

FOR ENERGY EFFICIENT INNOVATIONS

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300 W Ultra High Density Power Density Adapter @500kHz

AC-DC Power System Solutions

Public Information



UHD 300W AC-DC Parameters Highlights & Key points

Input / Output

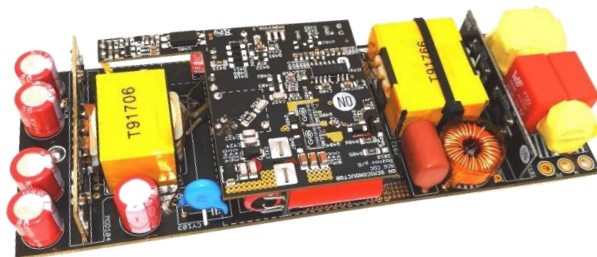
- Input voltage range
90 – 265 V AC
- Output voltage 19 V
- Output current: 16 A
- Peak power: up to 340 W

Dimensions:

- Size: 160 x 56 x 18 mm
- Volume: 9.84 inch³

Power density:

- Up to 34 W/inch³



Used controllers:

- PFC stage: NCP1616
- LLC stage: NCP13992
- GaN HB Driver: NCP51820
- SR: NCP4306

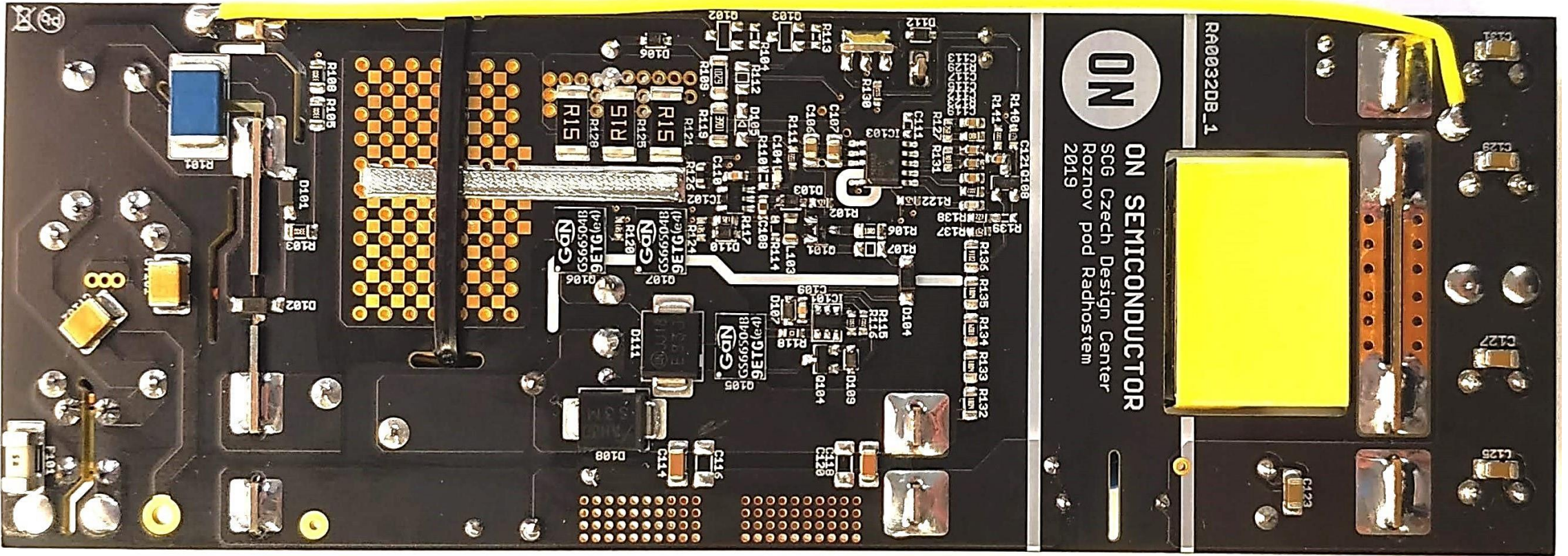
Used GaN device:

- GaN Systems GS66504B ,
650 V, 100 mΩ

Highlights:

- Only 2-layer PCB design
- High versatility
- PFC with SR
- Semi-bridgeless line rectifier option

UHD 300W AC-DC: Bottom Side View



UHD 300W AC-DC: Bottom Side View: Assembling principle

1.

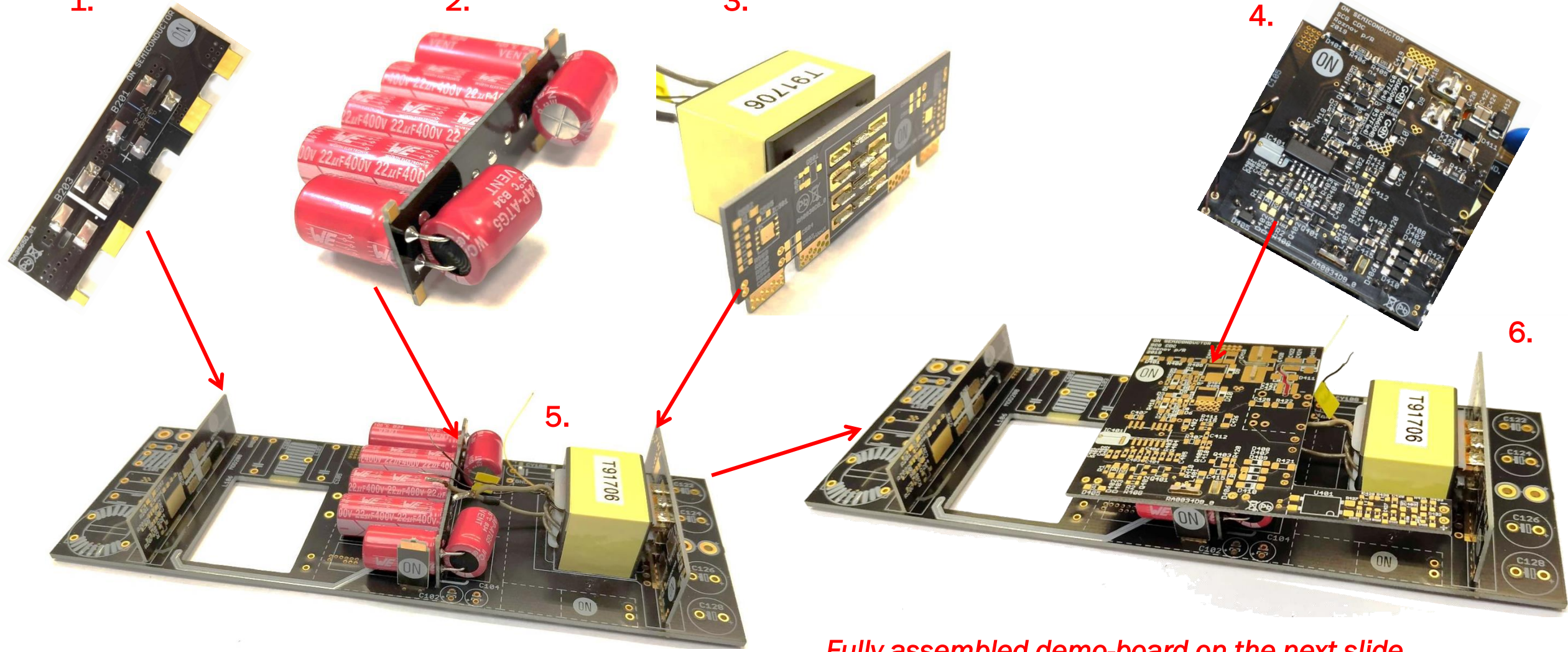
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4.

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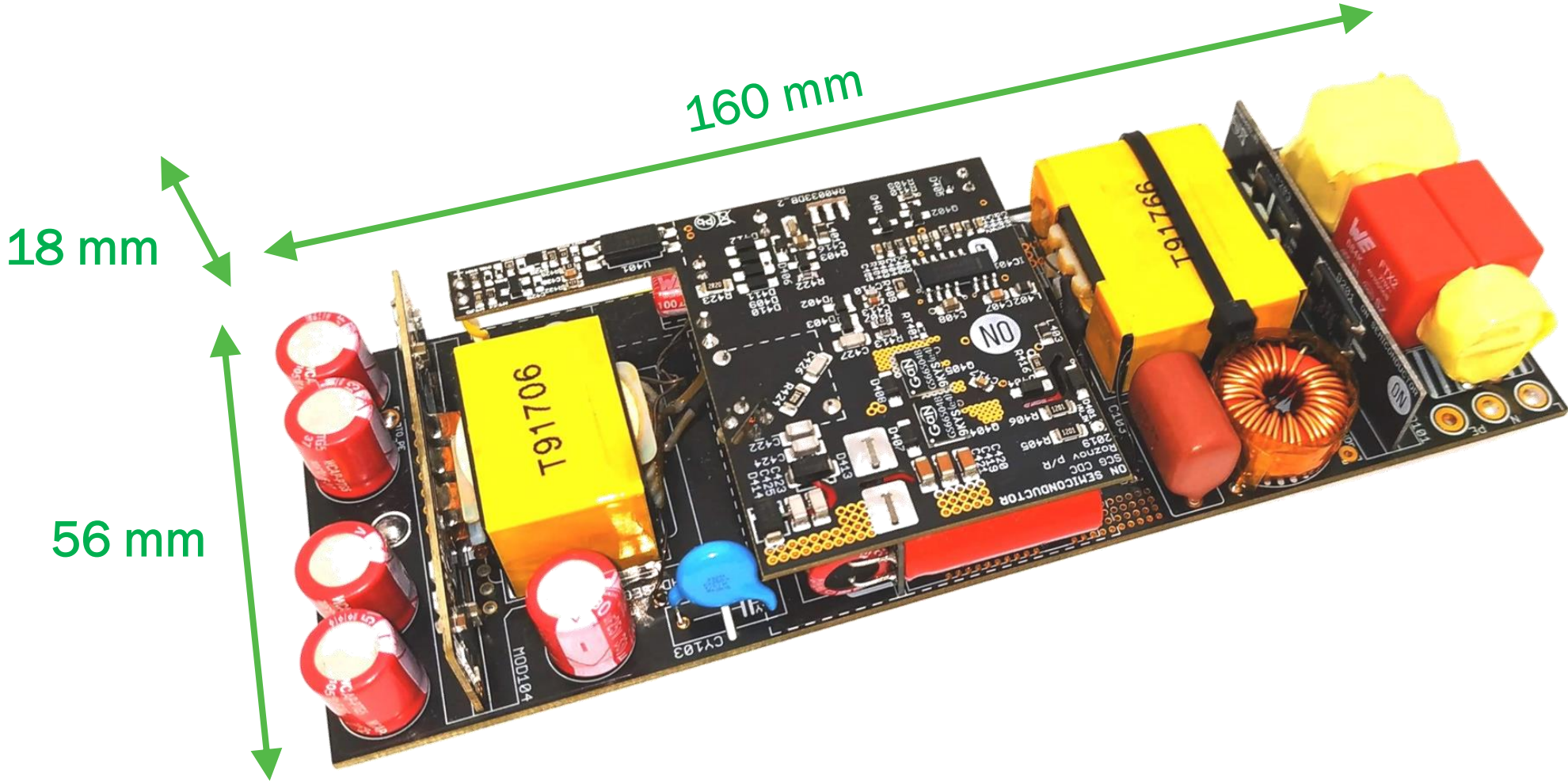
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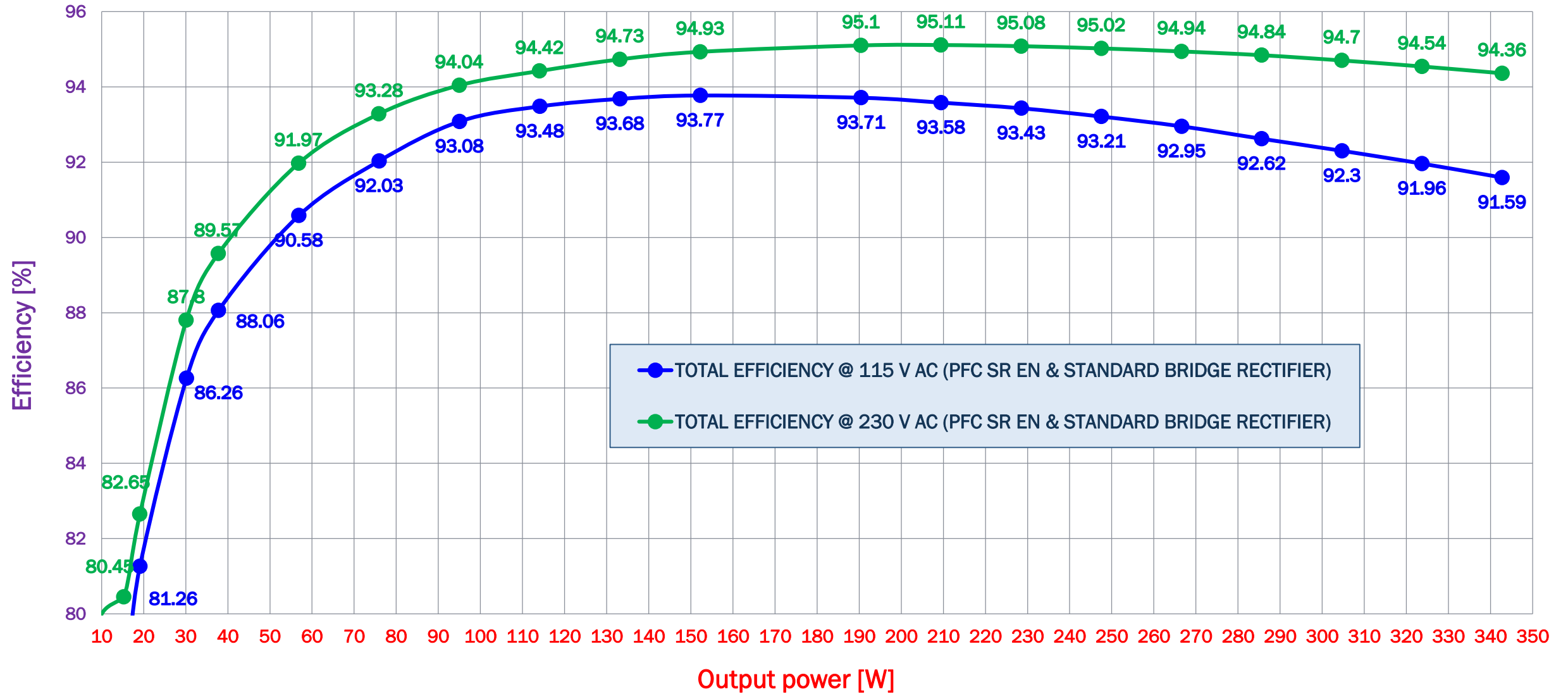
Fully assembled demo-board on the next slide



UHD 300W AC-DC: Fully Assembled Board & Dimensions

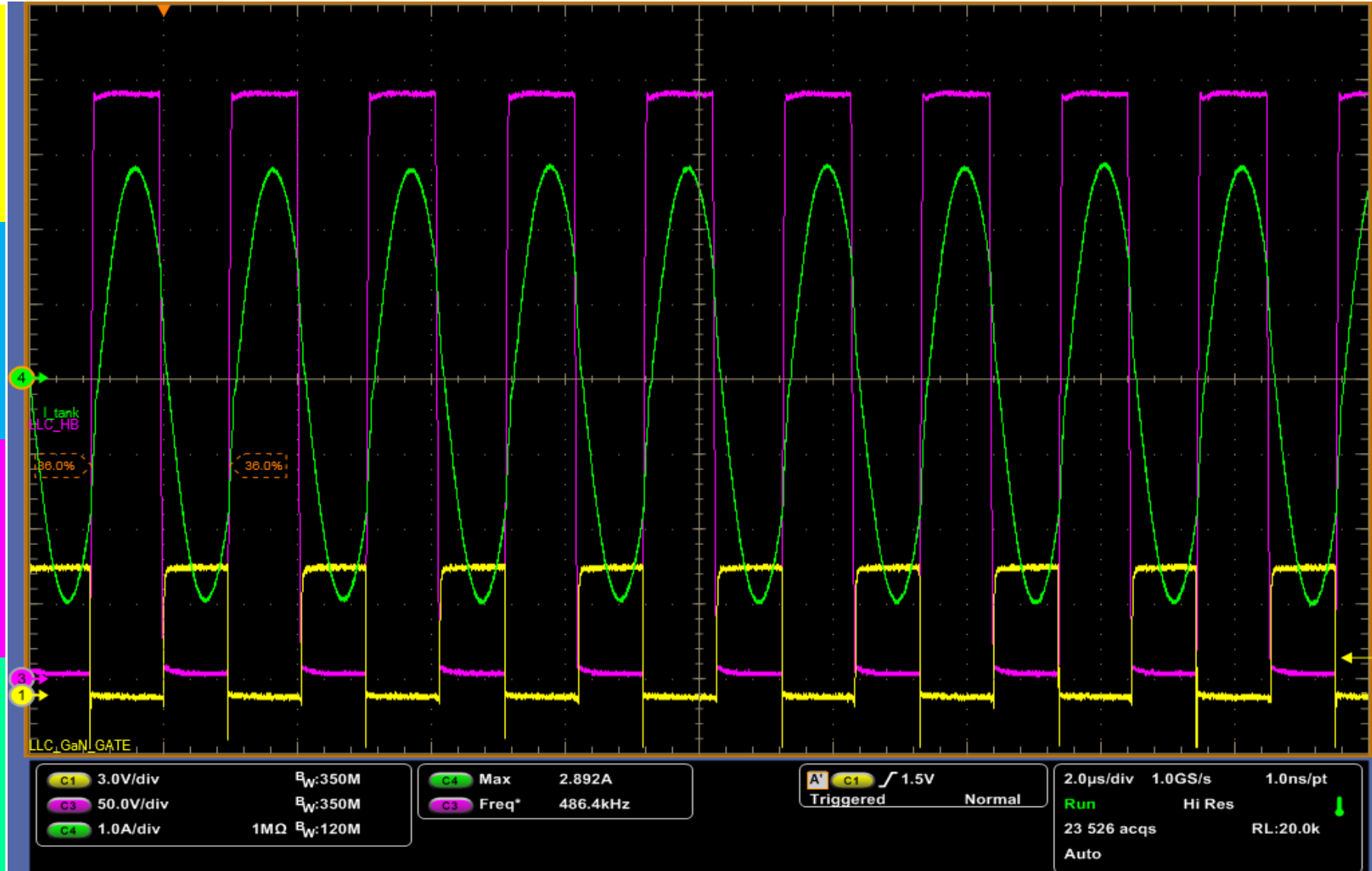


UHD 300W: total efficiency with active PFC SR & standard bridge rectifier

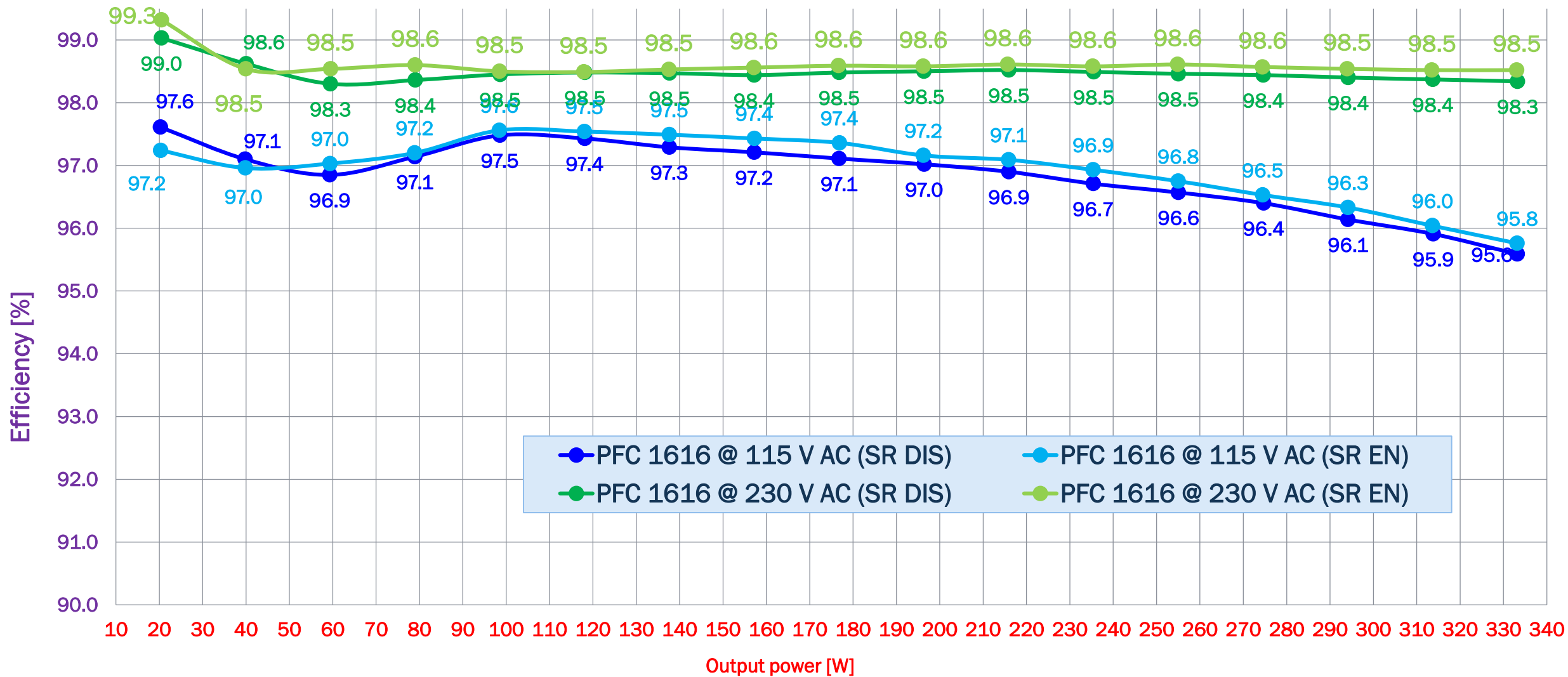


LLC STAGE PRIMARY SIDE WAVEFORM @ 340 W load (NORMAL MODE)

CH1	3 V/div	LOW SIDE GaN DEVICE DRIVING PULSE $V_{GS}(t)$
CH2	N/A	N/A
CH3	50 V/div	HALF-BRIDGE NODE VOLTAGE (t)
CH4	1 A/div	RESONANT TANK CURRENT $I_{TANK}(t)$



Stand alone PFC Stage efficiency



UHD 300W: Efficiency & consumption overall summary

LOAD		Consumption [mW] or efficiency [%]				Required @ 230VAC
		@120VAC		@230VAC		
		100 kHz AIO EVB	500 kHz Adapter	100 kHz AIO EVB	500 kHz Adapter	
NO-LOAD		< 115mW	<130 mW*	< 125mW	<130 mW*	<150mW
	Load 250 mW	466 mW	< 490 mW*	475 mW	< 500 mW*	<500mW
	Load 500mW	720 mW	< 800 mW*	823 mW	< 850 mW*	<1000mW
Load 20%	50	90,2	90,6	91,5	92,0	>90%
Load 25%	62,5	91,8	92,0	93,0	93,3	-
Load 50%	125	93,4	93,7	94,4	94,7	>94%
Load 75%	187,5	93,1	93,7	94,6	95,1	-
Load 100%	250	92,6	93,2	94,5	95,0	>91%
4 point AVG		92,7	93,2	94,1	94,5	-

* preliminary information, may be changed.

