

8 Watts

- EN50155 for Rail Applications
- EN50121-3-2 EMC for Rail Applications
- Single and dual outputs
- 3000VDC Isolation
- -40 to 85°C Operation
- Remote on/off
- 5 Year warranty



The HTR08 series of DC/DC converters come in both single and dual outputs in a DIP 24 pin package. Inputs are available in nominal 24 & 110V and outputs from 3.3 to 15V single and dual. The unit is complete with remote on/off function. The units operate from -40 to +85°C. All models have a FiDUS 5 year warranty.

Dimensions:

1.25 x 0.80 x 0.40" (31.8 x 20.3 x 10.2mm)

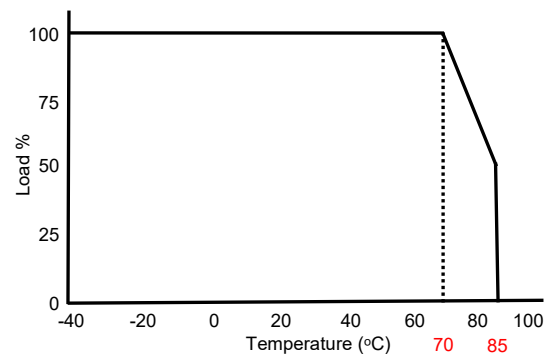
Models & Ratings

Model Number	Input Voltage	Output Voltage	Output Current	Input Current		Maximum Capacitive Load	Efficiency
				No Load	Full Load		
HTR082403	13-70V	3.3V	2400mA	30mA	397.59mA	1330uF	83%
HTR082405		5V	1600mA	20mA	387.60mA	1330uF	86%
HTR082412		12V	665mA	10mA	391.18mA	330uF	85%
HTR082415		15V	535mA	10mA	388.18mA	220uF	86%
HTR082405D		±5V	±800mA	10mA	401.61mA	±900uF	83%
HTR082412D		±12V	±335mA	10mA	394.12mA	±220uF	85%
HTR082415D		±15V	±265mA	10mA	385.17mA	±100uF	86%
HTR0811003	42-176V	3.3V	2400mA	10mA	88.89mA	1330uF	81%
HTR0811005		5V	1600mA	10mA	86.58mA	1330uF	84%
HTR0811012		12V	665mA	5mA	86.36mA	330uF	84%
HTR0811015		15V	535mA	5mA	87.90mA	220uF	83%
HTR0811005D		±5V	±800mA	5mA	90.91mA	±900uF	80%
HTR0811012D		±12V	±335mA	5mA	89.14mA	±220uF	82%
HTR0811015D		±15V	±265mA	5mA	87.08mA	±100uF	83%

Notes

1. Under no load conditions the unit may not meet all specifications
2. Series diode required for reverse polarity protection

Derating curve



Input	
Parameter	Rating
Input voltage range	See table
Input reflected ripple current	20mA pk-pk through 12uH inductor and cap 3.3uF
Input surge (100mS max)	24V Models 100VDC Max. 110V Models 185VDC Max.
Input filter	Pi type

Output					
Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Output voltage	3.3		15	VDC	See Model & Ratings table
Set point accuracy			±1	%	
Line regulation			±0.5	%	Low line to High line
Load regulation			±0.5	%	Single outputs. 0 to 100% load change
			±1		Dual outputs. 0 to 100% load change
Cross regulation			±5	%	On dual output models when one load is varied by 25 to 100% and the other is 100% load.
Ripple & Noise			75	mV pk-pk	All models measured with 0.1uF ceramic capacitor and 10uF electrolytic capacitor.
Overvoltage protection	3.3V output 3.9V. 12V output 15V. ±5V output ±6.2V. ±15V output ±18V	5V output 6.2V. 15V output 18V. ±12V output ±15V.		VDC	
Transient response	All models except single 3.3V: ±3 % max			% Deviation	For a 25% load change (1A/uS), at nominal Vin recovery to within 3% within 250uS typically.
	Single Output 3.3V: ±5 % max				
Short circuit protection					Continuous with automatic recovery
Maximum capacitive load					See Model and Ratings table
Remote on/off	Module on: 3.0 to 12.0 Vdc or open circuit. Module off: short circuit pin 2/3 and 1 or 0 to 1.2 Vdc. Off input current 5mA typ.				

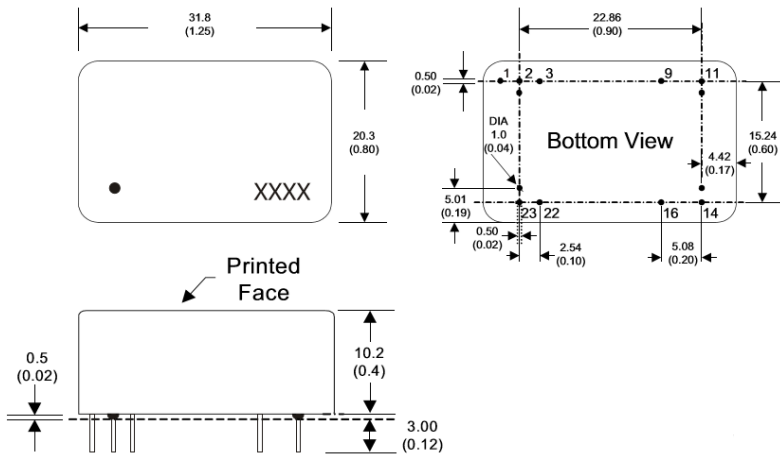
General					
Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	80		86	%	See Model & Ratings table
Isolation			3000	VDC	Input to output
			1000		Metal Case Input / Output
Isolation resistance	1000			M Ohm	
Isolation capacitance			1000	pF	
Switching frequency		330		KHz	24V Modes
		220			110V Modes
Power density			20	W/In ³	
MTBF		>800		KHrs	As per MIL-HDBK-217F, 25°C GB

Environmental					
Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating temperature	-40		85	°C	Max. 70°C at 100% load. 85°C at 50% load
Storage temperature	-55		125	°C	
Case temperature			105	°C	
Cooling					Convection cooled
Humidity			95	% RH	Non-condensing

EMC: Emissions		
	Standard	Notes & Conditions
Conducted	EN50121-3-2	99dBuV from 0.15-0.5MHz and 93dBuV from 0.5-30MHz, EN55022 Level A
Radiated	EN50121-3-2	40dBuV from 30-230MHz and 47dBuV from 230-1000MHz, EN55022 Level A

EMC: Immunity			
	Standard	Criteria	Notes & Conditions
ESD	EN50121-3-2	A	Air ±8KV, Contact ±6KV
Radiated	EN50121-3-2	A	20V/m
EFT/Burst	EN50121-3-2	A	2KV: External input capacitor required: 330uF/100V models HTR0824XX, 2x in parallel 100uF/250V models HTR08110XX
Surges	EN50121-3-2	A	2KV: External input capacitor required: 330uF/100V models HTR0824XX, 2x in parallel 100uF/250V models HTR08110XX
Conducted	EN50121-3-2	A	10V
Magnetic fields	EN61000-4-8	A	10A/m

Mechanical Details



Pin Connections		
Pin	Single	Dual
1	CTRL	CTRL
2	-Vin	-Vin
3	-Vin	-Vin
9	N.P.	Common
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Notes

1. All dimensions shown in millimetres (inches)
2. Pin diameter 0.5 ± 0.05 (0.02 ± 0.002)
3. Case tolerance ± 0.5 (± 0.002)

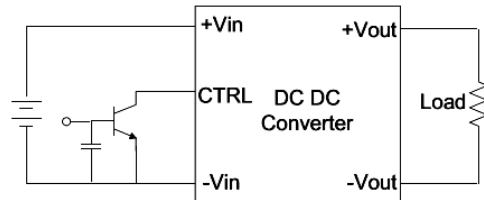
Physical

Parameter	Rating
Case material	Nickel coated copper
Pin material	0.5mm Brass solder coated
Potting material	Epoxy (UL94V-0)
Weight	18g (Metal Case)
Dimensions	1.25 x 0.80 x 0.40"
Soldering temperature	1.5mm from case, 10s and 260°C max.

Application notes

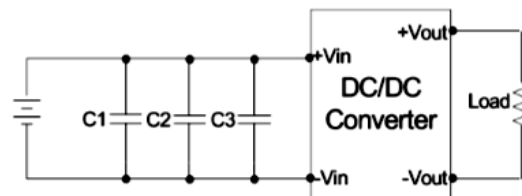
Remote ON/OFF

The HTR08 series output can be turned on and off using the remote on/off function. If Pin 1 is left open circuit or 3-12VDC then the unit is ON. Module off: short circuit pin 1 and 2 or 0 to 1.2 Vdc. Off input current 5mA typ.



EMI Filter

The input filter components C1, C2 and C3 can be fitted to help meet conducted emission requirements for EN50121-3-2. They should be mounted as close as possible to the module. Lead lengths should be minimized and where possible avoid running input and output tracks under the module as part of good design practice for best EMC performance. If the module is embedded in a system running from a AC/DC converter, this will have its own additional immunity protection and EMI filtering that will impact the overall system EMI performance. Using this same filter 24V will pass EN55032 level A emissions



Model number	C1, C2, C3
HTR0824XX	None
HTR08110XX	MLCC, 1uF, 250V