

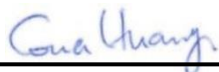


HEARING AID COMPATIBILITY RF EMISSIONS TEST REPORT

FCC ID : UZ7TC58AE
Equipment : Touch Computer
Brand Name : Zebra
Model Name : TC58AE
WD Emission Result : PASS
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Standard : FCC 47 CFR §20.19
ANSI C63.19-2019

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in ANSI 63.19-2019 / 47 CFR Part 20.19 and has been pass the FCC requirement.

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



Approved by: Cona Huang / Deputy Manager



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Appendix A. UID specifications for HAC RFE



History of this test report

Report No.	Version	Description	Issued Date
HA481306-03A	Rev. 01	Initial issue of report	Jan. 05, 2026



1. General Information

Product Feature & Specification	
Applicant Name	Zebra Technologies Corporation
Equipment Name	Touch Computer
Brand Name	Zebra
Model Name	TC58AE
FCC ID	UZ7TC58AE
Frequency Band	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz LTE Band 106: 897.5 MHz ~ 900.5 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n13: 777 MHz ~ 787 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450 MHz ~ 3550 MHz, 3550 MHz ~ 3700 MHz 5G NR n78: 3700 MHz ~ 3800 MHz, 3450 MHz ~ 3550 MHz, 3550 MHz ~ 3700 MHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 6E: 5925 MHz ~ 6425 MHz, 6425MHz~6525MHz, 6525MHz~6875 MHz, 6875MHz~7125MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC: ASK
HW Version	DV1-2
SW Version	nemesis_A13_userdebug_GMS_RelKey_2023-12-12-0451_main_SE
FW Version	FUSION_QA_6_1.1.0.004_T
MFD	02OCT25
Remark:	
1.	Based on original report no: HA411111A to enable LTE B106 and additional evaluation RF _{AIPL} .



Sample List	
Sample 1	SE55 + 8GB+128G (Samsung/SK Hynix)
Sample 2	SE55 + 8GB+128G (Micron/Micron)
Sample 3	SE4720 + 6GB+64G(SK Hynix /WD)
Sample 4	SE4720 + 8GB+128G(Micron/Micron)
Sample 5	SE4770 + 6GB+64G(SK Hynix /WD)
Sample 6	SE4770 + 8GB+128G(Micron/Micron)

Specification of Accessories				
Adapter	Brand Name	Zebra	Model	SAWA-65-20005A
			Part Number	PWR-WUA5V12W0US
Battery 1 (1x)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-0020
Battery 2 (1.5x)	Brand Name	Zebra	Model	BT-000442A
			Part Number	BT-000442-0820
Battery 3 (BLE battery)	Brand Name	Zebra	Model	BT-000442B
			Part Number	BT-000442-002B
Battery 4 (Wireless Battery)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-002A
Battery 5 (1x)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-1020
USB TYPE A to TYPE C cable	Brand Name	Zebra	Part Number	CBL-TC5X-USBC2A-01
USB TYPE C to 3.5mm audio connector	Brand Name	Zebra	Part Number	ADP-USBC-35MM1-01
3.5mm Earphone	Brand Name	Zebra	Part Number	HDST-35MM-PTT1-01
Rugged Headset	Brand Name	Zebra	Part Number	HS2100-OTH
USB TYPE C Earphone	Brand Name	Zebra	Part Number	HPST-USBC-PTT1-01
Trigger Handle	Brand Name	Zebra	Part Number	TRG-NGTC5-ELEC-01
Soft Holster	Brand Name	Zebra	Part Number	SG-NGTC5TC7-HLSTR-01
TC53/TC58 RUGGED BOOT	Brand Name	Zebra	Part Number	SG-NGTC5EXO1-01
3.5mm to 3.5mm audio connector	Brand Name	Zebra	Part Number	CBL-HS2100-3MS1-01

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Applied Standards

- FCC CFR47 Part 20.19
- ANSI C63.19-2019
- FCC KDB 285076 D01 HAC Guidance v06r04
- FCC KDB 285076 D03 HAC FAQ v01r07



3. Air Interfaces

Air Interface	Band MHz	Type	C63.19 RF _{FAIL} Tested	Simultaneous Transmitter	Name of Voice Service	Power State for HAC Compliance
WCDMA	Band II	VO	No ⁽¹⁾	WLAN, BT	CMRS Voice	Pmax ⁽⁴⁾
	Band IV					
	Band V					
	HSPA	VD	No ⁽¹⁾		Google Meet WFC ⁽³⁾	
LTE FDD	Band 2	VD	No ⁽¹⁾	5G NR, WLAN, BT	VoLTE / Google Meet WFC ⁽³⁾	Pmax ⁽⁴⁾
	Band 4					
	Band 5					
	Band 7					
	Band 12					
	Band 13					
	Band 14					
	Band 17					
	Band 25					
	Band 26					
	Band 30					
	Band 66					
	Band 71					
	Band 106					
LTE TDD	Band 38	VD	Yes			
	Band 41					
	Band 48					
5G NR FDD	n2	VD	No ⁽¹⁾			
	n5					
	n7					
	n12					
	n13					
	n14					
	n25					
	n26					
	n30					
	n66					
	n71					
5G NR TDD	n38	VD	Yes			
	n41					
	n48					
	n77					
	n78					
Wi-Fi	2450	VD	No ⁽¹⁾	WCDMA, LTE, 5G NR, 5G/6GHz WLAN, BT	VoWiFi / Google Meet WFC ⁽³⁾	Head ⁽⁴⁾
	5200			WCDMA, LTE, 5G NR, 2.4GHz WLAN, BT		
	5300					
	5500					
	5800 / 5900	VD	No ⁽¹⁾		WCDMA, LTE, 5G NR, 2.4GHz WLAN, BT	VoWiFi / Google Meet WFC ⁽³⁾
	UNII-5					
	UNII-6					
	UNII-7					
BT	2450	DT	No	WCDMA, LTE, 5G NR, WLAN	NA	NA
Type Transport: VO= Voice only DT= Digital Transport only (no voice) VD= CMRS and IP Voice Service over Digital Transport						
Remark: 1. The air interface max power plus MIF is complies with ANSI63.19-2019 Table 4.1 RF _{AIPL} 2. Because features of Google Meet allow the option of voice-only communications, Meet has been tested for HAC/T-Coil compatibility to ensure the best user experience. 3. The Workforce Connect (WFC) is an over-the-top (OTT) – voice services operating over IP, and this voice application was development and pre-installed on a wireless handset by the Zebra Technologies Corporation. 4. The product only 3G/4G/5G support Time average SAR feature, therefore UMTS/LTE/5GFR1 HAC were tested at highest instantons Pmax power level, however, due the WiFi operation doesn't support Time average SAR feature, therefore, WiFi operation were assessment at head power level to meet volume control compliance						

4. WD Emission Requirements

The WD's conducted power must be at or below either the stated RFAIPL (Table 4.1) or the stated peak power level (Table 4.2), or the average near-field emissions over the measurement area must be at or below the stated RFAIL (Table 4.3), or the stated peak field strength (Table 4.4). The WD may demonstrate compliance by meeting any of these four requirements, but it must do so in each of its operating bands at its established worst-case normal speech-mode operating condition.

Table 4.1 - Wireless device RF audio interference power level	
Frequency range (MHz)	RF_{AIPL} (dBm)
< 960	29
960 - 2000	26
> 2000	25

Table 4.2 - Wireless device RF peak power level	
Frequency range (MHz)	RF_{Peak Power} (dBm)
< 960	35
960 - 2000	32
> 2000	31

Table 4.3 - Wireless device RF audio interference level	
Frequency range (MHz)	RF_{AIL} [dB(V/m)]
< 960	39
960 - 2000	36
> 2000	35

Table 4.4 - Wireless device RF peak near-field level	
Frequency range (MHz)	RF_{Peak} [dB(V/m)]
< 960	45
960 - 2000	42
> 2000	41



5. Modulation Interference Factor

For any specific fixed and repeatable modulated signal, a Modulation Interference Factor (MIF, expressed in decibels) may be developed that relates its interference potential to its steady state rms signal level or average power level. This factor is a function only of the audio frequency amplitude modulation characteristics of the signal and is the same for field strength or conducted power measurements. It is important to emphasize that the MIF is valid only for a specific repeatable audio frequency amplitude modulation characteristic. Any change in modulation characteristic requires determination and application of a new MIF.

MIF may be determined using a radiated RF field, a conducted RF signal, or, in a preliminary stage, a mathematical analysis of a modeled RF signal.

- a. Verify the slope accuracy and dynamic range capability over the desired operating frequency band of a fast probe or sensor, square-law detector, as specified in ANSI 63.19: 2019 D.3, and weighting system as specified in ANSI 63.19: 2019 D.4 and ANSI 63.19: 2019 D.5. For the probe and instrumentation included in the measurement of MIF, additional calibration and application of calibration factors are not required.
- b. Using RF illumination, or conducted coupling, apply the specific modulated signal in question to the measurement system at a level within its confirmed operating dynamic range
- c. Measure the steady-state rms level at the output of the fast probe or sensor
- d. Measure the steady-state average level at the weighting output
- e. Without changing the square-law detector or weighting system, and using RF illumination, or conducted coupling, substitute for the specific modulated signal a 1 kHz, 80% amplitude modulated carrier at the same frequency and adjust its strength until the level at the weighting output equals the Step d) measurement
- f. Without changing the carrier level from Step e), remove the 1 kHz modulation and again measure the steady-state rms level indicated at the output of the fast probe or sensor.
- g. The MIF for the specific modulation characteristic is given by the ratio of the Step f) measurement to the Step c) measurement, expressed in decibels ($20 \cdot \log(\text{step6}/\text{step3})$)

In practice, Step e) and Step f) need not be repeated for each MIF determination if the relationship between the two measurements has been pre-established for the measurement system over the operating frequency and dynamic ranges. In such cases, only the modulation characteristic being tested needs to be available during WD testing

Since indirect measurement procedure was using for RF audio interference power level evaluation, the MIF values applied in this test report were provided by the HAC equipment provider of SPEAG, and the worst values for all air interface are listed below to be determine the Wireless device RF audio interference power level.

UID	Communication System Name	MIF(dB)
10170	LTE-FDD(SC-FDMA,1RB,20MHz,16-QAM)	-9.76



6. Evaluation of WD RF interference potential

General Note:

1. In this report, max conducted power from each air interface was first used to evaluate whether it complies with ANSI63.19-2019 Table 4.1 RF_{AIPL} , compliance with table 4.1 means compliance with WD emission requirements.
2. Use maximum power plus worst case MIF to determine whether it complies with RF_{AIPL}

Ant 1					
Air Interface	Max Average Antenna Input Power (dBm)	Worst Case MIF (dB)	Power + MIF(dB)	Limit RF_{AIPL}	C63.19 test required(2019)
LTE B106	25.20	-9.76	15.44	29	No

Conclusion

The device max average conducted power plus MIF are meet table 4.1 of ANSI 63.19:2019 section 4.7 requirement.



7. References

- [1] ANSI C63.19:2019, "American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids", Aug. 2019.
- [2] FCC KDB 285076 D01v06r04, "Equipment Authorization Guidance for Hearing Aid Compatibility", Sep 2023.
- [3] FCC KDB 285076 D03v01r07, "Hearing aid compatibility frequently asked questions", Jul. 2022
- [4] SPEAG DASY System Handbook