



LSA150-001 Loudspeaker Amplifier ASM-LSA400 Installation and Operation Manual Supplement

This supplement contains installation and operation information that is unique to the LSA150-001 Loudspeaker Amplifier. Installation and operation information common to the LSA400-001 base unit can be found in the ASM-LSA400 Installation and Operation Manual.

Prepared By: Tony Pearson Designer July 16, 2018	Checked By: Steve Kempf Designer Jul 26/18	Approved By: Tom Betzelt Product Support Manager July 23, 2018
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Section 1.0 Description

The LSA150-001 Loudspeaker Amplifier is identical to the LSA400-001 with the following exceptions:

- a) The speaker output driver is intended to drive 110 Wrms into 11 Ohms.

Section 2.0 Installation

For installation information and drawings, see ASM-LSA400 Section 2.0. Select the appropriate revision of the drawing for the serial number of the unit. The drawings specific to this derivative are listed below and can be found at the end of this supplement.

2.1 Installation Drawings

DOCUMENT Part No.	REV.	DESCRIPTION	TYPE	SERIAL NO.
LSA150-001-403-0	1.00	Loudspeaker Amplifier	Interconnect	074614 and up
LSA150-001-403-1	1.00	Loudspeaker Amplifier	Interconnect	074614 and up
LSA150-001-403-2	1.01	Loudspeaker Amplifier	Interconnect	074614 and up
LSA150-001-405-0	1.00	Loudspeaker Amplifier	Connector Map	074614 and up
LSA150-001-521-0	1.00	Loudspeaker Amplifier	Environmental Qualification Form	074614 and up
LSA150-001-922-0	1.00	Loudspeaker Amplifier	Mechanical Installation	074614 and up

Section 3.0 Operation

For operation information, see ASM-LSA400 Section 3.0.

End of Supplement


LSA150-001 INSTALLATION NOTES

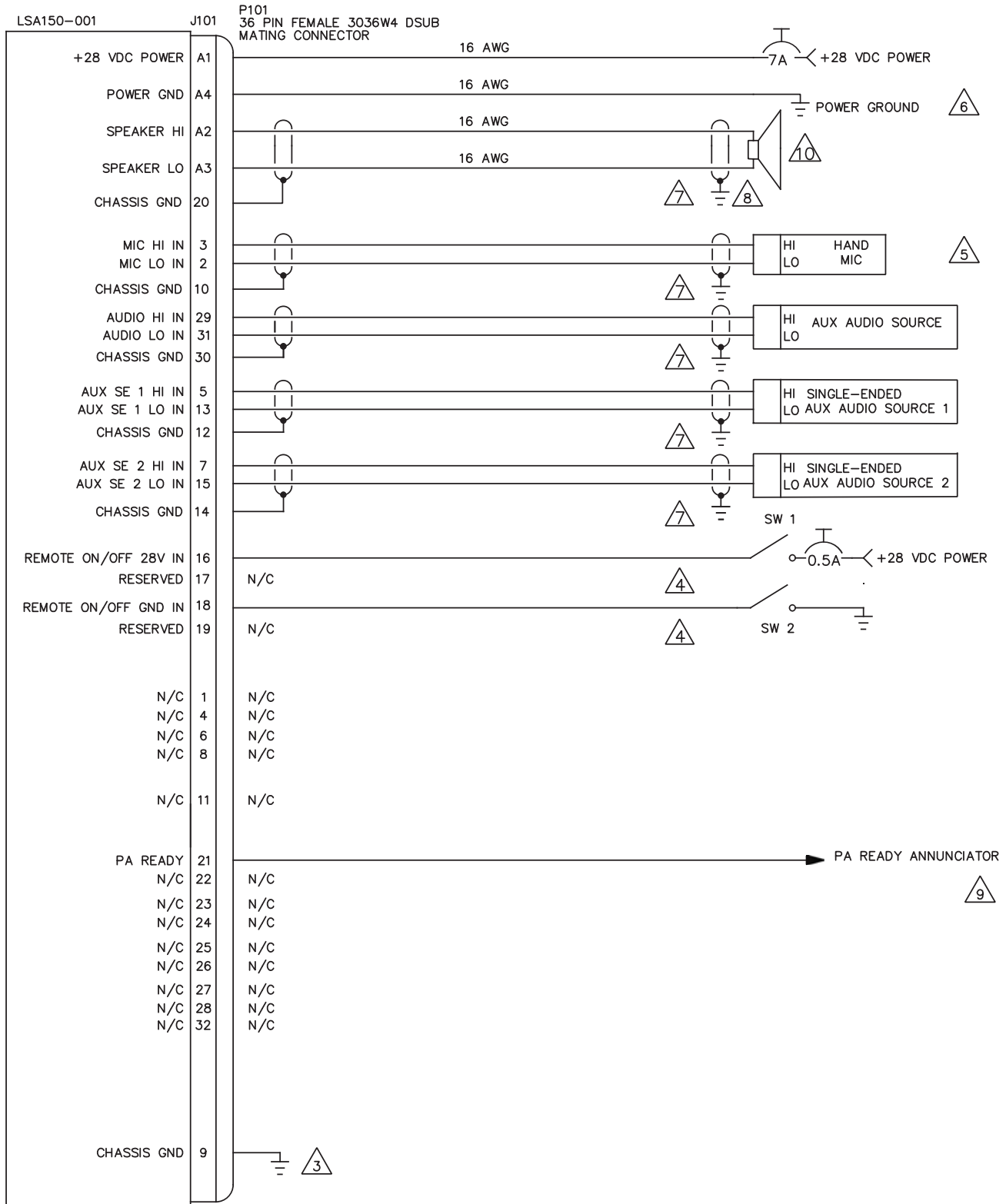
NOTES:




1. ALL WIRES SHOULD BE 22 AWG UNLESS OTHERWISE SPECIFIED. ALL UNSHIELDED WIRE SHALL BE SELECTED IN ACCORDANCE WITH AC43.13-1B CHANGE 1, PARAGRAPHS 11-76 THROUGH 11-78. WIRE TYPES SHOULD BE TO MIL-W-22759 AS SPECIFIED IN AC43.13-1B CHANGE 1, PARAGRAPHS 11-85, 11-86 AND LISTED IN TABLE 11-11. ALL SHIELDED WIRE/CABLE SHOULD BE IN ACCORDANCE WITH MIL-C-27500.
2. CABLE LENGTH NOT TO EXCEED 30 FT [9.14 M] UNLESS OTHERWISE SPECIFIED.
- ③ CABLE LENGTH NOT TO EXCEED 1 FT [0.3 M].
- ④ USE ONLY ONE OF THE REMOTE ON/OFF OPTIONS.
- ⑤ SYSTEM CROSSTALK MAY BE EFFECTED BY STYLE OF HEADSET AND JACK. CHECK SPECIFICATIONS AND SYSTEM REQUIREMENTS BEFORE SELECTING AND INSTALLING SAME.
- ⑥ CABLE LENGTH NOT TO EXCEED 3.3 FT [1.0 M].
- ⑦ SHIELDS SHOULD BE GROUNDED TO LOCAL AIR FRAME GROUND, UNLESS OTHERWISE SPECIFIED.
- ⑧ SHIELD LENGTH NOT TO EXCEED 1 FT [0.3 M].
- ⑨ SWITCHED TO POWER GROUND WHEN ACTIVE. CURRENT (SINK) 0.4A MAX.
- ⑩ REFERENCE SHEET 3 FOR SPEAKER WIRING CONFIGURATIONS.

DEFINITIONS:

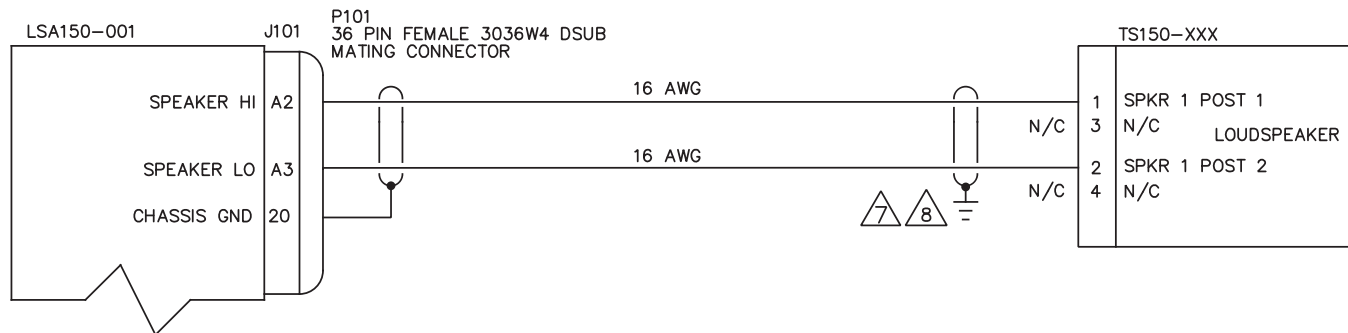
- N/C: NO CONNECTION. THE PIN IS NOT CONNECTED TO ANYTHING INTERNALLY, AND THEREFORE SHALL HAVE NO CONNECTION EXTERNALLY.
- N/C SPARE: NO CONNECTION INTERNALLY, BUT A SPARE WIRE SHALL BE INSTALLED IN THE WIRE HARNESS.
- RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE. THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION. THE PIN MAY BE USED FOR TEST PURPOSES. THERE IS NO EXTERNAL CONNECTION.
- RESERVED SPARE: (RSV SP) RESERVED, BUT INSTRUCTIONS SHALL BE FOLLOWED TO ACTIVATE THE CIRCUITRY. A SPARE WIRE SHALL BE INSTALLED IN THE WIRE HARNESS.




NAME		DATE		UNLESS OTHERWISE SPECIFIED:		 ANODYNE ELECTRONICS MANUFACTURING CORP.		KELOWNA BC CANADA	
DRAWN		MAR 1/18		DIMENSIONS ARE IN INCHES				(250)-763-1088	
CHECKED		May 11, 2018		TOLERANCES:		TITLE: LOUDSPEAKER AMPLIFIER INTERCONNECT		WWW.AEM-CORP.COM	
APPROVED		Jun 07/18		FRACTIONAL ± 0.5 Deg				SCALE: 1:1	
PROPRIETARY AND CONFIDENTIAL		INTERPRET GEOMETRIC TOLERANCING PER:		ANGULAR: MACH ± BEND ±				DRAWING No.: 403-0	
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ANODYNE ELECTRONICS MANUFACTURING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ANODYNE ELECTRONICS MANUFACTURING IS PROHIBITED.		MATERIAL		TWO PLACE DECIMAL ± 0.01		PART No.		REV	
		FINISH		THREE PLACE DECIMAL ± 0.005		LSA150-001		1.00	
		DO NOT SCALE DRAWING		SIZE		SHEET 1 of 3			
				A					
				L9015					



NAME	DATE	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 0.5 Deg ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± 0.01 THREE PLACE DECIMAL ± 0.005	 ANODYNE ELECTRONICS MANUFACTURING CORP.	KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM		
DRAWN	SK MAR 1/18	INTERPRET GEOMETRIC TOLERANCING PER:		TITLE: LOUDSPEAKER AMPLIFIER INTERCONNECT		
CHECKED	 May 11, 2018	MATERIAL	SIZE	CAGE CODE	PART No.	REV
APPROVED	 Jun 07/18	FINISH	A	L9015	LSA150-001	1.00
PROPRIETARY AND CONFIDENTIAL		DO NOT SCALE DRAWING	SCALE: 1:1		DRAWING No.: 403-0	SHEET 2 of 3
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ANODYNE ELECTRONICS MANUFACTURING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ANODYNE ELECTRONICS MANUFACTURING IS PROHIBITED.						

TS150 SPKR CONFIGURATION



NAME		DATE		UNLESS OTHERWISE SPECIFIED:		 ANODYNE ELECTRONICS MANUFACTURING CORP.		KELOWNA BC CANADA					
DRAWN		SK		MAR 1/18				DIMENSIONS ARE IN INCHES		(250)-763-1088			
CHECKED				May 11, 2018		TOLERANCES:		WWW.AEM-CORP.COM					
APPROVED				Jun 07/18		FRACTIONAL ± 0.5 Deg							
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				N/A		A		L9015		LSA150-001		REV	
				FINISH		N/A		SCALE: 1:1		DRAWING No.: 403-0		SHEET 3 of 3	
DO NOT SCALE DRAWING													








LSA150-001 INSTALLATION NOTES

NOTES:

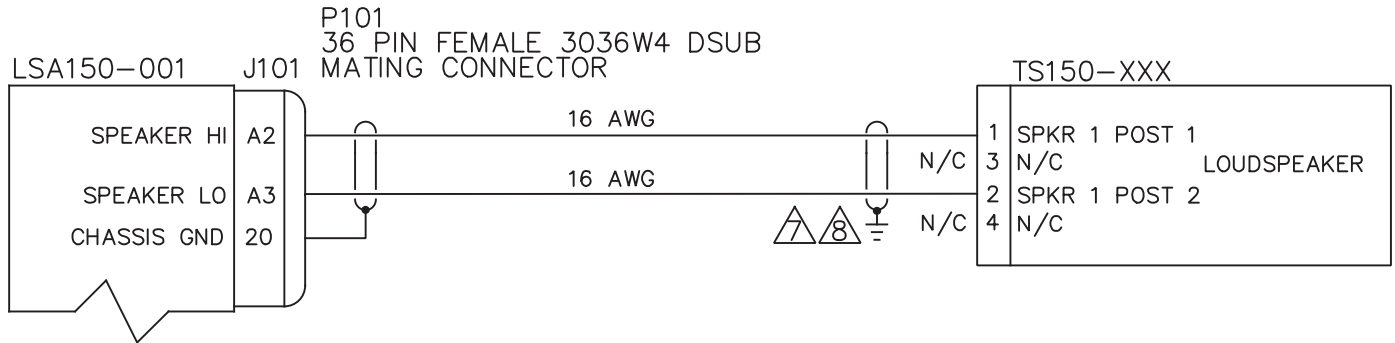
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4. SYSTEM CROSSTALK MAY BE EFFECTED BY STYLE OF HEADSET AND JACK. CHECK SPECIFICATIONS AND SYSTEM REQUIREMENTS BEFORE SELECTING AND INSTALLING SAME.
5. OPTIONAL. PARALLEL TO HEADPHONE (1 ONLY) CONNECTION FOR MONITORING RADIOS VIA EXTERNAL P.A. SPEAKER.
6. CABLE LENGTH NOT TO EXCEED 3.3 FT [1.0 M].
7. SHIELDS SHOULD BE GROUNDED TO LOCAL AIRFRAME GROUND, UNLESS OTHERWISE SPECIFIED.
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<table border="1"> <tr> <td>NAME</td> <td>DATE</td> <td>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 0.5 Deg ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± 0.01 THREE PLACE DECIMAL ± 0.005</td> </tr> <tr> <td>DRAWN</td> <td>SK JUN 7/18</td> <td></td> </tr> <tr> <td>CHECKED</td> <td> June 11, 2018</td> <td></td> </tr> <tr> <td>APPROVED</td> <td> Jun 11/18</td> <td></td> </tr> </table>	NAME	DATE	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 0.5 Deg ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± 0.01 THREE PLACE DECIMAL ± 0.005	DRAWN	SK JUN 7/18		CHECKED	 June 11, 2018		APPROVED	 Jun 11/18				KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM	
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	SIZE	CAGE CODE	PART No.	REV												
	A	L9015	LSA150-001	1.00												
	SCALE: 1:1	DRAWING No.: 403-1		SHEET 1 of 3												

TS150 SPKR CONFIGURATION



DRAWN		NAME	DATE	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 0.5 Deg ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± 0.01 THREE PLACE DECIMAL ± 0.005	 ANODYNE ELECTRONICS MANUFACTURING CORP.	KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM			
CHECKED			June 11, 2018			TITLE:	LOUDSPEAKER AMPLIFIER INTERCONNECT, SPEAKER CONFIGS		
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DO NOT SCALE DRAWING				SCALE: 1:1	DRAWING No.: 403-1		SHEET 3 of 3		

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	RAS#788 - INTERCONNECT CORRECTIONS.	12-JUL-18	LAC




LSA150-001 INSTALLATION NOTES

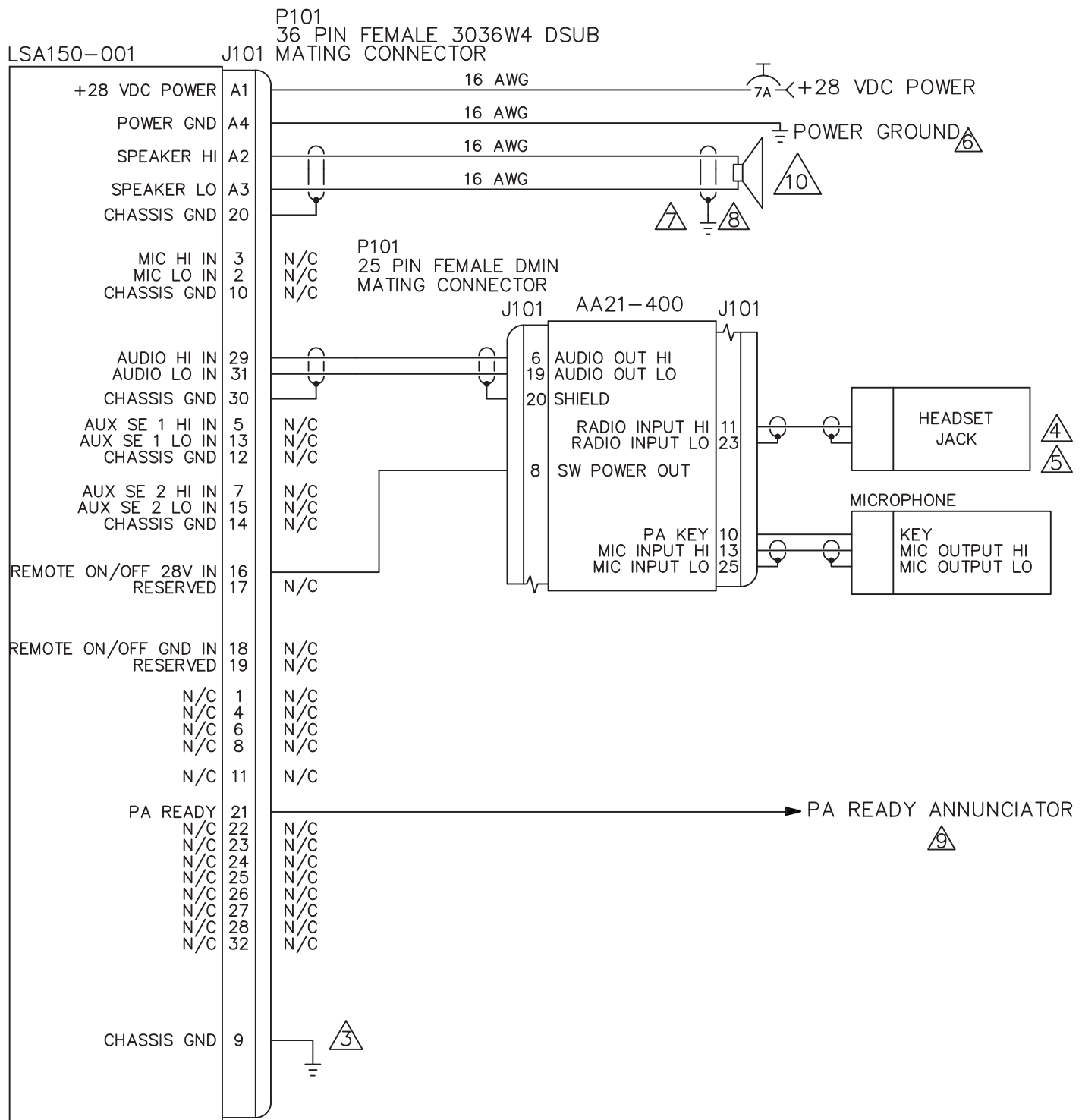
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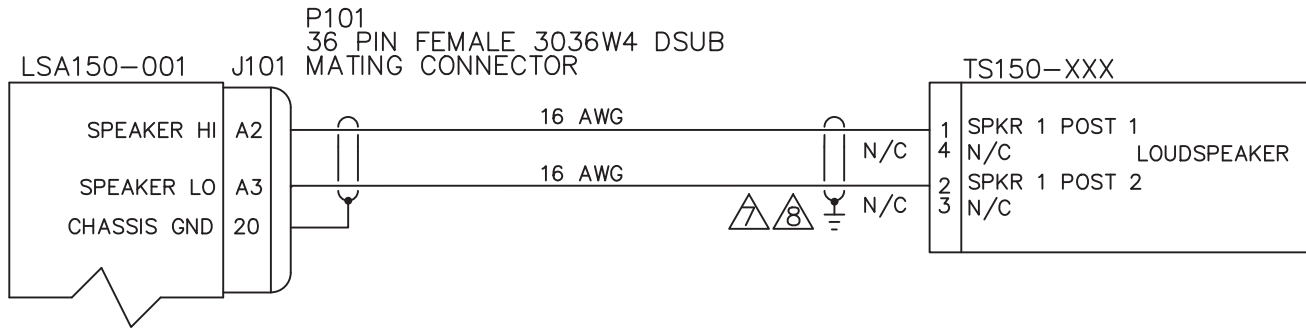
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DRAWN	SK	MAR 1/18		DIMENSIONS ARE IN INCHES							
CHECKED		July 16, 2018		TOLERANCES:		TITLE: LOUDSPEAKER AMPLIFIER INTERCONNECT					
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				N/A		A	L9015	LSA150-001	1.01		
				FINISH		DO NOT SCALE DRAWING		SCALE: 1:1	DRAWING No.: 403-2	SHEET 1 of 3	
				N/A							



NAME	DATE	UNLESS OTHERWISE SPECIFIED:	 ANODYNE ELECTRONICS MANUFACTURING CORP. KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM				
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APPROVED		Jul 16/18	FRACTIONAL ± 0.5 Deg				
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			N/A	A	L9015	LSA150-001	1.01
			FINISH	SCALE: 1:1		DRAWING No.: 403-2	SHEET 2 of 3
			DO NOT SCALE DRAWING				

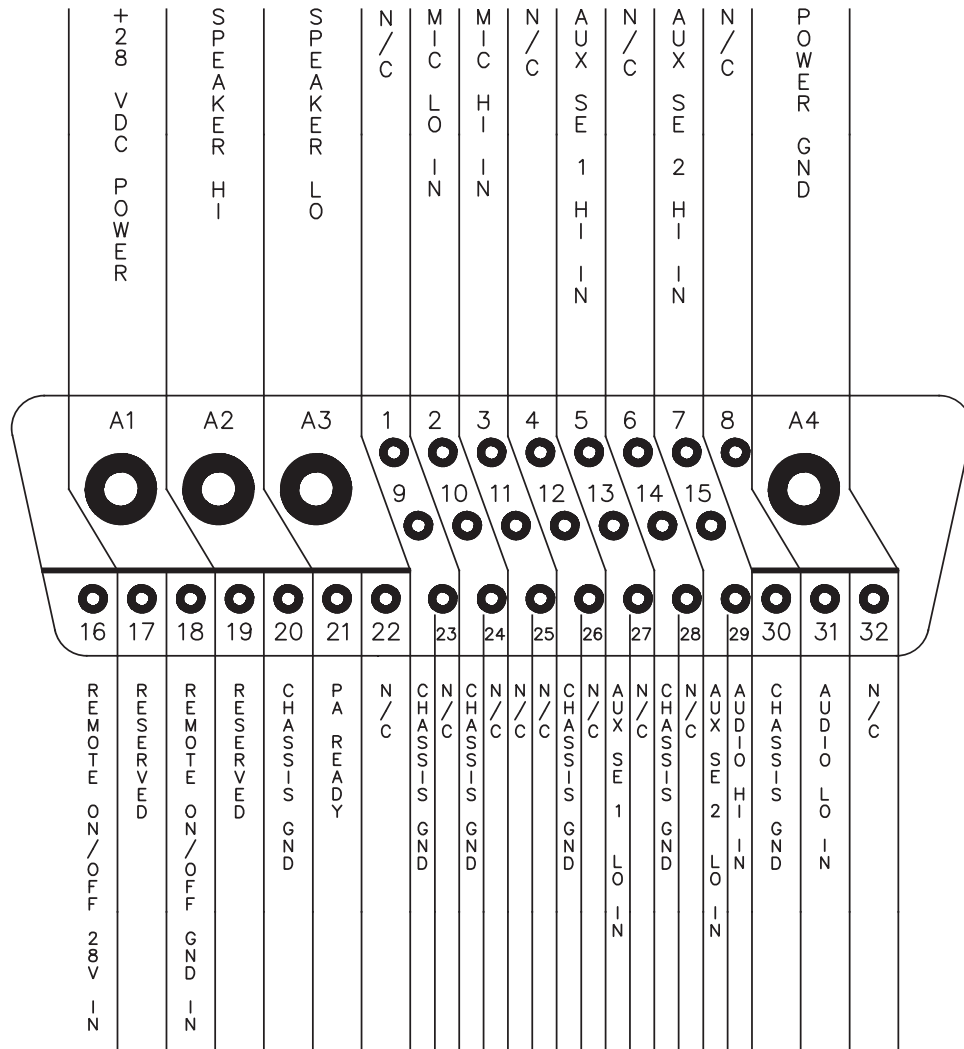
TS150 SPKR CONFIGURATION






NAME		DATE	UNLESS OTHERWISE SPECIFIED:		 ANODYNE ELECTRONICS MANUFACTURING CORP. KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM				
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PROPRIETARY AND CONFIDENTIAL			INTERPRET GEOMETRIC TOLERANCING PER:		TITLE: <h2 style="text-align: center;">LOUDSPEAKER AMPLIFIER INTERCONNECT, SPEAKER CONFIGS</h2>				
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			DO NOT SCALE DRAWING		SCALE: 1:1	DRAWING No.: 403-2		SHEET 3 of 3	

P101

36 PIN D-MIN SOCKET
MATING CONNECTOR



VIEW IS FROM REAR OF AIRFRAME CONNECTOR.

NAME	DATE	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 0.5 Deg ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± 0.01 THREE PLACE DECIMAL ± 0.005	 ANODYNE ELECTRONICS MANUFACTURING CORP.	KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM			
DRAWN	SK	FEB 28/18		TITLE: LOUDSPEAKER AMPLIFIER CONNECTOR MAP			
CHECKED		May 11, 2018	SIZE	CAGE CODE	PART No.	REV	
APPROVED		Jun 07/18	A	L9015	LSA150-001	1.00	
PROPRIETARY AND CONFIDENTIAL			DO NOT SCALE DRAWING		SCALE: 1:1	DRAWING No.: 405-0	SHEET 1 of 1
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ENVIRONMENTAL QUALIFICATION FORM

Description: Loudspeaker Amplifier Document: LSA150-001-521-0100


Part #: LSA150-001 TSO #: N/A

Manufacturer's Specification and/or Other Applicable Specification: _____


Manufacturer: Anodyne Electronics Manufacturing Corp.

Address: #15 - 1925 Kirschner Rd., Kelowna, BC, Canada. V1Y 4N7

DO-160 Rev: G

Prepared By:  Steve Kempf
Designer
Jun 20/18

Checked By:  Ron Briggs
Designer
Jun 20/18

Approved By:  Todd Blackstock
R&D Manager
Jun 20/18

Conditions	Section	Description of Conducted Tests
Temperature and Altitude	4.0	Equipment tested to Categories B4
Ground Survival Low Temp.	4.5.1	-55° C
Short-Time Operating Low Temp.	4.5.1	-30° C
Operating Low Temp.	4.5.2	-30° C
Ground Survival High Temp.	4.5.3	+85° C
Short-Time Operating High Temp.	4.5.3	+70° C
Operating High Temp.	4.5.4	+60° C
In-flight Loss of Cooling	4.5.5	N/A
Altitude	4.6.1	+25,000 ft (+7,620 m)
Decompression	4.6.2	N/A
Overpressure	4.6.3	N/A
Temperature Variation	5.0	Equipment tested to Category B ± 5° C/min.
Humidity	6.0	Equipment tested to Category A 95% RH for 48 hrs.
Operational Shocks and Crash Safety	7.0	Equipment tested to Category B
Operational Shocks	7.2.2	6 g for 11 ms in all axes
Crash Safety Impulse	7.3.2	20 g for 11 ms in all axes
Crash Safety Sustained	7.3.3	20 g for 3 s in all axes



Conditions	Section	Description of Conducted Tests
Vibration	8.0	Equipment tested to Category S Profiles B and M. Equipment tested to Category U2 Profiles F and F1.
Explosive Atmosphere	9.0	Category X, no test performed.
Waterproofness	10.0	Category X, no test performed.
Fluids Susceptibility	11.0	Category X, no test performed.
Sand and Dust	12.0	Category X, no test performed.
Fungus	13.0	Category X, no test performed.
Salt Fog Test	14.0	Category X, no test performed.
Magnetic Effect	15.0	Equipment tested to Category A Defection of 1°: $0.3 \leq D \leq 1.0$ m
Power Input	16.0	Equipment tested to Categories BXX
Voltage (Average Value DC)	16.6.1.1	Maximum Operating Voltage: +30.3 Vdc Nominal Operating Voltage: +28.0 Vdc Minimum Operating Voltage: +22.0 Vdc Emergency Operating Voltage: N/A
Momentary Power Interruptions (DC)	16.6.1.3	50ms Max
Normal Surge Voltage (DC)	16.6.1.4	As per DO-160G
Engine Starting Undervoltage (DC)	16.6.1.5	As per DO-160G
Voltage Steady State (DC)	16.6.2.1	N/A
Low Voltage Conditions (DC)	16.6.2.2	N/A
Momentary Undervoltage Operation (DC)	16.6.2.3	N/A
Abnormal Surge Voltage (DC)	16.6.2.4	N/A
Voltage Spike	17.0	Equipment tested to Category A 600 Vpp for 10 μ s Positive and negative spikes

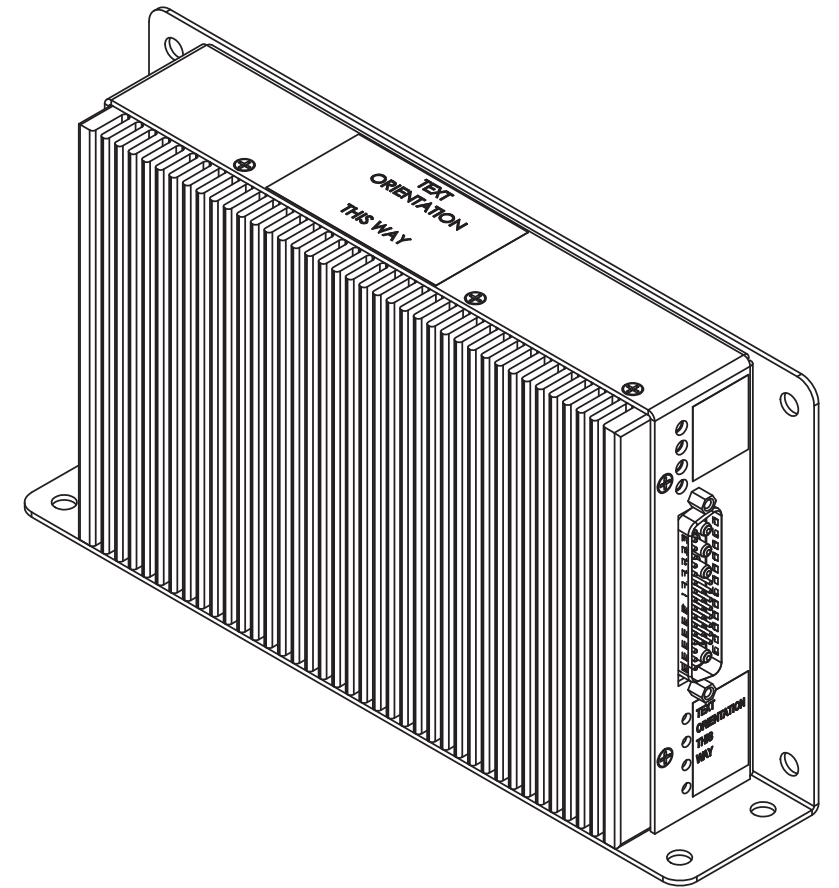
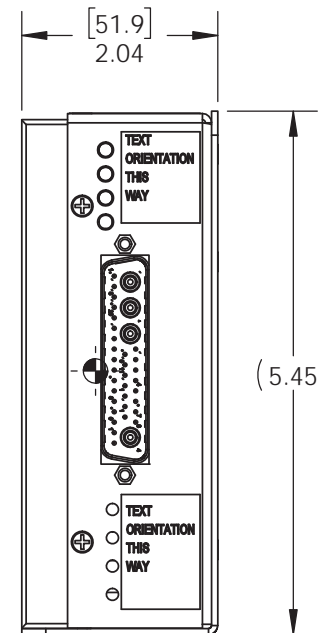
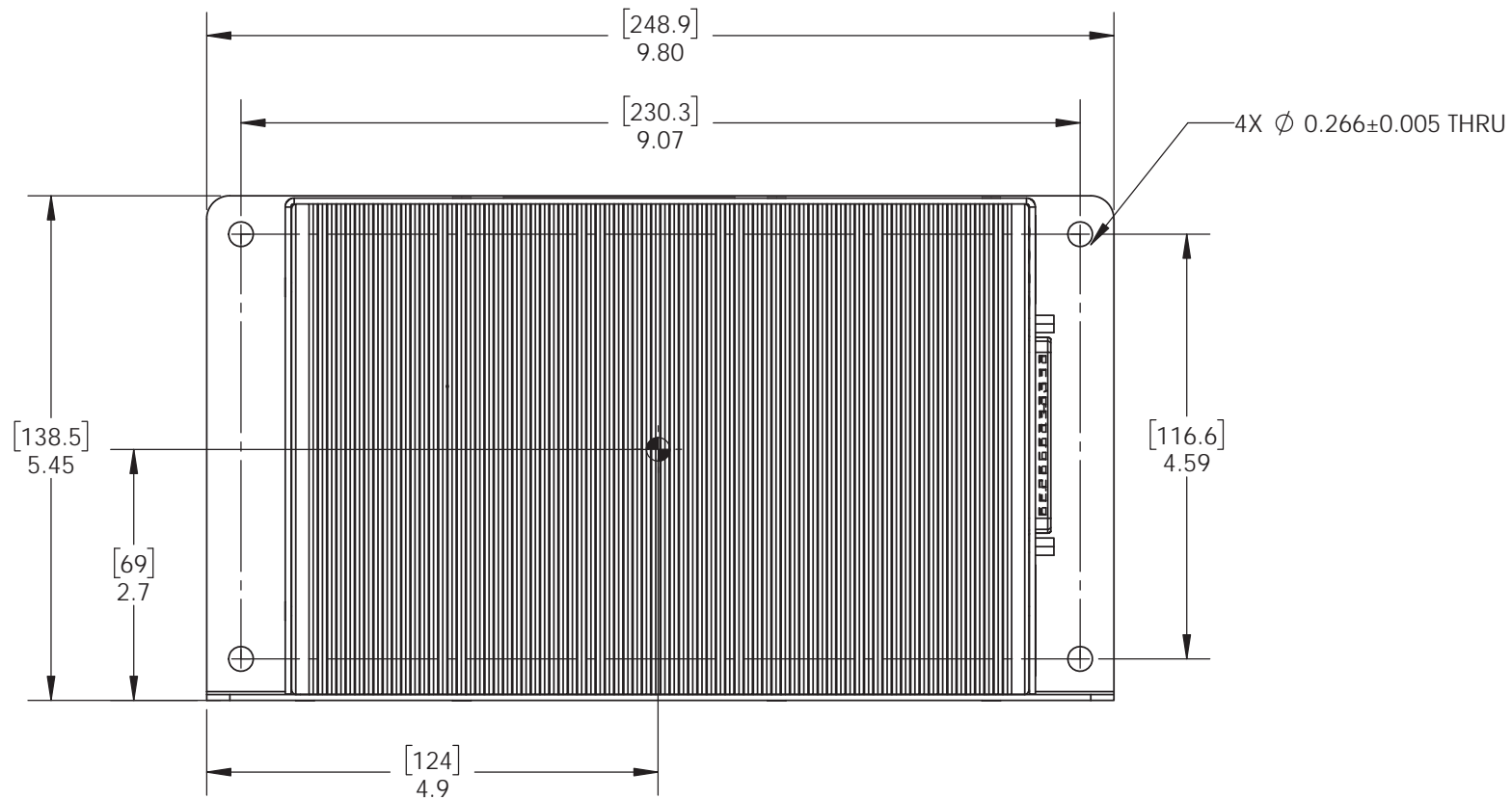
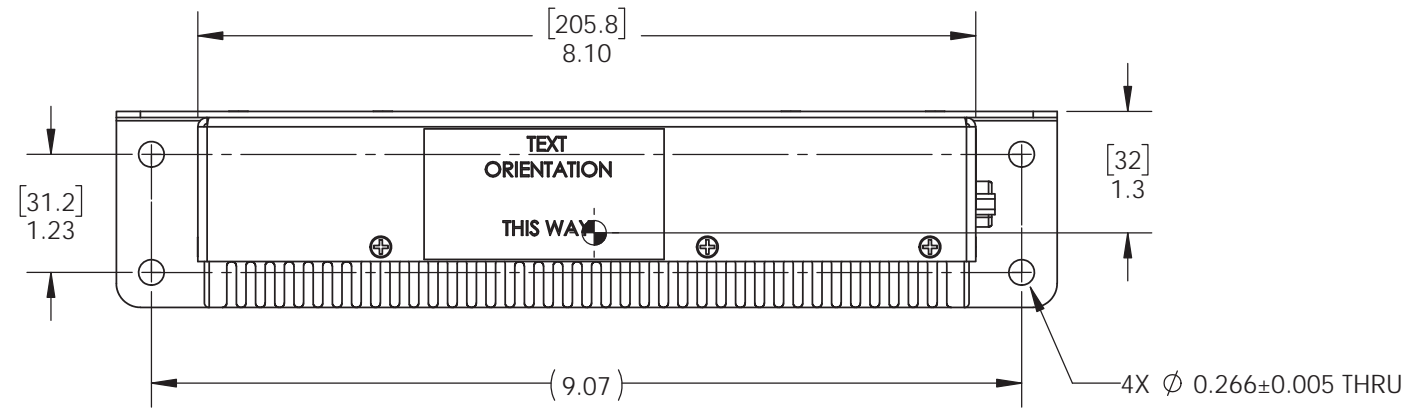


Conditions	Section	Description of Conducted Tests
Audio Frequency Susceptibility	18.0	Equipment tested to Category B 1.6 Vpp 0.2 to 1 kHz 4.0 Vpp 1 to 15 kHz
Induced Signal Susceptibility Magnetic Fields Into Equipment Electric Fields Into Equipment Magnetic Fields Into Cables Electric Fields Into Cables Spikes Induced Into Cables	19.0 19.3.1 19.3.2 19.3.3 19.3.4 19.3.5	Equipment tested to Category AC 20 Arms @ 400 Hz 170 Vrms @ 400 Hz 18 A•m @ 380 to 420 Hz 360 V•m from 380 to 420 Hz Positive and negative spikes as per DO-160G
Radio Frequency Susceptibility Conducted Susceptibility Radiated Susceptibility	20.0 20.4 20.5	Equipment tested to Category RR 0.01 to 400 MHz SW/CW: 20 V/m from 100 to 400 MHz PM: 150 V/m from 0.4 to 8 GHz
Radio Frequency Emission Conducted RF Emission Radiated RF Emission	21.0 21.4 21.5	Equipment tested to Category L Power lines: 150 kHz to 152 MHz Interconnecting Cables: 150 kHz to 152 MHz 100 MHz to 6 GHz
Lightning Induced Transient Susceptibility	22.0	Category X, no test performed.
Lightning Direct Effects	23.0	Category X, no test performed.
Icing	24.0	Category X, no test performed.
Electrostatic Discharge	25.0	Equipment tested to Category A 15,000 Vp, 10 positive and negative spikes.
Fire, Flammability	26.0	Category C The enclosure is constructed of metal (metal finish that is non flammable), on all sides, and has no vent holes

**REMARKS**

- All sections with the exception of 21.4 were qualified by analysis to the LSA400-001.
- Section 21.4 testing was conducted at Anodyne Electronics Manufacturing Corp. (AEM) in Kelowna BC.
- Section 16.6.1.1 Emergency Operating Voltage and Section 16.6.2 Abnormal Operating Conditions were not tested.
- Section 20 full threat testing is complete. Alleviated levels specified in DO-214, Sec 2.5.11.2 were completed for radiated susceptibility and partially completed for conducted susceptibility. Alleviated conducted susceptibility was completed on +28 Vdc Power wire (CW & SW) as well as main interconnecting bundle (SW only).

End of Environmental Qualification Form



- NOTES:
1. MASS 3.7 lb [1.7kg] MAX.
 2. DENOTES CENTER OF GRAVITY (est.)

	NAME	DATE	UNLESS OTHERWISE SPECIFIED:
DRAWN	DMF	06-Mar-18	DIMENSIONS ARE IN INCHES [MM]
CHECKED		Mar 29/18	TOLERANCES:
APPROVED		May 03/18	ANGULAR: $\pm 0.5^\circ$
			FRACTIONAL: ± 0.0625
			ONE DECIMAL PLACE: ± 0.050
			TWO DECIMAL PLACE: ± 0.030
			THREE DECIMAL PLACE: ± 0.010
CONFIDENTIAL AND PROPRIETARY			MATERIAL:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ANODYNE ELECTRONICS MANUFACTURING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ANODYNE ELECTRONICS MANUFACTURING IS PROHIBITED.			N/A
			FINISH:
			N/A

		ANODYNE ELECTRONICS MANUFACTURING CORP.		15-1925 KIRSCHNER RD. KELOWNA BC V1Y 4N7 (250)-763-1088 WWW.AEM-CORP.COM	
TITLE: LOUD SPEAKER AMPLIFIER MECHANICAL INSTALLATION					
PAPER SIZE: B	CAGE CODE: L9015	PART No.:	LSA150-001	REVISION: 1.00	
SCALE: 1:2		DO NOT SCALE DRAWING		DRAWING No. : 922-0	
SHEET: 1 OF 1					