Low Noise CMOS Voltage Regulators

Features

- 2.3V to 8V operating input voltage
- Up to 400mA output current capability
- Fixed output voltage range: ±2% accuracy
- Ultra low input consumption current: 2.0μA (typical)
- Stable with 1μF ceramic output capacitor
- Fast output discharge to ground when shutdown
- Soft-start function when powered on
- High PSRR: 75dB at 1kHz
- Low output noise: 50μVRMS from 10Hz to 100kHz
- Over current and over temperature protection features
- Enable/disable function
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)

Applications

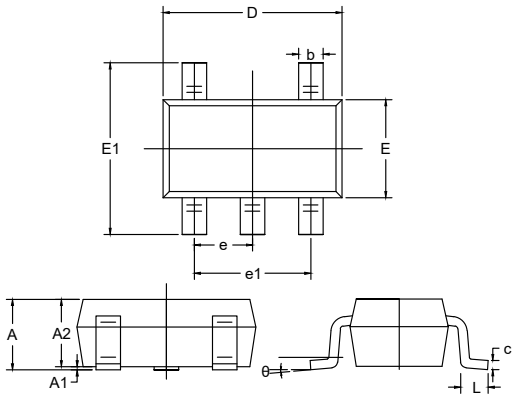
- IoT devices
- Smart/Health wearable devices

Description

The MC73XX are a series of low dropout voltage regulators with an input voltage range from 2.3V to 8V. They are available in a range of fixed output voltages from 1.2V to 5V. When the CE pin input is low, a fast discharge path pulls the output voltage low via an internal pull-down resistor. An internal over-current protection circuit prevents the devices from damage even if their output was shorted to ground. An over-temperature protection circuit ensures the device junction temperature will not exceed a temperature of 150ºC.
Due to the device's outstanding PSRR and low output noise performance features, they are suitable for use in powering RF applications such as sub-1GHz transceivers.

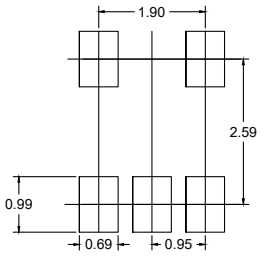
MCC Part Number	Device Marking
MC7333	7333

SOT23-5L

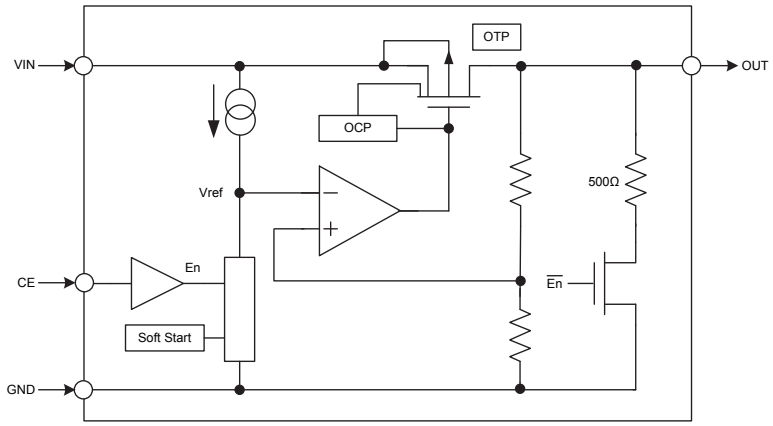


DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.041	0.049	1.05	1.25	
A1	0.000	0.004	0.00	0.10	
A2	0.041	0.045	1.05	1.15	
b	0.012	0.020	0.30	0.50	
c	0.004	0.008	0.10	0.20	
D	0.111	0.119	2.82	3.02	
E	0.059	0.067	1.50	1.70	
E1	0.104	0.116	2.65	2.95	
e	0.037(BSC)		0.950(BSC)		
e1	0.071	0.079	1.80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

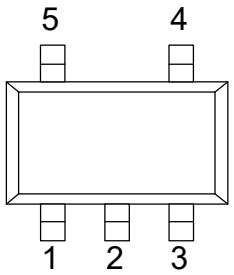
Suggested Solder Pad Layout



Functional Block Diagram

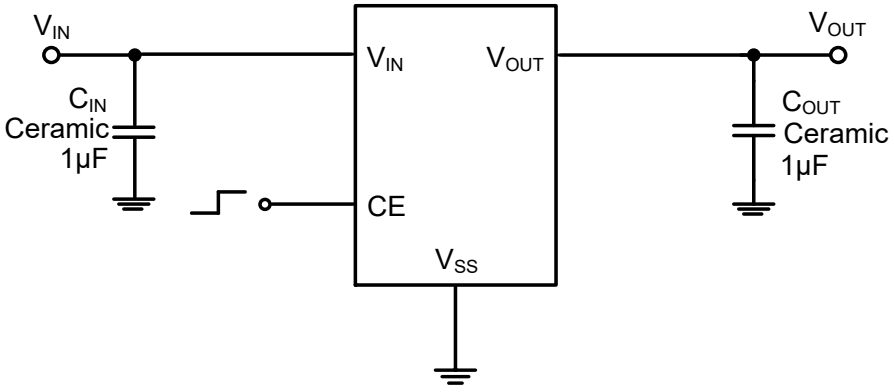


Pin Configuration and Functions (Top View)



Number	Name	Function
1	V_{IN}	Power Input Pin
2	V_{SS}	Ground
3	CE	Chip Enable Pin
4	NC	No Connection
5	V_{OUT}	Output Pin

Typical Application Circuit



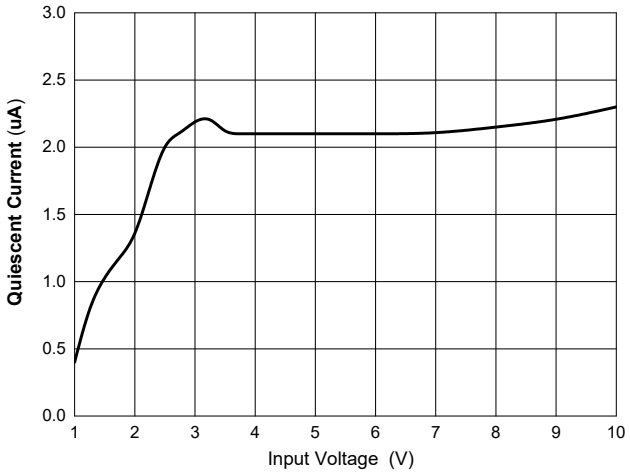
Absolute Maximum Ratings

- Input Voltage :-0.3V to +10V
- CE Voltage:-0.3V to V_{IN}+0.3V
- Output Current:450mA
- Power Dissipation:0.25W
- Maximum Junction Temperature, T_J: +150°C
- Operating Junction Temperature Range: -40~+125°C
- Storage Temperature Range: -55~+165°C
- Thermal Resistance: 500°C/W Junction to Ambient
- Thermal Resistance: 82°C/W Junction to Case
- ESD Rating,
  HBM:2KV
  MM:200V

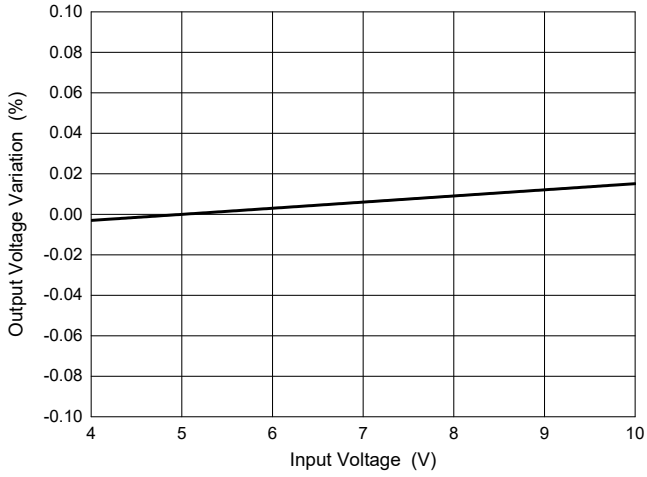
Electrical Characteristics(V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1μF, T_A=25℃, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Input Voltage						
Supply Input Voltage	V_{IN}		2.3	-	8	V
POR Threshold	V_{PORTH}	VIN falling			2.1	V
POR Hysteresis	V_{PORHYS}	VIN rising		0.2		V
Quiescent Current	I_Q	V_{IN}=V_{OUT}+1V,I_{OUT}=0mA	-	2.0	2.8	uA
Shutdown Current	I_{SHDN}	V_{EN}=0V	-	0.01	0.1	uA
Output Voltage						
Output Voltage Accuracy	V_{OUT}	I_{OUT}=1mA	-2	-	2	%
Output Start Up Time	t_{STR}	V_{IN}=V_{OUT}+1V， V_{IN} 90% to V_{OUT} 90%		150	500	us
Output Current	I_{OUT}		300	-	-	mA
Output Line Regulation	$V_{OUT(LINE)}$	(V_{OUT}+1V)<=V_{IN}<=6.0V,I_{OUT}=10mA	-	0.02	0.1	%/V
Output Load Regulation	$V_{OUT(LOAD)}$	1mA<=I_{OUT}<=200mA	-	0.2	1	%
Output Voltage Noise		BW=10Hz~100KHz		50		uVrms
Power Supply Rejection Ration	PSRR	V_{OUT}=3.3V,I_{OUT}=50mA,f=1KHz	-	75	-	dB
Dropout Voltage	V_{DROP}	V_{OUT}>=3V,I_{OUT}=50mA	-	75	130	mV
Enable						
Enable High Level	V_{EN}	V_{IN}=6V	1.2	-	-	V
Disable Low Level	V_{SD}	V_{IN}=6V	-	-	0.4	V
EN Input Current	I_{EN}	V_{EN}=8V			0.1	uA
Enable Dealy Time		V_{IN}=V_{OUT}+1V， V_{EN} High to V_{OUT} 10%		10	50	us
Output Pull Low Resistance		Force V_{IN}=6V,V_{EN}=0V,V_{OUT}=0.5V	-	500	-	Ω
Protection						
Current Limit Threshold	I_{LIM_TH}	V_{IN}=V_{OUT}+1V	-	450	-	mA
Short Circuit Current	I_{LIM_SC}	V_{IN}=V_{OUT}+1V， V_{OUT}=0V		350		mA
Thermal Shutdown Temperature	T_{SD}		-	150	-	°C
Thermal Shutdown Hysteress	T_{SDHYDS}		-	25	-	°C

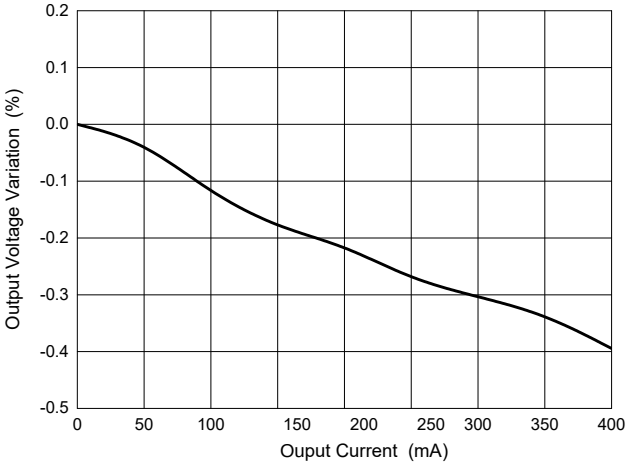
Quiescent Current vs Input Voltage



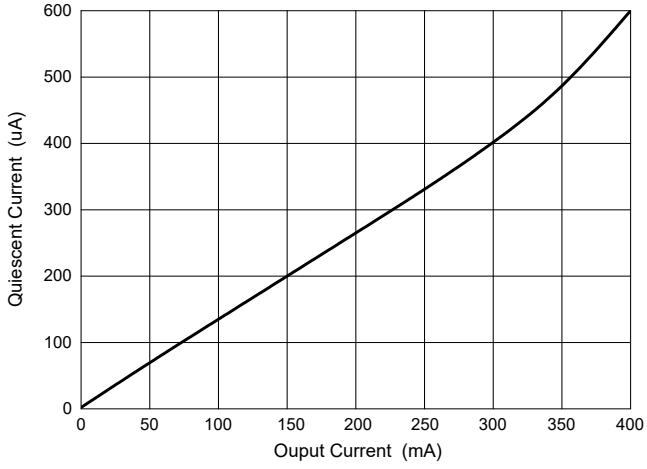
Output Voltage Line Regulation



Output Voltage Load Regulation



Quiescent Current vs Ouput Current



Ordering Information

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