International
IOR Rectifier

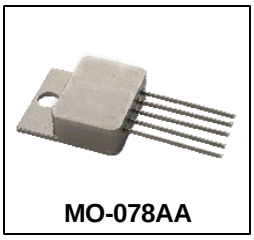
PD-94487A

200 Krad(Si) Ultra Low Dropout Positive Adjustable Linear Regulator Hermetic Package

OMR9804SF
OMR9804SC
+ 3.3Vin at 3.0A

Product Summary

Part Number	Dropout	Io	Vin	Package
OMR9804SC	0.4 V	3.0A	3.3V	MO-078AA
OMR9804SF	0.4 V	3.0A	3.3V	8-Lead Flatpack



MO-078AA

The OMR9804 is a radiation hardened, ultra low dropout adjusable linear regulator designed specifically for space applications. This product has been characterized to a total ionizing dose of 200 Krad (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 capabilitiy to 200 Krad(Si) allows use in space applications
- Ultra low dropout voltage of 0.4 volt signifi cantly 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
Vin	Input Voltage	+7.0	V
Vout	Output Voltage Range	+1.26 to +3.2	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

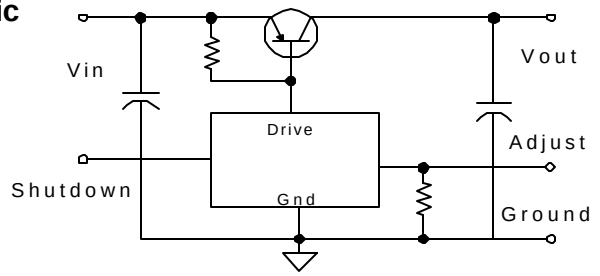
Electrical Characteristics @ TA= 25°C (Unless Otherwise Specified)

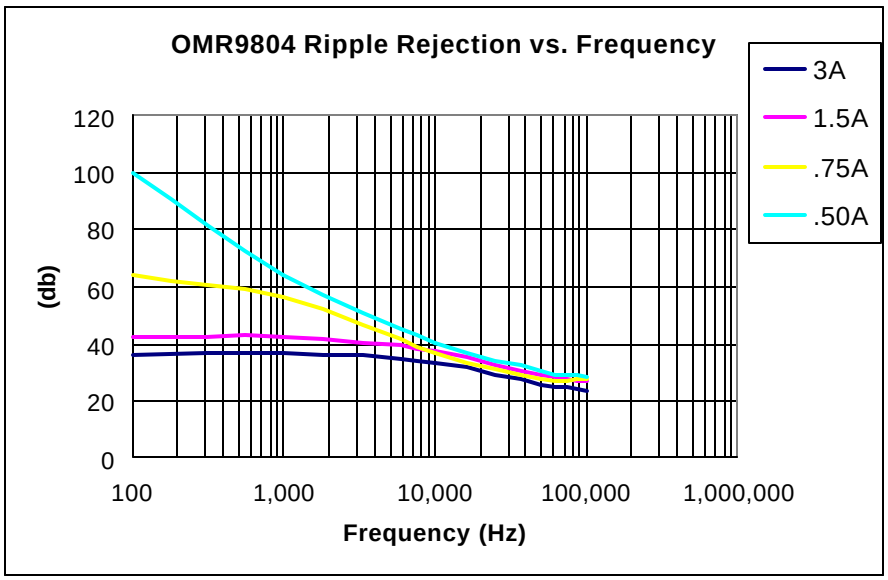
Parameter	Conditions	Symbol	Min.	Typ.	Max	Unit
Input Voltage Range-Operating	Io= 3.0A	Vin	2.9		6.5	V
Reference Voltage		Vref	1.252	1.265	1.278	V
Line Regulation	3.13 ≤ Vin ≤ 3.46, Io= 3.0A 2.9 ≤ Vin ≤ 3.8, Io= 50mA	Vline	-100 -5		+100 +5	mV mV
Load Regulation	Vin= 3.3V 10ma ≤ Iout ≤ 3.0A	Vload	-20		+20	mV
Dropout Voltage	Io= 3.0A, Vout= 2.5V	Vdrop			0.4	V
Current Limit	Vin= 3.3V, Overcurrent Latchup	Ilatch	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= 3.3V, Io= 50mA, Shdn= +5.0V	Vout (shdn)	-0.1		+0.1	V

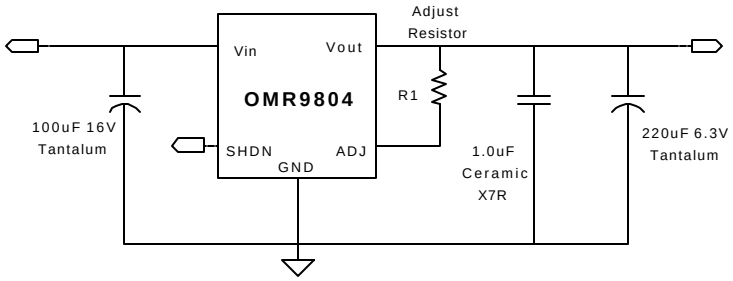
Electrical Characteristics TA= -55 to +125°C

Parameter	Conditions	Symbol	Min.	Typ.	Max	Unit
Input Voltage Range-	Io= 3.0A	Vin	2.9		6.5	V
Reference Voltage		Vref	1.225	1.265	1.305	V
Line Regulation	3.13 ≤ Vin ≤ 3.46, Io= 3.0A 2.9 ≤ Vin ≤ 3.8, Io= 50mA	Vline	-150 -150		+150 +150	mV mV
Load Regulation	Vin= 3.3V 10ma ≤ Iout ≤ 3.0A	Vload	-150		+150	mV
Dropout Voltage	Io= 3.0A, Vout= 2.5V	Vdrop			0.4	V
Current Limit	Vin= 3.3V, Overcurrent Latchup	Ilatch	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= 3.3V, Io= 50mA, Shdn= +5.0V	Vout (shdn)	-0.1		+0.1	V

Simplified Schematic







Vout =Vref x (1+R1/1000)

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.

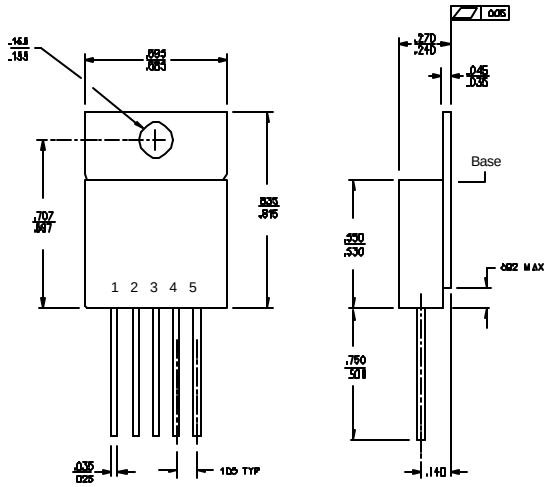
Shutdown: The regulator can be shutdown by applying a voltage >1.6V to pin 4. The regulator will restart when the SHDN pin is pulled below the shutdown threshold of 1.0V. If remote shutdown is not required, pin 4 shold be connected to GND to insure a safe "off" state.

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	Adjust

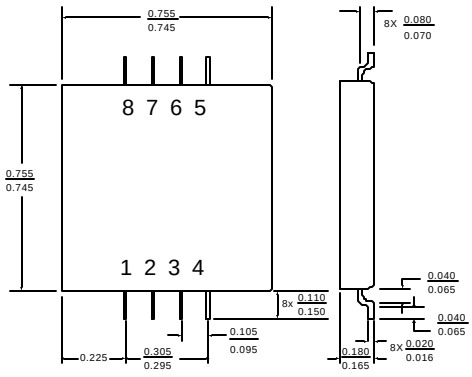


Mechanical Outline 8-Lead Flat Pack

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	Adjust
5,6	Vout
7,8	Vin



Part Number Nomenclature

OM	R	9804	X	X	X
Omnirel	Radiation Hardened/Tolerant	Device	S=Isolated N=Non-Isolated	Package	Screening

Part Number	Package Description	Screening
OMR9804SCP	MO-078AA 5 - Lead	100% Final Electrical
OMR9804SCH	MO-078AA 5 - Lead	Class H per MIL-PRF-38534
OMR9804SCK	MO-078AA 5 - Lead	Class K per MIL-PRF-38534
OMR9804SFP	8 -Lead Flat Pack	100% Final Electrical
OMR9804SFH	8 -Lead Flat Pack	Class H per MIL-PRF-38534
OMR9804SFK	8 -Lead Flat Pack	Class K per MIL-PRF-38534

MIL-PRF-38534 Screening Requirements

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