

## **EXHIBIT VI**

### **Test Report Bluetooth - Certification**

**FCC ID: KBCIX260MPIA555BT**

**IX260 Rugged Laptop with**

**Bluetooth Intentional Radiator**

**Co-located with**

- 1.) Aircard 555 Cellular PCS radio modem under Parts22/24**
- 2.) MPI350 802.11(b) WLAN, DTS Intentional Radiator under Part 15.247  
(see separate reports for each transmitter)**

**This Report is For The Bluetooth Intentional Radiator**

**Under Part 15.247 FHSS**

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Exhibit VI

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## BLUETOOTH APPROVALS

The following exhibit indicates the FCC Spread Spectrum requirements in Section 15.247(only) for devices meeting the Bluetooth Specifications for devices operating in the USA. The purpose of this exhibit is to help expedite the approval process for Bluetooth devices. This exhibit provides items that vary for each device and also provides a list of items that are common to Bluetooth devices that explains the remaining requirements. The list of common items can be submitted for each application for equipment authorization. This Bluetooth transmitter is a Frequency Hopping Spread Spectrum(FHSS) transmitter in the data mode and a Hybrid transmitter in the acquisition mode.

For each individual device, the following items, 1-6, will vary from one device to another and must be submitted.

- 1) The occupied bandwidth in Section 15.247(a)1ii .
- 2) Conducted output power specified in Section 15.247(b)1.
- 3) EIRP limit in Section 15.247(b)3.
- 4) RF safety requirement in Section 15.247(b)4
- 5) Spurious emission limits in Section 15.247(c).
- 6) Power spectral density in the **acquisition mode**.

For all devices, the following items, 1-12, are common to all Bluetooth devices and will not vary from one device to another. The list can be copied and pasted into the filing.

### **1 Output power and channel separation of a Bluetooth device in the different operating modes:**

The different operating modes (data-mode, acquisition-mode) of a Bluetooth device don't influence the output power and the channel spacing. There is only one transmitter which is driven by identical input parameters concerning these two parameters. Only a different hopping sequence will be used. For this reason the check of these RF parameters in one op-mode is sufficient.

### **2 Frequency range of a Bluetooth device:**

Hereby we declare that the maximum frequency of this device is: **2402 – 2480 MHz**.

This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for devices which will be operated in the USA. This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/04-E). Other frequency ranges ( e.g. for Spain, France, Japan) which are allowed according the Core Specification are **not** supported by this device.

### **3 Co-ordination of the hopping sequence in data mode to avoid simultaneous occupancy by multiple transmitters:**

Bluetooth units which want to communicate with other units must be organized in a structure called piconet. This piconet consist of max. 8 Bluetooth units. One unit is the master the other seven are the slaves. The master co-ordinates frequency occupation in this piconet for all units. As the master hop sequence is derived from it's BD address which is unique for every Bluetooth device, additional masters intending to establish new piconets will always use different hop sequences.

### **4 Example of a hopping sequence in data mode:**

Example of a 79 hopping sequence in data mode:

40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67,

56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59,  
72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75,

09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06,  
01, 51, 03, 55, 05, 04

### **5 Equally average use of frequencies in data mode and behavior for short transmissions:**

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD\_ADDRESS. The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5  $\mu$ s. The clock has a cycle of about one day (23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

The first connection between the two devices is established, a hopping sequence was generated. For transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact that the Bluetooth clock has a different value, because the period between the two transmission is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5  $\mu$ s). The hopping sequence will always differ from the first one.

### **6 Receiver input bandwidth and behavior for repeated single or multiple packets:**

The input bandwidth of the receiver is 1 MHz. In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence (see chapter 5). The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single or multislot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence

### **7 Dwell time in data mode**

The dwell time of 0.3797s within a 30 second period in data mode is independent from the packet type (packet length). The calculation for a 30 second period is as follows:

Dwell time = time slot length \* hop rate / number of hopping channels \* 30s

Example for a DH1 packet (with a maximum length of one time slot)

Dwell time = 625  $\mu$ s \* 1600 1/s / 79 \* 30s = 0.3797s (in a 30s period)

For multislot packet the hopping is reduced according to the length of the packet.

Example for a DH5 packet (with a maximum length of five time slots)

Dwell time =  $5 * 625 \mu s * 1600 * 1/5 * 1/s / 79 * 30s = 0.3797s$  (in a 30s period)

This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for all Bluetooth devices. Therefore all Bluetooth devices **comply** with the FCC dwell time requirement in data mode. This was checked during the Bluetooth Qualification tests. The Dwell time in hybrid mode is approximately 2.6 mS (in a 12.8s period)

### **8 Channel Separation in hybrid mode**

The nominal channel spacing of the Bluetooth system is 1Mhz independent of the operating mode. The maximum “initial carrier frequency tolerance” which is allowed for Bluetooth is  $f_{center} = 75 \text{ kHz}$ . This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/07-E) for three frequencies (2402, 2441, 2480 MHz).

### **9 Derivation and examples for a hopping sequence in hybrid mode**

For the generation of the inquiry and page hop sequences the same procedures as described for the data mode are used (see item 5), but this time with different input vectors:\*\*For the inquiry hop sequence, a predefined fixed address is always used. This results in the same 32 frequencies used by all devices doing an inquiry but every time with a different start frequency and phase in this sequence. \*\*For the page hop sequence, the device address of the paged unit is used as input vector. This results in the use of a subset of 32 frequencies which is specific for that initial state of the connection establishment between the two units. A page to different devices would result in a different subset of 32 frequencies.

So it is ensured that also in hybrid mode the frequency use equally averaged.

Example of a hopping sequence in inquiry mode:

48, 50, 09, 13, 52, 54, 41, 45, 56, 58, 11, 15, 60, 62, 43, 47, 00, 02, 64, 68, 04, 06, 17, 21, 08, 10, 66, 70, 12, 14, 19, 23

Example of a hopping sequence in paging mode:

08, 57, 68, 70, 51, 02, 42, 40, 04, 61, 44, 46, 63, 14, 50, 48, 16, 65, 52, 54, 67, 18, 58, 56, 20, 53, 60, 62, 55, 06, 66, 64

### **10 Receiver input bandwidth and synchronization in hybrid mode:**

The receiver input bandwidth is the same as in the data mode (1 MHz). When two Bluetooth devices establish contact for the first time, one device sends an inquiry access code, the other device is scanning for this inquiry access code. If two devices have been connected previously and want to start a new transmission, a similar procedure takes place. The only difference is, instead of the inquiry access code, a special access code, derived from the BD\_ADDRESS of the paged device will be, will be sent by the master of this connection. Due to the fact that both units have been connected before (in the inquiry procedure) the paging unit has timing and frequency information about the page scan of the paged unit. For this reason the time to establish the connection is reduced considerable.

### **11 Spread rate / data rate of the direct sequence signal**

The Spread rate / Data rate in inquiry and paging mode can be defined via the access code. The access code is the only criterion for the system to check if there is a valid transmission or not. If you regard the presence of a valid access code as one bit of information, and compare it with the length of the access code of 68 bits, the Spread rate / Data rate will be 68/1.

### **12 Spurious emission in hybrid mode**

The Dwell in hybrid mode is shorter than in data mode. For this reason the spurious emissions average level in data mode is worst case. The spurious emissions peak level is the same for both modes.

**EXHIBIT 6A          TEST: 20 dB BANDWIDTH**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: FCC reply to TCB council 10/08/02, Frequency hoppers in the 2.4 GHz band are required to use a minimum of 15 non-overlapping channels. The hopping channel bandwidth can be wider than 1 MHz as long as the channels do not overlap and all emissions stay within the 2400- 2483.5 MHz band. For example a system that uses the minimum 15 channels can have hopping channel bandwidth that are up to 5 MHz wide.

Test Results: The measured 20 dB bandwidth complies with the non-overlapping channel requirements of the FCC interpretation referenced above.

Authorization Procedure: Part 2.1049

**HIGH POWER**

**Method of Measurement:**

1. The output power level had been preset during production.
2. The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer. The setting were RBW of 10 kHz & VBW of 30 kHz.
3. The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator.
4. The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data.
5. Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

<b>Measurement Results of Modulated Occupied Bandwidth</b>			
Channel	Channel Frequency GHz	Measured Maximum 20 dB BW EUT modulated	Limit Non-overlapping channels, all emissions within band
Plot 1 Low	2.402	617 kHz	complies
Plot 2 Middle	2.441	617 kHz	complies
Plot 3 High	2.480	617 kHz	complies

Plots 1, 2 & 3 of the 20 dB Bandwidth, supporting the above data, are located in Appendix 1 at the end of this report.

**EXHIBIT 6A TEST: CONDUCTED PEAK OUTPUT POWER**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(b)1 is 1 Watt Maximum

Test Results: The measured output power level of the sample shows compliance with the maximum permissible 1 Watt limit.

Authorization Procedure: Part 2.1046

Manufacturers Rated Output Power: 14 dBm typical, - **Class I Bluetooth**

Measured Maximum Output Power: 14.46 dBm or 27.92 mWatt conducted

**HIGH POWER**

**Method of Measurement:**

- 1.) The output power levels referenced above, had been preset during production.
- 2.) The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer.
- 3.) The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator. The EUT was *modulated* and hopping during this measurement. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data.
- 4.) Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

Channel	Frequency (GHz)	Measured Peak Output Power (mW)	Measured Peak Output Power (dBm)	Internal EUT Cable loss dB	Corrected Peak Output Power (dBm))	Corrected Peak Output Power (mW))
<b>Low</b>	<b>2.402</b>	<b>26.12</b>	<b>14.17</b>	<b>.29</b>	<b>14.46</b>	<b>27.92</b>
Middle	2.441	25.11	14.00	.29	14.29	26.85
High	2.480	22.38	13.50	.29	13.79	23.93

Plots 5, 6 & 7 supporting the above data are located in Appendix 1 at the end of this report.

**Equivalent Isotropic Radiated Power**

$$\begin{array}{ll}
 14.46 & \text{max. conducted power)} \\
 + 4.50 & \text{dBi (Rangestar Antenna, P/N 100929, 4.5 dBi peak antenna gain)} \\
 = 18.96 & \text{dBm EIRP}
 \end{array}$$

This Bluetooth Intentional Radiator complies with the maximum de-facto EIRP limit with the only antenna that can be used with this device, with the Rangestar Antenna, P/N 100929, peak antenna gain of 4.5 dBi.

**EXHIBIT 6G TEST: SPURIOUS RF CONDUCTED EMISSIONS**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c) In any 100 kHz bandwidth outside the 2.412 – 2.485 band RF power shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest power.

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1051

Frequency Range Observed: 0 to 25 GHz

Operating Frequencies: 2.402, 2.441, & 2.480 GHz (2.402 – 2.480 GHz band)

Measured Output Power: 14.46 dBm or 27.92 mWatt conducted **HIGH POWER**

**Method of Measurement:**

- 1) The output power level had been preset during production.
- 2) The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer. The setting were 1 MHz for both RBW & VBW.
- 3) The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator.
- 4) The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data
- 5.) Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

<b>Highest Conducted Spurious Emission Measured For Each Channel</b>				
Channel	Frequency GHz	Emission level dBm	Limit in dBm 20 dBc	dB below limit
Plot 9 - 2Fo, Low	4.804	-46.00	-20.0	31.83
Plot 9 - 2Fo, Middle	4.882	-47.50	-20.0	41.67
Plot 9 - 2Fo, High	4.960	-48.17	-20.0	42.34

Note: All three channels displayed max hold collectively on 2 plots to cover the wide frequency range.  
 Plot 9, covering 10 – 2900 MHz, (1 MHz RBW & VBW) &  
 Plot 10, covering 2.750 – 25 GHz (1 MHz RBW & VBW) are located in Appendix 1.

**BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS**

Please refer to Plots 11 and 12 for the lower and upper band-edge measurements, located in Appendix 1.

Trace A - Band-edge channel modulated, hopping disabled

Trace B - All channels modulated, hopping enabled (indication of spreading function evident)



**EXHIBIT 6G TEST: FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS**

FCC ID: KBCIX260A750MPIBT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c)

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1053

Test Equipment Set Up: See Block Diagram in Exhibit 7

10/21/03

Frequency Range Observed: 0 to 25 GHz

**HIGH POWER**

<b>RADIATED HARMONIC AND SPURIOUS EMISSIONS &amp; RESTRICTED BANDS</b>									
Frequency GHz	Max. SA Rdg. dBuV	Ant. Vert. or Horz.	Peak or Average Detector	Antenna Factor dB	Cable & filter loss dB	Amp Gain	Corrected Reading dBuV/m	Limit 74 Peak 54 Avg dBuV	Margin in dB below LIMIT
<b>Fo - 2.402</b>									
4.804	54.57	H	Peak	32.83	3.95	23.2	68.15	74	5.85
4.804	37.07	H	Average	32.83	3.95	23.2	50.94	54	3.06
7.260	46.90	H	Peak	36.77	4.55	25.9	62.32	74	11.68
7.260	32.48	H	Average	36.77	4.55	25.9	47.90	54	6.10
9.608	42.17	V	Peak	37.55	5.0	24.5	60.76	74	13.24
9.608	29.10	V	Average	37.55	5.0	24.5	47.15	54	6.85
<b>Fo - 2.441</b>									
4.882	52.61	H	Peak	33.33	3.95	23.2	66.69	74	7.31
4.882	36.69	H	Average	33.33	3.95	23.2	50.72	54	3.23
7.323	47.70	H	Peak	36.77	4.55	25.9	63.12	74	10.98
7.323	33.40	H	Average	36.77	4.55	25.9	48.82	54	5.18
9.764	44.77	V	Peak	38.33	5.0	24.7	63.40	74	10.60
9.764	29.50	V	Average	38.33	5.0	24.7	48.13	54	5.87
<b>Fo - 2.480</b>									
4.960	55.93	H	Peak	33.33	3.95	23.2	70.10	74	3.99
4.960	38.09	H	Average	33.33	3.95	23.2	52.17	54	1.83
7.440	53.73	H	Peak	36.77	4.55	25.9	69.15	74	4.85
7.440	37.33	H	Average	36.77	4.55	25.9	52.75	54	1.25
9.920	47.82	V	Peak	38.33	5.0	24.7	66.45	74	7.55
9.920	31.72	V	Average	38.33	5.0	24.7	50.35	54	3.65
<b>Harmonic emissions on all three channels (low, mid &amp; high) 5Fo - 10Fo at or below noise floor</b>									
Channel	Frequency in GHz	Harmonics Observed				Limit 74 dBuV/m Peak & 54 dBuV/m Average			
Low Ch.	2.402								
<b>5Fo - 10Fo</b>	<b>12.101 - 24.020</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			
Mid Ch.	2.441								
<b>5Fo - 10Fo</b>	<b>12.205 - 24.410</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			
High Ch.	2.480								
<b>5Fo - 10Fo</b>	<b>12.400 - 24.800</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			

**EXHIBIT 6G TEST: FIELD STRENGTH OF SPURIOUS RADIATION AT UPPER BAND EDGE**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c)

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1053

Test Equipment Set Up: See Block Diagram in Exhibit 7

Frequency Range Observed: 2.480 – 2.5GHz

10/21/03

**HIGH POWER**

Note: No significant emissions were observed in the restricted band 2.835 – 2.5 GHz so a band-edge measurement was made.

RADIATED EMISSIONS MEASUREMENT AT UPPER BAND EDGE										
Frequency GHz	SA Rdg. dBuV	Ant. Vert. or Horz.	Peak or Average Reading	Antenna Factor dB	Cable & filter loss dB	Amp Gain	Corrected Reading dBuV/m	Corrected Reading uV/m	Peak Limit dBuV	Avg Limit dBuV
2.4835	36.59	V	Peak	28.37	3.15	22.3	45.81	195.21	74	---
2.4835	35.81	H	Peak	28.37	3.15	22.3	45.03	178.44	74	---
2.4835	25.47	V	Average	28.37	3.15	22.3	34.69	54.26	---	54
2.4835	27.45	H	Average	28.37	3.15	22.3	36.67	68.15	---	54

**Radiated Test Notes**

- 1.) All spurious and harmonics in the *restricted bands* listed in Part 15.205 are below the Part 15.209 limit.
- 2.) No peak emissions above 1 GHz are more than 20 dB above the average limit.
- 3.) Peak measurements made with 1 MHz RBW & VBW, Average made with 1MHz RBW & 10 Hz VBW.
- 4.) During preliminary measurements the EUT was measured in 3 mutually orthogonal planes. The highest level for Fo was found with the EUT standing Upright. So this position was used during final measurements at 3 meters.
- 5.) The EUT was AC powered during the testing.
- 6.) The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data.
- 7.) Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems
- 8.) A HP preamplifier and a high pass filter was used during the measurements of the harmonics to reduce the fundamental signal and avoid overloading the front end of the analyzer.

**EXHIBIT 6A TEST: 20 dB BANDWIDTH**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: FCC reply to TCB council 10/08/02, Frequency hoppers in the 2.4 GHz band are required to use a minimum of 15 non-overlapping channels. The hopping channel bandwidth can be wider than 1 MHz as long as the channels do not overlap and all emissions stay within the 2400- 2483.5 MHz band. For example a system that uses the minimum 15 channels can have hopping channel bandwidth that are up to 5 MHz wide.

Test Results: The measured 20 dB bandwidth complies with the non-overlapping channel requirements of the FCC interpretation referenced above.

Authorization Procedure: Part 2.1049

**LOW POWER**

**Method of Measurement:**

1. The output power level had been preset during production.
2. The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer. The setting were RBW of 10 kHz & VBW of 30 kHz.
3. The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator.
4. The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data. Power level set to 30 low power.
5. Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

<b>Measurement Results of Modulated Occupied Bandwidth</b>			
Channel	Channel Frequency GHz	Measured Maximum 20 dB BW EUT modulated	Limit Non-overlapping channels, all emissions within band
Plot 1 Low	2.402	707 kHz	complies
Plot 2 Middle	2.441	683 kHz	complies
Plot 3 High	2.480	687 kHz	complies

Plots 1, 2 & 3 of the 20 dB Bandwidth, supporting the above data, are located in Appendix 2 at the end of this report.

**EXHIBIT 6A TEST: CONDUCTED PEAK OUTPUT POWER**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(b)1 is 1 Watt Maximum

Test Results: The measured output power level of the sample shows compliance with the maximum permissible 1 Watt limit.

Authorization Procedure: Part 2.1046

Manufacturers Rated Output Power: 11 dBm typical minimum low power, - **Class I Bluetooth**

Measured Maximum Output Power: 9.12 dBm or 8.16 mWatt conducted **LOW POWER**

**Method of Measurement:**

1. The output power levels referenced above, had been preset during production.
2. The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer.
3. The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator. The EUT was *modulated* and hopping during this measurement. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data. Power level set to 30 low power.
4. Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

Channel	Frequency (GHz)	Measured Peak Output Power (mW)	Measured Peak Output Power (dBm)	Internal EUT Cable loss dB	Corrected Peak Output Power (dBm))	Corrected Peak Output Power (mW))
<b>Low</b>	<b>2.402</b>	<b>7.63</b>	<b>8.83</b>	<b>.29</b>	<b>9.12</b>	<b>8.16</b>
Middle	2.441	7.36	8.67	.29	8.96	7.87
High	2.480	6.80	8.33	.29	8.62	7.27

Plots 5, 6 & 7 supporting the above data are located in Appendix 2 at the end of this report.

**Equivalent Isotropic Radiated Power**

$$\begin{aligned}
 &9.12 \text{ max. conducted power)} \\
 &\quad + 4.50 \text{ dBi (Rangestar Antenna, P/N 100929, 4.5 dBi peak antenna gain)} \\
 &= 13.62 \text{ dBm EIRP}
 \end{aligned}$$

This Bluetooth Intentional Radiator complies with the maximum de-facto EIRP limit with the only antenna that can be used with this device, with the Rangestar Antenna, P/N 100929, peak antenna gain of 4.5 dBi.

**EXHIBIT 6G TEST: SPURIOUS RF CONDUCTED EMISSIONS**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c) In any 100 kHz bandwidth outside the 2.412 – 2.485 band RF power shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest power.

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1051

Frequency Range Observed: 0 to 25 GHz

Operating Frequencies: 2.402, 2.441, & 2.480 GHz (2.402 – 2.480 GHz band)

Measured Output Power: 9.12 dBm or 8.16 mWatt conducted **LOW POWER**

**Method of Measurement:**

1. The output power level had been preset during production.
2. The output of the EUT was connected directly via an adapter to the input of the HP8562A spectrum analyzer. The setting were 1 MHz for both RBW & VBW.
3. The measured channels cover the low, middle and high channels of the operational frequency range requested for this intentional radiator.
4. The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data. Power level set to 30 low power.
5. Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems.

<b>Highest Conducted Spurious Emission Measured For Each Channel</b>				
Channel		Emission level in dBm	Limit in dBm 20 dBc	dB below limit
Low	2FO to 10FO	All harmonics at or below noise floor	-20.0	> 20 dB below limit
Mid	2FO to 10FO	All harmonics at or below noise floor	-20.0	> 20 dB below limit
High	2FO to 10FO	All harmonics at or below noise floor	-20.0	> 20 dB below limit

Note: All three channels displayed max hold collectively on 2 plots to cover the wide frequency range.  
 Plot 9, covering 10 – 2900 MHz, (1 MHz RBW & VBW) &  
 Plot 10, covering 2.750 – 25 GHz (1 MHz RBW & VBW) are located in Appendix 2.

**BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS**

Please refer to Plots 11 and 12 for the lower and upper band-edge measurements, located in Appendix 1.  
 Trace A - Band-edge channel modulated, hopping disabled  
 Trace B - All channels modulated, hopping enabled (indication of spreading function evident)

**EXHIBIT 6G TEST: FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c)

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1053

Test Equipment Set Up: See Block Diagram in Exhibit 7

10/21/03

Frequency Range Observed: 0 to 25 GHz

**LOW POWER**

<b>RADIATED HARMONIC AND SPURIOUS EMISSIONS &amp; RESTRICTED BANDS</b>									
Frequency GHz	Max. SA Rdg. dBuV	Ant. Vert. or Horz.	Peak or Average Detector	Antenna Factor dB	Cable & filter loss dB	Amp Gain	Corrected Reading dBuV/m	Limit 74 Peak 54 Avg dBuV	Margin in dB below LIMIT
<b>Fo - 2.402</b>									
4.804	43.36	H	Peak	32.83	3.95	23.2	56.94	74	17.06
4.804	31.25	H	Average	32.83	3.95	23.2	44.83	54	9.17
7.260	40.45	H	Peak	36.77	4.55	25.9	55.87	74	18.13
7.260	27.20	H	Average	36.77	4.55	25.9	43.12	54	10.88
<b>Fo - 2.441</b>									
4.882	42.48	H	Peak	33.33	3.95	23.2	56.56	74	17.44
4.882	29.85	H	Average	33.33	3.95	23.2	43.93	54	10.07
7.323	40.69	H	Peak	36.77	4.55	25.9	56.11	74	17.89
7.323	28.05	H	Average	36.77	4.55	25.9	43.47	54	10.53
<b>Fo - 2.480</b>									
4.960	46.20	H	Peak	33.33	3.95	23.2	60.28	74	13.72
4.960	32.80	H	Average	33.33	3.95	23.2	46.88	54	7.12
7.440	45.70	H	Peak	36.77	4.55	25.9	61.12	74	12.88
7.440	32.80	H	Average	36.77	4.55	25.9	48.22	54	5.78
<b>Harmonic emissions on all three channels (low, mid &amp; high) 4Fo - 10Fo at or below noise floor</b>									
Channel	Frequency in GHz	Harmonics Observed				Limit 74 dBuV/m Peak & 54 dBuV/m Average			
Low Ch.	2.402								
<b>5Fo - 10Fo</b>	<b>12.101 - 24.020</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			
Mid Ch.	2.441								
<b>5Fo - 10Fo</b>	<b>12.205 - 24.410</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			
High Ch.	2.480								
<b>5Fo - 10Fo</b>	<b>12.400 - 24.800</b>	None -at or < noise floor @3m				All emissions < 54 dBuV/m or 500 uV/m			

**EXHIBIT 6G TEST: FIELD STRENGTH OF SPURIOUS RADIATION AT UPPER BAND EDGE**

FCC ID: KBCIX260MPIA555BT  
 Applicant: ITRONIX Corp.  
 Model: IX260 with Bluetooth, Aircard 555 & MPI350

Minimum Standard Specified: Part 15.247(c)

Test Results: Equipment complies with standard

Authorization Procedure: Part 2.1053

Test Equipment Set Up: See Block Diagram in Exhibit 7

Frequency Range Observed: 2.480 – 2.5GHz

10/21/03

**LOW POWER**

Note: No significant emissions were observed in the restricted band 2.835 – 2.5 GHz so a band-edge measurement was made.

RADIATED EMISSIONS MEASUREMENT AT UPPER BAND EDGE										
Frequency GHz	SA Rdg. dBuV	Ant. Vert. or Horz.	Peak or Average Reading	Antenna Factor dB	Cable & filter loss dB	Amp Gain	Corrected Reading dBuV/m	Corrected Reading uV/m	Peak Limit dBuV	Avg Limit dBuV
2.4835	37.06	V	Peak	28.37	3.15	22.3	46.28	206.06	74	---
2.4835	36.76	H	Peak	28.37	3.15	22.3	45.98	199.06	74	---
2.4835	29.63	V	Average	28.37	3.15	22.3	38.85	87.60	---	54
2.4835	28.87	H	Average	28.37	3.15	22.3	38.09	80.26	---	54

**Radiated Test Notes**

1. All spurious and harmonics in the *restricted bands* listed in Part 15.205 are below the Part 15.209 limit.
2. No peak emissions above 1 GHz are more than 20 dB above the average limit.
3. Peak measurements made with 1 MHz RBW & VBW, Average made with 1MHz RBW & 10 Hz VBW.
4. During preliminary measurements the EUT was measured in 3 mutually orthogonal planes. The highest level for Fo was found with the EUT standing Upright. So this position was used during final measurements at 3 meters.
5. The EUT was AC powered during the testing.
6. The EUT was *modulated but not hopping* channels during this test. The data rate is 1mbps per the Bluetooth standard. The Payload is PRBS9 data. Power level set to 30 low power.
7. Measurements done according to DA 00-705 Filing and Measurement Guide for FHSS Systems
8. A HP preamplifier and a high pass filter was used during the measurements of the harmonics to reduce the fundamental signal and avoid overloading the front end of the analyzer.

## **Appendix 1 - HIGH POWER**

**Plots 1 to 12 are located on the following pages.**

**Plots 1 to 4      20 dB Bandwidth**

**Plot 4            79 Hopping Frequencies Occupied Band**

**Plots 5 to 7      Conducted Output Power**

**Plot 8            240 MHz Span ( high, mid & low channel transmit )**

**Plots 9 to 10    Spurious RF Conducted Emissions**

**Plot 11           Lower Band-edge Compliance of RF Conducted Emissions**

**Plot 12           Upper Band-edge Compliance of RF Conducted Emissions**



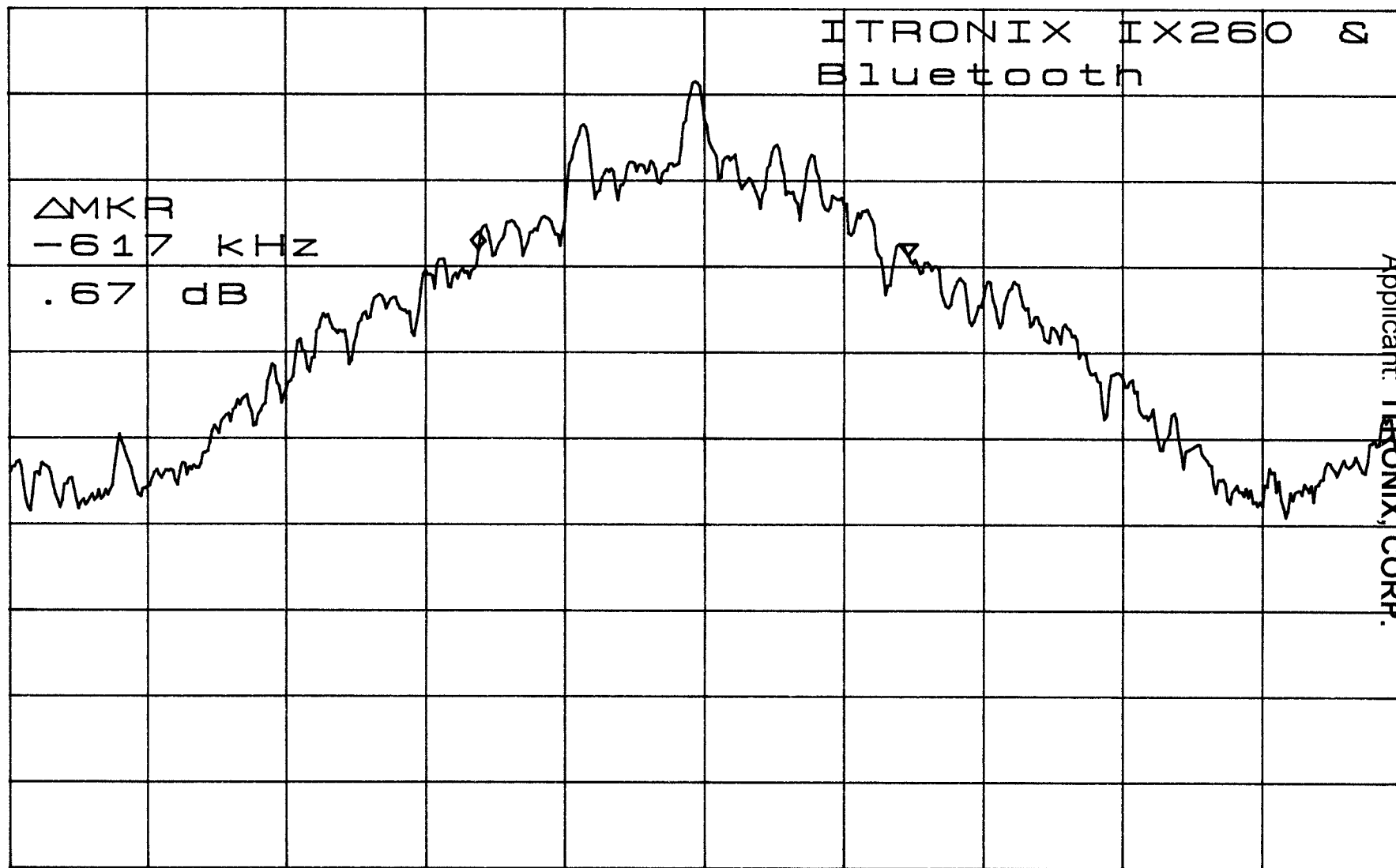
\*ATTEN 30dB

RL 20.0dBm

10dB/

 $\Delta$ MKR .67dB

-617kHz



CENTER 2.402000GHz

SPAN 2.000MHz

\*RBW 10kHz

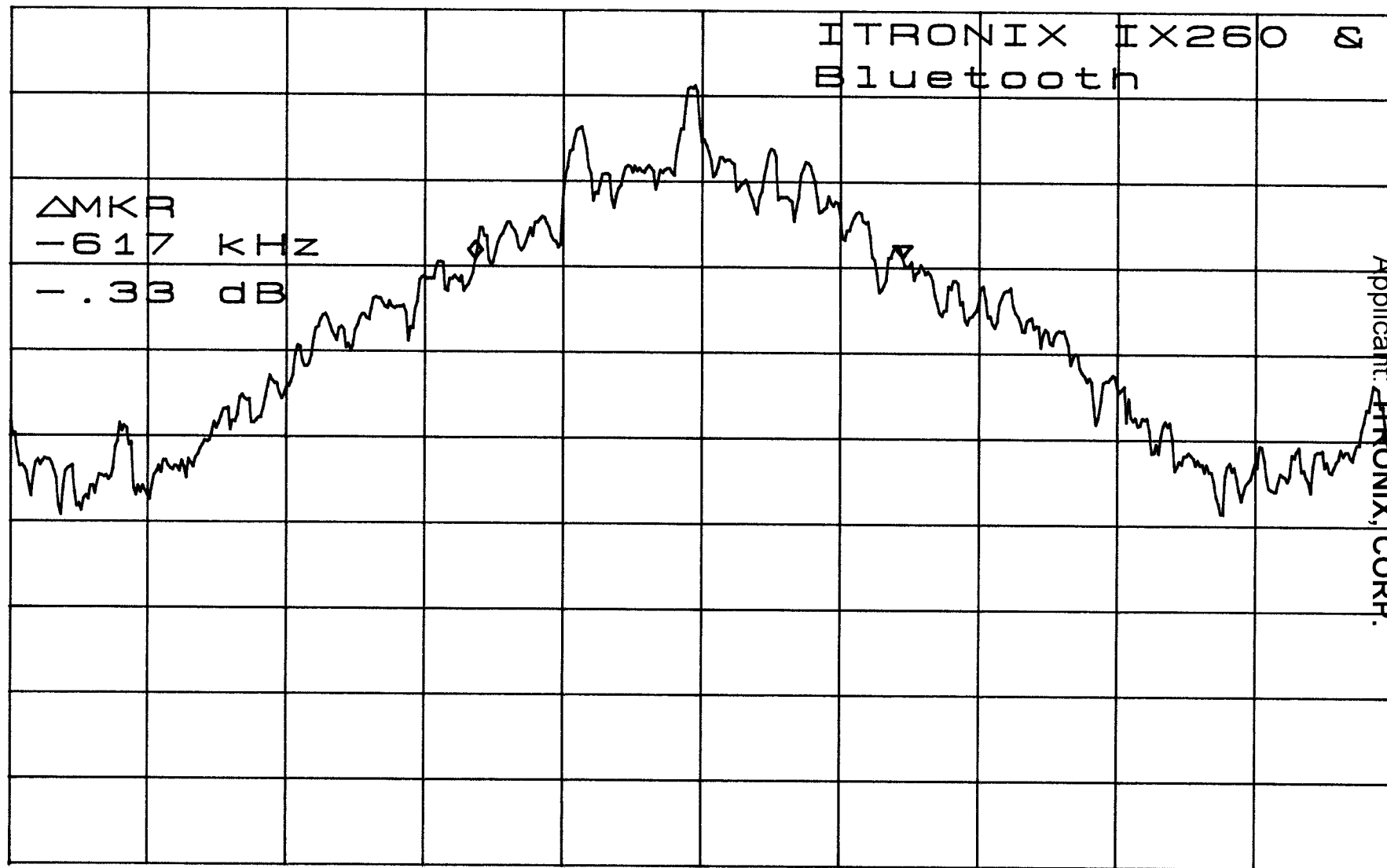
\*VBW 30kHz

SWP 50ms

\*ATTEN 30dB  
RL 20.0dBm

10dB/

$\Delta MKR$  -.33dB  
-617kHz



CENTER 2.441000GHz SPAN 2.000MHz  
\*RBW 10kHz \*VBW 30kHz SWP 50ms

\*ATTEN 30dB

ΔMKR -.33dB

RL 20.0dBm

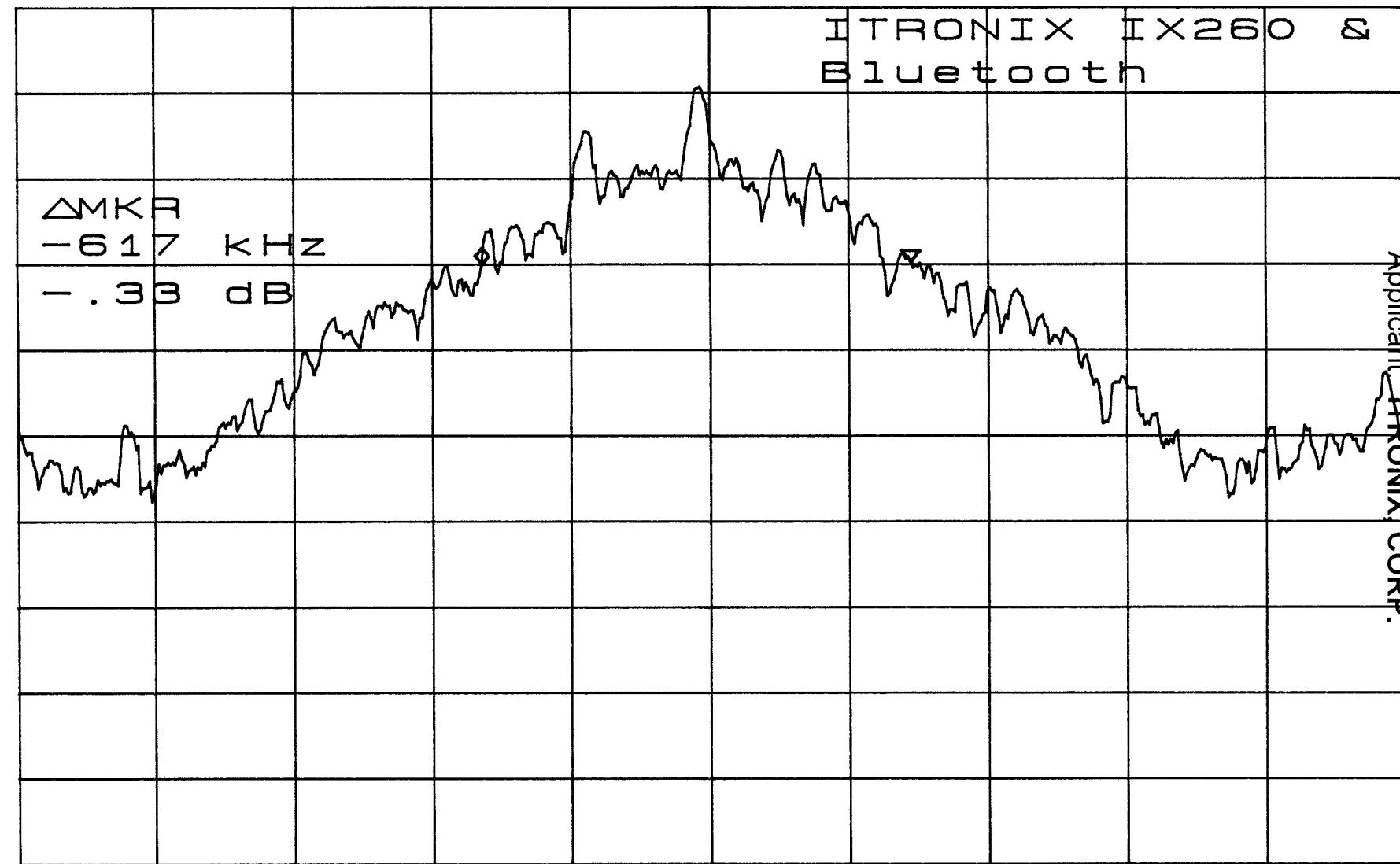
10dB/

-617kHz

ITRONIX IX260 &  
Bluetooth

ΔMKR  
-617 kHz  
-.33 dB

Applicant: ITRONIX CORP.



CENTER 2.480000GHz

SPAN 2.000MHz

\*RBW 10kHz

\*VBW 30kHz

SWP 50ms

FCC ID: KBCIX260MPIA750BT

HIGH POWER PLOT - 3

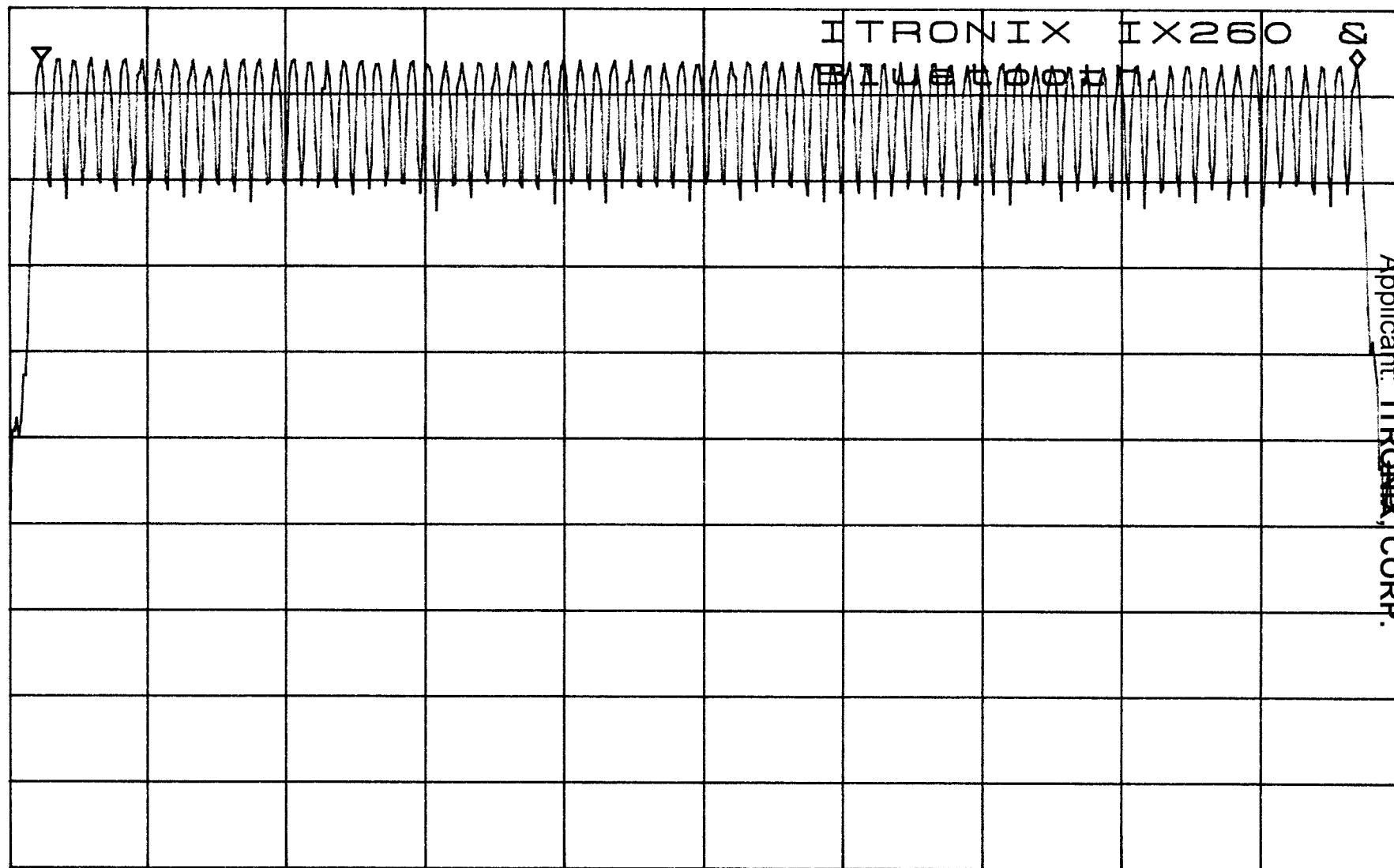
\*ATTEN 30dB

 $\Delta MKR - .50dB$ 

RL 20.0dBm

10dB/

78.44MHz



Applicant: ITRONIX, CORP.

START 2.40000GHz

STOP 2.48300GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 50ms

\*ATTEN 30dB

MKR 14.17dBm

RL 20.0dBm

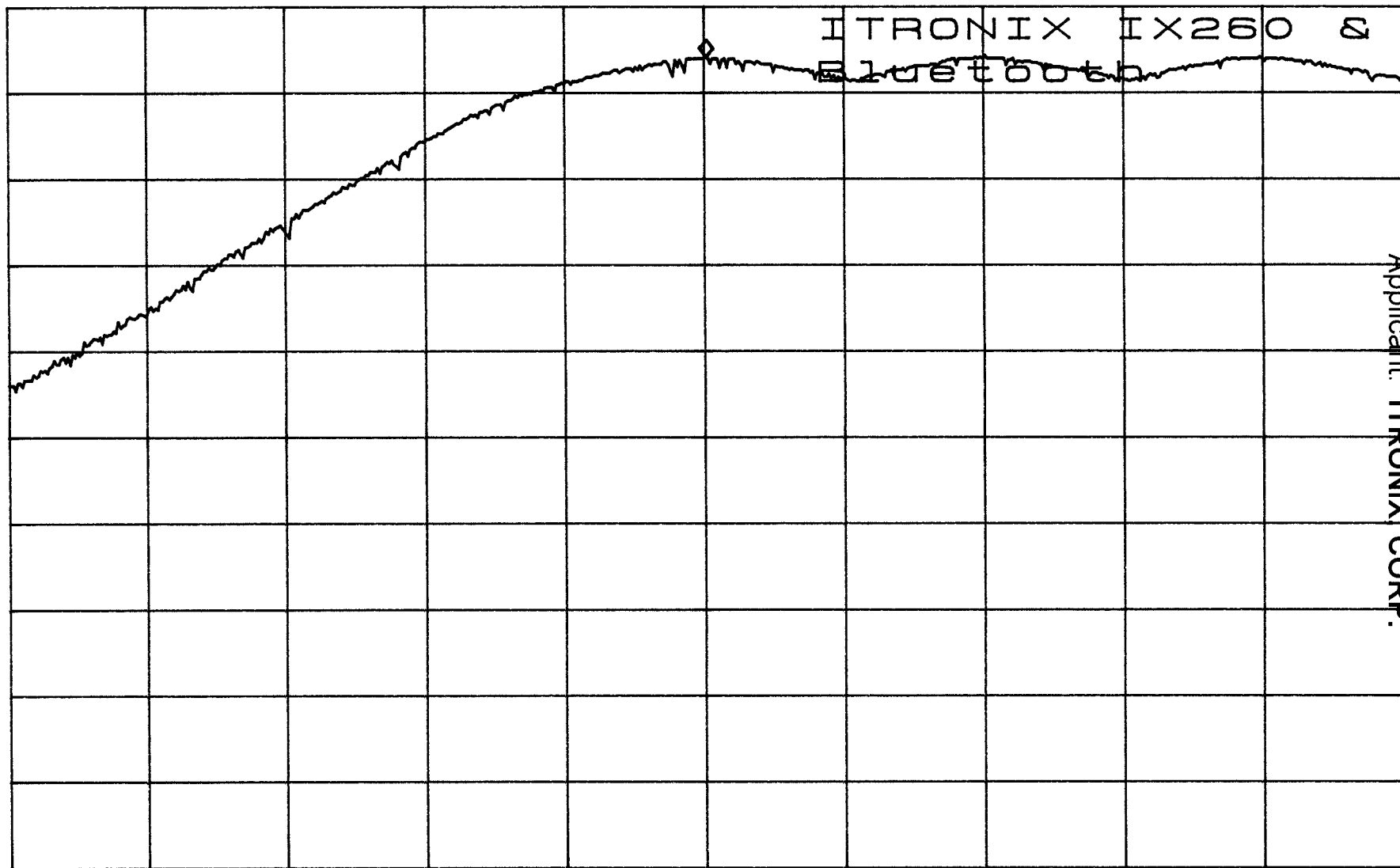
10dB/

2.402008GHz

ITRONIX IX260 &

Bluetooth

Applicant: ITRONIX CORP.



CENTER 2.402000GHz

SPAN 5.000MHz

\*RBW 1.0MHz

\*VBW 3.0MHz

SWP 50ms

FCC ID: KBCIX260MPIA750BT

HIGH POWER PLOT - 5

\*ATTEN 30dB

RL 20.0dBm

10dB/

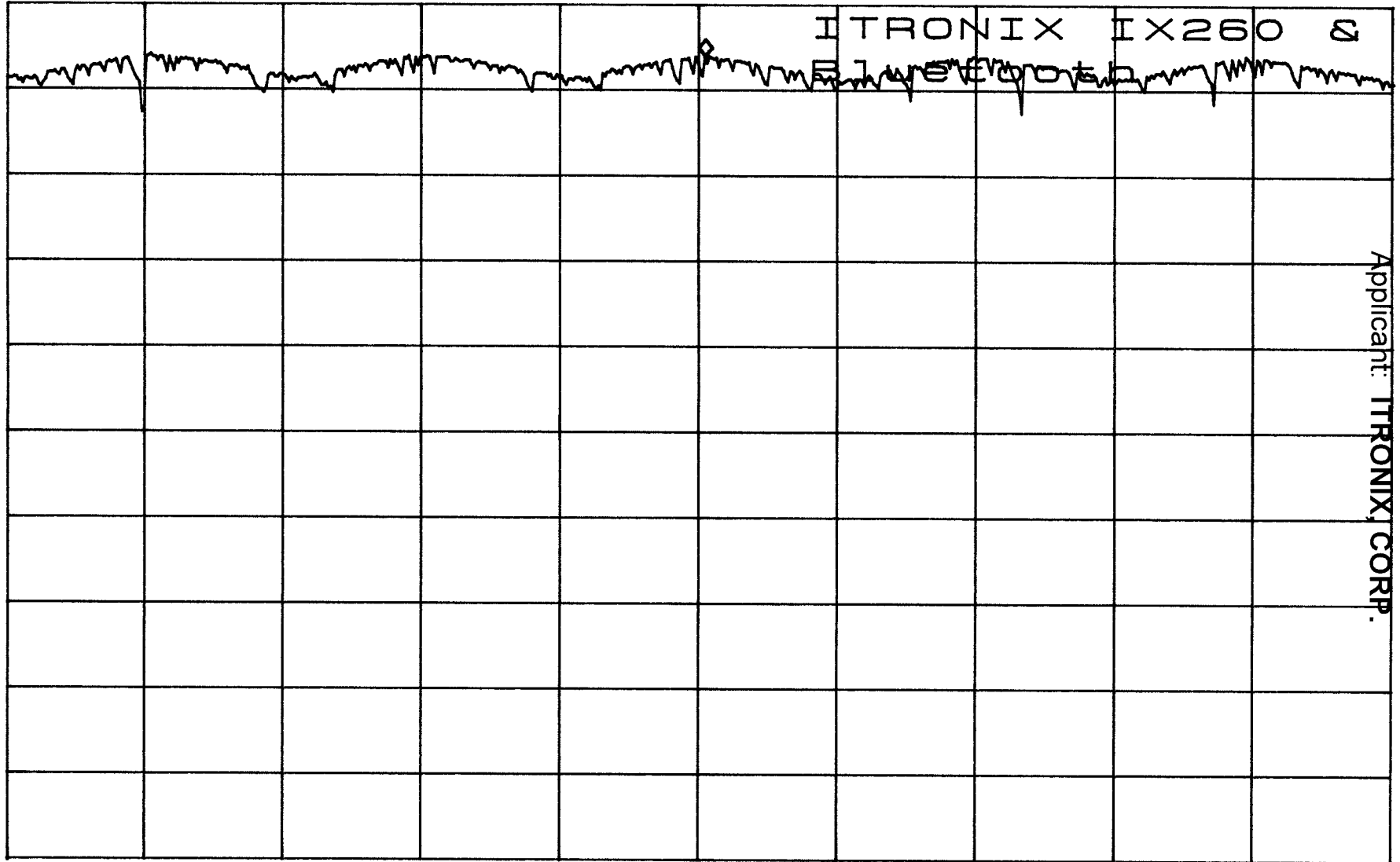
MKR 14.00dBm

2.441025GHz

ITRONIX IX260 &

Blue Sky

Applicant: ITRONIX, CORP.



CENTER 2.441000GHz

SPAN 5.000MHz

\*RBW 1.0MHz

\*VBW 3.0MHz

SWP 50ms

\*ATTEN 30dB

RL 20.0dBm

10dB/

MKR 13.50dBm

2.480017GHz

ITRONIX	IX260	&
Bluetooth		

Applicant: **ITRONIX, CORP.**

CENTER 2.480000GHz

SPAN 5.000MHz

\*RBW 1.0MHz

\*VBW 3.0MHz

SWP 50ms

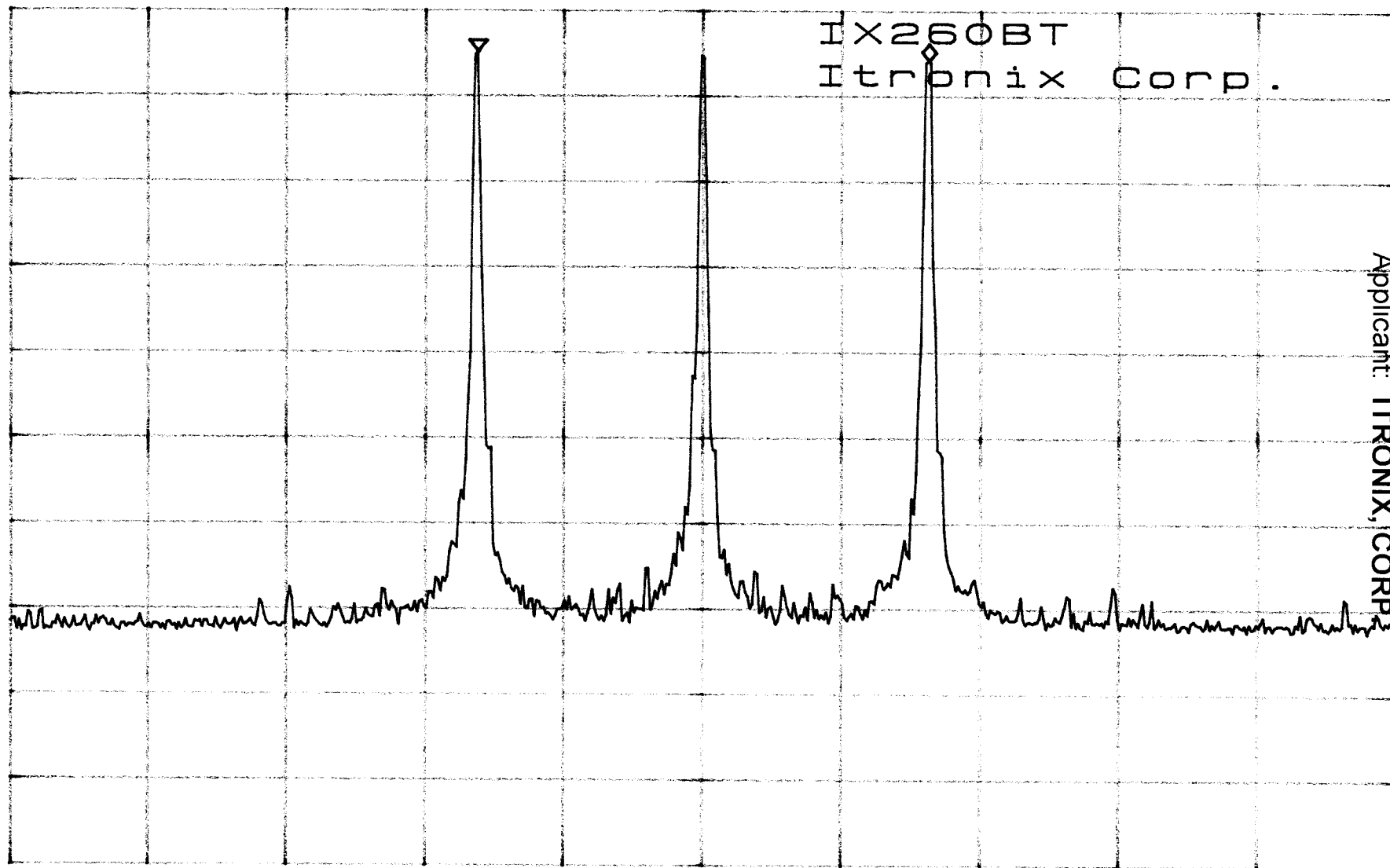
**FCC ID: KBCIX260MPIA750BT**

## HIGH POWER PLOT - 7

\*ATTEN 30dB  
RL 20.0dBm

10dB/

$\Delta$ MKR -1.00dB  
78.0MHz



CENTER 2.4410GHz  
\*RBW 100KHz \*VBW 300KHz

SPAN 240.0MHz  
\*SWP 12sec



\*ATTEN 30dB

RL 20.0dBm

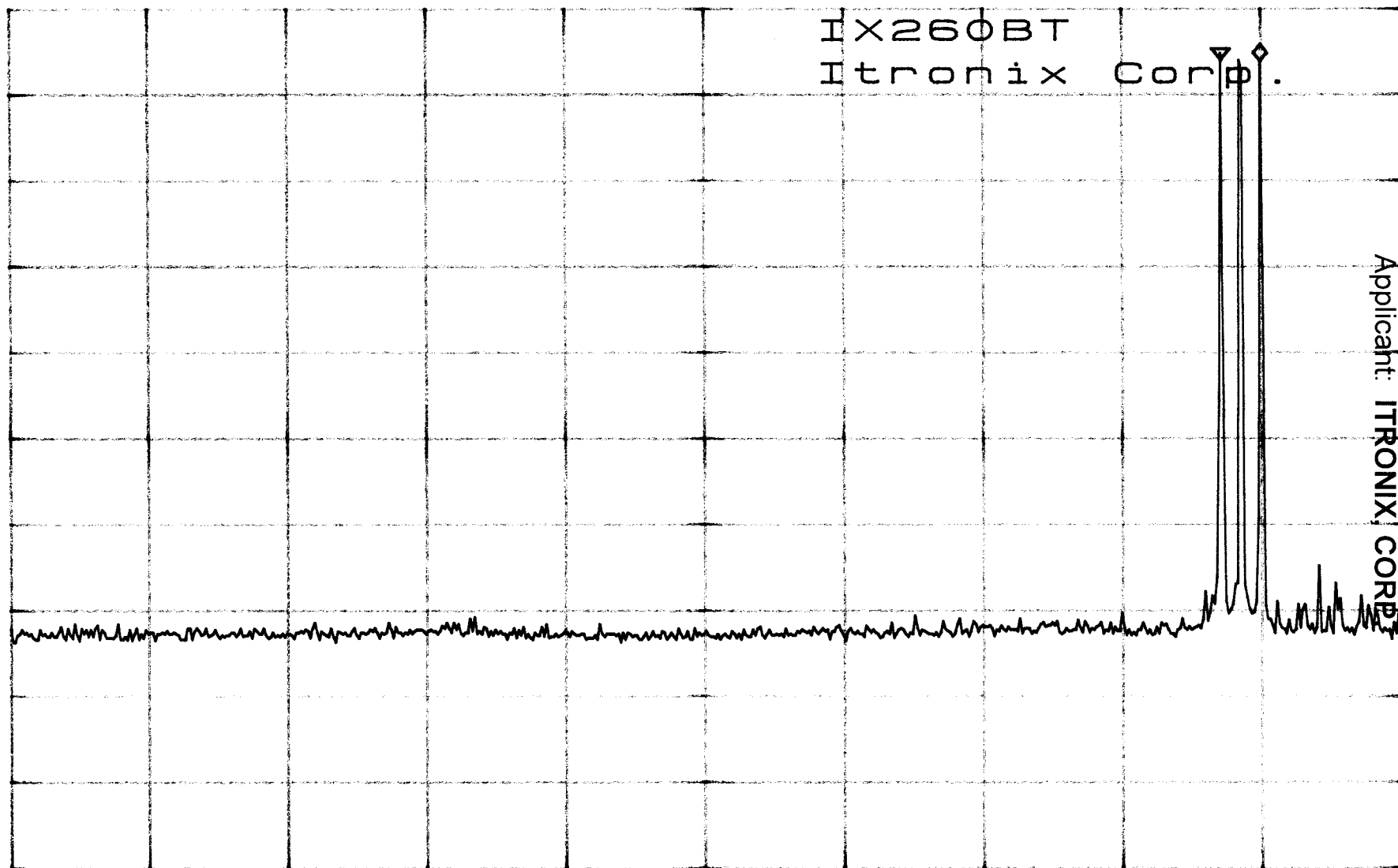
10dB/

 $\Delta MKR - .17dB$ 

77MHz

IX260BT

Itronix Corp.



Applicant: ITRONIX CORP

START 30MHz

STOP 2.750GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 700ms

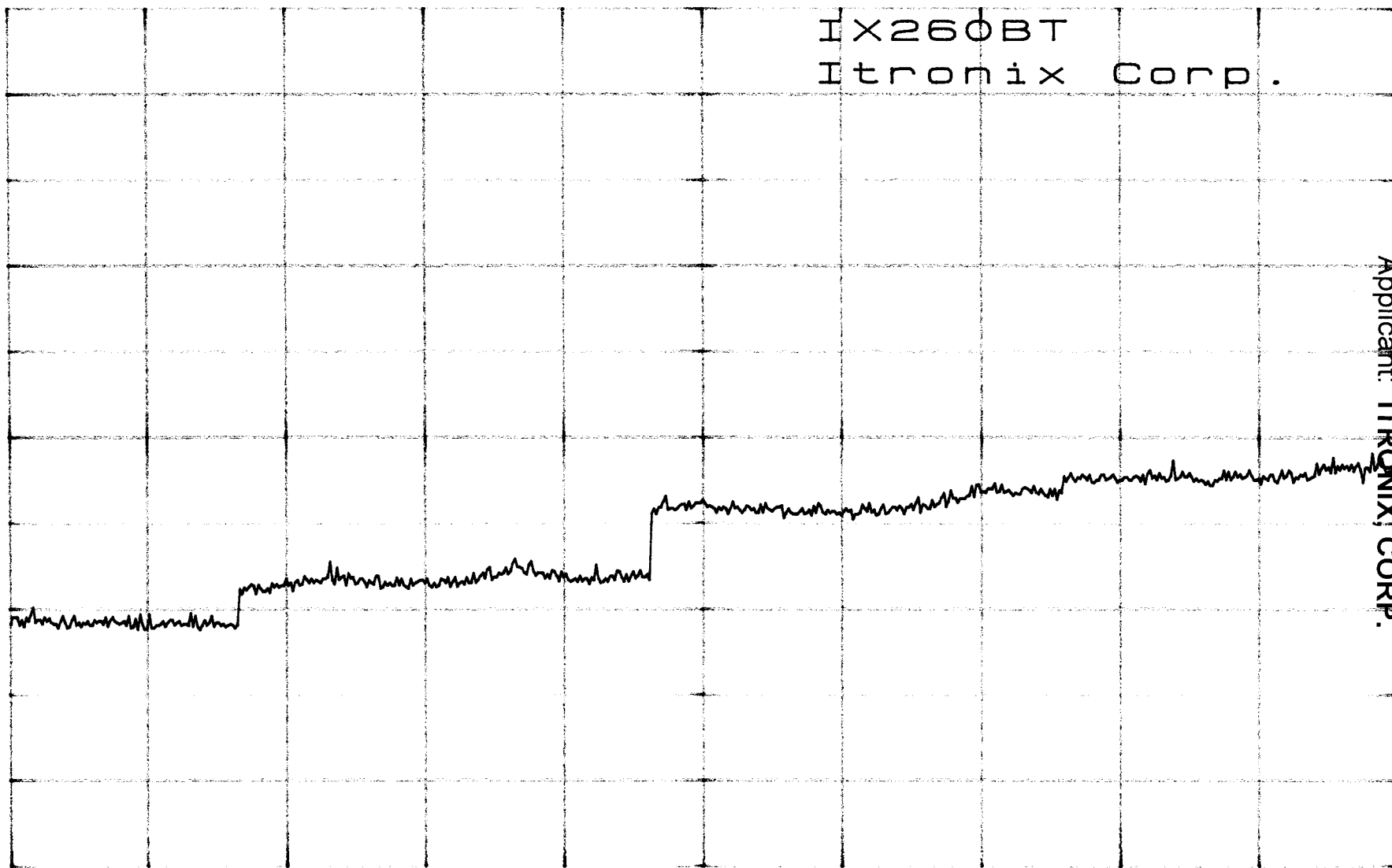
\*ATTEN 30dB

RL 20.0dBm

10dB/

IX260BT  
Itronix Corp.

Applicant: ITRONIX, CORP.



START 2.75GHz

STOP 25.00GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 6.0sec

FCC ID: KBCIX260MPIA750BT

HIGH POWER PLOT - 10

\*ATTEN 30dB

ΔMKR -62.34dB

RL 20.0dBm

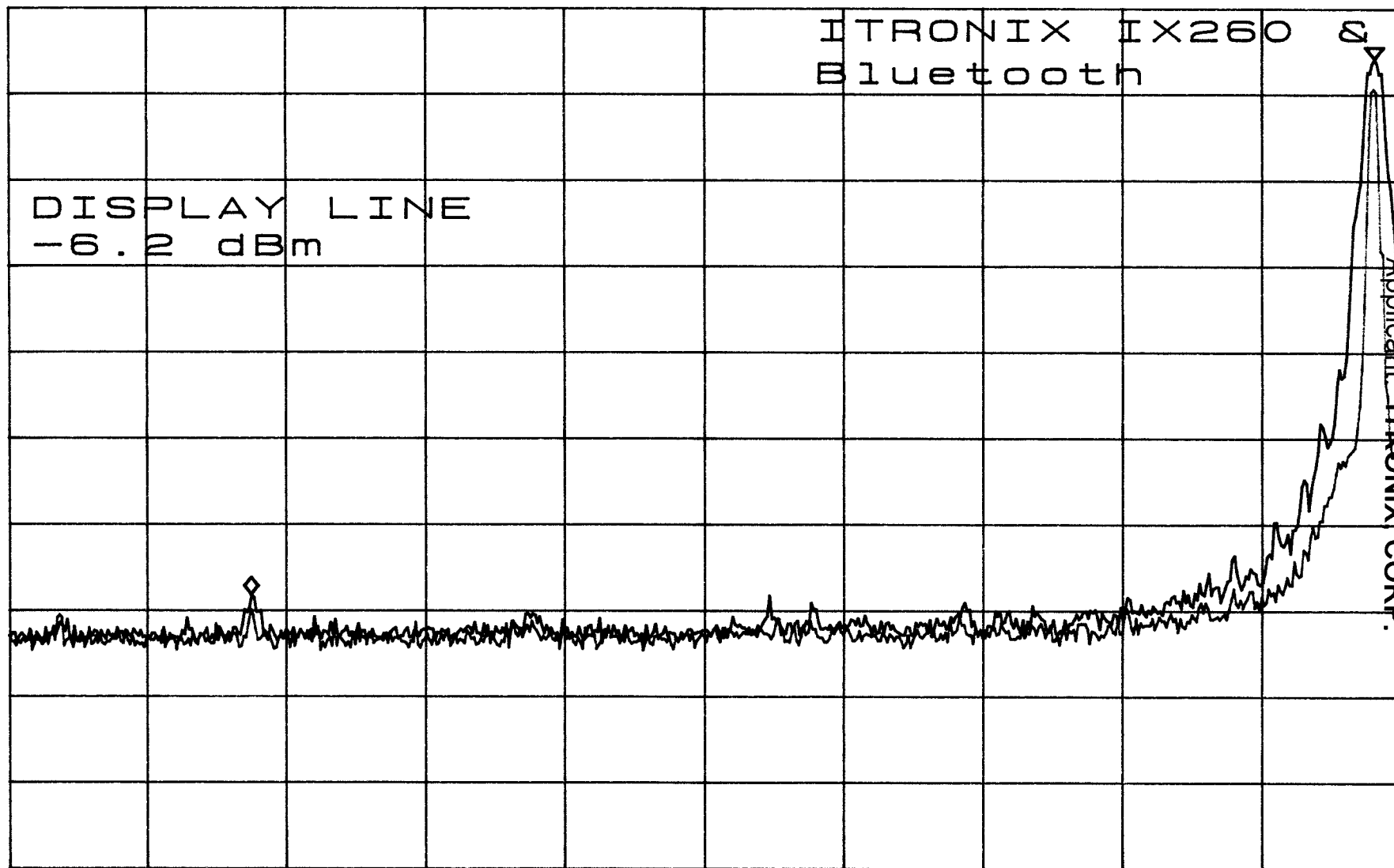
10dB/

-32.20MHz

ITRONIX IX260 &  
Bluetooth

DISPLAY LINE  
-6.2 dBm

Applicant: ITRONIX CORP.



START 2.36300GHz

STOP 2.40300GHz

\*RBW 100kHz

\*VBW 300kHz

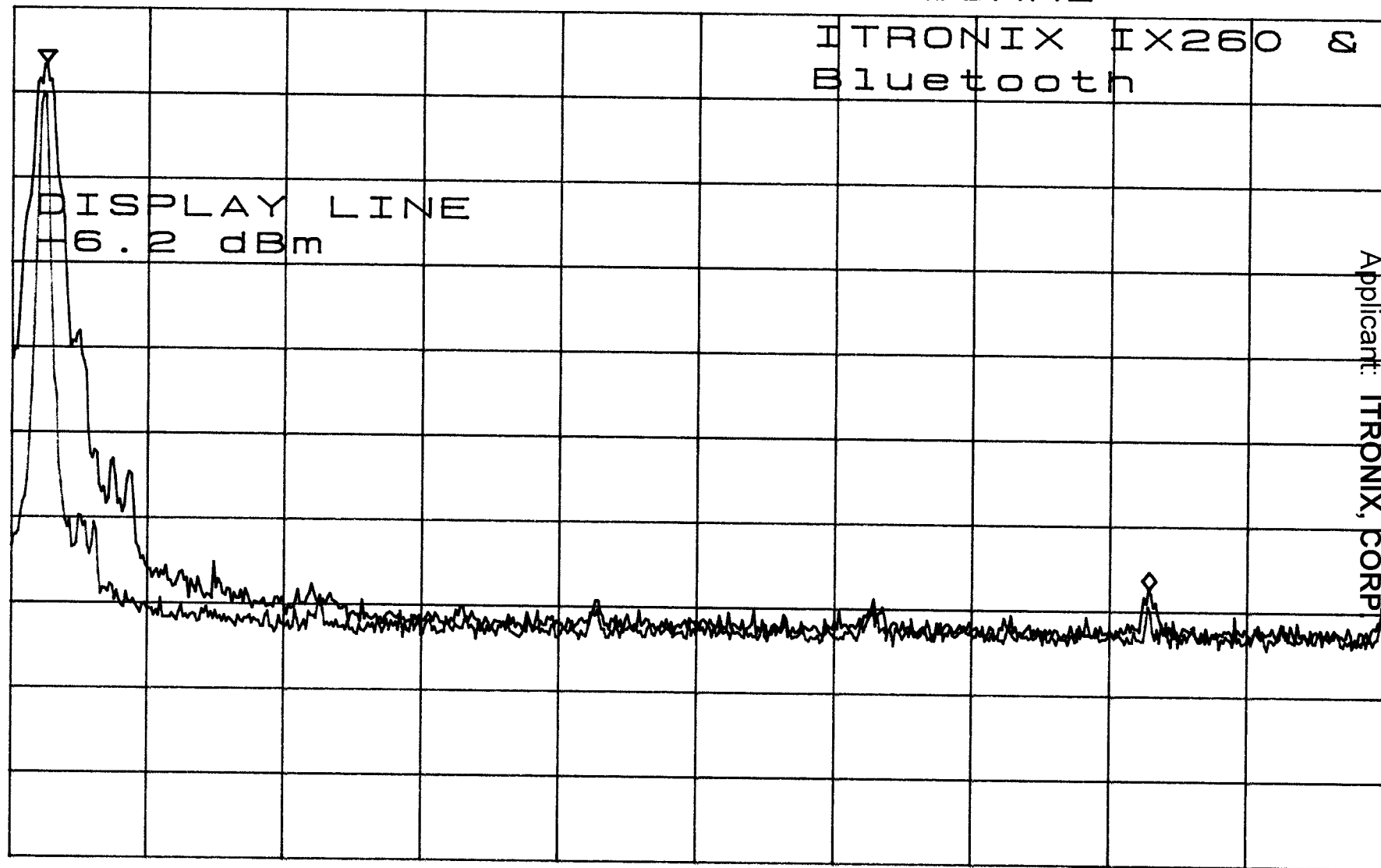
SWP 50ms

\*ATTEN 30dB  
RL 20.0dBm

10dB/

$\Delta$ MKR -60.83dB  
32.13MHz

ITRONIX IX260 &  
Bluetooth



CENTER 2.49900GHz  
\*RBW 100kHz \*VBW 300kHz

SPAN 40.00MHz  
SWP 50ms

## **Appendix 2 – LOW POWER**

**Plots 1 to 12 are located on the following pages.**

**Plots 1 to 4      20 dB Bandwidth**

**Plot 4            79 Hopping Frequencies Occupied Band**

**Plots 5 to 7      Conducted Output Power**

**Plot 8            240 MHz Span ( high, mid & low channel transmit )**

**Plots 9 to 10    Spurious RF Conducted Emissions**

**Plot 11           Lower Band-edge Compliance of RF Conducted Emissions**

**Plot 12           Upper Band-edge Compliance of RF Conducted Emissions**

FCC ID: KBCIX260MPIA750BT

LOW POWER PLOT - 1

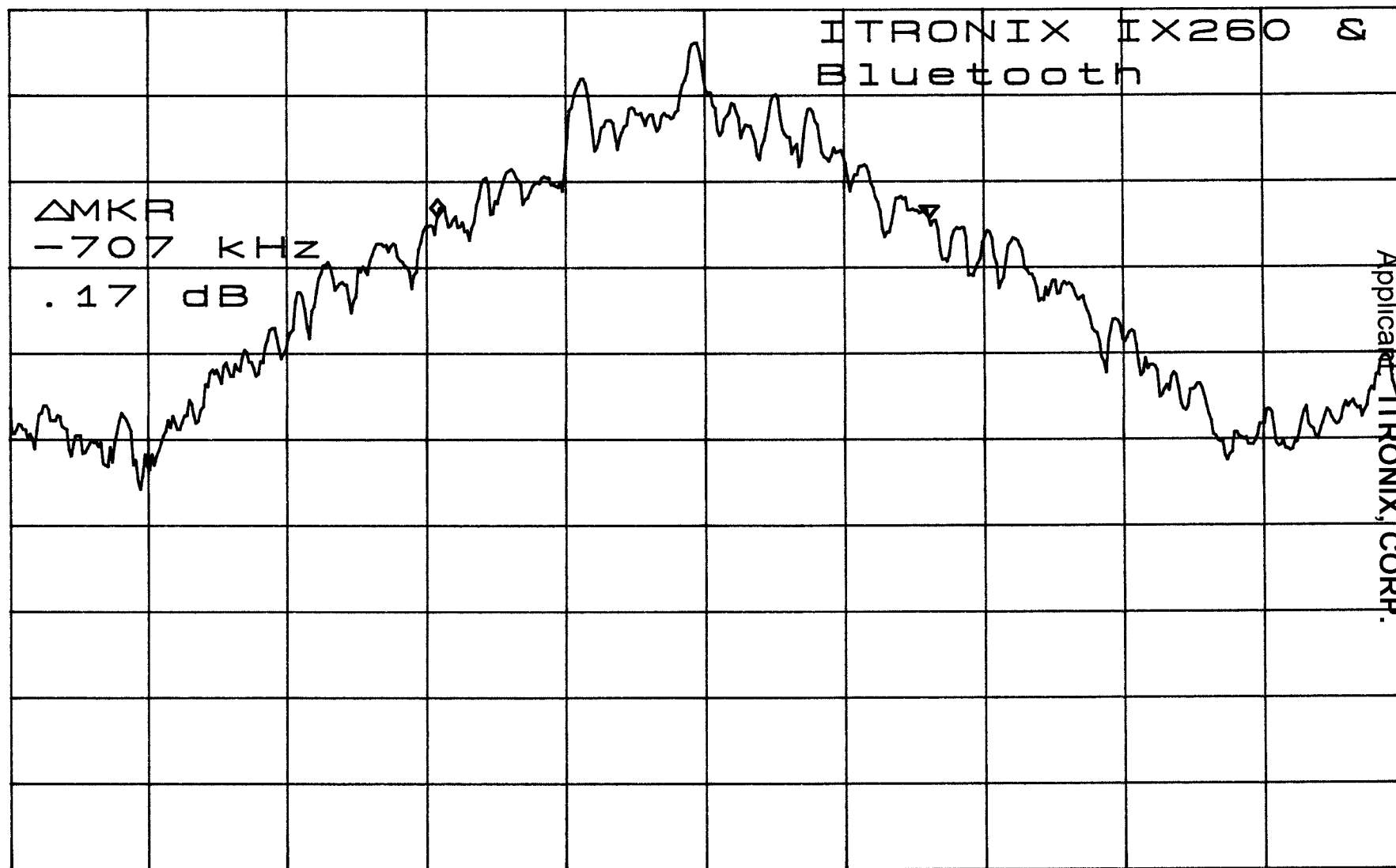
\*ATTEN 20dB

RL 10.0dBm

10dB/

$\Delta$ MKR .17dB

-707kHz



CENTER 2.402000GHz

SPAN 2.000MHz

\*RBW 10kHz

\*VBW 30kHz

SWP 50ms

\*ATTEN 20dB

ΔMKR .17dB

RL 10.0dBm

10dB/

-683kHz

ITRONIX IX260 &  
Bluetooth

ΔMKR  
-683 kHz  
.17 dB

D

Application: ITRONIX, CORP.

CENTER 2.441000GHz

SPAN 2.000MHz

\*RBW 10kHz

\*VBW 30kHz

SWP 50ms

FCC ID: KBCIX260MPIA750BT

LOW POWER PLOT - 3

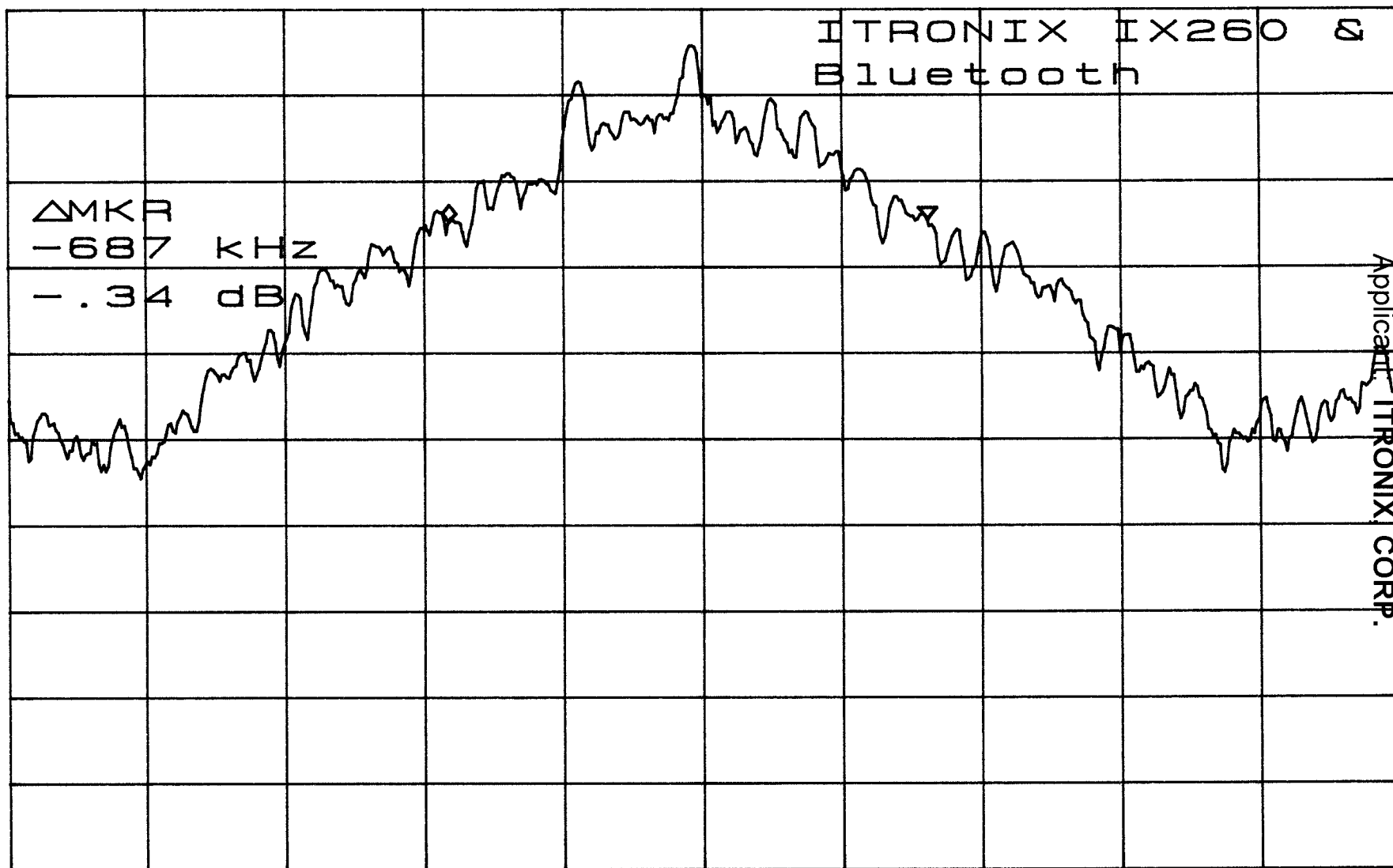
\*ATTEN 20dB

RL 10.0dBm

10dB/

$\Delta$ MKR -.34dB

-687kHz



CENTER 2.480000GHz

SPAN 2.000MHz

\*RBW 10KHz

\*VBW 30KHz

SWP 50ms



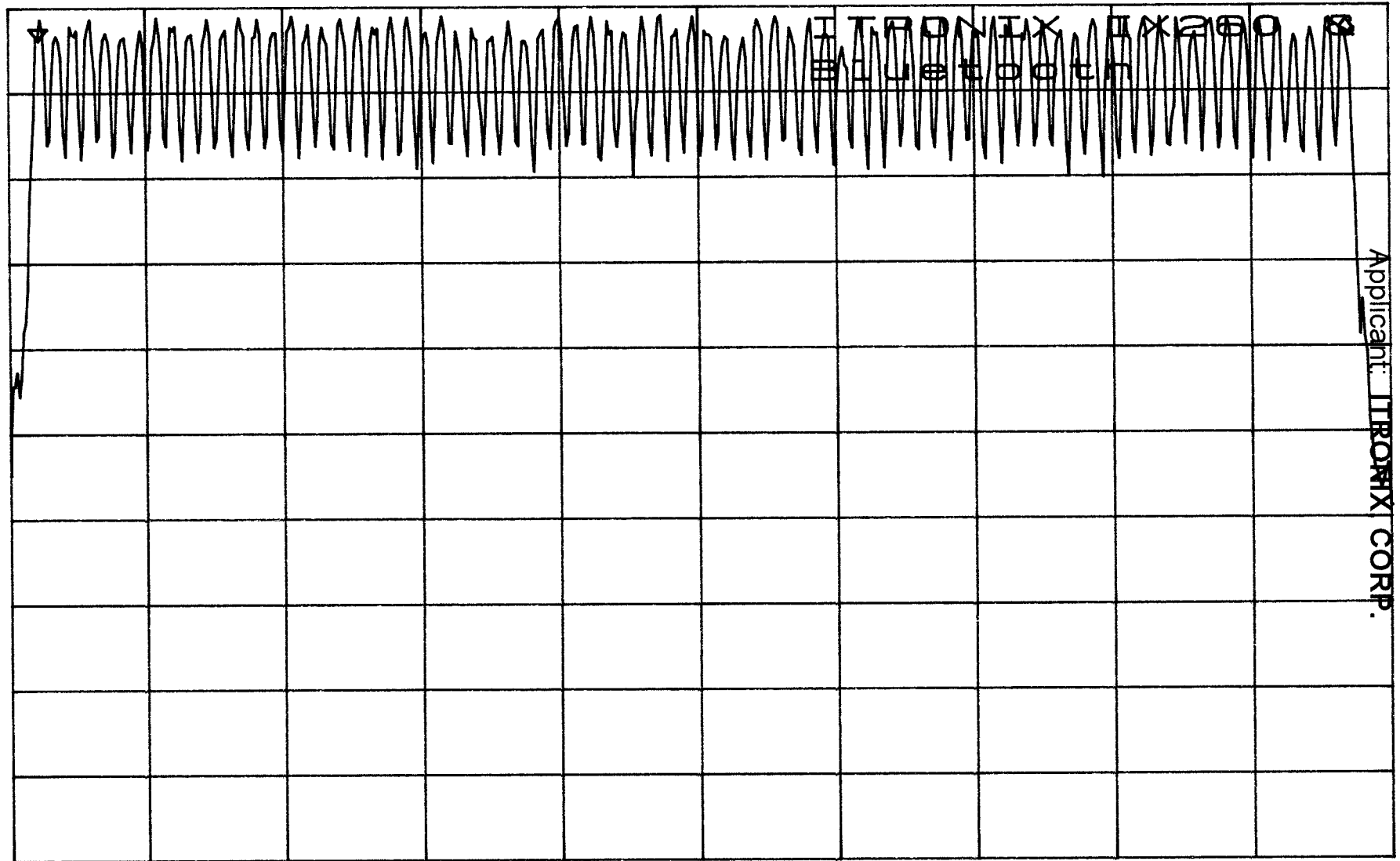
\*ATTEN 20dB

ΔMKR .16dB

RL 10.0dBm

10dB/

78.57MHz



START 2.400000GHz

STOP 2.483000GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 50ms

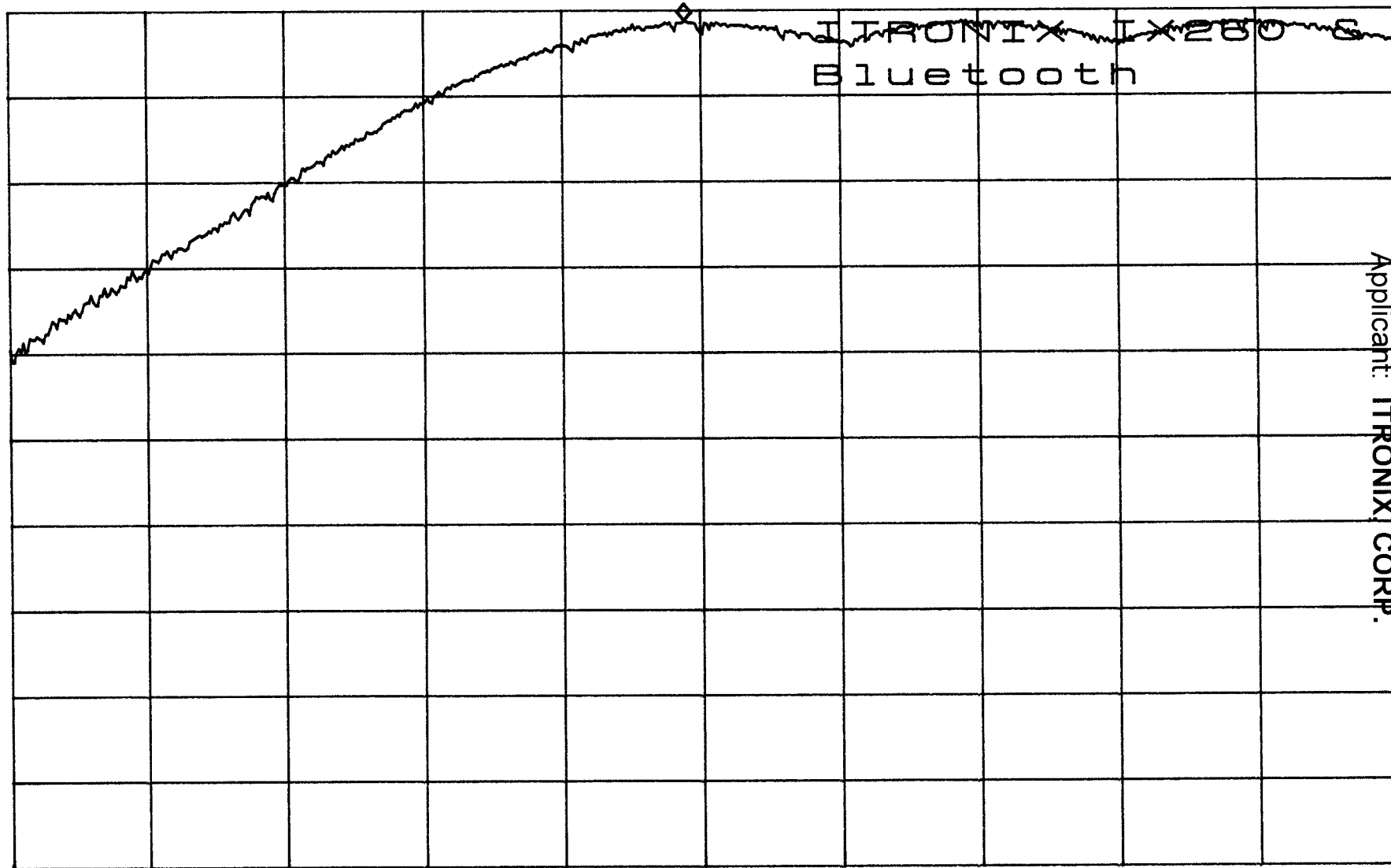
FCC ID: KBCIX260MPIA750BT

LOW POWER PLOT - 5

\*ATTEN 20dB  
RL 10.0dBm

10dB/

MKR 8.83dBm  
2.401942GHz



Applicant: ITRONIX CORP.

CENTER 2.402000GHz SPAN 5.000MHz  
\*RBW 1.0MHz \*VBW 3.0MHz SWP 50ms

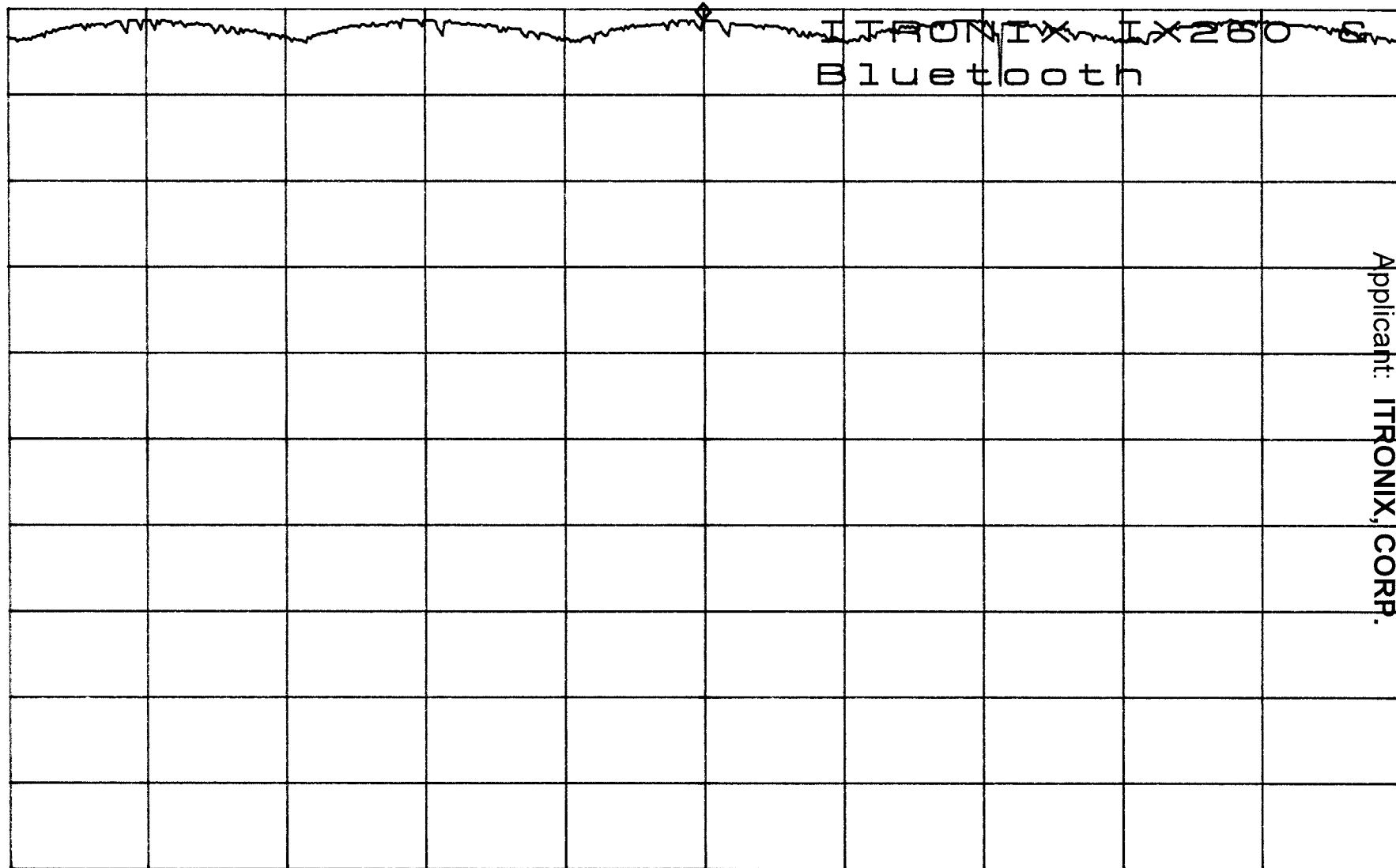
\*ATTEN 20dB

RL 10.0dBm

10dB/

MKR 8.67dBm

2.441000GHz



CENTER 2.441000GHz

SPAN 5.000MHz

\*RBW 1.0MHz

\*VBW 3.0MHz

SWP 50ms

\*ATTEN 20dB

MKR 8.33dBm

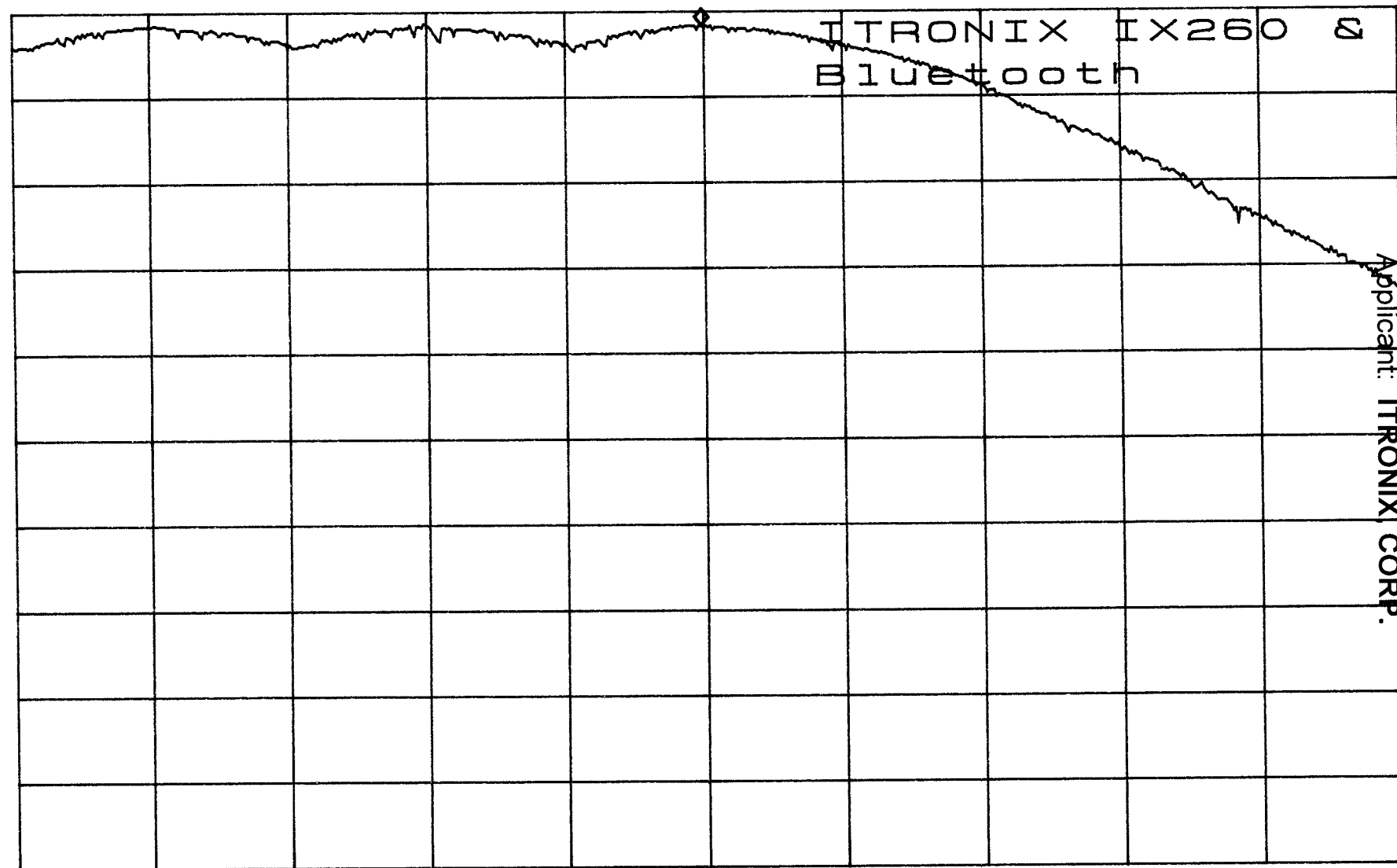
RL 10.0dBm

10dB/

2.479992GHz

ITRONIX IX260 &  
Bluetooth

Applicant: ITRONIX CORP.



CENTER 2.480000GHz

SPAN 5.000MHz

\*RBW 1.0MHz

\*VBW 3.0MHz

SWP 50ms

\*ATTEN 30dB  
RL 11.0dBm

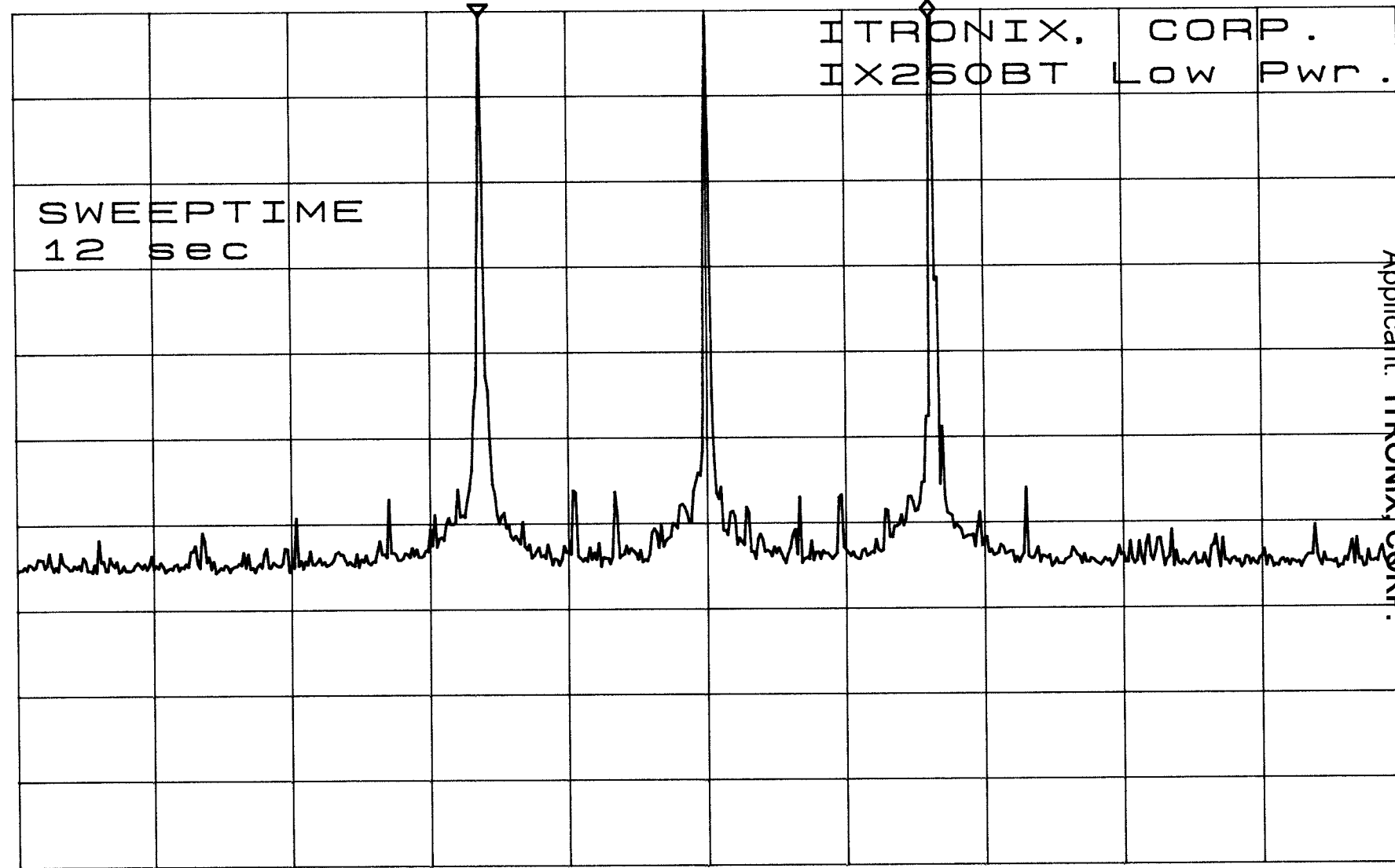
10dB/

$\Delta MKR$  -.33dB  
78.0MHz

SWEPTIME  
12 sec

ITRONIX, CORP.  
IX260BT Low Pwr.

Applicant: ITRONIX, CORP.



CENTER 2.4410GHz

SPAN 240.0MHz

\*RBW 100KHz

\*VBW 300KHz

\*SWP 12sec

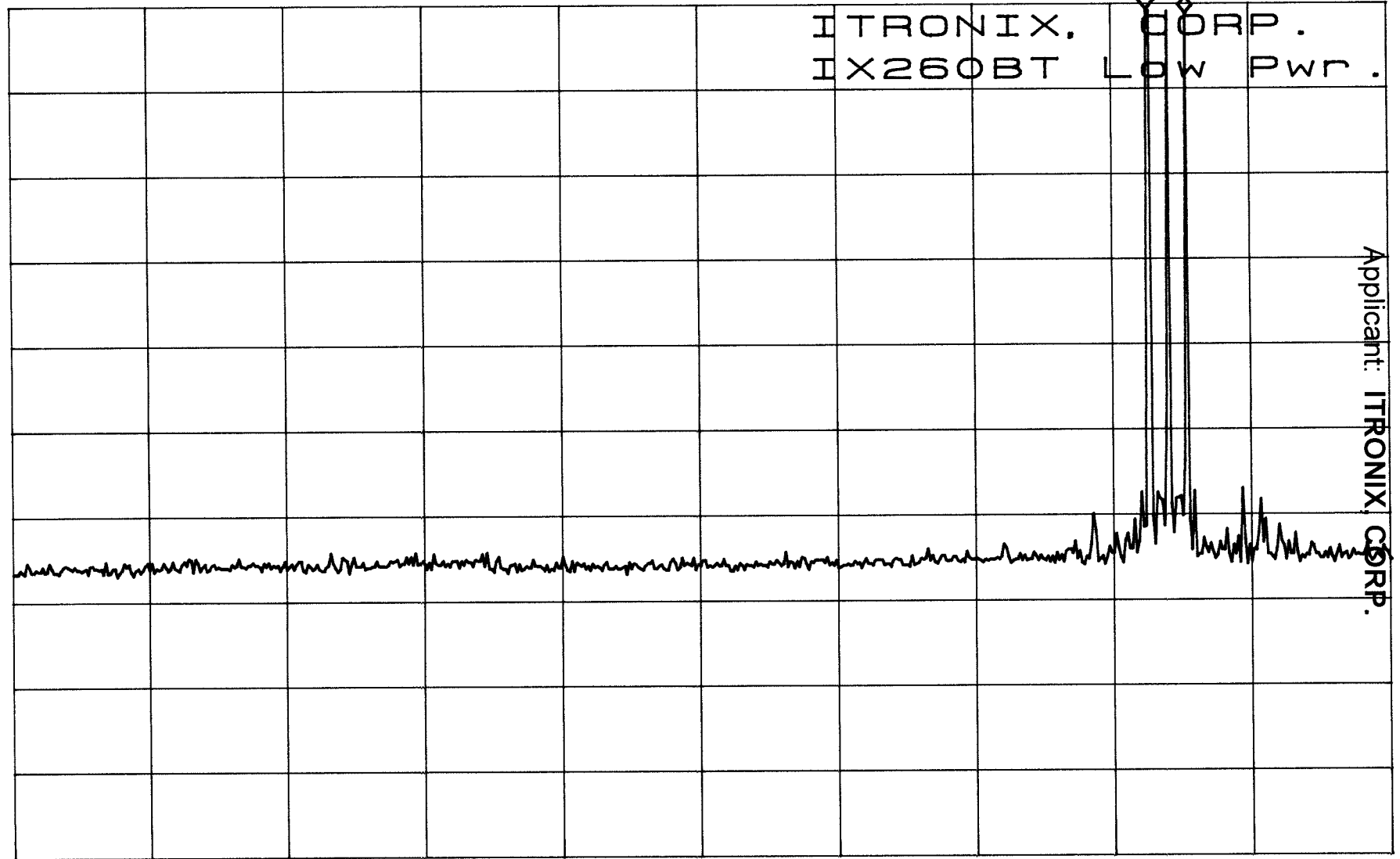
\*ATTEN 30dB  
RL 11.0dBm

10dB/

ΔMKR -.50dB  
81MHz

ITRONIX, CORP.  
IX260BT Low Pwr.

Applicant: ITRONIX, CORP.



START 30MHz

STOP 2.900GHz

\*RBW 100KHz

\*VBW 300KHz

SWP 800ms

FCC ID: KBCIX260MPIA750BT

LOW POWER PLOT - 10

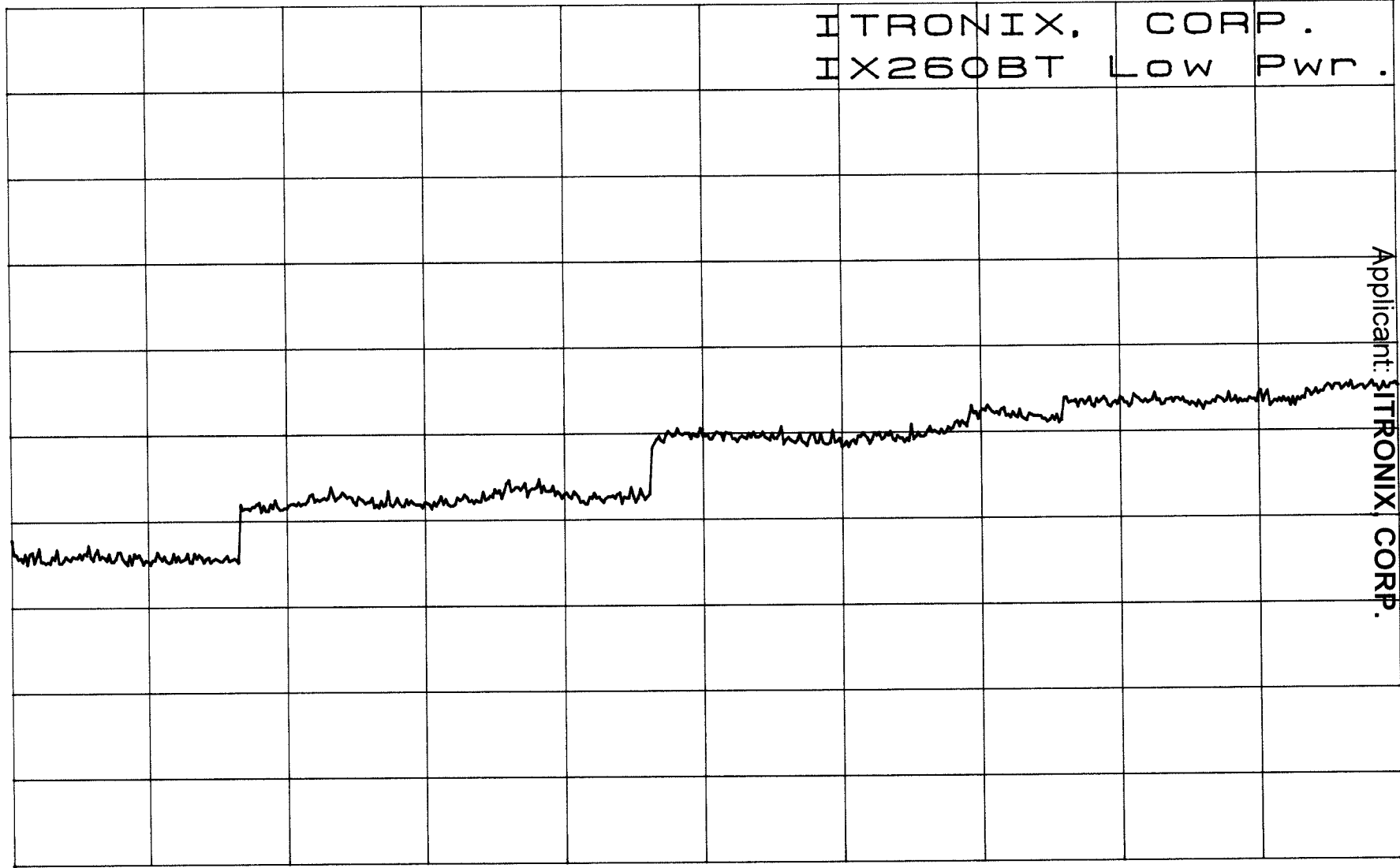
\*ATTEN 30dB

RL 11.0dBm

10dB/

ITRONIX, CORP.  
IX260BT Low Pwr.

Applicant: ITRONIX CORP.



START 2.75GHz

STOP 25.00GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 6.0sec

\*ATTEN 30dB

RL 20.0dBm

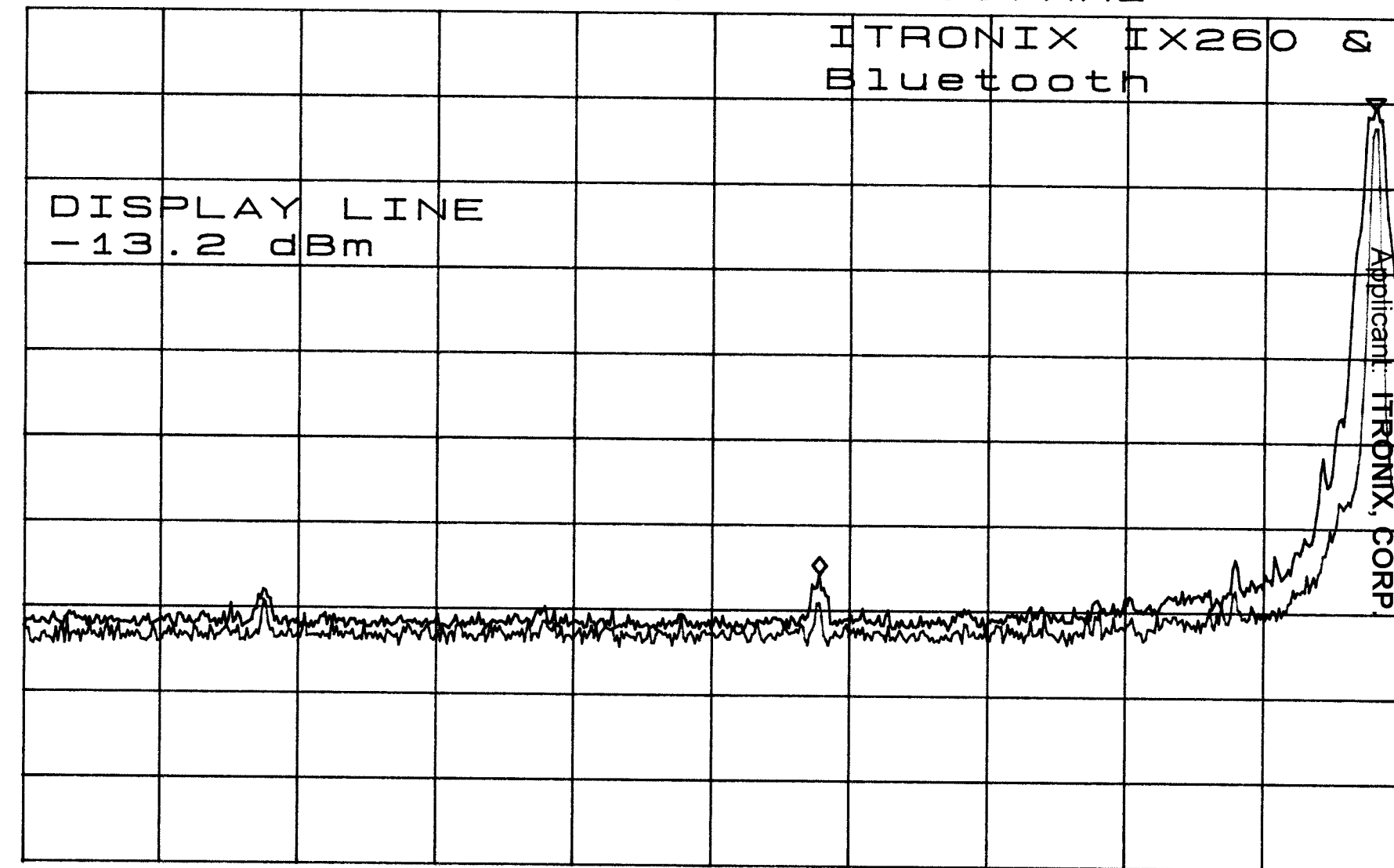
10dB/

 $\Delta$ MKR -55.00dB

-16.07MHz

ITRONIX IX260 &  
BluetoothDISPLAY LINE  
-13.2 dBm

Applicant: ITRONIX, CORP.



START 2.36300GHz

STOP 2.40300GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 50ms



\*ATTEN 30dB

 $\Delta$ MKR -57.00dB

RL 20.0dBm

10dB/

16.00MHz

ITRONIX IX260 &  
BluetoothDISPLAY LINE  
13.2 dBm

Applicant: ITRONIX, CORP.

START 2.47900GHz

STOP 2.51900GHz

\*RBW 100kHz

\*VBW 300kHz

SWP 50ms