

Features

- Low profile 4.0mm
- Low cost
- Wide input range (5V - 36V)
- Short circuit protection
- Casellated connections

ROF-78E

Non Isolated Power Module

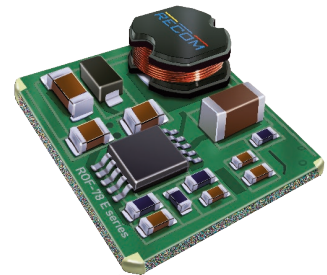


Description

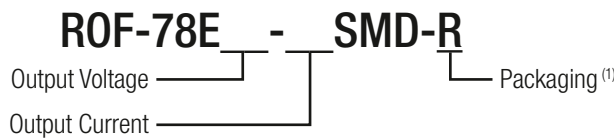
The ROF-78E is a switching regulator with a wide input voltage range, high efficiency and a low profile, pin-less SMD package. Two low-ripple output voltages are available as standard: 3.3V or 5V with 500mA continuous output current rating over the full operating temperature range of -40°C to +75°C without derating. An enable connection allows power sequencing or very low standby consumption (3.5µA) for battery powered applications. These modules can be SMD reflow soldered. The connection pads have corner halfvias to enable optical inspection of the joints after soldering.

Selection Guide

| Part Number | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. [%] |
|---------------------|---------------------------|----------------------|---------------------|---------------------|
| ROF-78E3.3-0.5SMD-R | 5 - 36 | 3.3 | 500 | 73 - 84 |
| ROF-78E5.0-0.5SMD-R | 9 - 36 | 5.0 | 500 | 79 - 87 |



Model Numbering



Notes:

Note1: suffix -R for tape&reel packaging

Ordering Examples:

ROF-78E3.3-0.5SMD-R = 3.3 Output Voltage, 0.5 Output Current, SMD, tape and reel packaging

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

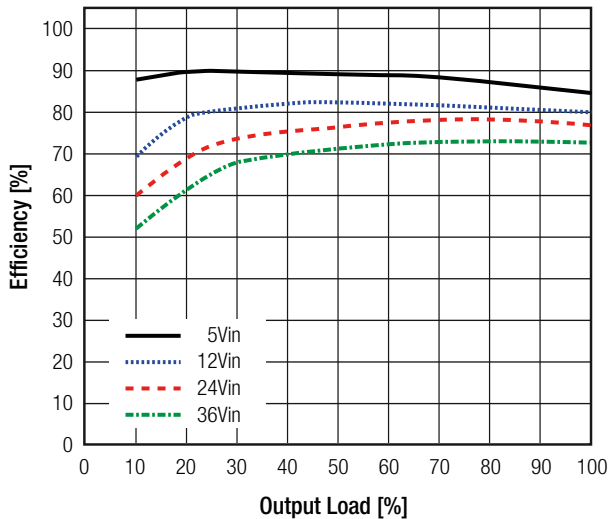
| Parameter | Condition | Min. | Typ. | Max. |
|------------------------------|---------------------------|-----------------------|--------|------------------------------------|
| Input Voltage Range | nom. Vin= 12VDC and 24VDC | 5VDC | | 36VDC |
| Input Current | | | | 500mA |
| Quiescent Current | | | | 5mA |
| Minimum Load ⁽²⁾ | | 10% | | |
| ON/OFF CTRL | max. Vin= 5VDC | DC-DC ON DC-DC OFF | | Open or >1.75VDC GND or <0.7VDC |
| Standby Current | DC-DC OFF | | 3.5µA | 6.5µA |
| Internal Operating Frequency | | | 650kHz | |
| Output Ripple and Noise | 20MHz BW | | | 100mVp-p |

Notes:

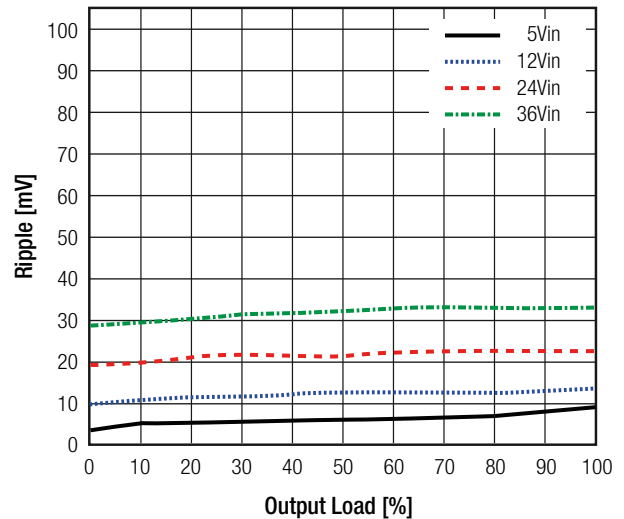
Note2: Operation at no load will not harm the converter, but specifications may not be met

ROF-78E3.3-0.5SMD

Efficiency vs. Load

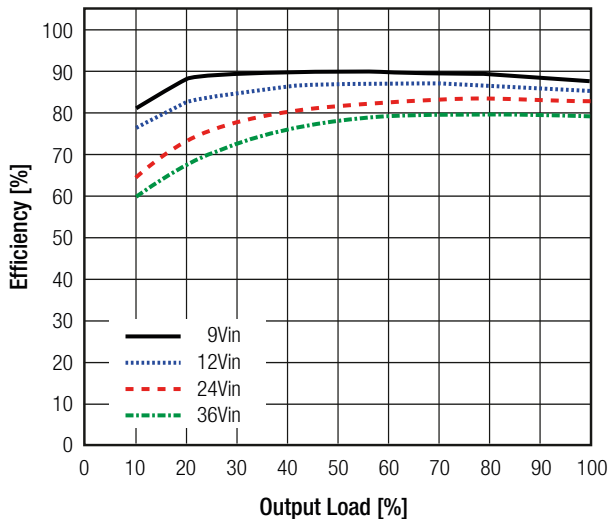


Ripple vs. Load

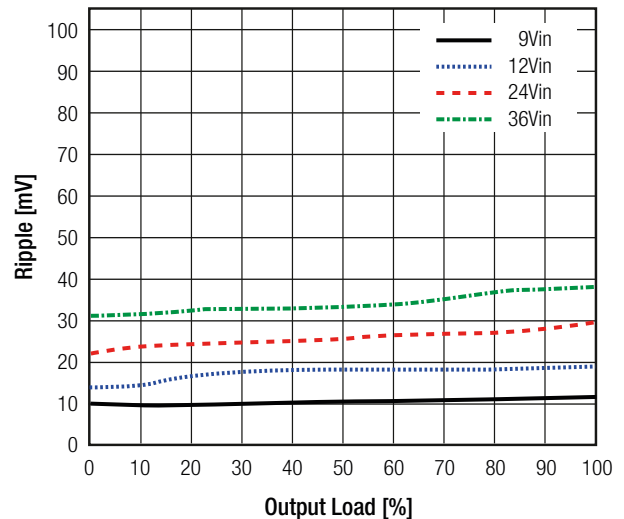


ROF-78E5.0-0.5SMD

Efficiency vs. Load



Ripple vs. Load



Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

| REGULATIONS | | |
|--------------------|-----------------------|-------------|
| Parameter | Condition | Value |
| Output Accuracy | | ±5.0% max. |
| Line Regulation | low line to high line | ±1.0% max. |
| Load Regulation | 10% to 100% load | ± 3.0% typ. |
| Transient Response | 100% to 50% load | ±100mV |
| | 100% to 10% load | ±200mV |

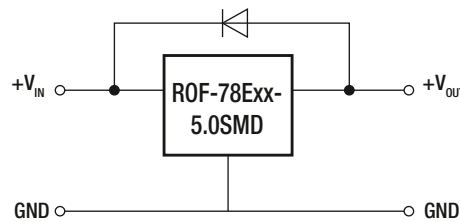
| PROTECTIONS | | |
|--------------------------------|-----------|-------------------------|
| Parameter | Condition | Value |
| Short Circuit Protection (SCP) | | automatic recovery |
| Short Circuit Input Current | | 200mA max. |
| Over Current Protection (OCP) | | >950mA typ. Hiccup mode |

Optional Diode Protection Circuit

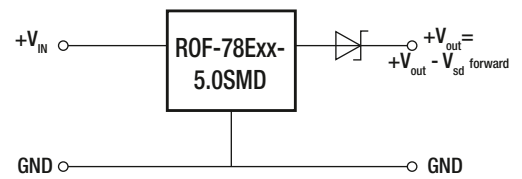
Add a blocking diode to Vout if current can flow backwards into the output, as this can damage the converter when it is powered down.

The diode can either be fitted across the device if the source is low impedance or fitted in series with the output (recommended).

Optional Protection 1:

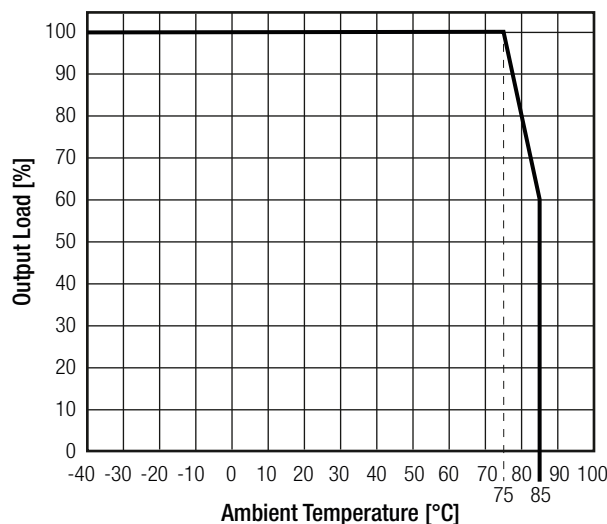


Optional Protection 2:



| ENVIRONMENTAL | | |
|-----------------------------|---|------------------------------|
| Parameter | Condition | Value |
| Operating Temperature Range | with derating @ free air convection (see graph) | -40°C to +85°C |
| Operating Humidity | non-condensing | 5% - 95% RH max. |
| MTBF | according to MIL-HDBK-217F, G.B. +25°C | 3500 x 10 ³ hours |

Derating Graph
(@ free air convection)



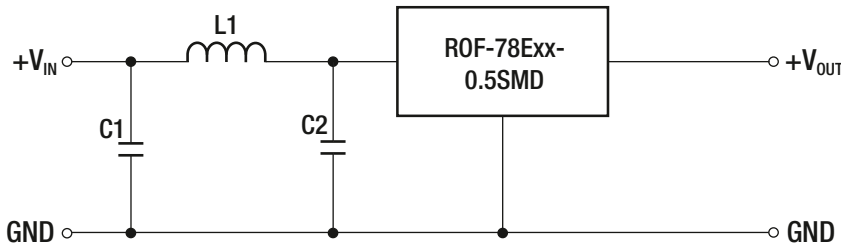
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Report / File Number | Standard |
|---------------------------|----------------------|-------------------------------|
| RoHS 2+ | | RoHS-2011/65/EU + AM-2015/863 |
| EAC | RU-AT.49.09571 | TP TC 004/2011 |

| EMC Compliance | Condition | Standard / Criterion |
|--|----------------------|----------------------|
| Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement | with external filter | EN55032, Class B |

EMC Filtering Suggestion according to EN55032 Class A and Class B



Component List Class A and B

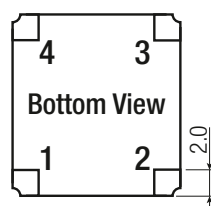
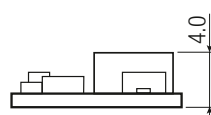
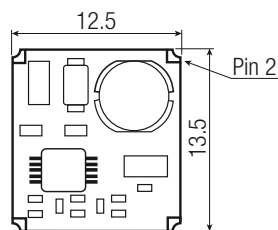
| C1 | C2 | L1 |
|-----|-----|------|
| 1µF | 1µF | 33µH |

The capacitors used are ceramic capacitors, rated voltage 50V

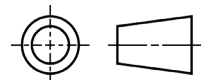
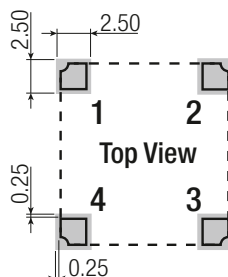
DIMENSION AND PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|---------------------------|------|---------------------|
| Material | PCB | FR4, (UL94 V-0) |
| Package Dimension (LxWxH) | | 12.5 x 13.5 x 4.0mm |
| Package Weight | | 1g typ. |

Dimension Drawing (mm)



Recommended Footprint Details



Pin Connections

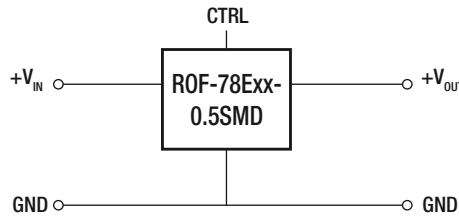
| Pin # | Single |
|-------|--------|
| 1 | +Vin |
| 2 | GND |
| 3 | +Vout |
| 4 | CTRL |

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

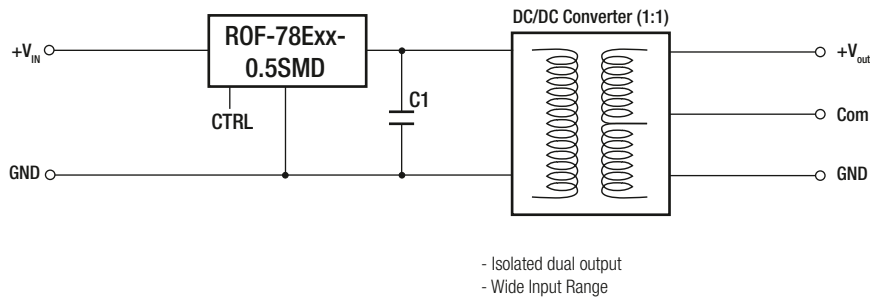
INSTALLATION AND APPLICATION

Standard Application Circuit

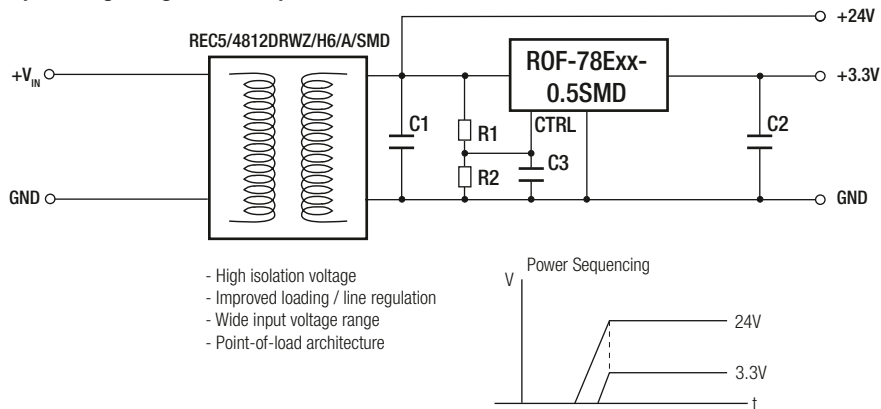


Application Examples

High Efficiency, Isolated, Dual Unregulated Output



Isolated (up to 6kVDC), Wide Input Range Regulated Output



PACKAGING INFORMATION

| Parameter | Type | Value |
|-----------------------------|------------------------|------------------------|
| Packaging Dimension (LxWxH) | tape and reel (carton) | 355.0 x 342.0 x 36.0mm |
| Packaging Quantity | tape and reel | 500pcs |
| Tape Width | | 24mm |
| Storage Temperature Range | | -55°C to +125°C |
| Storage Humidity | | 95% RH max. |

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