



SPECIFICATION

For

SWITCHING ADAPTER

M/N: MPM-X120 series

Revisions History

REV.	Oct. 20 th 2008	Adding TÜ V T-mark and CB as approved.
REV.	Nov. 5 th 2008	Adding derating info, option ac cable tie set, and part number coding.
REV.	Nov. 6 th 2008	Adding additional performance photo and drawings.
REV.	Nov. 20 th 2008	Adding RoHS conform logo.
REV.	Nov. 25 th 2008	Rewrite 8. Option from “cable tie set” to “Strain Relief Kit”.
REV.	Nov. 26 th 2008	Adding data value for Conduction Line with input 110V.
REV.	Feb. 9 th 2009	Adding UL, cUL logo as approved and update regular stocking items.
REV.	Feb. 6 th 2010	Adding output cable select notes.
REV.	May. 5 th 2010	Correcting the wrong dimension description to 175 x 90 x 51.3mm.
REV.	Oct. 13 th 2010	Updating safety approval status.
REV.	Mar. 28 th 2011	Update the safety approved status.
REV.	Aug. 23 rd 2011	Update the safety approved status.
REV.	Sep. 25 th 2011	Update the mechanical drawing.
REV.	Dec. 28 th 2011	Update the part number coding.



BF direct patient contact rated



FEATURES

- 120W medical adapter with active PFC
- Green power CEC/Energy Star group V complied
- Medical standard of IEC 60601-1 2nd & 3rd, EN 60601-1 2nd & 3rd and UL 60601-1 1st edition approved.
- IT standard of IEC 60950-1 2nd, CCC GB 4943-2001 and PSE J60950 approved.
- Conductive EMI meets CISPR/FCC Class B
- Design to meet medical standard type BF rated
- Wall mount mechanical construction possible
- Optional strain relief kit for tightening the AC power cord

1. Description

MPM-X120 series is a signal output, 120W with active PFC adapter for medical system applications. The adapter is design to meet EN 60601-1 and UL 60601-1 safety standards.

Model Name	Output Voltage	Min. Output Current	Rated Output Wattage	Rated output current	Line Regulation	Load Regulation	Ripple & Noise p-p	Initial Setting Accuracy
MPM-X123	+12-13.8V	0A	120W	10-8.6A	±1%	3%	120mV	2%
MPM-X124-1	+19-20V	0A	120W	6.3-6A	±1%	2%	190mV	2%
MPM-X125	+24V	0A	120W	5A	±1%	2%	200mV	2%
MPM-X125-1	+36V	0A	120W	3.3A	±1%	3%	240mV	2%

Note: 1) suffix "-G" means Optional removing Y capacitor between input ground to output return ground. Connect the input ground directly to output return ground. Please refer part number coding at section 9.
 2) optional shielded output cable by request, please refer part number coding at section 9.

2. Input Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Input Voltage	Continuous input range.	90	115/230	264	VAC
Input Frequency	AC input.	47		63	Hz
Hold Up Time	Nominal AC Input Voltage (115VAC), rated load.	16			ms
Input Current	Nominal AC Input Voltage (115VAC/230VAC), rated load.			2	A
Inrush Current	Nominal AC Input Voltage (115VAC/230VAC), one cycle at 25°C.			30/60	A

3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	Rated load, 115VAC. Varies with distribution of loads among output.			>90	%
Minimum load					See Chart of Description
Ripple & Noise	Rated load, 20MHz bandwidth and the each output is connected With a 47µF electrolytic capacitor and a 0.1µF ceramic capacitor.				See Chart of Description
Output Power	Continuous output power.				See Chart of Description

4. Internal Protection

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Over Voltage Protection	Fully protected against over voltage and the trigger point is:				Vdc
	MPM-X123	15		17	
	MPM-X124-1	24		27	
	MPM-X125	26.5		30	
	MPM-X125-1	37		41.5	
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.				
Earth Leakage Current	Limit of type BF compliant. Worst case leakage current is less than 300µA at 264Vac, 63Hz normal condition and 500µA single fault condition.				



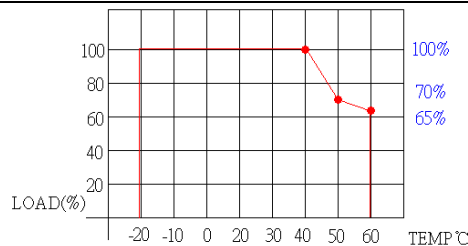
5. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description			
Safety	IEC 60601-1: 1988+A1+A2		TUV approved	
	IEC 60601-1: 2005		TUV approved	
	EN 60601-1: 2006		TUV approved	
	UL 60601-1, 1 st Edition, 2006-04-26		UL approved	
	CAN/CSA-C22.2 No.601.1-M90, 2005		cUL approved	
	IEC 60950-1: 2005+A1		TUV approved	
	GB 4943-2001		CCC approved	
	*J60950(H19)		TUV approved	
Hi-Pot	Input to output	6346	VDC	
Energy Star / CEC	California Energy Commission's Appliance Regulations Section 1601-1608 of title 20 of the California code of regulations	V	Level	
EMI	EN 60601-1-2: 2007	B	Class	
	GB 9254-2008			
	GB 17625.1-2003			
PFC	EN 61000-3-2: 2006+A2: 2009 & EN 610003-3: 2008	D		
EMS	IEC 61000-4-2: 2008, 8KV air discharge	A	Criteria	
	IEC 61000-4-3: 2006+A1: 2007+A2: 2010, 3V/m	A		
	IEC 61000-4-4: 2004+A1: 2010, 2KV line & PE	A		
	IEC 61000-4-5: 2005, L-N: 1KV, L/N-PE: 2KV	A		
	IEC 61000-4-6: 2008, 3V/m	A		
	IEC 61000-4-8: 2009, 3A/m	A		
	IEC 61000-4-11: 2004, Voltage dips >95%, 0.5 cycle	A		
		Voltage dips 30%, 5 cycles		A
		Voltage dips 60%, 25 cycles		B
		Voltage interruptions >95%, 250 cycles		B

*: The PSE approval marking on products is by request.

6. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Operating Temperature	Rated load and convection cooling, derating from 40-60°C.	-20		60	°C



Storage Temperature		-20		+85	°C
Relative Humidity	Non-condensing.	10		90	%RH

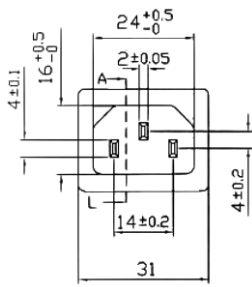
7. Mechanical Specification

Parameter	Conditions/Description
Dimension	175 x 90 x 51.3mm excluding the output cable, tolerance +/- 4mm.
Output cable	Length 1.8 m maximum for MPM-X124-1, MPM-X125 and MPM-X125-1. Length 1.2 m maximum for MPM-X123.
Connector	AC input: IEC 60320 Inlet / C14 (Class I) DC output plug: 4 pin DIN plug, 180°



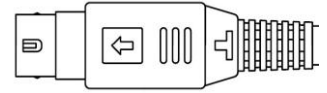
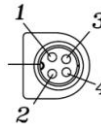
AC inlet:

IEC 60320 inlet C14

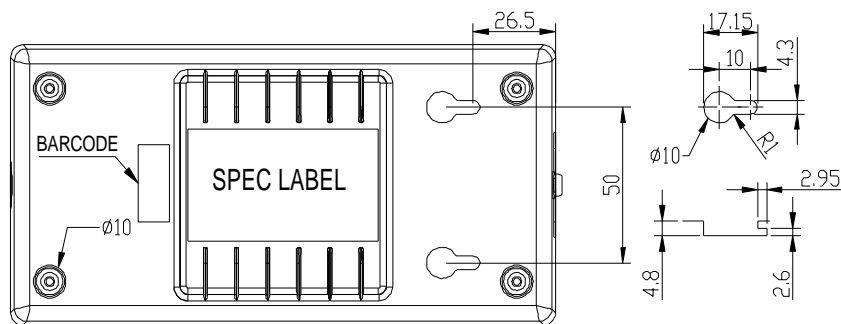
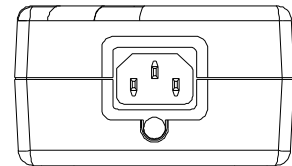
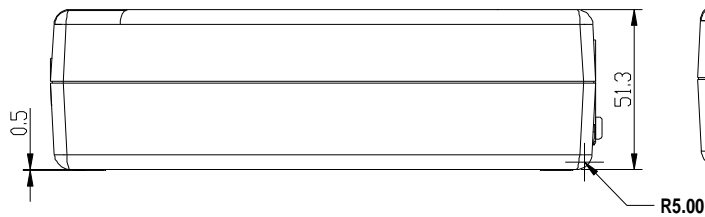
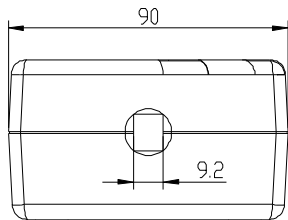
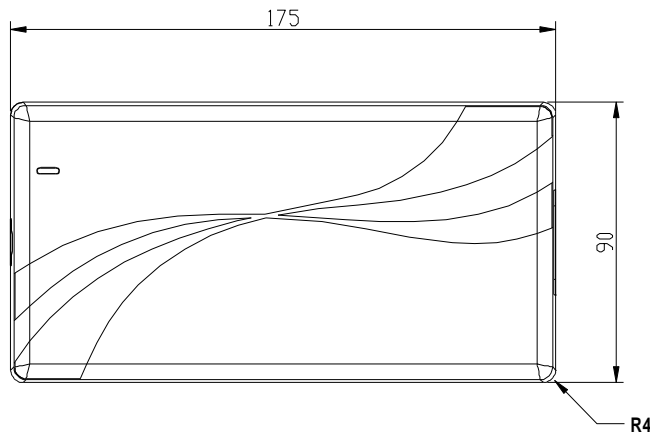


DC plug pin assignment:

#	Polarity
1	V+
2	V+
3	V-
4	V-



Mechanical drawing



8. Option

Parameter

Strain Relief Kit
(P/N 747-SWPL-2F)

Conditions/Description

Tighten the AC power cord to the adapter.





9. Part number coding

MPM-X12 Y - Z₁Z₂ Z₃ Z₄

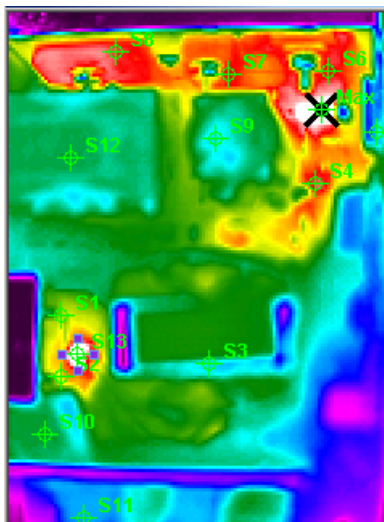
Please refer to the following table for characters:

Coding	Y	Regular Stocking	3	+12 Vdc	
			4-1	+19 Vdc	
			5	+24 Vdc	
		Options	3-1	+13.8 Vdc	
			4-2	+20 Vdc	
			5-1	+36 Vdc	
	Z ₁ Z ₂	Regular Stocking	52	Straight 4 pin din, pin 1 & 2: V+, pin 3 & 4: V-	
		Options	51	Straight 4 pin din, pin 1 & 3: V-, pin 2 & 4: V+	
	Z ₃	Regular Stocking	2	1.2m with one ferrite core	
			3	1.8m with one ferrite core	
		Options	6	1.2m shielding with one ferrite core	
			7	1.8m shielding with one ferrite core	
	Z ₄	Regular Stocking	0	Full isolated from PRI GND to SEC GND	
		Options	G	PRI GND connect directly to SEC GND	
	Note: 1) MPM-X123 & MPM-X123-1 can only use output cable length less than or equal 1.2m. 2) Please contact us for availability, lead time and the EMI criteria if request the extra options.				

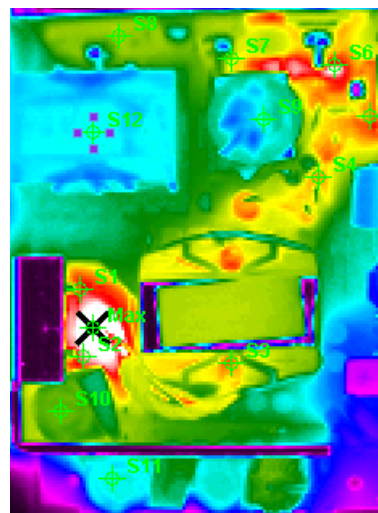
10. Performance

Thermal (input 90V/50Hz, output 24Vdc / full load, ambient temperature 25°C)

Thermal (input 264V/50Hz, output 24Vdc / full load, ambient temperature 25°C)



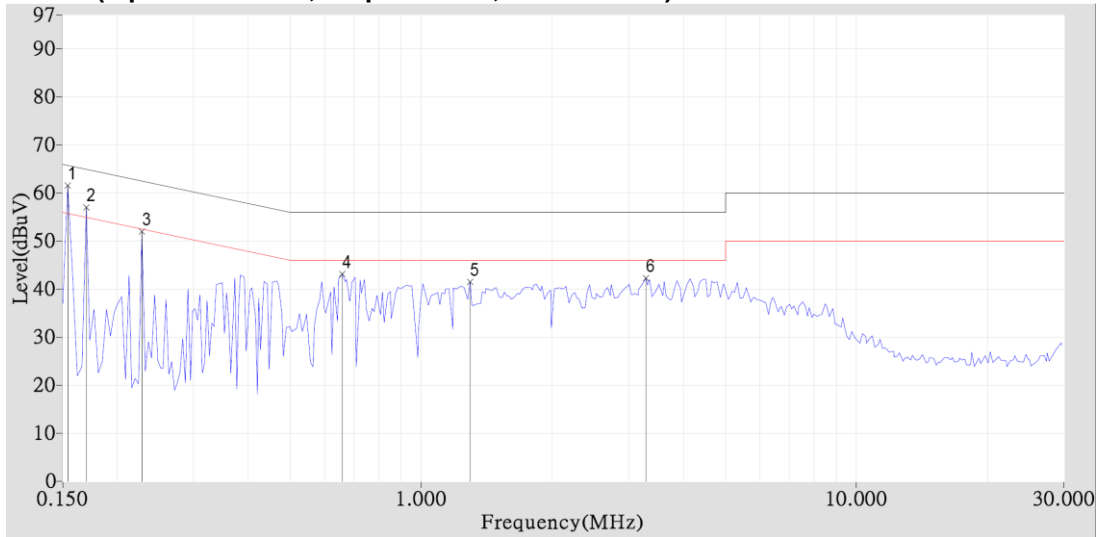
#	Part	Temp.
S1	D5	73.5°C
S2	Q3	76.7°C
S3	T1	56.4°C
S4	DZ5	85.3°C
S5	Q1	57.3°C
S6	Q2	82.5°C
S7	D2	82.8°C
S8	DB1	84.0°C
S9	C7	56.6°C
S10	C21A	64.1°C
S11	C21	54.4°C
S12	T2	63.6°C
S13	R30	97.7°C



#	Part	Temp.
S1	D5	77.4°C
S2	Q3	82.2°C
S3	T1	74.3°C
S4	DZ5	73.7°C
S5	Q1	74.4°C
S6	Q2	81.8°C
S7	D2	70.1°C
S8	DB1	68.1°C
S9	C7	55.4°C
S10	C21A	66.7°C
S11	C21	55.5°C
S12	T2	55.0°C

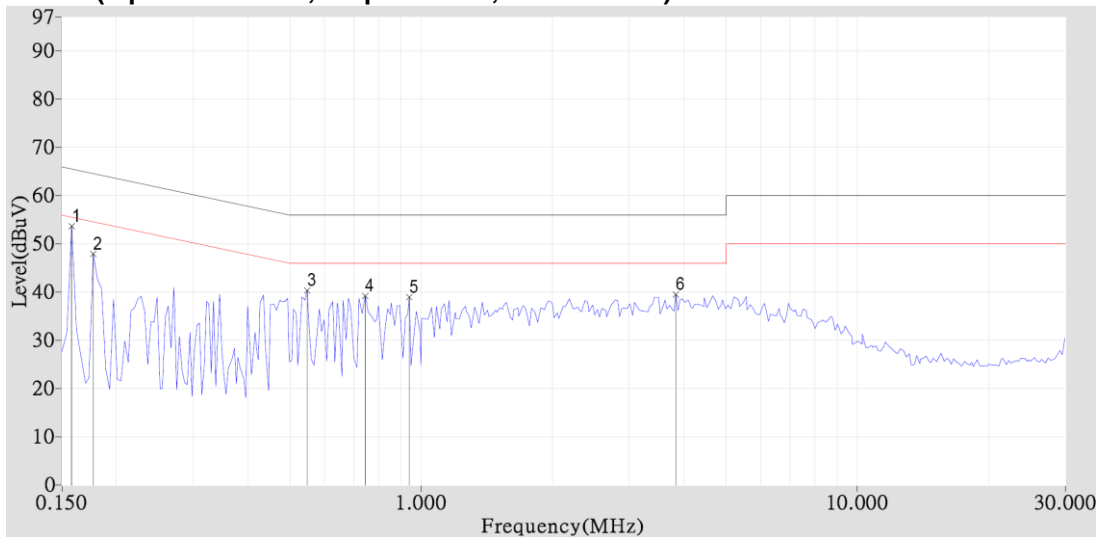


Conduction Line (input 230V/50Hz, output 36Vdc, and full load)



	QP/AV Freq.	QP/AV Level	Margin	Limit Level	Read Level	Total Factor	Ant. Factor	Cable Factor	Other Factor	Det. Mode
	MHz	dBuV	dB	dB	dBuV	dB	dB	dB	dB	
1	0.154	58.78	-7.00	65.78	58.65	0.13	0.10	0.03	0.00	QP
1	0.154	36.69	-19.09	55.78	36.56	0.13	0.10	0.03	0.00	AV
2	0.170	55.75	-9.21	64.96	55.62	0.13	0.10	0.03	0.00	QP
2	0.170	32.44	-22.52	54.96	32.31	0.13	0.10	0.03	0.00	AV
3	0.228	46.14	-16.38	62.52	46.01	0.13	0.10	0.03	0.00	QP
3	0.228	22.67	-29.85	52.52	22.54	0.13	0.10	0.03	0.00	AV

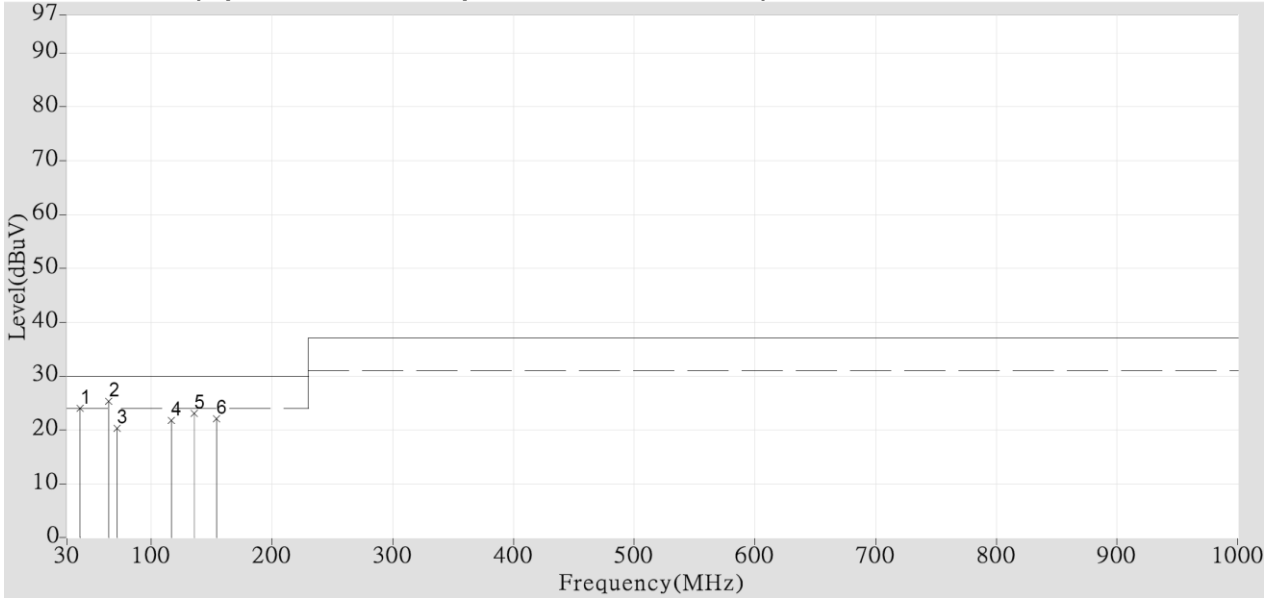
Conduction Line (input 110V/50Hz, output 36Vdc, and full load)



	QP/AV Freq.	QP/AV Level	Margin	Limit Level	Read Level	Total Factor	Ant. Factor	Cable Factor	Other Factor	Det. Mode
	MHz	dBuV	dB	dB	dBuV	dB	dB	dB	dB	
1	0.158	49.18	-16.39	65.57	49.05	0.13	0.10	0.03	0.00	QP
1	0.158	27.98	-27.59	55.57	27.85	0.13	0.10	0.03	0.00	AV
2	0.177	45.05	-19.58	64.63	44.92	0.13	0.10	0.03	0.00	QP
2	0.177	23.84	-30.79	54.63	23.71	0.13	0.10	0.03	0.00	AV
3	0.548	38.53	-17.47	56.00	38.39	0.14	0.10	0.04	0.00	QP
3	0.548	25.58	-20.42	46.00	25.44	0.14	0.10	0.04	0.00	AV

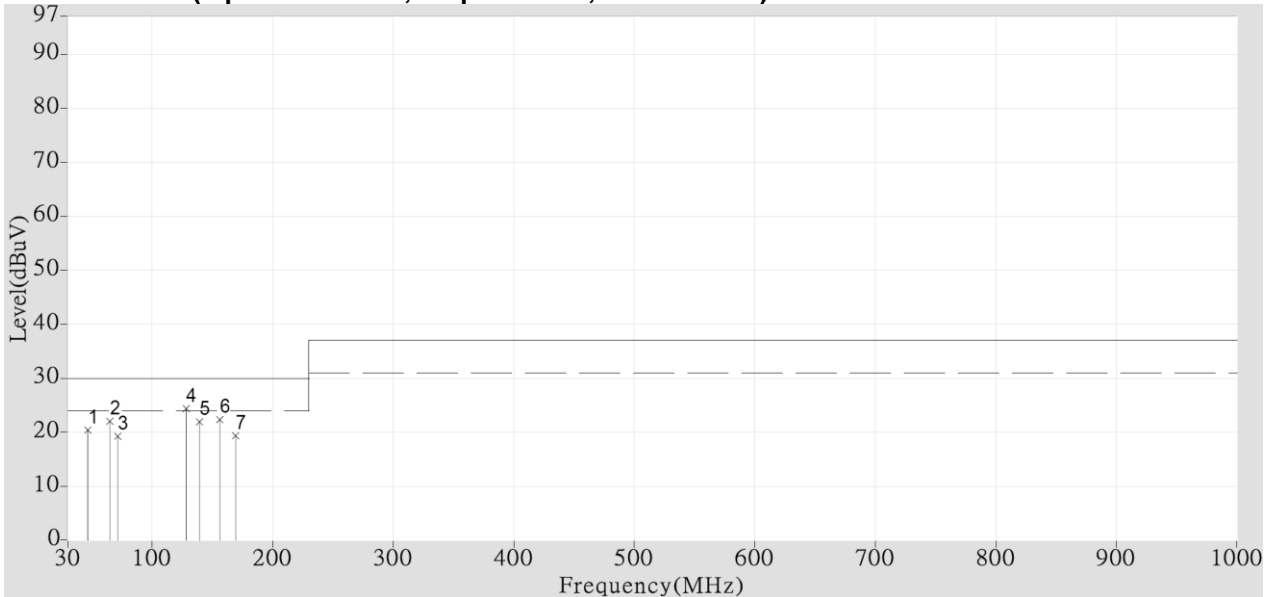


Radiation Vertical (input 230V/50Hz, output 36Vdc, and full load)



	QP/AV Freq. MHz	QP/AV Level dBuV	Margin dB	Limit Level dB	Read Level dBuV	Total Factor dB	Ant. Factor dB	Cable Factor dB	Other Factor dB	Table Pos.	Ant. Pos. cm	Det. Mode
1	40.94	23.97	-6.03	30.00	43.80	-19.83	12.09	1.39	33.31	223.0	100	QP
2	64.63	25.31	-4.69	30.00	52.20	-26.89	5.10	1.33	33.32	360.0	100	QP
3	71.72	20.28	-9.72	30.00	46.92	-26.64	5.36	1.37	33.37	113.0	100	QP
4	116.5	21.75	-8.25	30.00	42.50	-20.75	11.09	1.67	33.51	62.0	100	QP
5	135.4	23.05	-6.95	30.00	44.26	-21.21	10.61	1.78	33.60	103.0	100	QP
6	154.0	22.03	-7.97	30.00	43.92	-21.89	9.84	1.91	33.64	106.0	100	QP

Radiation Vertical (input 110V/60Hz, output 36Vdc, and full load)



	QP/AV Freq. MHz	QP/AV Level dBuV	Margin dB	Limit Level dB	Read Level dBuV	Total Factor dB	Ant. Factor dB	Cable Factor dB	Other Factor dB	Table Pos.	Ant. Pos. cm	Det. Mode
1	46.64	20.38	-9.62	30.00	43.23	-22.85	9.18	1.34	33.37	75.0	100	QP
2	64.83	22.01	-7.99	30.00	48.90	-26.89	5.10	1.33	33.32	12.0	100	QP
3	71.5	19.21	-10.79	30.00	45.90	-26.69	5.32	1.36	33.37	231.0	100	QP
4	128.3	24.35	-5.65	30.00	45.30	-20.95	10.93	1.69	33.57	236.0	100	QP
5	139.2	21.88	-8.12	30.00	43.20	-21.32	10.44	1.85	33.61	255.0	100	QP
6	156.0	22.30	-7.70	30.00	44.26	-21.96	9.76	1.92	33.64	213.0	100	QP
7	169.2	19.35	-10.65	30.00	42.10	-22.75	9.09	1.94	33.78	203.0	100	QP