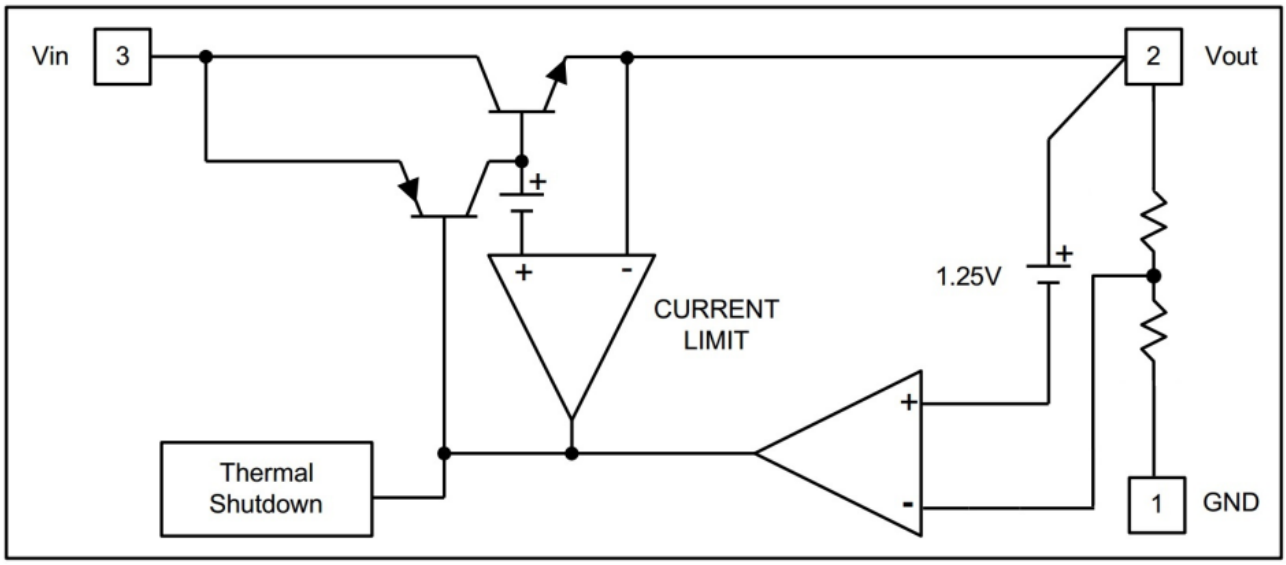
Block Diagram & Symbol



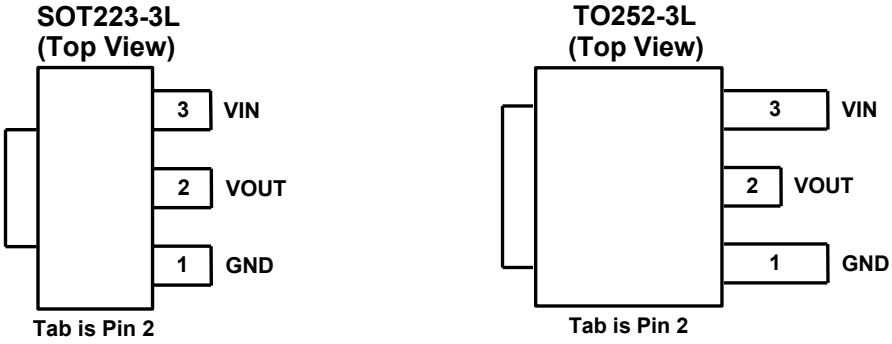
Ordering Information

LSP 9808 - XX XX X

- Packing
- Package
- Output Voltage

Output Voltage	Package	Packing
12 : 1.2V 18 : 1.8V 25 : 2.5V 33 : 3.3V	E3 : SOT223-3L D3 : TO252-3L	A : Tape & Reel

Pin Assignment



Pin Descriptions

Pin Number	Pin Name	Pin Description
1	GND	Ground Pin
2	VOUT	Voltage Output
3	VIN	Voltage Input

Absolute Maximum Ratings(at T_A=25°C)

Note: Operate over the "Absolute Maximum Ratings" may cause permanent damage to the device. Exposure to such conditions for extended time may still affect the reliability of the device.

Characteristics		Symbol	Rating	Unit
VCC Pin Voltage		V_{CC}	-0.3 to 8	V
Feedback Pin Voltage		V_{FB}	-0.3 to VCC	mA
Storage Temperature		T_{STG}	-65 to +150	°C
Junction Temperature		T_{JC}	150	°C
Thermal Resistance (Junction to Case)	SOT223-3L	θjc	31	°C/W
	TO252-3L		30	
Thermal Resistance (Junction to Ambient)	SOT223-3L	θja	125	°C/W
	TO252-3L		140	
Power dissipation	SOT223-3L	P_D	800	mW
	TO252-3L		1000	
Moisture Sensitivity		MSL	Please refer the MSL label on the IC package bag/carton for detail	

Note1: Ratings apply to ambient temperature at 25°C

Recommended Operating Conditions

Characteristics	Symbol	Min	Max	Unit
Input Voltage	V_{IN}	V_{REF}	6.5	V
Output Current	I_{OUT}	0	1000	mA
Operating Junction Temperature Range	T_J	-20	125	°C

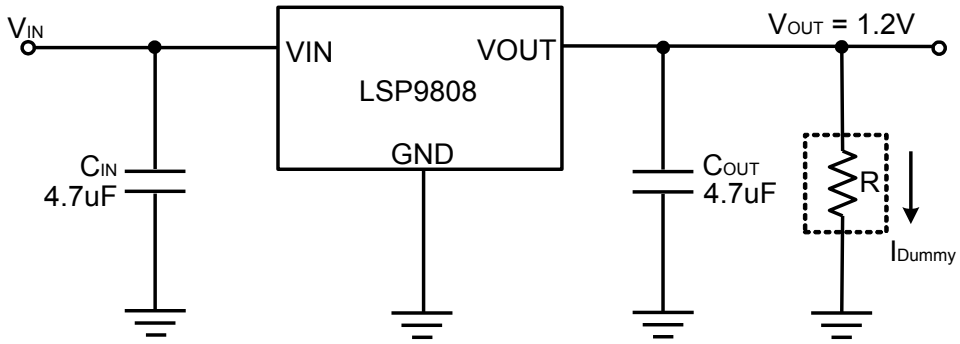
Electrical Characteristics

(V_{IN} = 5V,T_A=25°C, unless otherwise specified)

Characteristics	Conditions		Min	Typ	Max	Unit
Output Voltage (V_{OUT})	LSP9808-1.2V	IO = 10mA , TA = 25°C	1.176	1.200	1.224	V
	LSP9808-1.8V	IO = 10mA , TA = 25°C	1.764	1.800	1.836	
	LSP9808-2.5V	IO = 10mA , TA = 25°C	2.450	2.500	2.550	
	LSP9808-3.3V	IO = 10mA , TA = 25°C	3.235	3.300	3.365	
Line Regulation	IO = mA,VOUT+1.5V<VIN<6.5V, TA = 25°C				0.3	%
Load Regulation	LSP9808-1.2V	VIN=3.3V, TA = 25°C			1	%
	LSP9808-1.8V	VIN=3.3V, TA = 25°C			1	%
	LSP9808-2.5V	VIN=5.0V, TA = 25°C			1	%
	LSP9808-3.3V	VIN=5.0V, TA = 25°C			1	%
Dropout Voltage (VIN-VOUT)	IOUT=1A, ΔVOUT=1%Vout				1.4	V
Current Limit	(VIN-VOUT) = 5V		1.1			A
Thermal Regulation	TA = 25°C, 30ms pulse			0.008	0.04	%/W
Ripple Rejection	F = 120Hz, COUT = 25uF ,IOUT = 1.0A			65		dB
Quiescent Current (*for VOUT =1.8V/2.5V/3.3V Version)					3	mA
Minimum Load Current (*for VOUT =1.2V Version)					3	mA
Temperature Stability	IO = 10mA			0.5		%
Thermal Shutdown	Junction temperature			145		oC
Thermal Shutdown Hysteresis				25		oC

Note : Thes speicifications are guaranteed by designed and are not tested when in mass-production.

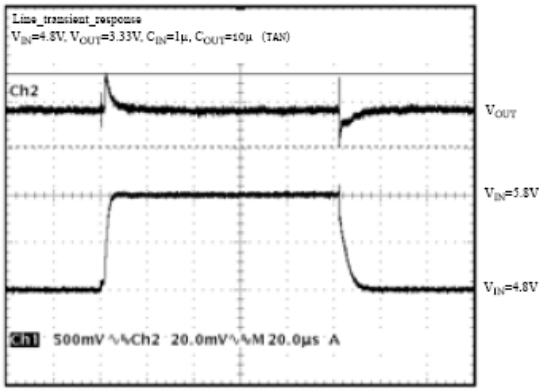
Application Circuit



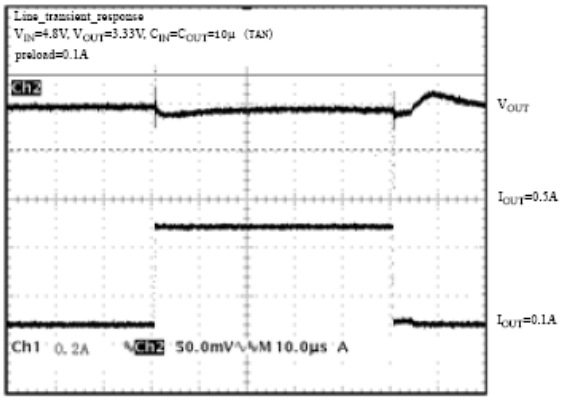
The LSP9808 fixed 1.2V version needs a dummy load current as the quiescent current to stabilize the output voltage when the normal output load current is smaller than 3mA. Other voltage versions do not need the dummy load current.
The CIN, COUT capacitor are 4.7uF (Low ESR Ceramic, MLCC), and its ESR should be larger than 15mΩ, otherwise need to use electrolytic capacitor, and 10uF is a typical value.

Typical Characteristics

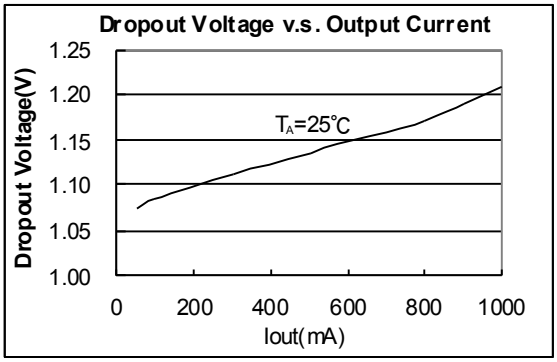
Load Transient Response



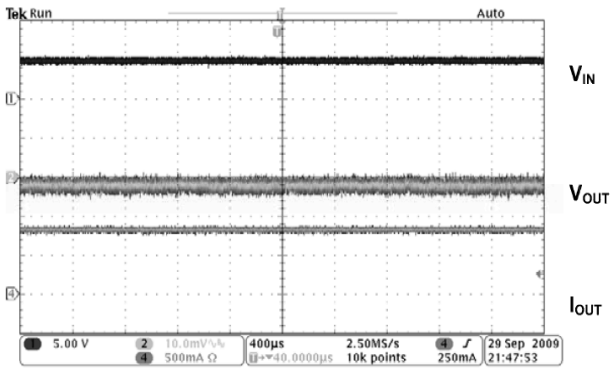
Load Transient Response



Dropout Voltage vs output Current

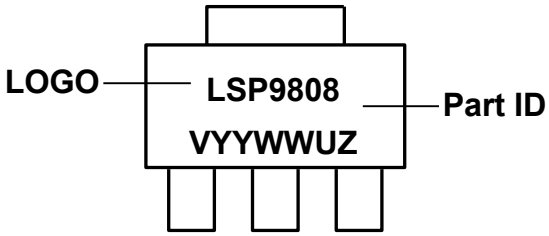


Output Voltage Ripple and Noise



Marking Information

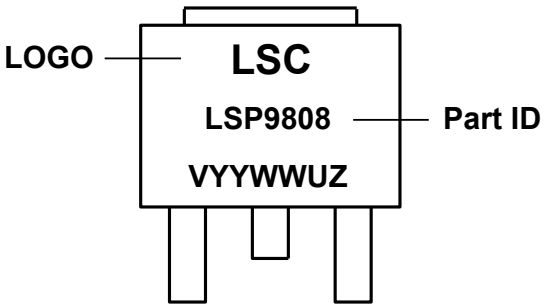
(1) SOT223-3L



V YYWW UZ

- Internal Code
- Date Code
  YY：Year(09=2009,10=2010,11=2011,12=2012...)
  WW：Week(01~53)
- Output Voltage
  P=1.2V
  C=1.8V
  D=2.5V
  J=3.3V

(2) TO252-3L

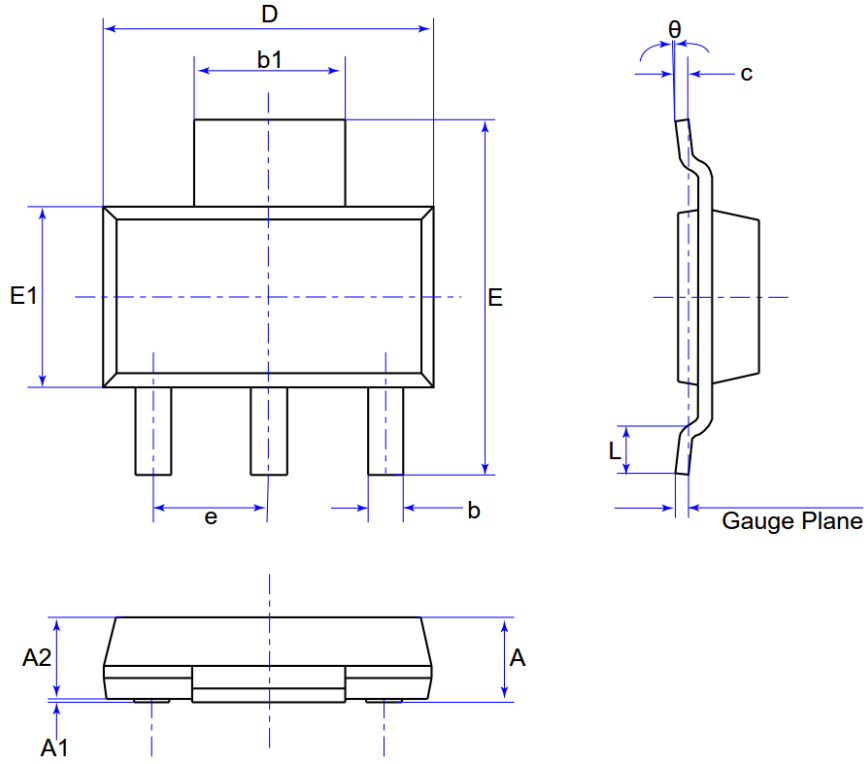


V YYWW UZ

- Internal Code
- Date Code
  YY：Year(09=2009,10=2010,11=2011,12=2012...)
  WW：Week(01~53)
- Output Voltage
  P=1.2V
  C=1.8V
  D=2.5V
  J=3.3V

Mechanical Information

(1) Package type: SOT223-3L

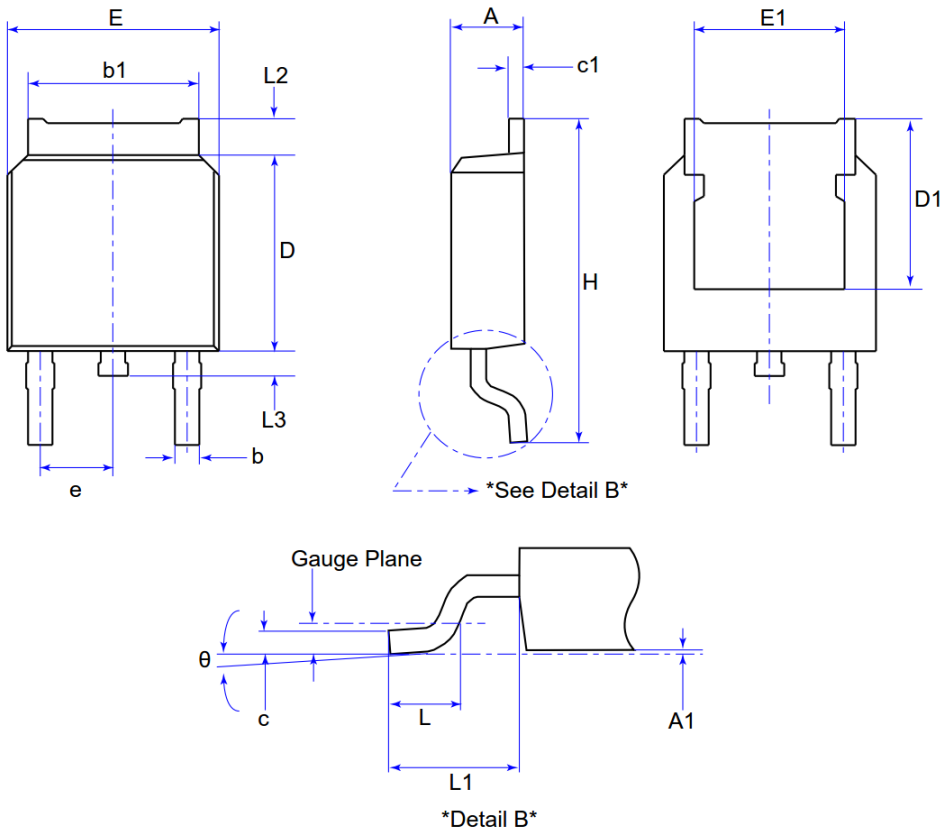


Unit: mm

Symbol	Min	Max
A	-	1.80
A1	-	0.10
A2	1.45	1.75
b	0.66	0.84
c	0.23	0.35
D	6.20	6.70
b1	3.00 REF	
E	6.70	7.30
E1	3.30	3.70
e	2.30 BSC	
L	0.75	-
θ	0^{o}	10^{o}
Gauge Plane	0.30 REF	

Mechanical Information (Continued)

(2) Package type: TO252



Unit : mm

Symbol	Min	Max
A	2.200	2.400
A1	-	0.127
b	0.660	0.860
b1	5.334 REF	
c	0.460	0.600
c1	0.460	0.580
D	6.000	6.200
D1	5.300 REF	
E	6.500	6.700
E1	4.830 REF	
e	2.186	2.400
H	9.800	10.400
L	1.400	1.700
L1	2.900 REF	
Gauge Plane	0.508 REF	
L2	0.900	1.300
L3	0.600	1.000
θ	0^{o}	8^{o}

MSL (Moisture Sensitive Level) Information

IPC/JEDEC J-STD-020D.1 Moisture Sensitivity Levels Table

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS				
			Standard		Accelerated Equivalent [1]		
					eV 0.40-0.48	eV 0.30-0.39	CONDITION
	TIME	CONDITION	TIME (hours)	CONDITION	TIME (hours)	TIME (hours)	
1	Unlimited	≤30 °C /85% RH	168 +5/-0	85 °C /85% RH	NA	NA	NA
2	1 year	≤30 °C /60% RH	168 +5/-0	85 °C /60% RH	NA	NA	NA
2a	4 weeks	≤30 °C /60% RH	696[2] +5/-0	30 °C /60% RH	120 -1/+0	168 -1/+0	60 °C/ 60% RH
3	168 hours	≤30 °C /60% RH	192[2] +5/-0	30 °C /60% RH	40 -1/+0	52 -1/+0	60 °C/ 60% RH
4	72 hours	≤30 °C /60% RH	96[2] +2/-0	30 °C /60% RH	20 +0.5/-0	24 +0.5/-0	60 °C/ 60% RH
5	48 hours	≤30 °C /60% RH	72[2] +2/-0	30 °C /60% RH	15 +0.5/-0	20 +0.5/-0	60 °C/ 60% RH
a	24 hours	≤30 °C /60% RH	48[2] +2/-0	30 °C /60% RH	10 +0.5/-0	13 +0.5/-0	60 °C/ 60% RH
6	Time on Label (TOL)	≤30 °C /60% RH	TOL	30 °C /60% RH	NA	NA	NA

Note 1: CAUTION - To use the ‘‘accelerated equivalent’’ soak conditions, correlation of damage response (including electrical, after soak and reflow), should be established with the ‘‘standard’’ soak conditions. Alternatively, if the known activation energy for moisture diffusion of the package materials is in the range of 0.40 - 0.48 eV or 0.30 - 0.39 eV, the ‘‘accelerated equivalent’’ may be used. Accelerated soak times may vary due to material properties (e.g .mold compound, encapsulant, etc.). JEDEC document JESD22-A120 provides a method for determining the diffusion coefficient.

Note 2: The standard soak time includes a default value of 24 hours for semiconductor manufacturer’s exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor’s facility. If the actual MET is less than 24 hours the soak time may be reduced. For soak conditions of 30 °C/60% RH, the soak time is reduced by 1 hour for each hour the MET is less than 24 hours. For soak conditions of 60 °C/60% RH, the soak time is reduced by 1 hour for each 5 hours the MET is less than 24 hours. If the actual MET is greater than 24 hours the soak time must be increased. If soak conditions are 30 °C/60% RH, the soak time is increased 1 hour for each hour that the actual MET exceeds 24 hours. If soak conditions are 60 °C/60% RH, the soak time is increased 1 hour for each 5 hours that the actual MET exceeds 24 hours.