



## GENERAL DESCRIPTION

The HMIC5205 series is a set of low voltage differential (LDO converters) with a wide voltage input range of 3.0V to 20V, low voltage differential, low power consumption, and miniaturized packaging.

The output voltage range is 3.0-5.0V, and the HMIC5205 has low static current characteristics as low as 2.0uA.

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
- Low Temperature Coefficient
- Withstanding Voltage 20V
- Quiescent Current 2.0uA
- Output Voltage Accuracy: Tolerance  $\pm 2\%$
- High Output Current: 250mA

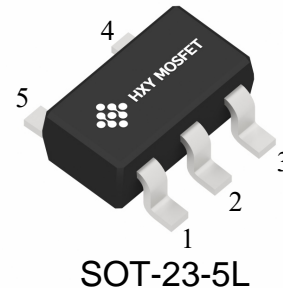
## TYPICAL APPLICATIONS

- Battery-powered
- Equipments Communication
- Audio/Video Equipments
- Smart Battery Packs
- Smoke Detectors

## PRODUCT INFORMATION

Product ID	Vin	Vout	Pack	QTY(PCS)
HMIC5205-3.0YM5	20V	3.0V	SOT-23-5L	3000
HMIC5205-3.3YM5	20V	3.3V	SOT-23-5L	3000
HMIC5205-5.0YM5	20V	5.0V	SOT-23-5L	3000

## PIN CONFIGURATION



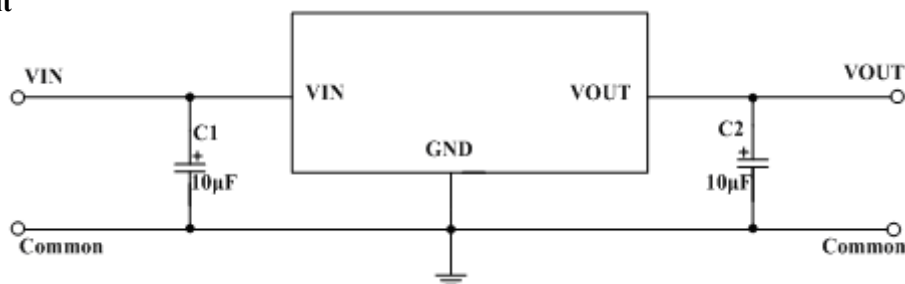
## PIN DESCRIPTION

PIN No.	Name	Functions Description
SOT-23-5L		
1	V <sub>IN</sub>	input
2	GND	ground
3	CE	ON / OFF
4	NC	No Connect
5	V <sub>OUT</sub>	output

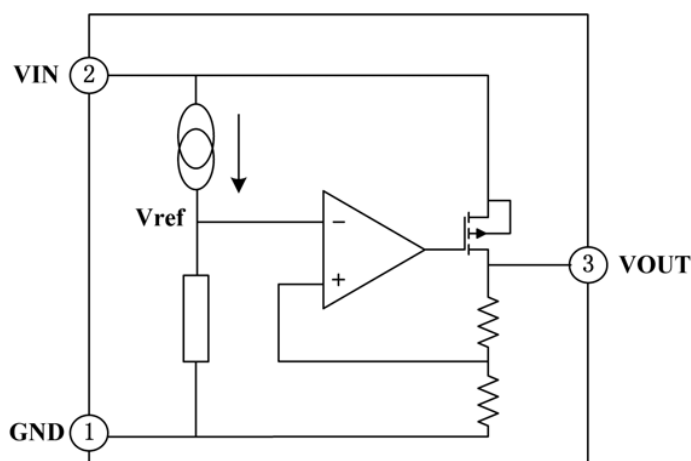


## TYPICAL APPLICATION CIRCUIT

### Basic Circuit



## FUNCTIONAL BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Description	Symbol	Value range	Unit
Limit Power Voltage	$V_{IN}$	$-0.3 \sim +22$	V
Storage Temperature Range	$T_{STG}$	$-50 \sim +125$	$^{\circ}\text{C}$
Operating Free-air Temperature Range	$T_A$	$-30 \sim +85$	$^{\circ}\text{C}$
Thermal resistance	$\theta_{JA}$	500	$^{\circ}\text{C}/\text{W}$
Power dissipation	$P_W$	200	mW

**Note :** Stresses greater than those listed under “Absolute Maximum Ratings” may 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 Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.



## DC CHARACTERISTICS (unless otherwise noted $T_A = +25^{\circ}\text{C}$ )

( $V_{IN} = V_{OUT} + 2.0\text{V}$ ,  $C_{IN} = C_L = 10\mu\text{F}$ ,  $T_A = 25^{\circ}\text{C}$ , unless otherwise noted)

### Series +3.0V OUTPUT

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	$V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$	2.94	3.00	3.06	V
Output Current	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	250	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT} = 1\text{mA}$ , $\Delta V_{OUT} = 2\%$	—	30	100	mV
Quiescent Current	$I_{SS}$	No Load	—	2.0	3.0	$\mu\text{A}$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} / \frac{\Delta V_{IN}}{V_{IN}}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	20	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$ , $-40^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$	—	100	—	ppm/ $^{\circ}\text{C}$

**Note :** When  $V_{IN} = V_{OUT} + 2.0\text{V}$ , 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	$V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$	3.234	3.30	3.366	V
Output Current	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	250	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT} = 1\text{mA}$ , $\Delta V_{OUT} = 2\%$	—	25	55	mV
Quiescent Current	$I_{SS}$	No Load	—	2.0	3.0	$\mu\text{A}$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} / \frac{\Delta V_{IN}}{V_{IN}}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	20	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$ , $-40^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$	—	100	—	ppm/ $^{\circ}\text{C}$

**Note :** When  $V_{IN} = V_{OUT} + 2.0\text{V}$ , 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	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	—	300	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 70mA$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=1mA$ , $\Delta V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	$I_{SS}$	No Load	—	2.0	3.0	$\mu A$
Line Regulation	$\Delta V_{OUT}/V_{OUT}^*$ $\Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 20V$ , $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	20	V
Temperature Coefficient	$\Delta V_{OUT}/\Delta T_A * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10mA$ , $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	100	—	ppm/ $^{\circ}C$

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

## FUNCTIONAL DESCRIPTION

MIC5205 series are linear voltage regulator IC withstanding 20V voltage.

The series IC consists of a voltage reference,an error amplifier,a current limiter and a phase compensationcircuit plus a driver transistor.

The output stabilization capacitor is also compatible with low ESR ceramic capacitors.

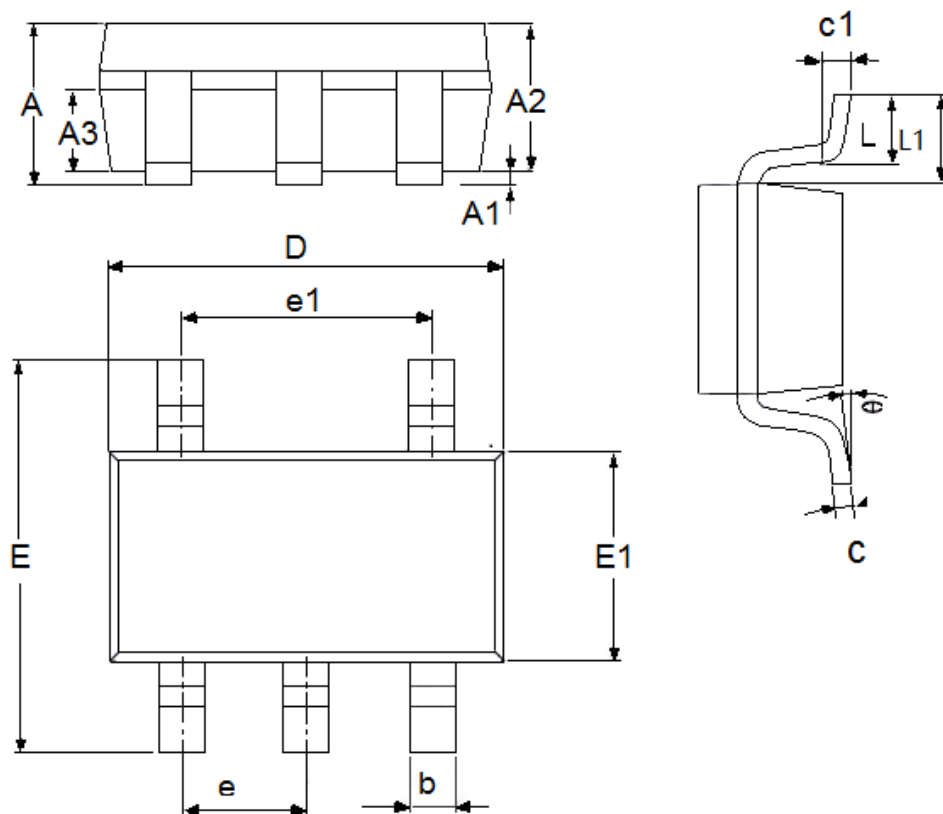
The over current protection circuit and the over voltage protection circuit are built-in.

The protection circuit will operate when the output current or input voltage reaches limit level.



## PACKAGEIN FORMATION

- SOT-23-5L



Symbol	Dimensions in Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	



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