SPECIFICATION

For

SWITCHING POWER SUPPLY

M/N: MPE-S203 (12V / 16.6A)

Revision History

Version	Revise Date	Change Items
Rev. 01	Aug. 24. 2020	Established.
Rev. 02	Feb. 19. 2021	Changed derating curve.
Rev. 03	Apr. 14. 2021	Changed derating curve.

MPE-S203

12V / 16.6A AC / DC

FEATURES

- ✓ 200W with forced-air cooling.
- ✓ 150W convection-cooled.
- ✓ Compact size 2” x 4”.
- ✓ No-load power consumption < 0.1W.
- ✓ IEC62368-1, UL62368-1 Approved.
- ✓ Meets EMI CISPR / FCC class B.

Models & Ratings

Model Number	Wattage (Rated / Max)	Output Voltage	Min. Current	Rated Current	Max. Current
MPE-S203	150 W / 200 W	+12 V	0 A	12.5 A	16.6 A

Total Output Power: Max. 150W with convection cooled at 50°C environment temperature, Max. 200W with 10 CFM.

Model no. coding:

M P E – S 2 0 3 – X

X(Connector Type):	[Blank]	JST Type Connector or equivalent.
		Dinkle P-820W Terminal blocks or equivalent.

Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	85	115 / 230	264	VAC	Continuous input range.
Input Frequency	47	50 / 60	63	Hz	At AC input.
Efficiency		90		%	At input 230 VAC
Operation Temperature	-20*		+80	˚C	*Can be started up / activated at -20C. In order to stabilize within specification, it needs to **warm up** at negative temperature. Please refer to the derating curves.
Weight		205		g	
Dimensions	101.6 (L) x50.8 (W) x 37.6(H) mm, Tolerance +/- 0.4mm.				
EMC	EN55032, CISPR 22 & FCC Part 15, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11				
Safety Approvals	IEC 62368-1, UL 62368-1, 2nd Edition, CSA C22.2 No. 62368-1-14,2nd Edition				

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	85	115 / 230	264	VAC	Universal input range.
Input Frequency	47	50 / 60	63	Hz	At AC input.
Input Current			2.5 / 1.5	A	Nominal AC Input Voltage (115 / 230 VAC), rated load.
Inrush Current			50	A	Nominal AC Input Voltage (115 / 230 VAC), one cycle at 25°C cold start.
No-load power consumption			< 0.1	W	Nominal AC Input Voltage (115 / 230 VAC).
Input Protection	One non-user serviceable internally located AC input line fuse. Fuse：T5.0A / 250 VAC * 1pcs				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		12		VDC	
Output Current		12.5	16.6	A	
Initial Set Accuracy		±1.0		%	Initial setting accuracy is at Input 115 VAC and output at 60% rated load.
Minimum Load		0		A	
Start Up Delay		0.2	0.5	Sec	Time required for initial output voltage stabilization.
Hold Up Time		10 / 55		mS	Nominal AC Input Voltage (115 / 230 VAC), rated load.
Line Regulation		±0.5		%	Less than ±0.5% at rated load with ±10% changing in input voltage 115 / 230 VAC.
Load Regulation		±0.5		%	Measured from 60% to 100% rated load and from 60% to 20% rated load (60% ±40% rated load).
Ripple & Noise		120		mV	Measured at rated load and Nominal AC Input Voltage (115 / 230 VAC) by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10μF Electrolytic Capacitor and a 0.1μF Ceramic Capacitor.
Leakage Current			0.6	mA	At input 264 VAC, 63Hz
Overvoltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will Latch-off the outputs to prevent damaging external circuits, the trigger point is around 110%~133% of output voltage.				
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.				

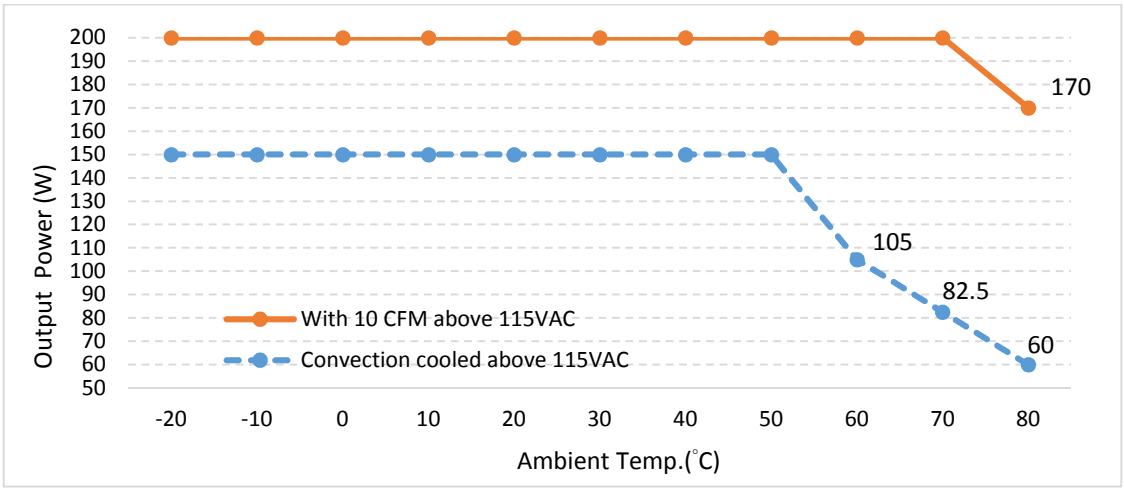
General

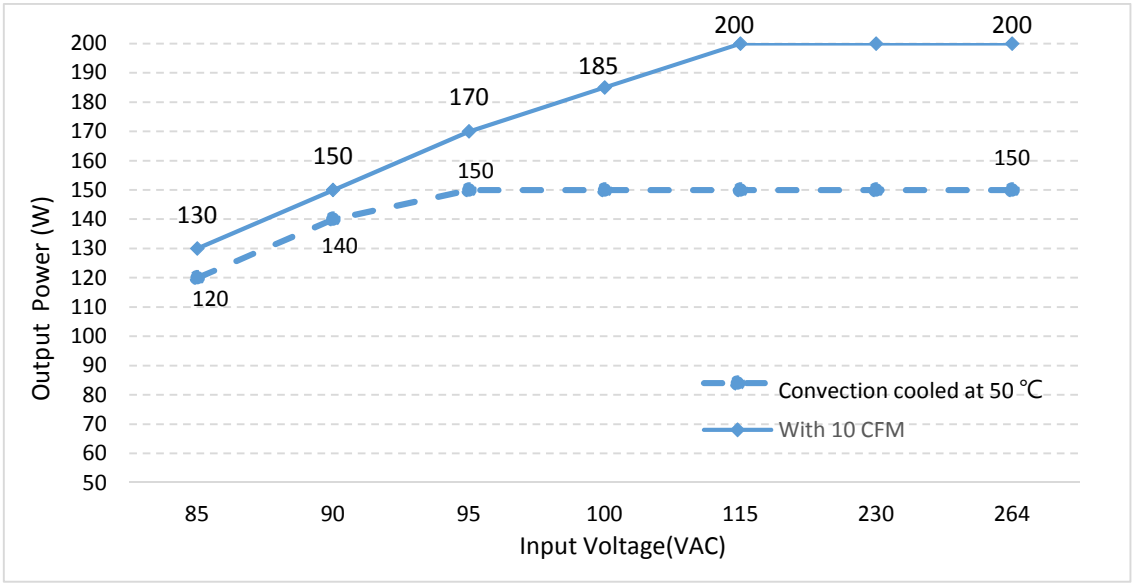
Characteristic		Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			90		%	At input 230VAC.
Isolation	IP to OP	3000			VAC	
	IP to GND	1800			VAC	
Switching Frequency			65		KHZ	

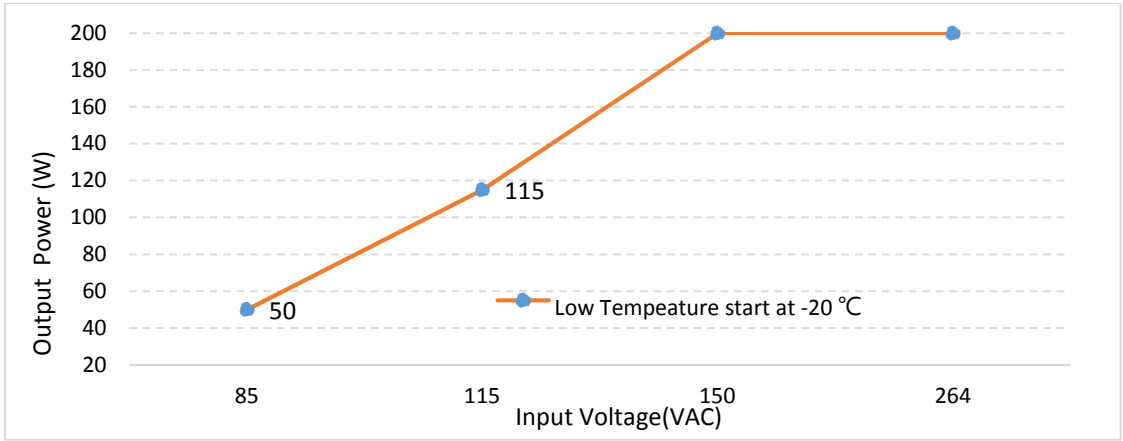
Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20*		+80	˚C	*Can be started up / activated at -20C. In order to stabilize within specification, it needs to **warm up** at negative temperature. Please refer to the derating curves as following.
Storage Temperature	-40		+85	°C	
Relative Humidity	5		95	%RH	Non-condensing.
Cooling	10			CFM	
Operating Altitude		5000		M	
Vibration	0.26		6.09	G	Frequency Type: Sweep Frequency Frequency Range: 10~55 Hz Displacement: 1.0mm Sweep Rate: 60 minute / cycle Number of cycle: 1 cycle / axis Direction: X ,Y and Z axis

Derating curve







EMC: Emissions

Phenomenon	Standard	Class	Notes & Conditions
Conducted	EN 55032 / CISPR 32 & FCC Part 15	B	
Radiated	EN 55032 / CISPR 32 & FCC Part 15	B	
Harmonic	EN 61000-3-2	A	
Voltage Flicker	EN 61000-3-3	Pass	

EMC: Immunity

Phenomenon	Standard	Criteria	Notes & Conditions
ESD	IEC 61000-4-2	A	±8KV air discharge, ±6KV contact discharge
Radiated	IEC 61000-4-3	A	10V/m
EFT	IEC 61000-4-4	A	±2KV Line & PE
Surges	IEC 61000-4-5	A	L-N:±1KV, L/N-PE:±2KV
Conducted	IEC 61000-4-6	A	10V
Power Magnetic	IEC 61000-4-8	A	10A/m
Dips and Interruptions	IEC 61000-4-11	A / B A / B A / B B	DIP: >95%, 0.5 cycle (Note 1.) DIP: 30%, 25 cycles (Note 1.) DIP: 60%, 5 cycles (Note 1.) INT: >95%, 250 cycles

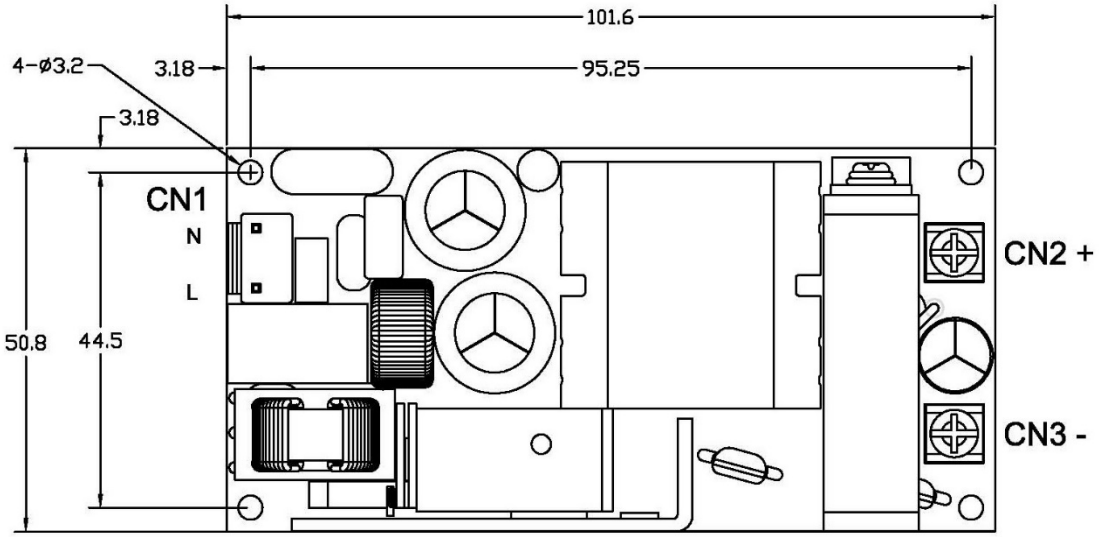
Note:
1. The test result of input 240Vac / 100Vac is criteria A / B.

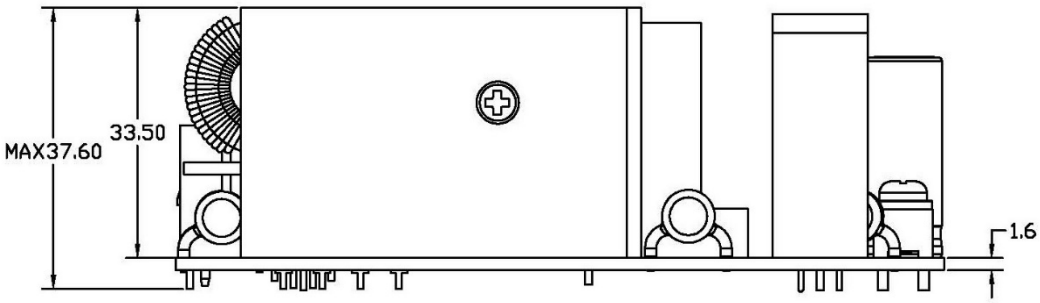
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB	IEC 62368-1, 2nd Edition	Approved.
UL/cUL	UL 62368-1, 2nd Edition, CSA C22.2 No. 62368-1-14, 2nd Edition	Approved.

Mechanical Details

Unit: mm
SIZE：101.6(L) x 50.8(W) x37.6(H)mm, Tolerance +/-0.4mm.





Parameter	Conditions/Description				
Dimension	101.6(L) x50.8(W) x 37.6(H)mm, Tolerance +/-0.4mm.				
Connector & Pin Assignment	Location	Pin	Assignment	Proposed Housing	Proposed Terminals
	CN1 (Input)	1	AC in (L)	JST: VHR-3N or equivalent	JST:SVH-21T-P1-1 or equivalent
		2	AC in (N)		
	CN2 (Output)	1	+V	Dinkle P-820W Terminal blocks or equivalent	
	CN3 (Output)	1	0V		

Thermal Considerations

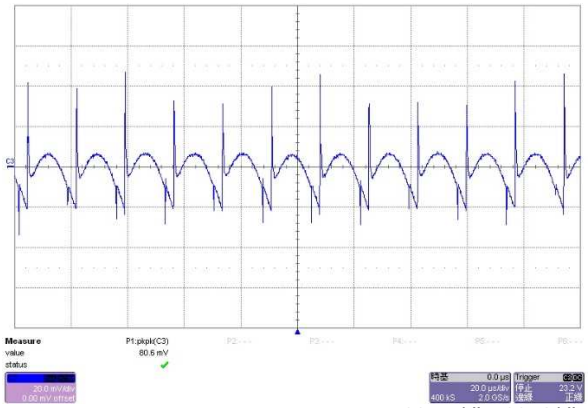
In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded.
Temperature should be monitored using J type thermocouples placed on the hottest part of the component (out of any direct air flow). See Mechanical Details for component locations.

Temperature Measurements at max. Amb.	
Component	Max Temperature ℃
C1	100
T1	110
L1	100
Q5	100
C12	100

Performance

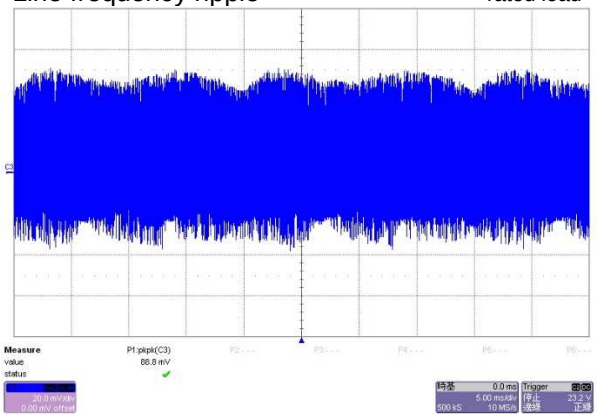
(Input voltage: 230Vac)

Switching frequency ripple rated load



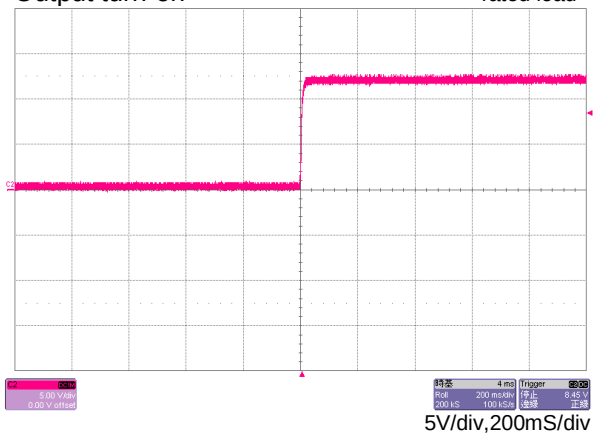
20mV/div, 20uS/div

Line frequency ripple rated load



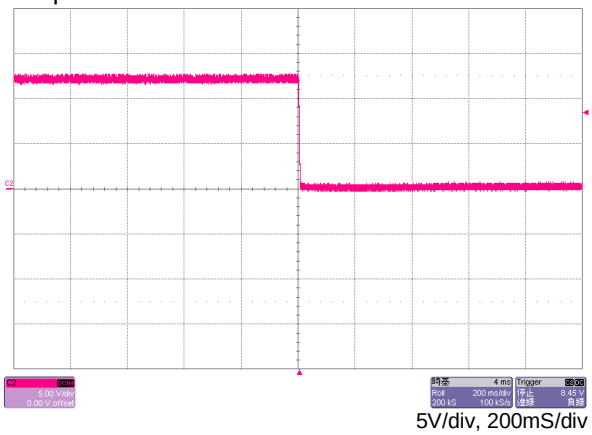
20mV/div, 5mS/div

Output turn-on rated load



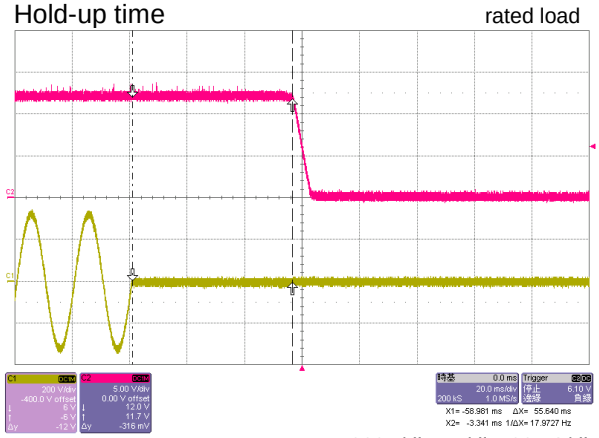
5V/div,200mS/div

Output turn-off rated load



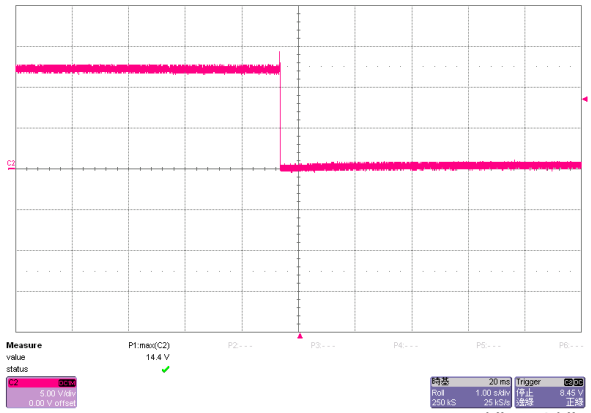
5V/div, 200mS/div

Hold-up time rated load



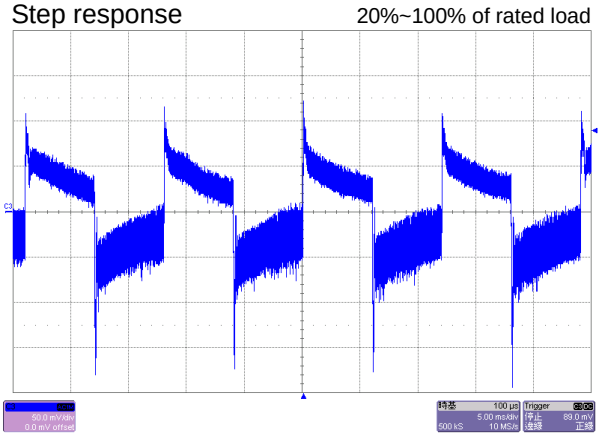
200V/div,5V/div, 20mS/div

OVP 60% of rated load



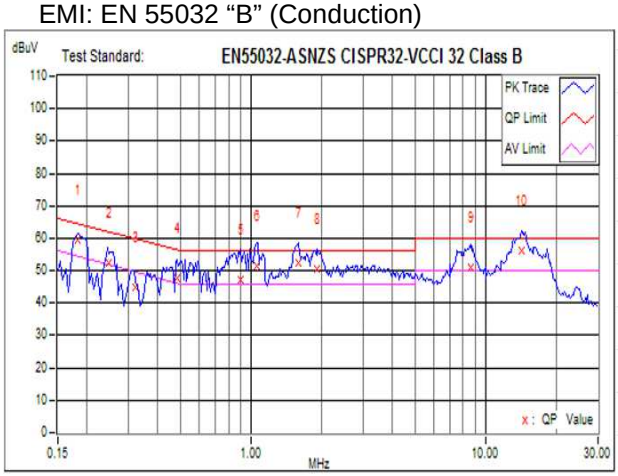
5V/div, 1S/div

Step response 20%~100% of rated load



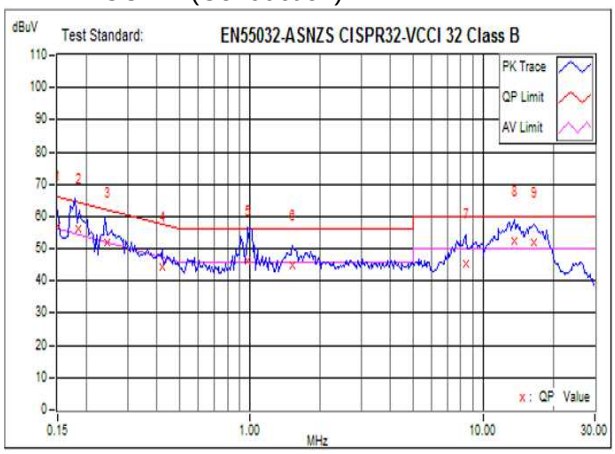
50mV/div, 5mS/div

EMI: EN 55032 “B” (Conduction)



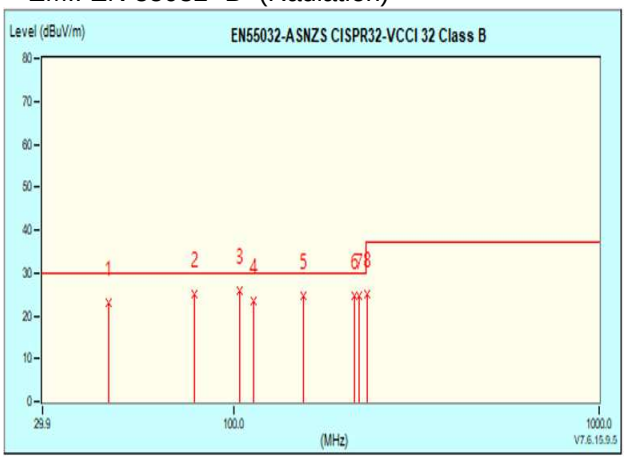
230Vac/Max. load

EMI: FCC “B” (Conduction)



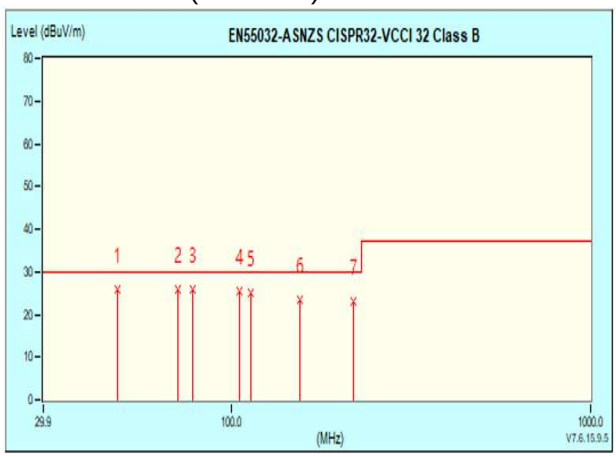
115Vac/Max. load

EMI: EN 55032 “B” (Radiation)



230Vac/Max. load

EMI: FCC “B” (Radiation)



115Vac/Max. load