# CM7W-15W Series

*15W 4:1 Regulated Single & Dual output*

Features

- Ultra Wide 4:1 Input Range
- 3000 VDC Isolation
- Efficiency up to 90%
- Operating Temperature Range -40 ~ 100°C max.
- Adjustable Output Voltage
- Remote ON/OFF Control ( CTRL )
- Continuous Short Circuit Protection
- Over Load Protection
- Over Voltage Protection
- Soft Start
- Built-in EMI filter meets EN55032 classA without external components


## PART NUMBER STRUCTURE

**CM7W - 24 12 S 15 SK**

(1) (2) (3) (4) (5) (6)

**(1) Series**

**(2) Input Voltage Range**
- **24** - 9-36 V
- **48** - 18-75 V

**(3) Output Voltage**
- **3R3** - 3.3 V
- **05** - 5.0 V
- **12** - 12 V
- **15** - 15 V

**(4) Output Type**
- **S** - Single Output
- **D** - Dual Output

**(5) Watt**

**(6) Heat-sink ( Optional )**
- **Blank** - Without Heat-sink
- **SK** - With Heat-sink

# CM7W-15W Series

*15W 4:1 Regulated Single & Dual output*

ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

| Model Number | Input Voltage Range (VDC) | Input Current | | Output Voltage (VDC) | Output Current | | Efficiency @FL (%, typ.) | Capacitive Load @FL (μF, max.) |
|---|---|---|---|---|---|---|---|---|
| | | No-Load (mA, max.) | Full Load (mA, typ.) | | Min. load (mA) | Full load (mA) | | |
| CM7W-243R3S15 | 9-36 | 10 | 503 | 3.3 | 0 | 3000 | 82 | 3300 |
| CM7W-2405S15 | 9-36 | 10 | 731 | 5 | 0 | 3000 | 85.5 | 3300 |
| CM7W-2412S15 | 9-36 | 10 | 702 | 12 | 0 | 1250 | 89 | 680 |
| CM7W-2415S15 | 9-36 | 10 | 702 | 15 | 0 | 1000 | 89 | 470 |
| CM7W-2405D15 | 9-36 | 10 | 727 | ±5 | 0 | ±1500 | 86 | ±2200 |
| CM7W-2412D15 | 9-36 | 10 | 706 | ±12 | 0 | ±625 | 88.5 | ±470 |
| CM7W-2415D15 | 9-36 | 15 | 698 | ±15 | 0 | ±500 | 89.5 | ±330 |
| CM7W-483R3S15 | 18-75 | 10 | 252 | 3.3 | 0 | 3000 | 82 | 3300 |
| CM7W-4805S15 | 18-75 | 10 | 363 | 5 | 0 | 3000 | 86 | 3300 |
| CM7W-4812S15 | 18-75 | 10 | 351 | 12 | 0 | 1250 | 89 | 680 |
| CM7W-4815S15 | 18-75 | 10 | 355 | 15 | 0 | 1000 | 88 | 470 |
| CM7W-4805D15 | 18-75 | 8 | 363 | ±5 | 0 | ±1500 | 86 | ±2200 |
| CM7W-4812D15 | 18-75 | 8 | 347 | ±12 | 0 | ±625 | 90 | ±470 |
| CM7W-4815D15 | 18-75 | 10 | 351 | ±15 | 0 | ±500 | 89 | ±330 |

# CM7W-15W Series

*15W 4:1 Regulated Single & Dual output*

## INPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Voltage Range | 24V Input | | 9 | 24 | 36 | VDC |
| | 48V Input | | 18 | 48 | 75 | |
| Under Voltage Protection | 24V Input | Module ON | | 8.8 | | VDC |
| | | Module OFF | | 7.6 | | |
| | 48V Input | Module ON | | 17.5 | | |
| | | Module OFF | | 16.5 | | |
| Input Filter | | | | Pi Type | | |
| Input Reflected Ripple Current (1) | | | | 20 | | mApk-pk |
| Start up Time | Nominal Vin and constant resistive load | | | 30 | | ms |
| Remote ON/OFF Control (2) | Module ON ( Open Circuit ) | | 3.0 | | 12 | VDC |
| | Module OFF ( Short circuit pin 2 and pin 6 ) | | 0 | | 1.2 | |
| | OFF idle current | | | 2.0 | | mA |
| Recommended input fuse ( slow blow ) | 24V Input | | | 3.15 | | A |
| | 48V Input | | | 1.6 | | |

Note：
1. Measured with a simulated source inductance of 12μH and a source capacitor Cin ( 47μF, ESR<1.0Ω at 100kHz ).
2. The remote ON/OFF control pin is referenced to –Vin ( pin2 ).

## OUTPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy | | | -1.0 | | +1.0 | % |
| Output Voltage Adjustability ( Trim ) | Single Output | | -10 | | +10 | % |
| Line Regulation | | | -0.5 | | +0.5 | % |
| Load Regulation | From 0% to 100% Load | Single Output | -0.5 | | +0.5 | % |
| | | Dual Output | -1.0 | | +1.0 | |
| Cross Regulation | Asymmetrical Load 25% / 100% for Dual Output | | -5 | | +5 | % |
| Ripple & Noise (1) | 20MHz bandwidth | Single Output | | | 75 | mVpk-pk |
| | | Dual Output | | | 60 | |
| Over Voltage Protection | | | | 140 | | % of Vout |
| Over Current Protection | | | | 170 | | % of FL |
| Short Circuit Protection | | | Indefinite ( hiccup ) ( Automatic Recovery ) | | | |
| Temperature Coefficient | | | -0.02 | | +0.02 | %/°C |
| Maximum Capacitive Load | Minimum Vin and constant resistive load | | See Table | | | |
| Transient Recovery Time | Nominal Vin and 25% load step change ( 75%-50%-25% of Io ) | For All models | | 250 | | μs |
| Transient Response Deviation | | 3.3V Single Output | -5 | | +5 | % |
| | | Other Output | -3 | | +3 | |

Note：
1. Measured with a 10μF MLCC.

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input Surge Voltage ( 100 ms ) | 24V Input | | | 50 | VDC |
| | 48V Input | | | 100 | |
| Soldering Temperature | 1.5mm from case 10sec max. | | | 260 | °C |

Note：These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

# CM7W-15W Series

*15W 4:1 Regulated Single & Dual output*

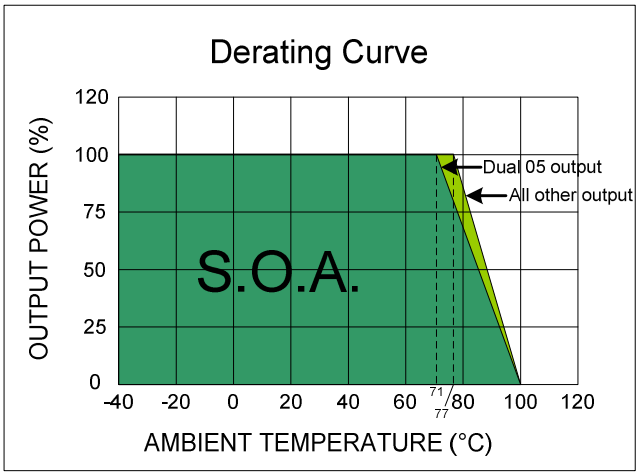
| GENERAL SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit** |
| Isolation Voltage | Input-output, and rated for 60sec | 3000 | | | VDC |
| | Case-I/O, and rated for 60sec | 1600 | | | |
| Isolation Resistance | Input-output | 1000 | | | MΩ |
| Isolation Capacitance | Input-output | | 2000 | | pF |
| Switching Frequency | 3.3 V & 05 V Single Output | | 270 | | kHz |
| | Other Output | | 330 | | |
| MTBF | MIL-HDBK-217 F @ 25°C | 600 | | | k hours |
| Safety Approval | IEC / EN / UL 62368-1 | DK-68165-M1-UL, E252573 | | | |
| Environmental compliance | | RoHS | | | |

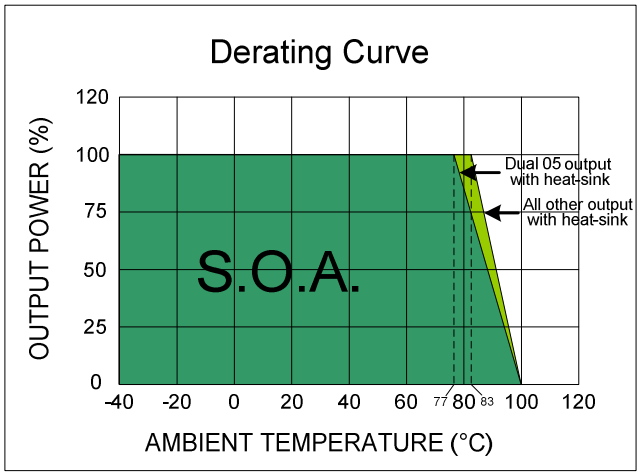
| ENVIRONMENT SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit** |
| Operating Ambient Temperature | See the Derating Curve | -40 | | 100 | °C |
| Maximum Case Temperature | | | | 105 | °C |
| Thermal Impedance | Without Heat-sink | 12 | | | °C/W |
| | With Heat-sink | 11 | | | |
| Storage Humidity | | | | 95 | % rel. H |
| Storage Temperature | | -55 | | 125 | °C |
| Cooling | Natural Convection | 30-65 LFM | | | |

| EMC SPECIFICATIONS | | | |
|---|---|---|---|
| **Parameter** | **Standard** | **Condition** | Criterion |
| Conducted Emissions | EN55032 | | A |
| Radiated Emissions | EN55032 | | A |
| ESD | IEC 61000-4-2 | Contact: ± 6kV | B |
| RS | IEC 61000-4-3 | 10V/m | A |
| EFT | IEC 61000-4-4 | ±2kV with external components | A |
| Surge | IEC 61000-4-5 | ±2kV with external components | A |
| CS | IEC 61000-4-6 | 10Vrms | A |
| PFMF | IEC 61000-4-8 | 100A/m | A |

| PHYSICAL SPECIFICATIONS | |
|---|---|
| **Parameter** | **Value** |
| Case Material | Copper |
| Base Material | Nonconductive Black Plastic ( UL94V-0 rated ) |
| Pin Material | Ø1.0mm Brass Solder-coated |
| Potting Material | Epoxy ( UL94V-0 rated ) |
| Weight | 29.0 g, typ. ( Without Heat-sink ) |
| | 35.5 g, typ. ( With Heat-sink ) |
| Dimensions | 1.60" x 1.00" x 0.41" |

## ELECTRICAL CHARACTERISTIC CURVES

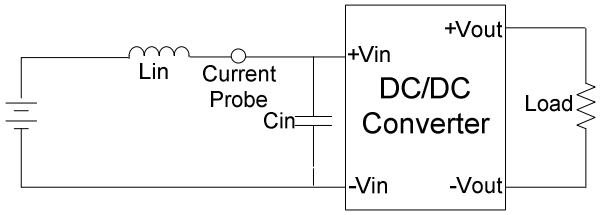



## TEST CONFIGURATIONS

### Input Reflected Ripple Current Test Step

Input reflected ripple current is measured with a source inductor Lin ( 12μH ) and a source capacitor Cin ( 47μF, ESR<1.0Ω at 100kHz ) at nominal input and full load.



## DESIGN & FEATURE CONFIGURATIONS

### Over Current Protection

The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup).The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

### Over Voltage Protection

The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

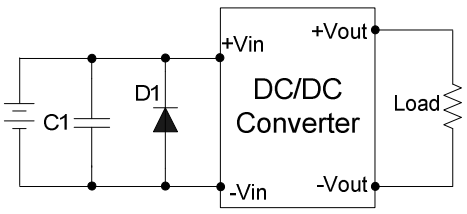
### Remote Module ON / OFF

Positive logic turns on the module during high logic and off during low logic. Remote module ON/OFF can be controlled by an external switch between the CTRL terminal and -Vin terminal. For positive logic if the remote feature is not used, please leave the CTRL pin floating.

## DESIGN & FEATURE CONFIGURATIONS

### EMC Filter

The Circuit is used to meet Surge & EFT test.

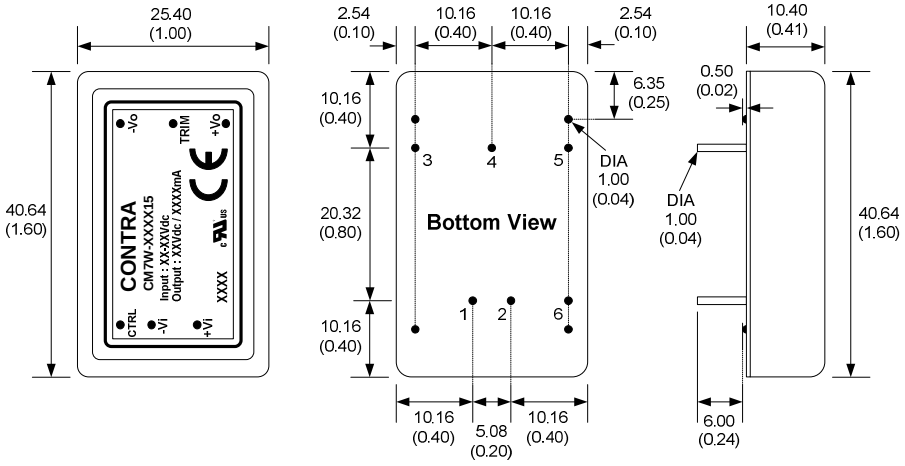



| | C1 | D1 |
|---|---|---|
| CM7W-24XXX15 | NIPPON Chemi-con KY series 330μF, 100V | SMDJ58A |
| CM7W-48XXX15 | | SMDJ120A |

# CM7W-15W Series

*15W 4:1 Regulated Single & Dual output*

## MECHANICAL SPECIFICATIONS



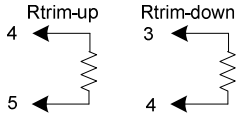

| PIN CONNECTIONS | | |
|---|---|---|
| PIN NUMBER | SINGLE | DUAL |
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | +Vout | +Vout |
| 4 | Trim | COM |
| 5 | -Vout | -Vout |
| 6 | CTRL | CTRL |

Notes：All dimensions are typical in millimeters ( inches ).

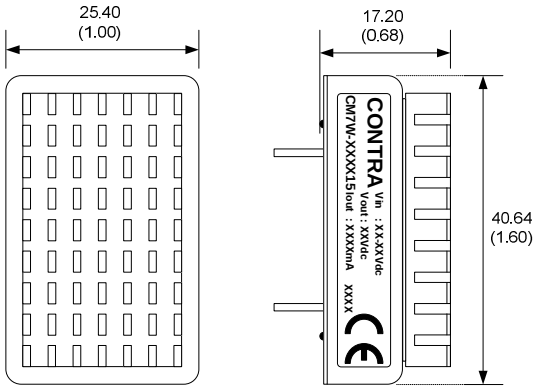
1. Pin diameter: 1.0±0.05 ( 0.04±0.002 )
2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )
3. Case tolerance: ±0.5 ( ±0.02 )
4. Stand-off tolerance: ±0.1 ( ±0.004 )

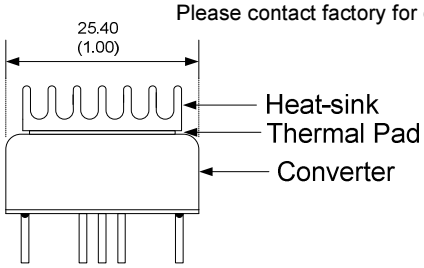
### EXTERMAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only )




## With Heat-sink



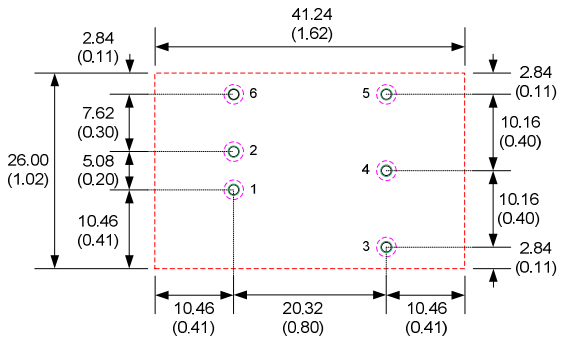




Order code: CM7W-XXXXX15SK ( contain: heat-sink, thermal pad )

Material: Aluminum
Finish: Anodic treatment ( black )
Weight: 6.5 g ( 0.23 oz ) ( without converter )
Note:

1. Converters will be supplied with heat-sinks already mounted. Please contact factory for quotation.

## RECOMMENDED FOOTPRINT DETAILS




Notes：1. All dimensions are typical in millimeters ( inches ).
Through hole ( black ) 1~6: Ø1.3 ( 0.051 )
Top view pad ( green ) 1~6: Ø1.5 ( 0.059 )
Bottom view pad ( pink ) 1~6: Ø2.6 ( 0.102 )