

RF Exposure Report

Report No.: SA131028E08N

FCC ID: UZ7MC32N0

Test Model: MC32N0

Received Date: Mar. 15, 2017

Test Date: Mar. 21, 2017

Issued Date: Apr. 21, 2017

Applicant: Zebra Technologies Corporation

Address: 1 Zebra Plaza, Holtsville, NY 11742

Manufacturer: Symbol Technologies, Inc.

Address: 1 Zebra Plaza, Holtsville, NY 11742

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Report Issue History Record of EUT (MC32N0)

Attachment No.	Issue Date	Description
131028E08	Feb. 07, 2014	Original release.
131028E08J	Mar. 02, 2017	1. Upgraded standard version. 2. Change Mg alloy to Al alloy for LCD frame 3. Remove 2 LCD contact springs in the middle 4. Reduce 3 screws from PCB to Option Frame mount from LCD side 5. Change Audio amplifier from SSM2317 to TPA2038 6. Change uSD socket without card detection pin 7. Remove IST (sensor hub) microcontroller and connect the Accelerometer directly to SoC (OMAP) 8. Change Antenna connector from Hirose to IPEX 9. Solder bumps instead of gold tracing in PCB board
131028E08K	Mar. 29, 2017	1. Add BT-LE function 2. Add new OS Android Lollipop
131028E08N	Apr. 21, 2017	1. Add RF Exposure Report

Release Control Record

Issue No.	Description	Date Issued
SA131028E08N	Original release.	Apr. 21, 2017

1 Certificate of Conformity

Product: Mobile Computer

Brand: Symbol

Test Model: MC32N0

Sample Status: MASS-PRODUCTION

Applicant: Zebra Technologies Corporation

Test Date: Mar. 21, 2017

Standards: FCC Part 2 (Section 2.1093)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :



Date:

Apr. 21, 2017

Wendy Wu / Specialist

Approved by :



Date:

Apr. 21, 2017

May Chen / Manager

2 Evaluation Rule

Following FCC KDB 447498 D01 “General SAR test exclusion guidance”

The corresponding SAR Exclusion Threshold condition, listed below:

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot [\sqrt{f(\text{GHz})}]$$
$$\leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$
 - $f(\text{GHz})$ is the RF channel transmit frequency in GHz.
 - Power and distance are rounded to the nearest mW and mm before calculation.
 - The result is rounded to one decimal place for comparison. The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- 2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:
 - a) [Threshold at 50 mm in step 1) + (test separation distance - 50mm) · ($f(\text{MHz})/150$)] mW, at 100MHz to 1500 MHz
 - b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz
- 3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion.
 - a) The threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm.
 - b) The threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm.
 - c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

3 SAR Test Exclusion Thresholds (BT-LE)

For BT-LE SAR Test Exclusion Thresholds

Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	SAR test exclusion calculation value ^(NOTE 1)	10-g extremity SAR test exclusion thresholds	Result
2.402 ~ 2.480	2	2	0.6	7.5	Pass

NOTE: 1. Calculate SAR test exclusion thresholds from condition “1” formulas.

4 Simultaneous Multi-band Transmission Evaluation

4.7.4 Simultaneous Multi-band Transmission Evaluation

<Estimated SAR Calculation>

According to KDB 447498 D01, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR was estimated according to following formula to result in substantially conservative SAR values of ≤ 0.4 W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \frac{\sqrt{f_{(\text{GHz})}}}{7.5}$$

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the test separation distance is > 50 mm, the 0.4 W/kg is used for SAR-1g.

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
BT (DTS)	2.48	2.0	Body-worn	0	0.08

Note:

1. The separation distance is determined from the outer housing of the EUT to the user.
2. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	WLAN (DTS) + BT (DTS)	Body-Worn	0.19	0.08	0.27	$\Sigma \text{SAR} < 1.6$, Not required
2	WLAN (NII) + BT (DTS)	Body-Worn	0.85	0.08	0.93	$\Sigma \text{SAR} < 1.6$, Not required

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