



■ 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 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

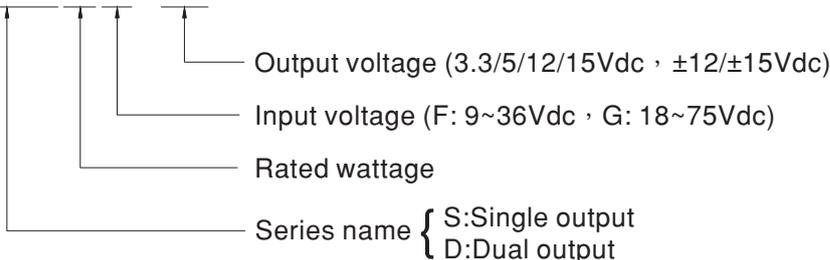
- Telecom/datacom system
- Wireless network
- Industrial control facility
- Instrument
- Analyzer
- Detector
- Data switch

■ 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 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





20W 1"x1" Package DC-DC Regulated Converter **SKMW20 & DKMW20 series**

| 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 <small>Note.2</small> | 3.3/5Vout models: 75mVp-p, other models:100mVp-p | | |
| | LINE REGULATION <small>Note.3</small> | ±0.2% | | |
| | LOAD REGULATION <small>Note.4</small> | 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°C (Refer to "Derating Curve") | | |
| | CASE TEMPERATURE | +105°C max. | | |
| | WORKING HUMIDITY | 20% ~ 90% RH non-condensing | | |
| | STORAGE TEMP., HUMIDITY | -55 ~ +125°C, 10 ~ 95% RH non-condensing | | |
| | TEMP. COEFFICIENT | 0.03% / °C (0 ~ 60°C) | | |
| | SOLDERING TEMPERATURE | 1.5mm from case of 1 ~ 3sec./260°C 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 004 approved | | |
| | WITHSTAND VOLTAGE | I/P-O/P:1.5KVDC | | |
| | ISOLATION RESISTANCE | I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH | | |
| | ISOLATION CAPACITANCE (Typ.) | 1500pF | | |
| | EMC EMISSION | Parameter | Standard | Test Level / Note |
| | | Conducted | EN55032(CISPR32) | N/A |
| | | Radiated | EN55032(CISPR32) | Class A |
| | EMC IMMUNITY | Parameter | Standard | Test Level / Note |
| | | ESD | EN61000-4-2 | Level 2, ±8KV air, ±4KV contact |
| | | Radiated Susceptibility | EN61000-4-3 | Level 2, 3V/m |
| | | EFT/Burest | EN61000-4-4 | Level 1, 0.5KV |
| | | Surge | EN61000-4-5 | Level 1, 0.5KV Line-Line |
| | | Conducted | EN61000-4-6 | Level 2, 3V(e.m.f.) |
| Magnetic Field | | EN61000-4-8 | Level 2, 3A/m | |
| OTHERS | MTBF | 3.3/5Vout models: 910Khrs, Other models: 1220Khrs MIL-HDBK-217F(25°C) | | |
| | 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 | <p>1. All parameters are specified at normal input(F:24Vdc, G:48Vdc), rated load, 25°C 70% RH ambient.</p> <p>2. Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µf & 47µf capacitor.</p> <p>3. Line regulation is measured from low line to high line at rated load.</p> <p>4. Load regulation is measured from 0% to 100% rated load.</p> <p>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 http://www.meanwell.com)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx</p> | | | |

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:

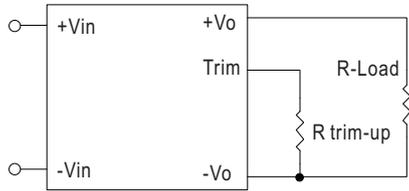


Figure 1. Trim-up Voltage Setup

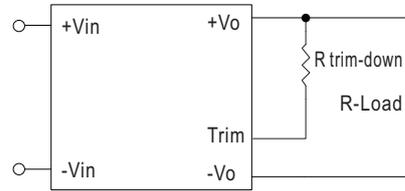


Figure 2. Trim-down Voltage Setup

1. The value of Rtrim-up defined as:

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

Where

R_{trim-up} is the external resistor in Kohm.

V_{o,nom} is the nominal output voltage.

V_o is the desired output voltage.

R₁, R_t, R₂, R₃ and V_r 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:

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

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

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

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

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

$$V_r = 2.5V$$

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

2. The value of Rtrim-down defined as:

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

Where

R_{trim-down} is the external resistor in Kohm.

V_{o,nom} is the nominal output voltage.

V_o is the desired output voltage.

R₁, R_t, R₂, R₃ and V_r 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:

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

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

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

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

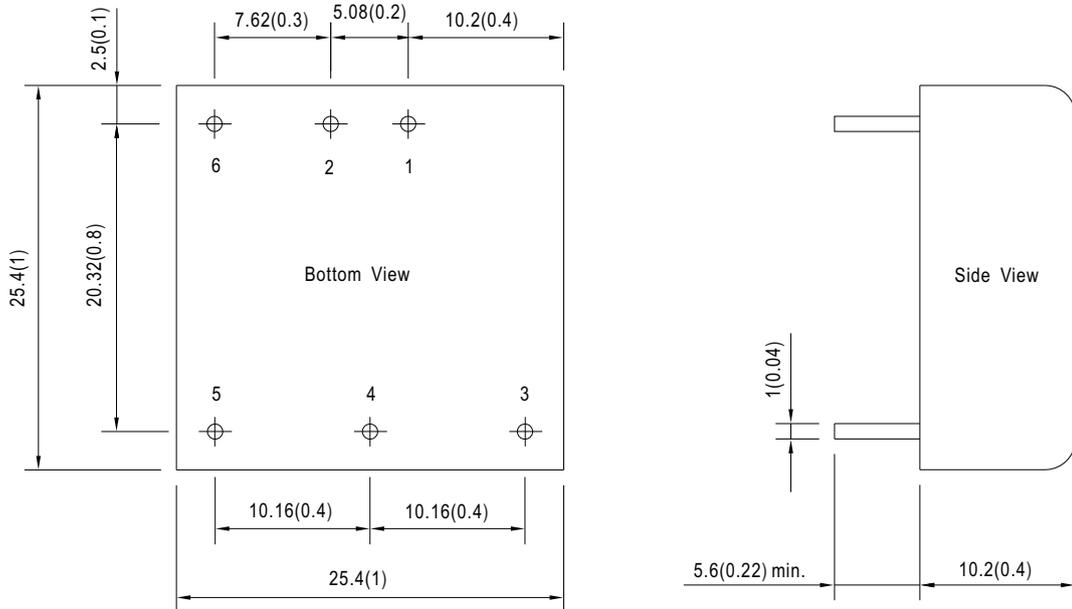
$$R_t = 8.2 \text{ K}\Omega$$

$$V_r = 2.5V$$

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

Mechanical Specification

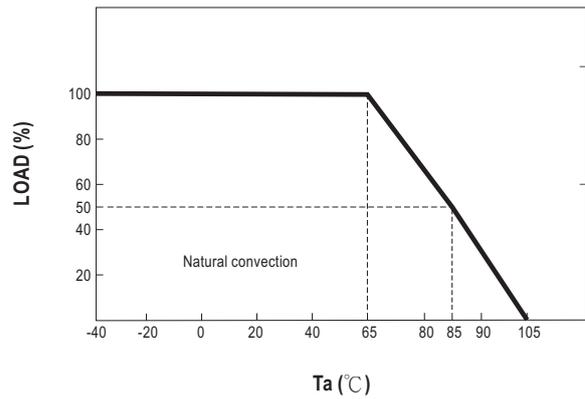
- All dimensions in mm(inch)
- Tolerance: x.x±1mm(x.xx±0.25")
- Pin size is 1±0.1mm (0.04"±0.004")



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>