

Test Report Serial No.:	012625-	Γ1304-N15	Report Issue Date:	1/28/2015
Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



COMPLIA	NCE RF	MEASUREMENT REPORT - 15.249 / RSS-210
Test Lab Information	Name	CELLTECH LABS INC.
Test Lab Information	Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada
Test Lab Registration No.(s)	FCC	714830
rest Lab Registration No.(s)	IC	3874A-1
Applicant Information	Name	TLInk Golf Inc.
Applicant information	Address	240 West Chestermere Dr., Chestermere, Alberta, Canada, T1X 1B2
	FCC	47 CFR Part 15.249
Standard(s) & Procedure(s)	IC	RSS-210 Issue 8; RSS-Gen Issue 4
	ANSI	C63.4-2009
Device Classification(s)	FCC	Low Power Communication Device (DXX)
Device Glassification(s)	IC	Low-power License-exempt Radiocommunication Device
Application Type(s)	FCC/IC	TCB/CB Certification
Device Identifier(s)	FCC ID:	2AD4A-T1
Device identifier(s)	IC:	12229A-T1
Device Model(s) Tested	T1	
Test Sample Serial No.	#1	
Transmit Frequency Band	2400 – 248	33.5 MHz
Transmit Frequency Range	2402-2480	MHz
Antenna Type(s) Tested	Integral, -9	dBi
Power Source(s) Tested	Internal D	C Cell
Lab Test Software	TILE, vers	sion 3.4.E.2 (2005).

This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Part 15.249; Industry Canada RSS-210 Issue 8 and RSS-Gen Issue 4; and ANSI C63.4-2009.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results and statements contained in this report pertain only to the device(s) evaluated.

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Test Report Approved By

| Glen Westwell | Laboratory Manager | Celltech Labs Inc.

Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	AT INK
DUT:		TLink 2.4GHz Transmitter							
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Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	C TUNK
DUT :		TLink 2.4GHz Transmitter							
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TEST SUMMARY										
F	Referenced Standard(s):	FCC CFR	Title 47 Part 15 Su	bpart C/ RS	S-210					
Section	Description of Test	FCC Reference	Ind. Can. Reference	Test Start	Test End	Result				
8	Field Strength of Intentional Radiators, Band Edge & Restricted Band Emissions	15.249 (a)	RSS-210	Nov 2014	Jan 2015	Pass				
9	Radiated Spurious Emissions	15.249 (d)	RSS-210	Nov 2014	Jan 2015	Pass				
10	Antenna Requirements	n/a	n/a	n/a	n/a	Pass				

## **REVISION LOG**

Revision	Description	Implemented By	Issue Date
1.0	Initial Release	Glen Westwell	1/28/2015

## **SIGNATORIES**

	Glen Westwell		Art Voss	Date
Prepared By	Lab Manager	Reviewed By	Senior Engineer	1/28/2015

Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	A TUNK
DUT :		TLink 2.4GHz Transmitter							Contain although
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#### 1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of TLink's T1 transmitter. The measurement results were applied against the applicable FCC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Part 15 Subpart C and Industry Canada Radio Standards Specification RSS-210 Issue 8 and RSS-Gen Issue 4.

#### 2.0 REFERENCES

#### 2.1 Normative References

ANSI/ISO 17025:2005 General Requirements for competence of testing and calibration laboratories

IEEE/ANSI C63.4-2009 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic

Equipment in the Range of 9 kHz to 40 GHz

CFR Title 47 Part 15C Code of Federal Regulations

Title 47: Telecommunication Part 15C: Intentional Radiators

IC Spectrum Management & Radio Standards Specification

Telecommunications Policy RSS-210 Issue 8 - Low-Power License-Exempt Radiocommunication Devices (All Frequency

Bands): Category I Equipment

RSS-Gen Issue 4 - General Requirements and Information for the Certification of

Radiocommunication Equipment

#### 3.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

Applicant:		TLink	AT INK							
DUT :		TLink 2.4GHz Transmitter								
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## 4.0 GENERAL INFORMATION

#### 4.1 DUT Description & Specifications

Device Type:	art 15.249 / RSS-210 Low Power Bluetooth LE transmitter.					
Device Model(s):	1					
Test Sample Serial No.:	1					
Device Identifier(s):	FCC ID: 2AD4A-T1 12229A-T1					
Band of Operation:	2400-2483.5 MHz					
Transmit Frequency Range of DUT:	2402-2480 MHz.					
Modulation:	GFSK					
Rated RF Output Power :	0 dBm					
Antenna Gain:	ntegral PCB Trace, -9.0 dBi.					
DUT Power Source:	nternal DC cell.					
Type of Equipment:	ow Power Transmitter (DXX)					
Deviation(s) from standard/procedure:	one					
Modification of DUT:	<ul> <li>50 ohm connection to the RF output for conducted measure</li> <li>Test SW provided for channel &amp; modulation selection.</li> </ul>	ements.				

## **DUT Description**

The TLink Golf Watch, T1, is a lightweight device that uses Bluetooth Low Energy to pair with a smartphone to provide golfers the front, middle, and back yardage to the green. It also tracks steps walked and calories burnt on the golf course.

Applicant:		TLink	TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							
DUT:		TLink 2.4GHz Transmitter								
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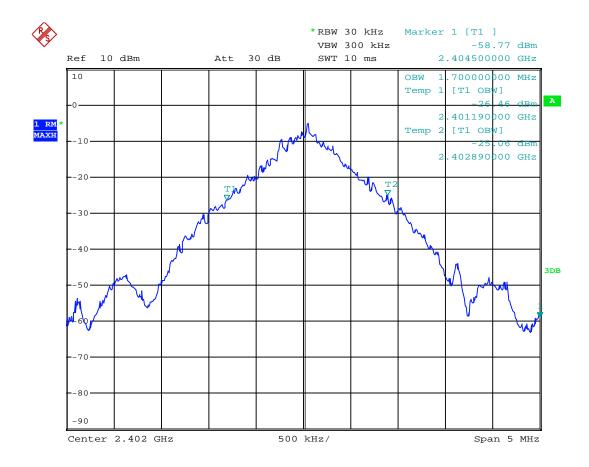
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# 5.0 99% OCCUPIED BANDWIDTH = 1.73 MHZ

#### **TLink**

#### **Bottom Channel**



Date: 22.JAN.2015 22:06:42

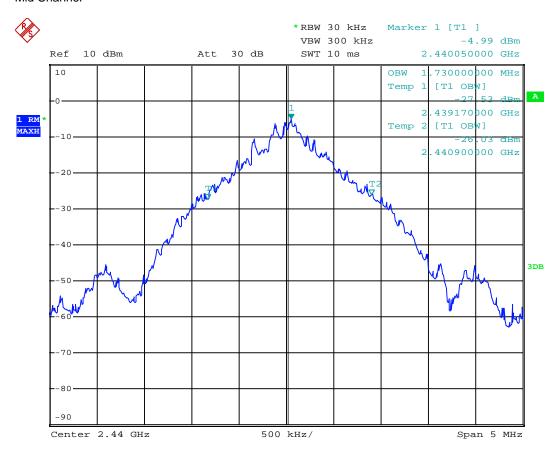
Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1								
DUT:		TLink 2.4GHz Transmitter								
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#### Mid Channel



Date: 22.JAN.2015 22:08:10

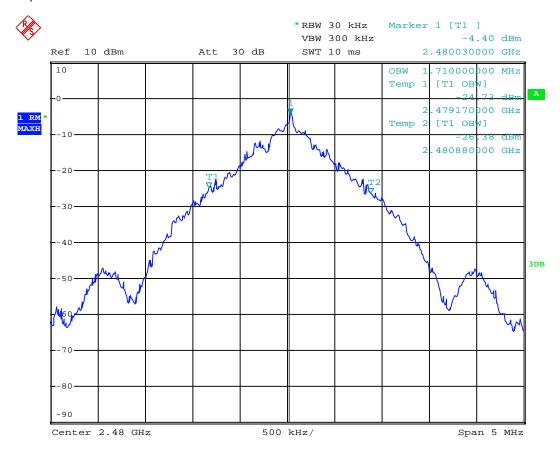
Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1								
DUT:		TLink 2.4GHz Transmitter								
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IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



## Top Channel



Date: 22.JAN.2015 22:09:02

Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1								
DUT:		TLink 2.4GHz Transmitter								
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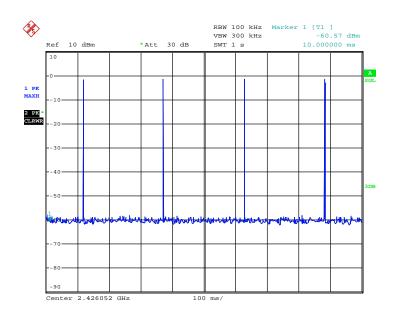


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IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1

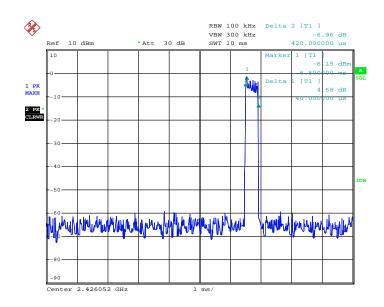


## 6.0 DUTY CYCLE CORRECTION FACTOR.

Measured Duty Cycle =  $(420 u Sec \times 4)/100 m Sec = 1.68 m Sec = -35.5 dB$ . Therefore full duty cycle correction of -20 dB.



Date: 24.DEC.2014 17:23:23



Date: 24.DEC.2014 17:28:39

Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1								
DUT:		TLink 2.4GHz Transmitter								
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IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



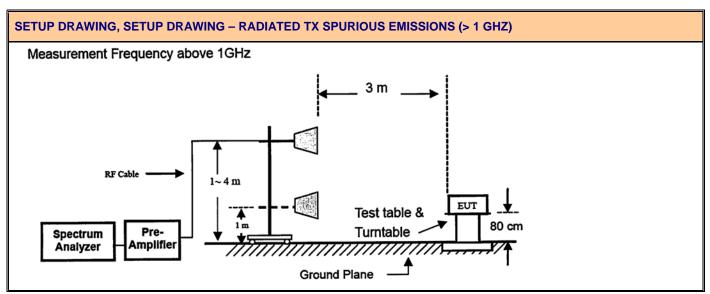
# 7.0 <u>FIELD STRENGTH OF INTENTIONAL RADIATOR, BAND EDGE AND RESTRICTED BAND EMISSIONS</u>

REFERENCES	
Normative Reference Standard	FCC CFR 47 §15.249; RSS-210
Procedure Reference	ANSI C63.4:2009

ENVIRONMENTAL CONDITIONS							
Temperature	Temperature 25 +/- 5 °C						
Humidity	40 +/- 10 %						
Barometric Pressure	Barometric Pressure 101 +/- 3 kPa						

EQUIPMENT LIST	EQUIPMENT LIST									
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL / NEXT CAL DUE						
00241	R&S	FSP40	Spectrum Analyzer	09-Apr-13 / 09-Apr-15						
00072	EMCO	2075	Mini-mast	n/a						
00073	EMCO	2080	Turn Table	n/a						
00071	EMCO	2090	Multi-Device Controller	n/a						
00050	Chase	CBL-6111A	Bilog Antenna	25-Ap-14 / 25-Ap-16						
00034	ETS	3115	Double Ridged Guide Horn	*06-Dec-12 / 06-Mar-15						
00161	Waveline	899	18-26.5 GHz Horn	N/A						

 <sup>\*</sup> Horn calibration extended due to the test starting prior to expiration of cal period.



Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	AT INK
DUT:			TL	ink 2.4GHz T	ransmitter				C ICLINA
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	15.249(a) Field Strength of Fundamental – Peak Detector										
	TLink										
Frequency	Antenna	Emission	Antenna	Cable	Distance	D/C	Emission	Limit	Margin		
(MHz)	Pol.	Level	Factor	Loss	Correction	Corr.	Level	(dBuV/m@3m)			
		(dBuV/m)	(dB)		(1m to 3m)		(dBuV/m@3				
		@1m					m)				
2402.0	V	66.2	28.4	1.5	-9.54	-20	66.56	94	-27.44		
2402.0	Н	64.7	28.4	1.5	-9.54	-20	65.06	94	-28.94		
2442.0	V	66.8	28.4	1.5	-9.54	-20	67.16	94	-26.84		
2442.0	Н	65.1	28.4	1.5	-9.54	-20	65.46	94	-28.54		
2480.0	V	65.5	28.4	1.5	-9.54	-20	65.86	94	-28.14		
2480.0	Н	62.3	28.4	1.5	-9.54	-20	62.66	94	-31.34		
			<b>Band Ed</b>	lge -15.2	49(d) (Wor	st Case	e)				
2400.0	V	47.3	28.4	1.5	-9.54	-20	47.66	54	-6.34		
2483.5	V	36.4	28.4	1.5	-9.54	-20	36.76	54	-17.24		
	•	15.20	05 Restric	ted Band	l Emission	s (wors	t Case)		•		
2390.0	V	34.0	28.4	1.5	-9.54	-20	34.36	54	-19.64		
2483.5	V	36.4	28.4	1.5	-9.54	-20	36.76	54	-17.24		

Data presented using a Pk detector compared to average limits.

Device characterization was performed on all axis to determine worst case orientation. The device was tested using a fresh DC cell throughout all testing.

D/C = Duty Cycle

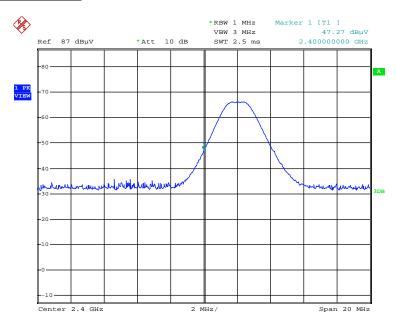
Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							A TUNK
DUT:		TLink 2.4GHz Transmitter							Samuel of State State
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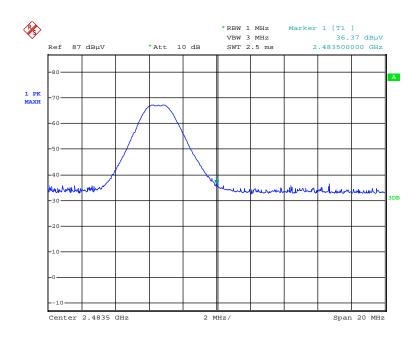


# Band Edge Plots (restricted bands) LBE -2.400 GHz



Date: 23.JAN.2015 20:38:08

#### UBE -2.4835 GHz



Date: 23.JAN.2015 20:46:59

Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	AT INK
DUT:		TLink 2.4GHz Transmitter							Constitute and the sent
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# 8.0 RADIATED SPURIOUS EMISSIONS

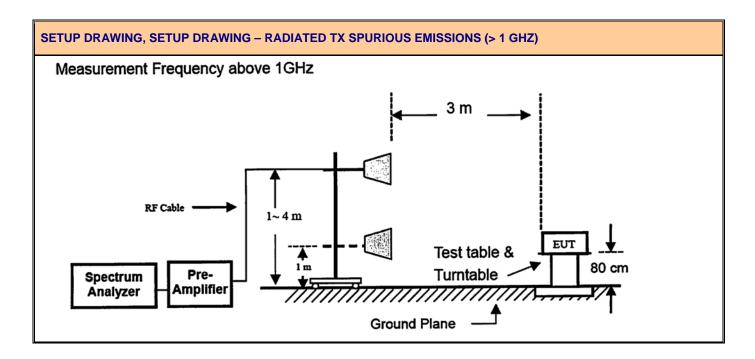
REFERENCES											
Normative Refere	ence Standard	FCC C	FR 47 §1	5.205; §1	5.209: §15.249,	RSS-210, IECS-003					
Procedure R	eference	ANSI (	ANSI C63.4:2009								
ENVIRONMENTA	L CONDITIONS	CONDITIONS									
Tempera	ature	25 +/-	5 ºC								
Humid	lity	40 +/-	10 %								
Barometric I	Pressure	101 +/-	- 3 kPa								
EQUIPMENT LIST											
ASSET NUMBER	MANUFACTUI	RER	MOE	DEL	D	ESCRIPTION	LAST CAL / NEXT CAL DUE				
00051	HP		856	6B	Spectrum /	Analyzer RF Section	30-Ap-14 / 30-Ap-16				
00049	HP		8565	50A	Quas	i-peak Adapter	30-Ap-14 / 30-Ap-16				
00047	HP		8568	35A	RF	Preselector	30-Ap-14 / 30-Ap-16				
00072	EMCO		207	75		Mini-mast	n/a				
00073	EMCO		208	30	٦	Turn Table	n/a				
00071	EMCO		209	90	Multi-D	Device Controller	n/a				
00030	HP		830′	17A	Microway	ve system amplifier	n/a				
00050	Chase		CBL-6	111A	Bil	log Antenna	25-Ap-14 / 25-Ap-16				
00034	ETS		3115 Double Ridged Guide Horn *06-Dec-12 / 06-Mar-								
00085	EMCO		650	03-Jun-13 / 03-Jun-15							
00162	Waveline	)	89	9	Но	orn Antenna	n/a				
MEASUREMENT	EQUIPMENT SI	ETUP									
		na types	s may be	required	to cover the ap		ected as shown in E.4. e tested. The ranges in				
MEASUREMENT		Fre	quency R	lange		RX Antenna	TX Antenna				
EQUIPMENT CONNECTIONS		91	kHz – 30ľ	Mhz		Active Loop	N/a				
CONNECTIONS		30	) MHz - 10	GHz		Bilog	N/a				
			GHz - 18			ETS 3115 Horn	N/a				
		1	18-26.5 G	Hz		Waveline Horn	N/a				
	For the spurio	ous out-c	of-band e	missions,	the spectrum a	nalyzer was set to the fol	lowing settings:				
	Meas	uramant			RBW	VBW	Detector				
	ivicasi	surement KHz KHz Detecto									
MEASUREMENT	< 1 GHz 100 300 Peak*										
EQUIPMENT SETTINGS	> 1	GHz			1000	3000	Peak*				
	harn • All d	nonic of the letected of the l	the funda emissions	imental. s are repo	orted.	st frequency generated ting prior to expiration of	by the EUT to the 10 <sup>th</sup> cal period.				

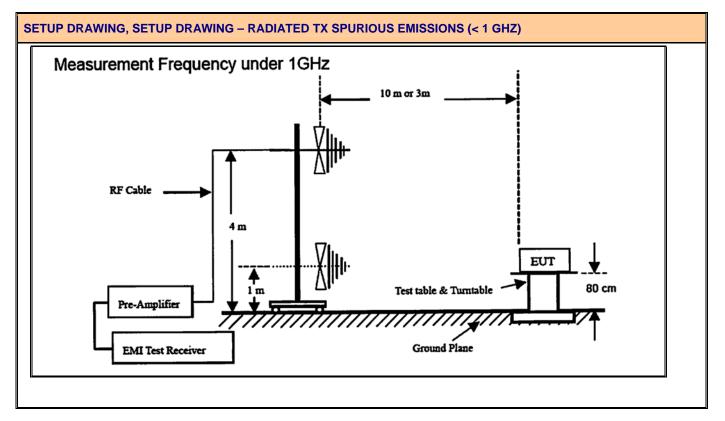
l	Applicant:		TLink   Model:   T1   FCC ID:   2AD4A-T1   IC:   12229A-T1									
	DUT :		TLink 2.4GHz Transmitter									
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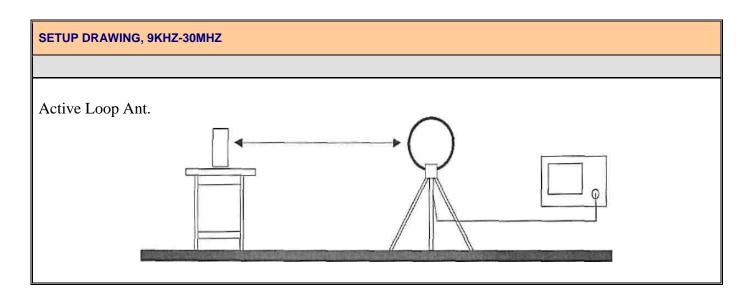


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	15.249(a)(d) Emissions Field Strength- Peak Detector TLink - Low Power Transmitter												
Frequency	Antenna	Emission	Antenna	Cable	Distance	D/C	Emission	Limit	Margin				
(MHz)	Pol.	Level	Factor	Loss	Correction	Corr.	Level	(dBuV/m@3m)					
		(dBuV/m)	(dB)				(dBuV/m@3						
		@1m					m)						
4804	V	37.7	32.9	2.3	-9.54	-20	43.36	54	-10.64				
4884	V	37.2	32.9	2.3	-9.54	-20	42.86	54	-11.14				
4960	V	35.1	32.9	2.3	-9.54	-20	40.76	54	-13.24				

Notes

Data presented using a Pk detector compared to average limits.

Device characterization was performed on all axis to determine worst case orientation.

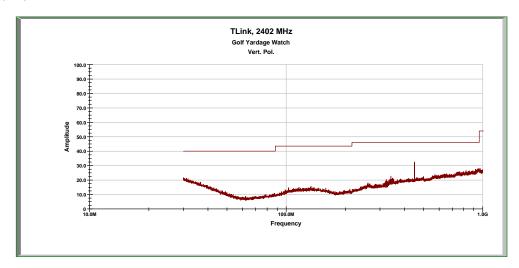
The device was tested using a fresh battery charge throughout testing.

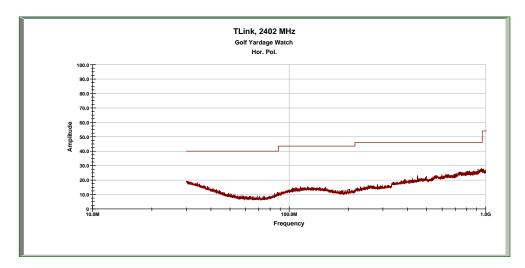
Worst case performance has been presented.

The Device was searched to the 10<sup>th</sup> harmonic of the fundamental (24GHz). No harmonics beyond 4.8GHz were detected.

All detected emissions have been reported.

# 15.209 Radiated Emissions - <u>Note:</u> the 450 MHz emission in the plots below is an ambient emission and not from this device. Lower Band Channel





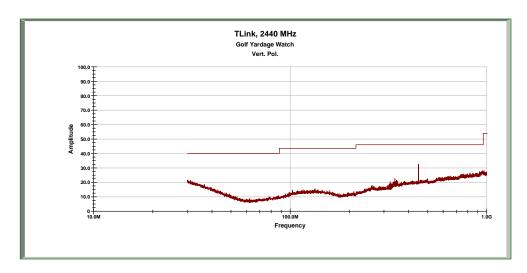
Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	A TUNK	
DUT:		TLink 2.4GHz Transmitter								
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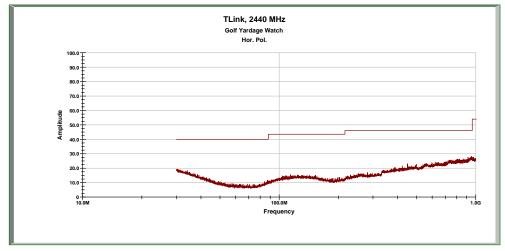


Test Report Serial No.:	012625-	Γ1304-N15	Report Issue Date:	1/28/2015
Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



15.209 Radiated Emissions Mid Band Channel





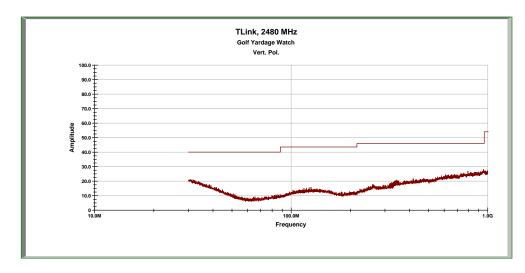
Applicant:		TLink	Model:	T1	FCC ID:	2AD4A-T1	IC:	12229A-T1	AT INK
DUT:	TLink 2.4GHz Transmitter								
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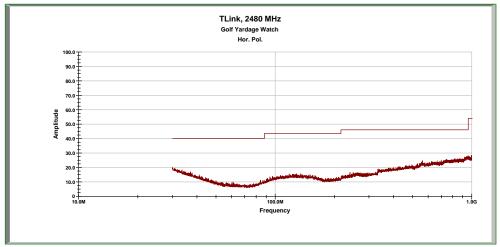


Test Report Serial No.:	012625-	Γ1304-N15	Report Issue Date:	1/28/2015
Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



## 15.209 Radiated Emissions High Band Channel





Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1								
DUT:	TLink 2.4GHz Transmitter									
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Test Report Serial No.:	012625-	Γ1304-N15	Report Issue Date:	1/28/2015
Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	Nov 2014-Jan 201 47 CFR §15.249		FCC Test Firm Reg. No.:	714830
IC Standard(s):	IC Standard(s): RSS-210 R		IC Test Site No.:	IC 3874A-1



#### 9.0 ANTENNA REQUIREMENTS

#### § 15.203 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The DUT complies with the antenna requirements of 15.203 as follows:

Integral antenna is used.

Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							AT INK
DUT:	TLink 2.4GHz Transmitter								Constitute and the sent
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Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



# 10.0 TEST SET UP PHOTO'S



Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							
DUT:	TLink 2.4GHz Transmitter								O TLINK
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Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



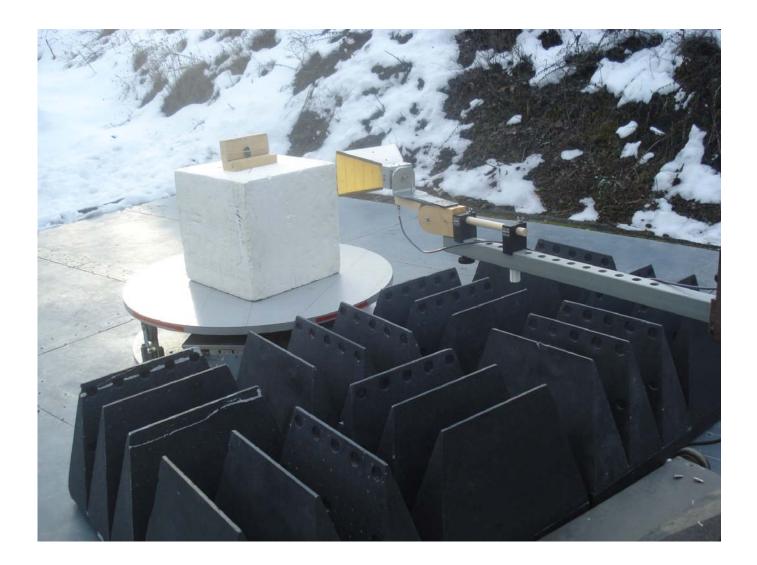


Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							
DUT:		TLink 2.4GHz Transmitter							
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Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1





Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							
DUT:	: TLink 2.4GHz Transmitter								O TLINK
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Test Report Serial No.:	012625-	Γ1304-N15	Report Issue Date:	1/28/2015
Measurement Date(s):	Nov 2014	l-Jan 2015	Report Revision No.:	Revision 1.0
FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1





Applicant:		TLink	AT INK						
DUT:	: TLink 2.4GHz Transmitter								Contract of agent and
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FCC Rule Part(s):	47 CFR	§15.249	FCC Test Firm Reg. No.:	714830
IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1



## **END OF DOCUMENT**

Applicant:		TLink Model: T1 FCC ID: 2AD4A-T1 IC: 12229A-T1							C) TUNK
DUT:	UT : TLink 2.4GHz Transmitter								
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