RADIO TEST REPORT

Test Report No. 15450284S-B

Customer	**Japan Radio Co., Ltd.**
Description of EUT	**X-band SOLID-STATE TRANSMITTER / RECEIVER**
Model Number of EUT	**NTG-560**
FCC ID	**CKENTG560**
Test Regulation	**FCC Part 80 Subpart E**
Test Result	**Complied**
Issue Date	**March 10, 2025**
Remarks	**-**

Representative Test Engineer	Approved By
Kenichi Adachi Engineer	Toyokazu Imamura Engineer

CERTIFICATE 1266.03

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.

☒ There is no testing item of "Non-accreditation".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 24.0

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No. 15450284S-B

Revision	Test Report No.	Date	Revised Contents
- (Original)	15450284S-B	March 10, 2025	-

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	ICES	Interference-Causing Equipment Standard
AC	Alternating Current	IEC	International Electrotechnical Commission
AFH	Adaptive Frequency Hopping	IEEE	Institute of Electrical and Electronics Engineers
AM	Amplitude Modulation	IF	Intermediate Frequency
Amp, AMP	Amplifier	ILAC	International Laboratory Accreditation Conference
ANSI	American National Standards Institute	ISED	Innovation, Science and Economic Development Canada
Ant, ANT	Antenna	ISO	International Organization for Standardization
AP	Access Point	JAB	Japan Accreditation Board
APD	Absorbed Power Density	LAN	Local Area Network
ASK	Amplitude Shift Keying	LIMS	Laboratory Information Management System
Atten., ATT	Attenuator	MCS	Modulation and Coding Scheme
AV	Average	MRA	Mutual Recognition Arrangement
BPSK	Binary Phase-Shift Keying	N/A	Not Applicable
BR	Bluetooth Basic Rate	NIST	National Institute of Standards and Technology
BT	Bluetooth	NS	No signal detect.
BT LE	Bluetooth Low Energy	NSA	Normalized Site Attenuation
BW	BandWidth	NVLAP	National Voluntary Laboratory Accreditation Program
Cal Int	Calibration Interval	OBW	Occupied Band Width
CCK	Complementary Code Keying	OFDM	Orthogonal Frequency Division Multiplexing
Ch., CH	Channel	P/M	Power meter
CISPR	Comite International Special des Perturbations Radioelectriques	PCB	Printed Circuit Board
CW	Continuous Wave	PER	Packet Error Rate
DBPSK	Differential BPSK	PHY	Physical Layer
DC	Direct Current	PK	Peak
D-factor	Distance factor	PN	Pseudo random Noise
DFS	Dynamic Frequency Selection	PRBS	Pseudo-Random Bit Sequence
DQPSK	Differential QPSK	PSD	Power Spectral Density
DSSS	Direct Sequence Spread Spectrum	QAM	Quadrature Amplitude Modulation
EDR	Enhanced Data Rate	QP	Quasi-Peak
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	QPSK	Quadri-Phase Shift Keying
EMC	ElectroMagnetic Compatibility	RBW	Resolution Band Width
EMI	ElectroMagnetic Interference	RDS	Radio Data System
EN	European Norm	RE	Radio Equipment
ERP, e.r.p.	Effective Radiated Power	RF	Radio Frequency
EU	European Union	RMS	Root Mean Square
EUT	Equipment Under Test	RSS	Radio Standards Specifications
Fac.	Factor	Rx	Receiving
FCC	Federal Communications Commission	SA, S/A	Spectrum Analyzer
FHSS	Frequency Hopping Spread Spectrum	SAR	Specific Absorption Rate
FM	Frequency Modulation	SG	Signal Generator
Freq.	Frequency	SVSWR	Site-Voltage Standing Wave Ratio
FSK	Frequency Shift Keying	TR	Test Receiver
GFSK	Gaussian Frequency-Shift Keying	Tx	Transmitting
GNSS	Global Navigation Satellite System	VBW	Video BandWidth
GPS	Global Positioning System	Vert.	Vertical
Hori.	Horizontal	WLAN	Wireless LAN
HPF	High-Pass Filter	WPT	Wireless Power Transmit

CONTENTS PAGE

SECTION 1: Customer Information

Company Name	Japan Radio Co., Ltd.
Address	834, Inasatomachi, Nagano-shi, Nagano 381-2289, Japan
Telephone Number	+81-26-214-7696
Contact Person	Shigeyuki Niimura

The Information provided by the customer is as follows;
- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT during testing

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	X-band SOLID-STATE TRANSMITTER / RECEIVER
Model Number	NTG-560
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab.
Receipt Date	October 25, 2024
Test Date	October 28 to November 12, 2024

2.2 Product Description

General Specification

Rating	DC 48 V
Operating temperature	-15 deg. C to +50 deg. C, Non-condensing

Radio Specification

Equipment Type	Transceiver
Frequency of Operation	Non-chirp pulse: 9410 MHz (P0N) Chirp pulse: 9440 MHz +/-15 MHz (Q0N) Non-chirp/Chirp pulse: 9410 MHz and 9440 MHz (P0N/Q0N)
RF output power	270 W +1 dB / -3 dB (at EUT output port, peak)
Modulation type	Non-chirp pulse: Pulse Chirp pulse: Frequency pulse modulation Non-chirp/Chirp pulse: Pulse and Frequency pulse modulation

SECTION 3: Test specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC part 80 Subpart E The latest version on the first day of the testing period
Title	FCC 47 CFR Part 80 Stations in the Maritime Services Subpart E General Technical Standards

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
RF output power	**FCC:** TIA-603-E, 2.2.1 FCC section 2.1046	**FCC:** Section 80.215	-	N/A *1)	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.2			
Modulation Characteristics	**FCC:** TIA-603-E, 2.2.3, 2.2.6 FCC section 2.1047(a) & (b)	**FCC:** Section 80.213(g)	-	Complied	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 3.2			
Emission Bandwidth	**FCC:** TIA-603-E, 2.2.11, FCC section 2.1049	**FCC:** Section 80.205, 80.211(f), 80.209(b)	-	Complied	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.3			
Emission masks	**FCC:** TIA-603-E, 2.2.11, FCC section 2.1049	**FCC:** Section 80.211(f), 80.209(b)	-	Complied	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.3			
Spurious emission at antenna terminals	**FCC:** TIA-603-E, 2.2.13, FCC section 2.1051	**FCC:** Section 80.211(f)	-	Complied	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.3			
Field Strength of Spurious Emissions	**FCC:** TIA-603-E, 2.2.12, FCC section 2.1053	**FCC:** Section 80.211(f)	3.32 dB, (28320.000 MHz, Vertical, Peak)	Complied	Radiated
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.3			
Frequency Stability	**FCC:** TIA-603-E, 2.2.2, FCC section 2.1055	**FCC:** Section 80.209(b)	-	Complied *2)	Conducted
	ISED: RSS-Gen	**ISED:** RSS-238 section 4.1			

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003605.
These tests were also referred to "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards" (TIA-603-E: 2016)

*1) There is no limit for radar equipment.
*2) The frequency stability test with temperature variation was tested in Ise Lab since size of the EUT is bigger than Shonan EMC Lab own humidity chamber. Shonan EMC Lab. confirmed that the data was complied.

3.3 Addition to Standard

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
99 % Occupied Bandwidth	**ISED:** RSS-Gen 6.7	**ISED:** -	N/A	-	Radiated

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor *k*=2.

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz to 30 MHz	3.0 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.8 dB
	200 MHz to 1 GHz	6.1 dB
	1 GHz to 6 GHz	4.7 dB
	6 GHz to 18 GHz	5.3 dB
	18 GHz to 40 GHz	5.5 dB
Radiated Emission (Measurement distance: 1 m)	1 GHz to 18 GHz	5.6 dB
	18 GHz to 40 GHz	5.8 dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)	1.3 dB
Power Measurement above 1 GHz (Peak Detector)	1.5 dB
Spurious Emission (Conducted) below 1 GHz	0.93 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	0.93 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	3.0 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.3 dB
Frequency Measurement	1.6 x 10^-7
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature	2.2 deg.C.
Humidity	3.4 %
Voltage	0.92 %

Ise EMC Lab.

Antenna terminal test	Uncertainty (+/-)
Frequency readout (Spectrum analyzer frequency readout function) *	2.13 ppm
Humidity (constant temperature bath) *	2.98%

*Temperature variation of Frequency Stability in Ise EMC Lab.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan
Telephone: +81-463-50-6400
A2LA Certificate Number: 1266.03
(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

Test room	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber (SAC1)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber (SAC2)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber (SAC3)	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber (SAC4)	8.1 x 5.1 x 3.55	8.1 x 5.1	-
Wireless anechoic chamber 1 (WAC1)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
Wireless anechoic chamber 2 (WAC2)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
No.1 Shielded room	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	2.55 x 4.1 x 2.5	-	-
No.2 Measurement room	4.5 x 3.5 x 2.5	-	-
Wireless shielded room 1	3.0 x 4.5 x 2.7	3.0 x 4.5	-
Wireless shielded room 2	3.0 x 4.5 x 2.7	3.0 x 4.5	-

UL Japan, Inc. Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan
Telephone: +81-596-24-8999
A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002

3.6 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test sequence is used: Non-chirp pulse: P, Chirp pulse: Q, Non-Chirp/Chirp pulse: P & Q
* Pulse range table: Transmission Table (1)

Mode	Details
(1)	Tx 9410 MHz (P), Pulse range table No.1 (on 0.07 us., repetition 2280 Hz), mode P (pulse modulation)
(2)	Tx 9410 MHz (P), Pulse range table No.2 (on 0.16 us., repetition 2280 Hz), mode P (pulse modulation)
(3)	Tx 9410 MHz (P), Pulse range table No.3 (on 0.30 us., repetition 2280 Hz), mode P (pulse modulation)
(4)	Tx 9410 MHz (P), Pulse range table No.4 (on 0.16 us., repetition 1280 Hz), mode P (pulse modulation)
(5)	Tx 9410 MHz (P), Pulse range table No.5 (on 0.16 us., repetition 640 Hz), mode P (pulse modulation)
(6)	Tx 9410 MHz (P), Pulse range table No.6 (on 0.30 us., repetition 1864 Hz), mode P (pulse modulation)
(7)	Tx 9410 MHz (P), Pulse range table No.7 (on 0.60 us., repetition 1280 Hz), mode P (pulse modulation)
(8)	Tx 9410 MHz (P), Pulse range table No.8 (on 0.07 us., repetition 4100 Hz), mode P (pulse modulation)
(9)	Tx 9440 MHz (Q), Pulse range table No.1 (on 2.80 us., repetition 2280 Hz), mode Q (frequency modulation)
(10)	Tx 9440 MHz (Q), Pulse range table No.2 (on 4.60 us., repetition 2280 Hz), mode Q (frequency modulation)
(11)	Tx 9440 MHz (Q), Pulse range table No.3 (on 9.10 us., repetition 2280 Hz), mode Q (frequency modulation)
(12)	Tx 9440 MHz (Q), Pulse range table No.4 (on 18.3 us., repetition 1280 Hz), mode Q (frequency modulation)
(13)	Tx 9440 MHz (Q), Pulse range table No.5 (on 28.0 us., repetition 640 Hz), mode Q (frequency modulation)
(14)	Tx 9440 MHz (Q), Pulse range table No.6 (on 9.10 us., repetition 1864 Hz), mode Q (frequency modulation)
(15)	Tx 9440 MHz (Q), Pulse range table No.7 (on 9.10 us., repetition 1280 Hz), mode Q (frequency modulation)
(16)	Tx 9440 MHz (Q), Pulse range table No.8 (on 18.3 us., repetition 4100 Hz), mode Q (frequency modulation)
(17)	Tx 9410 MHz (P), Pulse range table No.1 + Tx 9440 MHz (Q), Pulse range table No.1
(18)	Tx 9410 MHz (P), Pulse range table No.2 + Tx 9440 MHz (Q), Pulse range table No.2
(19)	Tx 9410 MHz (P), Pulse range table No.3 + Tx 9440 MHz (Q), Pulse range table No.3
(20)	Tx 9410 MHz (P), Pulse range table No.4 + Tx 9440 MHz (Q), Pulse range table No.4
(21)	Tx 9410 MHz (P), Pulse range table No.5 + Tx 9440 MHz (Q), Pulse range table No.5
(22)	Tx 9410 MHz (P), Pulse range table No.6 + Tx 9440 MHz (Q), Pulse range table No.6
(23)	Tx 9410 MHz (P), Pulse range table No.7 + Tx 9440 MHz (Q), Pulse range table No.7
(24)	Tx 9410 MHz (P), Pulse range table No.8 + Tx 9440 MHz (Q), Pulse range table No.8

This EUT is two pulse radio-frequency output.
Spurious emission (Radiated) test was mode (21) that selected in the mode that became the worst result by Pre check.
Spurious emission (Conducted) test were mode (7),(13),(21) that selected in the mode that became the worst result by Pre check.

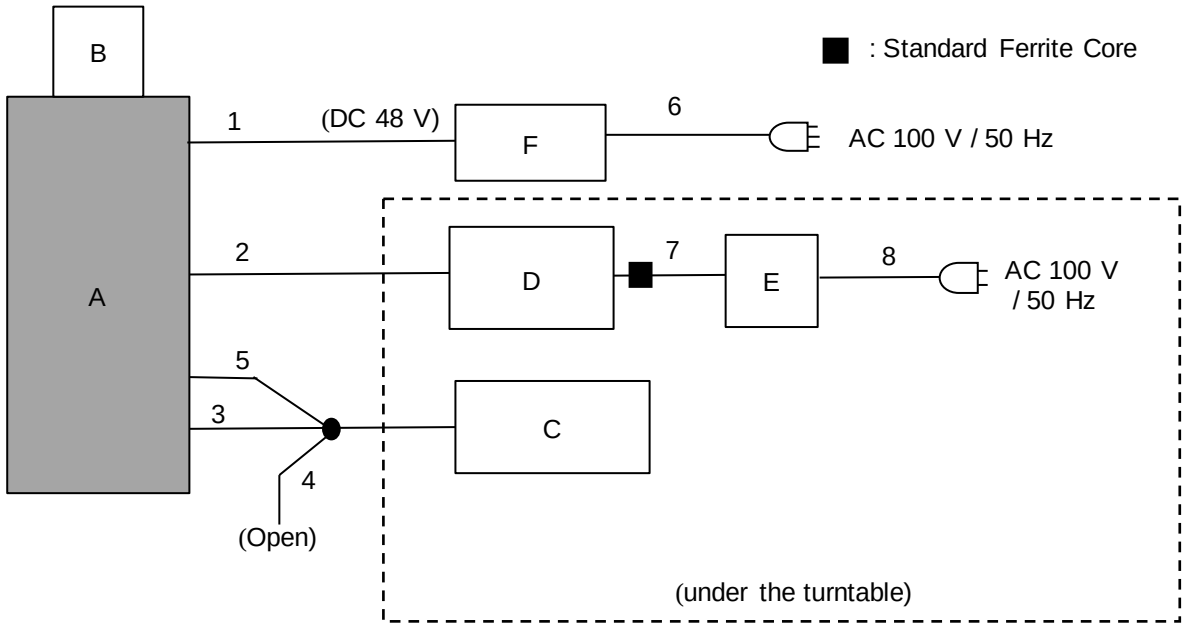
* The frequency stability test was used at minimum measurement time mode (Because EUT cannot set to no modulation.):
mode P: Pulse range table No.7 (7) / mode Q: Pulse range table No.5 (13)

Power of the EUT was set by the software as follows;
Power Setting: 270 W
Software: CDC-1469_402_Appli.bin Version: 402
This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and Peripherals

[Radiated emission tests]



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

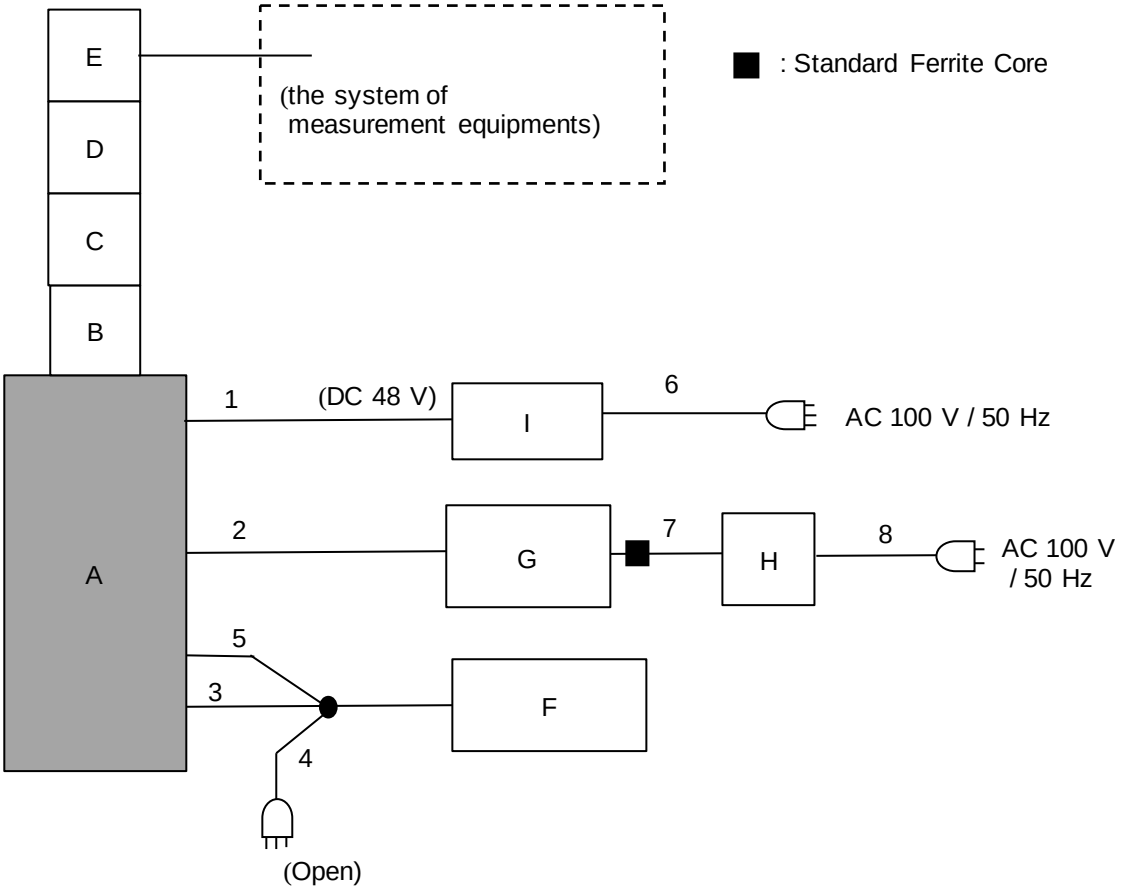
Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	X-band SOLID-STATE TRANSMITTER / RECEIVER	NTG-560	WB35457	Japan Radio Co., Ltd.	EUT
B	Waveguide terminator	WDL-095	559820	Nihon Koshuha Co., Ltd.	-
C	Scanner unit	NJU-85	MXB6990	Japan Radio Co., Ltd.	-
D	Personal Computer	Latitude3540	4MZB824	DELL	-
E	AC adapter	LA65NS2-01	CN-03PHNW-LOC00-413-343E-A01	DELL	-
F	DC power supply	PAN60-10A	SJ002492	KIKUSUI	-

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	DC	5.1	Unshielded	Unshielded	-
2	LAN	33.0	Unshielded	Unshielded	Customer's cable (20 m) is extended with the cables supplied by the test lab.
3	Signal	14.0	Shielded	Shielded	-
4	AC	0.8	Unshielded	Unshielded	-
5	Ground	0.5	Unshielded	Unshielded	-
6	AC	3.0	Unshielded	Unshielded	-
7	DC	1.7	Unshielded	Unshielded	-
8	AC	0.9	Unshielded	Unshielded	-

[Antenna terminal conducted tests]



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	X-band SOLID-STATE TRANSMITTER / RECEIVER	NTG-560	WB35457	Japan Radio Co., Ltd.	EUT
B	Waveguide to N transducer	5C341	V4614028D	SPC ELECTRONICS	-
C	Attenuator (10 dB, 50 W)	PE7019-10	No.22994249	Pasternack	-
D	Attenuator (10 dB, 50 W)	PE7019-10	No.22994256	Pasternack	-
E	Attenuator (10 dB, 50 W)	PE7019-10	No.22994264	Pasternack	-
F	Scanner unit	NJU-85	MXB6990	Japan Radio Co., Ltd.	-
G	Personal Computer	Latitude3540	4MZB824	DELL	-
H	AC adapter	LA65NS2-01	CN-03PHNW-LOC00-413-343E-A01	DELL	-
I	DC power supply	PAN60-10A	SJ002492	KIKUSUI	-

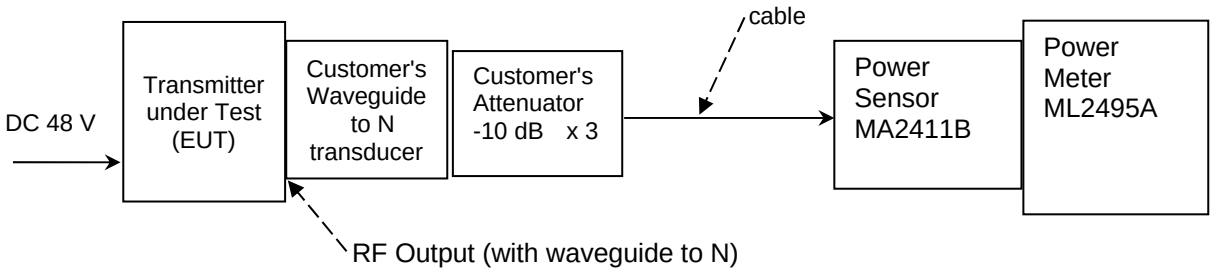
List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	DC	5.1	Unshielded	Unshielded	-
2	LAN	20.0	Unshielded	Unshielded	-
3	Signal	14.0	Shielded	Shielded	-
4	AC	1.5	Unshielded	Unshielded	-
5	Ground	0.5	Unshielded	Unshielded	-
6	AC	3.0	Unshielded	Unshielded	-
7	DC	1.7	Unshielded	Unshielded	-
8	AC	0.9	Unshielded	Unshielded	-

SECTION 5: RF Output Power

Test Procedure : FCC part 2 section 2.1046, TIA-603-E section2.2.1
Test data : APPENDIX
Test result : Pass

Measurement Block Diagram

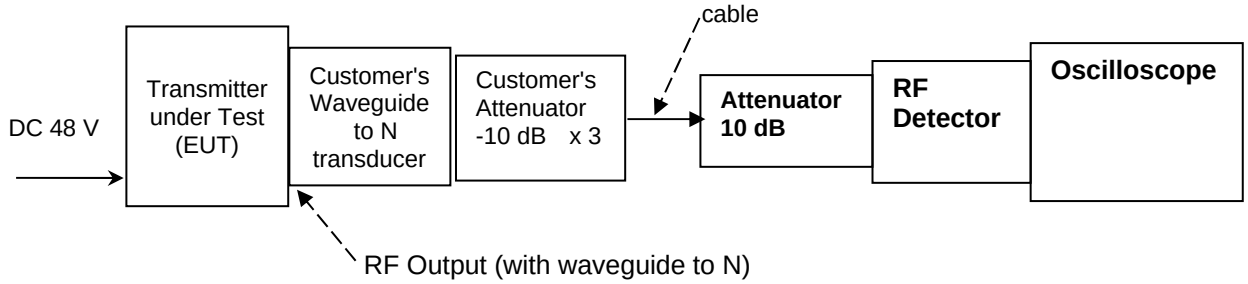


RF Power Measurement (FCC section 2.1046, TIA-603-E section 2.2.1)

SECTION 6: Modulation Characteristics

Test Procedure : FCC part 2 section 2.1047, TIA-603-E section2.2.3
Test data : APPENDIX
Test result : Pass

Measurement Block Diagram

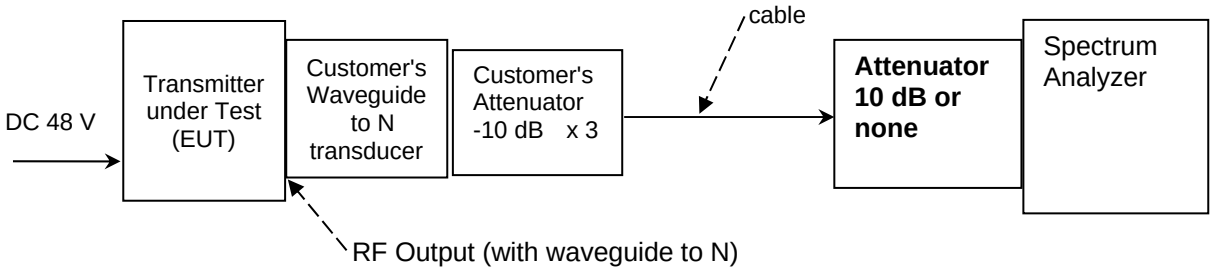


Modulation Characteristics (FCC section 2.1047, TIA-603-E section 2.2.3)

SECTION 7: Emissions Bandwidth and Emission

Test Procedure : FCC part 2 section 2.1049, TIA-603-E section2.2.11
Test data : APPENDIX
Test result : Pass

Measurement Block Diagram



Emission Bandwidth (FCC section 2.1049, TIA-603-E section 2.2.11)

SECTION 8: Spurious emission at Antenna Terminals

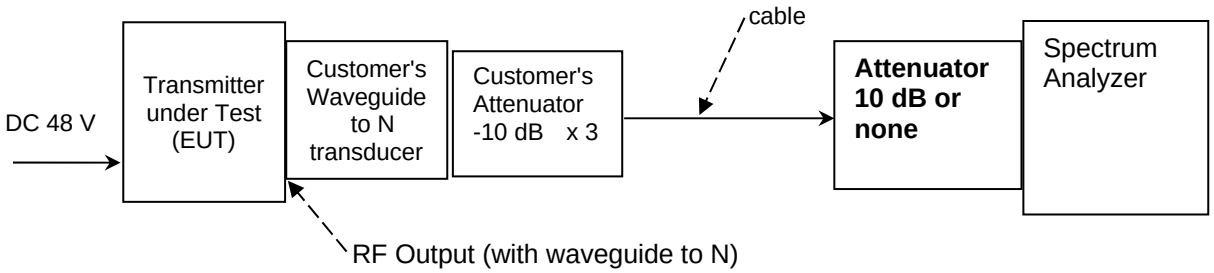
Test Procedure : FCC part 2 section 2.1051, TIA-603-E section2.2.13

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	Peak: RBW: 10 kHz/VBW: 30 kHz	Peak: RBW: 1 MHz/VBW: 3 MHz

Transmitter spurious Limit: -60 dBc = Carrier peak level - 60 dB (refer to RSS-238 clause 4.3) or
-13 dBm = 10 x log (mean power (W) x 10 ^ 3) - (43 + 10 x log (mean power (W)))(FCC 80.211(f)(3))/FCC 90.210(b)(3))

Test data : APPENDIX
Test result : Pass

Measurement Block Diagram



Spurious Emission at Antenna Terminals (FCC section 2.1051, TIA-603-E section 2.2.13)

SECTION 9: Field Strength of Spurious Emission

Test Procedure : FCC part 2 section 2.1053, TIA-603-E section 2.2.12

EUT was placed on a polystyrene platform of nominal size, 1.5 m by 1.0 m, raised 0.8 m above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3 m(below 18GHz) / 1 m(above 18 GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detection of the test receiver.

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	Peak: RBW: 10 kHz/VBW: 300 kHz	Peak: RBW: 1 MHz/VBW: 3 MHz

Transmitter Spurious Limit (General emissions): refer to FCC part 15 subpart C section 15.209
Transmitter Spurious Limit (Harmonics emissions): Carrier Level - (43 + 10 x log (Average power [W) = Peak power x Duty))

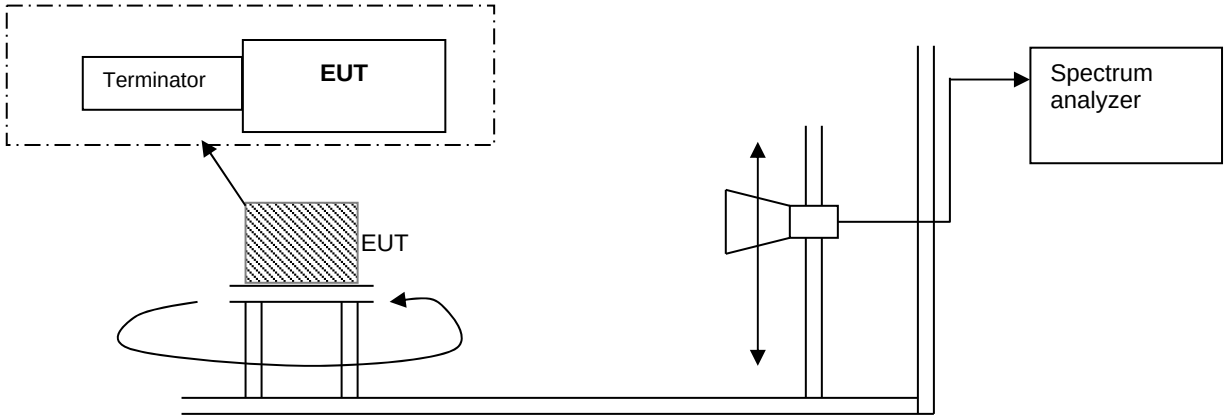
The Result is converted from electric field strength in dBuV/m to EIRP in Watts using the following formula

F [V/m] = 10 ^ ((E [dBuV/m] - 120) / 20)
P = ((F x d [m]) ^ 2) / (30 x g)

E = measurement electric field strength, in dBuV/m
F = measurement electric field strength. in V/m
P = EIRP, in dBm
d = measurement distance, in meters = 3 [m] or 1 [m]
g = numeric antenna gain (=1)

Test Data : APPENDIX
Test Result : Pass

Measurement Block Diagram



Field Strength of Spurious Emission (FCC section 2.1053, TIA-603-E section 2.2.12)

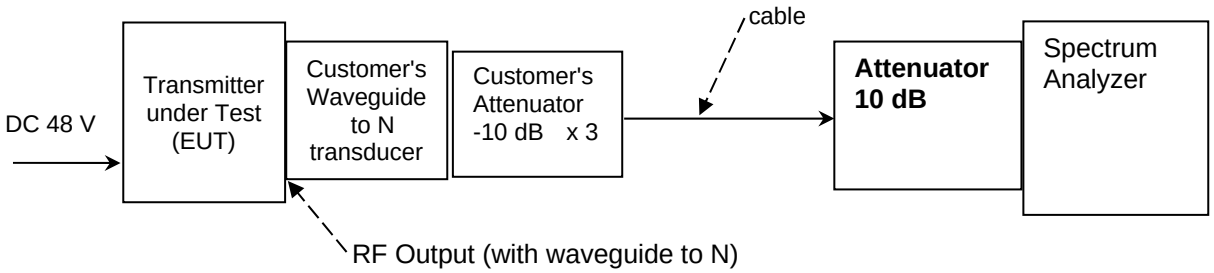
SECTION 10: Frequency Stability

Test Procedure : FCC part 2 section 2.1055, TIA-603-E section2.2.2

Refer to FCC part 2, section 2.1055.
Input voltage: 85 % to 115 % at 20 deg.C.

Test data : APPENDIX
Test result : Pass

Measurement Block Diagram



Frequency Stability (FCC section 2.1055, TIA-603-E section 2.2.2)

APPENDIX 1: Test Data

RF output power (Conducted)(mean power)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting

Pulse range table 1 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	19.44	3.88	29.76	0.25	38.50	14.83	0.030
Q	9440	19.69	3.89	29.79	0.24	21.84	31.77	1.503
P + Q	9410 + 9440	19.70	3.89	29.79	0.24	21.84	31.78	1.507

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 2 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	19.93	3.88	29.76	0.25	34.58	19.24	0.084
Q	9440	19.61	3.89	29.79	0.24	19.65	33.88	2.443
P + Q	9410 + 9440	19.61	3.89	29.79	0.24	19.65	33.88	2.443

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 3 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	20.00	3.88	29.76	0.25	31.40	22.49	0.178
Q	9440	19.51	3.89	29.79	0.24	16.75	36.68	4.656
P + Q	9410 + 9440	19.51	3.89	29.79	0.24	16.75	36.68	4.656

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 4 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	19.93	3.88	29.76	0.25	37.08	16.74	0.047
Q	9440	19.56	3.89	29.79	0.24	16.26	37.22	5.272
P + Q	9410 + 9440	19.57	3.89	29.79	0.24	16.26	37.23	5.284

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

* Duty factor: Refer to “Modulation Characteristics (Pulse chart 2)”

RF output power
(Conducted)(mean power)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting

Pulse range table 5 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	19.87	3.88	29.76	0.25	40.11	13.65	0.023
Q	9440	19.70	3.89	29.79	0.24	17.44	36.18	4.150
P + Q	9410 + 9440	19.71	3.89	29.79	0.24	17.44	36.19	4.159

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 6 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	20.02	3.88	29.76	0.25	32.28	21.63	0.146
Q	9440	19.55	3.89	29.79	0.24	17.64	35.83	3.828
P + Q	9410 + 9440	19.57	3.89	29.79	0.24	17.64	35.85	3.846

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 7 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	20.04	3.88	29.76	0.25	31.16	22.77	0.189
Q	9440	19.67	3.89	29.79	0.24	19.26	34.33	2.710
P + Q	9410 + 9440	19.67	3.89	29.79	0.24	19.26	34.33	2.710

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor

Pulse range table 8 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Duty factor [dB]	Result (average power) [dBm]	[W]
P	9410	19.51	3.88	29.76	0.25	35.88	17.52	0.057
Q	9440	19.62	3.89	29.79	0.24	11.22	42.32	17.061
P + Q	9410 + 9440	19.63	3.89	29.79	0.24	11.22	42.33	17.100

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss - Duty factor
* Duty factor: Refer to “Modulation Characteristics (Pulse chart 2)”

RF output power
(Conducted)(peak power)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting

Pulse range table 1 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Result (Peak power) [dBm]	[kW]	FCC Limit [kW]	RSS-238 Limit [kW]
P	9410	19.44	3.88	29.76	0.25	53.33	0.215	-	60.00
Q	9440	19.69	3.89	29.79	0.24	53.61	0.230	-	60.00
P + Q	9410 + 9440	19.70	3.89	29.79	0.24	53.62	0.230	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 2 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Result (Peak power) [dBm]	[kW]	FCC Limit [kW]	RSS-238 Limit [kW]
P	9410	19.93	3.88	29.76	0.25	53.82	0.241	-	60.00
Q	9440	19.61	3.89	29.79	0.24	53.53	0.225	-	60.00
P + Q	9410 + 9440	19.61	3.89	29.79	0.24	53.53	0.225	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 3 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Result (Peak power) [dBm]	[kW]	FCC Limit [kW]	RSS-238 Limit [kW]
P	9410	20.00	3.88	29.76	0.25	53.89	0.245	-	60.00
Q	9440	19.51	3.89	29.79	0.24	53.43	0.220	-	60.00
P + Q	9410 + 9440	19.51	3.89	29.79	0.24	53.43	0.220	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 4 (* P/M: Power Meter with power sensor)

mode	Frequency [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Wave guide Loss [dB]	Result (Peak power) [dBm]	[kW]	FCC Limit [kW]	RSS-238 Limit [kW]
P	9410	19.93	3.88	29.76	0.25	53.82	0.241	-	60.00
Q	9440	19.56	3.89	29.79	0.24	53.48	0.223	-	60.00
P + Q	9410 + 9440	19.57	3.89	29.79	0.24	53.49	0.223	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

RF output power
(Conducted)(peak power)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting

Pulse range table 5 (* P/M: Power Meter with power sensor)

mode	Frequency	P/M (Peak) Reading	Cable Loss	Atten. Loss	Wave guide Loss	Result (Peak power)		FCC Limit	RSS-238 Limit
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[kW]	[kW]	[kW]
P	9410	19.87	3.88	29.76	0.25	53.76	0.238	-	60.00
Q	9440	19.70	3.89	29.79	0.24	53.62	0.230	-	60.00
P + Q	9410 + 9440	19.71	3.89	29.79	0.24	53.63	0.231	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 6 (* P/M: Power Meter with power sensor)

mode	Frequency	P/M (Peak) Reading	Cable Loss	Atten. Loss	Wave guide Loss	Result (Peak power)		FCC Limit	RSS-238 Limit
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[kW]	[kW]	[kW]
P	9410	20.02	3.88	29.76	0.25	53.91	0.246	-	60.00
Q	9440	19.55	3.89	29.79	0.24	53.47	0.222	-	60.00
P + Q	9410 + 9440	19.57	3.89	29.79	0.24	53.49	0.223	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 7 (* P/M: Power Meter with power sensor)

mode	Frequency	P/M (Peak) Reading	Cable Loss	Atten. Loss	Wave guide Loss	Result (Peak power)		FCC Limit	RSS-238 Limit
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[kW]	[kW]	[kW]
P	9410	20.04	3.88	29.76	0.25	53.93	0.247	-	60.00
Q	9440	19.67	3.89	29.79	0.24	53.59	0.229	-	60.00
P + Q	9410 + 9440	19.67	3.89	29.79	0.24	53.59	0.229	-	60.00

Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Pulse range table 8 (* P/M: Power Meter with power sensor)

mode	Frequency	P/M (Peak) Reading	Cable Loss	Atten. Loss	Wave guide Loss	Result (Peak power)		FCC Limit	RSS-238 Limit
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[kW]	[kW]	[kW]
P	9410	19.51	3.88	29.76	0.25	53.40	0.219	-	60.00
Q	9440	19.62	3.89	29.79	0.24	53.54	0.226	-	60.00
P + Q	9410 + 9440	19.63	3.89	29.79	0.24	53.55	0.226	-	60.00

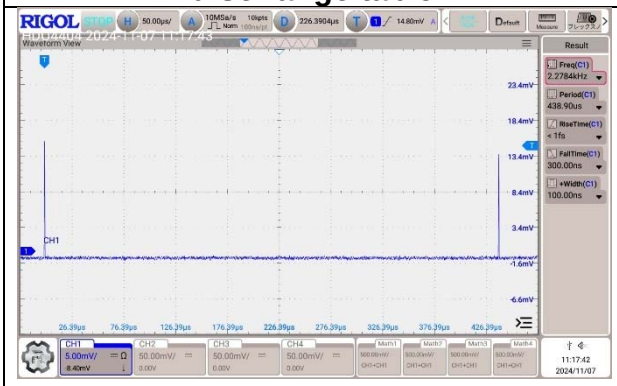
Sample calculation:
Result [dBm] = P/M (Peak) Reading + Cable Loss + Atten. Loss + Wave guide Loss

Modulation Characteristics
(Pulse chart 1)

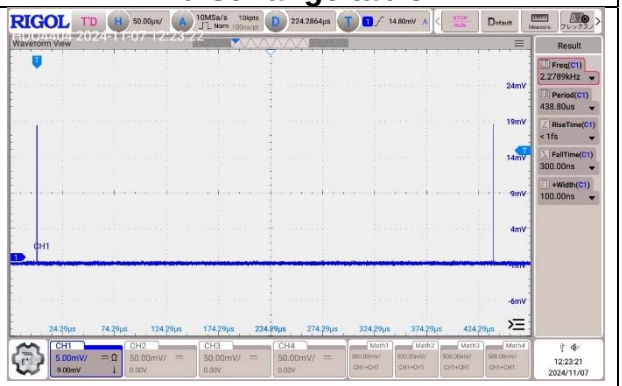
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Pulse 1 cycle time [µs]	Pulse Repetition rate [Hz]
1	438.900	2278.423
2	438.800	2278.943
3	438.900	2278.423
4	780.200	1281.723

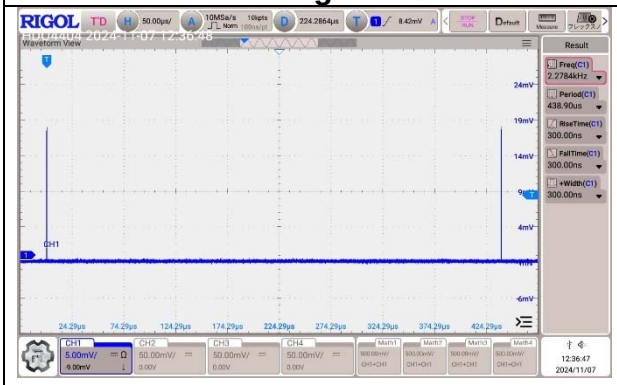
Pulse range table 1



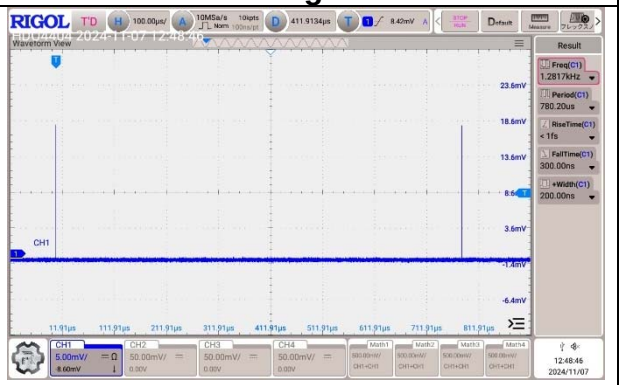
Pulse range table 2



Pulse range table 3



Pulse range table 4

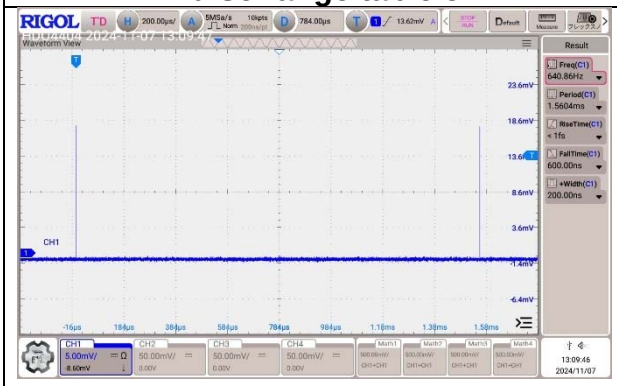


Modulation Characteristics
(Pulse chart 1)

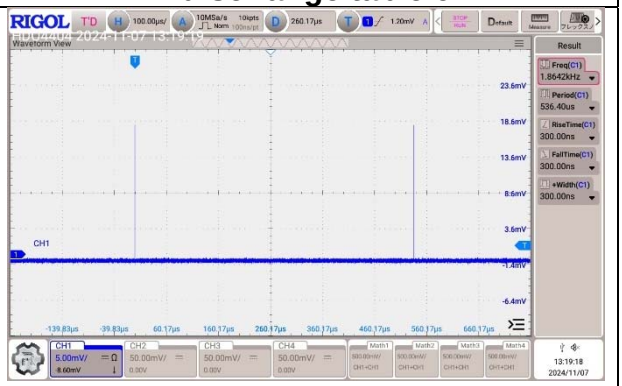
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Pulse 1 cycle time [µs]	Pulse Repetition rate [Hz]
5	1560.400	640.861
6	536.400	1864.280
7	780.200	1281.723
8	243.800	4101.723

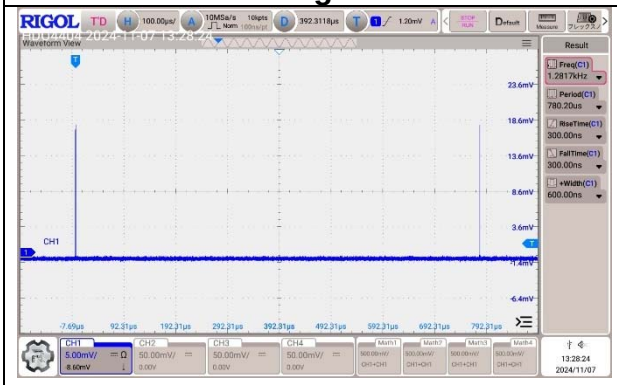
Pulse range table 5



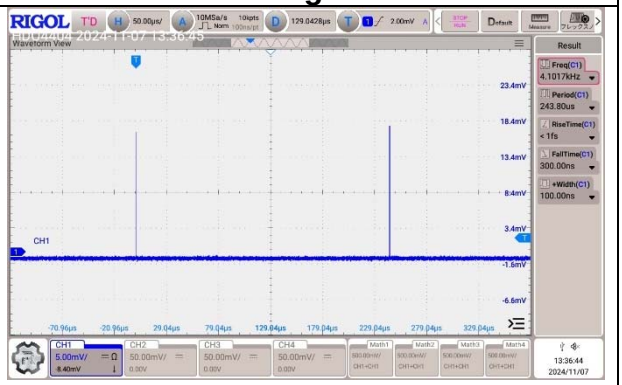
Pulse range table 6



Pulse range table 7



Pulse range table 8

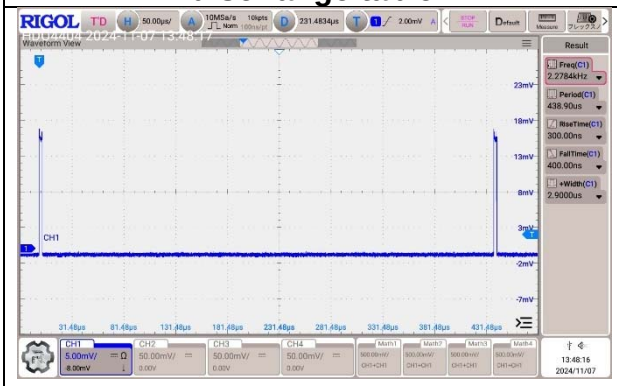


Modulation Characteristics
(Pulse chart 1)

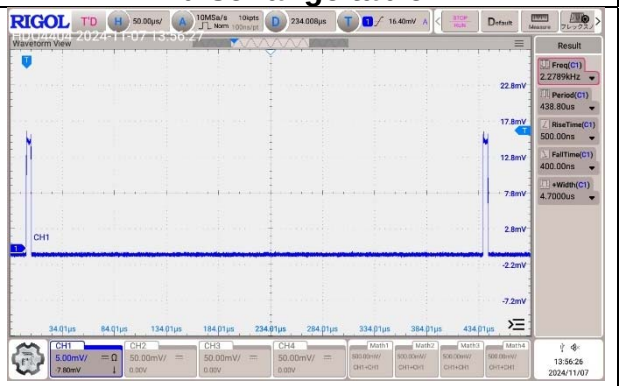
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Pulse 1 cycle time [µs]	Pulse Repetition rate [Hz]
1	438.900	2278.423
2	438.800	2278.943
3	438.800	2278.943
4	780.200	1281.723

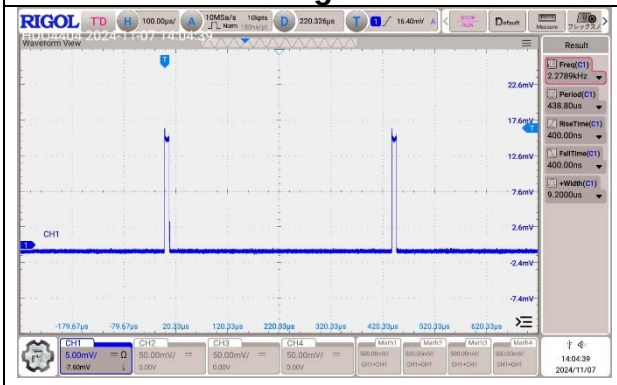
Pulse range table 1



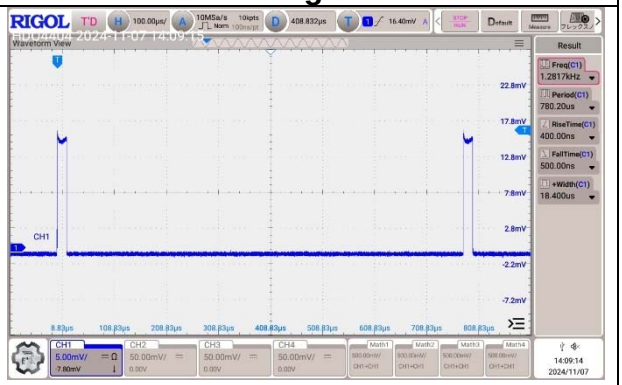
Pulse range table 2



Pulse range table 3



Pulse range table 4

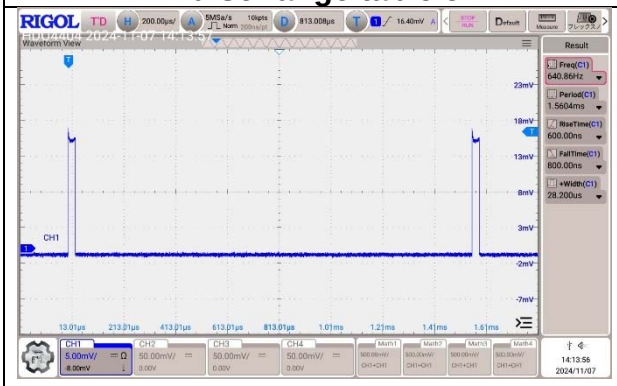


Modulation Characteristics
(Pulse chart 1)

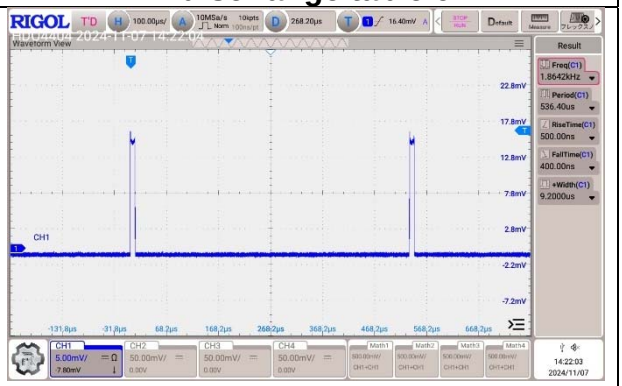
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Pulse 1 cycle time [µs]	Pulse Repetition rate [Hz]
5	1560.400	640.861
6	536.400	1864.280
7	780.200	1281.723
8	243.800	4101.723

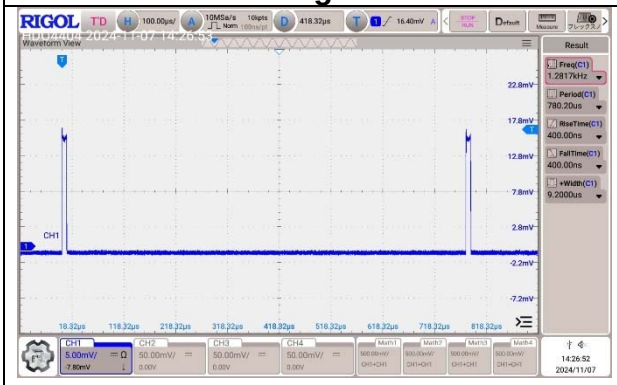
Pulse range table 5



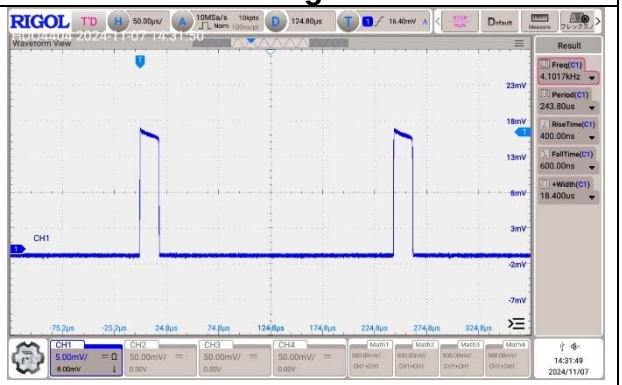
Pulse range table 6



Pulse range table 7



Pulse range table 8



Modulation Characteristics
(Pulse chart 2)

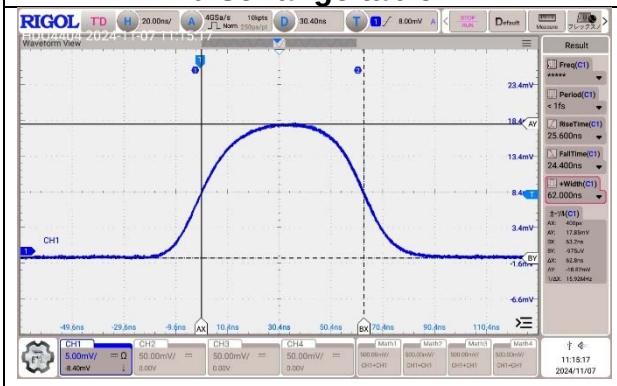
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Pulse 50 % length [µs]	Pulse 1 cycle *1) time [µs]	Duty [%]	Duty factor [dB]	1.5 / T *2) [MHz]
1	0.062	438.900	0.014	38.50	24.19
2	0.153	438.800	0.035	34.58	9.84
3	0.318	438.900	0.072	31.40	4.72
4	0.153	780.200	0.020	37.08	9.84

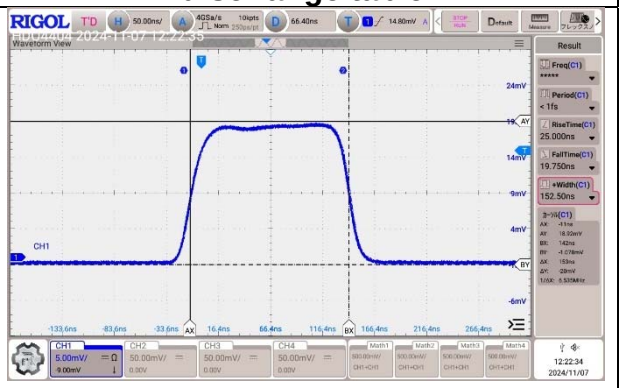
*1) Refer to "Modultion Characteristics (Pulse chart 1)"

*2) 1.5/T [MHz] = 1.5 / (Pulse 50 % length [us])

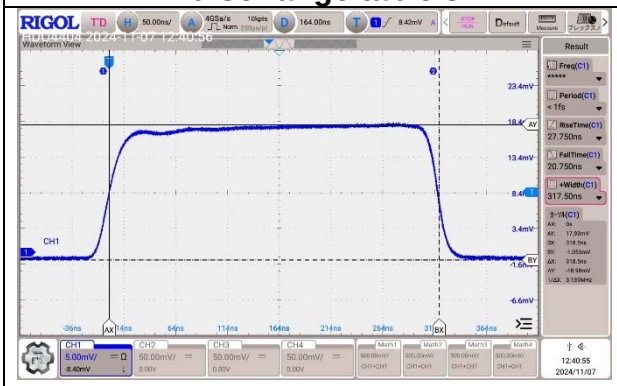
Pulse range table 1



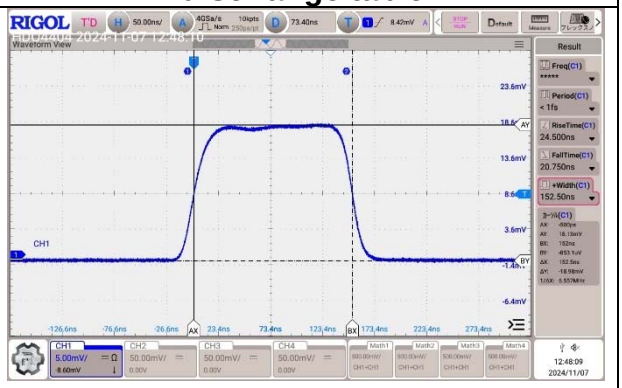
Pulse range table 2



Pulse range table 3



Pulse range table 4



Modulation Characteristics
(Pulse chart 2)

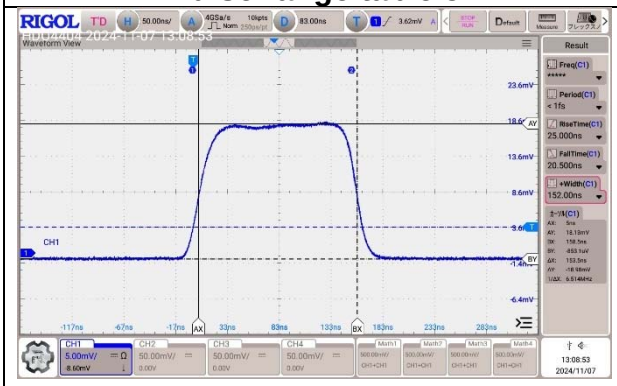
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Pulse 50 % length [µs]	Pulse 1 cycle *1) time [µs]	Duty [%]	Duty factor [dB]	1.5 / T *2) [MHz]
5	0.152	1560.400	0.010	40.11	9.87
6	0.317	536.400	0.059	32.28	4.73
7	0.597	780.200	0.077	31.16	2.51
8	0.063	243.800	0.026	35.88	23.81

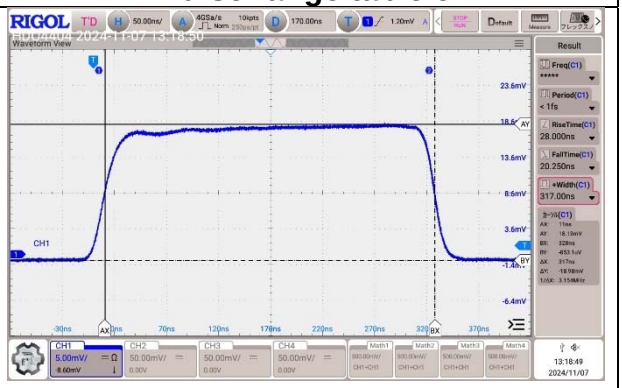
*1) Refer to "Modultion Characteristics (Pulse chart 1)"

*2) 1.5/T [MHz] = 1.5 / (Pulse 50 % length [us])

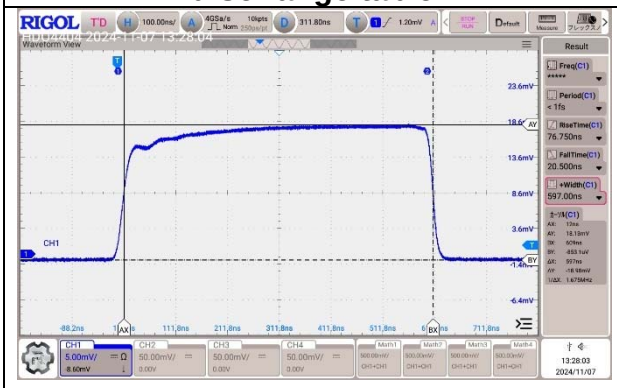
Pulse range table 5



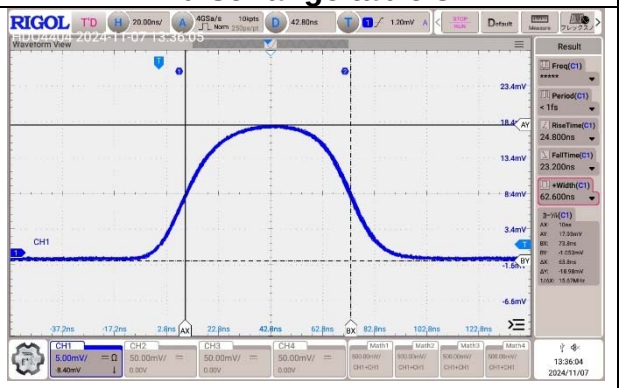
Pulse range table 6



Pulse range table 7



Pulse range table 8



Modulation Characteristics
(Pulse chart 2)

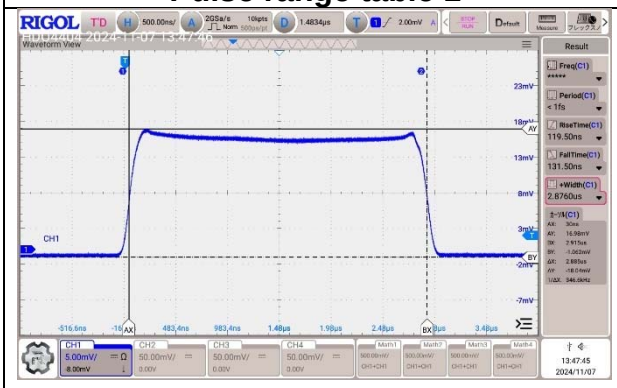
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Pulse 50 % length [µs]	Pulse 1 cycle *1) time [µs]	Duty [%]	Duty factor [dB]	1.5 / T *2) [MHz]
1	2.876	438.900	0.655	21.84	0.52
2	4.761	438.800	1.085	19.65	0.32
3	9.270	438.800	2.113	16.75	0.16
4	18.442	780.200	2.364	16.26	0.08

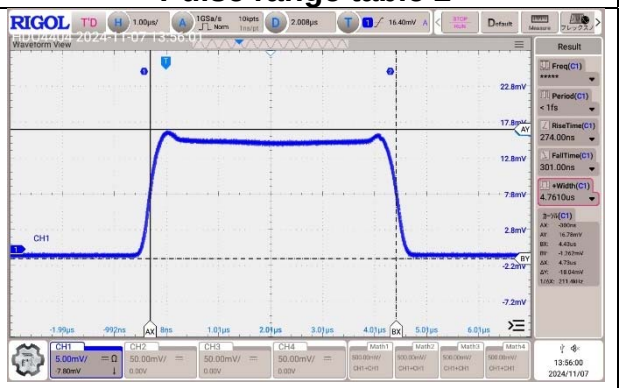
*1) Refer to "Modultion Characteristics (Pulse chart 1)"

*2) 1.5/T [MHz] = 1.5 / (Pulse 50 % length [us])

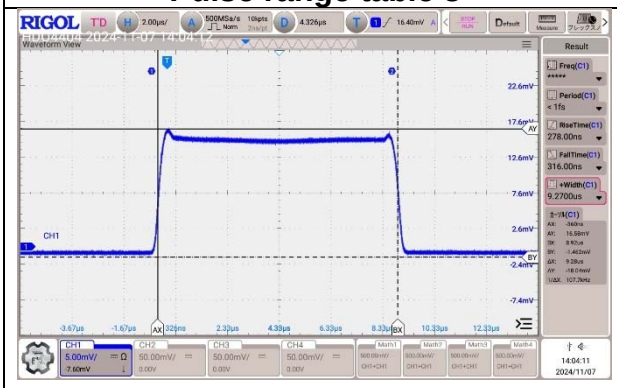
Pulse range table 1



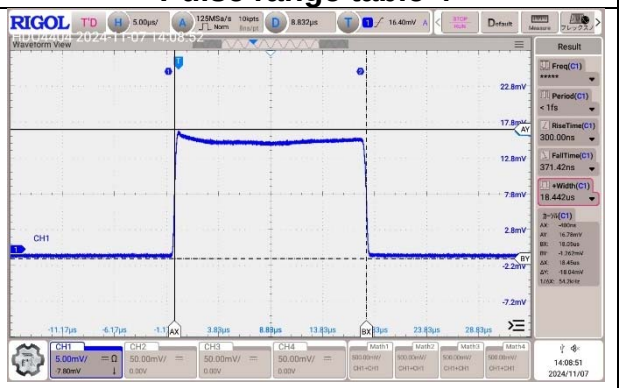
Pulse range table 2



Pulse range table 3



Pulse range table 4



Modulation Characteristics
(Pulse chart 2)

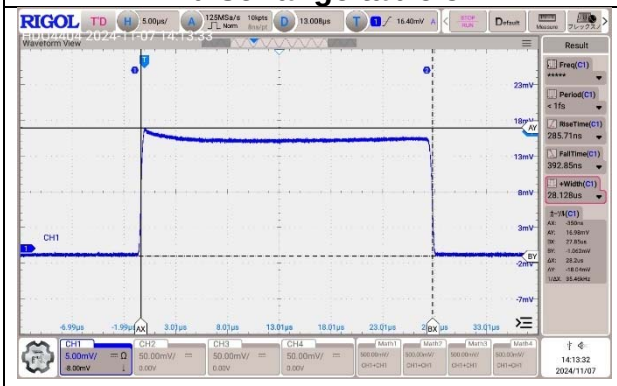
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Pulse 50 % length [µs]	Pulse 1 cycle *1) time [µs]	Duty [%]	Duty factor [dB]	1.5 / T *2) [MHz]
5	28.128	1560.400	1.803	17.44	0.05
6	9.242	536.400	1.723	17.64	0.16
7	9.250	780.200	1.186	19.26	0.16
8	18.400	243.800	7.547	11.22	0.08

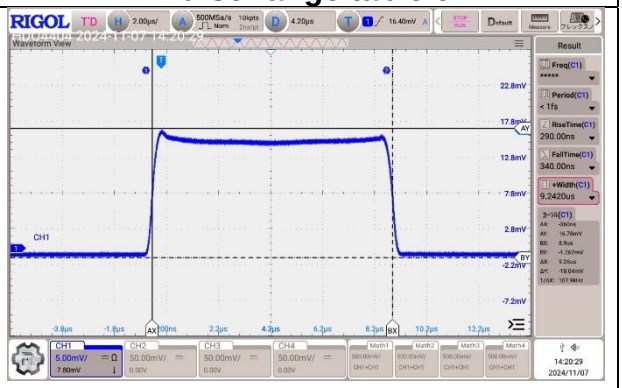
*1) Refer to "Modultion Characteristics (Pulse chart 1)"

*2) 1.5/T [MHz] = 1.5 / (Pulse 50 % length [us])

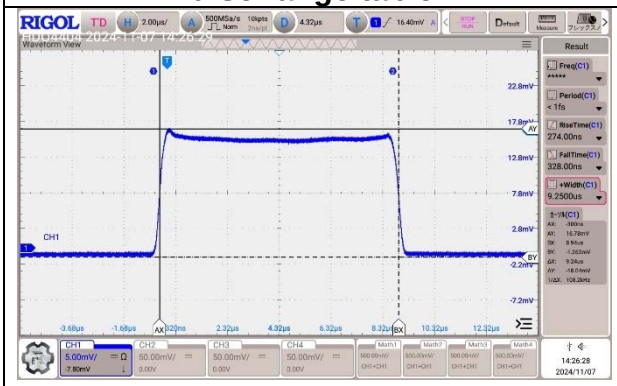
Pulse range table 5



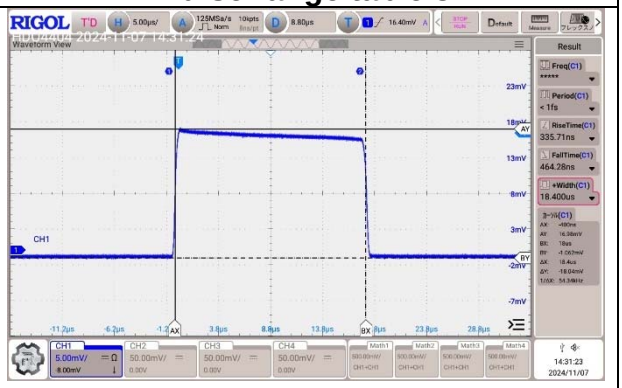
Pulse range table 6



Pulse range table 7



Pulse range table 8



Modulation Characteristics
(Pulse chart 3)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

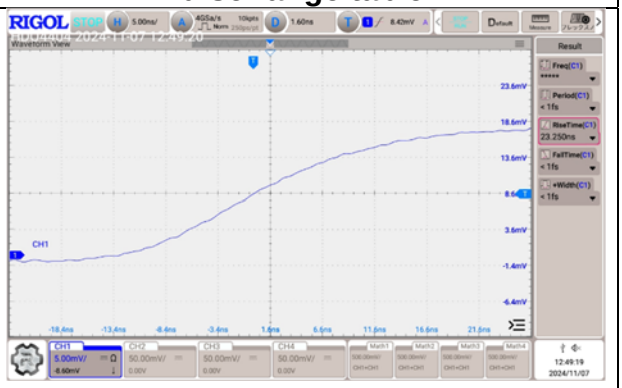
Pulse range table	Rise time [ns]
1	24.60
2	23.75
3	24.10
4	23.25

Pulse range table 1

Pulse range table 2

Pulse range table 3

Pulse range table 4



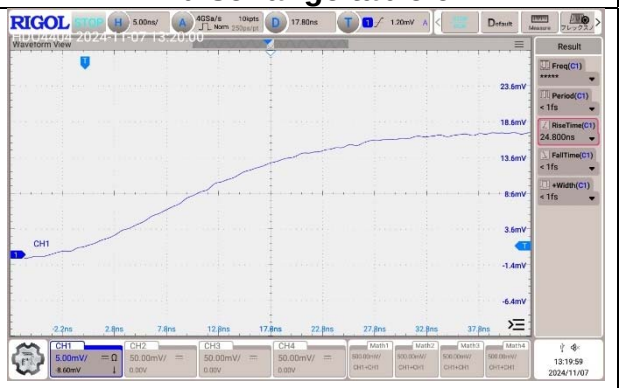
Modulation Characteristics
(Pulse chart 3)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Rise time [ns]
5	23.20
6	24.80
7	24.60
8	23.90

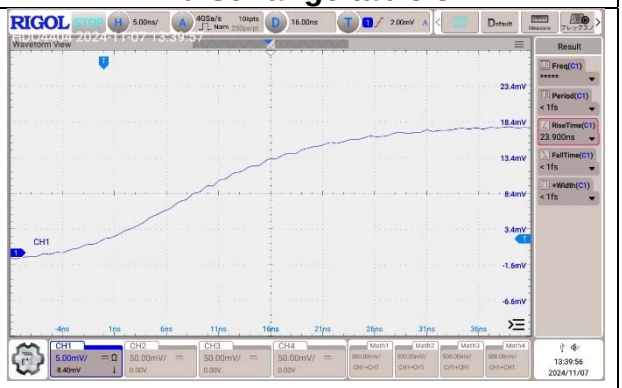
Pulse range table 5

Pulse range table 6



Pulse range table 7

Pulse range table 8



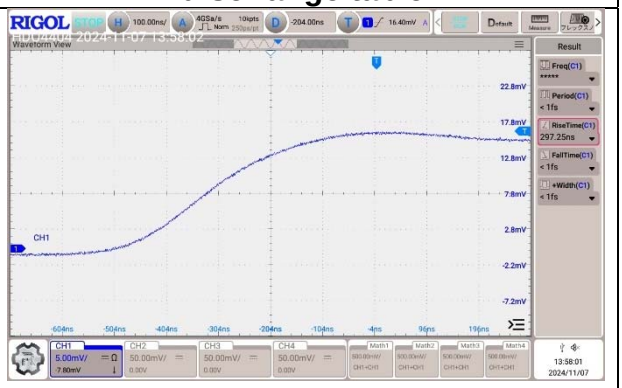
Modulation Characteristics
(Pulse chart 3)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Rise time [ns]
1	133.00
2	297.25
3	312.75
4	318.50

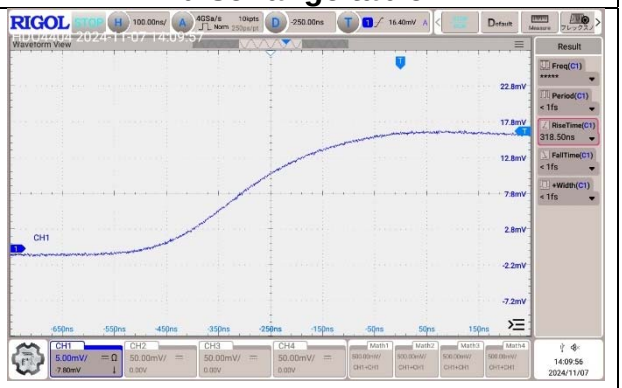
Pulse range table 1

Pulse range table 2



Pulse range table 3

Pulse range table 4



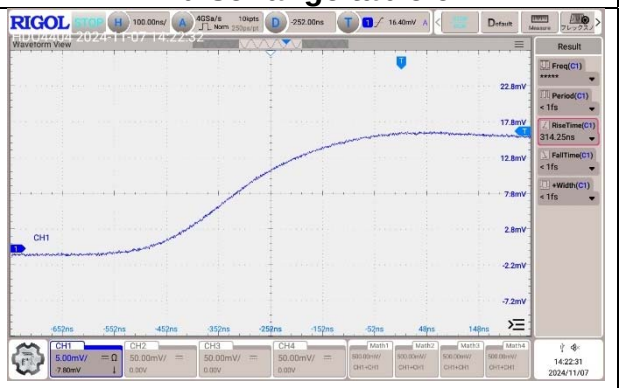
Modulation Characteristics
(Pulse chart 3)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Rise time [ns]
5	320.25
6	314.25
7	312.75
8	354.25

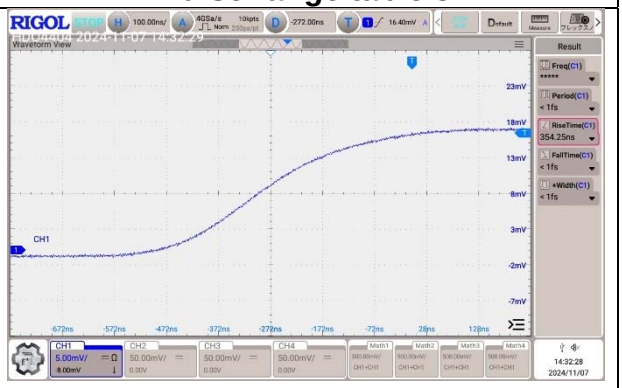
Pulse range table 5

Pulse range table 6



Pulse range table 7

Pulse range table 8



Modulation Characteristics
(Pulse chart 4)

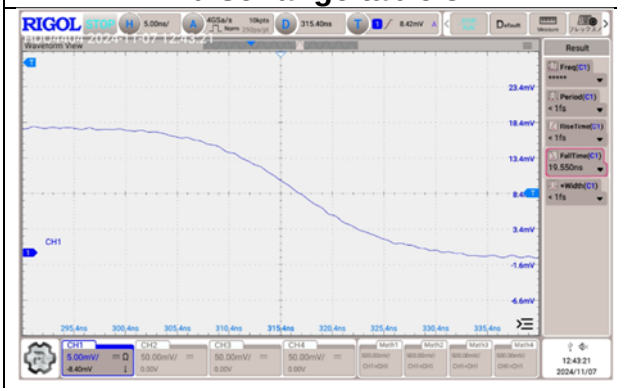
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Fall time [ns]
1	21.70
2	20.20
3	19.55
4	19.75

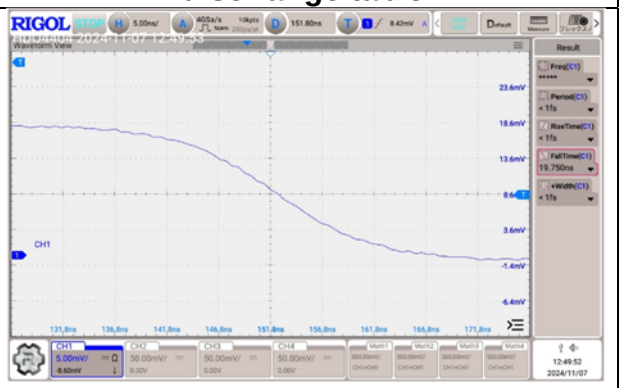
Pulse range table 1

Pulse range table 2

Pulse range table 3



Pulse range table 4



Modulation Characteristics
(Pulse chart 4)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	Fall time [ns]
5	20.35
6	19.75
7	18.65
8	22.80

Pulse range table 5

Pulse range table 6

Pulse range table 7

Pulse range table 8

Modulation Characteristics
(Pulse chart 4)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Fall time [ns]
1	139.50
2	317.75
3	316.75
4	358.25

Pulse range table 1

Pulse range table 2

Pulse range table 3

Pulse range table 4

Modulation Characteristics
(Pulse chart 4)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 7, 2024
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	Fall time [ns]
5	376.50
6	341.75
7	342.75
8	390.25

Pulse range table 5

Pulse range table 6

Pulse range table 7

Pulse range table 8

-26 dB Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
1	46.06	35.191
2	34.85	29.516
3	25.63	21.093
4	34.84	29.399

Pulse range table 1

Pulse range table 2

Pulse range table 3

Pulse range table 4

-26 dB Bandwidth and 99 % Occupied Bandwidth

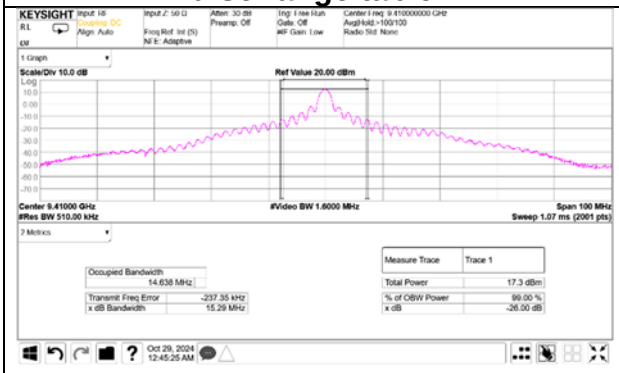
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 28, 2024
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
5	34.77	29.302
6	25.64	21.068
7	15.29	14.638
8	**46.07**	**35.378**

Pulse range table 5

Pulse range table 6

Pulse range table 7



Pulse range table 8

-26 dB Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
1	**34.13**	28.227
2	30.88	26.405
3	21.93	18.780
4	32.48	29.042

Pulse range table 1

Pulse range table 2

Pulse range table 3

Pulse range table 4

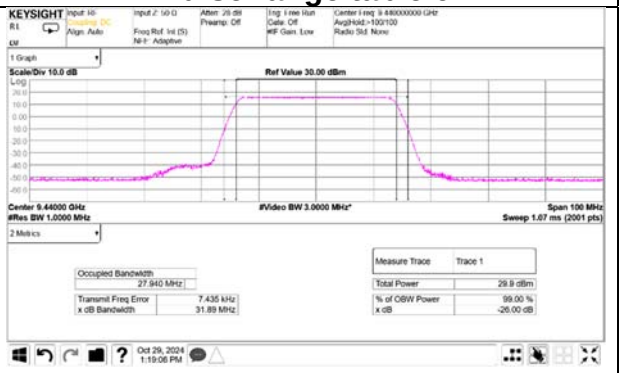
-26 dB Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
5	32.74	**29.540**
6	31.89	27.940
7	31.87	27.952
8	32.41	28.958

Pulse range table 5

Pulse range table 6



Pulse range table 7

Pulse range table 8

-26 dB Bandwidth and 99 % Occupied Bandwidth

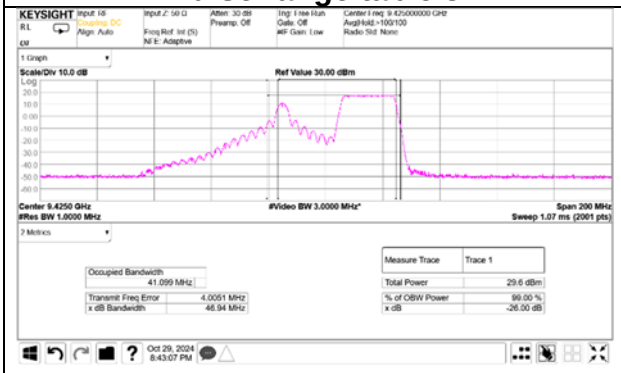
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q)

Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
1	**58.00**	**47.257**
2	56.04	45.644
3	46.94	41.099
4	51.58	45.004

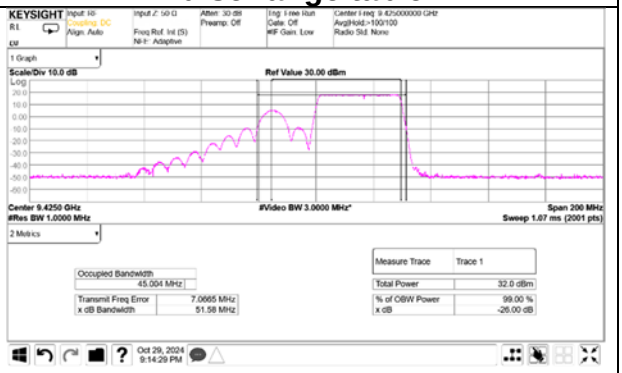
Pulse range table 1

Pulse range table 2

Pulse range table 3



Pulse range table 4

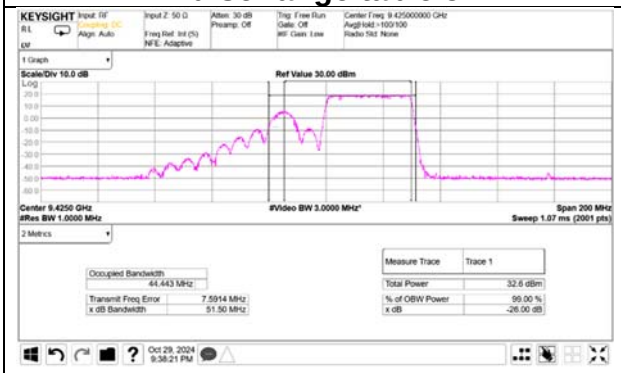


-26 dB Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q)

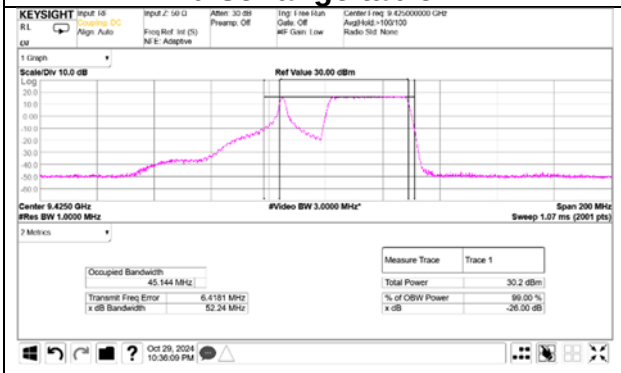
Pulse range table	-26 dB Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]
5	51.50	44.443
6	54.18	45.464
7	52.24	45.144
8	54.00	29.617

Pulse range table 5



Pulse range table 6

Pulse range table 7



Pulse range table 8

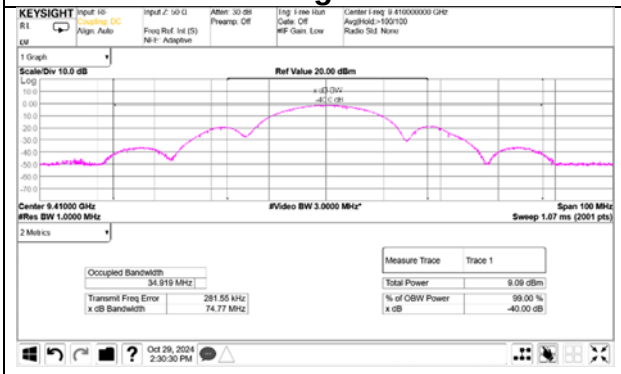
(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	-40 dB Bandwidth [MHz]
1	74.77
2	70.09
3	55.15
4	70.03

Pulse range table 1



Pulse range table 2

Pulse range table 3

Pulse range table 4

(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

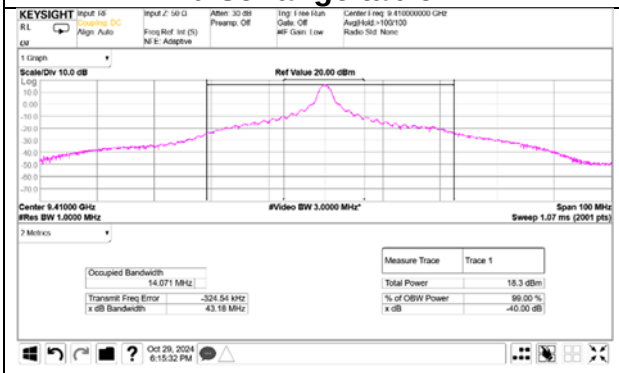
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P)

Pulse range table	-40 dB Bandwidth [MHz]
5	70.06
6	52.76
7	43.18
8	75.46

Pulse range table 5

Pulse range table 6

Pulse range table 7



Pulse range table 8

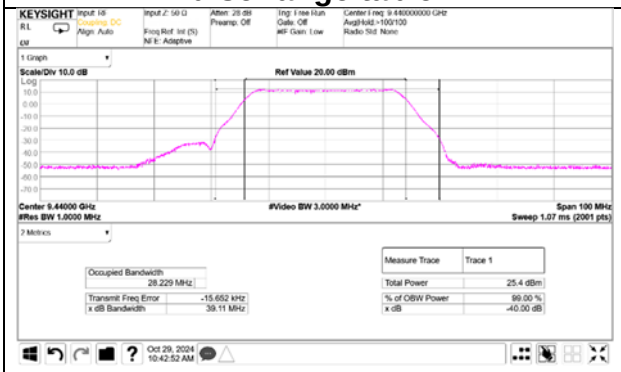
(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

Pulse range table	-40 dB Bandwidth [MHz]
1	39.11
2	33.32
3	23.90
4	34.39

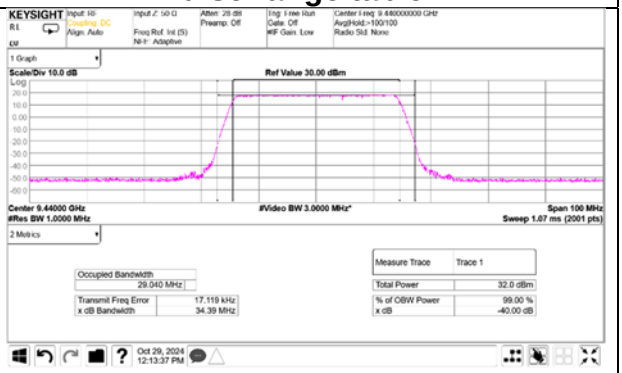
Pulse range table 1



Pulse range table 2

Pulse range table 3

Pulse range table 4



(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9440 MHz (Q)

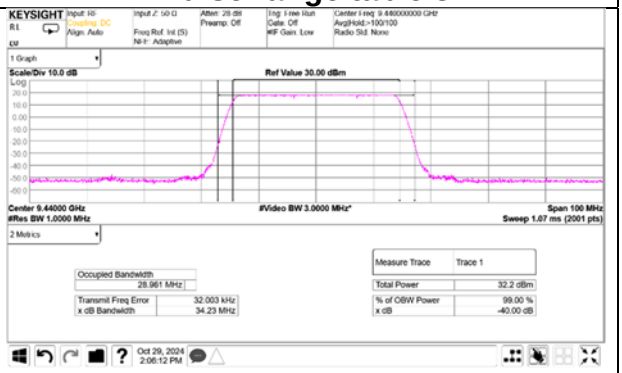
Pulse range table	-40 dB Bandwidth [MHz]
5	34.59
6	33.95
7	33.99
8	34.23

Pulse range table 5

Pulse range table 6

Pulse range table 7

Pulse range table 8



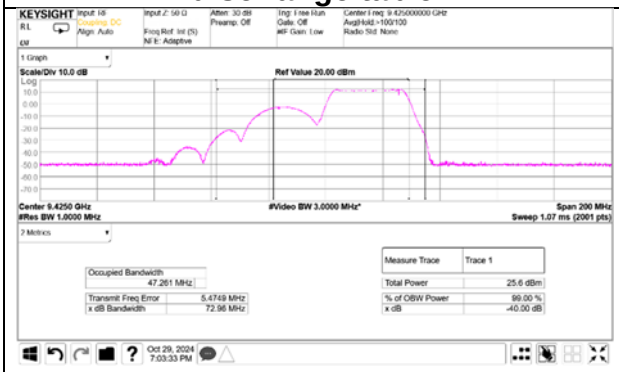
(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

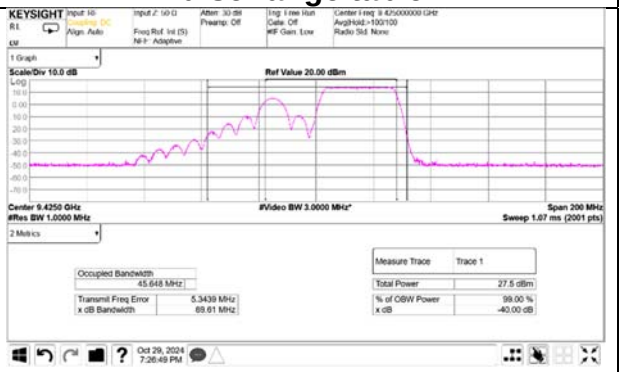
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q)

Pulse range table	-40 dB Bandwidth [MHz]
1	72.96
2	69.61
3	62.58
4	68.55

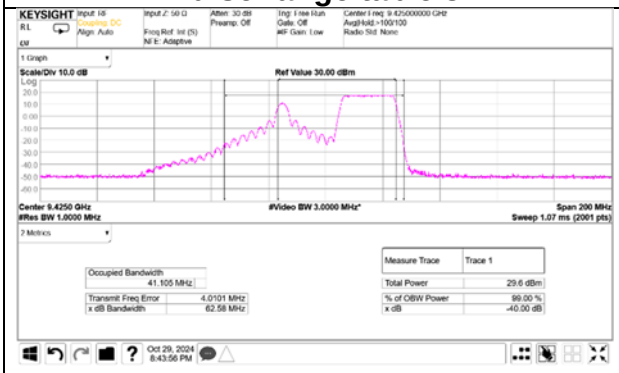
Pulse range table 1



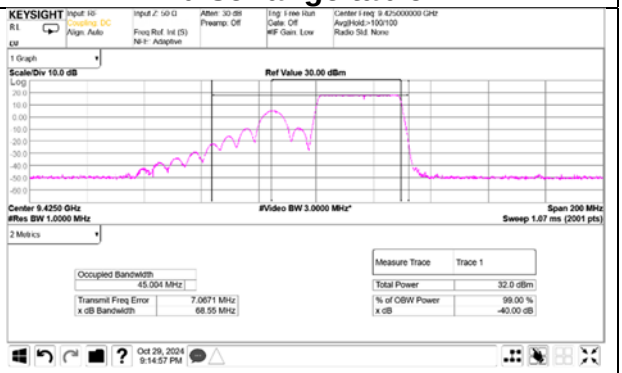
Pulse range table 2



Pulse range table 3



Pulse range table 4



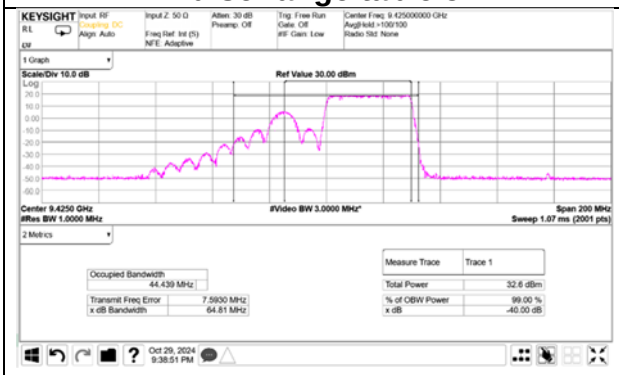
(Reference data) -40 dB Bandwidth

(This data is reference data tested based on a request of Canadian radio standard RSS-238)

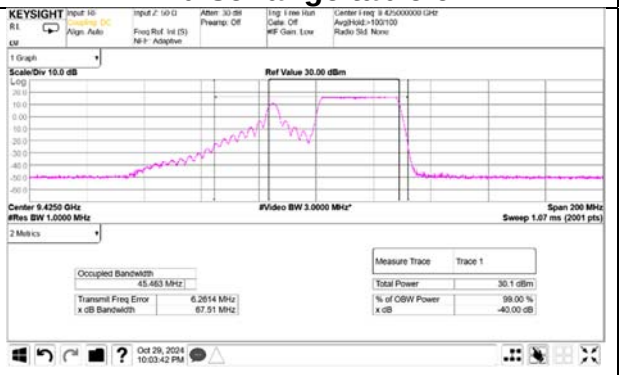
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 29, 2024
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Kenichi Adachi
Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q)

Pulse range table	-40 dB Bandwidth [MHz]
5	64.81
6	67.51
7	66.69
8	66.37

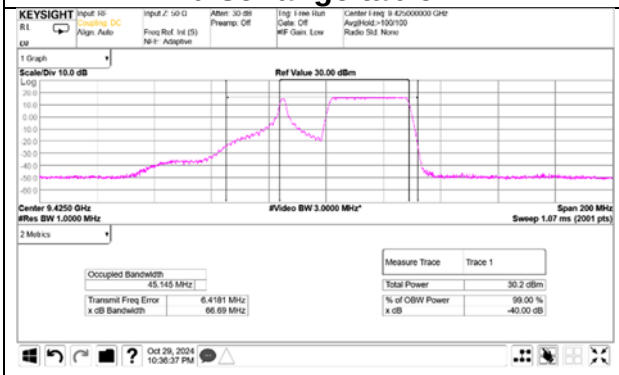
Pulse range table 5



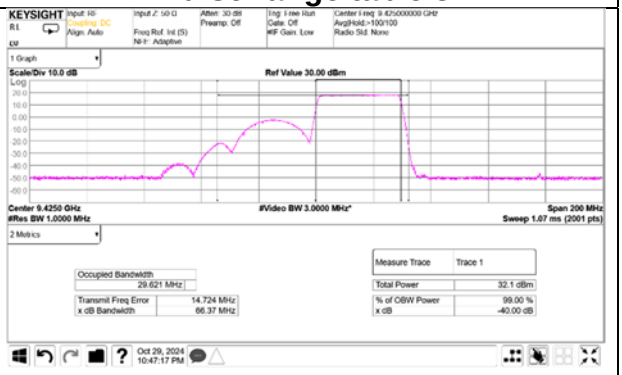
Pulse range table 6



Pulse range table 7



Pulse range table 8



Spurious emission (Conducted)

Test place	Shonan EMC Lab. No.3 Shielded Room
Date	October 30, 2024
Temperature / Humidity	24 deg. C / 42 % RH
Engineer	Kenichi Adachi
(1) Mode	Transmitting 9410 MHz (P)
(2) Mode	Transmitting 9440 MHz (Q)
(3) Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q)

FCC part 80, section 80.211(f)(3) Limit line
FCC part 90, section 90.210(b)(3) Limit line
(frequency range: 5 GHz to 10 GHz)

Frequency [MHz]	outside 250 % band [dBm]	cable loss [dB]	Attenuator loss [dB]	(Reference) Limit line [dBm]
9410	-13.00	1.00	39.74	-53.74
9440	-13.00	0.99	39.77	-53.76

* display limit line is FCC Limit, since worst limit is FCC limit

RSS-238 Limit line

outside 250 % band [dBm]
-60 dBc
-60 dBc

(frequency range: below 5 GHz and above 10 GHz)

Frequency [MHz]	outside 250 % band [dBm]	cable loss [dB]	Attenuator loss [dB]	(Reference) Limit line [dBm]
9410	-13.00	1.00	29.76	-43.76
9440	-13.00	0.99	29.79	-43.78

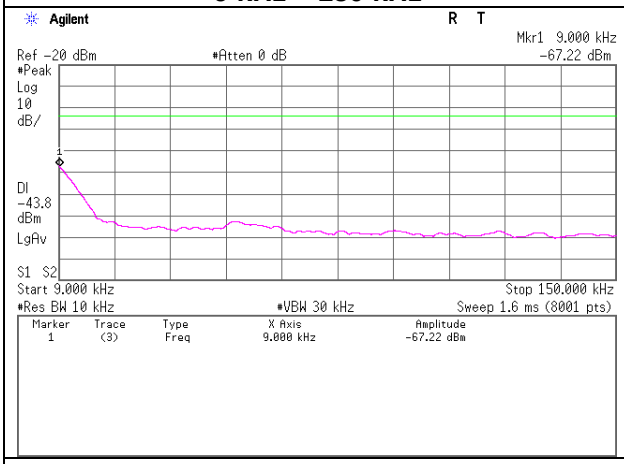
* display limit line is FCC Limit, since worst limit is FCC limit

Spurious emission (Conducted)

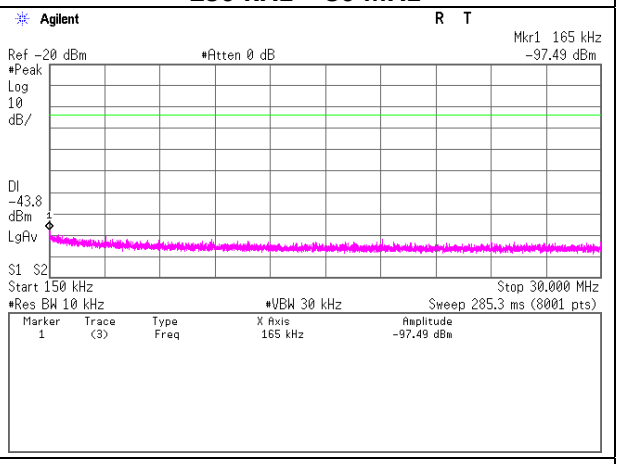
Transmitting 9410 MHz (P) (1/2)

Pulse range 7 (worst mode)

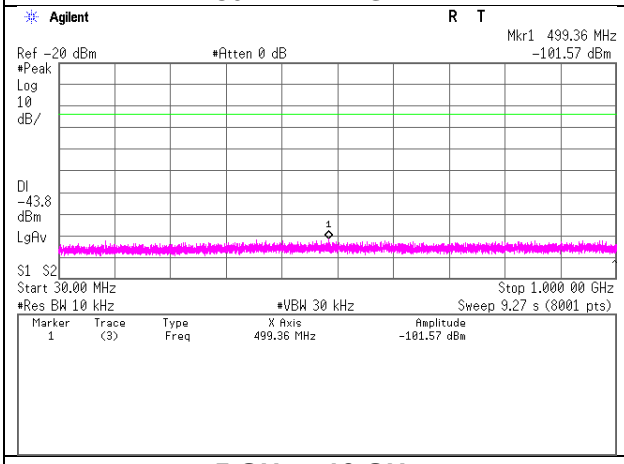
9 kHz – 150 kHz



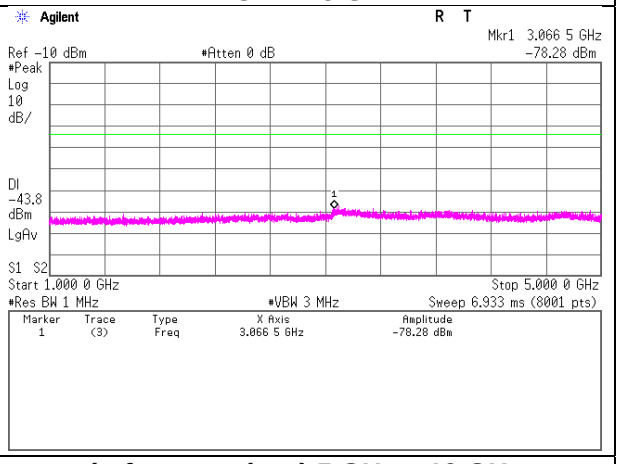
150 kHz – 30 MHz



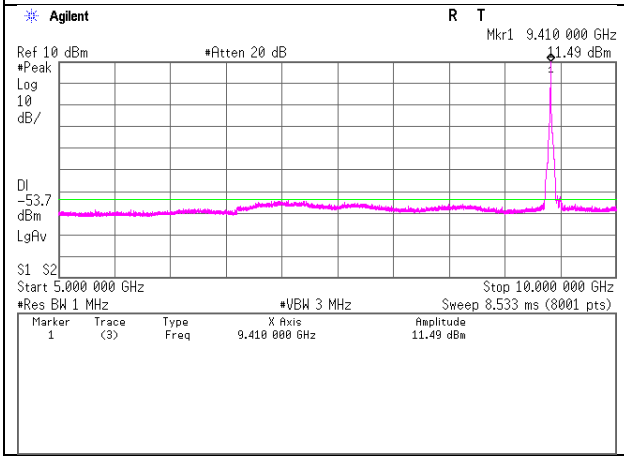
30 MHz – 1 GHz



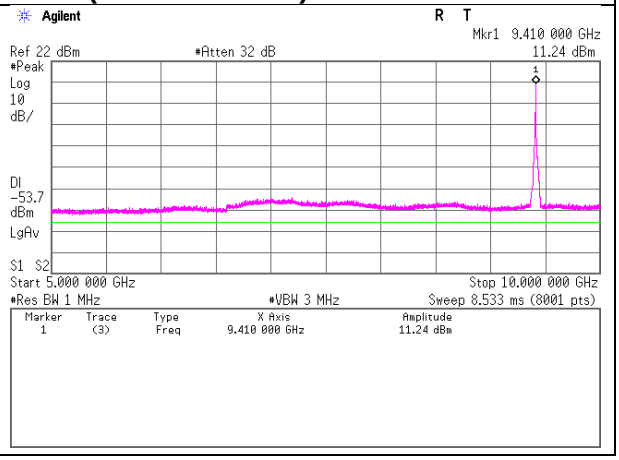
1 GHz – 5 GHz



5 GHz – 10 GHz



(reference chart) 5 GHz – 10 GHz

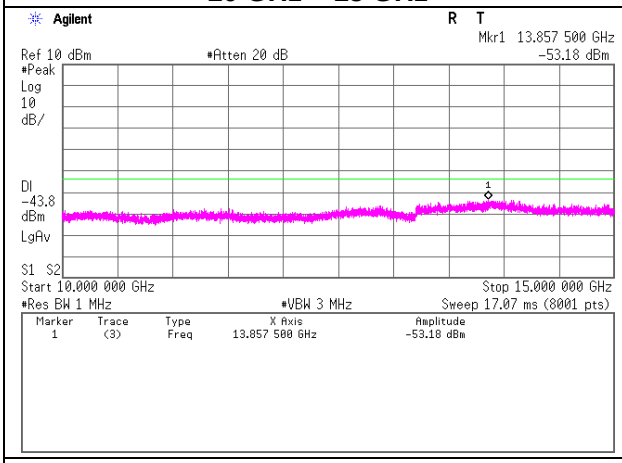


Spurious emission (Conducted)

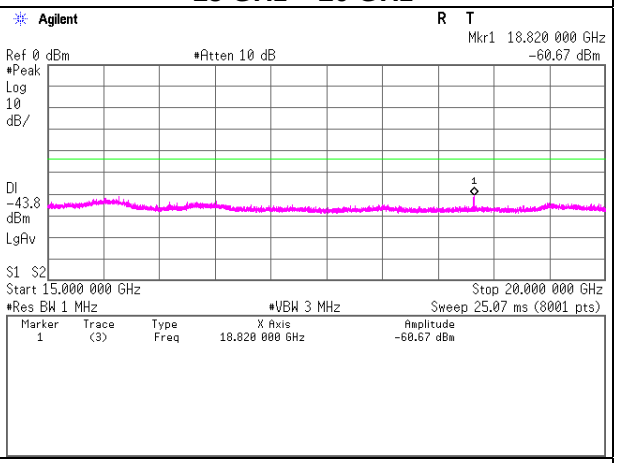
Transmitting 9410 MHz (P) (2/2)

Pulse range 7 (worst mode)

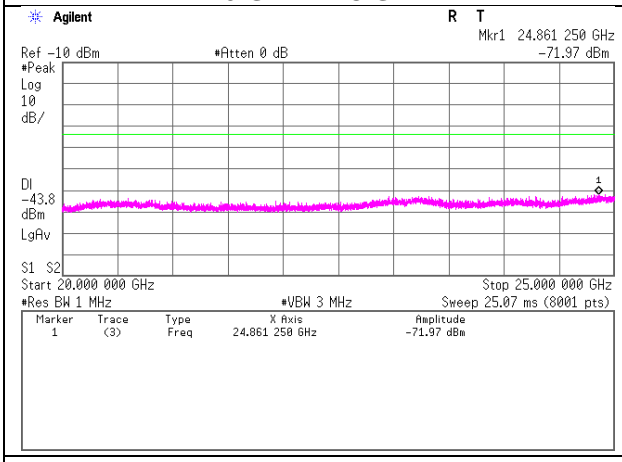
10 GHz – 15 GHz



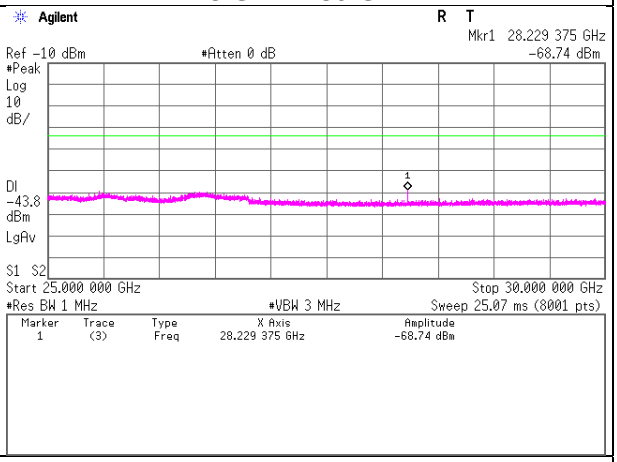
15 GHz – 20 GHz



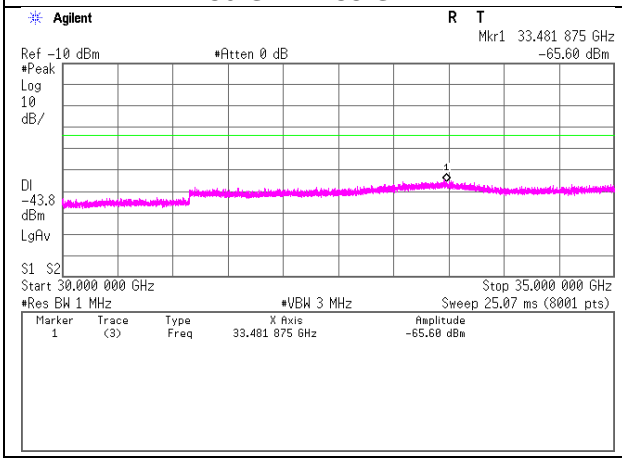
20 GHz – 25 GHz



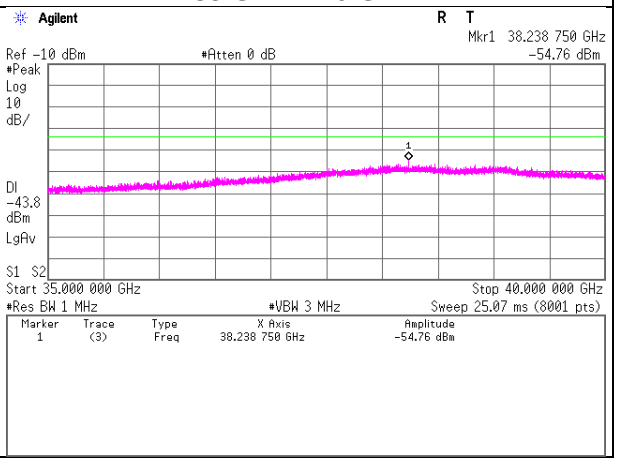
25 GHz – 30 GHz



30 GHz – 35 GHz



35 GHz – 40 GHz

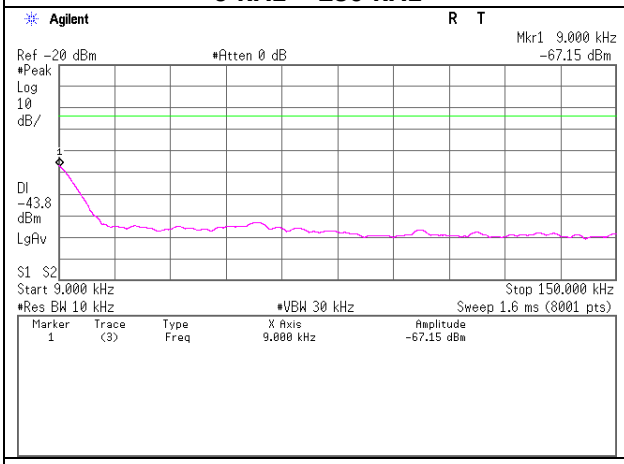


Spurious emission (Conducted)

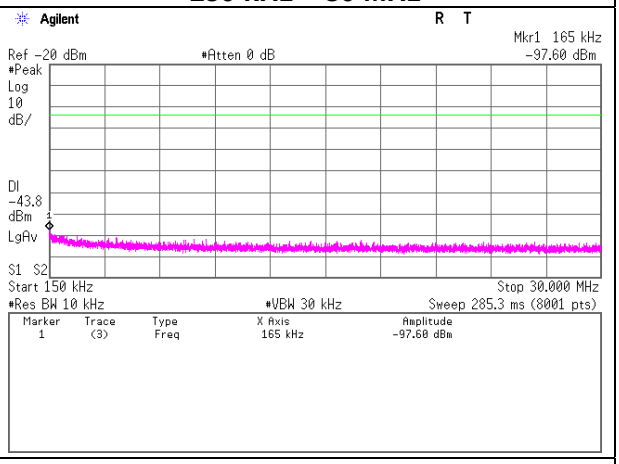
Transmitting 9440 MHz (Q) (1/2)

Pulse range 5 (worst mode)

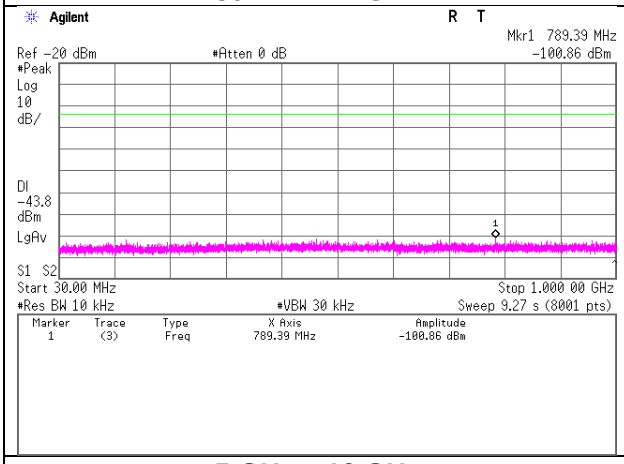
9 kHz – 150 kHz



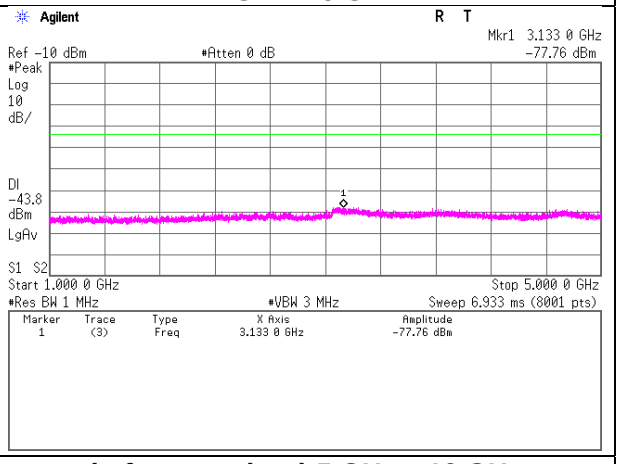
150 kHz – 30 MHz



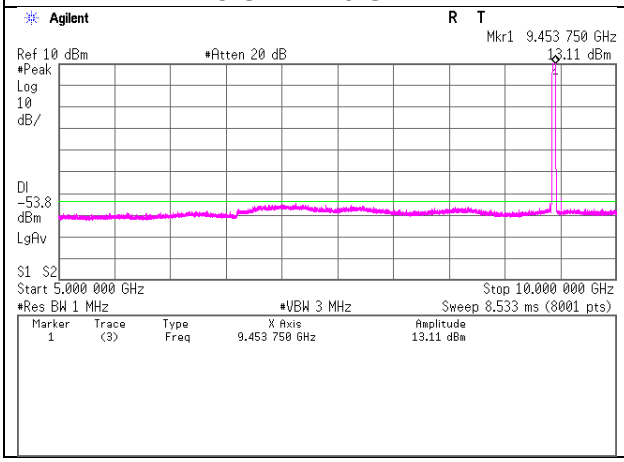
30 MHz – 1 GHz



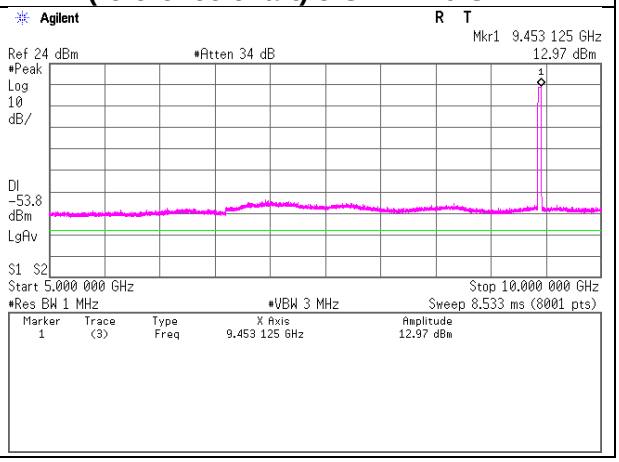
1 GHz – 5 GHz



5 GHz – 10 GHz



(reference chart) 5 GHz – 10 GHz

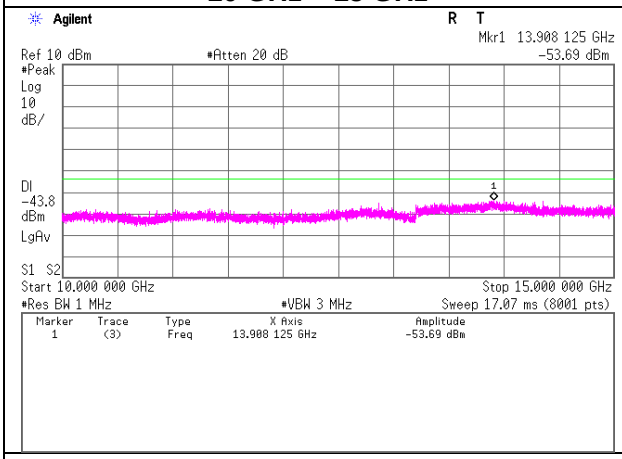


Spurious emission (Conducted)

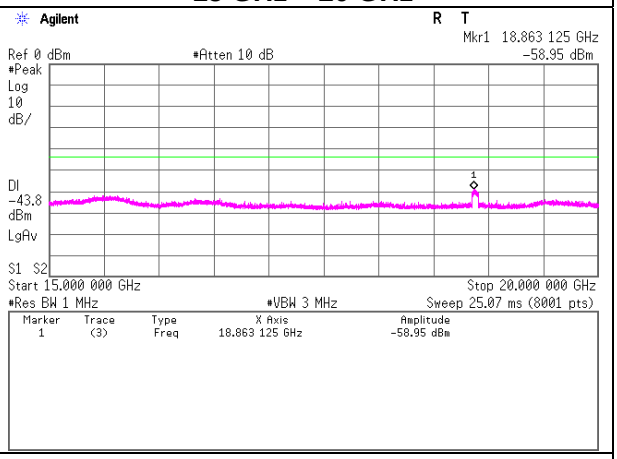
Transmitting 9440 MHz (Q) (2/2)

Pulse range 5 (worst mode)

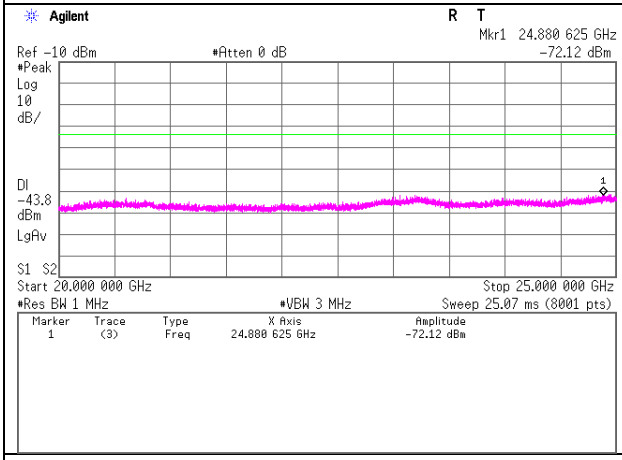
10 GHz – 15 GHz



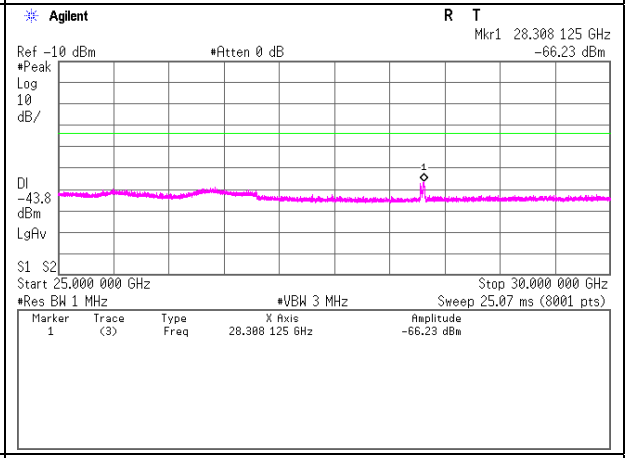
15 GHz – 20 GHz



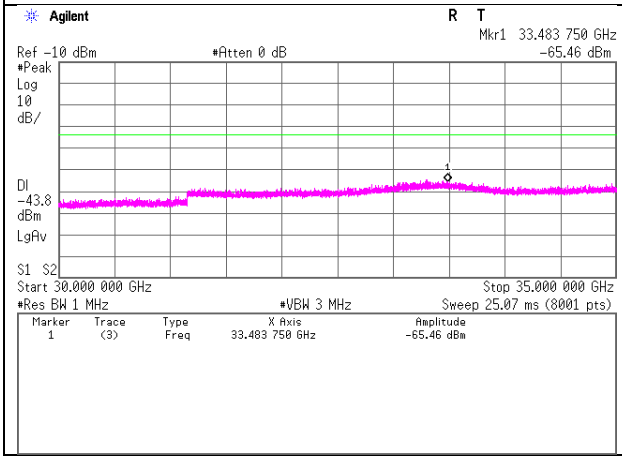
20 GHz – 25 GHz



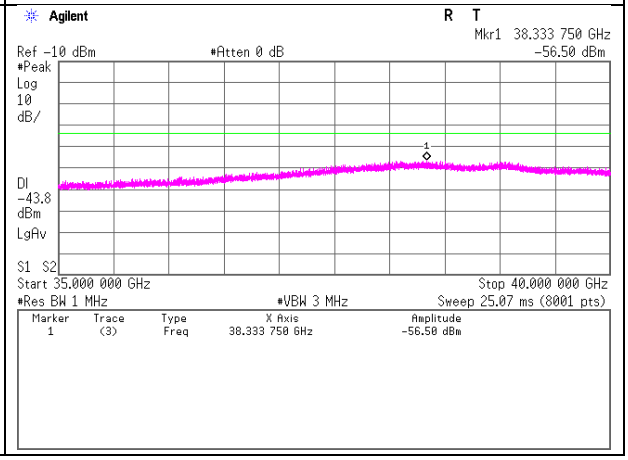
25 GHz – 30 GHz



30 GHz – 35 GHz



35 GHz – 40 GHz

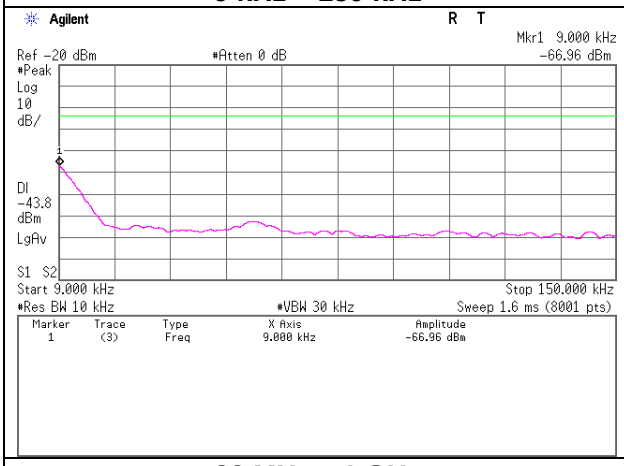


Spurious emission (Conducted)

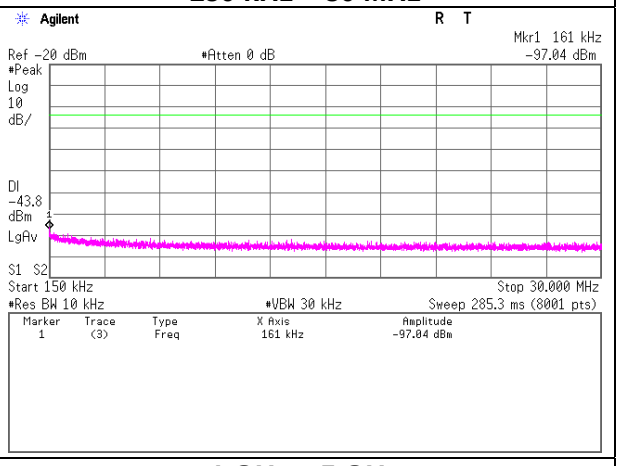
Transmitting 9410 MHz (P) + 9440 MHz (Q) (1/2)

Pulse range 5 (worst mode)

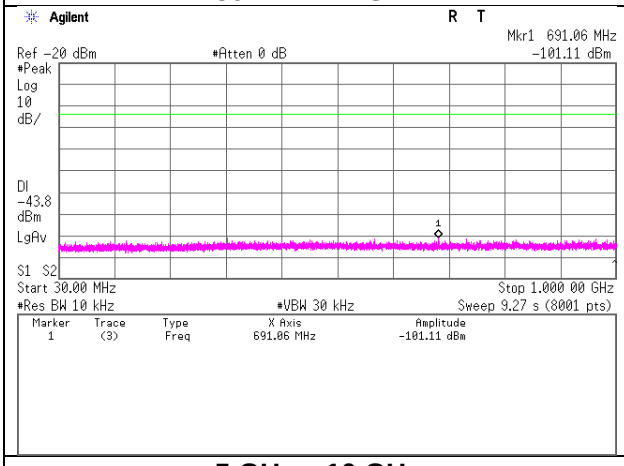
9 kHz – 150 kHz



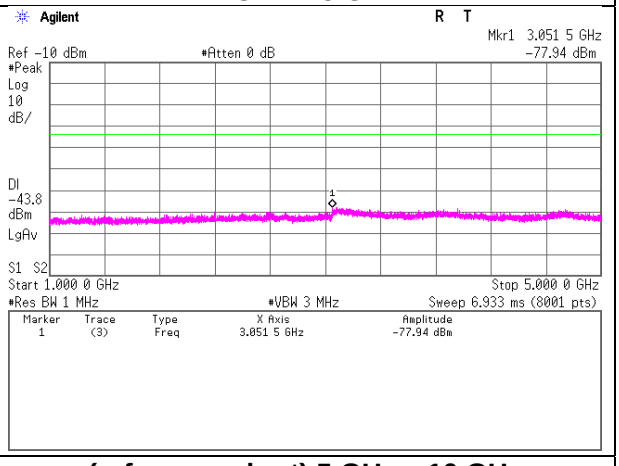
150 kHz – 30 MHz



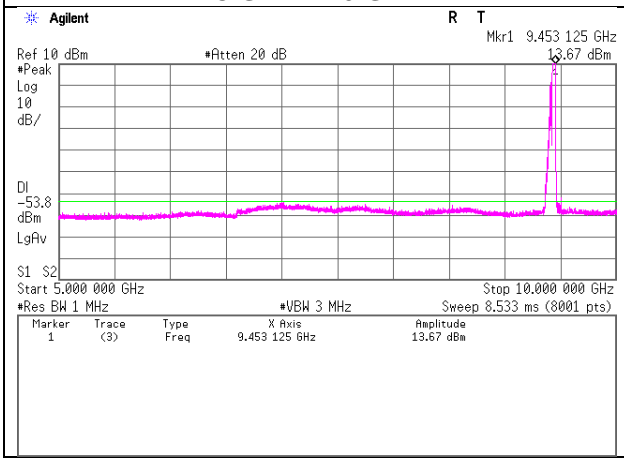
30 MHz – 1 GHz



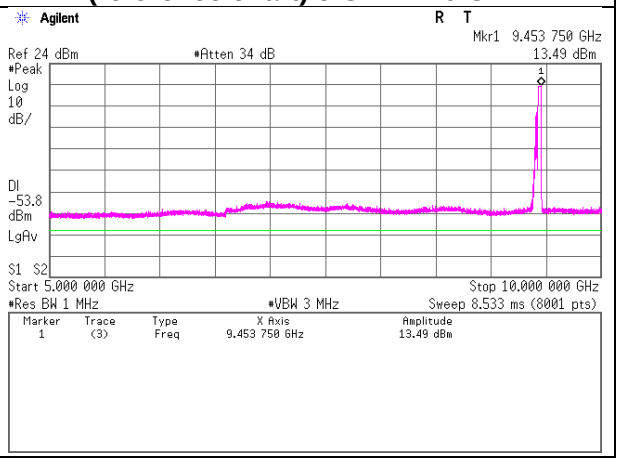
1 GHz – 5 GHz



5 GHz – 10 GHz



(reference chart) 5 GHz – 10 GHz

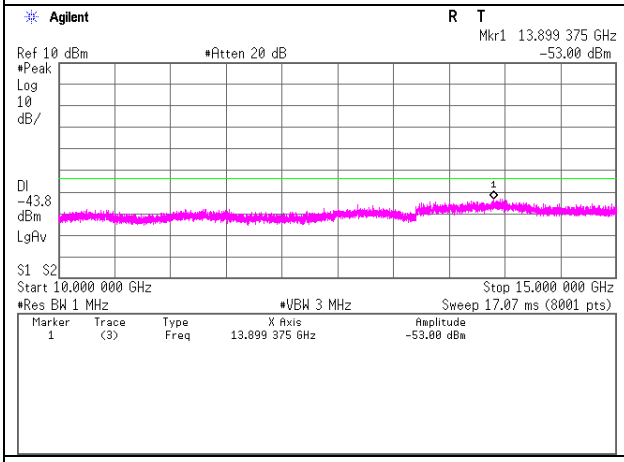


Spurious emission (Conducted)

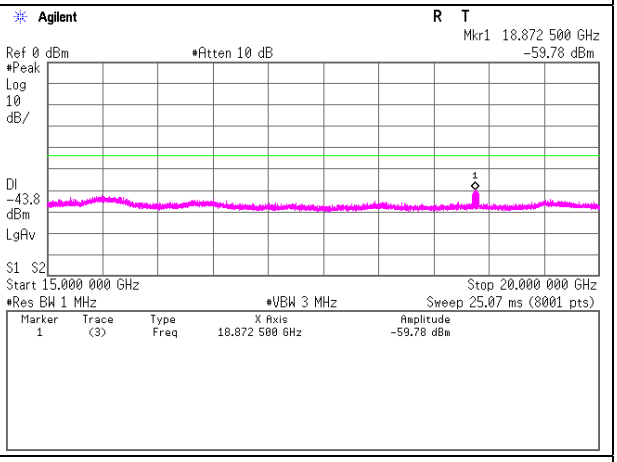
Transmitting 9410 MHz (P) + 9440 MHz (Q) (2/2)

Pulse range 5 (worst mode)

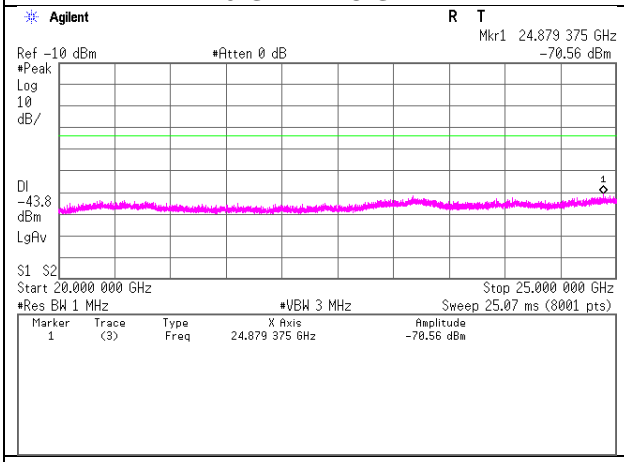
10 GHz – 15 GHz



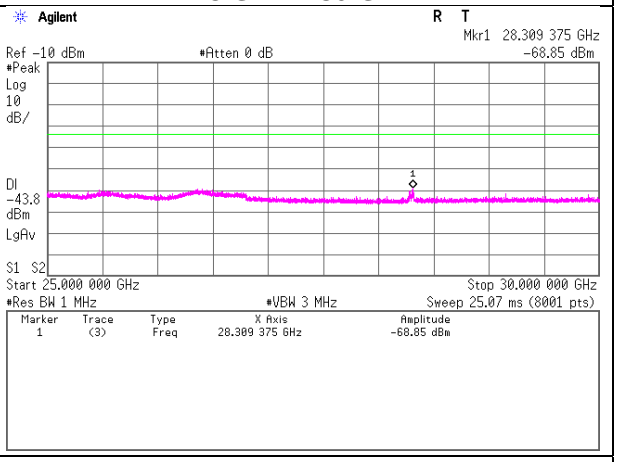
15 GHz – 20 GHz



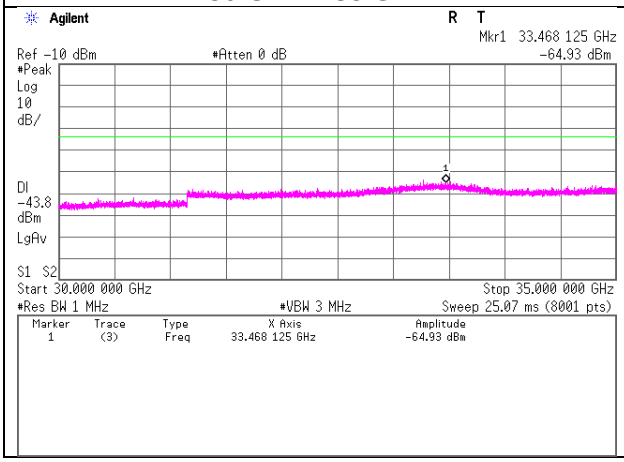
20 GHz – 25 GHz



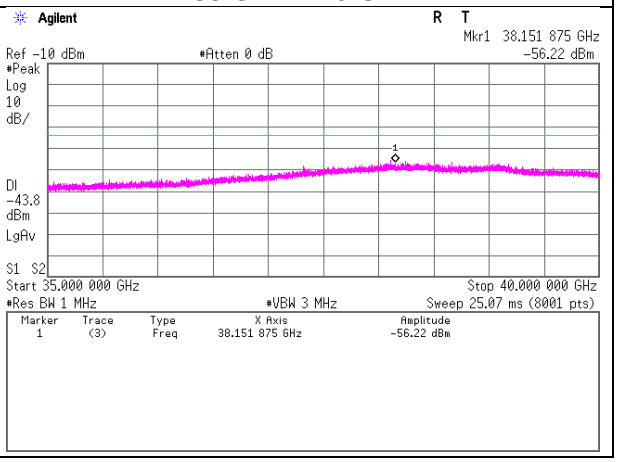
25 GHz – 30 GHz



30 GHz – 35 GHz



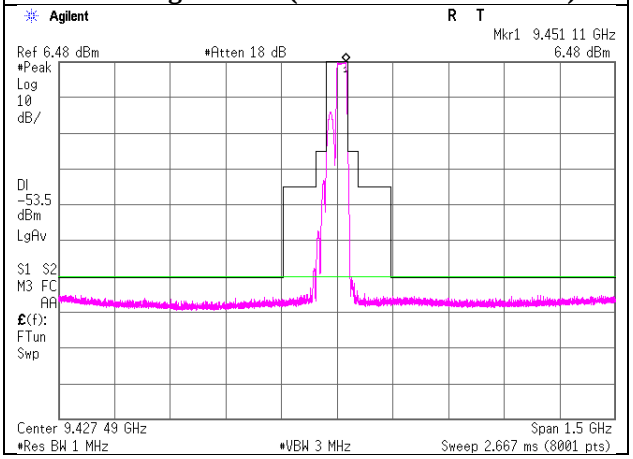
35 GHz – 40 GHz



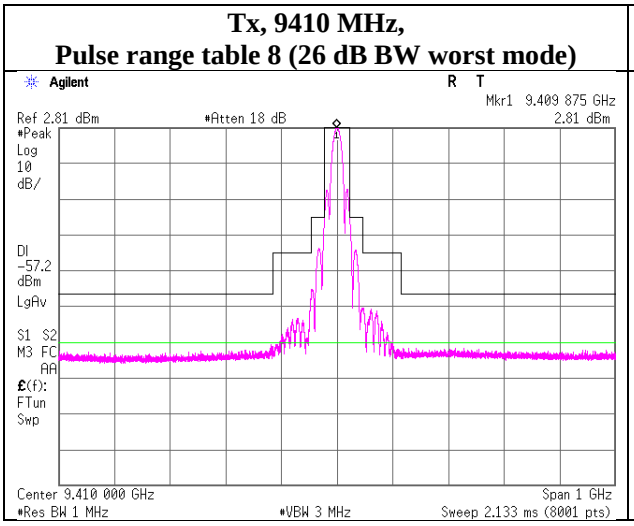
Spurious emission (Conducted)

Emission mask (Refer to FCC 80.211(f) / FCC 90.210(b) (emission mask B))

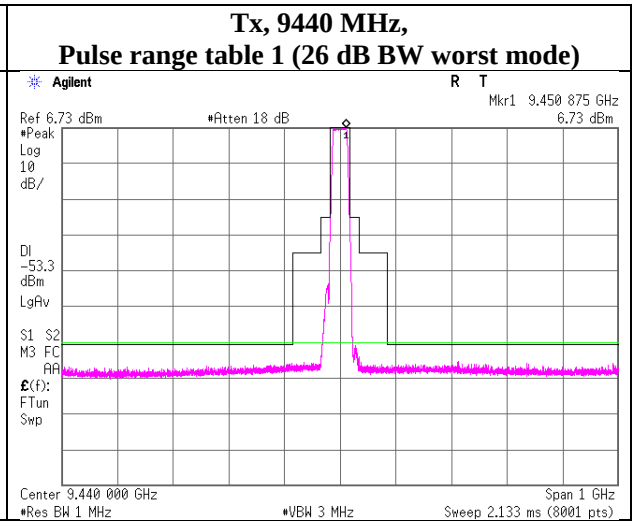
**Tx, 9410 MHz & 9440 MHz,
Pulse range table 1 (26 dB BW worst mode)**



**Tx, 9410 MHz,
Pulse range table 8 (26 dB BW worst mode)**



**Tx, 9440 MHz,
Pulse range table 1 (26 dB BW worst mode)**



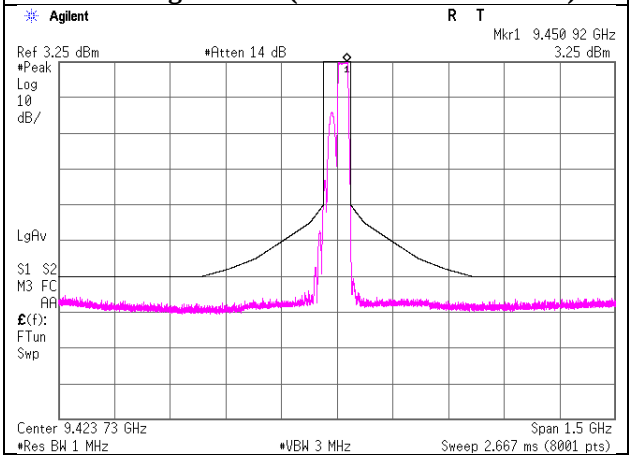
* center frequency to 50 % of nominal bandwidth (measured maximum 26 dB bandwidth): Reference Level (0 dBc) * since none-specification
* 50 % to 100 % nominal bandwidth: -25 dBc
* 100 % to 250 % nominal bandwidth: -35 dBc
* outside of 250 % nominal bandwidth: -13 dBm (Reference line -60 dBc line (green))

** Tx 9410 MHz: inserted 30 dB attenuator , Tx 9440 MHz / Tx 9410 MHz & 9440 MHz: inserted 40 dB attenuator

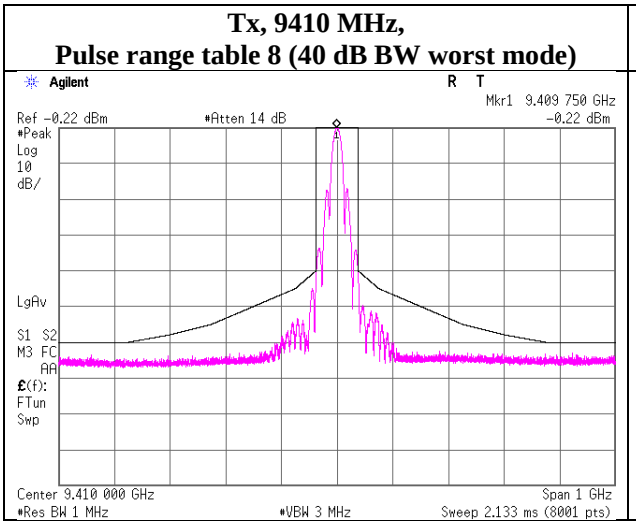
Spurious emission (Conducted)

Emission mask (Refer to RSS-238, clause 4.3)

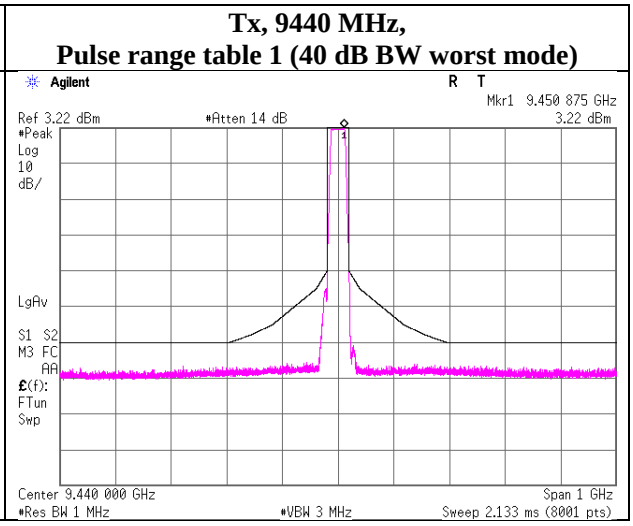
Tx, 9410 MHz & 9440 MHz,
Pulse range table 1 (40 dB BW worst mode)



Tx, 9410 MHz,
Pulse range table 8 (40 dB BW worst mode)



Tx, 9440 MHz,
Pulse range table 1 (40 dB BW worst mode)



* center frequency to 50 % of 40 dB bandwidth (measured maximum 40 dB bandwidth): Reference Level (0 dBc)
* 50 % to 500 % of 40 dB bandwidth: -40 dBc to -60 dBc (Refer to RSS-238, clause 4.3 (Refer to RSS-138 Issue 1, section 6.4.1))
* outside of 250 % of 40 dB bandwidth: -60 dBc

** Tx 9410 MHz: inserted 30 dB attenuator , Tx 9440 MHz / Tx 9410 MHz & 9440 MHz: inserted 40 dB attenuator

Radiated emission

Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	SAC 3	SAC 3	SAC 3
Date	November 6, 2024	November 5, 2024	November 5, 2024
Temperature / Humidity	24 deg. C / 34 % RH	25 deg. C / 35 % RH	25 deg. C / 35 % RH
Engineer	Kenichi Adachi (30 MHz to 1 GHz)	Kenichi Adachi (1 GHz - 18 GHz)	Yosuke Murakami (18 GHz - 40 GHz)
Mode	Transmitting 9410 MHz (P) + 9440 MHz (Q), Pulse range table 5 (worst mode)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance [m]	Result [dBuV/m]	Result [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	74.584	PK	41.83	6.27	7.18	32.14	3.0	23.14	-72.09	-13.00	59.09	249	87	-
Hori.	160.368	PK	41.69	15.13	7.96	32.06	3.0	32.72	-62.51	-13.00	49.51	196	263	
Hori.	266.666	PK	51.09	11.68	8.57	31.96	3.0	39.38	-55.85	-13.00	42.85	121	73	
Hori.	755.997	PK	34.09	20.55	10.88	31.66	3.0	33.86	-61.37	-13.00	48.37	112	114	
Hori.	1343.995	PK	51.27	25.47	13.33	41.03	3.0	49.04	-46.19	-13.00	33.19	152	194	
Hori.	2687.991	PK	52.92	27.89	14.93	41.65	3.0	54.09	-41.14	-13.00	28.14	100	165	
Hori.	8592.993	PK	51.35	37.84	19.03	43.30	3.0	64.92	-30.31	-13.00	17.31	100	229	
Hori.	9225.000	PK	48.32	38.51	19.40	43.05	3.0	63.18	-32.05	-13.00	19.05	100	0	
Hori.	9300.000	PK	48.33	38.66	19.45	43.06	3.0	63.38	-31.85	-13.00	18.85	100	0	
Hori.	9500.000	PK	48.38	38.36	19.56	43.10	3.0	63.20	-32.03	-13.00	19.03	100	0	
Hori.	18820.000	PK	53.06	40.15	13.69	48.14	1.0	58.76	-46.01	-13.00	33.01	100	136	
Hori.	18880.000	PK	62.55	40.18	13.71	48.12	1.0	68.32	-36.45	-13.00	23.45	100	142	
Hori.	28230.000	PK	69.46	43.67	17.32	61.08	1.0	69.37	-35.40	-13.00	22.40	100	279	
Hori.	28320.000	PK	85.91	43.69	17.37	61.07	1.0	85.90	-18.87	-13.00	5.87	100	250	
Hori.	37640.000	PK	55.26	44.17	20.18	64.22	1.0	55.39	-49.38	-13.00	36.38	100	0	
Hori.	37760.000	PK	59.58	44.11	20.21	64.24	1.0	59.66	-45.11	-13.00	32.11	100	225	
Vert.	31.804	PK	42.88	17.94	6.44	32.16	3.0	35.10	-60.13	-13.00	47.13	100	174	-
Vert.	74.079	PK	51.86	6.28	7.14	32.14	3.0	33.14	-62.09	-13.00	49.09	100	353	
Vert.	160.368	PK	40.98	15.13	7.96	32.06	3.0	32.01	-63.22	-13.00	50.22	100	351	
Vert.	174.098	PK	37.32	15.76	7.95	32.05	3.0	28.98	-66.25	-13.00	53.25	100	162	
Vert.	266.666	PK	53.84	11.68	8.57	31.96	3.0	42.13	-53.10	-13.00	40.10	164	125	
Vert.	755.997	PK	28.34	20.55	10.88	31.66	3.0	28.11	-67.12	-13.00	54.12	100	123	
Vert.	1343.995	PK	51.34	25.47	13.33	41.03	3.0	49.11	-46.12	-13.00	33.12	108	349	
Vert.	2687.991	PK	54.69	27.89	14.93	41.65	3.0	55.86	-39.37	-13.00	26.37	110	159	
Vert.	8592.993	PK	52.33	37.84	19.03	43.30	3.0	65.90	-29.33	-13.00	16.33	104	198	
Vert.	9225.000	PK	48.35	38.51	19.40	43.05	3.0	63.21	-32.02	-13.00	19.02	100	0	
Vert.	9300.000	PK	48.37	38.66	19.45	43.06	3.0	63.42	-31.81	-13.00	18.81	100	0	
Vert.	9500.000	PK	48.42	38.36	19.56	43.10	3.0	63.24	-31.99	-13.00	18.99	100	0	
Vert.	18820.000	PK	50.79	40.15	13.69	48.14	1.0	56.49	-48.28	-13.00	35.28	100	149	
Vert.	18880.000	PK	64.99	40.18	13.71	48.12	1.0	70.76	-34.01	-13.00	21.01	100	136	
Vert.	28230.000	PK	69.74	43.67	17.32	61.08	1.0	69.65	-35.12	-13.00	22.12	100	149	
Vert.	28320.000	PK	88.46	43.69	17.37	61.07	1.0	88.45	-16.32	-13.00	**3.32**	100	147	
Vert.	37640.000	PK	55.36	44.17	20.18	64.22	1.0	55.49	-49.28	-13.00	36.28	100	0	
Vert.	37760.000	PK	60.34	44.11	20.21	64.24	1.0	60.42	-44.35	-13.00	31.35	100	342	

Result [dBuV/m] = Reading[dBuV] + Ant Factor [dB/m]+ Loss (Cable+Attenuator/Filter)[dB] - Gain(Amprifier) [dB]

Result [dBm] = 10 x log((((10 ^ ((Result [dBuV/m] –120) / 20)) [V/m] x (Distance [m])) ^ 2) / (30 x 10 ^ ((Gain = 0 [dBi]) / 10)) x 10 ^ 3)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Limit: -13 [dBm] = 10 x log (mean power (W) x 10 ^ 3) - (43 + 10 x log (mean power (W))) (FCC 80.211(f)(3), FCC 90.210(b)(3))

Frequency Stability (Voltage)

Test place Shonan EMC Lab. No.3 Shielded Room
Date October 31, 2024
Temperature / Humidity 25 deg. C / 37 % RH
Engineer Kenichi Adachi
Mode Transmitting 9410 MHz (P) Pulse range table 7

9410 MHz

Test condituon Temperature	Voltage	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	(Specification) Limit *1) [+/- ppm]	Margin [ppm]
20 deg.C	DC 48.0 V	Power on	9410.007165	0.007165	0.76	300	299.24
		on 2 min.	9409.816698	-0.183302	-19.48	300	280.52
		on 5 min.	9409.560813	-0.439187	-46.67	300	253.33
		on 10 min.	9409.402681	-0.597319	-63.48	300	236.52
20 deg.C	DC 40.8 V	Power on	9410.069520	0.069520	7.39	300	292.61
		on 2 min.	9409.504214	-0.495786	-52.69	300	247.31
		on 5 min.	9409.452206	-0.547794	-58.21	300	241.79
		on 10 min.	9409.418454	-0.581546	-61.80	300	238.20
20 deg.C	DC 55.2 V	Power on	9410.002921	0.002921	0.31	300	299.69
		on 2 min.	9409.488888	-0.511112	-54.32	300	245.68
		on 5 min.	9409.552788	-0.447212	-47.53	300	252.47
		on 10 min.	9409.436987	-0.563013	-59.83	300	240.17

* Caliculation: Measured frequency = center frequency 9410 MHz + Frequency error

Limit: 9410.0000 MHz +/- 300 ppm = +/-2.823000 MHz

*1) (FCC) Frequency Lower Limit = 9300 + 1.5/T = 9324.1935 MHz, Upper Limit = 9500 - 1.5/T = 9475.8065 MHz (FCC part 80))

Test place Shonan EMC Lab. No.3 Shielded Room
Date October 31, 2024
Temperature / Humidity 25 deg. C / 37 % RH
Engineer Kenichi Adachi
Mode Transmitting 9440 MHz (Q) Pulse range table 5

9440 MHz

Test condituon Temperature	Voltage	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	(Specification) Limit *1) [+/- ppm]	Margin [ppm]
20 deg.C	DC 48.0 V	Power on	9440.006149	0.006149	0.65	300	299.35
		on 2 min.	9440.022065	0.022065	2.34	300	297.66
		on 5 min.	9440.083582	0.083582	8.85	300	291.15
		on 10 min.	9440.060128	0.060128	6.37	300	293.63
20 deg.C	DC 40.8 V	Power on	9439.995554	-0.004446	-0.47	300	300.47
		on 2 min.	9440.002024	0.002024	0.21	300	299.79
		on 5 min.	9439.979746	-0.020254	-2.15	300	302.15
		on 10 min.	9440.008067	0.008067	0.85	300	299.15
20 deg.C	DC 55.2 V	Power on	9440.001804	0.001804	0.19	300	299.81
		on 2 min.	9440.012467	0.012467	1.32	300	298.68
		on 5 min.	9440.060586	0.060586	6.42	300	293.58
		on 10 min.	9440.025231	0.025231	2.67	300	297.33

* Caliculation: Measured frequency = center frequency 9440 MHz + Frequency error

Limit: 9440.0000 MHz +/- 300 ppm = +/-2.832000 MHz

*1) (FCC) Frequency Lower Limit = 9300 + 1.5/T = 9300.5216 MHz, Upper Limit = 9500 - 1.5/T = 9499.4784 MHz (FCC part 80))

Frequency Stability (Temperature)

Test place	UL Japan Inc., Ise Lab. measurement room
Date	November 12, 2024
Temperature / Humidity	21 deg. C / 55 % RH
Engineer	Kiyoshiro Okazaki
Mode	Transmitting 9410 MHz (P) Pulse range table 7

9410 MHz

Test condituon Temperature	Voltage	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	(RSS-238) Limit *1) [+/- ppm]	Margin [ppm]
50 deg.C	DC 48.0 V	Power on	9409.579062	-0.420938	-44.73	1250	1205.27
		on 2 min.	9409.597467	-0.402533	-42.78	1250	1207.22
		on 5 min.	9409.611695	-0.388305	-41.27	1250	1208.73
		on 10 min.	9409.612606	-0.387394	-41.17	1250	1208.83
40 deg.C		Power on	9409.740177	-0.259823	-27.61	1250	1222.39
		on 2 min.	9409.576091	-0.423909	-45.05	1250	1204.95
		on 5 min.	9409.548823	-0.451177	-47.95	1250	1202.05
		on 10 min.	9409.496711	-0.503289	-53.48	1250	1196.52
30 deg.C		Power on	9409.463225	-0.536775	-57.04	1250	1192.96
		on 2 min.	9409.575671	-0.424329	-45.09	1250	1204.91
		on 5 min.	9409.499680	-0.500320	-53.17	1250	1196.83
		on 10 min.	9409.458972	-0.541028	-57.50	1250	1192.50
20 deg.C		Power on	9409.126456	-0.873544	-92.83	1250	1157.17
		on 2 min.	9409.192721	-0.807279	-85.79	1250	1164.21
		on 5 min.	9409.192844	-0.807156	-85.78	1250	1164.22
		on 10 min.	9409.083156	-0.916844	-97.43	1250	1152.57
10 deg.C		Power on	9409.997775	-0.002225	-0.24	1250	1249.76
		on 2 min.	9409.997598	-0.002402	-0.26	1250	1249.74
		on 5 min.	9409.997472	-0.002528	-0.27	1250	1249.73
		on 10 min.	9409.997440	-0.002560	-0.27	1250	1249.73
0 deg.C		Power on	9409.997942	-0.002058	-0.22	1250	1249.78
		on 2 min.	9409.997670	-0.002330	-0.25	1250	1249.75
		on 5 min.	9409.997625	-0.002375	-0.25	1250	1249.75
		on 10 min.	9409.997542	-0.002458	-0.26	1250	1249.74
-10 deg.C		Power on	9409.723995	-0.276005	-29.33	1250	1220.67
		on 2 min.	9409.432583	-0.567417	-60.30	1250	1189.70
		on 5 min.	9409.337256	-0.662744	-70.43	1250	1179.57
		on 10 min.	9409.308812	-0.691188	-73.45	1250	1176.55
-20 deg.C		Power on	9409.478591	-0.521409	-55.41	1250	1194.59
		on 2 min.	9409.808898	-0.191102	-20.31	1250	1229.69
		on 5 min.	9409.819802	-0.180198	-19.15	1250	1230.85
		on 10 min.	9409.822423	-0.177577	-18.87	1250	1231.13
-30 deg.C		Power on	9409.979800	-0.020200	-2.15	1250	1247.85
		on 2 min.	9409.925061	-0.074939	-7.96	1250	1242.04
		on 5 min.	9409.908014	-0.091986	-9.78	1250	1240.22
		on 10 min.	9409.940703	-0.059297	-6.30	1250	1243.70

* Caliculation: Measured frequency = center frequency 9410 MHz + Frequency error

Limit: 9410.0000 MHz +/- 1250 ppm = +/-11.762500 MHz

*1) (FCC) Frequency Lower Limit = 9300 + 1.5/T = 9300.006153 MHz, Upper Limit = 9500 - 1.5/T = 9499.993847 MHz (FCC part 80))

Frequency Stability (Temperature)

Test place	UL Japan Inc., Ise Lab. measurement room
Date	November 12, 2024
Temperature / Humidity	21 deg. C / 55 % RH
Engineer	Kiyoshiro Okazaki
Mode	Transmitting 9440 MHz (Q) Pulse range table 5

9440 MHz

Test condituon Temperature	Voltage	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	(RSS-238) Limit *1) [+/- ppm]	Margin [ppm]
50 deg.C	DC 48.0 V	Power on	9440.110382	0.110382	11.69	1250	1238.31
		on 2 min.	9440.081282	0.081282	8.61	1250	1241.39
		on 5 min.	9440.039846	0.039846	4.22	1250	1245.78
		on 10 min.	9440.039469	0.039469	4.18	1250	1245.82
40 deg.C		Power on	9439.902311	-0.097689	-10.35	1250	1260.35
		on 2 min.	9440.068068	0.068068	7.21	1250	1242.79
		on 5 min.	9440.061318	0.061318	6.50	1250	1243.50
		on 10 min.	9440.054341	0.054341	5.76	1250	1244.24
30 deg.C		Power on	9439.992270	-0.007730	-0.82	1250	1250.82
		on 2 min.	9439.987544	-0.012456	-1.32	1250	1251.32
		on 5 min.	9440.017848	0.017848	1.89	1250	1248.11
		on 10 min.	9440.034812	0.034812	3.69	1250	1246.31
20 deg.C		Power on	9440.096447	0.096447	10.22	1250	1239.78
		on 2 min.	9439.989928	-0.010072	-1.07	1250	1251.07
		on 5 min.	9440.037170	0.037170	3.94	1250	1246.06
		on 10 min.	9440.049349	0.049349	5.23	1250	1244.77
10 deg.C		Power on	9440.092688	0.092688	9.82	1250	1240.18
		on 2 min.	9440.025542	0.025542	2.71	1250	1247.29
		on 5 min.	9440.046856	0.046856	4.96	1250	1245.04
		on 10 min.	9440.015255	0.015255	1.62	1250	1248.38
0 deg.C		Power on	9440.179202	0.179202	18.98	1250	1231.02
		on 2 min.	9440.050727	0.050727	5.37	1250	1244.63
		on 5 min.	9440.055055	0.055055	5.83	1250	1244.17
		on 10 min.	9440.031717	0.031717	3.36	1250	1246.64
-10 deg.C		Power on	9440.185695	0.185695	19.67	1250	1230.33
		on 2 min.	9440.056424	0.056424	5.98	1250	1244.02
		on 5 min.	9440.033270	0.033270	3.52	1250	1246.48
		on 10 min.	9440.014603	0.014603	1.55	1250	1248.45
-20 deg.C		Power on	9439.938542	-0.061458	-6.51	1250	1256.51
		on 2 min.	9440.009475	0.009475	1.00	1250	1249.00
		on 5 min.	9440.021145	0.021145	2.24	1250	1247.76
		on 10 min.	9440.022103	0.022103	2.34	1250	1247.66
-30 deg.C		Power on	9440.159435	0.159435	16.89	1250	1233.11
		on 2 min.	9440.031245	0.031245	3.31	1250	1246.69
		on 5 min.	9440.030289	0.030289	3.21	1250	1246.79
		on 10 min.	9440.026893	0.026893	2.85	1250	1247.15

* Caliculation: Measured frequency = center frequency 9440 MHz + Frequency error

Limit: 9440.0000 MHz +/- 1250 ppm = +/-11.800000 MHz

*1) (FCC) Frequency Lower Limit = 9300 + 1.5/T = 9300.006153 MHz, Upper Limit = 9500 - 1.5/T = 9499.993847 MHz (FCC part 80))

APPENDIX 2: Test instruments

Test Instruments (1/2)

Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int (Month)
AT	145144	Attenuator	Keysight Technologies Inc	8493C-020	74891	2024/03/05	12
AT	145174	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	2024/03/07	12
AT	145347	Coaxial Crystal Detector	Keysight Technologies Inc	8473C	MY42240890	-	-
AT	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2024/03/25	12
AT	145801	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250152	2024/08/29	12
AT	146267	Power Meter	Anritsu Corporation	ML2495A	850009	2024/05/14	12
AT	146309	Power sensor	Anritsu Corporation	MA2411B	917063	2024/05/14	12
AT	179108	Coaxial Cable	Junkosha	MWX241-03000KMSKMS/B	1901Q033-R	2024/04/09	12
AT	236410	Spectrum Analyzer	Keysight Technologies Inc	N9030B	MY63050151	2024/04/26	12
AT	242068	Attenuator	Weinschel Corp.	54A-10	120524	2023/11/02	12
AT	245996	Digital Oscilloscope	RIGOL	DHO4404	HDO4A250200006	2024/05/24	12
AT, RE	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2024/09/24	12
AT, RE	191840	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2024/08/12	12
RE	144892	Attenuator	Keysight Technologies Inc	8490D 010	6036	2024/10/10	12
RE	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	2046104	2024/02/16	12
RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2024/08/21	12
RE	145023	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	91032666	2024/05/10	12
RE	145126	Pre Amplifier	SONOMA	310N	290213	2024/02/07	12
RE	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	B3208602403-176	2024/05/09	12
RE	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	2024/04/01	12
RE	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2024/08/21	12
RE	145501	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-739	2024/03/20	12
RE	145512	Horn Antenna	ETS-Lindgren	3160-09	00094868	2024/06/20	12
RE	145514	Horn Antenna	ETS-Lindgren	3160-10	00092383	2024/06/20	12
RE	145529	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	196	2024/05/10	12
RE	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2024/04/03	12
RE	146432	Tape Measure	TAJIMA	GL19-55	-	-	-
RE	156380	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	SN MY 13406/4E	2024/05/09	12
RE	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	Ver 3.1.0546	-	-
RE	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2024/03/05	12
RE	196945	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803414/2	2024/03/12	12
RE	206229	Bandpass Filter	Micro-Tronics	BPC50411	086	2024/03/05	12
RE	213530	Test Receiver	Rohde & Schwarz	ESW44	103068	2024/02/22	12
RE	243217	Coaxial Cable	Hayashi-Repic co., Ltd.	SMS13-13A26-NMS13-9.0m	49306-01-04	2023/12/20	12
RE	248303	Attenuator	JFW	50HFFA-006-2/18N	-	2024/05/06	12

Test Instruments (2/2)

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
FS	141269	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	03/08/2024	12
FS	141329	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	04/08/2024	12
FS	141360	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	070900532	01/31/2024	12
FS	141572	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	3401	01/10/2024	12
FS	141885	Spectrum Analyzer	Keysight Technologies Inc	E4448A	US44300523	11/29/2023	12
FS	66130	Humidity Chamber	Espec	EWSH282-4CW	3010226D	05/15/2024	12

***Hyphens for Last Calibration Date, Calibration Due 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.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

Test item: RE: Radiated Emission test,
AT: Antenna Terminal Conducted test
FS: Frequency Stability