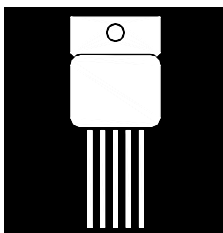


1 M Rad (Si), ULTRA LOW DROPOUT POSITIVE LINEAR REGULATOR



**+3.3V_{in} to +2.5V Output at 3.0A
In A Hermetic 5- Pin Package**

FEATURES

- Total dose capability to 1M Rad (Si) allows use in broad range of space applications
- Ultra low dropout voltage of 0.4V @ 3A out significantly reduces power consumption
- Single Event Effects data available
- Remote Shutdown permits power sequencing to be easily implemented
- Hermetic MO-78AA (TO-258) packaging ensures higher reliability
- K-level screening available

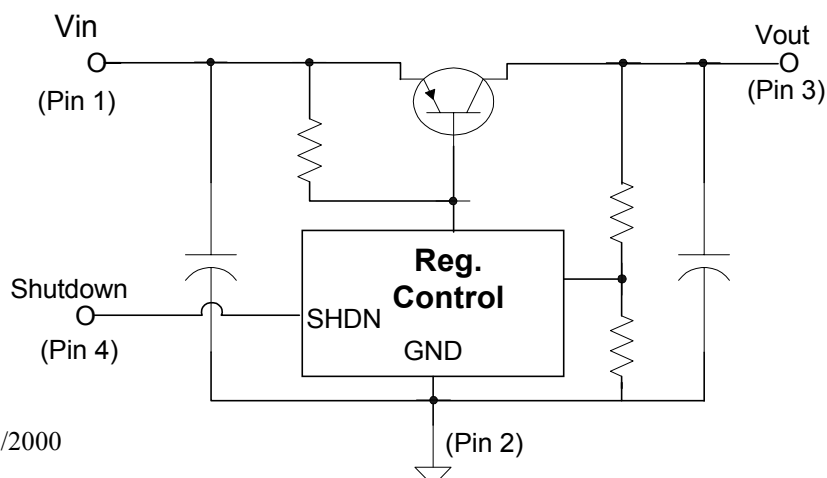
DESCRIPTION

The OMR9601CCK is a radiation hardened, ultra low dropout linear regulator designed specifically for a broad range of space applications. This product has been characterized to a total ionizing dose of 1M 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 in filtering out noise for low noise application circuits.

MAXIMUM RATINGS (T_j=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Output Current	I _o	3.5	A
Input Voltage	V _{in}	+7.0	V
Lead Temperature	T _l	300	°C
Power Dissipation, T _C =25°C	P _{TOT}	19	W
Thermal Resistance, Junction to Case	R _{thJC}	6.5	°C/W
Operating Temperature	T _j	-55...+125	°C
Storage Temperature Range	T _s	-65...+150	°C

Block Diagram



Rev 08, 08/15/2000

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ	Max	Unit
Output Voltage	Vin= 3.3V, Io= 3.0A	Vout	2.475	2.5	2.525	V
Input Voltage Range-Operating	Io= 3.0A		2.9		6.5	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 Short Circuit	Isc	3.0			A
Bias Current- Line	2.9 ≤ Vin ≤ 3.8, Io= 10mA		-5		+5	mA
Bias Current- Load	Vin= 3.3V, 10ma ≤ Iout ≤ 2.5A		-5		+5	mA
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

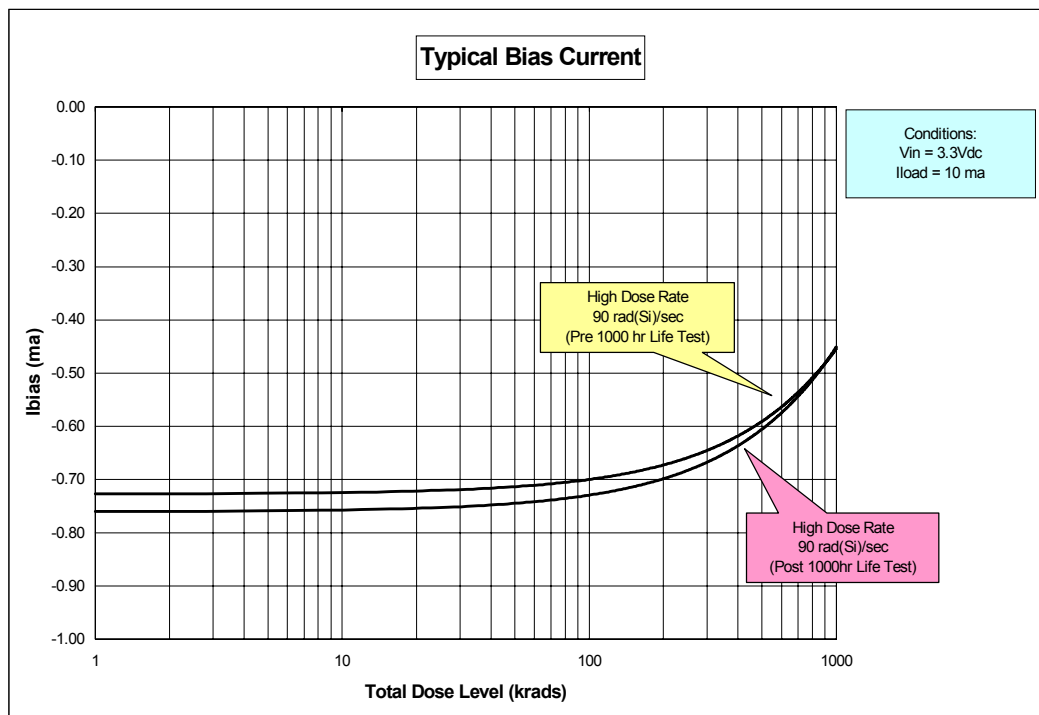
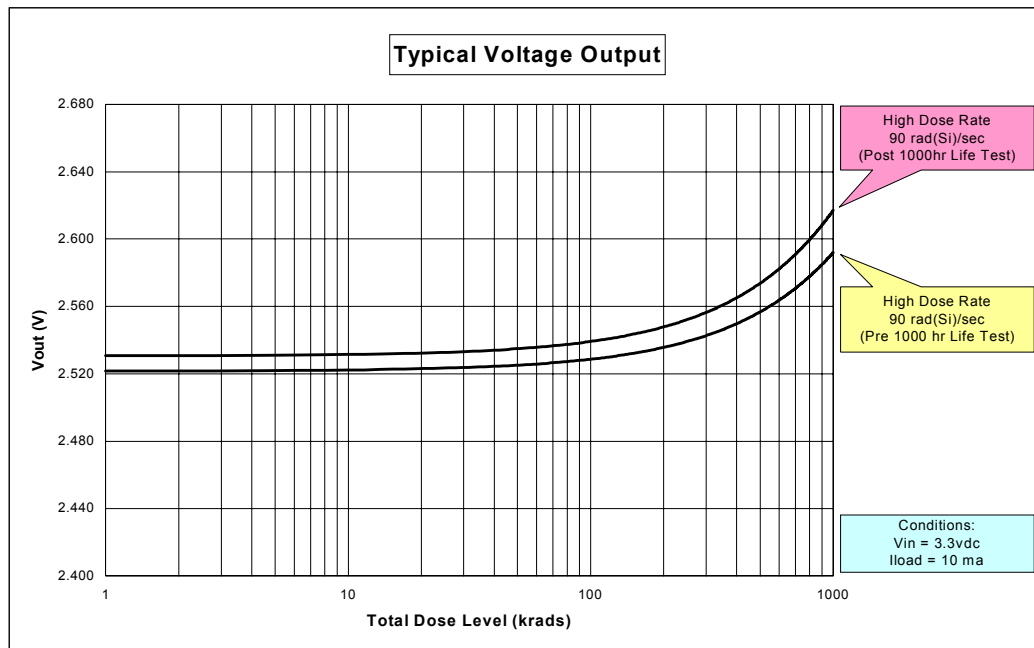
ELECTRICAL CHARACTERISTICS (Ta= -55 to +125°C)

Parameter	Conditions	Symbol	Min.	Typ.	Max	Unit
Output Voltage	Vin= 3.3V, Io= 3.0A	Vout	2.375	2.5	2.625	V
Input Voltage Range-Operating	Io= 3.0A		2.9		6.5	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 Short Circuit	Isc	3.0			A
Bias Current- Line	2.9 ≤ Vin ≤ 3.8, Io= 10mA		-5		+5	mA
Bias Current- Load	Vin= 3.3V, 50ma ≤ Iout ≤ 2.5A		-15		+15	mA
Ripple Rejection	F= 120 Hz., Vout= Vref		65			B
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

Rev 08, 08/15/2000

Post Radiation Characteristics

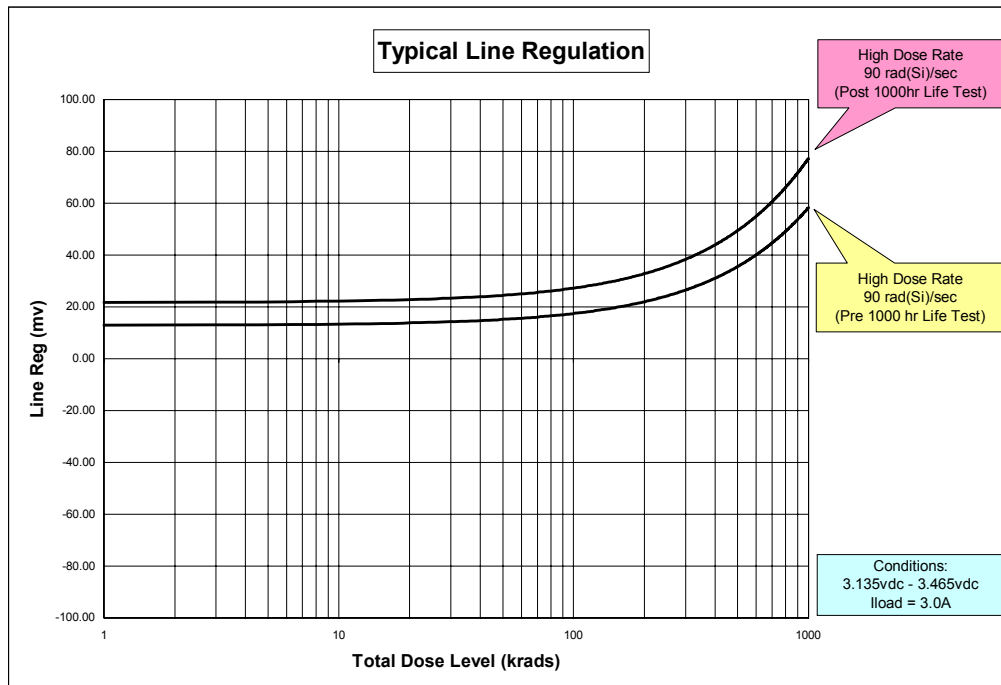
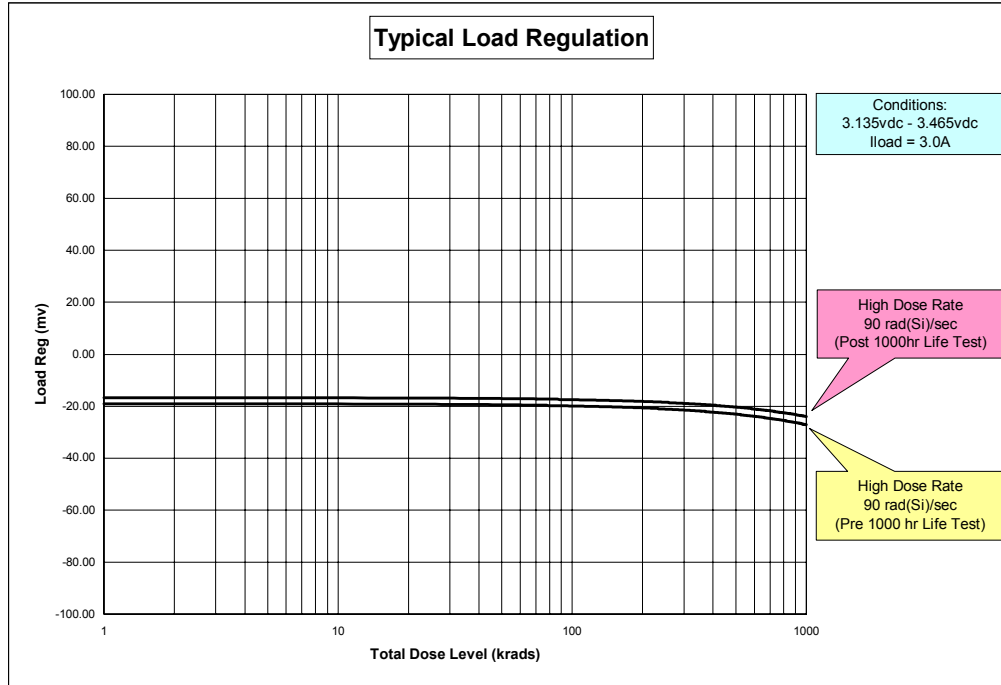
High Dose Rate Characteristics (90 Rads(Si)/Sec)



Rev 08, 08/15/2000

Post Radiation Characteristics

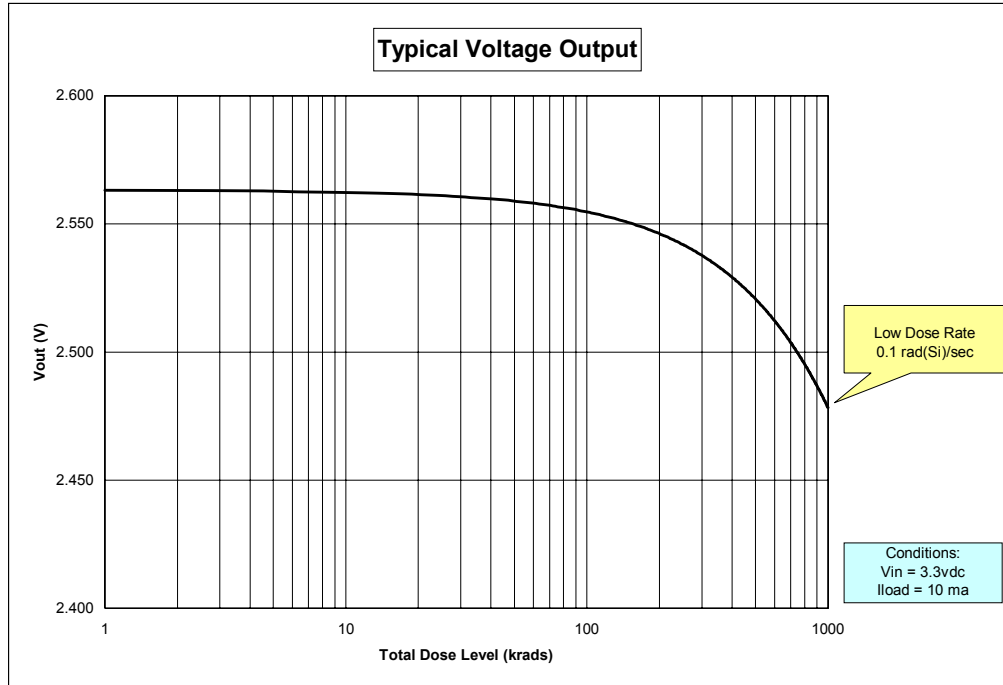
High Dose Rate Characteristics (90 Rads (Si)/Sec)



Rev 08, 08/15/2000

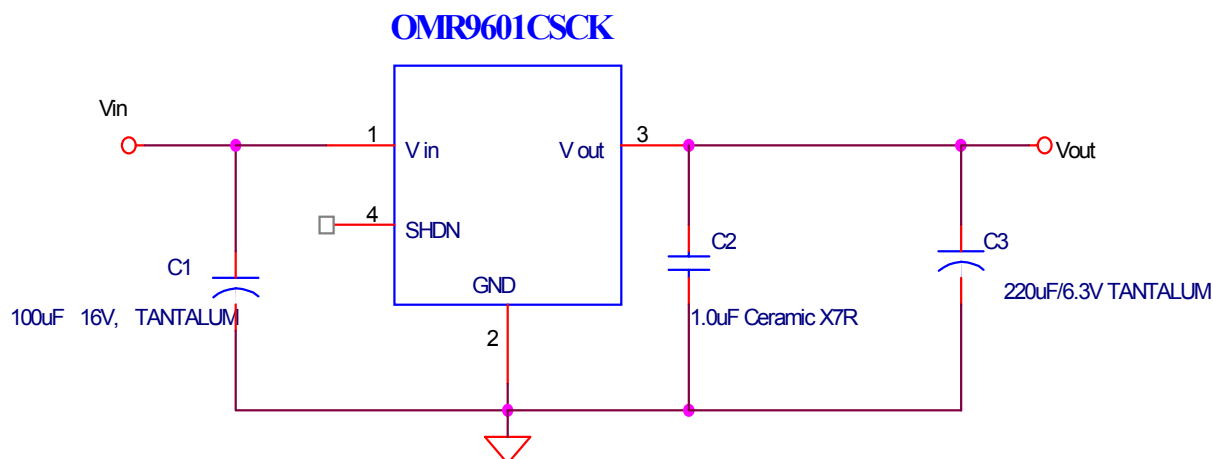
Post Radiation Characteristics

Low Dose Rate Characteristics (0.1 Rads (Si)/Sec)



Rev 08, 08/15/2000

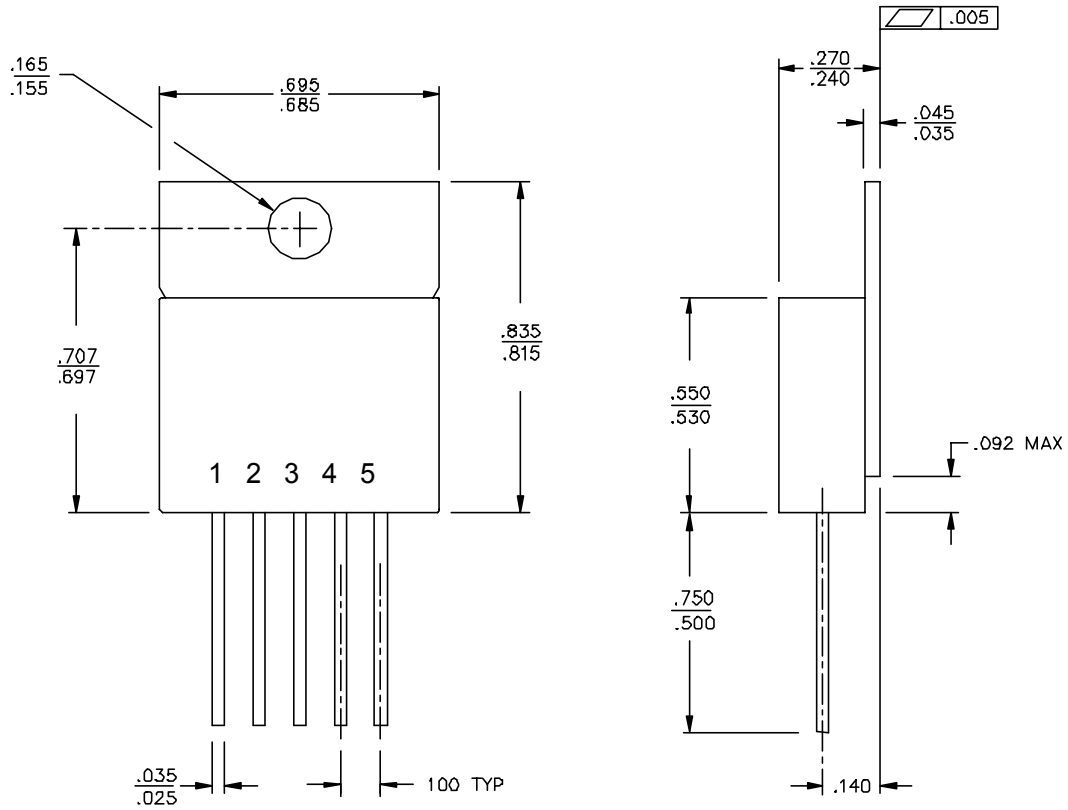
Application Schematic



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 $\pm 20\%$ 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.

Mechanical Outline- MO-78AA



Pin Connections

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

Rev 08, 08/15/2000