WS9055CEV1 Demo Manual

100~264VAC非调光 LED 驱动电源

概述

WS9055C是一款超低系统成本的高精度LED恒流驱动芯片，芯片采用自供电技术，无需外围供电元件，且不会因为自供电而发烫；系统工作在电感电流临界模式，转换效率高，EMI低，输出电流自动适应电感量的变化和输出电压的变化，从而真正实现了恒流驱动 LED. 具有多重保护功能，包括逐周期电流限制保护（OCP），LED 开/短路保护，VDD欠压保护， 智能温控，管脚浮空保护等。

特点

- 电路简单、 元器件少、成本低
- 高效率（>91% @ 230VAC, Vo=77V）
- 高精度线性调整率（<±2% @ 100VAC-264VAC ， Vo=77V）
- 高精度负载调整率（<±3% @ 230VAC，Vo=40-80V）
- 高可靠性（具有多重保护功能）
- 智能温度控制技术，避免高温灯闪
- 彻底杜绝关灯回闪
- 引脚悬空保护

应用

- 球泡灯/蜡烛灯/玉米灯
- 吸顶灯/T5/T8 灯管

规格

参数	数值
输入电压	100-264V
输出功率	11W
输出电流	140mA
输出电压	80V
功率因数	>0.4
效率	>91%
尺寸	45.5 x 20

Demo 图片

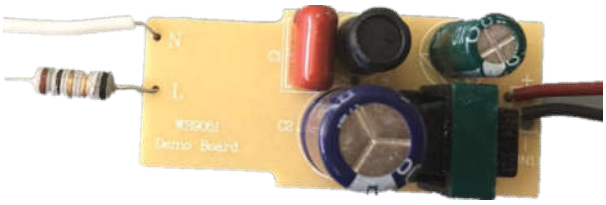


图1: 正面

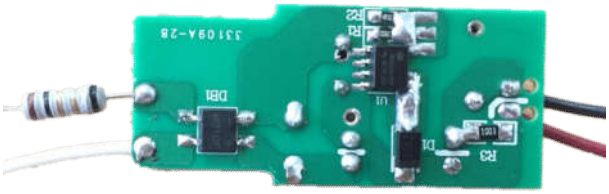


图 2: 反面

PCB 走线

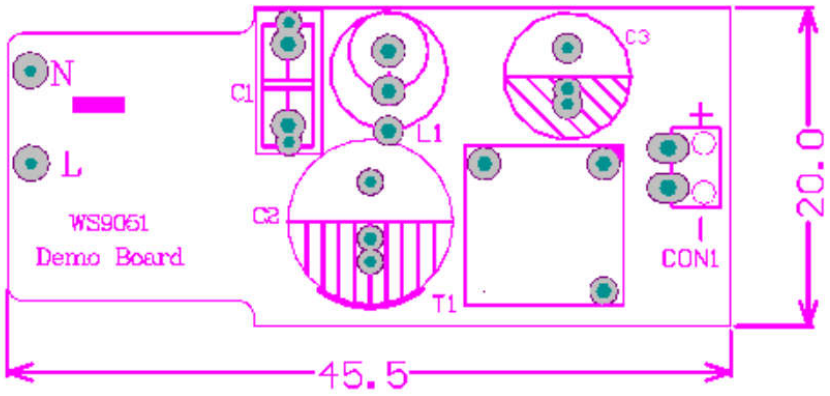


图3: PCB Layout Top View

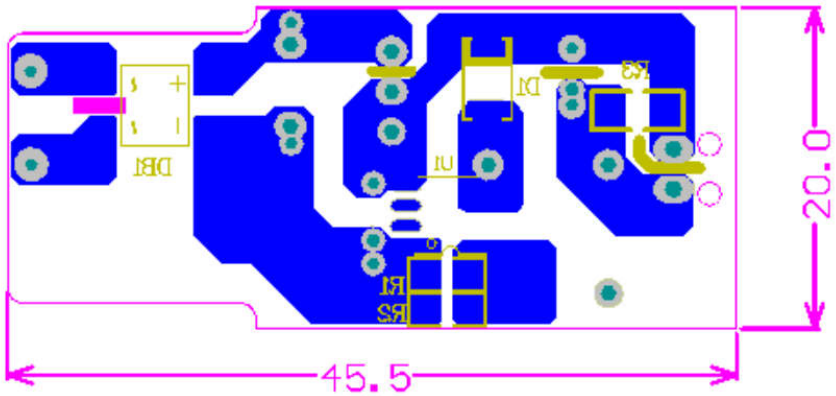


图4: PCB Layout Bottom View

原理图

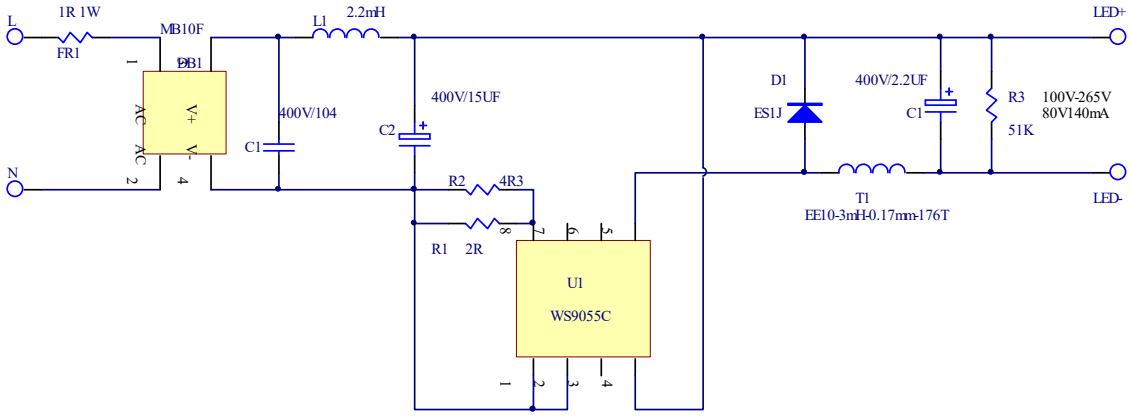
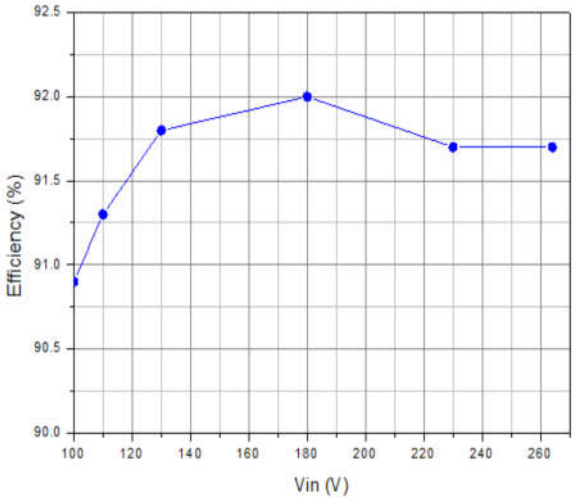


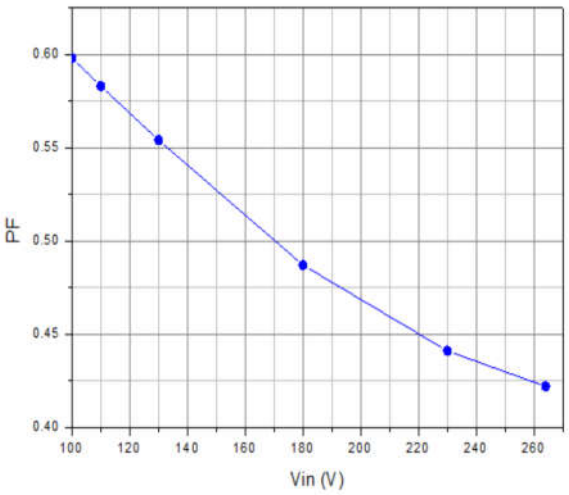
图5: 原理图

电气特性

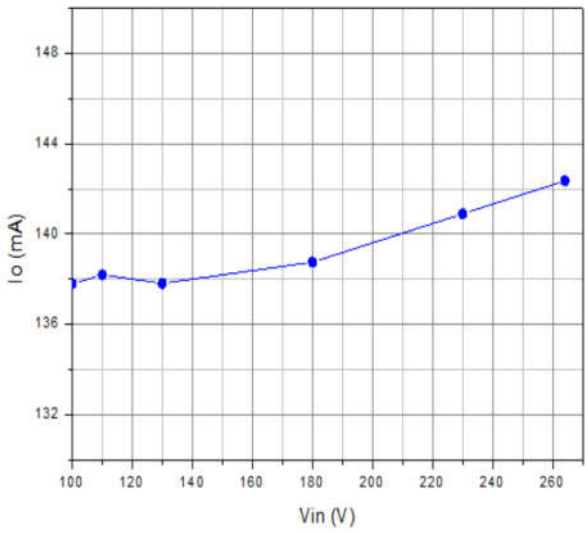
效率随输入电压变化曲线



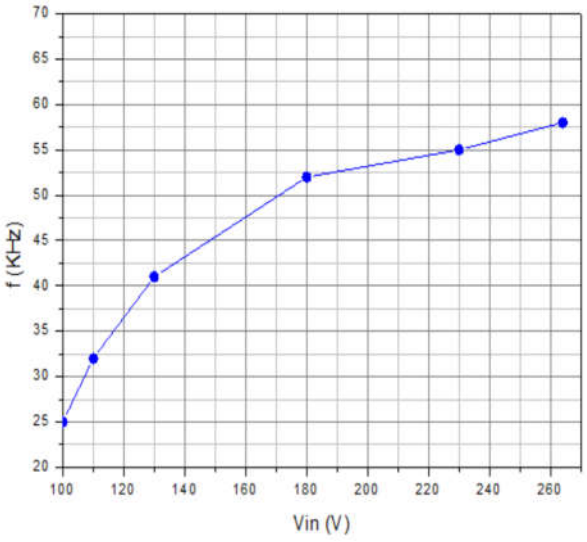
功率因数随输入电压变化曲线



输出电流随输入电压变化曲线

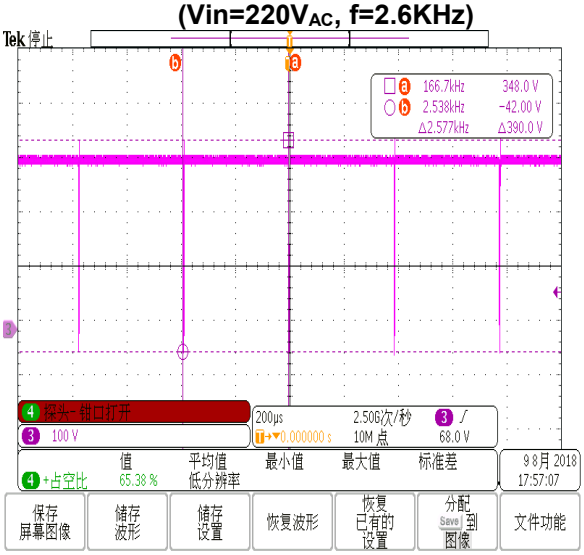


频率随输入电压变化曲线

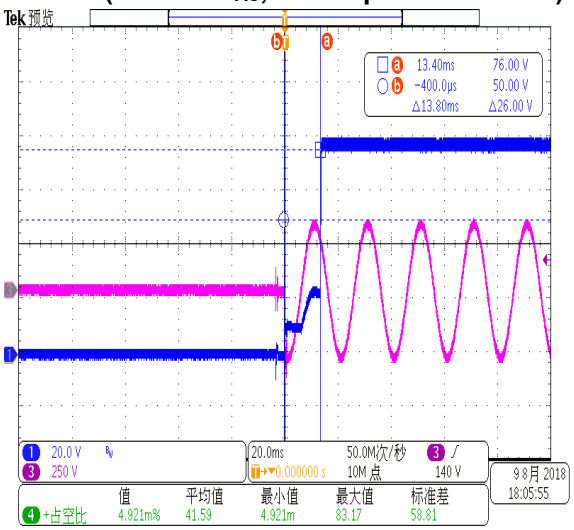


关键波形

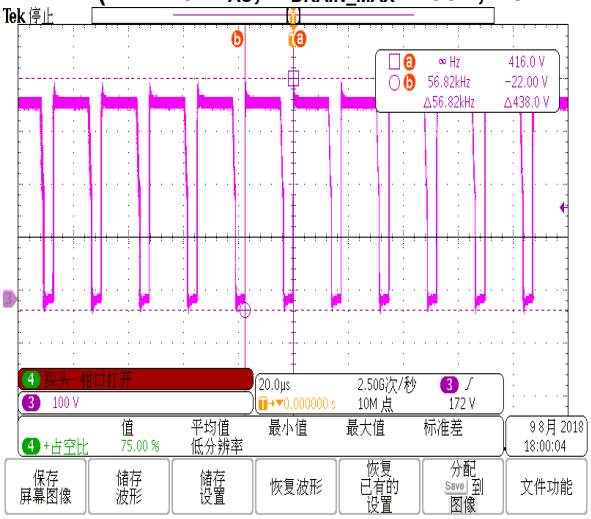
LED Short Protection
(Vin=220VAC, f=2.6KHz)



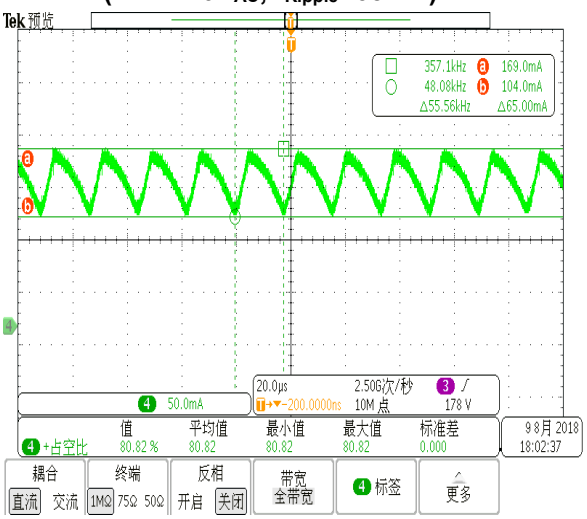
Start-up Time
(Vin=220VAC, Start-up time=13.8mS)



IC V_{DRAIN} Waveform
(Vin=264VAC, V_{DRAIN_MAX}=438V,f=57KHz)

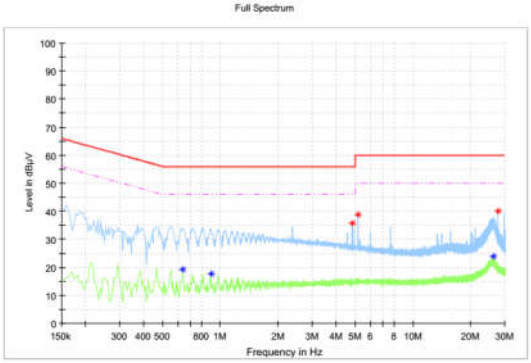


Io Waveform
(Vin=220VAC, I_{Ripple}=65mA)



EMI 传导测试（未读点数据）

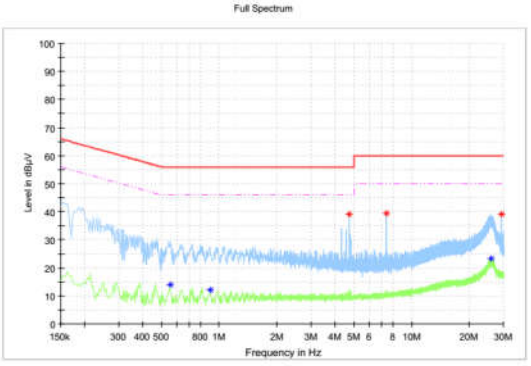
Line Terminal
(Vin=120VAC,Pass)



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Comment
0.634000	---	19.15	46.00	26.85	L1	OFF	11:36:56 - 2018/8/6
0.898000	---	17.76	46.00	28.24	L1	OFF	11:36:56 - 2018/8/6
4.838000	35.81	---	56.00	20.19	L1	OFF	11:36:56 - 2018/8/6
5.174000	38.83	---	60.00	21.17	L1	OFF	11:36:56 - 2018/8/6
26.306000	---	23.84	50.00	26.16	L1	OFF	11:36:56 - 2018/8/6
27.734000	39.91	---	60.00	20.09	L1	OFF	11:36:56 - 2018/8/6

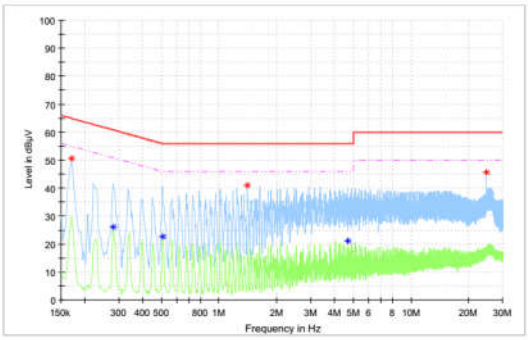
Neutral Terminal
(Vin=120VAC,Pass)



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Comment
0.554000	---	14.00	46.00	32.00	N	OFF	11:34:29 - 2018/8/6
0.894000	---	12.15	46.00	33.85	N	OFF	11:34:29 - 2018/8/6
4.758000	39.11	---	56.00	16.89	N	OFF	11:34:28 - 2018/8/6
7.362000	39.55	---	60.00	20.45	N	OFF	11:34:28 - 2018/8/6
25.890000	---	23.37	50.00	26.63	N	OFF	11:34:29 - 2018/8/6
29.434000	39.01	---	60.00	20.99	N	OFF	11:34:28 - 2018/8/6

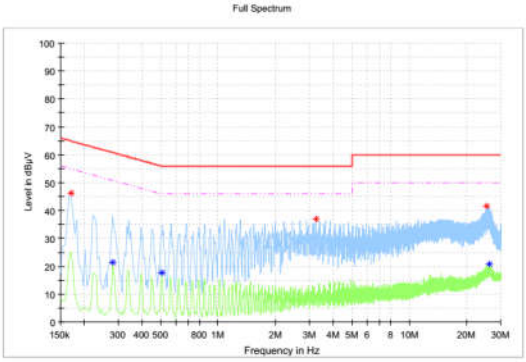
Line Terminal
(Vin=220VAC, Pass)



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Comment
0.170000	50.57	---	64.96	14.39	L1	OFF	11:25:48 - 2018/8/6
0.282000	---	26.02	50.76	24.74	L1	OFF	11:25:48 - 2018/8/6
0.506000	---	22.58	46.00	23.42	L1	OFF	11:25:48 - 2018/8/6
1.406000	40.98	---	56.00	15.02	L1	OFF	11:25:48 - 2018/8/6
4.666000	---	21.25	46.00	24.75	L1	OFF	11:25:48 - 2018/8/6
24.754000	45.59	---	60.00	14.41	L1	OFF	11:25:48 - 2018/8/6

Neutral Terminal
(Vin=220VAC, Pass)

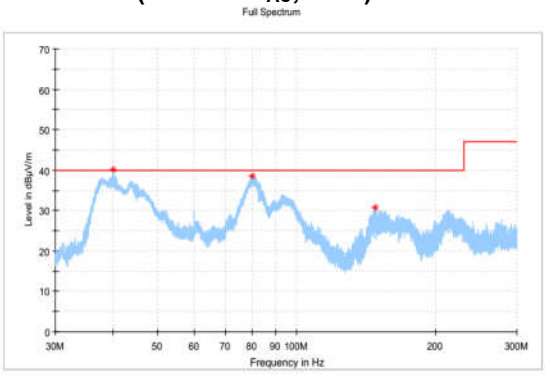


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Comment
0.170000	46.26	---	64.96	18.70	N	OFF	11:29:20 - 2018/8/6
0.282000	---	21.44	50.76	29.32	N	OFF	11:29:20 - 2018/8/6
0.510000	---	17.64	46.00	28.36	N	OFF	11:29:20 - 2018/8/6
3.266000	37.04	---	56.00	18.96	N	OFF	11:29:20 - 2018/8/6
25.390000	41.51	---	60.00	18.49	N	OFF	11:29:20 - 2018/8/6
26.070000	---	20.74	50.00	29.26	N	OFF	11:29:20 - 2018/8/6

EMI 辐射测试（未读点数据）

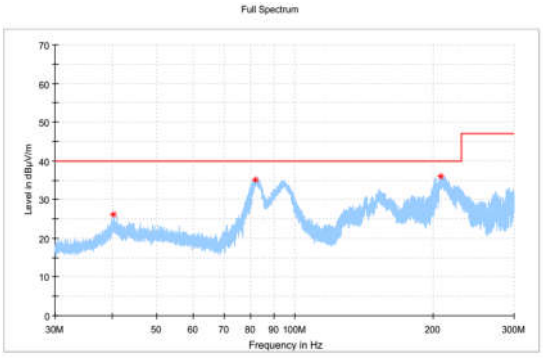
Vertical
(Vin=120V_{AC},Pass)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
148.134000	30.69	40.00	9.31	---	---	100.0	V	18.0
79.986000	38.61	40.00	1.39	---	---	100.0	V	275.0

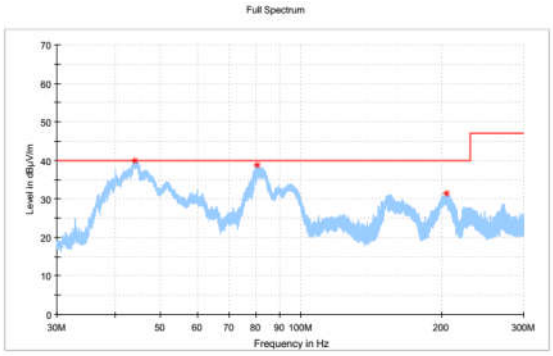
Horizontal
(Vin=120V_{AC},Pass)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
82.065000	35.22	40.00	4.78	---	---	400.0	H	89.0
40.215000	26.11	40.00	13.89	---	---	400.0	H	273.0
207.678000	35.94	40.00	4.06	---	---	200.0	H	333.0

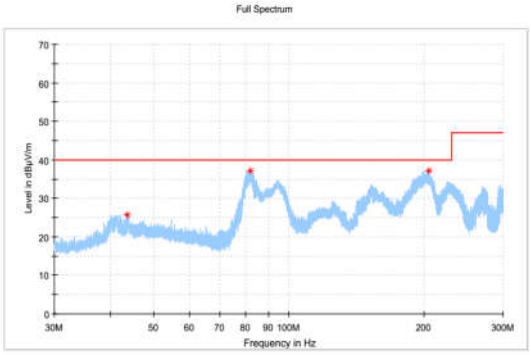
Vertical
(Vin=220V_{AC},Pass)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
44.040000	40.00	40.00	0.00	---	---	100.0	V	184.0
80.544000	38.76	40.00	1.24	---	---	100.0	V	232.0
204.492000	31.41	40.00	8.59	---	---	100.0	V	255.0

Horizontal
(Vin=220V_{AC},Pass)

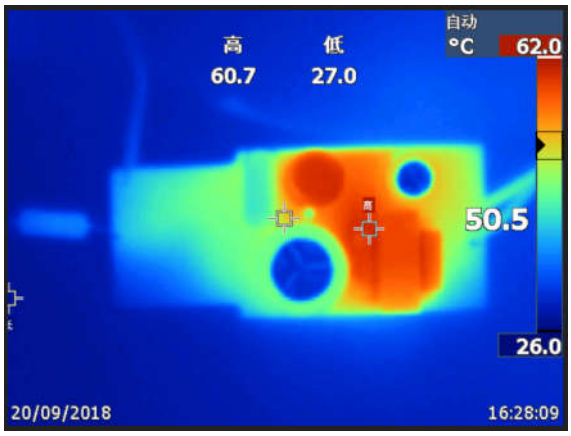


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
81.984000	37.16	40.00	2.84	---	---	400.0	H	85.0
43.518000	25.79	40.00	14.21	---	---	200.0	H	227.0
204.321000	37.19	40.00	2.81	---	---	200.0	H	339.0

温度测试

Top
(Vin=230VAC，open)



Bottom
(Vin=230VAC，open)