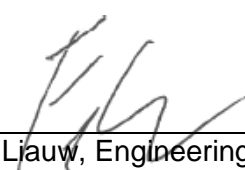


# EMC Test Report

**Project Number: 3720850****Report Number: 3720850EMC02****Revision Level: 1****Client: Hi-P (SINGAPORE) TECHNOLOGY PTE LTD****Equipment Under Test: iDEN Cellular Phone with Bluetooth****Model Number: H375i****FCC ID: 2ACUZH375I****Applicable Standards: FCC Part 90, Subpart S****FCC Part 24, Subpart D****RSS - 119****RSS - 134****Report issued on: 29 June 2015****Test Result: Compliant**

Tested by:

  
Fendy Ljauw, Engineering Technician

Reviewed by:

  
David Schramm, EMC/RF/SAR/HAC Manager**Remarks:**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or Testing done by SGS International Electrical Approvals in connection with distribution or use of the product described in this report must be approved by SGS international Electrical Approvals in writing.

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# 1 Summary of Test Results

Basic Standards	Test Result
<b>Emissions Testing</b>	
Transmitter Output Power	Compliant
Modulation Characteristics	Compliant
Radiated Spurious Emissions	Compliant
Frequency Stability	Compliant
Effective Radiated Power (ERP)	Compliant

## 1.1 Modifications Required to Compliance

None

## 1.2 Performance Criteria for Immunity

Criteria A – No loss of performance or data during or after the test

Criteria B – No loss of data, some loss of performance that is self recoverable without operator intervention

Criteria C – No loss of data, some loss of performance that can be recovered with operator intervention

## 2 General Information

### 2.1 Client Information

Name: Hi-P Technology PTE LTD  
Address: 12 Ang Mo Kio Street 64 #03-02, UE BIZHUB Central (BLK A)  
City, State, Zip, Country: Singapore 569088

### 2.2 Test Laboratory

Name: SGS North America, Inc.  
Address: 620 Old Peachtree Road NW, Suite 100  
City, State, Zip, Country: Suwanee, GA 30024, USA

### 2.3 General Information of EUT

Description: iDEN Cellular Phone with Bluetooth  
Model Number: H375i  
Serial Number: 364KRE00H2  
Rated Voltage: 3.7 VDC 1830mAh rechargeable battery  
Test Voltage: 3.7 VDC 1830mAh

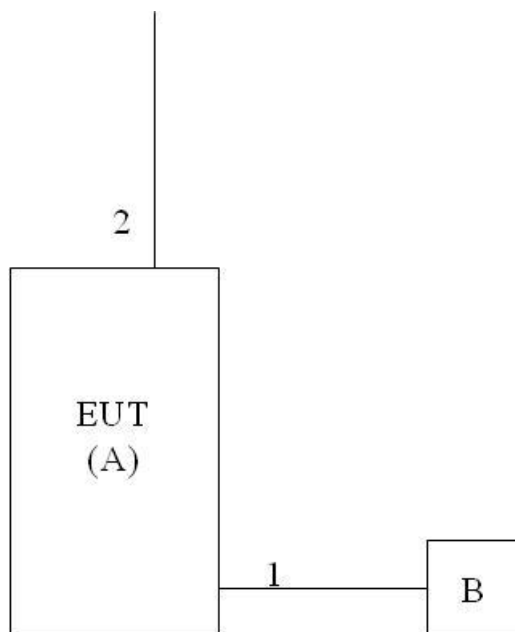
Sample Received Date: 31 March 2015  
Dates of testing: 8 Apr - 18 May 2015

### 2.4 Operating Modes and Conditions

The EUT was programmed by the manufacturer to run continuously exercising all modes of operation.

During immunity testing any loss of function was determined if equipment failed to stay in the continuous operating mode or led lighting recover automatically.

## 2.5 EUT Connection Block Diagram



## 2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Hi-P Technology	iDEN Cellular Phone with Bluetooth	H375i	364KRE00H2
B	Motorola	AC Power Supply	SSW-2442EU	SPN5655A

## 2.7 Cable List

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	AC Main	EUT	Power Supply	1	N	N
2	Audio	EUT	Ear Phones	1	N	N

### 3 Transmitter Output Power

#### 3.1 Test Result

Test Description	Product Specific Reference	Basic Reference	Test Result
Land Mobile Transmitter Power	47 CFR 90.7 / 24.132	47 CFR 2.1046	Compliant
Maximum Output Power Rating	47 CFR 90.635(d) / 24.132(a)	47 CFR 2.1033(c)(7)	Compliant
Operating output power range		47 CFR 2.1033(c)(6)	Compliant
DC power used by final amplifier device		47 CFR 2.1033(c)(8)	Compliant

#### 3.2 Test Method

The EUT was connected to the spectrum analyzer, which was gated to measure only when the device was transmitting. An RMS detector was used to measure maximum average power.

#### 3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.8 °C

Relative Humidity: 44.1 %

Atmospheric Pressure: 98.23 kPa

#### 3.4 Test Equipment

Test Date: 8-Apr-2015

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	28-Aug-2015
DC POWER SUPPLY	382280	EXTECH	EA03	1-Apr-2016
MULTIFLEX COAXIAL CABLE	141	HUBER&SUHNER	B095589	6-Aug-2015

Note: The calibration period equipment is 1 year.

### 3.5 Test Data

Characteristics	800 MHz		900 MHz		901.5 MHz	
Power Setting	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
DC Voltage, Volts	3.7	3.7	3.7	3.7	3.7	3.7
DC Current, A	0.302	0.512	0.290	0.497	0.292	0.496
RF Output Power, mW	0.22	640	0.22	640	0.22	640

Maximum output power rating: 640 milliwatts (28.06 dBm), pulse average power. Output power will vary from 0.22 to 640 milliwatts (pulse average power).

Note 1: Nominal output power rating: 600 milliwatts (27.78 dBm) (Pulse average power).

Note 2: These ratings are compliant with the FCC maximum of 100 watts (50 dBm) for Mobile stations operating under Part 90.

Note 3: These ratings are compliant with the FCC maximum of 7 watts ERP for Mobile stations operating under Part 24.

Note 4: The term pulse average power is used to specify the power that would be measured during the intervals of recurrent TDM transmission pulses by an average responding RF power meter. Power expressed in this manner is independent of the TDM duty cycle, and facilitates RF system coverage analysis.

## 4 Modulation Characteristics

### 4.1 Test Result

Test Description	Product Specific Reference	Basic §	Test Result
Modulation Characteristics and Necessary Bandwidth	47 CFR 24.131, §24.133(a)(1), §90.210(g), §90.669(a), and §90.691; RSS-Gen Section 3, RSS-119 Section 4.2, RSS-134 Section 6.3.	47 CFR 2.1033(c)(13) §2.1047(d), §2.1049, §2.202	Compliant

### 4.2 Test Method

Emission Mask G is applied between 809 and 824 MHz, per the Applicable Emission Masks Table in §90.210.

Emission Mask G is applied also in the range between 806 and 809 MHz. The above referenced table calls for Emission Mask H, but the band plan for this spectrum was established for 12.5 kHz channels (§90.209(b)(5)). Mask H is intended for that application. The subject transmitter's emission is suited to 25 kHz channels (aggregated), and thus the G-Mask is applicable.

Similarly, the table calls for the use of Emission Mask J in the spectrum between 896 and 901 MHz, which was established for 12.5 kHz channels. The subject transmitter operates on (aggregated) 25 kHz channels in this band as well, and thus the G-Mask is most appropriate.

For these plots, the Authorized Bandwidth is taken to be 20 kHz (per §90.205(b)(5)) for all the above bands.

According to the above reference table, the EA Mask (§90.691) is also applicable, and thus compliance to this requirement is also demonstrated in this exhibit.

### 4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

#### Environmental Conditions

Temperature: 21.6 °C  
Relative Humidity: 32.4 %  
Atmospheric Pressure: 98.10 kPa

### 4.4 Test Equipment

Test Date: 24-Apr-2015

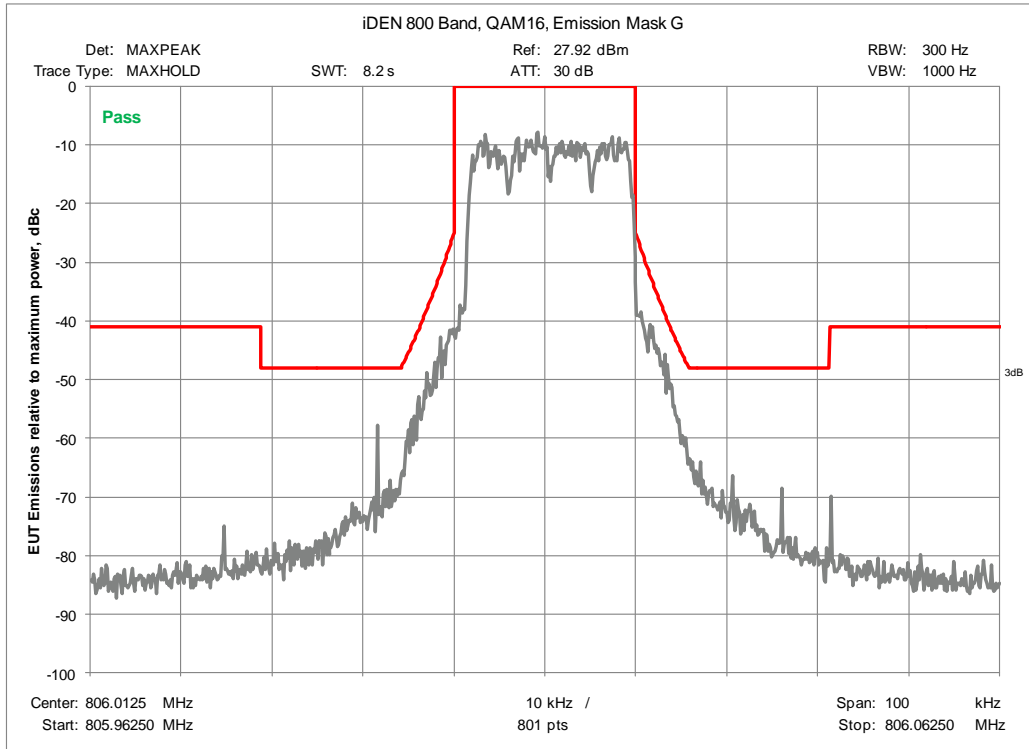
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	28-Jul-2015
MULTIFLEX COAXIAL CABLE	141	HUBER&SUHNER	B095589	6-Aug-2015

Note: The calibration period equipment is 1 year.

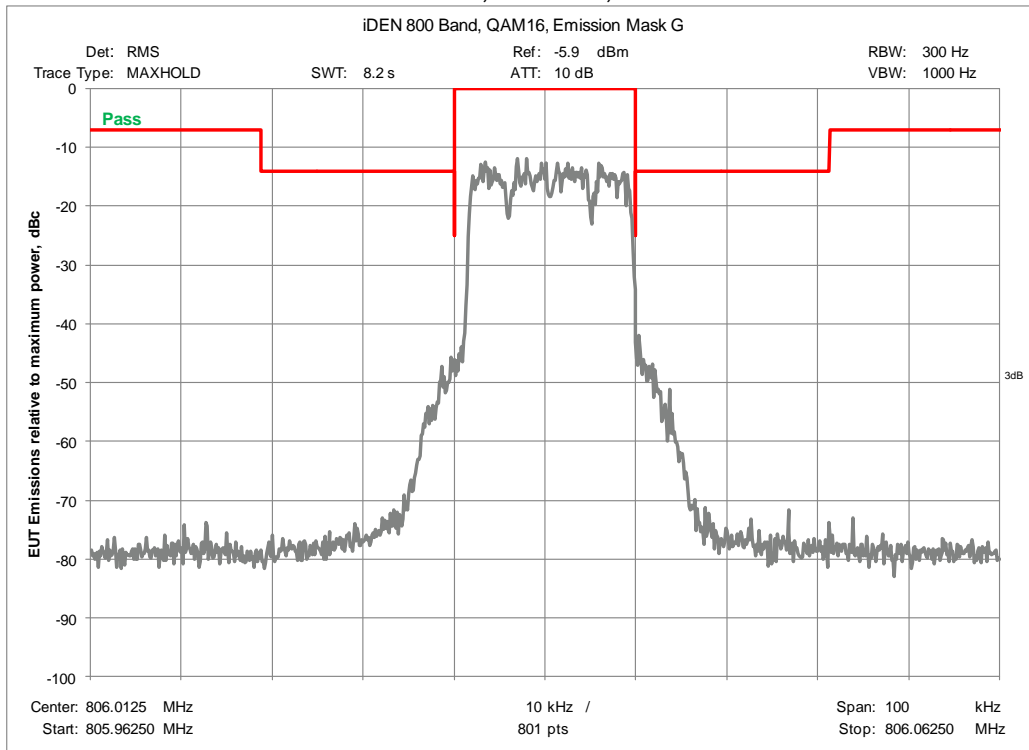


## 4.5 Test Data

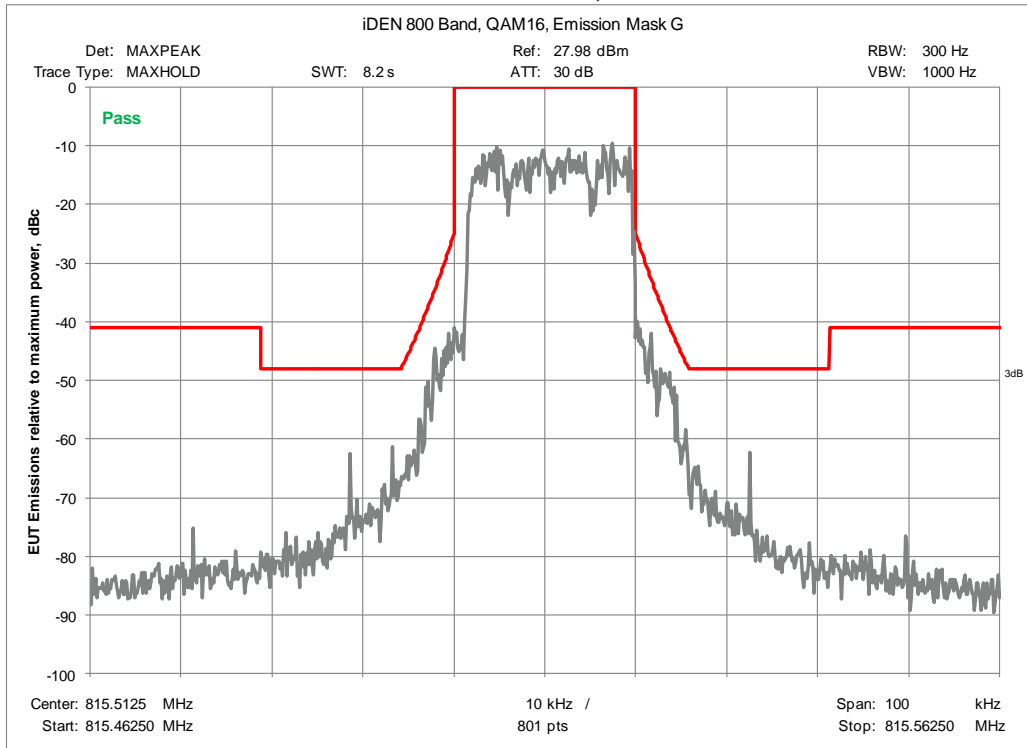
### iDEN 806.0125 MHz, QAM 16



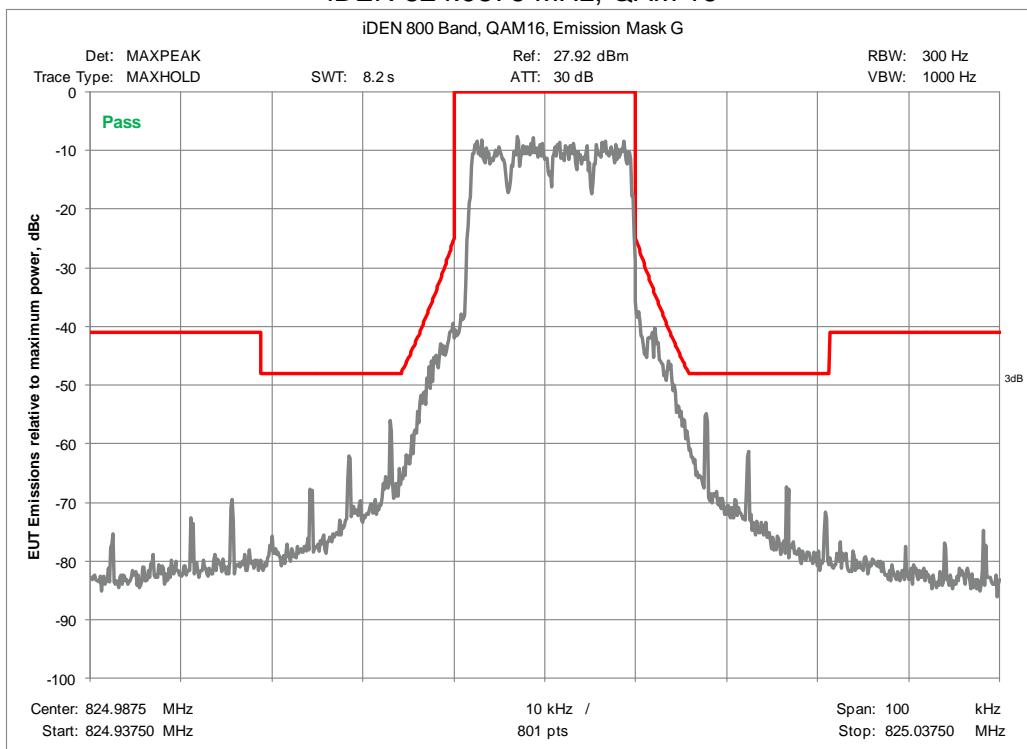
### iDEN 806.0125 MHz, QAM 16, Minimum Power



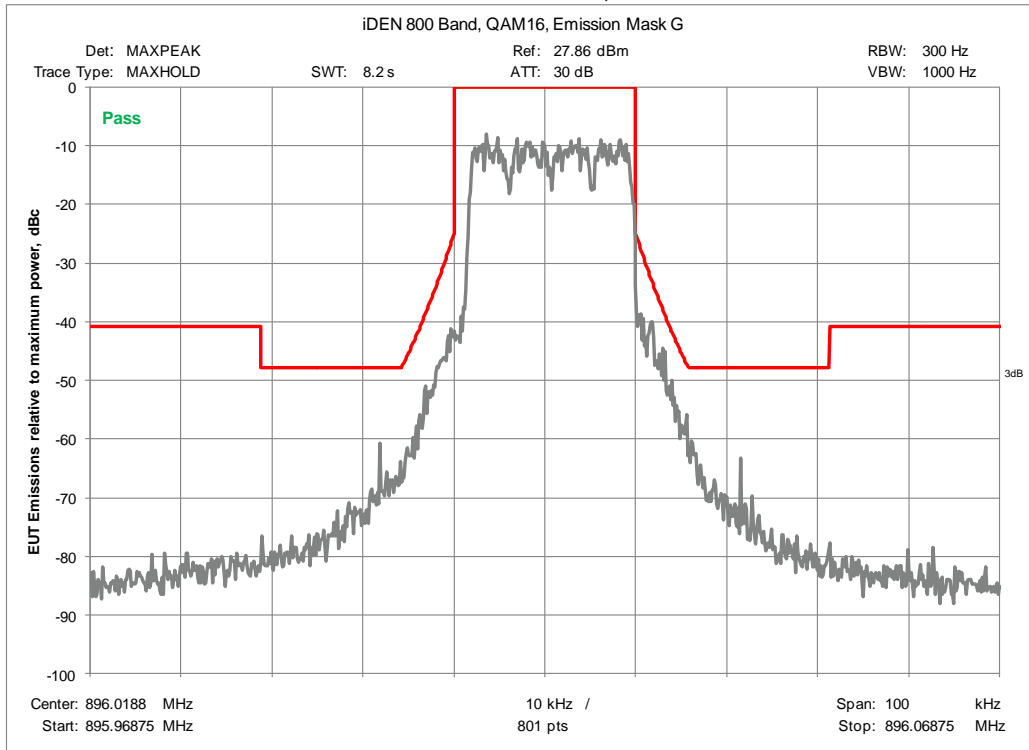
## iDEN 815.5125 MHz, QAM 16



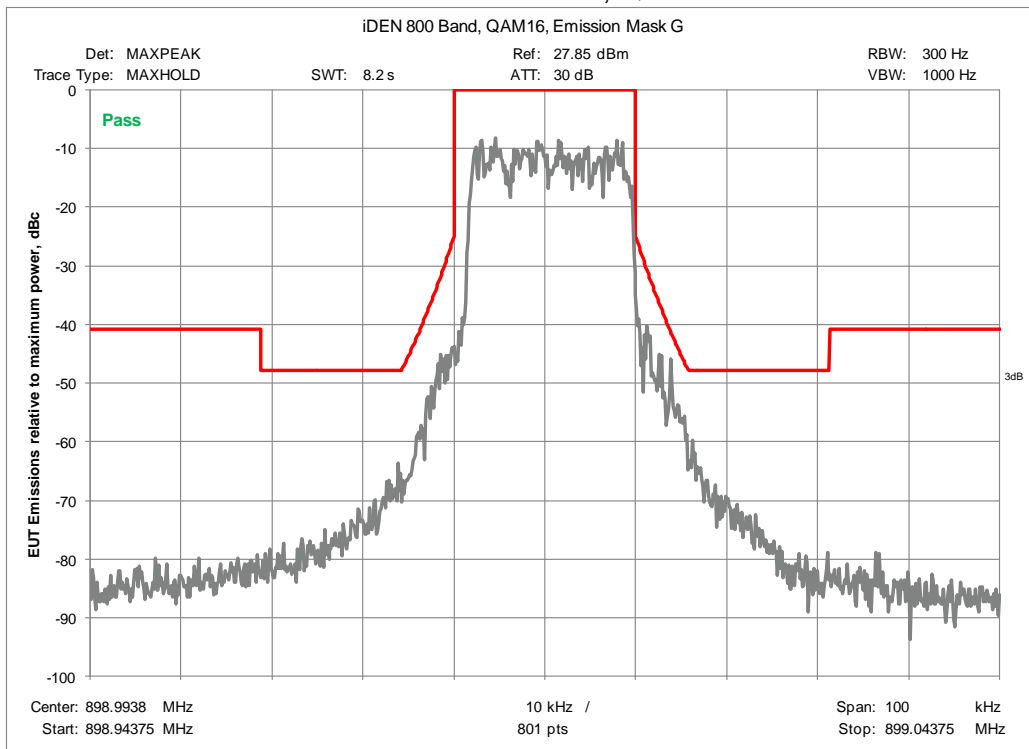
## iDEN 824.9875 MHz, QAM 16



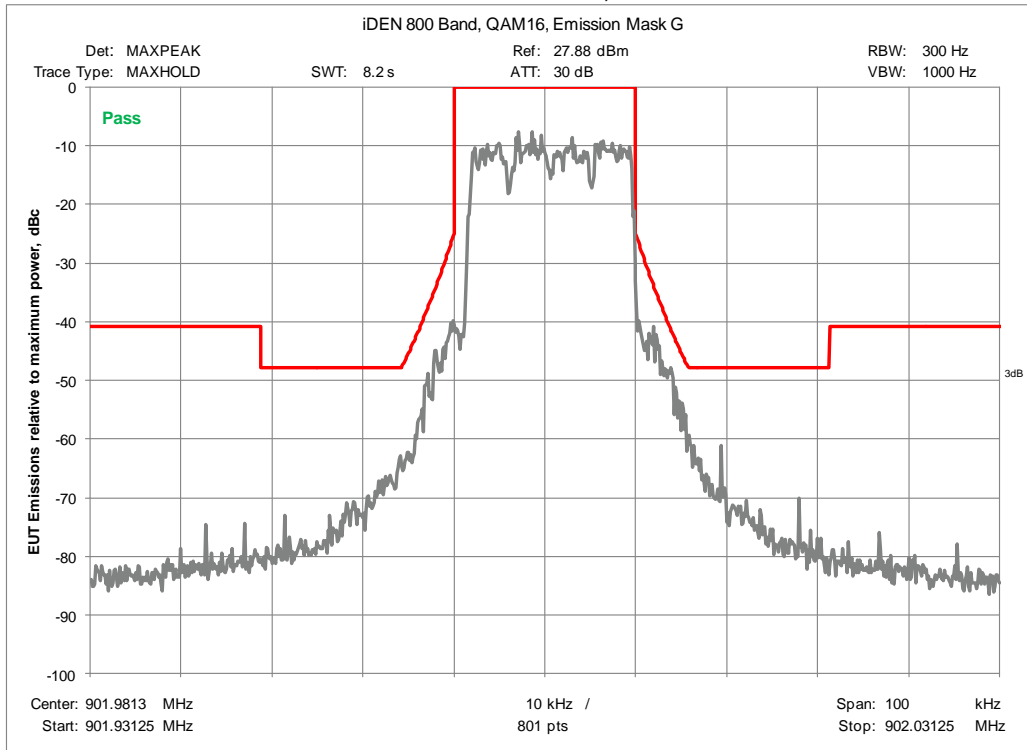
### iDEN 896.01875 MHz, QAM 16



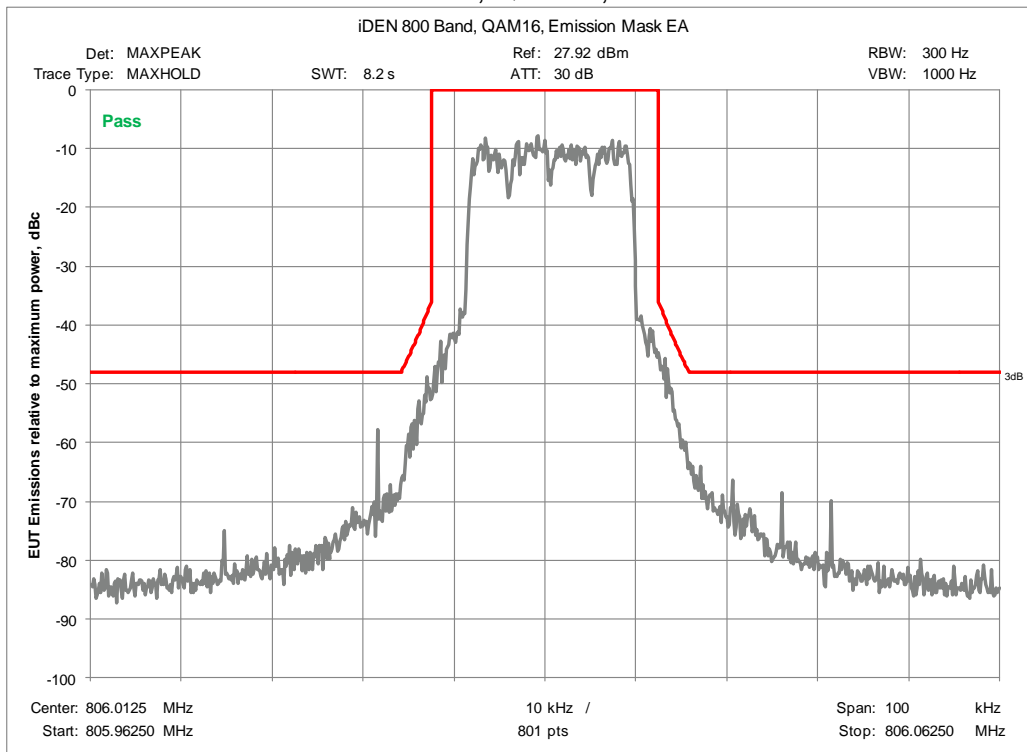
### iDEN 898.99375 MHz, QAM 16



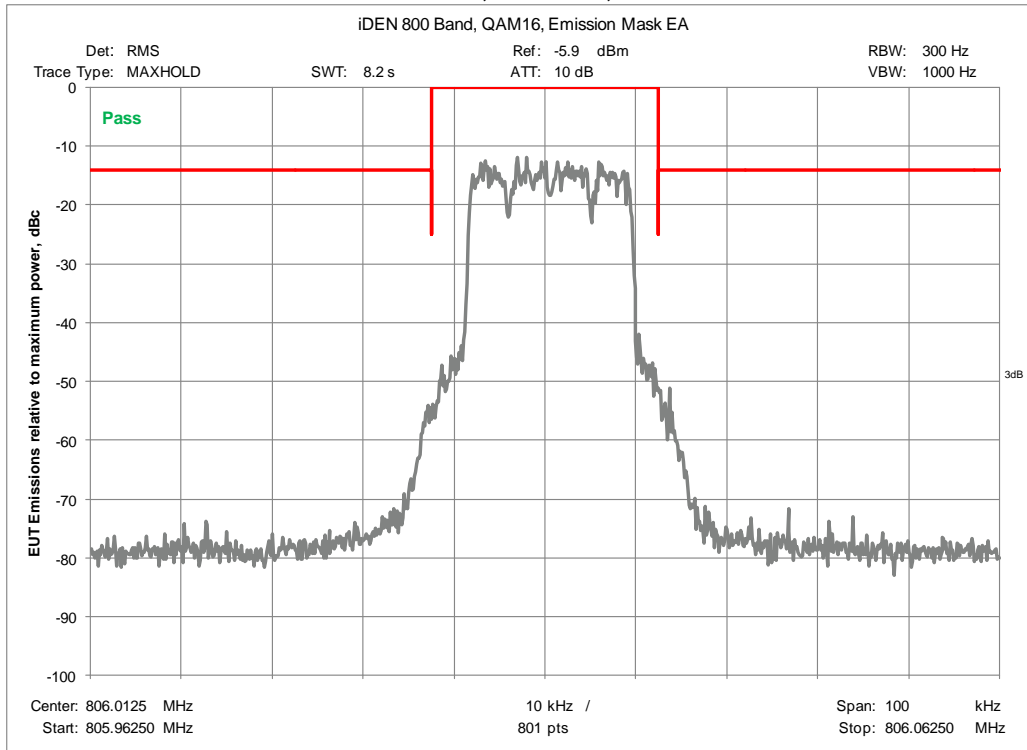
### iDEN 901.98125 MHz, QAM 16



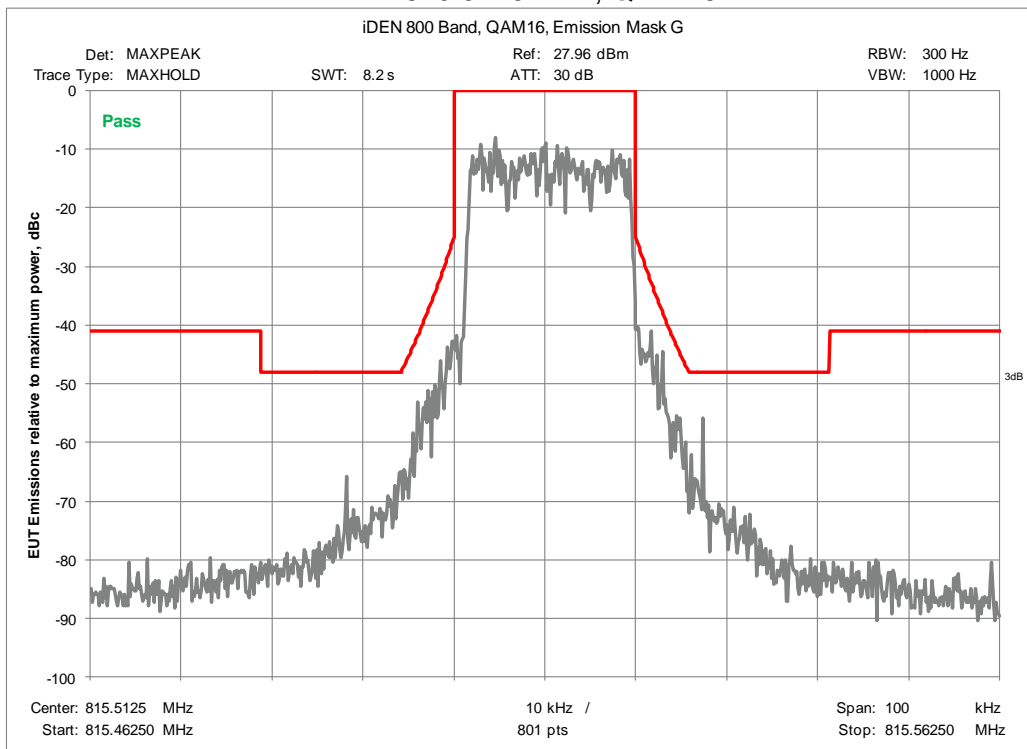
### iDEN 806.0125 MHz, QAM 16, Maximum Power



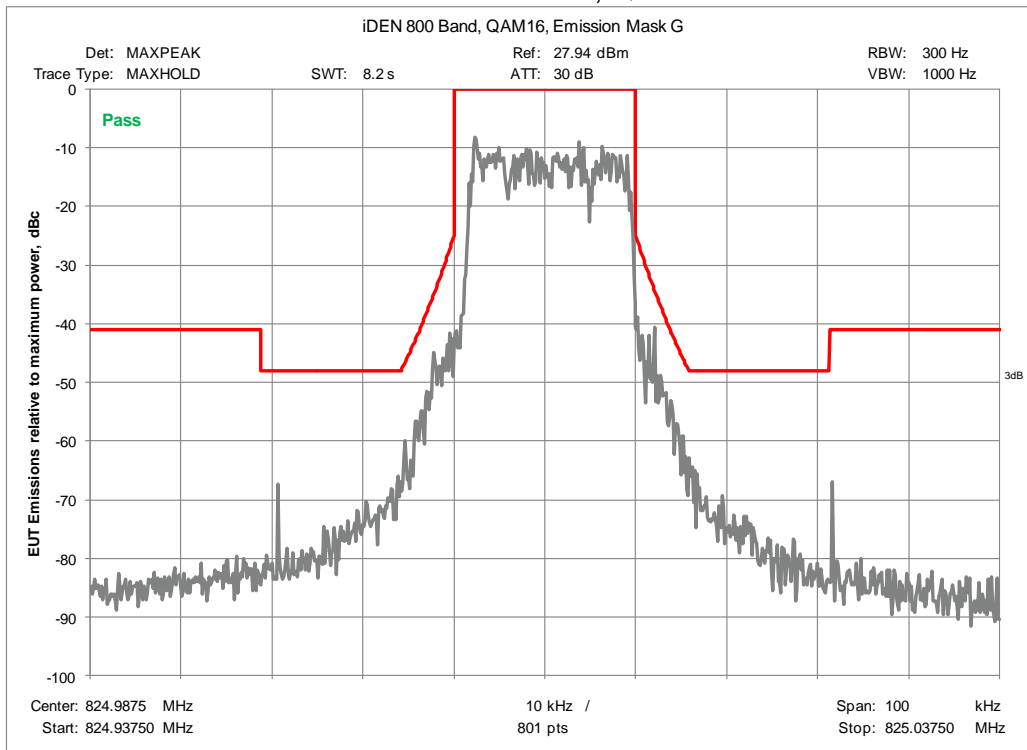
### iDEN 806.0125 MHz, QAM 16, Minimum Power



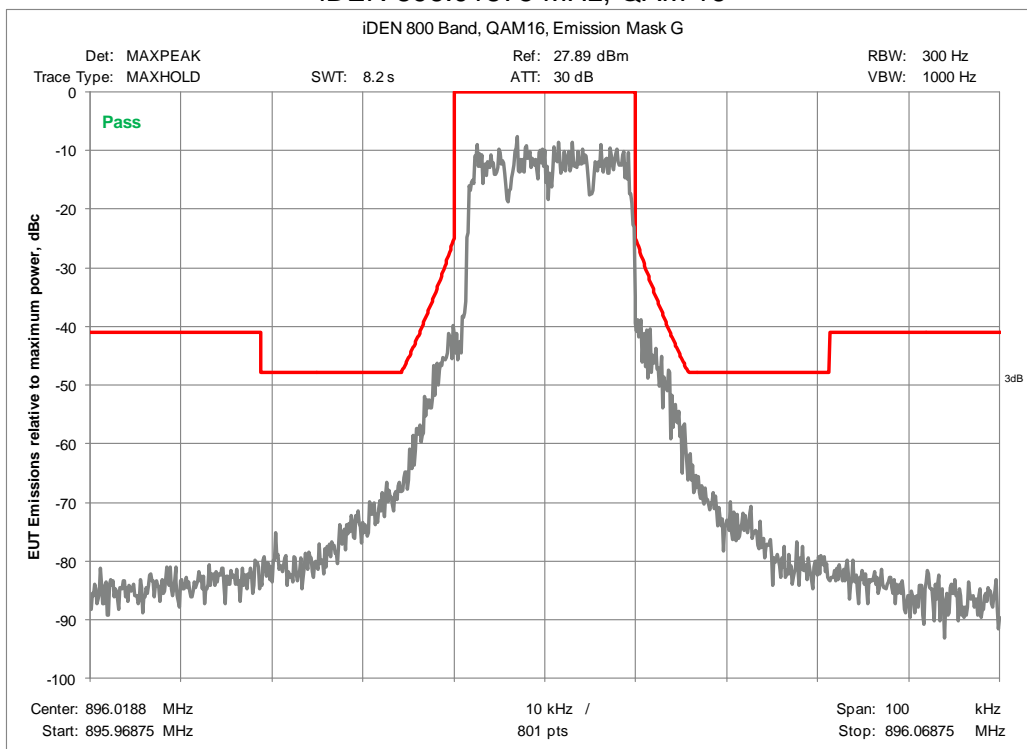
### iDEN 815.5125 MHz, QAM 16



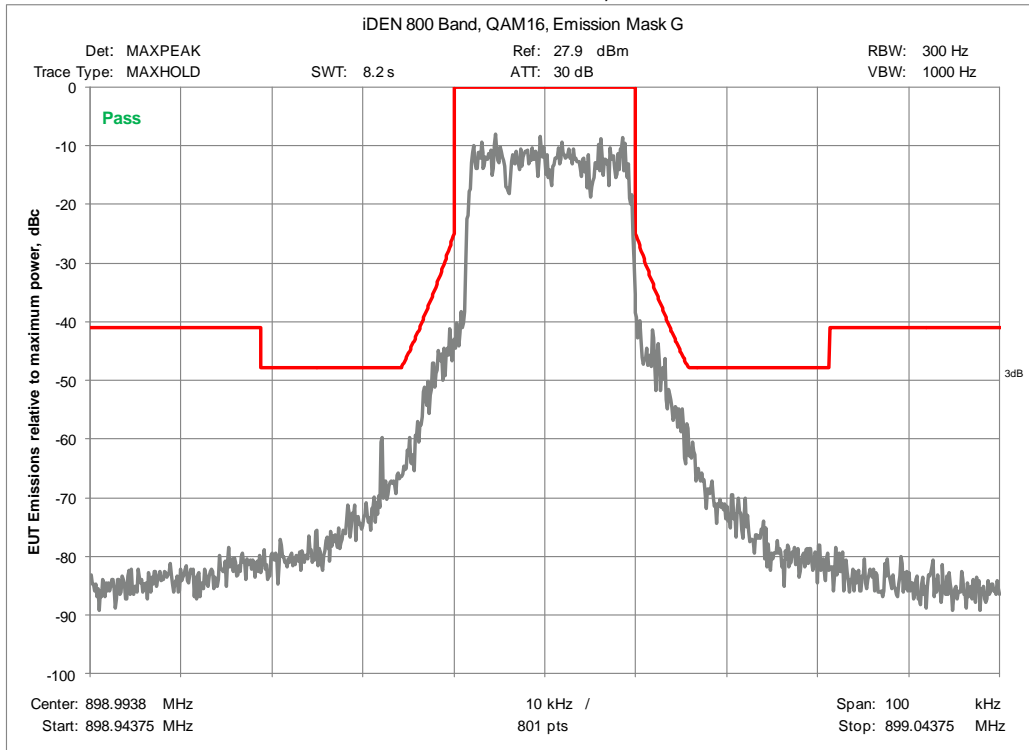
### iDEN 824.9875 MHz, QAM 16



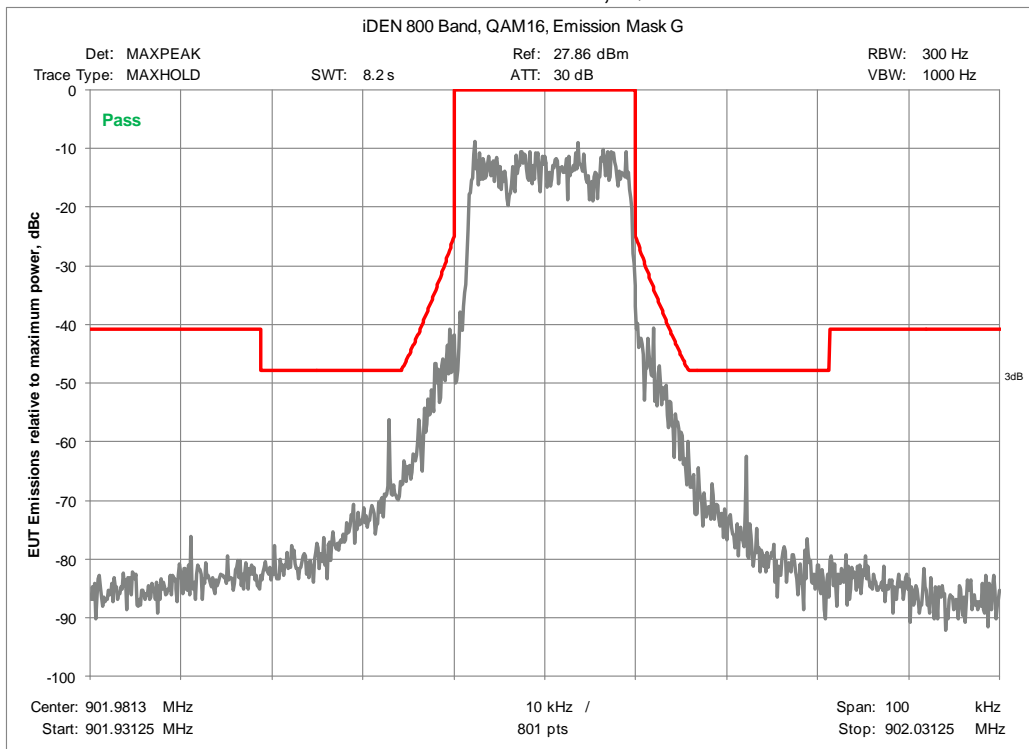
### iDEN 896.01875 MHz, QAM 16



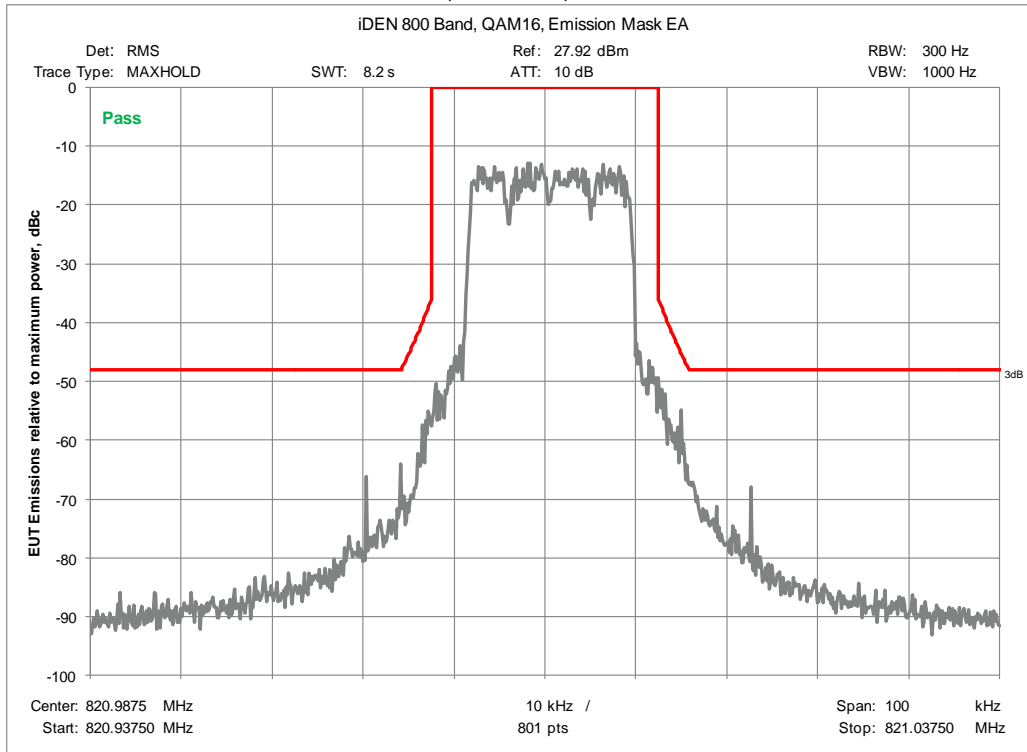
### iDEN 898.99375 MHz, QAM 16



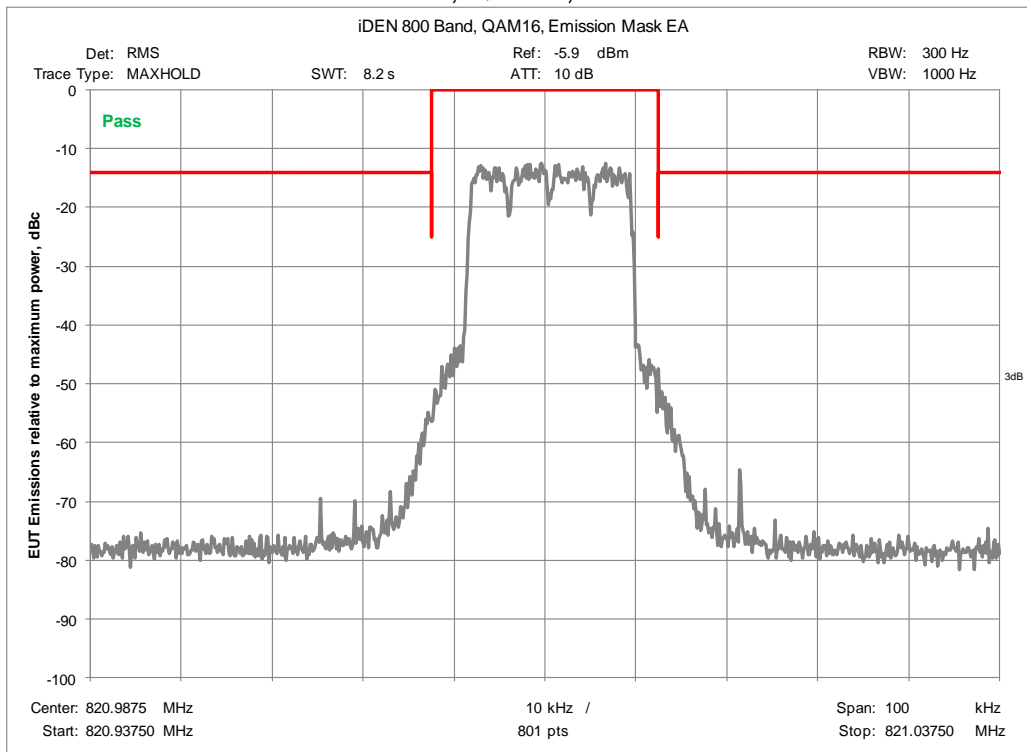
### iDEN 901.98125 MHz, QAM 16



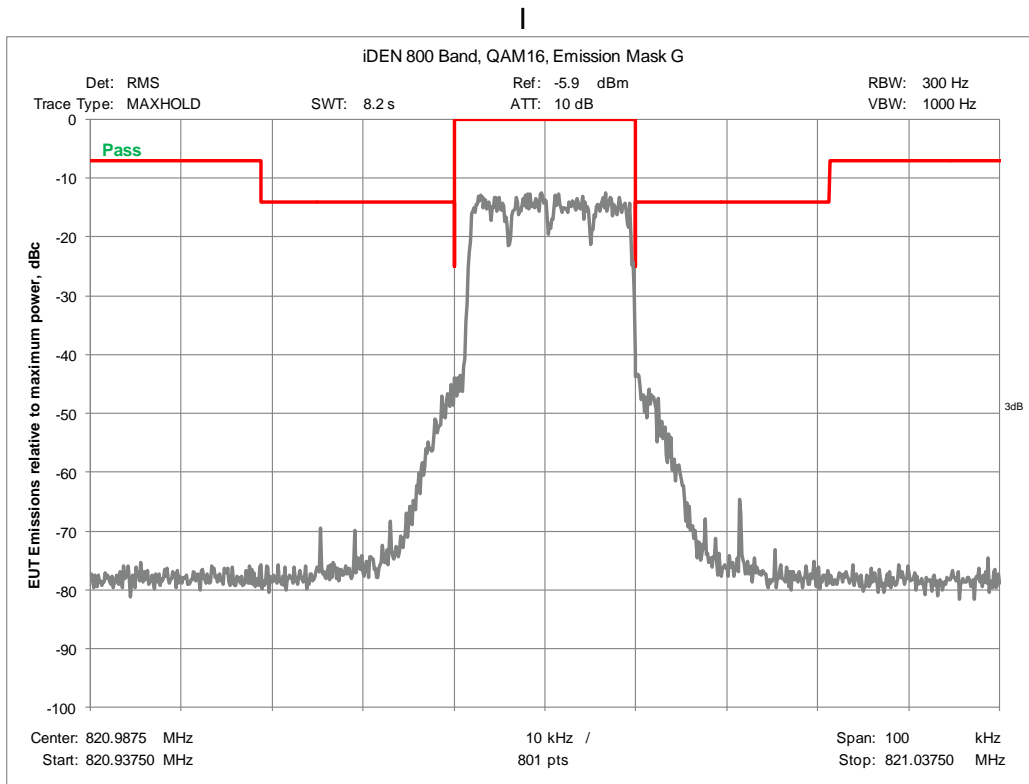
### iDEN 800, QAM16, Max Power



### iDEN 800, QAM16, Min Power







## 5 Radiated Spurious Emissions

### 5.1 Test Result

Test Description	Product Specific Standard	Basic Standard	Test Result
Radiated Spurious Emissions	47 CFR 2.1053 47 CFR Part 90	ANSI / TIA 603-C:2004	Compliant

### 5.2 Test Method

The spectrum was investigated from 30 MHz to at least the 10<sup>th</sup> harmonic of the fundamental. The substitution method of ANSI / TIA 603-C:2004 was used to make the measurements.

Instrument Settings

Frequency	RBW, MHz	VBW, MHz
Up to 1 GHz	0.1	1
Above 1 GHz	1	3

For Emission Mask G, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- on any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

For a power of P in W, the emissions must be attenuated by  $43 + 10 \log (P)$ , in dB. This equates to -43 dBW or -13 dBm.

The EUT was rotated through 3 orthogonal axes. The highest axis was reported.

### 5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.5 °C

Relative Humidity: 50.9 %

Atmospheric Pressure: 98.10 kPa

### 5.4 Test Equipment

Test Date: 15-Apr-2015

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
ANTENNA, BILOG	JB6	SUNOL	B079689	3-Sep-2015
RF CABLE - 12000MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079714	4-Aug-2015
10 FT N TYPE COAX	HS 84133215	HUBER&SUHNER	B079659	5-Aug-2015
DRG HORN (MEDIUM)	3117	ETS-LINDGREN	B079691	24-Jun-2015
PREAMPLIFIER-ANTENNA SYS	TS-PR18	ROHDE & SCHWARZ	B094463	13-Feb-2016
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	28-Jul-2015

Note: The calibration period equipment is 1 year.

## 5.5 Test Data

### 806.0125 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1612.03	V	-50.0	-13.0	-37.0
1612.03	H	-49.0	-13.0	-36.0

There were no other emissions within 20 dB of the limit.

### 815.5125 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1631.03	H	-41.8	-13.0	-28.8
1631.03	V	-55.2	-13.0	-42.2

### 824.9875 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1649.98	V	-52.6	-13.0	-39.6
2474.96	V	-55.6	-13.0	-42.6
1649.98	H	-49.0	-13.0	-36.0
2474.96	H	-50.3	-13.0	-37.3

There were no other emissions within 20 dB of the limit.

### 896.01875 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1792.04	V	-42.7	-13.0	-29.7
2688.06	V	-44.6	-13.0	-31.6
1792.04	H	-36.6	-13.0	-23.6
2688.06	H	-53.0	-13.0	-40.0

### 898.99375 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1797.99	V	-63.0	-13.0	-50.0
2696.98	V	-47.8	-13.0	-34.8
1797.99	H	-43.7	-13.0	-30.7
2696.98	H	-51.3	-13.0	-38.3

### 901.98125 MHz

Frequency MHz	Azimuth (V/H)	EIRP dBm	Limit dBm	(dB)
1803.96	V	-41.3	-13.0	-28.3
2705.94	V	-62.2	-13.0	-49.2
1803.96	H	-40.6	-13.0	-27.6
2705.94	H	-51.7	-13.0	-38.7

## 6 Frequency Stability

### 6.1 Test Result

Test Description	Product Specific Standard	Basic Standard	Test Result
Modulation Characteristics	47 CFR 2.947(c) and 47 CFR 2.1055	47 CFR 2.1055(a)(1), §2.1055(d)(2), §24.135	Compliant

### 6.2 Test Method

The center frequency was determined by using the average of the two 20dB points.

#### Frequency Error vs. temperature

A Power Supply was controlled to provide a continuous 3.7 VDC to the unit tested. The sensor leads from the power supply were attached to the input of the DC/RF test fixture in which the radio was placed. A Temperature Chamber was used to control a temperature range of –30 degree Celsius to +60 degree Celsius.

At each set point, a soak time of 20 minutes was used to ensure thermal penetration of the unit tested before each measurement of frequency error was taken. A soak time of 45 minutes was used at –30 degree Celsius to ensure thermal penetration of the unit tested because of the variance from the starting temperature of +25 degree Celsius. Soak cycles of 20 minutes each thereafter were used because of the fact that the set points were incremented at 10 degree (Celsius) steps.

#### Frequency Error vs. voltage

A Power Supply was controlled to provide a voltage range of 85% to 115% of the nominal voltage of the unit tested. The sensor leads from the power supply were attached to the input of the battery eliminator of the unit tested.

After having taken a frequency error measurement at the maximum voltage, the Power Supply's output was reduced to the minimum voltage.

### 6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

#### Environmental Conditions

Temperature: 23.2 °C  
Relative Humidity: 42 %  
Atmospheric Pressure: 98.79 kPa

### 6.4 Test Equipment

Test Date: 2-May-2015

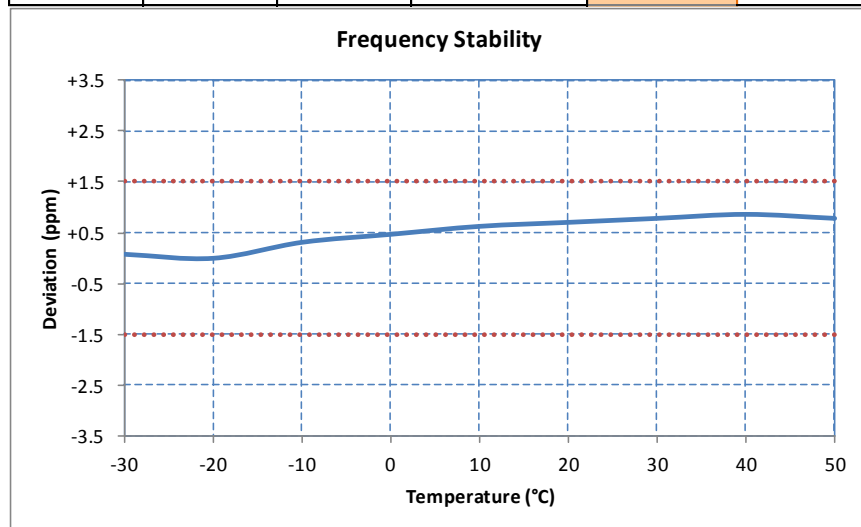
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
MULTIFLEX COAXIAL CABLE	141	HUBER&SUHNER	B095589	6-Aug-2015
DC POWER SUPPLY	382280	EXTECH	EA03	1-Apr-2016
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	28-Aug-2015

Note: The calibration period equipment is 1 year.

## 6.5 Test Data

### 806.0125 MHz

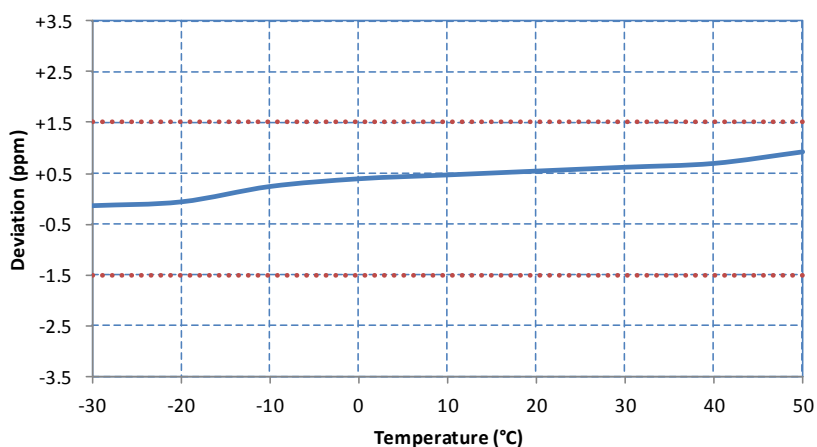
Voltage %	Power V <sub>DC</sub>	Temp °C	Frequency MHz	Freq Dev Hz	Freq Dev ppm
100%	3.70	+20 (Ref)	806.0130625	+562	+0.70
100%	3.70	-30	806.0125624	+62	+0.08
100%	3.70	-20	806.0125000	-0	-0.00
100%	3.70	-10	806.0127500	+250	+0.31
100%	3.70	0	806.0128750	+375	+0.47
100%	3.70	+10	806.0130000	+500	+0.62
100%	3.70	+20	806.0130625	+562	+0.70
100%	3.70	+30	806.0131250	+625	+0.78
100%	3.70	+40	806.0131875	+687	+0.85
100%	3.70	+50	806.0131250	+625	+0.78
115%	4.26	+20	806.0130625	+562	+0.70
85%	3.15	+20	806.0130000	+500	+0.62



### 815.5125 MHz

Voltage %	Power $V_{DC}$	Temp °C	Frequency MHz	Freq Dev Hz	Freq Dev ppm
100%	3.70	+20 (Ref)	815.5131875	+687	+0.84
100%	3.70	-30	815.5123750	-125	-0.15
100%	3.70	-20	815.5124375	-63	-0.08
100%	3.70	-10	815.5126875	+187	+0.23
100%	3.70	0	815.5128125	+312	+0.38
100%	3.70	+10	815.5128750	+375	+0.46
100%	3.70	+20	815.5129375	+437	+0.54
100%	3.70	+30	815.5130000	+500	+0.61
100%	3.70	+40	815.5130625	+562	+0.69
100%	3.70	+50	815.5132500	+750	+0.92
115%	4.26	+20	815.5131250	+625	+0.77
85%	3.15	+20	815.5130625	+562	+0.69

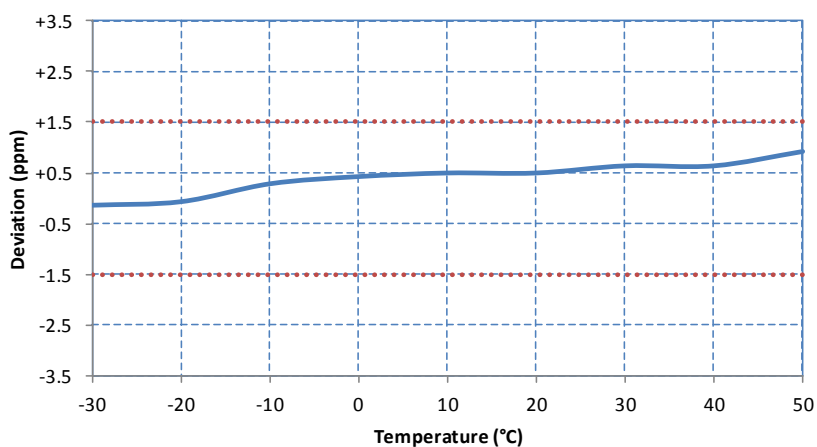
### Frequency Stability



### 896.01875 MHz

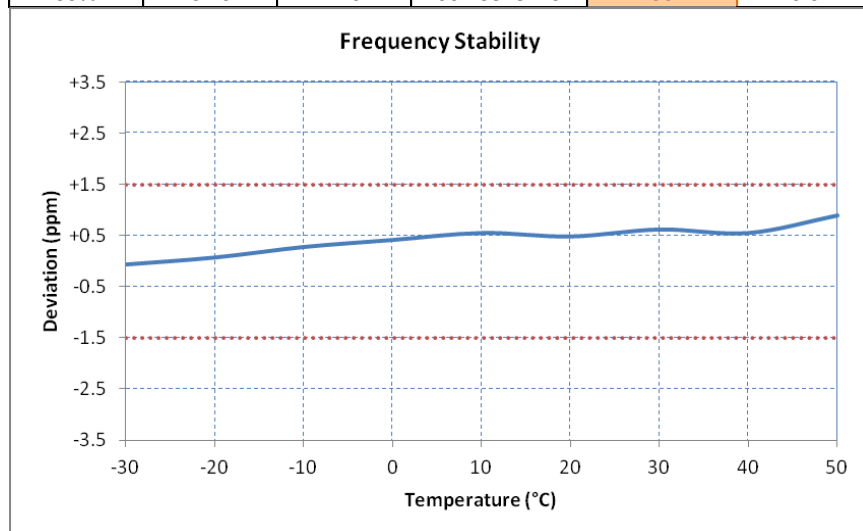
Voltage %	Power V <sub>DC</sub>	Temp °C	Frequency MHz	Freq Dev Hz	Freq Dev ppm
100%	3.70	+20 (Ref)	896.0194375	+688	+0.77
100%	3.70	-30	896.0186250	-125	-0.14
100%	3.70	-20	896.0186875	-63	-0.07
100%	3.70	-10	896.0190000	+250	+0.28
100%	3.70	0	896.0191250	+375	+0.42
100%	3.70	+10	896.0191875	+437	+0.49
100%	3.70	+20	896.0191875	+437	+0.49
100%	3.70	+30	896.0193125	+563	+0.63
100%	3.70	+40	896.0193125	+563	+0.63
100%	3.70	+50	896.0195625	+813	+0.91
115%	4.26	+20	896.0194375	+688	+0.77
85%	3.15	+20	896.0194375	+688	+0.77

### Frequency Stability



### 901.88125 MHz

Voltage %	Power $V_{DC}$	Temp °C	Frequency MHz	Freq Dev Hz	Freq Dev ppm
100%	3.70	+20 (Ref)	901.8818750	+625	+0.69
100%	3.70	-30	901.8811875	-63	-0.07
100%	3.70	-20	901.8813125	+62	+0.07
100%	3.70	-10	901.8815000	+250	+0.28
100%	3.70	0	901.8816250	+375	+0.42
100%	3.70	+10	901.8817500	+500	+0.55
100%	3.70	+20	901.8816875	+437	+0.49
100%	3.70	+30	901.8818125	+562	+0.62
100%	3.70	+40	901.8817500	+500	+0.55
100%	3.70	+50	901.8820625	+812	+0.90
115%	4.26	+20	901.8818750	+625	+0.69
85%	3.15	+20	901.8818125	+562	+0.62





## 7 Effective Radiated Power (ERP)

### 7.1 Test Result

Test Description	Product Specific Standard	Basic Standard	Test Result
ERP	47 CFR 2.1046 §24.132(b)	47 CFR 2.1046	Compliant

### 7.2 Test Method

The EUT was connected to the transient test system and was made to function as indicated in the "Operating Modes and Conditions" section of this report. The test system was set to generate the required test voltage. The EUT was monitored for performance.

### 7.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.9 °C

Relative Humidity: 53.9 %

Atmospheric Pressure: 97.66 kPa

### 7.4 Test Equipment

Test Date: 18-May-2015

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL GENERATOR	SMB 100A	ROHDE & SCHWARZ	B085760	18-Jun-2016
ULTRAFLEX COAXIAL CABLE	LMR-240	MES MICROWAVE SYSTEM	B091046	5-Aug-2015
DIPOLE BALUN 4	3121D-DB4	ETS-LINDGREN	B085753	16-Mar-2018
ANTENNA, BILOG	JB6	SUNOL	B079689	3-Sep-2015
RF CABLE - 12000MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079714	4-Aug-2015

Note: The calibration period equipment is 1 year.

## 7.5 Test Data

Frequency MHz	ERP dBm	ERP W
815.5125	27.46	0.557
898.99375	27.34	0.542
901.98125	27.09	0.512

## 8 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	19 May 2015
1	Added FCC ID to cover page Corrected model number in header Corrected frequency typo, page 26	29 June 2015