HM1139 --- Low Noise, High PSRR, High Speed, CMOS LDO

GENERAL DESCRIPTION

The HM1139 is a high accuracy, low noise, high speed, low dropout CMOS Linear regulator with high ripple rejection and fast discharge function. The device offers a new level of cost effective performance in cellular phones, surveillance system, Bluetooth, wireless and other portable electronic devices.

HM1139 can provide product selections of output value in the range of 1.0V~3.6V by every 0.1V step.

HM1139 offer over temperature protection to ensure the device working in well conditions.

The HM1139 regulators are available in standard DFN1x1-4L packages. Standard products are Pb-free and Halogen-free.

FEATURES

- Input voltage : 2.5V~6.5V
- Output range: 1.0V~3.6V
  (customized by every 0.1V step)
- Maximum output current: 750mA @ V_{IN}-V_{OUT}=0.5V
- PSRR: 75dB @1KHz 55dB@1MHz
- Dropout voltage: 110mV @ I_{OUT}=200mA
- Quiescent current : 45μA Typ.
- Shut-down current: < 1μA
- Recommend capacitor: 1μF
- Ultra-low output noise: 20μV_{RMS}

APPLICATIONS

- Digital cameras
- Cellphones
- Bluetooth and wireless handsets
- Other portable electronic devic

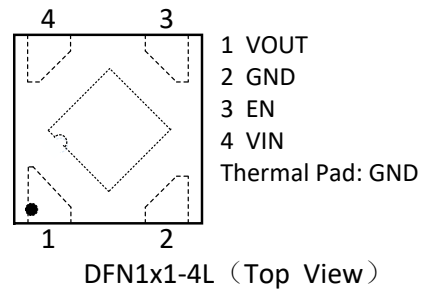## TYPICAL APPLICATION CIRCUIT
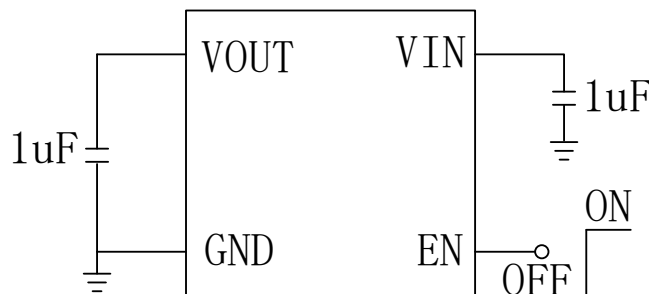
PIN ASSIGNMENT

DFN1x1-4L

1 VOUT
2 GND
3 EN
4 VIN
Thermal Pad: GND

DFN1x1-4L（Top View）

ORDER INFORMATION

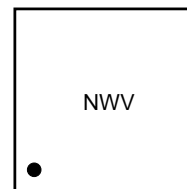| PART NO	PACAKGE	VOUT DISCHARGE	TEMPERATURE	TAPE & REEL
HM1139-XX[Note]	DFN1x1-4L	Yes	-40 ~ +85℃	10000/REEL

Note: XX indicates 1.0V~3.6V by 0.1V step. For example, 28 means product outputs 2.8V

PART NUMBER RULES

HM1139 ①-②-③

Code	Description
①	Vout discharge A: Yes
②	Voltage version: XX: 1.0V~3.6V by 0.1V step Example: 28: 2.8V
③	Package: DR: DFN1x1-4L

MARKING DESCRIPTION:

NWV

DFN1x1-4L

"N": Product code, here use "N" stands for "HM1139".

"W": The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "a" stands for week 27, "z" stands for week 52.

"V": Output voltage code.

PIN DESCRIPTION

PIN NO	SYMBOL	I/O	DESCRIPTTION
1	VOUT	O	Output
2	GND	Ground	Ground
3	EN	I	Enable (active high, do not float)
4	VIN	Power	Input

TYPICAL OUTPUT VOLTAGE CODE TABLE

| V$_{OUT}$	CODE	V$_{OUT}$	CODE
1.0V	A	1.2V	B
1.5V	C	1.8V	D
2.8V	M	3.0V	G
3.3V	H	3.6V	I

ABSOLUTE MAXIMUM RATINGS (Note)

SYMBOL	ITEMS		VALUE	UNIT
V$_{IN}$	Input Voltage		-0.3~8	V
I$_{OUT}$	Output Current		750	mA
P$_{DMAX}$	Power Dissipation	DFN1x1-4L	0.3	W
T$_J$	Junction Temperature		-40~125	℃
T$_A$	Ambient Temperature		-40~85	℃
T$_{STG}$	Storage Temperature		-55 to 150	℃
T$_{SOLDER}$	Package Lead Soldering Temperature		260℃, 10s	

Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMANDED OPERATING RANGE

SYMBOL	ITEMS	VALUE	UNIT
V$_{IN}$	Supply Voltage	2.5 to 6.5	V
I$_{OUT}$	Output Current	<500	mA
T$_{OPT}$	Operating Temperature	-40 to +85	℃

SIMPLIFIED BLOCK DIAGRAM
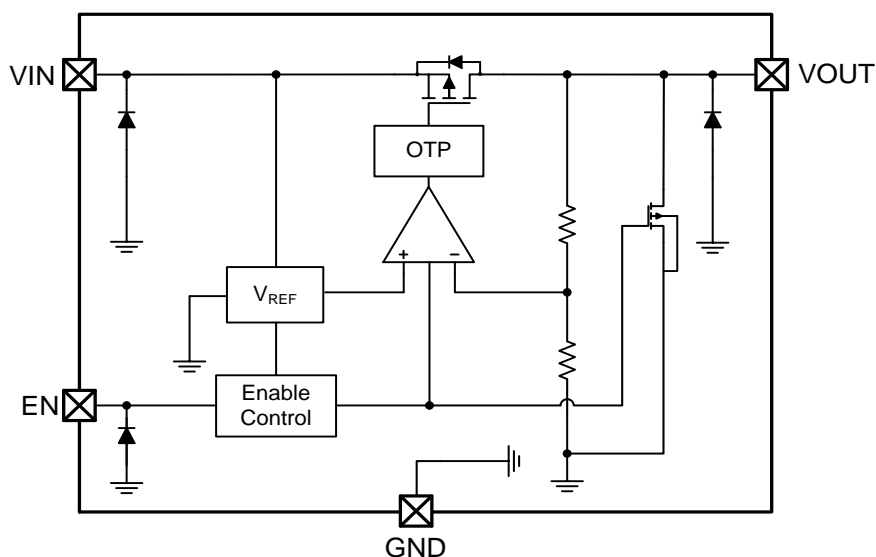
ELECTRICAL CHARACTERISTICS

The following specifications apply for V_{IN}=4.3V, V_{OUT}=3.3V, T_A=25℃, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage				6.5	V
V_{OUT}	Output Range	V_{OUT} <2V V_{IN}=2.7V, I_{OUT}=1mA	-3	V_{OUT}	3	%
		V_{OUT}≥2V, I_{OUT}=1mA	-2	V_{OUT}	2	
I_Q	Quiescent Current	V_{OUT}=3.3V, I_{OUT}=0		45		µA
I_{OUT_PK}	Maximum Output Current	V_{IN}=V_{EN}=4.3V		700		mA
V_{DROP}	Dropout Voltage	V_{OUT}=3.3V, I_{OUT}=200mA		110	125	mV
		V_{OUT}=3.3V, I_{OUT}=300mA		160	175	
$\triangle V_{LINE}$	Line Regulation	V_{IN}=3.5~5.5V, I_{OUT}=1mA		0.01	0.15	%/V
$\triangle V_{LOAD}$	Load Regulation	V_{OUT}=3.3V, I_{OUT}=1~300mA		40	70	mV
I_{SHDN}	Shut-down Current	V_{EN}=0V			1	µA
PSRR	Power Supply Rejection Rate	V_{IN}=5V_{DC}+0.5V_{P-P} F=1KHz, I_{OUT}=10mA		75		dB
		V_{IN}=5V_{DC}+0.5V_{P-P} F=1MHz, I_{OUT}=10mA		55		
V_{ENH}	EN logic high voltage	V_{IN}=5.5V, I_{OUT}=1mA	1.2		V_{IN}	V
V_{ENL}	EN logic low voltage	V_{IN}=5.5V, V_{OUT}=0V			0.4	V
I_{EN}	EN Input Current	V_{EN}= 0 to 5.5V			1.0	µA
e_{NO}	Output Noise Voltage	10Hz to 100KHz, C_{OUT}=1µF		20		µV$_{RMS}$
T_{SD}	Thermal Shutdown Protection	V_{IN}=V_{EN}=4.3V, I_{OUT}=1mA		160		℃

HM1139
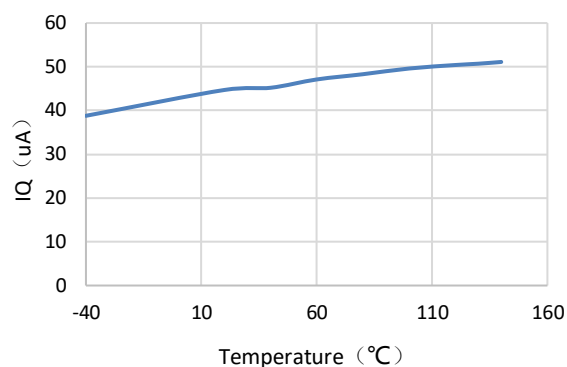
TYPICAL PERFORMANCE CHARACTERISTICS

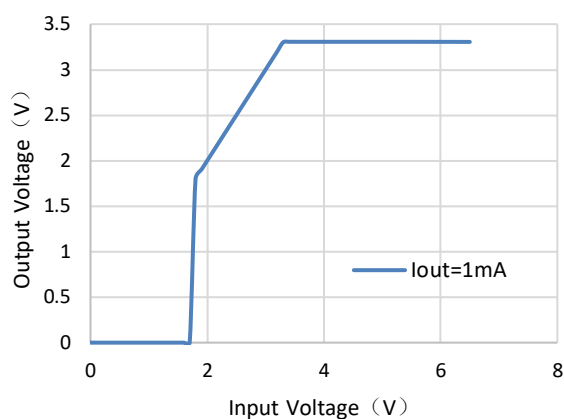C_{IN}=1uF, C_{OUT}=1uF, V_{IN}=4.3V, V_{OUT}=3.3V T_A=25°C, unless specified otherwise.
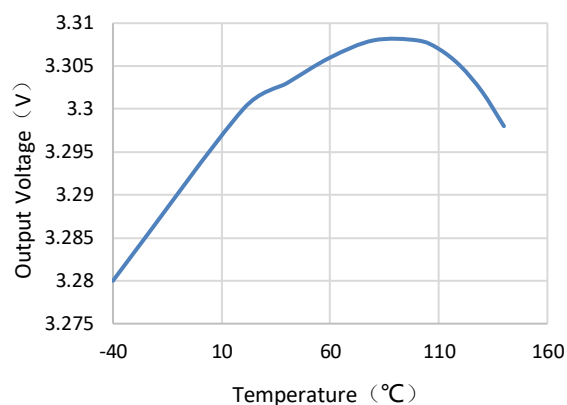
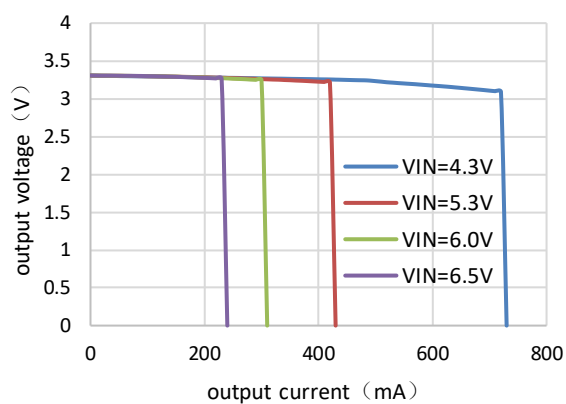### IQ vs. Input Voltage
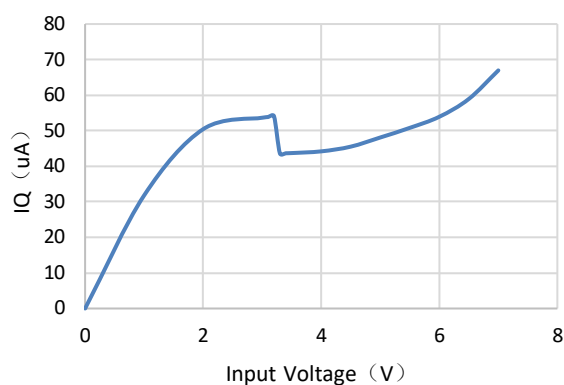
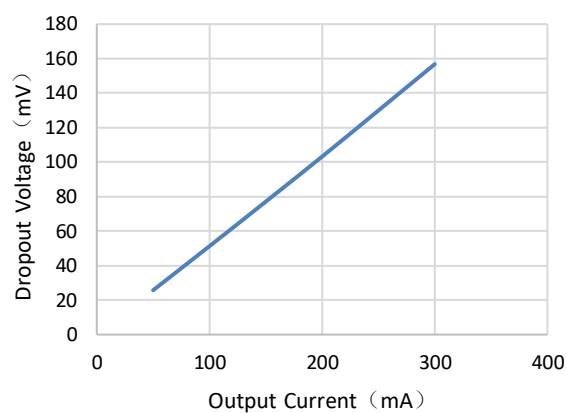### IQ vs. Temperature

Output Voltage vs. Input Voltage

Output Voltage vs. Temperature

output voltage vs. output current

Dropout Voltage vs. Output Current

CH1:V$_{IN}$　　　　**CH2:V$_{OUT}$**　　　　**CH3:EN**　　　　**CH4:I$_{OUT}$**

EN ON/OFF

EN=0V to 3V, I$_{OUT}$=10mA

EN=3V to 0V, I$_{OUT}$=10mA

POWER ON/OFF

V$_{IN}$=0V to 4.3V, I$_{OUT}$=10mA
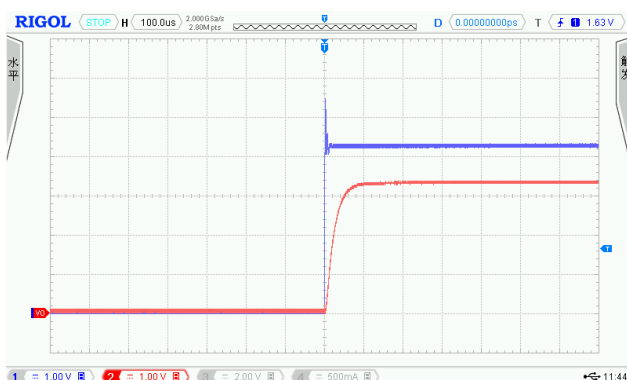
V$_{IN}$=4.3V to 0V, I$_{OUT}$=10mA

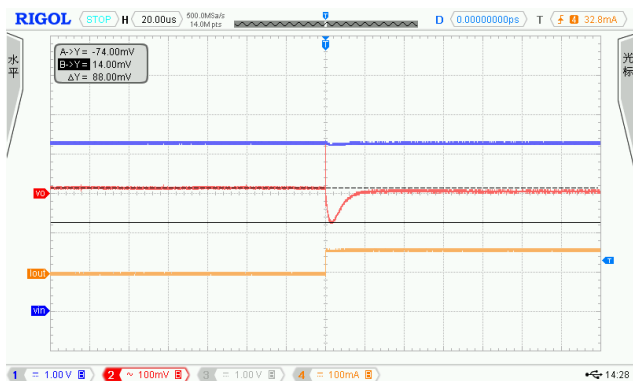## LINE TRANSIENT

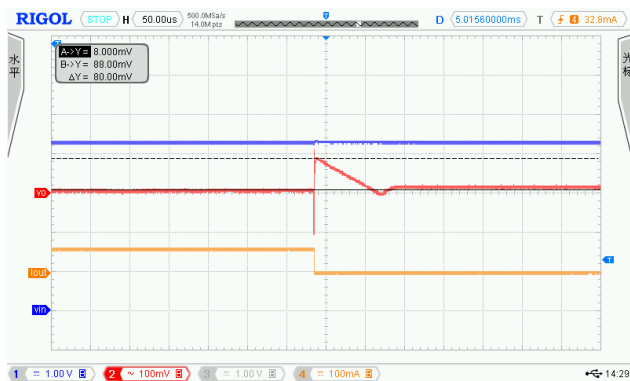V$_{IN}$=4.3V to 5.3V, I$_{OUT}$=10mA
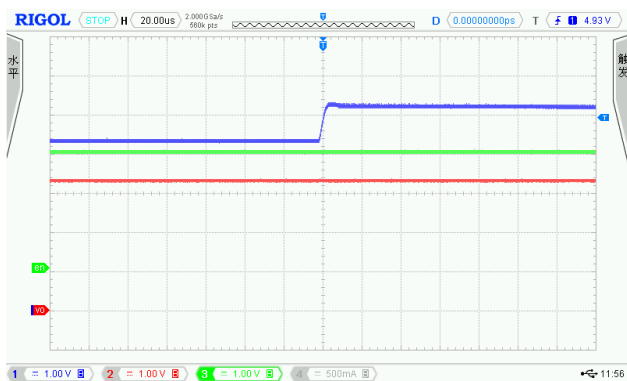
V$_{IN}$=5.3V to 4.3V, I$_{OUT}$=10mA
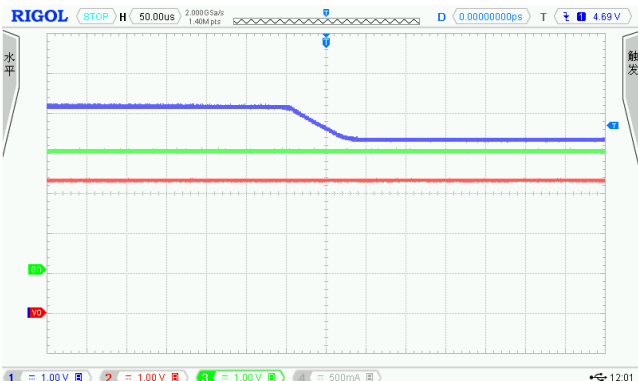
LOAD TRANSIENT
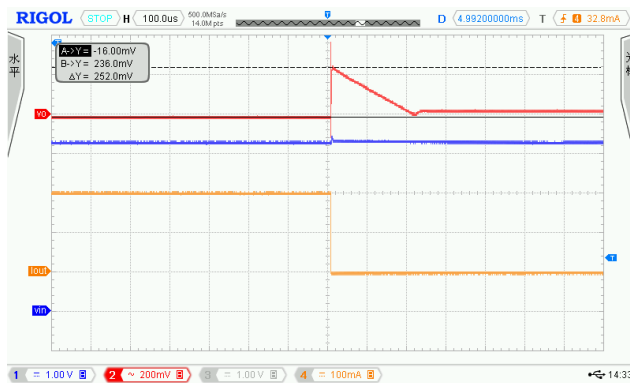
V_{IN}=4.3V, I_{OUT}=1mA to 60mA

V_{IN}=4.3V, I_{OUT}=60mA to 1mA
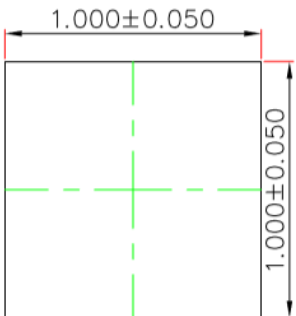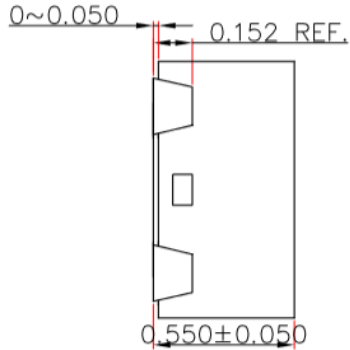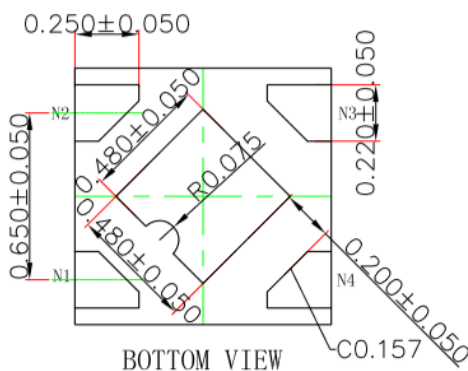

V_{IN}=4.3V, I_{OUT}=1mA to 200mA
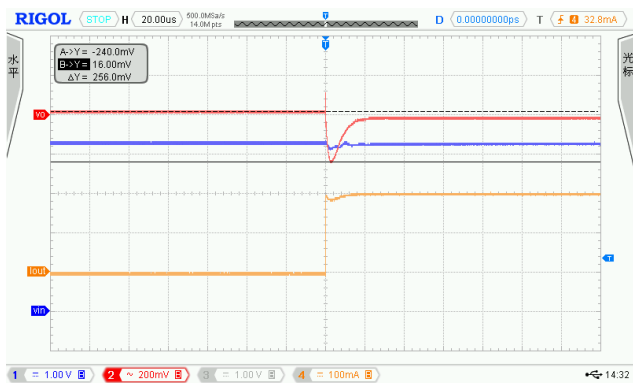
V_{IN}=4.3V, I_{OUT}=200mA to 1mA

PACKAGE OUTLINE

Package	DFN1x1-4L	Devices per reel	10000Pcs	Unit	mm

Package Dimension：

1.000±0.050

1.000±0.050

TOP VIEW
[顶视图]

0~0.050   0.152 REF.

0.550±0.050

SIDE VIEW
侧视图

0.250±0.050

0.480±0.050

0.480±0.050

R0.075

0.650±0.050

N2

N1

0.220±0.050

N3

N4

0.200±0.050

C0.157

BOTTOM VIEW
背视图