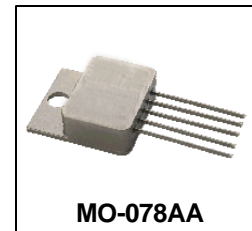


**1 M Rad(Si) Ultra Low Dropout
 Linear Regulator
 Hermetic Package**

**OMR9603SC
 OMR9603SF
 + 7.4V_{in} to +6.8V_{out} at 3.0A**

Product Summary

| Part Number | Dropout | I _o | V _{in} | V _{out} | Package |
|-------------|---------|----------------|-----------------|------------------|----------------|
| OMR9603SC | 0.4 V | 3.0A | 7.4V | 6.8V | MO-078AA |
| OMR9603SF | 0.4 V | 3.0A | 7.4V | 6.8V | 8-pin Flatpack |



The OMR9603 is a radiation hardened, ultra low dropout linear regulator designed specifically for space applications. This product has been characterized to a total ionizing dose of 1 M Rad (Si) per MIL-STD-883, Method 1019, Condition A at both high and low dose rates under biased and unbiased conditions to account for ELDRS effects in bipolar devices. The ultra low dropout voltage of 0.4V @ 3A makes the part particularly useful for applications requiring low noise and higher efficiency.

Features:

- Total dose and low dose capability to 1M Rad(Si) allows use in space applications
- Ultra low dropout of 0.4 volt significantly reduces power consumption
- Low noise, higher efficiency
- Remote shutdown permits power sequencing to be easily implemented
- Hermetic MO-078AA (TO-258AA) and 8-lead flat pack ensure higher reliability
- K-level screened

Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|-------------------|--|-------------|-------|
| I _o | Output Current | 3.5 | A |
| V _{in} | Input Voltage | +8.0 | V |
| P _{TOT} | Power Dissipation TC=25 °C | 19 | W |
| R _{THJC} | Thermal Resistance, Junction to Case (MO-078AA) | 6.5 | °C/W |
| R _{THJC} | Thermal Resistance, Junction to Case (8 lead flatpack) | 6.5 | °C/W |
| T _J | Operating Junction | -55 to +125 | °C |
| T _{STG} | Storage Temperature Range | -65 to +150 | °C |
| T _L | Lead Temperature | 300 | °C |

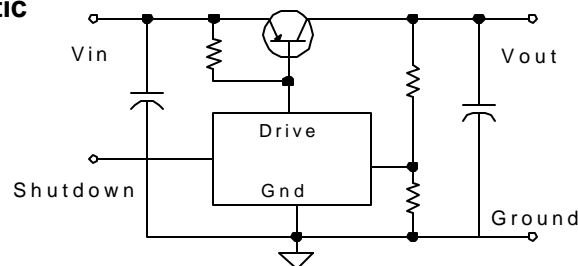
Electrical Characteristics @ TA= 25°C (Unless Otherwise Specified)

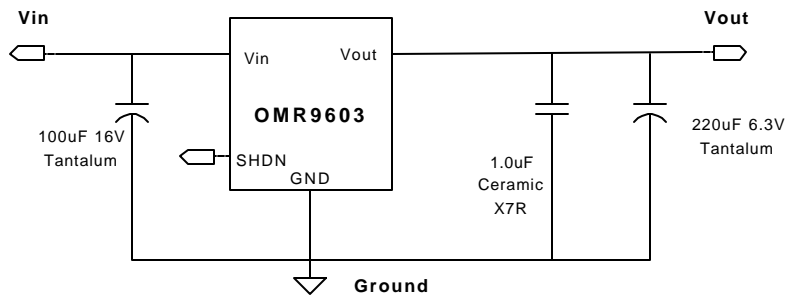
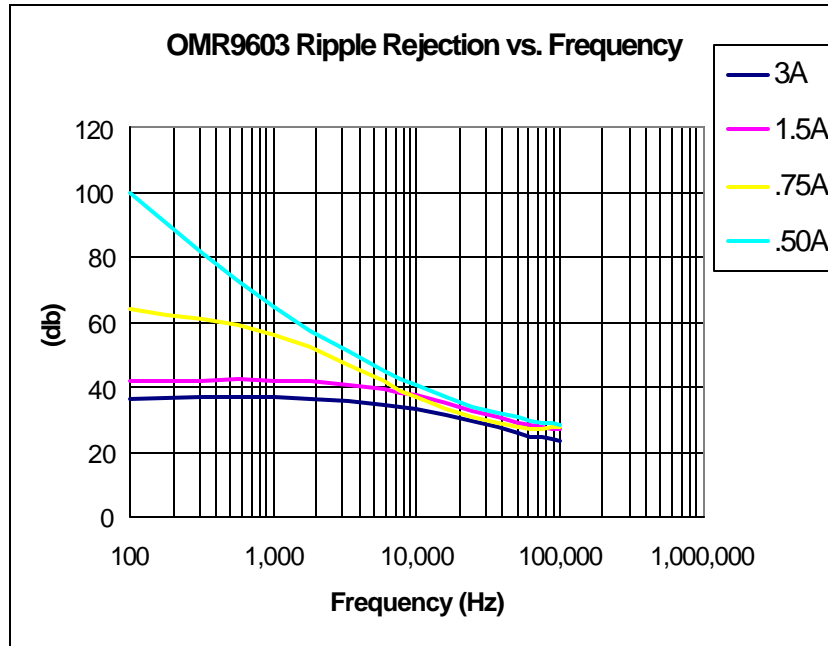
| Parameter | Conditions | Symbol | Min. | Typ. | Max | Unit |
|-------------------------------|-------------------------------------|--------------------|-------|------|-------|------|
| Output Voltage | Vin= 7.4V, Io= 3.0A | Vout | 6.732 | 6.8 | 6.868 | V |
| Input Voltage Range-Operating | Io= 3.0A | | 7.2 | | 8.0 | V |
| Line Regulation | 7.1 ≤ Vin ≤ 7.7, Io= 3.0A | Vline | -100 | | +100 | mV |
| | 6.7 ≤ Vin ≤ 8.1, Io= 50mA | | -5 | | +5 | mV |
| Load Regulation | Vin= 7.4V 10ma ≤ Iout ≤ 3.0A | Vload | -20 | | 20 | mV |
| Dropout Voltage | Io= 3.0A, Vout= 6.8V | Vdrop | | | 0.4 | V |
| Current Limit | Vin= 7.4V, Overcurrent Latchup | I _{latch} | 3.0 | | | A |
| Ripple Rejection | F= 120 Hz., Vout= Vref | | 65 | | | dB |
| Shutdown source current | Vshdn= 5V | Ishdn | | 200 | | uA |
| Shutdown Pin Threshold | Isource= 200uA | Vshdn | 1.0 | | 1.6 | V |
| Output Voltage at Shutdown | Vin= 7.4V, Io= 50mA, Shdn= +5.0V | Vout (shdn) | -0.1 | | +0.1 | V |

Electrical Characteristics TA= -55 to +125°C

| Parameter | Conditions | Symbol | Min. | Typ. | Max | Unit |
|-------------------------------|------------------------------------|--------------------|------|------|------|------|
| Output Voltage | Vin= 7.4V, Io= 3.0A | Vout | 6.46 | 6.8 | 7.14 | V |
| Input Voltage Range-Operating | Io= 3.0A | | 7.2 | | 8 | V |
| Line Regulation | 7.1 ≤ Vin ≤ 7.7, Io= 3.0A | Vline | -150 | | +150 | mV |
| | 6.7 ≤ Vin ≤ 8.1, Io= 50mA | | -150 | | +150 | mV |
| Load Regulation | Vin= 7.4V 10ma ≤ Iout ≤ 3.0A | Vload | -150 | | +150 | mV |
| Dropout Voltage | Io= 3.0A, Vout= 6.8V | Vdrop | | | 0.4 | V |
| Current Limit | Vin= 7.4V, Overcurrent Latchup | I _{latch} | 3 | | | A |
| Ripple Rejection | F= 120 Hz., Vout= Vref | | 65 | | | dB |
| Shutdown source current | Vshdn= 5V | Ishdn | | 200 | | uA |
| Shutdown Pin Threshold | Isource= 200uA | Vshdn | 1 | | 1.6 | V |
| Output Voltage at Shutdown | Vin=7.4V, Io= 50mA, Shdn= +5.0V | Vout (shdn) | -0.1 | | +0.1 | V |

Simplified Schematic





In order to maintain regulation and stability specified additional input and output bulk capacitors are recommended. Capacitors recommended above should be low ESR tantalums with tolerances of +/- 20% max. Internal to the product are a 4.7uF input capacitor and a 4.7uF output capacitor in parallel with a 0.33uF ceramic capacitor.

Shutdown: The regulator can be shutdown by applying a voltage >1.6V to pin 4. The regulator will restart when the SHDN pin is pulled below the shutdown threshold of 1.0V. If remote shutdown is not required, pin 4 should be connected to GND to insure a safe "off" state.

OMR9603SC, OMR9603SF

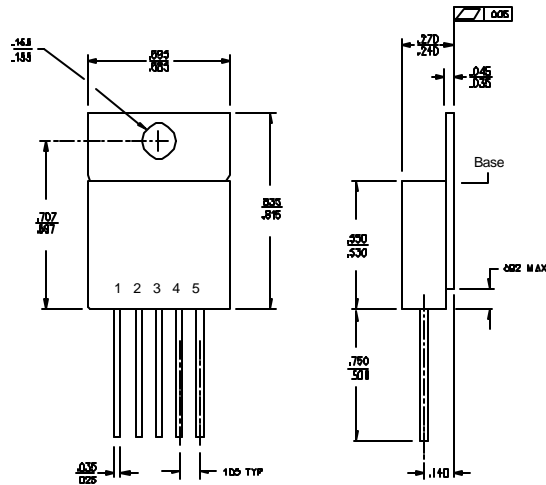


Mechanical Outline MO-078AA

Base: GLIDCOP
Pins: Copper core, Alloy 52
Seals: Glass

Pin Connections

| Terminal | Description |
|----------|---------------|
| 1 | Vin |
| 2 | GND |
| 3 | Vout |
| 4 | Shutdown |
| 5 | No Connection |

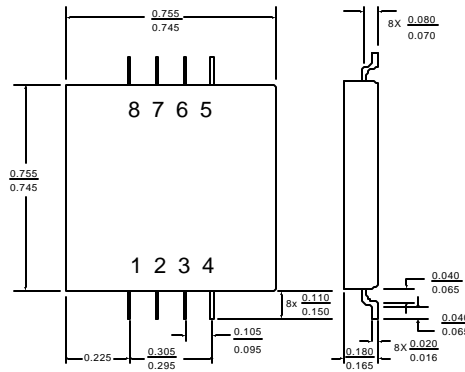


Mechanical Outline 8-Lead Flat Pack

Base: 1010-1018 C.R.S.
Pins: #52 Alloy, Copper Cored
Seals: Glass – 9013 or Equiv.
Finish: 100-250 Microinches Electroless Nickel Over 50-250 Microinches Electrolytic Nickel.

Pin Connections

| Terminal | Description |
|----------|---------------|
| 1,2 | GND |
| 3 | Shutdown |
| 4 | No Connection |
| 5,6 | Vout |
| 7,8 | Vin |



| Part Number Nomenclature | | | | | |
|---------------------------------|--------------------------------|--------------------|------------------------------|-----------------|-----------------|
| <u>OM</u> | <u>R</u> | <u>9603</u> | <u>X</u> | <u>X</u> | <u>X</u> |
| Omnirel | Radiation Hardened/Tolerant | Device | S=Isolated N=Non-Isolated | Package | Screening |

| Part Number | Package Description | Screening |
|--------------------|----------------------------|---------------------------|
| OMR9603SCP | MO-078AA 5 - Lead | 100% Final Electrical |
| OMR9603SCK | MO-078AA 5 - Lead | Class K per MIL-PRF-38534 |
| OMR9603SFP | 8 -Lead Flat Pack | 100% Final Electrical |
| OMR9603SFK | 8 -Lead Flat Pack | Class K per MIL-PRF-38534 |

MIL-PRF-38534 Screening Requirements

| TEST/INSPECTION | SCREENING LEVEL | MIL-STD-883 |
|--------------------------|----------------------------------|--------------------|
| | Class K (Space Level) | Method |
| Pre Seal Burn-In | Optional | 1030 |
| Nondestructive Bond Pull | 100% | 2023 |
| Internal Visual | 100% | 2017 |
| Temperature Cycle | 100% | 1010 |
| Constant Acceleration | 100% | 2001 |
| Mechanical Shock | 100% | 2002 |
| PIND | 100% | 2020 |
| Pre Burn-In Electrical | 100% | |
| Burn-In | 100% | 1015 |
| Final Electrical | 100% | |
| Seal | 100% | 1014 |
| Radiographic | 100% | 2012 |
| External Visual | 100% | 2009 |