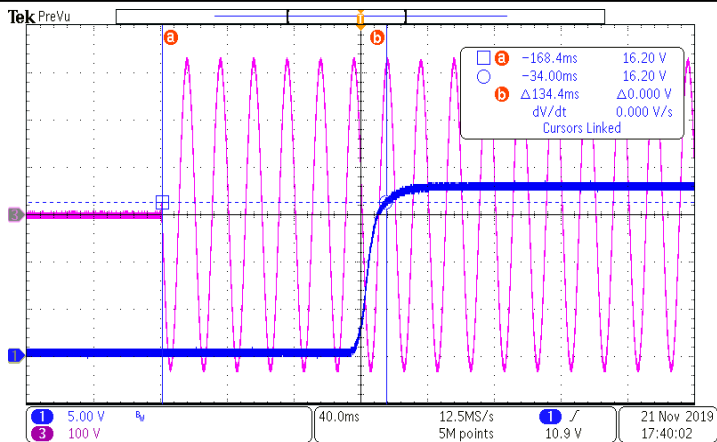
90 V_{AC} / 47 Hz



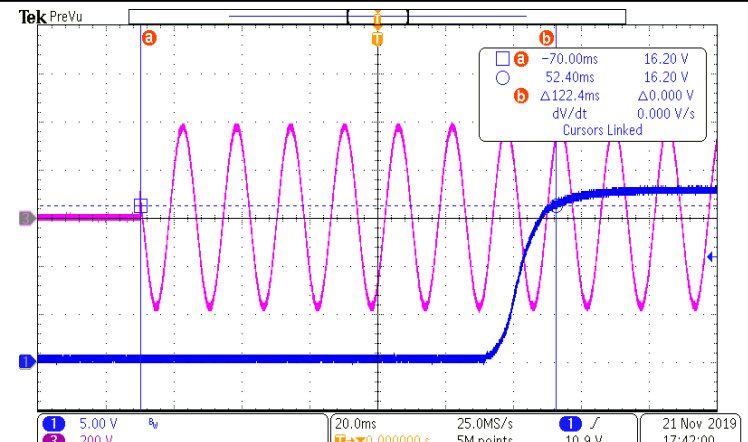
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



264 V_{AC} / 63 Hz



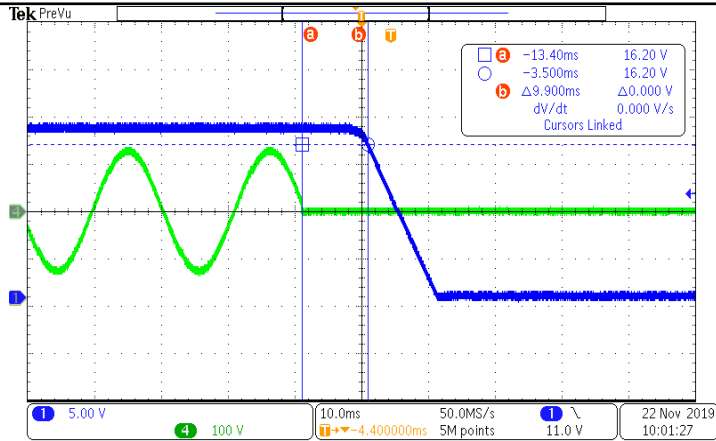
14. Hold-up Time

Input Voltage	90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current	Full Load			
Measured Point of Output Voltage	End of Cable			
Angle of AC Off	0°			
Requirement	> 10 mS @ Typical AC Input			

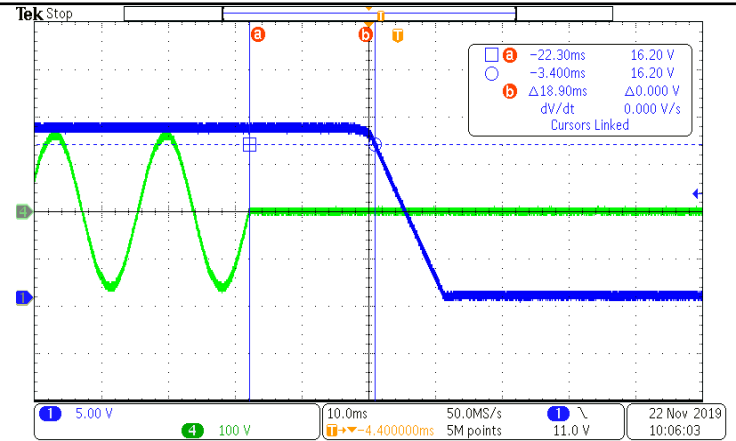
V_{IN,AC} (V / Hz)	T_{HOLD-UP} (mS)	Requirement (mS)
90 / 47	9.9	—
115 / 60	18.9	> 10
230 / 50	91.6	> 10
264 / 63	124	—

14. Hold-up Time (Cont.)

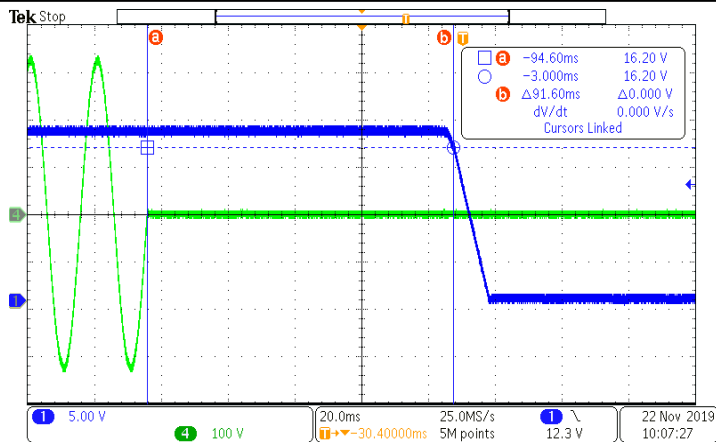
90 V_{AC} / 47 Hz



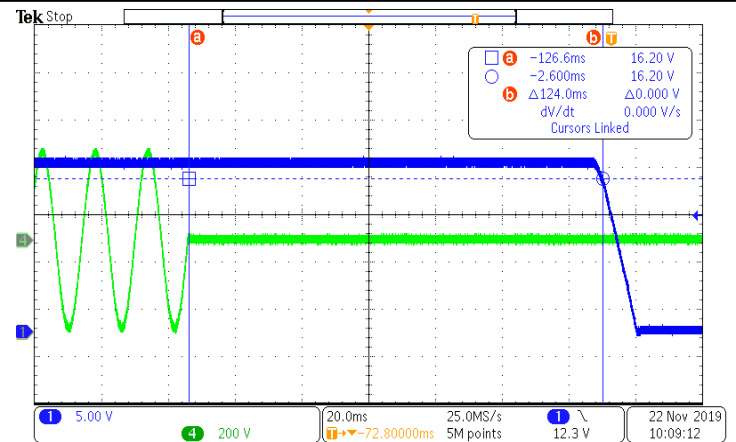
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



264 V_{AC} / 63 Hz



15. Rise Time & Overshoot

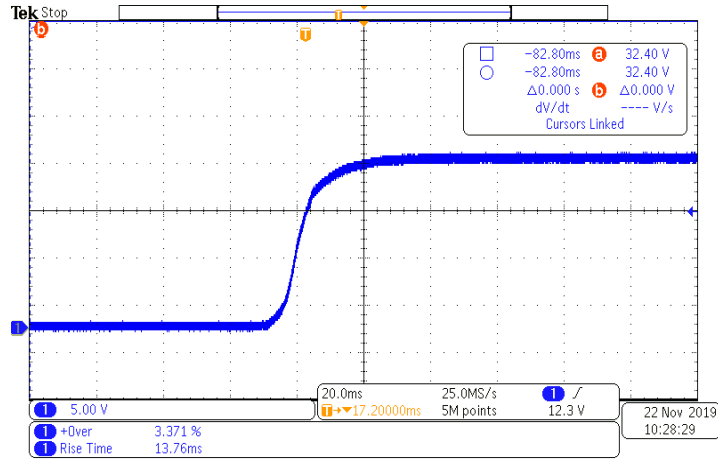
Input Voltage		90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current		Full Load			
Measured Point of Output Voltage		End of Cable			
Requirement	Rise Time	< 20 mS			
	Overshoot	< 10 %			

V_{IN,AC} (V / Hz)	T_{RISE} (mS)	Requirement (mS)
90 / 47	13.76	< 20
115 / 60	13.57	
230 / 50	13.18	
264 / 63	12.74	

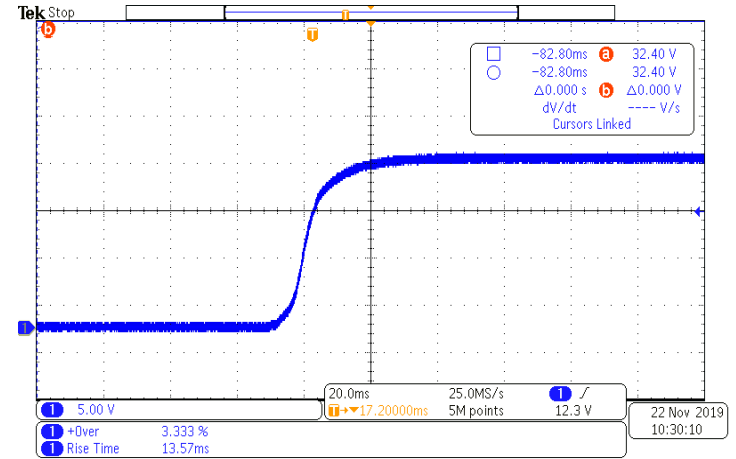
V_{IN,AC} (V / Hz)	Overshoot (%)	Requirement (%)
90 / 47	3.37	< 10
115 / 60	3.33	
230 / 50	4.54	
264 / 63	3.40	

15. Rise Time & Overshoot (Cont.)

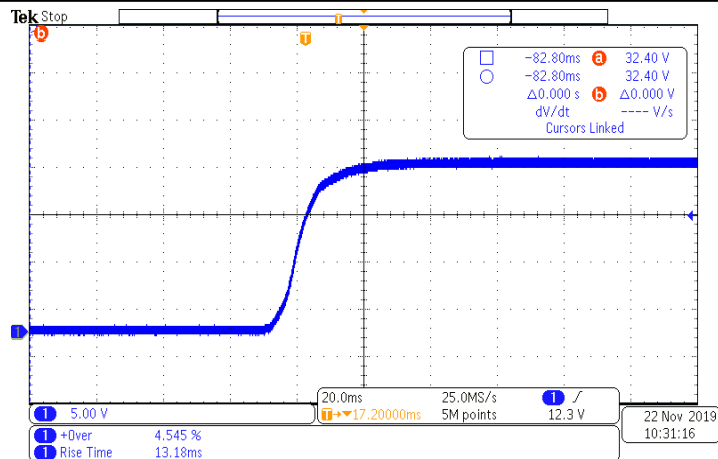
90 V_{AC} / 47 Hz



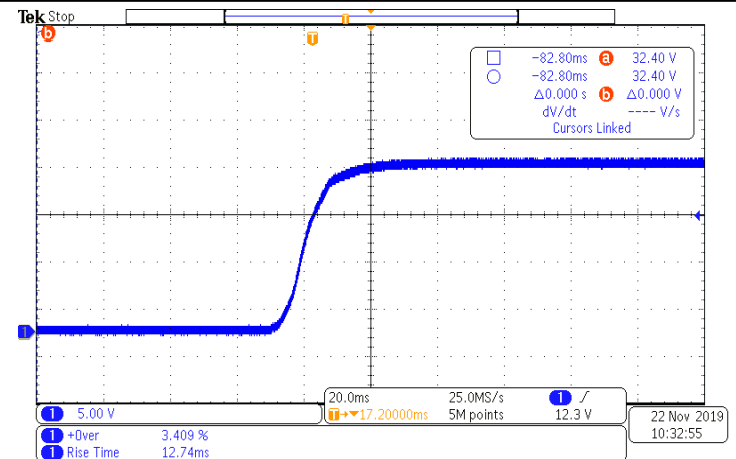
115 V_{AC} / 60 Hz



230 V_{AC} / 50 Hz



264 V_{AC} / 63 Hz



16. Supply Voltage of IC (LD961A)

Input Voltage	90 V _{AC} / 47 Hz	115 V _{AC} / 60 Hz	230 V _{AC} / 50 Hz	264 V _{AC} / 63 Hz
Output Current	No Load & Full Load			
Requirement	> V _{CC_OFF} & < V _{CC_OVP}			

V _{IN,AC} (V / Hz)	V _{CC,U1} (V)					Requirement (V)
	0 A		4.2A		4.2 A Turn-on Drop	
	Min.	Max.	Min.	Max.	Min.	
90 / 47	11.8	14.0	14.5	15.1	12.49	8 ~ 27.8
115 / 60	11.8	13.9	14.4	15	12.49	
230 / 50	11.8	14	14.2	15	12.49	
264 / 63	11.7	14.1	14.2	14.9	12.49	

17. Stress on Switching Parts

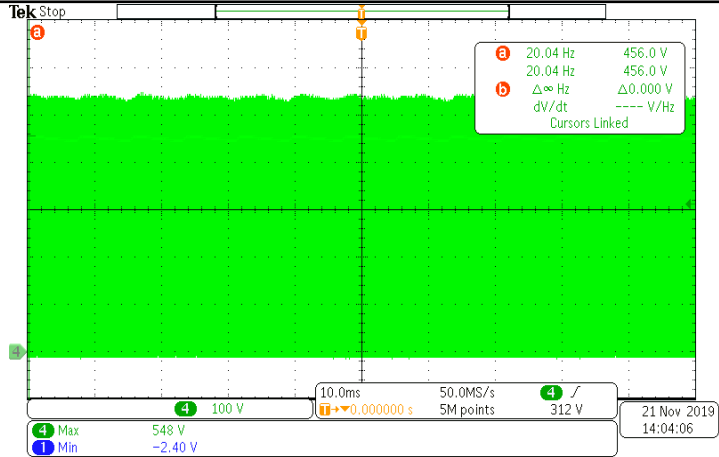
Input Voltage	264 V _{AC} / 63 Hz
Output Current	Full Load
Requirement	Normal < 90 % De-rating, Turn-on & Short < 95 % De-rating

Location	Part No.	Condition	V _{DS} (V)	Requirement (V)
U1	LD961A	Normal	548	< 585 (650 * 0.9)
		Turn-on	546	
		Short Circuit	550	

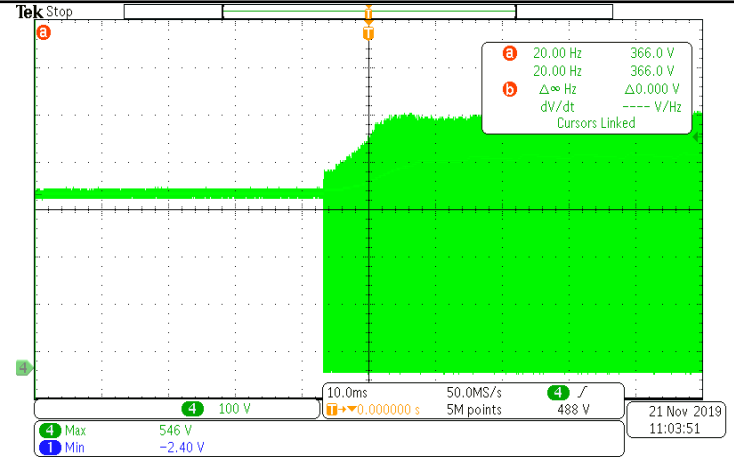
Location	Part No.	Condition	V _{RRM} (V)	Requirement (V)
D1,D2	20V100CTF	Normal	94.4	< 135 (150 * 0.9)
		Turn-on	93.6	
		Short Circuit	93.6	

17. Stress on Switching Parts (Cont.)

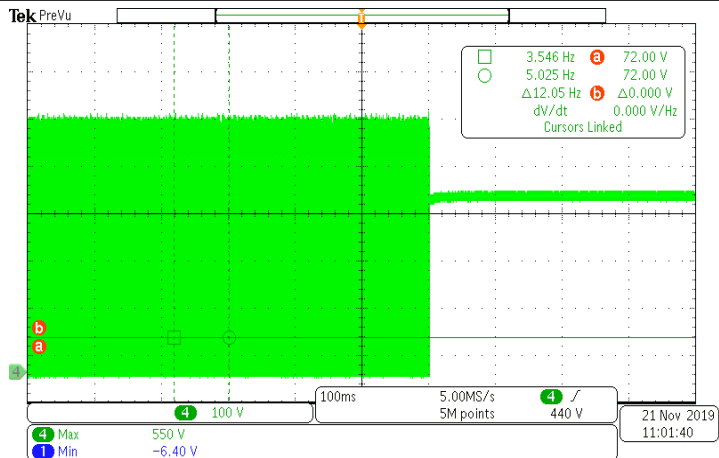
U1_Normal



U1_Turn-on

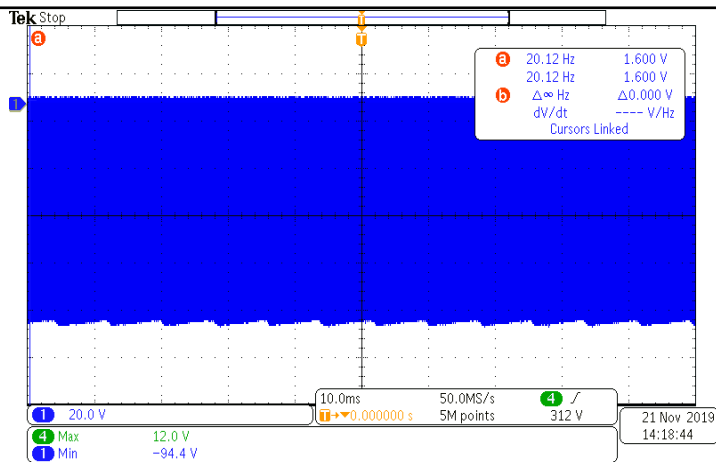


U1_Short Circuit

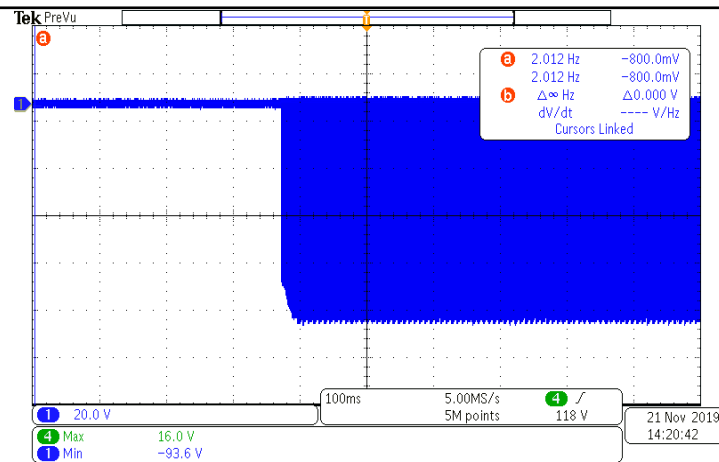


17. Stress on Switching Parts (Cont.)

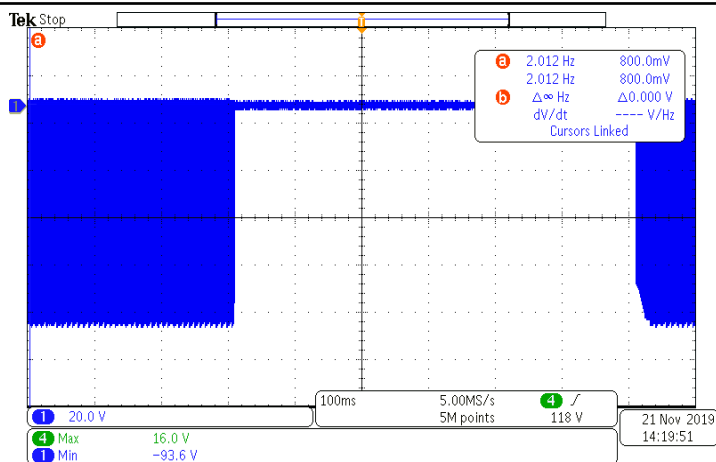
D1,D2_Normal



D1,D2_Turn-on



D1,D2_Short Circuit



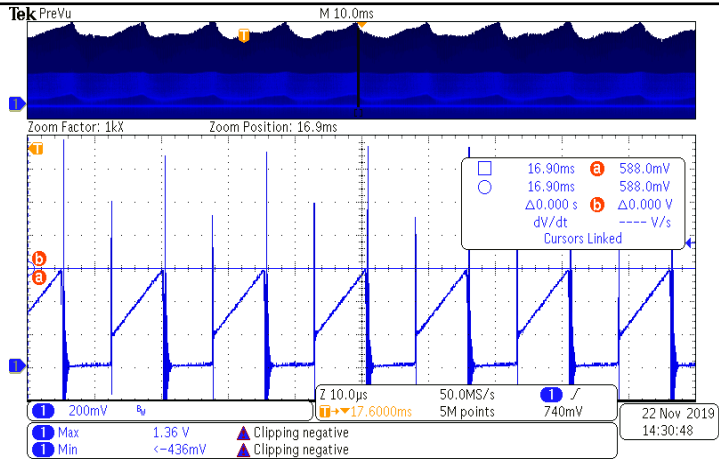
18. Flux Density of Transformer

Input Voltage	90 V _{AC} / 47 Hz	264 V _{AC} / 63 Hz
Output Current	Full Load & Maximum Power & Turn-on & Short Circuit	
Requirement	< 4,200	

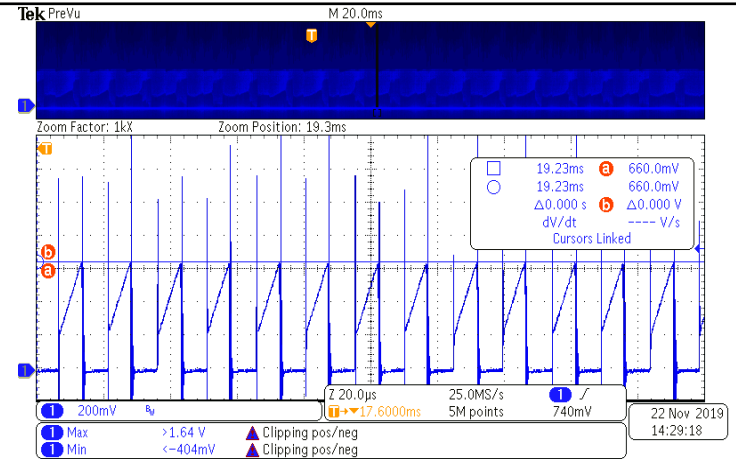
V_{IN,AC} (V / Hz)	I_{OUT} (A)	V_{CS,MAX} (V)	I_{PR1,MAX} (A)	B_{MAX} (G)	Requirement (G)
90 / 47	4.2	0.588	3.266	2874	< 4,200
	OCP	0.660	3.666	3226	
	4.2 A Turn-on	0.660	3.666	3226	
	Short Circuit	0.660	3.666	3226	
264 / 63	4.2	0.584	3.244	2855	
	OCP	0.600	3.333	2933	
	4.2A Turn-on	0.596	3.311	2913	
	Short Circuit	0.608	3.377	2972	

18. Flux Density of Transformer (Cont.)

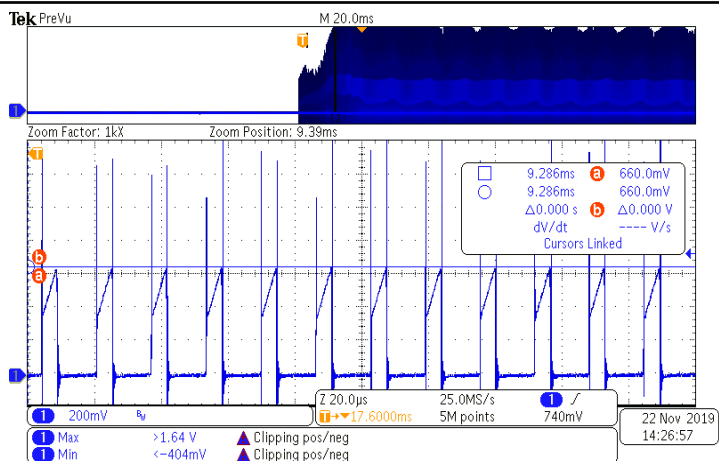
90 V_{AC} / 47 Hz_4.2 A



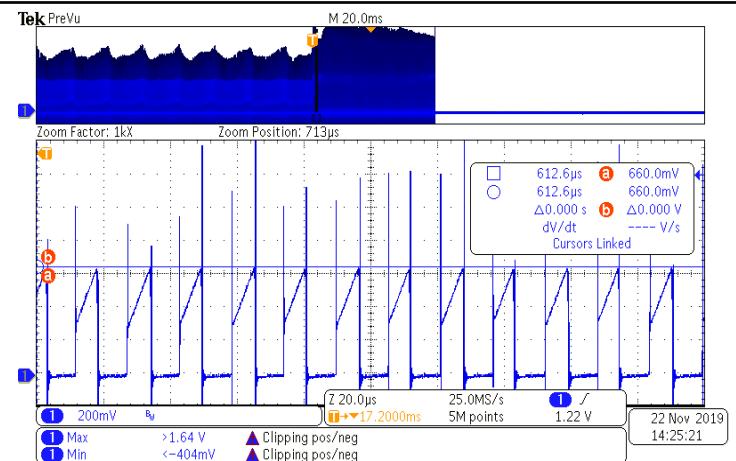
90 V_{AC} / 47 Hz_OCP



90 V_{AC} / 47 Hz_4.2 A Turn-on

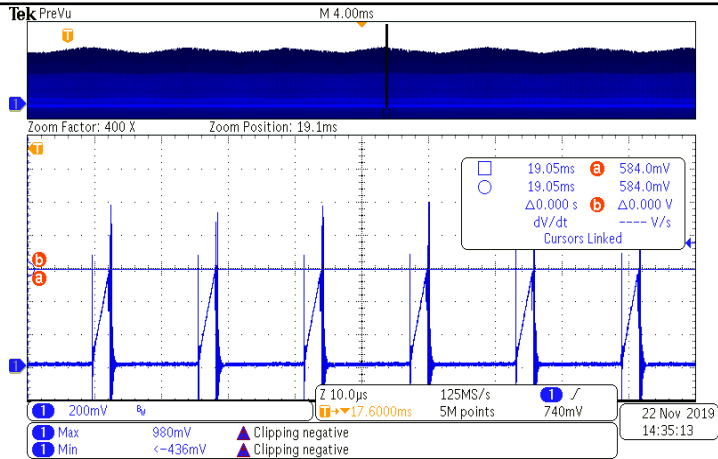


90 V_{AC} / 47 Hz_Short Circuit

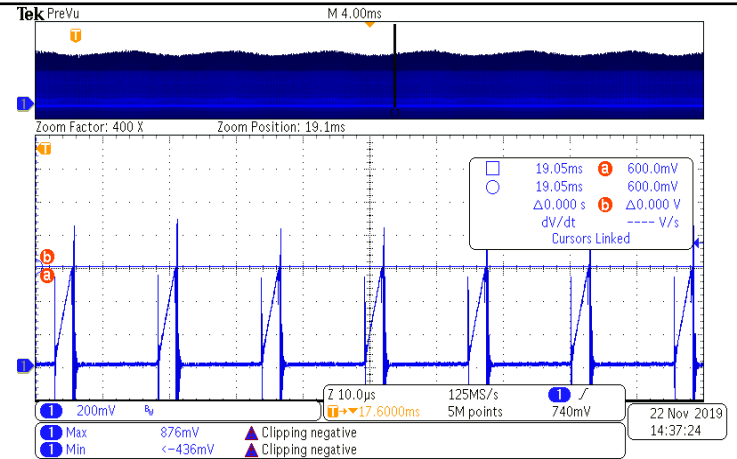


18. Flux Density of Transformer (Cont.)

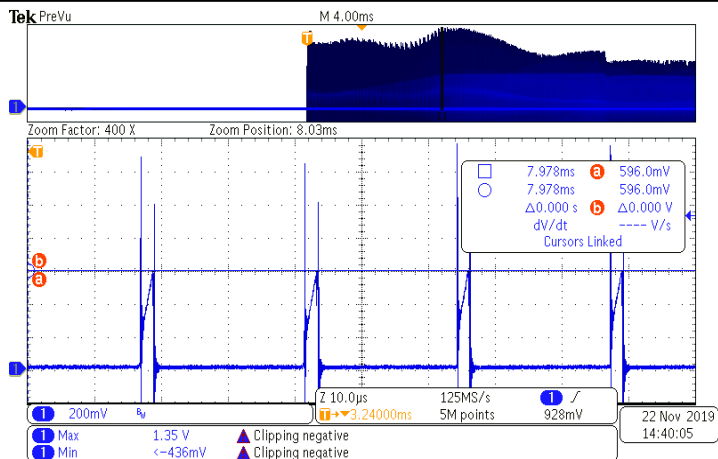
264 V_{AC} / 63 Hz_4.2 A



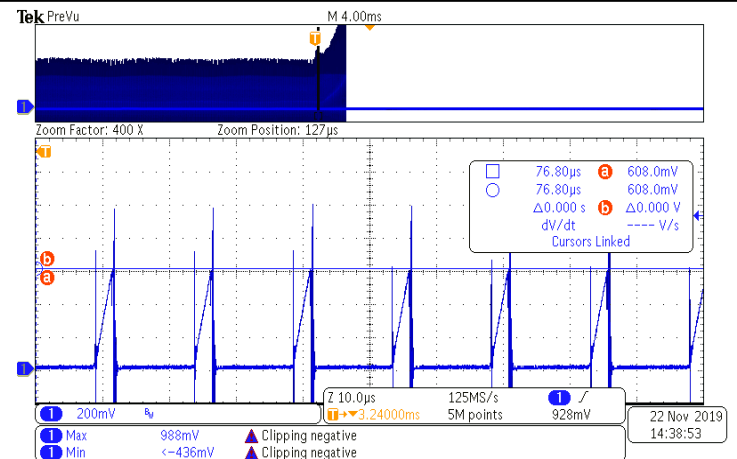
264 V_{AC} / 63 Hz_OCP



264 V_{AC} / 63 Hz_4.3 A Turn-on



264 V_{AC} / 63 Hz_Short Circuit



20. Thermal

No.	Location	198Vac/47Hz	230Vac/50Hz	264Vac/63Hz	90Vac/47
		18V / 4.2A / 75.6W			18V / 3.5A / 63W
1	L4	49.0	45.6	43.1	70.1
2	L2	44.3	43.0	41.7	51.9
3	NTC1	81.2	76.6	72.4	102.5
4	D002	51.6	49.4	48.0	65.2
5	D001	50.7	48.0	47.0	62.6
6	C1	43.1	42.2	41.3	49.6
7	C2	44.7	44.2	43.7	51.5
8	U1	69.2	73.4	77.4	78.4
9	D1	79.4	81.4	80.8	74.5
10	D2	79.2	80.3	80.6	73.3
11	T1-C	67.9	69.4	70.0	63.0
12	T1-W	69.6	70.6	72.0	65.5
13	C19	52.6	52.9	53.3	49.7
14	C18	49.3	49.6	49.9	47.0
15	AMB	28.4	28.4	28.8	28.9

The Best Company for AC-DC Mid & High Power Application Total Solution



THANK YOU

