

LSR7810 Series

Low Cost, Miniature 1.0A Surface Mount POL Switching Regulators



Key Features:

- Efficiency to 93%
- 1.0A Output Current
- Compact SMT Case
- LM78xx Replacement
- Wide Input Range
- Remote ON/OFF Control
- Adjustable Output Voltage
- Short Circuit Protected
- Thermal Shutdown
- Low Noise
- **Low Low Cost**



Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Output					
Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.0	±3.0	%
Output Voltage Adjustment Range	Contact Factory For Information				
Line Regulation	V _{IN} = Min to Max	±0.2	±0.5		%
Load Regulation	I _{OUT} = 10% to 100%	±0.4	±1.0		%
Ripple & Noise (20 MHz)	See Output Filter Circuit (Page 2)	20	35		mV P - P
		10	15		
Thermal Shutdown	See Note 1	150			°C
Temperature Coefficient				0.02	%/°C
Maximum Capacitive Load				1,000	µF
Output Current Limit			1.8		A
Output Short Circuit	Hiccup Mode, Continuous (Autorecovery)				

General					
Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Not Isolated				
Switching Frequency			1.40		MHz

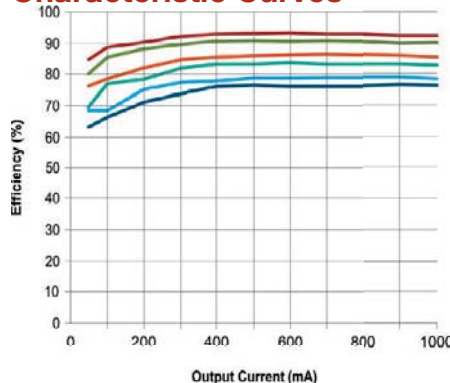
Remote On/Off					
Parameter	Conditions	Min.	Typ.	Max.	Units
Supply On	See Note 2	1.2		6.0	VDC
Supply Off				0.6	VDC
ON/OFF Control Current			100	200	µA
Standby Input Current			120	200	µA

Environmental					
Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case			+100	°C
Storage Temperature Range		-55		+125	°C
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C
Derating	Over 71°C, derate output power 2.85%/°C to 60% at 85°C				
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

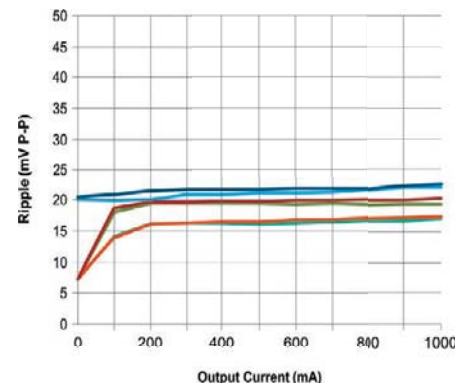
Physical					
Parameter	Conditions	Min.	Typ.	Max.	Units
Case Size	See Mechanical Diagram (Page 2)				
Case Material	Non-Conductive Black Plastic (UL-94V0)				
Weight	0.08 Oz (2.3g)				

Reliability Specifications					
Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.0			MHours

Characteristic Curves



Efficiency vs Load (V_{IN}=Nom)



Ripple vs Load (V_{IN} = Nom)

MicroPower Direct

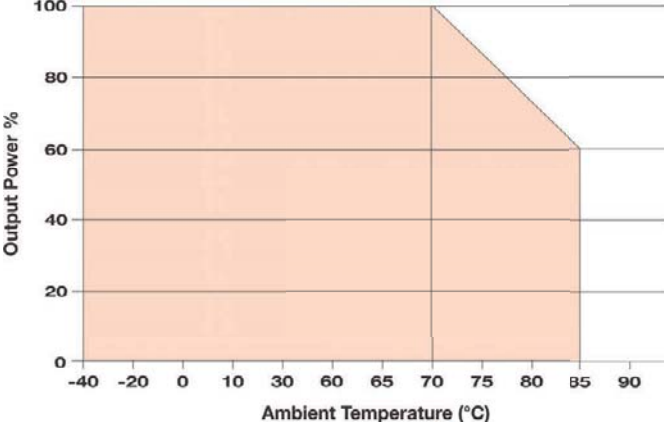


Model Selection Guide

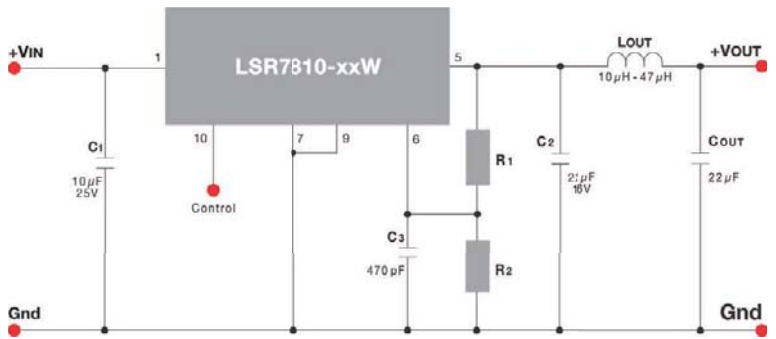
Model Number	Input			Output			Efficiency (% , Max)	
	Voltage (VDC) Nom.	Voltage (VDC) Range	Current (mA)	Voltage (VDC) Nom.	Voltage (VDC) Adj Range	Current (A)	Min V _{IN}	Max V _{IN}
LSR7810-015W	12	4.75 - 15.0	165	1.5	Fixed	1.0	76	74
LSR7810-018W	12	4.75 - 15.0	190	1.8	1.5 - 3.6	1.0	79	77
LSR7810-02W	12	5.0 - 18.0	245	2.5	1.5 - 3.9	1.0	83	81
LSR7810-03W	12	5.0 - 18.0	320	3.3	1.8 - 5.5	1.0	84	84
LSR7810-05W	12	7.0 - 18.0	460	5.0	2.5 - 6.5	1.0	90	88
LSR7810-06W	12	8.5 - 18.0	580	6.5	Fixed	1.0	93	91

- Notes:**
1. Measured at an internal IC junction.
 2. If the control pin (pin 10) is left open, the unit operates. If the control pin is grounded, the unit is off.
 3. This regulator is not designed to be used in parallel with another unit to increase output power.
 4. The input should not exceed the range given in the model selection chart. Exceeding this limit could damage the unit.
 5. If the output voltage is adjusted, the input/output relationship must meet: $V_{in} - V_{out} = >2V$. Attempting to operate below this differential could damage the unit.

Derating Curve

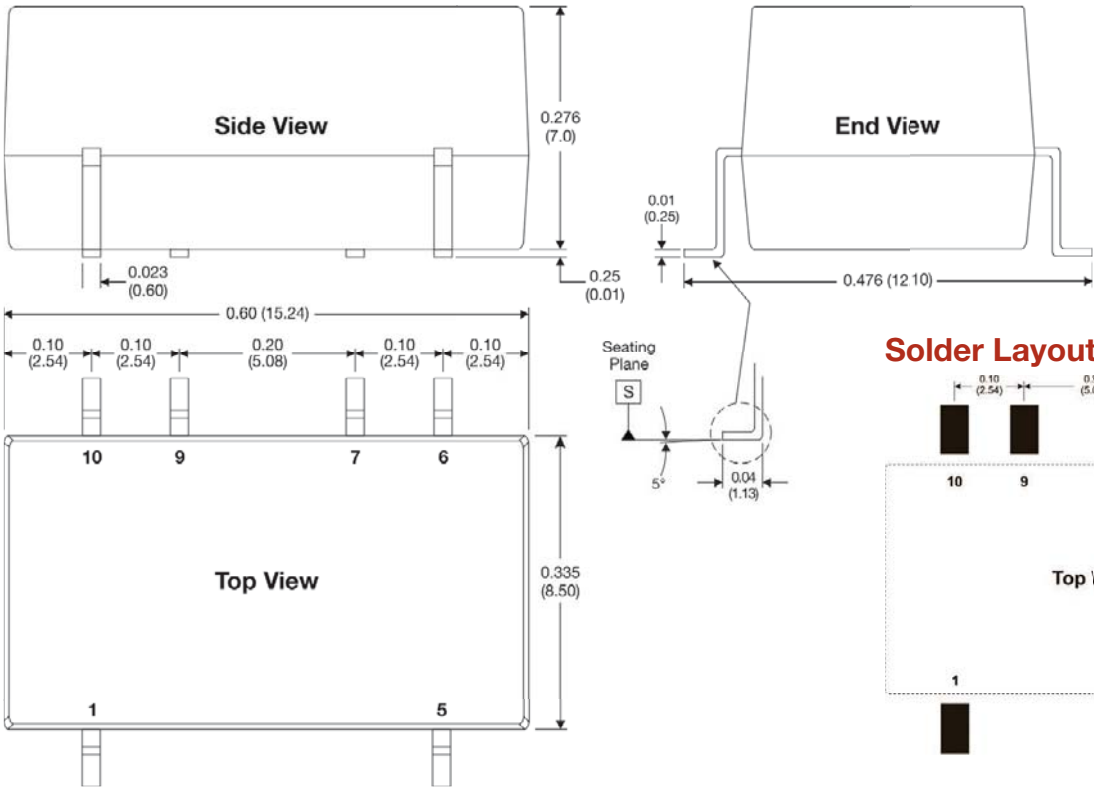


Typical Application Circuits



- The figure at above shows a typical connection of the LSR7810. Some notes on this connection are:
1. C₁ & C₂ are low ESR ceramic capacitors used to minimize noise at the regulator. A tantalum or low ESR electrolytic capacitor may also be used. These capacitors are required and should be mounted as close to the regulator pins as possible.
 2. R₁ & R₂ are used to adjust the regulator output. If this is not required, the V_{ADJ} pin (pin 6) should be connected to ground through 470 pF ceramic capacitor. For more information on adjusting the output, please contact the factory.
 3. A simple LC network may be used to improve the output ripple of the unit. This is illustrated by L_{OUT} and C_{OUT}.

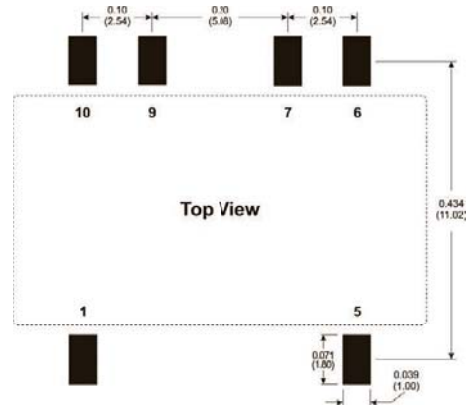
Mechanical Dimensions



Pin Connection

Pin	Function	Pin	Function
1	+V _{IN}	7	Gnd
5	+V _{OUT}	9	Gnd
6	V _{ADJ}	10	Control

Solder Layout



- Notes:**
- All dimensions are typical in inches (mm)
 - Tolerance x.xx = ±0.02 (±0.50)
 - Pin 1 is marked by a "dot" or indentation on the side of the unit