Test Report

(FCC Rules 47 CFR,
2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, and 80.209, 80.211, 80.213, 80.215)

For

Trade name: Furuno
Model: Transceiver for Radar Sensor DRS6A-NXT
Type: RTR-119

Report no.: LIC 12-16-165
Rev.1

Date of Revised issue: 3 March 2017

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Report Summary

LIC project number:	LIC 04-16-0387		
Test report number of initial issue:	LIC 12-16-165	Date of initial issue	27 February 2017
Test report number of revised/replaced issue:	LIC 12-16-165, Rev.1	Date of revised/replaced issue	3 March 2017
Test report revision/ replacement history:	Rev. no.: 1 Date: 3 March 2017 Page: --- Item: ---	Description of change/reason:	Photograph of Test Setup/Arrangement was removed at the customer's request.
Test standard(s)/ Test specifications:	FCC Rules 47 CFR, Sections: 2.1046 - RF Power Output 2.1047 - Modulation Characteristics 2.1049 - Occupied Bandwidth 2.1051 - Spurious Emissions at Antenna Terminals 2.1053 - Field Strength of Spurious Radiation 2.1055 - Frequency Stability 80.209 - Transmitter frequency tolerances 80.211 - Emission limitations 80.213 - Modulation requirements 80.215 - Transmitter power		
Customer:	Furuno Electric Co., Ltd. 9-52 Ashihara-Cho, Nishinomiya-City, 662-8580 Japan		
Manufacturer:	Furuno Electric Co., Ltd. 9-52 Ashihara-Cho, Nishinomiya-City, 662-8580 Japan		
Trade name:	Furuno		
Model:	Transceiver for Radar Sensor DRS6A-NXT		
Type:	RTR-119		
Product function and intended use:	For Marine Safety Navigation		
Number of samples tested:	One		
Serial number:	1000-7200-0001		
Power rating:	12/24 VDC, 9.5/5.0 A		
Product status:	Pre-production model		
Modifications made to samples during testing:	None.		
Date of receipt of samples:	2 December 2016		
Test period:	From 6 December 2016 to 12 January 2017		
Place of test:	Labotech International Co., Ltd. FCC Test firm Designation Number: JP2007, FCC Test firm Registration #: 838049 - LABOTECH EMC Center 1-16, Fukazu-cho, Nishinomiya-shi, Hyogo, 663-8203 Japan Anechoic Chamber used for the test has also been registered by FCC. (FCC File number: 818191) - Nishinomiya-Hama Lab. 2-20, Nishinomiya-Hama, Nishinomiya-shi, Hyogo, 662-0934 Japan Anechoic Chamber used for the test has also been registered by FCC. (FCC File number: 90607)		
Test results/ Compliance:	Passed. The test results of this report relate only to the samples tested.		
Tested by:	Atsushi Takagi and Yuya Katoh		
Written by:	Akiko Inoue		
Verified by:	Yasuharu Nakamura		

Approved by:	3 March 2017 Name: Yasuharu Nakamura Title: Manager, Technical Department, Labotech International Co., Ltd. Signature:

Testing Laboratory Status

Labotech International Co., Ltd. (hereafter called "LIC") has been holding the following status after having been assessed according to the provisions of ISO/IEC 17025 and/or the relevant rules:

(1) JAB Accredited Testing Laboratory:
- accredited by Japan Accreditation Board (JAB),
- Laboratory accreditation number: RTL03220
- Date of initial accreditation: 14 January 2011 (*)
- Scope of accreditation: Electrical testing - EMC, Climatic, and Vibration tests

(2) Telefication Listed Testing Laboratory:
- listed by Telefication B. V., (The Netherlands)
- Laboratory assignment number: L116
- Date of initial listing: 26 July 1999 (*)
- for testing the following product categories/ test standards: EN 60945, IEC 61162-1/-2, IEC/EN 61162-450 and IEC 62288

(3) TÜV Appointed EMC Test Laboratory:
- appointed by TÜV Rheinland Japan Ltd.,
- Laboratory assignment number: UA 50046428
- Date of initial appointment: 21 December 1998 (*)
- for carrying out the tests of:
  EN 55011, CISPR 11, EN 55012, CISPR 12,EN 55022, CISPR 22, EN 55024, CISPR 24, EN 55025, CISPR 25, EN/IEC 61000-3-2/-3, EN/IEC 61000-4-2/-3/-4/-5/-6/-8/-11, EN/IEC 61000-6-1/-2/-3/-4, EN/IEC 60945, EN/IEC 61326-1, EN/IEC 61326-2-6, EN/IEC 60601-1-2, JIS T 0601-1-2, JIS C 1806-1, ISO 11452-1/-2/-4, EN ISO 14982, IEC 62236-3-2, EN 50121-3-2.

(4) RMRS Recognized Testing Laboratory:
- recognized by Russian Maritime Register of Shipping (RMRS), (Russia)
- Laboratory recognition number: 11.02594.011
- Date of initial recognition: 27 January 2009 (*)
- for carrying out testing in the field of:
  Electrical measurements and tests, EMC tests, Mechanical measurements and tests, Equipment protection degree tests, and Climatic tests for Ship's radio and navigational equipment and IEC 60945: 2002

(5) RRR Recognized Test Laboratory:
- recognized by Russian River Register (RRR), (Russia)
- Recognition certificate number: 154262 (*)
- Date of initial recognition: 31 May 2013
- for carrying out of tests of ships radio and navigation equipment

(6) DNV GL Recognized Environmental Test Laboratory:
- recognized by Det Norske Veritas AS, Germanischer Lloyd (DNV GL), (Norway)
- Recognition certificate number: 262.1-015854-J-12
- Date of initial recognition: 12 July 2013 (*)
- Scope of recognition: Testing according to the standards IEC 60945, IEC 61162-1/-2/-450, IEC 62288, IEC 62388 and IEC 62252 Annex E
- Application: Provisions of Environmental, interface and safety testing.

(7) CCS Recognized Test Agency :
- recognized by China Classification Society
- Recognition certificate number : DB13A00001
- Date of initial recognition : 29 January 2014 (*)
- Scope of recognition : Performance/Environmental/EMC/Special purpose/Safety precautions tests for Electrical & Electronic Product including Maritime Navigation and Radio-communication Equipment & Systems

Note: (*) – The current certificates may be found in the LIC web site (http://www.labotech-intl.co.jp/).

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1 Principal Information

1.1 Equipment under test (EUT)

1.1.1 General

(a) Trade name: Furuno

(b) Manufacturer: Furuno Electric Co., Ltd.
9-52, Ashihara-cho, Nishinomiya-city, 662-8580 Japan

(c) Model: Radar Sensor DRS6A-NXT

	Type	Serial Number	Note
Radar Sensor	DRS6A-NXT	1000-7200-0001	
Scanner unit	RSB-137	1000-7200-0001	Antenna rotation rate: 24/36/48 rpm
Transceiver unit	RTR-119	1000-7200-0001	Contained in the Scanner unit.
Antenna radiator	XN10A/XN12A/XN13A	---	One selectable.

(d) FCC ID: ADB9ZWRTR119

(e) Primary Function: Search, Navigation and Anti-collision

(f) Frequency Range: Fixed frequency, X-band (9380-9440 MHz)
Type of Emission: P0N/Q0N
(Emission designator)

(g) Occupied bandwidth:

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2
Occupied bandwidth (MHz)	ch1(P0N)	57.75	50.42	37.58	26.58	18.33	11.00	8.25	8.25
	ch1(Q0N)	19.25	19.25	15.58	9.17	8.25	6.42	5.50	4.58
	ch2(P0N)	55.92	51.33	39.42	28.42	18.33	10.08	8.25	8.25
	ch2(Q0N)	19.25	19.25	15.58	9.17	8.25	6.42	6.42	4.58
	ch3(P0N)	55.00	51.33	39.42	28.42	17.42	11.92	8.25	8.25
	ch3(Q0N)	19.25	19.25	15.58	9.17	8.25	6.42	5.50	4.58

Note: representative measured data.

(h) Size and mass: Antenna Unit: 1036 mm x 445 mm (H), 20 kg (*1)
Antenna Unit: 1255 mm x 445 mm (H), 21 kg (*2)
Antenna Unit: 1795 mm x 445 mm (H), 23 kg (*3)
(*1): with Antenna XN10A installed.
(*2): with Antenna XN12A installed.
(*3): with Antenna XN13A installed.

(i) Power Supply: 12/24 VDC

1.1.2 Transceiver

Type: RTR-119 (Contained in the Antenna Unit)

1.1.2.1 Transmitter

(a) Assignable Frequency for Shipborne Radar:
Between 9300 and 9500 MHz (FCC Rule, 80.375 (d)-(1))

(b) Type of RF Generator:
Type: Solid-state device (no magnetron)
Peak Output Power: 20 W nominal

(c) Tx frequency: ch1: 9380 MHz (P0N)/ 9400 MHz (Q0N)
ch2: 9400 MHz (P0N)/ 9420 MHz (Q0N)
ch3: 9420 MHz (P0N)/ 9440 MHz (Q0N)

(d) Pulse Characteristics:

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulse length (μs) P0N/Q0N	0.04/5.0	0.08/5.0	0.15/7.5	0.3/11	0.5/13	0.8/15	1.2/18	1.2/48
P.R.F.(Hz)	2000	2000	2000	2000	2000	1100	1100	700

1.1.2.2 Receiver

(a) Passband
RF Stage: 300 MHz
IF Stage: 60 MHz
(b) Intermediate Frequency: 93.75 MHz
(c) Gain (overall): Approximately 40 dB
(d) Overall Noise Figure: 5 dB (typical)
(e) Video Output Voltage: Not provided (by LAN communication)
(f) Features Provided: Sensitivity Time Controls (Anti-clutter Sea)
Fast Time Constant (Anti-clutter Rain)
(g) If receiver is tunable, describe method for adjusting frequency: Not provided.

1.1.3 Antenna and Scanner

(a) Antenna Rotation ON-OFF Switch: Not provided.
(b) Construction: Slotted array antenna
(c) Length:

Antenna type	XN10A	XN12A	XN13A
Length (cm)	103.6	125.5	179.5

(d) Type of Beam: Vertical fan
(e) Beam Width (3 dB):

Antenna type	XN10A	XN12A	XN13A
Horizontal (°)	2.3	1.9	1.4
Vertical (°)	22	22	22

(f) Polarization: Horizontal
(g) Antenna Gain:

Antenna type	XN10A	XN12A	XN13A
Gain (dBi)	27.5	28.5	30.0

(h) Attenuation of Major Side and Back Lobes with respect to main beam:

Antenna type	XN10A	XN12A	XN13A
Within ±20° (dB)	-20	-27 (±10°)	-29 (±10°)
Outside ±20° (dB)	-28	-34 (±10°)	-37 (±10°)

(i) Scanning (rotating or oscillating): Rotating over 360° continuously clockwise
(j) Antenna Rotation Rate: 24/36/48 rpm
(k) Sector Scan: Provided.
(l) Rated Loss of Transmission line per hundred feet:
Negligible. (Transmission path is only in the antenna unit.)

1.1.4 Operational Features

(a) Is positive means provided to indicate whether or not the overall operation of the equipment is such that it may be relied upon to provide effective operation in accordance with its primary function: Yes (Receiver tuning indicator)
(b) Is the equipment for continuous operation: Yes
(c) Is provision made for operation with shore based radar beacons (RACONS): No

1.1.5 Construction Features

(a) Does equipment embody replacement units with chassis type assembly: Yes
(b) Are fuse alarms provided: No
(c) State units that are weatherproof: Antenna Unit (IEC 60529 – IP56)
(d) If all units are not housed in a single container, indicate number and give description of individual units: See Clause 1.1.1 (c) of this report.
(e) Approximate space required for installation excluding antenna unit: Not applicable.

1.2 Observation and comments

None.

2 Test Results Summary

Clause no. of this report	47 CFR Section	Item	Result	Test Engineer
3.1	2.1046 (a), 80.215	RF Power Output	Passed.	A. Takagi
3.2	2.1047	Modulation Characteristics	Passed.	A. Takagi
3.3	2.1055 (a)(2),(d)(1),(d)(3) 80.209 (b)	Frequency Stability	Passed.	A. Takagi
3.4	2.1049 (c)(1), 80.209 (b), 80.211 (f)	Occupied Bandwidth	Passed.	A. Takagi
3.5	2.1051, 80.211 (f)	Spurious Emissions at Antenna Terminals	Passed.	A. Takagi
3.6	2.1053, 80.211 (f)	Field Strength of Spurious Radiation	Passed.	A. Takagi and Y. Katoh

3 Test Results

3.1 RF Power Output (FCC Rule 47 CFR, 2.1046 and 80.215)

(1) Test conditions:

For all TX (S0/S1/S2/M1/M2/M3/L1/L2) Pulses, the transmitter output power was measured at the antenna port with Antenna replaced with the Non-reflective load.

(2) Test setup:

See Clause 4.

(3) Test Results:

CH1, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.001	0.002	0.004	0.007	0.013	0.011	0.017	0.011
Transmission pulse power Pp (W) (*1)	12.1	12.3	12.2	12.5	12.7	12.8	12.8	12.7
Pulse length *T* (µs) (-6 dB points)	0.038	0.070	0.144	0.295	0.498	0.796	1.198	1.198
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH1, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.144	0.150	0.213	0.311	0.372	0.239	0.305	0.480
Transmission pulse power Pp (W) (*1)	14.4	15.0	14.2	14.1	14.3	14.5	15.4	14.3
Pulse length T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH2, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.001	0.002	0.004	0.008	0.014	0.012	0.018	0.011
Transmission pulse power Pp (W) (*1)	12.6	13.2	13.3	13.5	13.6	13.5	13.7	13.6
Pulse length T (µs) (-6 dB points)	0.039	0.072	0.145	0.295	0.498	0.798	1.196	1.196
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH2, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.142	0.142	0.210	0.308	0.367	0.233	0.277	0.434
Transmission pulse power Pp (W) (*1)	14.2	14.2	14.0	14.0	14.1	14.1	14.0	12.9
Pulse length T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH3, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.001	0.002	0.004	0.008	0.013	0.012	0.018	0.011
Transmission pulse power Pp (W) (*1)	12.6	12.9	13.1	13.3	13.3	13.3	13.4	13.3
Pulse length T (µs) (-6 dB points)	0.039	0.073	0.144	0.294	0.498	0.798	1.198	1.198
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH3, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Transmission mean power Pm (W)	0.139	0.142	0.224	0.333	0.394	0.245	0.294	0.466
Transmission pulse power Pp (W) (*1)	13.9	14.2	14.9	15.1	15.1	14.9	14.8	13.9
Pulse length T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

(*1) P_p (W) = (P_m (W) / (T (µs) × PRF (Hz))) × 1000000

Environmental conditions observed: On 25 December 2016, 20°C to 20°C, 64%RH to 64%RH
On 27 December 2016, 20°C to 20°C, 64%RH to 64%RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

3.2 Modulation Characteristics (FCC Rule 47 CFR, 2.1047)

(1) Test Conditions:

The RF envelope of the magnetron output pulse was measured using an envelope detector and an oscilloscope. Each pulse spectrum was measured using a spectrum analyzer.

(2) Test setup:

See Clause 4.

(3) Test Results:

CH1, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	0.038	0.070	0.144	0.295	0.498	0.796	1.198	1.198
Rise time tr (µs) (10 - 90 % amplitude)	0.034	0.033	0.034	0.032	0.031	0.031	0.031	0.032
Fall time tf (µs) (90 - 10 % amplitude)	0.021	0.028	0.026	0.027	0.025	0.025	0.024	0.025
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH1, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
Rise time tr (µs) (10 - 90 % amplitude)	0.120	0.120	0.216	0.296	0.300	0.380	0.500	1.320
Fall time tf (µs) (90 - 10 % amplitude)	0.126	0.126	0.208	0.284	0.348	0.404	0.488	1.360
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH2, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	0.039	0.072	0.145	0.295	0.498	0.798	1.196	1.196
Rise time tr (µs) (10 - 90 % amplitude)	0.032	0.033	0.031	0.031	0.029	0.030	0.030	0.030
Fall time tf (µs) (90 - 10 % amplitude)	0.022	0.028	0.025	0.026	0.026	0.026	0.025	0.025
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH2, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
Rise time tr (µs) (10 - 90 % amplitude)	0.136	0.128	0.216	0.288	0.340	0.380	0.520	1.280
Fall time tf (µs) (90 - 10 % amplitude)	0.134	0.132	0.202	0.294	0.348	0.400	0.488	1.340
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH3, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	0.039	0.073	0.144	0.294	0.498	0.798	1.198	1.198
Rise time tr (µs) (10 - 90 % amplitude)	0.028	0.030	0.029	0.025	0.024	0.027	0.025	0.024
Fall time tf (µs) (90 - 10 % amplitude)	0.023	0.031	0.029	0.030	0.029	0.030	0.027	0.028
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

CH3, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Pulselength T (µs) (-6 dB points)	5.000	5.000	7.500	11.000	13.000	15.000	18.000	48.000
Rise time tr (µs) (10 - 90 % amplitude)	0.136	0.120	0.192	0.280	0.360	0.400	0.480	1.360
Fall time tf (µs) (90 - 10 % amplitude)	0.134	0.136	0.208	0.298	0.356	0.408	0.472	1.288
PRF (Hz)	2000	2000	2000	2000	2000	1100	1100	700

Measured Plots: See Clause 7.

Environmental conditions observed: On 27 December 2016, 20°C to 20°C, 64%RH to 64%RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

3.3 Frequency Stability –temperature & voltage (FCC Rule 47 CFR, 2.1055(a)(2)/(d)(1)/(d)(3), 80.209(b))

(1) Test Conditions:

(1) Radar Transmitter settings: All TX (S0/S1/S2/M1/M2/M3/L1/L2) Pulses
(2) Ambient Temperature settings: -20°C to +50°C (10°C interval)
(3) Power Supply Voltage settings: 85/100/115 % of nominal voltage
DC Processor unit (24 VDC): 10.2/24.0/27.6 VDC

(2) Test setup:

See Clause 4.

(3) Frequency Tolerance Limits (FCC Rule 47 CFR, 80.209(b)):

CH1, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	39.27	21.31	10.39	5.08	3.01	1.88	1.25	1.25
f(U) (MHz) (*2)	9460.7	9478.7	9489.6	9494.9	9497.0	9498.1	9498.7	9498.7
f(L) (MHz) (*2)	9339.3	9321.3	9310.4	9305.1	9303.0	9301.9	9301.3	9301.3

CH1, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	0.30	0.30	0.20	0.14	0.12	0.10	0.08	0.03
f(U) (MHz) (*2)	9499.7	9499.7	9499.8	9499.9	9499.9	9499.9	9499.9	9500.0
f(L) (MHz) (*2)	9300.3	9300.3	9300.2	9300.1	9300.1	9300.1	9300.1	9300.0

CH2, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	38.46	20.83	10.36	5.08	3.01	1.88	1.25	1.25
f(U) (MHz) (*2)	9461.5	9479.2	9489.6	9494.9	9497.0	9498.1	9498.7	9498.7
f(L) (MHz) (*2)	9338.5	9320.8	9310.4	9305.1	9303.0	9301.9	9301.3	9301.3

CH2, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	0.30	0.30	0.20	0.14	0.12	0.10	0.08	0.03
f(U) (MHz) (*2)	9499.7	9499.7	9499.8	9499.9	9499.9	9499.9	9499.9	9500.0
f(L) (MHz) (*2)	9300.3	9300.3	9300.2	9300.1	9300.1	9300.1	9300.1	9300.0

CH3, P0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	38.86	20.60	10.39	5.10	3.01	1.88	1.25	1.25
f(U) (MHz) (*2)	9461.1	9479.4	9489.6	9494.9	9497.0	9498.1	9498.7	9498.7
f(L) (MHz) (*2)	9338.9	9320.6	9310.4	9305.1	9303.0	9301.9	9301.3	9301.3

CH3, Q0N

Pulse type	S0	S1	S2	M1	M2	M3	L1	L2
Guard Band f(1.5/T) (MHz) (*1)	0.30	0.30	0.20	0.14	0.12	0.10	0.08	0.03
f(U) (MHz) (*2)	9499.7	9499.7	9499.8	9499.9	9499.9	9499.9	9499.9	9500.0
f(L) (MHz) (*2)	9300.3	9300.3	9300.2	9300.1	9300.1	9300.1	9300.1	9300.0

(*1): Guard Band is specified to be equal to 1.5/T MHz, where "T" is the pulselength in microseconds.
(FCC Rule 47 CFR, 80.209(b))
(*2): Upper limit frequency, f(U) = 9500 -1.5/T
Lower limit frequency, f(L) = 9300 +1.5/T

(4) Test Results:

Complied.

(4.1) At the rated supply voltage of 24.0 VDC:

CH1, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9381.3	9380.2	9380.5	9380.5	9380.0	9380.0	9380.0	9380.0	Complied
	-10°C	9380.2	9381.7	9380.7	9380.3	9380.2	9380.2	9380.2	9380.2	Complied
	0°C	9381.7	9380.9	9380.2	9379.8	9380.0	9380.0	9380.0	9380.3	Complied
	+10°C	9380.3	9380.0	9380.7	9380.2	9380.2	9380.2	9380.2	9380.2	Complied
	+20°C	9381.3	9380.3	9380.7	9380.3	9380.3	9380.3	9380.3	9380.3	Complied
	+30°C	9380.8	9380.3	9380.0	9380.0	9380.0	9380.0	9380.0	9380.2	Complied
	+40°C	9381.0	9379.5	9379.8	9379.8	9379.8	9380.0	9380.0	9380.0	Complied
	+50°C	9380.8	9380.8	9379.8	9379.8	9380.2	9380.2	9380.0	9380.2	Complied

CH1, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9399.8	9399.8	9400.0	9400.7	9400.0	9400.7	9400.5	9401.0	Complied
	-10°C	9400.0	9400.2	9400.3	9399.5	9400.7	9400.8	9401.3	9400.3	Complied
	0°C	9400.2	9401.0	9399.3	9399.7	9400.0	9400.2	9400.7	9399.7	Complied
	+10°C	9399.8	9399.8	9400.7	9400.5	9399.7	9400.3	9399.7	9401.2	Complied
	+20°C	9399.7	9400.3	9400.2	9400.8	9400.5	9399.5	9400.8	9399.3	Complied
	+30°C	9400.0	9399.7	9399.0	9401.0	9400.0	9400.5	9399.8	9399.3	Complied
	+40°C	9400.0	9399.8	9400.0	9399.0	9400.0	9399.8	9399.5	9399.3	Complied
	+50°C	9400.3	9399.8	9399.3	9400.0	9399.3	9400.5	9400.2	9400.3	Complied

CH2, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9400.3	9400.0	9400.2	9400.7	9400.3	9400.5	9400.5	9400.3	Complied
	-10°C	9400.5	9401.5	9400.7	9400.0	9400.5	9400.3	9400.3	9400.3	Complied
	0°C	9401.8	9401.2	9400.5	9400.2	9400.5	9400.0	9400.3	9400.3	Complied
	+10°C	9400.5	9400.3	9400.5	9400.7	9400.2	9400.3	9400.2	9400.2	Complied
	+20°C	9401.8	9401.2	9400.2	9400.2	9400.3	9400.3	9400.2	9400.3	Complied
	+30°C	9400.3	9401.2	9400.3	9399.7	9400.3	9400.0	9400.2	9400.2	Complied
	+40°C	9401.5	9399.8	9399.8	9400.7	9400.3	9400.3	9400.2	9400.2	Complied
	+50°C	9402.0	9401.5	9400.5	9400.7	9400.2	9400.0	9400.2	9400.3	Complied

CH2, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9420.2	9420.8	9419.5	9419.5	9420.3	9420.2	9420.5	9419.7	Complied
	-10°C	9420.5	9419.7	9420.5	9420.2	9420.7	9419.7	9421.5	9421.3	Complied
	0°C	9420.3	9419.8	9420.2	9420.2	9420.2	9419.2	9419.7	9421.2	Complied
	+10°C	9419.8	9420.2	9421.0	9421.2	9420.0	9419.5	9420.5	9420.8	Complied
	+20°C	9420.5	9419.8	9420.2	9420.7	9420.2	9420.0	9419.5	9420.8	Complied
	+30°C	9420.2	9420.3	9420.5	9421.5	9419.7	9420.5	9421.3	9420.3	Complied
	+40°C	9421.0	9421.3	9421.3	9420.8	9420.2	9420.5	9421.5	9420.3	Complied
	+50°C	9419.7	9419.5	9419.7	9419.8	9420.3	9419.8	9419.7	9420.8	Complied

CH3, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9420.8	9419.3	9420.8	9420.5	9420.5	9420.3	9420.3	9420.3	Complied
	-10°C	9419.7	9419.2	9419.7	9419.8	9420.3	9420.2	9420.2	9420.3	Complied
	0°C	9420.7	9419.3	9420.7	9420.7	9420.5	9420.3	9420.2	9420.3	Complied
	+10°C	9418.7	9419.5	9420.0	9420.3	9420.3	9420.2	9420.2	9420.2	Complied
	+20°C	9419.8	9419.5	9420.3	9420.0	9420.2	9420.3	9420.3	9420.2	Complied
	+30°C	9419.3	9420.2	9419.7	9419.7	9420.0	9420.0	9420.0	9420.2	Complied
	+40°C	9421.2	9419.3	9419.5	9420.2	9420.0	9420.2	9420.2	9420.0	Complied
	+50°C	9420.0	9418.8	9419.7	9420.5	9419.8	9420.2	9420.2	9420.3	Complied

CH3, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	-20°C	9440.0	9439.3	9439.5	9439.8	9440.3	9440.3	9440.8	9440.0	Complied
	-10°C	9440.5	9440.2	9440.5	9441.2	9441.2	9440.3	9440.2	9439.5	Complied
	0°C	9440.7	9440.7	9440.0	9440.7	9440.2	9440.3	9439.7	9440.5	Complied
	+10°C	9440.7	9440.7	9440.0	9440.2	9440.7	9440.2	9441.0	9440.3	Complied
	+20°C	9441.2	9440.8	9439.7	9441.0	9440.7	9441.2	9439.5	9441.0	Complied
	+30°C	9440.2	9440.3	9440.3	9440.3	9440.5	9440.5	9439.0	9440.7	Complied
	+40°C	9439.7	9439.0	9439.0	9438.5	9439.8	9439.2	9440.0	9439.3	Complied
	+50°C	9440.0	9440.3	9439.8	9440.2	9440.5	9440.8	9439.8	9440.8	Complied

(4.2) At the temperature of +20°C:

CH1, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9381.2	9380.2	9380.2	9380.2	9379.8	9380.0	9380.2	9380.2	Complied
	24.0 VDC	9381.3	9380.3	9380.7	9380.3	9380.3	9380.3	9380.3	9380.3	Complied
	27.6 VDC	9382.2	9381.2	9380.0	9380.0	9380.3	9379.8	9380.2	9380.3	Complied

CH1, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9400.0	9400.2	9399.5	9400.2	9400.3	9401.0	9400.7	9399.2	Complied
	24.0 VDC	9399.7	9400.3	9400.2	9400.8	9400.5	9399.5	9400.8	9399.3	Complied
	27.6 VDC	9399.8	9399.7	9401.0	9399.8	9399.2	9398.8	9399.7	9399.2	Complied

CH2, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9401.0	9401.2	9400.0	9399.7	9400.3	9400.3	9400.5	9400.5	Complied
	24.0 VDC	9401.7	9401.2	9400.2	9400.2	9400.3	9400.3	9400.2	9400.3	Complied
	27.6 VDC	9399.8	9399.3	9399.8	9399.8	9400.2	9400.5	9400.3	9400.2	Complied

CH2, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9419.8	9421.0	9421.0	9420.8	9420.5	9420.0	9421.5	9420.2	Complied
	24.0 VDC	9420.5	9419.8	9420.2	9420.7	9420.2	9420.0	9419.5	9420.8	Complied
	27.6 VDC	9420.5	9420.8	9420.8	9421.3	9420.2	9419.8	9419.7	9420.3	Complied

CH3, P0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9421.5	9419.8	9419.5	9420.0	9419.8	9420.3	9420.2	9420.2	Complied
	24.0 VDC	9419.8	9419.5	9420.3	9420.0	9420.2	9420.3	9420.3	9420.2	Complied
	27.6 VDC	9420.8	9419.0	9420.3	9420.2	9420.2	9420.2	9420.3	9420.2	Complied

CH3, Q0N

Pulse type		S0	S1	S2	M1	M2	M3	L1	L2	Result
Frequency at maximum emission (MHz)	10.2 VDC	9440.3	9439.2	9440.2	9440.2	9440.0	9441.2	9439.2	9439.7	Complied
	24.0 VDC	9441.2	9440.8	9439.7	9441.0	9440.7	9441.2	9439.5	9441.0	Complied
	27.6 VDC	9439.5	9440.0	9440.2	9440.2	9440.2	9440.2	9440.8	9439.5	Complied

Environmental conditions observed: On 22 December 2016, 23°C to 23°C, 67%RH to 67%RH
On 23 December 2016, 21°C to 21°C, 65%RH to 65%RH
On 24 December 2016, 19°C to 19°C, 54%RH to 54%RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

3.4 Occupied Bandwidth (FCC Rule 47 CFR, 2.1049(c)(1), 80.209(b), 80.211(f))

(1) Test conditions:

For all TX (S0/S1/S2/M1/M2/M3/L1/L2) Pulses, the transmitter occupied bandwidth was measured at the antenna port with Antenna replaced with the Non-reflective load.

(2) Test setup:

See Clause 4.

(3) Emission Limits (FCC Rule 47 CFR, 80.211 (f)):

Frequency removed from the assigned frequency (*1)	Emission attenuation (mean power, dB)
50 - 100 % (of the authorized bandwidth) (*2)	At least 25
100 - 250 % (of the authorized bandwidth) (*2)	At least 35
more than 250 % (of the authorized bandwidth) (*2)	At least 43 + 10 $\log_{10}$ (mean power in watts) = -13 dBm

(*1): Assigned frequency (center frequency) = 9380, 9400, 9420,and 9440 MHz (for X-band radars)
(*2): Authorized bandwidth = 110 MHz (for X-band radars)

(4) Test Results:

Complied.
Spectrum plots: See Clause 8.

Environmental conditions observed: On 28 December 2016, 23°C to 23°C, 45%RH to 45 %RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

3.5 Spurious Emissions at Antenna Port (FCC Rule 47 CFR, 2.1051, 80.211(f))

(1) Test Conditions:

For S0 Pulse, the transmitter output power was measured at the antenna port with Antenna replaced with the Non-reflective load. (*1)

(*1): Emission measurements only need to be carried out for the pulse length setting producing the widest calculated B–40 bandwidth. (IEC 62388 Ed.2/ Annex B.4.2 part)

(2) Test setup:

See Clause 4.

(3) Emission Limits (FCC Rule 47 CFR, 80.211 (f)):

Frequency removed from the assigned frequency (*1)	Emission attenuation (mean power, dB)
more than 250 % (*3) (of the authorized bandwidth) (*2)	At least 43 + 10 $\log_{10}$ (mean power in watts) = -13 dBm

(*1): Assigned frequency (center frequency) = 9380, 9400, 9420, and 9440 MHz (for X-band radars)
(*2): Authorized bandwidth = 110 MHz (for X-band radars)
(*3): Spurious measurement range for X-Band RADAR: 4.59 GHz to 40 GHz

(4) Spurious Frequencies:

f_0 (GHz)	$1/2f_0$	$2f_0$	$3f_0$	$4f_0$
9.380	4.69	18.76	28.14	37.52
9.400	4.70	18.80	28.20	37.60
9.420	4.71	18.84	28.26	37.68
9.440	4.72	18.88	28.32	37.76

(5) Test Results:

Complied.

Spurious emission levels measured were found to be attenuated more than 20 dB below the limits.
Environmental conditions observed: On 6 January 2017, 23°C to 23°C, 55%RH to 55 %RH
On 12 January 2017, 22°C to 22°C, 46%RH to 46 %RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

3.6 Field Strength of Spurious Radiation (FCC Rule 47 CFR, 2.1053, 80.211(f))

(1) Test Conditions:

For S0 Pulse, the transmitter output power was measured at the antenna port with Antenna replaced with the Non-reflective load. (*1)

(*1): Emission measurements only need to be carried out for the pulse length setting producing the widest calculated B–40 bandwidth. (IEC 62388 Ed.2/ Annex B.4.2 part)

(a) Spurious measurement range for X-Band RADAR: 4.59 GHz to 40 GHz

(b) Antenna port was terminated with dummy load.

(2) Test Site: LIC EMC Center, Semi-Anechoic Chamber (FCC file number: 818191)

(3) Distance between the radar set and measuring antenna: 3 m

(4) Test setup:

The GRP (Ground reference plane, metal floor) between the EUT and the measuring (receiving) antenna was lined with the Radio Absorbers (3.0 m × 2.4 m × 0.3 m) to reduce the influences of the reflections of the RF waves from the floor.

Measuring (Receiving) Antenna height and polarization:

(a) Antenna height: EUT center (1.88 m)

(b) Antenna polarization: vertical and horizontal.

EUT height: 1.5 m

(5) Field Strength Limits (FCC Rule 47 CFR, 80.211 (f)):

Frequency removed from the assigned frequency (*1)	Emission attenuation (mean power, dB)
more than 250 % (of the authorized bandwidth) (*2)	At least 43 + 10 $\log_{10}$ (mean power in watts) = -13 dBm

(*1): Assigned frequency (center frequency) = 9380, 9400, 9420, and 9440 MHz (for X-band radars)

(*2): Authorized bandwidth = 110 MHz (for X-band radars)

(6) Spurious Frequencies:

f_0 (GHz)	$1/2f_0$	$2f_0$	$3f_0$	$4f_0$
9.380	4.69	18.76	28.14	37.52
9.400	4.70	18.80	28.20	37.60
9.420	4.71	18.84	28.26	37.68
9.440	4.72	18.88	28.32	37.76

(7) Test Results:

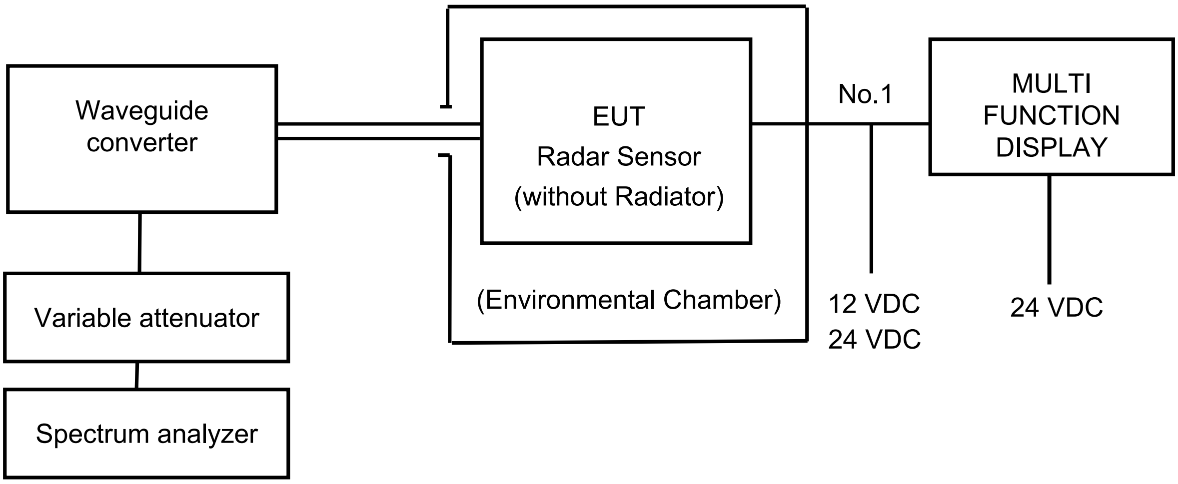
Complied.

Spurious emission levels measured were found to be attenuated more than 20 dB below the limits.

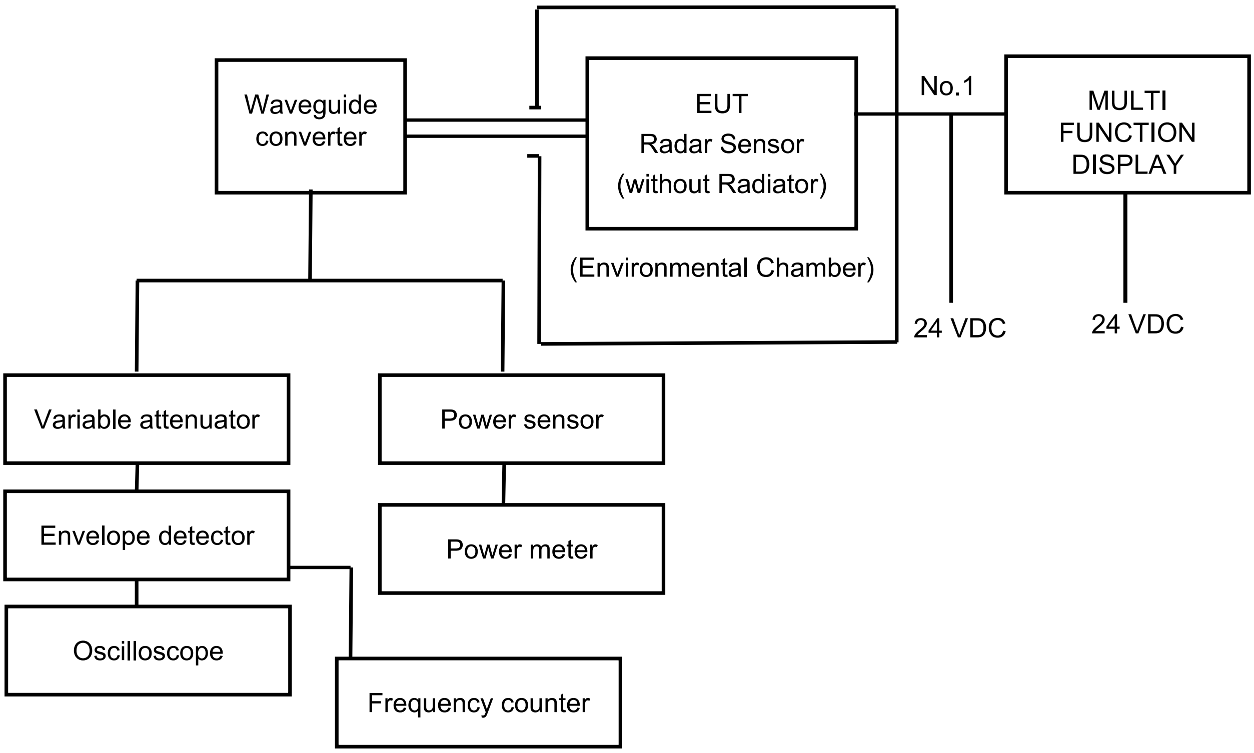
Environmental conditions observed: On 6 December 2016, 20°C to 20°C, 48%RH to 48%RH
On 7 December 2016, 20°C to 20°C, 48%RH to 48%RH
Power supply voltage measured: 24.0 VDC to 24.0 VDC

4 Test Setup for Measurements

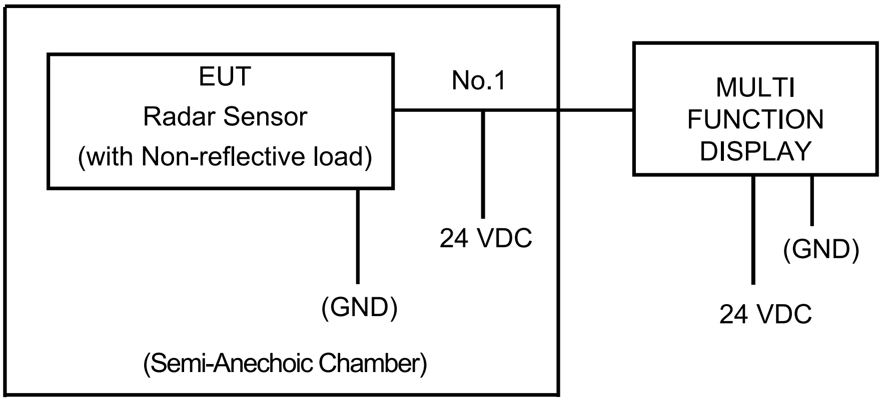
(1) Test Setup for Clauses 3.3, and 3.5.



(2) Test Setup for Clauses 3.1, 3.2, and 3.4.



(3) Test Setup for Clause 3.6.



Cable designations:

No.	Name	Length (m)
1	FRU-2P5S-FF-20M	20

5 Measuring Equipment List

Measuring/Test instruments have been appropriately calibrated/maintained according to the LIC programs/ procedures and ISO/IEC 17025. Measuring/Test instruments used for the tests are listed below.

(1) For 3.1 RF Power Output:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
0505026	Power meter	E4418B	GB43317662	Agilent	13 June 2016	1 year
120110402	Power Sensor	N8481A	MY48100658	Agilent	13 June 2016	1 year
RT213	Waveguide	WRJ-10	----	Furuno	15 June 2016	1 year
----	Adapter	X281C	2001A-01574	HP	----	----
HT430	DC Power Supply	PAN55-20	AK003303	Kikusui	----	----
HT510	Climatic chamber (Hama-L)	TBE-3HW4PE2F	3013002540	Tabai Espec	21 September 2016	1 year
HT725	Paperless recorder/Dual communication logger DAQSTATION FX100	FX106-4-1	S5JA01447	Yokogawa	21 September 2016	1 year
HT1024	Digital multi-meter	233	27230019	FLUKE	4 February 2016	1 year

(2) For 3.2 Modulation Characteristics:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
RT213	Waveguide	WRJ-10	----	Furuno	15 June 2016	1 year
----	Adapter	X281C	2001A-01574	HP	----	----
HT654	Attenuator	8494B	MY42148134	Agilent	19 February 2016	1 year
HT655	Attenuator	8495B	MY42144403	Agilent	22 February 2016	1 year
HT913	Crystal Detector	423B	MY51340543	Agilent	22 January 2016	1 year
8408087	Frequency Counter	TR5824A	41940036	ADVANTEST	23 May 2016	1 year
HT972	Oscilloscope	MSO4054B	C030483	TEKTRONIX	23 February 2016	1 year
HT430	DC Power Supply	PAN55-20	AK003303	Kikusui	----	----
HT510	Climatic chamber (Hama-L)	TBE-3HW4PE2F	3013002540	Tabai Espec	21 September 2016	1 year
HT725	Paperless recorder/Dual communication logger DAQSTATION FX100	FX106-4-1	S5JA01447	Yokogawa	21 September 2016	1 year
HT1024	Digital multi-meter	233	27230019	FLUKE	4 February 2016	1 year

(3) For 3.3 Frequency Stability –temperature & voltage:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
HT510	Climatic chamber (Hama-L)	TBE-3HW4PE2F	3013002540	Tabai Espec	21 September 2016	1 year
HT725	Paperless recorder/Dual communication logger DAQSTATION FX100	FX106-4-1	S5JA01447	Yokogawa	21 September 2016	1 year
RT213	Waveguide	WRJ-10	----	Furuno	15 June 2016	1 year
----	Adapter	X281C	2001A-01574	HP	----	----
HT654	Attenuator	8494B	MY42148134	Agilent	19 February 2016	1 year
HT655	Attenuator	8495B	MY42144403	Agilent	22 February 2016	1 year
HT676	Spectrum Analyzer	8564EC	4103A00440	Agilent	4 April 2016	1 year
HT430	DC Power Supply	PAN55-20	AK003303	Kikusui	----	----
HT1024	Digital multi-meter	233	27230019	FLUKE	4 February 2016	1 year

(4) For 3.4 Occupied Bandwidth:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
HT510	Climatic chamber (Hama-L)	TBE-3HW4PE2F	3013002540	Tabai Espec	21 September 2016	1 year
HT725	Paperless recorder/Dual communication logger DAQSTATION FX100	FX106-4-1	S5JA01447	Yokogawa	21 September 2016	1 year
RT213	Waveguide	WRJ-10	----	Furuno	15 June 2016	1 year
----	Adapter	X281C	2001A-01574	HP	----	----
HT654	Attenuator	8494B	MY42148134	Agilent	19 February 2016	1 year
HT655	Attenuator	8495B	MY42144403	Agilent	22 February 2016	1 year
HT430	DC Power Supply	PAN55-20	AK003303	Kikusui	----	----
HT1024	Digital multi-meter	233	27230019	FLUKE	4 February 2016	1 year
KB179	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	48932/4A	HUBER+ SUHNER	13 August 2016	1 year

(5) For 3.5 Spurious Emissions at Antenna Port:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
HT510	Climatic chamber (Hama-L)	TBE-3HW4PE2F	3013002540	Tabai Espec	21 September 2016	1 year
HT725	Paperless recorder/Dual communication logger DAQSTATION FX100	FX106-4-1	S5JA01447	Yokogawa	21 September 2016	1 year
RT213	Waveguide	WRJ-10	----	Furuno	15 June 2016	1 year
----	Adapter	X281C	2001A-01574	HP	----	----
----	Adapter	P281C	MY46040318	AGILENT	----	----
----	Adapter	----	BL00-6256-00	OrientMacrowave	----	----
----	Adapter	R281B	00472	HP	----	----
----	Isolator	OMC FX0157	8H0027	----	----	----
HT654	Attenuator	8494B	MY42148134	Agilent	19 February 2016	1 year
HT655	Attenuator	8495B	MY42144403	Agilent	22 February 2016	1 year
HT676	Spectrum Analyzer	8564EC	4103A00440	Agilent	4 April 2016	1 year
HT430	DC Power Supply	PAN55-20	AK003303	Kikusui	----	----
HT1024	Digital multi-meter	233	27230019	FLUKE	4 February 2016	1 year
KB179	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	48932/4A	HUBER+ SUHNER	13 August 2016	1 year
KB180	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	48933/4A	HUBER+ SUHNER	13 August 2016	1 year
KB181	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 102A	1261/2A	HUBER+ SUHNER	13 August 2016	1 year
KB192	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	500066/4A	HUBER+ SUHNER	1 June 2016	1 year

(6) For 3.6 Field Strength of Spurious Radiation:

C/N	Instrument	Type	S/N	Manufacturer	Date of last calibration	Calibration interval
HT744	Radiated emission measurement software	EP5/RE	Ver. 5.6.0	TOYO	----	----
HT745	EMI TEST RECEIVER(20 Hz - 40 GHz)	ESU40	110243	ROHDE&SCHWARZ	24 December 2015	1 year
HT758	Broadband horn antenna (1 GHz to 6 GHz)	9120B	522	SCHWARZBECK	30 December 2015	1 year
HT759	Double rigged horn antenna & amp.	HAP06-18W	00000065	TOYO	30 April 2016	1 year
HT761	Double rigged horn antenna & amp.	HAP18-26N	00000017	TOYO	30 December 2015	1 year
HT762	Double rigged horn antenna & amp.	HAP26-40N	00000010	TOYO	30 December 2015	1 year
HT755	Pre-amplifier	TPA018-40	1017	TOYO	24 July 2016	1 year
HT779	Semi-Anechoic chamber	10mSAC	90984	TOKIN	----	----
HT781	Programmable DC Power Supply	PAN60-20A	QM003356	Kikusui	----	----
8411057	Dummy Load	4D376	R25510001	Shimada	----	----
KB179	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	48932/4A	HUBER+ SUHNER	13 August 2016	1 year
KB180	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	48933/4A	HUBER+ SUHNER	13 August 2016	1 year
KB181	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 102A	1261/2A	HUBER+ SUHNER	13 August 2016	1 year
KB192	Coaxial Cable for Radiated Emission Measurement	SUCOFLEX 104A	500066/4A	HUBER+ SUHNER	1 June 2016	1 year

6 RF Envelope and Spectrum of the output pulse

CH1, P0N

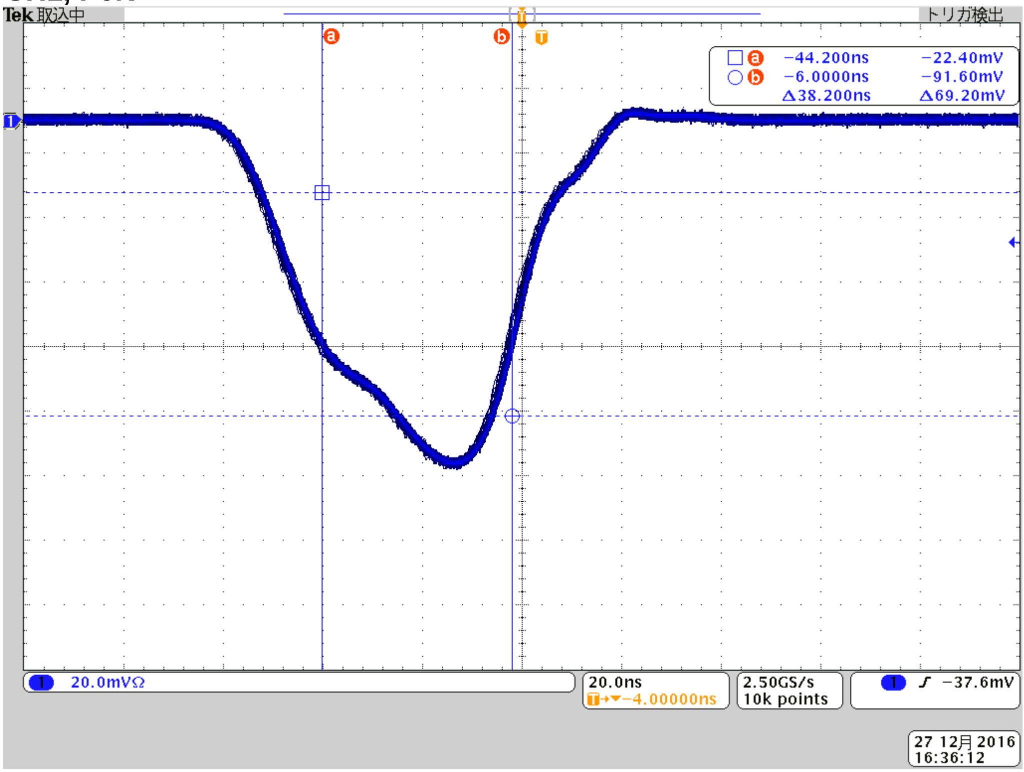


Fig. 7.1 S0 Pulse Envelope

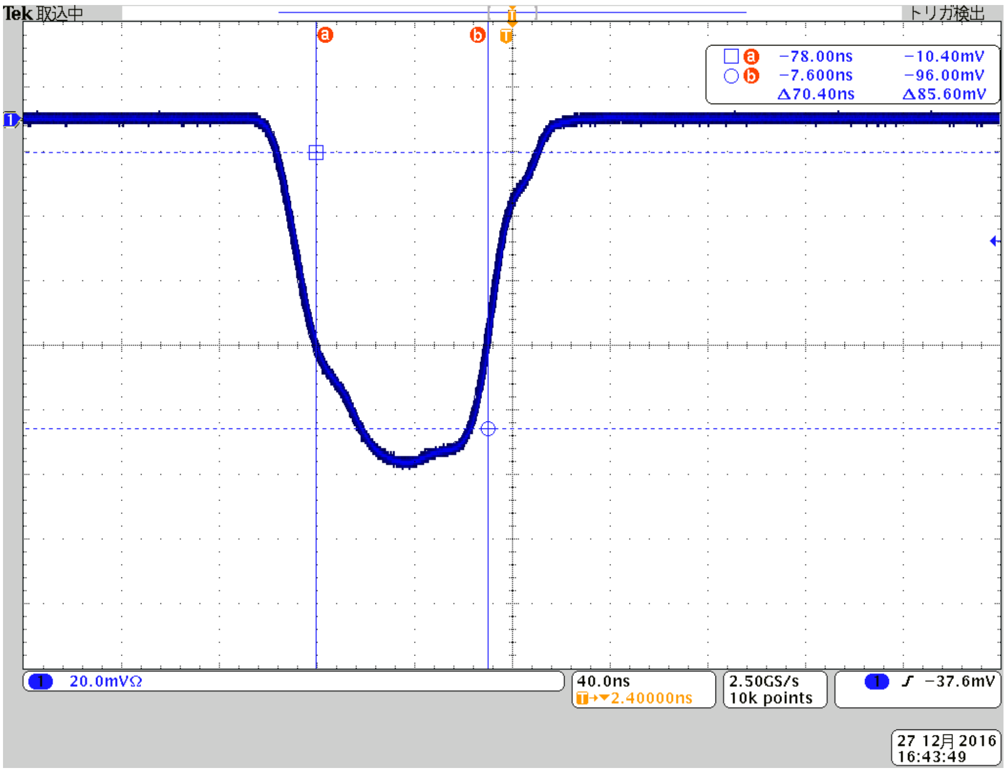


Fig. 7.2 S1 Pulse Envelope

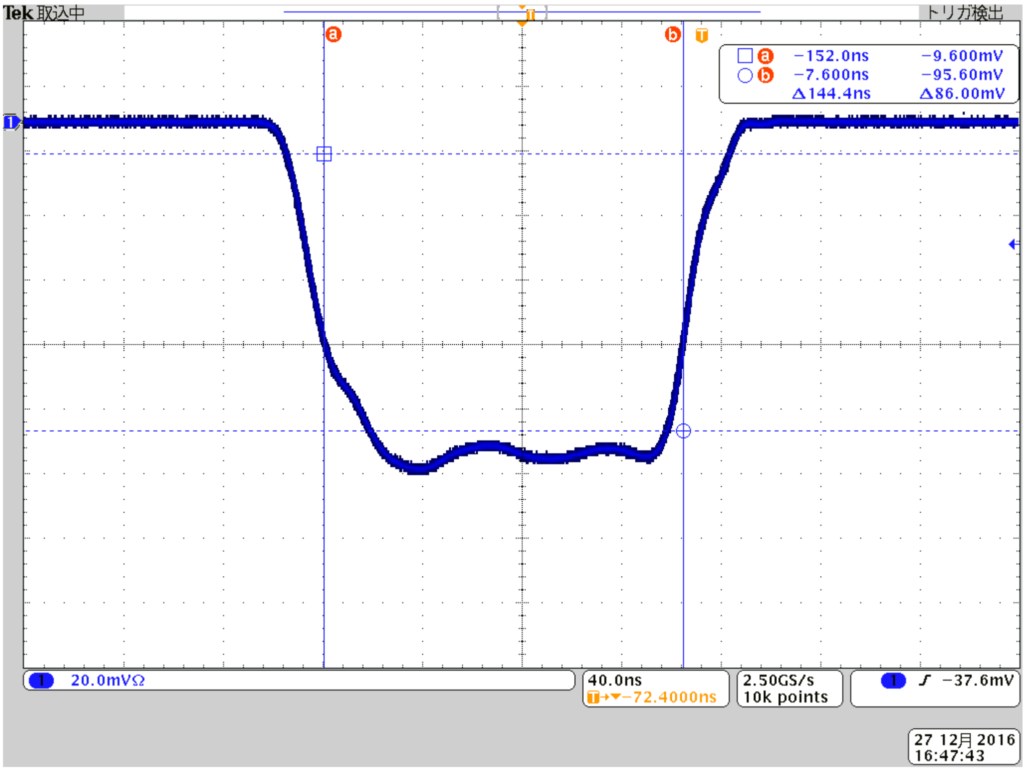


Fig. 7.3 S2 Pulse Envelope

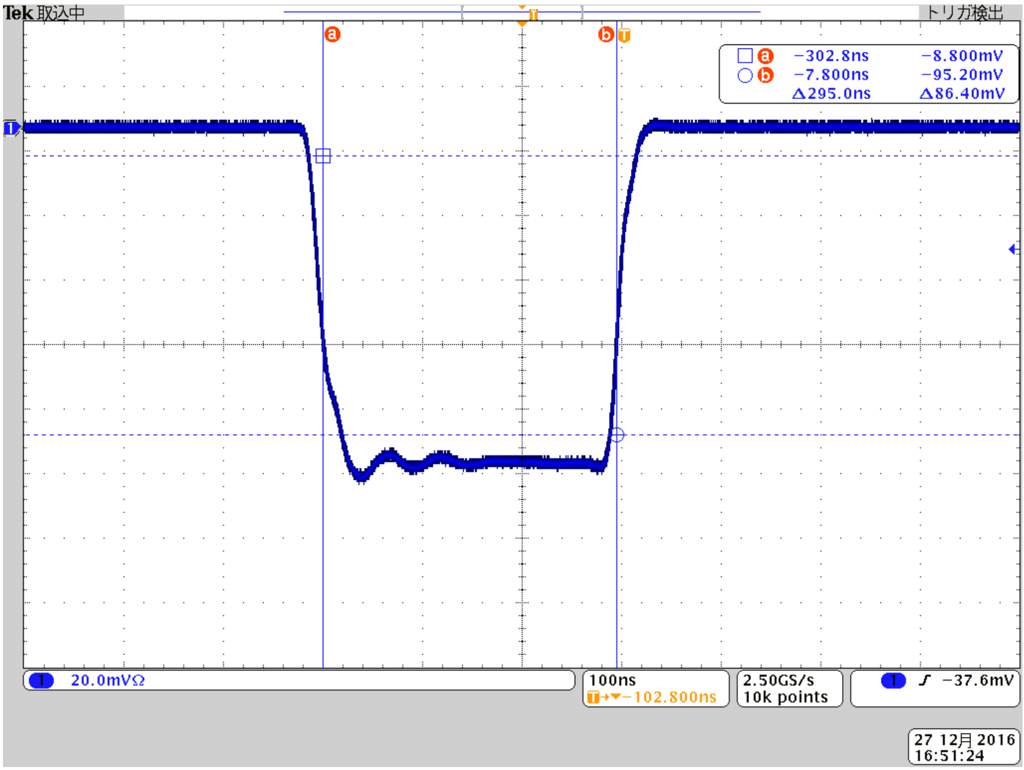


Fig. 7.4 M1 Pulse Envelope

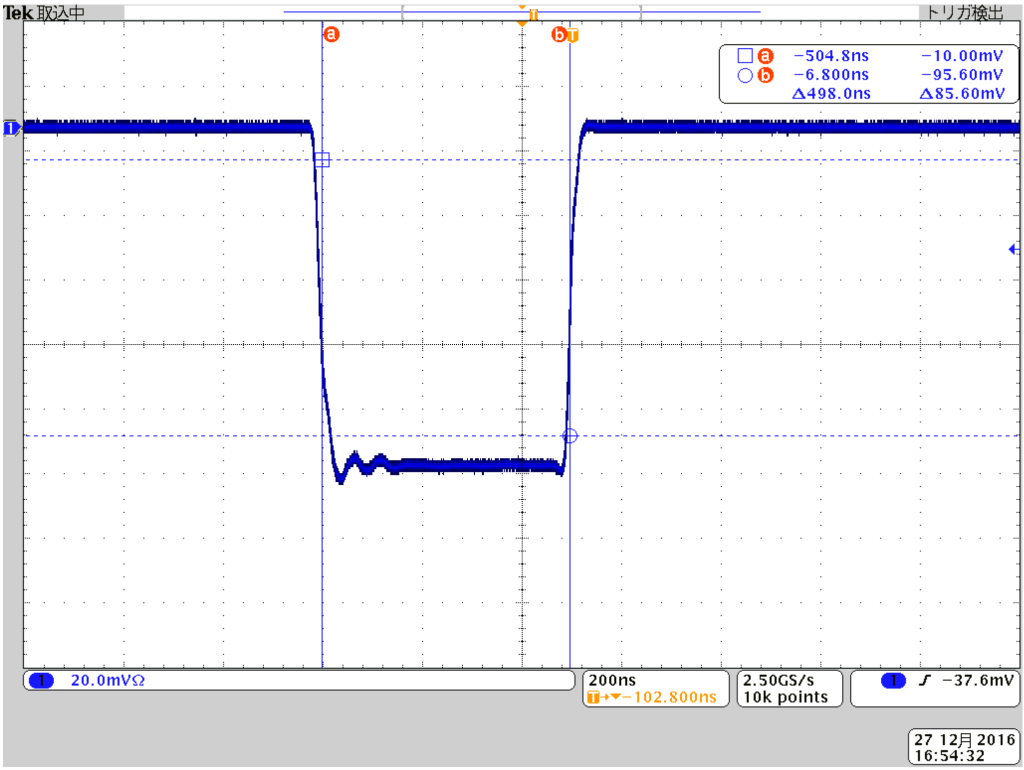


Fig. 7.5 M2 Pulse Envelope

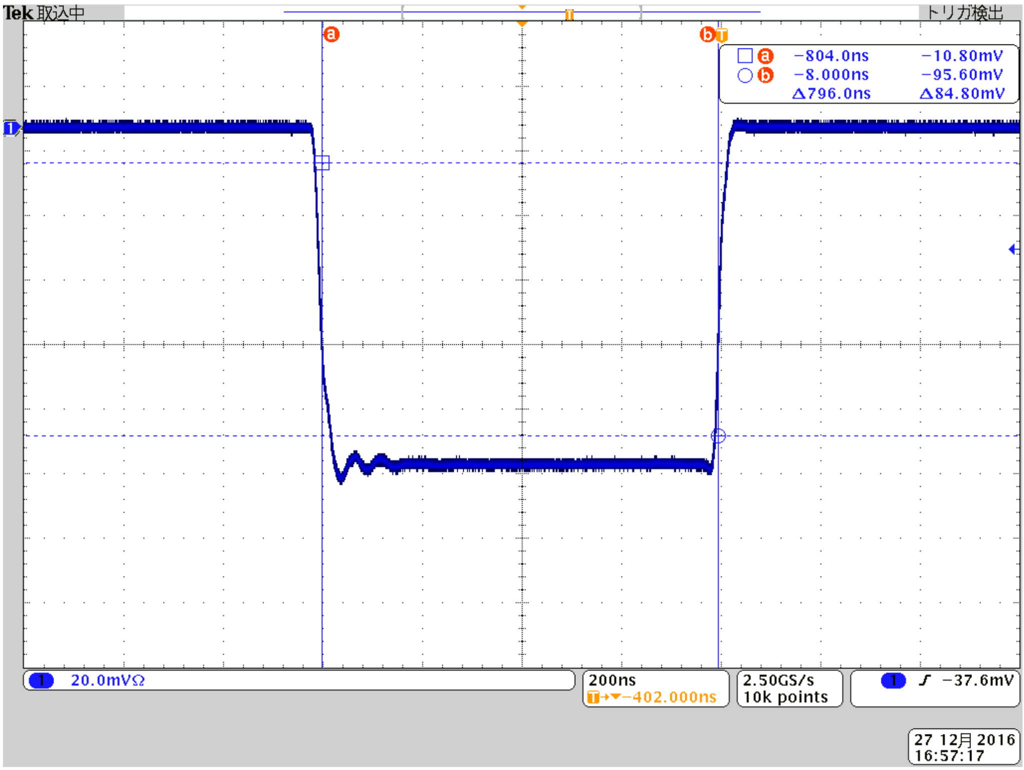


Fig. 7.6 M3 Pulse Envelope

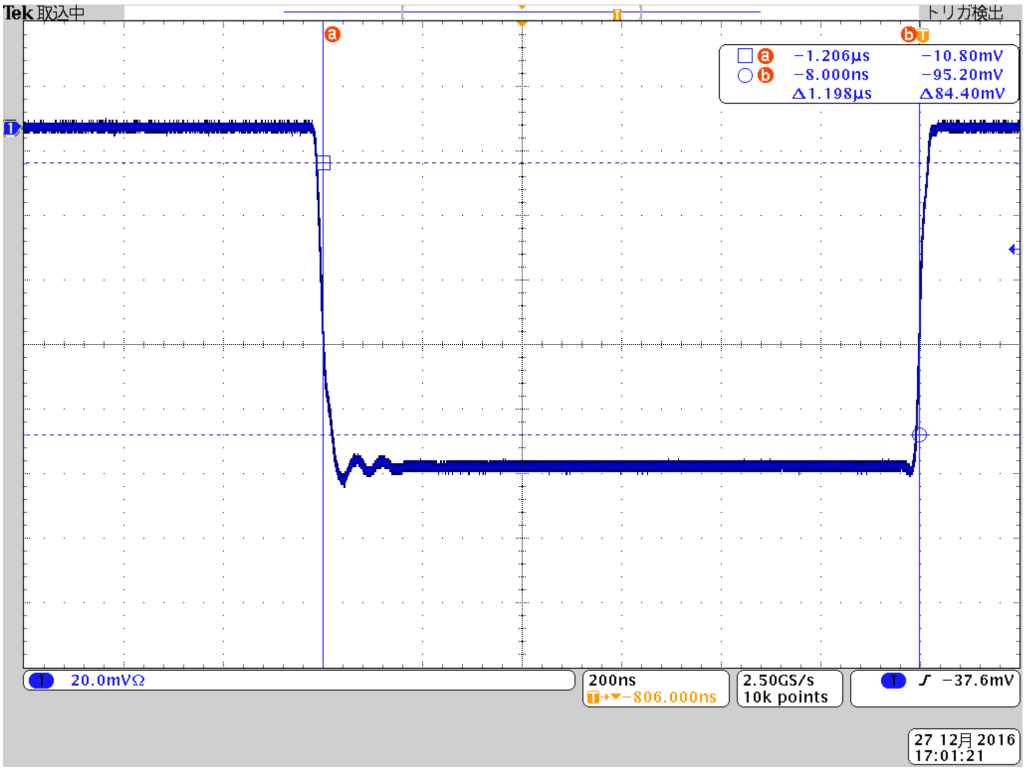


Fig. 7.7 L1 Pulse Envelope

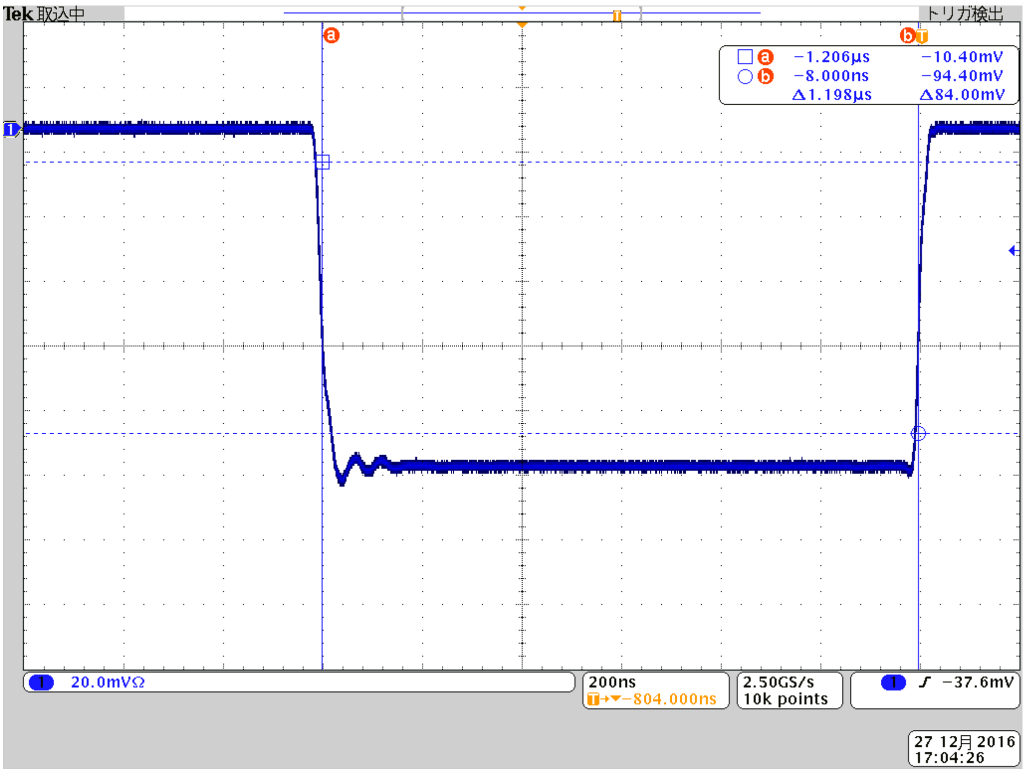


Fig. 7.8 L2 Pulse Envelope

CH1, Q0N

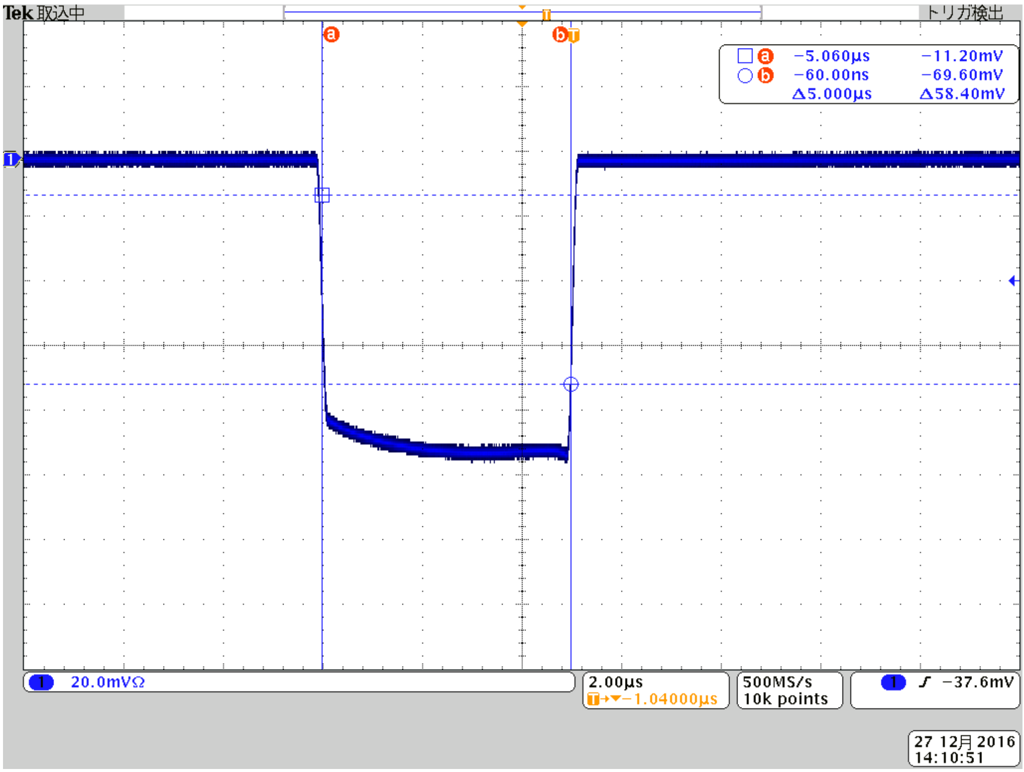


Fig. 7.9 S0 Pulse Envelope

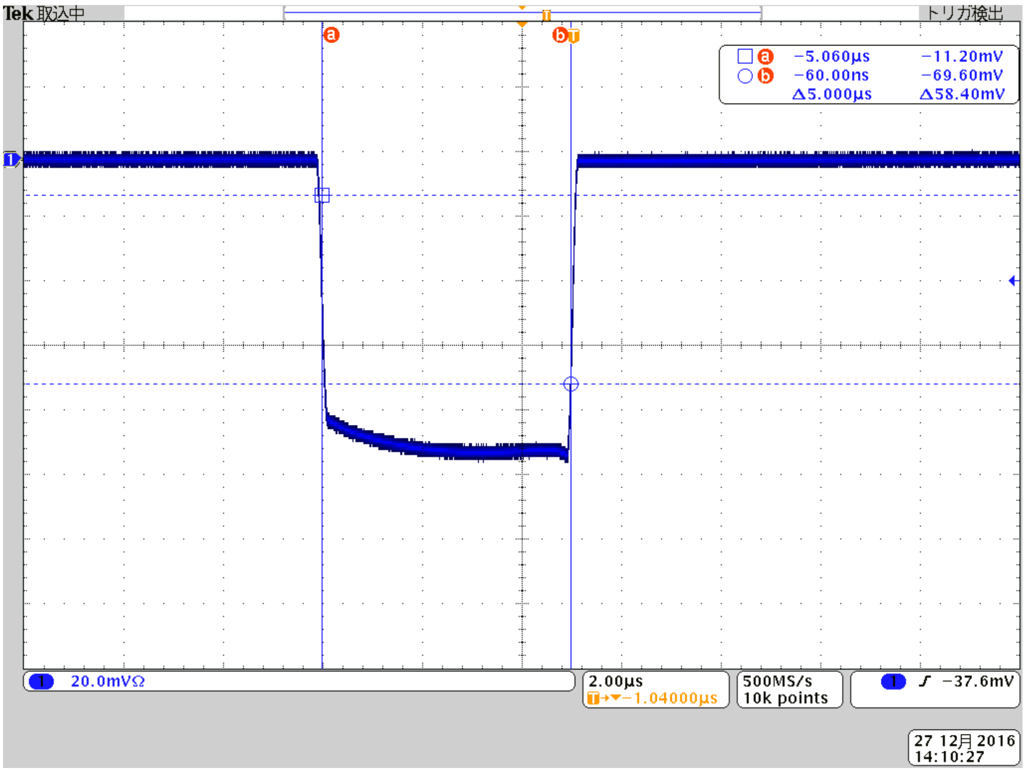


Fig. 7.10 S1 Pulse Envelope

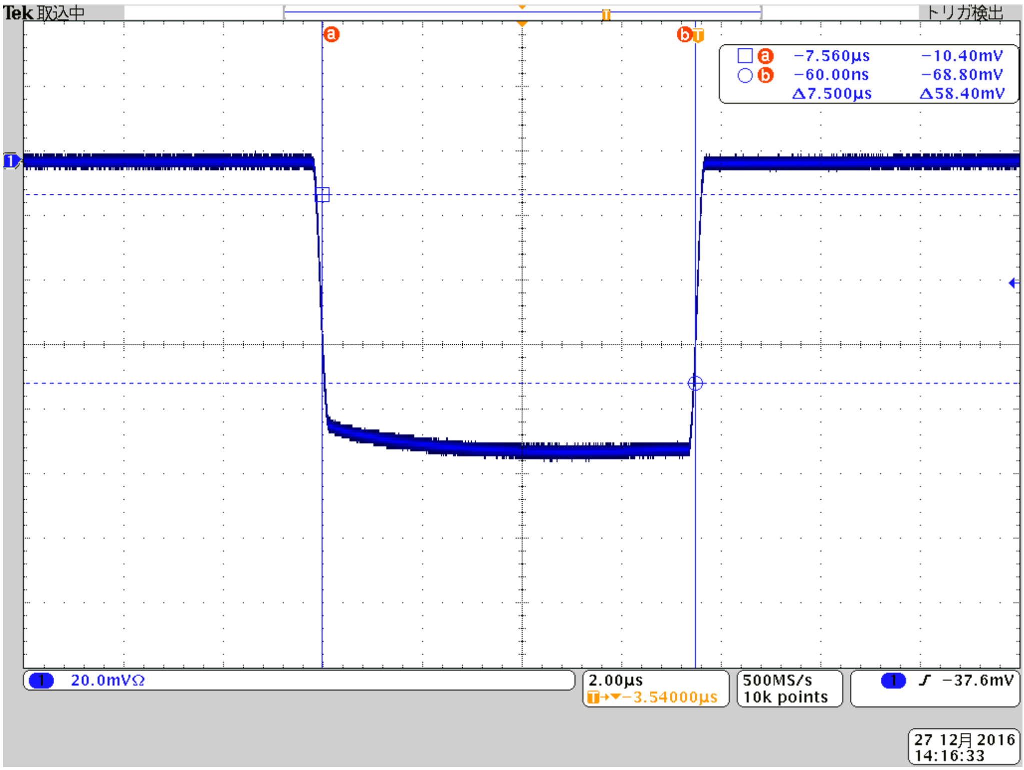


Fig. 7.11 S2 Pulse Envelope

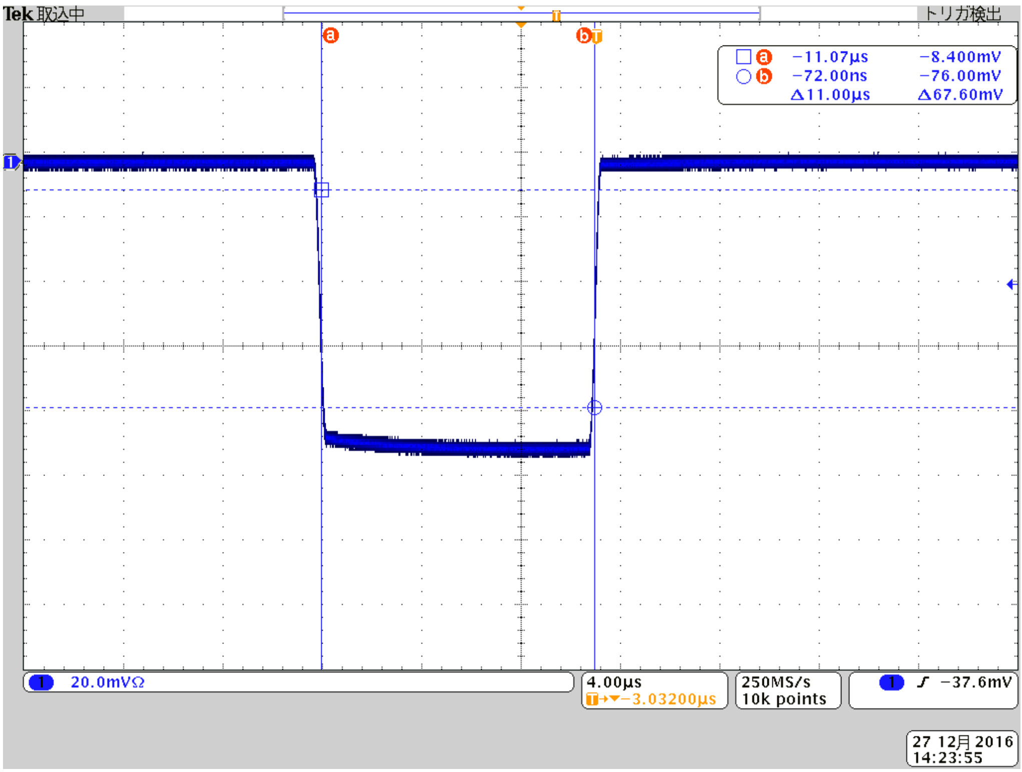


Fig. 7.12 M1 Pulse Envelope

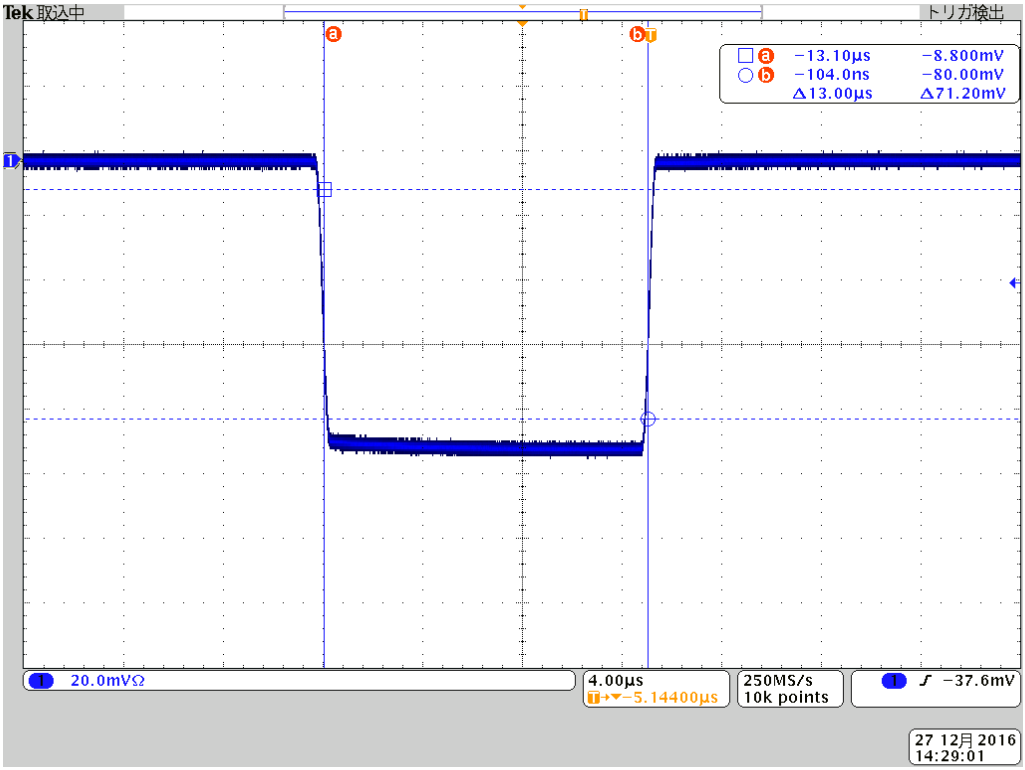


Fig. 7.13 M2 Pulse Envelope

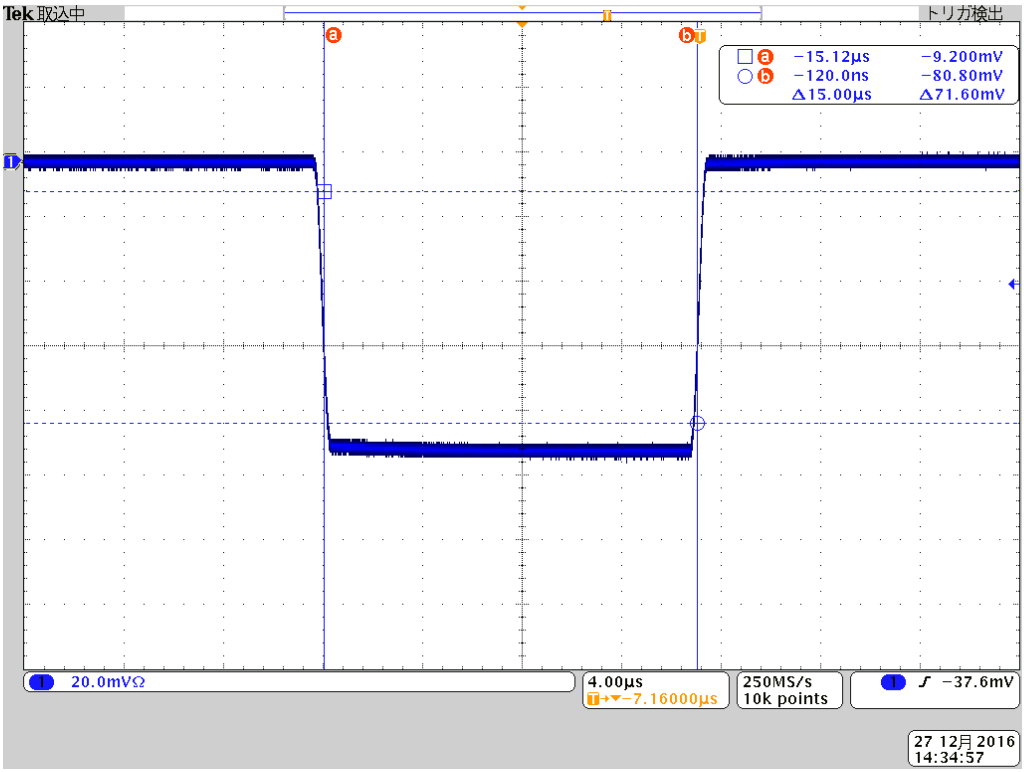


Fig. 7.14 M3 Pulse Envelope

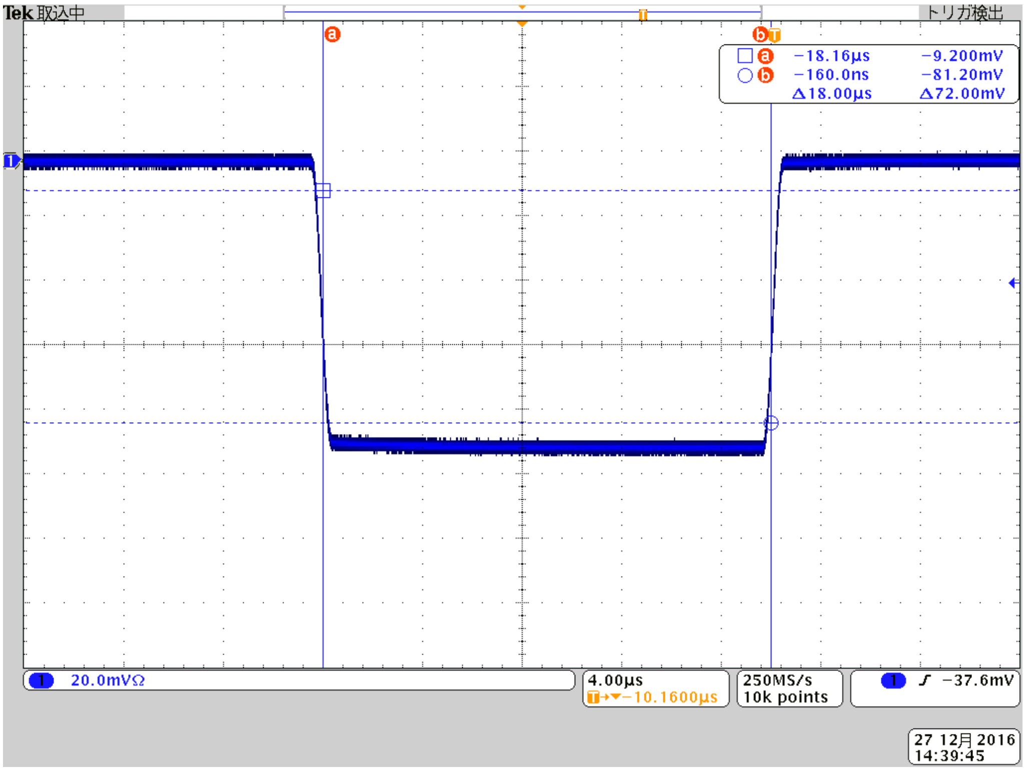


Fig. 7.15 L1 Pulse Envelope

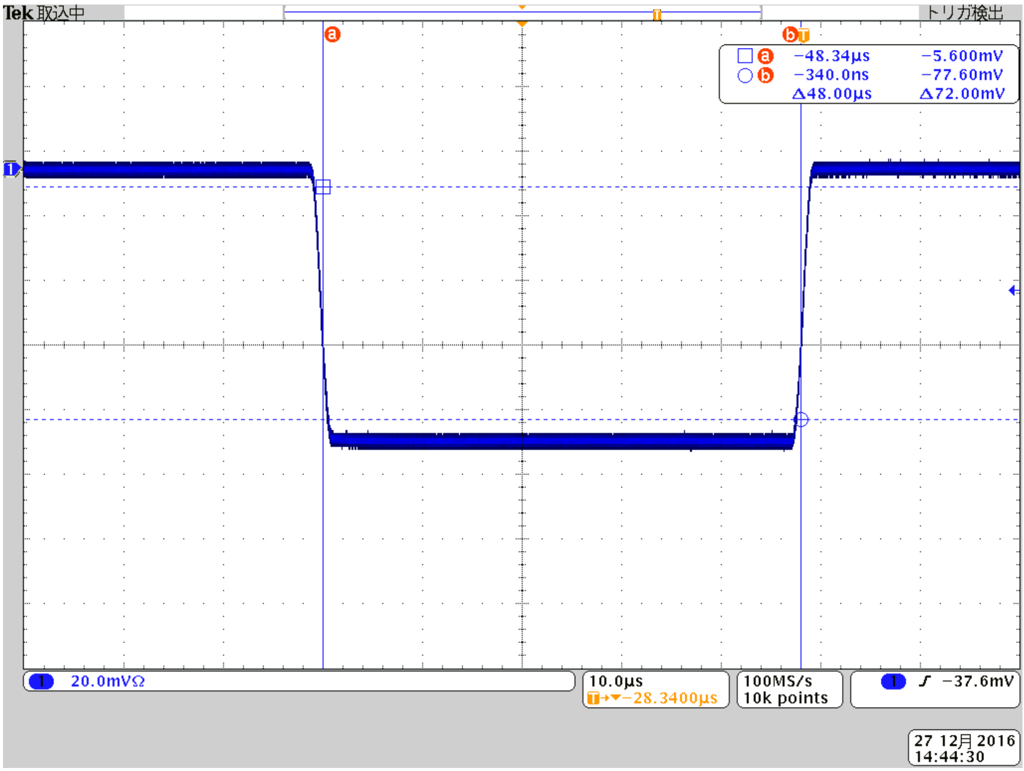


Fig. 7.16 L2 Pulse Envelope

CH2, P0N

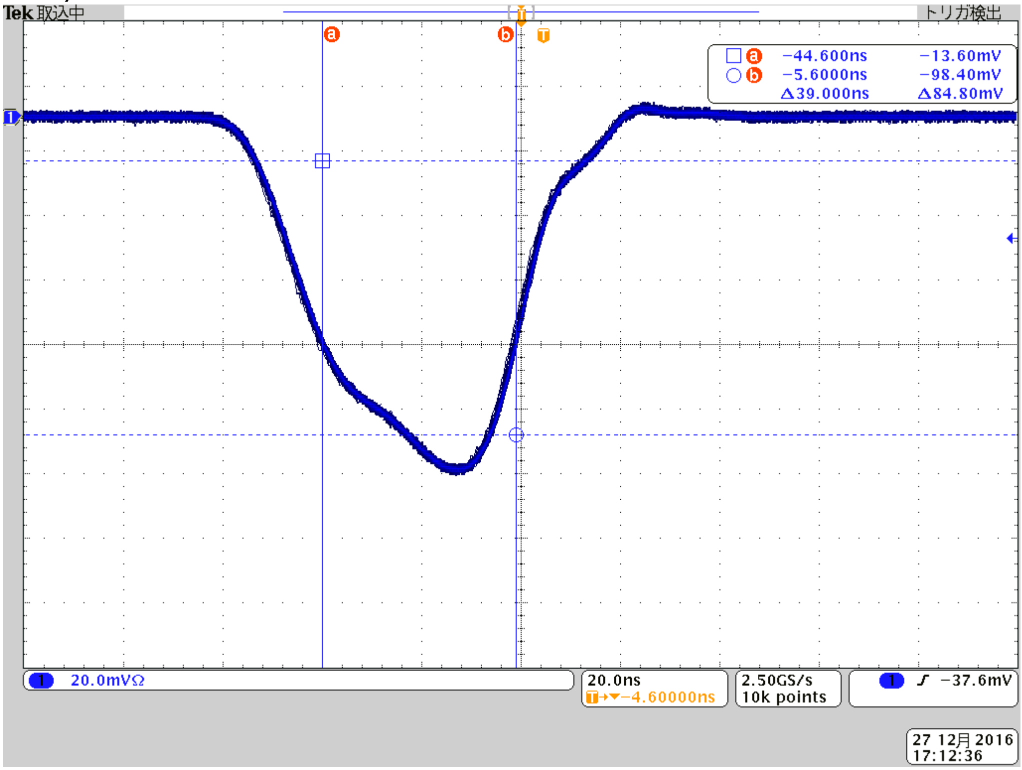


Fig. 7.17 S0 Pulse Envelope

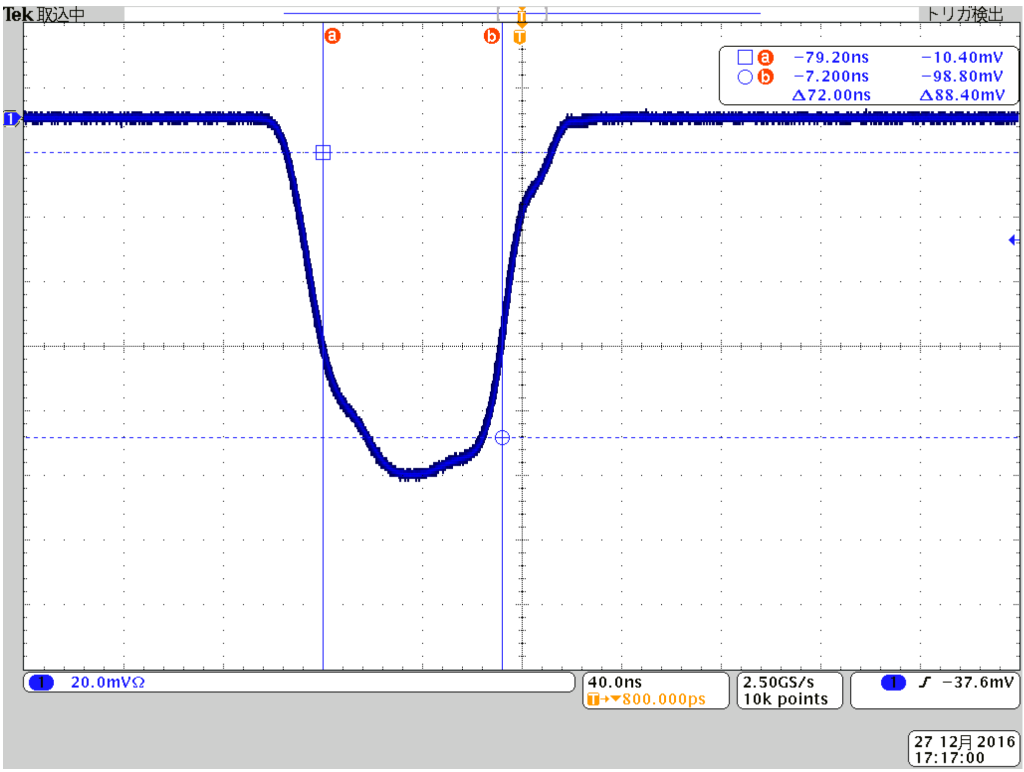


Fig. 7.18 S1 Pulse Envelope

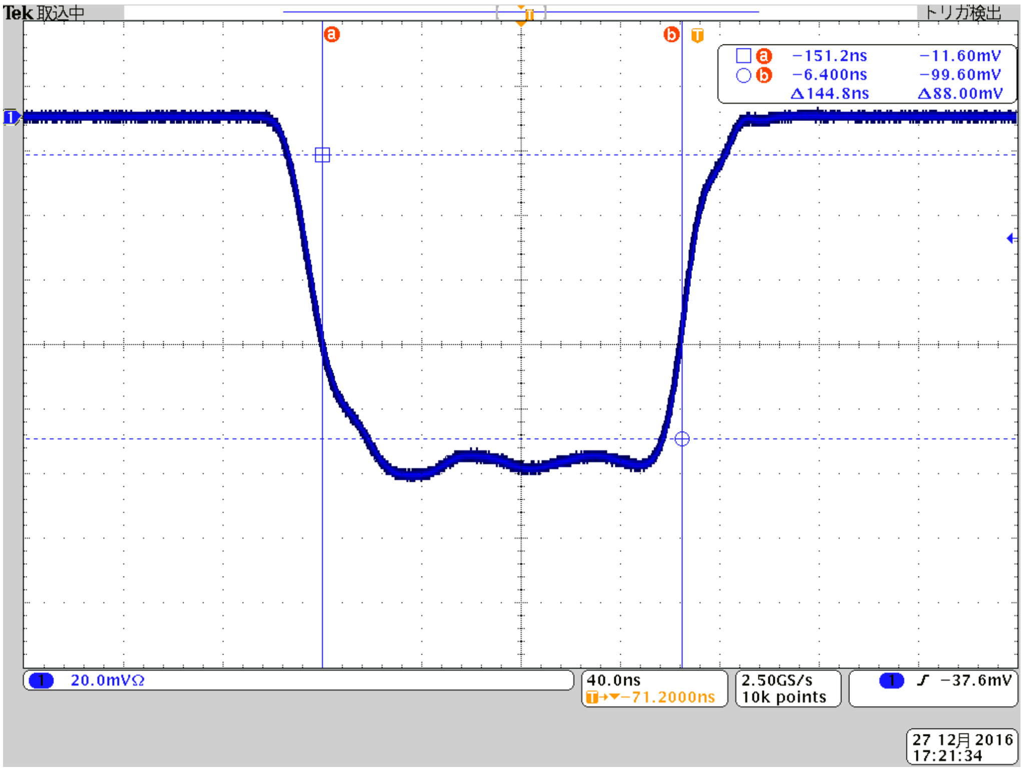


Fig. 7.19 S2 Pulse Envelope

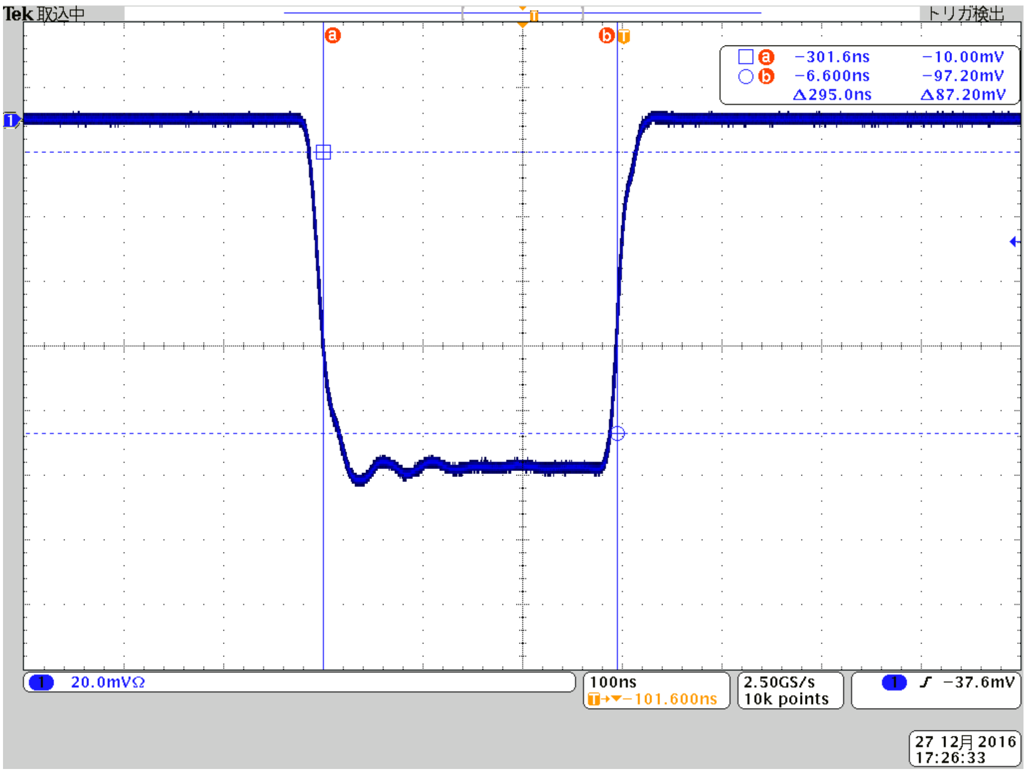


Fig. 7.20 M1 Pulse Envelope

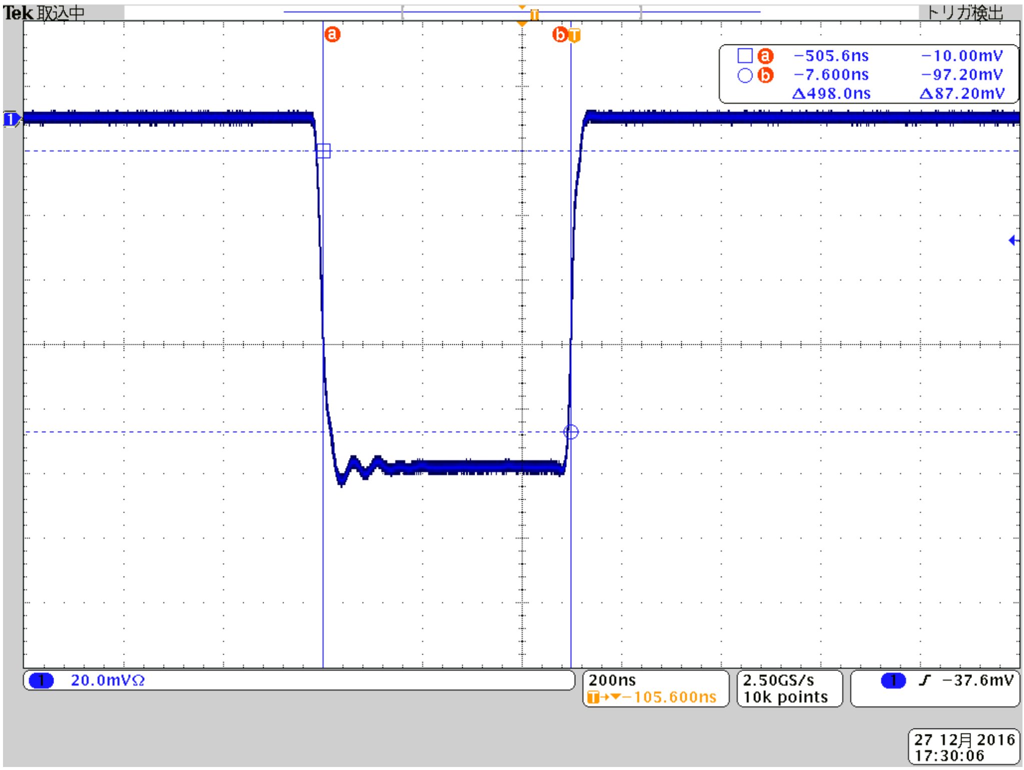


Fig. 7.21 M2 Pulse Envelope

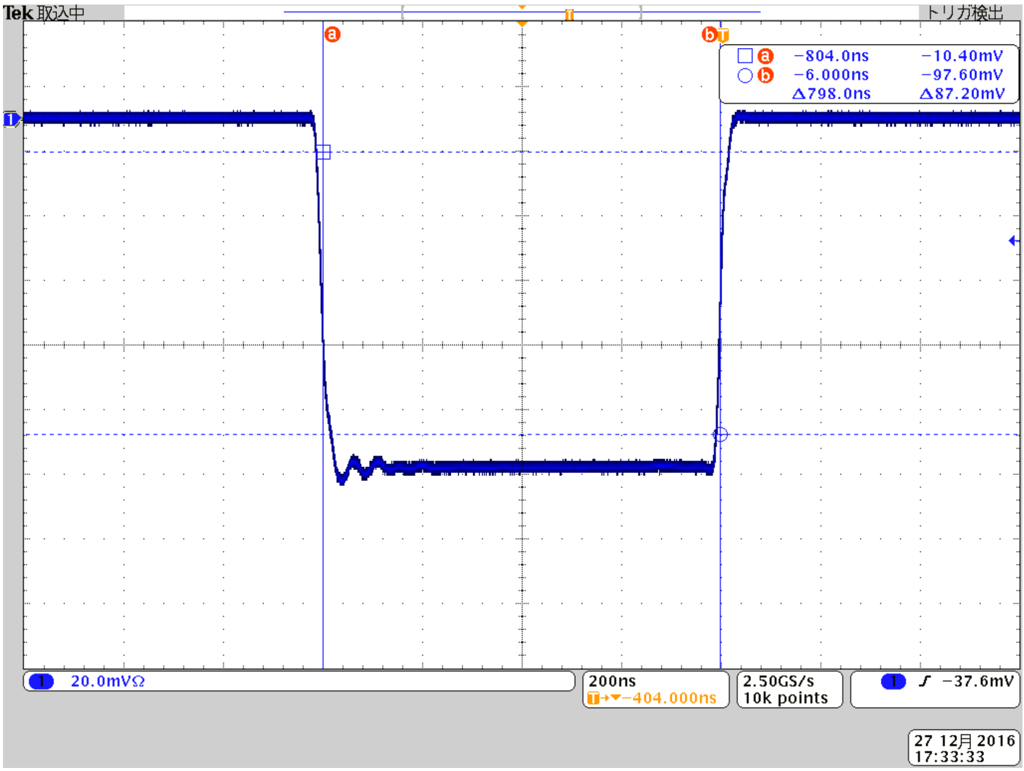


Fig. 7.22 M3 Pulse Envelope

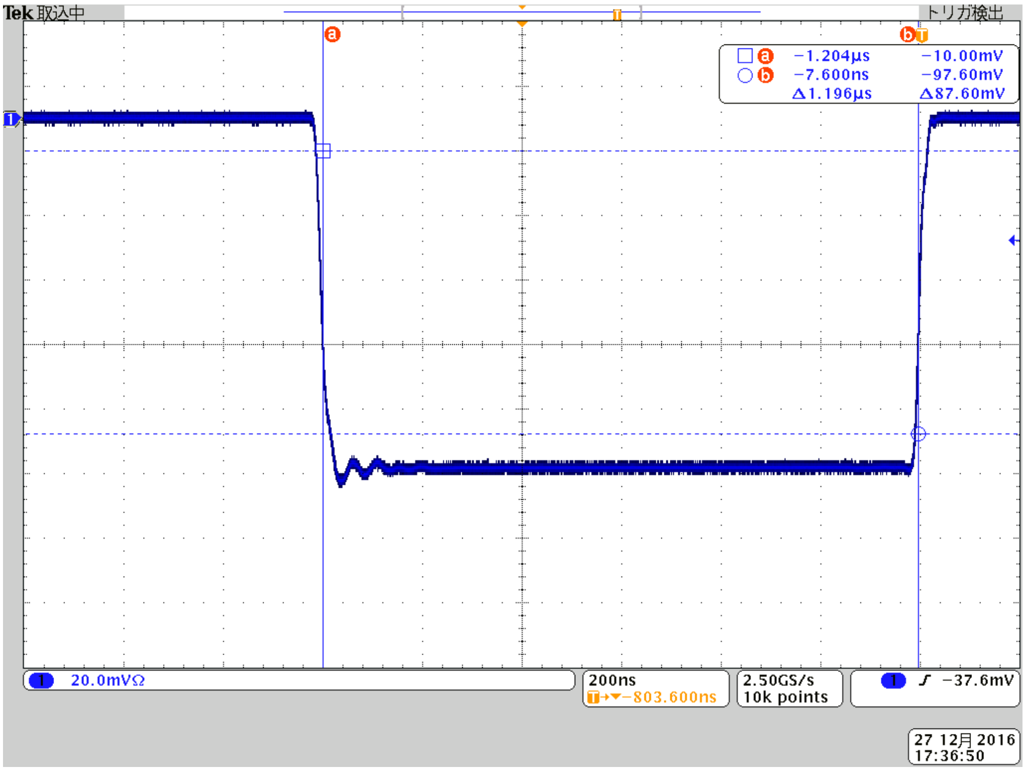


Fig. 7.23 L1 Pulse Envelope

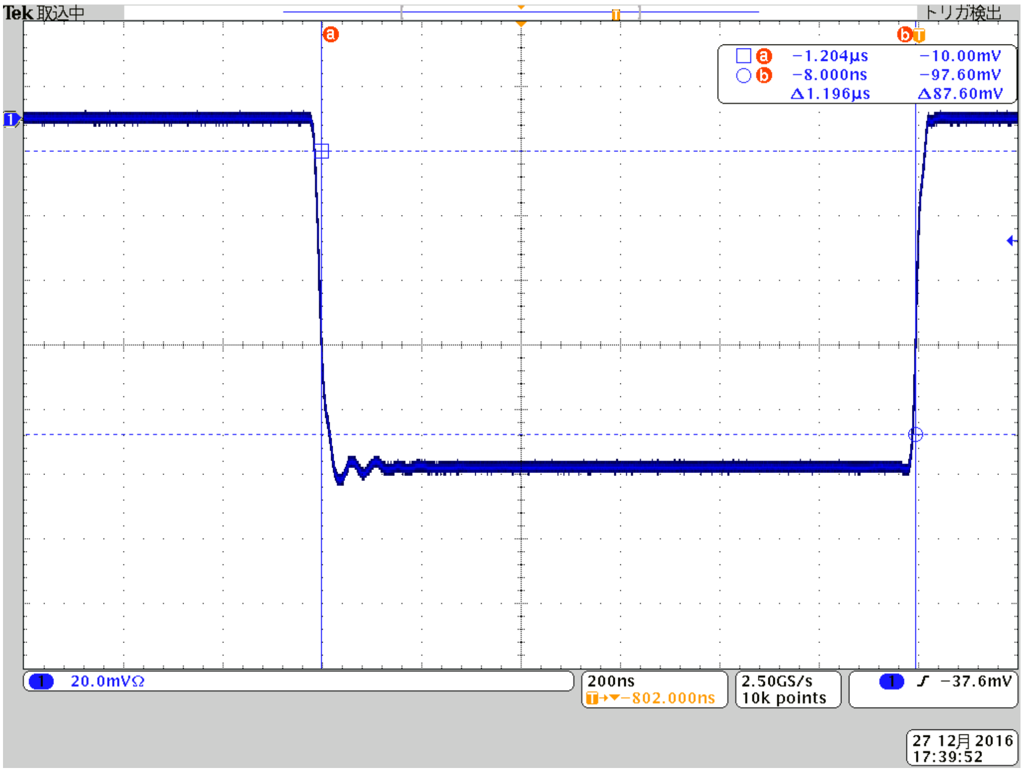


Fig. 7.24 L2 Pulse Envelope

CH2, Q0N

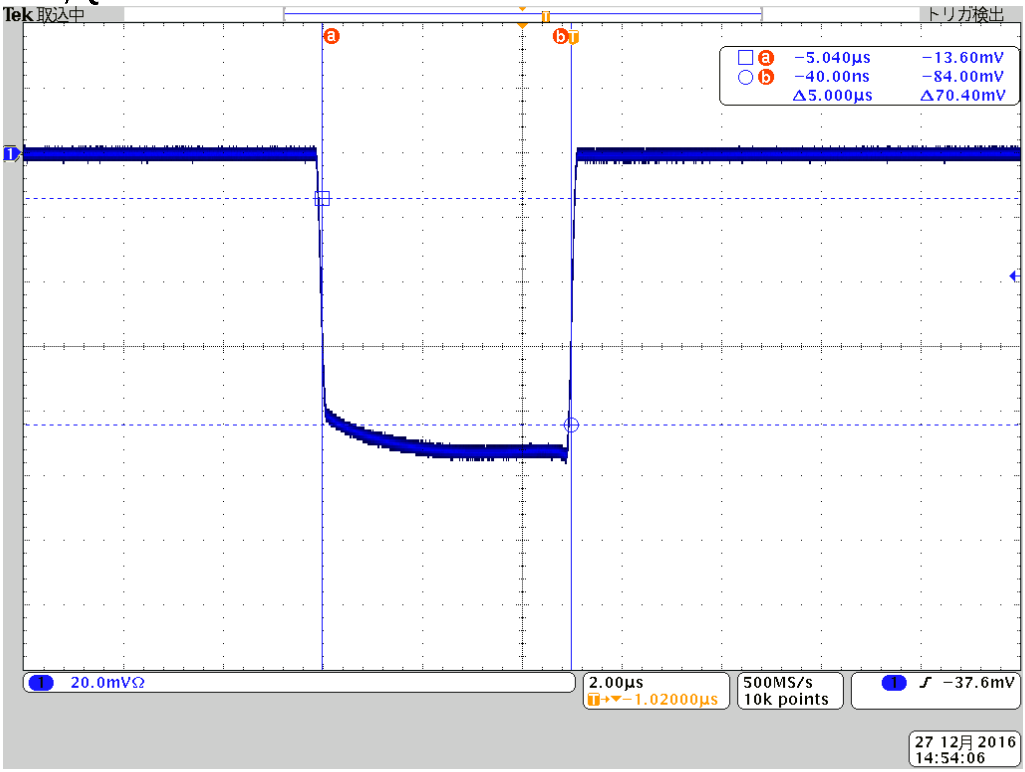


Fig. 7.25 S0 Pulse Envelope

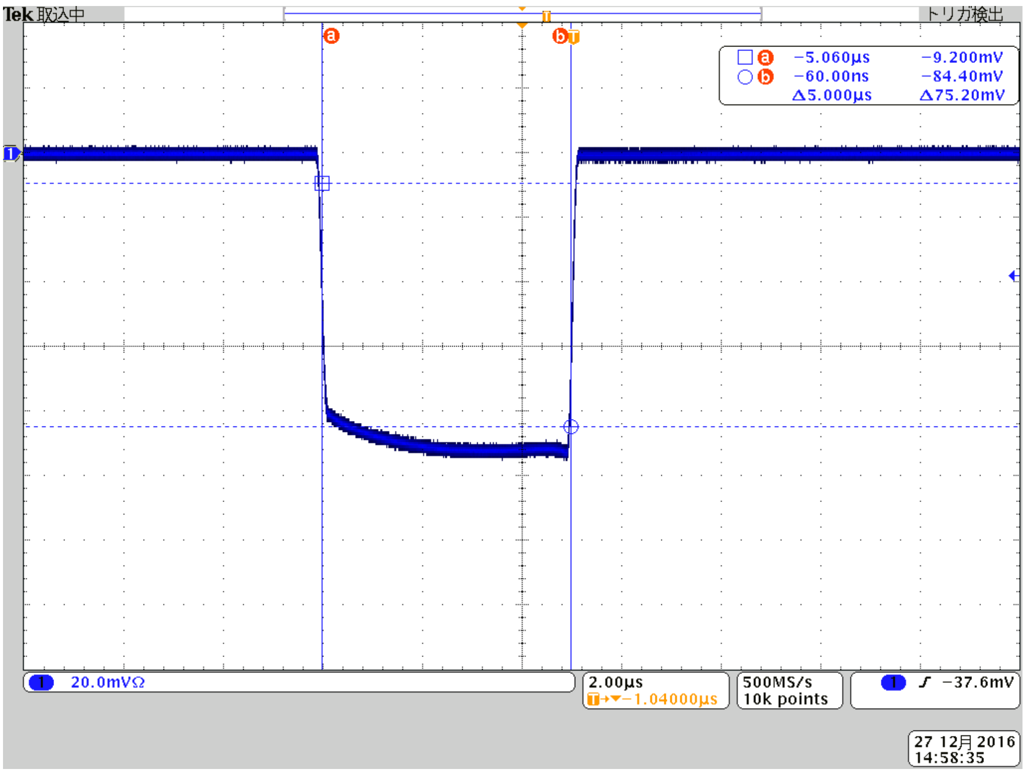


Fig. 7.26 S1 Pulse Envelope

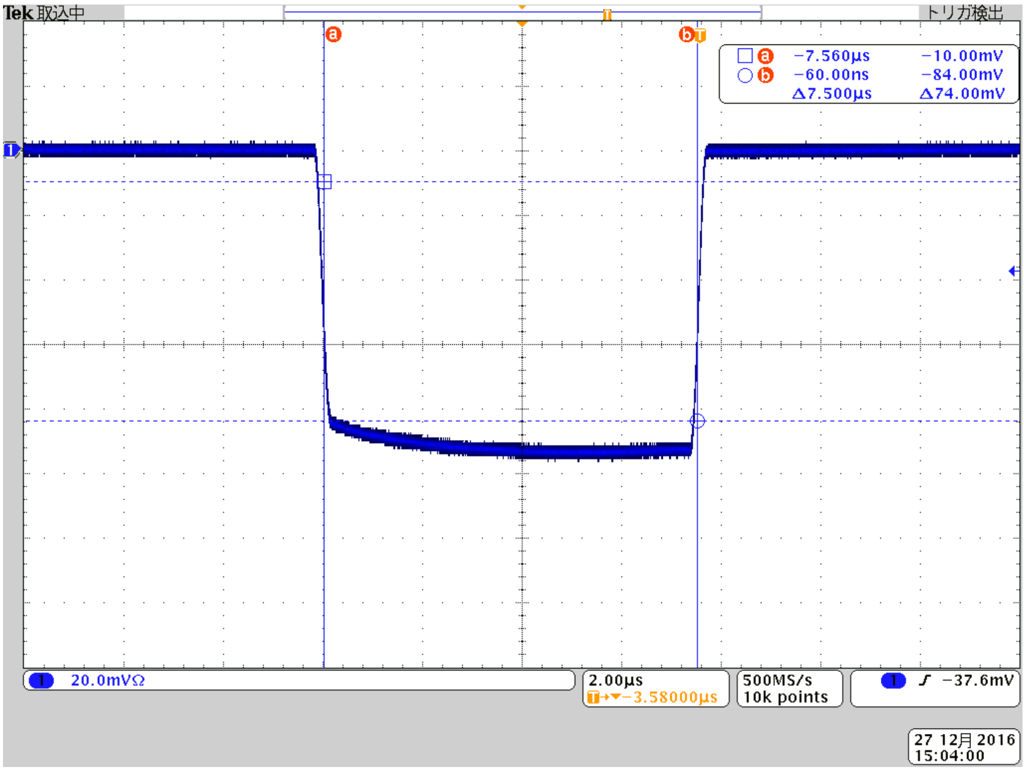


Fig. 7.27 S2 Pulse Envelope

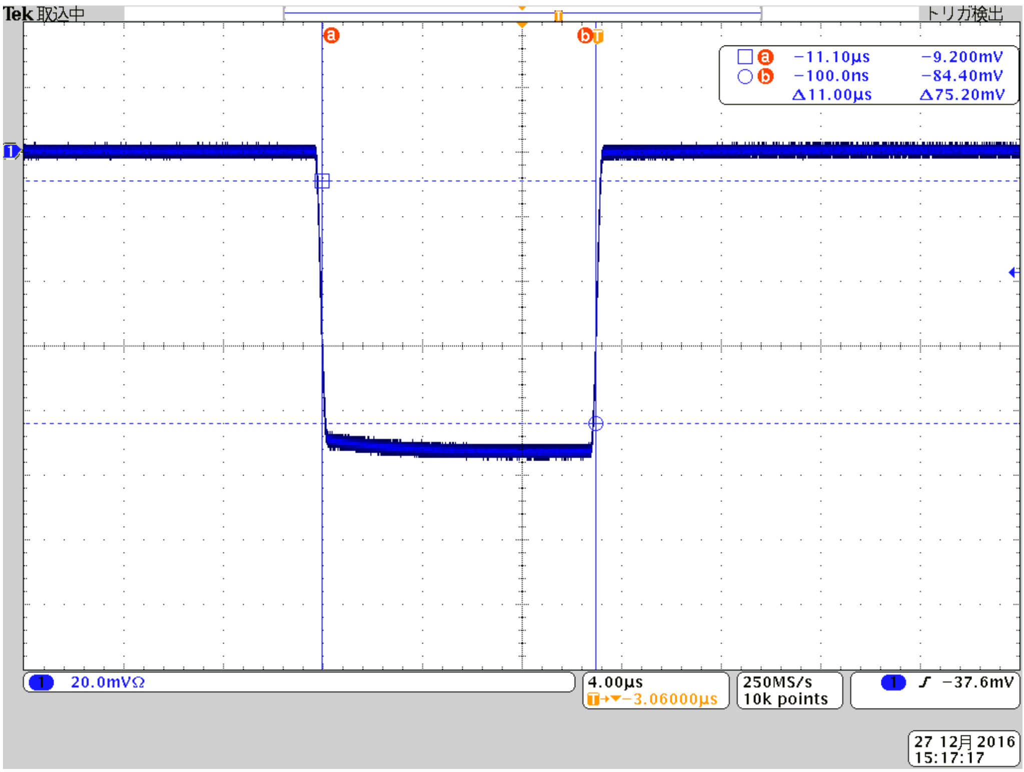


Fig. 7.28 M1 Pulse Envelope

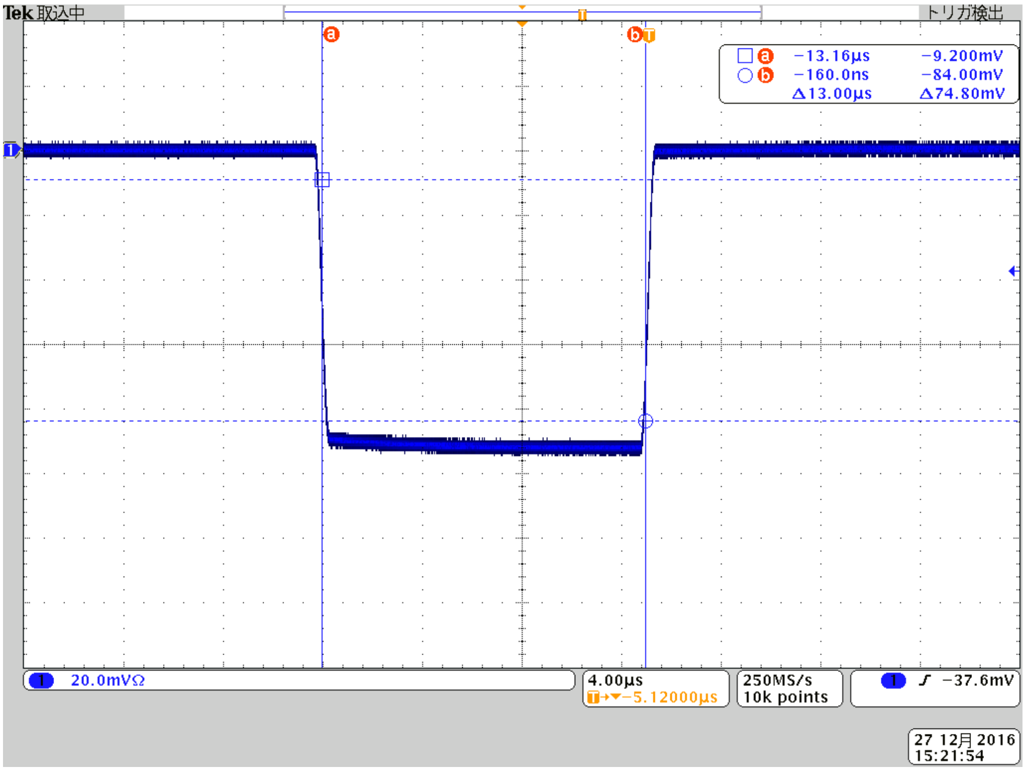


Fig. 7.29 M2 Pulse Envelope

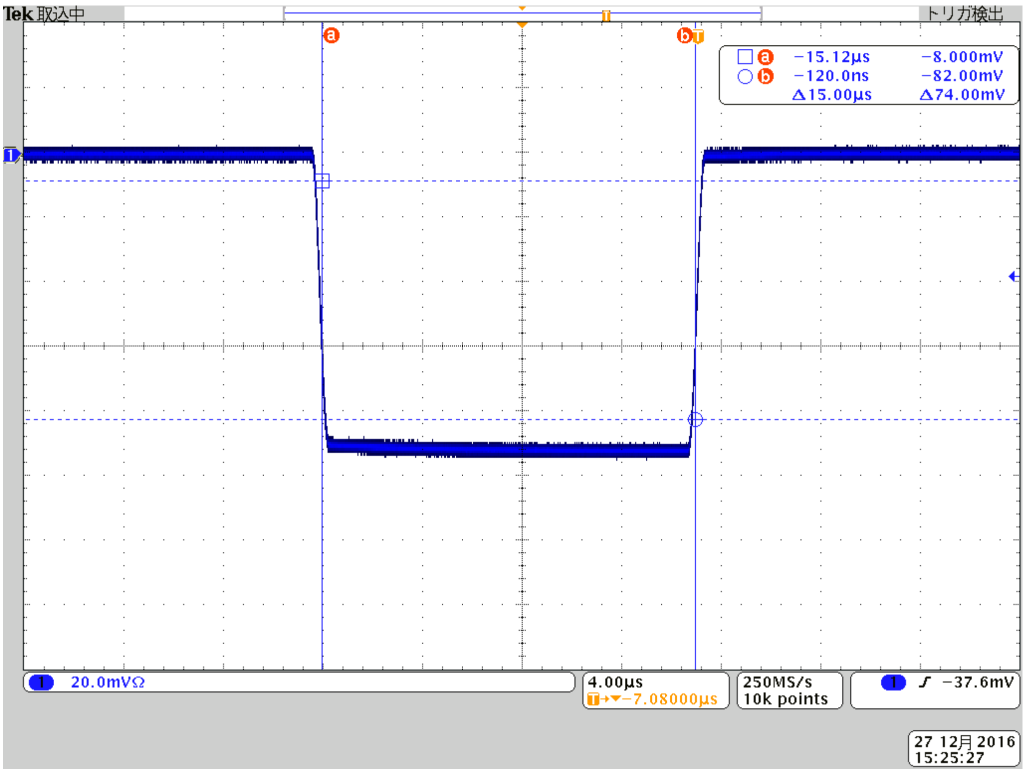


Fig. 7.30 M3 Pulse Envelope

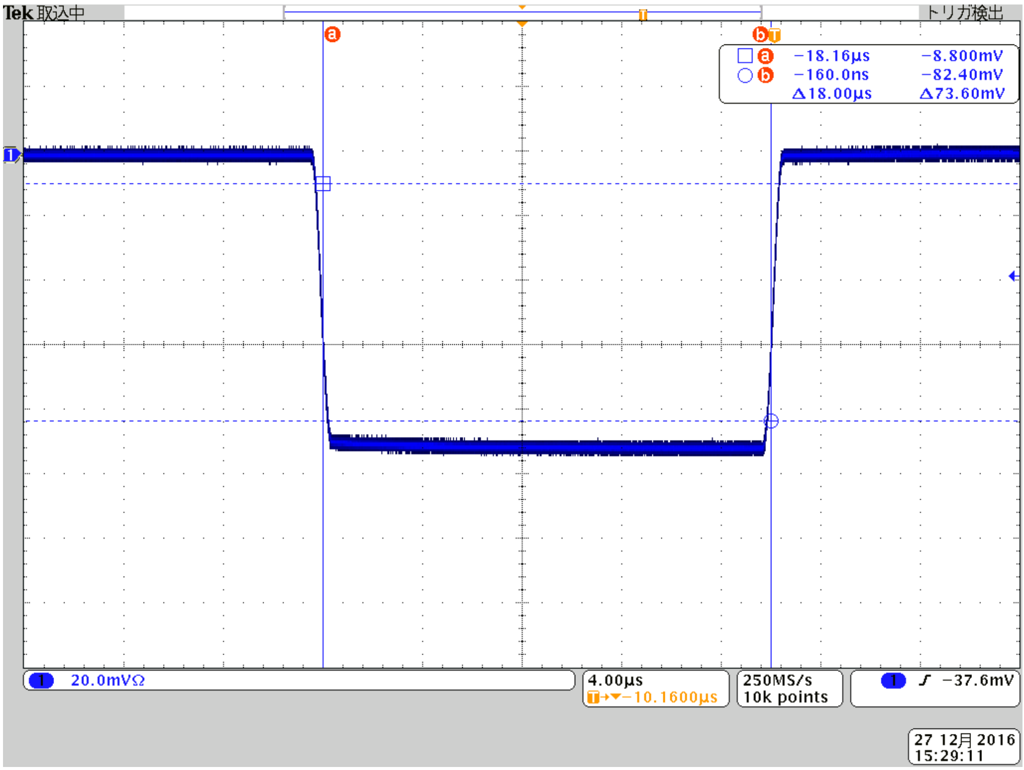


Fig. 7.31 L1 Pulse Envelope

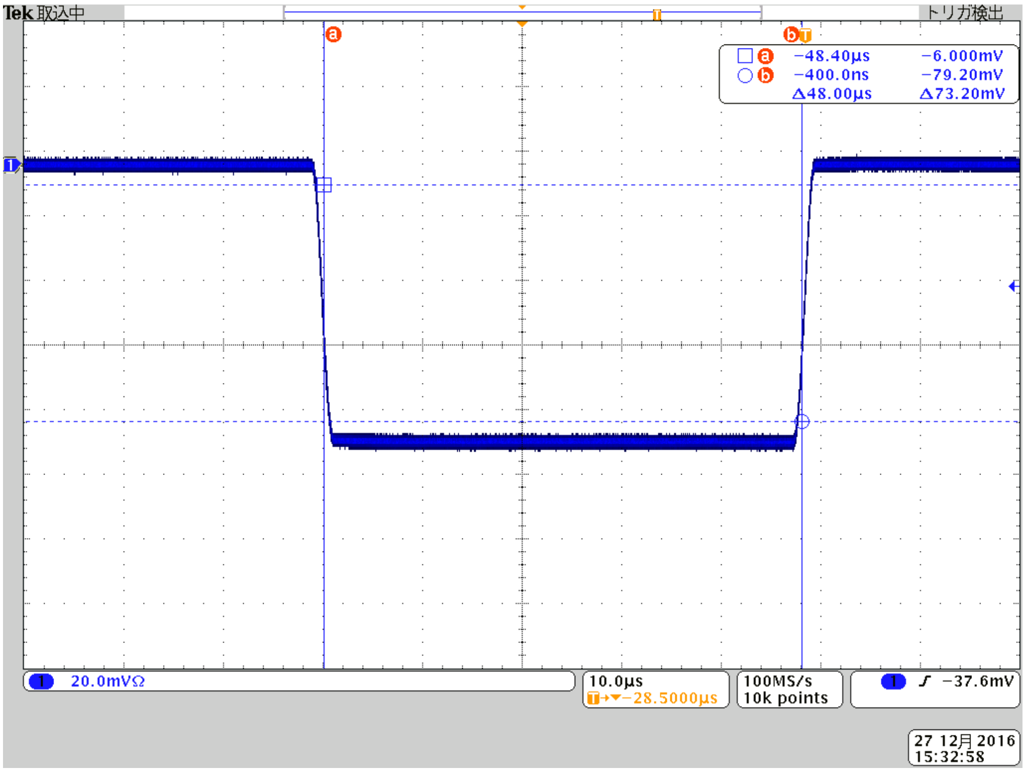


Fig. 7.32 L2 Pulse Envelope

CH3, P0N

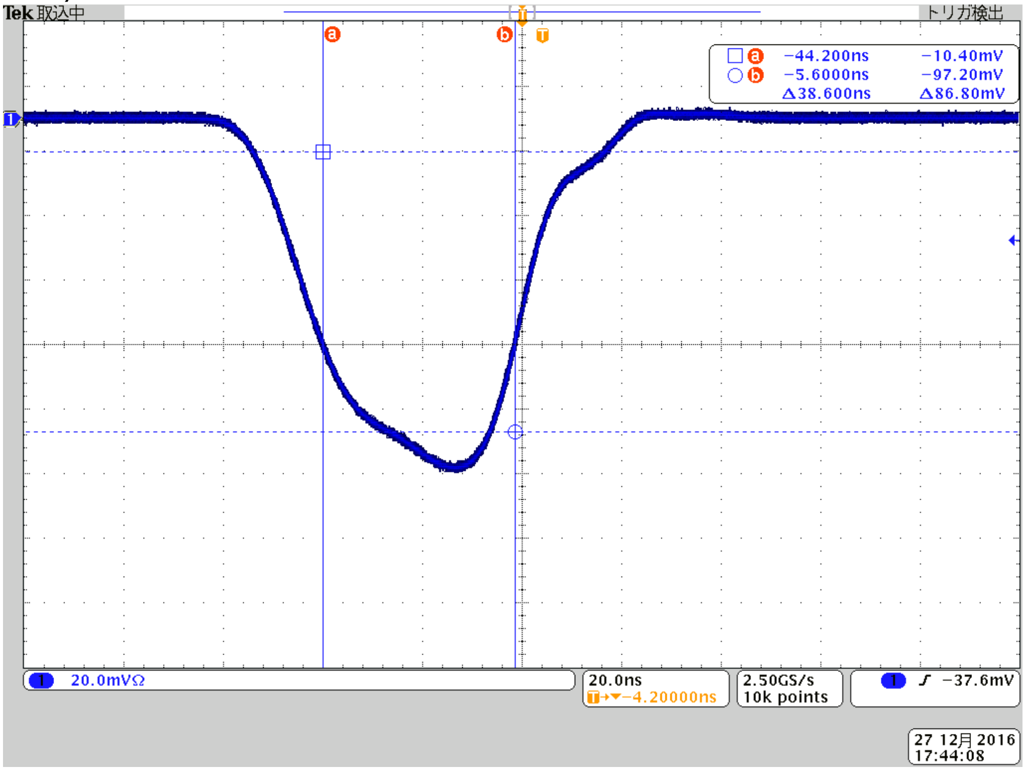


Fig. 7.33 S0 Pulse Envelope

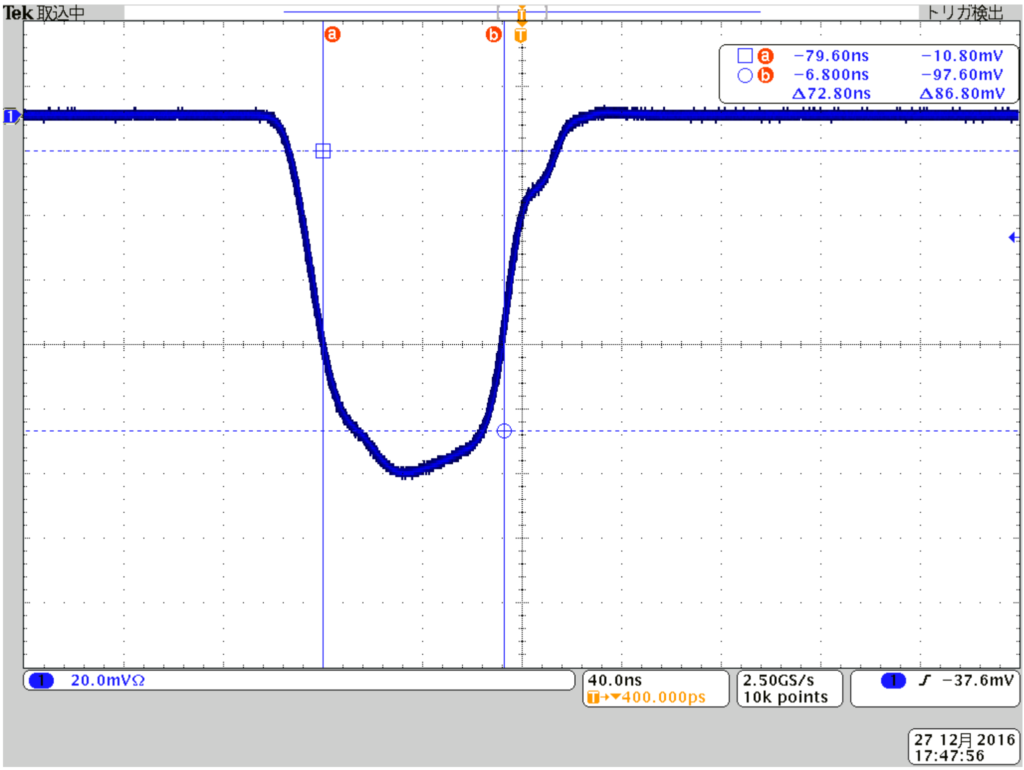


Fig. 7.34 S1 Pulse Envelope

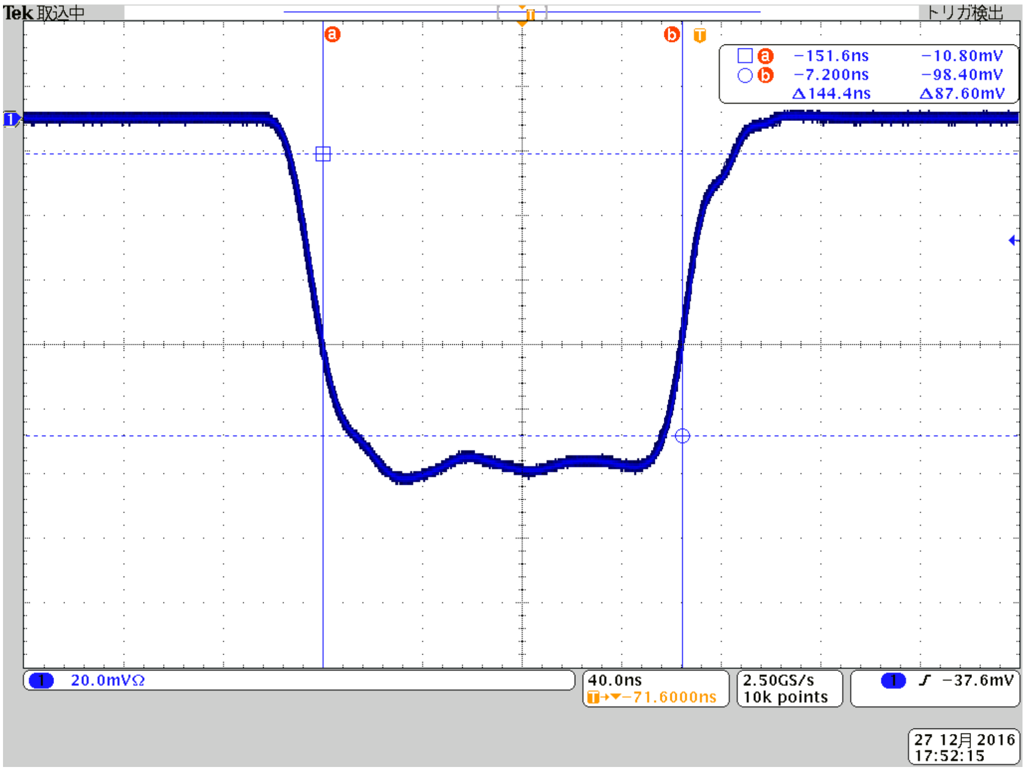


Fig. 7.35 S2 Pulse Envelope

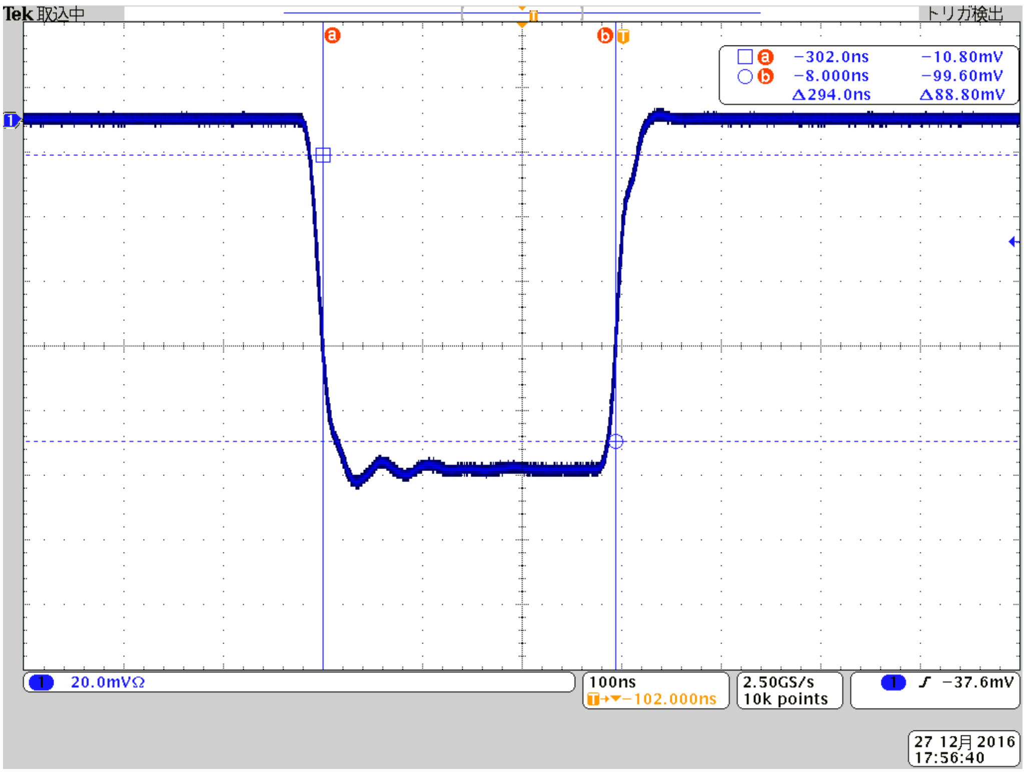


Fig. 7.36 M1 Pulse Envelope

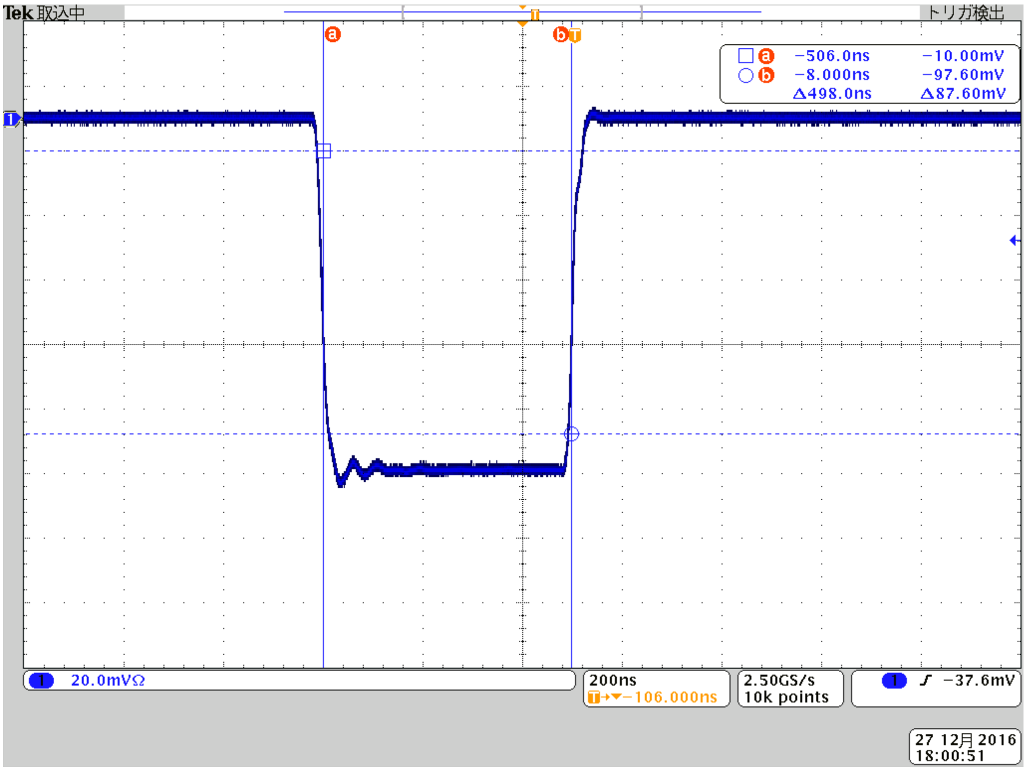


Fig. 7.37 M2 Pulse Envelope

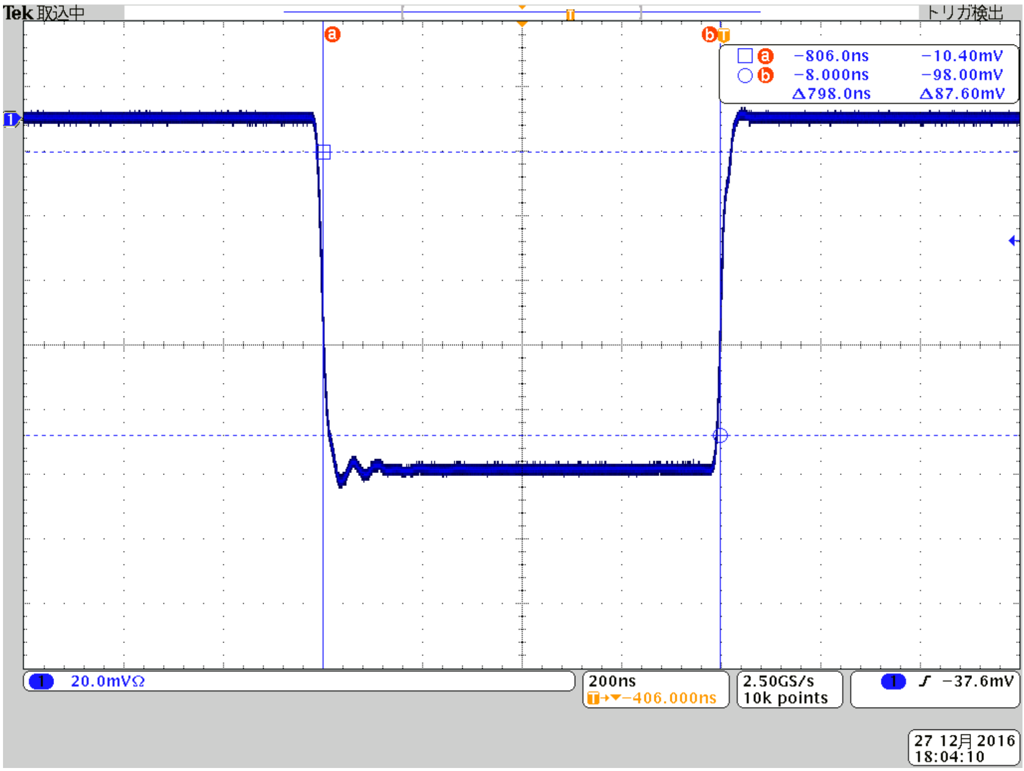


Fig. 7.38 M3 Pulse Envelope

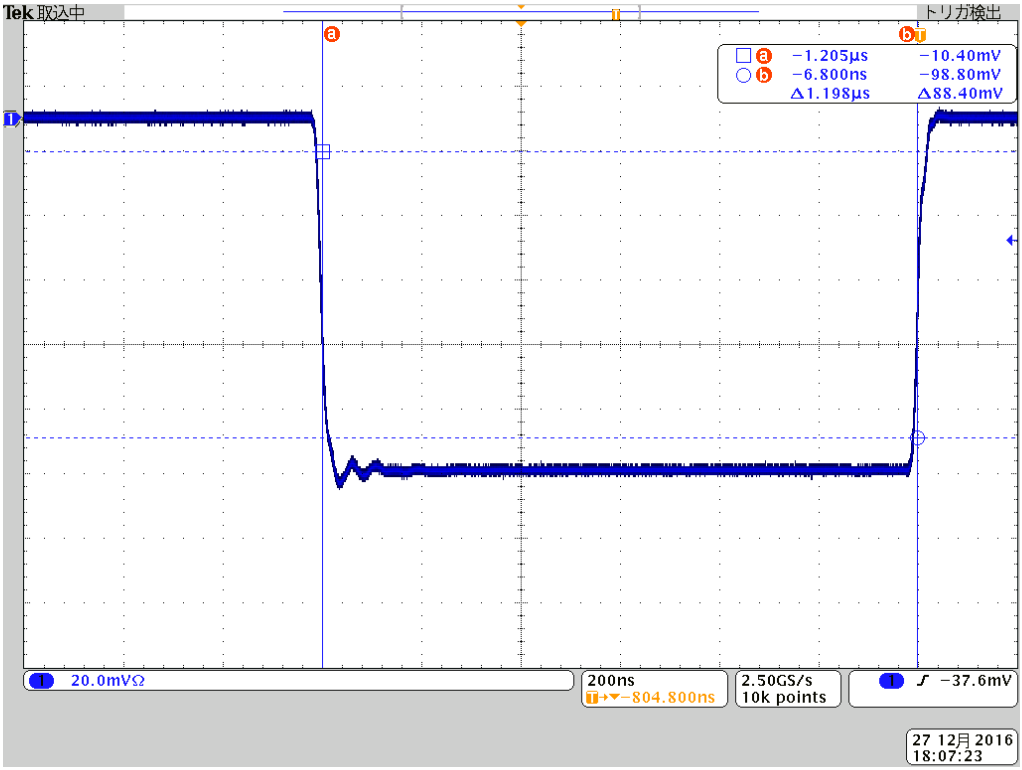


Fig. 7.39 L1 Pulse Envelope

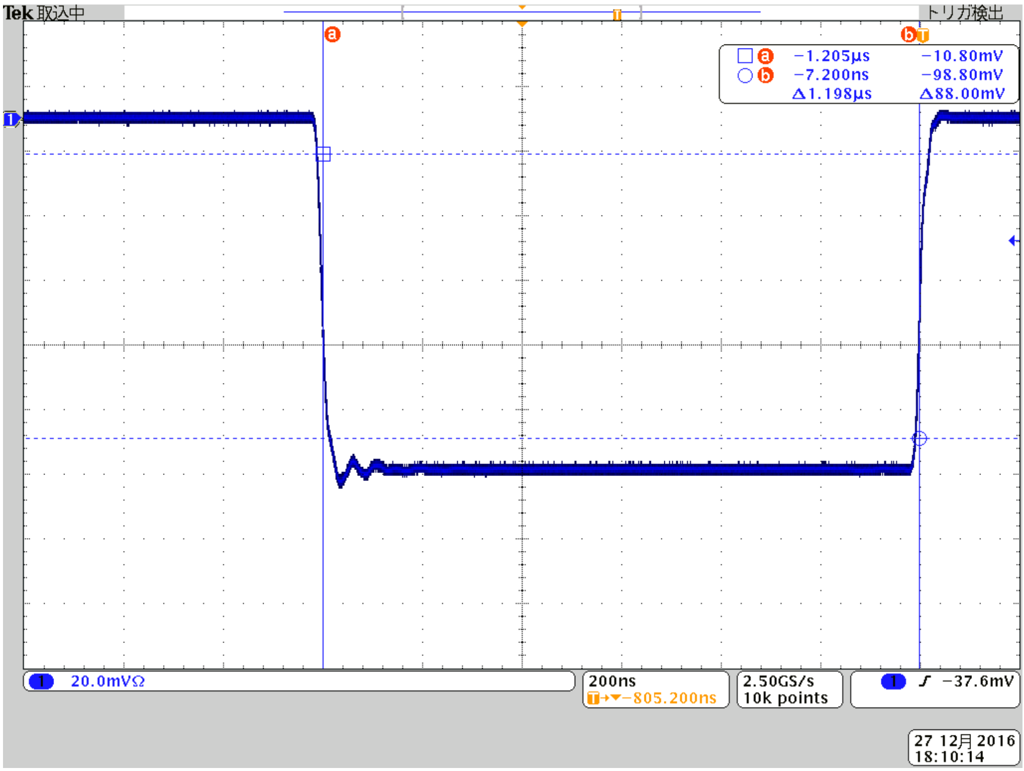


Fig. 7.40 L2 Pulse Envelope

CH3, Q0N

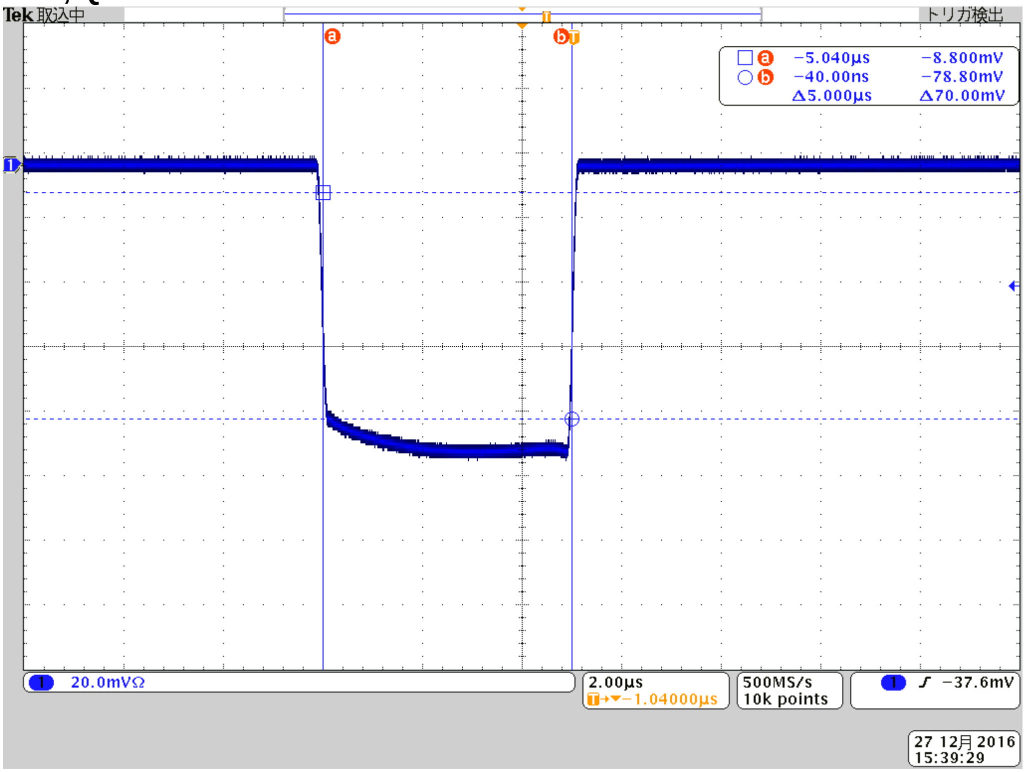


Fig. 7.41 S0 Pulse Envelope

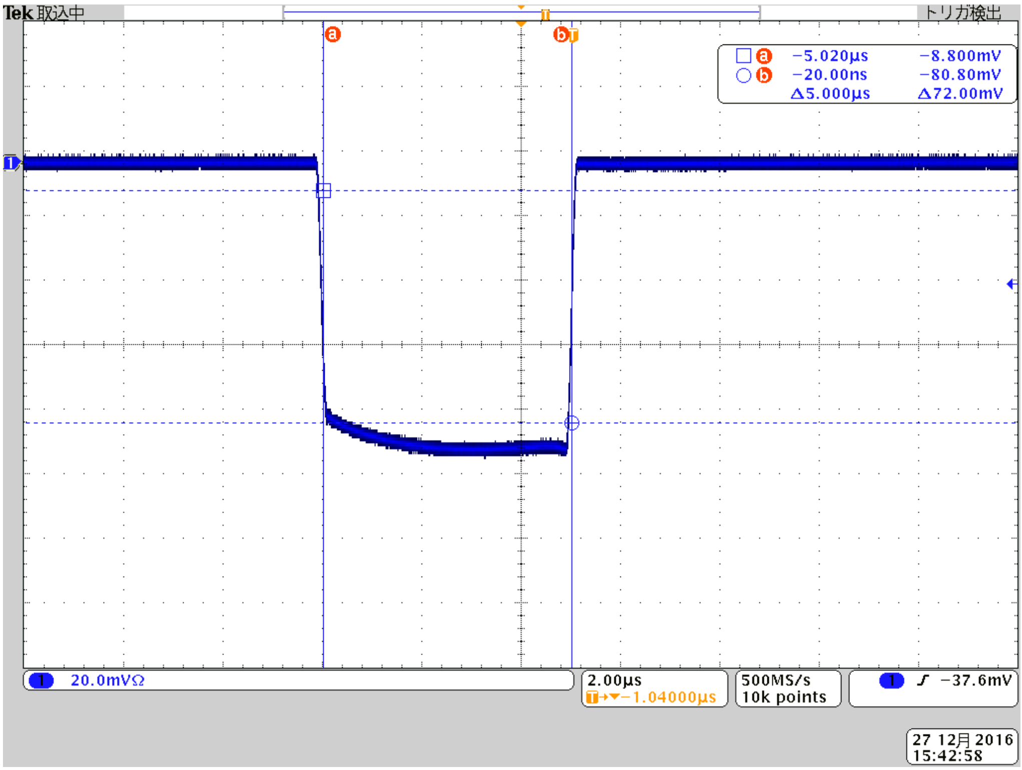


Fig. 7.42 S1 Pulse Envelope

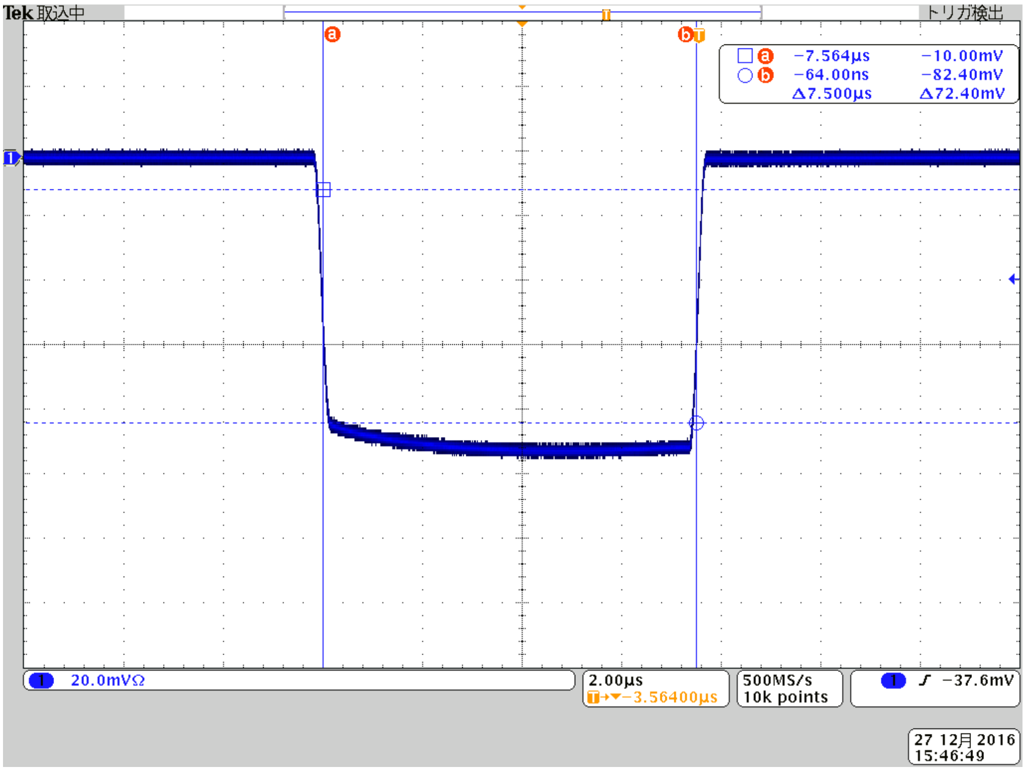


Fig. 7.43 S2 Pulse Envelope

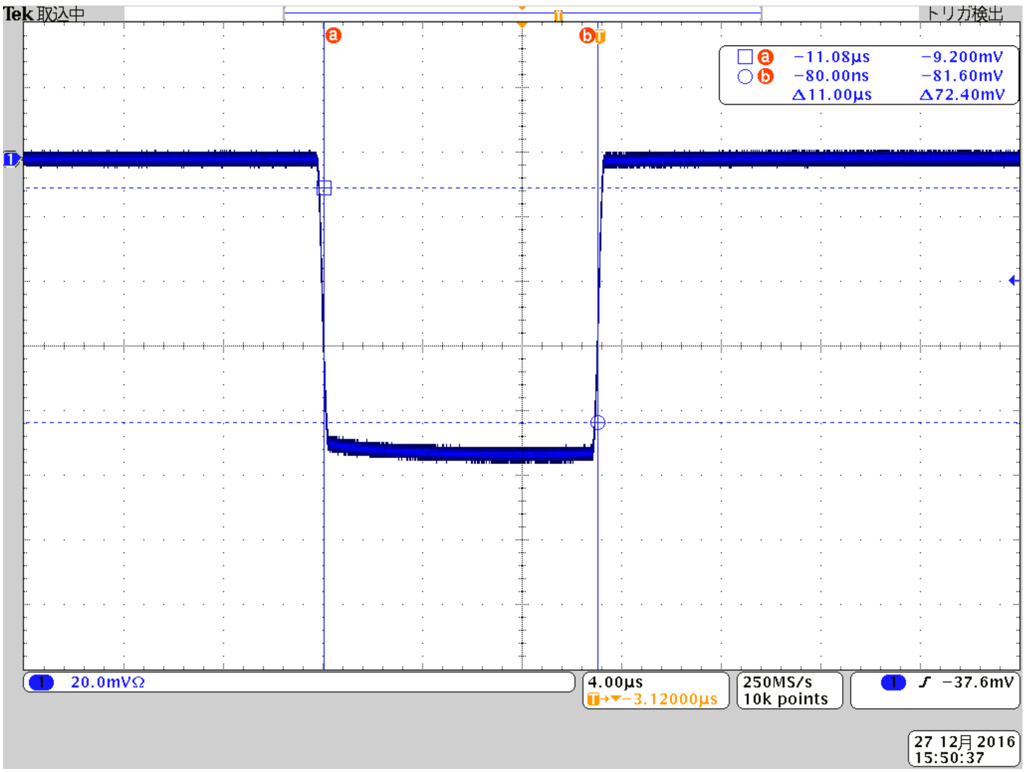


Fig. 7.44 M1 Pulse Envelope

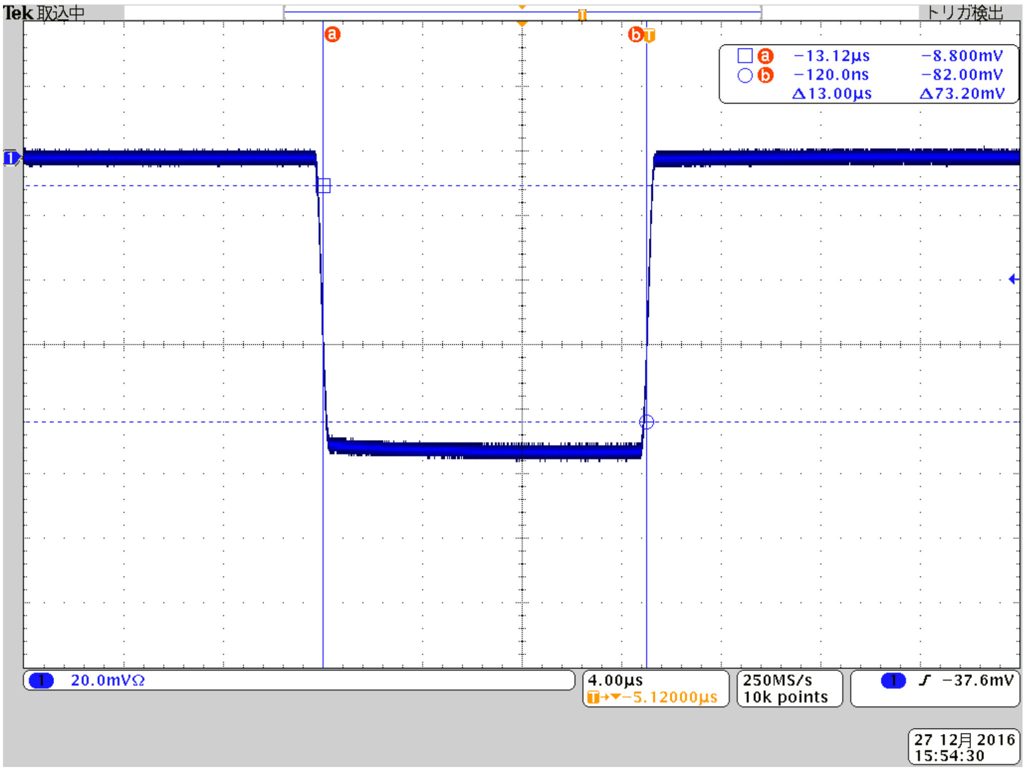


Fig. 7.45 M2 Pulse Envelope

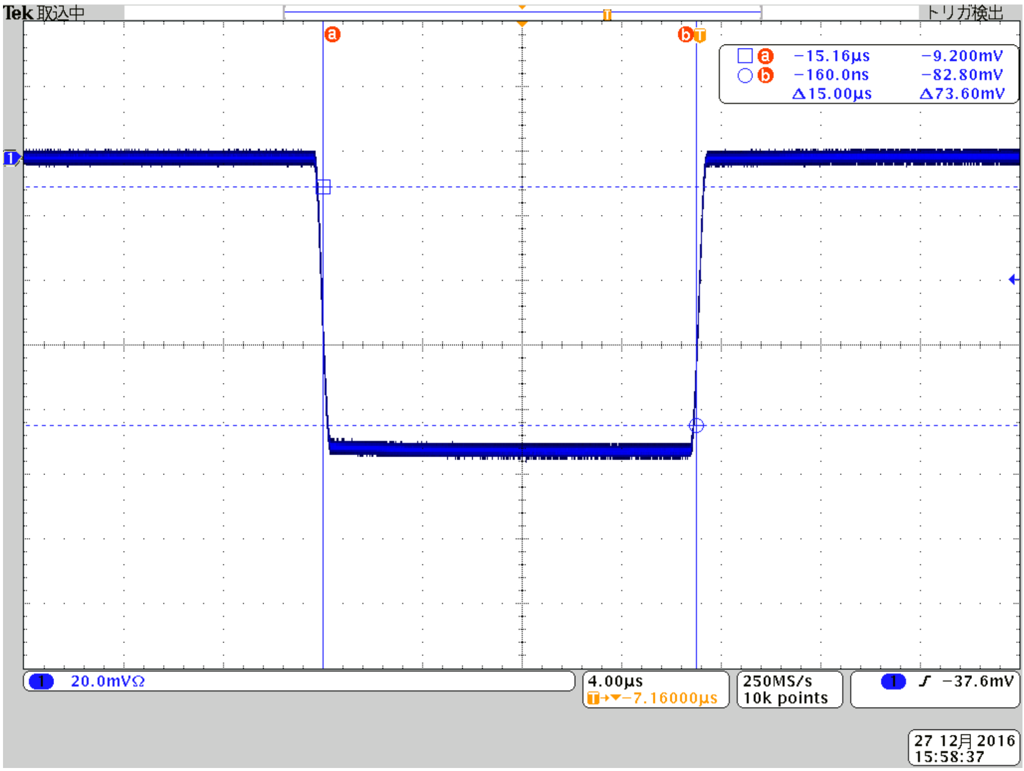


Fig. 7.46 M3 Pulse Envelope

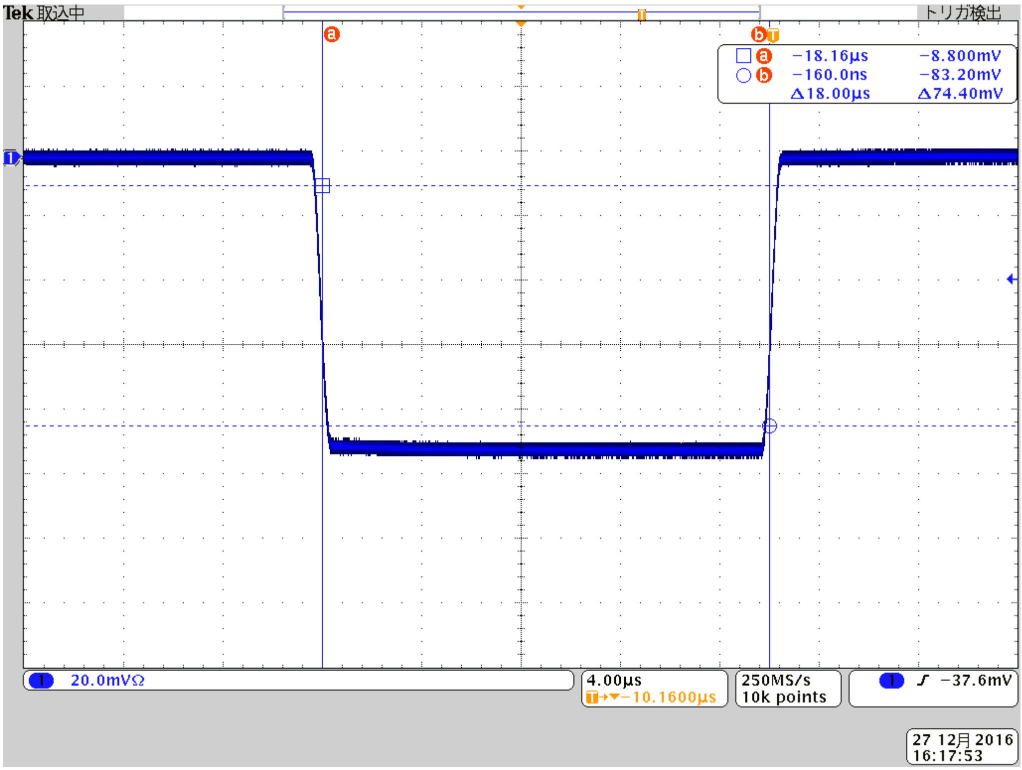


Fig. 7.47 L1 Pulse Envelope

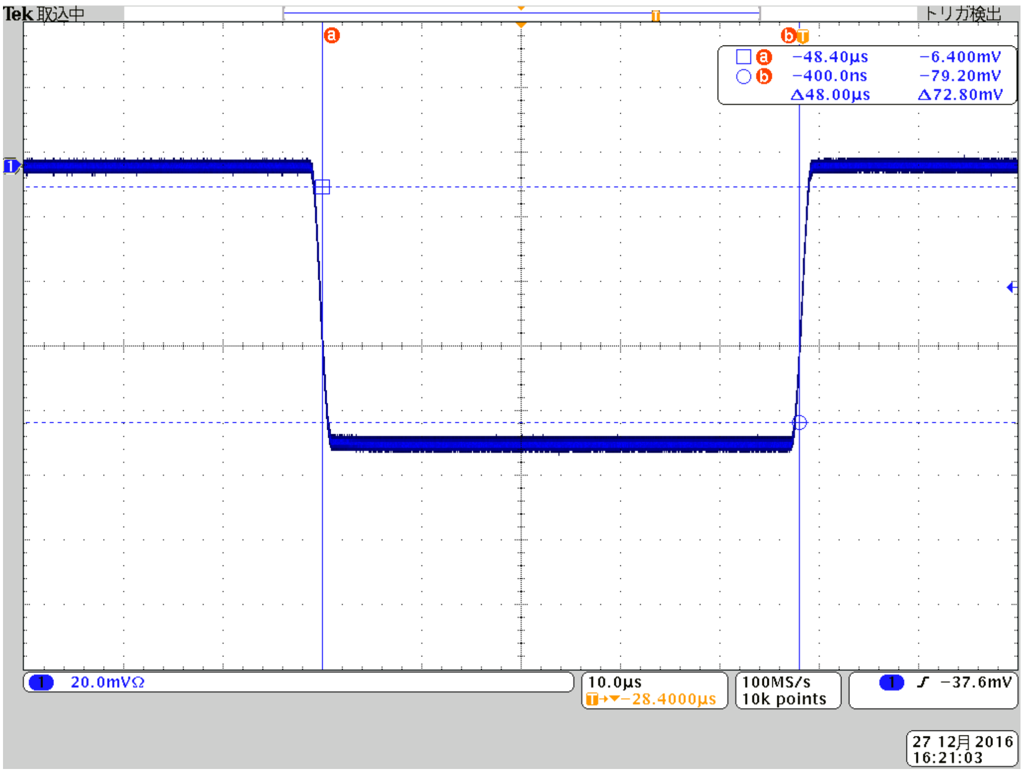


Fig. 7.48 L2 Pulse Envelope

7 Spurious Emission Plots measured at Antenna Terminal

CH1, P0N

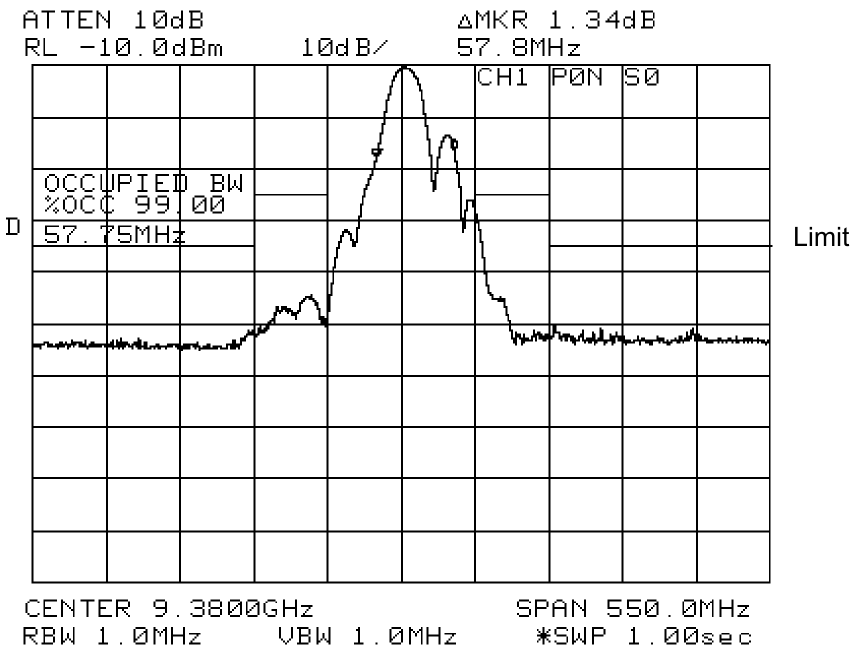


Fig. 8.1 for S0 Pulse

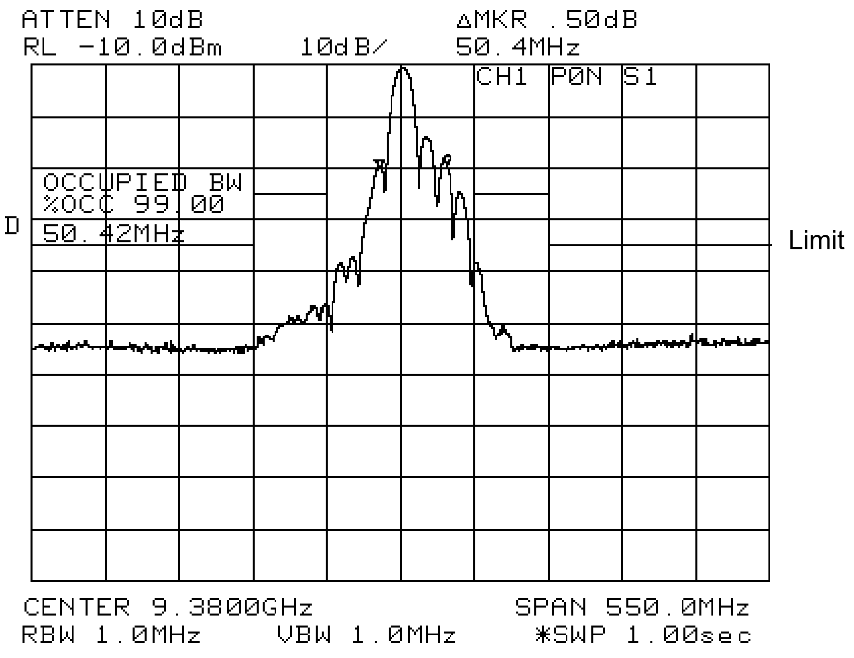


Fig. 8.2 for S1 Pulse

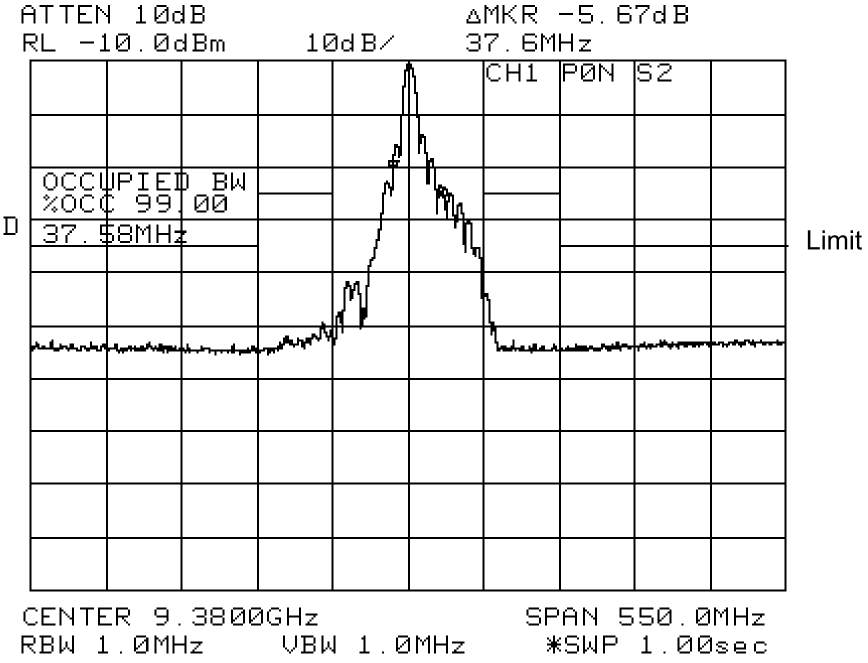


Fig. 8.3 for S2 Pulse

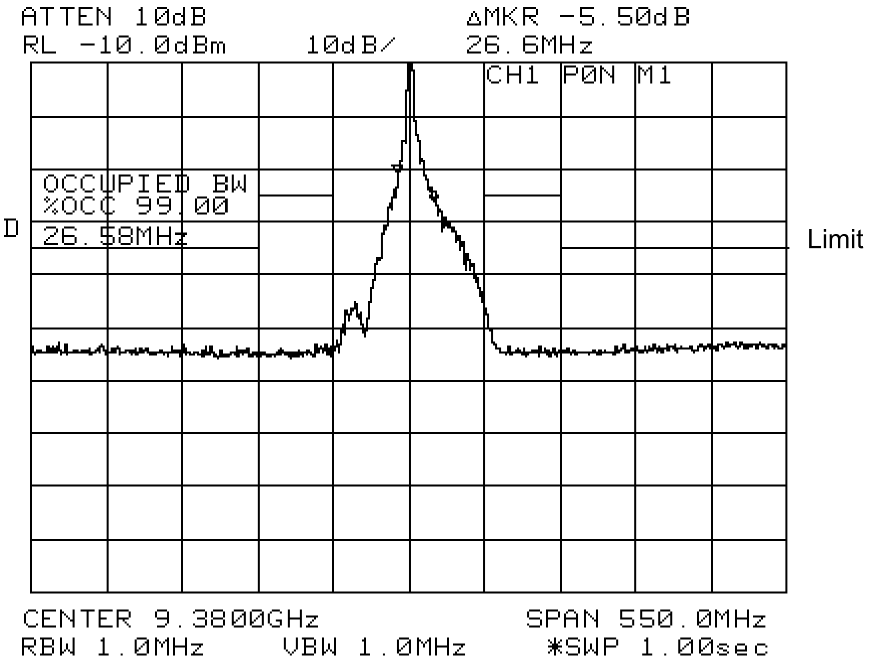


Fig. 8.4 for M1 Pulse

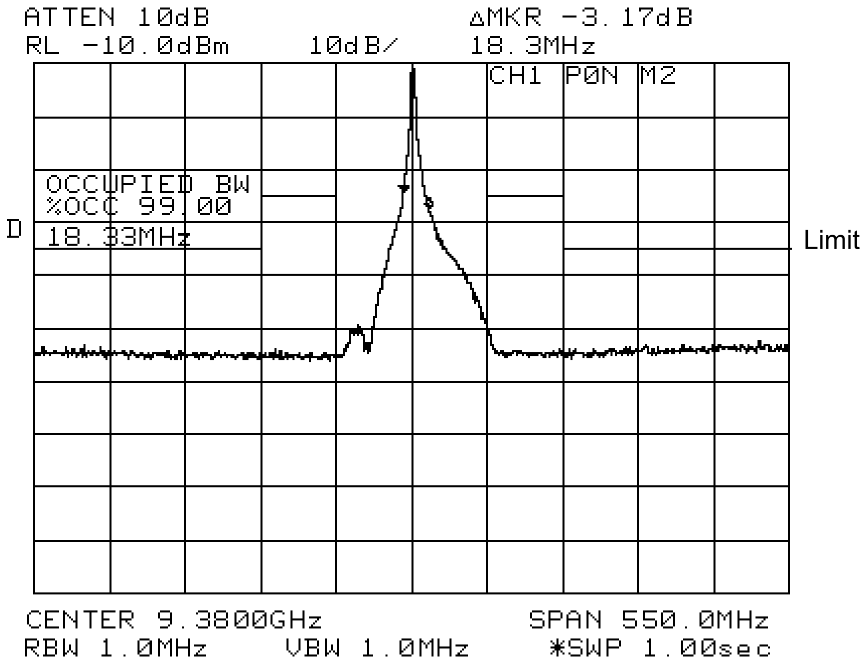


Fig. 8.5 for M2 Pulse

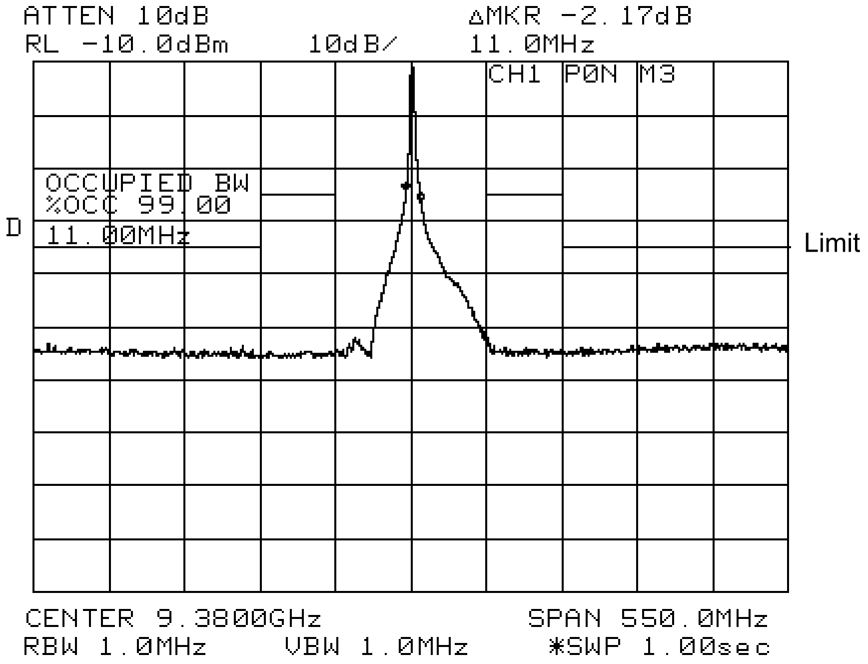


Fig. 8.6 for M3 Pulse

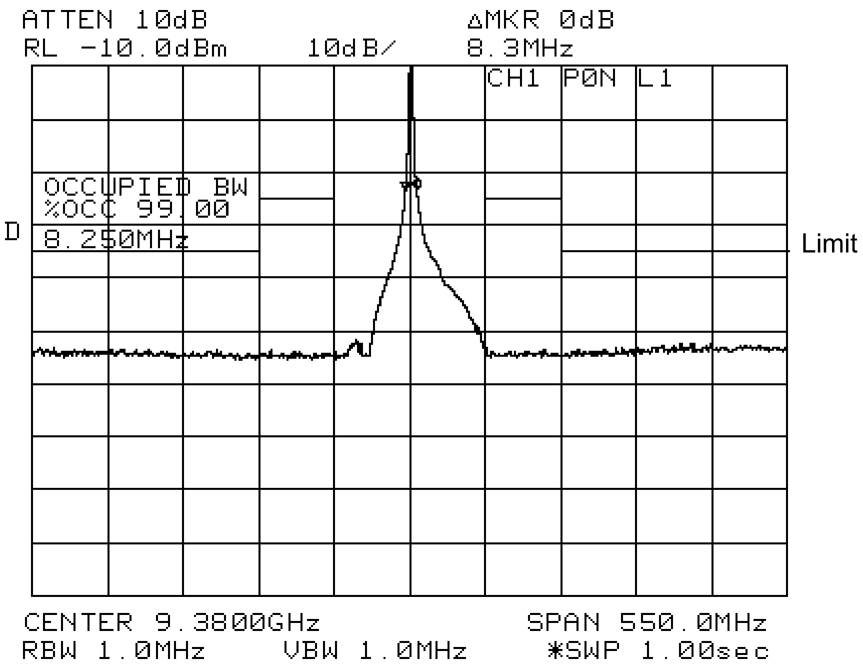


Fig. 8.7 for L1 Pulse

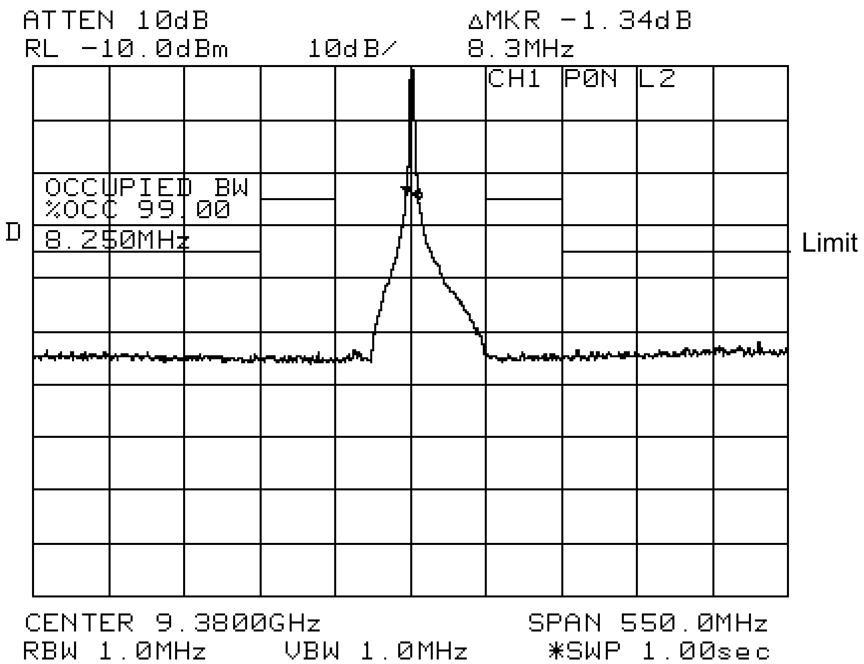


Fig. 8.8 for L2 Pulse

CH1, Q0N

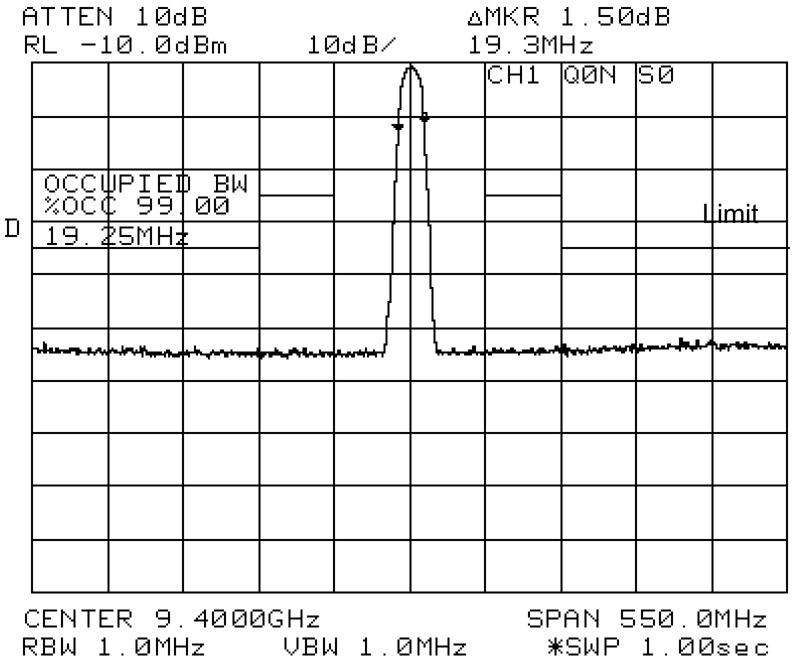


Fig. 8.9 for S0 Pulse

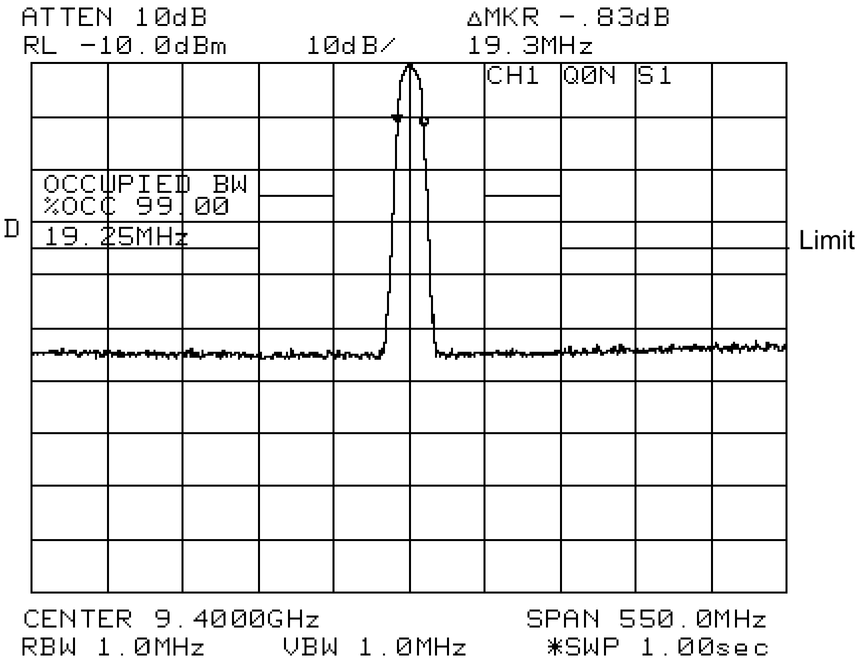


Fig. 8.10 for S1 Pulse

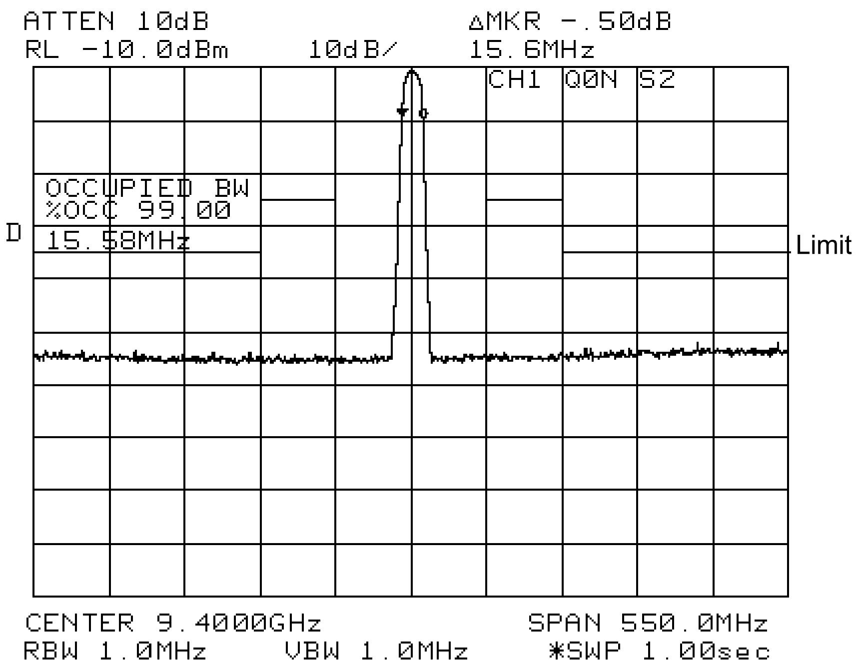


Fig. 8.11 for S2 Pulse

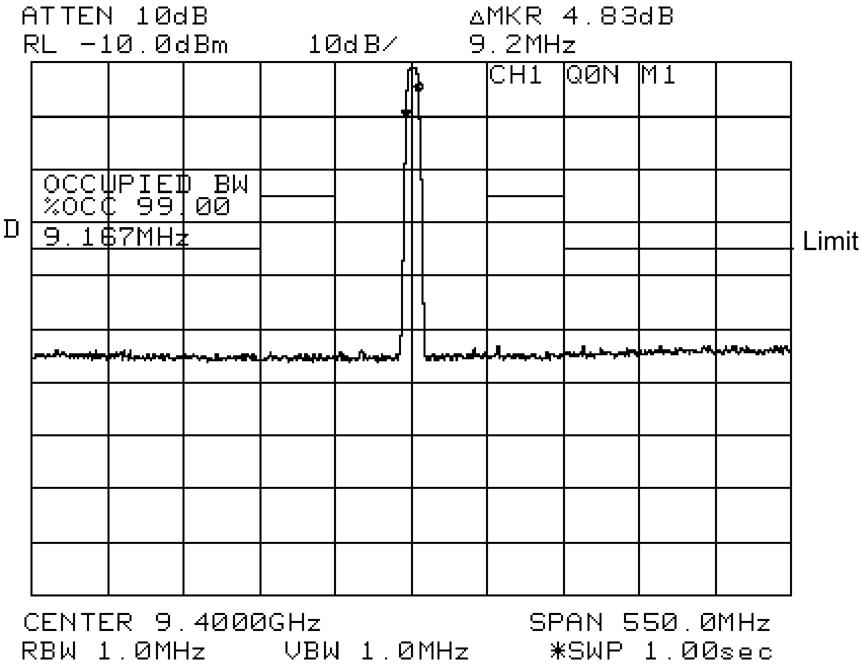


Fig. 8.12 for M1 Pulse

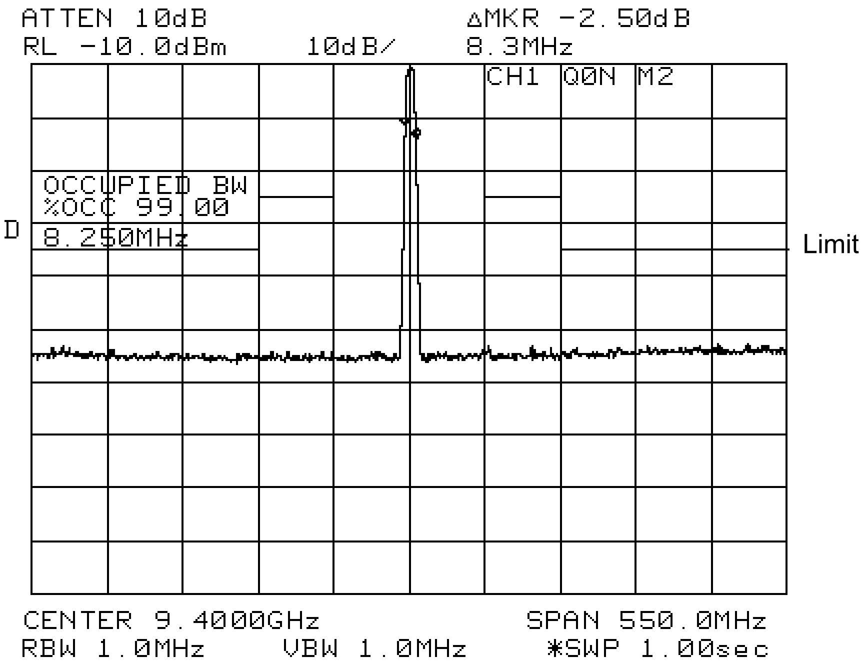


Fig. 8.13 for M2 Pulse

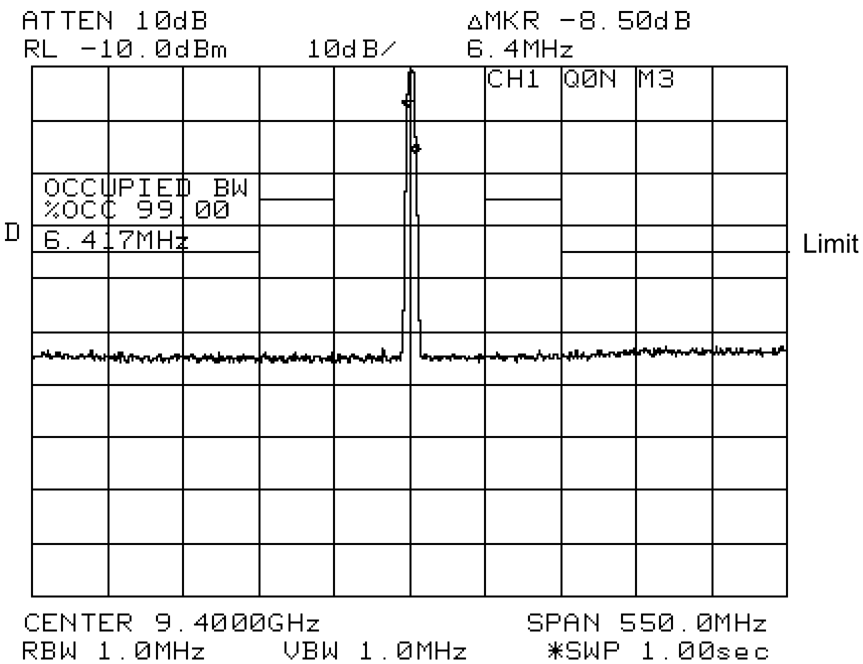


Fig. 8.14 for M3 Pulse

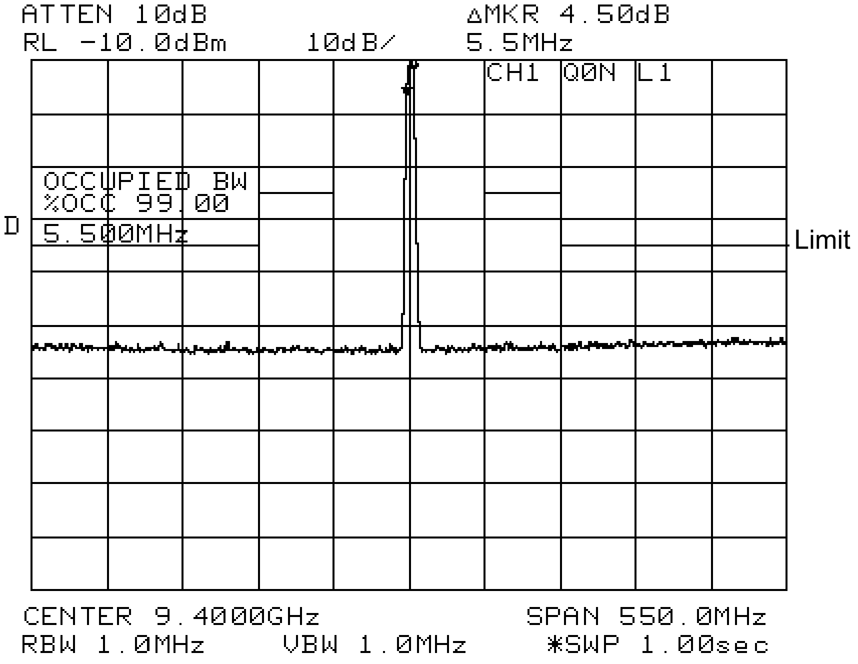


Fig. 8.15 for L1 Pulse

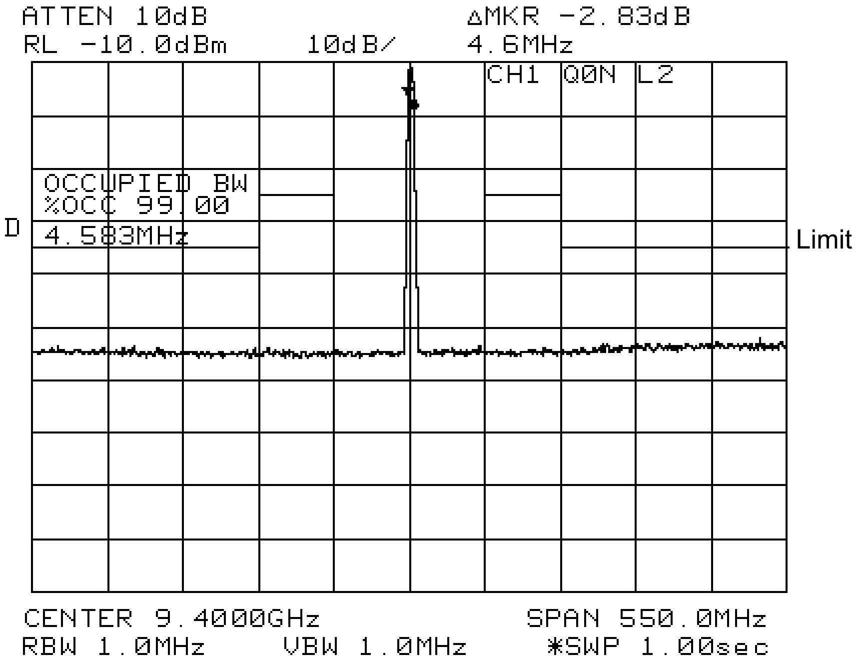


Fig. 8.16 for L2 Pulse

CH2, P0N

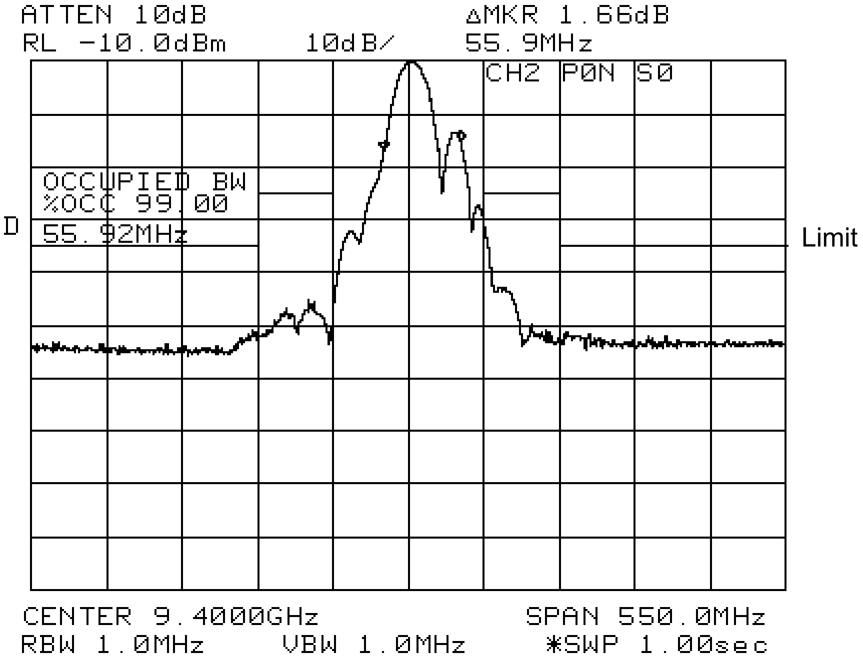


Fig. 8.17 for S0 Pulse

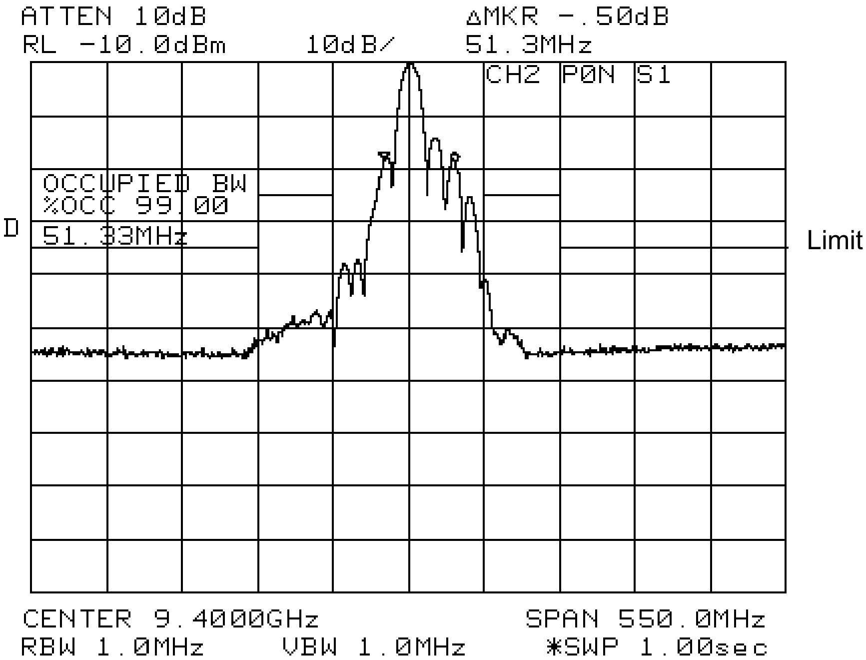


Fig. 8.18 for S1 Pulse

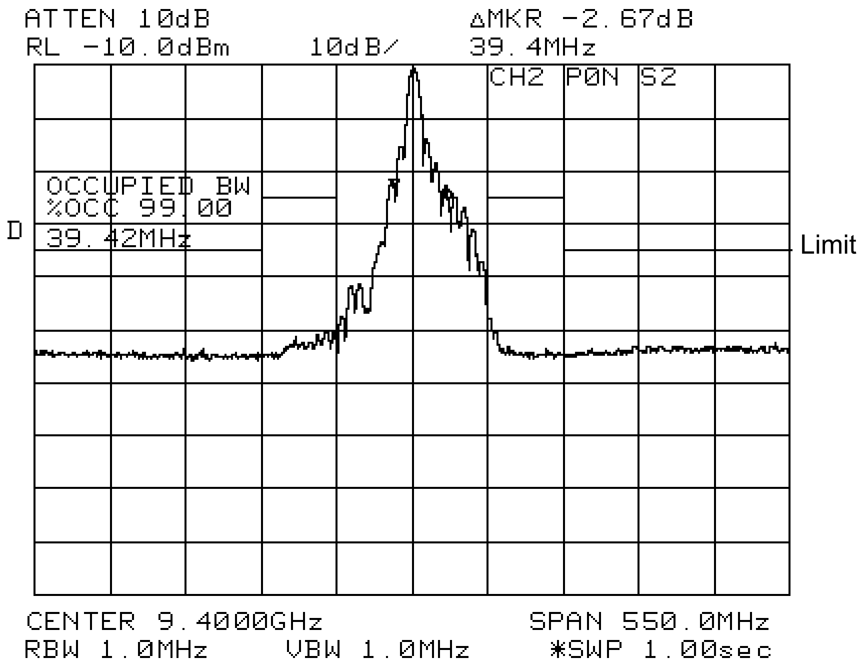


Fig. 8.19 for S2 Pulse

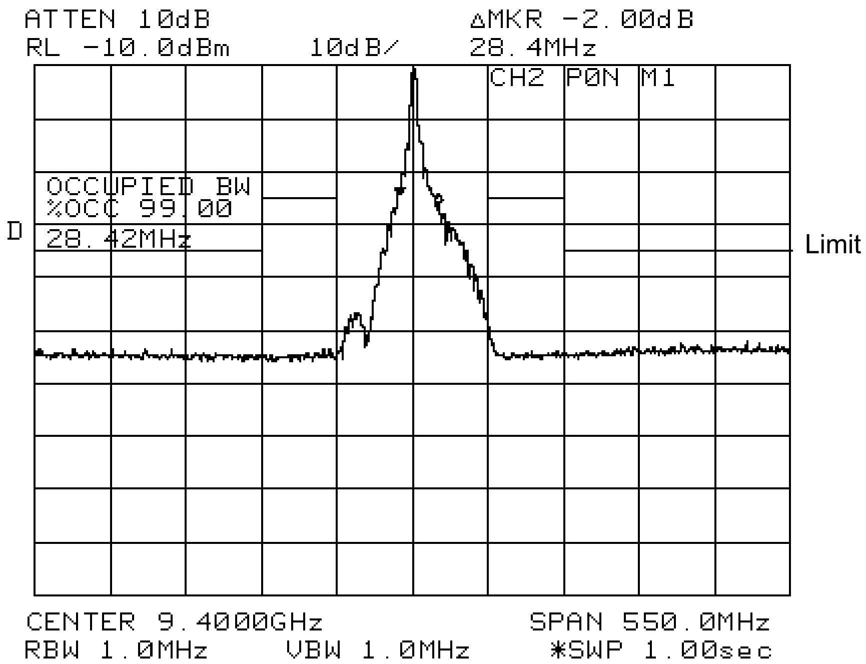


Fig. 8.20 for M1 Pulse

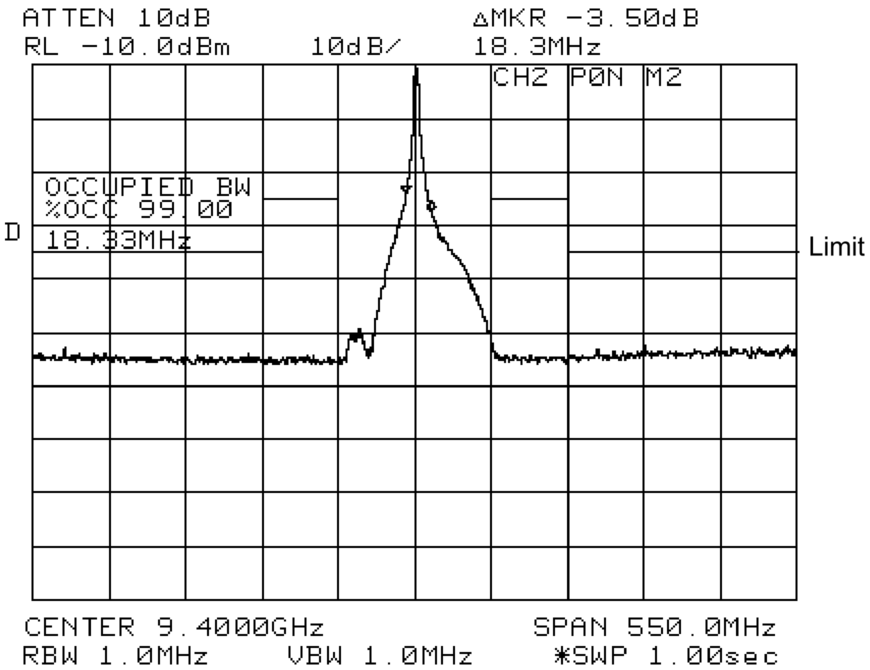


Fig. 8.21 for M2 Pulse

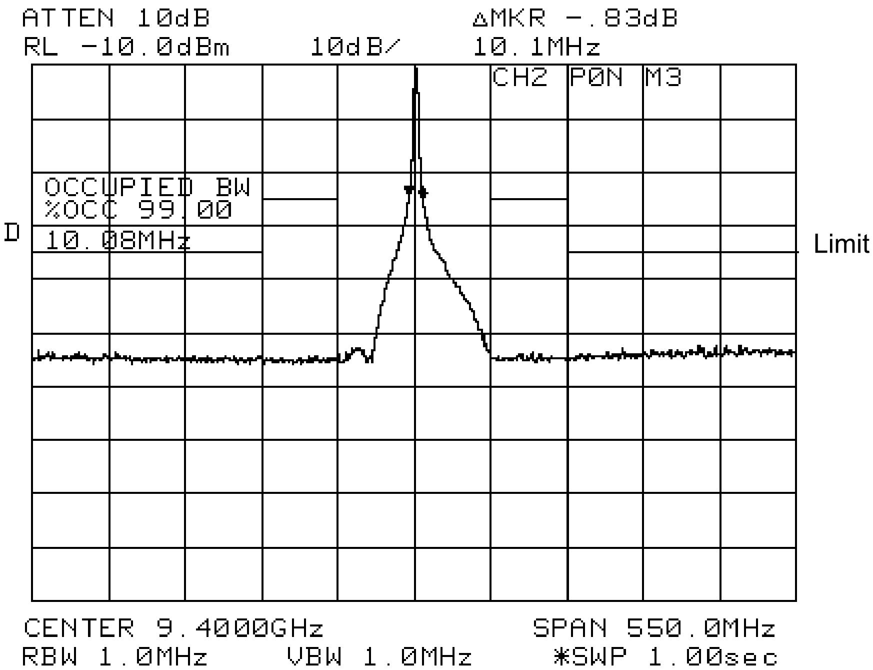


Fig. 8.22 for M3 Pulse

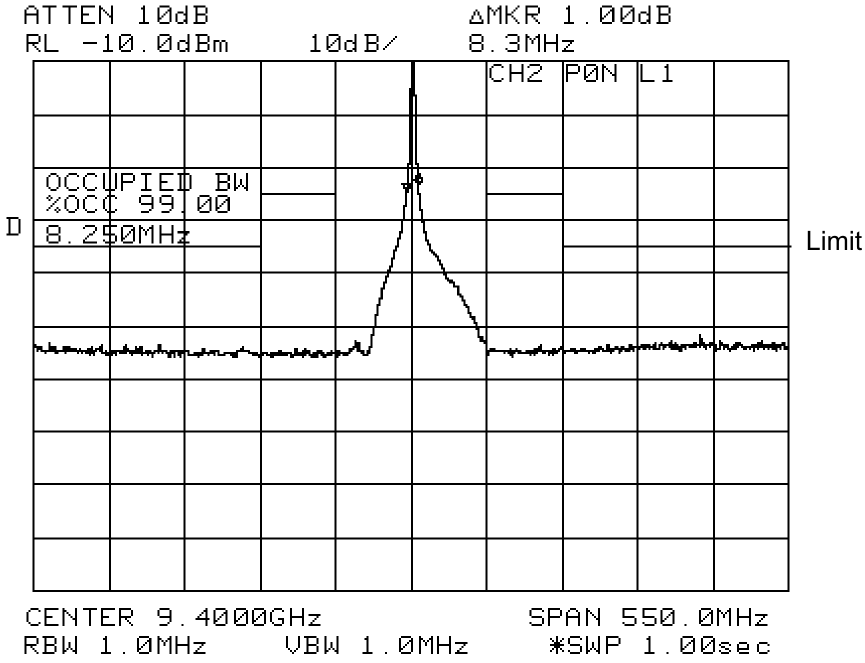


Fig. 8.23 for L1 Pulse

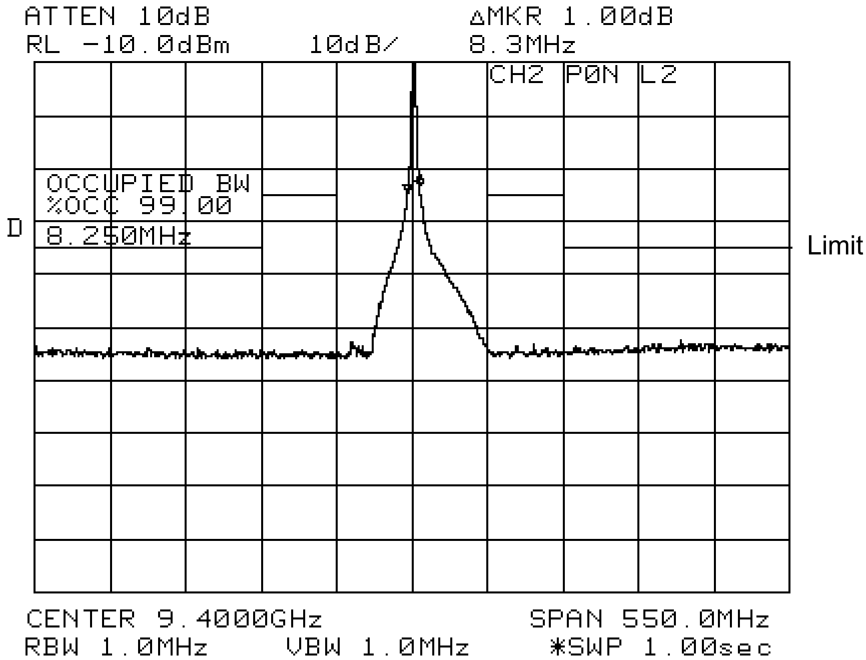


Fig. 8.24 for L2 Pulse

CH2, Q0N

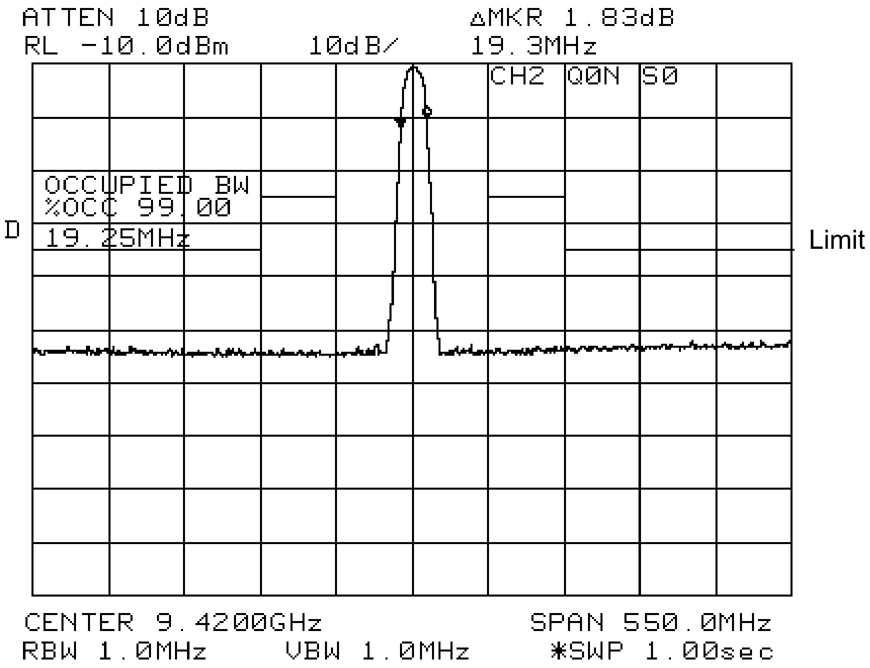


Fig. 8.25 for S0 Pulse

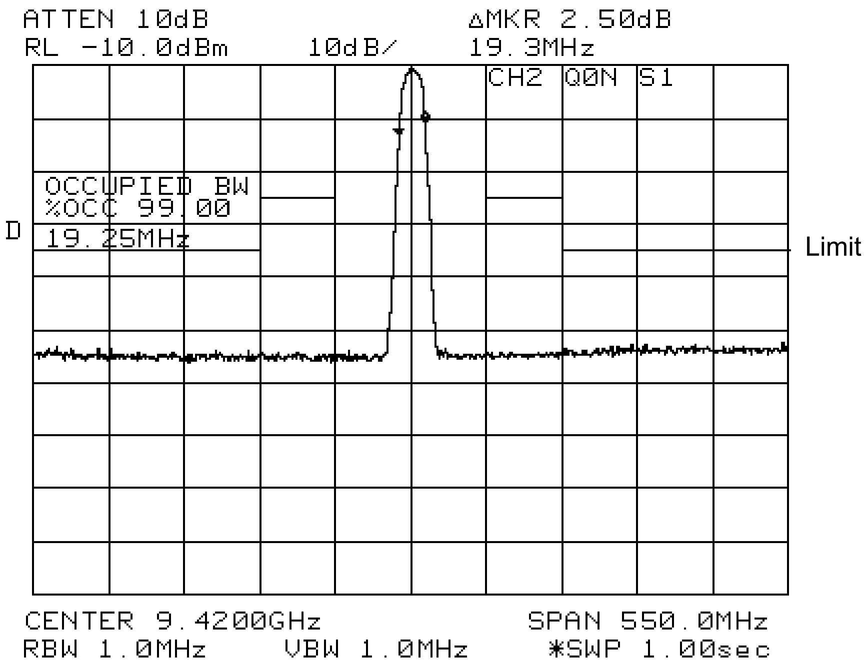


Fig. 8.26 for S1 Pulse

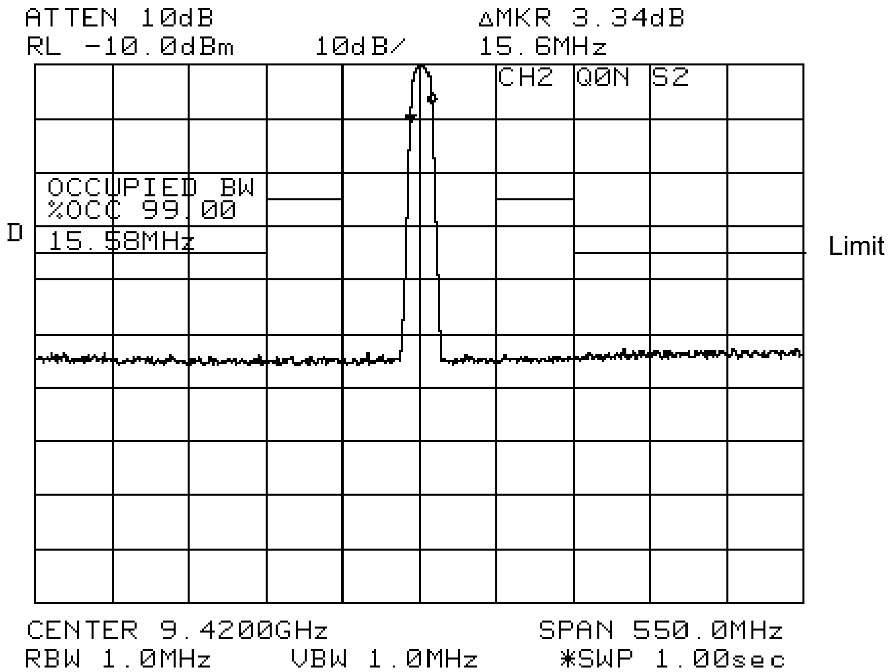


Fig. 8.27 for S2 Pulse

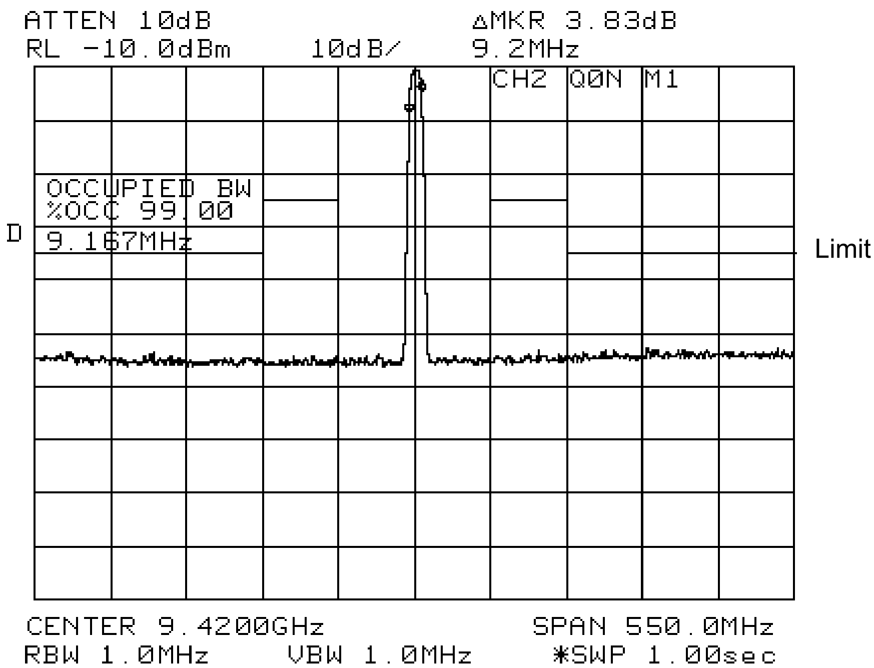


Fig. 8.28 for M1 Pulse

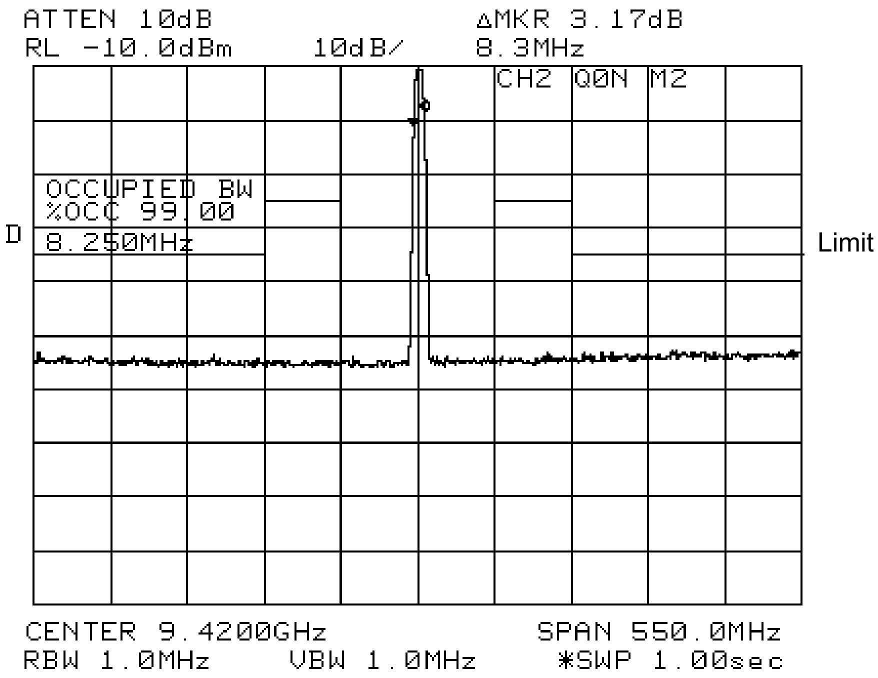


Fig. 8.29 for M2 Pulse

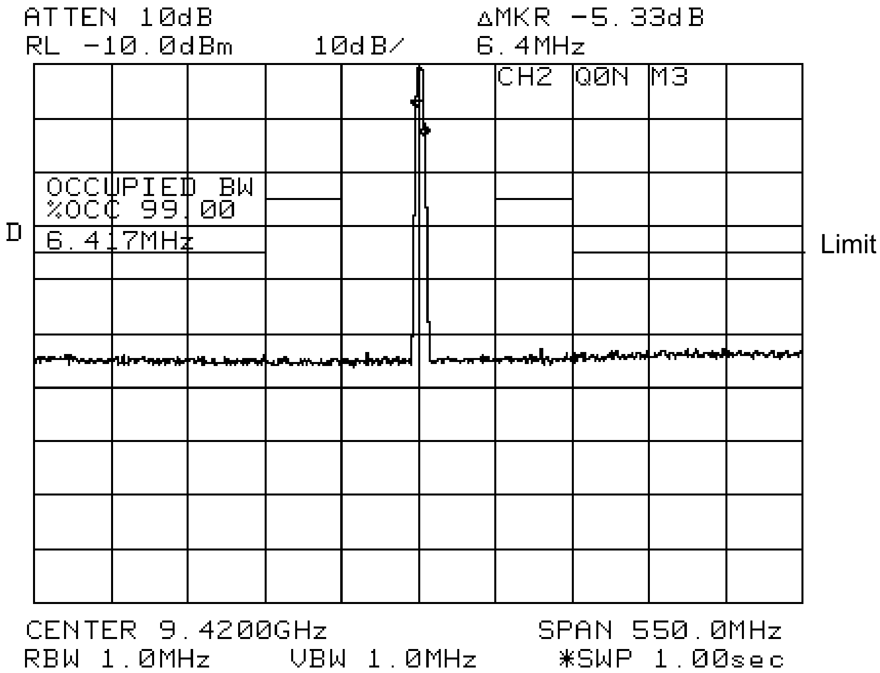


Fig. 8.30 for M3 Pulse

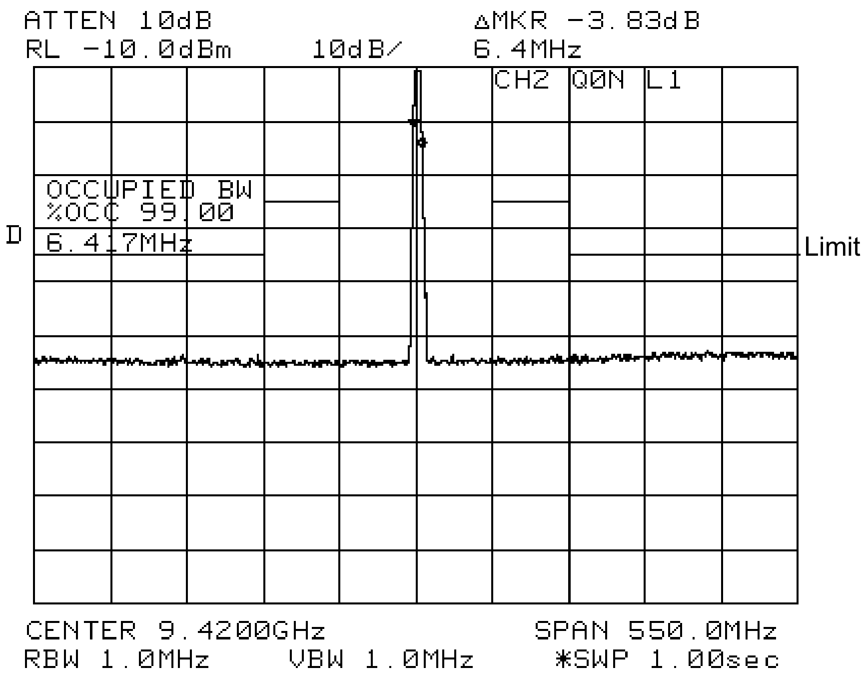


Fig. 8.31 for L1 Pulse

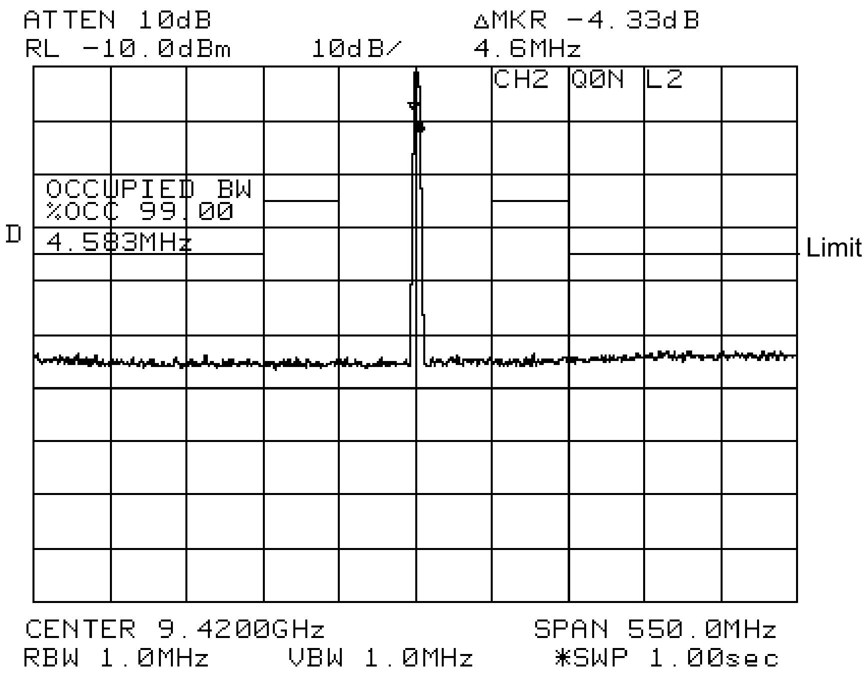


Fig. 8.32 for L2 Pulse

CH3, P0N

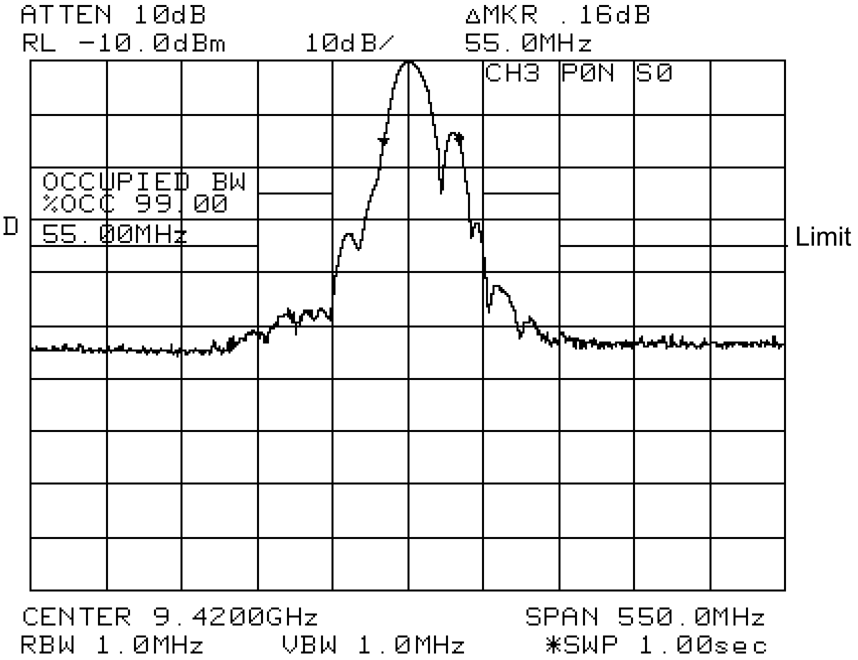


Fig. 8.33 for S0 Pulse

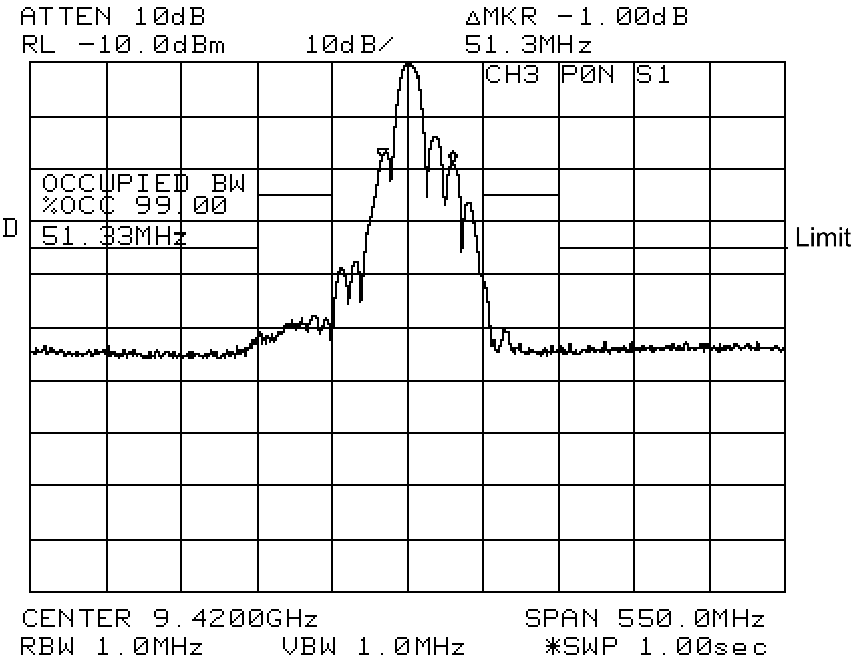


Fig. 8.34 for S1 Pulse

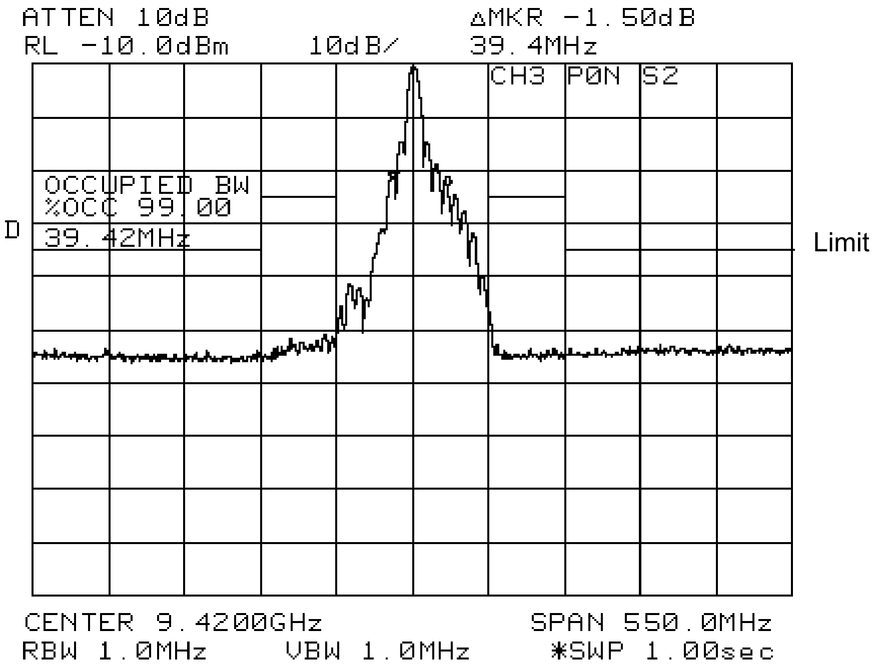


Fig. 8.35 for S2 Pulse

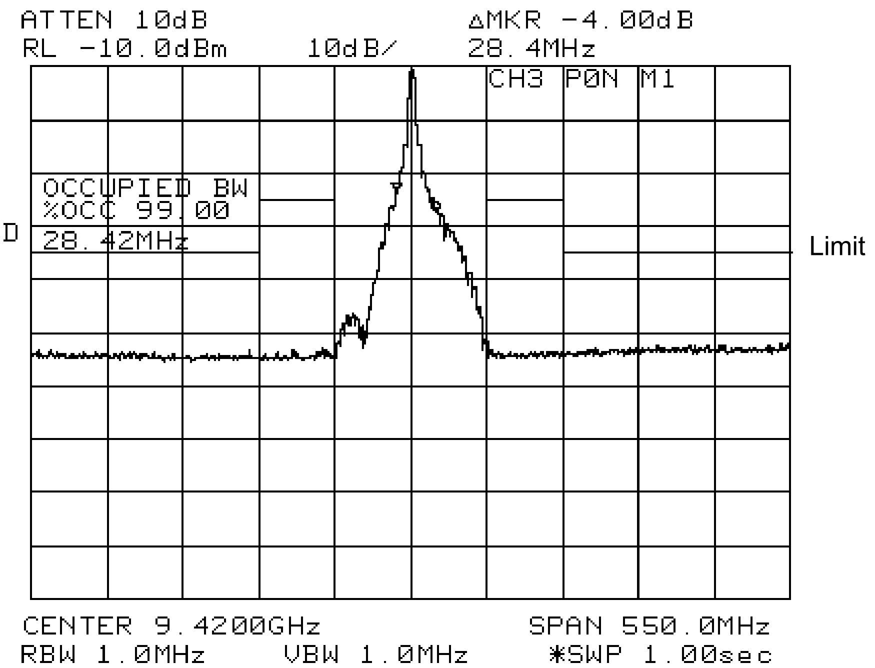


Fig. 8.36 for M1 Pulse

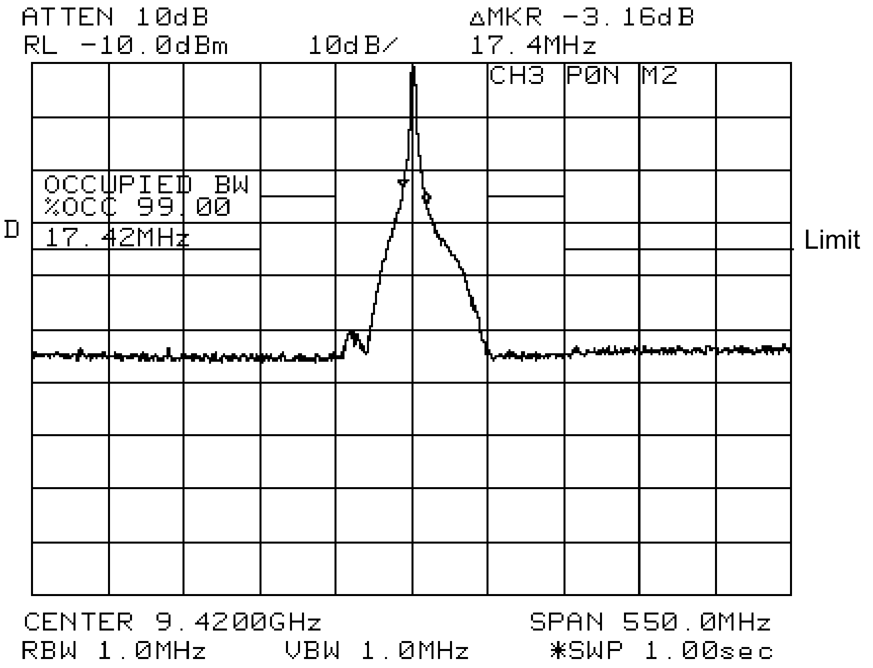


Fig. 8.37 for M2 Pulse

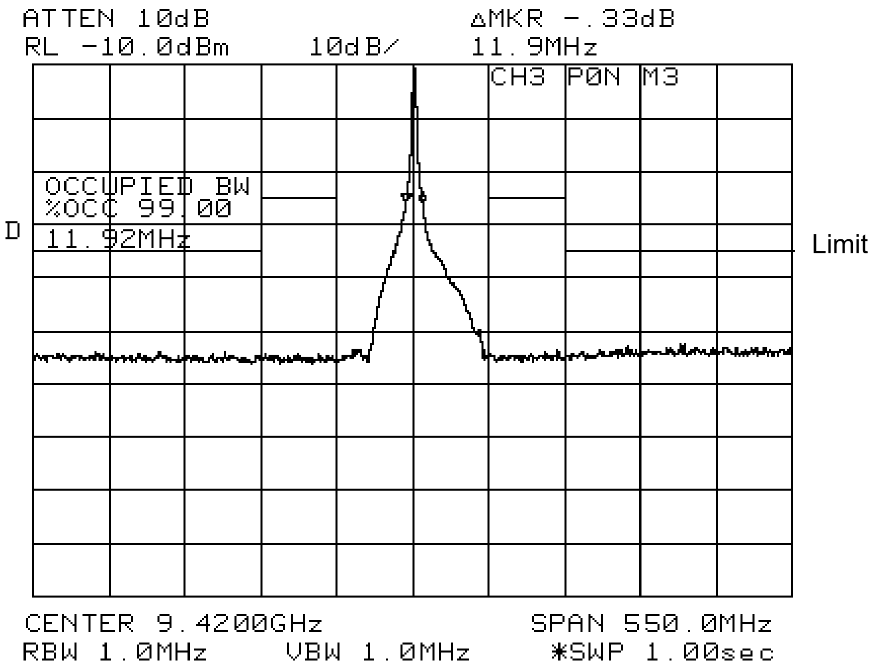


Fig. 8.38 for M3 Pulse

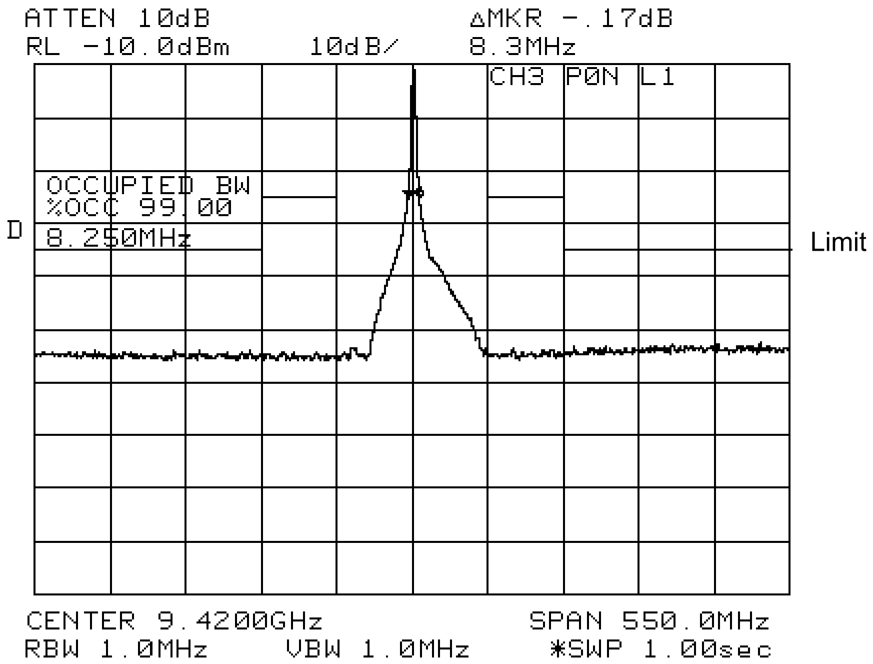


Fig. 8.39 for L1 Pulse

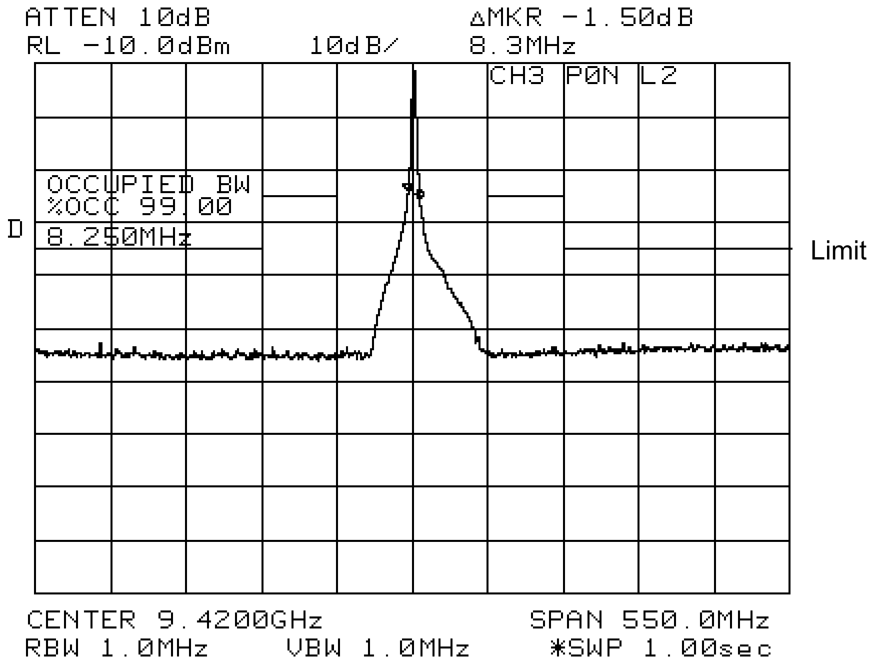


Fig. 8.40 for L2 Pulse

CH3, Q0N

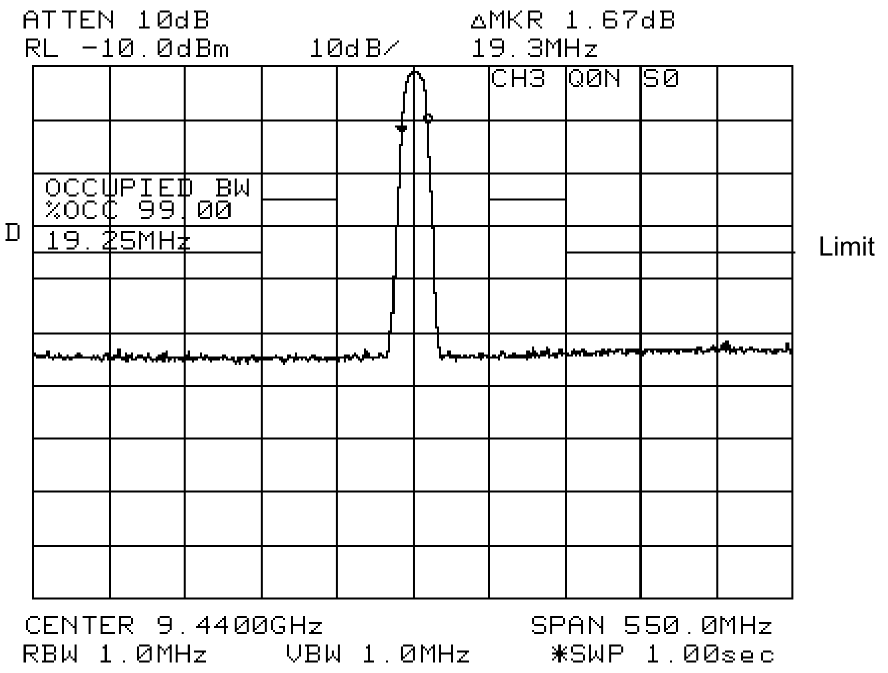


Fig. 8.41 for S0 Pulse

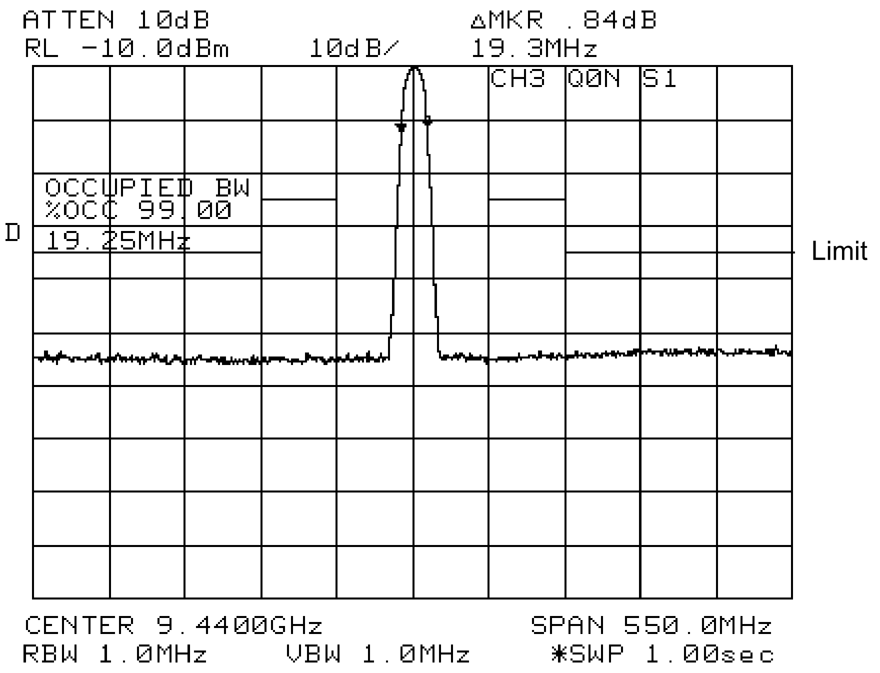


Fig. 8.42 for S1 Pulse

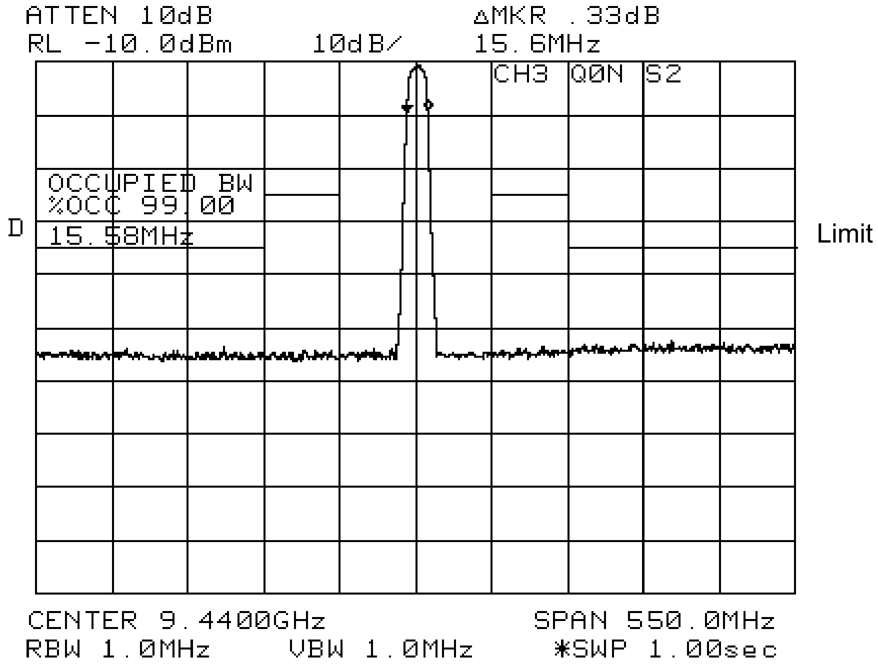


Fig. 8.43 for S2 Pulse

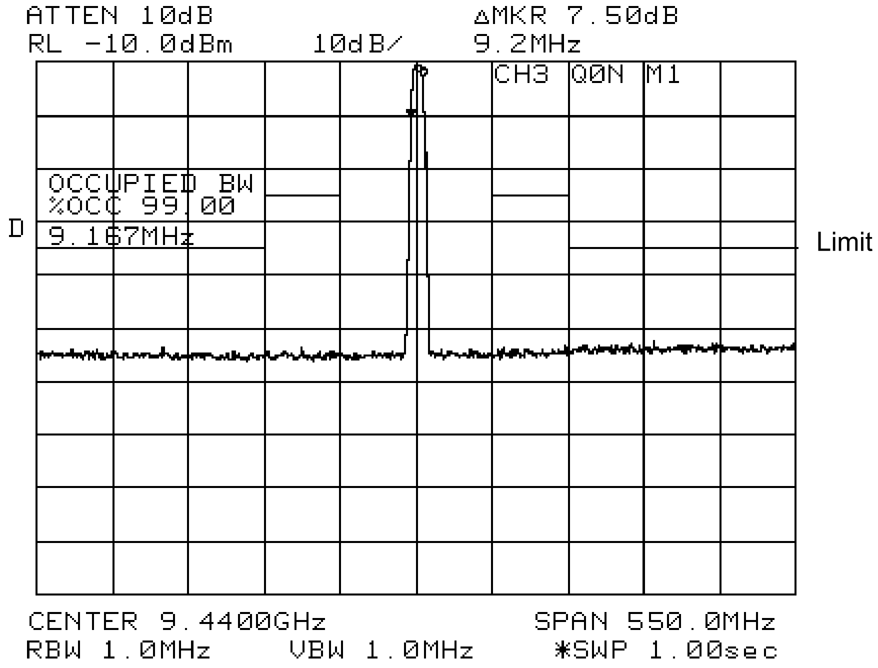


Fig. 8.44 for M1 Pulse

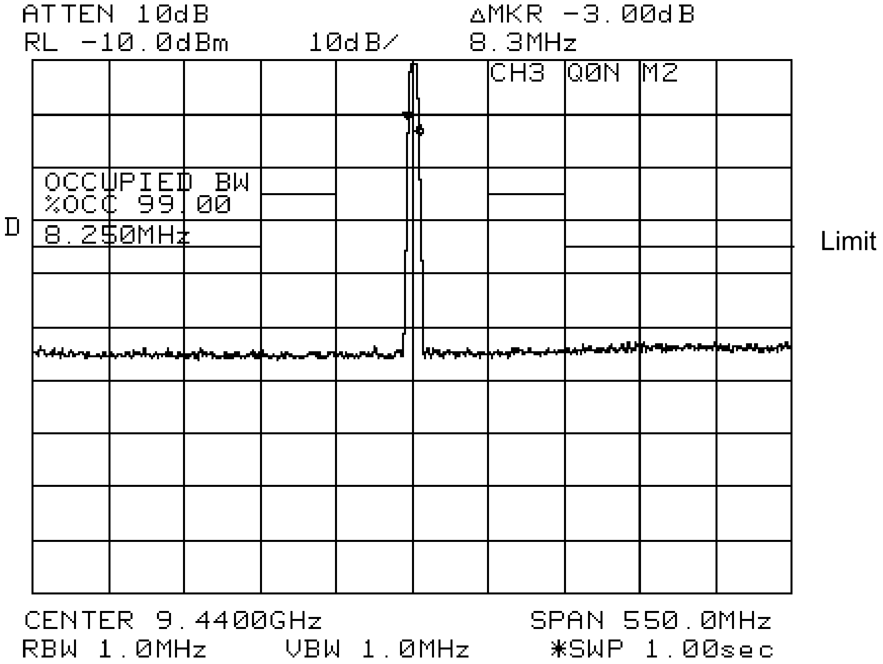


Fig. 8.45 for M2 Pulse

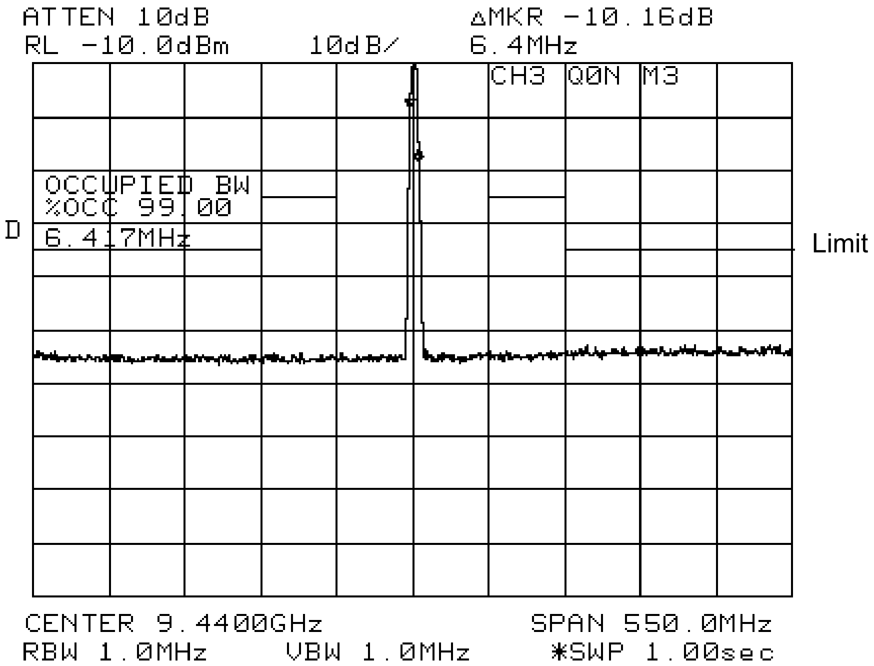


Fig. 8.46 for M3 Pulse

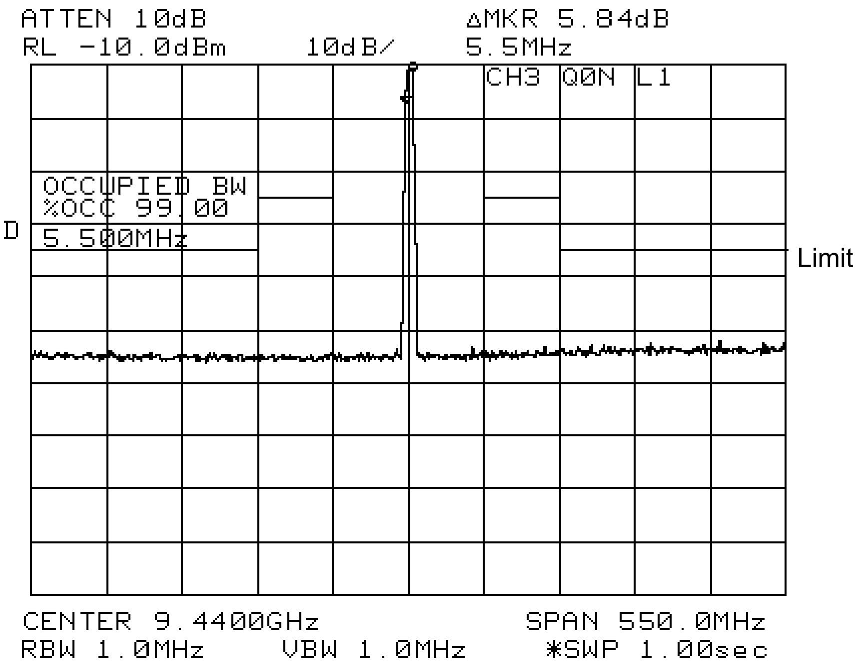


Fig. 8.47 for L1 Pulse

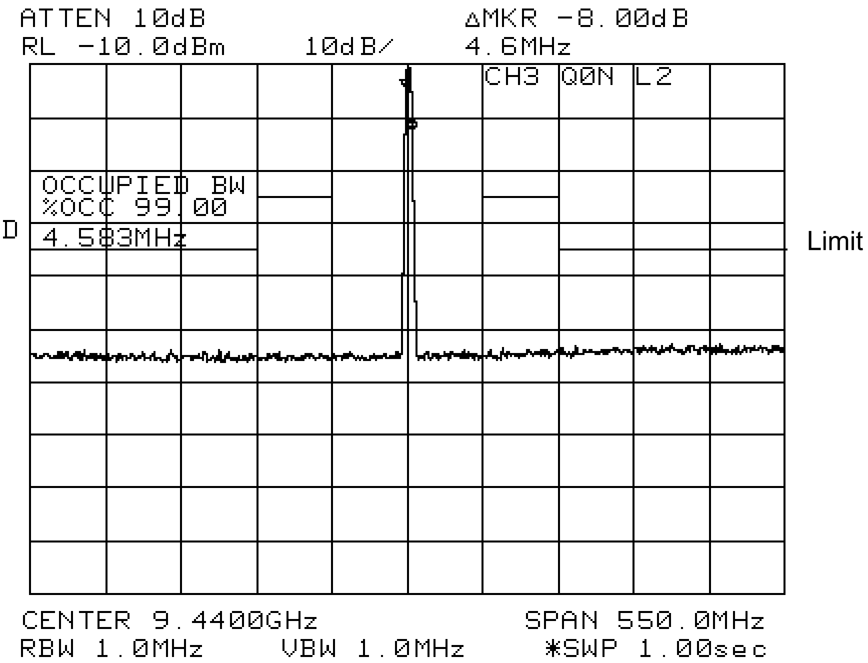


Fig. 8.48 for L2 Pulse