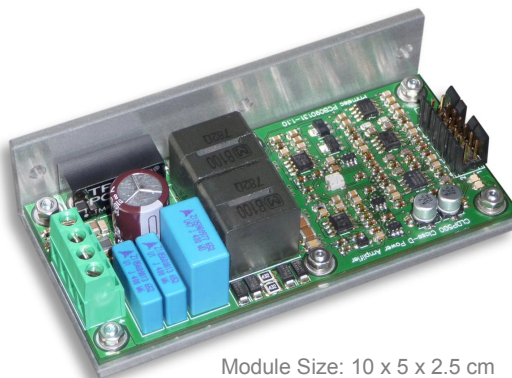


CLDP500

CLDP500

High Performance Audio Amplifier Module

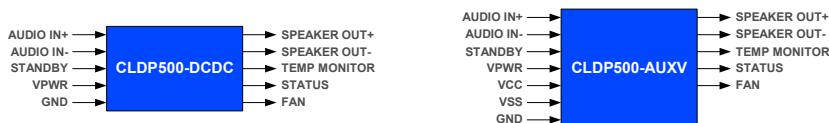


Module Size: 10 x 5 x 2.5 cm

The CLDP500 is a Class-D amplifier module with 500W high-quality output power over the full audio bandwidth. The high-end performance is achieved by the module's fully differential architecture, using a self-oscillating modulator with dual feedback topology, balanced true FET input stage and full-bridge power stage.

The CLDP500 is intended as a versatile amplifier module to design innovative audio solutions. The module's turn-key approach ensures shortest possible Time-to-Market for the end product.

Two versions of the module are available, differing only in the power supply requirements. The CLDP500-DCDC with on-board DC/DC converter works with a single supply voltage. The lower-cost version CLDP500-AUXV comes without DC/DC converter and requires auxiliary supply voltages for operation (+/-12V).



Both versions have a very compact design and provide excellent sound quality, very low radiated and conducted EMI, various protection circuits, adjustable dead-time, a standby input and outputs for status indication, temperature monitoring and fan driving with temperature regulated speed.

Typical Applications

- Professional high-end audio
- Active speakers and subwoofers
- A/V amplifiers and receivers
- Powerful automotive audio
- DIY-Projects
- Public address systems

Key Specifications

- THD+N = 0.0003% (5W, 8Ω, 1kHz)
- THD+N < 0.03% (500W, 4Ω, 20Hz < f < 20kHz)
- PBW = 3Hz to 60kHz (+0/-3dB, 4Ω)
- Dynamic range > 120dBA
- Overall efficiency = 93% (250W, 8Ω)
- Module size = 100 x 50 x 25mm

Main Features

- Balanced audio input / output with true FET input stage and full-bridge power stage
- Single supply operation (CLDP500-DCDC), wide operating voltage range
- Undervoltage, overcurrent and overtemperature protection
- Adjustable dead-time to tune for minimal THD or quiescent current
- Pop-free start and stop operation
- Standby input, standby power consumption < 2W
- Output for fan driving with temperature regulated speed (12V / 1W max)
- Outputs for status indication and temperature monitoring
- Customized designs available, contact Primelec for further information

Ordering Information

CLDP500-DCDC Audio amplifier module with on-board DC/DC converter

CLDP500-AUXV Audio amplifier module without DC/DC converter

CLDP500 - Electrical Specifications

The following specifications apply for $T_A = 25^\circ\text{C}$, $T_C = 35^\circ\text{C}$, $V_{PWR} = 72\text{V}$, $f = 1\text{kHz}$, balanced audio inputs, minimal dead-time (unless otherwise noted)

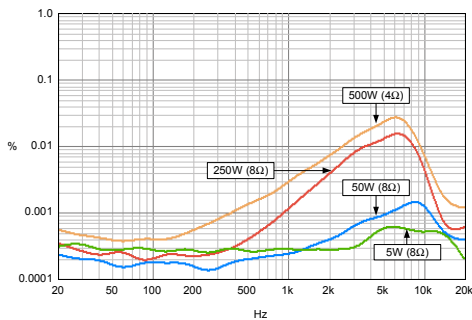
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
THD+N	Total Harmonic Distortion + Noise, MBW 20kHz	$P_O = 5\text{W}$, $Z_L = 8\Omega$		0.0003	0.0005	%
THD+N	Total Harmonic Distortion + Noise, MBW 20kHz	$20\text{Hz} < f < 20\text{kHz}$, $P_O = 5\text{W}$, $Z_L = 8\Omega$		0.0007	0.001	%
THD+N	Total Harmonic Distortion + Noise, MBW 20kHz	$20\text{Hz} < f < 20\text{kHz}$, $50\text{mW} < P_O < 500\text{W}$, $Z_L = 4\Omega$		0.03	0.05	%
P_{O_MAX}	Maximum Output Power	THD = 1%, $Z_L = 4\Omega$ THD = 1%, $Z_L = 8\Omega$		625 325		W
D	Dynamic Range	A-weighted		120		dB
A_V	Voltage Gain		26.5	27	27.5	dB
f_{ABW}	Frequency Response	$20\text{Hz} < f < 20\text{kHz}$, $Z_L = 4\Omega$			± 0.5	dB
Z_O	Output Impedance	$f = 1\text{kHz}$		25		$\text{m}\Omega$
Z_L	Load Impedance		2		∞	Ω
Z_I	Input Impedance	Balanced input		100		$\text{k}\Omega$
PSRR	Power Supply Rejection Ratio	$\Delta V_{PWR} = 2\text{V}$, 100Hz – 1kHz	65			dB
f_{SW_O}	Offset Switching Frequency	Idle		880		kHz
V_{PWR}	Main Supply Voltage	Operating voltage range	36.0		74.0	V
V_{CC}	Positive Auxiliary Supply Voltage ^(note 1)	Operating voltage range	11.4	12.0	12.6	V
V_{SS}	Negative Auxiliary Supply Voltage ^(note 1)	Operating voltage range	-12.6	-12.0	-11.4	V
I_{VPWR_SD}	Standby Current CLDP500-DCDC ^(note 2) Standby Current CLDP500-AUXV ^(note 2)	With on-board DC/DC converter $V_{CC} = 12.0\text{V}$, $V_{SS} = -12.0\text{V}$		30	1	mA
I_{VPWR_Q}	Quiescent Current CLDP500-DCDC ^(note 3) Quiescent Current CLDP500-AUXV ^(note 3)	With on-board DC/DC converter $V_{CC} = 12.0\text{V}$, $V_{SS} = -12.0\text{V}$	70 40		200 170	mA
I_{VCC}	Quiescent Current ^(note 1)	$V_{CC} = 12.0\text{V}$, $V_{SS} = -12.0\text{V}$		130		mA
I_{VSS}	Quiescent Current ^(note 1)	$V_{CC} = 12.0\text{V}$, $V_{SS} = -12.0\text{V}$		-40		mA
η	Overall Efficiency (CLDP500-DCDC)	$P_O = 250\text{W}$, $Z_L = 8\Omega$		93		%

Note 1: External auxiliary supply voltages are only required for the CLDP500-AUXV (module without DC/DC converter)

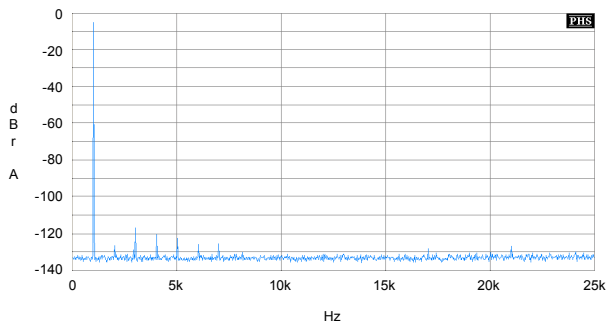
Note 2: Standby is activated by pulling low the standby input and / or by the internal protection circuits

Note 3: Quiescent current I_{VPWR_Q} varies with dead-time setting; reduced dead-time results in lower THD and higher I_{VPWR_Q}

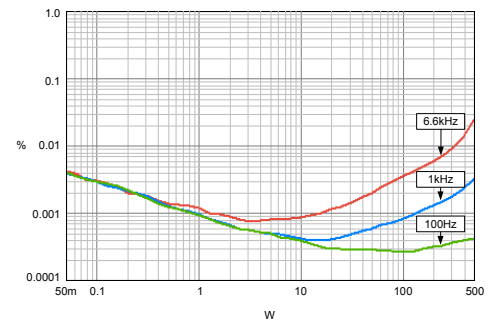
THD+N vs. Frequency (MBW = 20kHz)



1kHz (5W, 8Ω)



THD+N vs. Output Power (MBW = 20kHz, $Z_L = 4\Omega$)



IMD 19kHz + 20kHz (10W, 4Ω)

