

20 Watts

- High power density
- 2:1 Input range
- 1 x 1" Package
- Efficiency up to 90%
- Single and dual outputs
- Remote on/off
- 3 Year warranty



The HCG20 series of high power dense DC/DC converters come in both single and dual outputs. Inputs are available in 12, 24 & 48V versions with 2:1 range and outputs from 3.3V to 15V single and dual. The units operate from -40 to +75°C and are complete with remote on/off feature. All models have a FiDUS 3 year warranty.

Dimensions:

1.00 x 1.00 x 0.41" (25.4 x 25.4 x 10.4mm)

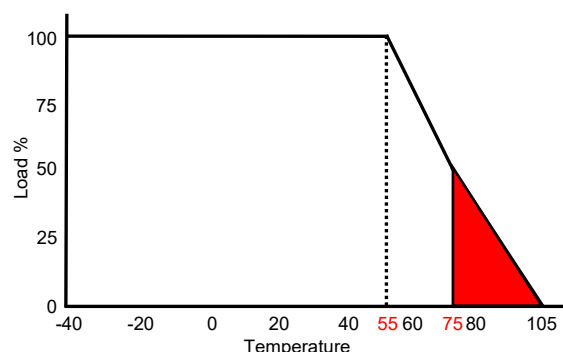
Models & Ratings

Model Number	Input Voltage	Output Voltage	Output Current	Input Current		Maximum Capacitive Load	Efficiency
				No Load	Full Load		
HCG201203	9-18V	3.3V	4500mA	60mA	1439mA	7000uF	86%
HCG201205		5V	4000mA	60mA	1852mA	5000uF	90%
HCG201212		12V	1670mA	30mA	1873mA	850uF	89%
HCG201215		15V	1330mA	30mA	1873mA	700uF	89%
HCG201212D		±12V	±833mA	30mA	1873mA	±470uF	89%
HCG201215D		±15V	±667mA	30mA	1873mA	±330uF	89%
HCG202403	18-36V	3.3V	4500mA	34mA	720mA	7000uF	86%
HCG202405		5V	4000mA	35mA	936mA	5000uF	89%
HCG202412		12V	1670mA	25mA	936mA	850uF	89%
HCG202415		15V	1330mA	25mA	936mA	700uF	89%
HCG202412D		±12V	±833mA	30mA	936mA	±470uF	89%
HCG202415D		±15V	±667mA	30mA	936mA	±330uF	89%
HCG204803	36-75V	3.3V	4500mA	25mA	360mA	7000uF	86%
HCG204805		5V	4000mA	25mA	468mA	5000uF	89%
HCG204812		12V	1670mA	15mA	468mA	850uF	89%
HCG204815		15V	1330mA	15mA	463mA	700uF	85%
HCG204812D		±12V	±833mA	20mA	468mA	±470uF	89%
HCG204815D		±15V	±667mA	20mA	468mA	±330uF	89%

Notes

1. Under no load conditions the unit may not meet all specifications
2. Do not operate continuously in the red area of the derating curve

Derating curve



Input	
Parameter	Rating
Input voltage range	See table
Input reflected ripple current	30mA pk-pk through 12uH inductor
Input surge (100mS max)	12V Models 25V DC Max. 24V Models 50VDC Max. 48V Models 100VDC 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	3.3 and 5V output models.
			100		All other output models. Measured with 1uF ceramic capacitor and 10uF tandem. 20 MHz bandwidth
Overvoltage protection	3.3V output 3.9V. 12V output 15V. ±12V output ±15V.	5V output 6.2V. 15V output 18V. ±15V output ±18V		VDC	
Transient response			±3	% Deviation	For a 25% load change, recovery to within 3% within 250uS typically.
Short circuit protection					Continuous with automatic recovery
Maximum capacitive load					See Model and Ratings table
Remote on/off	ON:3 to 12Vdc or open circuit. OFF <1.2Vdc or short circuit pins 2 & 3. Off idle current :5mA typical.				

General

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	86		90	%	See Model & Ratings table
Isolation			1600	VDC	Input to output
Isolation resistance	1000			M Ohm	
Isolation capacitance		1500		pF	
Switching frequency		330		KHz	
Power density			50	W/In ³	
MTBF		>560		KHrs	As per MIL-HDBK-217F, 25°C GB

Environmental

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating temperature	-40		75	°C	Max. 55°C at 100% load
Storage temperature	-55		125	°C	
Case temperature			105	°C	
Cooling					Convection cooled
Humidity			95	% RH	Non-condensing
Temperature coefficient			±0.02	%/°C	

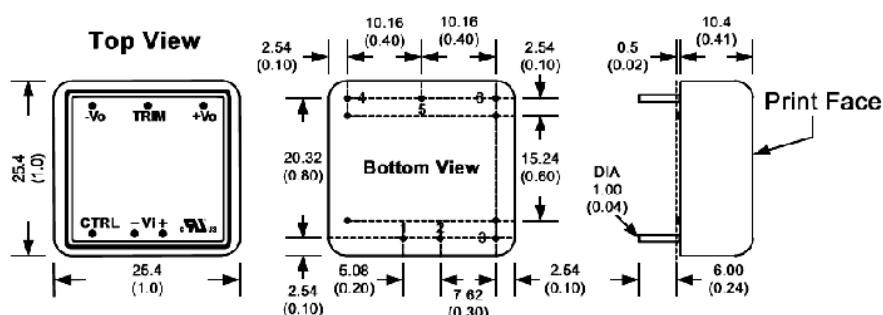
EMC: Emissions

	Standard	Test level	Notes & Conditions
Conducted	EN55032	Class A	No components required
Radiated	EN55032	Class A	

EMC: Immunity

	Standard	Test level	Criteria	Notes & Conditions
ESD	EN61000-4-2	3	A	8kV air discharge, 6kV contact discharge
Radiated	EN61000-4-3	3	A	80~1000 MHz, 10V/m, 80% AM (1kHz)
EFT/Burst	EN61000-4-4	3	A	A 220uF/100V capacitor required. Power line : 2kV
Surges	EN61000-4-5	3	A	A 220uF/100V capacitor required. 1.2/50 µs Open Circuit Voltage, 8/20 µs Short Circuit Current, DC Port, Line to line : 1.0kV
Conducted	EN61000-4-6	10Vrms	A	0.15 ~ 80 MHz, 10Vrms, 80% AM (1kHz)
Magnetic fields	EN61000-4-8	1A/m	A	50Hz, 1A/m

Mechanical Details



Pin Connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	Trim	0V
6	-Vout	-Vout

Notes

1. All dimensions shown in millimetres (inches)
2. Pin diameter 1.0 ±0.05 (0.04 ±0.002)
3. Case tolerance ±0.5 (±0.002)

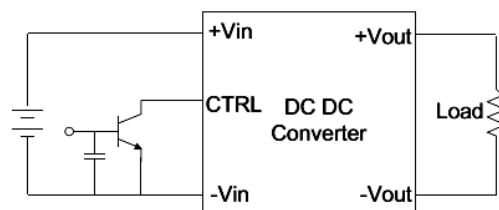
Physical

Parameter	Rating
Case material	Nickel coated copper
Pin material	1.0mm Brass solder coated
Potting material	Non conductive plastic (UL94V-0)
Weight	19g
Dimensions	1.00 x 1.00 x 0.40"
Soldering temperature	1.5mm from case, 10s and 260°C max.

Application notes

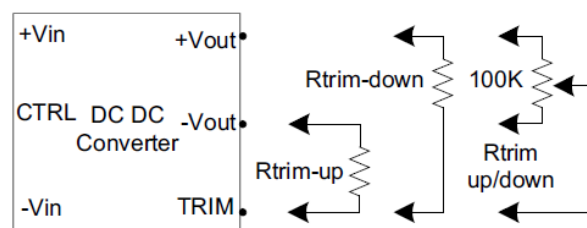
Remote ON/OFF

The HCG20 series output can be turned on and off using the remote on/off function. If Pin 3 is left open circuit or high impedance then the unit is ON. To turn off short pin 2 and 3 or supply 0-1.2V. Idle current 5mA typically.



Trim Tables

Output voltage trim function allows the user to increase or decrease the output voltage set point. The module may be connected with an external resistor (Rtrim) between TRIM pin and either +Vout or -Vout. By adjusting Rtrim, the output voltage can be changed by $\pm 10\%$ of nominal the output voltage.



HCG20XX03

Trim down	1	2	3	4	5	6	7	8	9	10	%
Vout=	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.970	Volts
Rtrim-down	286.268	154.699	100.178	70.355	51.546	38.601	29.147	21.940	16.264	11.678	KOhms
Trim up	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	%
Vout=	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630	Volts
Rtrim-up	494.831	167.448	93.381	60.637	42.176	30.327	22.077	16.002	11.342	7.655	KOhms

HCG20XX05

Trim down	1	2	3	4	5	6	7	8	9	10	%
Vout=	4.950	4.900	4.850	4.800	4.750	4.700	4.650	4.600	4.550	4.500	Volts
Rtrim-down	230.566	106.182	64.301	43.281	30.643	22.207	16.177	11.651	8.129	5.310	KOhms
Trim up	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	%
Vout=	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500	Volts
Rtrim-up	244.547	113.776	70.631	49.142	36.274	27.707	21.592	17.010	13.447	10.598	KOhms

HCG20XX12

Trim down	1	2	3	4	5	6	7	8	9	10	%
Vout=	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800	Volts
Rtrim-down	273.344	135.217	84.017	57.325	40.944	29.865	21.873	15.836	11.114	7.320	KOhms
Trim up	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	%
Vout=	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200	Volts
Rtrim-up	462.903	197.859	120.658	83.855	62.317	48.178	38.184	30.749	24.994	20.413	KOhms

HCG20XX15

Trim down	1	2	3	4	5	6	7	8	9	10	%
Vout=	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500	Volts
Rtrim-down	433.811	174.916	100.946	65.907	45.468	32.077	22.625	15.596	10.165	5.842	KOhms
Trim up	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	%
Vout=	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500	Volts
Rtrim-up	347.293	178.523	115.235	82.084	61.833	47.863	37.882	30.336	24.430	19.682	KOhms