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EMC TEST REPORT

: Integrated Servo Motor Product

Trade mark

Model/Type reference : iSV2-RS6060, iSV2-CAN6060,

iSV2-RS6040, iSV2-CAN6040, iSV2-RS6020, iSV2-CAN6020, iSV2-RS6010, iSV2-CAN6010, iSV2-***6060*-*** (*=0~9,A~Z) iSV2-***6040*-*** (*=0~9,A~Z) iSV2-***6020*-*** (*=0~9,A~Z)

iSV2-***6010*-*** (*=0~9,A~Z)

Serial Number N/A

DC 24-70V Ratings

Report Number EED32N804871

Date of Issue : Jul. 16, 2021

: See below Regulations

Test Standards	Results
⊠ EN IEC 61000-6-2:2019	PASS
⊠ EN IEC 61000-6-4:2019	PASS



Prepared for:

China Leadshine Technology Co., Ltd. 11/F, Block A3, iPark No. 1001 Xueyuan Blvd., Nanshan District Shenzhen, China

Prepared by:

Centre Testing International Group Co., Ltd. Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China

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Reviewed by:

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Date of Issue:

Jul. 16, 2021

Check No.: 4921170621











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1. GENERAL INFORMATION

Applicant: China Leadshine Technology Co., Ltd.

11/F, Block A3, iPark No. 1001 Xueyuan Blvd., Nanshan

District Shenzhen, China

Manufacturer: China Leadshine Technology Co., Ltd.

11/F, Block A3, iPark No. 1001 Xueyuan Blvd., Nanshan

District Shenzhen, China

EMC Directive: 2014/30/EU

Product: Integrated Servo Motor

Trade mark:

| Leadshine | Baylehine | B

Model/Type reference: iSV2-RS6060, iSV2-CAN6060, iSV2-RS6040,

iSV2-CAN6040, iSV2-RS6020, iSV2-CAN6020,

iSV2-RS6010, iSV2-CAN6010, iSV2-***6060*-*** (*=0~9,A~Z) iSV2-***6040*-*** (*=0~9,A~Z) iSV2-***6020*-*** (*=0~9,A~Z) iSV2-***6010*-*** (*=0~9,A~Z)

Serial Number: N/A

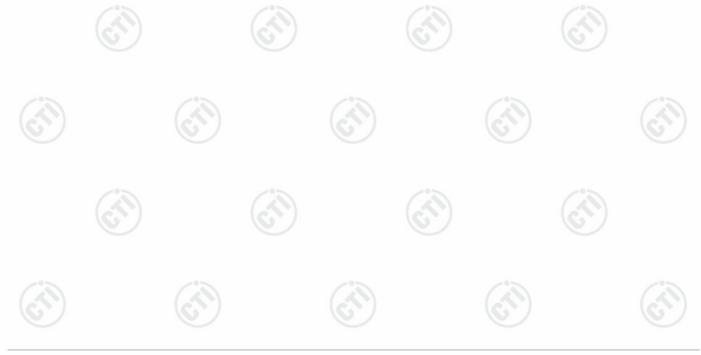
Report Number: EED32N804871

Sample Received Date: Jun. 17, 2021

Sample tested Date: Jun. 17, 2021 to Jul. 02, 2021

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which

CTI hasn't verified.





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2. TEST SUMMARY

The Product has been tested according to the following specifications:

EMISSION					
Standard Test Item Test					
EN 61000-6-4		Conducted Emission	Yes		
EN 61000-6-4	100	Radiated Emission	Yes		

IMMUNITY (EN 61000-6-2)				
Standard	Test Item	Test		
IEC 61000-4-2	Electrostatic discharge	Yes		
IEC 61000-4-3	Radio-frequency electromagnetic field	Yes		
IEC 61000-4-4	Fast transients	Yes		
IEC 61000-4-5	Surges	Yes		
IEC 61000-4-6	Radio-frequency common mode	Yes		
IEC 61000-4-8	Power-frequency magnetic fields	N/A ¹		
IEC 61000-4-11	Voltage dips and voltage interruptions	N/A ²		

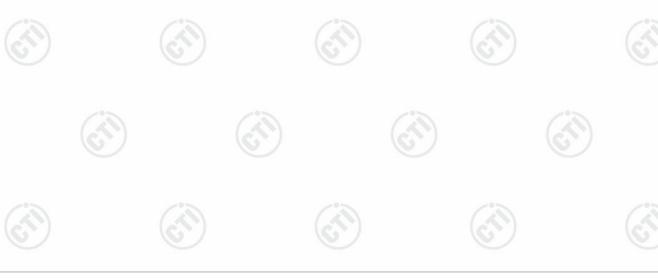
Remark:

- 1. The Product doesn't contain any device susceptible to magnetic fields.
- 2. The Product is powered by DC power.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)		
Conducted disturbance	3.1		
Radiated disturbance (30MHz to 1GHz)	4.9		





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4. PRODUCT INFORMATION AND TEST SETUP

4.1 PRODUCT INFORMATION

Natings.	DC 24-70V		
The highest frequency of the internal sources of the EUT is :	up to 1 GHz. between 108 only be made between 500 only be made above 1 GHz	MHz, the measurement so MHz and 500 MHz, the measure up to 2 GHz. MHz and 1 GHz, the measurement shall the to 5 GHz. The measurement shall the measurement shall	neasurement shall neasurement shall be made up to 5
Model difference:	internal wiring ar software version	ircuit design, layout, compe identical. The difference . The test model is iSV2-F pplicable to the others.	e is naming and

4.2 TEST SETUP CONFIGURATION

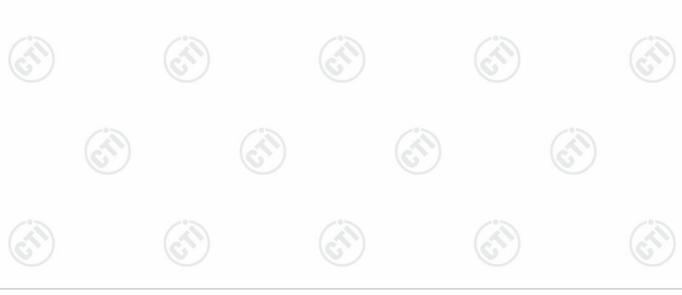
See test photographs attached in APPENDIX 1 PHOTOGRAPHS OF TEST SETUP for the actual connections between Product and support equipment.

4.3 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.			- /		F:0	(3

Notes:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.





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5. FACILITIES AND ACCREDITATIONS

5.1 TEST FACILITY

All measurement facilities used to collect the measurement data are located at Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing. The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

Shielding Room No. 3 - Conducted disturbance Test						
Equipment Manufacturer Model Serial No. Due Date						
Receiver	R&S	ESCI	100435	04/14/2022		
LISN	R&S	ENV216	100098	03/03/2022		

3M Semi-anechoic Chamber (2)- Radiated disturbance Test							
Equipment	Manufacturer	Model	Serial No.	Due Date			
3M Chamber & Accessory Equipment	TDK	SAC-3	and the same of th	05/22/2022			
Receiver	R&S	ESCI7	100938-003	10/15/2021			
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	10/16/2021			
Multi device Controller	maturo	NCD/070/10711 112					
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/14/2022			
Microwave Preamplifier	Agilent	8449B	3008A02425	07/10/2021			

Shielding Room No. 3 - Electrostatic discharge Test (EN 61000-4-2)						
Equipment Manufacturer Model Serial No. Due Date						
ESD Simulator	TESEQ	NSG437	1182	07/07/2021		



Hotline:400-6788-333 www.cti-cert.com E-mail:info@cti-cert.com Complaint call:0755-33681700 Complaint E-mail:complaint@cti-cert.com



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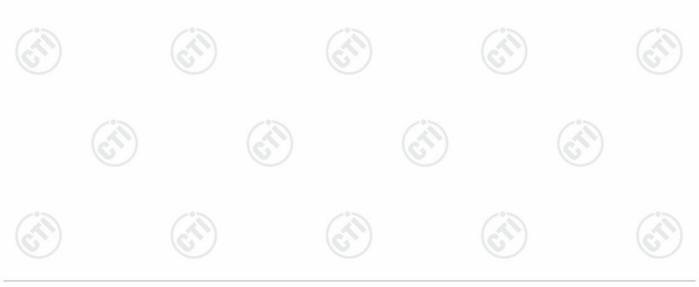
3M Full-anechoic Chamber - Radio-frequency electromagnetic field Test (EN 61000-4-3)						
Equipment	Manufacturer	Model	Serial No.	Due Date		
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	05/29/2022		
Power Amplifier	AR	150W1000	0322288	12/27/2021		
Stacked double LogPer. Antenna	schwarzbeck	STLP 9128 E special	9128ES-110	(
Signal Generator	Agilent	E4438C	MY42082153	12/27/2021		
Horn Antenna	AR	ATH800M5GA	0342530			
Power Amplifier	RFLIGHT	NTWPA-106050	18019001	12/27/2021		

Shielding Room No. 3 - Fast transients / Surges Test (EN 61000-4-4) (EN 61000-4-5)										
Equipment Manufacturer Model Serial No. Due Date										
Compact Generator EM-Test UCS500M/6B V0603101093 04/14/2022										

Shielding Room No. 2 - Radio-frequency continuous conducted Immunity Test (IEC 61000-4-6)										
Equipment	Equipment Manufacturer Model Serial No. Due Date									
Signal Generator	IFR	2023B	202307/883	04/23/2022						
Power Amplifier	AR	75A 250A	320297	04/23/2022						
Attenuator	BIRD	75-A-MFN-06	0543	08/05/2021						
CDN	EM-Test	CDN M2/M3	0204-01	10/15/2021						

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.





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6. CONDUCTED DISTURBANCE

6.1 Limits

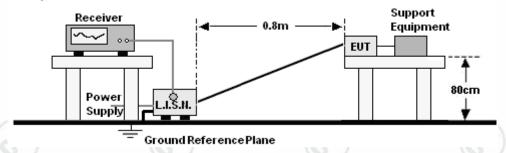
Limits

Frequency range (MHz)	Limits dB(μV)	
(1411 12)	Quasi-peak	Average
0,15 to 0,50	89	76
0,50 to 30	83	70

NOTE: The lower limit shall apply at the transition frequency.

6.2 BLOCK DIAGRAM OF TEST SETUP

For DC mains port:



6.3 TEST PROCEDURE

For DC mains port:

- a. The Product was placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.





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6.4 GRAPHS AND DATA

Product : Integrated Servo Motor

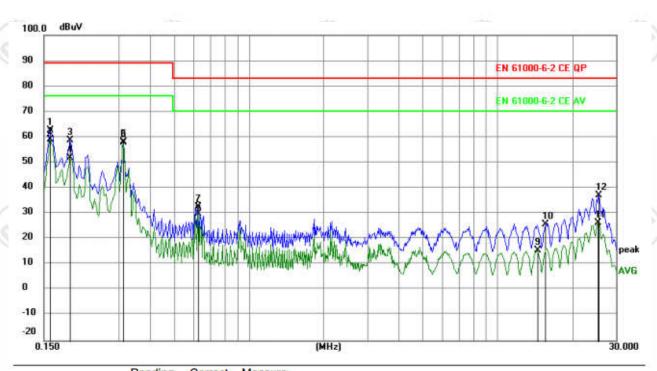
Power DC 24V

Mode Running **Polarization**



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Temperature/Humidity 24°C/52%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1		0.1590	52.67	9.87	62.54	89.00	-26.46	peak		
2		0.1590	49.05	9.87	58.92	76.00	-17.08	AVG		
3		0.1905	49.01	9.87	58.88	89.00	-30.12	peak		
4		0.1905	42.01	9.87	51.88	76.00	-24.12	AVG		
5		0.3120	48.14	10.06	58.20	89.00	-30.80	peak		
6		0.3120	47.81	10.06	57.87	76.00	-18.13	AVG		
7		0.6270	22.55	10.02	32.57	83.00	-50.43	peak		
8		0.6270	19.89	10.02	29.91	70.00	-40.09	AVG		
9		14.5005	5.57	9.91	15.48	70.00	-54.52	AVG		
10		15.6030	15.86	9.93	25.79	83.00	-57.21	peak		
11		25.4130	16.44	10.00	26.44	70.00	-43.56	AVG		
12		25.5570	27.14	10.00	37.14	83.00	-45.86	peak		
		1010 000 000	and the territory	Application of the second	CHARLES AND ACTOR			The second second		







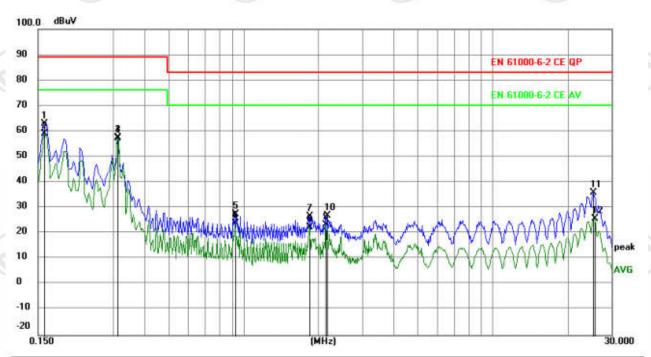






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Mode : Running Polarization : N



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	53.01	9.87	62.88	89.00	-26.12	peak	
2	*	0.1590	49.04	9.87	58.91	76.00	-17.09	AVG	
3		0.3120	47.56	10.06	57.62	89.00	-31.38	peak	
4		0.3120	47.20	10.06	57.26	76.00	-18.74	AVG	
5		0.9240	17.56	9.85	27.41	83.00	-55.59	peak	
6		0.9240	14.16	9.85	24.01	70.00	-45.99	AVG	
7		1.8465	16.90	9.80	26.70	83.00	-56.30	peak	
8		1.8465	12.59	9.80	22.39	70.00	-47.61	AVG	
9		2.1435	13.60	9.79	23.39	70.00	-46.61	AVG	
10		2.1614	17.16	9.79	26.95	83.00	-56.05	peak	
11		25.4400	26.08	10.00	36.08	83.00	-46.92	peak	
12		25.6290	15.90	10.00	25.90	70.00	-44.10	AVG	

Note: 1. Margin(dB)=Limit(dBuV)-Measurement(dBuV).

2. Measurement(dBuV)=Reading_Level(dBuV)+Correct Factor(dB).

3. Correct Factor(dB)=Cable Loss(dB)+LISN Factor(dB).









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RADIATED EMISSION

7.1 LIMITS

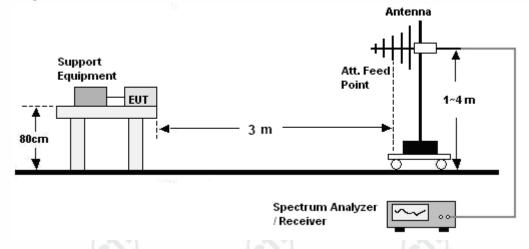
Limits for Group 1 class A Equipment

Frequency (MHz)	Quasi-peak limits at 3m dB(μV/m) (≤ 20 kVA)
30-230	50
230-1000	57

NOTE: The lower limit shall apply at the transition frequencies.

7.2 BLOCK DIAGRAM OF TEST SETUP

30MHz ~ 1GHz:



TEST PROCEDURE

30MHz ~ 1GHz:

- a. The Product was placed on the non-conductive turntable 0.8m above the ground at a
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.













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7.4 GRAPHS AND DATA

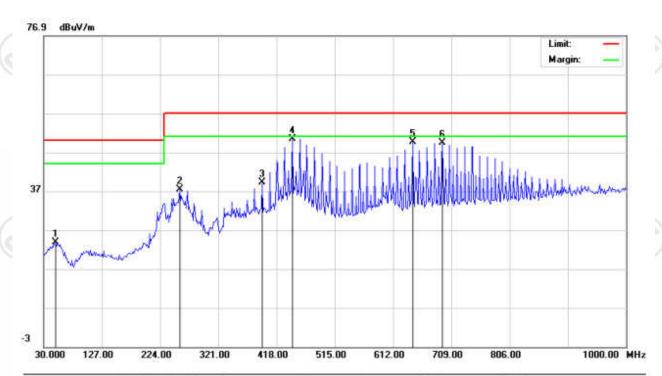
Product: Integrated Servo Motor

Power : DC 24V Mode : Running Model/Type reference

Temperature/Humidity 22°C/50% **Polarization** Horizontal

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iSV2-RS6040



No.	Freq.	Reading_ req. (dBu\		evel	Correct Factor	77.7	easuren dBuV/m			nit V/m)	Mai (d	rgin IB)		
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	49.3998	9.13			14.74	23.87			50.00		-26.13		P	
2	256.3333	22.01			15.31	37.32			57.00		-19.68		P	
3	393.7500	20.70			18.57	39.27			57.00		-17.73		P	
4	443.8666	30.58			19.75	50.33			57.00		-6.67		Р	
5	644.3333	26.04			23.55	49.59			57.00		-7.41		P	
6	694.4500	25.25			24.13	49.38			57.00		-7.62		P	

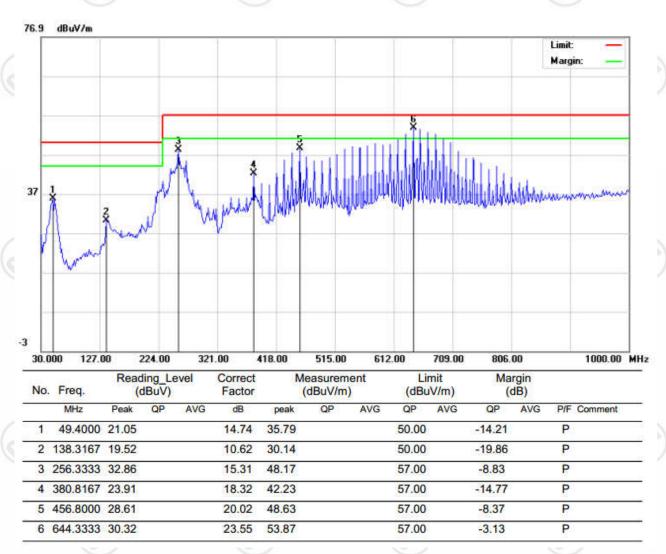




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Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

Power : DC 24V Temperature/Humidity : 22%/50% Mode : Running Polarization : Vertical



Note: 1. Margin(dB)=Measurement-Limit.

2. Measurement(dBuV/m)=Reading_Level+Correct Factor.

3. Correct Factor(dB)=Ant Factor+Cable loss.

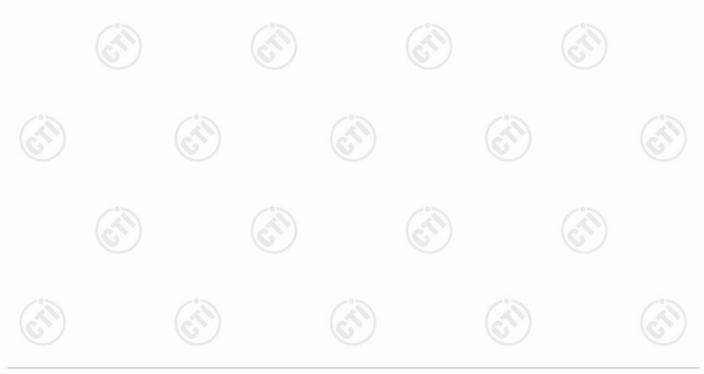




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8. IMMUNITY TEST

	General Performance Criteria
Product Standard	EN IEC 61000-6-2:2019
CRITERION A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
CRITERION B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
CRITERION C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.





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8.1 ELECTROSTATIC DISCHARGE

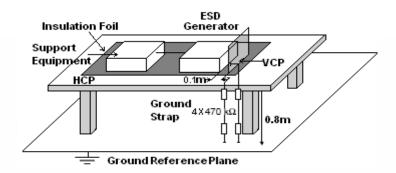
8.1.1 TEST SPECIFICATION

Basic Standard : EN IEC 61000-6-2 & IEC 61000-4-2

Test Port : Enclosure port
Discharge Impedance : 330 ohm / 150 pF
Discharge Mode : Single Discharge

Discharge Period : one second between each discharge

8.1.2 BLOCK DIAGRAM OF TEST SETUP



8.1.3 TEST PROCEDURE

- a. Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the Product.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the Product as fast as possible (without causing mechanical damage) to touch the Product. After each discharge, the ESD generator was removed from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the Product. The ESD generator was positioned vertically at a distance of 0.1 meters from the Product with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the Product were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the Product.



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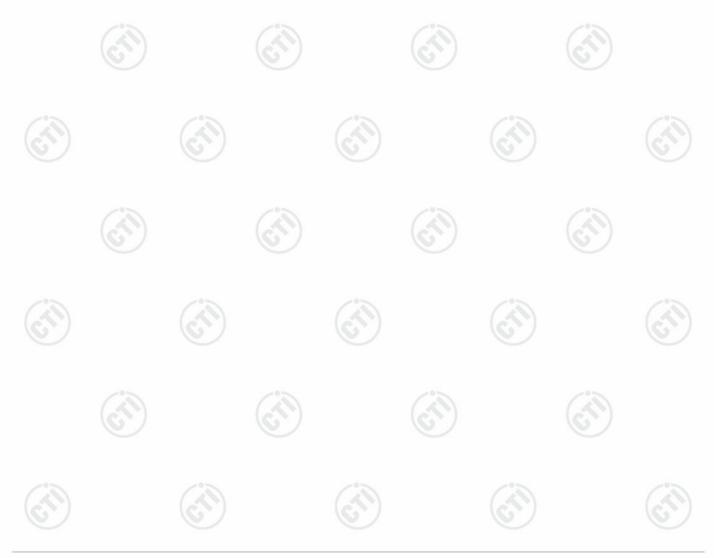
8.1.4 RESULTS & PERFORMANCE

Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

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Power: DC 24VTemperature: 23° CMode: RunningHumidity: 51%

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Performance Criterion
6	Conductive Surfaces	4	10	В	A
Contact Discharge	Indirect Discharge HCP	4	10	В	A
	Indirect Discharge VCP	4	10	В	А
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	В	A





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8.2 RADIO-FREQUENCY ELECTROMAGNETIC FIELD

8.2.1 TEST SPECIFICATION

Basic Standard : EN IEC 61000-6-2 & IEC 61000-4-3

Test Port : Enclosure port

Step Size : 1%

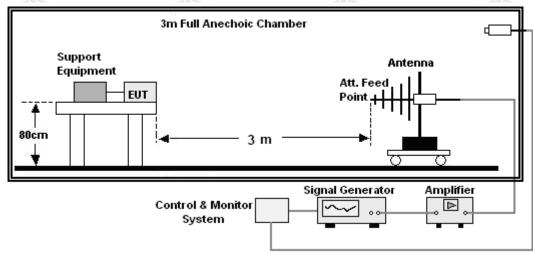
Modulation: 1kHz, 80% AM

Dwell Time : 1 second

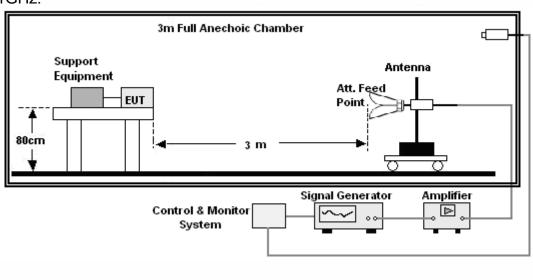
Polarization : Horizontal & Vertical

8.2.2 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz:



Above 1GHz:





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8.2.3 TEST PROCEDURE

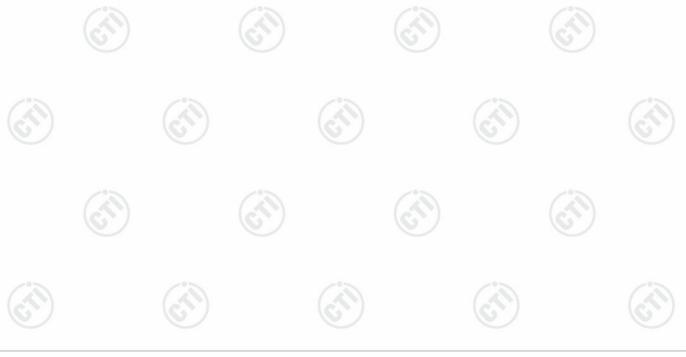
- a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3m from the Product.
- b. The frequency range is swept from 80MHz to 1000MHz and 1400MHz to 6000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10⁻³ decade/s. Where the frequency range is swept incrementally, the step size was 1%.
- c. The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.

8.2.4 RESULT & PERFORMANCE

Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

Power: DC 24VTemperature: 23° CMode: RunningHumidity: 51%

Frequency (MHz)	Position	Field Strength (V/m)	Required Level	Performance Criterion
80 - 1000	Front, Right, Back, Left	10	A A	A
1400 - 6000	Front, Right, Back, Left	3	A	A





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8.3 FAST TRANSIENTS

8.3.1 TEST SPECIFICATION

Basic Standard : EN IEC 61000-6-2 & IEC 61000-4-4

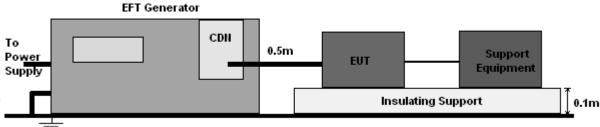
Test Port : Input DC power ports

Impulse Frequency: 5 kHzImpulse Wave-shape: 5/50 nsBurst Duration: 15 msBurst Period: 300 ms

Test Duration : 2 minute per polarity

8.3.2 BLOCK DIAGRAM OF TEST SETUP

For input DC power ports:



Ground Reference Plane

8.3.3 TEST PROCEDURE

- a. The Product and support units were located on a non-conductive table above ground reference plane.
- b. A 0.5m-long power cord was attached to Product during the test.

8.3.4 RESULTS & PERFORMANCE

Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

Power : DC 24V Temperature : 23° C Mode : Running Humidity : 51%

Coupling	Voltage (kV)	Polarity	Required Level	Performance Criterion
DC power ports	2	±	В	Α



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8.4 SURGES

8.4.1 TEST SPECIFICATION

Basic Standard : EN IEC 61000-6-2 & IEC 61000-4-5

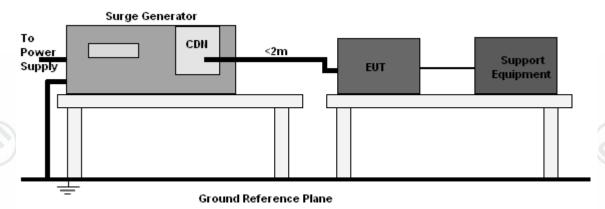
Test Port : Input DC power ports

Wave-Shape : Open Circuit Voltage - 1.2 / 50 us

Pulse Repetition Rate : 1 pulse / min.

Test Events: 5 pulses (positive & negative) for each polarity

8.4.2 BLOCK DIAGRAM OF TEST SETUP



8.4.3 TEST PROCEDURE

- a. The surge is to be applied to the Product power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave.
- b. The power cord between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter). Interconnection line between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter).

8.4.4 RESULTS & PERFORMANCE

Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

Power : DC 24V Temperature : 23° C Mode : Running Humidity : 51°

Coupling Line	Voltage (kV)	Polarity	Required Level	Performance Criterion	
DC port	0.5) ± (В	A	





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8.5 RADIO-FREQUENCY COMMON MODE

8.5.1 TEST SPECIFICATION

Basic Standard : EN IEC 61000-6-2 & IEC 61000-4-6

Test Port : Input DC power ports

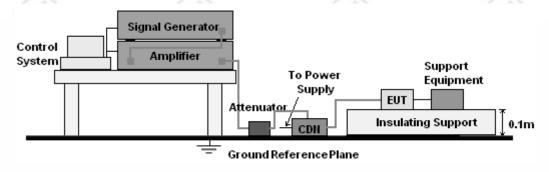
Step Size : 1%

Modulation : 1kHz, 80% AM

Dwell Time : 1 second

8.5.2 BLOCK DIAGRAM OF TEST SETUP

For input DC power ports:



8.5.3 TEST PROCEDURE

For DC power ports:

- a. The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
- b. The frequency range is swept from 150 kHz to 80MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10⁻³ decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.

8.5.4 RESULTS & PERFORMANCE

Product: Integrated Servo Motor Model/Type reference: iSV2-RS6040

Power: DC 24VTemperature: 23° CMode: RunningHumidity: 51%

Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Required Level	Performance Criterion
DC power ports	0.15 - 80	10	Α	Α



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APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP













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ELECTROSTATIC DISCHARGE TEST SETUP



RADIO-FREQUENCY ELECTROMAGNETIC FIELD TEST SETUP





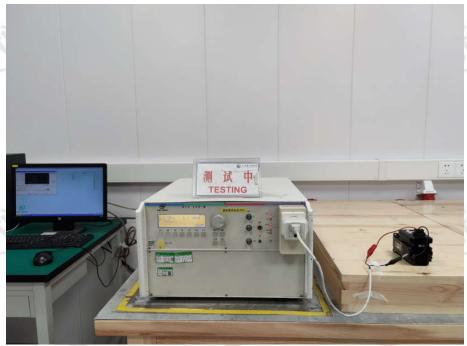








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FAST/SURGES TRANSIENTS TEST SETUP



RADIO-FREQUENCY COMMON MODE TEST SETUP













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PHOTOGRAPHS OF PRODUCT **APPENDIX 2**



View of Product-1



View of Product-2











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View of Product-3



View of Product-4





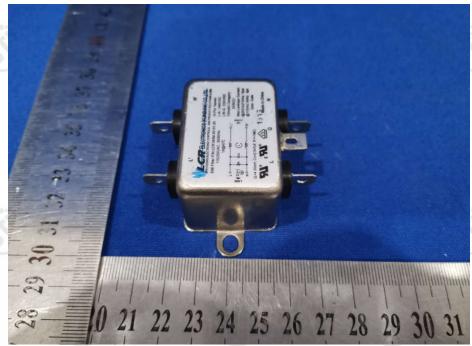








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View of Product-5

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***

