X2Y EMI Filter Devices for Appliances

CISPR 14-1: was amended in November of 2008

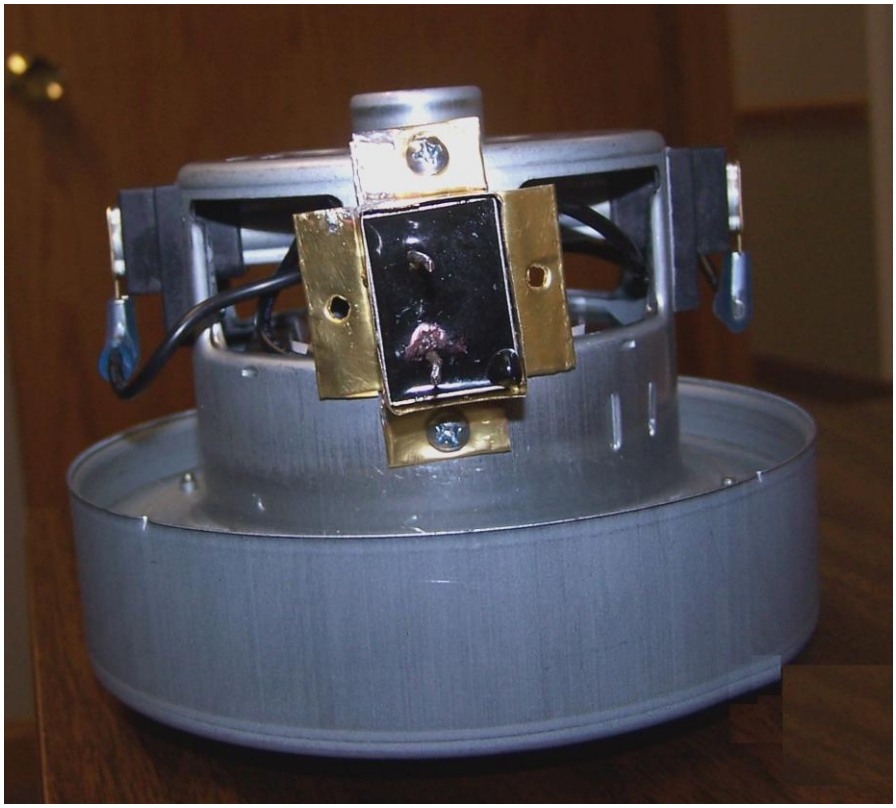
The amendment 2008-11 now specifies that to comply with the RE (radiated emissions) requirements products will have to meet the levels over the frequency range from 30 MHz to 1.0 GHz. Companies have until 2011 for all products to meet the new levels for all IEC countries.

A summary of the changes follows:

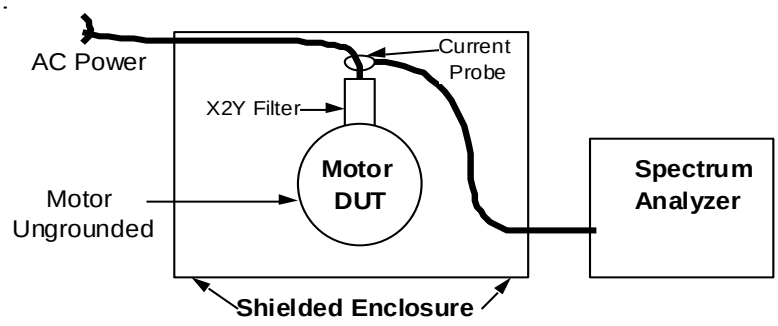
- The CISPR 14-1 amendment now specifies Radiated Emissions (RE) levels from 30 MHz to 1GHz. This amendment was issued in Nov of 2008 and requires that new products comply by 2011 for all IEC countries.
- The changes apply to the limits and the methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and electric apparatus.
- The scope of the specification has also changed and now applies to the conduction and the radiation of radio-frequency disturbances from appliances whose main functions are performed by motors and switching or regulating devices, unless the RF energy is intentionally generated or intended for illumination. Now included are the following non inclusive list of typical equipments: household electrical appliances, electric tools, regulating controls using semiconductor devices, motor-driven electro-medical apparatus, electric toys, automatic dispensing machines as well as cinema or slide projectors.

Companies working to meet product compliance by the 2011 deadline can use X2Y EMI filter devices to help electronic equipment can meet the new CISPR 14-1 specifications and lower filter costs.

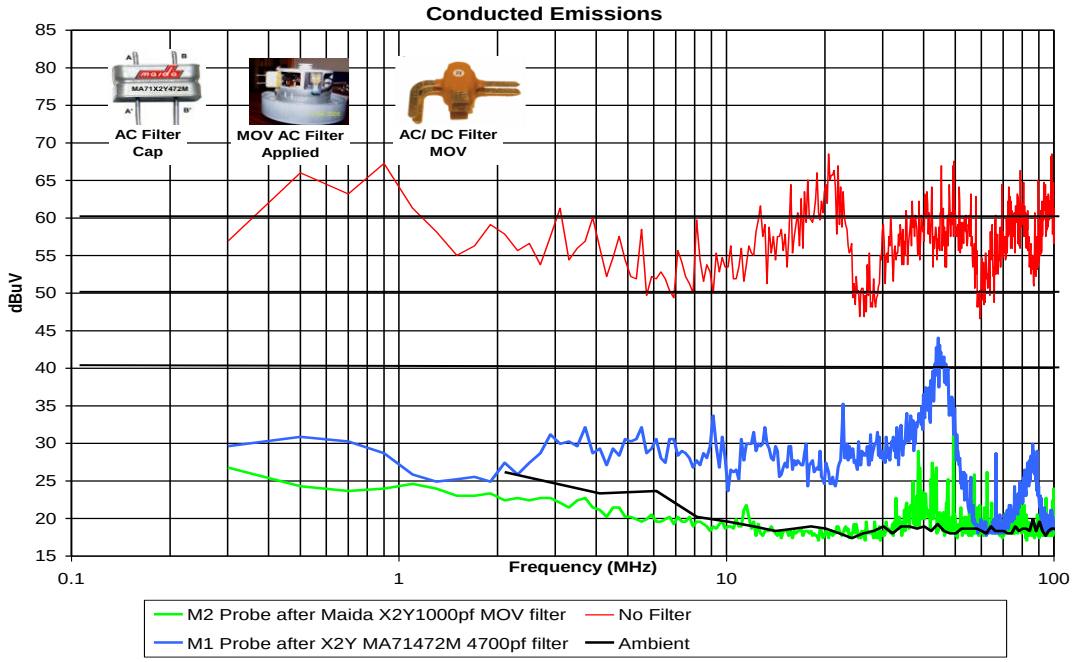
The picture on the next page shows a vacuum cleaner motor prototyped with an X2Y filter device supplied by Maida Development Company. The X2Y filter is located on the outside of the motor housing for prototype testing, and would be located within the motor housing for optimum performance, yet the filter performance is still very good.

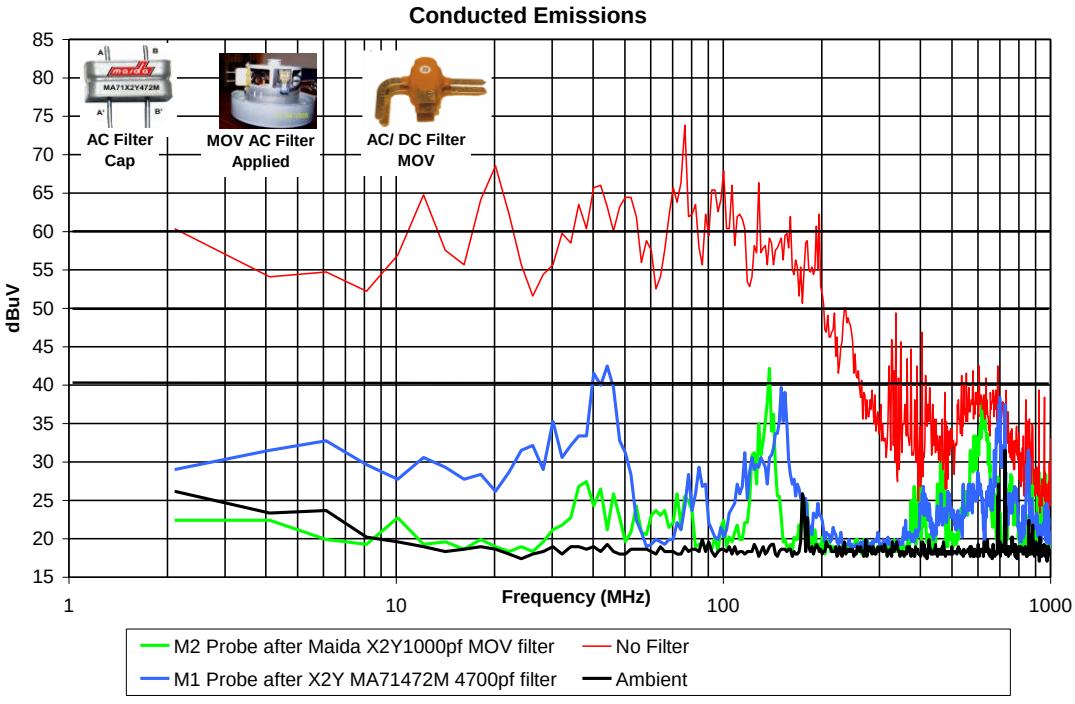


The data was generated using a current probe on the power leads with the DUT placed in a shielded enclosure as depicted below. X2Y utilizes this approach as a prototype test method to compare the performance of various types of EMI filters because many customers use this test method prior to sending DUTs for final testing by labs that are compliant for testing to CISCPR 14:1



Test Set Up





The following specification sheets represent the components used in the testing.

Technology in Balance

FILTER CAPACITOR SPEC SHEET

Date: 11/13/2008

Filter Capacitor SPECIFICATION SHEET

MAIDA STYLE NUMBER MA71472M **ITEM NUMBER** 01-1176 **CLASS RATING** Y2

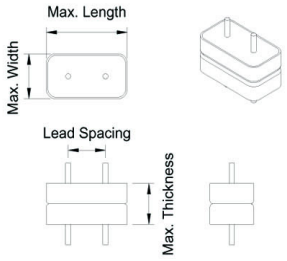
CUSTOMER **CUSTOMER P/N** NA **CONTACT** Ty Stewart

Performance Specifications

Operating Temperature	10 to 85	°C
Rated AC Voltage:	250	VAC
Capacitance @ 1KHz	4700	pF
Capacitance Tolerance	±20	%
Dissipation Factor @ 1KHz	5	%
Insulation Resistance @ 500VDC	10000	Mohm
Dielectric WithStanding Test Voltage For 1 Minute	2000	VAC
Temperature Characteristics	Z5U	
Maximum Capacitance Change	+22-56	%
Temperature Range	10 to 85	°C

Physical Specifications

Maximum Thickness	13.97 mm .550 in
Maximum Length	27.5 mm 1.083 in
Maximum Width	20.1 mm .791 in
Lead Configuration	Cust Spec Lead
Lead Spacing	11.9 mm .469 in
Lead Spacing Tolerance	± 1 mm .039 in
Lead Diameter	1.65 mm .065 in
Minimum Marking	MA71472M

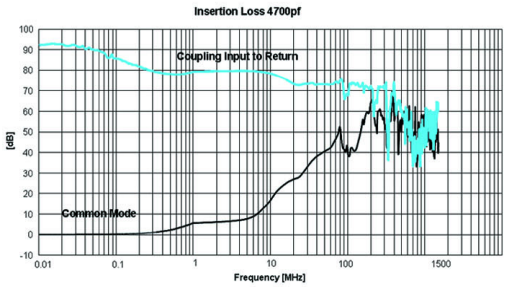


* Contact Maida for a more detailed configuration drawing.

Safety Agency Recognition

UL 1283 File Number	E309133
CUL (CSA 22.2) File Number	E309133
VDE 60384-14 File Number	40023355

Notes:
Licensed Manufacturer of
X2Y Attenuators, LLC. technology



maida
DEVELOPMENT COMPANY
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Technology in Balance

VARISTOR SPEC SHEET

MJ SERIES

Date: 12/01/2008

VARISTOR SPECIFICATION SHEET

MAIDA STYLE NUMBER MJQ2131M **MAIDA ITEM NUMBER** N/A

CUSTOMER N/A **CUSTOMER P/N** N/A **CONTACT** TY STEWART

Electrical Specifications

Continuous AC Voltage	130	VAC
Continuous DC Voltage	175	VDC
Maximum DC Leakage @ 175 VDC	200	uA
Low Varistor Voltage Limit	184	VDC
High Varistor Voltage Limit	224	VDC
Nominal Varistor Voltage	201	VDC
Current for Varistor Voltage	1	mA
Maximum Clamp Voltage	340	V
Maximum Clamp Voltage Test Current	50	A
Peak Current Rating (1 Pulse)	12000	A
Peak Current Rating (2 Pulse)	9000	A
Energy Rating (8X20us)	150	J
Energy Rating (10X1000us)	150	J
Typical Capacitance L-G	1800	pF
Typical Capacitance L-L	900	pF
Impulse Response Time	< 20	ns
Minimum Hipot of Coating	2500	VDC
Minimum I.R. of Coating	1000	MΩ

Thermal Specifications

Minimum Operating Temperature	-40	°C
Maximum Operating Temperature	85	°C
Varistor Voltage Temperature Coeff	-0.05	%/°C
Minimum Storage Temperature	-50	°C
Maximum Storage Temperature	125	°C
Current/Energy Derating Above 85°C	-2.5	%/°C

Notes Licensed manufacturer of X2Y Attenuators, Inc. technology

Lead Free - Complies with RoHS

maida

DEVELOPMENT COMPANY

P.O. Box 3529

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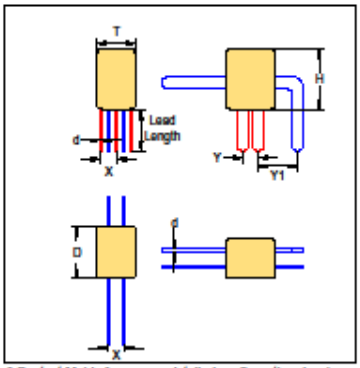
Physical Specifications

Lead Style		
X Nominal	0.164	in.
X Tolerance	0.02	in.
Y Nominal	0.165	in.
Y Tolerance	0.02	in.
Y1 Nominal	0.417	in.
Y1 Tolerance	0.02	in.
Lead Length Nominal	0.421	in.
Lead Length Tolerance	min.	in.
d Nominal	0.025	in.
Wire Gauge	22	AWG
Minimum Marking		
Nominal Disk Size	12	mm
D Maximum	0.703	in.
T Maximum	0.578	in.
H Maximum	0.778	in.



* Contact Maida for a more detailed configuration drawing.

Safety Agency Recognitions

UL 1449 File Number

UL 1414 File Number

CSA File Number

VDE File Number

SEV File Number

The following chart displays schematically the recommended placement of an X2Y filter device on a motor that is integrated into a motor enclosure. Additional application notes on this subject can be found in DC motor section of the X2Y Website: http://www.x2y.com/techlib.htm#dcpub. The same design recommendations for applying X2Y EMI filter devices in DC motors apply for AC motors.