CONTRACTOR SERIES

CH2

AC Power Draw and Thermal Dissipation

This document provides detailed information about the amount of power and current drawn from the AC mains by the *CH2* amplifier and the amount of heat produced under various conditions. The calculations presented here are intended to provide a realistic and reliable depiction of the amplifier. The following assumptions or approximations were made:

- The amplifier's available channels are loaded and full power is being delivered.
- The amplifier efficiency at standard 1-kHz power is estimated to be 65%.
- Quiescent power draw is approximately 60 watts.
- When running at full speed, typical power draw for the internal fan is 12 watts or less.
- The estimated duty cycles take into account the typical crest factor for each type of source material.
- Duty cycle of pink noise is 50%.
- Duty cycle of highly compressed rock 'n' roll midrange is 40%.
- Duty cycle of rock 'n' roll is 30%.
- Duty cycle of background music is 20%.
- Duty cycle of continuous speech is 10%.
- Duty cycle of infrequent, short duration paging is 1%.

Here are the equations used to calculate the data presented in Figure 1:

$$\text{AC Mains Power Draw (watts)} = \frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle}}{\text{Amplifier Efficiency}} + \text{Quiescent and Fan Power Draw (watts)}$$

The following equation converts power draw in watts to current draw in amperes:

$$\text{Current Draw (amperes)} = \frac{\text{AC Mains Power Draw (watts)}}{\text{AC Mains Voltage} \times \text{Power Factor}}$$

The value used for Power Factor is 0.83. The Power Factor variable is needed to compensate for the difference in phase between the AC mains voltage and current. The following equation is used to calculate thermal dissipation:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle} \times \text{Amplifier Inefficiency}}{\text{Amplifier Efficiency}} + \text{Quiescent and Fan Power Draw (watts)} \right) \times 3.415$$

The value used for inefficiency is 0.35 (1.00–0.65). The factor 3.415 converts watts to btu/hr. Thermal dissipation in btu is divided by the constant 3.968 to get kcal. If you plan to measure output power under real-world conditions, the following equation may also be helpful:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total measured output power from all channels (watts)} \times \text{Amplifier Inefficiency}}{\text{Amplifier Efficiency}} + \text{Quiescent and Fan Power Draw (watts)} \right) \times 3.415$$

CH2

	LOAD														
	4Ω DUAL / 8Ω BRIDGE					8Ω DUAL / 16Ω BRIDGE					70V,100V DUAL 600W / 140V, 200V BRIDGE 1200W				
Duty Cycle	AC Mains Power Draw (Watts)	Current Draw(Amps)		Thermal Dissipation		AC Mains Power Draw (Watts)	Current Draw(Amps)		Thermal Dissipation		AC Mains Power Draw (Watts)	Current Draw(Amps)		Thermal Dissipation	
		100-120	230-240	btu/hr	kcal/hr		100-120	230-240	btu/hr	kcal/hr		100-120	230-240	btu/hr	kcal/hr
50%	1075	10.8	5.4	1419	296	675	6.7	3.4	940	237	983	9.8	4.9	1308	330
40%	872	8.8	4.4	1175	260	552	5.5	2.8	793	200	798	8.0	4.0	1088	274
30%	669	6.7	3.4	993	235	429	4.3	2.2	646	163	614	6.1	3.1	867	218
20%	466	4.7	2.4	690	174	306	3.1	1.6	499	126	429	4.3	2.2	646	163
10%	263	2.6	1.3	448	113	183	1.8	1.4	352	89	245	2.5	1.3	426	107

Figure 1 Power Draw, Current Draw and Thermal Dissipation at Various Duty Cycles

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For more details refer to the applicable Reference Manual or Contact Crown Audio Technical Support. The provided data should not be construed as specifications.

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