



20W 1"x1" Package DC-DC Regulated Converter

# SKMW20 & DKMW20 series



## Features

- DIP 1"x1" package with industry standard pinout
- 4:1 ultrawide input range
- Operating temperature range -40 ~ +85°C
- No minimum load required
- Comply to BS EN/EN55032 radiated Class A without additional components
- High efficiency up to 89%
- Protections: Short circuit (Continuous) / Overload / Over voltage / Input under voltage
- 1.5KVDC I/O isolation
- Remote ON/OFF control and Trimming output ( $\pm 10\%$ )
- 3 years warranty

## Applications

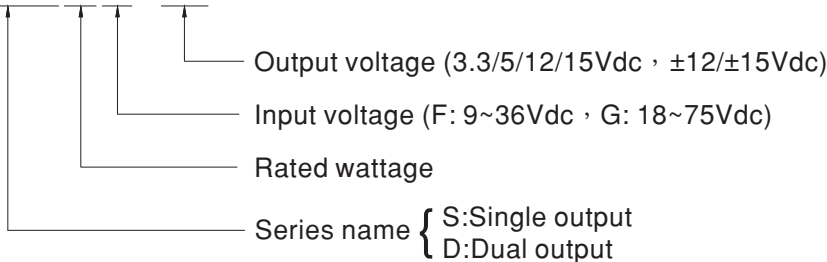
- Telecom/datacom system
- Wireless network
- Industrial control facility
- Instrument
- Analyzer
- Detector
- Data switch

## Description

SKMW20 and DKMW20 series are 20W isolated and regulated module type DC-DC converter with DIP 1"x1" package. It features international standard pins, a high efficiency up to 89%, wide working temperature range -40~+85°C, 1.5KVDC I/P-O/P isolation voltage, compliance to BS EN/EN55032 radiated Class A without additional components, continuous-mode short circuit, overload, over temperature, input under voltage protection, remote ON/OFF and trimmable output voltage etc. The models account for different input voltage 9~36V and 18~75V 4:1 ultrawide input range, and various output voltage, 3.3V/5V/12V/15V for single output and  $\pm 12V/\pm 15V$  for dual outputs, which are suitable for all kinds of systems, Such as industrial control, telecommunication field, distributed power architecture, and so on.

## Model Encoding

**SKMW20F-12**





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MODEL SELECTION TABLE							
ORDER NO.	INPUT			OUTPUT		EFFICIENCY (TYP.)	CAPACITOR LOAD (MAX.)
	INPUT VOLTAGE (RANGE)	INPUT CURRENT		OUTPUT VOLTAGE	OUTPUT CURRENT		
		NO LOAD	FULL LOAD				
SKMW20F-03	24V (9 ~ 36V)	10mA	781mA	3.3V	0~4500mA	87%	5000μF
SKMW20F-05		10mA	926mA	5V	0~4000mA	89%	4000μF
SKMW20F-12		10mA	936mA	12V	0~1670mA	88%	1650μF
SKMW20F-15		10mA	936mA	15V	0~1330mA	88%	1300μF
DKMW20F-12		10mA	936mA	± 12V	± 0 ~ 830mA	87%	*800μF
DKMW20F-15		10mA	936mA	± 15V	± 0 ~660mA	87%	*650μF
SKMW20G-03	48V (18 ~ 75V)	8mA	390mA	3.3V	0~4500mA	87%	5000μF
SKMW20G-05		8mA	463mA	5V	0~4000mA	87%	4000μF
SKMW20G-12		8mA	463mA	12V	0~1670mA	89%	1650μF
SKMW20G-15		8mA	468mA	15V	0~1330mA	88%	1300μF
DKMW20G-12		8mA	473mA	± 12V	± 0 ~ 830mA	87%	*800μF
DKMW20G-15		8mA	468mA	± 15V	± 0 ~660mA	88%	*650μF

\* For each output

SPECIFICATION				
INPUT	VOLTAGE RANGE	F: 9~36Vdc , G: 18~75Vdc		
	SURGE VOLTAGE (100ms max.)	24Vin models : 50Vdc, 48Vin models : 100Vdc		
	FILTER	Pi type		
	PROTECTION	Fuse recommended. 24Vin models: 3A delay time Type, 48Vin models: 1.5A delay time Type		
	INTERNAL POWER DISSIPATION	500mW		
OUTPUT	VOLTAGE ACCURACY	± 1.5%		
	RATED POWER	20W		
	RIPPLE & NOISE   Note.2	3.3/5Vout models: 75mVp-p, other models:100mVp-p		
	LINE REGULATION   Note.3	± 0.2%		
	LOAD REGULATION   Note.4	Single output models: ± 0.2%, Dual output models: ± 1%		
	SWITCHING FREQUENCY (Typ.)	3.3/5Vout models: 270KHz, other models: 330KHz		
	EXTERNAL TRIM ADJ. RANGE (Typ.)	± 10% (Single output model only)		
PROTECTION	SHORT CIRCUIT	Protection type : Continuous, automatic recovery		
	OVERLOAD	110 ~ 170% rated output power		
		Protection type : Recovers automatically after fault condition is removed		
	OVER VOLTAGE	Protection type : Clamp by diode		
	UNDER VOLTAGE LOCKOUT	Start-up voltage	24Vin (F-type): 8.8Vdc, 48Vin (G-type): 17Vdc	
Shutdown voltage		24Vin (F-type): 8Vdc, 48Vin (G-type): 16Vdc		
FUNCTION	REMOTE CONTROL	Power ON: R.C. ~ -Vin >3.5~75Vdc or open circuit ; Power OFF: R.C. ~ -Vin <1.2Vdc or short		
ENVIRONMENT	COOLING	Free-air convection		
	WORKING TEMP.	-40 ~ +85℃ (Refer to "Derating Curve")		
	CASE TEMPERATURE	+105℃ max.		
	WORKING HUMIDITY	20% ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-55 ~ +125℃, 10 ~ 95% RH non-condensing		
	TEMP. COEFFICIENT	0.03% / °C (0 ~ 60℃)		
	SOLDERING TEMPERATURE	1.5mm from case of 1 ~ 3sec./260℃ max.		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes		
SAFETY & EMC ( Note.5)	SAFETY STANDARDS	EAC TP TC 020/2011 (EAC TP TC 004 for 48Vin type only) approved		
	WITHSTAND VOLTAGE	I/P-O/P:1.5KVDC		
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH		
	ISOLATION CAPACITANCE (Typ.)	1500pF		
	EMC EMISSION	Parameter	Standard	Test Level / Note
		Conducted	BS EN/EN55032(CISPR32)	N/A
		Radiated	BS EN/EN55032(CISPR32)	Class A
	EMC IMMUNITY	Parameter	Standard	Test Level / Note
		ESD	BS EN/EN61000-4-2	Level 2, ±8KV air, ±4KV contact
		Radiated Susceptibility	BS EN/EN61000-4-3	Level 2, 3V/m
		EFT/Burest	BS EN/EN61000-4-4	Level 1, 0.5KV
		Surge	BS EN/EN61000-4-5	Level 1, 0.5KV Line-Line
		Conducted	BS EN/EN61000-4-6	Level 2, 3V(e.m.f.)
		Magnetic Field	BS EN/EN61000-4-8	Level 2, 3A/m
OTHERS		MTBF	3.3/5Vout models: 910Khrs, Other models: 1220Khrs MIL-HDBK-217F(25℃)	
	DIMENSION (L*W*H)	25.4*25.4*10.2mm (1*1*0.4 inch)		
	CASE MATERIAL	Black coated copper with non-conductive base		
	PACKING	18g		
NOTE	1.All parameters are specified at normal input(F:24Vdc, G:48Vdc), rated load, 25℃ 70% RH ambient. 2.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µf & 47µf capacitor. 3.Line regulation is measured from low line to high line at rated load. 4.Load regulation is measured from 0% to 100% rated load. 5.The final equipment must be re-confirm that it still meet EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.”(as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> ) ※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a>			

## ■ External Output Trimming

In order to trim the voltage up or down one needs to connect the trim resistor either between the trim pin and -Vo for trim-up and between trim pin and +Vo for trim-down. The output voltage trim range is  $\pm 10\%$ . This is shown in Figures 1 and 2:

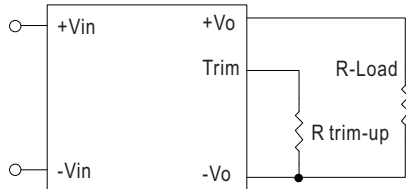


Figure 1. Trim-up Voltage Setup

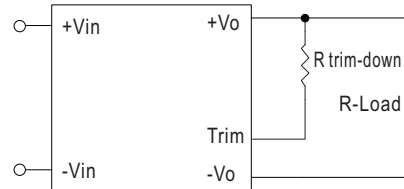


Figure 2. Trim-down Voltage Setup

### 1. The value of Rtrim-up defined as:

$$R_{\text{trim-up}} = \left( \frac{V_r \times R_1 \times (R_2 + R_3)}{(V_o - V_{o, \text{nom}}) \times R_2} \right) - R_t \text{ (K}\Omega\text{)}$$

Where

Rtrim-up is the external resistor in Kohm.

Vo, nom is the nominal output voltage.

Vo is the desired output voltage.

R1, Rt, R2, R3 and Vr are internal to the unit and are defined in Table 1.

Table 1 – Trim up and Trim down Resistor Values

Model Number	Output Voltage(V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Rt (KΩ)	Vr (V)
SKMW20F-03 SKMW20G-03	3.3	2.74	1.8	0.27	9.1	1.24
SKMW20F-05 SKMW20G-05	5.0	2.32	2.32	0	8.2	2.5
SKMW20F-12 SKMW20G-12	12.0	6.8	2.4	2.32	22	2.5
SKMW20F-15 SKMW20G-15	15.0	8.06	2.4	3.9	27	2.5

For example, to trim-up the output voltage of 5.0V module (SKMW20F-05) by 10% to 5.5V, R trim-up is calculated as follows:

$$V_o - V_{o, \text{nom}} = 5.5 - 5.0 = 0.5V$$

$$R_1 = 2.32 \text{ K}\Omega$$

$$R_2 = 2.32 \text{ K}\Omega$$

$$R_3 = 0 \text{ K}\Omega$$

$$R_t = 8.2 \text{ K}\Omega$$

$$V_r = 2.5V$$

$$R_{\text{trim-up}} = \left( \frac{2.5 \times 2.32 \times (2.32+0)}{0.5 \times 2.32} \right) - 8.2 = 3.4(\text{K}\Omega)$$

### 2. The value of Rtrim-down defined as:

$$R_{\text{trim-down}} = R_1 \times \left( \frac{V_r \times R_1}{(V_{o, \text{nom}} - V_o) \times R_2} - 1 \right) - R_t \text{ (K}\Omega\text{)}$$

Where

Rtrim-down is the external resistor in Kohm.

Vo, nom is the nominal output voltage.

Vo is the desired output voltage.

R1, Rt, R2, R3 and Vr are internal to the unit and are defined in Table 1.

For example, to trim-down the output voltage of 5.0V module (SKMW20F-05) by 10% to 4.5V, R trim-down is calculated as follows:

$$V_{o, \text{nom}} - V_o = 5.0 - 4.5 = 0.5V$$

$$R_1 = 2.32 \text{ K}\Omega$$

$$R_2 = 2.32 \text{ K}\Omega$$

$$R_3 = 0 \text{ K}\Omega$$

$$R_t = 8.2 \text{ K}\Omega$$

$$V_r = 2.5V$$

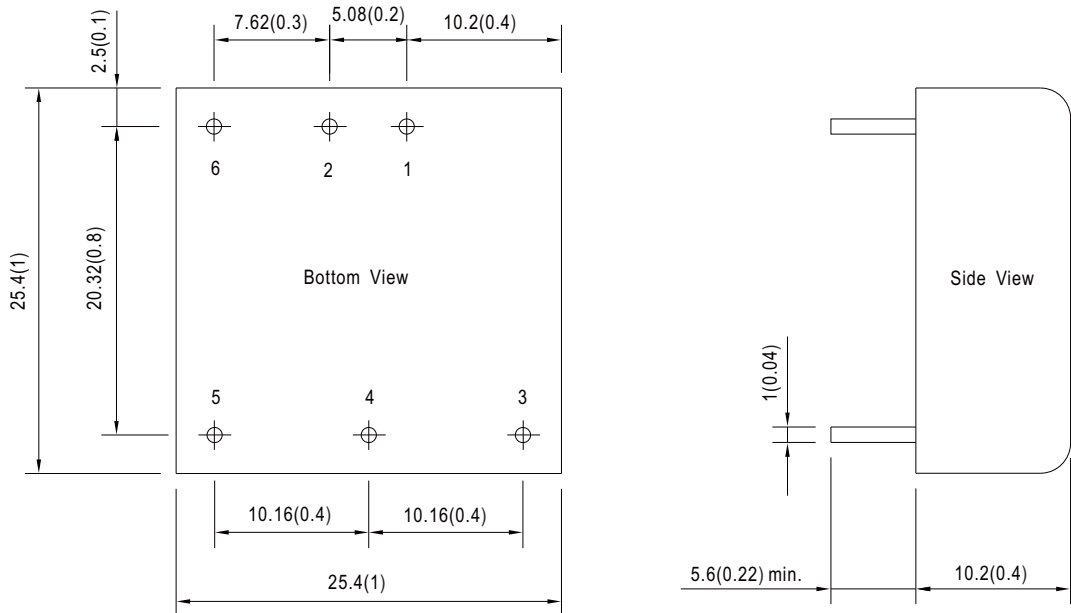
$$R_{\text{trim-down}} = 2.32 \times \left( \frac{2.5 \times 2.32}{0.5 \times 2.32} - 1 \right) - 8.2 = 1.08 (\text{K}\Omega)$$



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■ Mechanical Specification

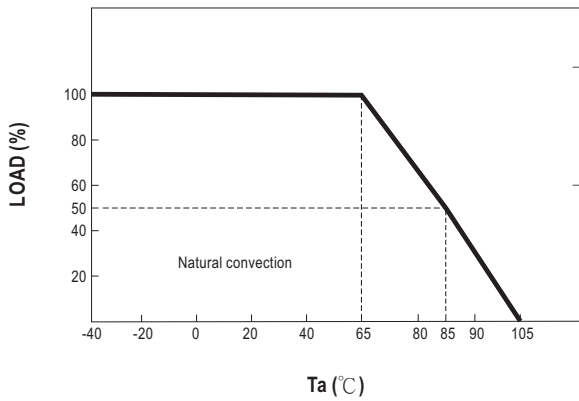
- All dimensions in mm(inch)
- Tolerance:  $x.x \pm 1\text{mm}$  ( $x.xx \pm 0.25"$ )
- Pin size is  $1 \pm 0.1\text{mm}$  ( $0.04" \pm 0.004"$ )



■ Plug Assignment

Pin-Out		
Pin No.	SKMW20 (Single output)	DKMW20 (Dual output)
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	R.C.	R.C.

■ Derating Curve



■ Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>