PD - 94743

International
IOR Rectifier

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

OM7580SC
5962 - 0323701MYA

MO-078AA

Product Summary

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

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

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

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Reference Voltage	V_{CTRL} = 2.7V, V_{PWR} = 2.0V, I_{LOAD} = 10mA	1.243	1.250	1.257	V
V_{ADJ}= 0V	V_{CTRL}=2.7 to 12V, V_{PWR}=1.75V to 5.5V, I_{LOAD} =10mA to 6.0A ①	1.237	1.250	1.263	
Line Regulation	V_{CTRL} = 2.5 to 12V, V_{PWR} = 3.0V to 5.5V, I_{LOAD} = 1.0mA ①	--	1.0	3.0	mV
Load Regulation	V_{CTRL} = 2.75V, V_{PWR} = 2.1V, I_{LOAD} = 10mA to 6.0A ①	--	1.0	5.0	
Minimum Load Current	V_{CTRL} = 5.0V, V_{PWR} = 3.3V, V_{ADJ}= 0V ①②	--	5.0	10	mA
Ground Pin Current	V_{CTRL} = 5.0V, V_{PWR} = 3.3V, I_{LOAD} = 0mA ①	--	6.0	10	
Control Pin Current ③	V_{CTRL}= 2.75V, V_{PWR}= 2.05V, I_{LOAD}= 7.0A, TJ = 25°C	--	--	120	
	V_{CTRL}= 2.75V, V_{PWR}= 2.05V, I_{LOAD}= 7.0A, TJ = 125°C	--	--	120	
	V_{CTRL}= 2.75V, V_{PWR}= 2.05V, I_{LOAD}= 6.0A, TJ = -55°C	--	--	130	
Adjust Pin Current	V_{CTRL}= 2.75V, V_{PWR} = 2.05V, I_{LOAD} = 10mA	--	50	120	µA
V_{ADJ}= 0V					
Ripple Rejection	V_{CTRL} = V_{PWR} = 5.0V (AVG), V_{RIPPLE} = 1.0V_{P-P}, f= 120Hz I_{OUT} = 4.0A TJ = 25°C	60	80	--	dB
Current Limit	V_{CTRL}= 2.75V, V_{PWR}= 2.05V, ΔV_{OUT} = 100mV, TJ = 25°C	7.1	8.0	--	A
	V_{CTRL}=2.75V, V_{PWR}=2.05V, ΔV_{OUT}=100mV, TJ=-55°C & TJ=+125°C	6.6	--	--	
Minimum $V_{CONTROL}$	V_{PWR} = 3.3V, I_{LOAD} = 7.0A, TJ = 25°C	--	--	1.33	V
	V_{PWR} = 3.3V, I_{LOAD} = 7.0A, TJ = 125°C	--	--	1.33	
	V_{PWR} = 3.3V, I_{LOAD} = 6.0A, TJ = -55°C	--	--	1.35	
Minimum V_{PWR}	V_{CTRL} = 2.75V, I_{LOAD} = 7.0A, TJ = 25°C	--	--	0.62	V
	V_{CTRL} = 2.75V, I_{LOAD} = 7.0A, TJ = 125°C	--	--	0.80	
	V_{CTRL} = 2.75V, I_{LOAD} = 6.0A, TJ = -55°C	--	--	0.80	
Thermal Regulation	V_{PWR} = 5.0V, I_O = 7.0A, $P_D \geq$ 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.

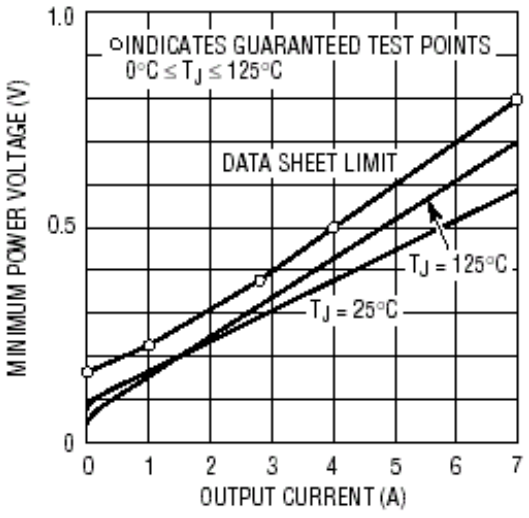


Fig 1: Typical Power Voltage Vs Output Current

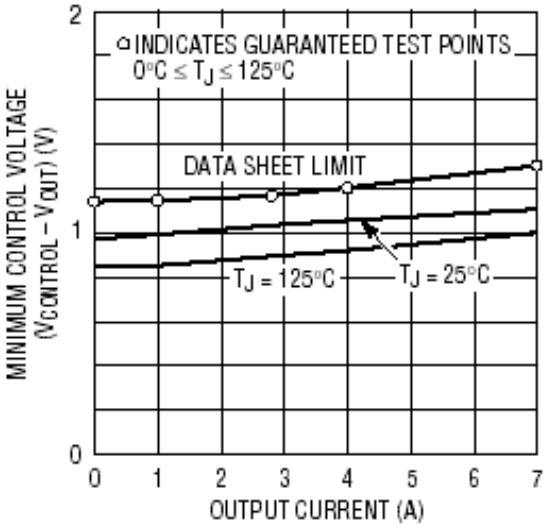


Fig 2: Typical Control Voltage Vs Output Current

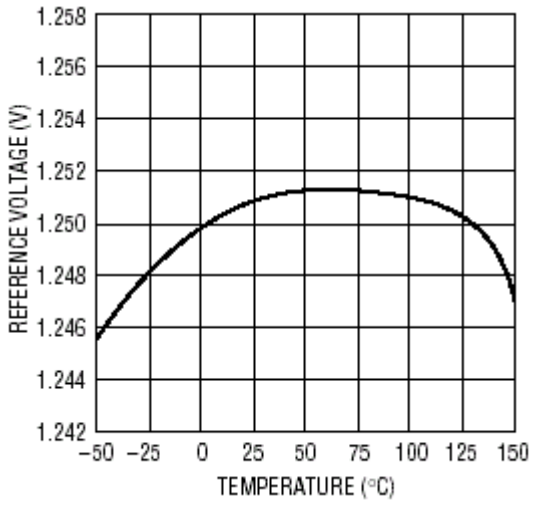


Fig 3: Typical Reference Voltage Vs Temperature

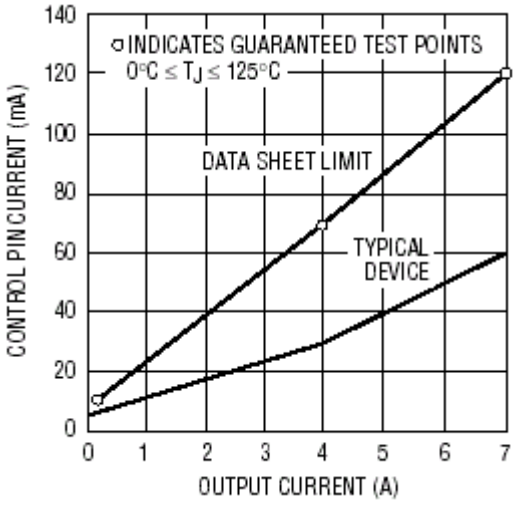


Fig 4: Typical Control Pin Current Vs Output Current

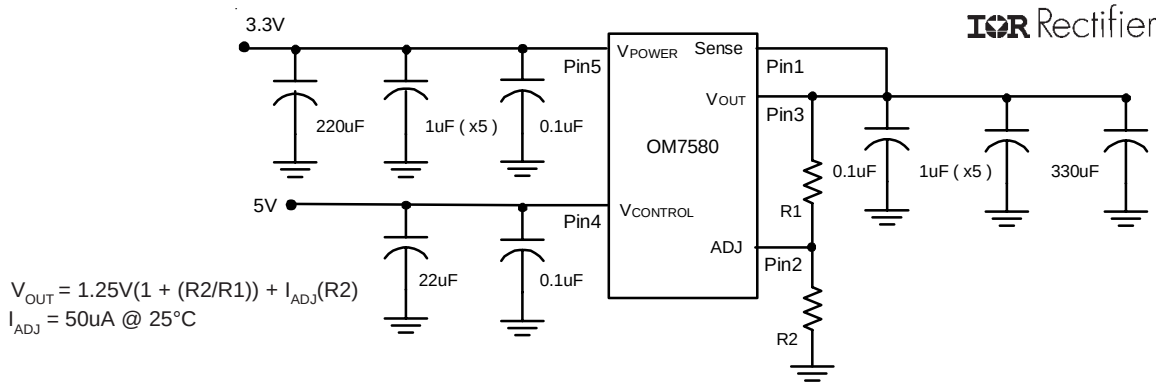
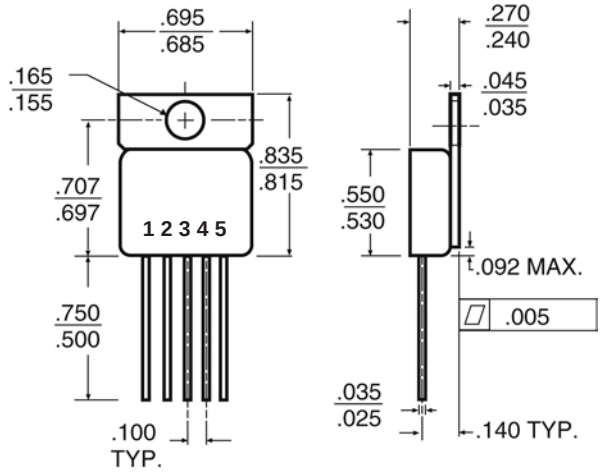


Fig 5: Typical Application

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. Specfications for capacitors: 330µF Tantalum Low ESR, 220µF Electrolytic, 22µF 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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Data and specifications subject to change without notice. *08/03*