



**Wise**  
integration

# **65W USB-C PD Active- Clamp Flyback Converter using WI62175**

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# 1 CIRCUIT DESCRIPTION

This design document describes a 65-W USB-C PD evaluation module which converts a universal input voltage of 90-VRMS to 264-VRMS down to 5 V, 9 V, 12V, 15 V and 20 V. This featured power supply is an active-clamp flyback topology utilizing Texas Instrument's UCC28782 controller, and WiseGaN Half Bridge WI62175. This design note provides complete circuit schematic, PCB, BOM and transformer information of the evaluation board. It also provides efficiency and thermal data of the evaluation board.

Active-clamp flyback topology effectively recycles the leakage energy. Another feature of this topology is the ZVS operation of the power transistors. Because of no leakage losses and ZVS operation, this topology is suited for high frequency operation which results in size reduction of the transformer. A ZVS fixed switching frequency power converter also simplifies EMI design and can be easily designed to avoid interference with other sensitive circuits in the system.

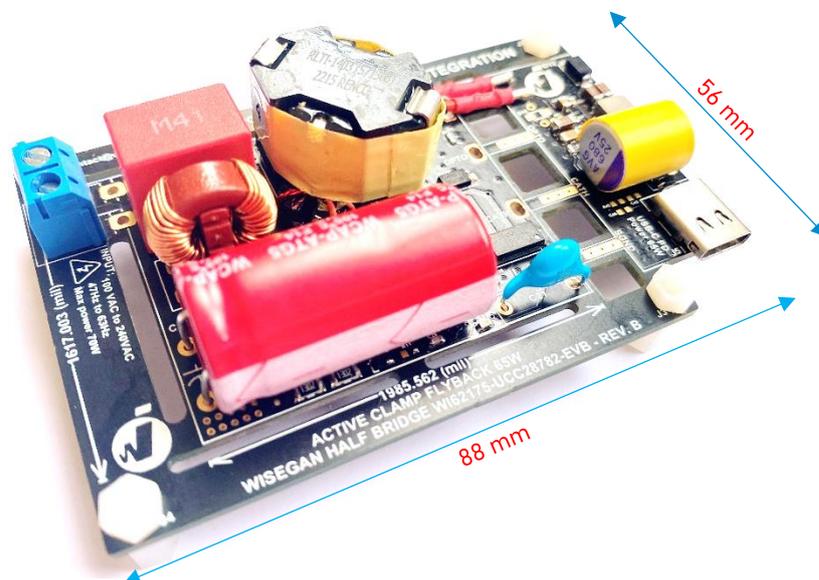


Figure 1. WI62175-UCC28782-EVB top view

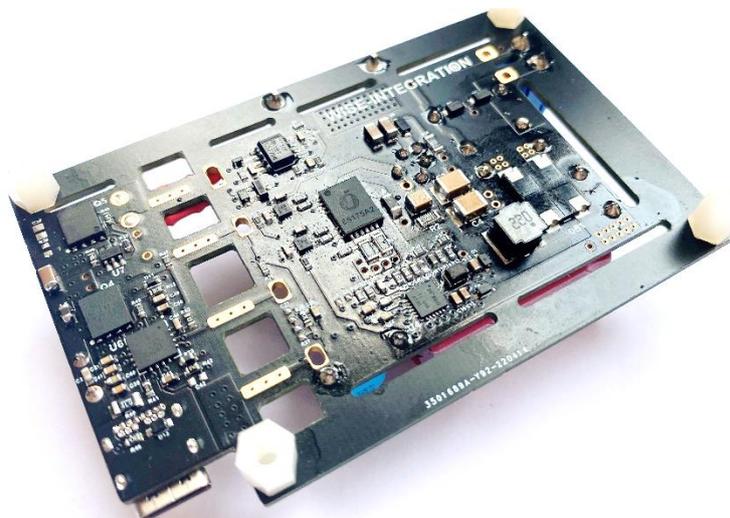


Figure 2. WI62175-UCC28782-EVB bottom view

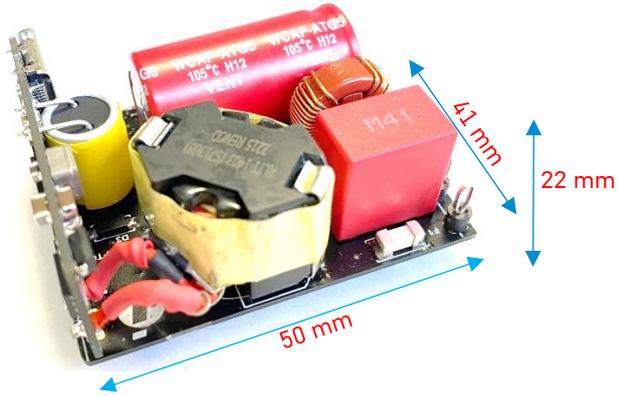


Figure 3. WI62175-UCC28782-EVB compact setup

## 2 ELECTRICAL PERFORMANCE SPECIFICATIONS

Table 2.1. WI62175-UCC28782-EVB Electrical Performance Specifications <sup>(1)</sup>

PARAMETER		TEST CONDITIONS	MIN	NOM	MAX	UNIT
<b>INPUT CHARACTERISTICS</b>						
V <sub>IN</sub>	Input line voltage (RMS)		90	115/230	265	V
f <sub>LINE</sub>	Input line frequency		47	50/60	63	Hz
<b>OUTPUT CHARACTERISTICS</b>						
V <sub>OUT</sub>	Output voltage (USB-C PD) V <sub>IN</sub> = 90 to 264 V <sub>RMS</sub>	I <sub>OUT</sub> = 0 to 3.25 A	19.950		V	
			15.060			
			12.040			
			9.050			
			5.050			
I <sub>OUT</sub>	Full load rated output current V <sub>IN</sub> = 90 to 264 V <sub>RMS</sub>	V <sub>OUT</sub> = 5.0, 9.0, 12.0, 15.0, 20.0 V	3.25		A	
V <sub>OUT_PP</sub>	Output ripple voltage V <sub>IN</sub> = 115/230 V <sub>RMS</sub>	V <sub>OUT</sub> = 20.0 V, I <sub>OUT</sub> = 0 to 3.25 A	150		mVpp	
		V <sub>OUT</sub> = 15.0 V, I <sub>OUT</sub> = 0 to 3.25 A	150			
		V <sub>OUT</sub> = 12.0 V, I <sub>OUT</sub> = 0 to 3.25 A	150			
		V <sub>OUT</sub> = 9.0 V, I <sub>OUT</sub> = 0 to 3.25 A	150			
		V <sub>OUT</sub> = 5.0 V, I <sub>OUT</sub> = 0 to 3.25 A	150			
<b>SYSTEMS CHARACTERISTICS</b>						
H <sub>100%</sub>	Full-load efficiency (V <sub>IN</sub> = 115/230 V <sub>RMS</sub> )	V <sub>OUT</sub> = 20 V, I <sub>OUT</sub> = 3.25A	93.9 / 93.3		%	
		V <sub>OUT</sub> = 15 V, I <sub>OUT</sub> = 3.25A	93.9 / 93.5			
		V <sub>OUT</sub> = 12 V, I <sub>OUT</sub> = 3.25A	93.5 / 93.5			
		V <sub>OUT</sub> = 9 V, I <sub>OUT</sub> = 3.25A	93.0 / 93.0			
		V <sub>OUT</sub> = 5 V, I <sub>OUT</sub> = 3.25A	88.3 / 89.7			
H <sub>10%</sub>	10% Load efficiency (V <sub>IN</sub> = 115/230 V <sub>RMS</sub> )	V <sub>OUT</sub> = 20 V, I <sub>OUT</sub> = 0.325A	79.1 / 81.1		%	
		V <sub>OUT</sub> = 15 V, I <sub>OUT</sub> = 0.325A	78.6 / 82.6			
		V <sub>OUT</sub> = 12 V, I <sub>OUT</sub> = 0.325A	77.8 / 82.8			
		V <sub>OUT</sub> = 9 V, I <sub>OUT</sub> = 0.325A	78.5 / 83.0			
		V <sub>OUT</sub> = 5 V, I <sub>OUT</sub> = 0.325A	76.5 / 80.3			
T <sub>AMB</sub>	Ambient operating temperature		26		°C	

(1) The performance listed in this table is achieved using secondary resonance

# 3 SCHEMATIC DIAGRAM

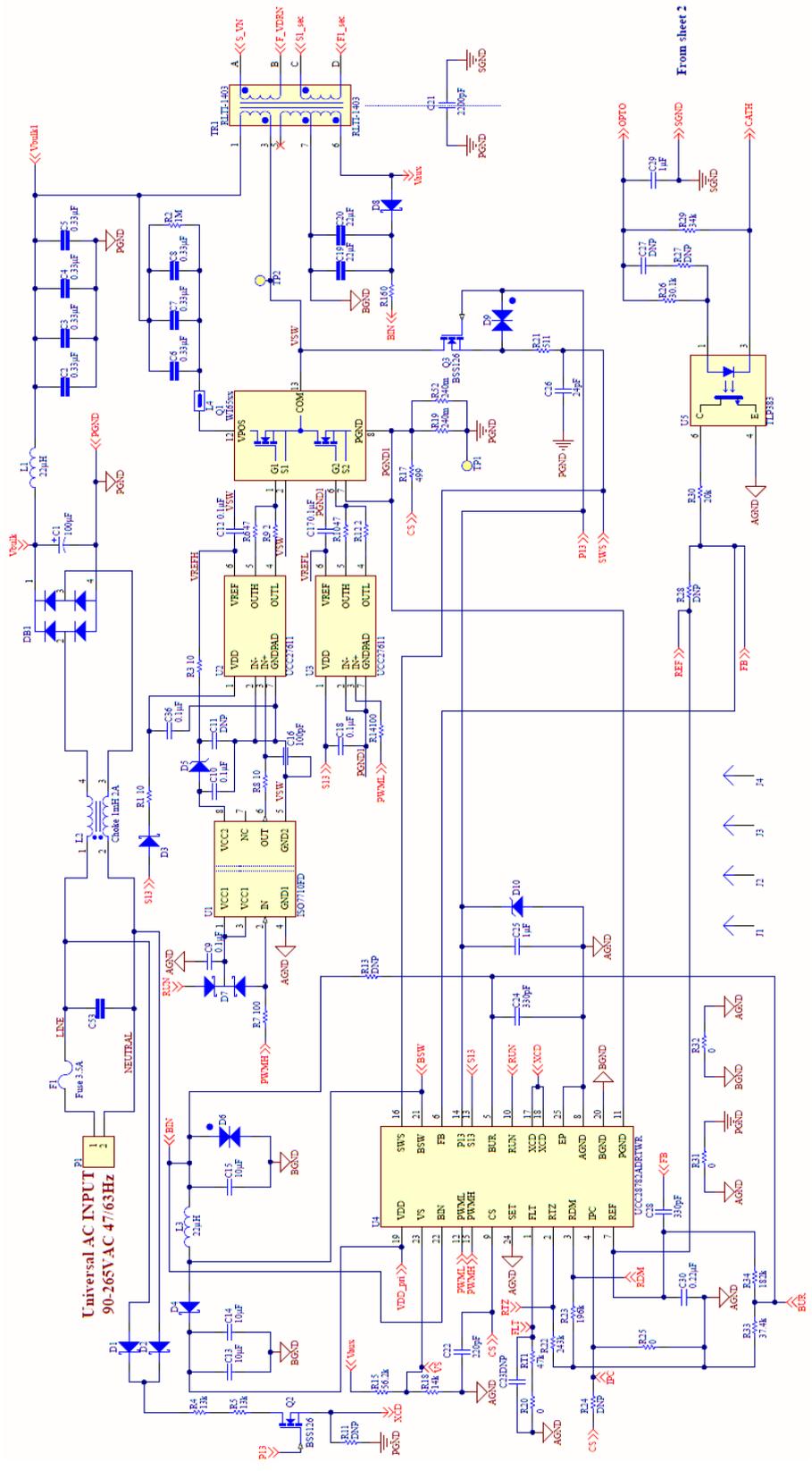


Figure 4. WI62175-UCC28782-EVB Schematic Diagram (1 of 2)

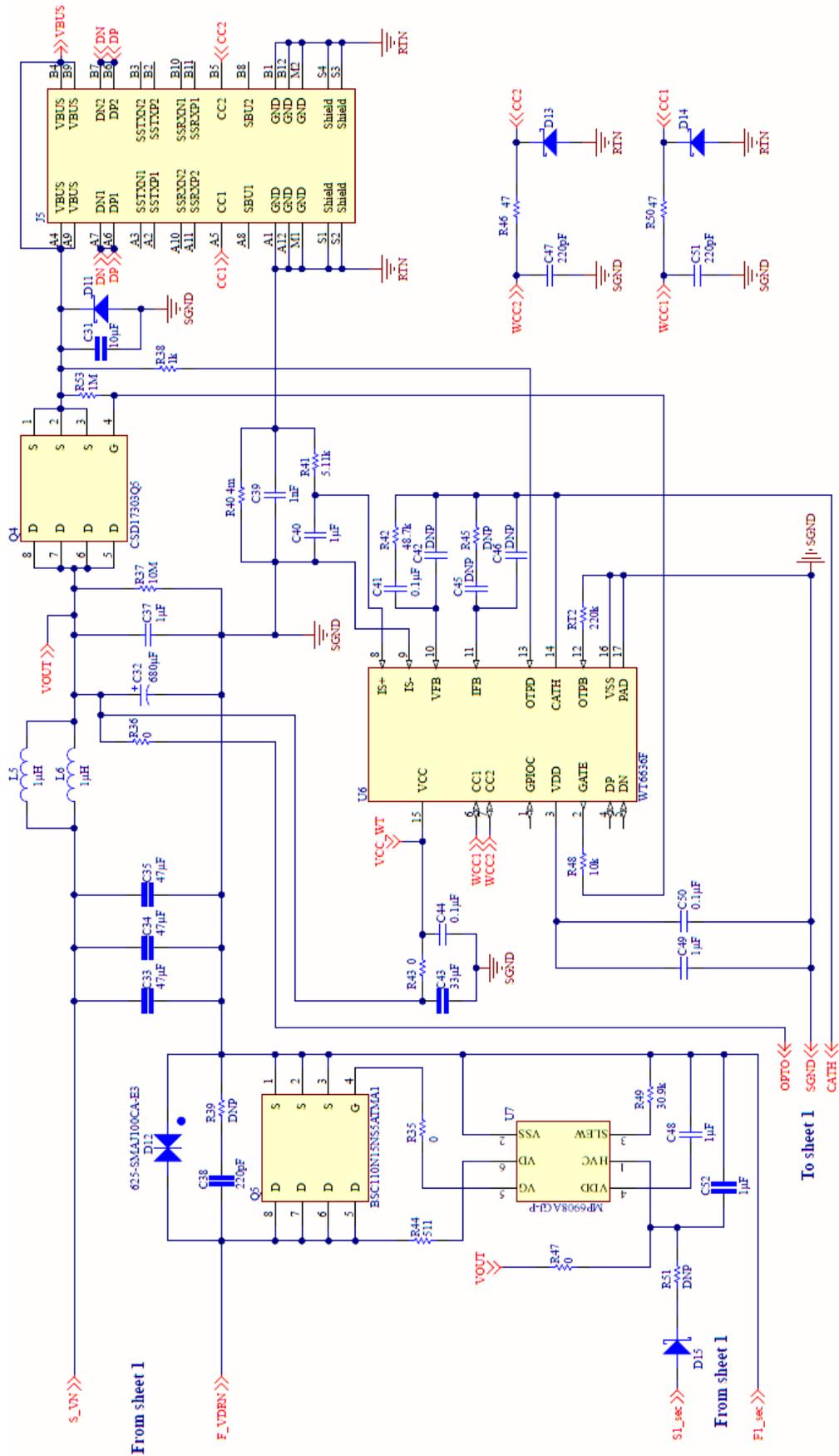


Figure 5. WI62175-UCC28782-EVB Schematic Diagram (2 of 2)

## 4 TEST SETUP

### 4.1 TEST SETUP REQUIREMENTS

**Safety:** This evaluation module is not encapsulated and there are accessible voltages that are greater than 50 V<sub>DC</sub>.

**Isolation Input Transformer:** A suitably rated 1:1 isolation transformer shall be used on the input(s) to this EVM and be constructed in a manner in which the primary winding(s) is separated from the secondary winding(s) by reinforced insulation, double insulation, or a screen connected to the protective conductor terminal.

**Voltage Source:** Isolated AC source or variable AC transformer capable of 265 V<sub>RMS</sub> and capable of handling 100 W power level. **Warning: Do not apply DC voltage to this board when making test, or damage may happen.** If DC voltage source has to be used, the XCD pins need to be grounded by adding R11 = 0  $\Omega$  and removing Q2.

**Voltmeter:** Digital voltage meter

**Power Analyzer:** Capable of measuring 1 mW to 100 W of input power and capable of handling 265-V<sub>RMS</sub> input voltage.

**Oscilloscope:**

- 4-Channel, 500 MHz bandwidth.
- Probes capable of handling 600 V.

**Output Load:** Resistive or electronic load capable of handling 100 W at 20 V.

**Recommended Wire Gauge:** Insulated 22 AWG to 18 AWG.



**WARNING**

**Caution: Do not leave EVM powered when unattended.**

**Do not apply DC voltage source to this board or damage may happen!! (See above setup of Voltage Source)**

## 4.2 TEST SETUP DIAGRAM

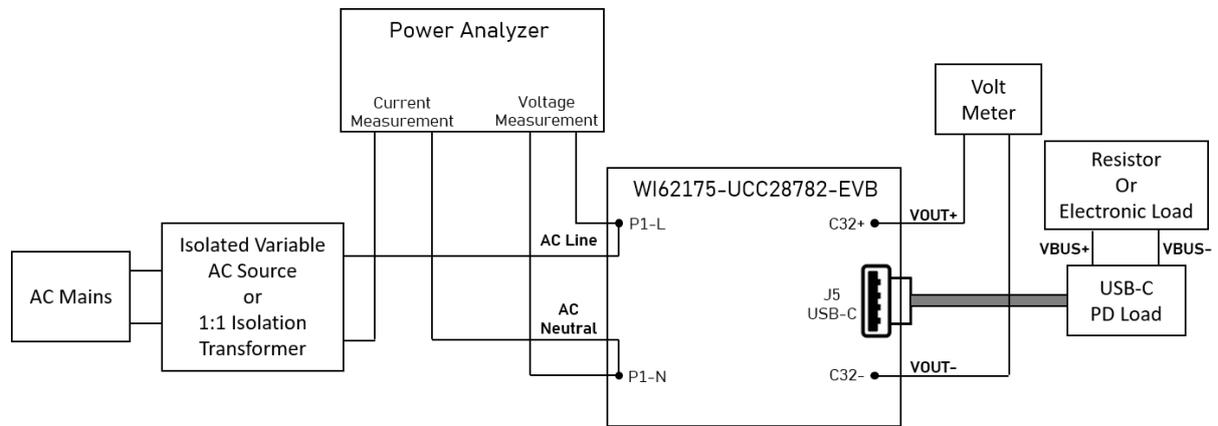


Figure 6. WI62175-UCC28782-EVB Test Setup Diagram

## 5 PERFORMANCE DATA AND CHARACTERISTIC CURVES

### 5.1 EFFICIENCY RESULT AT 20-V<sub>OUT</sub>

Table 5.1. Efficiency Test Data at 20-V<sub>OUT</sub>

V <sub>IN</sub> (RMS)	P <sub>IN</sub> (W)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	P <sub>OUT</sub> (%)	EFFICIENCY	Average Switching Frequency @ Full Load
90	7.8	19.96	0.325	10	<b>83.17</b>	150 kHz
90	35.3	20.00	1.626	50	<b>92.12</b>	
90	71.7	20.07	3.252	100	<b>91.03</b>	
115	8.0	19.97	0.325	10	<b>81.13</b>	160 kHz
115	35.3	20.01	1.626	50	<b>92.17</b>	
115	69.9	20.06	3.252	100	<b>93.33</b>	
230	8.2	19.96	0.325	10	<b>79.11</b>	220 kHz
230	35.5	20.01	1.626	50	<b>91.65</b>	
230	69.5	20.07	3.252	100	<b>93.91</b>	
265	8.5	19.97	0.325	10	<b>76.36</b>	230 kHz
265	35.7	20.01	1.626	50	<b>91.14</b>	
265	69.5	20.07	3.252	100	<b>93.91</b>	

### 5.2 EFFICIENCY RESULT AT 15-V<sub>OUT</sub>

Table 5.2. Efficiency Test Data at 15-V<sub>OUT</sub>

V <sub>IN</sub> (RMS)	P <sub>IN</sub> (W)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	P <sub>OUT</sub> (%)	EFFICIENCY	Average Switching Frequency @ Full Load
90	5.9	14.99	0.325	10	<b>82.57</b>	155 kHz
90	26.7	15.04	1.626	50	<b>91.59</b>	
90	53.1	15.1	3.252	100	<b>92.48</b>	
115	5.9	14.99	0.325	10	<b>82.57</b>	176 kHz
115	26.6	15.04	1.626	50	<b>91.94</b>	
115	52.5	15.1	3.252	100	<b>93.53</b>	
230	6.2	14.99	0.325	10	<b>78.58</b>	192 kHz
230	26.8	15.04	1.626	50	<b>91.25</b>	
230	52.3	15.1	3.252	100	<b>93.89</b>	
265	6.4	14.99	0.325	10	<b>76.12</b>	190 kHz
265	27	15.04	1.626	50	<b>90.57</b>	
265	52.4	15.1	3.252	100	<b>93.71</b>	

### 5.3 EFFICIENCY RESULT AT 12-V<sub>OUT</sub>

Table 5.3. Efficiency Test Data at 12-V<sub>OUT</sub>

V <sub>IN</sub> (RMS)	P <sub>IN</sub> (W)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	P <sub>OUT</sub> (%)	EFFICIENCY	Average Switching Frequency @ Full Load
90	4.7	11.97	0.325	10	<b>82.77</b>	132 kHz
90	21.4	12.02	1.626	50	<b>91.33</b>	
90	42.4	12.08	3.252	100	<b>92.65</b>	
115	4.7	11.97	0.325	10	<b>82.77</b>	148 kHz
115	21.4	12.02	1.626	50	<b>91.33</b>	
115	42	12.08	3.252	100	<b>93.53</b>	
230	5.0	11.97	0.325	10	<b>77.81</b>	156 kHz
230	21.6	12.02	1.626	50	<b>90.48</b>	
230	42	12.08	3.252	100	<b>93.53</b>	
265	5.1	11.97	0.325	10	<b>76.28</b>	155 kHz
265	21.8	12.02	1.626	50	<b>89.65</b>	
265	42.1	12.08	3.252	100	<b>93.31</b>	

### 5.4 EFFICIENCY RESULT AT 9-V<sub>OUT</sub>

Table 5.4. Efficiency Test Data at 9-V<sub>OUT</sub>

V <sub>IN</sub> (RMS)	P <sub>IN</sub> (W)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	P <sub>OUT</sub> (%)	EFFICIENCY	Average Switching Frequency @ Full Load
90	3.5	8.94	0.325	10	<b>83.01</b>	133 kHz
90	16.4	8.98	1.626	50	<b>89.03</b>	
90	31.8	9.04	3.252	100	<b>92.45</b>	
115	3.5	8.94	0.325	10	<b>83.01</b>	140 kHz
115	16.3	8.98	1.626	50	<b>89.58</b>	
115	31.6	9.04	3.252	100	<b>93.03</b>	
230	3.7	8.94	0.325	10	<b>78.53</b>	132 kHz
230	16.7	8.98	1.626	50	<b>87.43</b>	
230	31.6	9.04	3.252	100	<b>93.03</b>	
265	3.8	8.94	0.325	10	<b>76.46</b>	129 kHz
265	16.9	8.98	1.626	50	<b>86.40</b>	
265	31.7	9.04	3.252	100	<b>92.74</b>	

## 5.5 EFFICIENCY RESULT AT 5-V<sub>OUT</sub>

Table 5.5. Efficiency Test Data at 5-V<sub>OUT</sub>

V <sub>IN</sub> (RMS)	P <sub>IN</sub> (W)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	P <sub>OUT</sub> (%)	EFFICIENCY	Average Switching Frequency @ Full Load
90	2.0	4.94	0.325	10	<b>80.28</b>	95 kHz
90	9.6	4.99	1.626	50	<b>84.52</b>	
90	18.4	5.05	3.252	100	<b>89.25</b>	
115	2.0	4.94	0.325	10	<b>80.28</b>	96 kHz
115	9.6	4.99	1.626	50	<b>84.52</b>	
115	18.3	5.05	3.252	100	<b>89.74</b>	
230	2.1	4.94	0.325	10	<b>76.45</b>	82 kHz
230	10.1	4.99	1.626	50	<b>80.33</b>	
230	18.6	5.05	3.252	100	<b>88.29</b>	
265	2.2	4.94	0.325	10	<b>72.98</b>	79 kHz
265	10.3	4.99	1.626	50	<b>78.77</b>	
265	19.0	5.05	3.252	100	<b>86.43</b>	

## 5.6 EFFICIENCY TYPICAL CURVES

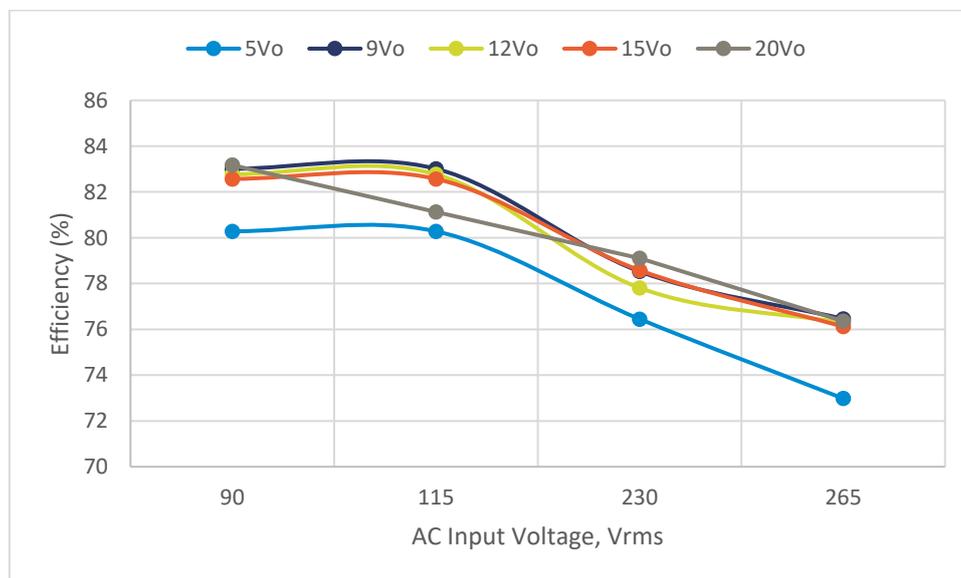


Figure 7. Efficiency of 10% Load vs. Input Voltage

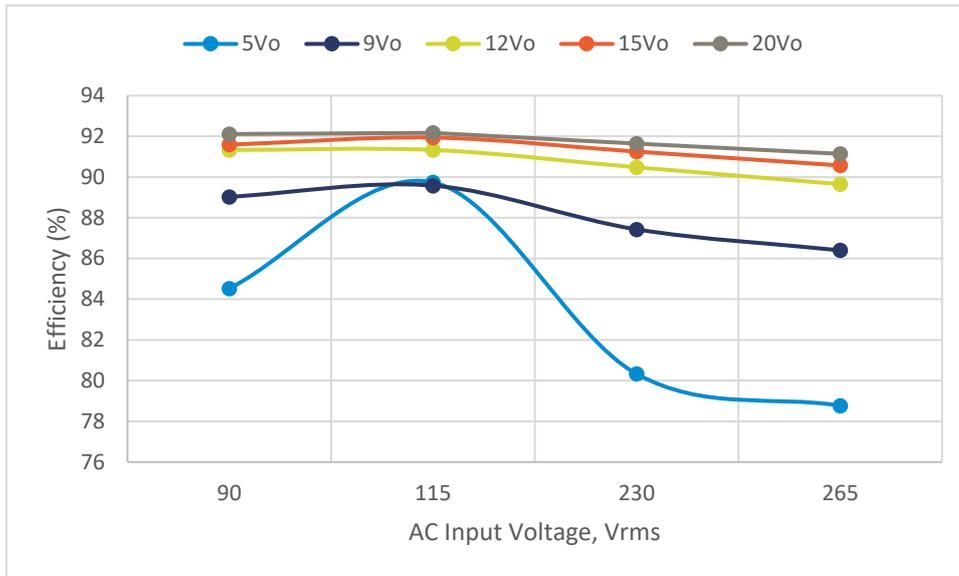


Figure 8. Efficiency of 50% Load vs. Input Voltage

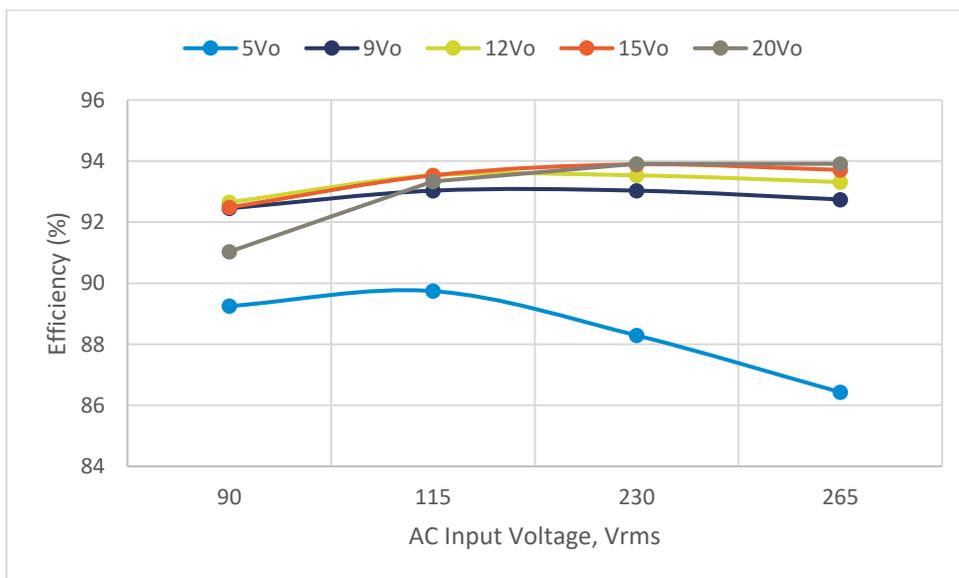


Figure 9. Efficiency of 100% Load vs. Input Voltage

## 5.7 SWITCHING WAVEFORMS AND OPERATION MODE

Typical operation modes are presented in Table 5.6:

- AAM: Adaptive Amplitude Modulation
- ABM: Adaptive Burst Mode
- LPM: Low Power Mode
- SBP1: First Standby Power Mode
- SBP2: Second Standby Power Mode

Table 5.6. Operation Mode & Load Current at 20-V Output and 115Vac Input

Mode	AAM	ABM	LPM	SBP1	SBP2
Burst Frequency, $f_{BUR}$	Not Applicable	>25kHz (2 to 9 pulses)	About 25kHz (2 pulses)	8.5kHz to 25kHz (2 pulses)	<8.5kHz (2 pulses)
Typical Load Current	1.8 A to 3.25 A	0.5 A to 1.8 A	0.2 A to 0.5 A	0.1 A to 0.2 A	<0.1 A

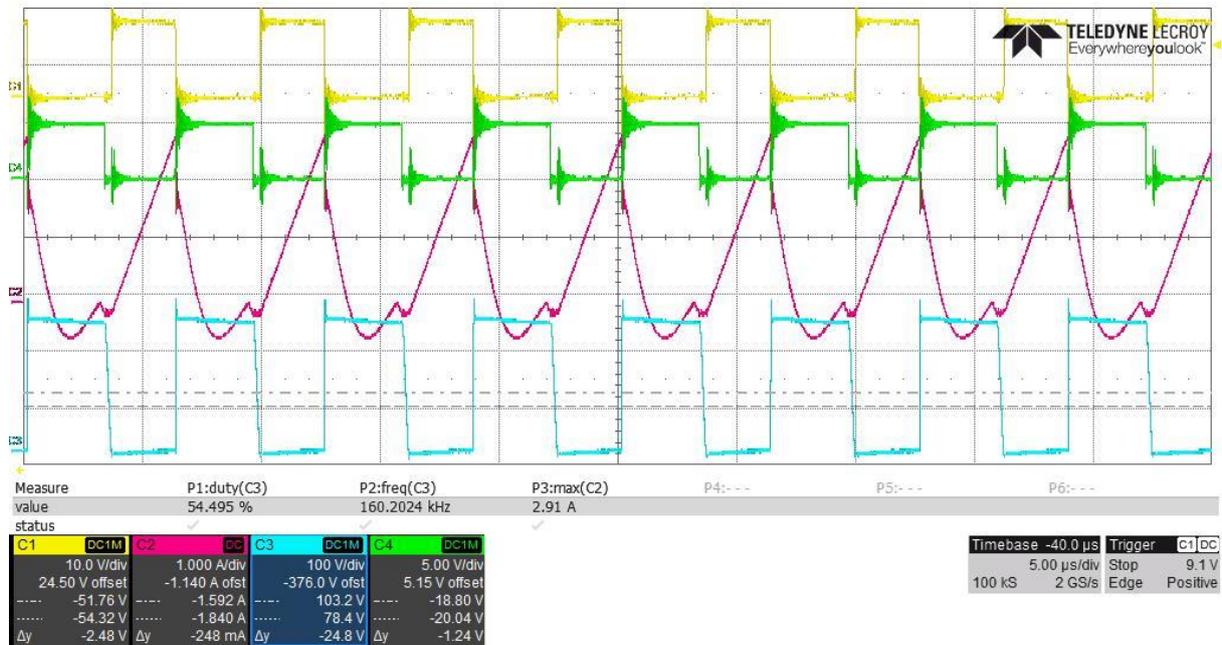


Figure 10. Typical Waveform in AAM Operation (100% Load), Yellow = PWML, Green = PWMH, Red = Transformer Primary Winding Current, Blue = VSW



## 5.8 EN55032 CLASS B CONDUCTED EMI MEASUREMENT

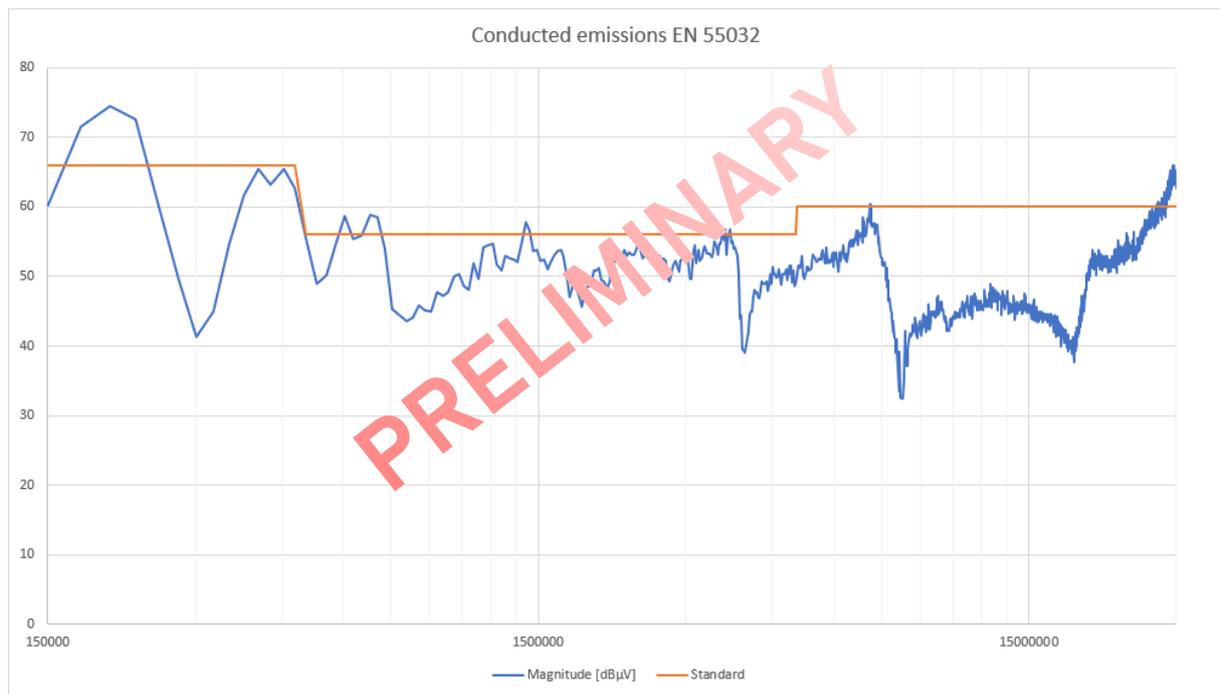


Figure 13.  $V_{IN} = 230 \text{ VRMS}$ ,  $V_{OUT} = 20 \text{ V}$ ,  $I_{Load} = 3.25 \text{ A}$  (Output Grounded to LISN Ground)

## 5.9 THERMAL IMAGES AT FULL LOAD (20V AND 3.25A)



Figure 14.  $V_{IN} = 90V_{RMS}$  Top Side  
(Transformer: 55.1°C)

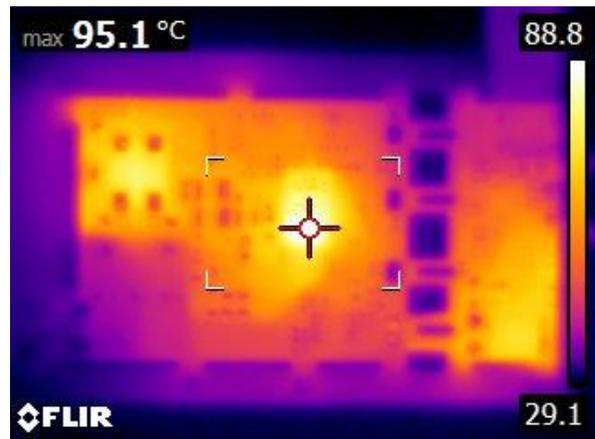


Figure 15.  $V_{IN} = 90V_{RMS}$  Bottom Side (GaN:  
95°C)



Figure 16.  $V_{IN} = 115V_{RMS}$  Top Side  
(Transformer: 58.8°C)

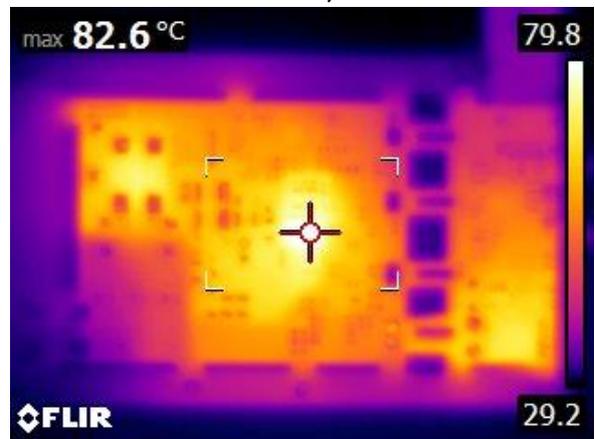


Figure 17.  $V_{IN} = 115V_{RMS}$  Bottom Side (GaN:  
82.6°C)

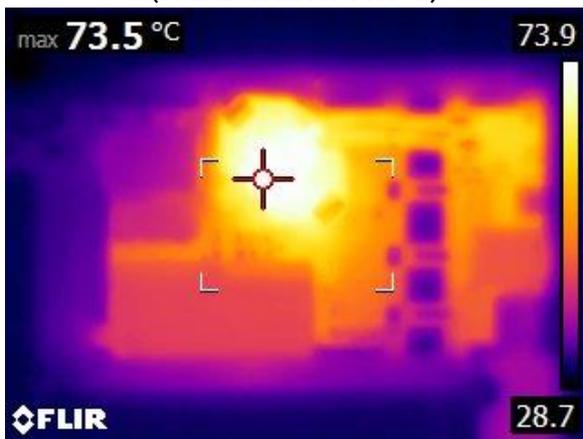


Figure 18.  $V_{IN} = 230V_{RMS}$  Top Side  
(Transformer: 73.5°C)

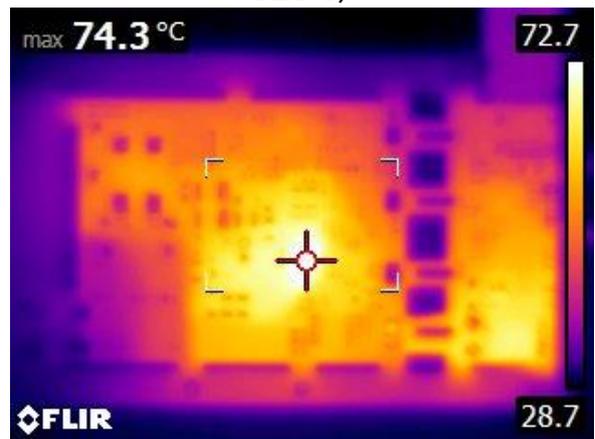


Figure 19.  $V_{IN} = 230V_{RMS}$  Bottom Side (GaN:  
74.3°C)

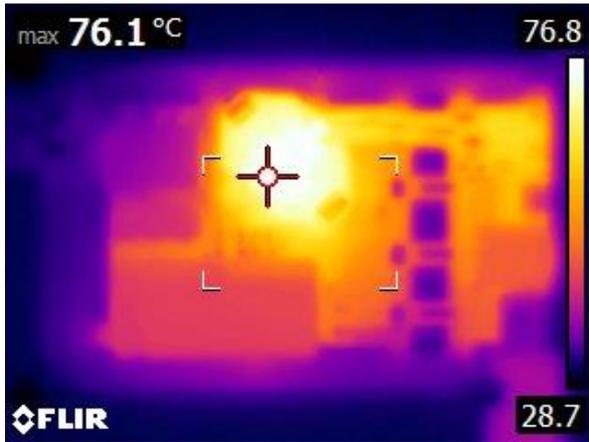


Figure 20.  $V_{IN} = 265V_{RMS}$  Top Side  
(Transformer: 76.1°C)

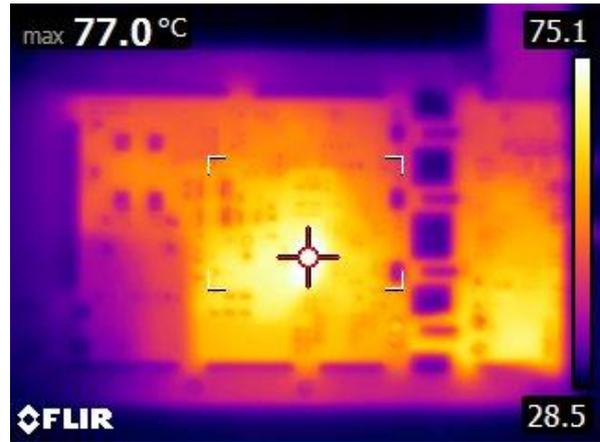
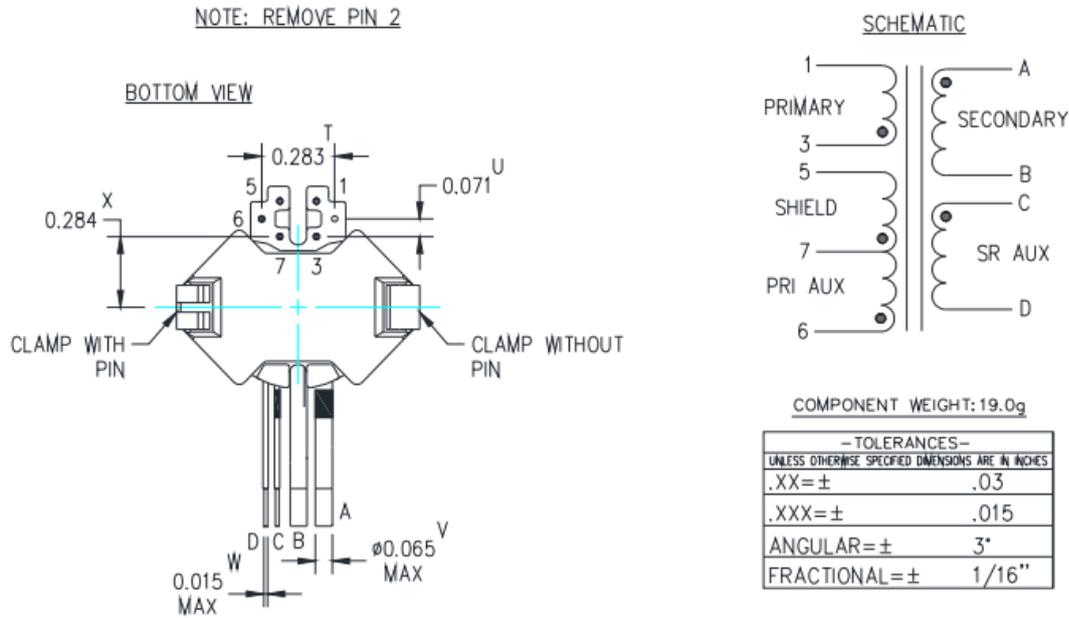


Figure 21.  $V_{IN} = 265V_{RMS}$  Bottom Side (GaN:  
77°C)

## 6 TRANSFORMER DETAILS

Renco Electronics transformer part number RLTI-1403 is used on this design and wound on an RM8 core set.



Electrical Parameter	Specification	Units	Tolerance	Pins	Test Data				
					1	2	3	4	5
Inductance 150kHz/0.1VAC	110	μH	± 5%	3-1	112	112	111	113	112
Leakage Inductance 150kHz/0.1VAC	2.5 Short Pins: A,B	μH	MAX	3-1	1.5	0.78	0.80	0.82	0.84
DC Resistance at 25°C	0.100	Ω	± 15%	3-1	0.087	0.087	0.087	0.087	0.087
	0.020	Ω	± 15%	6-7	0.020	0.020	0.020	0.020	0.020
	2.10	Ω	± 15%	7-5	2.08	2.14	2.10	2.08	2.11
	0.007	Ω	MAX	A-B	0.006	0.006	0.006	0.006	0.006
	0.120	Ω	± 15%	C-D	0.134	0.134	0.134	0.133	0.132
Hipot 3000 VAC/60Hz 1 sec/1mA MAX	Btwn 1,6 to A,C				PASS	PASS	PASS	PASS	PASS
1000 VDC 1 sec/1mA MAX	Btwn 1 to 6 Btwn 1,6 to CORE				PASS	PASS	PASS	PASS	PASS
Turns/Polarity					PASS	PASS	PASS	PASS	PASS

## 7 PCB LAYOUT

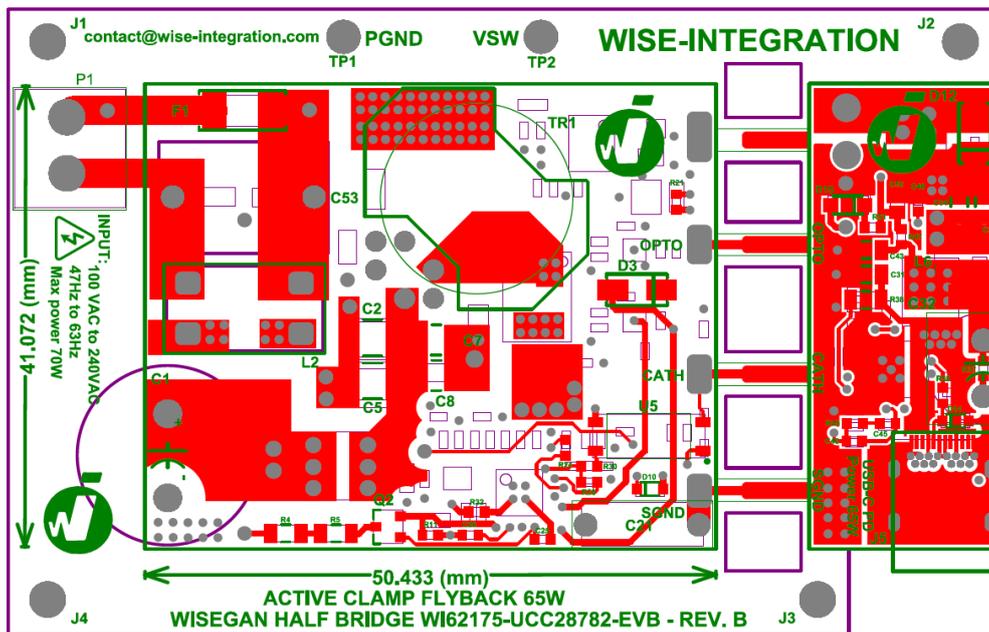


Figure 22. PCB Layout (Top view)

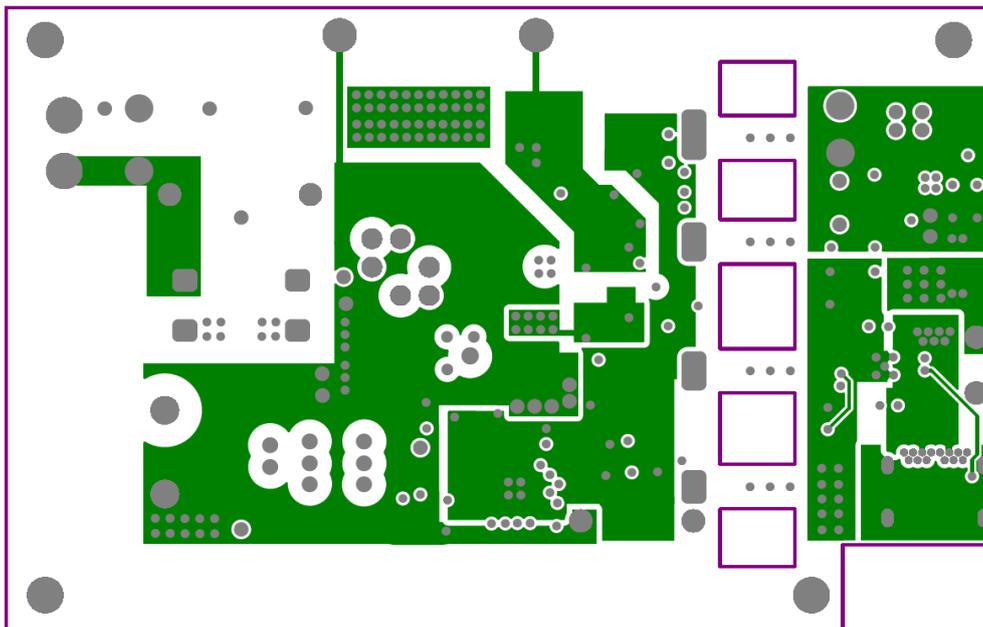


Figure 23. PCB Layout (Mid-layer 1 view)

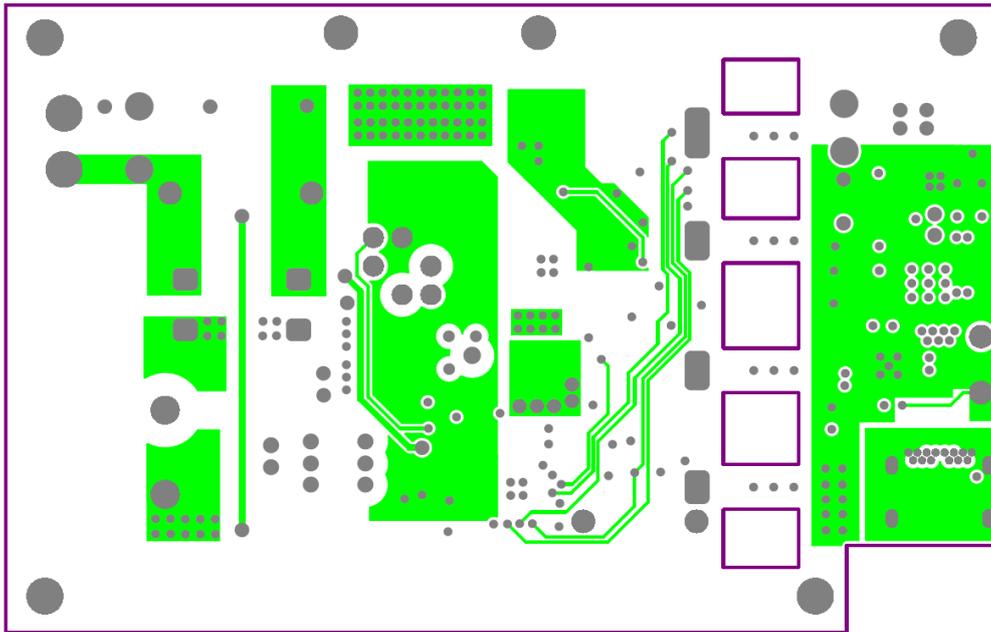


Figure 24. PCB Layout (Mid-layer 2 view)

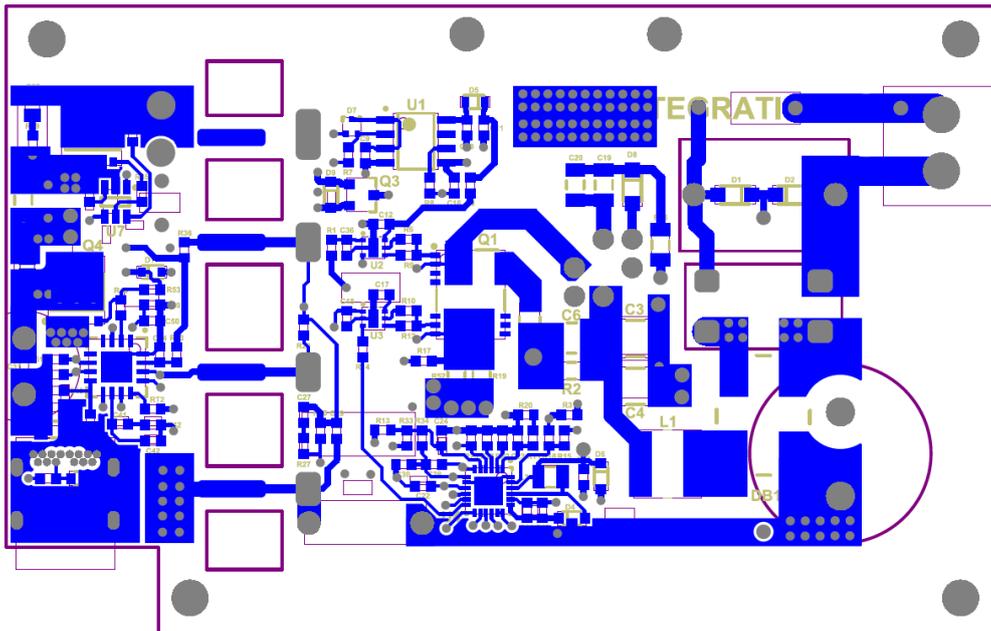


Figure 25. PCB Layout (Bottom view)

## 8 LIST OF MATERIALS

WI62175-UCC28782-EVB list of materials for the schematic diagrams shown in Figure 4 and in Figure 5.

Table 8.1. WI62175-UCC28782-EVB list of materials

Quantity	Designator	Description	Part Number
1	C1	CAP ALUM 100UF 20% 400V RADIAL	860021380020
4	C2, C3, C4, C5	Capacitor 500V 0.33uF X7R 1812 20%	C1812X334MCRACTU
3	C6, C7, C8	Capacitor 0.33 $\mu$ F, 250 V, 10%, X7R, 1210	C1210C334KARACAUTO
9	C9, C10, C12, C17, C18, C36, C41, C44, C50	Capacitor 0.1 $\mu$ F 25V 0603 X5R	CC0603JRX7R8BB104
6	C11, C23, C27, C42, C45, C46	Capacitor 0603 - DNP	
3	C13, C14, C15	Capacitor 10 $\mu$ F 35V 0603 X5R	GRM188R6YA106MA73D
1	C16	Capacitor 100pF 25V 0603 X5R	C1608C0G1H101K080AA
2	C19, C20	Capacitor 22 $\mu$ F, 25 V, 20%, X6S, 1206	GRM31CC81E226ME11L
1	C21	Capacitor 2200 pF, 250 V, 20%, E, Dia 9mm	DE1E3RA222MN4AN01F
3	C22, C47, C51	Capacitor 220 pF, 50 V, 0603	CC0603KRX7R9BB221
2	C24, C28	Capacitor, ceramic, 330 pF, 50 V, 0603	885012006060
6	C25, C29, C37, C40, C48, C49	Capacitor 1 $\mu$ F 25V 0603 X5R	CC0603KRX5R8BB105
1	C26	Capacitor, ceramic, 24 pF, 50 V, 0603	GRM1885C1H240JA01D
1	C30	Capacitor 0.22 $\mu$ F 25V 0603 X5R	GCM188R71E224KA55D
1	C31	Capacitor, ceramic, 10 $\mu$ F, 35 V, X5R, 1206	GRT319R6YA106KE01D
1	C32	CAP ALUM 680uF 25V 20% POLYMER	687AVG025MGBJ
3	C33, C34, C35	Capacitor, ceramic, 47 $\mu$ F, 25 V, X5R, 1206	C3216JB1E476M160AC
1	C38	Capacitor, ceramic, 220 pF, 250 V, 5%, 0805	GRM21A5C2E221JW01D
1	C39	Capacitor 1nF 50V 0603 X5R	CC0603JPX7R9BB102
1	C43	Capacitor, ceramic, 33 $\mu$ F, 25 V, X5R, 1206	C3216X5R1E336M160AC
1	C52	Capacitor, ceramic, 1 $\mu$ F, 100 V, 10%, X7S, 0805	GCM21BC72A105KE36L
1	C53	Capacitor, Film, 0.47 $\mu$ F, 275 V, 10%, TH	890324024005
2	D1, D2	Rectifiers 600V 1A Super Fast Rectifier	ES1JFL
1	D3	Rectifiers 600V 1A SMA Super Fast Rectifier	ES1JAF
1	D4	Diode, Schottky, 30 V, 0.8 A, SOD-323	CUS08F30, H3F
1	D5	Diode, Zener, 2 V, 150 mW, SOD-523F	CZRU52C12
1	D6	Diode, TVS, 24 V, Clamping 9 A, SOD-323	CDSOD323-T24SC
1	D7	Schottky Diodes & Rectifiers 30V 150mW	BAT54CT-7-F
2	D8, D15	Schottky Diodes & Rectifiers 150V VR 1A 0.84V VF PMDU ; SOD-123FL	RB168MM150TFTR
1	D9	Diode, TVS, Bi, 16.2 V, SOD-323	DF2B18FU, H3F
1	D10	Zener Diodes ZEN SOD323 REG 0.2W	SZMM3Z20VT1G
1	D11	Schottky Diodes & Rectifiers SCHOTTY 30V .1A	RB520SM-40T2R
1	D12	TVS 400W 100V 5% Bi-Directional	SMAJ100CA-E3/61
2	D13, D14	ESD Suppressors / TVS Diodes 5V BIDIRECTION ESD	PESD5V0L1BA115

Table 8.1. WI62175-UCC28782-EVB list of materials (continued)

Quantity	Designator	Description	Part Number
1	DB1	Bridge Rectifiers Low VF 4A 1000V	Z4DGP410L-HF
1	F1	Surface Mount Fuses 3.5A 350 VAC 72 VCD	0679H3500-01
1	J5	USB Connectors WR-COM USB3.1 Type C SuperSpeed+ Rcpt	632723300011
1	L1	Fixed Inductors WE-LQS 22uH 1.8A DCR=89 mΩ	74404064220
1	L2	Common Mode Chokes / Filters WE-CMB Choke Type XS 1mH 2A 45 mΩ	744821201
1	L3	Fixed Inductors 1007 22uH 728 mΩ +/-10%Tol 490mA	BRC2518T220K
1	L4	Ferrite Bead, 48 ohm@100 MHz, 5 mΩ at 6 A, 1206	7427931
1	L5	Fixed Inductors 0805 1uH 91 mΩ +/-20%Tol 400mA	LBR2012T1R0M
1	L6	Fixed Inductors 1uH 20%	IHLP2020CZER1R0M11
1	P1	Fixed Terminal Blocks Horizontal 5.00mm	691216710002
1	Q1	Haft Bridge GaN Transistor 650V 175mΩ Wise Integration	WI62175
2	Q2, Q3	MOSFET N-Ch 600V 21mA SOT-23-3	BSS126H6327XTSA2
1	Q4	MOSFET N-CH 30V 32A/100A 8VSON	CSD17303Q5
1	Q5	MOSFET, N-Channel, 150 V, 76 A, TDSO-N-8	BSC110N15NS5ATMA1
3	R1, R3, R8	Resistor 10 Ω 0603	ERJ-3EKF10R0V
1	R2	Resistor, 1 MΩ, 5%, 1206	CR1206-FX-1004ELF
2	R4, R5	Resistor, 13 kΩ, 5%, 1206	RC1206FR-0713KL
4	R6, R10, R46, R50	Resistor 47 Ω 0603	RC0603JR-0747RL
2	R7, R14	Resistor 100 Ω 0603	CR0603-JW-101ELF
2	R9, R12	Resistor 2 Ω 0603	CR0603-J/-2R0ELF
8	R11, R13, R24, R27, R28, R39, R45, R51	Resistor 0603 DNP	
1	R15	Resistor 56.2 kΩ 0603	RE0603FRE0756K2L
1	R16	Resistor, 0 Ω, 5%, 1206	RC1206JR-070RL
1	R17	Resistor 499 Ω 0603	RC0603FR-07499RL
1	R18	Resistor 14 kΩ 0603	RC0603FR-0714KL
2	R19, R52	Resistor, 0.24 Ω, 1%, 0.5 W, 1206	RCWE1206R240FKEA
8	R20, R25, R31, R32, R35, R36, R43, R47	Resistor, 0 Ω, 5%, 0603	RC0603FR-130RL
2	R21, R44	Resistor 511 Ω 0603	RC0603FR-07511RL
1	R22	Resistor 243 kΩ 0603	RC0603FR-07243KL
1	R23	Resistor 196 kΩ 0603	AC0603FR-07196KL
1	R26	Resistor 30.1 kΩ 0603	RC0603FR-0730K1L
1	R29	Resistor 34 kΩ 0603	AC0603FR-0734KL
1	R30	Resistor 20 kΩ 0603	CR0603-FX-2002ELF
1	R33	Resistor 37.4 kΩ 0603	RC0603FR-0737K4L
1	R34	Resistor 182 kΩ 0603	CRCW0603182KFKEA
1	R37	Resistor, 10 MΩ, 5%, 0603	CR0603-JW-106ELF
1	R38	Resistor, 1 kΩ, 5%, 1206	CR1206-JW-102ELF

Table 8.1. WI62175-UCC28782-EVB list of materials (continued)

Quantity	Designator	Description	Part Number
1	R40	Current Sense Resistors 4 mΩ 1% 1206	WSL12064L000FEA
1	R41	Resistor, 5.11 kΩ, 5%, 0603	CR0603-FX-5111ELF
1	R42	Resistor, 48.7 kΩ, 5%, 0603	CR0603-FX-4872ELF
1	R48	Resistor, 10 kΩ, 5%, 0603	CRCW060310K0JNEBC
1	R49	Resistor 30.9 kΩ 0603	RC0603FR-0730K9L
1	R53	Resistor, 1 MΩ, 5%, 0603	CRCW06031M00FKEAC
1	RT1	Thermistances CTN 47 KΩ 5% 0603	NCP18WB473J03RB
1	RT2	Thermistances CTN 220 KΩ 5% 0603	NCP18WM224J03RB
1	TR1	Transformer, 110 μH, RM8 core	RLTI-1403
1	U1	High Speed, Digital Isolator, SOIC-8	ISO7710FDR
2	U2, U3	Gate Drivers 4A/6A Hi-Spd 5V Opt	UCC27611DRVT
1	U4	IC Switch AC Flyback 24WQFN	UCC28782ARTWR
1	U5	Opto-isolator Transistor 5000 Vrms	TLP383(GR-TPL, E
1	U6	USB PD/QC4/QC4+ Controller	WT6636F
1	U7	Fast turn-off intelligent SR controller	MP6908AGJ-P

Revision	Date	Comments
B	14-03-22	1st release