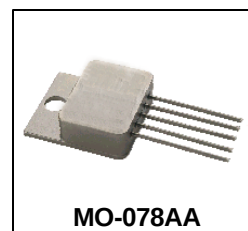


**1 M Rad(Si) Ultra Low Dropout
Linear Regulator
Hermetic Package**

**OMR9603SC
OMR9603SF
+ 7.4Vin to +6.8Vout at 3.0A**

Product Summary

Part Number	Dropout	Io	Vin	Vout	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

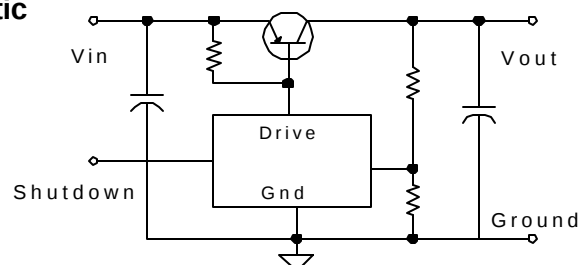
Symbol	Parameter	Value	Units
Io	Output Current	3.5	A
Vin	Input Voltage	+8.0	V
P _{TOT}	Power Dissipation TC=25 °C	19	W
R _{THJC}	Thermal Resistance, Junction to Case (MO-078AA)	6.5	°C/W
R _{THJC}	Thermal Resistance, Junction to Case (8 lead flatpack)	6.5	°C/W
T _J	Operating Junction	-55 to +125	°C
T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

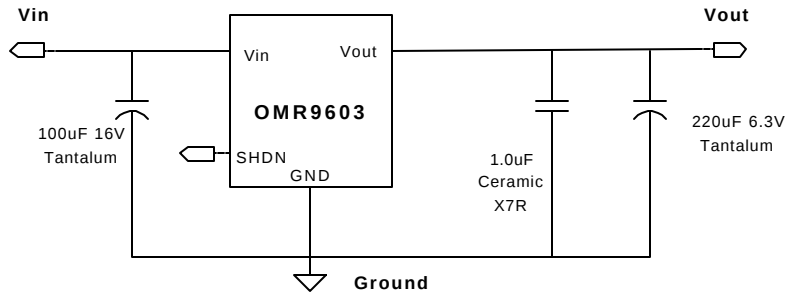
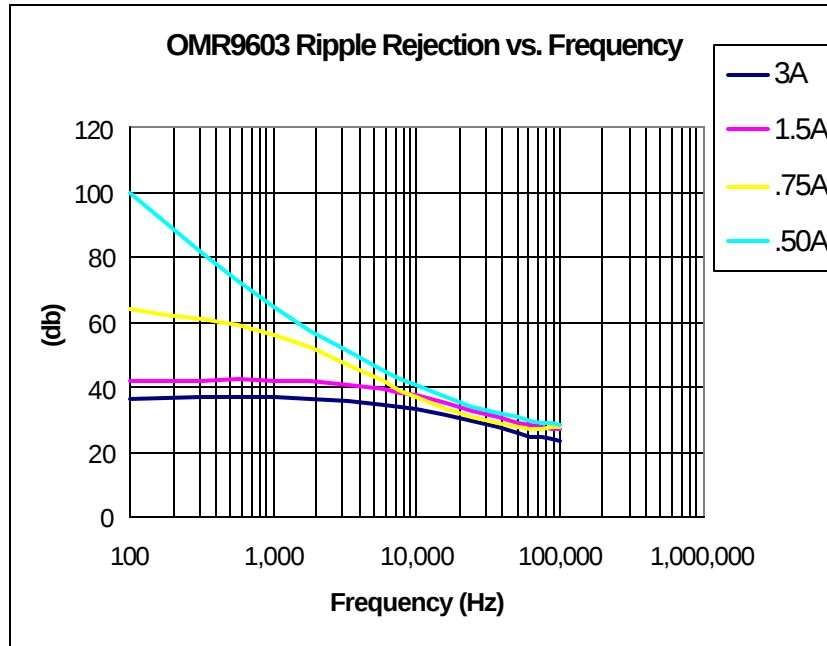
Electrical Characteristics @ TA= 25°C (Unless Otherwise Specified)

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 6.7 ≤ Vin ≤ 8.1, Io= 50mA	Vline	-100 -5		+100 +5	mV 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	I _{shdn}		200		uA
Shutdown Pin Threshold	I _{source} = 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 6.7 ≤ Vin ≤ 8.1, Io= 50mA	Vline	-150 -150		+150 +150	mV 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	I _{shdn}		200		uA
Shutdown Pin Threshold	I _{source} = 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.

International
IOR Rectifier

[illegible]

Seals: Glass

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

Technical drawing of a 16-pin connector. The drawing shows a top view of the connector with pins numbered 1 through 8 on both the top and bottom rows. Dimensions are provided in millimeters (mm) for various features:

- Top Row Pins (8, 7, 6, 5):**
 - Pin 8 width: 0.755 mm
 - Pin 7 width: 0.745 mm
 - Pin 6 width: 0.755 mm
 - Pin 5 width: 0.745 mm
- Bottom Row Pins (1, 2, 3, 4):**
 - Pin 1 width: 0.225 mm
 - Pin 2 width: 0.305 mm
 - Pin 3 width: 0.295 mm
 - Pin 4 width: 0.305 mm
- Pin Spacing and Widths:**
 - Pin 1 to Pin 2 spacing: 0.105 mm
 - Pin 2 to Pin 3 spacing: 0.095 mm
 - Pin 3 to Pin 4 spacing: 0.105 mm
 - Pin 4 to Pin 5 spacing: 0.150 mm
 - Pin 5 to Pin 6 spacing: 0.110 mm
 - Pin 6 to Pin 7 spacing: 0.150 mm
 - Pin 7 to Pin 8 spacing: 0.110 mm
- Connector Body Dimensions:**
 - Overall width: 8x 0.080 mm
 - Overall height: 8x 0.070 mm
 - Pin 1 to Pin 2 spacing: 8x 0.040 mm
 - Pin 2 to Pin 3 spacing: 8x 0.065 mm
 - Pin 3 to Pin 4 spacing: 8x 0.040 mm
 - Pin 4 to Pin 5 spacing: 8x 0.065 mm
 - Pin 5 to Pin 6 spacing: 8x 0.020 mm
 - Pin 6 to Pin 7 spacing: 8x 0.016 mm
 - Pin 7 to Pin 8 spacing: 8x 0.016 mm

Finish: 100-250 Microinches
Electroless Nickel Over 50-250
Microinches Electrolytic Nickel.

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