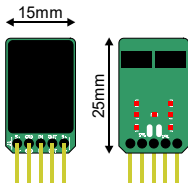


High-Performance Voltage Regulators

For detailed operation and installation instructions and specifications, please download the datasheet for this product from our website.



Features

- Ultra-low noise
- Wide bandwidth
- Excellent ripple rejection
- Low, load-independent output impedance
- Kelvin sense connections
- Size and pin compatible with TO-220 style regulators

Applications

- Preamplifiers and buffers
- RIAA input stages
- Playback head amplifiers
- Performance upgrade for existing products

Description

The HPR12/HNR12 are high performance voltage regulators targeted at performance-critical audio applications. Key performance parameters exceed that of industry-standard integrated circuits by several orders of magnitude. Kelvin sense connections provide point-of-load (local) regulation without requiring physical proximity.

General Performance Data

$V_I=18V$, $I_O=10mA$, $T_{amb}=25^{\circ}C$, unless otherwise noted

Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Note
Input Voltage		V_{IN}	15	18	25	V	¹⁾
Thermal dissipation		T_{DISP}		0,5	0,75	W	^{1) 2)}
Output Voltage		V_{OUT}	11.5	12	12.5	V	
Output Impedance	$T_j = 25^{\circ}C$	Z_{OUT}	-	50	70	m Ω	
Ripple Rejection	$T_j = 25^{\circ}C$	PSRR	105	110	-	dB	
Output Noise Voltage	MBW=10Hz to 20kHz	V_N	-	290	400	nV	
Dropout Voltage		V_D	-	-	3	V	
Quiescent Current	$T_j = 25^{\circ}C$	I_Q	-	14	20	mA	
Output Current Range		I_{OUT}	0	-	100	mA	
Short-Circuit Current		I_{SC}	-	500	-	mA	
Optimum Load Capacitance Range		C_L	2.2	-	∞	μF	



Attention: Observe precautions for handling electrostatic sensitive devices. This module uses semiconductors that can be damaged by electrostatic discharge (ESD). Damage due to inappropriate handling is not covered by warranty.

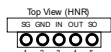
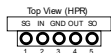
Environmental Specifications

Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Not e
Ambient Temperature	Storage		-25	-	70	°C	
	Operation	T_{amb}	0	-	50	°C	
Thermal resistance		$R_{\theta JA}$		105		°C/W	
Humidity	Max 85 percent relative humidity, non-condensing.						

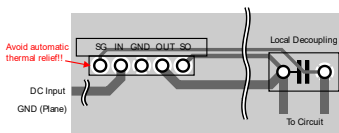
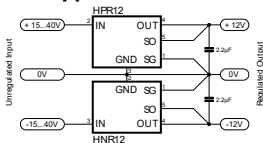
Connections

The middle three pins on the HxR12 modules match the pin-out of the standard LM7812CT/LM7912CT devices. If the decoupling capacitor is placed very close to the regulator, full pin-compatibility can be achieved by shorting the two solder jumpers on the back of the module and clipping the two outer pins. This adversely affects all performance parameters so this should only be done when retrofitting pre-existing equipment. In case of doubt, run two wires from the decoupling capacitor to the Kelvin sense connections.

HPR12			HNR12	
Pin	Name	Function	Name	Function
1	SG	Ground Sense input	SG	Ground Sense input
2	IN	Unregulated input	GND	Ground connection
3	GND	Ground connection	IN	Unregulated input
4	OUT	Regulated Output	OUT	Regulated Output
5	SO	Output Sense input	SO	Output Sense input



Typical Application Schematic



PCB Layout Considerations

The HxR12 regulators are fast, high-performance circuits. Care must be taken not to degrade performance by lay-out oversights. Most CAD tools automatically assign the output and sense pins to the same net. The sense traces must be routed manually from the decoupling capacitor to the regulator. When using a ground plane, special care should be taken to keep the layout program from drawing a thermal relief star straight to the ground plane. If necessary, use "0 ohm" jumpers to forcibly separate the negative kelvin sense from the GND net. Sense traces should be treated like a differential signal connection. Run them parallel and close to each other, not necessarily parallel to the output traces. The regulator has minimal decoupling internally. If the power traces from the unregulated supply to the regulator are particularly long, some extra decoupling in the form of a series resistor and a small electrolytic capacitor might be added.