SAGEM
Morpho, Inc.

MA520 & OMA520

October 17, 2007

Report No. SAGM0027

EMC Test Report

Report Prepared By

www.nwemc.com
1-888-EMI-CERT

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: October 17, 2007
SAGEM Morpho, Inc.
Model: MA520 & OMA520

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Field Strength of Fundamental	FCC 15.225:2006	ANSI C63.4:2003	**Pass**
Field Strength of Spurious Emissions	FCC 15.225:2006	ANSI C63.4:2003	**Pass**
AC Powerline Conducted Emissions	FCC 15.207:2006	ANSI C63.4:2003	**Pass**
Frequency Stability	FCC 15.225:2006	ANSI C63.4:2003	**Pass**

Modifications made to the product
See the Modifications section of this report

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:

Donald Facteau, IS Manager

NVLAP

NVLAP Lab Code: 200630-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

Accreditations and Authorizations

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

NVLAP: Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.

CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

TÜV Product Service: Included in TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0604C.

TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.

NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).

Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

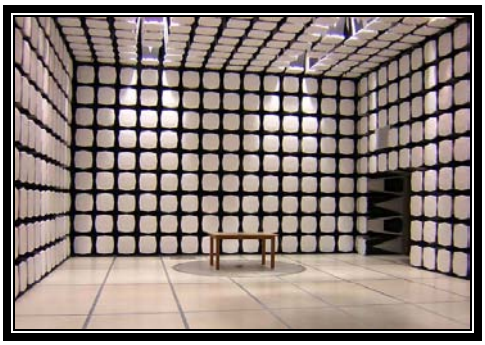
VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294).*

BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.

GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

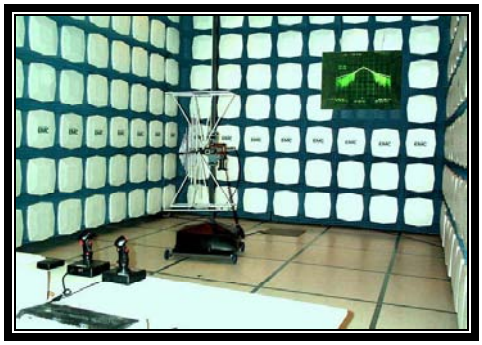
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/scope.asp



California – Orange County Facility
Labs OC01 – OC13

41 Tesla Ave. Irvine, CA 92618
(888) 364-2378 Fax: (503) 844-3826



Oregon – Evergreen Facility
Labs EV01 – EV11

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124
(503) 844-4066 Fax: (503) 844-3826

Washington – Sultan Facility
Labs SU01 – SU07

14128 339th Ave. SE Sultan, WA 98294
(888) 364-2378

Party Requesting the Test

Company Name:	SAGEM Morpho, Inc.
Address:	1145 Broadway Plaza, Suite 200
City, State, Zip:	Tacoma, WA 98402
Test Requested By:	Scott De Witt
Model:	MA520 & OMA520
First Date of Test:	August 1, 2007
Last Date of Test:	October 4, 2007
Receipt Date of Samples:	August 1, 2007
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Radio operating at 13.553 - 13.567 MHz. Identification & Authentication (Contactless card verification) Terminal: Waiting for contactless card and fingerprint presentation (Transmitter continuously on) to match card fingerprint template with live capture for Access or other events. The OMA520 and MA520 are electrically the same. The OMA520 is intended for outdoor use, and the MA520 is intended for indoor use.

Testing Objective:

Digitally modulated radio seeking TCB certification under FCC 15.225.

CONFIGURATION 1 SAGM0023

Software/Firmware Running during test	
Description	**Version**
Bio Loader	08.01.d
MorphoAccess Application	1.20
Microsoft Windows 2000 Service Pack 4	
MophoAccess Enrollment & Management System (MEMS)	6.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - MorphoAccess	SAGEM Morpho, Inc.	MA520 Pro	07470040A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Power Adapter	Elpac Power Systems	FW312 Power Supply	038700

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Computer	Gateway	ATXAEG LX3 E6000	0030135592
Mouse	Microsoft	X800382-002	Unknown
Keyboard	Microsoft	X800517-001	Unknown
Monitor	Gateway	Unknown	Unknown
Dongle	Rainbow	Ident-Lite Parallel	8900
MorphoAccess	SAGEM Morpho, Inc.	MA220	Unknown
Wiegand-ASCI Converter	Unknown	Unknown	None
USB / RS-485 Adapter	ULinks	USTL4	None
Power Adapter	Elpac Power Systems	FW312 Power Supply	Unknown

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ethernet	No	5.0m	Yes	EUT - MorphoAccess	Computer
Wiegand Out	PA	5.0m	Yes	EUT - MorphoAccess	Wiegand-ASCI Converter
Wiegand Out	PA	1.8m	Yes	Wiegand-ASCI Converter	Computer
COM1	No	1.8m	No	EUT - MorphoAccess	USB / RS-485 Adapter
USB	Yes	0.5m	No	Computer	USB / RS-485 Adapter
Wiegand In	No	5.0m	Yes	EUT - MorphoAccess	MorphoAccess
Power	PA	2.0m	Yes	MorphoAccess	Power Adapter
AC power	No	1.8m	No	Power Adapter	AC Mains
Keyboard	PA	1.8m	PA	Computer	Keyboard
Mouse	PA	1.8m	PA	Computer/Wiegand-ASCI Converter Connector	Mouse
Video	PA	2.0m	PA	Computer	Monitor
AC Power	No	1.8m	No	Computer	AC Mains
AC Power	No	1.8m	No	Computer	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 2 SAGM0023

Software/Firmware Running during test	
Description	**Version**
Bio Loader	08.01.d
MorphoAccess Application	1.20
Microsoft Windows 2000 Service Pack 4	
MophoAccess Enrollment & Management System (MEMS)	6.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - MorphoAccess	SAGEM Morpho, Inc.	MA520 Pro	07470040A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Power Adapter	Elpac Power Systems	FW312 Power Supply	038700
Computer	Gateway	ATXAEG LX3 E6000	0030135592
Mouse	Microsoft	X800382-002	Unknown
Keyboard	Microsoft	X800517-001	Unknown
Monitor	Gateway	Unknown	Unknown
Dongle	Rainbow	Ident-Lite Parallel	8900
Wiegand-ASCI Converter	Unknown	Unknown	None
USB / RS-485 Adapter	ULinks	USTL4	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
MorphoAccess	SAGEM Morpho, Inc.	MA220	Unknown
Power Adapter	Elpac Power Systems	FW312 Power Supply	Unknown

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ethernet	No	5.0m	Yes	EUT - MorphoAccess	Computer
Wiegand Out	PA	5.0m	Yes	EUT - MorphoAccess	Wiegand-ASCI Converter
Wiegand Out	PA	1.8m	Yes	Wiegand-ASCI Converter	Computer
COM1	No	1.8m	No	EUT - MorphoAccess	USB / RS-485 Adapter
USB	Yes	0.5m	No	Computer	USB / RS-485 Adapter
Wiegand In	No	5.0m	Yes	EUT - MorphoAccess	MorphoAccess
Power	PA	2.0m	Yes	MorphoAccess	Power Adapter
AC power	No	1.8m	No	Power Adapter	AC Mains
Keyboard	PA	1.8m	PA	Computer	Keyboard
Mouse	PA	1.8m	PA	Computer/Wiegand-ASCI Converter Connector	Mouse
Video	PA	2.0m	PA	Computer	Monitor
AC Power	No	1.8m	No	Computer	AC Mains
AC Power	No	1.8m	No	Computer	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 1 SAGM0027

Software/Firmware Running during test	
Description	**Version**
MEMS	6.2
Morpho Access Aplication	1.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
MA520	SAGEM	260552310	072470040A

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Mid span POE (Mode B)	I.T.E Power Supply	PW130	None
RS422/485 USB Adaptor	uLinks	USTL4	None
Remote Morpho Access	SAGEM	MA200	0536650125
Weigand to ASCII converter	RF ideas	PC Prox BU rev. 1.2B	None
Remote Morpho Access PS	Elpac Power Systems	FW3012	042732
Remote PC	Gateway	E6000	0030135592
Software Dongle	SAGEM	Ident_lite	8900

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
8 conductor 22AWG	Yes	7.5m	No	EUT	Weigand to ASCII converter
8 conductor 22AWG	Yes	1.2m	No	Weigand to ASCII converter	Remote Morpho Access
DB9	No	0.5m	No	Weigand to ASCII converter	Remote PC
8 conductor 22AWG	Yes	7.5m	No	EUT	RS422/485 USB Adaptor
USB	Yes	1.0m	No	RS422/485 USB Adaptor	Remote PC
Cat5 Ethernet	Yes	7.5m	No	EUT	Mid span POE (Mode B)
Cat5 Ethernet cross over	No	1.0m	No	Mid span POE (Mode B)	Remote PC
AC Power	No	1.7m	No	AC Mains	Mid span POE (Mode B)
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 3 SAGM0027

Software/Firmware Running during test	
Description	**Version**
MEMS	6.2
Morpho Access Aplication	1.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
MA520	SAGEM	260552310	072470040A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Power Supply 1	Elpac Power Systems	FW3012	039005

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RS422/485 USB Adaptor	uLinks	USTL4	None
Remote Morpho Access	SAGEM	MA200	0536650125
Weigand to ASCII converter	RF ideas	PC Prox BU rev. 1.2B	None
Remote Morpho Access PS	Elpac Power Systems	FW3012	042732
Remote PC	Gateway	E6000	0030135592
Software Dongle	SAGEM	Ident_lite	8900

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
8 conductor 22AWG	Yes	7.5m	No	EUT	Weigand to ASCII converter
8 conductor 22AWG	Yes	1.2m	No	Weigand to ASCII converter	Remote Morpho Access
DB9	No	0.5m	No	Weigand to ASCII converter	Remote PC
8 conductor 22AWG	Yes	7.5m	No	EUT	RS422/485 USB Adaptor
USB	Yes	1.0m	No	RS422/485 USB Adaptor	Remote PC
Cat5 Ethernet	Yes	7.5m	No	EUT	End span POE switch (Mode A)
Cat5 Ethernet	No	1.5m	No	End span POE switch (Mode A)	Remote PC
AC Power	No	1.7m	No	AC Mains	48VDC Power supply
DC Power	No	1.7m	Yes	48VDC Power supply	End span POE switch (Mode A)
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 5 SAGM0027

Software/Firmware Running during test	
Description	**Version**
MEMS	6.2
Morpho Access Aplication	1.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
OMA520	SAGEM	260552310	073041032H

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Mid span POE (Mode B)	I.T.E Power Supply	PW130	None
RS422/485 USB Adaptor	uLinks	USTL4	None
Remote Morpho Access	SAGEM	MA200	0536650125
Weigand to ASCII converter	RF ideas	PC Prox BU rev. 1.2B	None
Remote Morpho Access PS	Elpac Power Systems	FW3012	042732
Remote PC	Gateway	E6000	0030135592
Software Dongle	SAGEM	Ident_lite	8900

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
8 conductor 22AWG	Yes	7.5m	No	EUT	Weigand to ASCII converter
8 conductor 22AWG	Yes	1.2m	No	Weigand to ASCII converter	Remote Morpho Access
DB9	No	0.5m	No	Weigand to ASCII converter	Remote PC
8 conductor 22AWG	Yes	7.5m	No	EUT	RS422/485 USB Adaptor
USB	Yes	1.0m	No	RS422/485 USB Adaptor	Remote PC
Cat5 Ethernet	Yes	7.5m	No	EUT	Mid span POE (Mode B)
Cat5 Ethernet cross over	No	1.0m	No	Mid span POE (Mode B)	Remote PC
AC Power	No	1.7m	No	AC Mains	Mid span POE (Mode B)
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 7 SAGM0028

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
OMA520	SAGEM	260552318	073041032H

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Power Supply 1	Elpac Power Systems	FW3012	039005

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RS422/485 USB Adaptor	uLinks	USTL4	None
Remote Morpho Access	SAGEM	MA200	0536650125
Weigand to ASCII converter	RF ideas	PC Prox BU rev. 1.2B	None
Remote Morpho Access PS	Elpac Power Systems	FW3012	042732
Remote PC	Gateway	E6000	0030135592
Software Dongle	SAGEM	Ident_lite	8900

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
8 conductor 22AWG	Yes	7.5m	No	EUT	Weigand to ASCII converter
8 conductor 22AWG	Yes	1.2m	No	Weigand to ASCII converter	Remote Morpho Access
DB9	No	0.5m	No	Weigand to ASCII converter	Remote PC
8 conductor 22AWG	Yes	7.5m	No	EUT	RS422/485 USB Adaptor
USB	Yes	1.0m	No	RS422/485 USB Adaptor	Remote PC
Cat5 Ethernet	Yes	7.5m	No	EUT	End span POE switch (Mode A)
Cat5 Ethernet	No	1.5m	No	End span POE switch (Mode A)	Remote PC
AC Power	No	1.7m	No	AC Mains	48VDC Power supply
DC Power	No	1.7m	Yes	48VDC Power supply	End span POE switch (Mode A)
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	8/1/2007	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	8/1/2007	Field Strength of Spurious Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	8/1/2007	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	8/1/2007	Radiated Emissions-High Freq.	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	8/2/2007	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	9/13/2007	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	10/4/2007	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	10/4/2007	Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Awaiting card presentation

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

7 - OMA520 Elpac +12VDC Conducted Emissions

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIR	11/20/2007	13
EV07 cable d	N/A	N/A	EVG	4/17/2007	13
Attenuator	Tektronix	011-0059-02	ATC	12/27/2006	13
High Pass Filter	TTE	H97-100K-50-720B	HFX	8/22/2006	24
Receiver	Rohde & Schwartz	ESCI	ARG	12/7/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

NORTHWEST

EMC

AC Powerline Conducted Emissions

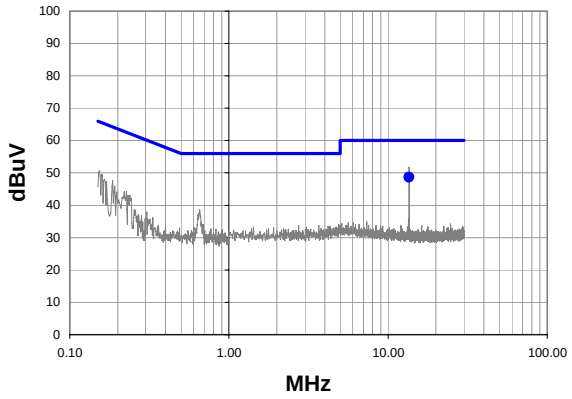
Version 2007.8.27
PSA-ESCI 2007.05.07

Work Order:	SAGM0028	**Date:**	09/13/07		
Project:	None	**Temperature:**	22° C		
Job Site:	EV07	**Humidity:**	44		
Serial Number:	073041032H	**Barometric Pres.:**	30.01	**Tested by:**	Dan Haas
EUT:	OMA520				
Configuration:	7 - OMA520 Elpac +12VDC Conducted Emissions				
Customer:	SAGEM Morpho, Inc.				
Attendees:	Scott DeWitt				
EUT Power:	120V/60Hz				
Operating Mode:	Awaiting Fingerprint presentation.				
Deviations:					
Comments:					

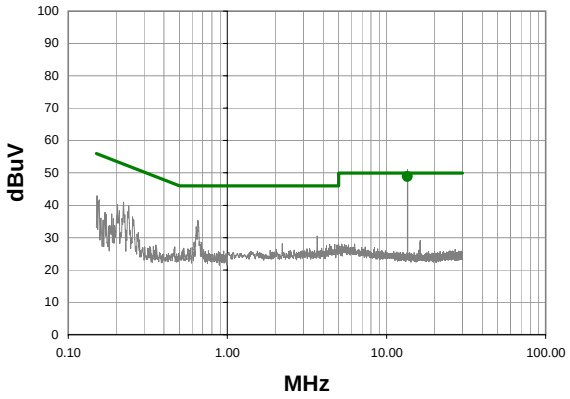
Test Specifications	**Test Method**
FCC 15.207:2006	ANSI C63.4:2003

Run #	3	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted	Spec. Limit	Compared to Spec. (dB)
13.560	28.2	0.5	48.7	60.0	-11.3

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted	Spec. Limit	Compared to Spec. (dB)
13.560	28.4	0.5	48.9	50.0	-1.1

NORTHWEST

EMC

AC Powerline Conducted Emissions

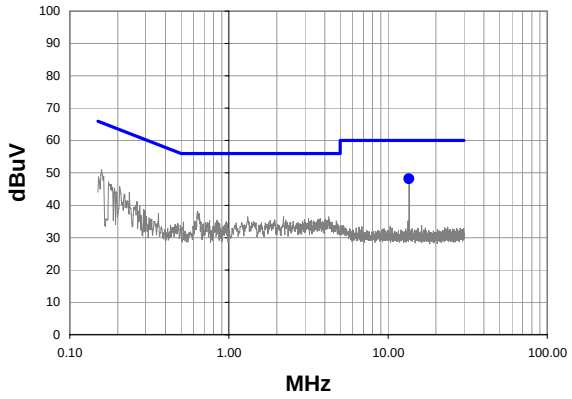
Version 2007.8.27
PSA-ESCI 2007.05.07

Work Order:	SAGM0028	**Date:**	09/13/07		
Project:	None	**Temperature:**	22° C		
Job Site:	EV07	**Humidity:**	44		
Serial Number:	073041032H	**Barometric Pres.:**	30.01	**Tested by:**	Dan Haas
EUT:	OMA520				
Configuration:	7 - OMA520 Elpac +12VDC Conducted Emissions				
Customer:	SAGEM Morpho, Inc.				
Attendees:	Scott DeWitt				
EUT Power:	120V/60Hz				
Operating Mode:	Awaiting Fingerprint presentation.				
Deviations:					
Comments:					

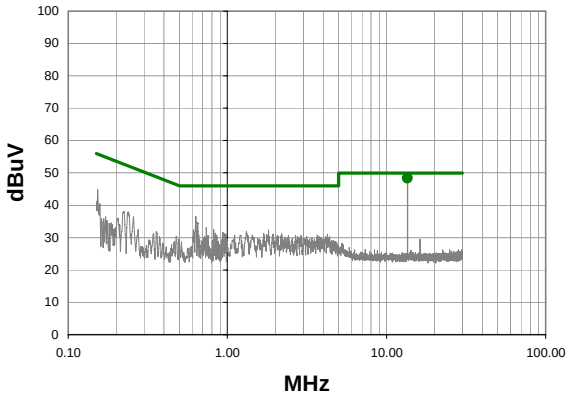
Test Specifications	**Test Method**
FCC 15.207:2006	ANSI C63.4:2003

Run #	4	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit

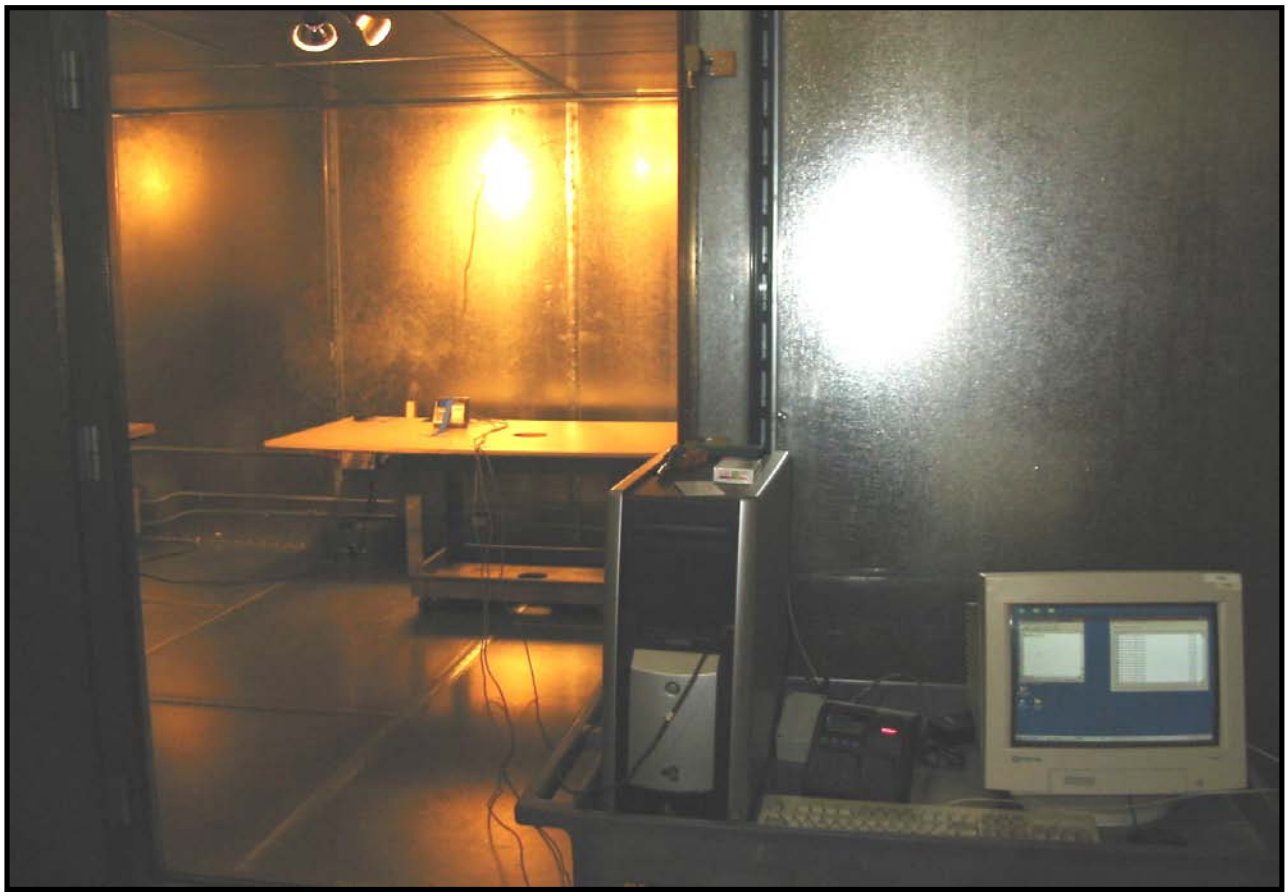


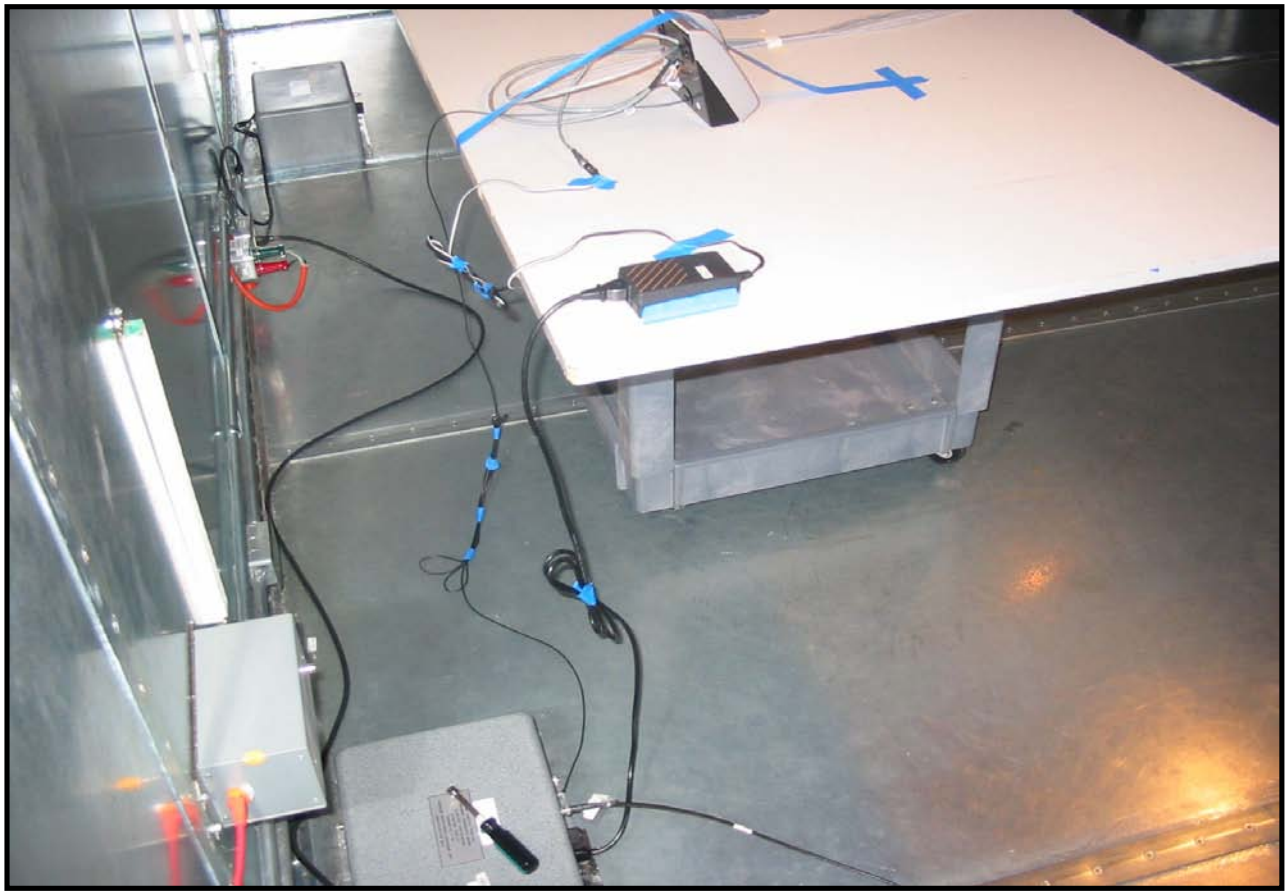
Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted	Spec. Limit	Compared to Spec. (dB)
13.560	27.7	0.5	48.2	60.0	-11.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted	Spec. Limit	Compared to Spec. (dB)
13.560	27.9	0.5	48.4	50.0	-1.6





FIELD STRENGTH OF FUNDAMENTAL

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Waiting for card presentation, transmitter continuously on

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	13.11 MHz	Stop Frequency	14.01 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Antenna, Loop	EMCO	6502	AOA	5/7/2007	24
EV01 cables c,g, h			EVA	12/29/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

NORTHWEST EMC

FIELD STRENGTH OF FUNDAMENTAL

PSA 2007.05.07
EMI 2007.7.24

EUT:	MA520	Work Order:	SAGM0023
Serial Number:	07470040A	Date:	08/01/07
Customer:	SAGEM Morpho, Inc.	Temperature:	21
Attendees:	Scott De Witt	Humidity:	35%
Project:	None	Barometric Pres.:	30.23
Tested by:	Rod Peloquin	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1.5 - 4	Test Distance (m)	3

COMMENTS

Weigand In communcations to Remote MA220, Wiegand Out communications to PC, Ethernet to PC, COM1 (RS-485) to PC

EUT OPERATING MODES

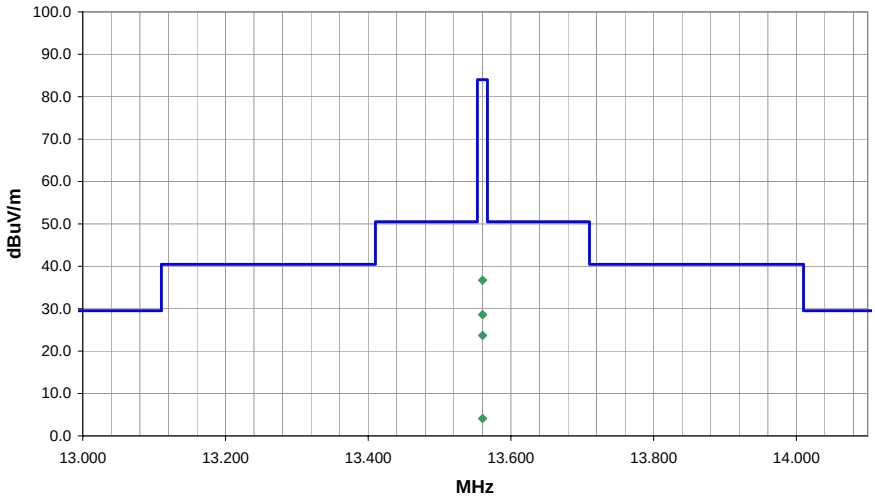
Waiting for card presentation, transmitter continuously on

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
13.560	53.9	10.7	97.0	2.6	3.0	0.0	oop/Active l	QP	27.9	36.7	84.0	-47.3	3m, Perp to EUT/Par to Gnd, EUT on side
13.560	54.9	10.7	38.0	2.4	3.0	0.0	oop/Active l	QP	37.0	28.6	84.0	-55.4	3m, Perp to EUT/Par to Gnd, EUT typical
13.560	53.1	10.7	256.0	1.5	3.0	0.0	oop/Active l	QP	40.1	23.7	84.0	-60.3	3m, Perp to EUT/Par to Gnd, EUT horizontal
13.560	50.2	10.7	318.0	1.5	3.0	0.0	oop/Active	QP	56.8	4.1	84.0	-79.9	3m, Perp to EUT/Perp to Gnd, EUT horizontal
13.560	45.1	10.7	7.0	1.5	3.0	0.0	oop/Active	QP	58.6	-2.8	84.0	-86.8	3m, Par to EUT, EUT horizontal

NORTHWEST EMC

FIELD STRENGTH OF FUNDAMENTAL

PSA 2007.05.07
EMI 2007.7.24

EUT:	MA520	Work Order:	SAGM0023
Serial Number:	07470040A	Date:	08/01/07
Customer:	SAGEM Morpho, Inc.	Temperature:	21
Attendees:	Scott De Witt	Humidity:	35%
Project:	None	Barometric Pres.:	30.23
Tested by:	Rod Peloquin	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1.5 - 4	Test Distance (m)	5

COMMENTS

Weigand In communcations to Remote MA220, Wiegand Out communications to PC, Ethernet to PC, COM1 (RS-485) to PC

EUT OPERATING MODES

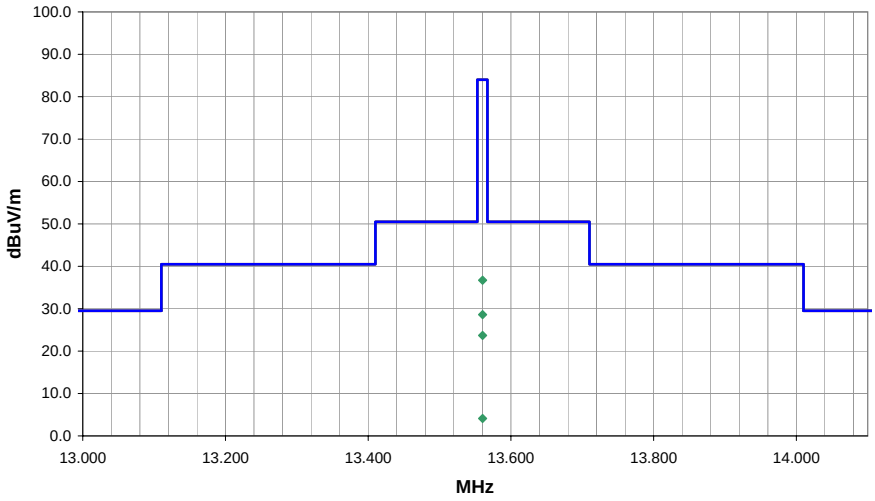
Waiting for card presentation, transmitter continuously on

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
13.560	47.7	10.7	106.0	2.4	5.0	0.0	oop/Active l	QP	21.7	36.7	84.0	-47.3	5m, Perp to EUT/Par to Gnd, EUT on side
13.560	46.7	10.7	30.0	3.2	5.0	0.0	oop/Active l	QP	28.8	28.6	84.0	-55.4	5m, Perp to EUT/Par to Gnd, EUT typical
13.560	44.2	10.7	62.0	3.2	5.0	0.0	oop/Active l	QP	31.2	23.7	84.0	-60.3	5m, Perp to EUT/Par to Gnd, EUT horizontal
13.560	37.6	10.7	318.0	1.5	5.0	0.0	oop/Active	QP	44.2	4.1	84.0	-79.9	5m, Perp to EUT/Perp to Gnd, EUT horizontal
13.560	32.1	10.7	7.0	1.5	5.0	0.0	oop/Active	QP	45.6	-2.8	84.0	-86.8	5m, Par to EUT, EUT horizontal

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon the measured fall-off

EUT: MA520
S/N:
Date: 8/1/2007
Job Number: SAGM0023

Frequency (MHz)	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
13.560	Par/EUT, Perp/GND	3	55.8	13.0	58.6	30.0	58.6
	Par/EUT, Perp/GND	5	42.8				45.6
13.560	Perp/EUT, Perp/GND	3	60.9	12.6	56.8	30.0	56.8
	Perp/EUT, Perp/GND	5	48.3				44.2
13.560	Perp/EUT, Par/GND	3	63.8	8.9	40.1	30.0	40.1
	Perp/EUT, Par/GND	5	54.9				31.2
13.560	Perp/EUT, Par/GND	3	64.6	6.2	27.9	30.0	27.9
	Perp/EUT, Par/GND	5	58.4				21.7
13.560	Perp/EUT, Par/GND	3	65.6	8.2	37.0	30.0	37.0
	Perp/EUT, Par/GND	5	57.4				28.8

NORTHWEST EMC

FIELD STRENGTH OF FUNDAMENTAL

PSA 2007.05.07
EMI 2007.7.24

EUT:	MA520			Work Order:	SAGM0023
Serial Number:	07470040A			Date:	08/01/07
Customer:	SAGEM Morpho, Inc.			Temperature:	21
Attendees:	Scott De Witt			Humidity:	35%
Project:	None			Barometric Pres.:	30.23
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1.5 - 4	Test Distance (m)	3

COMMENTS

Weigand In communcations to Remote MA220, Wiegand Out communications to PC, Ethernet to PC, COM1 (RS-485) to PC

EUT OPERATING MODES

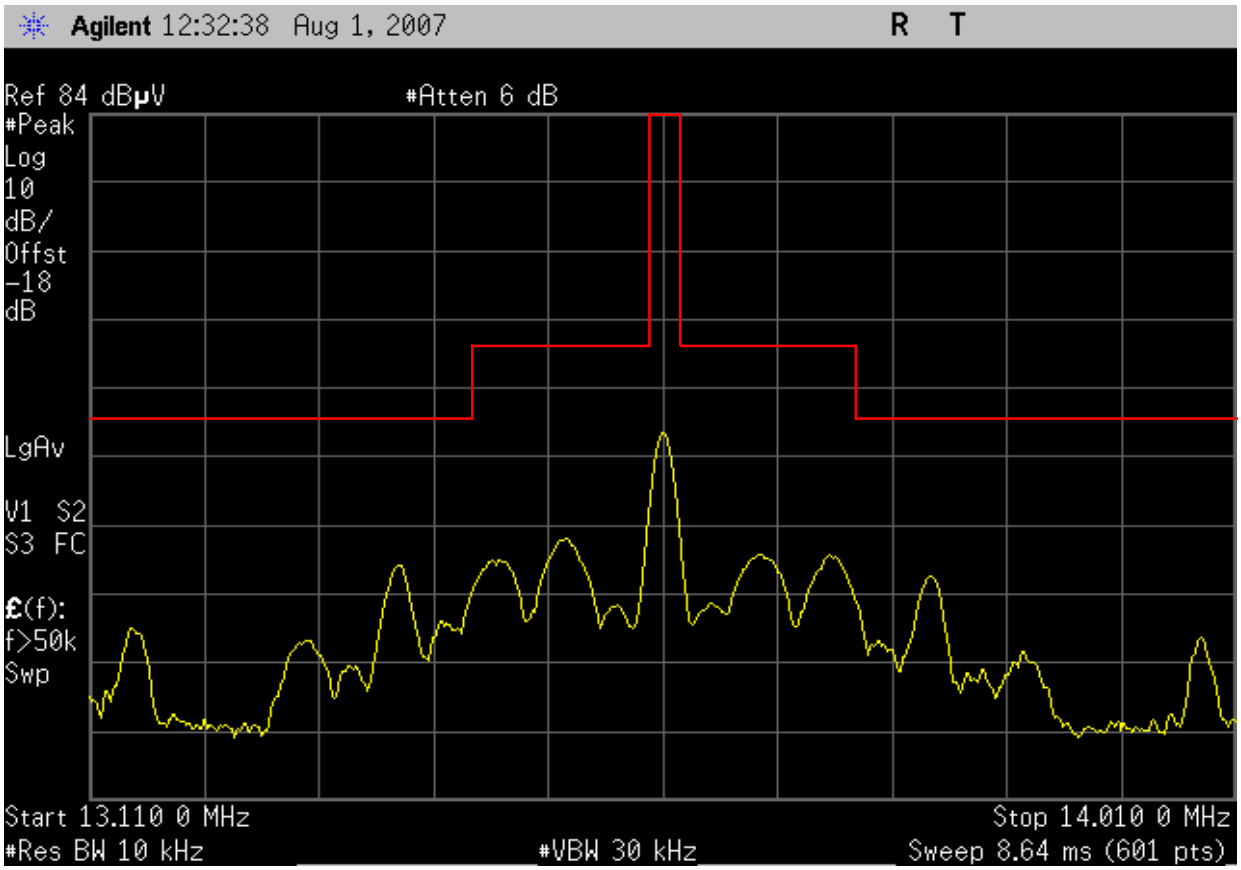
Waiting for card presentation, transmitter continuously on

DEVIATIONS FROM TEST STANDARD

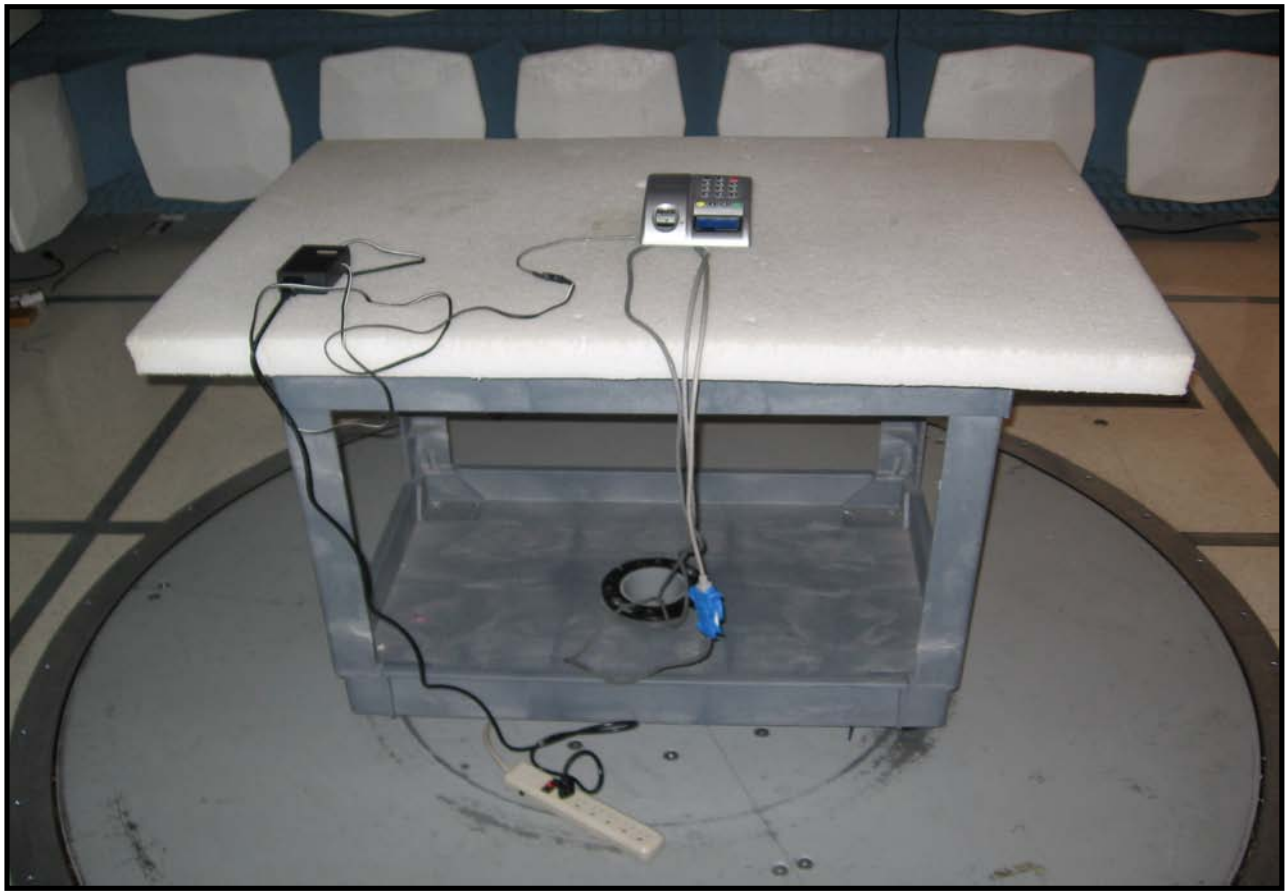
No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



FIELD STRENGTH OF FUNDAMENTAL



FIELD STRENGTH OF FUNDAMENTAL

FIELD STRENGTH OF FUNDAMENTAL

FREQUENCY STABILITY

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Near Field Probe	EMCO	7405	IPD	NCR	0
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13
Multimeter	Tektronix	DMM912	MMH	12/7/2006	13
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	7/31/2006	13
Chamber Temp. & Humidity Controlle	ESZ / Eurotherm	Dimension II	TBC	7/31/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal. The EUT is DC powered from either an AC adapter or infrastructure DC power, so a DC lab supply was used to vary the supply voltage up to 115% of 9V and down to the EUT's voltage end point.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-20° to +50° C) and at 10°C intervals.

The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

NORTHWEST EMC

FREQUENCY STABILITY

XMit 2007.06.13

EUT:	MA520			Work Order:	SAGM0023
Serial Number:	07470040A			Date:	08/02/07
Customer:	SAGEM Morpho, Inc.			Temperature:	25°C
Attendees:	Scott De Witt			Humidity:	33%
Project:	None			Barometric Pres.:	29.99
Tested by:	Rod Peloquin	Power:	15 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

COMMENTS

Weigand In communcations to Remote MA220, Wiegand Out communications to PC, Ethernet to PC, COM1 (RS-485) to PC

DEVIATIONS FROM TEST STANDARD

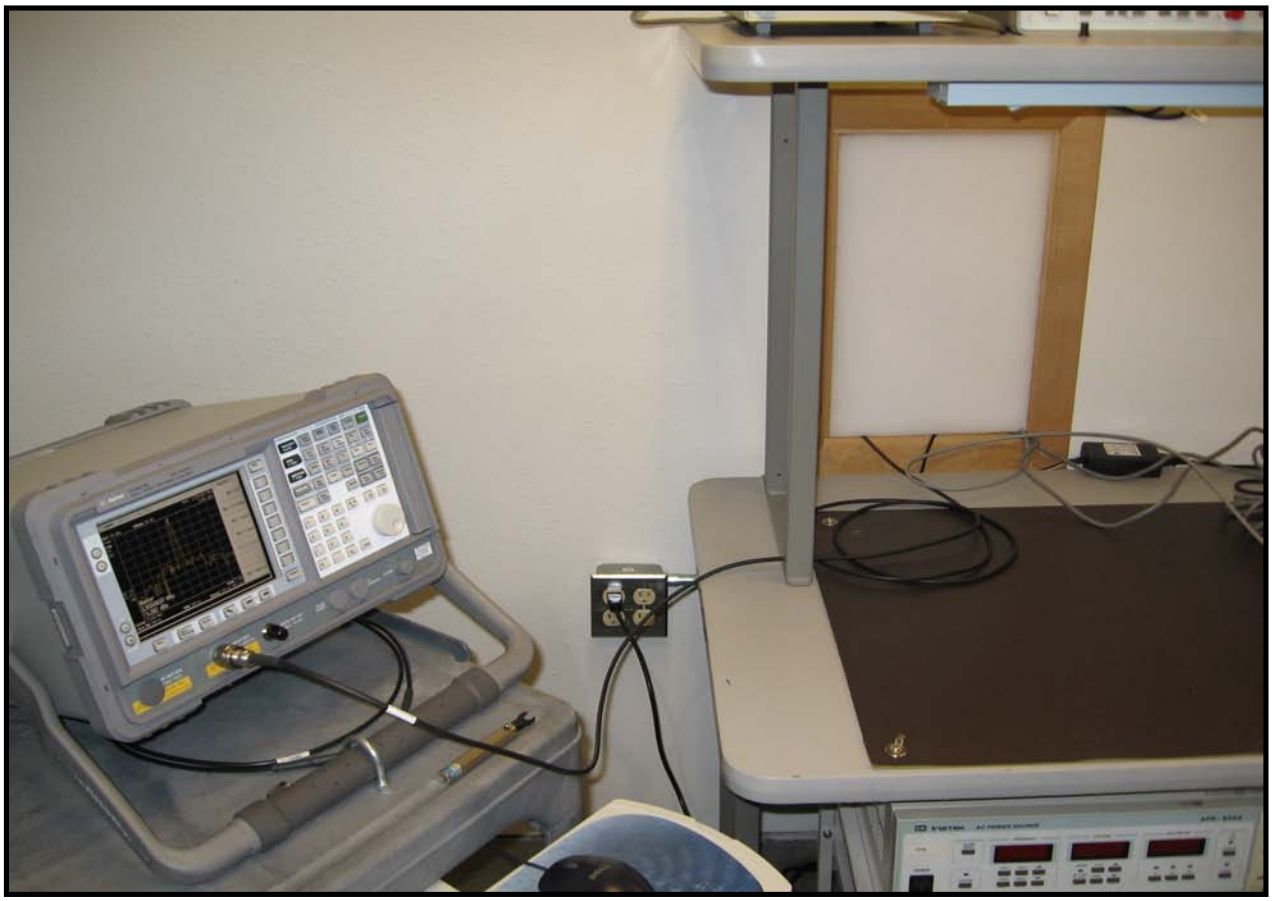
Configuration #	2	Signature

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 12 VDC)

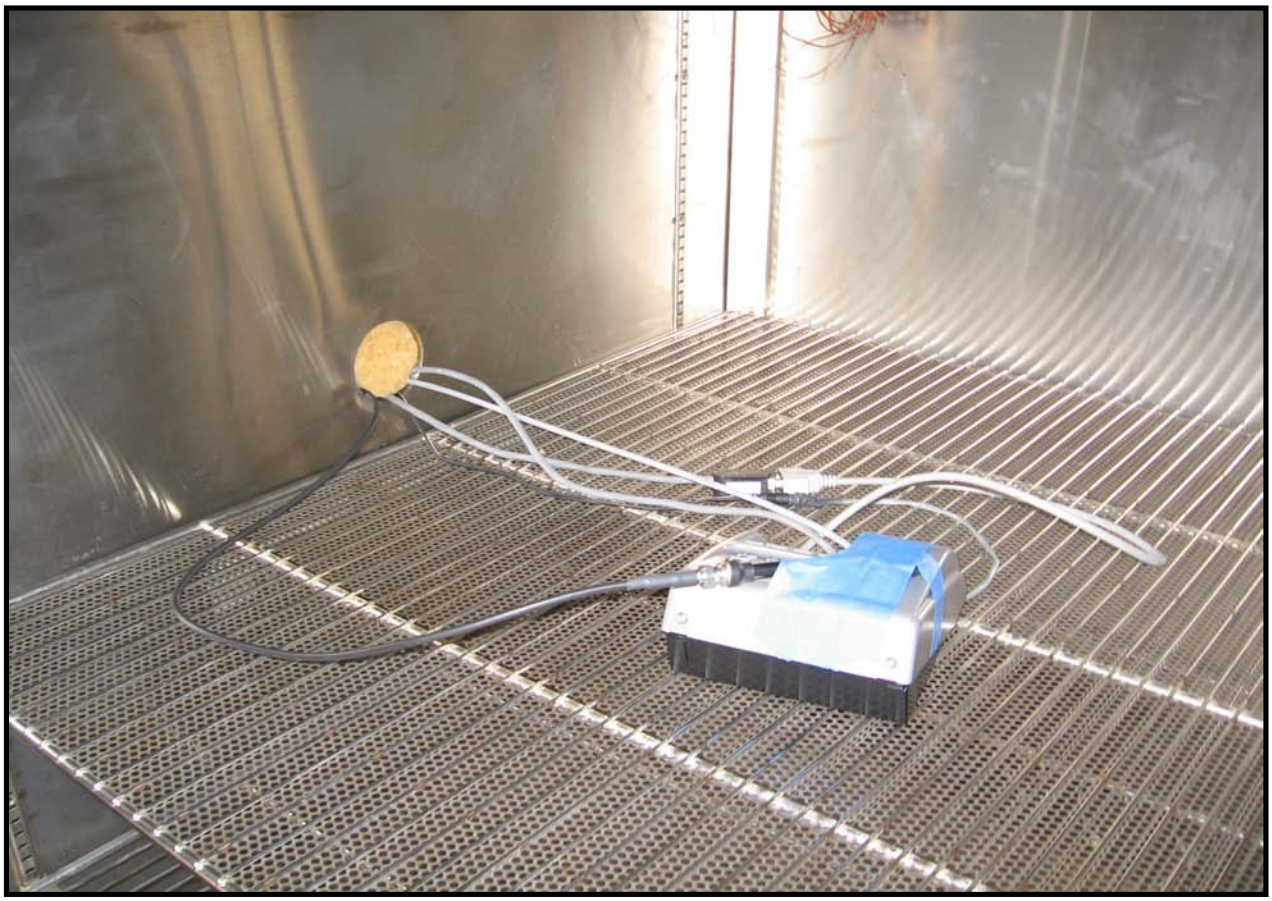
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (± %)
50	13.560000	13.559936	0.00000	0.01%
40	13.560000	13.559924	0.00001	0.01%
30	13.560000	13.559924	0.00001	0.01%
20	13.560000	13.559937	0.00000	0.01%
10	13.560000	13.559936	0.00000	0.01%
0	13.560000	13.559948	0.00000	0.01%
-10	13.560000	13.559963	0.00000	0.01%
-20	13.560000	13.559963	0.00000	0.01%

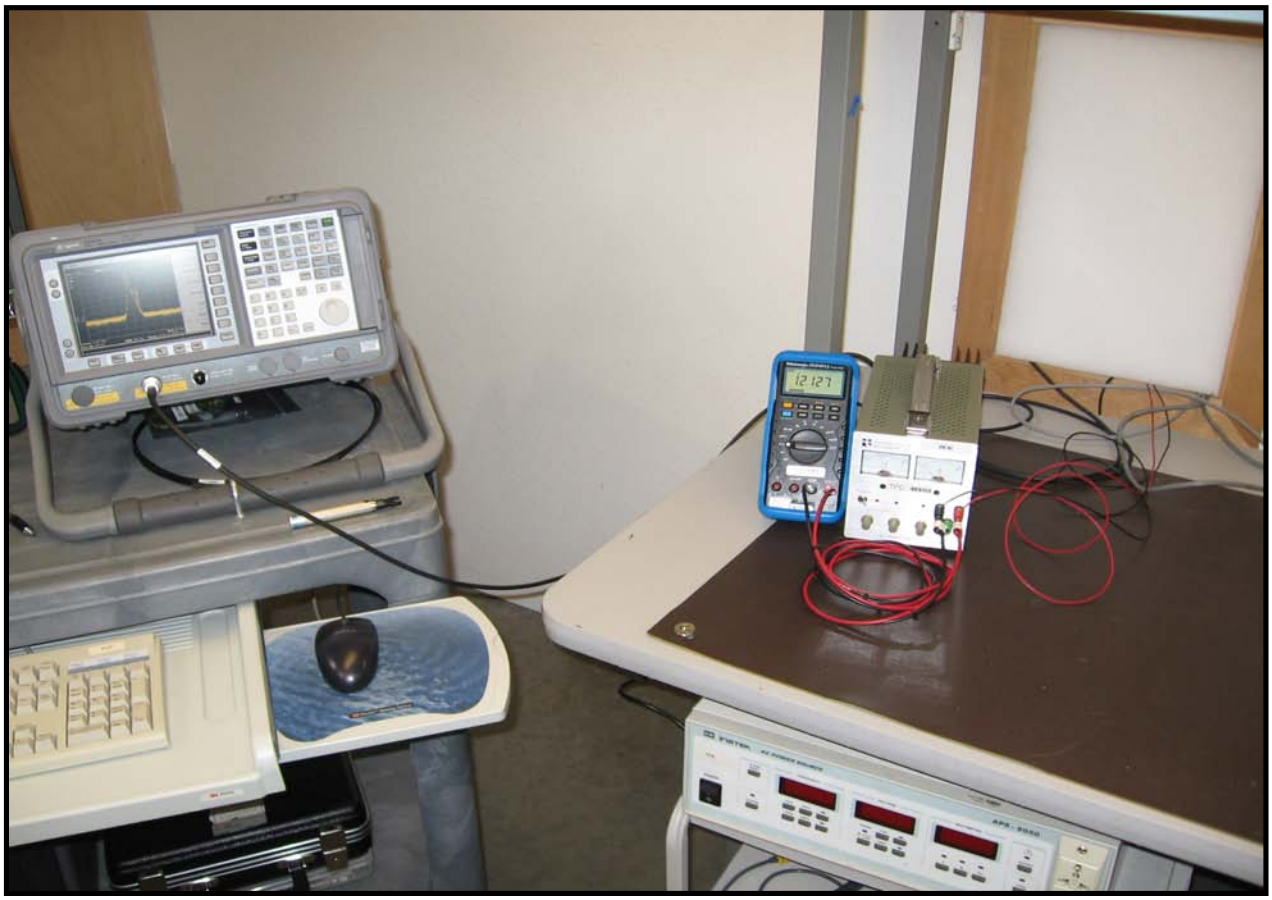
Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20° C)

Voltage (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (± %)
10.2	13.560000	13.559927	0.00001	0.01%
12.0	13.560000	13.559937	0.00000	0.01%
13.8	13.560000	13.559927	0.00001	0.01%



FREQUENCY STABILITY





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Awaiting card presentation

POWER SETTINGS INVESTIGATED

POE

Elpac 12VDC power supply

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
EV01 cables c,g, h			EVA	12/29/2006	13
Antenna, Loop	EMCO	6502	AOA	5/7/2007	24
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting at its only available channel. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

NORTHWEST EMC

Spurious Radiated Emissions

PSA 2007.05.07
EMI 2006.11.29

EUT:	MA520			Work Order:	SAGM0027
Serial Number:	072470040A			Date:	10/04/07
Customer:	SAGEM Morpho, Inc.			Temperature:	21
Attendees:	Scott De Witt			Humidity:	38%
Project:	None			Barometric Pres.:	1010.8
Tested by:	Rod Peloquin	Power:	PoE Mode B	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

PoE power supply is remote.

EUT OPERATING MODES

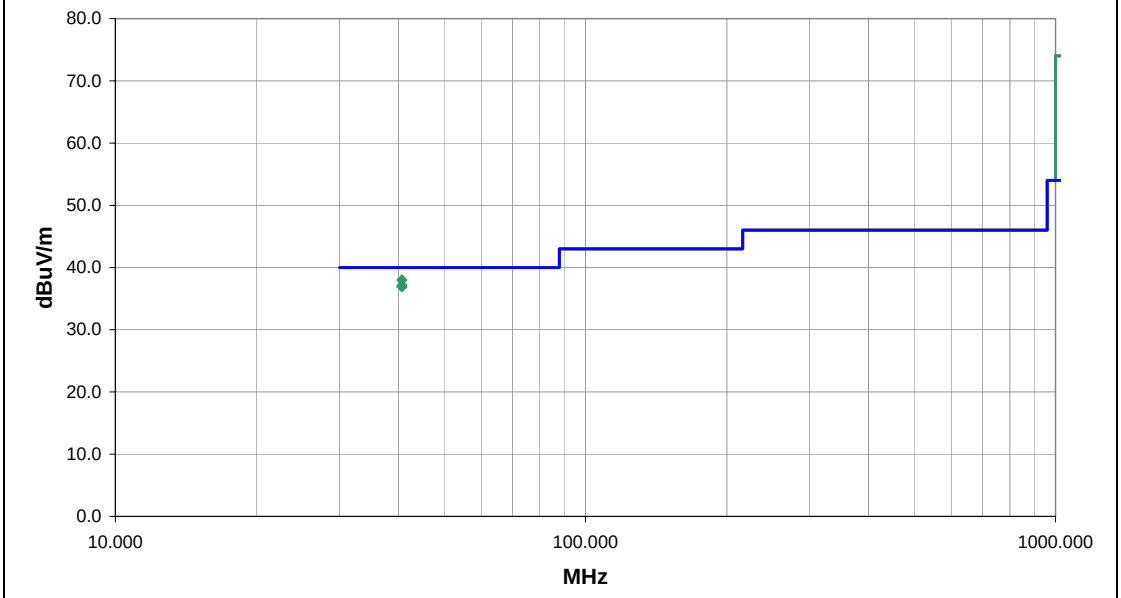
Awaiting card presentation

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
40.692	40.1	-2.1	301.0	1.0	3.0	0.0	V-Bilog	QP	0.0	38.0	40.0	-2.0	EUT horizontal
40.692	39.2	-2.1	290.0	1.1	3.0	0.0	V-Bilog	QP	0.0	37.1	40.0	-2.9	EUT vertical
40.692	39.0	-2.1	249.0	1.0	3.0	0.0	V-Bilog	QP	0.0	36.9	40.0	-3.1	EUT on side

NORTHWEST EMC

Spurious Radiated Emissions

PSA 2007.05.07
EMI 2006.11.29

EUT:	MA520	Work Order:	SAGM0027
Serial Number:	072470040A	Date:	10/04/07
Customer:	SAGEM Morpho, Inc.	Temperature:	21
Attendees:	Scott De Witt	Humidity:	38%
Project:	None	Barometric Pres.:	1010.8
Tested by:	Greg Kiemel	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3 & 5

COMMENTS

Power supply on table. Measurements made at 3 & 5 meters to determine the fall-off.

EUT OPERATING MODES

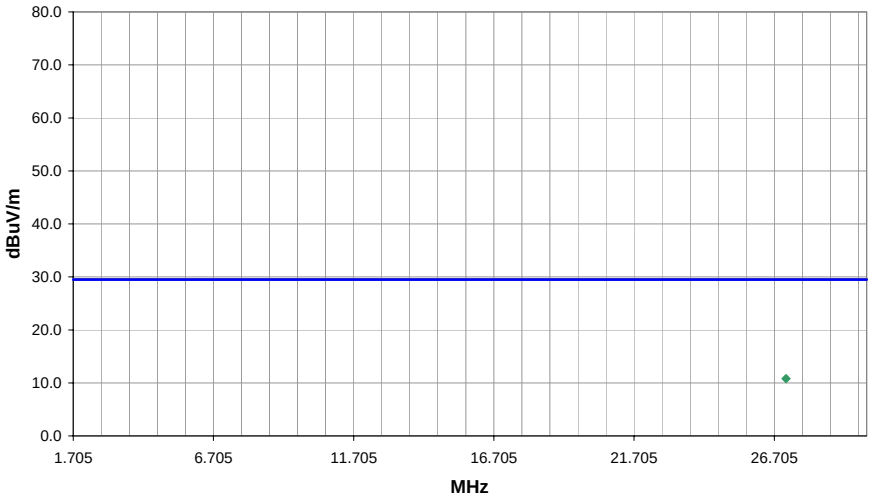
Awaiting card presentation

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	4
Configuration #	3
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
27.123	15.3	9.0	51.0	3.8	3.0	0.0	Loop	QP	13.5	10.8	29.5	-18.7	Loop parallel to ground, Perpendicular to EUT
27.122	12.3	9.0	51.0	3.8	5.0	0.0	Loop	QP	10.5	10.8	29.5	-18.7	Loop parallel to ground, Perpendicular to EUT

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon the measured fall-off

EUT: MA520
S/N:
Date: 10/4/2007
Job Number: SAGM0027

Frequency (MHz)	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
27.122	Perp/EUT, Par/GND	3	24.3	3.0	13.5	30.0	13.5
	Perp/EUT, Par/GND	5	21.3				10.5