



General Description

The LP5907QMFx-xxQ1 series are highly accurate, low noise, CMOS LDO Voltage Regulators. Offering low output noise, high ripple rejection ratio, low dropout and very fast turn-on times, the LP5907QMFx-xxQ1 series is ideal for today's cutting edge mobile phone. Internally the LP5907QMFx-xxQ1 includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators. The LP5907QMFx-xxQ1's output voltage is set by current trimming. Voltages are selectable in 100mV steps within a range of 0.9V to 5.0V. When the CE input pin is low, the fast discharge channel can pass, a built-in pull-down resistor pulls the output voltage low. Fast discharge function.

The LP5907QMFx-xxQ1 series is also fully compatible with low ESR ceramic capacitors, reducing cost and improving output stability. This high level of output stability is maintained even during frequent load fluctuations, due to the excellent transient response performance and high PSRR achieved across a broad range of frequencies. The CE function allows the output of regulator to be turned off, resulting in greatly reduced power consumption.

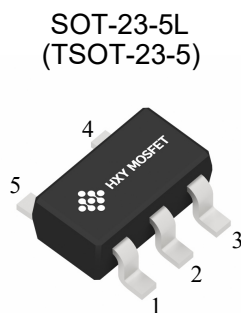
Features

- Low power consumption: 10uA (Typ.)
- Low voltage drop:
0.11V@100mA@VOUT=2.8V(Typ.)
- Standby Mode: 0.1uA
- Low temperature coefficient
- Good line Regulation: 0.05%/V
- High Ripple Rejection: 75dB@100Hz(Typ.)
- High input voltage (up to 6.5V)
- Output voltage accuracy: tolerance ±2%
- SOT-23-5L package

Application

- Battery-powered equipment
- Communication equipment
- Mobile phones
- Portable games
- Cameras, Video cameras
- Reference voltage sources

Pin Configuration And Descriptions



PIN No.	Name	Functions Description
SOT-23-5L (TSOT-23-5)		
1	V _{IN}	Input
2	GND	Ground
3	CE	ON/OFF Control
4	NC	No Connect
5	V _{OUT}	Output

Order Information

Orderable Device	Package	Output Voltage	Packing Option
LP5907QMFx-xxQ1	SOT-23-5L(TSOT-23-5)	1.2V 1.5V 1.8V 2.5V 2.8V 3.0V 3.3V	3000/Reel

xx:From 1.2-5.0



Absolute Maximum Ratings

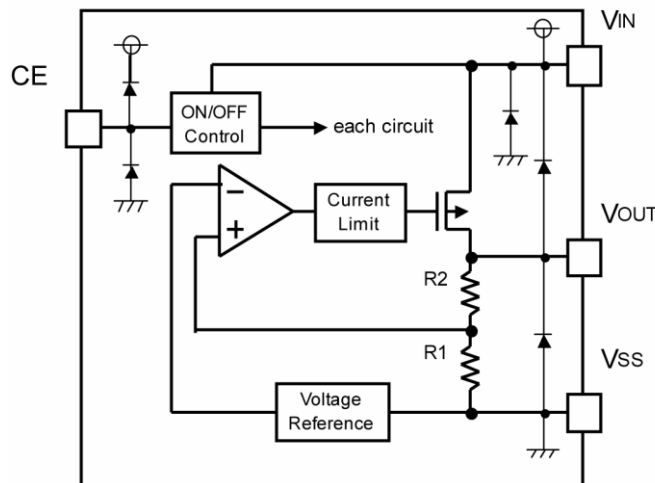
Description	Symbol	Value Range	Unit
Supply Voltage	V_{IN}	-0.3~+8	V
Storage Temperature Range	T_{STG}	-50~+125	°C
Operating Temperature	T_A	-40~+85	°C

Note: Stresses greater than 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 or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

Heat Dissipation

Description	Symbol	Package	Value Range	Unit
Thermal resistance	θ_{JA}	SOT-23-5L	260	°C/W
Power dissipation	P_W	SOT-23-5L	0.4	W

Block Diagram



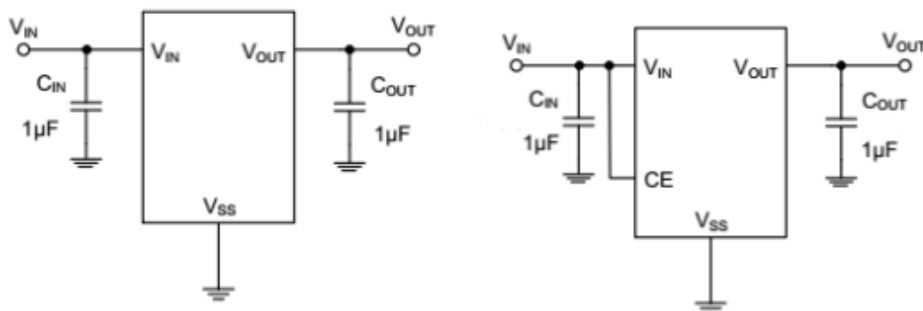


DC Characteristics (unless otherwise noted $T_A = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$V_{out} \leq 2.5V$	$V_{in} = V_{out} + 1V$ $1.0mA \leq I_{out} \leq 100mA$	$V_{out} - 0.05$		$V_{out} + 0.05$	V
	$2.5V \leq V_{out} \leq 5V$	$V_{in} = V_{out} + 1V$ $1.0mA \leq I_{out} \leq 300mA$	$V_{out} \times 0.98$	--	$V_{out} \times 1.02$	V
Output Current*1	I_{out}	$V_{in} - V_{out} = 1V$	--	300	--	mA
Line Regulation	$\frac{\Delta V_{out}}{\Delta V_{in}} \cdot V_{out}$	$4.3V \leq V_{in} \leq 8V$ $I_{out} = 10mA$	--	0.05	0.2	%/V
Load Regulation	ΔV_{out}	$V_{in} = 4.3V$ $1.0mA \leq I_{out} \leq 100mA$	--	15	40	mV
Dropout Voltage	V_{DROP}	$I_{out} = 100mA$	--	0.11	--	V
Output voltage Temperature Coefficiency	$\frac{\Delta V_{out}}{T_A \cdot V_{out}}$	$I_{out} = 30mA$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$	--	± 100	--	Ppm/ $^\circ\text{C}$
Supply Current	I_{SS}	--	--	10	15	μA
Input Voltage	V_{in}	--	--	--	6.5	V
EN logic high voltage	V_{ENH}	$V_{IN} = 5.0V$	1.5	--	--	V
EN logic low voltage	V_{ENL}	$V_{IN} = 5.0V$	--	--	0.4	V
PSRR	PSRR	$F = 100\text{Hz}$, $V_{in} = (V_{OUT} + 1)$ dc+1Vpp	--	75	--	dB
		$F = 1000\text{Hz}$, $V_{in} = (V_{OUT} + 1)$ dc+1Vpp	--	65	--	dB

Application Circuit

Basic Circuits





Operational Explanation

<Low ESR Capacitors>

With the LP5907QMFx-xxQ1 series, a stable output voltage is achievable even if used with low ESR capacitors as a phase compensation circuit is built-in. In order to ensure the effectiveness of the phase compensation, we suggest that an output capacitor (C_L) is connected as close as possible to the output pin (V_{OUT}) and the V_{SS} pin. Please use an output capacitor with a capacitance value of at least 10 μ F. Also, please connect an input capacitor (C_{IN}) of 10 μ F between the V_{IN} pin and the V_{SS} pin in order to ensure a stable power input. Stable phase compensation may not be ensured if the capacitor runs out capacitance when depending on bias and temperature. In case the capacitor depends on the bias and temperature, please make sure the capacitor can ensure the actual capacitance.

<CE Pin>

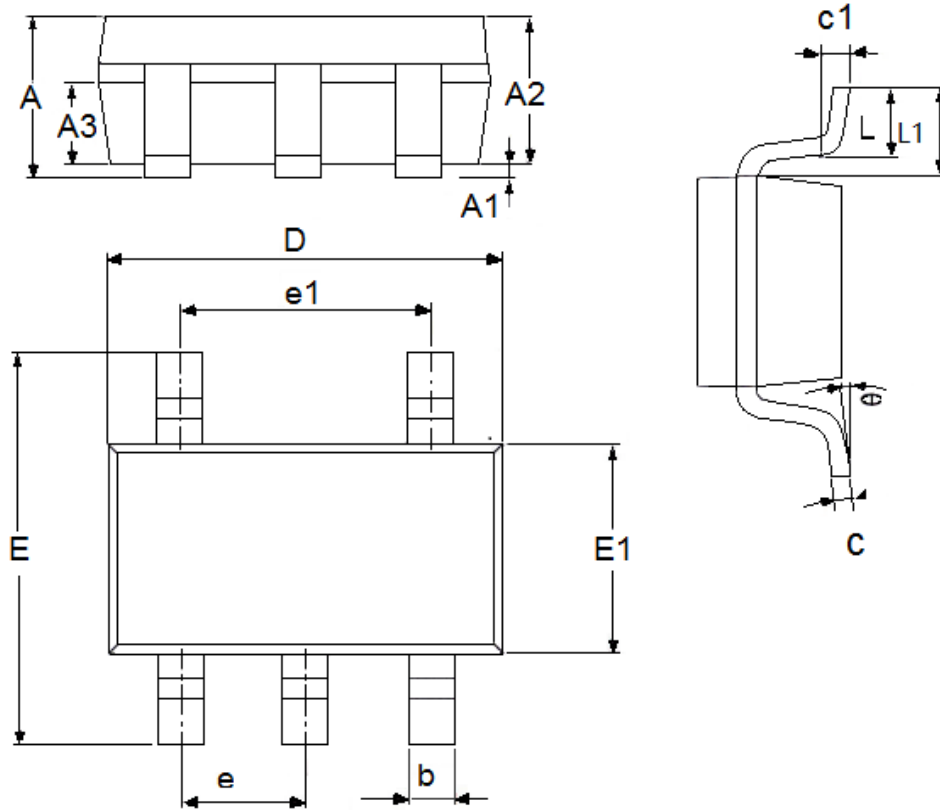
The IC's internal circuitry can be shutdown by the signal from the CE pin with the LP5907QMFx-xxQ1 series. In shutdown mode, output at the V_{OUT} pin will be pulled down to the V_{SS} . Although the CE pin is equal to an inverter input with CMOS hysteresis, with either the pull-up or pull-down options, the CE pin input current will increase when the IC is in operation. If you want add resistor before the CE pin, the resistor must be under 10K. We suggest that you use this IC with either a V_{IN} voltage or a V_{SS} voltage input at the CE pin. If this IC is used with the correct specifications for the CE pin, the operational logic is fixed and the IC will operate normally. However, supply current may increase as a result of through current in the IC's internal circuitry.

Notes on Use

1. Please use this IC within the stated absolute maximum ratings. The IC is liable to malfunction should the ratings be exceeded.
2. Where wiring impedance is high, operations may become unstable due to noise and/or phase lag depending on output current. Please keep the resistance low between V_{IN} and V_{SS} wiring in particular.
3. Please wire the input capacitor (C_{IN}) and the output capacitor (C_L) as close to the IC as possible.



Package Outline Dimensions
SOT-23-5L(TSOT-23-5)



Symbol	Dimensions in Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.