

**Ultra Low Dropout, 7.0A  
 Adjustable Positive Linear Regulator  
 Thru-Hole (MO-078AA)**

**OM7580SC**  
**5962 - 0323701MYA**

**Product Summary**

Part Number	Output Voltage	Current	Dropout
OM7580SC	+1.5V to +5.5V	7.0A	0.54V



**MO-078AA**

**Description**

The OM7580SC is a 7.0A, ultra low dropout, adjustable linear regulator specifically designed for low voltage, high current applications. Housed in a hermetic package, the dropout of this device is 540mV at full load and as low as 100mV at light loads. The low dropout is achieved by an additional low current input voltage. This unit is ideally suited for military/defense, commercial aircraft, industrial control and other harsh environments where a hermetically sealed package is required.

**Features:**

- Dropout Voltage of 540mV at Full Load
- Dropout Voltage of 100mV at Light Loads
- Fast Transient Response
- Adjustable Output: 1.8 to 5.5V
- Remote Sense
- Hermetic MO-078AA Package ensures High Reliability

**Absolute Maximum Ratings**

Parameter	Symbol	Value	Units
Output Current	$I_O$	7.0	A
Power Input Voltage	$V_{PWR}$	6.0	V
Control Input Voltage	$V_{CTRL}$	13	
Power Dissipation @ $T_c = 25^\circ\text{C}$	$P_D$	20	W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	5.0	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +150	
Lead Temperature Soldering (10second maximum)	$T_L$	300	

**Electrical Characteristics @ T<sub>A</sub> = 25°C (Unless Otherwise Specified)**

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Reference Voltage V <sub>ADJ</sub> = 0V	V <sub>CTRL</sub> = 2.7V, V <sub>PWR</sub> = 2.0V, I <sub>LOAD</sub> = 10mA	1.243	1.250	1.257	V
	V <sub>CTRL</sub> = 2.7 to 12V, V <sub>PWR</sub> = 1.75V to 5.5V, I <sub>LOAD</sub> = 10mA to 6.0A ①	1.237	1.250	1.263	
Line Regulation	V <sub>CTRL</sub> = 2.5 to 12V, V <sub>PWR</sub> = 3.0V to 5.5V, I <sub>LOAD</sub> = 1.0mA ①	--	1.0	3.0	mV
Load Regulation	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.1V, I <sub>LOAD</sub> = 10mA to 6.0A ①	--	1.0	5.0	
Minimum Load Current	V <sub>CTRL</sub> = 5.0V, V <sub>PWR</sub> = 3.3V, V <sub>ADJ</sub> = 0V ①②	--	5.0	10	mA
Ground Pin Current	V <sub>CTRL</sub> = 5.0V, V <sub>PWR</sub> = 3.3V, I <sub>LOAD</sub> = 0mA ①	--	6.0	10	
Control Pin Current ③	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 25°C	--	--	120	
	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 125°C	--	--	120	
	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, I <sub>LOAD</sub> = 6.0A, T <sub>J</sub> = -55°C	--	--	130	
Adjust Pin Current V <sub>ADJ</sub> = 0V	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, I <sub>LOAD</sub> = 10mA	--	50	120	μA
Ripple Rejection	V <sub>CTRL</sub> = V <sub>PWR</sub> = 5.0V (AVG), V <sub>RIPPLE</sub> = 1.0V <sub>p-p</sub> , f = 120Hz I <sub>OUT</sub> = 4.0A T <sub>J</sub> = 25°C	60	80	--	dB
Current Limit	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, ΔV <sub>OUT</sub> = 100mV, T <sub>J</sub> = 25°C	7.1	8.0	--	A
	V <sub>CTRL</sub> = 2.75V, V <sub>PWR</sub> = 2.05V, ΔV <sub>OUT</sub> = 100mV, T <sub>J</sub> = -55°C & T <sub>J</sub> = +125°C	6.6	--	--	
Minimum V <sub>CONTROL</sub>	V <sub>PWR</sub> = 3.3V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 25°C	--	--	1.33	V
	V <sub>PWR</sub> = 3.3V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 125°C	--	--	1.33	
	V <sub>PWR</sub> = 3.3V, I <sub>LOAD</sub> = 6.0A, T <sub>J</sub> = -55°C	--	--	1.35	
Minimum V <sub>PWR</sub>	V <sub>CTRL</sub> = 2.75V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 25°C	--	--	0.62	V
	V <sub>CTRL</sub> = 2.75V, I <sub>LOAD</sub> = 7.0A, T <sub>J</sub> = 125°C	--	--	0.80	
	V <sub>CTRL</sub> = 2.75V, I <sub>LOAD</sub> = 6.0A, T <sub>J</sub> = -55°C	--	--	0.80	
Thermal Regulation	V <sub>PWR</sub> = 5.0V, I <sub>O</sub> = 7.0A, P <sub>D</sub> ≥ 20W, pulse width = 30ms	--	--	0.02	%/W
Dropout Voltage	Dropout is caused by either minimum control voltage or minimum power voltage. Both parameters are specified with respect to the output voltage. The specifications represent the minimum input/output voltage required to maintain 1% regulation.				

**Footnotes**

- ①- Denotes specifications which apply over the full operating temperature range.
- ②- The minimum load current is minimum current required to maintain regulation. Normally the current in the resistor divider used to set the output voltage is selected to meet the minimum load current requirement.
- ③- The control pin current is the drive current required for the output transistor. The control pin current is approximately 0.01% output current. The minimum value is equal to quiescent current of the device.

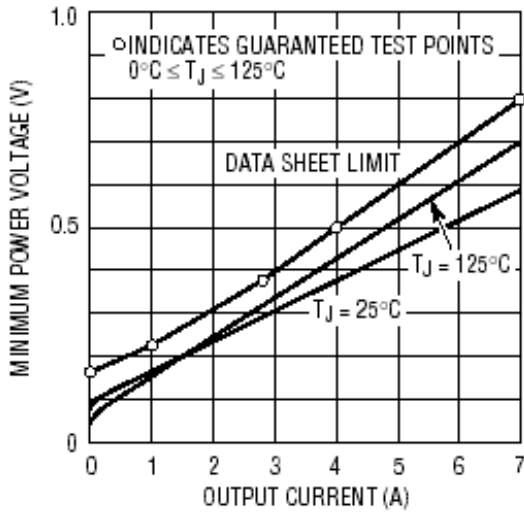


Fig 1: Typical Power Voltage Vs Output Current

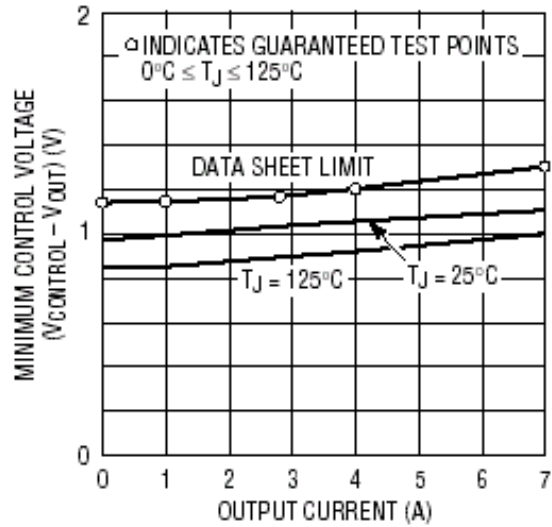


Fig 2: Typical Control Voltage Vs Output Current

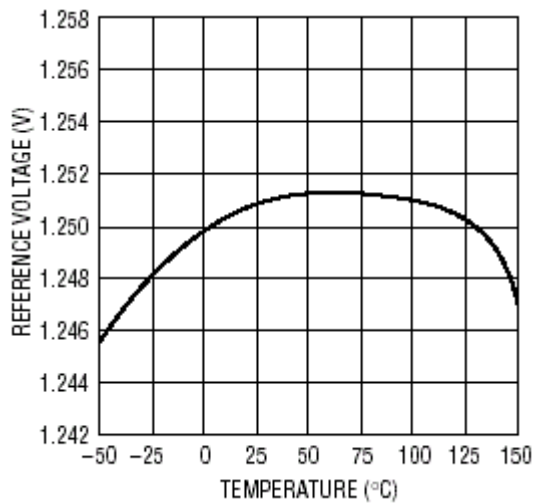


Fig 3: Typical Reference Voltage Vs Temperature

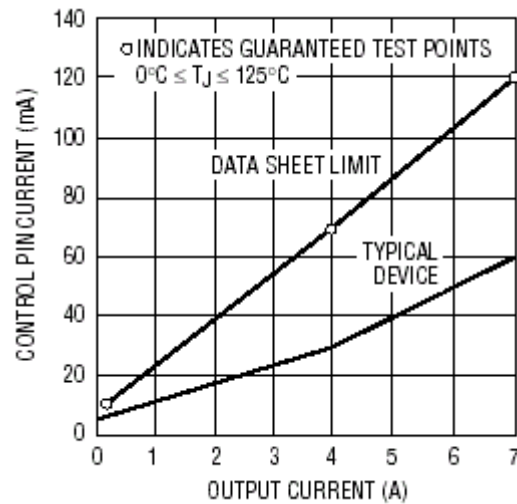
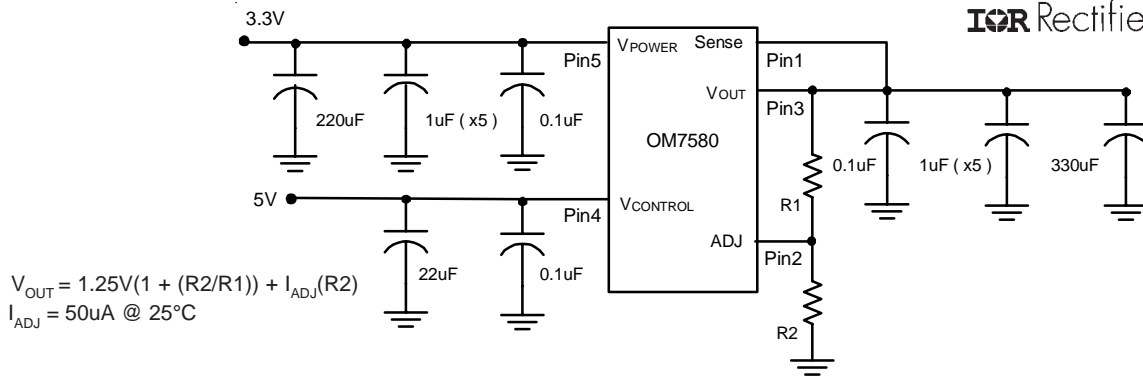


Fig 4: Typical Control Pin Current Vs Output Current

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$$V_{OUT} = 1.25V(1 + (R2/R1)) + I_{ADJ}(R2)$$

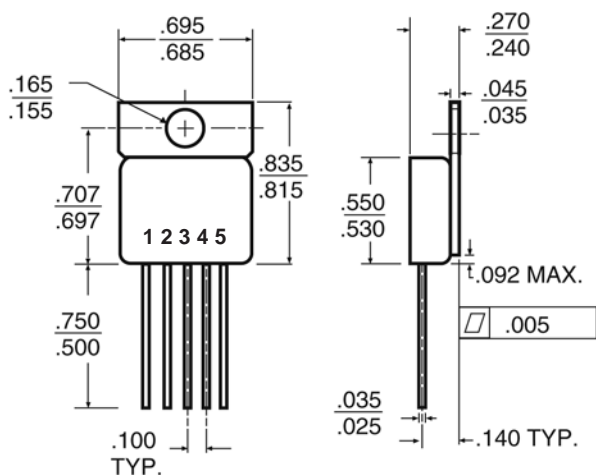
$$I_{ADJ} = 50\mu A @ 25^{\circ}C$$

Fig 5: Typical Application

### Layout Consideration

It is recommended that output capacitors be located as close as possible to the  $V_{OUT}$  terminal of the device to prevent any high frequency oscillation that may result due to excessive stray inductance. Specifications for capacitors: 330 $\mu$ F Tantalum Low ESR, 220 $\mu$ F Electrolytic, 22 $\mu$ F Electrolytic

### Case Outline and Dimensions — MO-078AA



### Pin Assignment

Pin #	Pin Description
1	SENSE
2	ADJUST
3	$V_{OUT}$
4	$V_{CTRL}$
5	$V_{PWR}$

### Part Numbering Nomenclature

OM	7580	S	C	X
Omnirel	Device	S=Isolated	Package	Screening



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