Features

- Output voltage range: 1.2V to 3.6V
- I_{OUT}(max) : 300mA
- PSRR: 70dB at 1KHz
- Standby current: 70μA (typ.)
- Shutdown current: 1μA (max)
- ESD Protected up to 2KV(HBM),200V(CDM)

300mA Low Drop-out Voltage Regulators

Applications

- CDMA / GSM
- PDAs/MP3
- WLAN, Bluetooth
- Cordless phone
- Battery-powered system

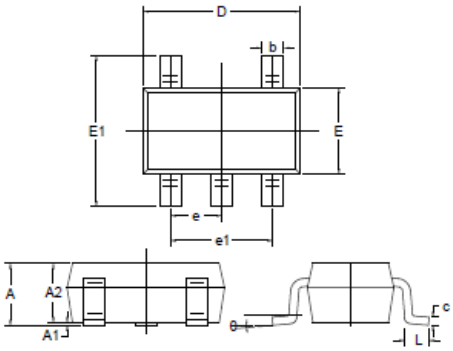
Description

The MCL9193K5 series are high ripple rejection, low-power consumption, low-dropout CMOS step-down voltageregulators with over-current and short circuit protection. These devices have very low quiescent bias current (70μA typ.), they can delivery 300mA of output current with very small input and output voltage differences, and still maintain good regulation. Due to the small voltage difference between the input and output and the low quiescent bias current, these devices are especially suitable for battery-operated products such as computers, consumer products and industrial equipment, which want to prolong the useful battery life.

Part Number and Marking Code

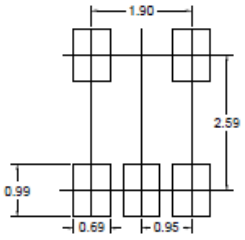
Part No	Package	Marking
MCL9193K512	SOT23-5L	DA=G3K
MCL9193K515	SOT23-5L	DS=J2T
MCL9193K518	SOT23-5L	DC=E2H
MCL9193K530	SOT23-5L	DK-06L
MCL9193K533	SOT23-5L	DE=A1D

SOT23-5L

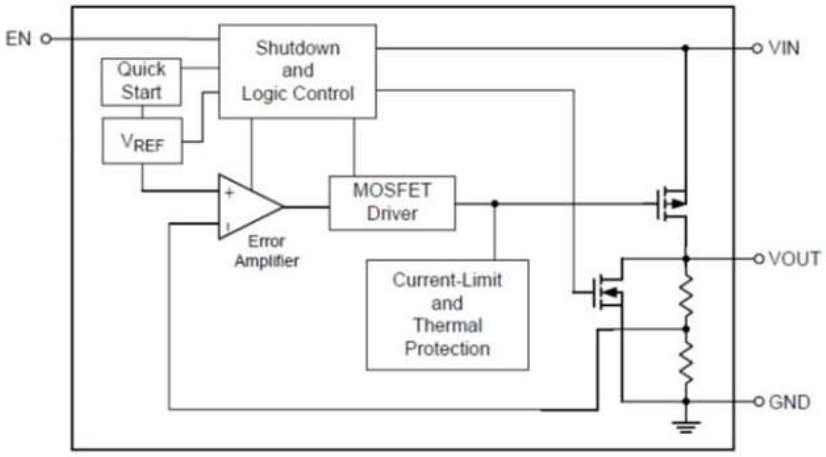


DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.041	0.049	1.05	1.25	
A1	0.000	0.004	0.00	0.10	
A2	0.041	0.045	1.05	1.15	
b	0.012	0.020	0.30	0.50	
c	0.004	0.008	0.10	0.20	
D	0.111	0.119	2.82	3.02	
E	0.059	0.067	1.50	1.70	
E1	0.104	0.116	2.65	2.95	
e	0.037(BSC)		0.950(BSC)		
e1	0.071	0.079	1.80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

Suggested Solder Pad Layout

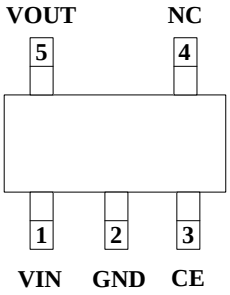


Functional Block Diagram



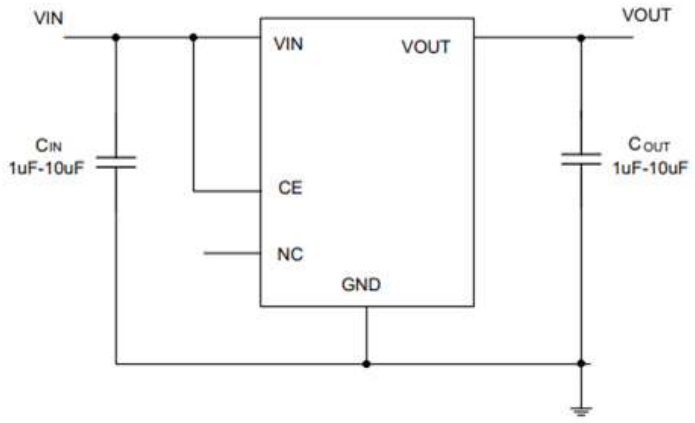
Pin Configuration and Functions (Top View)

SOT-23-5L



Pin No	Name	Description
1	VIN	Power supply.
2	GND	Ground.
3	CE	Enable.
4	NC	No connection.
5	VOUT	Output pin.

Typical Application Circuit



Absolute Maximum Ratings

- Operating Junction Temperature Range: -40~+85°C
- Storage Temperature Range: -55~+125°C

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	7	V
Output Current	I_{out}	450	mA
Output Voltage	V_{out}	Vss-0.3 to Vout+0.3	V
Soldering Temperature	T_{solder}	260, 10s	℃

Package	Pd(mW)
SOT-23-5L	300

Electrical Characteristics

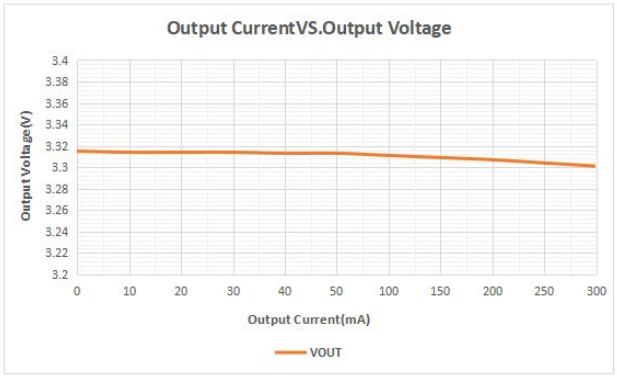
(V_{IN} = 5V, T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT} = 40mA, V_{IN} = Vout + 1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				5.5	V
Maximum Output Current	I_{OUT}(max)	V_{IN} = Vout + 1V		300		mA
EN Starting Voltage	VCE_ON (Note 3)		1.1			V
EN Off Voltage	VCE_OFF				0.4	V
Load Regulation	ΔV_{OUT}	V_{IN} = Vout + 1V, 1mA ≤ I_{OUT} ≤ 100mA		50		mV
Dropout Voltage (Note 4)	V_{dif1}	I_{OUT} = 100mA		90		mV
	V_{dif2}	I_{OUT} = 200mA		230		mV
Standby Current	I_{SS}	V_{IN} = Vout+1V		70		μA
Shutdown Current	I_{CEL}	Vce = 0V		1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} = 40mA Vout + 1V ≤ V_{IN} ≤ 8V		0.05		%/V
Output Noise Voltage	en	I_{OUT} = 40mA, 300Hz to 50kHz		50		μVrms
Power Supply Rejection Ratio	PSRR	Vin=[Vout+1]V +1Vp-pAC I_{OUT} = 40mA, f = 1kHz		70		dB

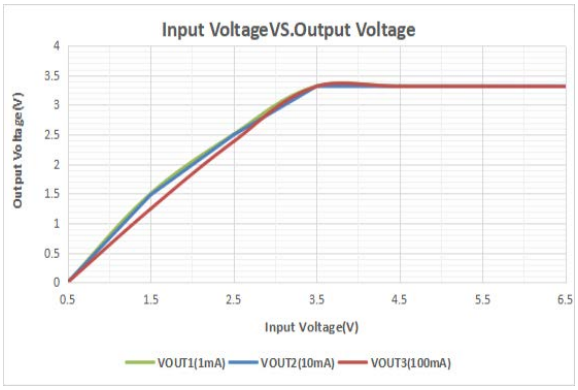
Note:

1. V_{OUT} (T): Specified output voltage.
2. V_{OUT} (E): Effective output voltage (that is, the output voltage when VIN = (V_{OUT} (T)+1.0V) when I_{OUT} remains at a certain value.
3. V_{CE} : Considering the high and low temperature and process deviation, it is recommended that customers set the enable voltage of CE pin to 1.1V with a margin. There is a built-in 1MΩ resistor between CE pin and GND pin inside the chip.
4. V_{dif} : V_{IN1} –V_{OUT} (E)'.
   V_{IN1} : Gradually reduce the input voltage, the input voltage when the output voltage drops to 98% of V_{OUT} (E).
   V_{OUT} (E)'= V_{OUT} (E)X98%.

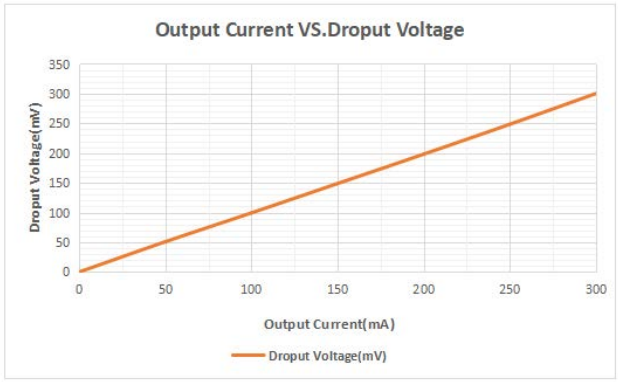
Curve Characteristics



Output Current VS Output Voltage



Input Voltage VS Output Voltage



Output Current VS Dropout Voltage

Ordering Information

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