

Features

- Output Current Up to 500mA
- Low Dropout Voltage Typically 1V at 500mA Output Current Application
- Low Quiescent Current: 2.5uA
- Operating Input Voltage Range: 3.0V to 24V
- Fixed Output Voltage Options: 1.5V to 5.0V
- $\pm 2\%$ Initial Voltage Accuracy
- Fast Transient Response Over Line and Load Transient
- High PSRR: 90dB at 1KHz
- Build Internal Soft-Start
- Over Current Protection and Short-circuit Protection
- Over-temperature Protection
- Green Product RoHS Compliant and Halogen Free
- ESD Protected up to 2KV(HBM), 200V(CDM)

Applications

- Vehicular Equipment
- Battery-powered Equipment
- Telecom Infrastructure
- Microprocessor and Chipset Supplies
- Home Applications
- Industrial Automation Supplies
- Servers Device Applications

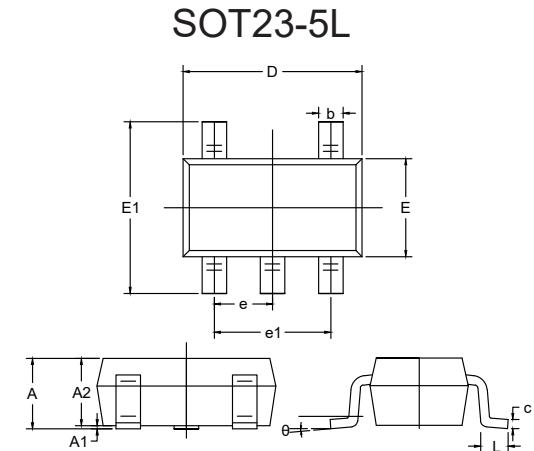
Description

The MCL9913K5 is a 500mA low dropout linear voltage regulator with 2.5uA low quiescent current, operating input voltage up to 24V, and offering fixed output voltage ranges from 1.5V to 5.0V. Also, the device is designed for use in applications requiring high input voltage in the EN Pin to enable and disable the linear regulator. Integrating many functions the MCL9913K5 provides high power supply rejection, and owns excellent line and load transient response with only a small 1uF~10uF ceramic output capacitor. Building internal soft-start minimizes stress on the input power source by reducing capacities inrush current during start-up time. The functions of thermal shutdown, over current and short-circuit protection to protect the device against thermal and current over-loads. A wide fixed output voltage options, making the MCL9913K5 a very common solution in different applications.

Part Number and Marking Code

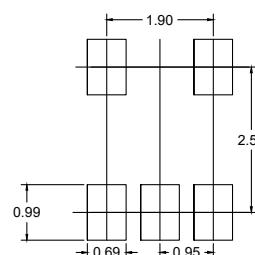
Part No	Package	Marking
MCL9913K533	SOT23-5L	PDYW
MCL9913K550	SOT23-5L	PAYW

500mA Low Drop-out Voltage Regulators

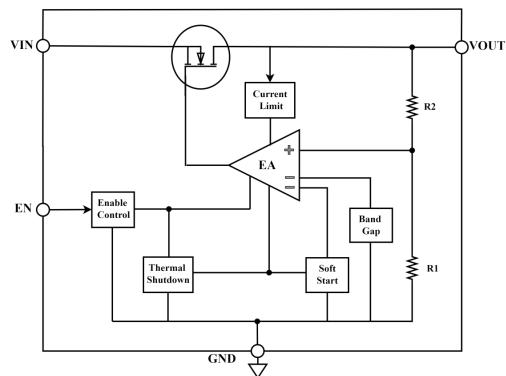


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.041	0.049	1.05	1.25	
A1	0.000	0.004	0.00	0.10	
A2	0.041	0.045	1.05	1.15	
b	0.012	0.020	0.30	0.50	
c	0.004	0.008	0.10	0.20	
D	0.111	0.119	2.82	3.02	
E	0.059	0.067	1.50	1.70	
E1	0.104	0.116	2.65	2.95	
e	0.037(BSC)		0.950(BSC)		
e1	0.071	0.079	1.80	2.00	
L	0.012	0.024	0.30	0.60	
θ	0°	8°	0°	8°	

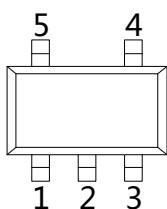
Suggested Solder Pad Layout



Functional Block Diagram

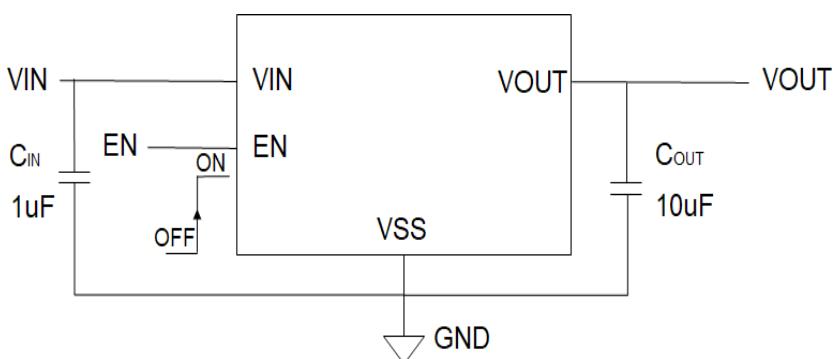


Pin Configuration and Functions (Top View)



Pin No	Name	Description
1	VIN	Supply input voltage. A 1μF ceramic capacitor is recommended at this pin.
2	GND	IC Ground.
3	EN	Enable control input(Active High), don't leave this pin open.
4	NC	Not connected.
5	VOUT	Output Voltage. The power output of the device. A 10μF ceramic capacitor is recommended at this pin.

Typical Application Circuit



Absolute Maximum Ratings

- Operating Junction Temperature Range: -40~+85°C
- Storage Temperature Range: -65~+150°C

Electrical Characteristics

(VIN=5.0V, CIN=1uF, COUT=10μF, TA=25°C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Supply Voltage						
V _{IN}	Input Voltage	V _{IN} Input Range , V _{OUT} =V _{FB}	3.0		24	V
V _{IN_H}	V _{IN} POR Rising Threshold	I _{OUT} =1.0mA		1.6		V
V _{IN_L}	V _{IN} POR Hysteresis	I _{OUT} =1.0mA		60		mV
I _{GND}	Quiescent Current	V _{IN} =12V, I _{OUT} =0A		2.5		uA
I _{SD}	Shutdown Current	V _{IN} =12V, EN=0V		0.2	1.0	uA
Output Voltage						
V _{OUT}	Output Voltage Accuracy	V _{IN} =12V, I _{OUT} =10mA	-2.0		+2.0	%
ΔV _{LOAD}	Load Regulation	V _{IN} =12V, 1mA ≤ I _{OUT} ≤ 100mA		0.02		%/mA
ΔV _{LINE_VIN}	Line Regulation	Set V _{OUT} +0.5V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA		0.01		%/V
V _{DROP}	Dropout Voltage	V _{OUT} =5V, I _{OUT} =50mA		62.5		mV
		V _{OUT} =5V, I _{OUT} =100mA		125		mV
Enable						
I _{EN}	EN Input Bias Current	V _{IN} =V _{EN} =12V			1.0	uA
V _{ENH}	EN Input Voltage High	V _{IN} =12V, I _{OUT} =10mA	1.4			V
V _{ENL}	EN Input Voltage Low	V _{IN} =12V, I _{OUT} =10mA			0.4	V
PSRR						
PSRR	Ripple Rejection	V _{IN} =12V, V _{OUT} =3.3V, I _{OUT} =10mA, F=1KHz		90		dB
Output Current Protection						
I _{OUT_MAX}	Output Current	V _{IN} =12V	500			mA
I _{OPC}	Limit Current	V _{IN} =12V		830		mA
I _{SHORT}	Short Current	V _{IN} =12V, V _{OUT} <0.2V		430		mA
T _{SS}	Soft Start Time	V _{IN} =12V, V _{OUT} =5V, I _{OUT} =0A		280		uS
Enable						
I _{EN}	EN Input Bias Current	V _{IN} = V _{EN} = 12V			1.0	μA
V _{EN_H}	EN Input Voltage High	V _{IN} = 5V, I _{OUT} = 10mA	1.2			V
V _{EN_L}	EN Input Voltage Low	V _{IN} = 5V, I _{OUT} = 10mA			0.4	V
R _{DIS}	ShutdownAuto-Discharge Resistance	EN=0V, V _{IN} =5V		2.44		KΩ
Thermal Shutdown						
T _{SD}	Thermal Shutdown Temperature	T _J Rising		150		°C
T _{SR}	Thermal Shutdown Returned Temperature			130		°C

Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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