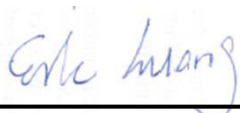


# FCC SAR Test Report

APPLICANT : Zebra Technologies Corporation  
EQUIPMENT : Touch computer  
BRAND NAME : Zebra  
MODEL NAME : TC700K  
FCC ID : UZ7TC700K  
STANDARD : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2013

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

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## **Table of Contents**

|                                                        |          |
|--------------------------------------------------------|----------|
| <b>1. Statement of Compliance .....</b>                | <b>4</b> |
| <b>2. Administration Data .....</b>                    | <b>5</b> |
| <b>3. Equipment Under Test (EUT) Information .....</b> | <b>5</b> |
| 3.1 General Information .....                          | 5        |
| <b>4. Re-use of Measured Data .....</b>                | <b>6</b> |
| <b>5. Antenna Location .....</b>                       | <b>7</b> |
| <b>6. Simultaneous Transmission Analysis .....</b>     | <b>8</b> |
| 6.1 Head Exposure Conditions .....                     | 8        |
| 6.2 Body-Worn Accessory Exposure Conditions .....      | 8        |
| <b>Appendix A. Reference Report</b>                    |          |
| <b>Appendix B. Test Setup Photos</b>                   |          |

## Revision History

| REPORT NO.  | VERSION | DESCRIPTION             | ISSUED DATE   |
|-------------|---------|-------------------------|---------------|
| FA672834-04 | Rev. 01 | Initial issue of report | Jan. 05, 2017 |
|             |         |                         |               |
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## **1. Statement of Compliance**

The maximum results of Specific Absorption Rate (SAR) found during testing for Zebra Technologies Corporation, Touch computer, TC700K, are as follows.

| Equipment Class | Frequency Band | Highest SAR Summary      |                                | Highest Simultaneous Transmission<br>1g SAR (W/kg) |
|-----------------|----------------|--------------------------|--------------------------------|----------------------------------------------------|
|                 |                | Head<br>(Separation 0mm) | Body-worn<br>(Separation 15mm) |                                                    |
|                 |                | 1g SAR (W/kg)            |                                |                                                    |
| DTS             | 2.4GHz WLAN    | 0.31                     | 0.15                           | 0.33                                               |
| NII             | 5GHz WLAN      | 0.12                     | 0.37                           | 0.51                                               |
| DSS             | Bluetooth      |                          | < 0.01                         | 0.21                                               |

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

## **2. Administration Data**

| Testing Laboratory |                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL INC.                                                                                                                       |
| Test Site Location | No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |

| Applicant    |                                    |
|--------------|------------------------------------|
| Company Name | Zebra Technologies Corporation     |
| Address      | 1 Zebra Plaza Holtsville, NY 11742 |

| Manufacturer |                                                                                        |
|--------------|----------------------------------------------------------------------------------------|
| Company Name | Wistron Corporation                                                                    |
| Address      | 21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih Dist, New Taipei City 221, Taiwan R.O.C. |

## **3. Equipment Under Test (EUT) Information**

### **3.1 General Information**

| Product Feature & Specification         |                                                                                                                                                                                                                                                                |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment Name                          | Touch computer                                                                                                                                                                                                                                                 |
| Brand Name                              | Zebra                                                                                                                                                                                                                                                          |
| Model Name                              | TC700K                                                                                                                                                                                                                                                         |
| FCC ID                                  | UZ7TC700K                                                                                                                                                                                                                                                      |
| Wireless Technology and Frequency Range | WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz<br>WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz<br>WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz<br>WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz<br>WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz<br>NFC : 13.56 MHz |
| Mode                                    | · 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80<br>· Bluetooth BR/EDR/LE<br>· NFC:ASK                                                                                                                                                                           |
| HW Version                              | DV                                                                                                                                                                                                                                                             |
| SW Version                              | Android version 6.0.1                                                                                                                                                                                                                                          |
| FW Version                              | 91-12.04.4-MG-00                                                                                                                                                                                                                                               |
| MFD                                     | 08NOV16                                                                                                                                                                                                                                                        |
| EUT Stage                               | Engineering sample                                                                                                                                                                                                                                             |

## 4. Re-use of Measured Data

### 1. Introduction Section :

The SAR test data for WLAN/BT (equipment class: DTS/NII/DSS) of UZ7TC700K (model: TC700K) is referenced from UZ7TC75EK (model: TC75EK).

The applicant takes full responsibility that the test data as referenced in this report represent compliance for UZ7TC700K (model: TC700K).

### 2. Difference Section :

FCC ID: UZ7TC700K is a variant version of FCC ID: UZ7TC75EK by changing hardware in UZ7TC700K, the detail difference information please referred to Product Equality Declaration.

### 3. Spot Check Verification Data Section :

#### <Head SAR>

| Band        | Mode          | Test Position | Gap (mm) | Antenna | Ch. | Freq. (MHz) | Original Model (FCC ID : UZ7TC75EK ) |                     |              |                        |                        | Spot Check Model (FCC ID : UZ7TC700K ) |                     |              |                        |                        | Deviation |
|-------------|---------------|---------------|----------|---------|-----|-------------|--------------------------------------|---------------------|--------------|------------------------|------------------------|----------------------------------------|---------------------|--------------|------------------------|------------------------|-----------|
|             |               |               |          |         |     |             | Average Power (dBm)                  | Tune-Up Limit (dBm) | Duty Cycle % | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) | Average Power (dBm)                    | Tune-Up Limit (dBm) | Duty Cycle % | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |           |
| WLAN 2.4GHz | 802.11b 1Mbps | Right Cheek   | 0mm      | Ant 1   | 11  | 2462        | 18.13                                | 18.30               | 98.62        | 0.049                  | 0.052                  | 17.80                                  | 18.30               | 98.62        | 0.045                  | 0.051                  | -1.9%     |
| WLAN 2.4GHz | 802.11b 1Mbps | Left Cheek    | 0mm      | Ant 2   | 11  | 2462        | 18.23                                | 19.10               | 98.62        | 0.246                  | 0.305                  | 18.39                                  | 19.10               | 98.62        | 0.207                  | 0.246                  | -19.4%    |
| WLAN 5GHz   | 802.11a 6Mbps | Right Tilted  | 0mm      | Ant 1   | 60  | 5300        | 16.09                                | 16.10               | 92.86        | 0.011                  | 0.012                  | 15.82                                  | 16.10               | 92.86        | 0.010                  | 0.011                  | -8.3%     |
| WLAN 5GHz   | 802.11a 6Mbps | Left Cheek    | 0mm      | Ant 2   | 60  | 5300        | 17.56                                | 17.80               | 92.86        | 0.095                  | 0.108                  | 17.12                                  | 17.80               | 92.86        | 0.072                  | 0.091                  | -15.7%    |
| WLAN 5GHz   | 802.11a 6Mbps | Right Cheek   | 0mm      | Ant 1   | 116 | 5580        | 15.84                                | 16.10               | 92.86        | 0.065                  | 0.074                  | 16.02                                  | 16.10               | 92.86        | 0.080                  | 0.087                  | 17.6%     |
| WLAN 5GHz   | 802.11a 6Mbps | Left Cheek    | 0mm      | Ant 2   | 144 | 5720        | 17.59                                | 17.80               | 92.86        | 0.087                  | 0.098                  | 17.66                                  | 17.80               | 92.86        | 0.085                  | 0.095                  | -3.1%     |
| WLAN 5GHz   | 802.11a 6Mbps | Right Cheek   | 0mm      | Ant 1   | 165 | 5825        | 15.88                                | 16.10               | 92.86        | 0.103                  | 0.117                  | 16.07                                  | 16.10               | 92.86        | 0.123                  | 0.133                  | 13.7%     |
| WLAN 5GHz   | 802.11a 6Mbps | Left Tilted   | 0mm      | Ant 2   | 157 | 5785        | 17.60                                | 17.80               | 92.86        | 0.053                  | 0.060                  | 17.43                                  | 17.80               | 92.86        | 0.050                  | 0.059                  | -1.7%     |

#### <Body-Worn Accessory SAR>

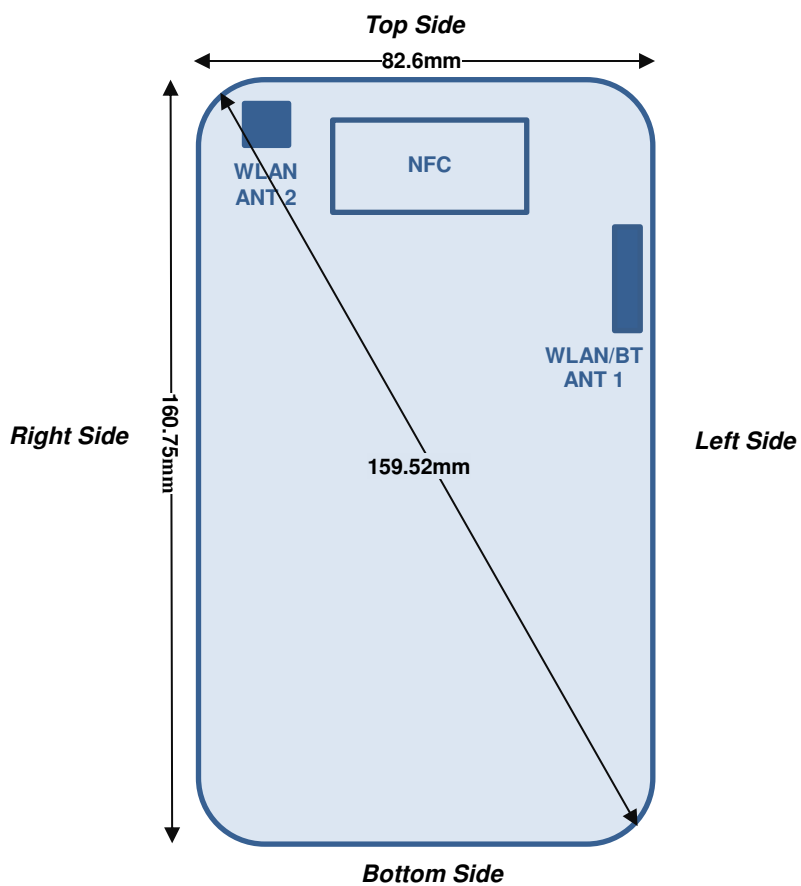
| Band        | Mode          | Test Position | Gap (mm) | Antenna | Ch. | Freq. (MHz) | Original Model (FCC ID : UZ7TC75EK ) |                     |              |                        |                        | Spot Check Model (FCC ID : UZ7TC700K ) |                     |              |                        |                        | Deviation |
|-------------|---------------|---------------|----------|---------|-----|-------------|--------------------------------------|---------------------|--------------|------------------------|------------------------|----------------------------------------|---------------------|--------------|------------------------|------------------------|-----------|
|             |               |               |          |         |     |             | Average Power (dBm)                  | Tune-Up Limit (dBm) | Duty Cycle % | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) | Average Power (dBm)                    | Tune-Up Limit (dBm) | Duty Cycle % | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |           |
| WLAN 2.4GHz | 802.11b 1Mbps | Back          | 15mm     | Ant 1   | 6   | 2437        | 18.04                                | 18.30               | 98.62        | 0.143                  | 0.154                  | 18.03                                  | 18.30               | 98.62        | 0.142                  | 0.153                  | -0.6%     |
| WLAN 2.4GHz | 802.11b 1Mbps | Back          | 15mm     | Ant 2   | 6   | 2437        | 18.72                                | 19.10               | 98.62        | 0.094                  | 0.104                  | 18.77                                  | 19.10               | 98.62        | 0.087                  | 0.095                  | -8.7%     |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 1   | 60  | 5300        | 16.09                                | 16.10               | 92.86        | 0.130                  | 0.140                  | 15.82                                  | 16.10               | 92.86        | 0.130                  | 0.148                  | 5.7%      |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 2   | 52  | 5260        | 17.55                                | 17.80               | 92.86        | 0.317                  | 0.361                  | 17.27                                  | 17.80               | 92.86        | 0.350                  | 0.425                  | 17.7%     |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 1   | 116 | 5580        | 15.84                                | 16.10               | 92.86        | 0.093                  | 0.106                  | 16.02                                  | 16.10               | 92.86        | 0.116                  | 0.126                  | 18.9%     |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 2   | 116 | 5580        | 17.54                                | 17.80               | 92.86        | 0.321                  | 0.367                  | 17.58                                  | 17.80               | 92.86        | 0.359                  | 0.405                  | 10.4%     |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 1   | 157 | 5785        | 15.93                                | 16.10               | 92.86        | 0.090                  | 0.101                  | 16.07                                  | 16.10               | 92.86        | 0.077                  | 0.083                  | -17.8%    |
| WLAN 5GHz   | 802.11a 6Mbps | Back          | 15mm     | Ant 2   | 165 | 5825        | 17.57                                | 17.80               | 92.86        | 0.313                  | 0.355                  | 17.45                                  | 17.80               | 92.86        | 0.358                  | 0.416                  | 17.2%     |

**Note:** In the tables above, all the deviation of SAR test results are compliant with uncertainty budget.

### 4. Reference detail Section:

| Equipment Class | Reference FCC ID | Folder Test/RF Exposure | Report Title/Section              |
|-----------------|------------------|-------------------------|-----------------------------------|
| DTS             | UZ7TC75EK        | RF Exposure (FA672834)  | Sections related to DTS test data |
| NII             | UZ7TC75EK        | RF Exposure (FA672834)  | Sections related to NII test data |
| DSS             | UZ7TC75EK        | RF Exposure (FA672834)  | Sections related to DSS test data |

## 5. Antenna Location



B

## 6. Simultaneous Transmission Analysis

| NO. | Simultaneous Transmission Configurations | Head | Body-worn |
|-----|------------------------------------------|------|-----------|
| 1.  | WLAN Ant 1 + WLAN Ant 2                  | Yes  | Yes       |
| 2.  | Bluetooth Ant 1 + WLAN Ant 2             |      | Yes       |

### General Note:

- In this report, all the test results and transmission simultaneous analysis are referred to UZ7TC75EK (FCC ID: UZ7TC75EK), Sporton Report No: FA672834 or Appendix A.
- WLAN and Bluetooth share the same antenna 1, and cannot transmit simultaneously.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
- The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - Scalar SAR summation  $< 1.6\text{W/kg}$ .
  - $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where  $(x1, y1, z1)$  and  $(x2, y2, z2)$  are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - If  $\text{SPLSR} \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - Simultaneously transmission SAR measurement, and the reported multi-band SAR  $< 1.6\text{W/kg}$ .
  - The SPLSR calculated results please refer to section 16.4.
- For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
  - $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$  for test separation distances  $\leq 50 \text{ mm}$ ; where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR.
  - When the minimum separation distance is  $< 5\text{mm}$ , the distance is used 5mm to determine SAR test exclusion.
  - 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is  $> 50 \text{ mm}$ .

| Bluetooth Max Power | Exposure Position    | Body worn (Front with holster) | Body worn (Front) |
|---------------------|----------------------|--------------------------------|-------------------|
|                     | Test separation      | 5 mm                           | 15 mm             |
| 4 dBm               | Estimated SAR (W/kg) | 0.126 W/kg                     | 0.042 W/kg        |

### 6.1 Head Exposure Conditions

| Exposure Position | 1<br>2.4GHz WLAN Ant 1<br>1g SAR (W/kg) | 2<br>2.4GHz WLAN Ant 2<br>1g SAR (W/kg) | 3<br>5GHz WLAN Ant 1<br>1g SAR (W/kg) | 4<br>5GHz WLAN Ant 2<br>1g SAR (W/kg) | 1+2 Summed 1g SAR (W/kg) | 3+4 Summed 1g SAR (W/kg) |
|-------------------|-----------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|--------------------------|--------------------------|
|                   |                                         |                                         |                                       |                                       |                          |                          |
| Right Cheek       | 0.052                                   | 0.156                                   | 0.117                                 | 0.028                                 | 0.208                    | 0.145                    |
| Right Tilted      | 0.021                                   | 0.139                                   | 0.035                                 | 0.036                                 | 0.160                    | 0.071                    |
| Left Cheek        | 0.020                                   | 0.305                                   | 0.018                                 | 0.108                                 | 0.325                    | 0.126                    |
| Left Tilted       | 0.026                                   | 0.247                                   | 0.026                                 | 0.089                                 | 0.273                    | 0.115                    |

### 6.2 Body-Worn Accessory Exposure Conditions

| Exposure Position  | 1<br>2.4GHz WLAN Ant 1<br>1g SAR (W/kg) | 2<br>2.4GHz WLAN Ant 2<br>1g SAR (W/kg) | 3<br>5GHz WLAN Ant 1<br>1g SAR (W/kg) | 4<br>5GHz WLAN Ant 2<br>1g SAR (W/kg) | 5<br>Bluetooth Ant 1<br>1g SAR (W/kg) | 1+2 Summed 1g SAR (W/kg) | 3+4 Summed 1g SAR (W/kg) | 2+5 Summed 1g SAR (W/kg) | 4+5 Summed 1g SAR (W/kg) |
|--------------------|-----------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                    |                                         |                                         |                                       |                                       |                                       |                          |                          |                          |                          |
| Front              | 0.012                                   | 0.066                                   | 0.018                                 | 0.040                                 | 0.042                                 | 0.078                    | 0.058                    | 0.108                    | 0.060                    |
| Front with Holster | 0.012                                   | 0.083                                   | 0.016                                 | 0.044                                 | 0.126                                 | 0.095                    | 0.060                    | 0.209                    | 0.142                    |
| Back               | 0.154                                   | 0.104                                   | 0.140                                 | 0.367                                 | 0.001                                 | 0.258                    | 0.507                    | 0.105                    | 0.141                    |