General Description

The MIC5233 series is a set of low voltage differential (LDO) converters with a wide voltage input range of 40V, low voltage differential, low power consumption, and miniaturized packaging. The output voltage range is 3.0-5.0V, and the MIC5233 has low static current characteristics as low as 25uA.

The circuit also has a CE enable control port, which can put the circuit into sleep mode. It is particularly suitable for battery powered and long-term standby system equipment applications, helping to reduce standby power consumption of system equipment, effectively extending standby time and battery life.

Features

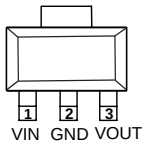
- Low Power Consumption
- Low Voltage Drop
- 1uA Max IQ in Shutdown Mode
- Withstanding Voltage 40V
- Quiescent Current 2.0uA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 150mA

Application

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments

Pin Configuration And Descriptions

SOT-223
(SOT-223-3)



No.	Name	Functions Description
1	V_{IN}	Input
2	GND	Ground
3	V_{OUT}	Output

Order Information

Orderable Device	Package	Output Voltage	Packing Option
MIC5233-3.0YS	SOT-223(SOT-223-3)	3.0V	2500/Reel
MIC5233-3.3YS	SOT-223(SOT-223-3)	3.3V	2500/Reel
MIC5233-5.0YS	SOT-223(SOT-223-3)	5.0V	2500/Reel

Absolute Maximum Ratings

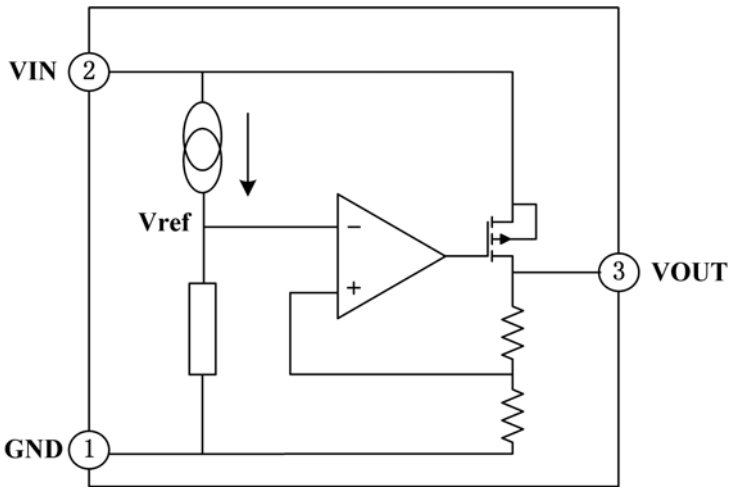
Description	Symbol	Value Range	Unit
Limit Power Voltage	V_{IN}	-0.3～+45	V
Storage Temperature Range	T_{STG}	-50～+125	°C
Operating Free-air Temperature Range	T_A	-40～+85	°C

Note:Stresses greater than those listed under "Absolute Maximum Ratingsmay" 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 Conditionsis" not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Heat Dissipation

Description	Symbol	Value Range	Unit
Thermal resistance	θ_{JA}	150	°C/W
Power dissipation	P_W	600	mW

Block Diagram



DC Characteristics (unless otherwise noted T_A= 25°C)

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25°C, unless otherwise noted)

Series +3.0V OUTPUT

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA	2.94	3.00	3.06	V
Output Current	I_{OUT}	V_{IN}=V_{OUT}+2.0V		150		mA
Load Regulation	△V_{OUT}	V_{IN}=V_{OUT}+2.0V 1mA≤I_{OUT}≤100mA			40	mV
Voltage Drop	V_{DIF}	I_{OUT}=1mA，△V_{OUT}=2%			55	mV
Quiescent Current	I_{SS}	No Load		2.0	5.0	uA
Line Regulation	△V_{OUT}/V_{OUT}* △V_{IN}	V_{OUT}+1.0V≤V_{IN}≤30V， I_{OUT}=1mA			0.2	%/V
Input Voltage	V_{IN}				40	V
Temperature Coefficient	△V_{OUT}/ △T_A*V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA， -40℃≤T_A≤85℃		100		ppm/°C

Note:When V_{IN}=V_{OUT}+2.0V,as the output voltage declined 2%,the V_{DIF}=V_{IN}-V_{OUT}.

Series +3.3V OUTPUT

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA	3.234	3.30	3.366	V
Output Current	I_{OUT}	V_{IN}=V_{OUT}+2.0V		150		mA
Load Regulation	△V_{OUT}	V_{IN}=V_{OUT}+2.0V 1mA≤I_{OUT}≤100mA			40	mV
Voltage Drop	V_{DIF}	I_{OUT}=1mA，△V_{OUT}=2%			55	mV
Quiescent Current	I_{SS}	No Load		2.0	3.0	uA
Line Regulation	△V_{OUT}/V_{OUT}* △V_{IN}	V_{OUT}+1.0V≤V_{IN}≤30V， I_{OUT}=1mA			0.2	%/V
Input Voltage	V_{IN}				40	V
Temperature Coefficient	△V_{OUT}/ △T_A*V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA， -40℃≤T_A≤85℃		100		ppm/°C

Note:When V_{IN}=V_{OUT}+2.0V,as the output voltage declined 2%,the V_{DIF}=V_{IN}-V_{OUT}.

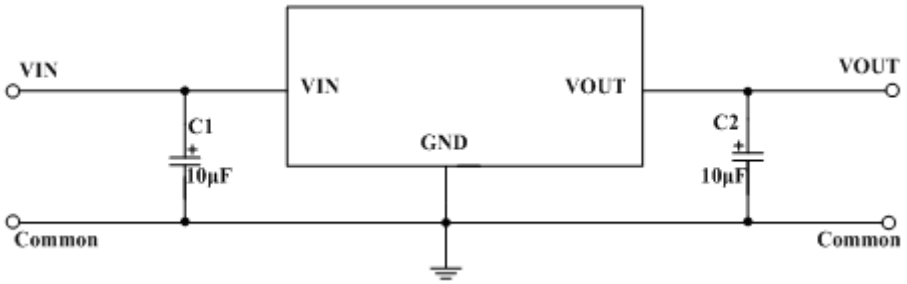
Series +5.0V OUTPUT

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA	4.9	5.0	5.1	V
Output Current	I_{OUT}	V_{IN}=V_{OUT}+2.0V		150		mA
Load Regulation	△V_{OUT}	V_{IN}=V_{OUT}+2.0V 1mA≤I_{OUT}≤100mA			40	mV
Voltage Drop	V_{DIF}	I_{OUT}=1mA，△V_{OUT}=2%			55	mV
Quiescent Current	I_{SS}	No Load		2.0	3.0	uA
Line Regulation	△V_{OUT}/V_{OUT}* △V_{IN}	V_{OUT}+1.0V≤V_{IN}≤30V， I_{OUT}=1mA			0.2	%/V
Input Voltage	V_{IN}				40	V
Temperature Coefficient	△V_{OUT}/ △T_A*V_{OUT}	V_{IN}=V_{OUT}+2.0V， I_{OUT}=10mA， -40℃≤T_A≤85℃		100		ppm/°C

Note:When V_{IN}=V_{OUT}+2.0V,as the output voltage declined 2%,the V_{DIF}=V_{IN}-V_{OUT}.

Application Circuit

Basic Circuits

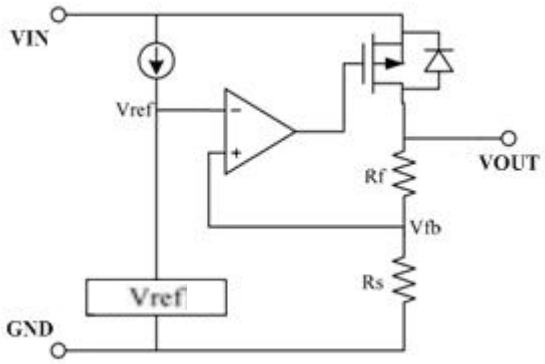


Function Description

MIC5233 series are linear voltage regulator ICs withstanding 40V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors.The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate wheb the output current or input voltage reaches limit level.

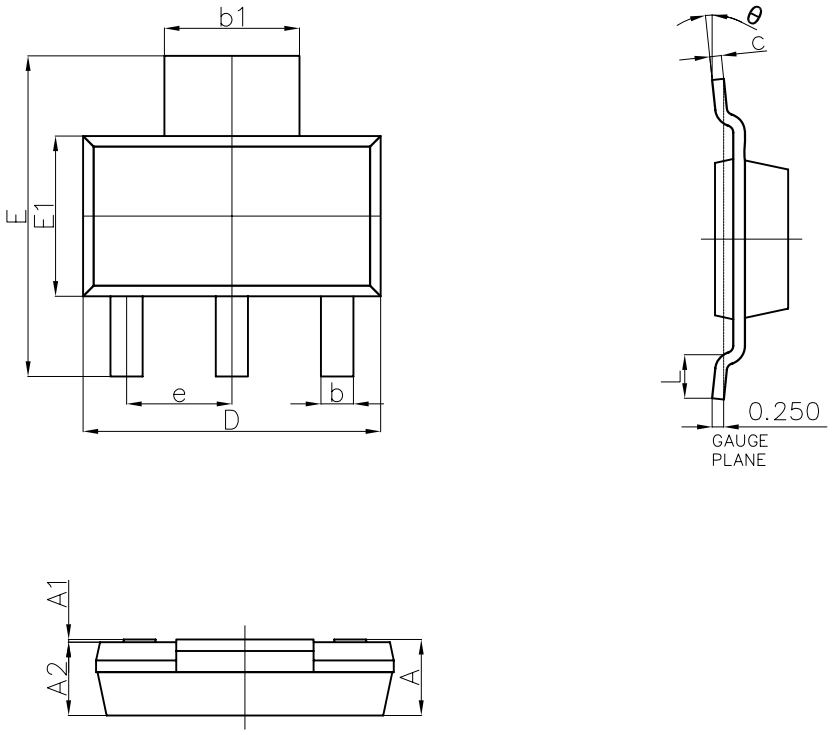
Application Description

The error amplifier compares the input voltage of the divider resistor composed of feedback resistors Rs and Rf with the reference voltage vref, and provides the necessary gate voltage to the output transistor through this error amplifier, so that the output voltage is not affected by input voltage or temperature changes and remains constant.



1. When applying, try to connect the capacitor near the VIN and VOUT pins.
2. A phase compensation circuit is used inside the circuit and the ESR of the output capacitor is used for compensation. Therefore, the output to ground must be connected to a capacitor 2.2uF, larger than , and ctantalum capacitors are recommended.
3. Pay attention to the usage conditions of input and output voltage and load current to avoid the power consumption inside the IC exceeding the maximum power consumption allowed by the package.

Package Dimensions
SOT-223(SOT-223-3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	——	1.800	——	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	——	0.030	——
θ	0°	10°	0°	10°

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