Test Report

Prepared for Harman Becker Automotive Systems

This report presents Maximum Permissible Exposure for

CY20 DA UPPER

Prepared by

Aravind Buddana

Engineer II

Approved by

Jason Kanakry

General Manager

Issue date: 12/03/2021

Report No: AH21100601-HAR-134_FCC_MPE v1

Contents

• Test Request Information

Test Request #:	7700096778
Test Requested By:	Mark Bowman
	Harman International Industries, Inc.
	30001 Cabot Drive, Novi, MI 48377
Test item Description:	CY20 DA UPPER
Part Number:	T077
DUT Sample Number:	AH21100601-HAR-134#1
Hardware Version of DUT:	PV1
Software Version of DUT:	1.20.020
Component Category of DUT:	N/A
Type of Test:	FCC/ISED Certification
Test Method:	FCC Part 2 (Section 2.1093)
	KDB 447498 D01 General RF Exposure Guidance v06
	IEEE C95.1-1992
Deviations from standard:	None
Approved Test Plan Number:	N/A
Test Plan Revision:	N/A
Date test sample received:	10-20-2021
Date test started:	10-27-2021
Date test finished:	11-10-2021

- ## Test Laboratory Information

Location of Test Lab:	The radiated and conducted emissions test sites are located at Bureau Veritas 815 N. Opdyke Rd #100, Auburn Hills, MI 48326, Phone: +1-248-836-4700
Key Contact:	Jason Kanakry (General Manager) Jason.Kanakry@BureauVeritas.com Phone: +1-248-836-4747
Laboratory Accreditations:	BUREAU VERITAS CONSUMER PRODUCTS SERVICES, INC is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
ISO/IEC 17025:2017:	5678.01
FCC Test Site Number:	US1278 (242530)
IC Test Site Number:	US0229 (26240)

- **RF Exposure**

1.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz; *Plane-wave equivalent power density

1.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and centre of the radiator in cm

1.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

1.4 Antenna information

Band	Antenna Type	Antenna Gain (dBi)
BT Classic	External detachable antenna	2.4dBi
WLAN_2.4G	External detachable antenna	3.4dBi
WLAN_5G	External detachable antenna	1.89dBi

1.5 Calculation Result of Maximum Conducted Power

Band	Frequency (MHz)	Max Power (dBm)	Max Power (mW)	Turn-Up Tolerance	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
BT_Classic	2441	5.848	3.844	±1dB	2.4	20	0.00167	1
WLAN_2.4G	2437	11.592	14.427	±1dB	3.4	20	0.00790	1
WLAN_5G	5775	7.296	5.365	±1dB	1.89	20	0.00207	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Calculate SAR test exclusion thresholds from condition “1” formulas.

1.6 Conclusion

The formula of calculated the MPE is:

CPD1 / LPD1 …….etc. < 1

CPD = Calculation power density

LPD = Limit of power density

BT + WLAN2.4G + WLAN 5G Co-location = 0.00167 + 0.00790 + 0.00207 = 0.01164 <1

Therefore the maximum calculations of above situations are less than the “1” limit.

Document Revisions

Version	Date	Modifier	Changes
1.0	12/03/2021	Aravind Buddana	• Initial release

End of Report