GAPTEC®
GREEN TECHNOLOGY

20DMW_1.5 Series

20W - Single/Dual Output - Ultra Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 20 Watt

- **Wide 2:1 input voltage range**
- **High efficiency up to 90%**
- **Remote On/Off**
- **Input/output isolation voltage: 1.5K Vdc**
- **Short circuit protection (SCP)**
- **RoHS compliant**
- **Operating temperature range: -40°C to +85°C**
- **Over voltage protection: clamp mode**
- **Shielded metal case with insulated baseplate**
- **20W DIL PACKAGE Standard 1"x1" package**
- **Customer design available**

The 20DMW_S & 20DMW_D series are isolated 20W DC/DC converters. Designed with high efficiency, they allow the operating temperature range of these units to be -40°C to +85°C (with derating) in a 6 pin DIP package with industry-standard footprint. Further features include wide 2 : 1 input voltage range, remote on/off control, trimmable output, short-circuit protection and over voltage protection.

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.

Common specifications

Short circuit protection:	Hiccup, continuous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C~+125°C
Maximum case temperature:	100°C MAX
Soldering temperature:	265°C MAX for 10 sec.
Switching frequency:	330kHz TYP
Storage humidity range:	95% MAX
Safety standards:	EN 60950-1, IEC 60950-1
Vibration and thermal shock:	MIL-STD-810E
Case material:	Nickel-coated copper (six-sided)
Base material:	Non-conductive black FR4
Potting material:	Epoxy (UL94V-0)
MTBF (MIL-HDBK-217F @25°C):	340,000 hours
Weight:	16.5g

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage tolerance				±2	%
Line regulation	Vmin to Vmax			0.5	%
Load regulation	• 25% -100% (single) • Balanced load (dual)			±0.5 ±1.0	% %
Load variation	Unbalanced load 25% to 100% full load			±5	%
Minimum load	required			10	%
Temperature drift	Vout		±0.05		%/°C
Ripple and noise*	20MHz Bandwidth			100	mVp-p
Start up time	nominal Vin and constant resistive load		450		ms
Transient response setting time	25% load step change		300		µs
Over load protection	% of full load at nominal input	110			%
Over voltage protection	• 3.3VDC • 5VDC • 12VDC • 15VDC	3.7 5.6 13.5 16.8		5.4 7 19.6 20.5	% % % %
Output current limitation	at 150 % of Iout max., constant current				

* Ripple & Noise measurement bandwidth is 20 MHz, measured with a 1uF M/C and a 10uF T/C.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input surge voltage (100ms max.)	• 12V • 24V • 48V		25 50 100		V V V
Start-up voltage	• 12V • 24V • 48V		8.7 16.9 33	9 18 36	VDC VDC VDC
Under voltage shutdown	• 12V • 24V • 48V		8.3 16.2 30.5	9 18 36	VDC VDC VDC
Input filter	LC network				
Input reflected ripple current	Nominal Vin and full load		30		mA
Remote ON/OFF	• Converter: ON • Converter: OFF • Off idle current	3.0 ~ 15 VDC or open circuit 0 ~ 1.2 VDC or short circuit pin 6 and pin 2	2.5		mA
EMI (Conducted & radiation)	EN 55022 level A				
Protection	Fuse recommended				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input to output			1500	VDC
Isolation resistance	Test at 500VDC	1000			Ω
Isolation capacitance			1000		pF

Model selection:
WCTV_xxyyN##
W= Watt; **C=**Case; **T=** Type; **V=** Voltage Variation (omitted ± 10%);
xx= Vin; **yy=** Vout; **N=** Numbers of Output; **##=** Isolation (kVDC)

Example:
20DMW_2415S1.5
20=20Watt; D= DIP; M=series; W= wide input (2:1) 18-36Vin; 15Vout; S= single output; 1.5= 1500VDC

Note:
1. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
2. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.

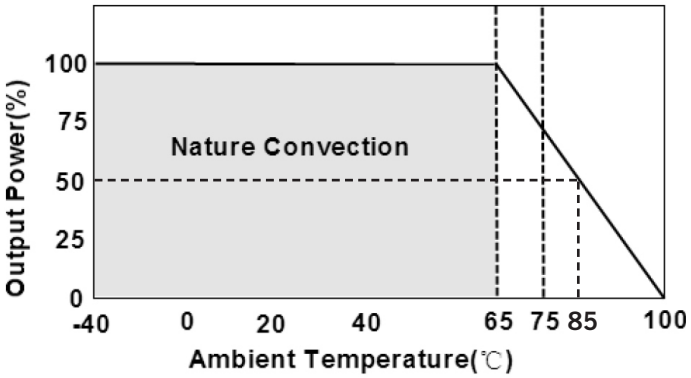
GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

20DMW_1.5 Series

20W - Single/Dual Output - Ultra Wide Input - Isolated & Regulated DC-DC Converter

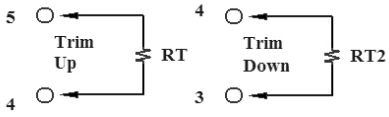
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA]	Input Current [mA]		Efficiency [%, Typ.]	Capacitor load [µF, Max]
	Nominal	Range	Max			No load	Full load		
20DMW_1203S1.5	12	9-18	20	3.3	4500	50	1456	85	8800
20DMW_1205S1.5	12	9-18	20	5	4000	70	1894	88	5600
20DMW_1212S1.5	12	9-18	20	12	1670	30	1898	88	960
20DMW_1215S1.5	12	9-18	20	15	1333	30	1889	88	470
20DMW_1212D1.5	12	9-8	20	±12	±833	30	1872	89	470
20DMW_1215D1.5	12	9-18	20	±15	±667	30	1874	89	330
20DMW_2403S1.5	24	18-36	40	3.3	4500	70	719	86	8800
20DMW_2405S1.5	24	18-36	40	5	4000	70	947	88	5600
20DMW_2412S1.5	24	18-36	40	12	1670	25	938	89	960
20DMW_2415S1.5	24	18-36	40	15	1333	25	924	90	470
20DMW_2412D1.5	24	18-36	40	±12	±833	25	936	89	470
20DMW_2415D1.5	24	18-36	40	±15	±667	25	937	89	330
20DMW_4803S1.5	48	36-75	80	3.3	4500	30	360	96	8800
20DMW_4805S1.5	48	36-75	80	5	4000	30	473	88	5600
20DMW_4812S1.5	48	36-75	80	12	1670	15	474	88	330
20DMW_4815S1.5	48	36-75	80	15	1333	15	472	88	330
20DMW_4812D1.5	48	36-75	80	±12	±833	25	468	89	330
20DMW_4815D1.5	48	36-75	80	±15	±667	25	468	89	220

Temperature derating curve

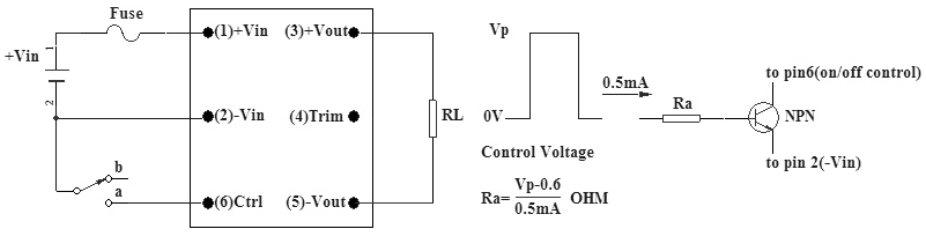


Output voltage adjustment

Output can be externally trimmed by using the method shown below.

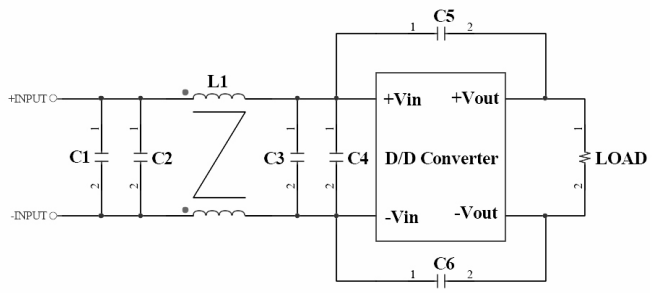


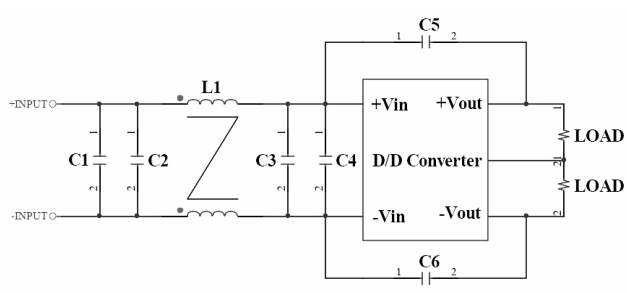
Control Pin suggest circuit



When pin6 short to pin2,D/D ON=>OFF
When pin6 leave open,D/D => ON

EMC considerations



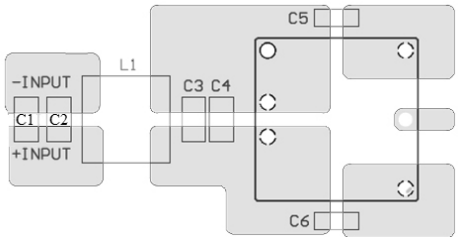


Suggested Schematic to comply with EN55022 Conducted Noise emission Class B

Following components are needed to comply with EN55022 Class B conducted noise:

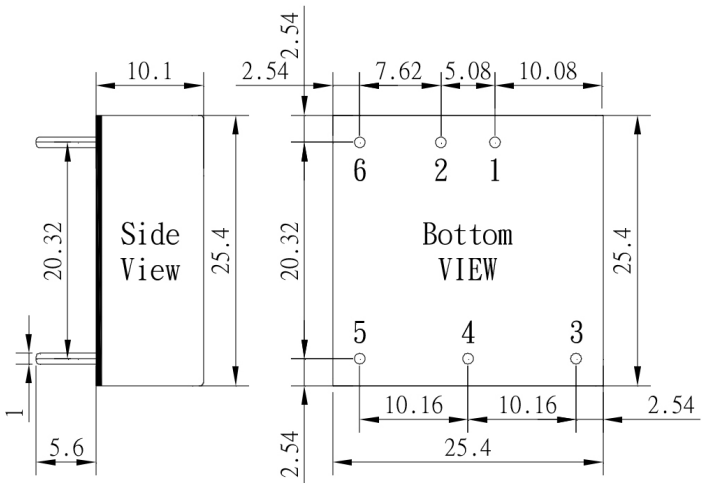
Component	Value	Voltage	Reference
C1, C2, C3	6.8uF	50V	1812 MLCC
C5, C6	1000pF	2KV	1206 MLCC
L1	325uH		Common Mode Choke

Component	Value	Voltage	Reference
C1, C2, C3, C4	2.2uF	100V	1812 MLCC
C5, C6	1000pF	2KV	1206 MLCC
L1	325uH		Common Mode Choke



Recommended layout with input filter

Mechanical dimensions



Note:
Unit: mm[inch]
General tolerances: ±0.5mm [±0.02inch]

PIN connection	1	2	3	4	5	6
Single	+Vin	-Vin	+Vout	Trim	-Vout	Ctrl ON/OFF
Dual	+Vin	-Vin	+Vout	Com	-Vout	Ctrl ON/OFF