

Page 1 of 20

APPLICATION FOR VERIFICATION On Behalf of Hornady Manufacturing Company

RAPID Safe Gen II Model No.:HOM001RL Full Size, HOM001RM Medium Size

FCC ID: 2AFJZ-HOM001RL

Prepared for : Hornady Manufacturing Company

Address : 3625 Old Potash Hwy Grand Island, NE 68803

United States

Prepared by : Accurate Technology Co., Ltd.

Address : F1, Bldg. A&D, Changyuan New Material Port, Keyuan

Rd., Science & Industry Park, Nanshan District, Shenzhen

518057, P.R. China

Tel: +86-755-26503290 Fax: +86-755-26503396

Report No. : ATE20151711

Date of Test : Aug 1-14, 2015

Date of Report : Aug 17, 2015

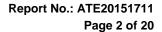




TABLE OF CONTENTS

Description	Page
Test Report Declaration	
1. TEST RESULTS SUMMARY	4
2. GENERAL INFORMATION	5
2.1. Description of Device (EUT)	
2.2. Special Accessory and Auxiliary Equipment	
2.3. Description of Test Facility	6
2.4. Measurement Uncertainty	
3. POWER LINE CONDUCTED MEASUREMENT	7
3.1. For Power Line Conducted Emission	
3.2. Power Line Conducted Emission Measurement Limits (Class B)	
3.3. Power Line Conducted Emission Measurement Results	
4. RADIATED EMISSION MEASUREMENT	
4.1. For Radiated Emission Measurement	
4.2. TEST CONFIGURATION	
4.3. Block Diagram of Test Setup	
4.4. Radiated Emission Limit	
4.5. EUT Configuration on Measurement	
4.6. Operating Condition of EUT	
4.8. Radiated Emission Noise Measurement Result	
5. ANTENNA REQUIREMENT	

The Requirement20

5.1.

5.2.



Page 3 of 20

Test Report Declaration

Applicant&: Hornady Manufacturing Company

address 3625 Old Potash Hwy Grand Island, NE 68803 United States

Manufacturer&: Hornady Manufacturing Company

address 3625 Old Potash Hwy Grand

3625 Old Potash Hwy Grand Island, NE 68803 United States

Product : RAPiD Safe Gen II

Model No. : HOM001RL Full Size, HOM001RM Medium Size

Trade name : N/A

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C 15.207&15.209 FCC/ANSI C63.10-2013

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test : Aug 1-14, 2015

Date of Report : Aug 17, 2015

Prepared by:

(Mark Chen, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)



Page 4 of 20

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Power Line Conducted Emission	FCC Part 15.207	Pass
Radiated Emission	FCC Part 15.209	Pass





2. GENERAL INFORMATION

2.1.Description of Device (EUT)

The submitted sample is a RAPiD Safe Gen II. The sample is powered by AC 120V.

		RAPiD Safe Gen II
Frequency	:	125KHz
Number of Channels	:	1
Modulation Type	:	GFSK
Type of Antenna	:	Internal Antenna
Max antenna gain	:	3dBi
Power Supply	:	AC120V(Adapter)
Adapter	:	MODEL: PK1201000 INPUT:100-240V~50/60Hz 0.6A OUTPUT:12V/1A

2.2. Special Accessory and Auxiliary Equipment

N/A



Page 6 of 20

2.3. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004

Listed by FCC

The Registration Number is 253065

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-1

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for

Laboratories

The Certificate Registration Number is L3193

Name of Firm : Accurate Technology Co., Ltd.

Site Location : F1, Bldg. A&D, Changyuan New Material Port, Keyuan

Rd., Science & Industry Park, Nanshan District, Shenzhen

518057, P.R. China

2.4. Measurement Uncertainty

Conducted emission expanded uncertainty : U=2.23dB, k=2 Power disturbance expanded uncertainty : U=2.92dB, k=2

Radiated emission expanded uncertainty U=3.08dB, k=2

(9kHz-30MHz)

Radiated emission expanded uncertainty : U=4.42dB, k=2

(30MHz-1000MHz)

Radiated emission expanded uncertainty U=4.06dB, k=2

(Above 1GHz)



Report No.: ATE20151711 Page 7 of 20

3. POWER LINE CONDUCTED MEASUREMENT

3.1. For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval	
1.	Test Receiver	Rohde & Schwarz	ESCS30	100307	Jan. 11, 2015	1 Year	
2.	L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan. 11, 2015	1 Year	
3.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	Jan. 11, 2015	1 Year	
1	50Ω Coaxial	Anritsu Corp	MP59B	620028393	Jan. 11, 2015	1 Year	
4. Switch 3							
Expa	nded Uncertainty:	U= 2.23dB, k=2					

3.2. Power Line Conducted Emission Measurement Limits (Class B)

Frequency	Limits dB(μV)					
MHz	Quasi-peak Level	Average Level				
0.15—0.50	66—56*	56—46*				
0.50—5.00	56	46				
5.00—30.0	60	50				

Notes: 1. *Decreasing linearly with logarithm of frequency.

3.3. Power Line Conducted Emission Measurement Results **PASS.**

^{2.} The lower limit shall apply at the transition frequencies.





The frequency range from 150kHz to 30MHz is checked.

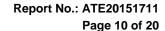
Test mode : TX (120V/60HZ)								
MEASUREMENT	RESULT	: "RY0	814-1	fin"				
0 (14 (0015 4	0.4534		_					
8/14/2015 4:0 Frequency MHz			Limit dBµV		n Detect B	or Li	ne PE	
0.450000 2.600000 12.115000	33.90 27.90 37.00	10.7 11.0 11.3	57 56 60	23. 28. 23.	O QP 1 QP O QP	L1 L1 L1	GND GND GND	
MEASUREMENT	RESULT	: "RY0	814-1_	fin2"				
8/14/2015 4:0								
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margi d	n Detect B	or Li	ne PE	
0.450000	26.40	10.7	47	20.	5 AV	L1	GND	
1.360000	25.10	10.9 11.3	46			L1		
12.115000	30.20	11.3	50	19.	8 AV	L1	. GND	
MEASUREMENT	DECITE OF	UDW003	1125	(no. !!				
MEASUREMENT	RESULT:	RIUOI	4-2_11	LII				
8/14/2015 4:03		Tl	Timit	Manain	Datastas	Tina	PE	
Frequency MHz	Level : dBµV	rransa dB	dBµV	margin dB	Detector	Line	PE	
0.450000 1.730000	33.50 27.60	10.7	57 56	23.4 28.4		N N	GND GND	
0.450000 1.730000 10.885000	29.30	11.3	60	30.7		N	GND	
MEASUREMENT	RESULT:	"RY081	.4-2_f:	Ĺn2"				
8/14/2015 4:0	8 PM		_					
Frequency MHz				_	Detector	Line	PE	
0.450000	20.30	10.7	47	26.6	AV	N	GND	
2.720000	22.30	11.0 11.3	46	23 7	AV	N	GND	
10.885000	21.30	11.3	50	28.7	AV	N	GND	



est mode : TX (240V/60HZ)									
MEASUREMENT RESULT: "RY0818-1_fin"									
8/18/2015 9:3 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line	PE		
0.180000 3.770000 26.395000	43.50 36.20 29.60	10.5 11.1 11.5	65 56 60	21.0 19.8 30.4	QP	L1 L1 L1	GND GND GND		
MEASUREMENT	RESULT:	"RY08.	18-1_£	in2"					
8/18/2015 9:3 Frequency		Transd	Limit	Margin	Detector	Line	PE		
	dBμV		dΒμV	dB	Bedeededi	22110			
0.605000 3.800000 6.490000	26.60 23.00 18.50	10.7 11.1 11.2	46 46 50	19.4 23.0 31.5	AV AV AV	L1 L1 L1	GND GND GND		
MEASUREMENT	RESULT	"RY08	18-2_1	fin"					
3/18/2015 9:4 Frequency MHz					Detector	Line	PE		
0.150000 3.710000 6.920000	43.90 35.20 29.10	10.5 11.1 11.2	66 56 60	22.1 20.8 30.9	QP QP QP	N N N	GND GND GND		
MEASUREMENT	RESULT:	"RY08	18-2_1	in2"					
8/18/2015 9:4 Frequency MHz			Limit dBµV	Margin dB	Detector	Line	PE		
0.605000 3.700000 6.680000	23.30		46		AV	N N	GND GND GND		

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.





CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: RAPiD Safe Gen II M/N:HOM001RL Full Size

Manufacturer: Hornady Operating Condition: TX

Test Site: 1#Shielding Room

Operator: Ricky Test Specification: L 120V/60Hz

Comment: Report No.:ATE20151711 Start of Test: 8/14/2015 / 3:59:34PM

SCAN TABLE: "V 9K-30MHz fin" Short Description: __SU

___SUB_STD_VTERM2 1.70

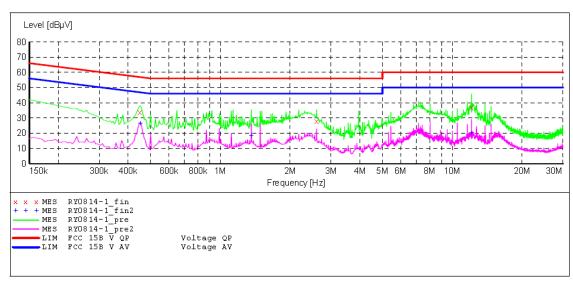
Step Start Stop Detector Meas. IF Transducer

Frequency Frequency Width 9.0 kHz 150.0 kHz 100.0 Hz Time Bandw. QuasiPeak 1.0 s 200 Hz NSLK8126 2008

Average

150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Average

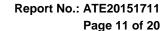


MEASUREMENT RESULT: "RY0814-1 fin"

8/14/2015 4	:04PM						
Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz		dB	dBuV	ďB			
11112	αυμ.	Q.D	шри.	Q.D			
0.450000	22.00	10 7		00.0	0.00		03.15
0.450000	33.90	10.7	57	23.0	QP	$_{L1}$	GND
2.600000	27.90	11.0	56	28.1	QP	$_{ m L1}$	GND
12.115000	37.00	11.3	60	23.0	OP	T.1	GND
12.110000	51.00	11.0	00	20.0	×-		OIVD

MEASUREMENT RESULT: "RY0814-1 fin2"

8/14/2015 4:04	4PM						
Frequency MHz	Level dBµV		Limit dBµV	Margin dB	Detector	Line	PΕ
0.450000	26.40	10.7	47	20.5	AV	L1	GND
1.360000	25.10	10.9	46	20.9	AV	L1	GND
12 115000	30 20	11 3	50	19.8	ΛV	T.1	GND





CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: RAPiD Safe Gen II M/N:HOM001RL Full Size

Manufacturer: Hornady

Operating Condition: TX

Test Site: 1#Shielding Room

Operator: Ricky
Test Specification: N 120V/60Hz

Comment: Report No.:ATE20151711 Start of Test: 8/14/2015 / 4:04:57PM

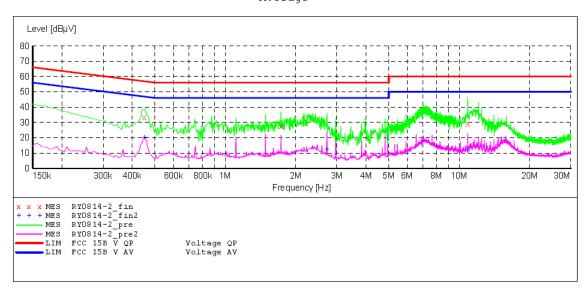
SCAN TABLE: "V 9K-30MHz fin"

Short Description: __SUB_STD_VTERM2 1.70

Start Stop Step Detector Meas. IF Transducer Frequency Frequency Width Time Bandw.
9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008

Average 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Ãverage

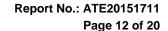


MEASUREMENT RESULT: "RY0814-2 fin"

8/14/2015	4:08PM						
Frequenc					Detector	Line	PΕ
MH	z dBµV	dB	dΒμV	dB			
0.45000	0 33.50	10.7	57	23.4	QP	N	GND
1.73000	0 27.60	10.9	56	28.4	QP	N	GND
10.88500	0 29.30	11.3	60	30.7	OP	N	GND

MEASUREMENT RESULT: "RY0814-2 fin2"

8/14/2015 4:08	3PM						
Frequency MHz	Level dBµV		Limit dBµV	Margin dB	Detector	Line	PE
0.450000	20.30	10.7	47	26.6		N	GND
2.720000	22.30	11.0	46 50	23.7		N N	GND





CONDUCTED EMISSION STANDARD FCC PART 15 B

RAPiD Safe Gen II M/N:HOM001RL Full Size

Hornady Manufacturer:

Operating Condition: TX

Test Site: 1#Shielding Room

Operator: Ricky Test Specification: L 240V/60Hz

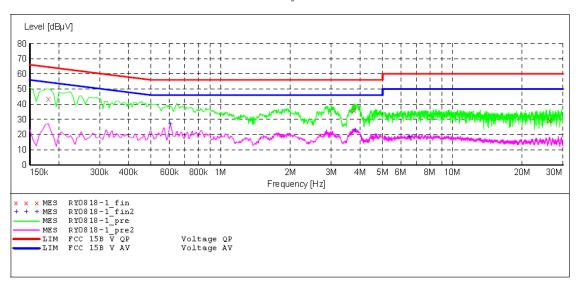
Comment: Report No.:ATE20151711 Start of Test: 8/18/2015 / 9:33:49AM

SCAN TABLE: "V 9K-30MHz fin" Short Description: _SU:

__SUB_STD_VTERM2 1.70

Stop Step Detector Meas. IF Transducer Frequency Frequency Width 9.0 kHz 150.0 kHz 100.0 Hz Bandw. Time QuasiPeak 1.0 s 200 Hz NSLK8126 2008 Average 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Average

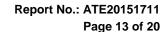


MEASUREMENT RESULT: "RY0818-1 fin"

8	/18/2015 9:3	6AM						
	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dΒμV	dB	dΒμV	dB			
	0 100000	40.50	10 5		01.0			
	0.180000	43.50	10.5	65	21.0	QP	$_{ m L1}$	GND
	3.770000	36.20	11.1	56	19.8	QP	L1	GND
	26.395000	29.60	11.5	60	30.4	QP	L1	GND

MEASUREMENT RESULT: "RY0818-1 fin2"

8/18/2015	9:36AM						
Frequen	4			_	Detector	Line	PΕ
М	Hz dBµV	' dB	dΒμV	dB			
0.6050	00 26.60	10.7	46	19.4	AV	L1	GND
3.8000	00 23.00	11.1	46	23.0	AV	L1	GND
6.4900	00 18.50	11.2	50	31.5	AV	L1	GND





CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: RAPiD Safe Gen II M/N:HOM001RL Full Size

Manufacturer: Hornady

Operating Condition: TX

Test Site: 1#Shielding Room

Operator: Ricky
Test Specification: N 240V/60Hz

Comment: Report No.:ATE20151711 Start of Test: 8/18/2015 / 9:37:41AM

SCAN TABLE: "V 9K-30MHz fin"

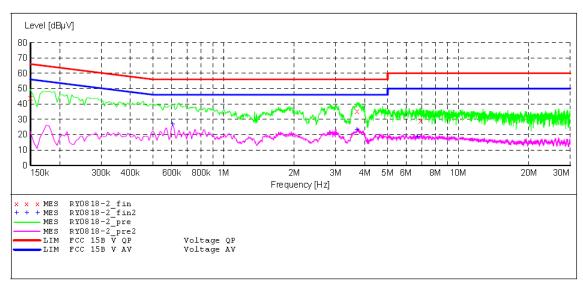
Short Description: __SUB_STD_VTERM2 1.70

Start Stop Step Detector Meas. IF Transducer Frequency Frequency Width Time Bandw.

9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008 Average

150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Average



MEASUREMENT RESULT: "RY0818-2 fin"

8/18/2015 9:40AM

- '	Frequency MHz	Level dBuV		Limit dBuV	Margin dB	Detector	Line	PΕ
					42	O.D.	7.1	CND
	0.150000 3.710000	43.90 35.20	10.5 11.1	66 56	22.1 20.8	~	N	GND
						£-	N	GND
	6.920000	29.10	11.2	60	30.9	QP	N	GND

MEASUREMENT RESULT: "RY0818-2_fin2"

8/18/2015 9:40AM

0	/10/2010 9:4	UAI ^M I						
	Frequency MHz	Level dBµV		Limit dBµV	Margin dB	Detector	Line	PΕ
	0.605000	26.60	10.7	46	19.4	AV	N	GND
	3.700000	23.30	11.1	46	22.7	AV	N	GND
	6.680000	18.70	11.2	50	31.3	AV	N	GND



4. RADIATED EMISSION MEASUREMENT

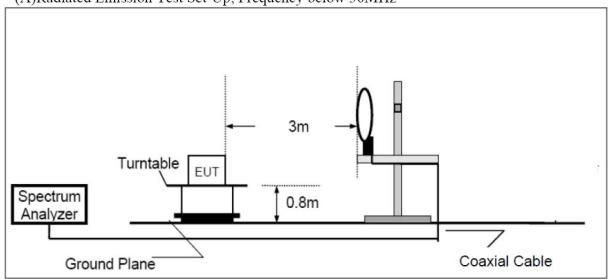
4.1.For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
						Interval
1.	Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2015	1 Year
2.	Test Receiver	Rohde &	ESCS30	100307	Jan. 11, 2015	1 Year
		Schwarz				
3.	Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	1 Year
4.	Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	1 Year
6.	50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan. 11, 2015	1 Year
12.	Pre-Amplifier	Rohde & Schwarz	CBLU11835	3791	Jan. 11, 2015	1 Year
	-		40-01			

Expanded Uncertainty (9kHz-30MHz): U=3.08dB, k=2 Expanded Uncertainty (30MHz-1000MHz): U=4.42dB, k=2 Expanded Uncertainty (Above 1GHz): U=4.06dB, k=2

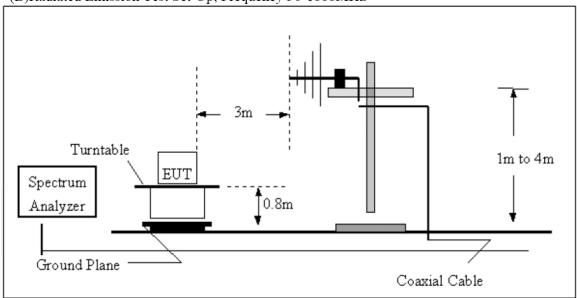
4.2.TEST CONFIGURATION

(A)Radiated Emission Test Set-Up, Frequency below 30MHz





(B)Radiated Emission Test Set-Up, Frequency 30-1000MHz



4.3.Block Diagram of Test Setup

4.3.1. Block diagram of connection between the EUT and simulators



4.4.Radiated Emission Limit

Frequency	Field Strength Limitation		Field Strength Limitation at 3m Measurement Dist			
(MHz)	(uV/m)	Dist	(uV/m)	(dBuV/m)		
0.009 - 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80		
0.490 - 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40		
1.705 - 30.00	30	30m	100* 30	20log 30 + 40		
30.0 - 88.0	100	3m	100	20log 100		
88.0 – 216.0	150	3m	150	20log 150		
216.0 - 960.0	200	3m	200	20log 200		
Above 960.0	500	3m	500	20log 500		

Limit: 2400/125=19.2uV/m@300m

Distance Correction Factor=40log(test distance/specific distance)

4.5.EUT Configuration on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.



Page 16 of 20

4.6. Operating Condition of EUT

- 4.6.1. Setup the EUT and simulator as shown as Section 4.2.
- 4.6.2. Turn on the power of all equipment.
- 4.6.3.Let the EUT work in test mode and measure it.

4.7.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2014 on radiated emission measurement.

From 9kHz to 30MHz at distance 3m The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

From 30MHz to 1000MHz at distance 3m The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The final measurement will be performed with an EMI Receiver set to Quasi Peak detector for the frequency bands 9kHz to 90kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209(d)(2).

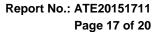
The final level, expressed in dBuV/m, is arrived at by taking the reading from the EMI receiver(Level dBuV) and adding the antenna correction factor and cable loss factor(Factor dB) to it. This result then has to be compared with the relevant FCC limit. The resolution bandwidth during the measurement is as follows:

9kHz - 150kHz: ResBW:200Hz 150kHz - 30MHz: ResBW:9kHz

The bandwidth of the EMI test receiver (R&S ESCS30) is set at 120kHz from 30MHz to 1000MHz.

4.8. Radiated Emission Noise Measurement Result

PASS.

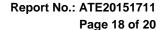




From 9 kHz to 30MHz

Frequency (MHz)	Quasi Peak (dBμV/m)	Azimuth	Polarity (H/V)	Factors (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.125	68.14	153	Н	-56.36	105.7	-37.56
2.02	40.55	36	Н	-54.15	69.5	-28.95
14.25	35.22	205	Н	-52.01	69.5	-34.28
0.125	72.14	185	V	-56.36	105.7	-33.56
3.68	42.74	352	V	-53.27	69.5	-26.76
17.35	36.24	15	V	-51.25	69.5	-33.26

Part 15 Section 15.31(f)(2) (9kHz-30MHz) Limit at 3m=Limit at 300m-40*log(300(m)/3(m)) Limit at 3m=Limit at 30m-40*log(30(m)/3(m))



Site: 2# Chamber

Tel:+86-0755-26503290

Fax: +86-0755-26503396





Model:

ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job No.: RICKY 2015 #82 Polarization: Horizontal

Standard: FCC Class B 3M Radiated Power Source: AC 120V/60Hz

 Test item:
 Radiation Test
 Date: 15/08/14/

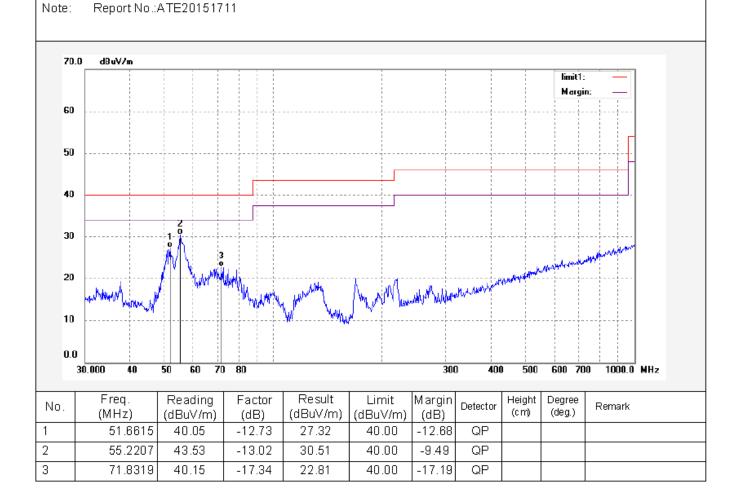
 Temp.(C)/Hum.(%)
 23 C / 48 %
 Time: 10/50/33

EUT: RAPiD Safe Gen II Engineer Signature: PE

Mode: TX Distance: 3m

Manufacturer: Hornady

HOM001RL Full Size





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Report No.: ATE20151711

Page 19 of 20

Job No.: RICKY2015 #83 Polarization: Vertical

Standard: FCC Class B 3M Radiated Power Source: AC 120V/60Hz

 Test item:
 Radiation Test
 Date: 15/08/14/

 Temp.(C)/Hum.(%)
 23 C / 48 %
 Time: 10/52/22

EUT: RAPiD Safe Gen II Engineer Signature: PEI

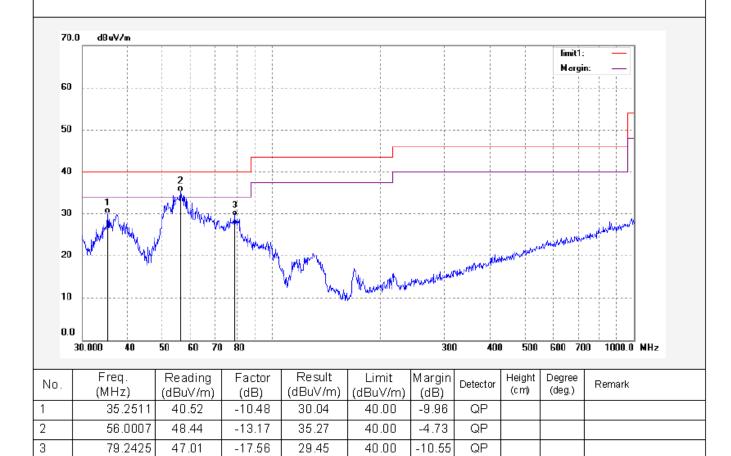
Mode: TX Distance: 3m

Manufacturer: Hornady

Model:

Note: Report No.:ATE20151711

HOM001RL Full Size





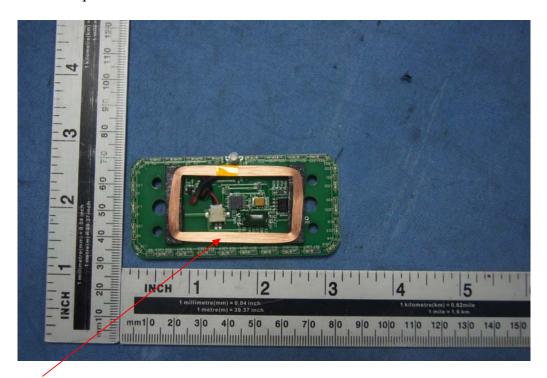
5. ANTENNA REQUIREMENT

5.1.The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 3dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna