GENERAL DESCRIPTION

The HM1136 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.

HM1136 can provide product selections of output value in the range of 1.0V~3.6V by every 0.1V step.

The current limiter's fold-back circuit also operates as a short circuit protection and an output current limiter at the output pin.

The HM1136 regulators are available in standard SOT23-5L and DFN1x1-4L packages. Standard products are Pb-free and Halogen-free.

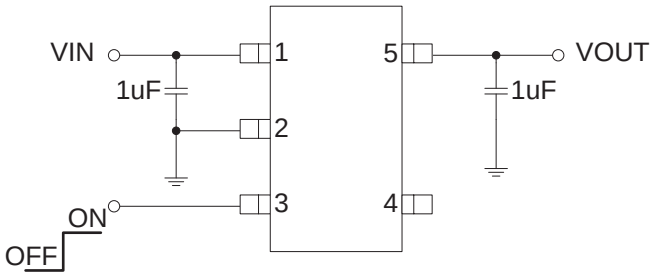
FEATURES

- Input voltage: 2.5V~6.5V
- Output range: 1.0V~3.6V (customized by every 0.1V step)
- Maximum output current: 400mA @ V_{IN}-V_{OUT}=0.5V
- PSRR: 75dB @1KHz
- Dropout voltage: 220mV @ I_{OUT}=200mA
- Quiescent current: 35μA 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 devices

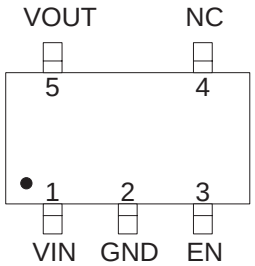
TYPICAL APPLICATION CIRCUIT



PIN ASSIGNMENT



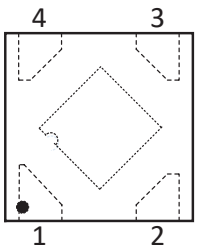
SOT23-5L



SOT23-5L（Top View）



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
HM1136AXXMR	SOT23-5L	Yes	-40 ~ +85℃	3000/REEL
HM1136BXXMR	SOT23-5L	No	-40 ~ +85℃	3000/REEL
HM1136AXXDR	DFN1x1-4L	Yes	-40 ~ +85℃	10000/REEL
HM1136BXXDR	DFN1x1-4L	No	-40 ~ +85℃	10000/REEL

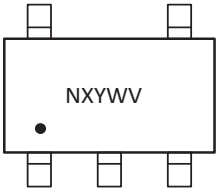
Note: *XX indicates 1.0V~3.6V by 0.1V step. For example, 28 means product outputs 2.8V*

PART NUMBER RULES

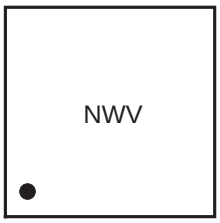
HM1136 [1]-[2]-[3]

Code	Description
[1]	Vout discharge A: Yes; B: No
[2]	Package: MR: SOT23-5L DR: DFN1x1-4L
[3]	Voltage version: XX: 1.0V~3.6V by 0.1V step Example: 28: 2.8V

MARKING DESCRIPTION:



SOT23-5L



DFN1x1-4L

"N": Product code, here use "L" stand for "HM1136"
"X": Package factory
"Y": Wafer foundry vendor.
"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 SOT23-5L	SYMBOL	I/O	DESCRIPTTION
1	VIN	Power	Input
2	GND	Ground	Ground
3	EN	I	Enable (active high, do not float)
4	NC	/	Not connected
5	VOUT	O	Output

PIN NO DFN1x1-4L	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		550	mA
P_{DMAX}	Power Dissipation	SOT23-5L	0.3	W
		DFN1x1-4L	0.6	
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

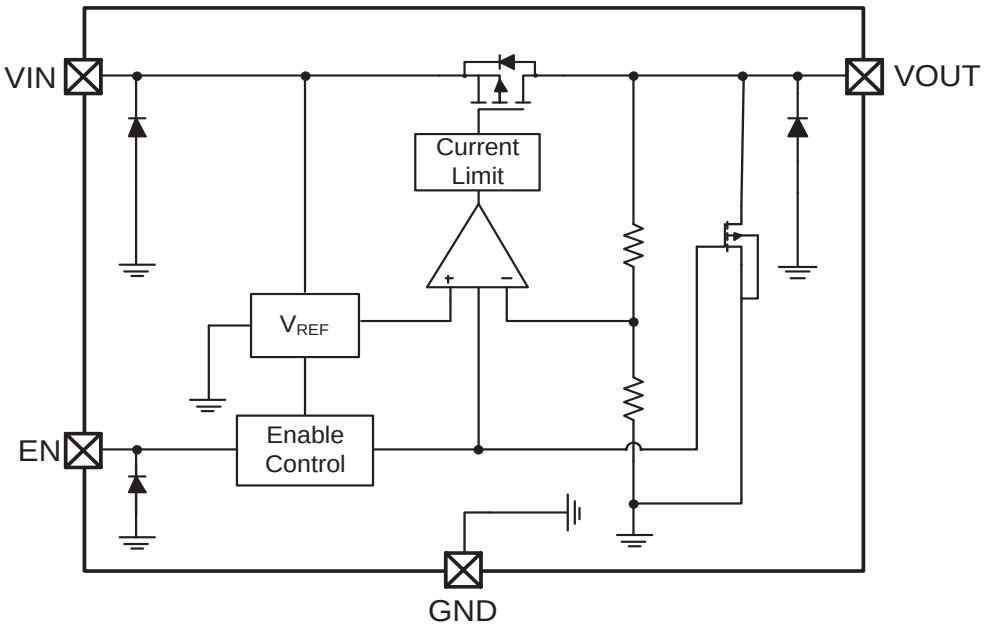
SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Supply Voltage	2.5 to 6.5	V
I_{OUT}	Output Current	<300	mA
T_{OPT}	Operating Temperature	-40 to +85	℃

ELECTRICAL CHARACTERISTICS

The following specifications apply for V_{OUT}=2.8V 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}=2.8V, I_{OUT}=0		35		μA
I_{LIMIT}	Current Limit	V_{IN}=V_{EN}=4.5V		500		mA
V_{DROP}	Dropout Voltage	V_{OUT}=2.8V, I_{OUT}=200mA		220	250	mV
		V_{OUT}=2.8V, I_{OUT}=300mA		320	350	
△V_{LINE}	Line Regulation	V_{IN}=2.7~5.5V, I_{OUT}=1mA		0.01	0.15	%/V
△V_{LOAD}	Load Regulation	V_{OUT}=2.8V, I_{OUT}=1~300mA		40	70	mV
I_{SHORT}	Short Current	V_{EN}=V_{IN}, V_{OUT} Short to GND with 1Ω		80		mA
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}

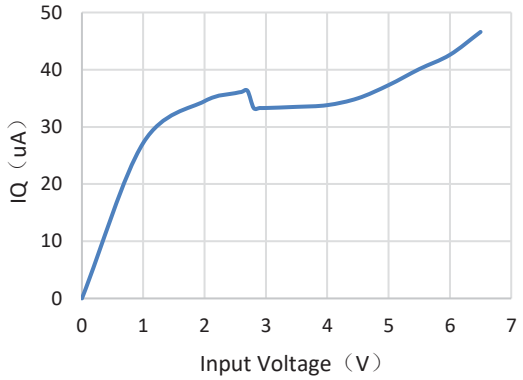
SIMPLIFIED BLOCK DIAGRAM



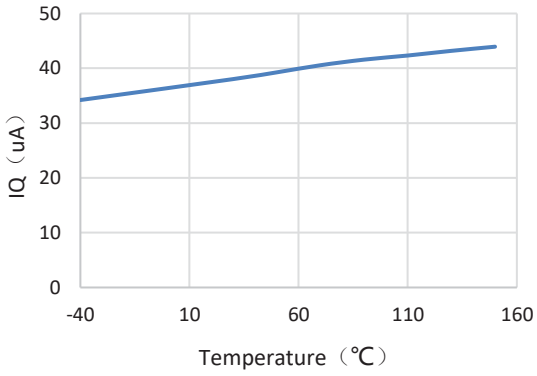
TYPICAL PERFORMANCE CHARACTERISTICS

C_{IN}=1uF, C_{OUT}=1uF, V_{IN}=4.5V, V_{OUT}=2.8V T_A=25℃, unless specified otherwise.（Package:SOT23-5L）

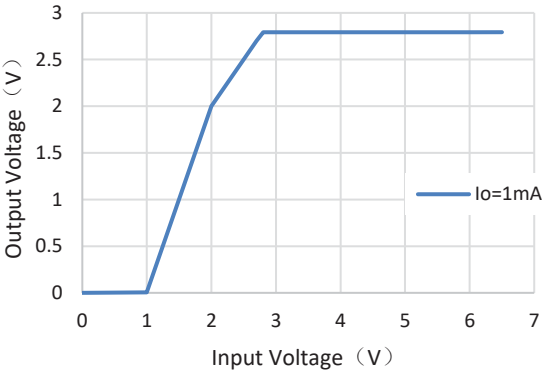
IQ vs. Input Voltage



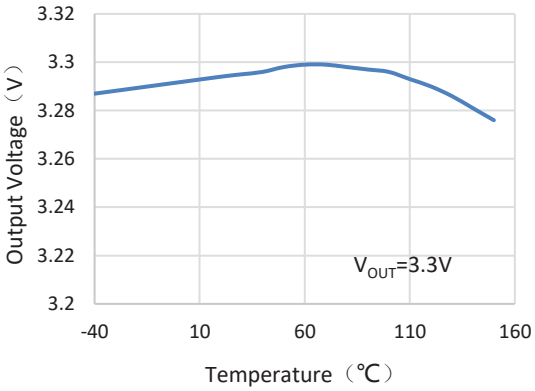
IQ vs. Temperature



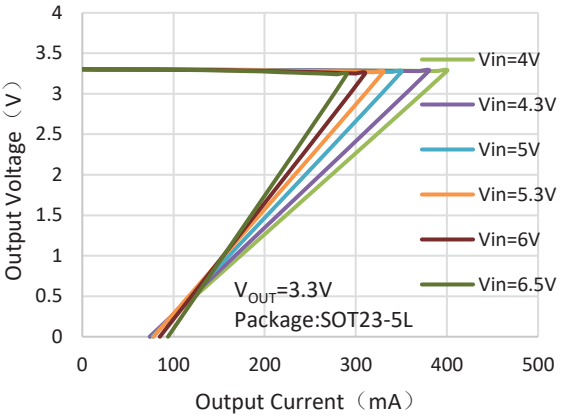
Output Voltage vs. Input Voltage



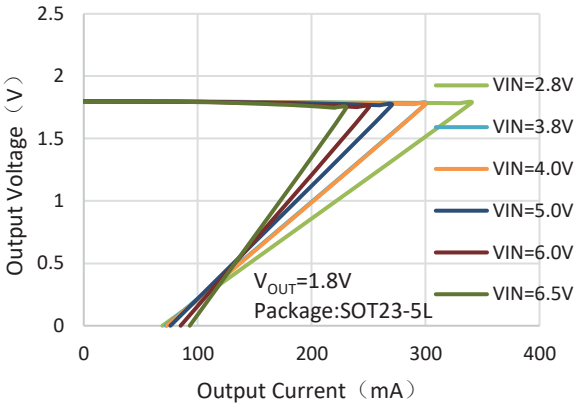
Output Voltage vs. Temperature



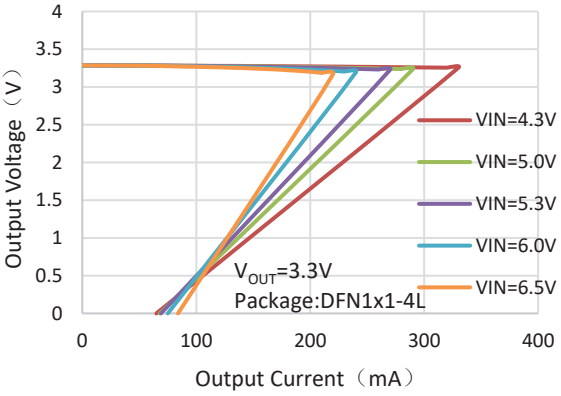
Output Voltage vs. Output Current



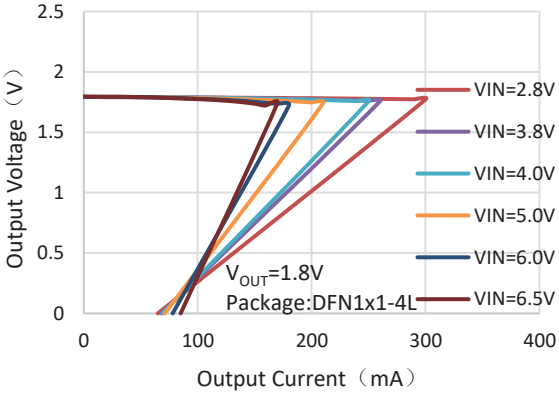
Output Voltage vs. Output Current

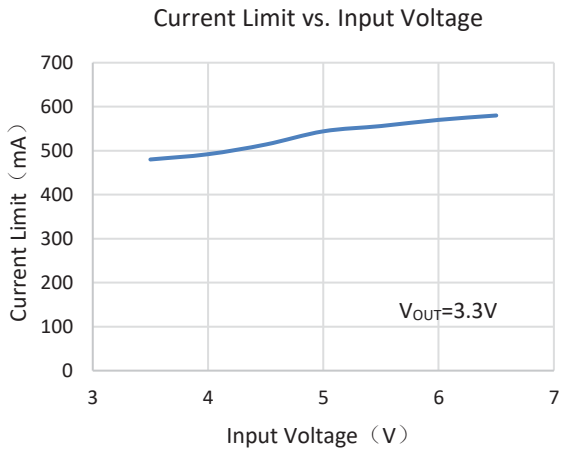


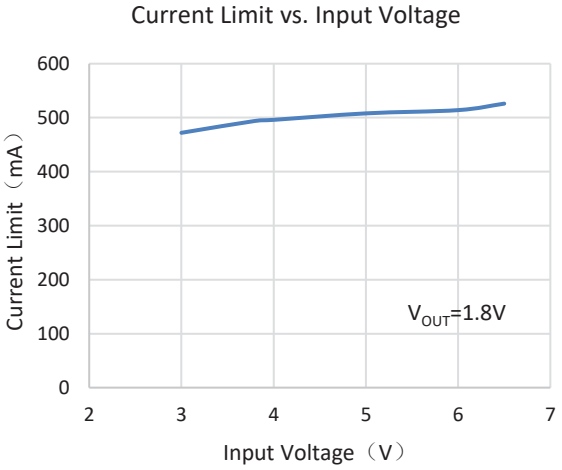
Output Voltage vs. Output Current

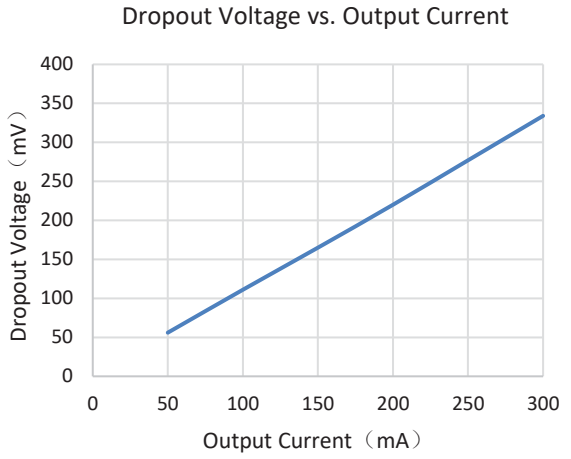


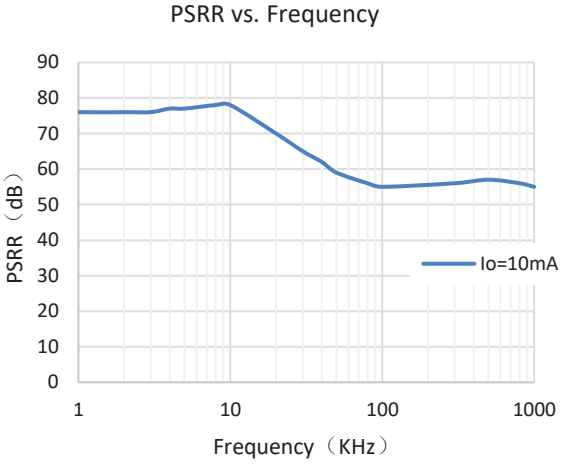
Output Voltage vs. Output Current





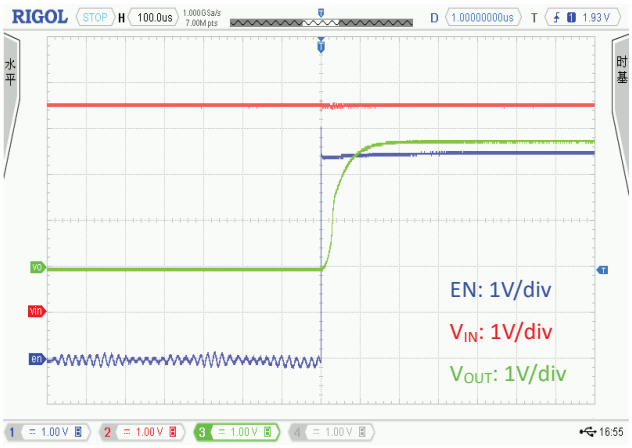






EN ON / OFF

V_{EN}=0V to 4.5V I_{OUT}=10mA



V_{EN}=4.5V to 0V I_{OUT}=10mA



Power ON / OFF

V_{IN}=0V to 4.5V I_{OUT}=10mA

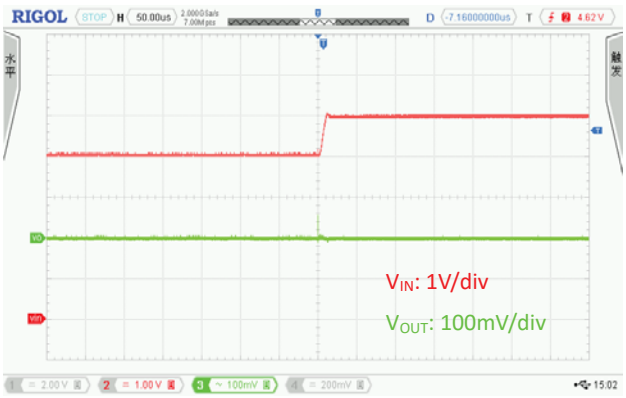


V_{IN}=4.5V to 0V I_{OUT}=10mA



Line Transient

V_{IN}=4V to 5V I_{OUT}=10mA

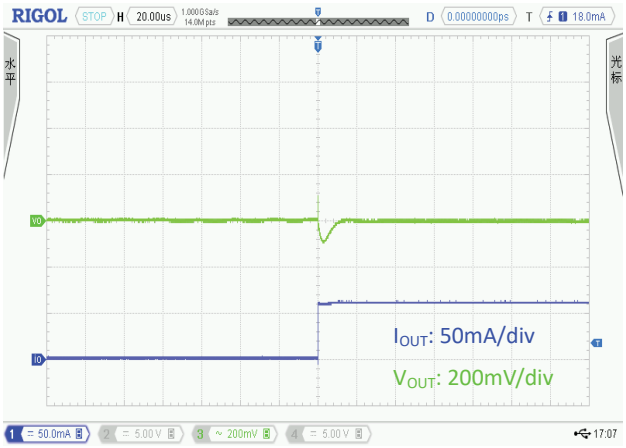


V_{IN}=5V to 4V I_{OUT}=10mA



Load Transient

V_{IN}=4.5V I_{OUT}=1mA to 60mA



V_{IN}=4.5V I_{OUT}=60mA to 1mA



V_{IN}=4.5V I_{OUT}=1mA to 200mA



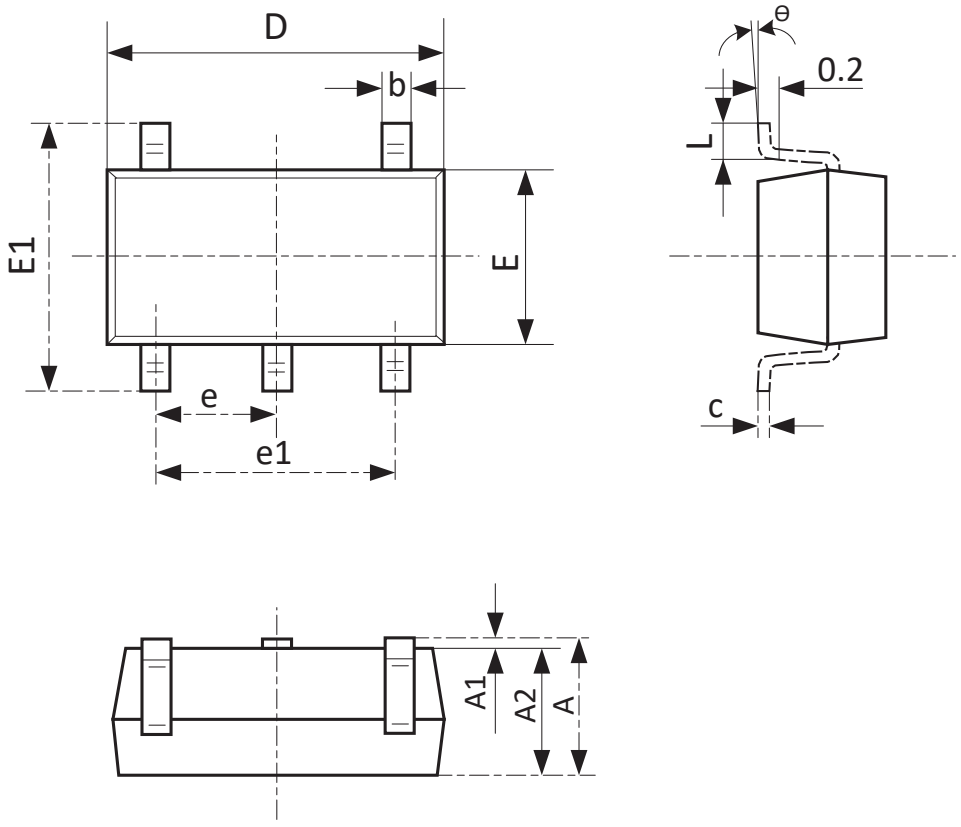
V_{IN}=4.5V I_{OUT}=200mA to 1mA



PACKAGE OUTLINE

Package	SOT23-5L	Devices per reel	3000Pcs	Unit	mm

Package Dimension：

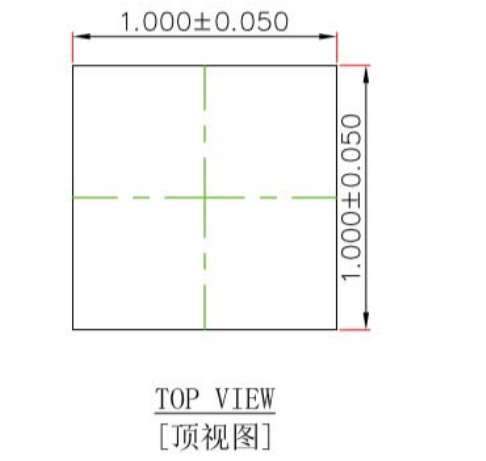


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0℃	8℃	0℃	8℃

PACKAGE OUTLINE

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

Package Dimension：



REVISION HISTORY

Version No.	Date	Description
Preliminary	2018-05-03	- Initial preliminary release
V0.1	2018-05-23	- Update electrical characteristics - Update typical performance characteristics
V0.2	2018-09-10	- Update current limit - Update temperature coefficient
V0.3	2018-12-04	- Add DFN1x1-4L package
V0.4	2019-02-25	- Update typical performance characteristics