MIL STD 1275E

TEST REPORT

For

Product Name: Defense Monitor

Model Number: TDM-D240

Brand Name: ELGENS

Issued to

ELGENS CO., LTD

7 F.-6, No. 492, Bannan Rd., Zhonghe Dist., New Taipei City 235602, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
Automotive electronics Laboratory
No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan
TEL: 886-2-2299-9720
FAX: 886-2-2299-9721
Issued Date: August 27, 2025

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 27, 2025	Initial Issue	ALL	May Lin

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1. TEST RESULT CERTIFICATION

Product:	Defense Monitor
Model:	TDM-D240
Brand:	ELGENS
Applicant:	**ELGENS CO., LTD** 7 F.-6, No. 492, Bannan Rd., Zhonghe Dist., New Taipei City 235602, Taiwan (R.O.C.)
Manufacturer:	**ELGENS CO., LTD** 7 F.-6, No. 492, Bannan Rd., Zhonghe Dist., New Taipei City 235602, Taiwan (R.O.C.)
Tested:	August 11 ~ 13, 2025
Received Date:	August 04, 2025

Standards	
MIL-STD-1275E	
Applicable Standard	**Test Result**
5.3.1 Steady state operation	Pass
5.3.2 Starting operation	Pass
5.3.3.1.1 Transient disturbances – Injected voltage spikes	Pass
5.3.3.1.2 Transient disturbances – Emitted voltage spikes	Pass
5.3.3.2.1 Transient disturbances – Injected voltage surges	Pass
5.3.3.2.2 Transient disturbances – Emitted voltage surges	Pass
5.3.4 Reverse polarity	Pass
Deviation from Applicable Standard	
N/A	
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

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The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in MIL STD 1275E. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Sam Zeng
Asst. Section Manager
Compliance Certification Services Inc.

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2. EUT DESCRIPTION

Product	Defense Monitor
Brand Name	ELGENS
Model	TDM-D240
Series Model	N/A
Model Discrepancy	N/A
Applicant	ELGENS CO., LTD

Remark: For more details, please refer to the User's manual of the ESA.

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3. TEST METHODOLOGY

All tests were performed in accordance with the procedure documented in MIL STD 461G.

4. INSTRUMENT AND CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Voltage compatibility verification method

Transients And Surge In The Vehicular Environment Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Voltage Drop Simulator	EM TEST	VDS 200 N10	P1449144556	2026-05-28
Arbitrary Generator	EM TEST	Autowave-2CH	P1450145402	2026-05-28
Continuous Wave Simulator For Low Frequencies	EM TEST	CWS 500E	V0606101158	2025-12-02
Programmable DC Power Supply	CHROMA	62150H-600	62150EB01180	2026-07-22
Transient pulse generator main frame	KIKUSI	KES7840S	XH003716	2025-08-14
Switch Trigger Pulse	EM TEST	BS 200N100	P1446143147	2026-01-14
Artificial Networks	EM TEST	AN 200N100	P1447143610	2026-08-02
Oscilloscope	Keysight	DSOX6004A	MY61500221	2026-06-29
Voltage Probe	Keysight	10076C	003	2026-06-08
Software	iso.control V5.4.3			

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5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

Tel: 886-2-2299-9720 / Fax: 886-2-2299-9721

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support.

6.2 PHOTOGRAPHS OF EUT

See test photographs attached in Appendix II for the EUT's external structure.

6.3 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook	HP	HSN-Q35C-4	5CD3064W7Y	NA	NA	NA

Remarks:

1. *All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

6.4 TEST SETUP

The equipment under test connects to notebook and test instrument, then type the character "H" during test.

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7. MIL STD 1275E REQUIREMENTS

7.1 STEADY STATE OPERATION

APPLICABILITY

This section describes the steady state voltage range, which excludes engine starting disturbances, and applies to all utilization equipment. Utilization equipment shall operate without degradation or damage when subjected to the operational voltage range specified in this section.

TEST

Operational voltage range

The utilization equipment voltage operating range is between 20 VDC and 33 VDC, including ripple.

Voltage ripple

The maximum peak-to-peak ripple voltage limits are specified in MIL-STD-461 CS101 with the same values used at 150 kHz extended to 250 kHz, as shown in Figure 1.

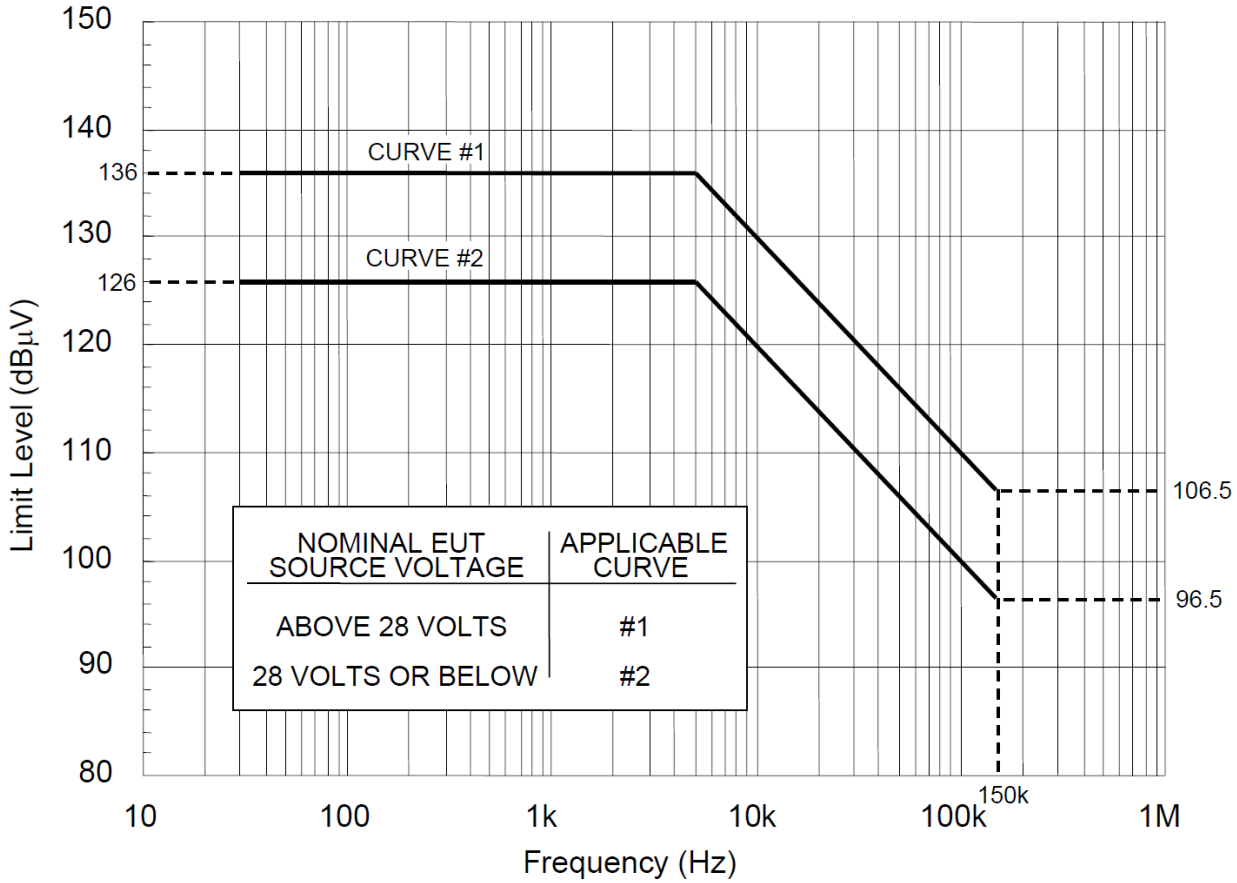

FIGURE 1. CS101 voltage limit for all applications

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TEST CONFIGURATION

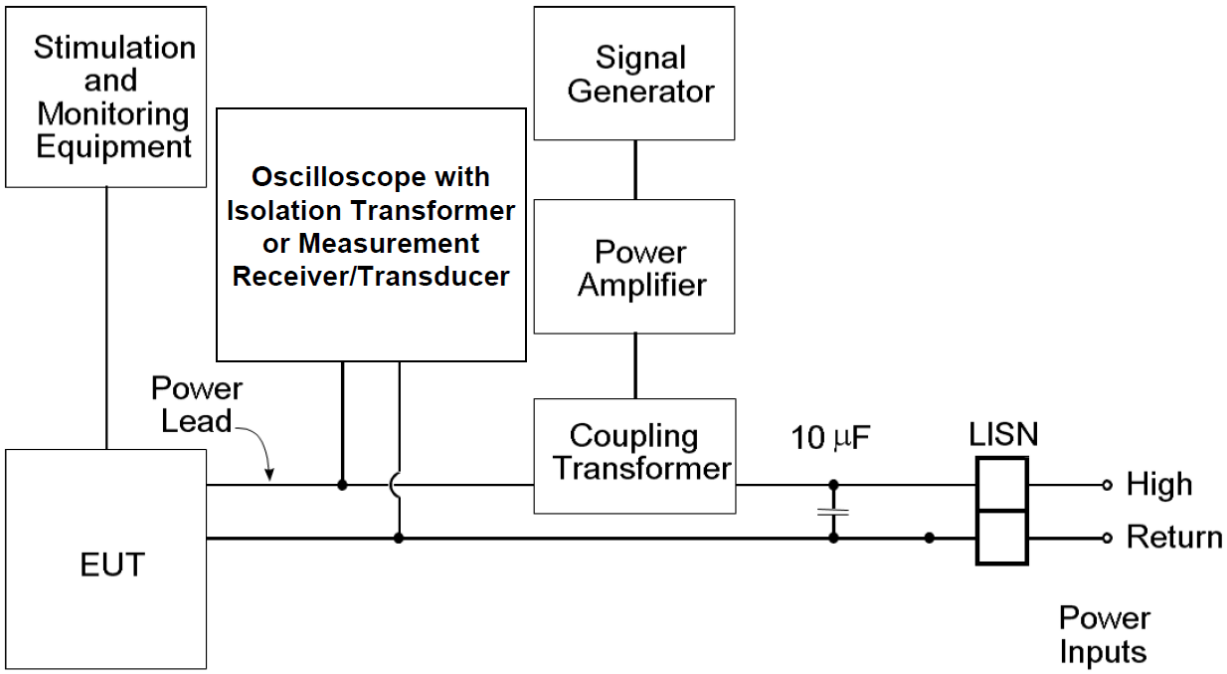

FIGURE 2. Test set-up to Voltage ripple

TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

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TEST RESULTS

Pass

Operational voltage range

EUT Power	Test Lines	Test Level	Limit	Test Result	Pass/ Fail
28V	Power lines	20V	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass
		33V		During and after test, EUT function is normal.	Pass

Voltage ripple

EUT Power	Test Lines	Test Curve(#)	Limit	Test Result	Pass/ Fail
28	Power lines	2	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass

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Test Data

Operational voltage range

Project No.:	TM-2508000026P
Date of test:	Augest-11-2025
Tester:	Adam Cheng
Customer:	ELGENS CO., LTD
D. U. T:	Defense Monitor
Standard:	MIL-STD-1275E
Application:	12 V system
Ambient Temperature:	25.8°C
Humidity:	46%
Pressure:	102 kPa

D . U . T	
Name:	Defense Monitor
Serial Number:	TDM-D240
Operation Mode:	Operating mode
Description:	

T e s t P r o c e d u r e			
Pulse Name:	MIL-STD-1275E : 5.3.1.1 Operational voltage range		
Test generator:	VDS200N10	Software No.:	000933
		Serial No.:	P1449144556
Va (Alternator):	28.0 V	Current limit:	10 A
Software:	autowave.control	Version:	5.8.5

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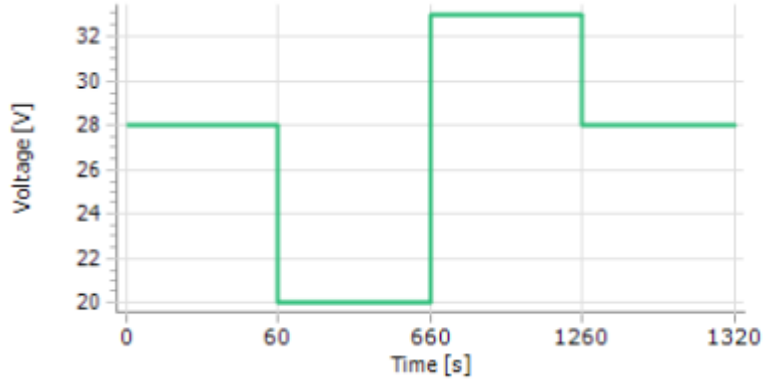
Test Setup


Segments						
1: DC	t1 :	1	min	V1 :	28	V
2: DC	t1 :	10	min	V1 :	20	V
3: DC	t1 :	10	min	V1 :	33	V
4: DC	t1 :	1	min	V1 :	28	V

Test Result	
Pulses:	1
Result:	Test passed ! During and after test, EUT function is normal.

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Voltage ripple

TEST REPORT

Project No.: TM-2508000026P

Standard	MIL STD-1275E 5.3.1.2 Voltage ripple
Test object	EUT: Defense Monitor M/N: TDM-D240 DC: 24V system
Customer	ELGENS CO., LTD
Test engineer	Eason Chen
Recorded	August 13, 2025 11:09:47 am , with ICD 3.54.01
Test equipment	1.) EM TEST AG, CWS 500E, 153
Result file	C:\Users\admin\Desktop\g.prj
Comment	During and after test, EUT function is normal.
Result	

Test Plan

Testfile

Name	voltage ripple curve2.nrm
Path	c:\emtest\icd354\standard\automotive\international\iso\mil-std-1275e\cs101\voltage ripple curve2.nrm
Modification date	2023/5/22 ¤W¤È 10:08:42

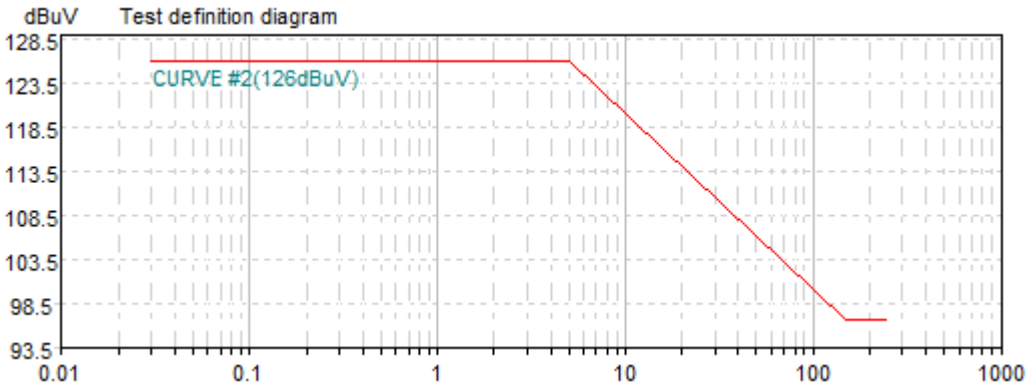
Climatic condition

Temperature	23
Humidity	50
Pressure	1015

Test Values

no.	title	F1 [kHz]	L1 [dBuV]	F2 [kHz]	L2 [dBuV]	F-step [kHz]	td [s]	tp [s]	Modulation
3.	CURVE #2(126dBuV)	0.030	126.0	5.000	126.0	5.0 %	3.0 s	0.0 s	CW
4.		5.000	126.0	150.000	96.5	5.0 %	3.0 s	0.0 s	CW
5.		150.000	96.5	250.000	96.5	5.0 %	3.0 s	0.0 s	CW

Diagrams



Test summary

no.	Calibration file	Tp. count	Ev. count	passed
1.	Trafo2-1 CURVE #2(126dBuV) 0_03 - 250_0 kHz, 5_0 %.CAL	187/189	1	no

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Coupling device: 1

Model Trafo2-1
Sno
Note 60VAC, 50ADC max
Frequency range 0.010 .. 250.000 kHz

Port description DC-Port

Diagrams

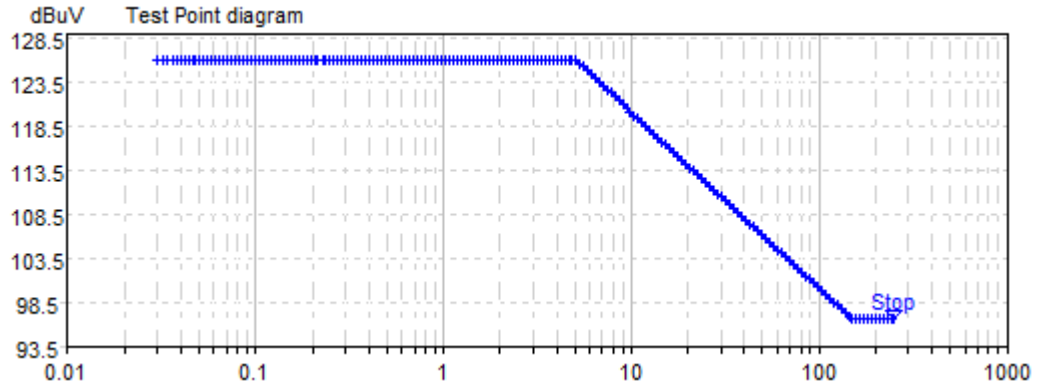

Table of events : 1

no.	Frequency [kHz]	Events	Level [dBuV]	Comment
1	250.000	Stop	9.6500E+01	

Table of Test points : 187

no.	Frequency [kHz]	Level [dBuV]
1	0.030	126.0
2	0.032	126.0
3	0.034	126.0
4	0.036	126.0
5	0.038	126.0
6	0.040	126.0
7	0.042	126.0
8	0.044	126.0
9	0.046	126.0
10	0.048	126.0
11	0.050	126.0
12	0.052	126.0
13	0.055	126.0
14	0.058	126.0
15	0.061	126.0
16	0.064	126.0
17	0.067	126.0
18	0.070	126.0
19	0.074	126.0
20	0.078	126.0
21	0.082	126.0
22	0.086	126.0
23	0.090	126.0
24	0.094	126.0
25	0.099	126.0
26	0.104	126.0
27	0.109	126.0
28	0.114	126.0

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29	0.120	126.0
30	0.126	126.0
31	0.132	126.0
32	0.139	126.0
33	0.146	126.0
34	0.153	126.0
35	0.161	126.0
36	0.169	126.0
37	0.177	126.0
38	0.186	126.0
39	0.195	126.0
40	0.205	126.0
41	0.215	126.0
42	0.226	126.0
43	0.237	126.0
44	0.249	126.0
45	0.261	126.0
46	0.274	126.0
47	0.288	126.0
48	0.302	126.0
49	0.317	126.0
50	0.333	126.0
51	0.350	126.0
52	0.368	126.0
53	0.386	126.0
54	0.405	126.0
55	0.425	126.0
56	0.446	126.0
57	0.468	126.0
58	0.491	126.0
59	0.516	126.0
60	0.542	126.0
61	0.569	126.0
62	0.597	126.0
63	0.627	126.0
64	0.658	126.0
65	0.691	126.0
66	0.726	126.0
67	0.762	126.0
68	0.800	126.0
69	0.840	126.0
70	0.882	126.0
71	0.926	126.0
72	0.972	126.0
73	1.021	126.0
74	1.072	126.0
75	1.126	126.0
76	1.182	126.0
77	1.241	126.0
78	1.303	126.0
79	1.368	126.0
80	1.436	126.0
81	1.508	126.0
82	1.583	126.0
83	1.662	126.0
84	1.745	126.0
85	1.832	126.0
86	1.924	126.0
87	2.020	126.0
88	2.121	126.0
89	2.227	126.0
90	2.338	126.0
91	2.455	126.0
92	2.578	126.0
93	2.707	126.0
94	2.842	126.0
95	2.984	126.0
96	3.133	126.0
97	3.290	126.0
98	3.454	126.0
99	3.627	126.0

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100	3.808	126.0
101	3.998	126.0
102	4.198	126.0
103	4.408	126.0
104	4.628	126.0
105	4.859	126.0
107	5.000	126.0
108	5.250	125.6
109	5.512	125.2
110	5.788	124.7
111	6.077	124.3
112	6.381	123.9
113	6.700	123.5
114	7.035	123.0
115	7.387	122.6
116	7.756	122.2
117	8.144	121.8
118	8.551	121.3
119	8.979	120.9
120	9.428	120.5
121	9.899	120.1
122	10.394	119.7
123	10.914	119.2
124	11.460	118.8
125	12.033	118.4
126	12.635	117.9
127	13.267	117.5
128	13.930	117.1
129	14.626	116.7
130	15.357	116.3
131	16.125	115.8
132	16.931	115.4
133	17.778	115.0
134	18.667	114.6
135	19.600	114.2
136	20.580	113.7
137	21.609	113.3
138	22.689	112.9
139	23.823	112.4
140	25.014	112.0
141	26.265	111.6
142	27.578	111.2
143	28.957	110.8
144	30.405	110.3
145	31.925	109.9
146	33.521	109.5
147	35.197	109.1
148	36.957	108.7
149	38.805	108.2
150	40.745	107.8
151	42.782	107.4
152	44.921	106.9
153	47.167	106.5
154	49.525	106.1
155	52.001	105.7
156	54.601	105.3
157	57.331	104.8
158	60.198	104.4
159	63.208	104.0
160	66.368	103.6
161	69.686	103.1
162	73.170	102.7
163	76.828	102.3
164	80.669	101.9
165	84.702	101.4
166	88.937	101.0
167	93.384	100.6
168	98.053	100.2
169	102.956	99.8
170	108.104	99.3
171	113.509	98.9

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172	119.184	98.5
173	125.143	98.1
174	131.400	97.6
175	137.970	97.2
176	144.868	96.8
178	150.000	96.5
179	157.500	96.5
180	165.375	96.5
181	173.644	96.5
182	182.326	96.5
183	191.442	96.5
184	201.014	96.5
185	211.065	96.5
186	221.618	96.5
187	232.699	96.5
188	244.334	96.5
189	250.000	96.5

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7.2 STARTING OPERATION.

APPLICABILITY

This section applies to utilization equipment operating while subjected to engine starting disturbances. Utilization equipment shall operate without degradation or damage when subjected to engine starting disturbances within the limits shown in Figure 4.

TEST

Initial engagement surge (IES)
The minimum voltage supplied to utilization equipment during an IES is 12 VDC. The maximum duration of the IES is one (1) second. Consecutive IES events are a minimum of one (1) second apart.

A starting disturbance is the variation in system voltage from the normal operating voltage range caused by the initial engagement of the engine starter and subsequent engine cranking. The duration of the Initial Engagement Surge (IES) is measured from the time at which it departs from the normal operating voltage to the time at which it reaches and remains at the cranking voltage. An example showing “Initial Engagement Surge” (IES) and “Cranking”; i.e., voltage level during active engine cranking is shown in Figure 3.

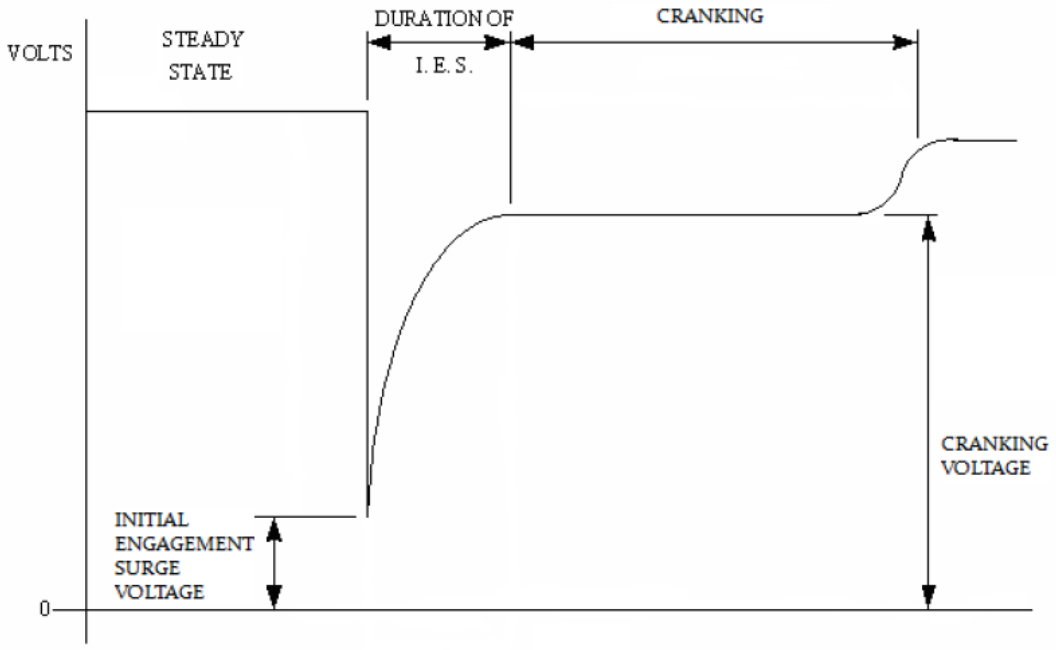

Figure 3. Sample starting disturbance waveform

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Cranking surges

The minimum voltage supplied to utilization equipment during cranking surges is 16 VDC. The maximum duration of cranking surges is thirty (30) seconds.

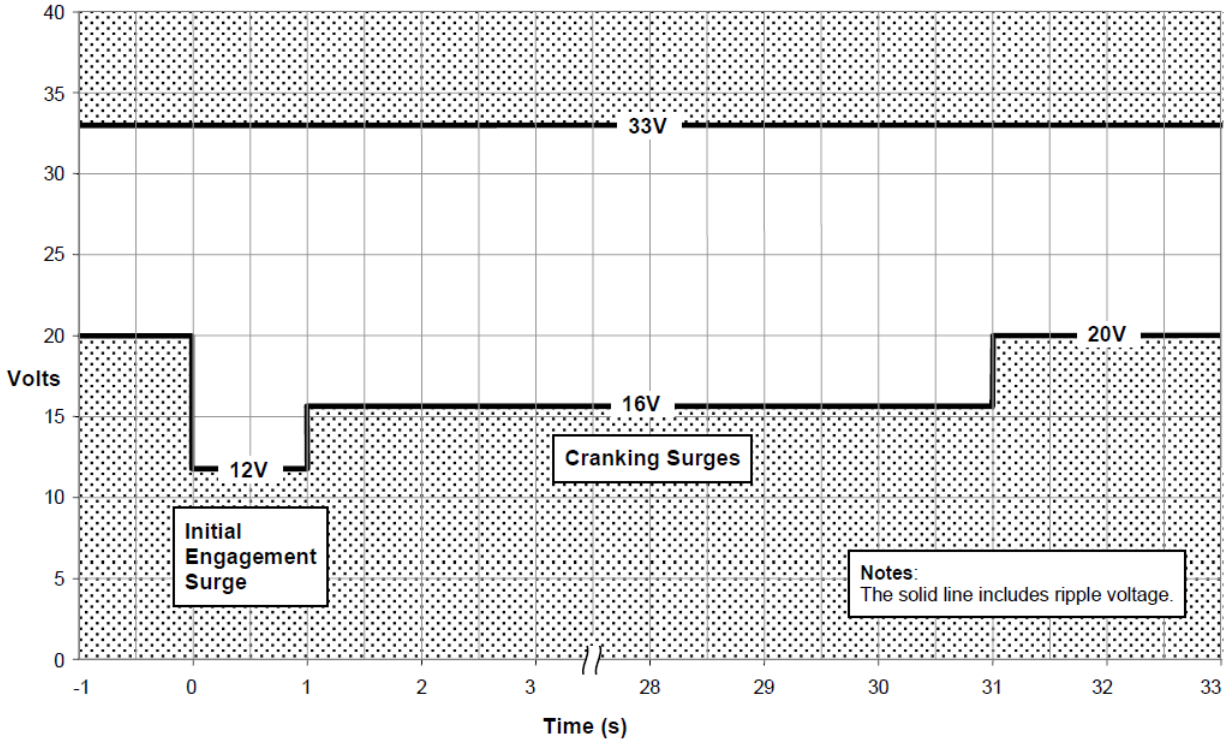
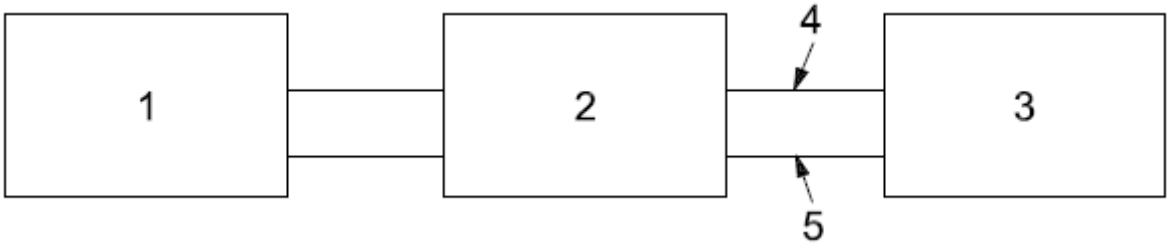


Figure 4. Starting disturbance limits on 28VDC systems

TEST CONFIGURATION



Key
1 sweep generator
2 power supply unit capable of being modulated
3 DUT
4 positive
5 ground or return

FIGURE 5. Test set-up to Starting operation

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TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

TEST RESULTS

Pass

Test Voltage (V)	Limit	Test Result	Pass / Fail
12 to 20	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass

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Test Data

Project No.:	TM-2508000026P
Date of test:	Augest-11-2025
Tester:	Adam Cheng
Customer:	ELGENS CO., LTD
D. U. T:	Defense Monitor
Standard:	MIL-STD-1275E
Application:	12 V system
Ambient Temperature:	25.8°C
Humidity:	46%
Pressure:	102 kPa

D . U . T	
Name:	Defense Monitor
Serial Number:	TDM-D240
Operation Mode:	Operating mode
Description:	

T e s t P r o c e d u r e			
Pulse Name:	MIL-STD-1275E : 5.3.2 Strating operation		
Test generator:	VDS200N10	Software No.:	000933
		Serial No.:	P1449144556
Va (Alternator):	28.0 V	Current limit:	10 A
Software:	autowave.control	Version:	5.8.5

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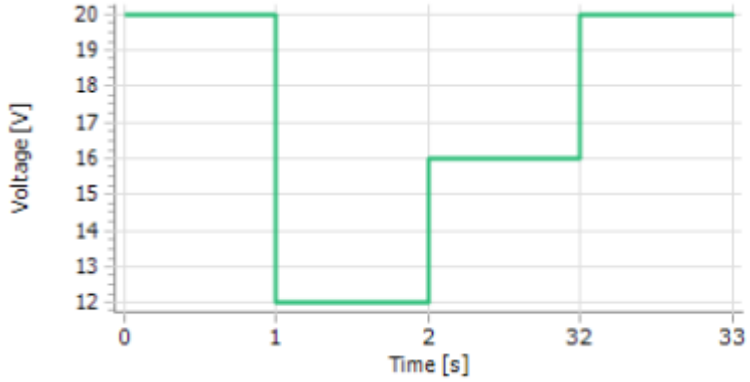
Test Setup


Segments				
1: DC	t1 :	1s	V1 :	20V
2: DC	t1 :	1s	V1 :	12V
3: DC	t1 :	30s	V1 :	16V
4: DC	t1 :	1s	V1 :	20V

Test Result	
Pulses:	1
Result:	Test passed ! During and after test, EUT function is normal.

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7.3 TRANSIENT DISTURBANCES_ IINJECTED VOLTAGE SPIKES

APPLICABILITY

Utilization equipment shall operate without degradation or damage when subjected to voltage spikes within the limits shown in Figure 6. The maximum rise time (t_{RISE}) of the injected spikes is 50 nanoseconds, and the maximum total energy content of a single spike is 2 Joules.

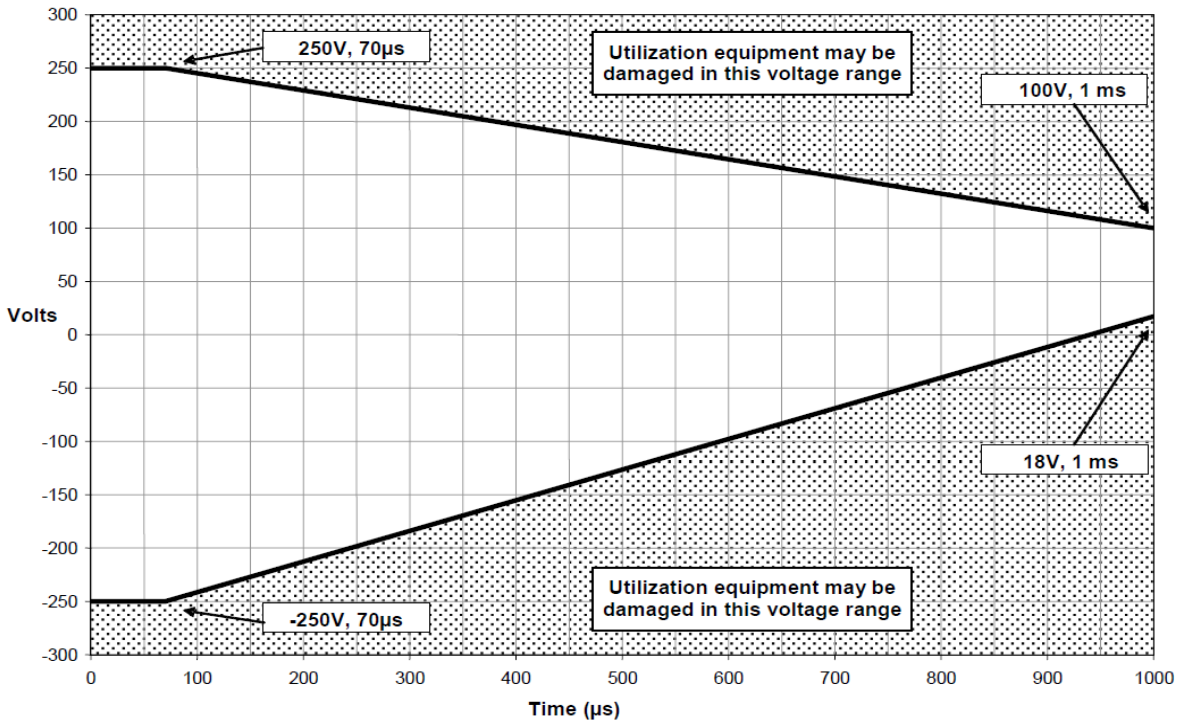

Figure 6. Envelope of spikes for 28VDC systems.

TEST

The EUT shall be supplied power by a voltage source set to the nominal 28 VDC operating voltage through a Line Impedance Stabilization Network (LISN). The test operator shall inject voltage spikes into the EUT using a test setup similar to Figure 7.

One LISN shall be used when the power return is the vehicle chassis; in this case the ground plane provides the power return current path. Two LISNs shall be used when the EUT has a dedicated power return conductor, such as wires, buss bar, etc. This simulates the additional vehicle wiring harness present in the vehicle.

Both positive and negative voltage spikes shall be applied to the EUT. A minimum of fifty (50) 250V spikes of each polarity shall be applied at one (1) second intervals. Each test spike shall have a peak amplitude of 250V, a risetime not exceeding 50 ns, a frequency of oscillation greater than 100 kHz and less than 500 kHz, and a maximum energy content of 2 Joules.
Verify the EUT operates as specified while subjected to the voltage spikes. Any deviation from normal operation shall be recognized as a failure of the EUT.

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TEST CONFIGURATION

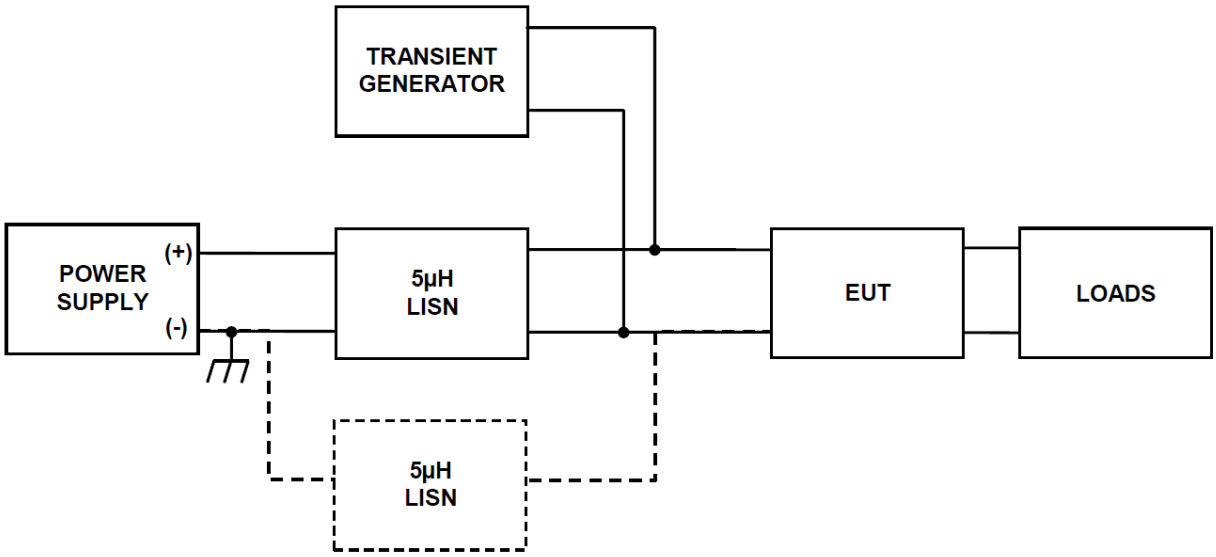

Figure 7. Sample test setup for immunity to injected voltage spikes

TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

TEST RESULTS

Pass

Test Pulse	Test Voltage (V)	Limit	Test Result	Pass / Fail
Positive Spike	+250	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass
Negative spike	-250	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass

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Test Data

Project No.:	TM-2508000026P
Date of test:	Augest-11-2025
Tester:	Eason Chen
Customer:	ELGENS CO., LTD
D. U. T:	Defense Monitor
Standard:	MIL-STD-1275E
Application:	12 V system
Ambient Temperature:	25.8°C
Humidity:	46%
Pressure:	102 kPa

D . U . T			
Name:	Defense Monitor		
Serial Number:	TDM-D240		
Operation Mode:	Operating mode		
Description:			

T e s t P r o c e d u r e			
Pulse Name:	Injected voltage spikes		
Test generator:	KES7842S		
Coupling network:	KRS7848S		
Software:	耐誘導ノイズ試験装置	Version:	1.01

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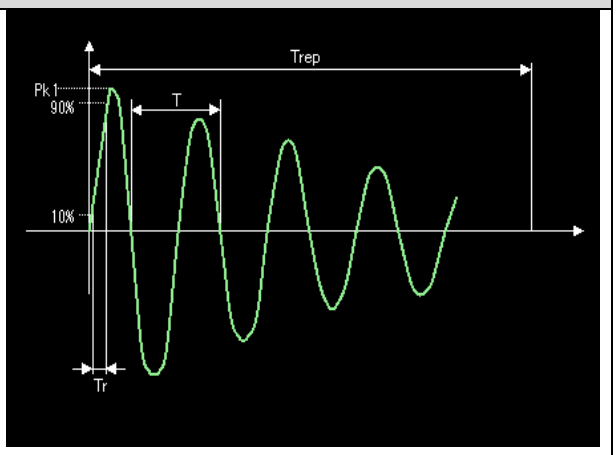
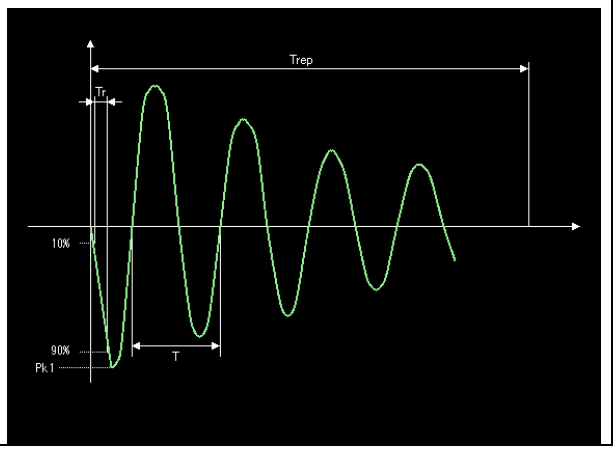
Test Setup			
Pk 1	250	V	
Tr	50	ns	
T	100	kHz	
Dr	35	%	
Trep	0.01	KHz	
Tt	600	S	
Ri	50	Ω	

Test Setup			
Pk 1	-250	V	
Tr	50	ns	
T	100	kHz	
Dr	35	%	
Trep	0.01	KHz	
Tt	600	S	
Ri	50	Ω	

Test Result
Pulses: 1
Result: During and after test, EUT function is normal.

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7.4 TRANSIENT DISTURBANCES_ EMITTED VOLTAGE SPIKES

APPLICABILITY

Emitted voltage spikes from utilization equipment shall be within the limits shown in Figure 8. The maximum total energy content of a single emitted spike is 125 millijoules (mJ).

TEST

The EUT shall be supplied power by a source set to the nominal 28 VDC operating voltage. Unless otherwise specified in the applicable performance specification, use the conducted transient emissions test method specified in SAE J1113-42 to measure the spikes emitted by the EUT using a test setup similar to Figure 9.

One LISN shall be used when the power return is the vehicle chassis; in this case the ground plane provides the power return current path. Two LISNs shall be used when the EUT has a dedicated power return conductor, such as wires, buss bar, etc. This simulates the additional vehicle wiring harness present in the vehicle.
The test operator shall exercise switching function(s) of the EUT capable of producing spikes, (e.g., the switching of any inductive loads controlled by the EUT). If the power source to the EUT is controlled by means of a vehicle mounted switch or relay, the test shall be performed using this switch or relay. Each switching function shall be exercised a minimum of thirty-two (32) times in order to give a reasonable probability that the maximum spike voltage is recorded. The test operator shall monitor the operation of the EUT. Voltage spikes emitted by the EUT shall be within the limits shown in Figure 8. Any voltage spike or combination of voltage spikes emitted from a single event shall have an energy content less than 125 mJ.

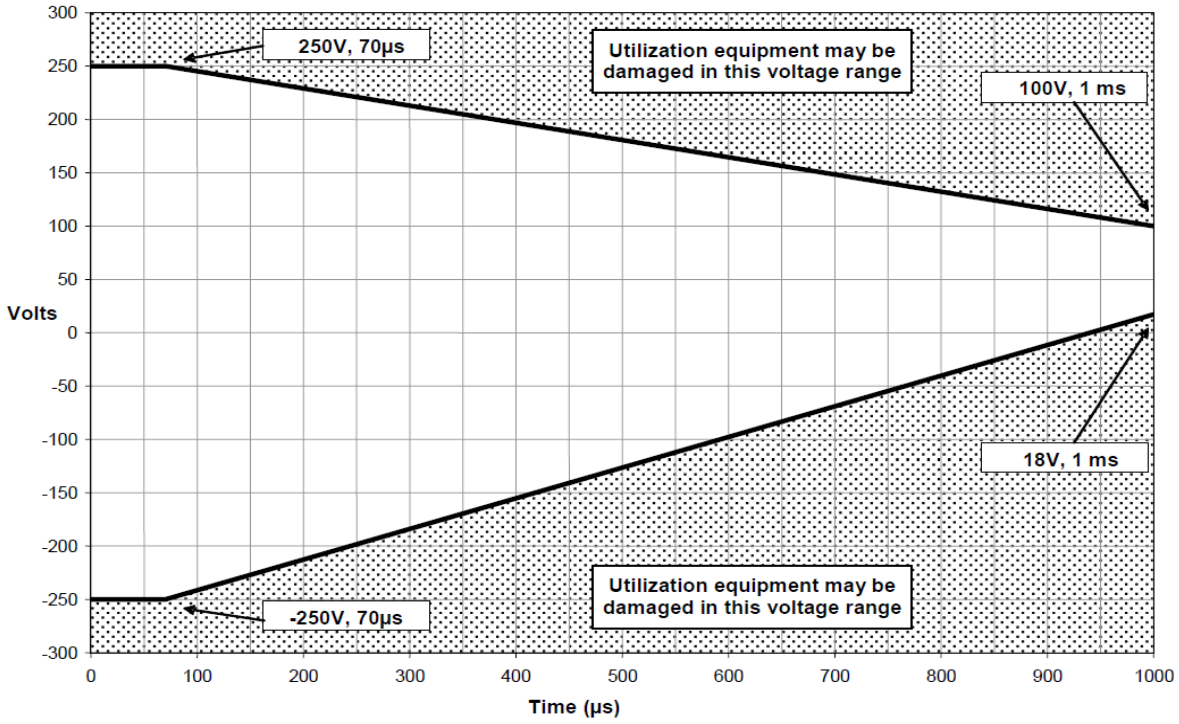

FIGURE 8. Envelope of spikes for 28VDC systems.

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TEST CONFIGURATION

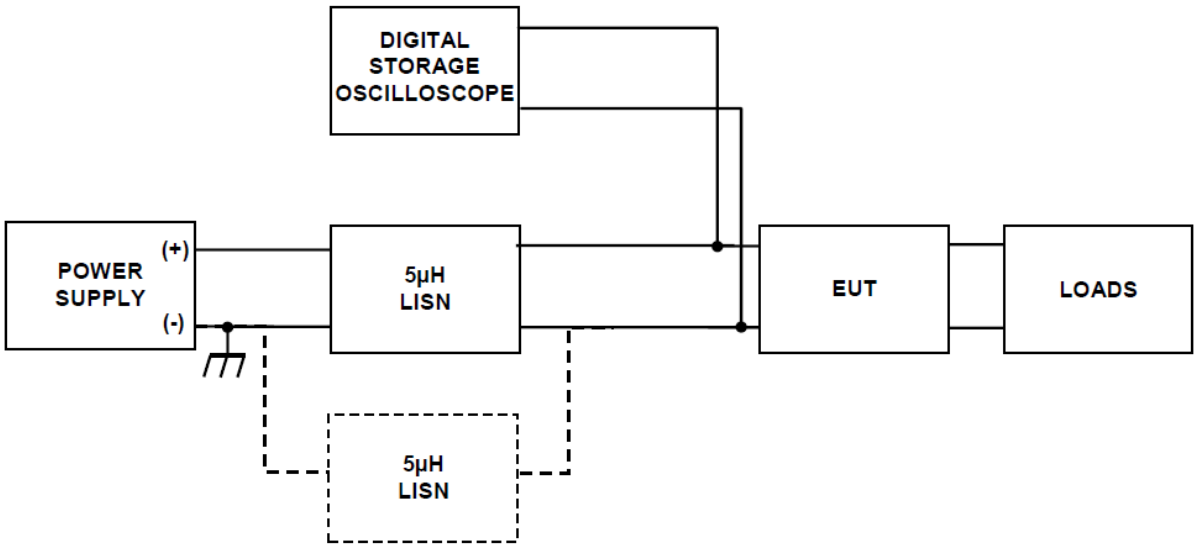

Figure 9. Sample test setup for exported voltage spikes

TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

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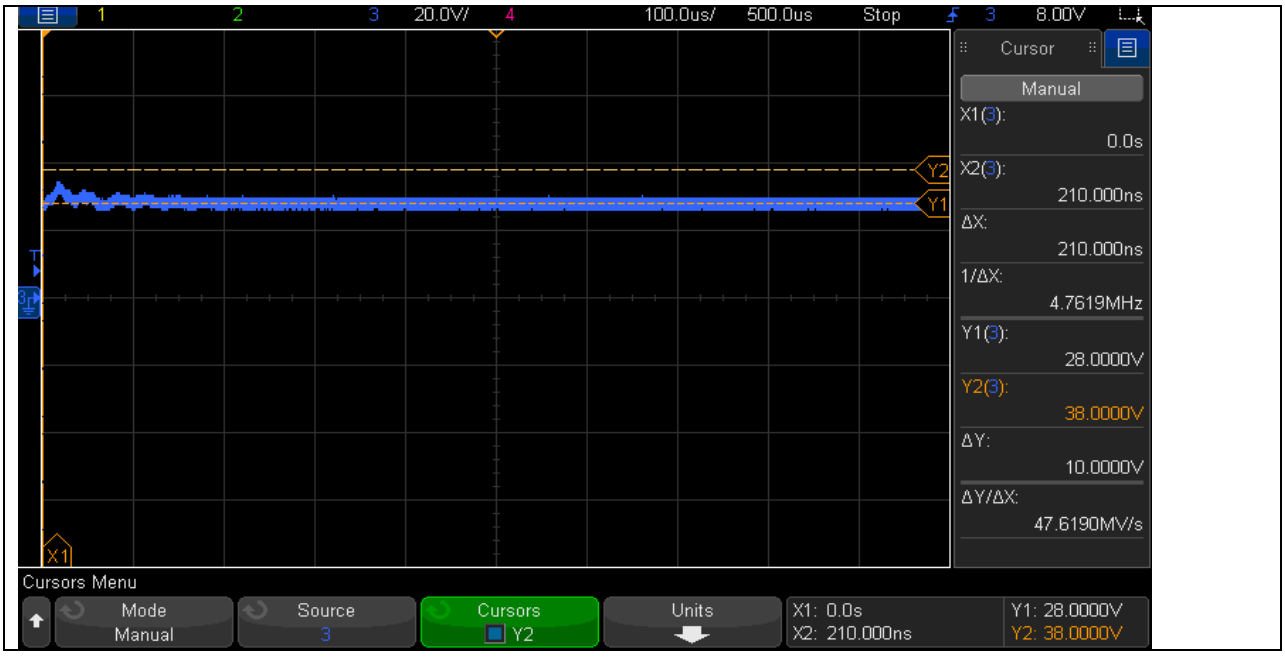
TEST RESULTS

Pass

Test Data

Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted spikes	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Positive
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Fast



No.	Result (V)	Time(us)	limit (V)	Margin(V)	Pass/Fail
1	38	0.21	250.00	212.00	PASS

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Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted spikes	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Negative
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Fast

No.	Result (V)	Time(us)	limit (V)	Margin(V)	Pass/Fail
1	7.75	0	-250.00	257.75	PASS

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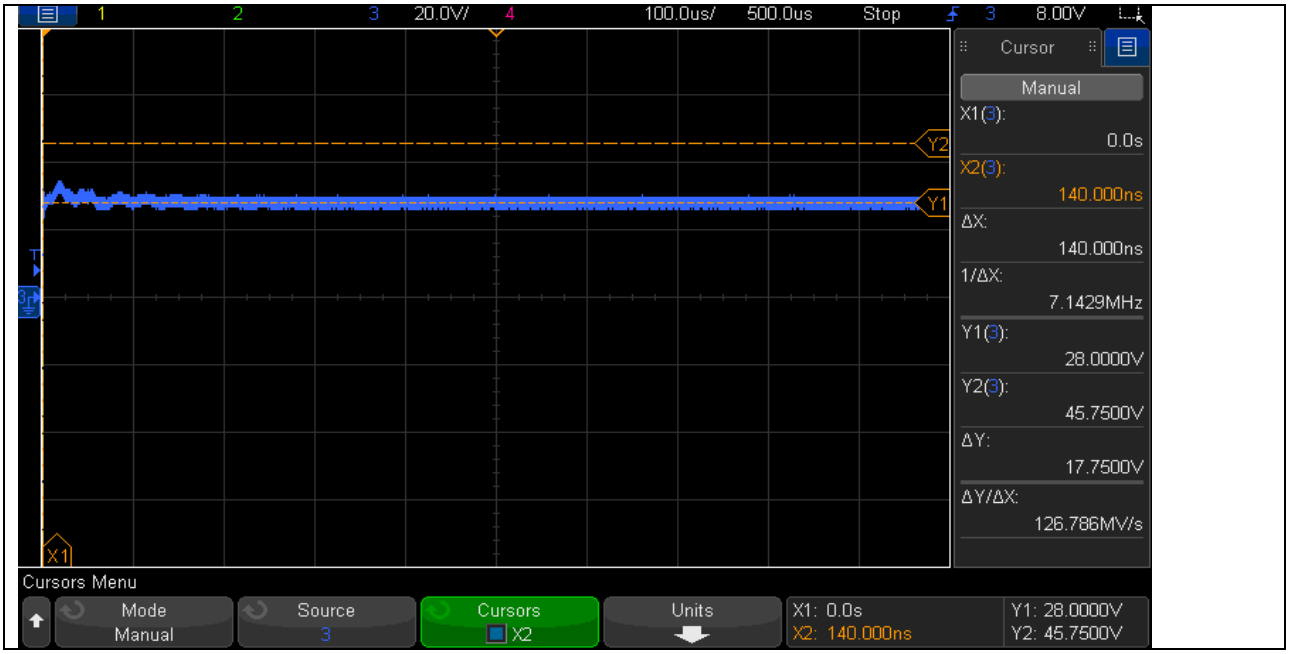
Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted spikes	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Positive
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Slow



No.	Result (V)	Time(us)	limit (V)	Margin(V)	Pass/Fail
1	45.75	0.14	250.00	204.25	PASS

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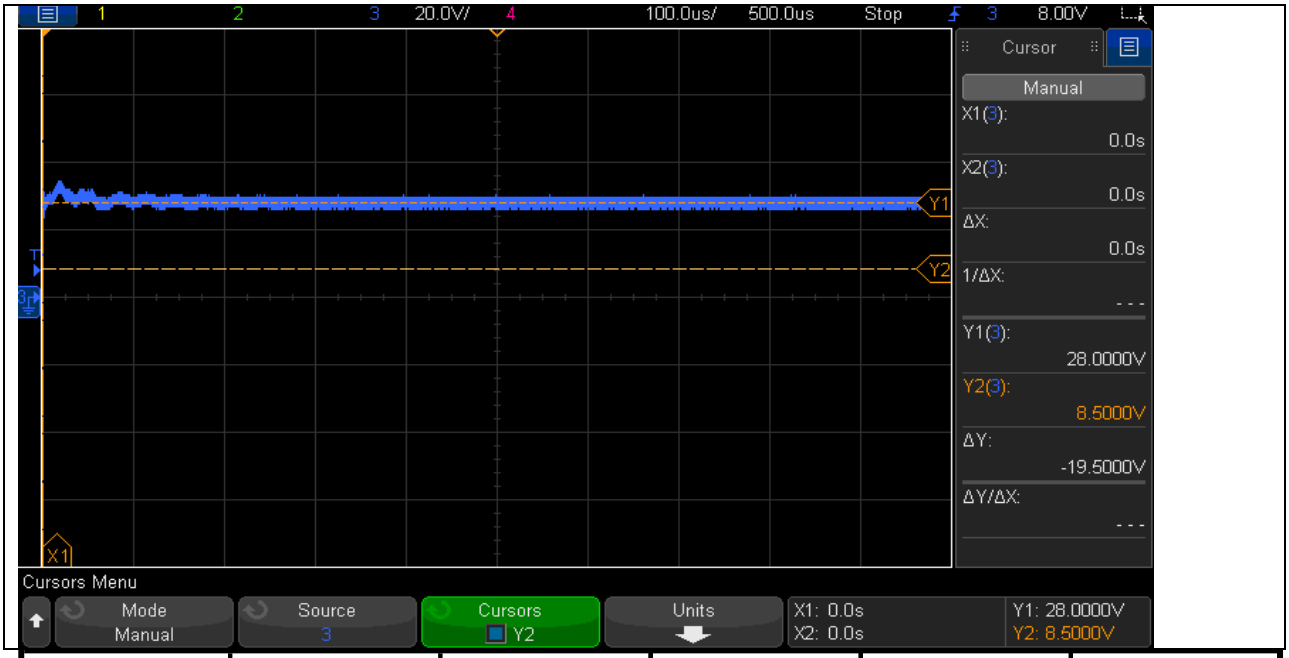
Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted spikes	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Negative
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Slow



No.	Result (V)	Time(us)	limit (V)	Margin(V)	Pass/Fail
1	8.5	0	-250.00	258.50	PASS

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7.5 TRANSIENT DISTURBANCES_INJECTED VOLTAGE SURGES

APPLICABILITY

Utilization equipment shall operate without degradation or damage when subjected to voltage surges within the limits shown in Figure 10. The maximum total energy content of a single surge is 60 Joules (J).

LIMIT

The test operator shall inject voltage surges into the EUT using a test setup similar to Figure 10.

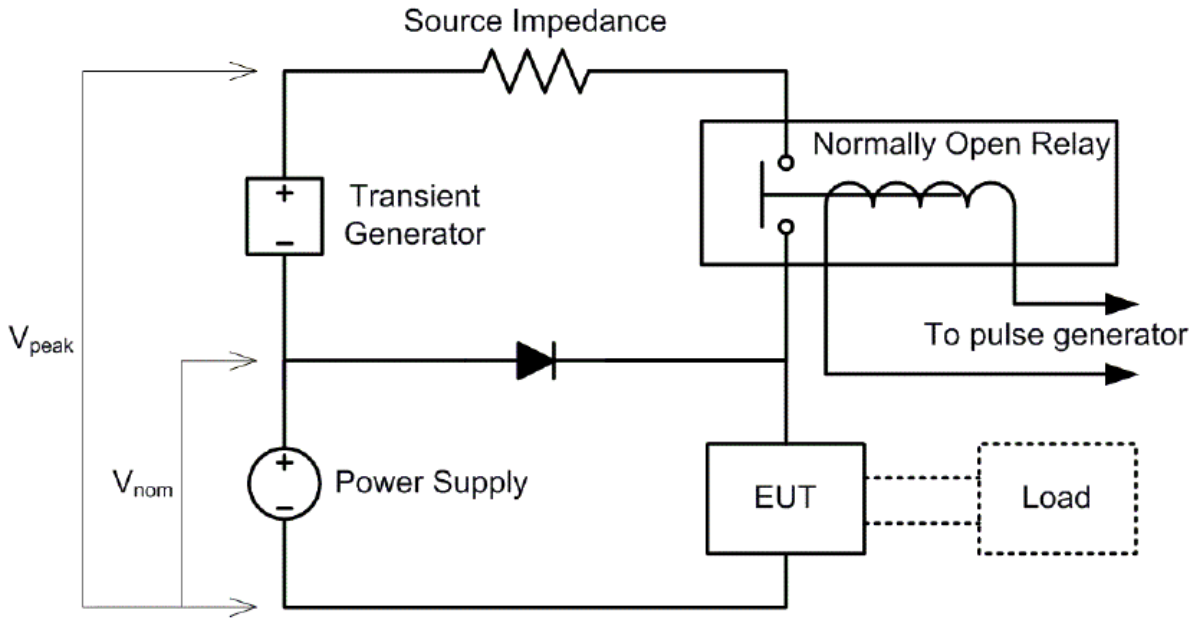

Figure 10. Sample test circuit for immunity to injected voltage surges

The voltage waveform injected on the power line(s) of the EUT shall simulate the voltage surge shown in Figure 11. The voltage surge parameters are shown in Table 1. Energy emitted from the transient surge generator shall be limited to 60 Joules.

Table 1. Positive voltage surge test parameters.

Operating Voltage (V_{nom})	Amplitude (V_{peak})	Rise Time (ms)	Duration (ms)	Source Impedance (mΩ)	Number of Pulses	Time Between Pulses (s)
30 -0/+1	100 -0/+10	1 < t < 10	50 -0/+5	500 -25/+0	5	15

Prior to connection of the EUT, the test operator shall verify the amplitude and duration of the voltage surge specified in Table I with a non-inductive load whose resistance is matched to the source impedance of the transient generator.
Verify the EUT operates as specified while subjected to the voltage surges. Any deviation from normal operation shall be recognized as a failure of the EUT.

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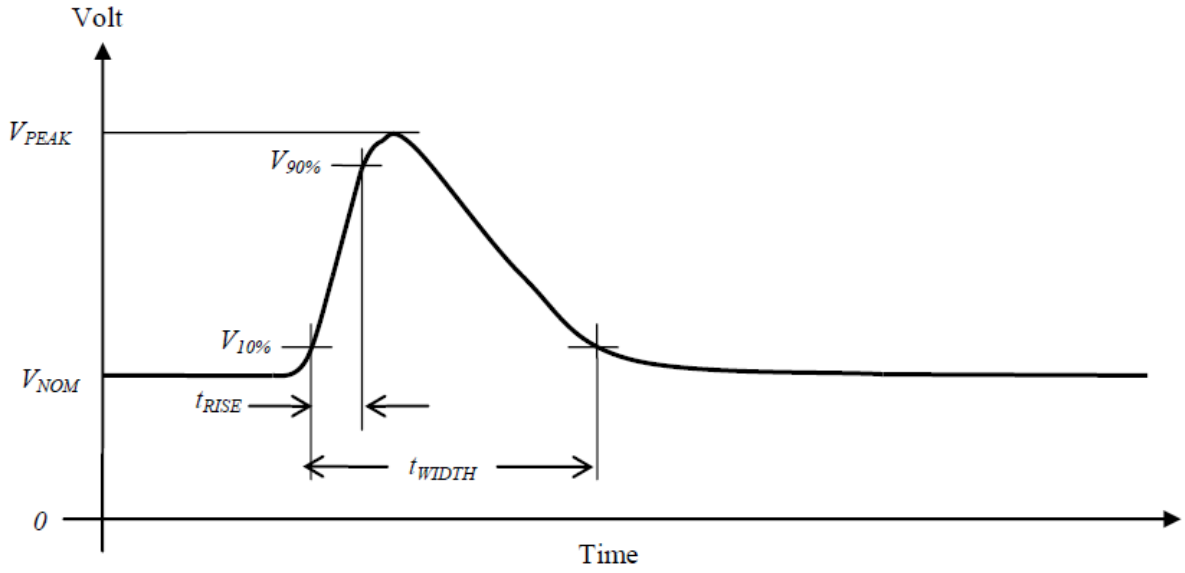

Figure 11. Sample alternator load dump waveform.

TEST CONFIGURATION

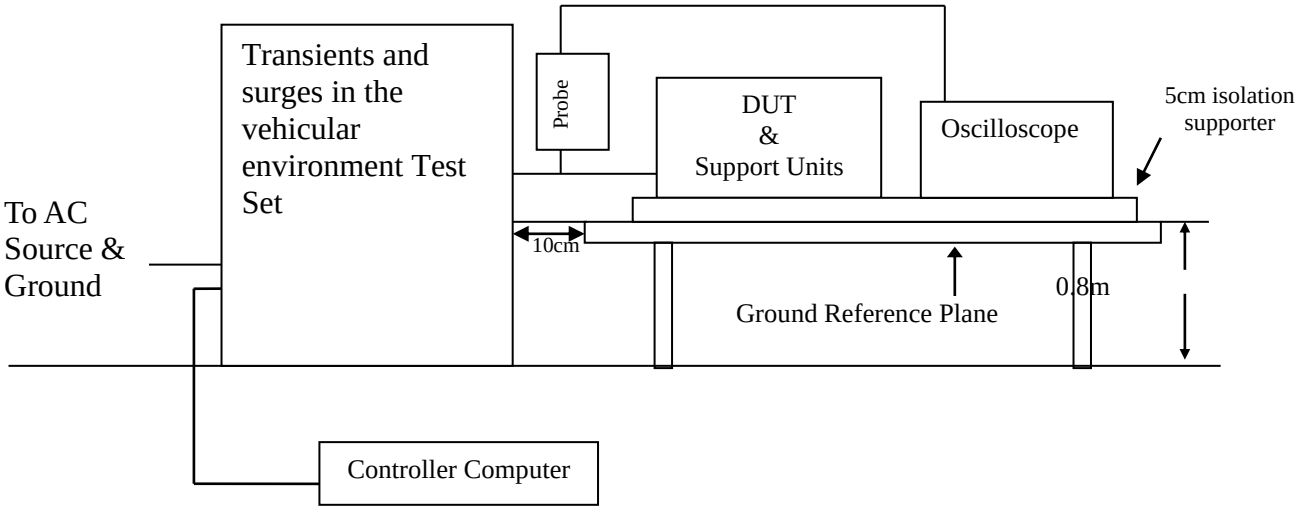

Figure 11. test set-up for Injected voktage surges

TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

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TEST RESULTS

Pass

Test Voltage (V_{peak})	Limit	Observation	Pass / Fail
100	Any deviation from normal operation shall be recognized as a failure of the EUT.	During and after test, EUT function is normal.	Pass

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Test Data

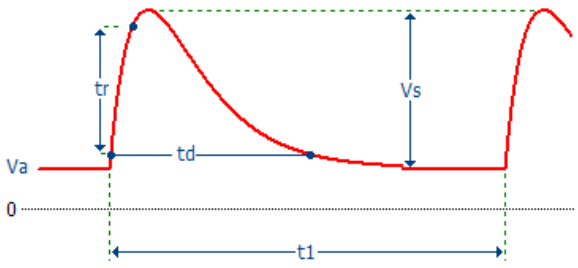
Project No.:	TM-2508000026P
Date of test:	Augest-11-2025
Tester:	Adam Cheng
Customer:	ELGENS CO., LTD
D. U. T:	Defense Monitor
Standard:	MIL-STD-1275E
Application:	12 V system
Ambient Temperature:	25.8°C
Humidity:	46%
Pressure:	102 kPa

D.U.T	
Name:	Defense Monitor
Serial Number:	TDM-D240
Operation Mode:	Operating mode
Description:	

Test Procedure			
Pulse Name:	MIL-STD-1275E : 5.3.3.2.1 Injected voltage surges		
Test generator:	LD200N	Software No.:	000384
		Serial No.:	P1447143711
Coupling network:	UCS200N50	Serial No.:	P1504147528
Va (Alternator):	30.0 V	Current limit:	10 A
Software:	iso.control	Version:	5.4.3

Test Setup

Vs:	+70	V
t1:	15	s
td:	50	ms
tr:	5-10	ms
Ri:	0.5	Ohm
Events:	5	
Test duration:	00:01:15	h



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Test Result	
Pulses:	5
Result:	Test passed ! During and after test, EUT function is normal.

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7.6 TRANSIENT DISTURBANCES_EMITTED VOLTAGE SURGES

APPLICABILITY

Emitted voltage surges from utilization equipment shall be within the limits shown in Figure 12.

TEST

The EUT shall be supplied power by a source set to the nominal 28 VDC operating voltage. The test operator shall measure voltage surges emitted by the EUT using a test setup similar to Figure 13. The test operator shall exercise function(s) of the EUT capable of producing surges. Each surge-producing function shall be exercised a minimum of thirty-two (32) times in order to give a reasonable probability that the maximum surge voltage is recorded.

The test operator shall monitor the operation of the EUT. Voltage surges emitted by the EUT shall be within the limits shown in Figure 12.

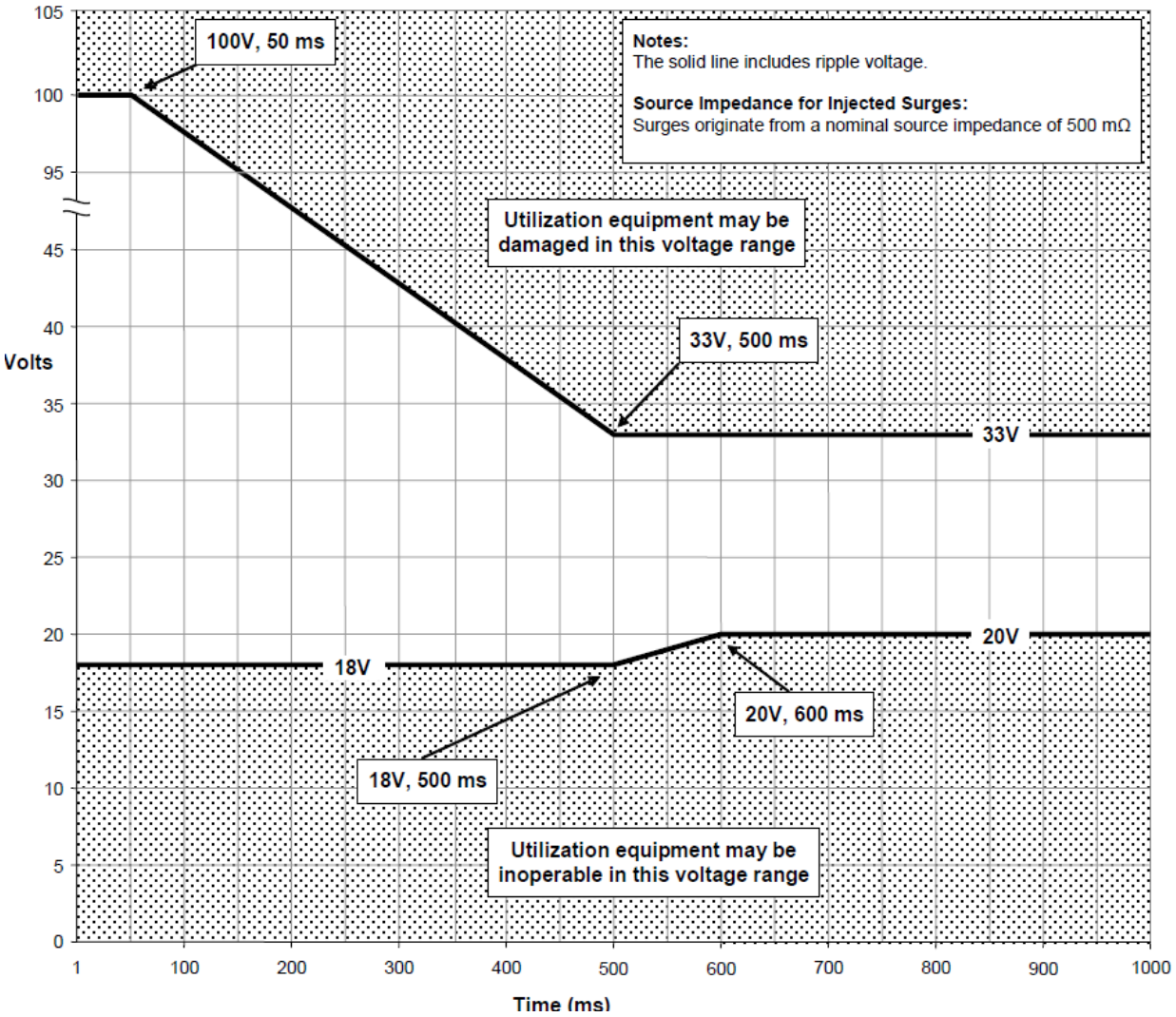

Figure 12. Envelope of surges for 28VDC systems.

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TEST CONFIGURATION

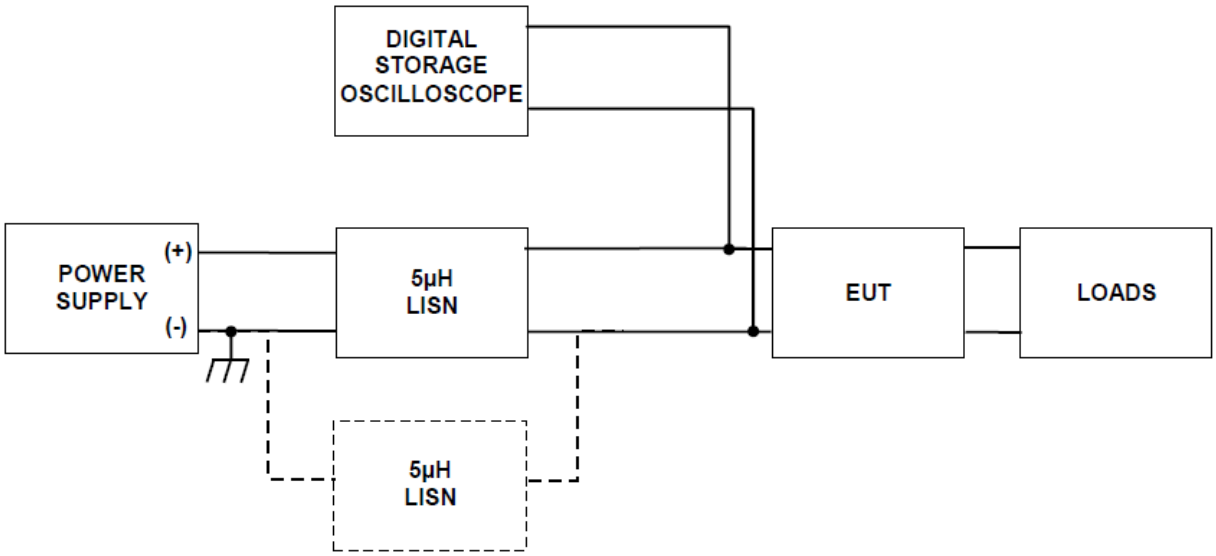

Figure 13. Sample test setup for exported voltage surges

TEST PROCEDURE

The magnetic emission of EUT representative of its type shall be tested by the method(s) according to MIL STD 1275E.

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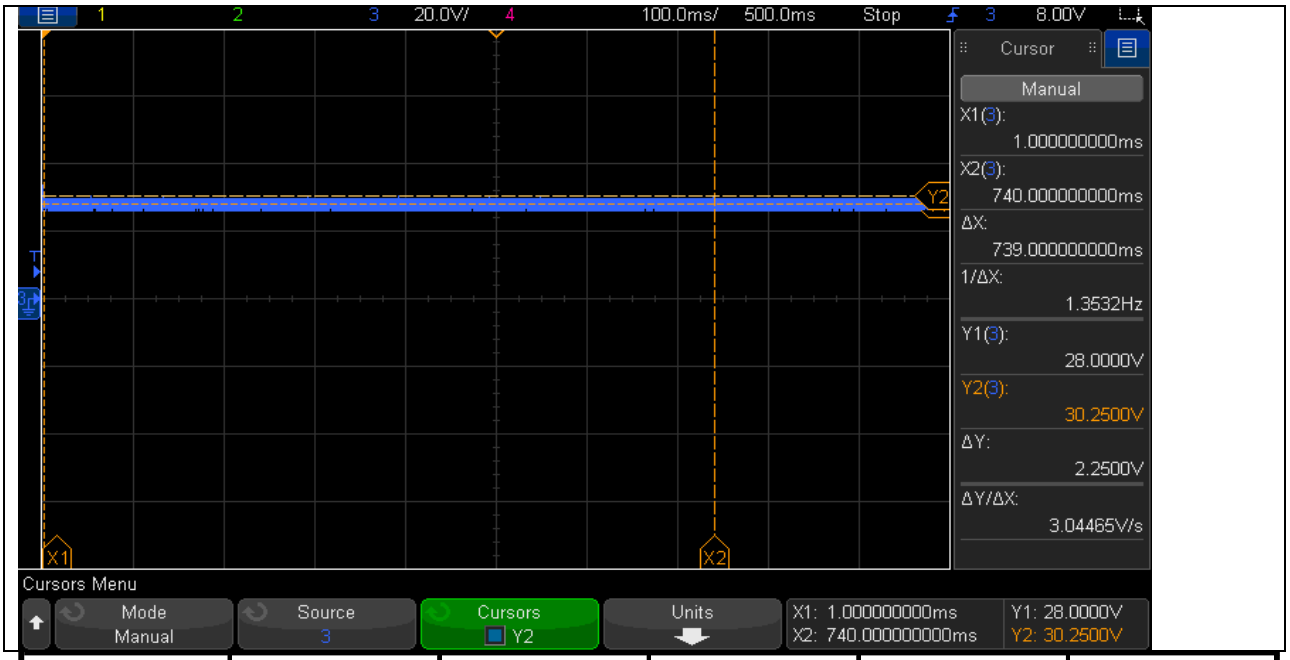
TEST RESULTS

Pass

Test Data

Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted voltage surges	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Positive
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Fast



No.	Result (V)	Time(ms)	limit (V)	Margin(V)	Pass/Fail
1	30.25	740	33.00	2.75	PASS

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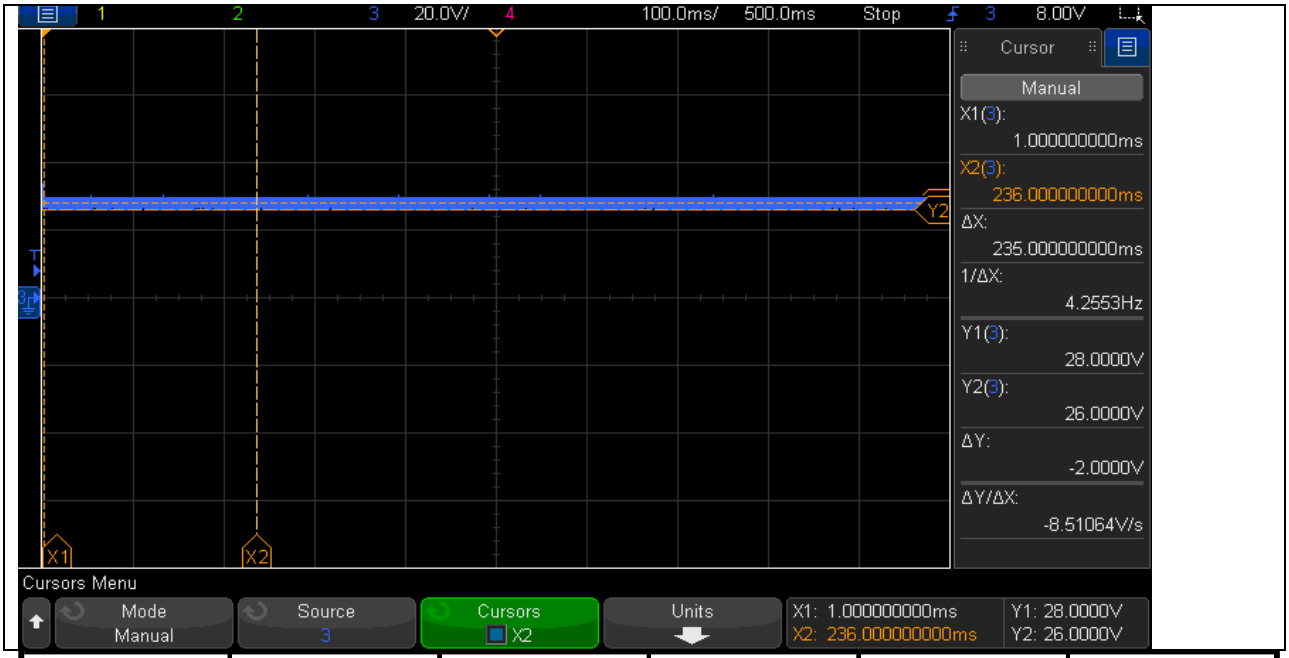
Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted voltage surges	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Negative
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Fast



No.	Result (V)	Time(ms)	limit (V)	Margin(V)	Pass/Fail
1	26	236	18.00	8.00	PASS

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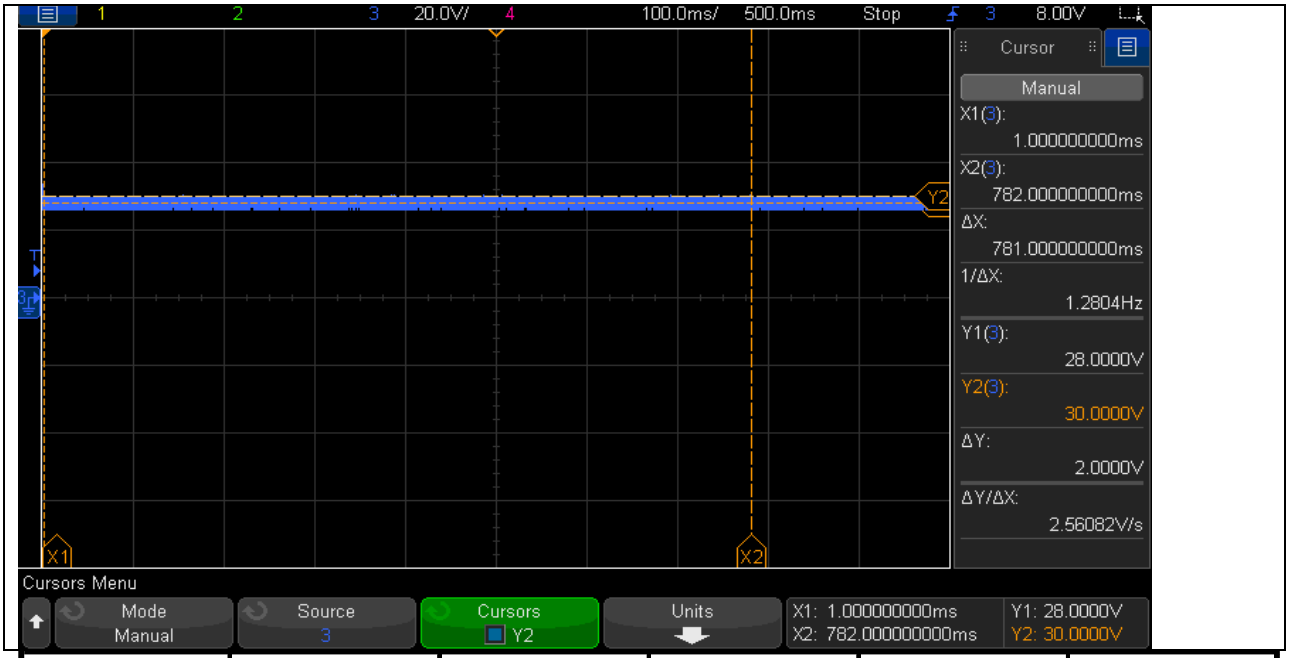
Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted voltage surges	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Positive
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Slow



No.	Result (V)	Time(ms)	limit (V)	Margin(V)	Pass/Fail
1	30	782	33.00	3.00	PASS

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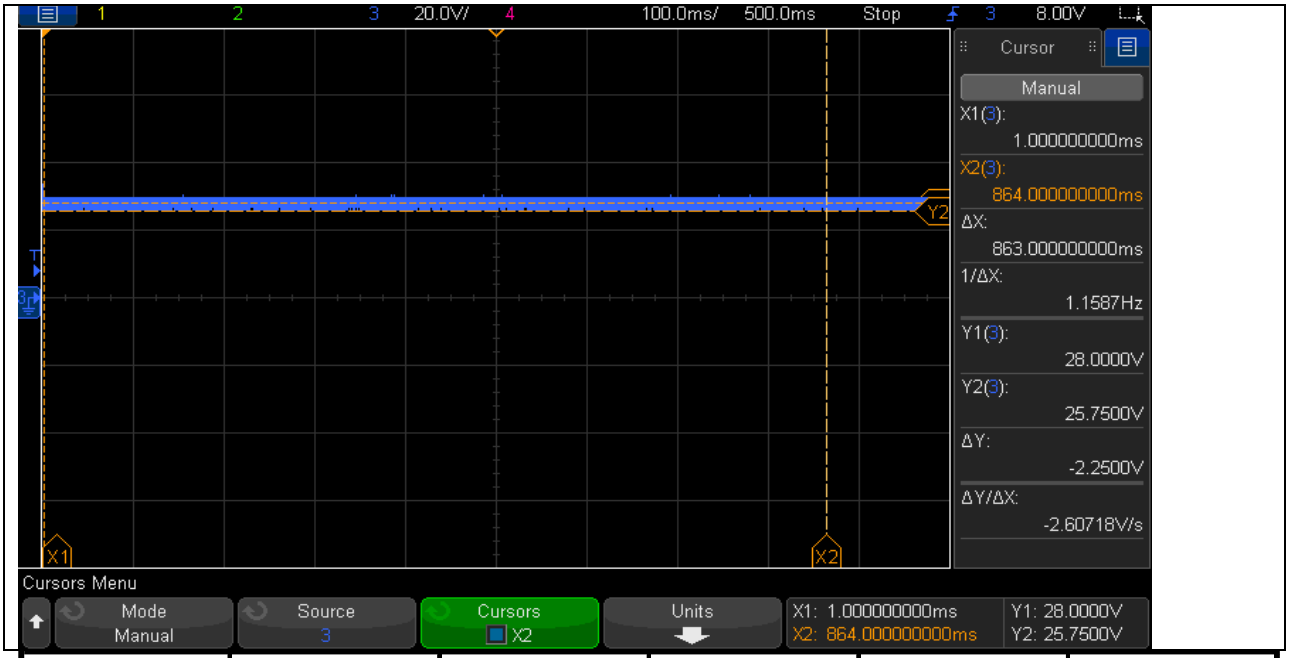
Project No.:	TM-2508000026P	Test Site	7637B
Standard:	MIL-STD-1275E	Power Source:	DC 28V
Test item:	Emitted voltage surges	Date:	2025/08/11
Temp.(℃)/Hum.(%):	26.8℃/46%	Polarization	Negative
Trade Name:	Defense Monitor	Engineer Signature:	Adam Cheng
Model:	TDM-D240	Description:	Slow



No.	Result (V)	Time(ms)	limit (V)	Margin(V)	Pass/Fail
1	25.75	864	20.00	5.75	PASS

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7.7 REVERSE POLARITY

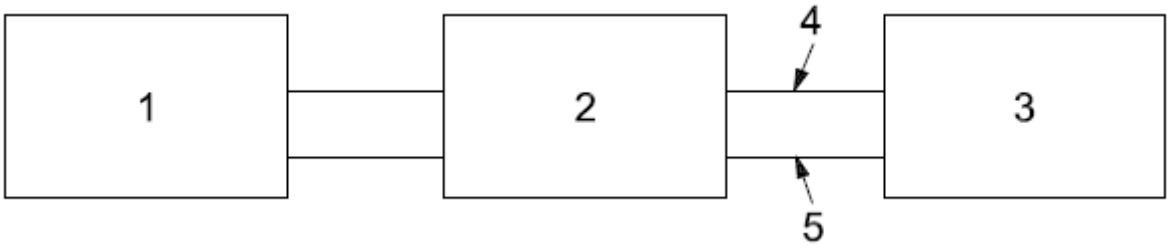
APPLICABILITY

Utilization equipment shall protect itself against damage due to input power with reverse polarity. With reverse polarity voltage applied to the input power terminals of the utilization equipment, the magnitude of the reverse polarity input current shall be equal to or less than the magnitude of the utilization equipment normal operating current.

TEST

Connect the positive (+) terminal of the EUT to the negative (-) terminal of the power supply system. Connect the negative (-) terminal of the EUT to the positive (+) terminal of the power supply system. Set the voltage on the power supply to 33 VDC and leave connected for five (5) minutes. Connect EUT input terminals to power with the correct polarity and verify device operates as specified. Any deviation from normal operation shall be recognized as a failure of the EUT.

TEST CONFIGURATION



Key
1 sweep generator
2 power supply unit capable of being modulated
3 DUT
4 positive
5 ground or return

Figure 14. Test set-up to reverse polarity

TEST PROCEDURE

The immunity of ESA representative of its type shall be tested by the method(s) according to MIL STD 1275E.

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TEST RESULTS

Pass

Test Voltage (V)	Limit	Test Result	Pass / Fail
-33	Connect EUT input terminals to power with the correct polarity and verify device operates as specified. Any deviation from normal operation shall be recognized as a failure of the EUT.	Before and after test, EUT function is normal	Pass

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Test Data

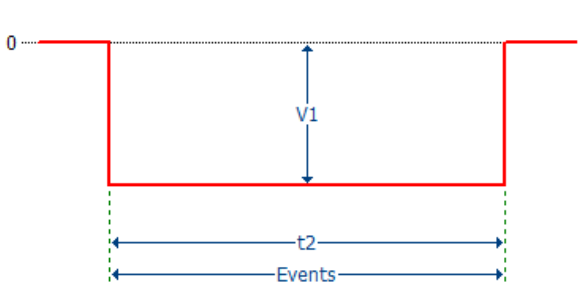
Project No.:	TM-2508000026P
Date of test:	Augest-11-2025
Tester:	Adam Cheng
Customer:	ELGENS CO., LTD
D. U. T:	Defense Monitor
Standard:	MIL-STD-1275E
Application:	12 V system
Ambient Temperature:	25.8°C
Humidity:	46%
Pressure:	102 kPa

D . U . T	
Name:	Defense Monitor
Serial Number:	TDM-D240
Operation Mode:	Operating mode
Description:	

T e s t P r o c e d u r e			
Pulse Name:	MIL-STD-1275E : 5.3.4 Reverse polarity		
Test generator:	VDS200N10	Software No.:	000933
		Serial No.:	P1449144556
Va (Alternator):	28.0 V	Current limit:	10 A
Software:	iso.control	Version:	5.4.3

T e s t S e t u p

V1:	-33.0	V
t2:	60	s
Events:	5	
Test duration:	00:05:00	h



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Test Result	
Pulses:	5
Result:	Test passed ! Before and after test, EUT function is normal

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8. APPENDIX I PHOTOGRAPHS OF TEST SETUP

Steady state operation

Operational voltage range

Voltage ripple

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Starting operation

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Transient disturbances _injected voltage spikes

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Transient disturbances_emitted voltage spikes

Fast

Slow

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Transient disturbances _ Injected voltage surges

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Transient disturbances _ emitted voltage surges

Fast

Slow

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Reverse polarity

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9. APPENDIX I
EXTERNAL PHOTOGRAPHS OF EUT

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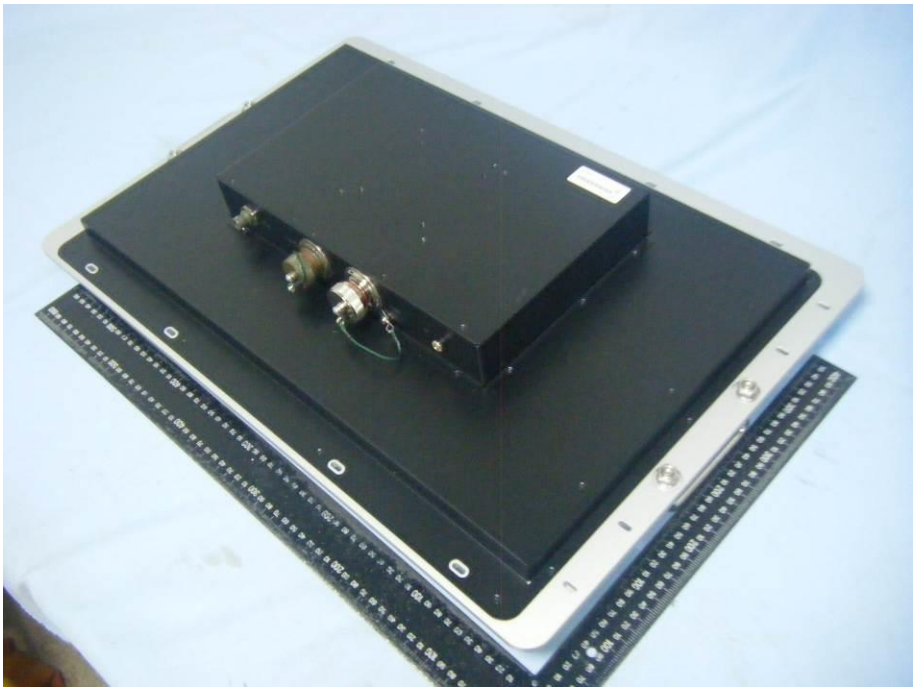

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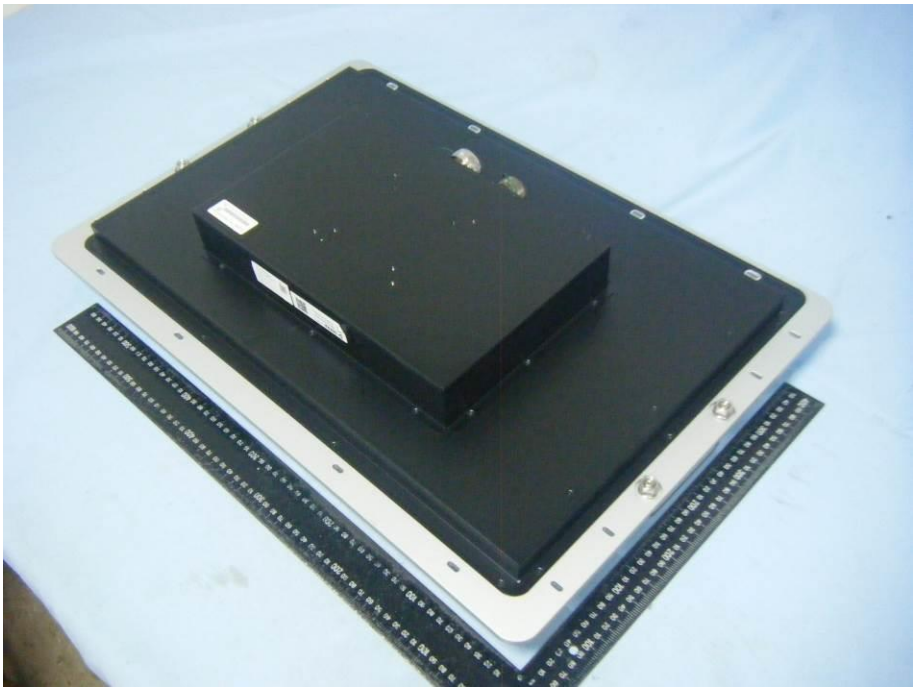

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