



## EMI Test Log

Manufacturer:	Aleph Objects Inc	Project Number:	B40815
Model:	KT-PR0016	S/N:	KT-PR0016-6616
Customer Representative:	Seth Sinnema		
Standard Referenced:	EN55022: 2010, FCC Part 15		

FR0105

### 10m Emissions

Test	Test Code	Date	Event	O T	Time (hrs)	Result	Initials
RE	6006	August 12, 2014 0800-0900	Test#1: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz Unit has low end noise and 16MHz harmonics from 16MHz CPU.		1.0	Fail	KJ
		0900-0945	Test#2: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz <b>Reduced speed rate to 26%</b> Prescan stopped		0.75	Fail	KJ
		0945-1015	Test#3: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz <b>Changed power supply</b> Prescan stopped		0.5	Fail	KJ
		1015-1115	Test#4: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance <b>230Vac/50Hz</b>		1.0	Fail	KJ
		1115-1200	Test#5: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 230Vac/50Hz <b>Changed UUT to SN: KT-PR0016-6618</b> Original power supply		0.75	Fail	KJ
CE		1230-1330	Test#6: 150KHz – 30MHz 230Vac/50Hz		1.0	Pass	KJ
CE		1330-1400	Test#7: 150KHz – 30MHz 120Vac/60Hz		0.5	Pass	KJ
			<b>NOTE: Client would like to decline the emission test report at this time</b>				

**10m Emissions**

Test	Test Code	Date	Event	O T	Time (hrs)	Result	Initials
					Regular hours:	5.5	
					Overtime/Prem hours:		
					Total hours:	5.5	

**Ground Planes / CALC**

Test	Test Code	Date	Event	O T	Time (hrs)	Result	Initials
4-3	4344	August 14, 2014 1230 -1630	Radiated RF Immunity 3V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 230 VAC / 50 Hz		4.0	Fail	MN
---	---	----	Unit stopped at certain frequencies. Some were repeatable , some not. See data sheet for specifics. Lcd froze, couldn't push or turn knob. Temperature was reading but after power cycle the bed and nozzle were indeed off and cooling down. The LCD didn't flash or change at all when the printer froze.		---	---	MN
4-6	4612	August 18, 2014 0800 - 0930	Conducted RF Immunity 3Vrms, 0.15 - 80 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (AC main & no I/O) 230 VAC / 50 Hz		1.5	Pass	MN
4-11	4101	August 18, 2014 0930 - 1000	Voltage Dips and Interruptions (EU) 0% nom, 0.5 cycles / 70% nom, 25 cycles / 0% nom, 250 cycles 230 VAC / 50 Hz		0.5	Pass	MN
4-4	4401	August 18, 2014 1000 - 1100	Electrical Fast Transient / Burst Mains: +/- 1kV, I/O: +/- 500V (AC main & no I/O) 230 VAC / 50 Hz Unit freezing on all tests. See data sheet for details.		1.0	Fail	MN
4-8	4801	August 18, 2014 1100 - 1200	Power Frequency H-Field Immunity 1A/m, 50 / 60 Hz, 3 axes 230 VAC / 50 Hz		1.0	Pass	MN
3-2	3201	August 18, 2014 1230 - 1330	AC Harmonic Emissions Class A 230 VAC / 50 Hz		1.0	Fail	MN
3-3	3302	August 18, 2014 1330 - 1530	AC Short and Long Term Flicker -- 230 VAC / 50 Hz		2.0	Pass	MN

**Ground Planes / CALC**

Test	Test Code	Date	Event	O T	Time (hrs)	Result	Initials
4-5	4515	August 19, 2014 0800 - 1300	Surge Immunity Mains: +/- 2kV CM, +/- 1kV DM, (0, 90, 180, 270) 230 VAC / 50 Hz Unit failed Common Mode Line At every discharge the power supply sounded like there was arcing going on inside of it. This occurred at all phase angles, plus and minus voltage. Power supply failed		5.0	Fail	MN
---	---	---	Trying another power supply to see if arcing sound occurs .Starting at 2kv Common . Arcing sound did occur on second supply.		---	---	MN
4-2	4223	August 19, 2014 1300 - 1530	Electrostatic Discharge +/- 2, 4kV Contact, +/-2, 4, 8kV Air 230 VAC / 50 Hz Please see data sheet for information.		2.5		

Regular hours:   
 Overtime/Prem hours:   
 Total hours:

**Shield Room**

Test	Test Code	Date	Event	O T	Time (hrs)	Result	Initials

Regular hours:   
 Overtime/Prem hours:   
 Total hours:

Project #: B40815

Quote #: 2014072505

PO#: PO03923

Amount: \$6900.00

Company: Aleph Objects Inc  
 626 West 66th Street  
 Loveland CO 80538  
 Phone: (970) 377-1111  
 Ext 644  
 Fax:

Contact: Seth Sinnema  
 Email: seth@lulzbot.com

Model#:   
 Serial #:

Test Notes: Formal Testing  
 EFT/CI: AC main, no I/O >3m  
 Provide client with formal reports.

**Quoted Work**

Date	Test Code	Description	Standard	Result	Cost	Billed
August 13, 2014	1342	Radiated Emissions, 30 MHz - 1 GHz -- 120 VAC / 60 Hz	FCC Part 15, Class B	Trouble Shooting	\$700.00	
August 13, 2014	1242	Radiated Emissions, 30 MHz - 1 GHz -- 230 VAC / 50 Hz	EN55022, Class B	Trouble Shooting	\$700.00	
August 13, 2014	2241	Conducted Emissions, 150 kHz - 30 MHz -- 230 VAC / 50 Hz	EN55022, Class B	Trouble Shooting	\$350.00	
August 13, 2014	2341	Conducted Emissions, 150 kHz - 30 MHz -- 120 VAC / 60 Hz	FCC Part 15, Class B	Trouble Shooting	\$350.00	
August 19, 2014	4223	Electrostatic Discharge +/- 2, 4kV Contact, +/-2, 4, 8kV Air 230 VAC / 50 Hz	EN61000-4-2	Pass	\$600.00	
August 14, 2014	4344	Radiated RF Immunity 3V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 230 VAC / 50 Hz	EN61000-4-3	Fail	\$800.00	
August 18, 2014	4401	Electrical Fast Transient / Burst Mains: +/- 1kV, I/O: +/- 500V (AC main & no I/O) 230 VAC / 50 Hz	EN61000-4-4	Fail	\$200.00	
August 19, 2014	4515	Surge Immunity Mains: +/- 2kV CM, +/- 1kV DM, (0, 90, 180, 270) 230 VAC / 50 Hz	EN61000-4-5	Fail	\$1000.00	

**Quoted Work**

Date	Test Code	Description	Standard	Result	Cost	Billed
August 18, 2014	4612	Conducted RF Immunity 3Vrms, 0.15 - 80 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (AC main & no I/O) 230 VAC / 50 Hz	EN61000-4-6	Pass	\$400.00	
August 18, 2014	4801	Power Frequency H-Field Immunity 1A/m, 50 / 60 Hz, 3 axes 230 VAC / 50 Hz	EN61000-4-8	Pass	\$200.00	
August 18, 2014	4101	Voltage Dips and Interruptions (EU) 0% nom, 0.5 cycles / 70% nom, 25 cycles / 0% nom, 250 cycles 230 VAC / 50 Hz	EN61000-4-11	Pass	\$200.00	
August 18, 2014	3201	AC Harmonic Emissions Class A 230 VAC / 50 Hz	EN61000-3-2	Fail	\$200.00	
August 18, 2014	3302	AC Short and Long Term Flicker -- 230 VAC / 50 Hz	EN61000-3-3	Pass	\$400.00	
	9040	Emissions Test Report - Soft Copy -- --	--	Not at this time	\$400.00	Declined
	9010	Immunity Test Report - Soft Copy -- --	--	Not at this time	\$400.00	Declined

**Unquoted Work**

Date	Test Code	Description	Cost	Billed

**Modifications Required For Compliance**

Test	Description of Modification	Client Initials
ESD	In order to comply with ESD, the manufacturer has invoked the "permissible loss of performance" clause allowed by EN 61326-1: 2013 Section 6.4. The manufacturer must define the permissible loss of performance associated with this testing in their product manual, user manual or product documentation.	SS

Shipping Instructions:

	<b>Client Initials</b>

Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

Test Engineer: Mark Novak Date: August 19, 2014

**I, the client, verify that all the information provided concerning the unit which was tested, support equipment, etc., was accurate. This includes, but is not limited to, information provided via EMC Test Plan and/or EMC Test Protocol, information provided to complete EMCI's Product Data Sheet, etc.**

**Furthermore, I understand that my company may be assessed report revision fees for any report revisions resulting from inaccurate or incomplete information provided.**

Client: \_\_\_\_\_ Date: \_\_\_\_\_

Invoice Complete Invoice #: \_\_\_\_\_