



## 20DAW8\_1.6 series

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

## DC-DC Converter 20 Watt

- ⊕ 20W DIL package
- ⊕ 8:1 wide input voltage range
- ⊕ High efficiency up to 92%
- ⊕ Regulated output types
- ⊕ No minimum load required
- ⊕ Over power and short circuit protection
- ⊕ Over temperature protection
- ⊕ Operating temp. -40°C to +83°C (without derating)
- ⊕ UL94V-0 package material
- ⊕ 100% burned-in
- ⊕ 3 years warranty

The 20DAW8\_1.6 series of isolated 20W DC-DC products with an ultra 8:1 input voltage range. They feature efficiencies up to 92%, input to output isolation is tested with 1600VDC operating ambient temperature range of -40°C to +83°C, input under-voltage protection, output short-circuit, over-voltage, over-current protection, over temperature protection.



Common specifications	
Short circuit protection:	Hiccup, continous, auto recovery
Operation temperature:	-40°C~+83°C (See Fig. 1)
Storage temperature:	-55°C~+125°C
Storage humidity:	5% Min, 95% Max (Non-condensing)
Case Temperature:	105°C Max
Operating Ambient Temperature (Power Derating See Derating Graph)	Nominal Vin, 100% Load 20DAW8_3605S1.6, 20DAW8_3615S1.6, 77.2°C 20DAW8_3612D1.6, 40 ~ 80.2°C 20DAW8_3612S1.6, 20DAW8_3615D1.6 83.3°C 20DAW8_3624S1.6
Thermal Impedance:	20LFM 12.5 °C/W 100LFM 9.5 °C/W 200LFM 7.8 °C/W 400LFM 5.1 °C/W
MTBF:	976k hour, Typ. (MIL-HDBK-217F@25°C)
Case material:	Copper
Cooling:	Natural Convection
Dimensions:	50.8 x 25.4 x 11.6
Weight:	35g typ.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input Voltage		9	36	75	VDC
Input Surge Voltage	100ms max.	0.7		100	VDC
Start-up voltage				9	VDC
Input Under-voltage Protection			7.5		VDC
Input filter	Internal Pi type				
Start-up time	Constant Resistive Load, Nominal Vin				
	• Power up		30		ms
	• Remote ON/OFF		30		ms
Remote ON/OFF (Ctrl PIN Refer To Vin PIN)	Positive Logic • DC/DC ON • DC/DC OFF Input Current of Ctrl PIN • Remote Off Input Current	0.5		0.5	mA
			3		

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input to Output (60sec)	1600			VDC
	Input (Output) to Case (60sec)	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz/1V		2200		pF

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Voltage Tolerance	100% load	-2		+2	%
Line regulation	Vin(min) to Vin(max) @100% Load	-0.2		+0.2	%
Load regulation	0% Load to 100% Load	-0.5		+0.5	%
Ripple & Noise (BW=20MHz)	• 5Vout • 12Vout • 15Vout • 24Vout			100 100 150 150	mVp-p mVp-p mVp-p mVp-p
Transient Response Setting Time	25% load step change		350	500	μs
Transient response deviation	25% Load Step Change	-5	±3	+5	%
Temperature coefficient		-0.02		+0.02	%/°C
Voltage Adjustability	% of Vout	-10		+10	%
Switching Frequency	Full Load, Nominal Input	200	235	270	KHz
Output Power Protection	% of Io, Hiccup mode, auto recovery	115	150	190	%
Over Voltage Protection	• 5Vout • 12Vout, ±12Vout • 15Vout, ±15Vout • 24Vout		6.2 15 18 30		VDC VDC VDC VDC

**Example:**  
**20DAW8\_3615S1.6**  
 20 = 20Watt; D = DIL; A = series; W8 = wide input (8:1); 36 = 9-75Vin;  
 15 = 15Vout; S = single output; 1.6 = 1600VDC isolation

### Note:

- The recommended unbalance degree of the dual output module load is  $\leq \pm 5\%$ ; if the degree exceeds  $\pm 5\%$ , than the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a = 25^\circ\text{C}$ , humidity  $< 75\% \text{RH}$  with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on Company's corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Specifications are subject to change without prior notice.

## 20DAW8\_1.6 series

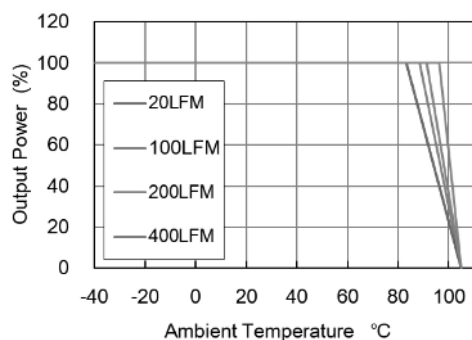
20W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

### Product Selection Guide

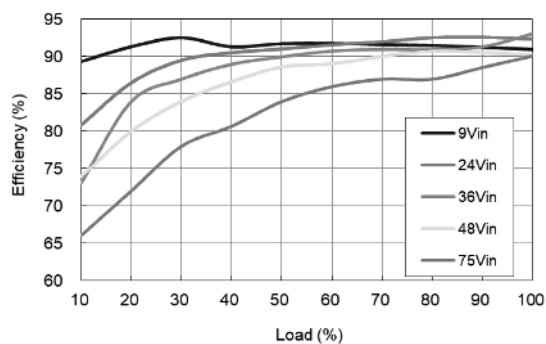
Part Number	Input Voltage [VDC]		Output Voltage [VDC]	Output Current [mA, Max]	Efficiency [%, Typ.]	Capacitive load [ $\mu$ F, Max]
	Nominal	Range				
20DAW8_3605S1.6	36	9-75	5	4000	90	6800
20DAW8_3612S1.6	36	9-75	12	1667	91	1200
20DAW8_3615S1.6	36	9-75	15	1334	90	750
20DAW8_3624S1.6	36	9-75	24	833	92	300
20DAW8_3612D1.6	36	9-75	$\pm 12$	$\pm 833$	90	$\pm 600$
20DAW8_3615D1.6	36	9-75	$\pm 15$	$\pm 667$	91	$\pm 390$

### Typical characteristics

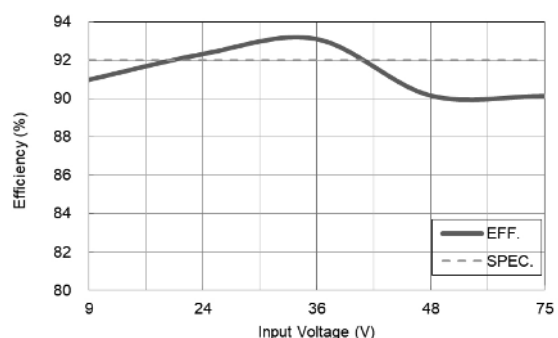
Temperature Derating Graph



### Efficiency

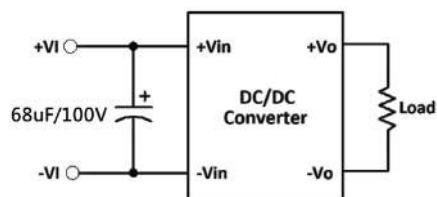


20DAW8\_3624S1.6



20DAW8\_3624S1.6

### Application Examples



It is necessary to parallel a capacitor across the input pins under normal operation.

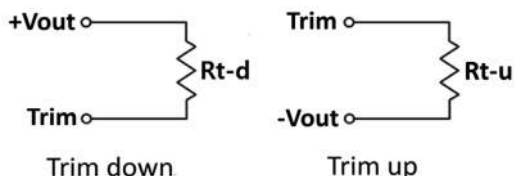
Minimum Capacitance: 68 $\mu$ F/100V.

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### External Output Trimming

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



#### 20DAW8\_3605S1.6

Trim down	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
Rt-d =		138.88KΩ	62.41KΩ	36.92KΩ	24.18KΩ	16.53KΩ	11.44KΩ	7.79KΩ	5.06KΩ	2.94KΩ	1.24KΩ
Trim up	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
Rt-u =		106.87KΩ	47.76KΩ	28.06KΩ	18.21KΩ	12.30KΩ	8.36KΩ	5.55KΩ	3.44KΩ	1.79KΩ	0.48KΩ

#### 20DAW8\_3612S1.6

Trim down	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
Rt-d =		280.90KΩ	125.65KΩ	73.90KΩ	48.02KΩ	32.50KΩ	22.15KΩ	14.76KΩ	9.21KΩ	4.90KΩ	1.45KΩ
Trim up	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
Rt-u =		225.50KΩ	100.75KΩ	59.17KΩ	38.38KΩ	25.90KΩ	17.58KΩ	11.64KΩ	7.19KΩ	3.72KΩ	0.95KΩ

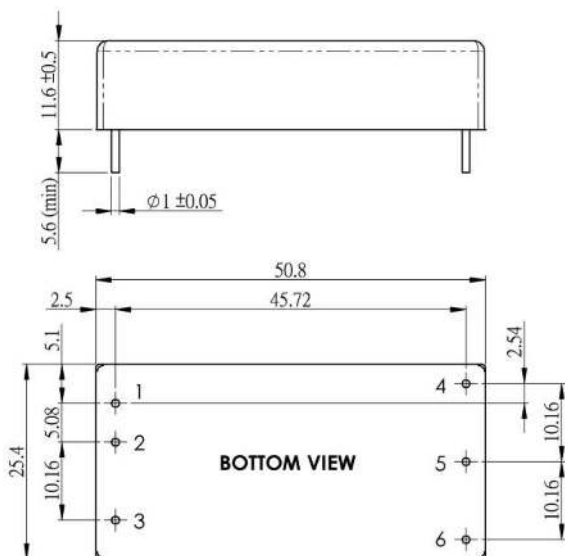
#### 20DAW8\_3615S1.6

Trim down	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
Rt-d =		499.18KΩ	223.09KΩ	131.06KΩ	85.05KΩ	57.44KΩ	39.03KΩ	25.88KΩ	16.02KΩ	8.35KΩ	2.22KΩ
Trim up	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
Rt-u =		404.82KΩ	180.91KΩ	106.27KΩ	68.95KΩ	46.56KΩ	31.64KΩ	20.97KΩ	12.98KΩ	6.76KΩ	1.78KΩ

#### 20DAW8\_3624S1.6

Trim down	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
Rt-d =		598.97KΩ	267.93KΩ	157.59KΩ	102.42KΩ	69.31KΩ	47.24KΩ	31.48KΩ	19.66KΩ	10.46KΩ	3.11KΩ
Trim up	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
Rt-u =		486.83KΩ	217.87KΩ	128.21KΩ	83.38KΩ	56.49KΩ	38.56KΩ	25.75KΩ	16.14KΩ	8.67KΩ	2.69KΩ

### Mechanical dimensions



Unit: mm

Tolerance: XX.X ± 0.5; XX.XX ± 0.25

#### PIN Assignment

Pin	Single	Dual	Diameter
1	+Vin	+Vin	1.0mm[0.04"]
2	-Vin	-Vin	1.0mm[0.04"]
3	Ctrl	Ctrl	1.0mm[0.04"]
4	+Vout	+Vout	1.0mm[0.04"]
5	-Vout	Com	1.0mm[0.04"]
6	Trim	-Vout	1.0mm[0.04"]