

7. 效率 (PFC + LLC)

➤ 恒压模式效率

Vin	Vo	25%load η(%)	50%load η(%)	75%load η(%)	100%load η(%)
180Vac	49V	93.9%	94.6%	95.4%	95.3%
230Vac	49V	93.7%	94.7%	95.7%	95.6%
264Vac	49V	92.9%	95.3%	96.0%	96.0%

➤ 恒流效率数据(CV48V)

Vin	PF	Vo	Io	100%load η(%)
180Vac	>0.9	48.3V	4.2	95.7%
230Vac	>0.9	48.3V	4.2	96.2%
264Vac	>0.9	48.3V	4.2	96.3%

注: FL5, PCB

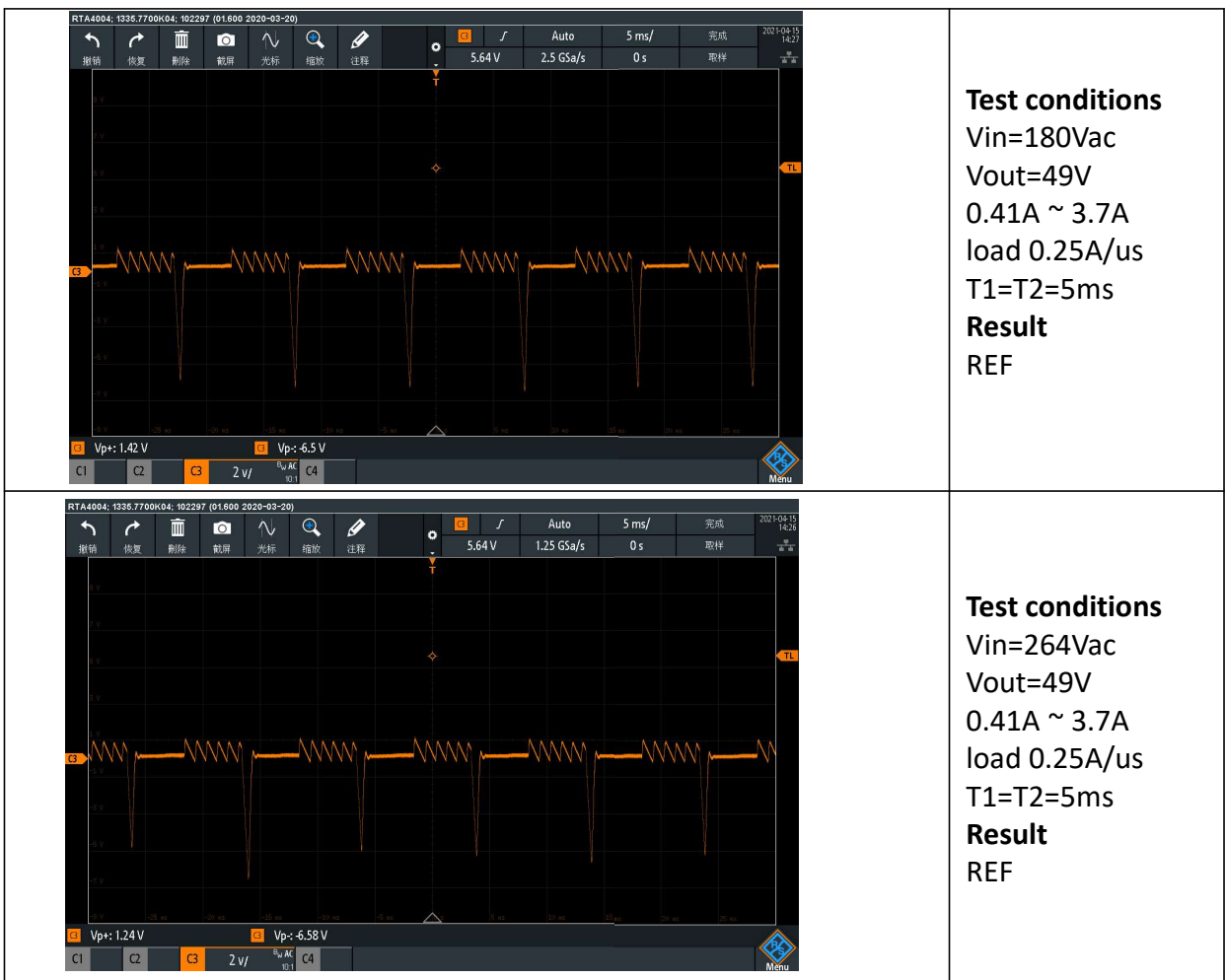
8. 最大电压应力测试波形

	<p>Test conditions Vin: 264Vac CC mode Vout 48V</p> <p>Result Vds_max: 411.6V</p>
	<p>Test conditions Vin = 264Vac CC mode Vout 48V</p> <p>Result Vds_max: 410.62V</p>
	<p>Test conditions Vin = 264Vac CC mode Vout 48V</p> <p>Result Vds_max: 105.6V</p>



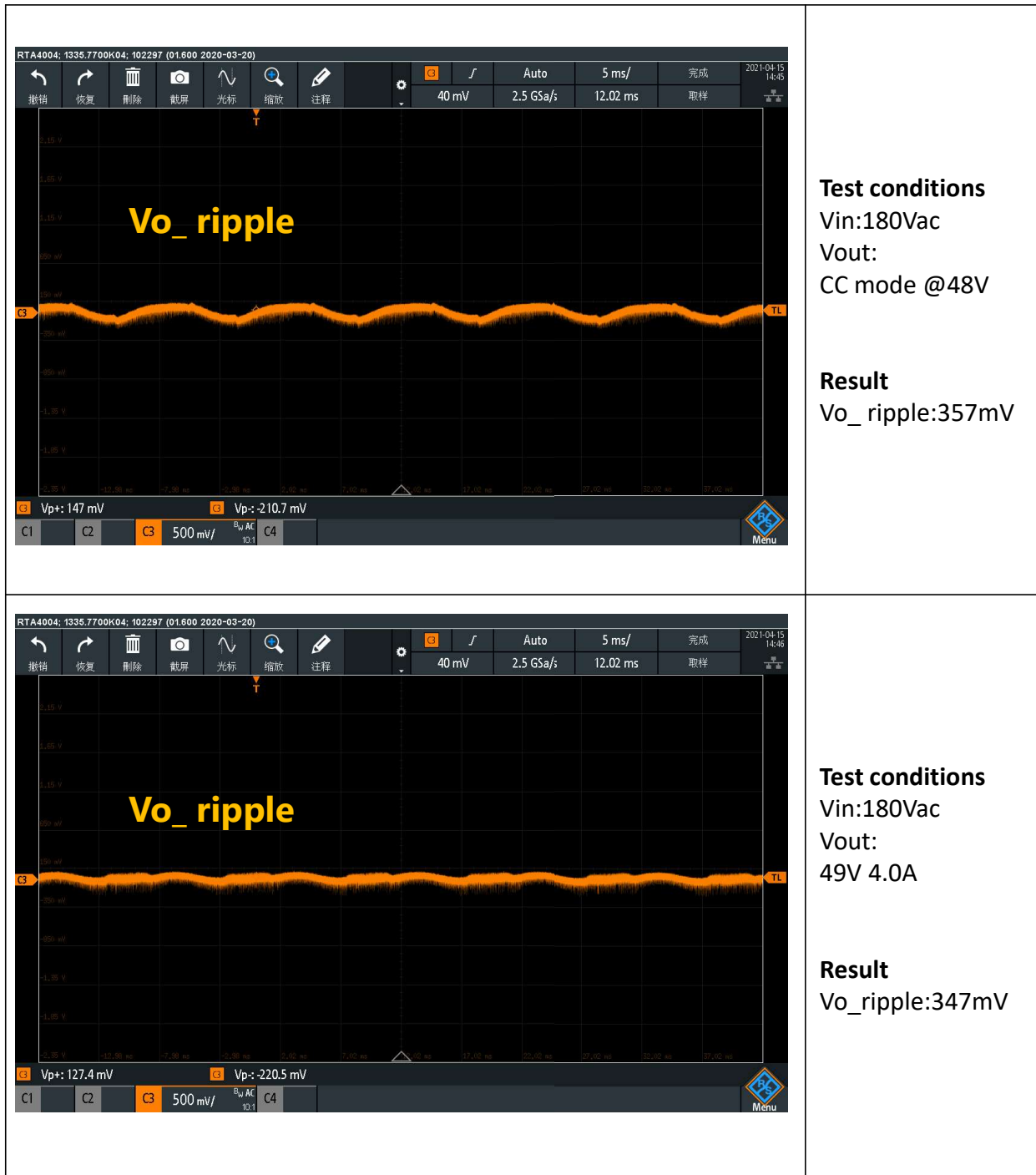
9. 动态测试波形

➤ 49V动态

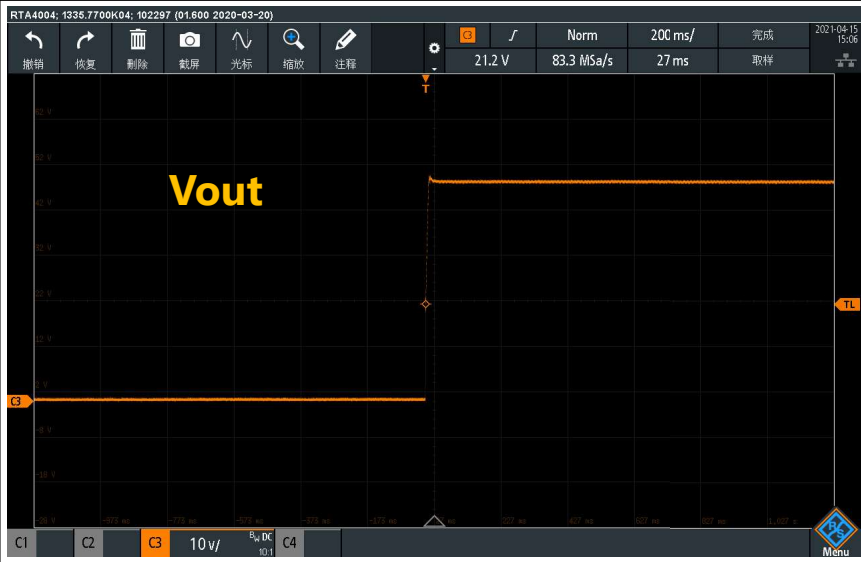




10. 纹波测试波形

➤ CC4.1A&Cv load 3.5A



11. 开机波形

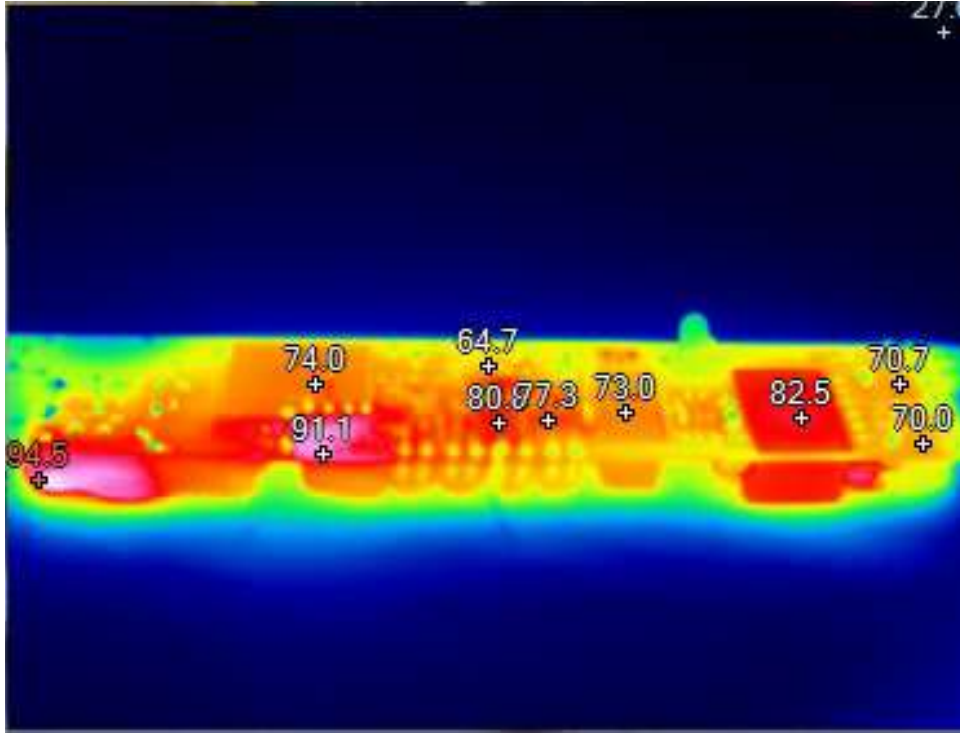
 <p>RTA4004: 1335.7700K04: 102297 (01.600 2020-03-20)</p> <p>Norm 200 ms/ 完成 2021-04-15 15:06</p> <p>21.2 V 83.3 MSa/s 27 ms 取样</p> <p>Vout</p> <p>10 v/ $E_{v,DC}$ 10.1 C4</p> <p>Menu</p>	<p>Test conditions Vin=180Vac CC mode @48V</p>
 <p>RTA4004: 1335.7700K04: 102297 (01.600 2020-03-20)</p> <p>Norm 200 ms/ 完成 2021-04-15 15:06</p> <p>21.2 V 83.3 MSa/s 27 ms 取样</p> <p>Vout</p> <p>10 v/ $E_{v,DC}$ 10.1 C4</p> <p>Menu</p>	<p>Test conditions Vin=230Vac CC mode @48V</p>
 <p>RTA4004: 1335.7700K04: 102297 (01.600 2020-03-20)</p> <p>Norm 200 ms/ 完成 2021-04-15 15:07</p> <p>21.2 V 83.3 MSa/s 27 ms 取样</p> <p>Vout</p> <p>10 v/ $E_{v,DC}$ 10.1 C4</p> <p>Menu</p>	<p>Test conditions Vin=264Vac CC mode @48V</p>

12. 短路电流保护

	<p>Test conditions Vin=180Vac CC mode @48V</p>
	<p>Test conditions Vin=230Vac CC mode @48V</p>
	<p>Test conditions Vin=264Vac CC mode @48V</p>

13. 热测试

Vin= 180Vac, 输出CC4.2A@48V, 环境温度27°C, 热机2小时。



PFC GaN : 91.2°C
 LLC GAN1: 80.°C
 LLC GAN2: 77.3°C
 PFC电感: 74.°C
 LLC变压器: 82.5°C
 LLC谐振电感: 73.0°C
 桥堆 : 94.6°C
 SR1 : 70.0°C
 SR2 : 70.7°C

注: 额外散热措施, AC180V, BD小板上桥堆点导热硅胶测试数据

14. EMI - CE

Test conditions: Input: 230Vac; 48V 4.2A

<p style="text-align: center;">EMI TEST REPORT</p> <p>Organization: Operator: EUT: parameter Place: Time: 2021/5/17/20:01 Test equipment: KH3939 Detector: PK+AV Test time[ms]: 30 SN: 390495 Limit: EN55022B Transducer[PK/AV]: PK / AV JZ: 2,14,1688 Remark: 5 接上, 684 X改474欧姆输入, 230V—L</p> <hr/> <p>Start(MHz) End(MHz) Step(MHz) freq, step 0.150 2.000 0.002 2.000 10.000 0.010 10.000 30.000 0.025</p> <hr/> <p>dBuV scan result</p>  <p>0.150 MHz 30.000 MHz</p> <hr/> <p>[QP] freq(MHz) lev(dBuV) Lim(dBuV) Δ(lev-Lim) final test 0.151 54.5 66.0 -11.5 0.967 49.7 56.0 -6.3 1.600 47.4 56.0 -8.6 4.182 46.3 56.0 -9.7</p>	<p>L line QP</p>
<p style="text-align: center;">EMI TEST REPORT</p> <p>Organization: Operator: EUT: parameter Place: Time: 2021/5/17/19:58 Test equipment: KH3939 Detector: PK+AV Test time[ms]: 30 SN: 390495 Limit: EN55022B Transducer[PK/AV]: PK / AV JZ: 2,14,1689 Remark: 5 接上, 684 X改474欧姆输入, 230V—N</p> <hr/> <p>Start(MHz) End(MHz) Step(MHz) freq, step 0.150 2.000 0.002 2.000 10.000 0.010 10.000 30.000 0.025</p> <hr/> <p>dBuV scan result</p>  <p>0.150 MHz 30.000 MHz</p> <hr/> <p>[QP] freq(MHz) lev(dBuV) Lim(dBuV) Δ(lev-Lim) final test 0.150 55.1 66.0 -10.9 0.972 46.2 56.0 -9.8 1.610 47.8 56.0 -8.2</p>	<p>N line QP</p>

注: 因此机是恒流48V输出, 在EMC测试中使用电阻负载测试, 需将输出改为恒压48V测试EMC。增加下底壳测试。