

# TitanONE Modular Power Amplifier Cards

T302, T602 & T1202



## General Description.

The TitanONE T302, T602, and T1202 are Class D (switch mode) dual channel power amplifier modules that are placed into the TitanONE T112 Smart Mainframe. Each card may be placed in any mainframe slot without configuration settings made on the amplifier cards.

Class D operation combined with an integral switch mode power supply offers many advantages. The AtlasIED design incorporates full use of these benefits:

- Higher Efficiency
- Increased Reliability
- Improved Performance
- Lower Operating Cost

Switch mode operation combined with high voltage power MOSFET devices make it possible to eliminate costly transformers.

The card contains no onboard attenuation controls. Attenuation is handled by the TitanONE T112 Smart Mainframe.

The power amplifier module has built-in voltage limiters to protect the loudspeakers. In addition, a temperature sensor on the heatsink will automatically shut down a module that becomes too hot in order to protect the electronics. When used with the TitanOne T112 Smart Mainframe. The amplifier module's status signals are monitored by the central processor. Any failures are detected and reported to the AtlasIED supervision system to alert the user that service is required.

The amplifier module has LED indicators located on its front edge. A single green LED will illuminate to indicate that the amplifier is powered on. Each channel on the card has a multi-color signal LED. It will illuminate green when input signal is present on the channel. This LED changes to yellow to indicate that the channel is clipping.

A power switch is provided on the front of each module. It is recessed and requires a tool to operate in order to prevent any accidental switch operation. The switch allows an individual card to be powered down and removed or replaced without affecting any other cards installed in the same mainframe. Each card provides +24VDC through current limiting resistors to operate the fans in the rear of the mainframe to aid in system cooling.

Each model is available for use in either 120VAC with 70V loudspeaker systems or 240VAC with 100V loudspeaker systems. Models containing a "-120V" suffix are designed for 120VAC/70V systems and models containing a "-230V" suffix are designed for 240VAC/100V systems.

## Available Amplifier Card Configurations:

T302-230V - T1	300W Total, 2 CH x 150W, 100V
T302-120V - T1	300W Total, 2 CH x 150W, 70V
T602-230V - T1	600W Total, 2 CH x 300W, 100V
T602-120V - T1	600W Total, 2 CH x 300W, 70V
T1202-230V - T1	1200W Total, 2 CH x 600W, 100V
T1202-120V - T1	1200W Total, 2 CH x 600W, 70V

Model Number	T302-230V -T1	T302-120V -T1	T602-230V -T1	T602-120V -T1	T1202-230V -T1	T1202-120V -T1
<b>Electrical</b>						
Power Supply Type	Switch Mode	Switch Mode	Switch Mode	Switch Mode	Switch Mode	Switch Mode
Amp Topology	Class D	Class D	Class D	Class D	Class D	Class D
Number of Fixed Inputs	2	2	2	2	2	2
<b>Output Power</b>						
100V x 2-CH (200Ω load-continuous) (Note 2)	50 Watt					
100V x 2-CH (64Ω load-pulse) (Note 1)	150 Watt					
70V x 2-CH (100Ω load-continuous) (Note 2)		50 Watt				
70V x 2-CH (32Ω load-pulse) (Note 1)		150 Watt				
100V x 2-CH (100Ω load-continuous) (Note 2)			100 Watt			
100V x 2-CH (32Ω load-pulse) (Note 1)			300 Watt			
70V X 2 CH (50Ω load-continuous) (Note 2)				100 Watt		
70V x 2 CH (16Ω load-pulse) (Note 1)				300 Watt		
100V x 2-CH (50Ω load-continuous) (Note 2)					200 Watt	
100V x 2-CH (16Ω load-pulse) (Note 1)					600 Watt	
70V x 2-CH (25Ω load-continuous) (Note 2)						200 Watt
70V x 2-CH (8Ω load-pulse) (Note 1)						600 Watt
<b>Factory Default Settings (as shipped)</b>						
Amplifier Configuration	2-CH 100V Mode (CH 1/2 = 100V)	2-CH 70V Mode (CH 1/2 = 70V)	2-CH 100V Mode (CH 1/2 = 100V)	2-CH 70V Mode (CH 1/2 = 70V)	2-CH 100V Mode (CH 1/2 = 100V)	2-CH 70V Mode (CH 1/2 = 70V)
<b>Inputs</b>						
Input Quantity	2 Balanced Inputs	2 Balanced Inputs	2 Balanced Inputs	2 Balanced Inputs	2 Balanced Inputs	2 Balanced Inputs
Input Type (Line Balanced or Unbalanced)	Balanced	Balanced	Balanced	Balanced	Balanced	Balanced
Input Impedance, Ω	20KΩ Balanced	20KΩ Balanced	20KΩ Balanced	20KΩ Balanced	20KΩ Balanced	20KΩ Balanced
Input Sensitivity	5dBu - 1.377V	5dBu - 1.377V	5dBu - 1.377V	5dBu - 1.377V	5dBu - 1.377V	5dBu - 1.377V
Maximum Input Level dBu & Vrms	14dBu - 3.82V	14dBu - 3.82V	14dBu - 3.82V	14dBu - 3.82V	14dBu - 3.82V	14dBu - 3.82V
Input Connectors Type	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
<b>Status Indicators - Front Panel and GUI</b>						
Power	Green Indicator	Green Indicator	Green Indicator	Green Indicator	Green Indicator	Green Indicator
Output Signal	Green, CH 1/2	Green, CH 1/2	Green, CH 1/2	Green, CH 1/2	Green, CH 1/2	Green, CH 1/2
Output Limit/Protect	Yellow, CH 1/2	Yellow, CH 1/2	Yellow, CH 1/2	Yellow, CH 1/2	Yellow, CH 1/2	Yellow, CH 1/2
<b>Control Ports (Rear Panel)</b>						
Ethernet	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe

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Model Number	T302-230V -T1	T302-120V -T1	T602-230V -T1	T602-120V -T1	T1202-230V -T1	T1202-120V -T1
<b>Output Terminals (Speaker)</b>						
Output Connectors Type	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
Output Connectors Number of Terminals	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
Output Connectors Fixed or Removable	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
Terminal Spacing	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe
Current Rating	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe	Depends on Amplifier System Mainframe
<b>Electrical Specifications (General)</b>						
Total Harmonic Distortion 1 kHz and 1 dB below rated power	< 0.10%	< 0.10%	< 0.10%	< 0.10%	< 0.10%	< 0.10%
Signal to Noise Ratio	> 85dB Below Rated Output 20Hz - 20kHz	> 85dB Below Rated Output 20Hz - 20kHz	> 85dB Below Rated Output 20Hz - 20kHz	> 85dB Below Rated Output 20Hz - 20kHz	> 85dB Below Rated Output 20Hz - 20kHz	> 85dB Below Rated Output 20Hz - 20kHz
Frequency Response	20 Hz - 20kHz (6.25 watt into 200Ω)	20 Hz - 20kHz (6.25 watt into 100Ω)	20 Hz - 20kHz (12.5 watt into 100Ω)	20 Hz - 20kHz (12.5 watt into 50Ω)	20 Hz - 20kHz (25 watt into 50Ω)	20 Hz - 20kHz (25 watt into 25Ω)
Damping Factor (20Hz to 400Hz)	Aprox 300	Aprox 150	Aprox 150	Aprox 80	Aprox 80	Aprox 50
Crosstalk CH 1-2 & CH 2-1	73dB	73dB	73dB	73dB	73dB	73dB
Protection	Power Limit 150%. Fused	Power Limit 150%. Fused	Power Limit 150%. Fused	Power Limit 150%. Fused	Power Limit 150%. Fused	Power Limit 150%. Fused
<b>AC Power Requirements</b>						
Operating Voltage (VAC)	210V-260V 50/60Hz (Factory Set)	105V-130V 50/60Hz (Factory Set)	210V-260V 50/60Hz (Factory Set)	105V-130V 50/60Hz (Factory Set)	210V-260V 50/60Hz (Factory Set)	105V-130V 50/60Hz (Factory Set)
Minimum Power-Up Voltage	180V	90V	180V	90V	180V	90V
Maximum Operating Voltage	260V	130V	260V	130V	260V	130V
Mains Interface	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
Power Cord (Ships With)	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
<b>Power Consumption, Current Draw</b>						
<b>Amps</b>						
Active Mode - No Signal	234mA	468mA	234mA	468mA	234mA	468mA
Both Channels @ 1/8 Power	0.322A	0.645A	0.41A	0.817A	0.58A	1.16A
Both Channels @ Clipping	0.86A	1.73A	1.48A	2.95A	2.79A	5.58A
<b>Watts</b>						
Active Mode - No Signal	39W(56VA-0VA)	39W(56VA-0VA)	39W(56VA-0VA)	39W(56VA-0VA)	39W(56VA-0VA)	39W(56VA-0VA)
Both Channels @ 1/8 Power	53.2W(77.5VA-12.5VA)=65VA	53.2W(77.5VA-12.5VA)=65VA	66.2W(98.54VA-25VA)=73.5VA	66.2W(98.54VA-25VA)=73.5VA	100W(139VA-50VA)=89VA	100W(139VA-50VA)=89VA
Both Channels @ Clipping	149W(208VA-100VA)=108VA	149W(208VA-100VA)=108VA	266W(354VA-200VA)=154VA	266W(354VA-200VA)=154VA	517W(670VA-400VA)=270VA	517W(670VA-400VA)=270VA
<b>BTU/hr (Note3)</b>						
Active Mode - No Signal	192BTU	192BTU	192BTU	192BTU	192BTU	192BTU
Both Channels @ 1/8 Power	222BTU	222BTU	249BTU	249BTU	304BTU	304BTU
Both Channels @ Clipping	369BTU	369BTU	525BTU	525BTU	920BTU	920BTU

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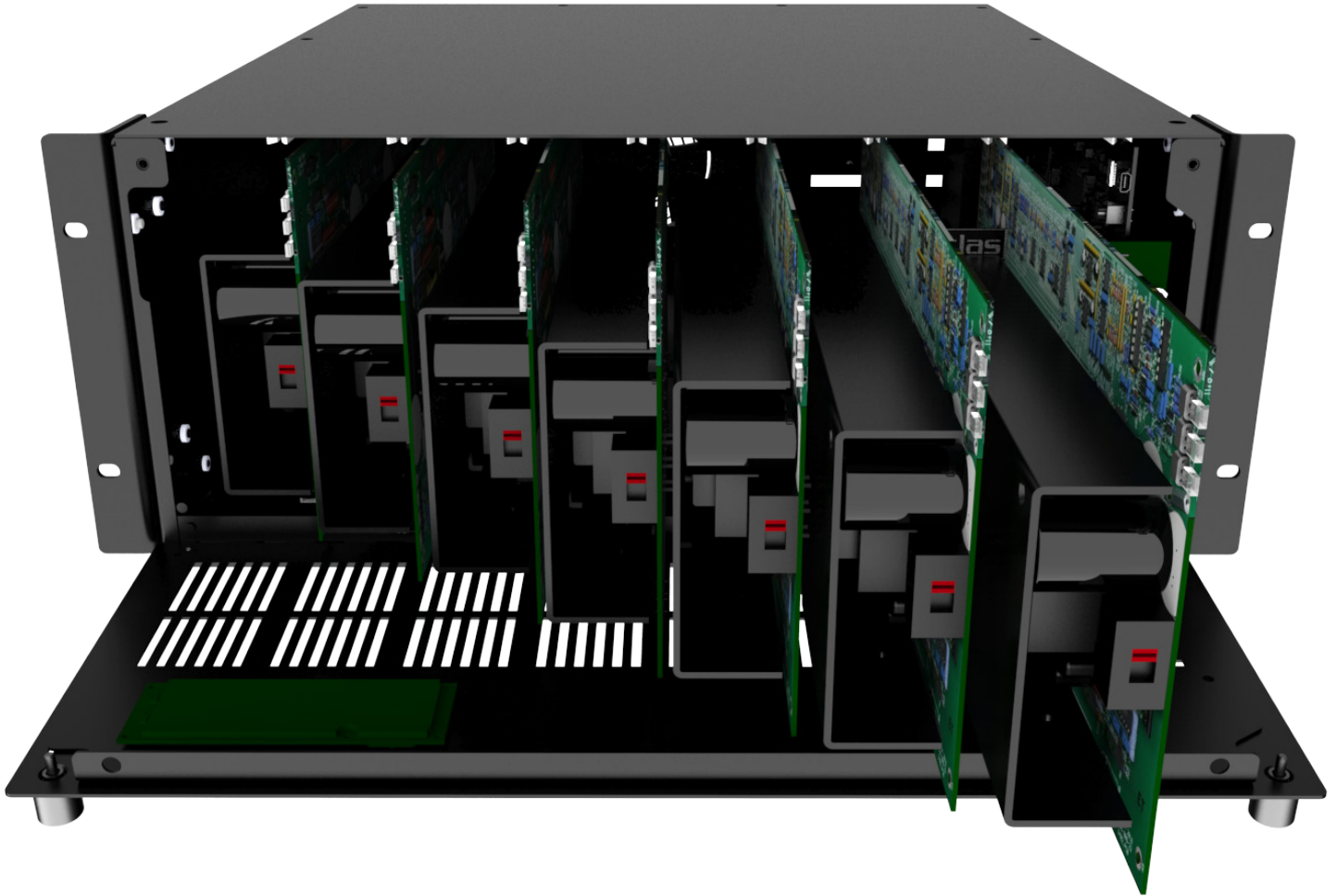
Model Number	T302-230V -T1	T302-120V -T1	T602-230V -T1	T602-120V -T1	T1202-230V -T1	T1202-120V -T1
<b>Environmental</b>						
Operating Temperature Range (Applicable for typical voice paging and background music applications)	+32 °F - +104 °F (0 °C - 40 °C)	+32 °F - +104 °F (0 °C - 40 °C)	+32 °F - +104 °F (0 °C - 40 °C)	+32 °F - +104 °F (0 °C - 40 °C)	+32 °F - +104 °F (0 °C - 40 °C)	+32 °F - +104 °F (0 °C - 40 °C)
Storage Temperature Range	-40 °F - +158 °F (-40 °C - +70 °C)	-40 °F - +158 °F (-40 °C - +70 °C)	-40 °F - +158 °F (-40 °C - +70 °C)	-40 °F - +158 °F (-40 °C - +70 °C)	-40 °F - +158 °F (-40 °C - +70 °C)	-40 °F - +158 °F (-40 °C - +70 °C)
<b>Cooling</b>						
Cooling System	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe	Part of Amplifier System Mainframe
Cooling Air Flow Direction	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back
<b>Dimensions and Weight</b>						
Rack Mount Requirements	Amplifier System Mainframe, T112	Amplifier System Mainframe, T112	Amplifier System Mainframe, T112	Amplifier System Mainframe, T112	Amplifier System Mainframe, T112	Amplifier System Mainframe, T112
Dimensions - Unit	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)	W 1.8" x H 6.8" x D 12.5" (4.6mm x 173mm x 31.75mm)
Dimensions - Shipping	N/A	N/A	N/A	N/A	N/A	N/A
Weight - Unit	4 Lbs. (1.8 Kg)	4 Lbs. (1.8 Kg)	4 Lbs. (1.8 Kg)	4 Lbs. (1.8 Kg)	4 Lbs. (1.8 Kg)	4 Lbs. (1.8 Kg)
Weight - Shipping	N/A	N/A	N/A	N/A	N/A	N/A
<b>Agency Approvals</b>						
North America Agency	Pending	Pending	Pending	Pending	Pending	Pending
Testing Standard North America	Pending	Pending	Pending	Pending	Pending	Pending
FCC Class A (Conducted & Radiated Emissions)	Pending	Pending	Pending	Pending	Pending	Pending
RoHS / WEE Compliant	Pending	Pending	Pending	Pending	Pending	Pending
CE	Pending	Pending	Pending	Pending	Pending	Pending

**NOTES:**

1. Power level is define as 1 kHz Sine wave signal burst of 20 cycles (20mS) at 1% THD+N, followed by 480 cycles of a 1kHz sine wave at 10% of the max.
2. Max Power is defined as 1 kHz input signal applied to achieve the maximum power output before clipping into lead appropriate to each amplifier's rating/size.
3. BTU is calculated by the AC Mains Volt-Amperes minus the RMS power output measured at the specified load and condition, multiplied by 3.412.

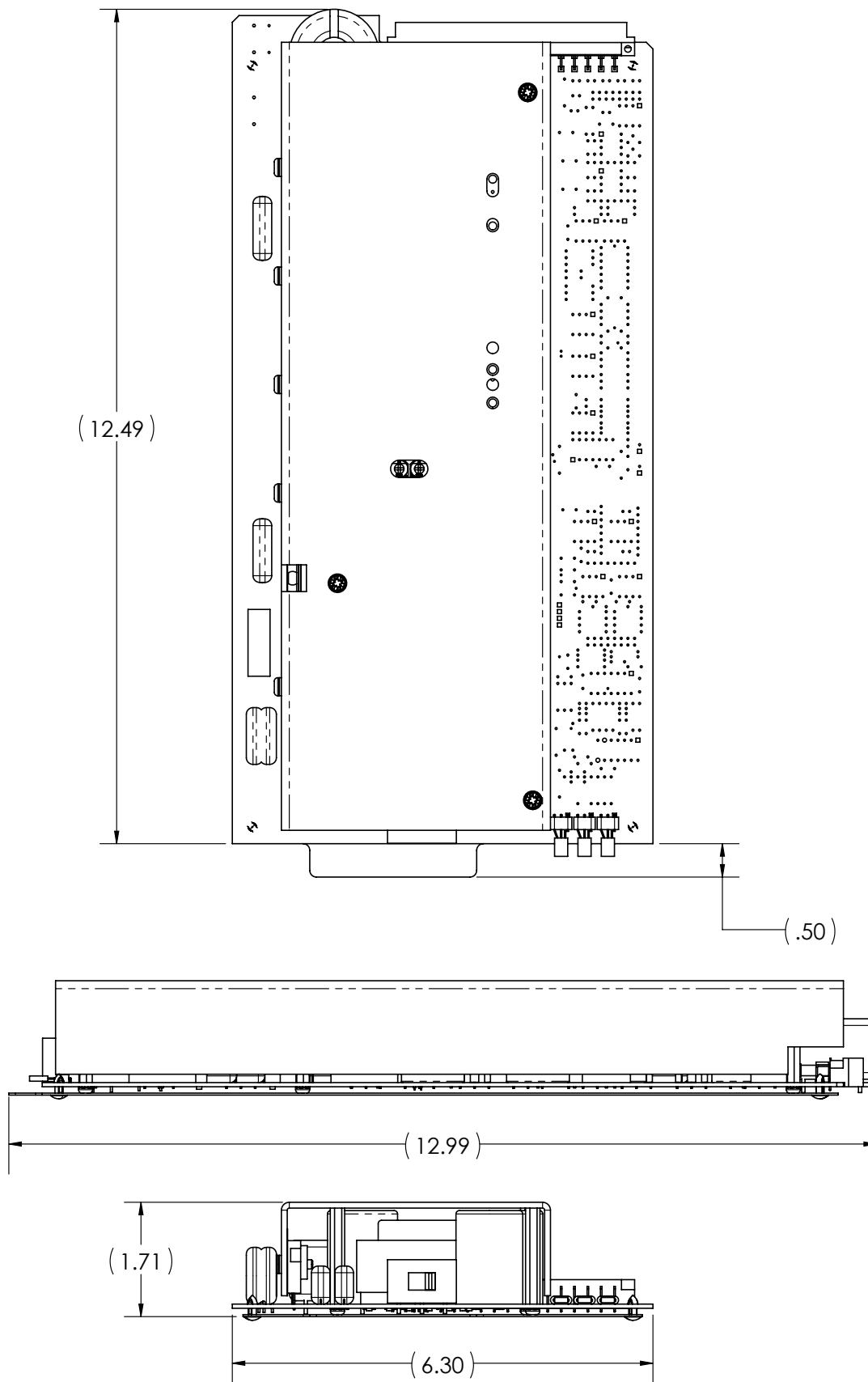
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Illustration of Amp Cards Sliding into the Mainframe



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Dimensional Drawings



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## Architect and Engineer Specifications

The Modular Power Amplifier Cards for use within the Smart Mainframe Power Amplifier are two channel Class D Switch Mode Amplifier Modules capable of delivering 150W (70.7/100V), 300W (70.7V/100V) or 600W (70.7V/100V) per channel. Any Card can be used in the TitanONE T112 Smart Mainframe Power Amplifier, in any slot without need to configure any settings on the card or in the T112. The Amplifier Module shall be under software control. No on-board manual controls for attenuation of the Modular Amplifier Card will be permitted.

Modular Power Amplifier Cards shall utilize voltage limiting to protect the loudspeakers and a temperature sensor to monitor the status of the amplifier channel(s). Status Signals shall alert the ATLASIED Supervision System that service is required.

The Modular Amplifier Cards shall include LED indicators for signal presence (Green) and for of the Output Clipping (Yellow).

Available Amplifier Configurations shall include models for 70.7V and 100V loads:

T302-230V – T1 (TitanONE) 300W Total, 2 CH x 150W, 100V  
T302-120V – T1 (TitanONE) 300W Total, 2 CH x 150W, 70V  
T602-120V – T1 (TitanONE) 600W Total, 2 CH x 300W, 70V  
T602-230V – T1 (TitanONE) 600W Total, 2 CH x 300W, 100V  
T1202-120V – T1 (TitanONE) 1200W Total, 2 CH x 600W, 70V  
T1202-230V – T1 (TitanONE) 1200W Total, 2 CH x 600W, 100V