

## 概述

WS9082是一款专用于LED 的有源PFC非隔离降压型恒流驱动集成电路，芯片采用super-THD<sup>®</sup>专利的THD控制技术，无需外围供电元件，且不会因为自供电而发烫；芯片还采用了专利的最高频率限制技术，避免在输入电压波谷处，因CS太小而导致频率过高；系统工作在谷底开关模式，转换效率高，EMI低，PF高，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。

## 特点

- LED 短路保护
- LED 开路保护
- 高 PF，低 THD
- 无启动电阻
- 芯片过温保护
- 内置 550V 功率 MOSFET
- 谷底开关，高效率，低 EMI

## 应用

- 球泡灯
- 通用恒流源
- LED 驱动器

## 规格

参数	数值
输入电压	100~265V
输出功率	8.6W
输出电流	105mA
输出电压	82V
功率因素	>0.9
效率	>90%
尺寸	45x 24 x 13mm

## Demo 图片



图1: 正面

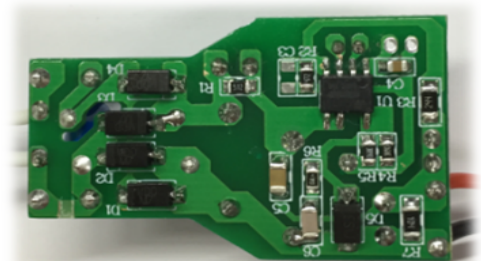


图 2: 反面

### PCB 走线

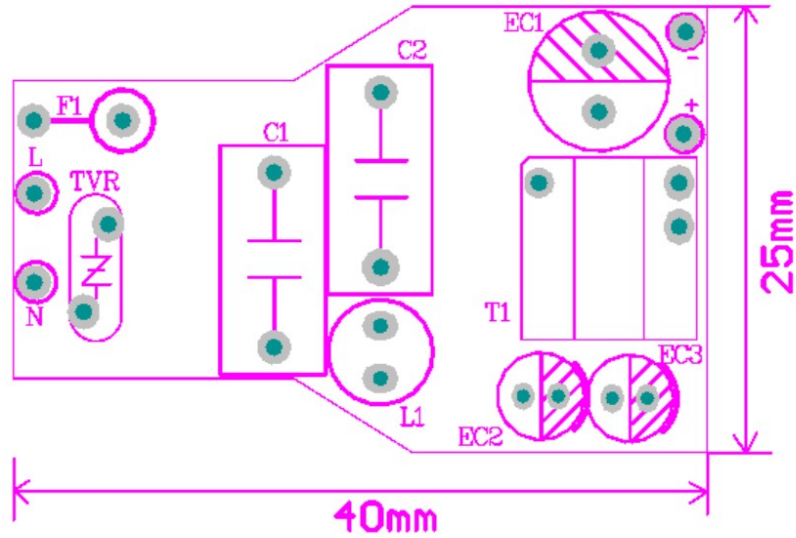


图3: PCB Layout Top View

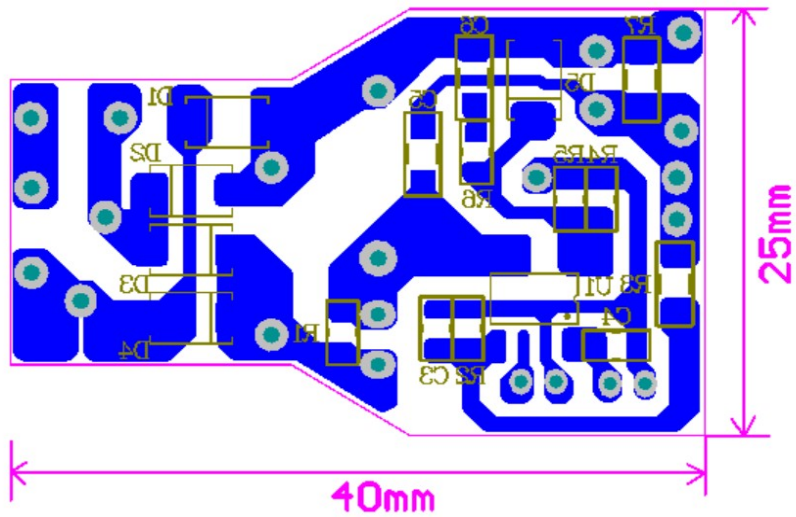


图4: PCB Layout Bottom View

### 原理图

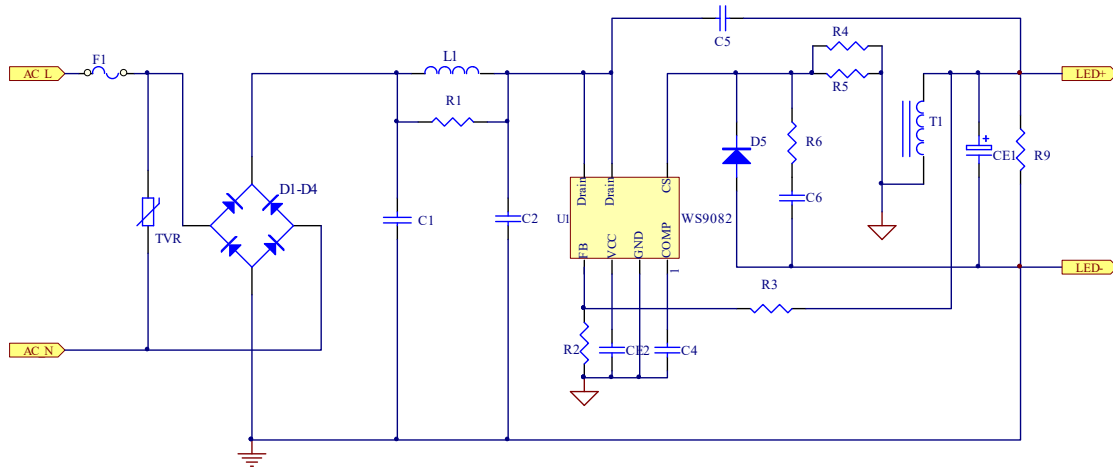


图5: 原理图

### 变压器设计

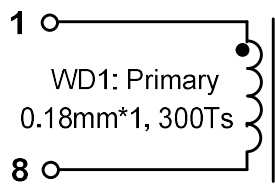
#### 骨架和磁芯

EE10 立式 4+4 脚

#### 变压器参数

1. 原边电感 (1 脚-8 脚, 去掉其他脚位):  $L_p=2\text{mH}, \pm 5\% @ 1\text{kHz}$
2. 原边匝数(1 脚-8 脚):  $N_p=300\text{Ts}$

#### 变压线绕线图



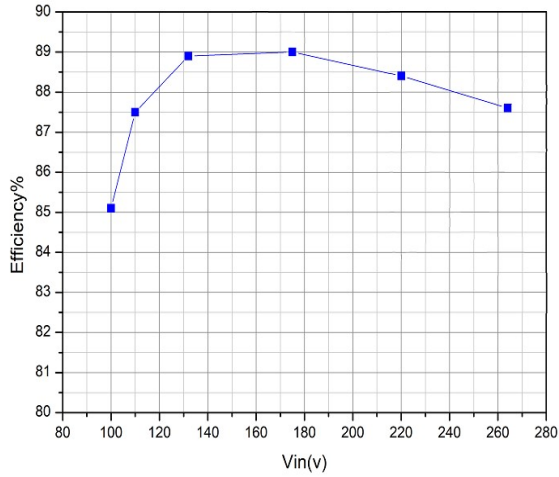
项	绕线名称	描述
1	原边绕线	起始于 1 脚, 用 0.18mm 的线径绕线 300 匝, 终于 8 脚。
2	屏蔽	2 层绝缘胶带

### BOM

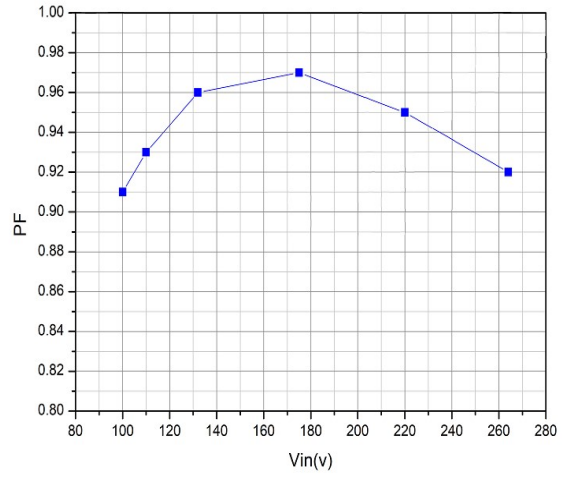
No.	Item	Description	Package	QTY
1	C1, C2	100nF/400V, CL21, Pitch=7.5mm	DIP	2
2	C3	NC	0805	0
3	C4	Ceramic Cap, 1uF/25V,X7R	0805	1
4	C5	Ceramic Cap, 10nF/1000V,X7R	1206	1
5	C6	NC	1206	0
6	EC1	E-Cap,47uF/100V,8*12mm	DIP	1
7	EC2	E-Cap,4.7uF/50V,5*12mm	DIP	1
8	D5	Fast Recovery Diode, ES1J, 1A/600V	SMA	1
9	VR1	Varistor, 07D511K	DIP	1
10	F1	Fuse Resistor,47R, 5%, 1W	DIP	1
11	R1	SMD Resistor,5.1K, 5%, 1/8W	0805	1
12	R3	SMD Resistor,240K, 5%, 1/4W	1206	1
13	R4,R5	SMD Resistor,3.9R, 1%, 1/8W	0805	2
14	R2	SMD Resistor,4.7K, 1%, 1/8W	0805	1
15	R7	SMD Resistor,100K, 5%, 1/4W	1206	1
16	D1-D4	Diode, M7, 1A/1000V	SMA	4
17	L1	Inductor 2.2mH, 6*8mm	DIP	1
18	T1	EE10, Vertical, 4+4 pin,Single Winding,2mH	DIP	1
19	U1	WS9082, high PFC Buck IC, Winsemi	SOP-7	1
20	PCB	FR4 Single layer, 40*26mm		
<b>Total</b>				<b>22</b>

### 电气特性

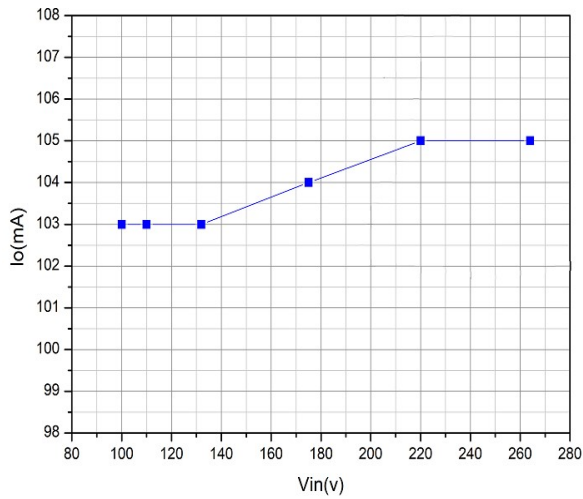
#### 效率随输入电压变化曲线



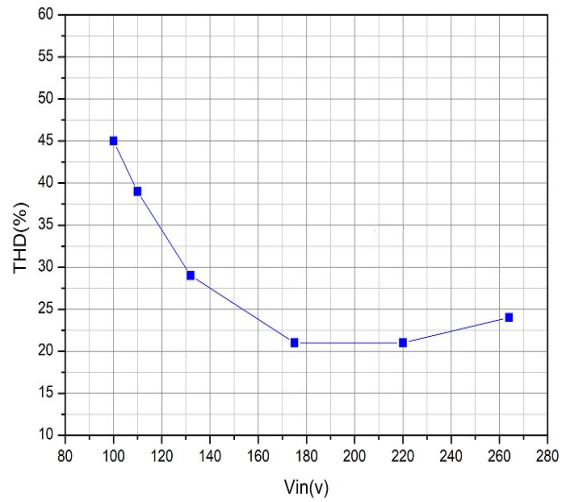
#### 功率因素随输入电压变化曲线



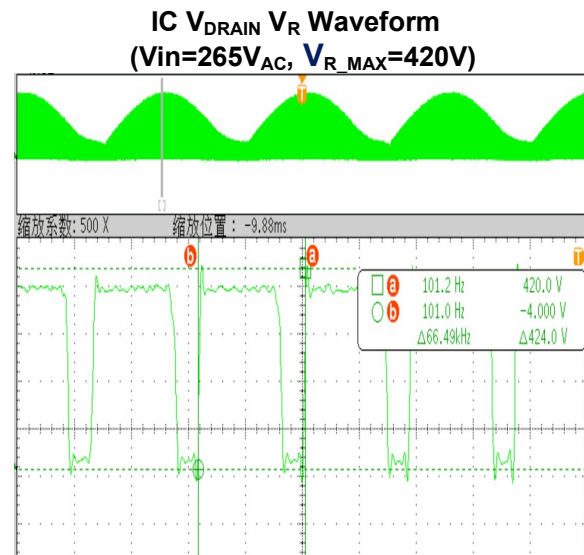
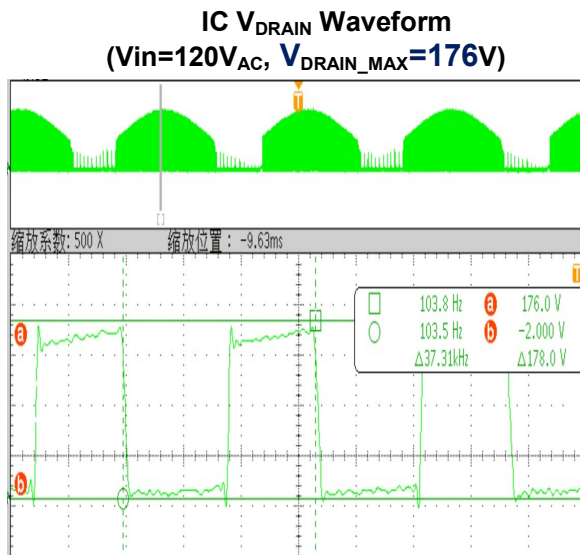
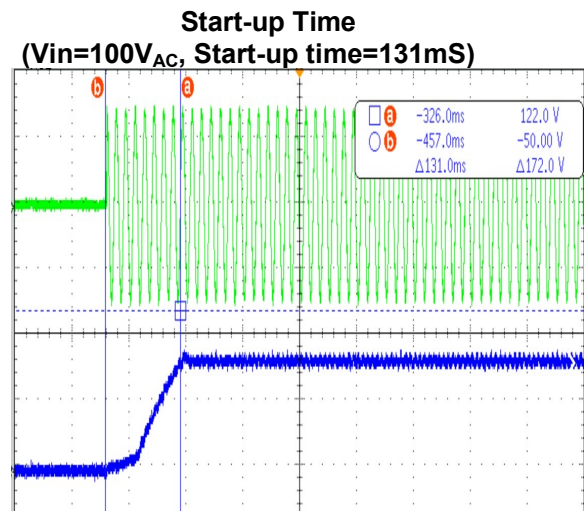
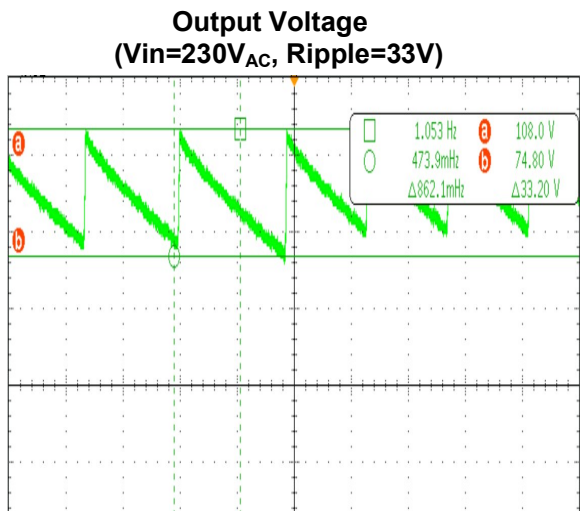
#### 输出电流随输入电压变化曲线



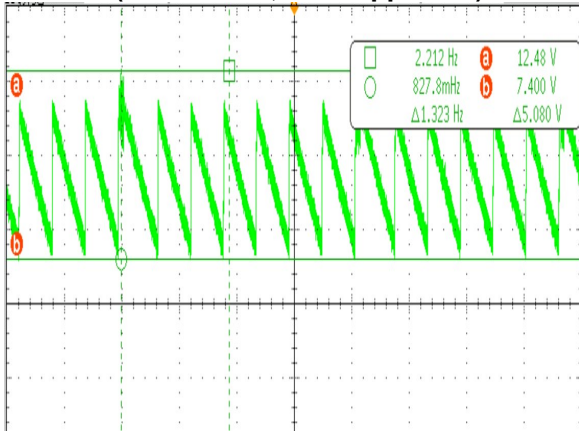
#### 谐波随输入电压变化曲线



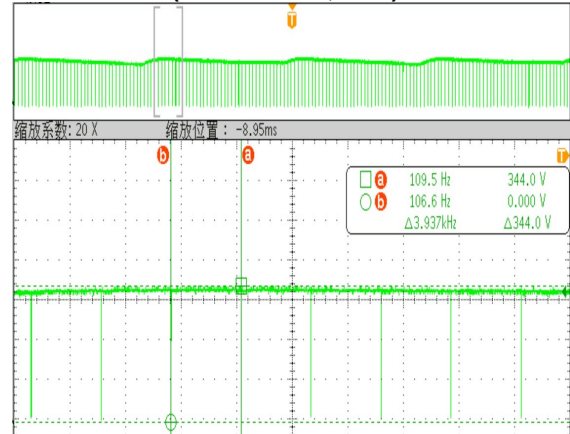
### 关键波形



**LED Open Protection**  
(Vin=230V<sub>AC</sub>, Vcc Ripple=5V)

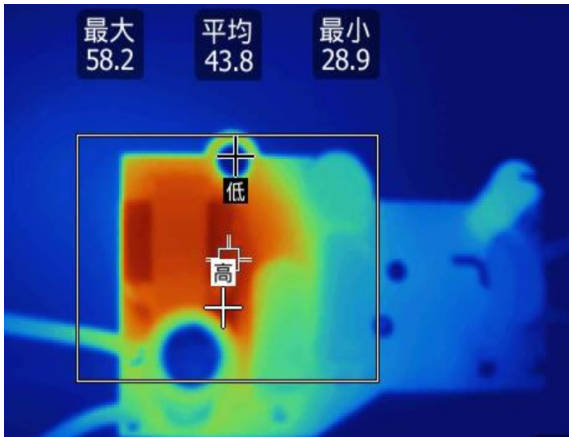


**LED Short Protection**  
(Vin=230V<sub>AC</sub>, f=4k)

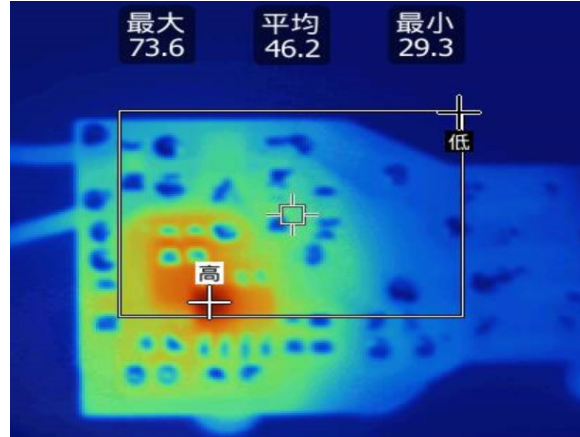


### 温度测试

**Top**  
(Vin=230V<sub>AC</sub>, Burn-in time=60min)

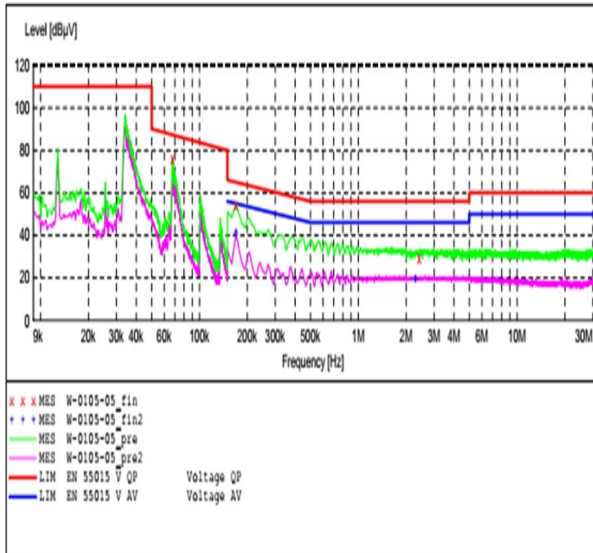


**Bottom**  
(Vin=230V<sub>AC</sub>, Burn-in time=60min)

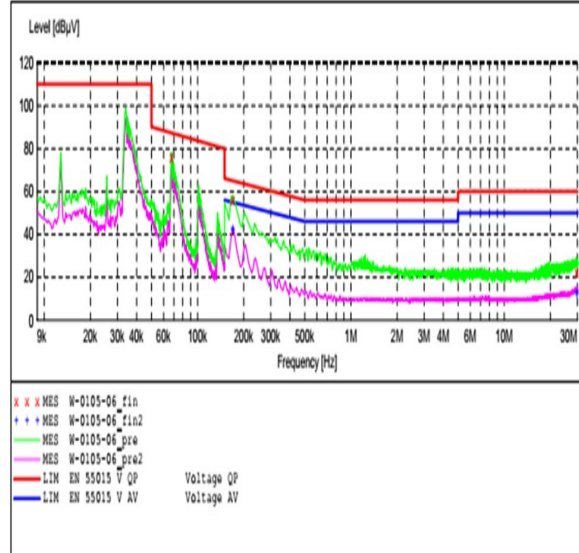


### EMI 传导测试

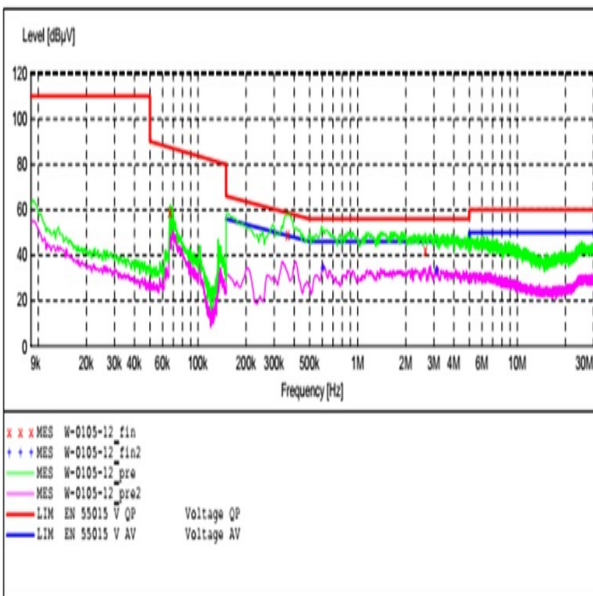
**Line Terminal**  
(Vin=120V<sub>AC</sub>, Pass)



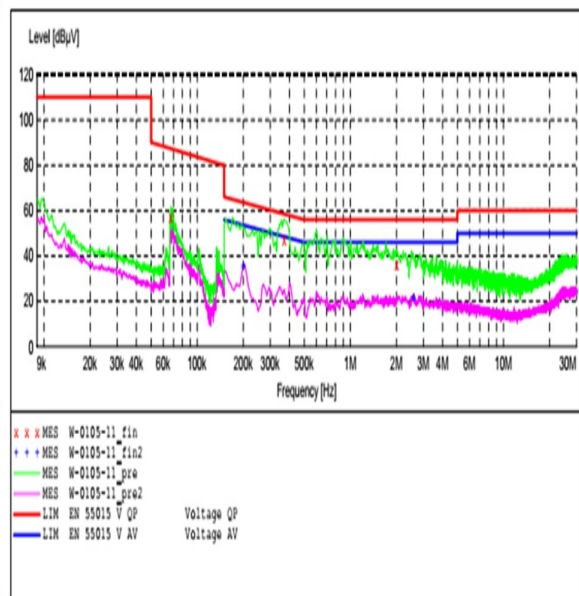
**Neutral Terminal**  
(Vin=120V<sub>AC</sub>, Pass)



**Line Terminal**  
(Vin=230V<sub>AC</sub>, Pass)



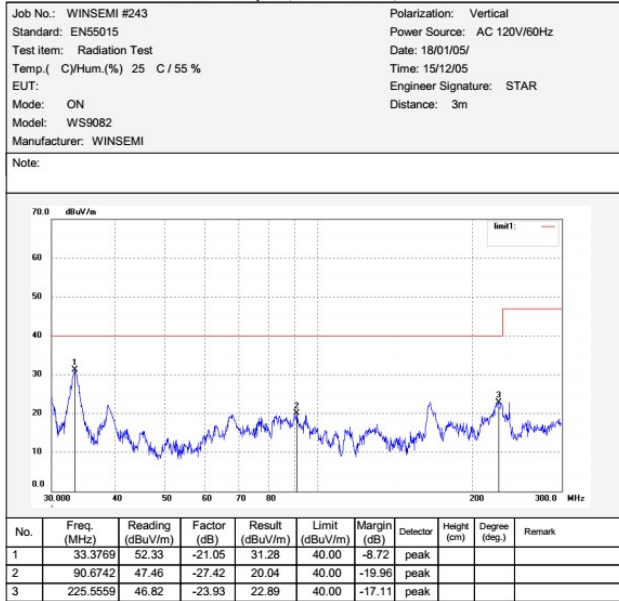
**Neutral Terminal**  
(Vin=230V<sub>AC</sub>, Pass)



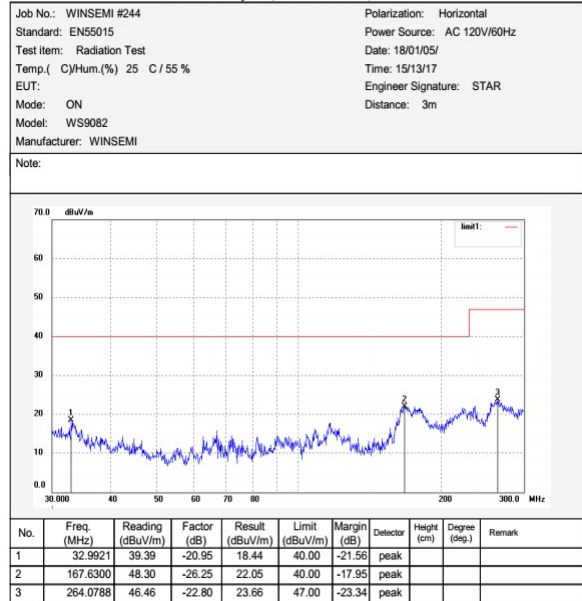


### EMI 辐射测试

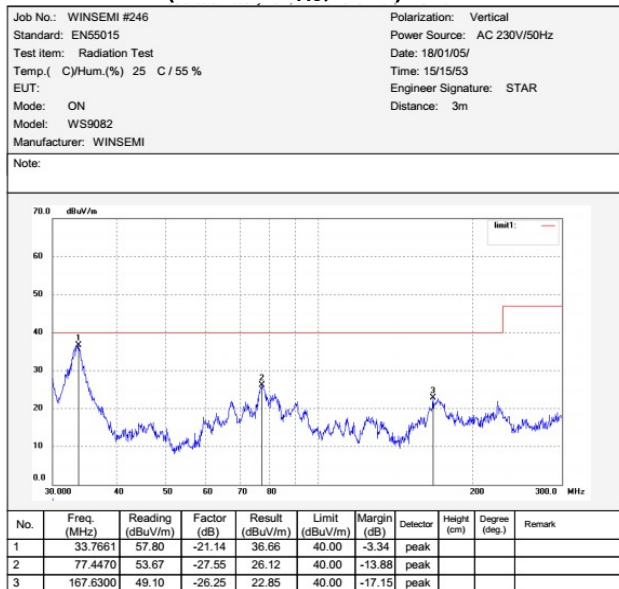
#### Vertical (Vin=120V<sub>AC</sub>, Pass)



#### Horizontal (Vin=120V<sub>AC</sub>, Pass)



#### Vertical (Vin=120V<sub>AC</sub>, Pass)



#### Horizontal (Vin=120V<sub>AC</sub>, Pass)

