Template Revision History

Revision	Date	Revised By	Reason for Revision
Rev 1.0	5/20/11	SMS	Retype into MS2010 and inserted GM links
Rev 2.0	12/9/13	MSE	Added section for Test Setup Photos, changed address of new building on title page, changed FCC & IC site registration #
Rev 3.0	3/3/2014	JE	Add minimum safe distance provision. Correct SAR exemption calculation to match latest revision of KDB 447498.
4.0	7/21/15	AR	Updated formatting issues throughout report
5.0	9/29/15	AR	
6.0	10/13/17	AReed	Added statement to report regarding max output power
7.0	9/7/18	AReed	Corrected GM fields & general formatting issues

1) **ITEMS IN RED THROUGOUT THE REPORT ARE ITEMS THAT NEED TO BE ADDRESSED BY THE ENG AT THE TIME OF COMPLETION.**

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EMI, EMC, RF Testing Experts Since 1963

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Test Report

Prepared for: Fortem Technologies

Model: R20, R20 DAN-C

Description: Navigation Radar

Serial Number: R20s-C00325

FCC ID: 2APIM-FTR20SKYD

To

FCC Part 1.1310

Date of Issue: October 30, 2019

On the behalf of the applicant:	**Fortem Technologies** **2015 West Grove Pkwy** **Pleasant Grove, UT 84062**
Attention of:	**Jeff Davis, Regulatory Manager** **Ph: (801)822-8043** **Email: jeffery.davis@fortemtech.com**

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Greg Corbin
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	October 30, 2019	Greg Corbin	Original Document

ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless below

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Testing Certificate Number: **2152.01**

FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

EUT Description
Model: R20, R20 DAN-C
Description: Navigation Radar
Firmware: N/A
Software: 2.6.2_1909231216_Radar_2.6.2
Serial Number: R20s-C00325
Additional Information:
The R20 True View Radar is a navigational radiolocation radar operating from 16.2 – 16.5 GHz at 45 dBm nominal output power.
The input voltage operating range is 18 – 36 vdc.
Power was supplied by a DIN mount power supply provided by the manufacturer.
The input to the power supply was 120 vac. The output voltage was 24 vdc.
The EUT uses FMCW modulation.
The Internal antenna gain is 12 dBi.

MPE Evaluation

This is a mobile device used in Uncontrolled Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)		
	0.3-1.234 MHz:	Limit [mW/cm²] = 100
	1.34-30 MHz:	Limit [mW/cm²] = (180/f²)
	30-300 MHz:	Limit [mW/cm²] = 0.2
	300-1500 MHz:	Limit [mW/cm²] = f/1500
	1500-100,000 MHz	Limit [mW/cm²] = 1.0

Test Data

Test Frequency, MHz	16200
Power, Conducted, mW (P)	2010.2
Antenna Gain Isotropic	12 dBi
Antenna Gain Numeric (G)	15.85
Antenna Type	patch
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mw/cm^2

Power Density (S) = 6.34 mw/cm^2
Limit = (from above table) = 1.0 mw/cm^2

The calculated RF exposure of 6.34 mw/cm^2 is over the 1.0 mw/cm^2 limit so the minimum separation distance is calculated below.

Minimum Safe Distance Evaluation

Test Data

Test Frequency, MHz	16200
Power, Conducted, mW (P)	2010.2
Antenna Gain Isotropic	12 dBi
Antenna Gain Numeric (G)	15.85
Antenna Type	patch
Limit (L)	1.0 mw/cm^2

R=√(PG/4πL)			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
50.4 cm	2010.2	15.85	1.0

The minimum safe distance is 50.4 cm

END OF TEST REPORT