

EMC Test Report



Test report file No. : S16048-F

Date of issue: 4 August, 2016

Type : Commercial Induction Cooktop

Model : KY-MK3500

Serial No. : P2 00009

EUT received : 2 August, 2016

Applicant : Panasonic Appliances Company of America

Kitchen Appliances Certification Liaison

Address : 1701 Golf Road Suite 3-106 Rolling Meadows, IL 60008

Manufacturer : Panasonic Corporation

Appliances Company Kitchen Appliances Business Division

Address : 1-5-1 Takatsukadai, Nishi-ku, Kobe City 651-2271, Japan

Test results according to the
standard(s) at page 3 :



Compliance



Non-compliance

This test report with appendix consists of 20 pages.

This test result only responds to the tested sample.

It is not allowed to copy this test report even partly without the allowance of the test laboratory.

	Title	Signer
Tested by :	Test engineer	
		Masaki Yamanaka
Reviewed :	Manager, Quality System Representative and Responsible engineer	
		Satoshi Arita
Approved by :	Laboratory Director, EMC Test Laboratory	
		Tsutomu Inada

A) DOCUMENTATION

DIRECTORY

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This test report contains only the results of a single investigation carried out on the product submitted. It is not a generally valid judgement by the EMC Test Laboratory of Panasonic Corporation Product Analysis Center regarding the properties of similar products taken from current production. It does not apply to all the EMC Test Laboratory of Panasonic Corporation Product Analysis Center specifications applicable to the tested products.

This test report may only be passed to a third party in its complete wording including this preamble and the date of issue. Any publication or reproduction require the prior written approval of the EMC Test Laboratory of Panasonic Corporation Product Analysis Center.

TEST STANDARD(S)

The tests were performed according to the following standard(s) :

- ☒ - FCC Rules and Regulations Part18 Subpart C - Technical Standards
- ☒ - FCC / OST MP-5 (1986) - Test Procedure.

Deviations from, additions to the test method from the standard: No deviation

TEST LABORATORY

Laboratory Name : EMC Test Laboratory, Product Analysis Center,
Panasonic Corporation

Corporation : Panasonic Corporation

JAB Code : RTL02730

Sasayama Site
Address : 231-1 Yashiro, Sasayama City, Hyogo 669-2356, Japan
TEL : +81(79) 552-5681
FAX : +81(79) 552-5682

E-mail : inada.tsutomu@jp.panasonic.com

ENVIRONMENTAL CONDITIONS

Temperature, Humidity and Atmospheric pressure : refer to Test Conditions and Result

POWER SUPPLY SYSTEM UTILIZED

Power supply system : AC 208 V / 60 Hz / 1 phase
: AC 240 V / 60 Hz / 1 phase

STATEMENT OF TRACEABILITY AND MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The test results are traceable to the national or international standards. The reader is cautioned that there may be measurement uncertainty within the calibration limits of the equipment and facilities that can account for a nominal measurement uncertainty of each test remarks. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

SHORT DESCRIPTION OF THE EQUIPMENT UNDERTEST (EUT)

This product is a commercial cooking appliances.

It is equipped with an induction heater for heating the pan was placed on top.

DEVIATION FROM THE STANDARDS

Deviations from or additions to the test method: No deviation or addition

DEFINITIONS FOR SYMBOLS USED IN THIS TEST REPORT

- ☒ - Check box indicates that the listed condition, standard or equipment was applicable for this test report.
- ☐ - Blank box indicates that the listed condition, standard or equipment was not applicable for this test report.

B) TEST CONDITIONS AND RESULTS

Conducted Emissions (Mains Port)

The measurement of the conducted emissions (interference voltage) at the mains ports in the frequency range of 9 kHz- 30 MHz were performed.

☒ - Test applicable

Test terminals :

- ☒ - Mains terminals
☐ - Discontinuous disturbance

Site location :

☒ - Sasayama EMC Site

Test location :

☒ - Multi Test Room

Test mains port :

- ☒ - AC
☐ - DC

Used test instruments and test accessories are shown in appendix B

All used test-instruments as well as the test-accessories are calibrated regularly.

Result :

The requirements are: MET ☒

NOT MET ☐

Min. limit margin 6.8 dB at 2.589 MHz

Max. limit exceeding _____ dB at _____ MHz

Remarks : -Temperature: 22 °C, Humidity: 62 %, Atmospheric pressure: 980 hPa

(2 August, 2016)

-Results of the mains port tests are shown in appendix A.

-The minimum margin was found with Ave. detector receiver on VA Phase (Neutral Phase) at 208 V 60 Hz.

-Measurement uncertainty = 3.00 dB

Radiated Emissions (Below 1 GHz : Magnetic Field)

The measurement of the radiated emissions (magnetic field)

in the frequency range of 9 kHz- 30 MHz were performed in horizontal and vertical antenna polarization.

☒ - Test applicable

Site location :

☒ - Sasayama EMC Site

Test location :

☒ - Reference Open Area Test Site

Test distance :

☐ - 3 meters

☐ - 10 meters

☒ - 30 meters

Used test instruments and test accessories are shown in appendix B

All used test-instruments as well as the test-accessories are calibrated regularly.

Result :

The requirements are: MET ☒

NOT MET ☐

Min. limit margin 9.9 dB at 0.024 MHz

Max. limit exceeding dB at MHz

Remarks : -Temperature: 27 °C, Humidity: 53 %, Atmospheric pressure: 981 hPa

(3 August, 2016)

-Results of the radiated emission tests are shown in appendix A.

-The minimum margin was found with X axis antenna polarization at 240 V 60 Hz.

-Measurement uncertainty = 2.38 dB

EQUIPMENT UNDER TEST

Operation - mode of the EUT :

The equipment under test was operated during the measurement under following conditions:

☒ Power mode

Modification of the EUT : The test laboratory did not modify the EUT during the test.

Following peripheral devices and interface cables were connected during the measurement:

< EUT >

No.	Device	Model	Serial No.	Manufacturer	Date of manufacture	EUT condition
A	Commercial Induction Cooktop	KY-MK3500	P2 00009	Panasonic	July, 2016	Pre

[Pre] = Pre Production, [Pro] = Production

No.	Device	Equipment authorization	FCC ID
A	Commercial Induction Cooktop	Certification	ACLAPZC93

< Details of ports >

No.	Name of port	Connection	Status of lines	Analog / Digital	Remarks
①	AC IN	EUT / AC	Passive	Analog	-

Note :

-The status of lines shows direction of signals on the EUT; "active" is "OUT" and "passive" is "IN".

< AC Power Cable >

No.	Name of cable ----- Manufacturer / Type	Cable type	Pin	Length (m)	Shielded	Ferrite quantity	Ground line
1	POWER CORD ----- TA HSING Electric Wire & Cable Co.,Ltd / ZN01AC93	e	3	1.80	Unshielded	None	YES

Note :

-Explanation of the abbreviations of the cable type and ferrite is shown in the table titled "characters of the cable type and ferrite".

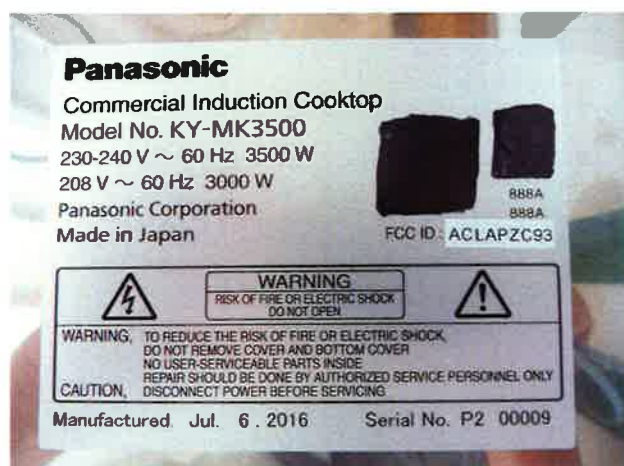
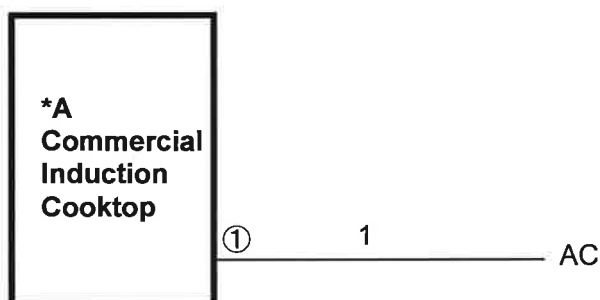
Characters of the cable type and ferrite :

Character	Cable type and Ferrite
a	Enclosed cable
b	Available accessory (exclusive cable)
c	Commercially available cable (with no designation)
d	Commercially available cable. (The selection and mounting procedure of the cable is designated in the instruction manual.)
e	Fixed cable
f	Enclosed ferrite (Setting up method of the ferrite is designated in the instruction manual.)
g	Commercially available ferrite. (The selection and setting up method of the ferrite is designated in the instruction manual.)
h	Fixed ferrite (Already fixed)

BLOCK DIAGRAM OF THE EQUIPMENT UNDER TEST (EUT)

Drawing :

*: EUT



SUMMARY

General remarks :

Emission tests were all good results.

Final judgment :

The requirements according to the technical standard(s) and tested operation modes are

☒ **MET**

☐ **NOT MET**

The equipment under test

☒ **Fulfills** the general approval requirements cited on page 3.

☐ **Does not fulfill** the general approval requirements cited on page 3.

Testing Start Date : 2 August, 2016

Testing End Date : 3 August, 2016

CONSTRUCTIONAL DATAFORM FOR EMC-TESTING

Applicant : Panasonic Appliances Company of America
Kitchen Appliances Certification Liaison

Address : 1701 Golf Road Suite 3-106 Rolling Meadows, IL 60008

Manufacturer : Panasonic Corporation
Appliances Company Kitchen Appliances Business Division

Address : 1-5-1 Takatsukadai, Nishi-ku, Kobe City 651-2271, Japan

Factory : Panasonic Corporation
Appliances Company Kitchen Appliances Business Division

Address : 1-5-1 Takatsukadai, Nishi-ku, Kobe City 651-2271, Japan

Type	: Commercial Induction Cooktop	Rated voltage	: 208 V / 60Hz 230V – 240 V / 60Hz
Model	: KY-MK3500	Rated input power	: 3000 W / 208 V 3500 W / 230V – 240 V
Serial No	: P2 00009	Protection class	: Class I

Configuration of equipment:

Commercial Induction Cooktop : KY-MK3500

Source of interference & internal frequencies:

Source	frequency
Micro computer	: 40 MHz / 32 MHz
PFC	: 70 kHz
Inverter for Induction heating	: 23 kHz - 85 kHz
	:

Noise suppression components:

None

Measures for electromagnetic shielding:

None

Place of issue : Hyogo Japan

Date : 1 August, 2016

Seal and signature of applicant :


Keiko Isoda

Section of the signer :

IHCookTop Engineering Department

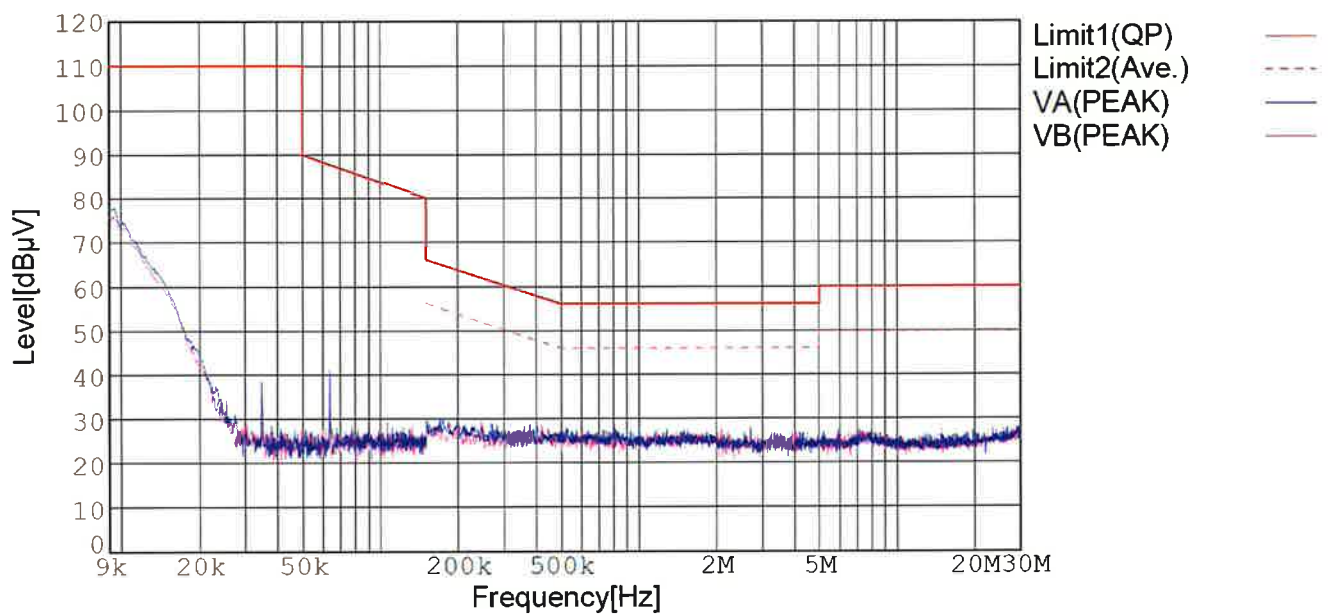
C) Appendix

Appendix A : Test Data

Conducted Emissions (Mains Port)

Conducted Emissions

Model Name	:		Temp.	:	22deg.C
Model No.	:		Humi.	:	62%
Serial No.	:		Pressure	:	980hPa
Operator	:	N.Nakai	Date	:	2016/8/2 12:57
Bands	:	7	Test Equip.	:	ESCI-3
Detector	:	PEAK	Comment	:	Floor Noise
Limit1: [FCC Part 18] cooking/ultrasonic (QP)					
Limit2: [FCC Part 18] cooking/ultrasonic (Ave.)					



*VA = Neutral Phase, VB = Line Phase

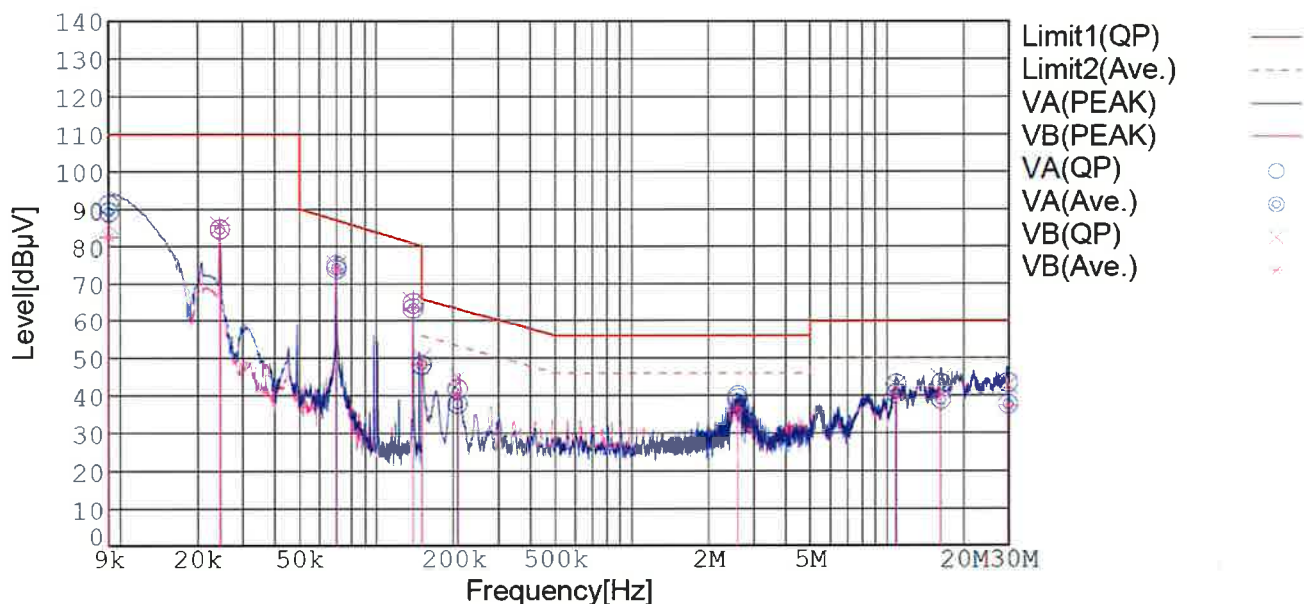
Conducted Emissions

Model Name : Induction Cook Top
Model No. : KY-MK3500
Serial No. : P2 00009
Operator : N.Nakai
Points : 20
Detector : PEAK

Temp. : 22deg.C
Humi. : 62%
Pressure : 980hPa
Date : 2016/8/2 13:13
Test Equip. : ESCI-3
Comment : 208V 60Hz

Limit1: [FCC Part 18] cooking/ultrasonic (QP)

Limit2: [FCC Part 18] cooking/ultrasonic (Ave.)



Frequency [MHz]	Meter Reading (QP) [dBμV]	Meter Reading (Ave.) [dBμV]	Factor [dB]	Level (QP) [dBμV]	Level (Ave.) [dBμV]	Line	Limit (QP) [dBμV]	Limit (Ave.) [dBμV]	Margin (QP)[dB]	Margin (Ave.) [dB]
0.0090	75.5	73.4	15.8	91.3	89.2	VA	110.0	—	18.7	—
0.0244	73.3	73.4	10.9	84.2	84.3	VA	110.0	—	25.8	—
0.0696	64.6	63.7	10.1	74.7	73.8	VA	87.0	—	12.3	—
0.1391	54.7	53.3	10.0	64.7	63.3	VA	80.7	—	16.0	—
0.1500	38.2	38.2	10.0	48.2	48.2	VA	66.0	56.0	17.8	7.8
0.2070	31.8	27.8	10.0	41.8	37.8	VA	63.3	53.3	21.5	15.5
2.5890	29.7	29.1	10.1	39.8	39.2	VA	56.0	46.0	16.2	6.8
10.8390	32.5	30.0	10.5	43.0	40.5	VA	60.0	50.0	17.0	9.5
16.2400	32.4	28.2	10.7	43.1	38.9	VA	60.0	50.0	16.9	11.1
29.7600	32.0	26.2	11.4	43.4	37.6	VA	60.0	50.0	16.6	12.4
0.0090	69.9	66.6	15.8	85.7	82.4	VB	110.0	—	24.3	—
0.0244	74.4	74.4	10.9	85.3	85.3	VB	110.0	—	24.7	—
0.0696	64.7	63.8	10.1	74.8	73.9	VB	87.0	—	12.2	—
0.1391	54.9	53.3	10.1	65.0	63.4	VB	80.7	—	15.7	—
0.1500	40.0	38.1	10.1	50.1	48.2	VB	66.0	56.0	15.9	7.8
0.2080	34.7	30.0	10.1	44.8	40.1	VB	63.3	53.3	18.5	13.2
2.5870	27.2	26.4	10.2	37.4	36.6	VB	56.0	46.0	18.6	9.4
10.8870	32.1	29.2	10.5	42.6	39.7	VB	60.0	50.0	17.4	10.3
16.2110	33.6	29.4	10.7	44.3	40.1	VB	60.0	50.0	15.7	9.9
29.7880	31.5	26.0	11.3	42.8	37.3	VB	60.0	50.0	17.2	12.7

*VA = Neutral Phase, VB = Line Phase

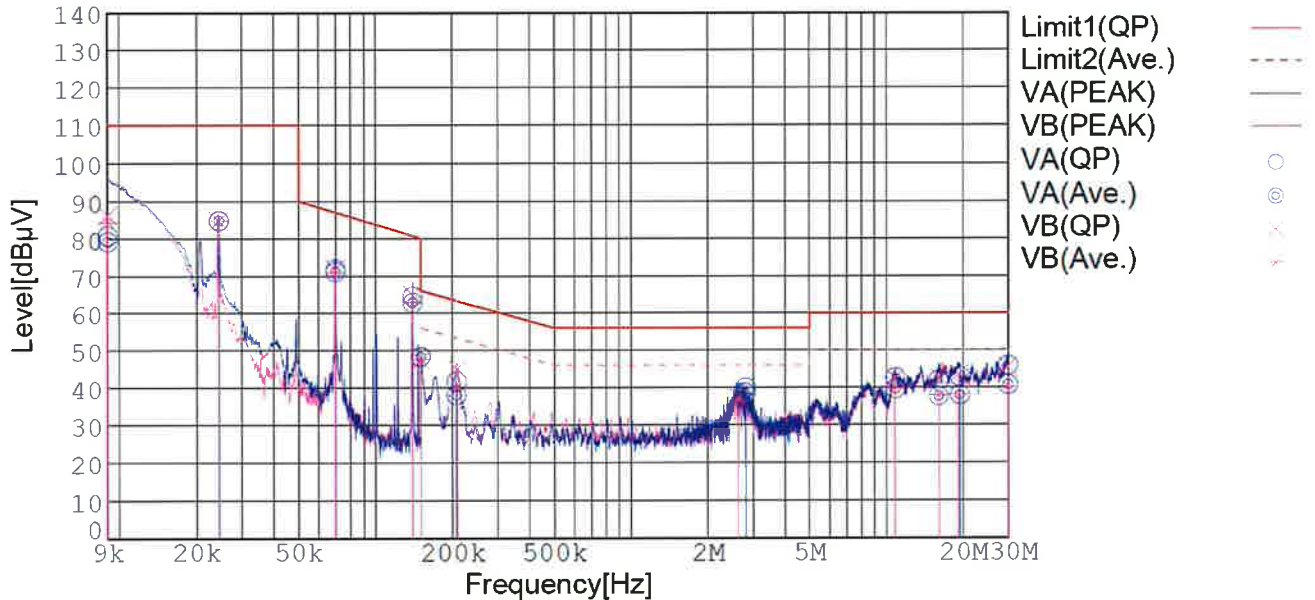
Conducted Emissions

Model Name : Induction Cook Top
 Model No. : KY-MK3500
 Serial No. : P2 00009
 Operator : N.Nakai
 Points : 22
 Detector : PEAK

Temp. : 22deg.C
 Humi. : 62%
 Pressure : 980hPa
 Date : 2016/8/2 13:32
 Test Equip. : ESCI-3
 Comment : 240V 60Hz

Limit1: [FCC Part 18] cooking/ultrasonic (QP)

Limit2: [FCC Part 18] cooking/ultrasonic (Ave.)



Frequency [MHz]	Meter Reading (QP) [dBμV]	Meter Reading (Ave.) [dBμV]	Factor [dB]	Level (QP) [dBμV]	Level (Ave.) [dBμV]	Line	Limit (QP) [dBμV]	Limit (Ave.) [dBμV]	Margin (QP)[dB]	Margin (Ave.) [dB]
0.0090	64.9	63.3	15.8	80.7	79.1	VA	110.0	—	29.3	—
0.0244	73.5	73.6	10.9	84.4	84.5	VA	110.0	—	25.6	—
0.0696	61.6	61.0	10.1	71.7	71.1	VA	87.0	—	15.3	—
0.1392	54.6	52.8	10.0	64.6	62.8	VA	80.7	—	16.1	—
0.1500	38.2	38.3	10.0	48.2	48.3	VA	66.0	56.0	17.8	7.7
0.2070	31.7	28.0	10.0	41.7	38.0	VA	63.3	53.3	21.6	15.3
2.8080	30.0	28.5	10.1	40.1	38.6	VA	56.0	46.0	15.9	7.4
10.8410	32.1	29.1	10.5	42.6	39.6	VA	60.0	50.0	17.4	10.4
16.0140	31.3	27.0	10.7	42.0	37.7	VA	60.0	50.0	18.0	12.3
19.4060	32.0	27.0	10.9	42.9	37.9	VA	60.0	50.0	17.1	12.1
29.9780	34.5	29.3	11.4	45.9	40.7	VA	60.0	50.0	14.1	9.3
0.0090	70.4	68.6	15.8	86.2	84.4	VB	110.0	—	23.8	—
0.0244	73.5	73.6	10.9	84.4	84.5	VB	110.0	—	25.6	—
0.0696	61.8	61.0	10.1	71.9	71.1	VB	87.0	—	15.1	—
0.1391	54.8	52.9	10.1	64.9	63.0	VB	80.7	—	15.8	—
0.1500	37.3	37.3	10.1	47.4	47.4	VB	66.0	56.0	18.6	8.6
0.2090	34.8	30.2	10.1	44.9	40.3	VB	63.3	53.3	18.4	13.0
2.6370	27.2	26.3	10.2	37.4	36.5	VB	56.0	46.0	18.6	9.5
10.7920	32.0	29.3	10.5	42.5	39.8	VB	60.0	50.0	17.5	10.2
16.1140	31.9	27.2	10.7	42.6	37.9	VB	60.0	50.0	17.4	12.1
19.1830	32.7	27.4	10.8	43.5	38.2	VB	60.0	50.0	16.5	11.8
29.9060	34.2	29.0	11.3	45.5	40.3	VB	60.0	50.0	14.5	9.7

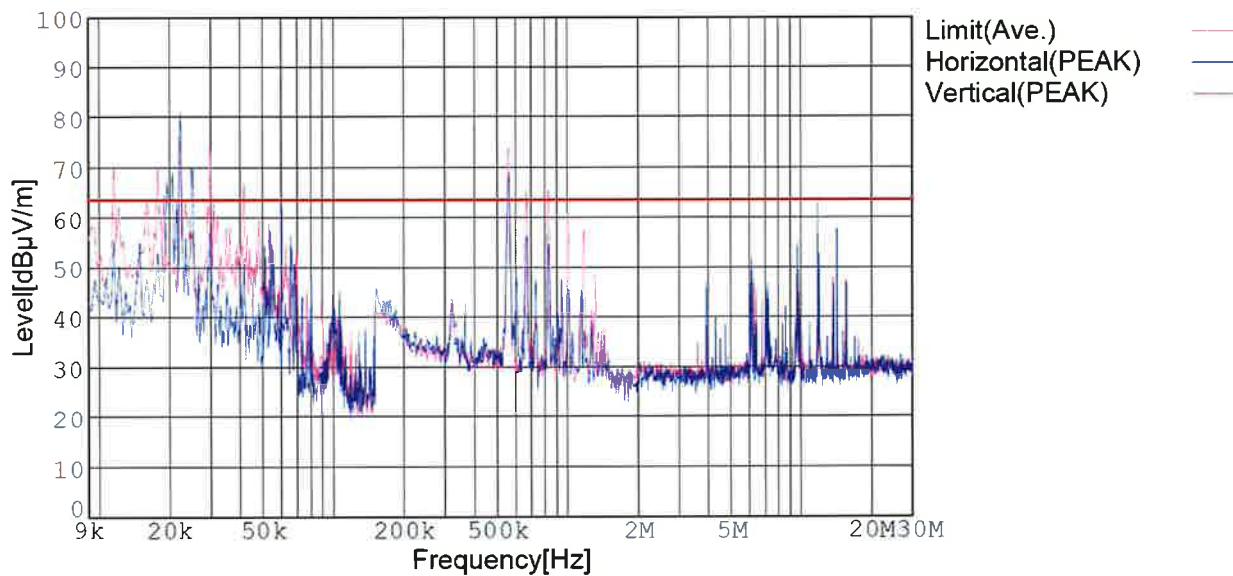
*VA = Neutral Phase, VB = Line Phase

Radiated Emissions (Below 1 GHz : Magnetic Field)

Radiated Emissions

Model Name :
Model No. :
Serial No. :
Operator : N.Nakai
Bands : 5
Detector : PEAK
Polarization : Hori. & Vert.
Limit: [FCC Part18] AV (<90k)<30m>

Temp. : 27deg.C
Humi. : 53%
Pressure : 981hPa
Test Equip. : ESI 26
Date : 2016/8/3 9:16
Comment : Floor Noise



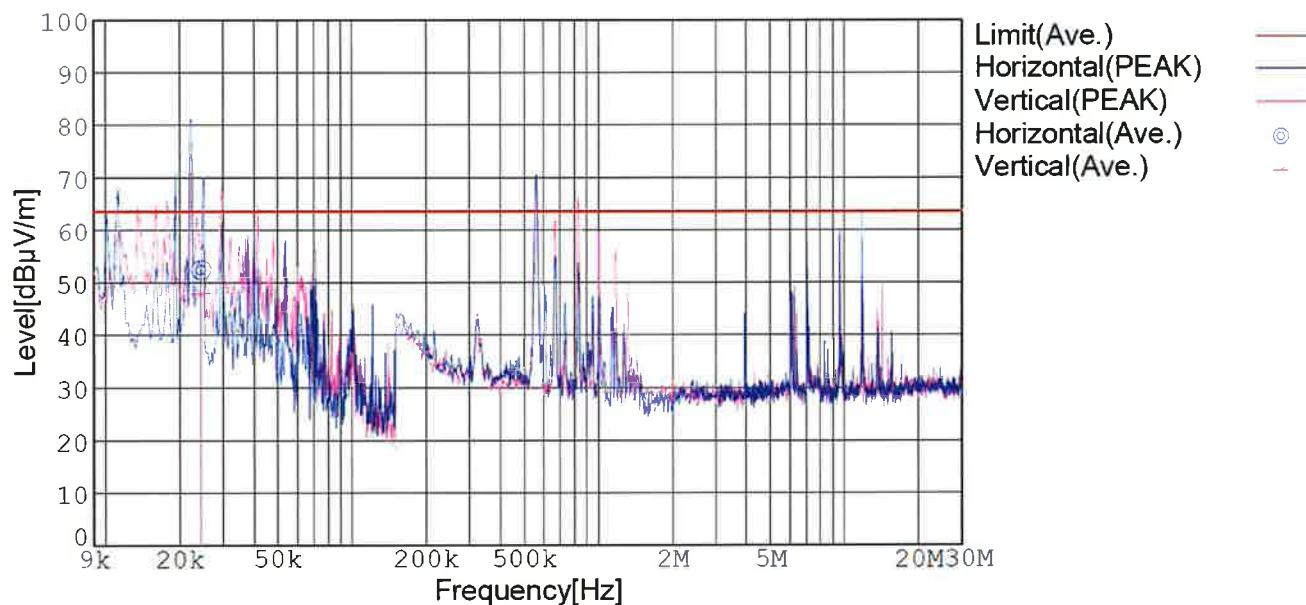
*Hori. = X Axis, Vert. = Y Axis

Radiated Emissions

Model Name : Induction Cook Top
Model No. : KY-MK3500
Serial No. : P2 00009
Operator : N.Nakai
Points : 2
Detector : PEAK
Polarization : Hori. & Vert.

Temp. : 27deg.C
Humi. : 53%
Pressure : 981hPa
Test Equip. : ESI 26
Date : 2016/8/3 9:40
Comment : 208V 60Hz

Limit: [FCC Part18] AV (<90k)<30m>



Frequency[MHz]	Meter Reading (Ave.) [dBμV]	Factor[dB]	Level(Ave.) [dBμV/m]	Angle[°]	Height [cm]	Polar.	Limit [dBμV/m]	Margin[dB]
0.024	31.6	20.8	52.4	18	200	Hori.	63.5	11.1
0.024	27.0	20.8	47.8	89	200	Vert.	63.5	15.7

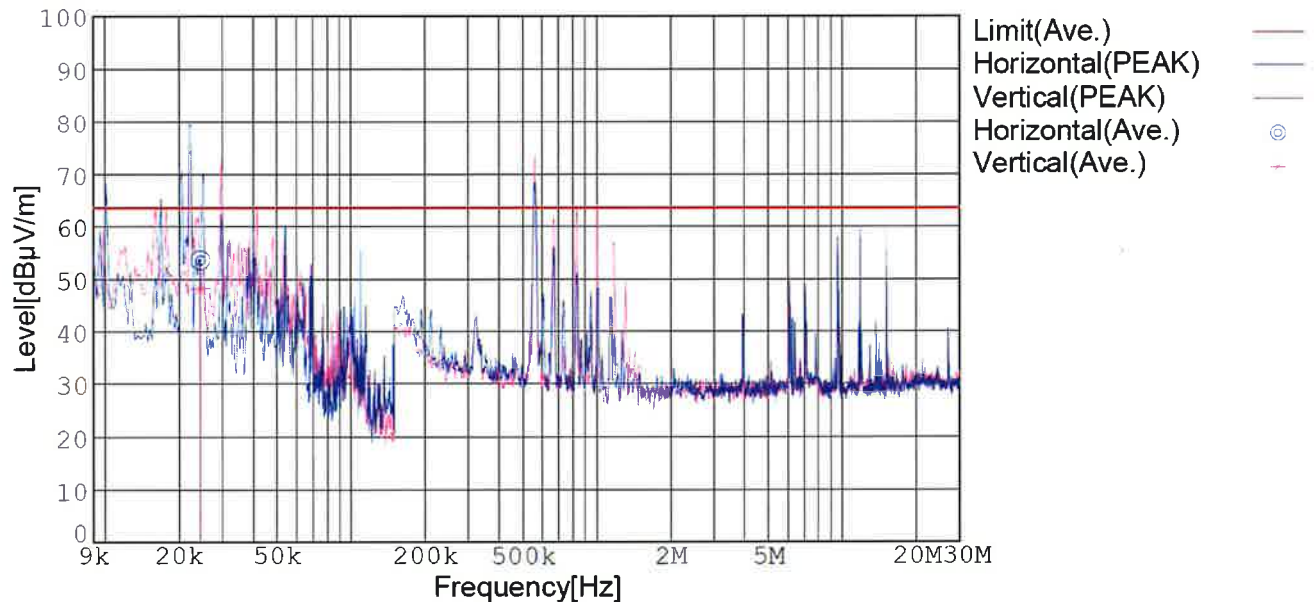
*Hori. = X Axis, Vert. = Y Axis

Radiated Emissions

Model Name : Induction Cook Top
 Model No. : KY-MK3500
 Serial No. : P2 00009
 Operator : N.Nakai
 Points : 2
 Detector : PEAK
 Polarization : Hori. & Vert.

Temp. : 27deg.C
 Humi. : 53%
 Pressure : 981hPa
 Test Equip. : ESI 26
 Date : 2016/8/3 10:32
 Comment : 240V 60Hz

Limit: [FCC Part18] AV (<90k)<30m>



Frequency[MHz]	Meter Reading (Ave.) [dBμV]	Factor[dB]	Level(Ave.) [dBμV/m]	Angle[°]	Height [cm]	Polar.	Limit [dBμV/m]	Margin[dB]
0.024	32.8	20.8	53.6	24	200	Hori.	63.5	9.9
0.024	27.3	20.8	48.1	48	200	Vert.	63.5	15.4

*Hori. = X Axis, Vert. = Y Axis

Appendix B : Test Equipment List

Conducted Emissions (AC Power Port)

Test equipment list used to perform the conducted emissions (AC Power Port).

Device	Model No.	Serial. No.	Reg. No.	Frequency range	Last Cal.	Next Cal.
EMI test receiver	Rohde & Schwarz ESCI	100296	RCV1081	9 kHz - 3 GHz	1 April, 2016	30 April, 2017
Line impedance stabilization network	Kyoritsu Technology KNW-242C	8-1312-5	AMN0426	9 kHz – 30 MHz	26 January, 2016	31 January, 2017

Device	Model No.	Version	Reg. No.
Software	VITEC Co., Ltd. EMI96	E26	S-SW004-1

Radiated Emissions (Magnetic Field)

Test equipment list used to perform the radiated emissions (magnetic field 9 kHz – 30 MHz).

Device	Model No.	Serial. No.	Reg. No.	Frequency range	Last Cal.	Next Cal.
EMI test receiver	Rohde & Schwarz ESI26	835336/006	RCV0526	9 kHz - 26.5Hz	20 February, 2016	28 February, 2017
Loop antenna	Rohde & Schwarz HFH2-Z2	871398/33	ANT0851	9 kHz - 30 MHz	19 September, 2015	30 September, 2016

Device	Model No.	Version	Reg. No.
Software	VITEC Co., Ltd. EMI96	E26	S-SW001-1