

# MSKSEMI 美森科

SEMICONDUCTOR



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## HT78XX-MS

Product specification

## GENERAL DESCRIPTION

The HT78XX-MS series is a set of low voltage differential (LDO) converters with a wide voltage input range of 2.8V to 5.0V, low voltage differential, low power consumption, and miniaturized packaging. The output voltage range is 3.0-5.0V, and the HT78XX-MS has low static current characteristics as low as 3.0 $\mu$ A. 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.

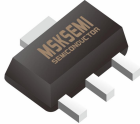
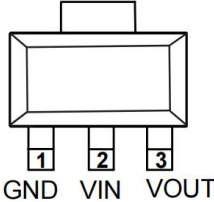





## FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 12V
- Quiescent Current 3.0 $\mu$ A
- Output Voltage Accuracy: tolerance  $\pm$ 2%
- High output current: 450mA

## TYPICAL APPLICATIONS

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

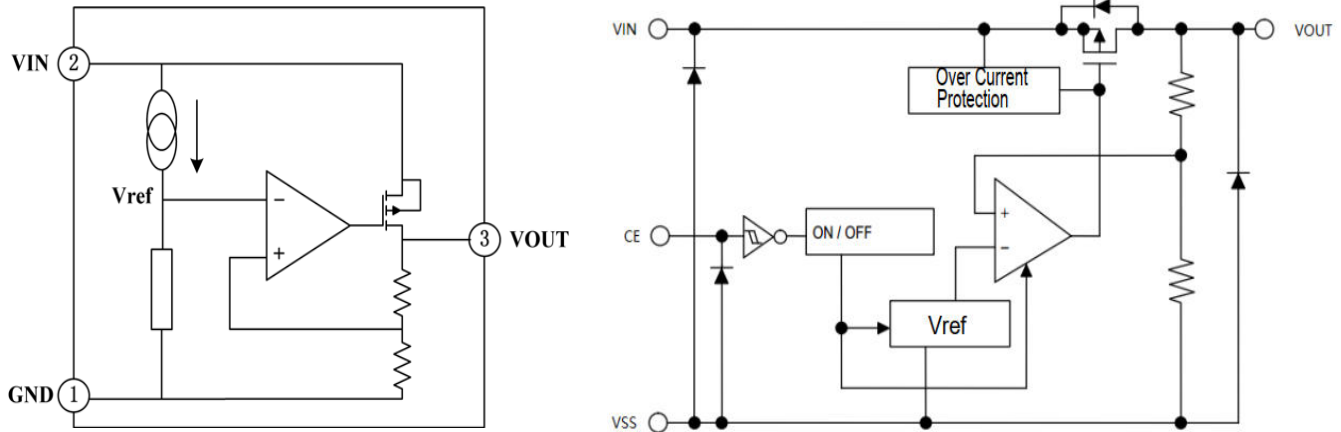
## PACKAGE/ORDER INFORMATION

Part Number	Output	Package		Pin Configuration	Marking	QTY
HT7828-MS	2.8V	SOT89-3				1000
HT7830-MS	3.0V					1000
HT7833-MS	3.3V					1000
HT7836-MS	3.6V					1000
HT7850-MS	5.0V					1000

## PIN DESCRIPTION

PIN No.	Name	Functions Description
1	GND	ground
2	VIN	input
3	VOUT	output

## FUNCTIONALBLOCKDIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Description	Symbol	Value range	Unit
Limit Power Voltage	$V_{IN}$	-0.3 ~ +15	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 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.

## HEAT DISSIPATION

Description	Symbol	Package	Value range	Unit
Thermal resistance	$\theta_{JA}$	SOT89	200	°C/W
Power dissipation	$P_W$	SOT89	500	mW

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Voltage	$V_{IN}$		3.0		12	V
Output Voltage	$V_{OUT}$		3.0		5.0	V
Voltage Accuracy		$I_{OUT} = 1\text{mA}$	-2		+2	%
Output Current	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	—	450	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 150\text{mA}$	—	50	—	mV
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ $I_{OUT} = 10\text{mA}$	—	0.015	0.2	%/V
Voltage Drop	$V_{DIF}^{\text{①}}$	$I_{OUT} = 100\text{mA}, V_{OUT} = 3.3\text{V}$	—	200	—	mV
Quiescent Current	$I_{SS}$	$V_{CE} = V_{IN}$	—	3.0	5.0	$\mu\text{A}$
Standby Current	$I_{STANDBY}$	$V_{CE} = V_{SS}$			0.2	$\mu\text{A}$
--	$V_{CEH}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	1.7		24	V
--	$V_{CEL}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	0		0.3	V
short-circuit current	$I_{SHORT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	400	—	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $I_{OUT} = 10\text{mA}$ $-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$	—	$\pm 100$	—	ppm/ $^\circ\text{C}$
Discharge Resistor	$R_{DIS}^{\text{②}}$	$V_{CE} < 0.5\text{V}$		300		$\Omega$

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

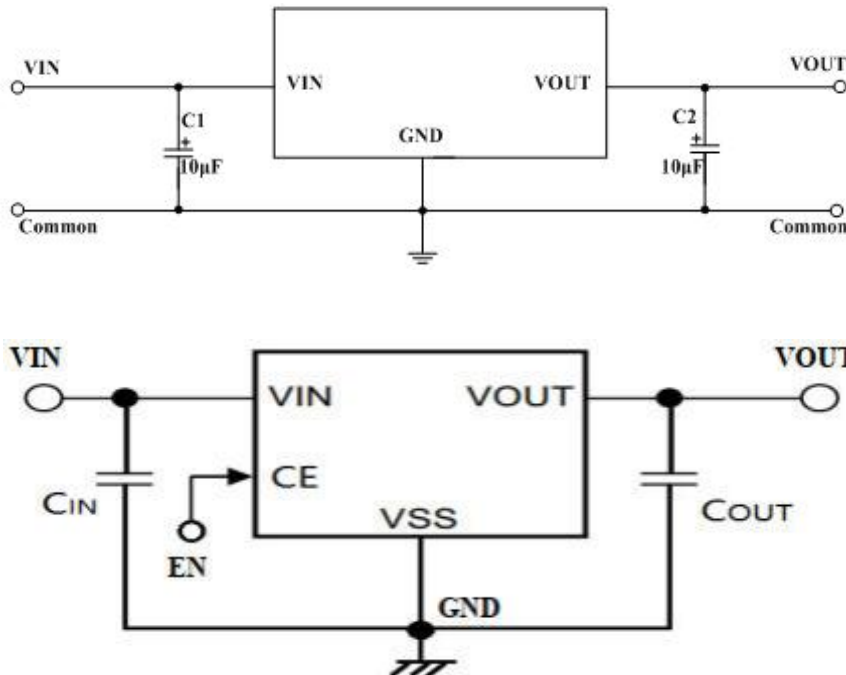
Output active discharge resistor  $R_{DIS}$ , As the input voltage increases, it decreases.

## FUNCTIONAL DESCRIPTION

HT78XX-MS series are linear voltage regulator ICs withstanding 14V 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.

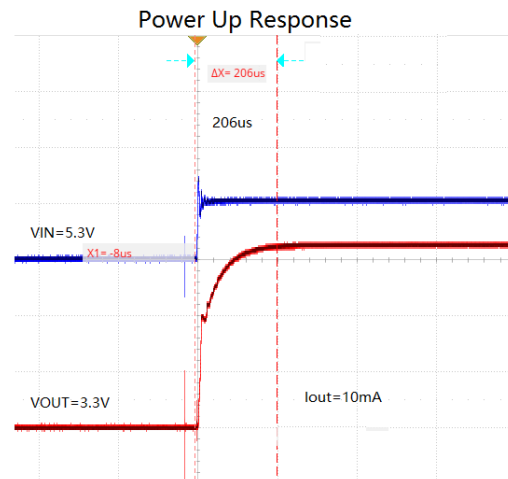
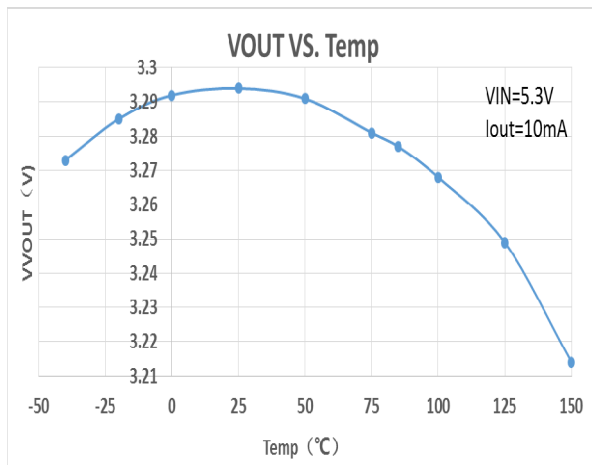
The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

## TYPICAL APPLICATION CIRCUIT



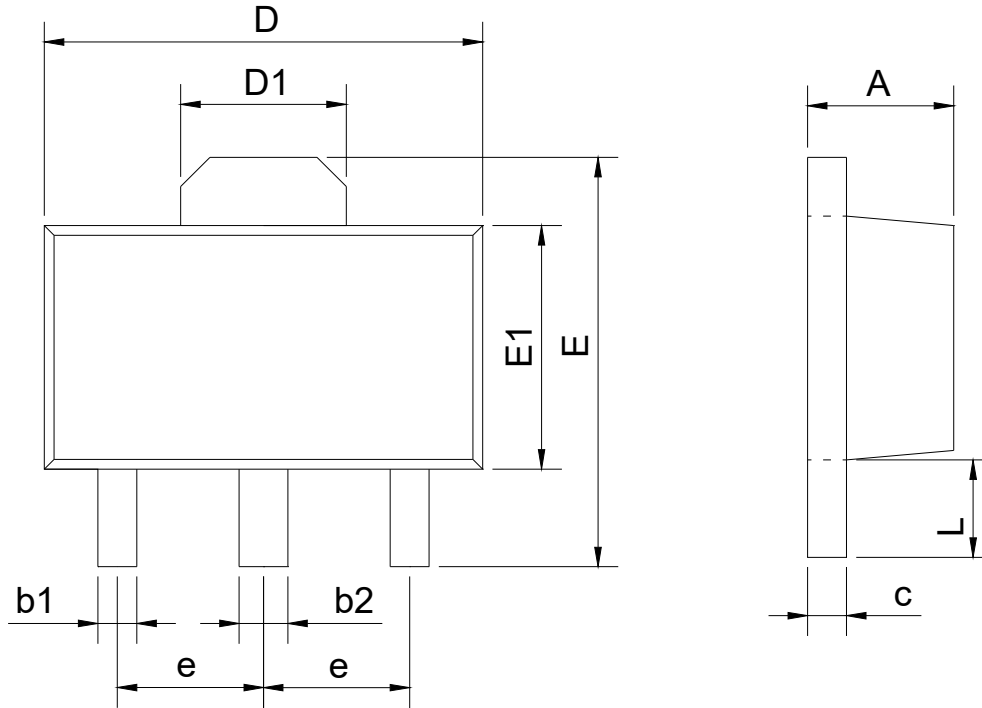
1. CIN is used to stabilize the input capacitor
2. CIN eramic capacitors greater than or equal to 1pF can be used for COUT.

## TYPICAL CHARACTERISTICS



**PACKAGE INFORMATION**

**SOT89**



SYMBOL	mm	
	min	max
A	1.40	1.60
b1	0.35	0.50
b2	0.45	0.60
c	0.36	0.46
D	4.30	4.70
D1	1.40	1.80
E	4.00	4.40
E1	2.30	2.70
e	1.50BSC	
L	0.80	1.20

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