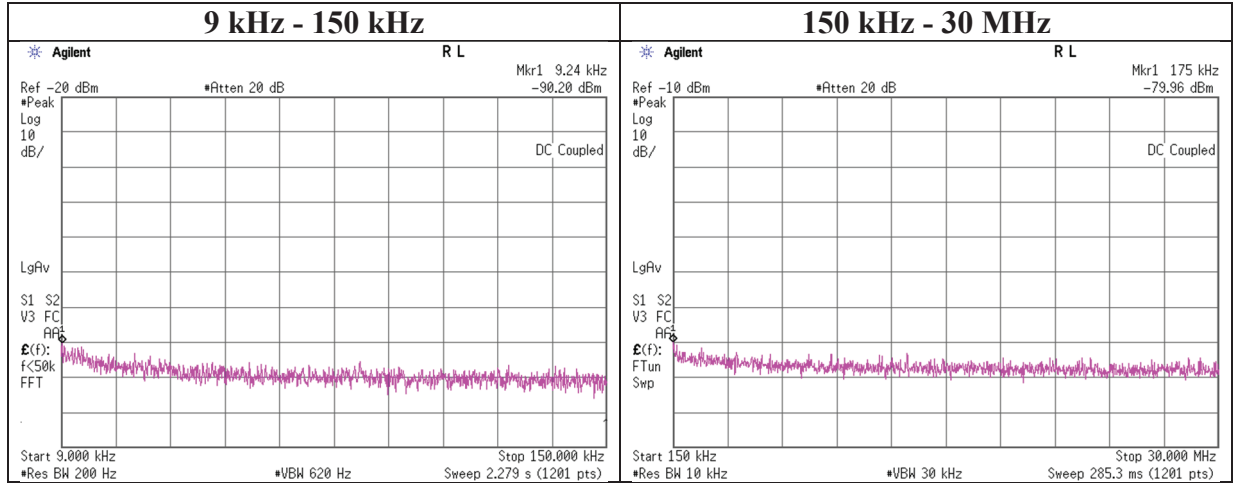


## Conducted Spurious Emission

Report No. 13692701S-B-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date February 10, 2021  
Temperature / Humidity 22 deg. C / 31 % RH  
Engineer Yosuke Murakami  
Mode Tx 11n-20 MIMO 2412 MHz



Chain 0

Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.240	-90.2	0.01	9.82	2.55	2	-74.8	300	6.0	-13.6	48.2	61.8	-
175.000	-80.0	0.01	9.82	2.55	2	-64.6	300	6.0	-3.3	22.7	26.0	-

$$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log (N)$$

N: Number of output

### Power Density

Report No. 13692701S-B-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date February 2, 2021  
Temperature / Humidity 25 deg. C / 47 % RH  
Engineer Yosuke Murakami  
Mode Tx 11b

11b Chain 0

Freq. [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	-4.60	1.52	9.87	6.79	8.00	1.21
2437	-4.80	1.52	9.87	6.59	8.00	1.41
2462	-5.09	1.52	9.87	6.30	8.00	1.70

Sample Calculation:

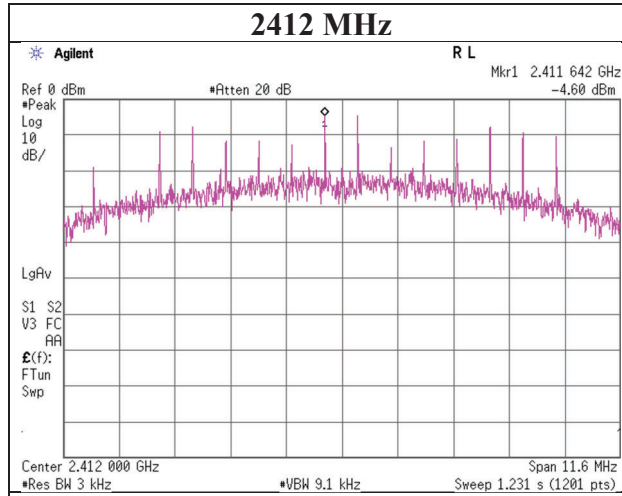
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

\*The equipment and cables were not used for factor 0 dB of the data sheets.

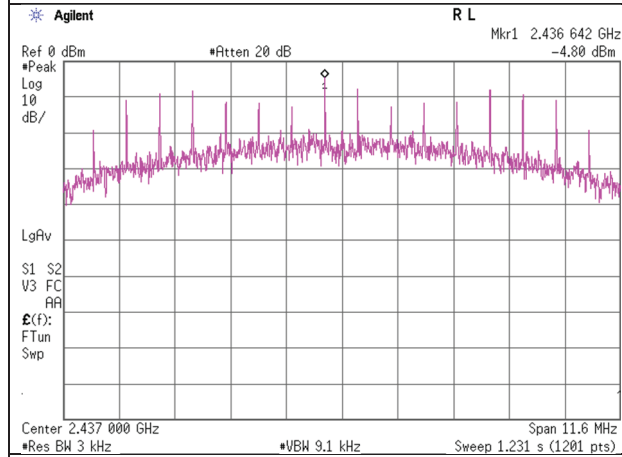
## Power Density

### 11b Chain 0

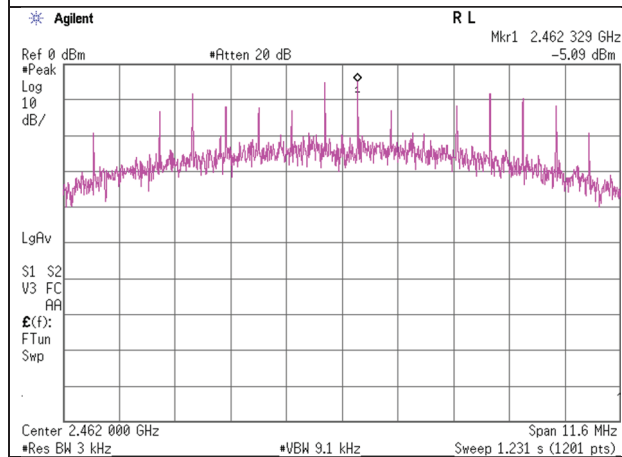
#### 2412 MHz



#### 2437 MHz



#### 2462 MHz



### Power Density

Report No. 13692701S-B-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date February 2, 2021  
Temperature / Humidity 25 deg. C / 47 % RH  
Engineer Yosuke Murakami  
Mode Tx 11g

11g Chain 0

Freq. [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2412	-25.88	1.52	9.87	-14.49	8.00	22.49
2437	-26.01	1.52	9.87	-14.62	8.00	22.62
2462	-26.11	1.52	9.87	-14.72	8.00	22.72

Sample Calculation:

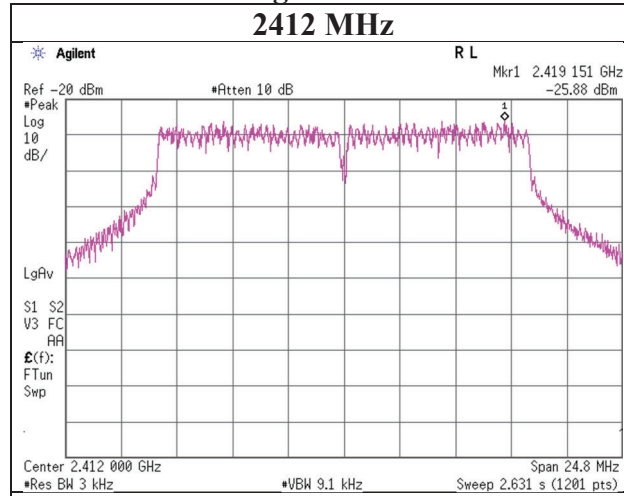
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

\*The equipment and cables were not used for factor 0 dB of the data sheets.

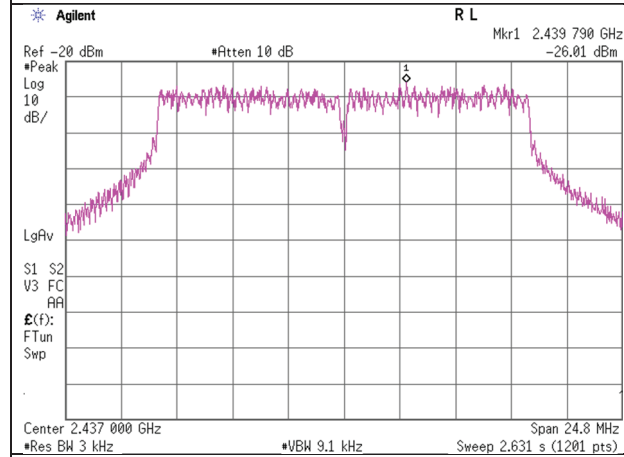
## Power Density

### 11g Chain 0

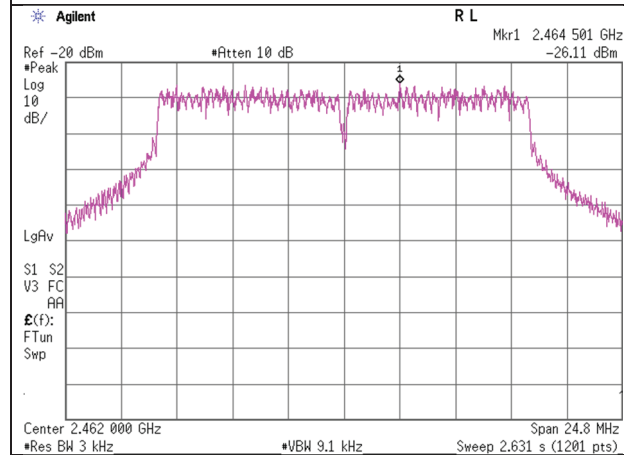
#### 2412 MHz



#### 2437 MHz



#### 2462 MHz



## Power Density

Report No. 13692701S-B-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date February 2, 2021  
Temperature / Humidity 25 deg. C / 47 % RH  
Engineer Yosuke Murakami  
Mode Tx 11n-20 SISO

### 11n-20 SISO Chain 0

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm/3 kHz]	[dB]	[dB]	[dBm/3 kHz]	[dBm/3 kHz]	[dB]
2412	-25.08	1.52	9.87	-13.69	8.00	21.69
2437	-25.77	1.52	9.87	-14.38	8.00	22.38
2462	-25.81	1.52	9.87	-14.42	8.00	22.42

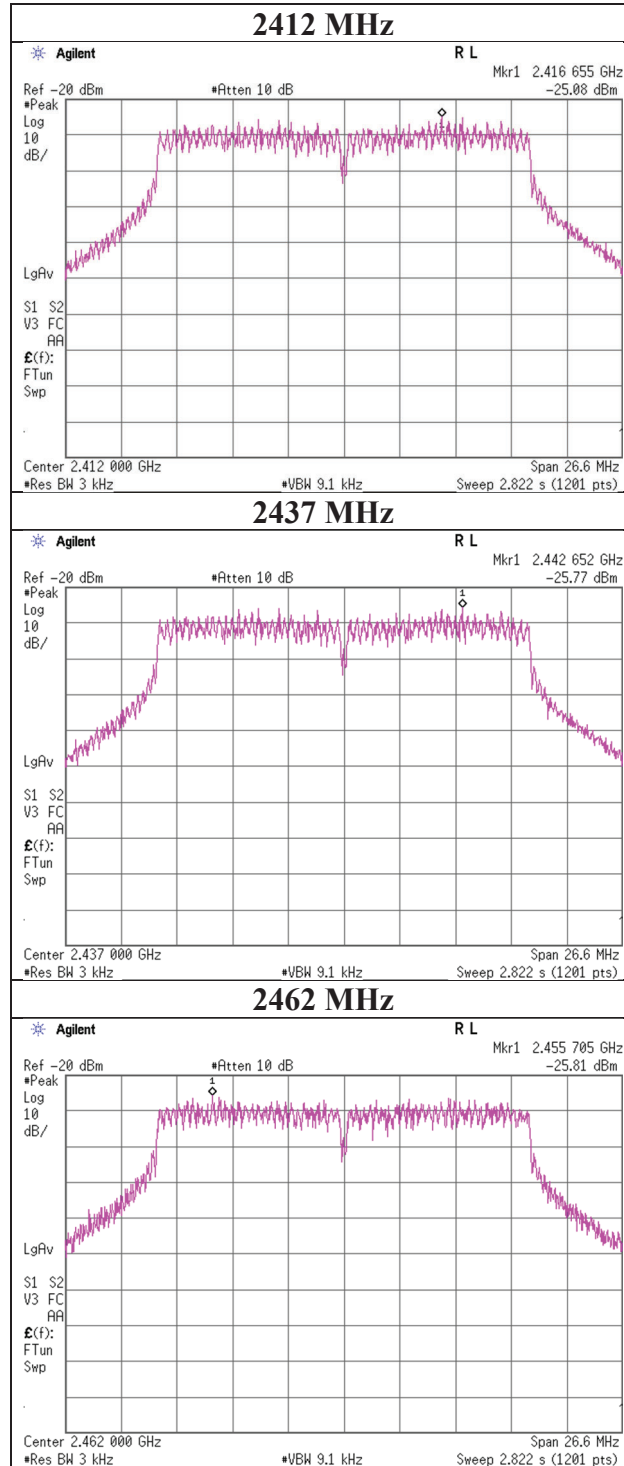
Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

\*The equipment and cables were not used for factor 0 dB of the data sheets.

## Power Density

### 11n-20 SISO Chain 0



## Power Density

Report No. 13692701S-B-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date February 10, 2021  
Temperature / Humidity 22 deg. C / 31 % RH  
Engineer Yosuke Murakami  
Mode Tx 11n-20 MIMO

### Chain 0 + Chain 1

Freq. [MHz]	Chain 0 Result [mW / 3 kHz]	Chain 1 Result [mW / 3 kHz]	Result		Limit [dBm / 3 kHz]	Margin [dB]
			[dBm / 3 kHz]	[mW / 3 kHz]		
2412	0.04	0.03	-11.35	0.07	8.00	19.35
2437	0.03	0.04	-11.16	0.08	8.00	19.16
2462	0.04	0.04	-11.11	0.08	8.00	19.11

Sample Calculation:

Result = Chain 0 Result + Chain 1 Result

### Chain 0

Freq. [MHz]	Reading [dBm / 3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit [dBm / 3 kHz]	Margin [dB]
				[dBm / 3 kHz]	[mW / 3 kHz]		
2412	-25.51	1.52	9.87	-14.12	0.04	8.00	22.12
2437	-26.32	1.52	9.87	-14.93	0.03	8.00	22.93
2462	-25.27	1.52	9.87	-13.88	0.04	8.00	21.88

### Chain 1

Freq. [MHz]	Reading [dBm / 3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit [dBm / 3 kHz]	Margin [dB]
				[dBm / 3 kHz]	[mW / 3 kHz]		
2412	-26.02	1.52	9.88	-14.62	0.03	8.00	22.62
2437	-24.92	1.52	9.88	-13.52	0.04	8.00	21.52
2462	-25.76	1.52	9.86	-14.38	0.04	8.00	22.38

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

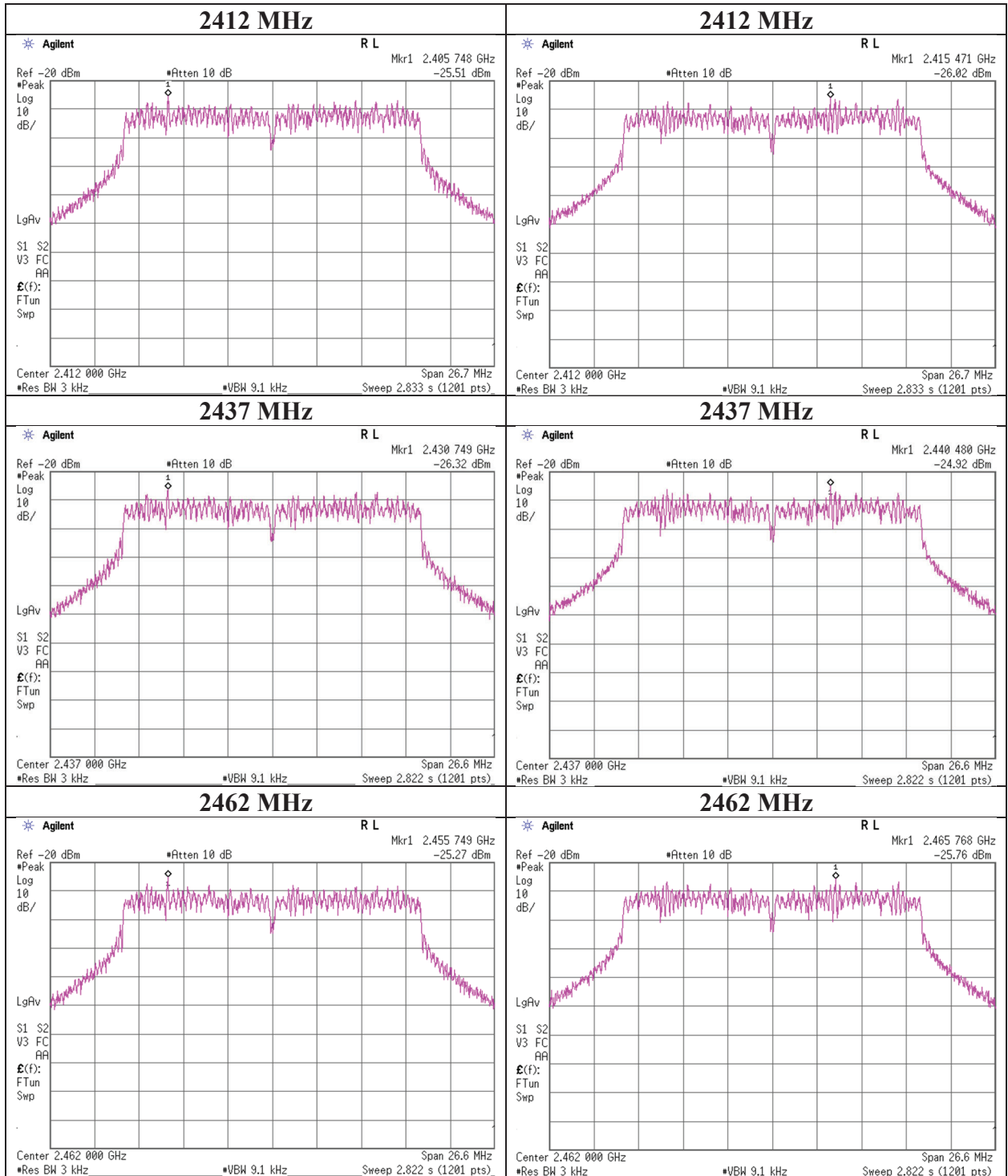
\*The equipment and cables were not used for factor 0 dB of the data sheets.



**Power Density**

**11n-20 MIMO Chain 0**

**11n-20 MIMO Chain 1**



## APPENDIX 2: Test instruments

### Test equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	KTS-07	145111	Digital Tester	SANWA	PC500	7019232	2020/10/21	12
AT	SAT10-13	151610	Attenuator	Weinschel Corp.	54A-10	81626	2020/03/02	12
AT	SAT10-16	160494	Attenuator	Weinschel Corp.	54A-10	83420	2020/12/21	12
AT	SCC-G63	196946	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803411/2	2020/03/10	12
AT	SCC-G65	196942	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803416/2	2020/03/10	12
AT	SOS-27	191845	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/29	12
AT	SOS-28	191846	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/29	12
AT	SPM-07	146247	Power Meter	Keysight Technologies Inc	8990B	MY5100272	2020/05/27	12
AT	SPSS-04	146310	Power sensor	Keysight Technologies Inc	N1923A	MY5326009	2020/05/27	12
AT	SPSS-05	146311	Power sensor	Keysight Technologies Inc	N1923A	MY5349008	2020/05/27	12
AT	SRENT-22	202830	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250036	2020/11/24	12
AT	STM-G10	171617	Terminator	Weinschel - API Technologies Corp	M1459A	92420	2020/06/03	12
RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
RE	KJM-10	146454	Measure	KOMELON	KMC-36	-	-	-
RE	KSA-08	145089	Spectrum Analyzer	Keysight Technologies Inc	E4446A	MY46180525	2020/11/24	12
RE	SAEC-02(NSA)	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	2020/03/20	12
RE	SAEC-02(SVSWR)	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2020/05/07	12
RE	SAF-02	145004	Pre Amplifier	SONOMA	310N	290212	2021/02/10	12
RE	SAF-05	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2020/06/03	12
RE	SAF-08	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2020/03/03	12
RE	SAT10-05	145136	Attenuator	Keysight Technologies Inc	8493C-010	74864	2020/10/05	12
RE	SAT3-11	150921	Attenuator	JFW	50HF-003N	-	2021/01/26	12
RE	SAT6-14	167095	Attenuator	JFW	50HF-006N	-	2021/02/10	12
RE	SBA-02	145022	Biconical Antenna	Schwarzbeck Mess - Elektronik	BBA9106	91032665	2020/04/04	12
RE	SCC-B1/B3/B5/B7/B8/B13/SRSE-02	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2020/04/17	12
RE	SCC-B2/B4/B6/B7/B8/B13/SRSE-02	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2020/04/17	12

**Test equipment (2/2)**

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	SCC-G15	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2020/03/04	12
RE	SCC-G41	151617	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S006	2021/01/19	12
RE	SCC-G50	178573	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	MY13407/4E	2020/03/09	12
RE	SCC-G51	178572	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800288 /4A	2020/03/09	12
RE	SCC-G57	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2020/05/12	12
RE	SCC-G69	200009	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575617/4	2020/07/07	12
RE	SFL-02	145301	Highpass Filter	MICRO-TRONICS	HPM50111	51	2020/10/05	12
RE	SFL-18	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2020/04/03	12
RE	SHA-02	145384	Horn Antenna	Schwarzbeck Mess Elektronik	BBHA9120D	9120D-726	2020/06/15	12
RE	SHA-04	145512	Horn Antenna	ETS-Lindgren	3160-09	00094868	2020/06/15	12
RE	SHA-09	194684	Horn Antenna	Schwarzbeck Mess Elektronik	BBHA 9120 C	695	2021/03/03	12
RE	SLA-06	145528	Logperiodic Antenna	Schwarzbeck Mess Elektronik	VUSLP9111B	195	2020/04/04	12
RE	SOS-21	191838	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/28	12
RE	SSA-03	145801	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250152	2020/08/12	12
RE	STR-07	146209	Receiver, EMI	Rohde & Schwarz	ESU26	100484	2020/09/07	12
RE	STS-02	145793	Digital Hitester	HIOKI CORPORATION E.E.	3805-50	80997819	2020/04/09	12

\*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item: RE: Radiated Emission test  
AT: Antenna Terminal Conducted test