



Design. Create. Certify. *Connect.*

W66 N220 Commerce Court • Cedarburg, WI 53012 USA • Phone: 262.375.4400 • Fax: 262.375.4248 • www.lsr.com

## ENGINEERING TEST REPORT # 314278 B

**LSR Job #: C-2060**

Compliance Testing of:

TLCKMAJD

Test Date(s)

February 6<sup>th</sup> and 26<sup>th</sup>, March 31<sup>st</sup>, 2015

Prepared For:

Stanley Black and Decker

Attn: Kirwan Magdamo

701 E. Joppa Road

Towson, MD 21286

Stanley Black and Decker Canada

Attn: Mark Emmerson

6275 Millcreek Drive

Mississauga, Ontario L5N7K6

**This Test Report is issued under the Authority of:** Shane D. Rismeyer, EMC Engineer

Signature:  Date: 4/13/15

*This Test Report may not be reproduced, except in full, without written approval of LS Research, LLC.*

Prepared For: Stanley Black and Decker

Name: TLCKMAJD

Report: RF314278 B FCC RF

Model: TLCKMAJD

LSR: C-2060

Serial: CL14A14502210

**Table of Contents**

i. Title Page ..... 1

ii. Table of Contents ..... 2

iii. LS Research, LLC ..... 3

1.0 Conformance Summary ..... 4

2.0 SAR Test Exclusion Threshold..... 4

3.0 Client Information..... 5

3.1 Equipment Under Test (EUT) Information..... 5

3.2 Product Description ..... 5

3.3 Modifications Incorporated In the EUT for Compliance Purposes ..... 5

3.4 Deviations & Exclusions from Test Specifications ..... 5

3.5 Additional Information ..... 5

4.0 RF Conducted Measurement Data ..... 6

5.0 SAR Test Exclusion Calculation ..... 6

6.0 MPE Calculation..... 8

Prepared For: Stanley Black and Decker	Name: TLCKMAJD
Report: RF314278 B FCC RF	Model: TLCKMAJD
LSR: C-2060	Serial: CL14A14502210

## LSR, LLC in Review

As an EMC Testing Laboratory, our Accreditation and Assessments are recognized through the following:

---



TESTING CERT #1255.01

A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025: 2005 with Electrical (EMC) Scope of Accreditation

A2LA Certificate Number: 1255.01

---

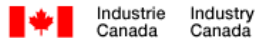


Federal Communications Commission (FCC) – USA

Listing of 3 Meter Semi-Anechoic Chamber based on Title 47 CFR – Part 2.948

FCC Registration Number: 90756

---



**Canada**

Industry Canada

On file, 3 Meter Semi-Anechoic Chamber based on RSS-212 – Issue 1

File Number: IC 3088-A

On file, 3 and 10 Meter OATS based on RSS-212 – Issue 1

File Number: IC 3088

---



U. S. Conformity Assessment Body (CAB) Validation

Validated by the European Commission as a U. S. Competent Body operating under the U. S./EU, Mutual Recognition Agreement (MRA) operating under the European Union Electromagnetic Compatibility – Council Directive 2004/108/EC (formerly 89/336/EEC, Article 10.2).

Date of Validation: January 16, 2001

Validated by the European Commission as a U.S. Notified Body operating under the U.S. /EU, Mutual Recognition Agreement (MRA) operating under the European Union Telecommunication Equipment – Council Directive 99/5/EC, Annex V.

Date of Validation: November 20, 2002

Notified Body Identification Number: 1243

Prepared For: Stanley Black and Decker

Name: TLCKMAJD

Report: RF314278 B FCC RF

Model: TLCKMAJD

LSR: C-2060

Serial: CL14A14502210

## 1.0 Conformance Summary

The EUT was found to MEET the 5mm minimum test separation distance threshold for SAR test exclusion per FCC §2.1091(mobile) using methods of FCC KDB 447498 D01 General RF Exposure Guidance v05r02 as a standalone device.

## 2.0 SAR Test Exclusion Threshold

SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 20$  cm

1-g SAR test exclusion threshold equation:

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] * \sqrt{f(\text{GHz})} \leq 3.0$$

10-g SAR test exclusion threshold equation:

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] * \sqrt{f(\text{GHz})} \leq 7.5$$

Prepared For: Stanley Black and Decker	Name: TLCKMAJD
Report: RF314278 B FCC RF	Model: TLCKMAJD
LSR: C-2060	Serial: CL14A14502210

### 3.0 Client Information

<b>Manufacturer Name:</b>	Stanley Black and Decker
<b>Address:</b>	701 E. Joppa Road
<b>Contact Person:</b>	Kirwan Magdamo

<b>Manufacturer Name:</b>	Stanley Black and Decker Canada
<b>Address:</b>	6275 Millcreek Drive
<b>Contact Person:</b>	Mark Emmerson

### 3.1 Equipment Under Test (EUT) Information

*The following information has been supplied by the applicant.*

<b>Product Name:</b>	TLCKMAJD
<b>Model Number:</b>	TLCKMAJD
<b>Serial Number:</b>	CL14A14502210
<b>FCC ID</b>	YJ7TLCKMAJD

### 3.2 Product Description

The TLCKMAJD is capable of connecting with mobile devices that support Bluetooth Smart technology.

### 3.3 Modifications Incorporated In the EUT for Compliance Purposes

None noted at time of test

### 3.4 Deviations & Exclusions from Test Specifications

None noted at time of test

### 3.5 Additional Information

Low Channel 37(2402 MHz), Middle Channel 17 (2440 MHz), High Channel 39 (2480 MHz). EUT programmed for continuous transmit or receive on selectable channel and data rate (modulation) using the touchscreen interface.

Prepared For: Stanley Black and Decker	Name: TLCKMAJD
Report: RF314278 B FCC RF	Model: TLCKMAJD
LSR: C-2060	Serial: CL14A14502210

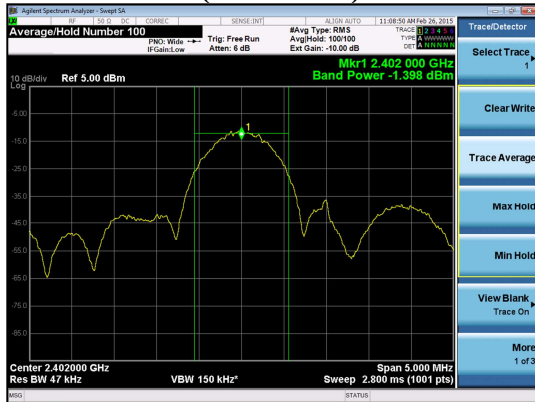
## 4.0 RF Conducted Measurement Data

Table

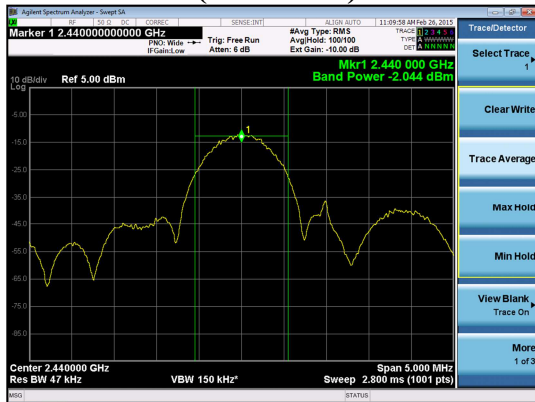
Frequency (MHz)	Power (dBm)
2402	-1.40
2440	-2.04
2480	-2.60

### Plots

#### Low Channel (2402 MHz)



#### Mid Channel (2440 MHz)



Prepared For: Stanley Black and Decker

Name: TLCKMAJD

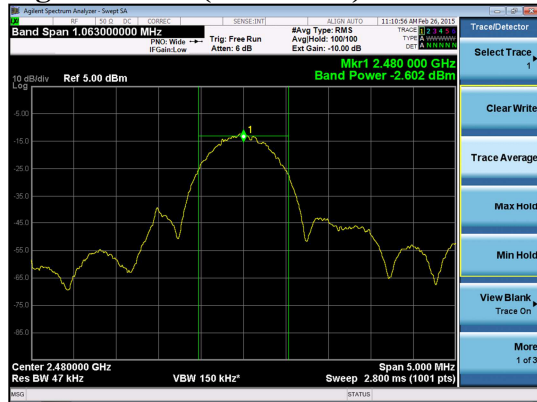
Report: RF314278 B FCC RF

Model: TLCKMAJD

LSR: C-2060

Serial: CL14A14502210

## High Channel (2480 MHz)



## 5.0 SAR Test Exclusion Calculation

Comparison to SAR threshold

The highest output power of the device is -1.4 dBm

Frequency = 2402 MHz

Output Power = -1.4 dBm

Output Power = 0.724 mW

Minimum separation distance = 5mm

$$[0.724\text{mW/mm}] * [\sqrt{2.402\text{ GHz}}] = 0.22 < 3.0$$

*RSS 102 Limit for 5mm separation distance = 4mW*

Output power of the device (conducted method + Antenna Gain) = -1.4 dBm + 1.5 dBi = 0.1 dBm

Output power of the device (radiated method) = 93.3 dBuV/m @ 3 meters = -1.93 dBm

Frequency (MHz)	Power (dBm)	Antenna Gain (dBi)	Power (mW)	Limit (mW)	Margin (mW)
2402	-1.40	1.5	1.02	4.26	3.24
2440	-2.04	1.5	0.88	4.05	3.17
2480	-2.60	1.5	0.78	3.94	3.16

Prepared For: Stanley Black and Decker

Report: RF314278 B FCC RF

LSR: C-2060

Name: TLCKMAJD

Model: TLCKMAJD

Serial: CL14A14502210

## 6.0 MPE Calculation

Note: Antenna gain over ground plane.

### Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<u>-1.40</u> (dBm)
Maximum peak output power at antenna input terminal:	<u>0.724</u> (mW)
Antenna gain(typical):	<u>1.5</u> (dBi)
Maximum antenna gain:	<u>1.413</u> (numeric)
Prediction distance:	<u>20</u> (cm)
Prediction frequency:	<u>2400</u> (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	<u>1</u> (mW/cm <sup>2</sup> )
Power density at prediction frequency:	0.000204 (mW/cm <sup>2</sup> )
Maximum allowable antenna gain:	38.4 (dBi)
Margin of Compliance at 20 cm =	36.9 dB



Prepared For: Stanley Black and Decker	Name: TLCKMAJD
Report: RF314278 B FCC RF	Model: TLCKMAJD
LSR: C-2060	Serial: CL14A14502210