

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

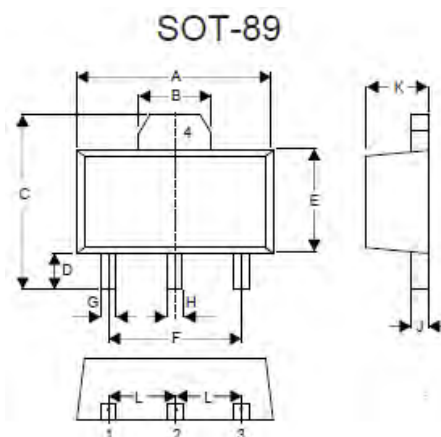
Description

The MCL9913F 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 MCL9913F 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 MCL9913F a very common solution in different applications.

Part Number and Marking Code

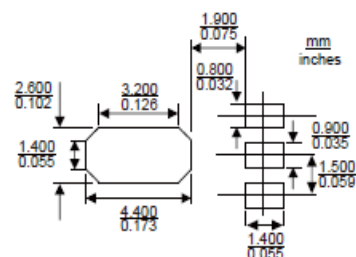
Part No	Marking
MCL9913FM30	ITE9913 YYXX30
MCL9913FM33	ITE9913 YYXX33
MCL9913FM50	ITE9913 YYXX50

500mA Low Drop-out Voltage Regulators

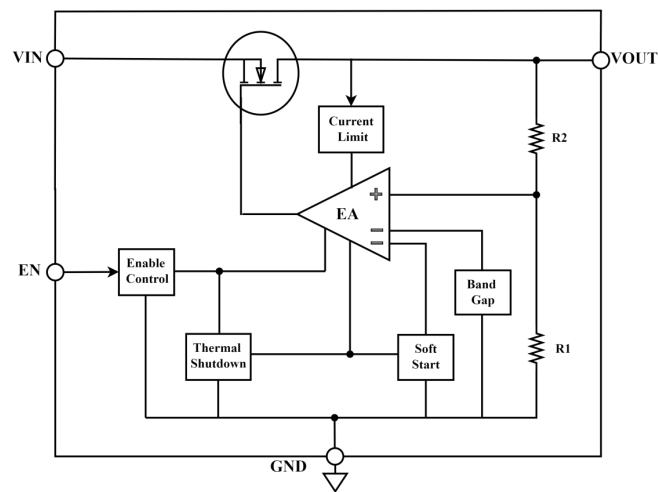


DIMENSIONS					NOTE
DIM	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.169	0.185	4.30	4.70	
B	0.061		1.55		TYP.
C	0.154	0.171	3.91	4.35	
D	0.031	0.047	0.80	1.20	
E	0.089	0.104	2.25	2.65	
F	0.118		3.00		TYP.
G	0.013	0.020	0.33	0.52	
H	0.015	0.021	0.38	0.53	
J	0.014	0.017	0.35	0.44	
K	0.055	0.063	1.40	1.60	
L	0.059		1.50		TYP.

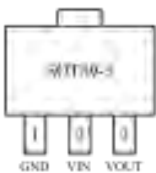
Suggested Solder Pad Layout



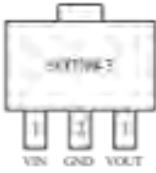
Functional Block Diagram



Pin Configuration and Functions (Top View)



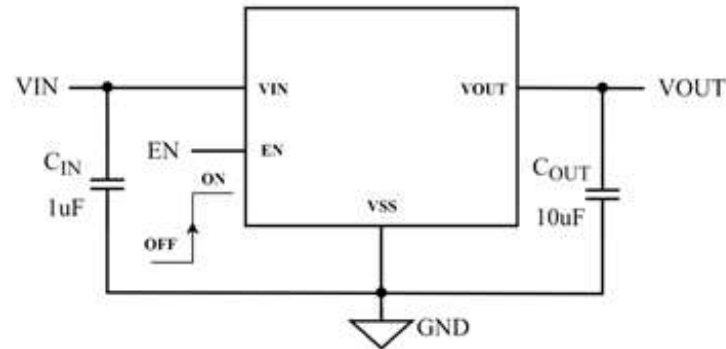
MCL9913FM



MCL9913FE

Name	Description
VIN	Supply input voltage. A 1μF ceramic capacitor is recommended at this pin.
GND	IC Ground.
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 Temperature Range: -40~+85°C
- Storage Temperature Range: -65~+150°C

Symbol	Parameter	Min	Max	Unit
V _{IN}	Supply Voltage	-0.3	36	V
V _{OUT}	Output Voltage	-0.3	6	V
V _{EN}	Enable Voltage	-0.3	45	V
T _{LEAD}	Lead Temperature Soldering Time		260°C, 10s	°C

Electrical Characteristics

(V_{IN}=5.0V, C_{IN}=10uF, C_{OUT}=10uF, T_A=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 _{OC}	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		℃
T _{SR}	Thermal Shutdown Returned Temperature			130		℃

Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 1Kpcs/Reel

IMPORTANT NOTICE

Micro Commercial Components Corp. reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . **Micro Commercial Components Corp.** does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold **Micro Commercial Components Corp.** and all the companies whose products are represented on our website, harmless against all damages. **Micro Commercial Components Corp.** products are sold subject to the general terms and conditions of commercial sale, as published at <https://www.mccsemi.com/Home/TermsAndConditions>.

LIFE SUPPORT

MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation.

CUSTOMER AWARENESS

Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. **MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources.** MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.