



## Features

- No external I/O filtering required
- +10.8V to +13.6V input
- +5V ( $\pm 50\text{mV}$ ), 5 Amp output
- Synchronous-rectifier topology
- 300kHz switching frequency
- Low output noise, 60mVp-p
- Quick transient response, 30 $\mu\text{sec}$
- High efficiency, 91%
- -40 to +70°C operation with no derating
- On/off control; Undervoltage shutdown
- Output trim capability (3.3V to 6V)
- 1" x 2" metal package; EMC compliant
- IEC950/EN60950/UL1950 pending
- Modifications and customs for OEM's

When your new tapping in 12V-to-5V Amps of current. Th

lutely no external filtering to achieve specified performance.

The UNR-5/5-D12 achieves its high power density (25W/in<sup>3</sup>) through circuit topology and packaging. Its 91% efficient, fixed-frequency (300kHz), synchronous-rectifier design is packaged, with thermally conductive potting compound, in a heat-radiating, black metal case. It achieves low cost and high reliability through its use of proven, fully automated, SMT-on-pcb assembly techniques. Consequently, every 1 Amp of 12V current gives you 2.2 Amps of additional 5V current at an incremental cost.

The impressively efficient UNR-5/5-D12 delivers its full rated 25W output power over the -40 to +70°C ambient temperature range without heat sinking or forced-air cooling. Units derate to +100°C ambient. Devices are fully line ( $\pm 0.25\%$  max.) and load ( $\pm 0.5\%$  max.) regulated and feature user-optional remote on/off control and output-voltage trim capabilities (from 3.3 to 6 Volts).

If you need more 5V current and you've already rejected the use of inefficient, step-down, linear regulators, take a look at one of Murata Power Solutions' "switchers." Their high efficiency and ease of use may surprise you. Safety agency approvals and full EMI/EMC characterization tests are currently in progress.

# OBSOLETE PRODUCT

Last time buy: 3 March 2014

[Click here for more information.](#)

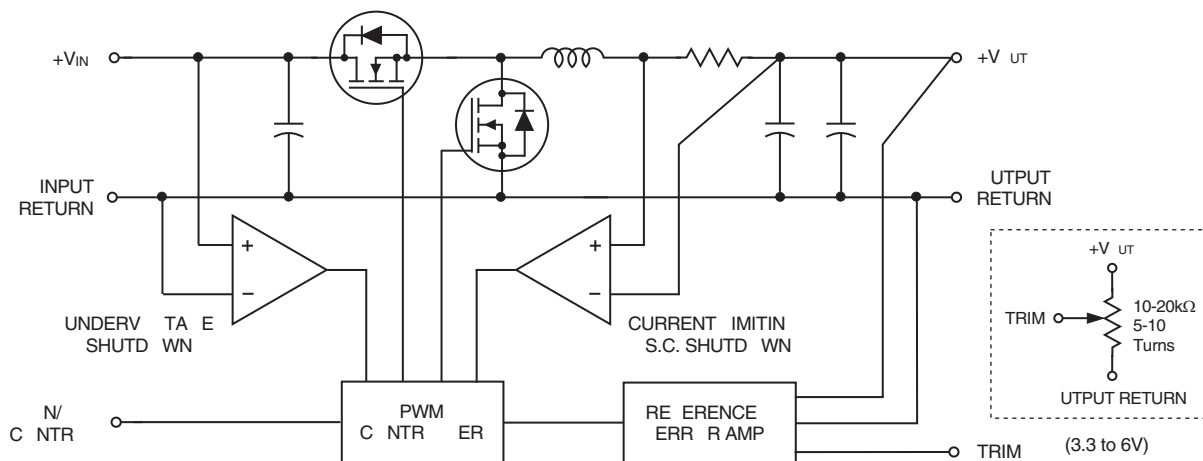


Figure 1. Simplified Schematic

Typical topology is shown.



**Single Output, Non-Isolated, 12V-to-5V  
5 Amp, DC/DC Converters**

**Performance/Functional Specifications**

Typical @ T<sub>A</sub> = +25°C under nominal line voltage and full-load conditions, with no external I/O filtering, unless noted. ①

| Input                                |                                                                                                       |
|--------------------------------------|-------------------------------------------------------------------------------------------------------|
| Input Voltage Range                  | 10.8-13.6 Volts (12V nominal)                                                                         |
| Input Current ②                      | 40/2290mA                                                                                             |
| Input Filter Type                    | Capacitive                                                                                            |
| Overvoltage Protection               | None                                                                                                  |
| Reverse-Polarity Protection          | None                                                                                                  |
| Start-Up Threshold ③                 | 10.2V typical, 10.4V maximum                                                                          |
| Undervoltage Shutdown ③              | 9.6V typical, 8.2V minimum                                                                            |
| On/Off Control (Pin 3) ④             | TTL high (or open) = on, low = off                                                                    |
| Output                               |                                                                                                       |
| V <sub>OUT</sub> Accuracy (50% load) | ±1% (±50mV) maximum                                                                                   |
| Temperature Coefficient              | ±0.02% per °C                                                                                         |
| Ripple/Noise (20MHz BW) ⑤            | 60mVp-p typical, 85mVp-p maximum                                                                      |
| Line/Load Regulation                 | ±0.25% maximum/±0.5% maximum                                                                          |
| Efficiency                           | 91% typical, 87% minimum                                                                              |
| Current Limiting ⑥                   | Auto-recovery                                                                                         |
| Dynamic Characteristics              |                                                                                                       |
| Transient Response (50% load step)   | 30µsec to ±1% of final value                                                                          |
| Switching Frequency                  | 300kHz (±30kHz)                                                                                       |
| Environmental                        |                                                                                                       |
| Operating Temperature (Ambient):     |                                                                                                       |
| Without Derating                     | -40 to +70°C                                                                                          |
| With Derating                        | to +100°C (Straight line to 0 Watts)                                                                  |
| Storage Temperature                  | -40 to +105°C                                                                                         |
| Physical                             |                                                                                                       |
| Dimensions                           | 2" x 1" x 0.48" (51 x 25 x 12.2mm)                                                                    |
| Shielding                            | 5-sided                                                                                               |
| Case Connection                      | Pin 2 (Input Return)                                                                                  |
| Case Material                        | Corrosion resistant steel with non-conductive, epoxy-based, black enamel finish and plastic baseplate |
| Pin Material                         | RoHS: Gold plate over copper alloy<br>Non-RoHS: Pure tin over copper alloy                            |
| Weight                               | 1.6 ounces (45.4 grams)                                                                               |
| Flammability                         | UL 94V-0                                                                                              |

**Absolute Maximum Ratings**

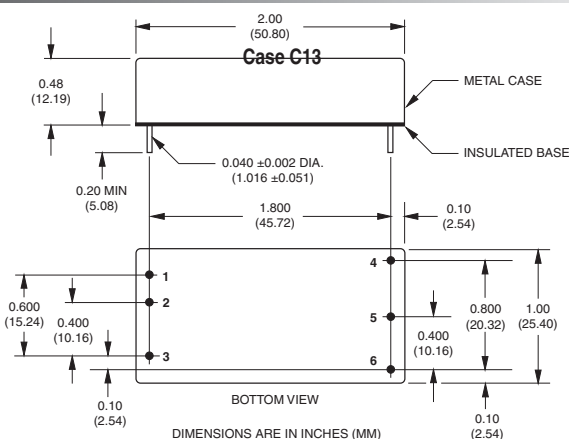
|                                       |                                                                                         |
|---------------------------------------|-----------------------------------------------------------------------------------------|
| Input Voltage                         | 15 Volts                                                                                |
| Output Current                        | Current limited. Devices can withstand a sustained output short circuit without damage. |
| Storage Temperature                   | -40 to +105°C                                                                           |
| Lead Temperature (soldering, 10 sec.) | +300°C                                                                                  |

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. Proper operation under conditions other than those listed in the Performance/Functional Specifications Table is not implied.

**On/Off Control Functionality**

The On/Off Control pin has an internal 10kΩ pull-up resistor to +V<sub>IN</sub>. It can be driven with any logic circuit capable of meeting the following drive requirements. Logic "0" = 0 to +0.8V. Logic "1" = +2.0V to +V<sub>IN</sub>. I<sub>IH</sub> (@ V<sub>IN</sub> = +2.0V) = -1.2mA. I<sub>IL</sub> (@ V<sub>IN</sub> = 0V) = -1.4mA. Open collector logic or a single NPN drive transistor can be used. The drive circuit should be rated for more than 13.6V. Applying a voltage to pin 3 when no input power is applied to the converter can cause permanent damage to the converter.

**MECHANICAL SPECIFICATIONS**



| I/O Connections |                |
|-----------------|----------------|
| Pin             | Function P21   |
| 1               | +Input         |
| 2               | Input Return   |
| 3               | On/Off Control |
| 4               | +Output        |
| 5               | Output Return  |
| 6               | Trim           |

**Note:**

The case is connected to pin 2 (Input Return).

UNR-5/5-D12  
UNR-5/5-D12-C

Non-Isolated, 12V-to-5V, 25 Watt, DC/DC Converter  
RoHS version



This product is subject to the following **operating requirements** and the **Life and Safety Critical Application Sales Policy**:  
Refer to: <http://www.murata-ps.com/requirements/>

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