Description

The WL75XXM series is a high voltage ultralow-power low dropout voltage regulator.

The device can deliver 100mA output current with a dropout voltage of 450mV@100mA and allows an input voltage as high as 30V. The typical quiescent current is only 2.5μA.

The WL75XXM is ideally suited for standby micro-control-unit systems, especially for always-on applications like E-meters, fire alarms, smoke detectors and other battery operated systems. The WL75XXM retains all of the features that are common to low dropout regulators including a low dropout PMOS pass device, short circuit protection, and thermal shutdown.

Features

- Low Power Consumption: 2.5μA (Typ)
- Maximum Output Current: 150mA
- Low Dropout Voltage: 450mV@100mA (V_{OUT}=3.3V)
- Operating Voltage Range: 2.5~24V
- Output Voltage Accurate: ±2%
- Good Transient Response
- Integrated Short-Circuit Protection
- Over-Temperature Protection
- Output Current Limit
- Low Temperature Coefficient
- Stable with Ceramic Capacitor
- RoHS Compliant and Lead (Pb) Free
- -40℃ to +85℃ Operating Temperature Range
- Fixed Output Voltage Versions: 2.5,3.0,3.3,3.6 and 5.0V
- Available in Green SOT23, SOT23-3, SOT89-3 Packages

Applications

- Portable, Battery Powered Equipment
- Smoke detector and sensor
- Audio/Video Equipmen
- Weighting Scales
- Home Automation
- Electronic fingerprint lock

Part NO.	Output Voltage	Package
WL7525M	2.5V	SOT23 SOT23-3 SOT89-3
WL7530M	3.0V	
WL7533M	3.3V	
WL7536M	3.6V	
WL7550M	5.0V	

Application Circuits

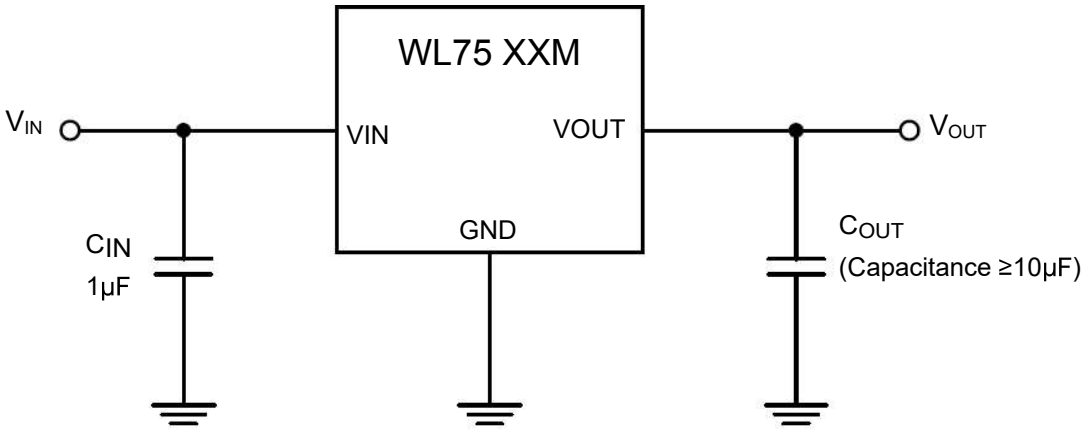
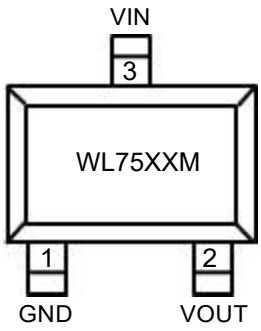


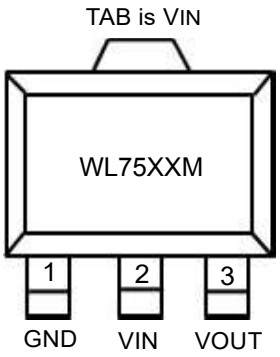
Figure 1. WL75XXM Typical Application Circuit

Pin Configuration （TOP VIEW）

SOT23 & SOT23-3L



SOT89-3L



Pin Description

Pin No.		Pin Name	Pin Function
SOT23-3、SOT23	SOT89-3		
1	1	GND	Ground
3	2	VIN	Power Input
2	3	VOUT	Output Voltage

Order Information

Part NO.	Marking	Description	Package	T/R Qty
WL75XXM	-----	WL75XXM 30V, 2.5uA IQ, 150mA Linear Voltage Regulator	SOT23	3,000 PCS
WL75XXM	-----		SOT23-3L	3,000 PCS
WL75XXM	-----		SOT89-3L	1,000 PCS

Marking Information

For marking information, contact our sales representative directly

Absolute Maximum Ratings

Item		Symbol	Rating	Unit
Supply Input Voltage		V_{IN}	-0.3 ~ 30	V
Regulated Output Voltage		V_{OUT}	-0.3 ~ 6.0	V
Output Current		I_{OUT}	Internally limited	mA
Power Dissipation P_D @T_A=+25℃	SOT23	P_D	350	mW
	SOT23-3		450	
	SOT89-3		700	
Thermal Resistance (Junction to air)	SOT23	θ_{JA}	350	°C /W
	SOT23-3		275	
	SOT89-3		180	
Human Body Model (HBM)		±2000		V
Charged Device Mode (CDM)		±1000		V
Machine Mode (MM)		200		V
Storage Temperature Range		T_{STG}	-65 ~ +150	°C
Operating Junction Temperature		T_J	+150	°C
Lead Temperature (Soldering 10s)		T_{LEAD}	+260	°C

Note：

1、Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these conditions is not implied. Exposure to absolute-maximum-rated conditions for extended period may affect device reliability.

2、Ratings apply to ambient temperature at +25°C

3、The package thermal impedance is calculated in accordance to JESD 51-7.

Recommended Operating Conditions

Item	Min	Max	Unit
Operating Ambient Temperature	-40	+85	°C
Input voltage	2.5	12	V
Output Voltage	-	5	V

Electronic Characteristics

Test Conditions:V_{IN}=V_{OUT}+1V,C_{IN}=C_{OUT}=1uF,T_A=25℃, unless otherwise specify

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage	V_{IN}		2.5	——	24	V
Quiescent Current	I_Q	V_{IN} =12V, I_{LOAD} =0mA	——	2.5	3.0	μA
Output Voltage	V_{OUT}	V_{IN} =12V, I_{LOAD} =10mA	V_{OUT}x0.98	——	V_{OUT}x1.02	V
Output Current	I_{OUT}	V_{IN} = V_{OUT} +2V	——	150	——	mA
Dropout Voltage V_{OUT} =3.3V	V_{DROP}	I_{LOAD} =100mA	——	450	——	mV
		I_{LOAD} =150mA	——	700	——	
Line Regulation	Δ V_{LINE}	I_{LOAD} =1mA V_{OUT} +2.0v ≦ V_{IN} ≦24V	——	0.15	——	% / V
Load Regulation	Δ V_{LOAD}	V_{IN} = V_{OUT} +2V 1mA≦ I_{LOAD} ≦100mA	——	——	20	mV
Short Current	I_{SHORT}	V_{OUT} = GND	——	80	——	mA
Thermal Shutdown Temperature	T_{SHDN}		——	160	——	℃
Thermal Shutdown Hysteresis	ΔT_{SHD}		——	20	——	℃

Note : All limits specified at room temperature (TA = 25°C) unless otherwise specified. All room temperature limits are 100% production tested. All limits at temperature extremes are ensured through correlation using standard Statistical Quality Control (SQC) methods. All limits are used to calculate Average Outgoing Quality Level (AOQL).

Functional Block Diagram

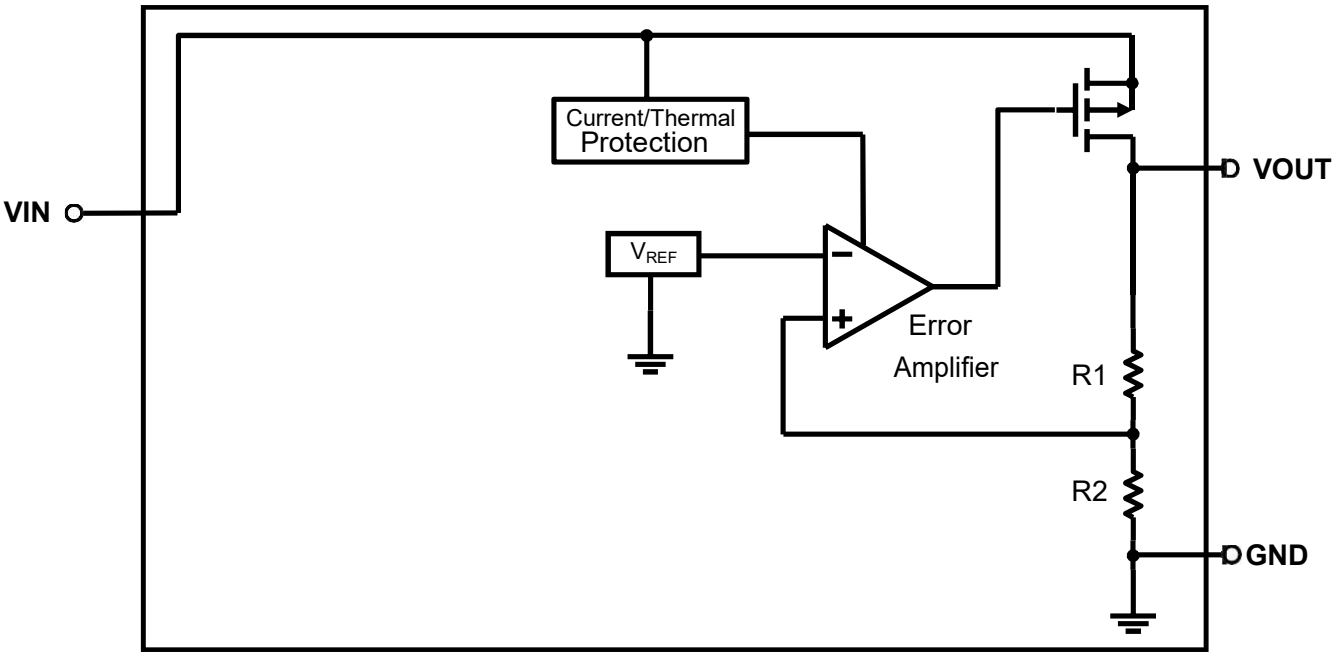


Figure 2. 75XXM Block Diagram

Application Guideline

Input Capacitor

A 1uf cap between VIN and GND pins to decouple input power supply glitch and noise. The amount of the capacitance may be increased without limit. This input capacitor must be located as close as possible to the device to assure input stability and less noise. For PCB layout, a wide copper trace is required for both VIN and GND.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended output capacitance is 10uf are X7R or X5R. Higher capacitance values help to improve load/line transient response. The output capacitance may be increased to keep low undershoot/overshoot. Place output capacitor as close as possible to VOUT and GND pins.

Dropout Voltage

The dropout voltage refers to the voltage difference between the VIN and VOUT pins while operating at specific output current. The dropout voltage VDROP also can be expressed as the voltage drop on the pass-FET at specific output current (IRATED) while the pass-FET is fully operating at ohmic region and the pass-FET can be characterized asan resistance RDS(ON). Thus the dropout voltage can bedefined as (VDROP = VIN OUT = RDS(ON) x IRATED). Fornormal operation, the suggested LDO operating range is (VIN > VOUT + VDROP) for good transient response and PSRR ability. Vice versa, while operating at the ohmic region will degrade the performance severely.

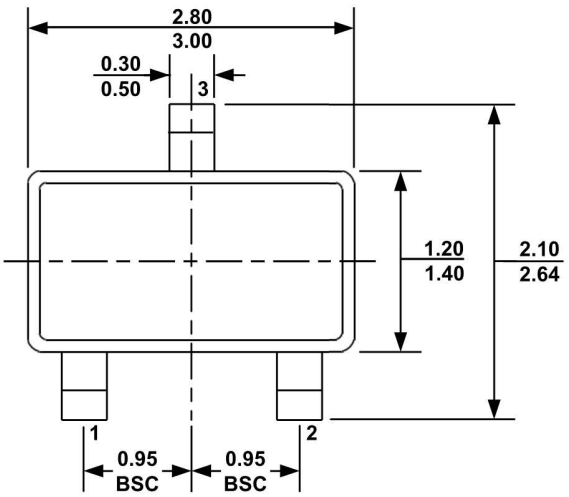
Thermal Application

For continuous operation, do not exceed the absolute maximum junction temperature. The maximum power dissipation depends on the thermal resistance of the IC package, PCB layout, rate of surrounding airflow, and difference between junction and ambient temperature. The maximum power dissipation can be calculated as : TA=25°C, WPM DEMO PCB, The max PD= (Tj TA) / JA. Power dissipation (PD) is equal to the product of the output current and the voltage drop across the output pass element, as shown in the equation : PD = (VIN VOUT) × IOUT

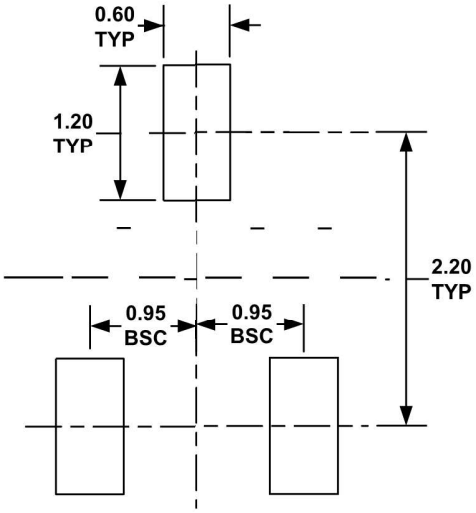
Layout Consideration

By placing input and output capacitors on the same side of the PCB as the LDO, and placing them as close as is practical to the package can achieve the best performance. The ground connections for input and output capacitors must be back to the 75XXM ground pin using as wide and as short of a copper trace as is practical. Connections using long trace lengths, narrow trace widths, and/or connections through via must be avoided. These add parasitic inductances and resistance that results in worse performance especially during transient conditions.

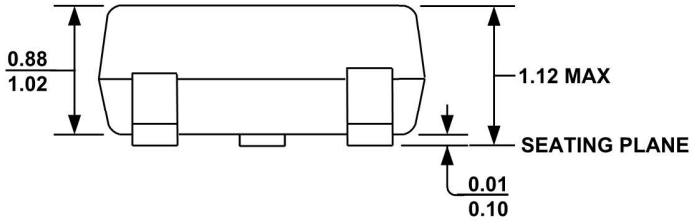
PACKAGE OUTLINE DRAWING FOR SOT23



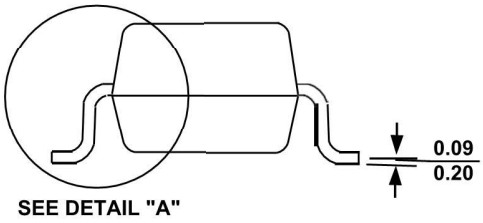
TOP VIEW



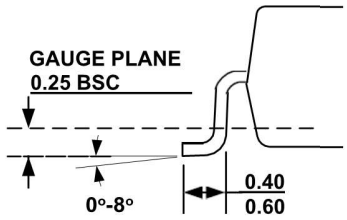
RECOMMENDED LAND PATTERN



FRONT VIEW



SIDE VIEW

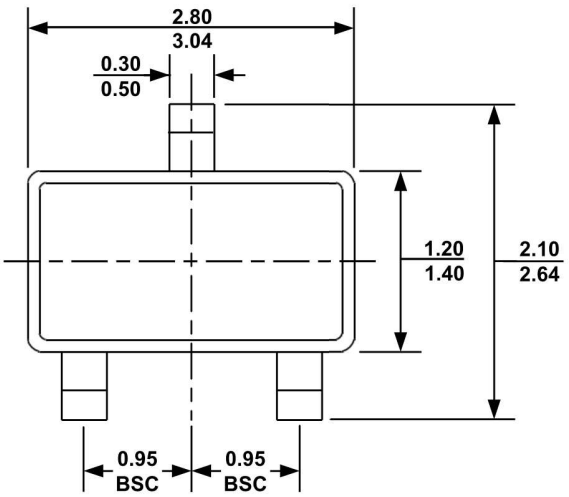


DETAIL "A"

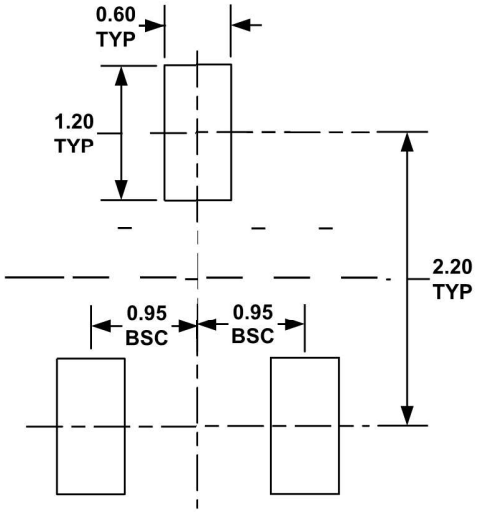
NOTE:

1) ALL DIMENSIONS ARE IN MILLIMETERS.
2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURR.
3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION.
4) LEAD COPLANARITY (BOTTOM OF LEADS AFTER FORMING) SHALL BE 0.10 MILLIMETERS MAX.
5) DRAWING IS NOT TO SCALE.
6) PIN 1 IS LOWER LEFT PIN WHEN READING TOP MARK FROM LEFT TO RIGHT, (SEE EXAMPLE TOP MARK)
DRAWING CONFORMS TO JEDEC TO-236, VARIATION AB.

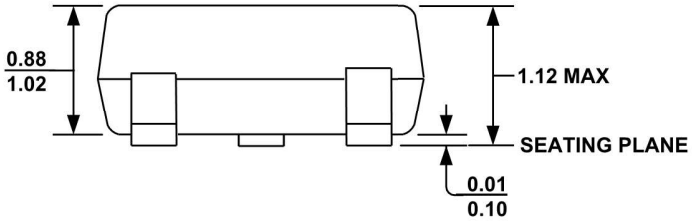
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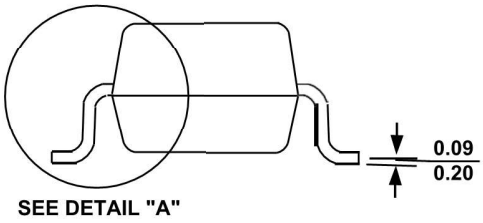
TOP VIEW



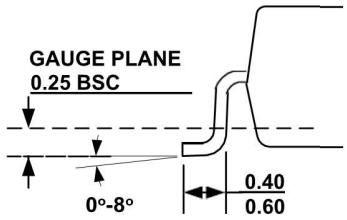
RECOMMENDED LAND PATTERN



FRONT VIEW



SIDE VIEW

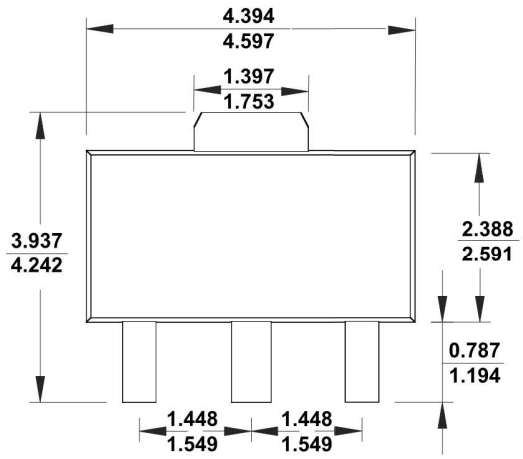


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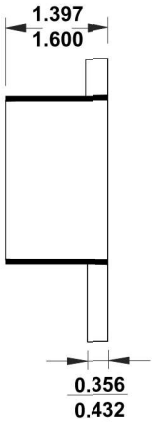
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DRAWING CONFORMS TO JEDEC TO-236, VARIATION AB.

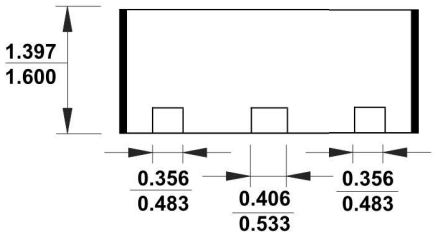
PACKAGE OUTLINE DRAWING FOR SOT89-3



TOP VIEW



SIDE VIEW



FRONT VIEW

NOTE:

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2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURR.
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