JVCKENWOOD

Ref. No.: EUCE18016-01

EMC TEST REPORT

(Date of issue)
発行日 : 09 / May / 2019

Brand/Model No.	KENWOOD	DNX7190DABS	Approved 承認	Checked 照査	Issued by 担当
Serial No.	PE-X0024		岩田 2019/5/10 Iwata	Safety EMC '19/05/09 AISO	EMC SAFETY 09.May.'19 KURIHARA
Version	E				
Test Result	PASS				
Reference Standard	EN50498:2010				

Testing item 検査項目	Quantity	Judgment (minimum margin)	Test site	Page
Ⅰ. Emission/ Active (電磁波妨害輻射)				
1. Disturbance Voltage at Antenna Terminal アンテナ端子雑音電圧	–	–		–
2. Disturbance Radiation (3m) 電界強度 (3m法)	–	–		–
3. Conducted Emission at Antenna port 伝導エミッション(アンテナポート)	–	–		–
4. Transient Emission 電圧過渡エミッション	1	PASS	A-1F Transient EMC Shield at Hachioji	13 – 20
5. Disturbance Radiation (1m) 電界強度(1m法)	1	＞5dB	A-1F 1m Anechoic Chamber at Hachioji	3 – 12
Ⅱ. Immunity/Passive(電磁波妨害耐性)				
1. Input Immunity (S1) アンテナ入力端子妨害耐性(S1)	–	–		–
2. Conducted Voltages(S2a) 流入妨害耐性 電圧印加法(S2a)	–	–		–
3. Conducted Currents(S2b) 流入妨害耐性 電圧印加法(S2b)	–	–		–
4. Radiated Fields(S3) 入射妨害耐性(S3)	–	–		–
5. Electrostatic Discharge 静電気放電耐性	–	–		–
6. Transient Immunity 過渡イミュニティ	1	PASS	A-1F Transient EMC Shield at Hachioji	21 – 30

Peripherals connected to the EUT(使用周辺機器)

Testing item	mode	Maker	Product No.	Model No.	
Disturbance Radiation (1m)	USB	Apacer	USB2.0/512M	AP512MAH321R-901	No.6
	CAR Play	Apple	iPhone6	MG492J/A	DNWPGKAKG5M9
	HDMI				
	SD	TOSHIBA	MicroSD/8GB	MSDAR40N08G	SD-04

Remarks

JVCKENWOOD Corporation
Automotive
2967-3 Ishikawa-mach, Hachioji-shi, Tokyo, 192-8525 Japan Tel:+81-42-646-5525 Fax:+81-42-646-7801

TEST FACILITY LIST

Test site: A-1F 1m Anechoic Chamber at Hachioji

<Disturbance Radiation(1m)>

	Instrumentation	Type no.	Manufacturer	Expiration date of calibration
■	TEST RECEIVER (TRE02)	ESR7	Rohde & Schwarz	2019/6/30
■	RF RELAY MATRIX(RRM01)	RFM-E131	TSJ	-
■	PRI AMPLIFIRE (AMP01)	INSTRUMENT 310	SONOMA	-
□	PRI AMPLIFIRE (AMP06)	MLA-0120-A02-34	TSJ	2019/6/30
■	Biconical Antenna + Balun (BC-A01)	BBA9106/VHBB91	SCHWARZBECK	2019/6/30
■	Log Periodic Antenna (LP-A02)	VULP9118A	SCHWARZBECK	2020/1/31
□	BROAD-BAND HORN Antenna (H-A01)	BBHA 9120 D	SCHWARZBECK	2019/6/30
□	LOD Antenna (L-A01)	3301C	ETS-Lindgren	2019/6/30
■	L.I.S.N. (AMN06)	NNBM 8124	SCHWARZBECK	2019/6/30
■	L.I.S.N. (AMN07)	NNBM 8124	SCHWARZBECK	2019/6/30
■	COAXIAL CABLE	CA09		-
■	COAXIAL CABLE	CA06		-
■	COAXIAL CABLE	CA05		-
□	COAXIAL CABLE	CA08		-
□	COAXIAL CABLE	CA07		-
□	COAXIAL CABLE	CA57		-
■	COAXIAL CABLE	CA58		-
□	COAXIAL CABLE	CA59		-
□	COAXIAL CABLE	CA43		-
□	COAXIAL CABLE	CA60		-
□	COAXIAL CABLE	CA03		-
■	ATTENUATOR(ATT06)	50Ω6dB		-

Test site: A-F Transient EMC Shield at Hachioji

<Transient Emission>

	Instrumentation	Type no.	Manufacturer	Expiration date of calibration
■	DIGITAL PHOSPHOR OSCILLOSCOPE (OSC0	RTO2022	ROHDE & SCHWARZ	2020/1/31
□	Mechanical Switch	BSM200N100	AMETEC CTS	-
■	Electoronical Switch	SM200N100	AMETEC CTS	-
■	L.I.S.N. (AMN12)	AN200N100	AMETEC CTS	2020/1/31
■	Resister Box (REG01)	RS-Box	AMETEC CTS	-

<Transient Immunity>

■	Voltage Drop Simulator	VDS200Q25	AMETEC CTS	2020/1/31
■	Ultra Compact Simulator	UCS200N50	AMETEC CTS	2020/1/31
□	Load Damp Generator	LD200N	AMETEC CTS	2020/1/31
□	Arbitary Generator	Auto Wave	AMETEC CTS	2020/1/31

JVCKENWOOD Corporation
Automotive
2967-3 Ishikawa-mach, Hachioji-shi, Tokyo, 192-8525 Japan Tel:+81-42-646-5525

Radiated Emission Test

Date of test:	May-8-2019
Tester:	K.Kurihara
EUT:	DNX7190DABS
Standard:	EN 50498 (2010)
Application:	12 V system
Ambient Temperature:	See data
Humidity:	See data

Test Result	
Result:	Test passed!

EUT Information	
Brand Name:	KENWOOD
Model Name:	DNX7190DABS
Type:	GPS NAVIGATION SYSTEM
Serial Number:	PE-X0024
Operation Mode:	See data
Description:	Colorbar, 1kHz, 1/8Po

Test Configuration

EUT was placed on a non-conductive pallet height of 50 mm above the ground plane as shown in Fig.1.

A ground plane was placed on a wooden table height of 900 mm.

EUT is in the operation condition specified.

Using Test receiver, sweeps of frequency bands (30-1000MHz) are made to verify the emission level.

Biconical antenna is used in 30 - 300 MHz, Log-periodic antenna is used in 300 - 1000 MHz.

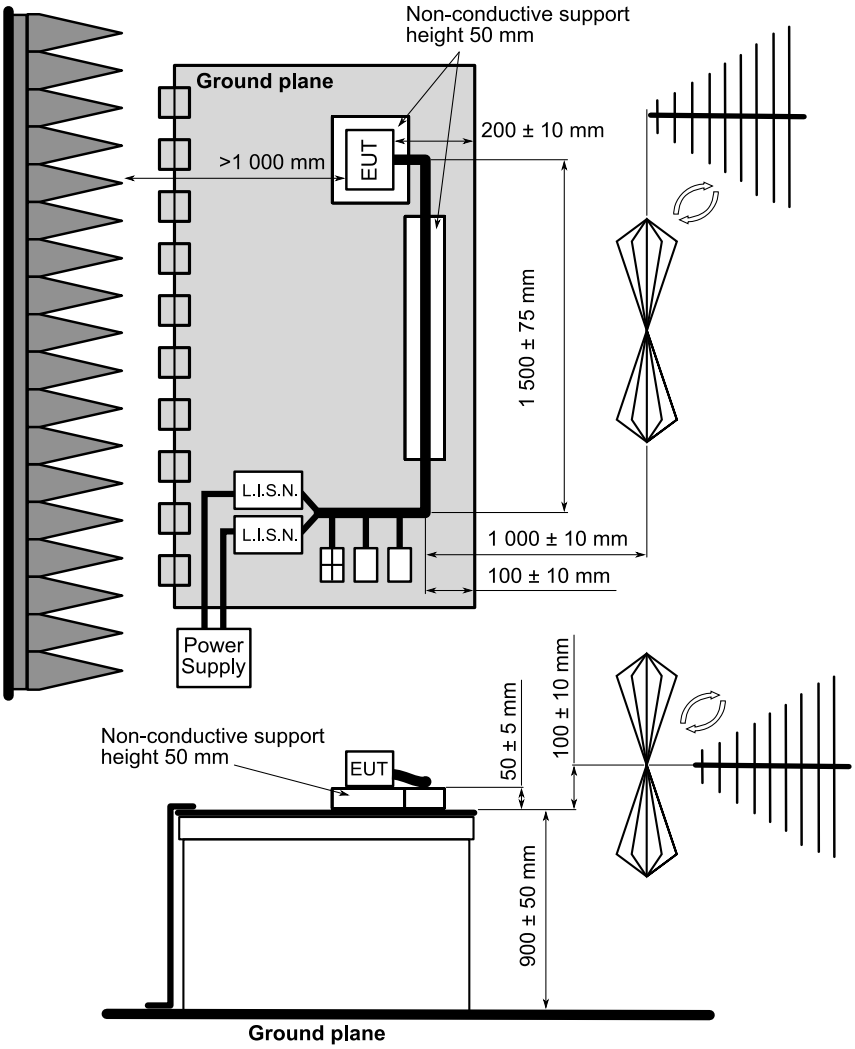


Fig.1 Drawing of the Test Set-up

TDS_EN50498_30M-1GHz.CND

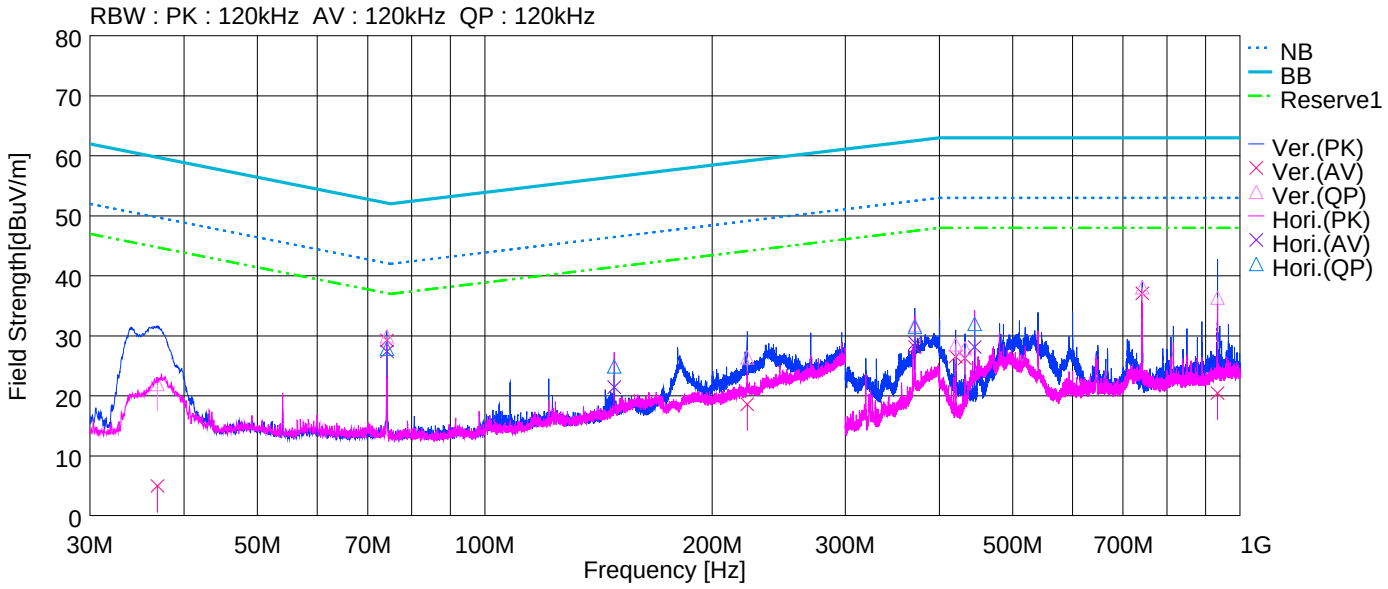
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/09 10:01

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 23deg C / 39%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: DVD PLAY(Colorbar, 1kHz, 1/8Po) & FM98MHz & DAB10A & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level PK	Level AV	Level QP	Factor	Result PK	Result AV	Result QP	NB/BB	Limit	Margin		Memo
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	36.8700	Vertic.	45.61	18.93	35.92	-13.94	31.67	4.99	21.98	BB	59.75	37.77	OK	
	74.1800	Vertic.	46.27	44.61	45.26	-15.34	30.93	29.27	29.92	NB	42.12	12.85	OK	
	74.1800	Horizo.	44.39	42.75	43.18	-15.34	29.05	27.41	27.84	NB	42.12	14.71	OK	
	148.3600	Horizo.	39.34	33.56	37.01	-12.09	27.25	21.47	24.92	NB	46.48	25.01	OK	
	222.5300	Vertic.	38.96	26.87	34.61	-8.22	30.74	18.65	26.39	BB	59.15	32.76	OK	
	370.8900	Vertic.	48.51	42.02	45.69	-13.90	34.61	28.12	31.79	BB	62.50	30.71	OK	
	370.8900	Horizo.	47.33	42.73	45.44	-13.90	33.43	28.83	31.54	NB	52.50	23.67	OK	
	420.0100	Vertic.	43.98	39.52	41.52	-12.96	31.02	26.56	28.56	NB	53.00	26.44	OK	
	431.9800	Vertic.	43.11	39.04	40.70	-12.75	30.36	26.29	27.95	NB	53.00	26.71	OK	
	445.0600	Horizo.	46.82	40.70	44.55	-12.54	34.28	28.16	32.01	BB	63.00	30.99	OK	
	741.7500	Vertic.	47.42	45.25	46.26	-8.17	39.25	37.08	38.09	NB	53.00	15.92	OK	
	933.0100	Vertic.	47.71	25.39	41.29	-4.92	42.79	20.47	36.37	BB	63.00	26.63	OK	

TDS_EN50498_30M-1GHz.CND

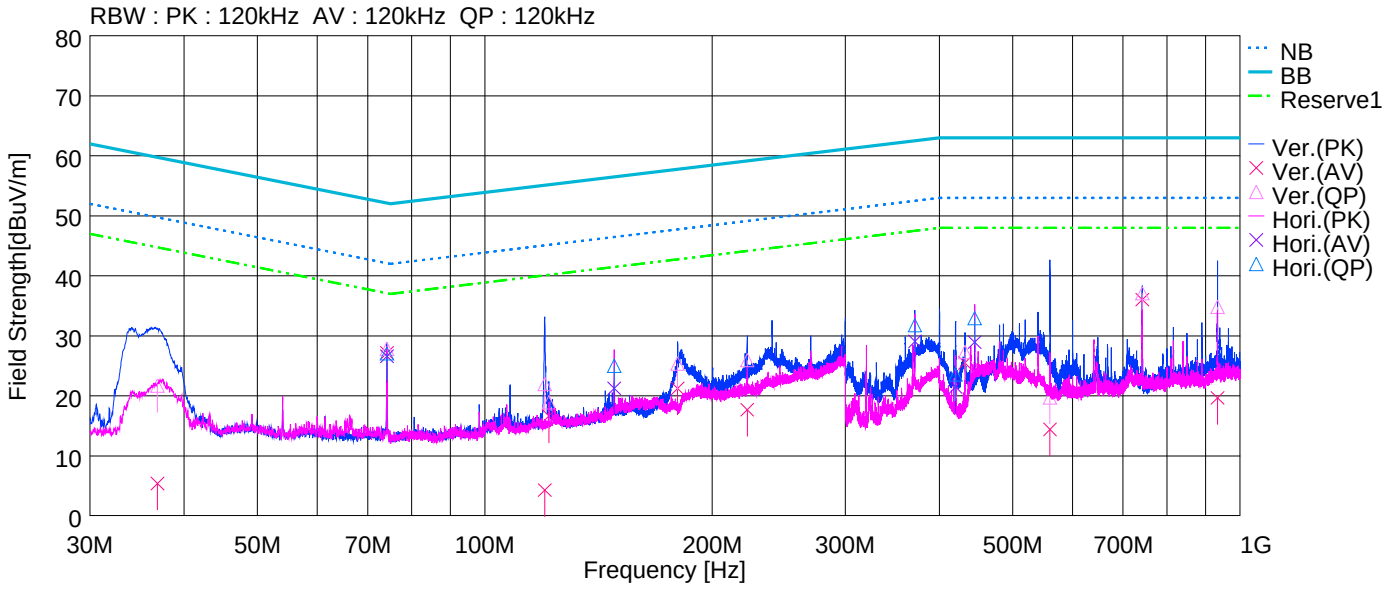
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/09 10:24

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 23deg C / 39%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: USB PLAY(Colorbar, 1kHz, 1/8Po) & FM108MHz & DAB13F & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level			Factor	Result			NB/BB	Limit	Margin		Memo
			PK	AV	QP		PK	AV	QP					
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	36.8700	Vertic.	45.12	19.33	35.66	-13.94	31.18	5.39	21.72	BB	59.75	38.03	OK	
	74.1800	Vertic.	44.29	42.53	43.19	-15.34	28.95	27.19	27.85	NB	42.12	14.93	OK	
	74.1800	Horizo.	43.61	41.99	42.42	-15.34	28.27	26.65	27.08	NB	42.12	15.47	OK	
	120.0100	Vertic.	46.62	17.74	35.43	-13.44	33.18	4.30	21.99	BB	55.09	33.10	OK	
	121.5100	Vertic.	35.78	30.03	32.33	-13.37	22.41	16.66	18.96	NB	45.17	28.51	OK	
	148.3600	Horizo.	39.84	33.36	37.12	-12.09	27.75	21.27	25.03	BB	56.48	31.45	OK	
	180.0000	Vertic.	39.82	31.98	36.11	-10.72	29.10	21.26	25.39	BB	57.75	32.36	OK	
	222.5300	Vertic.	38.28	25.90	34.16	-8.22	30.06	17.68	25.94	BB	59.15	33.21	OK	
	370.8900	Horizo.	47.50	42.98	45.69	-13.90	33.60	29.08	31.79	NB	52.50	23.42	OK	
	419.9800	Horizo.	39.40	34.47	36.57	-12.96	26.44	21.51	23.61	NB	53.00	31.49	OK	
	431.9800	Vertic.	43.35	38.26	40.08	-12.75	30.60	25.51	27.33	NB	53.00	27.49	OK	
	445.0600	Horizo.	47.78	41.50	45.50	-12.54	35.24	28.96	32.96	BB	63.00	30.04	OK	
	560.0200	Vertic.	53.49	25.23	30.59	-10.83	42.66	14.40	19.76	BB	63.00	43.24	OK	
	741.7500	Vertic.	46.56	44.21	45.28	-8.17	38.39	36.04	37.11	NB	53.00	16.96	OK	
	933.0100	Vertic.	47.43	24.58	39.77	-4.92	42.51	19.66	34.85	BB	63.00	28.15	OK	

TDS_EN50498_30M-1GHz.CND

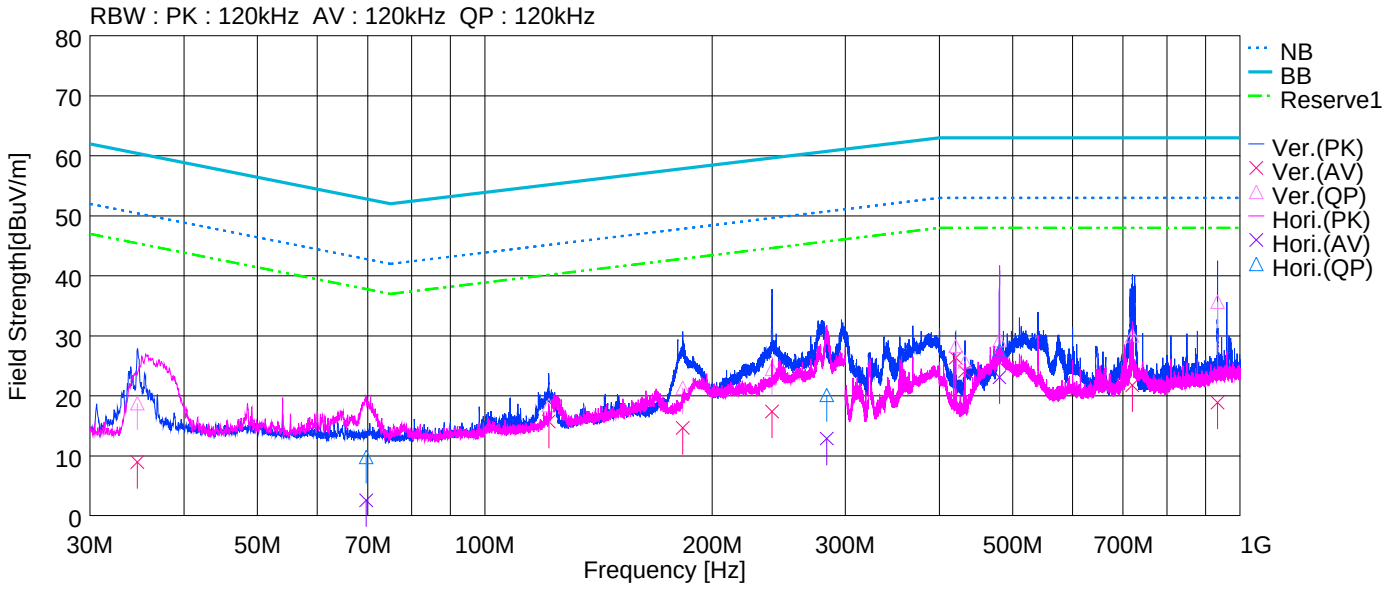
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/08 15:58

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 24deg C / 37%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: CarPlay(1kHz, 1/8Po) & FM87.5MHz & DAB5A & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level			Factor	Result			NB/BB	Limit	Margin		Memo
			PK	AV	QP		PK	AV	QP					
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	34.6800	Vertic.	41.79	22.97	32.79	-13.99	27.80	8.98	18.80	BB	60.42	41.62	OK	
	69.6500	Horizo.	35.17	17.90	25.12	-15.28	19.89	2.62	9.84	BB	52.81	42.97	OK	
	121.5100	Vertic.	36.69	29.10	31.83	-13.37	23.32	15.73	18.46	BB	55.17	36.71	OK	
	182.7600	Vertic.	41.36	25.31	31.98	-10.64	30.72	14.67	21.34	BB	57.85	36.51	OK	
	239.9900	Vertic.	44.88	24.48	31.60	-7.09	37.79	17.39	24.51	BB	59.64	35.13	OK	
	283.5700	Horizo.	35.51	17.03	24.30	-4.15	31.36	12.88	20.15	BB	60.74	40.59	OK	
	420.0100	Vertic.	43.57	39.34	41.26	-12.96	30.61	26.38	28.30	NB	53.00	26.62	OK	
	431.9800	Vertic.	42.02	36.84	38.50	-12.75	29.27	24.09	25.75	NB	53.00	28.91	OK	
	480.0100	Vertic.	52.95	37.59	41.30	-12.00	40.95	25.59	29.30	BB	63.00	33.70	OK	
	480.0100	Horizo.	53.73	35.12	39.58	-12.00	41.73	23.12	27.58	BB	63.00	35.42	OK	
	720.0000	Vertic.	48.47	30.17	38.50	-8.40	40.07	21.77	30.10	BB	63.00	32.90	OK	
	933.0100	Vertic.	47.45	23.82	40.62	-4.92	42.53	18.90	35.70	BB	63.00	27.30	OK	

TDS_EN50498_30M-1GHz.CND

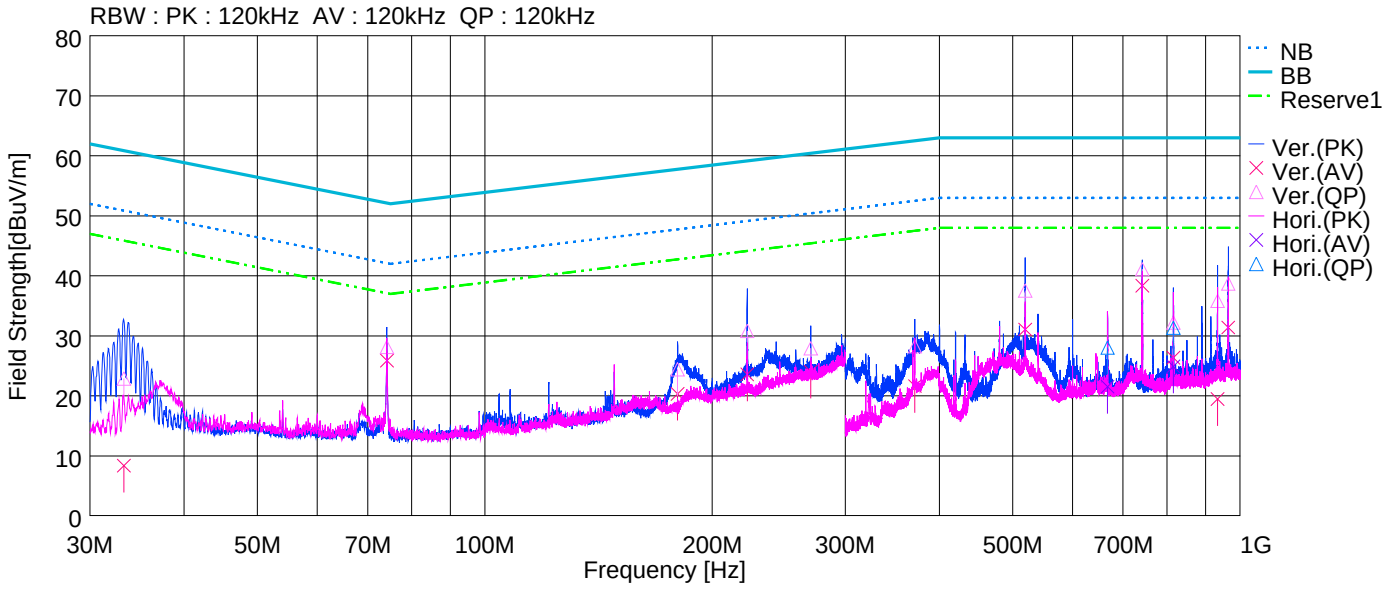
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/08 17:33

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 24deg C / 37%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: HDMI(iPhone, Colorbar, 1kHz, 1/8Po) & FM87.5MHz & DAB5A & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level PK	Level AV	Level QP	Factor	Result PK	Result AV	Result QP	NB/BB	Limit	Margin		Memo
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	33.2700	Vertic.	46.58	22.42	36.93	-14.04	32.54	8.38	22.89	BB	60.87	37.98	OK	
	74.1800	Vertic.	46.83	41.22	43.49	-15.34	31.49	25.88	28.15	NB	42.12	16.24	OK	
	180.0000	Vertic.	39.79	31.06	35.16	-10.72	29.07	20.34	24.44	BB	57.75	33.31	OK	
	222.5300	Vertic.	46.08	31.79	39.06	-8.22	37.86	23.57	30.84	BB	59.15	28.31	OK	
	270.0100	Vertic.	37.02	29.36	33.29	-5.31	31.71	24.05	27.98	BB	60.42	32.44	OK	
	370.8900	Vertic.	46.69	35.54	42.17	-13.90	32.79	21.64	28.27	BB	62.50	34.23	OK	
	519.2200	Vertic.	54.46	42.50	48.98	-11.42	43.04	31.08	37.56	BB	63.00	25.44	OK	
	667.5900	Horizo.	43.13	30.56	37.05	-9.02	34.11	21.54	28.03	BB	63.00	34.97	OK	
	741.7500	Vertic.	50.86	46.54	49.27	-8.17	42.69	38.37	41.10	NB	53.00	14.63	OK	
	815.9400	Horizo.	44.34	31.96	38.40	-7.05	37.29	24.91	31.35	BB	63.00	31.65	OK	
	815.9400	Vertic.	45.09	33.44	39.28	-7.05	38.04	26.39	32.23	BB	63.00	30.77	OK	
	933.0100	Vertic.	46.71	24.37	40.73	-4.92	41.79	19.45	35.81	BB	63.00	27.19	OK	
	964.2700	Vertic.	49.19	35.72	43.04	-4.33	44.86	31.39	38.71	BB	63.00	24.29	OK	

TDS_EN50498_30M-1GHz.CND

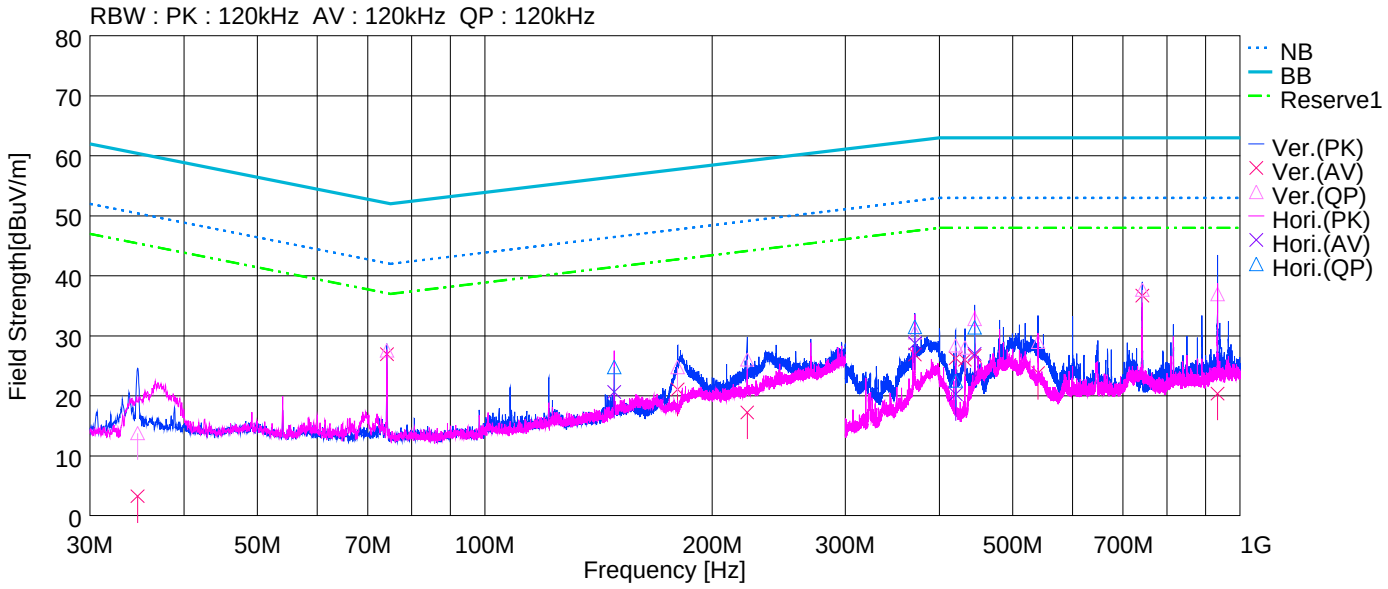
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/09 10:44

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 23deg C / 39%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: SD PLAY(Colorbar, 1kHz, 1/8Po) & FM108MHz & DAB13F & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level			Factor	Result			NB/BB	Limit	Margin		Memo
			PK	AV	QP		PK	AV	QP					
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	34.7100	Vertic.	38.61	17.27	27.79	-13.99	24.62	3.28	13.80	BB	60.41	46.61	OK	
	74.1800	Vertic.	44.02	42.28	42.94	-15.34	28.68	26.94	27.60	NB	42.12	15.18	OK	
	148.3600	Horizo.	39.61	32.76	36.92	-12.09	27.52	20.67	24.83	BB	56.48	31.65	OK	
	180.0000	Vertic.	39.13	31.79	35.52	-10.72	28.41	21.07	24.80	BB	57.75	32.95	OK	
	222.5300	Vertic.	38.03	25.46	34.28	-8.22	29.81	17.24	26.06	BB	59.15	33.09	OK	
	370.8900	Vertic.	47.65	40.82	44.55	-13.90	33.75	26.92	30.65	BB	62.50	31.85	OK	
	370.8900	Horizo.	47.48	42.67	45.44	-13.90	33.58	28.77	31.54	NB	52.50	23.73	OK	
	420.0100	Vertic.	43.89	39.26	41.38	-12.96	30.93	26.30	28.42	NB	53.00	26.70	OK	
	420.0100	Horizo.	38.45	33.25	35.51	-12.96	25.49	20.29	22.55	NB	53.00	32.71	OK	
	432.0100	Vertic.	43.97	38.77	40.83	-12.75	31.22	26.02	28.08	NB	53.00	26.98	OK	
	445.0600	Vertic.	47.69	39.23	45.41	-12.54	35.15	26.69	32.87	BB	63.00	30.13	OK	
	445.0600	Horizo.	46.75	39.54	43.97	-12.54	34.21	27.00	31.43	BB	63.00	31.57	OK	
	540.0100	Vertic.	44.53	34.93	40.15	-11.11	33.42	23.82	29.04	BB	63.00	33.96	OK	
	741.7500	Vertic.	47.17	44.87	45.86	-8.17	39.00	36.70	37.69	NB	53.00	16.30	OK	
	932.9800	Vertic.	48.13	25.32	41.89	-4.92	43.21	20.40	36.97	BB	63.00	26.03	OK	

TDS_EN50498_30M-1GHz.CND

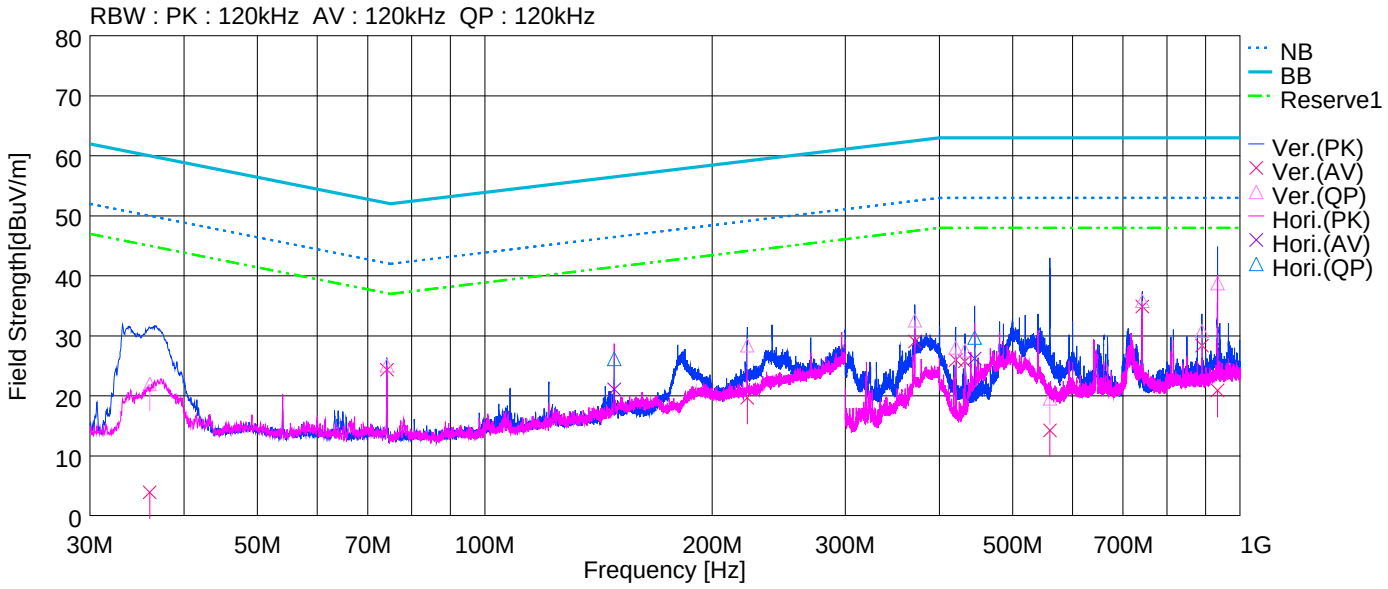
Radiated Disturbance Electromagnetic Quientnes

Hachioji Semi-anechoic chamber

Date : 2019/05/09 11:03

Brand name	: KENWOOD	Standard	: EN 50498
Model name	: DNX7190DABS	Temp./Humi.	: 23deg C / 39%
Type	: GPS NAVIGATION SYSTEM	Power Supply	: DC 12V
Serial No.	: PE-X0024	Measured By	: K.Kurihara
Notes	: USB2 PLAY(Colorbar, 1kHz, 1/8Po) & FM98MHz & DAB10A & NAVI simulate		

Limit1 : EN50498 ESA Narrow Band Limits
Limit2 : EN50498 ESA Broad Band Limits
Limit3 : EN50498 Narrow Band Limits[-5dB]



Band ID	Freq.	Pol	Level			Factor	Result			NB/BB	Limit	Margin		Memo
			PK	AV	QP		PK	AV	QP					
	[MHz]		[dBuV]			[dB]	[dBuV/m]				[dBuV/m]	[dB]		
	36.0000	Vertic.	45.38	17.91	35.94	-13.96	31.42	3.95	21.98	BB	60.01	38.03	OK	
	74.1800	Vertic.	41.75	39.69	40.43	-15.34	26.41	24.35	25.09	NB	42.12	17.77	OK	
	148.3600	Horizo.	40.79	33.21	38.29	-12.09	28.70	21.12	26.20	BB	56.48	30.28	OK	
	222.5300	Vertic.	39.69	27.91	36.65	-8.22	31.47	19.69	28.43	BB	59.15	30.72	OK	
	370.8900	Vertic.	49.09	42.99	46.49	-13.90	35.19	29.09	32.59	BB	62.50	29.91	OK	
	420.0100	Vertic.	44.43	38.93	41.00	-12.96	31.47	25.97	28.04	NB	53.00	27.03	OK	
	431.9800	Vertic.	43.17	38.51	40.36	-12.75	30.42	25.76	27.61	NB	53.00	27.24	OK	
	445.0600	Horizo.	44.73	38.77	42.28	-12.54	32.19	26.23	29.74	NB	53.00	26.77	OK	
	559.9900	Vertic.	53.86	25.09	30.41	-10.83	43.03	14.26	19.58	BB	63.00	43.42	OK	
	741.7500	Vertic.	45.58	43.05	44.00	-8.17	37.41	34.88	35.83	NB	53.00	18.12	OK	
	890.1100	Vertic.	39.50	34.18	36.62	-5.81	33.69	28.37	30.81	NB	53.00	24.63	OK	
	933.0100	Vertic.	49.78	25.82	43.67	-4.92	44.86	20.90	38.75	BB	63.00	24.25	OK	

Photo Documentation

Measurement of electrical radiated emission

Biconical antenna (30MHz-300MHz)

Log periodic antenna (300MHz-1000MHz)

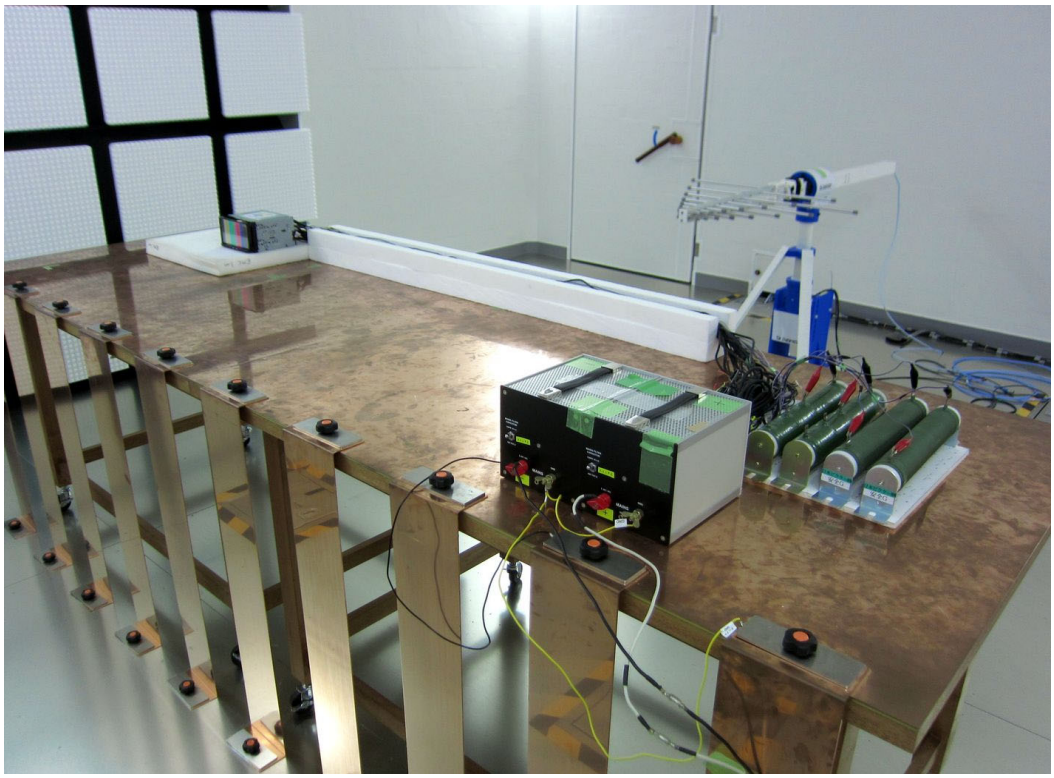
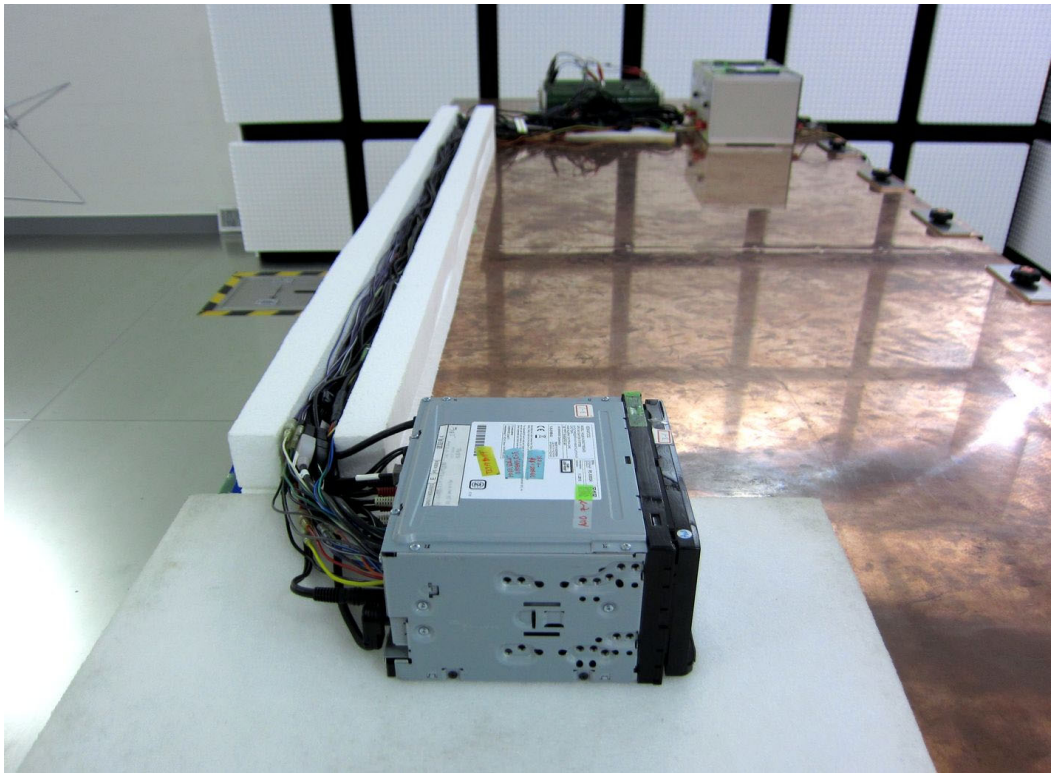
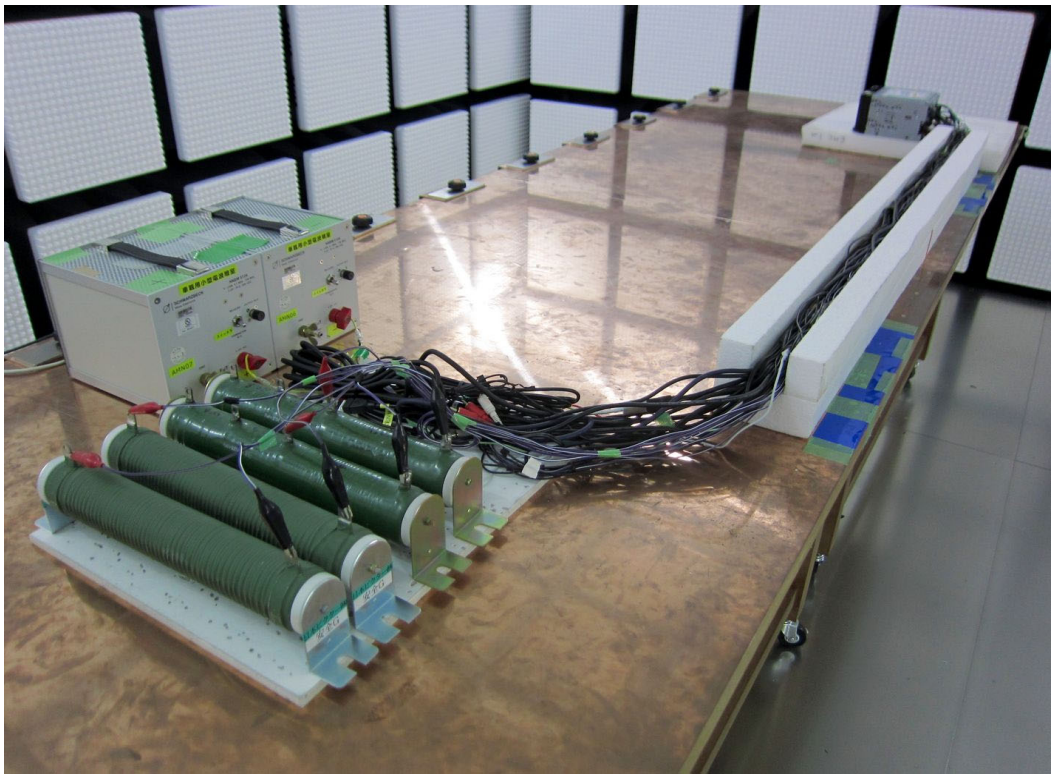


Photo Documentation

Measurement of electrical radiated emission





Voltage Transient Emission Test

Date of test:	April-25-2019
Tester:	K.Kurihara
EUT:	DNX7190DABS
Standard:	EN 50498 (2010)
Application:	12 V system
Ambient Temperature:	See data
Humidity:	See data

Test Result	
Result:	Test passed!

EUT Information	
Brand Name:	KENWOOD
Model Name:	DNX7190DABS
Type:	GPS NAVIGATION SYSTEM
Serial Number:	PE-X0024
Operation Mode:	DVD Play
Description:	Colorbar, 1kHz, 1/8Po

Test Configuration

EUT was placed on a non-conductive pallet height of 50 mm above the ground plane under the description of ISO 7637-2 as shown in Fig.1 and Fig.2.

The disturbance voltage was measured with switch closed and opened using a voltage probe and an oscilloscope.

The test was performed 10 times at each mode, and the data of the largest ampitude noise level was used as the final test result.

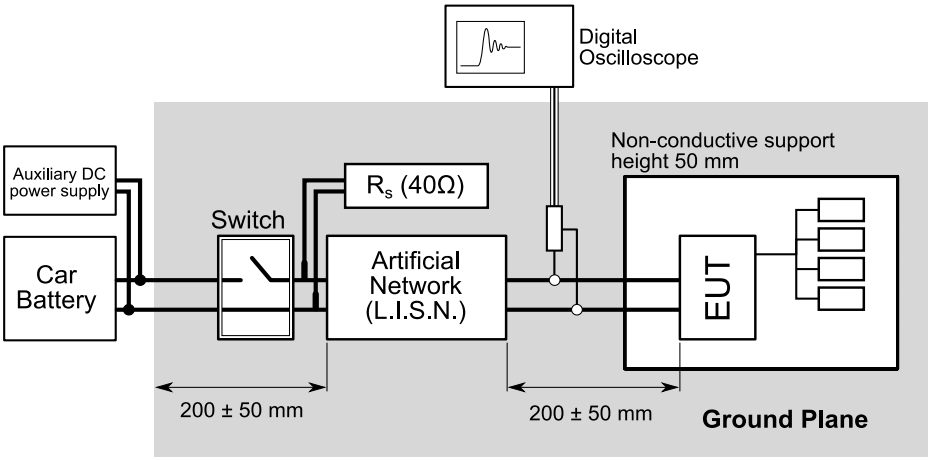


Fig.1 Drawing of the Test Set-up for Slow pulse

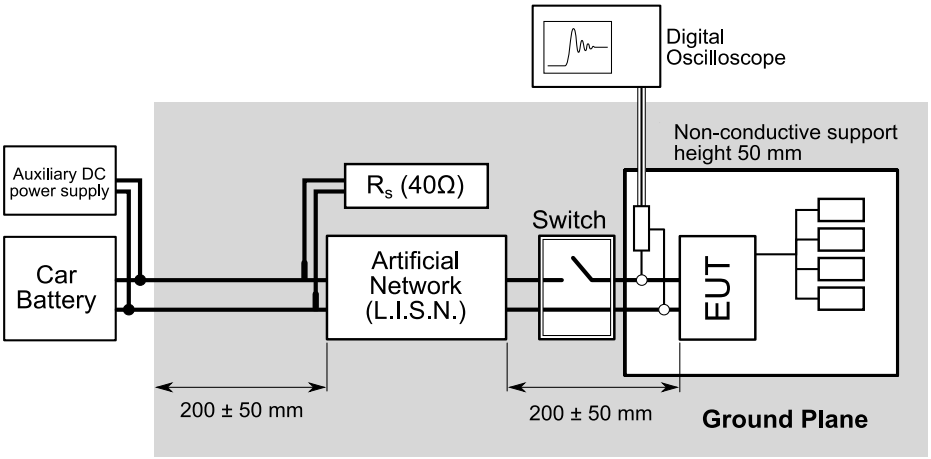
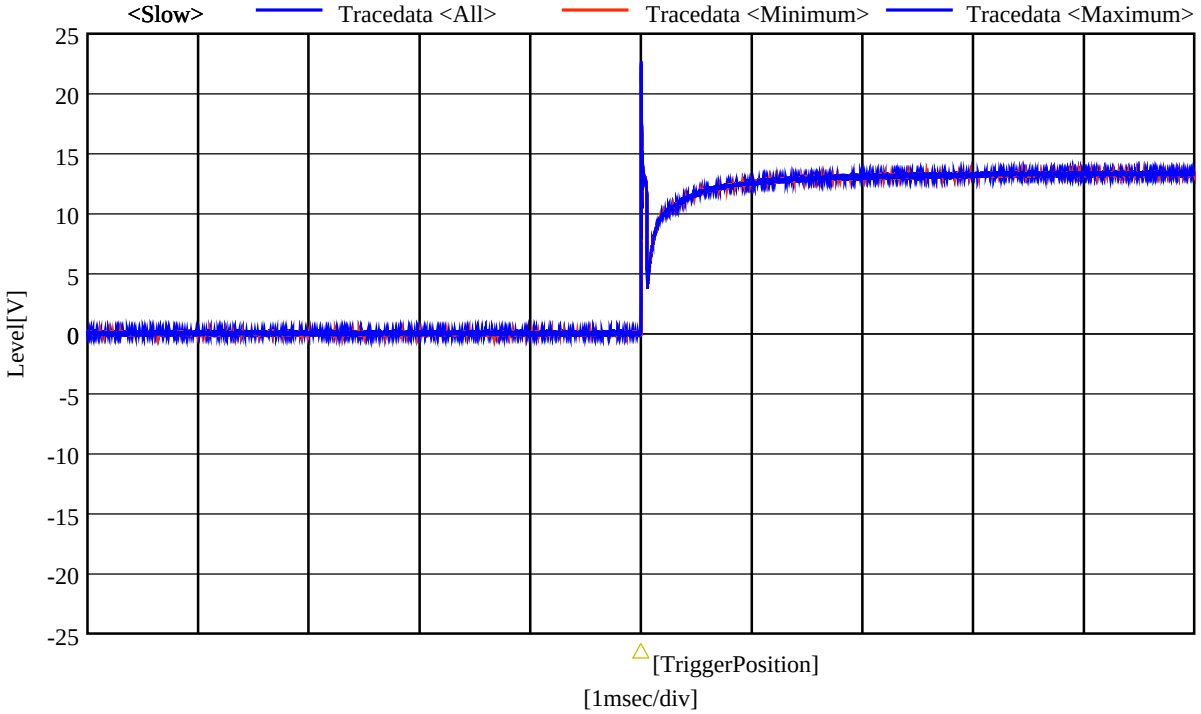


Fig.2 Drawing of the Test Set-up for Fast pulse

ISO 7637-2 Transient emission

Date : 2019/04/25 17:46

Trade Name	: KENWOOD	Standard	: ISO 7637-2
Model Name	: DNX7190DABS	Power Supply	: DC 13.5V
Serial No.	: PE-X0024	Temp/Humi	: 21degC 56%
Test Mode	: --	Operator	: K.Kurihara
Test Condition	: Slow OFF->ON		



switch/relay :Electronic Switch BS 200N100 EMTEST

********** Results of Measurement **********

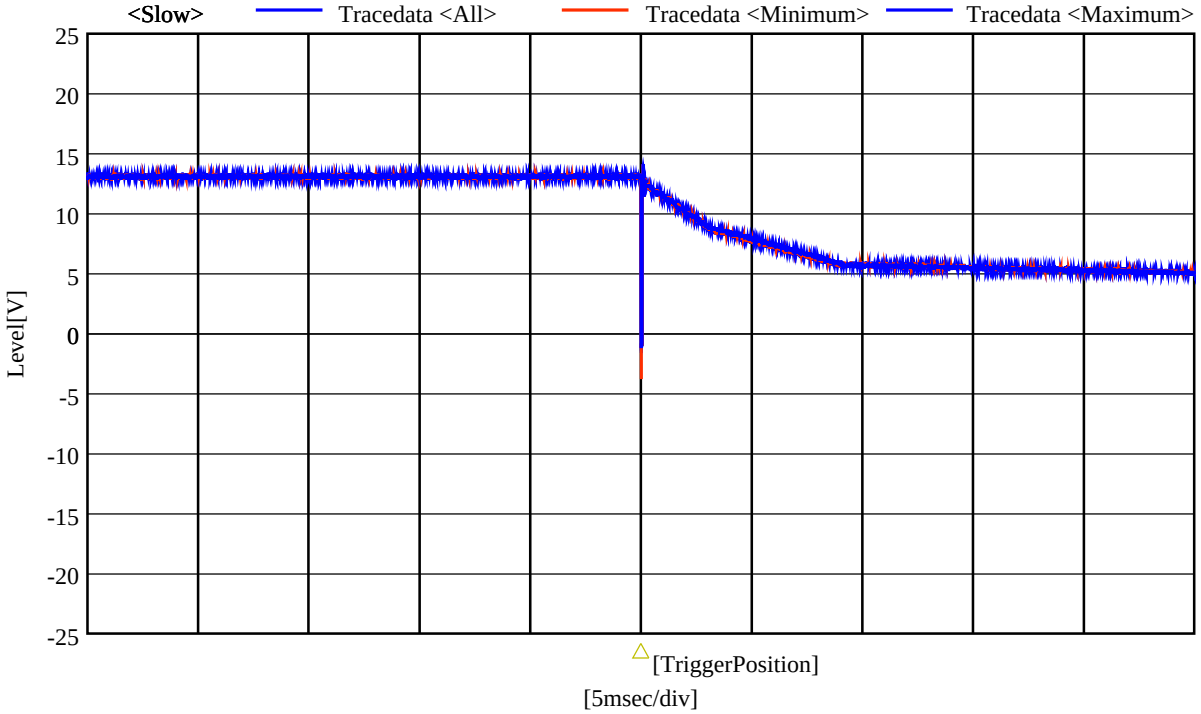
No	Min(V)	Max(V)
1	-13.7	8.8
2	-13.7	7.8
3	-13.7	7.3
4	-13.7	9.0
5	-13.9	7.6
6	-13.7	8.8
7	-13.7	9.2
8	-13.7	8.2
9	-13.7	8.0
10	-13.7	9.0

Minimum	-13.90 V
Average	-13.72 V
Deviation	0.06 V
Maximum	9.23 V
Average	8.40 V
Deviation	0.68 V

ISO 7637-2 Transient emission

Date : 2019/04/25 20:24

Trade Name	: KENWOOD	Standard	: ISO 7637-2
Model Name	: DNX7190DABS	Power Supply	: DC 13.5V
Serial No.	: PE-X0024	Temp/Humi	: 21degC 57%
Test Mode	: DVD Play(Colorbar, 1kHz, 1/8Po)	Operator	: K.Kurihara
Test Condition	: Slow ON->OFF		



switch/relay :Electronic Switch BS 200N100 EMTEST

********** Results of Measurement **********

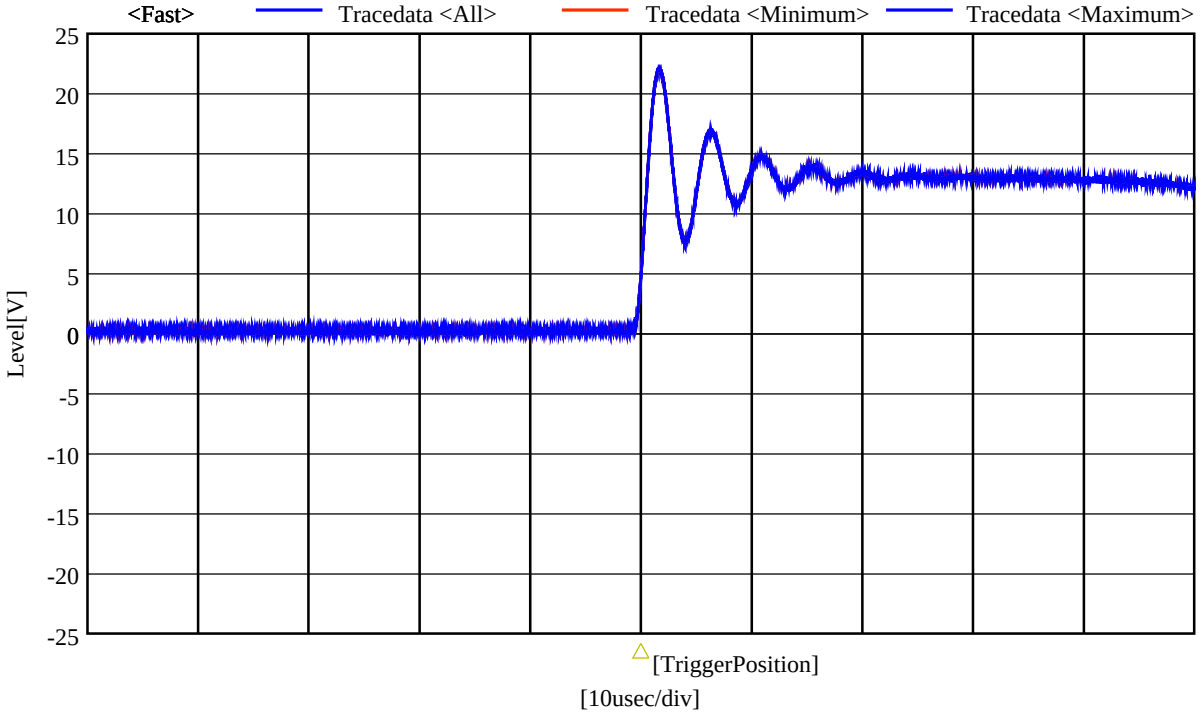
No	Min(V)	Max(V)
1	-14.7	0.5
2	-14.9	0.5
3	-14.7	0.5
4	-17.3	0.5
5	-15.1	0.5
6	-14.7	0.5
7	-14.7	0.5
8	-14.7	0.5
9	-14.7	0.5
10	-14.5	0.5

Minimum	-17.25 V
Average	-14.98 V
Deviation	0.81 V
Maximum	0.53 V
Average	0.53 V
Deviation	0.00 V

ISO 7637-2 Transient emission

Date : 2019/04/25 20:32

Trade Name	: KENWOOD	Standard	: ISO 7637-2
Model Name	: DNX7190DABS	Power Supply	: DC 13.5V
Serial No.	: PE-X0024	Temp/Humi	: 21degC 59%
Test Mode	: --	Operator	: K.Kurihara
Test Condition	: Fast OFF->ON		



switch/relay :Electronic Switch BS 200N100 EMTEST

********** Results of Measurement **********

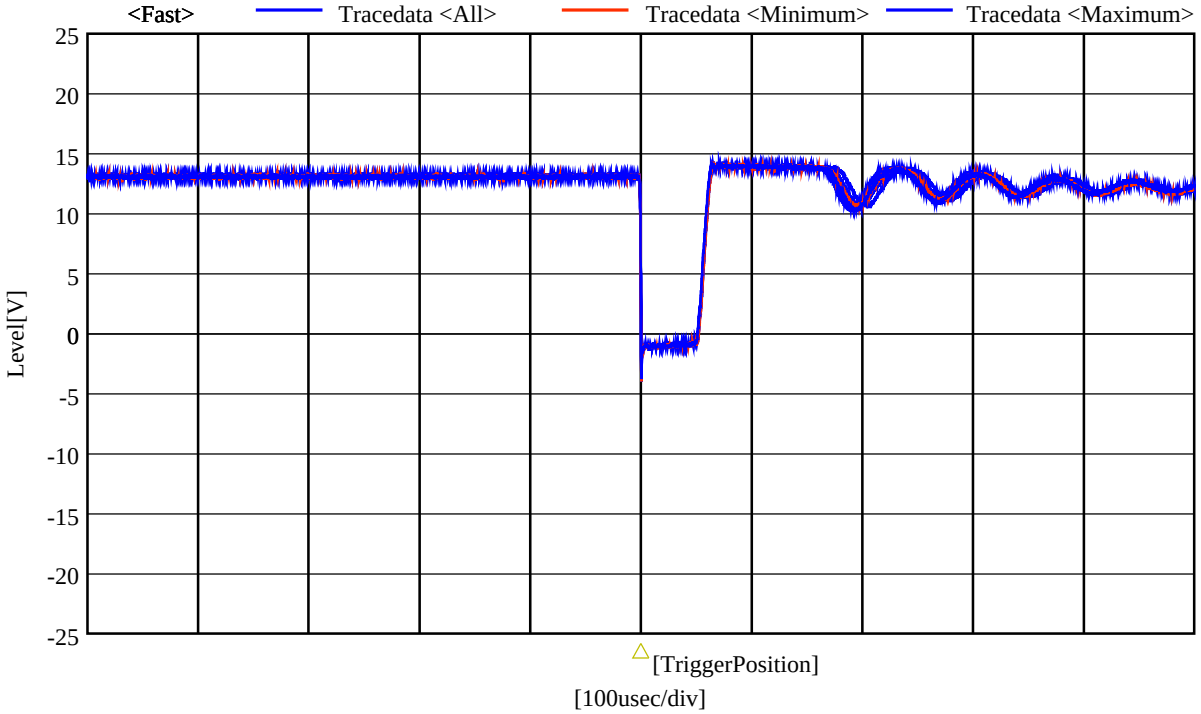
No	Min(V)	Max(V)
1	-13.7	8.8
2	-13.5	8.6
3	-13.7	8.6
4	-13.5	8.6
5	-13.5	8.6
6	-13.5	8.6
7	-13.5	8.6
8	-13.7	8.6
9	-13.7	8.6
10	-13.5	8.8

Minimum	-13.70 V
Average	-13.58 V
Deviation	0.10 V
Maximum	8.83 V
Average	8.67 V
Deviation	0.08 V

ISO 7637-2 Transient emission

Date : 2019/04/25 21:05

Trade Name	: KENWOOD	Standard	: ISO 7637-2
Model Name	: DNX7190DABS	Power Supply	: DC 13.5V
Serial No.	: PE-X0024	Temp/Humi	: 21degC 57%
Test Mode	: DVD Play(Colorbar, 1kHz, 1/8Po)	Operator	: K.Kurihara
Test Condition	: Fast ON->OFF		



switch/relay :Electronic Switch BS 200N100 EMTEST

********** Results of Measurement **********

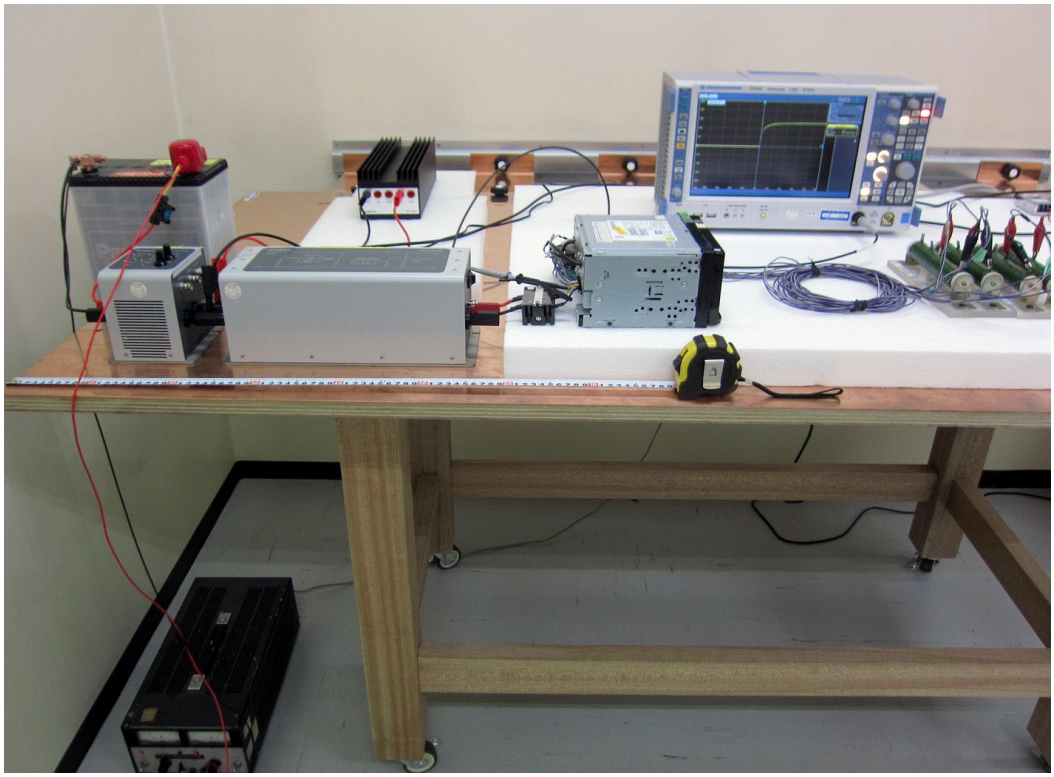
No	Min(V)	Max(V)
1	-17.3	0.9
2	-17.5	0.7
3	-17.3	0.7
4	-17.3	0.7
5	-17.5	0.7
6	-17.3	0.7
7	-17.3	0.9
8	-17.3	0.9
9	-17.5	0.7
10	-17.5	0.9

Minimum	-17.45 V
Average	-17.33 V
Deviation	0.10 V
Maximum	0.93 V
Average	0.81 V
Deviation	0.10 V

Photo Documentation

Measurement of electrical transient emission (ISO7637-2)

Set up for Slow pulse



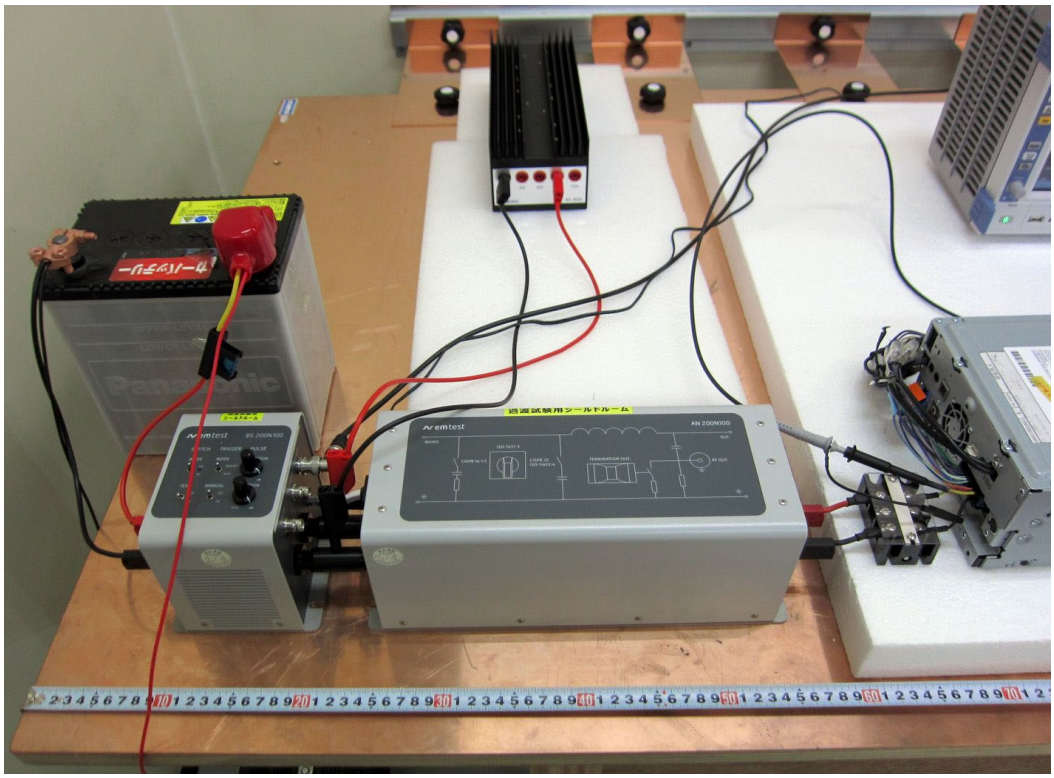
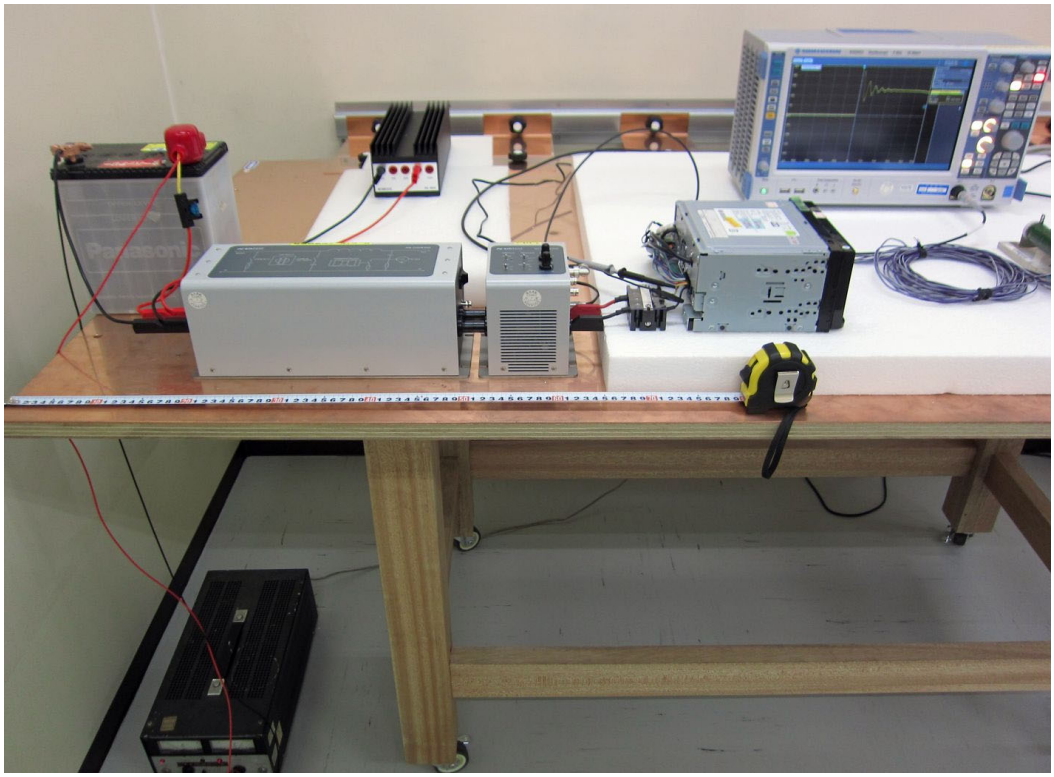
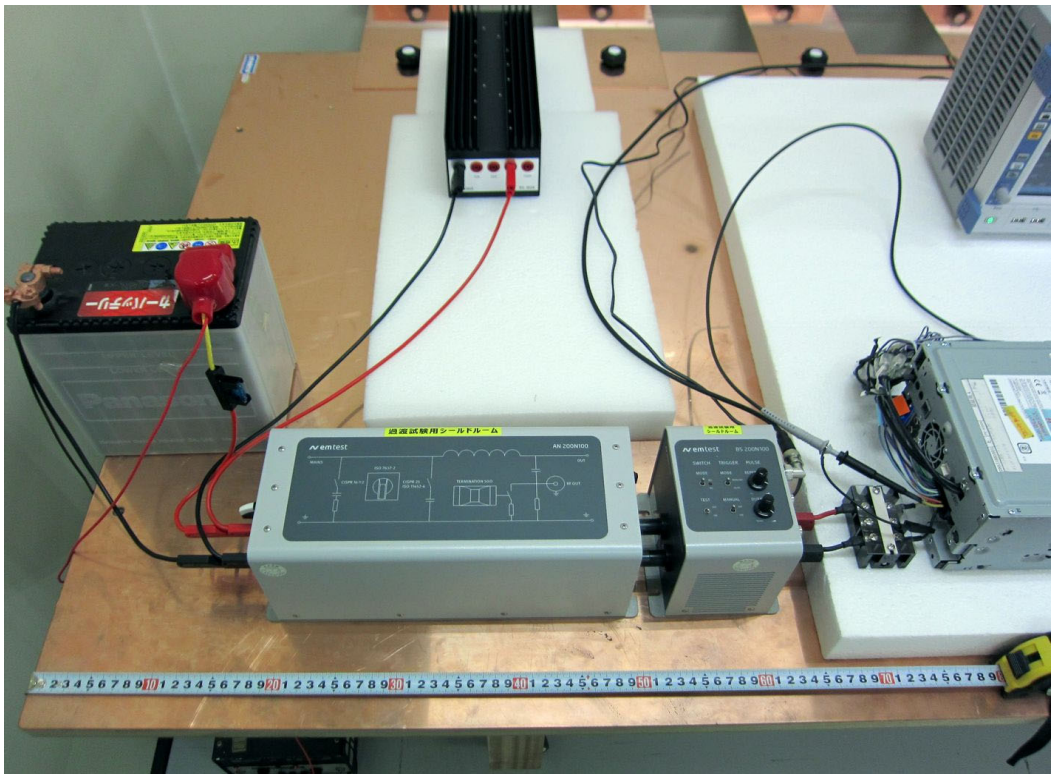


Photo Documentation

Measurement of electrical transient emission (ISO7637-2)

Set up for Fast pulse





Transient Immunity Test

Date of test:	April-25-2019
Tester:	K.Kurihara
D. U. T:	DNX7190DABS
Standard:	EN 50498 (2010)
Application:	12 V system
Ambient Temperature:	22 degC
Humidity:	57%

Test Result	
Result:	Test passed!

D.U.T Information	
Brand Name:	KENWOOD
Model Name:	DNX7190DABS
Type:	GPS NAVIGATION SYSTEM
Serial Number:	PE-X0024
Operation Mode:	DVD Play
Description:	1kHz, Colorbar

Test Configuration

D.U.T was placed on a non-conductive support height 50 mm above the ground plane under the description of ISO 7637-2 as shown in Fig.1.

D.U.T was in the operation condition specified.

The performance of D.U.T was monitored continuously.

The check of each operation was performed after each test.

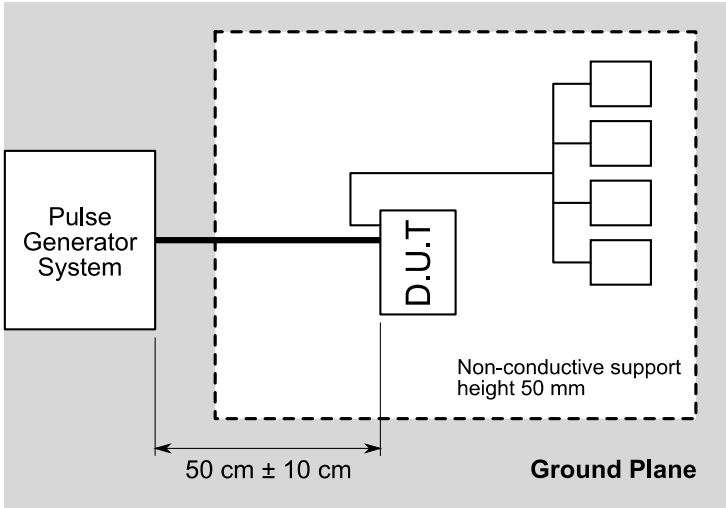
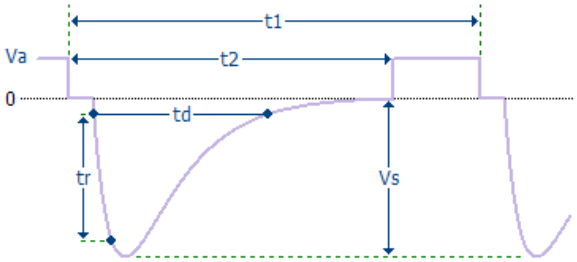


Fig.1 Drawing of the Test Set-up

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 1		
Test generator:	UCS200N50	Software No.:	000873
		Serial No.:	P1741204742
Coupling network:	UCS200N50	Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup		
Vs:	-75	V
t1:	0.5	s
t2:	200	ms
tr:	1	us
td:	2000	us
Ri:	10	Ohm
Coupling:	Battery	
Events:	5000	
Test duration:	00:41:40	h

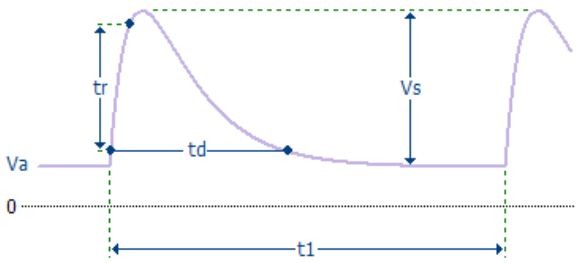


Test Result			
Pulses:	5000	Required functional status:	Class D
Result:	Test passed!		
Comments:	Power supply is shutdown during the pulse is applied. After the test, return to the normal state, and it can be operated normally.		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 2a		
Test generator:	UCS200N50	Software No.:	000873
		Serial No.:	P1741204742
Coupling network:	UCS200N50	Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

Vs:	+37	V
t1:	0.2	s
tr:	1	us
td:	50	us
Ri:	2	Ohm
Coupling:	Battery	
Events:	5000	
Test duration:	00:16:40	h

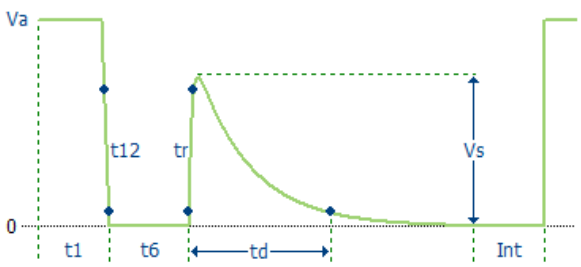


Test Result			
Pulses:	5000	Required functional status:	Class D
Result:	Test passed!		
Comments:	Normal operating both during and after the test		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 2b		
Test generator:	VDS200Q25	Software No.:	001298
		Serial No.:	P1804213872
Coupling network:	UCS200N50	Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

Vs:	10.0	V
t1:	1.0	s
t6:	1	ms
td:	200	ms
Int:	1.0	s
Ri:	0.05	Ohm
t12:	1	ms
tr:	1	ms
Events:	10	
Test duration:	00:00:28	h

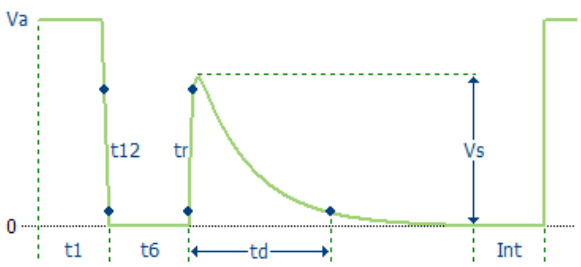


Test Result			
Pulses:	10	Required functional status:	Class D
Result:	Test passed!		
Comments:	Power supply is shutdown during the pulse is applied. After the test, return to the normal state, and it can be operated normally.		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 2b		
Test generator:	VDS200Q25	Software No.:	001298
		Serial No.:	P1804213872
Coupling network:	UCS200N50	Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

Vs:	10.0	V
t1:	1.0	s
t6:	1	ms
td:	2000	ms
Int:	1.0	s
Ri:	0.05	Ohm
t12:	1	ms
tr:	1	ms
Events:	10	
Test duration:	00:01:13	h

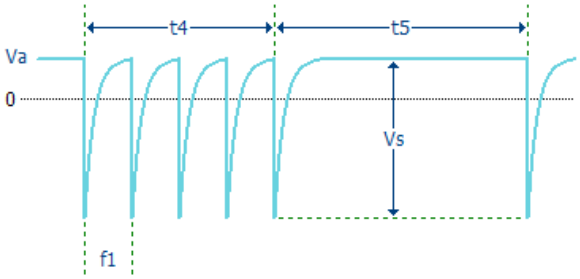


Test Result			
Pulses:	10	Required functional status:	Class D
Result:	Test passed!		
Comments:	Power supply is shutdown during the pulse is applied. After the test, return to the normal state, and it can be operated normally.		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 3a		
Test generator:	UCS200N50	Software No.:	000873
		Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

Vs:	-112	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test duration:	1	h

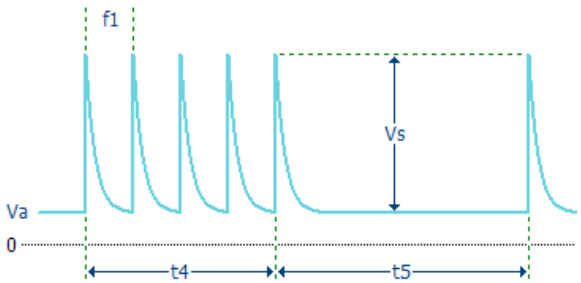


Test Result			
Test duration:	01:00:01 h	Required functional status:	Class D
Result:	Test passed!		
Comments:	Normal operating both during and after the test		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 3b		
Test generator:	UCS200N50	Software No.:	000873
		Serial No.:	P1741204742
Va (Alternator):	13.5 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

Vs:	+75	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test duration:	1	h

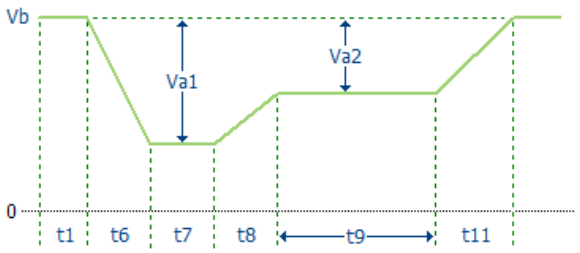


Test Result			
Test duration:	01:00:01 h	Required functional status:	Class D
Result:	Test passed!		
Comments:	Normal operating both during and after the test		

Test Procedure			
Pulse Name:	prEN 50498 (2008-03) : Pulse 4		
Test generator:	VDS200Q25	Software No.:	001298
		Serial No.:	P1804213872
Coupling network:	UCS200N50	Serial No.:	P1741204742
Vb (Battery):	12.0 V	Current limit:	25 A
Software:	iso.control	Version:	6.0.1

Test Setup

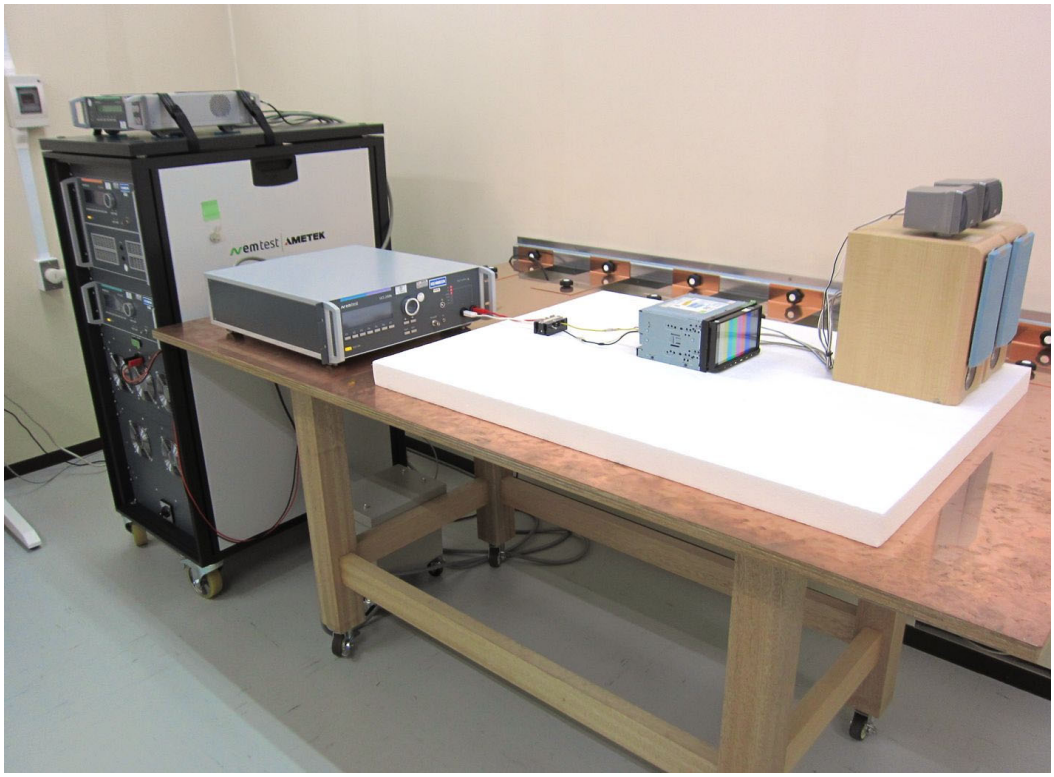
Va1:	-6.0	V
Va2	-5.0	V
t1:	1.0	s
t6:	5	ms
t7:	20	ms
t8:	30	ms
t9:	0.5	s
t11:	50	ms
Events:	1	
Test duration:	00:00:02	h

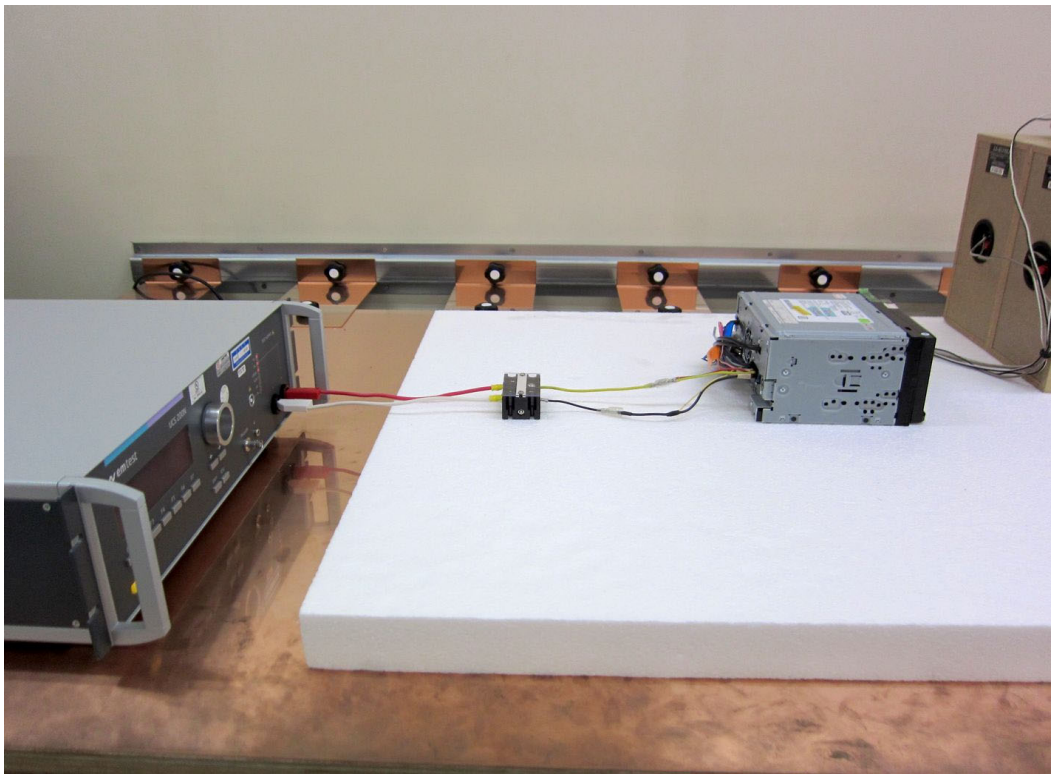


Test Result			
Pulses:	1	Required functional status:	Class D
Result:	Test passed!		
Comments:	Power supply is shutdown during the pulse is applied. After the test, return to the normal state, and it can be operated normally.		

Photo Documentation

Measurement of electrical transient immunity (ISO7637-2)





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