

Analog Devices

TEST REPORT FOR

LTP5903
Model: M2140

Tested to The Following Standards:

EN 300 328 v2.2.2

Report No.: 105708-2

Date of issue: July 22, 2021



Test Certificate # 803.01

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Analog Devices
32990 Alvarado-Niles RD Ste 910
Union City, CA 94587

Representative: Cristophe Niglio
Customer Reference Number: 45885046

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

Kim Romero
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338


Project Number: 105708

July 7, 2021

July 7, 2021

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink that reads "Steve Behm".

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
 CKC Laboratories, Inc.
 1120 Fulton Place
 Fremont, CA 94539

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.19

SUMMARY OF RESULTS

Standard / Specification: EN 300 328 v2.2.2

Test Procedure/Method	Description	Modifications*	Results
Transmitter Requirements			
Sub clause 4.3.2.2	RF Power Output	NA	NP
Sub clause 4.3.2.3	Power Spectral Density	NA	NP
Sub clause 4.3.2.4	Duty Cycle, Tx Sequence, Tx-gap	NA	NA1
Sub clause 4.3.2.5	Medium Utilisation (MU) Factor	NA	NA1
Sub clause 4.3.2.6	Adaptivity	NA	NA1
Sub clause 4.3.2.7	Occupied Channel Bandwidth	NA	NP
Sub clause 4.3.2.8	Transmitter Unwanted Emissions in the OOB Domain	NA	NP
Sub clause 4.3.2.9	Transmitter Unwanted RF Conducted Emissions in the Spurious Domain	NA	NP
Sub clause 4.3.2.9	Transmitter Unwanted Radiated Emissions in the Spurious Domain	NA	NP
Receiver Requirements			
Sub clause 4.3.2.10	Receiver Spurious RF Conducted Emissions	NA	NP
Sub clause 4.3.2.10	Receiver Spurious Radiated Emissions	NA	NP
Sub clause 4.3.2.11	Receiver Blocking	NA	PASS
Sub clause 4.3.2.12	Geo-Location Capability	NA	NA2

NA = Not Applicable

NA1 = Not applicable because a device has output power <10mW EIRP.

NA2 = Not applicable because a device is not used for geographical location.

NP = CKC Laboratories was not contracted to perform test.

ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Under Test:

Equipment	Manufacturer	Model Number	Serial Number
LTP5903	Analog Devices	M2140	18551e (MAC ID)

Support Equipment:

Equipment	Manufacturer	Model Number	Serial Number
Laptop	Dell	Latitude E7240	NA
Program Board for Eterna 1	Analog Devices	DC9010	1188

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	IEEE-802.15.4 TDMA
Operating Frequency Range:	2400-2483.5 MHz
Output Power:	8dBm
Modulation Type(s):	OQPSK
Nominal Channel Bandwidth(s):	2.7 MHz (OCBW)
Number of TX Chains:	15 Channels
Number of RX Chains:	15 Channels
Antenna Gain (A):	2 dBi (LT5903)
Beamforming Gain (Y):	NA
Antenna Connection Type:	MMCX
Nominal Input Voltage:	3.3V (2.75V to 3.6V Operating voltage)
Operating Temperature Range:	-40° to +85°C
Firmware / Software used for Test:	SmartMesh WirelessHART Manager, blSwVer 15, ldrSwVer 1.0.6.4
Geo-Location Capability:	NA

EN 300 328

4.3.2 Technical Requirements

4.3.2.11 Receiver Blocking

Test Setup/Conditions			
Test Location:	Fremont Lab C3	Test Engineer:	Hieu Song Nguyenpham
Test Method:	EN 300 328 v2.2.2 §5.4.11	Test Date(s):	7/7/2021
Configuration:	1		
Test Setup:	The EUT was operated as intended. Blocking signal level was set at the antenna port of the EUT. The Data transfer rate between EUT and a support board was set at Maximum Output Power. The Attenuator was used to adjust to wanted signal as the standard required Note: Receiver Category 2		

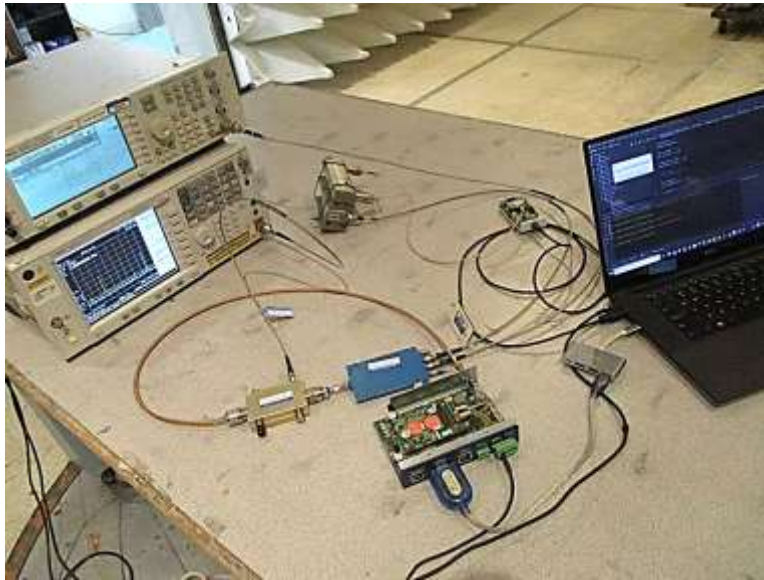
Environmental Conditions			
Temperature (°C)	20.5	Relative Humidity (%):	46.5

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
03360	Cable	Astrolab	32022-2-29094-36TC	4/9/2020	4/9/2022
03471	Spectrum Analyzer	Agilent	E4440A	2/11/2020	2/11/2022
P06898	Cable	Astrolab	32022-29094K-29094K-48TC	3/25/2020	3/25/2022
03429	Attenuator	HP	8496B	3/23/2021	3/23/2023
02475	Attenuator	HP	8494B	3/23/2021	3/23/2023
C00087	Site Equipment	Anaren	44000	11/27/2019	11/27/2021
C00082	Directional Coupler	MECA Electronics, Inc	722-10-1.500V	11/27/2019	11/27/2021
P06903	Cable	Astrolab	32022-29094K-29094K-36TC	1/7/2020	1/7/2022
03418	Signal Generator	Agilent	E4438C	4/27/2021	4/27/2023

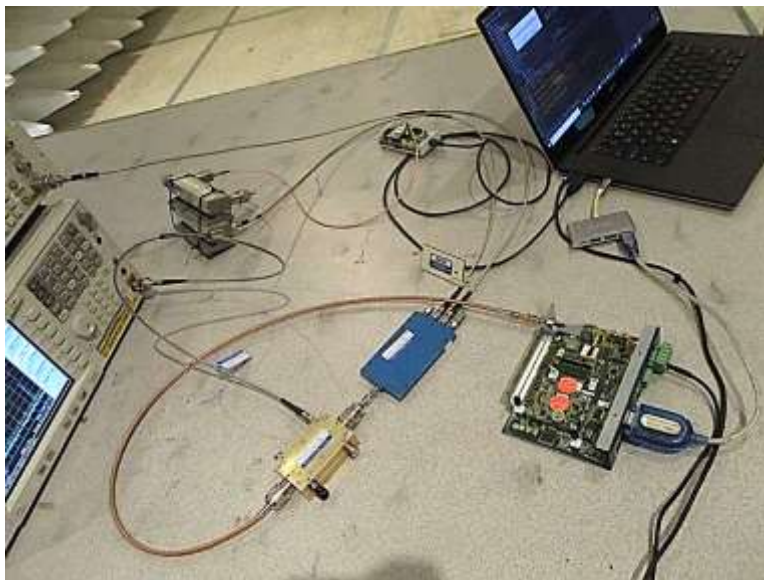
Receiver Blocking				
Wanted Signal mean power from companion device (dBm)	Blocking Frequency (MHz)	Blocking Signal power (dBm) CW	Degradation Observed	Results
-62.69	2380	-34	No degradation	Pass
-62.69	2504	-34	No degradation	Pass
-62.69	2300	-34	No degradation	Pass
-62.69	2584	-34	No degradation	Pass

Calculation for Wanted Signal = $-139 \text{ dBm} + 10 \times \log_{10}(2700000) + 10 \text{ dB} + 2 \text{ dBi (Antenna Gain)} = -62.29 \text{ dBm}$

Test Setup Photos



Overall Test Setup



Overall Test Setup; Close Up View

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Parameter Uncertainty	Actual	Limit	Unit of Measure
Uncertainty Parameter	Actual	Limit	Unit of Measure
Occupied Channel Bandwidth	1	5	%
RF output power, conducted	0.67	1.5	dB
Power Spectral Density, conducted	0.67	3	dB
Unwanted Emissions, conducted	0.67	3	dB
All emissions, radiated	3.73	6	dB
Temperature	1	3	°C
Humidity	3.4	5	%
DC and low frequency voltages	2	3	%
Time	1.1	5	%

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Compliance is deemed to occur provided measurements are below the specified limits.