GENERAL DESCRIPTION

The HM6215 series is a set of three-terminal, low power, high voltage regulators implemented in CMOS technology. The series features extremely low quiescent current which is typically 2.0μA. They allow input voltages as high as 16V. The device provides large current with a significantly small dropout voltage.

The HM6215 consists of a high-precision voltage reference, an error correction circuit, an over temperature protection circuit, and a current limited output driver. They are available with several fixed output voltages ranging from 2.5V to 5.0V. CMOS technology ensures low dropout voltage and low current consumption.

The HM6215 regulators are available in standard SOT89-3L and SOT23-3L packages. Standard products are Pb-free and Halogen-free.

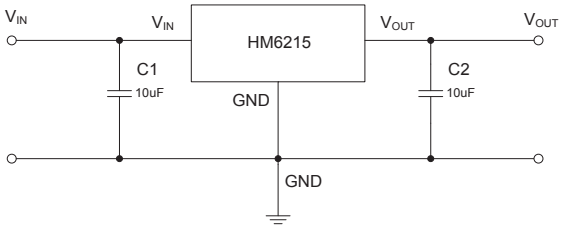
FEATURES

- Input voltage: 3V~16V
- Output range: 2.5V~5.0V
- Output current: 500mA (Within Max Power Dissipation)
- Dropout voltage: 200mV @ V_{OUT}=3.3V, I_{OUT}=100mA
- Quiescent current: 2μA Typ.
- Good line regulation: 0.01%/V
- Good load regulation: 5mV@1mA≤Io≤50mA
- Low temperature coefficient: 0.07mV/℃
- Soft start

APPLICATIONS

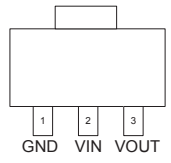
- Battery powered equipment
- Voltage regulator for microprocessor
- Voltage regulator for LAN cards
- Wireless communication equipment
- Audio/Video equipment

TYPICAL APPLICATION CIRCUIT



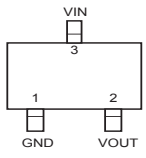
PIN ASSIGNMENT

HM6215PR **SOT89-3L**



SOT89-3L（Top View）

HM6215MR **SOT23-3L**



SOT23-3L（Top View）

ORDER INFORMATION

PART NO	PACAKGE	TEMPERATURE	TAPE & REEL
HM6215PXXMR	SOT23-3L	-40 ~ +85℃	3000/REEL
HM6215PXXPR	SOT89-3L	-40 ~ +85℃	1000/REEL

"XX": several fixed output voltages ranging from 2.5V to 5.0V

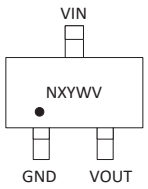
PART NUMBER RULES

HM6215[1]-[2]

Code	Description
[1]	Package: MR: SOT23-3L PR: SOT89-3L (B type pin-out)
[2]	Voltage version: XX: several fixed output voltages ranging from 2.5V to 5.0V Example: 33: 3.3V

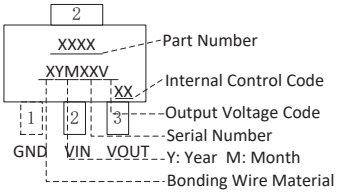
MARKING DESCRIPTION:

SOT23-3L:



"N": product code, here use "T" stands for "HM6215".
"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.

SOT89-3L:



TYPICAL OUTPUT VOLTAGE CODE TABLE

V_{OUT}	CODE	V_{OUT}	CODE
2.8V	M	3.0V	G
3.3V	H	3.6V	I
4.0V	J	5.0V	K

PIN DESCRIPTION

PIN NO		SYMBOL	I/O	DESCRIPTTION
HM6215PR	HM6215MR			
1	1	GND	Ground	Ground
2	3	VIN	Power	Input
3	2	VOUT	O	Output

ABSOLUTE MAXIMUM RATINGS (Note)

SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Input Voltage	-0.3~20	V
V_{OUT}	Output Voltage	-0.3~V_{IN}	V
P_{DMAX}	Power Dissipation	OTP Limited	W
T_J	Junction Temperature	-40~125	℃
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

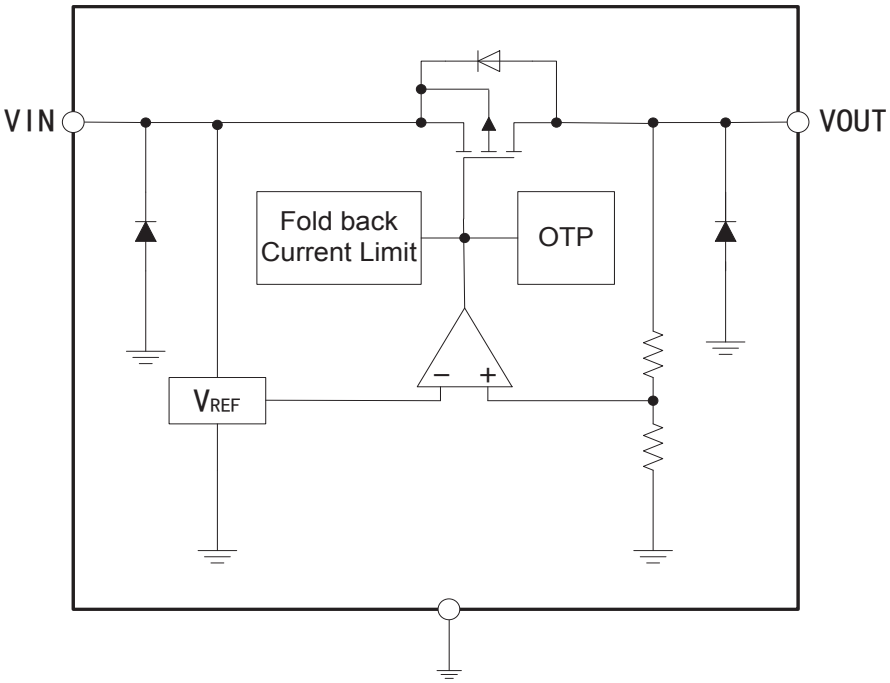
SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	VIN Supply Voltage	3 to 16	V
$R_{\theta JA}$	Thermal Resistance on PCB	75	℃/W
T_{OPT}	Operating Temperature	-40 to +85	℃

ELECTRICAL CHARACTERISTICS

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

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage		3	5	16	V
V_{OUT}	V_{OUT} Range	V_{IN}= V_{OUT} + 2 V, I_{OUT} = 1 mA	V_{OUT}*0.98	V_{OUT}	V_{OUT}*1.02	V
I_{OUT}	Output Current	Within Maximum Power Dissipation			500	mA
I_Q	Quiescent Current	No Load		2	3	μA
V_{DROP}	Dropout Voltage	V_{OUT} = 3.3 V, I_{OUT} = 100 mA, ΔV=2%		200	215	mV
		V_{OUT} = 5.0 V, I_{OUT} = 100 mA, ΔV=2%		115	130	
$\triangle V_{LINE}$	Line Regulation	V_{IN} = 5~12V, I_{OUT} = 1 mA		0	6	mV
$\triangle V_{LOAD}$	Load Regulation	V_{IN} = 12V, I_{OUT} = 1~100 mA		7	36	mV
I_{SHORT}	Short Current	V_{OUT} Short to GND with 3Ω		90	200	mA
$\Delta V_{OUT}/\Delta Ta$	Temperature coefficient	I_{OUT}=1mA, 0≤Ta≤70℃		0.07	0.2	mV/℃
T_{SD}	Thermal Shutdown Protection	V_{IN}= V_{OUT} + 2 V, I_{OUT} = 1 mA	140	160	180	℃

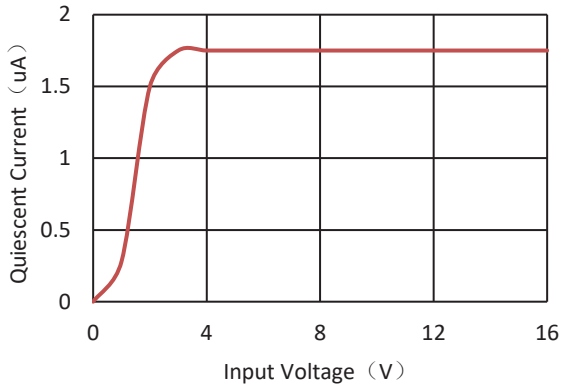
SIMPLIFIED BLOCK DIAGRAM



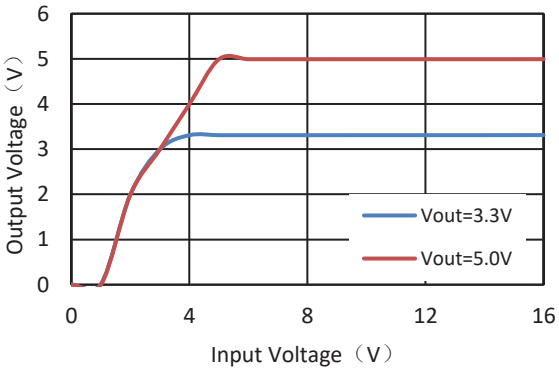
TYPICAL PERFORMANCE CHARACTERISTICS

C_{IN}=10μF, C_{OUT}=10μF, T_{OPT}=25℃, V_{IN}=5.3V, V_{OUT}=3.3V, unless specified otherwise. (Package:SOT89-3L)

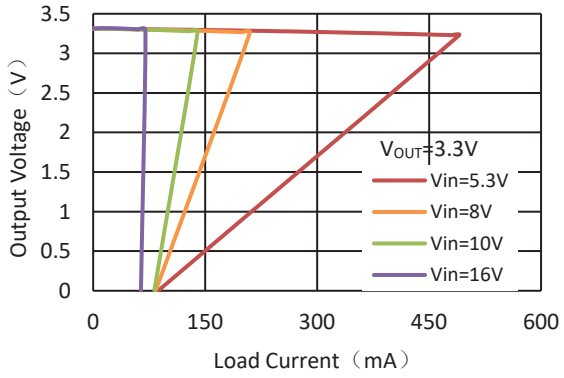
Quiescent Current vs. Input Voltage



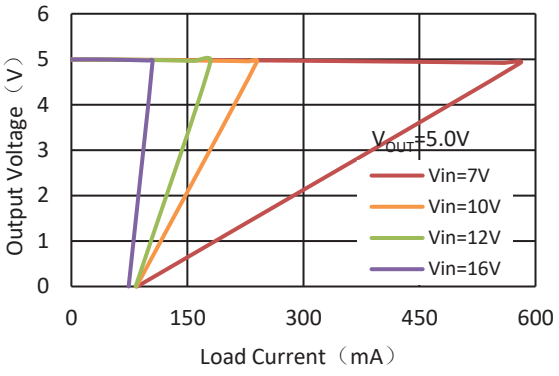
Output Voltage vs. Input Voltage



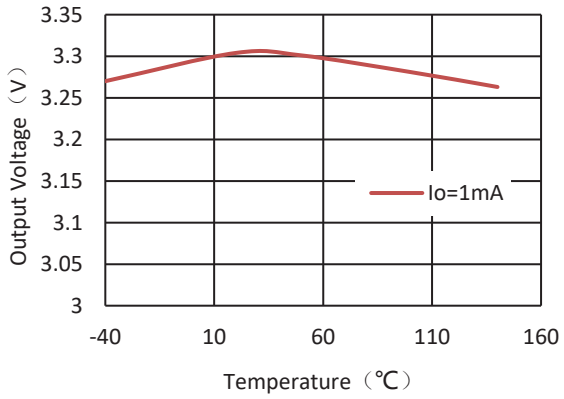
Output Voltage vs. Load Current



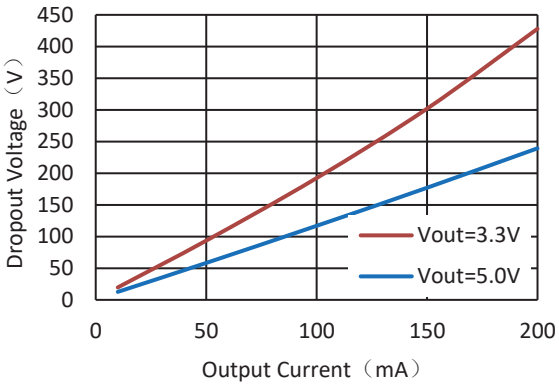
Output Voltage vs. Load Current



Output Voltage vs. Temperature

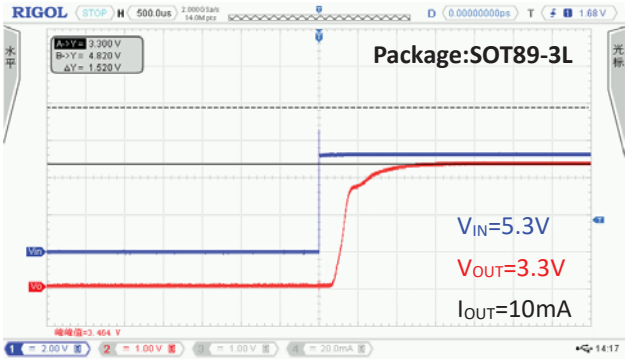


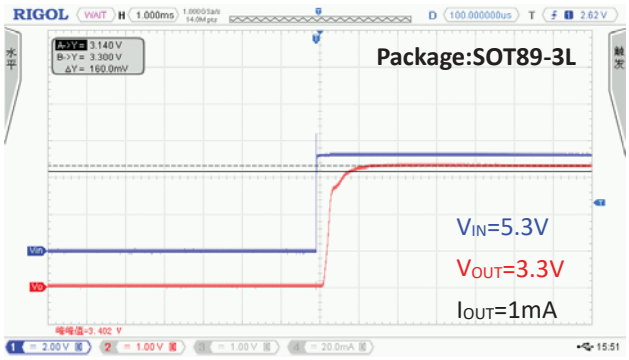
Dropout Voltage vs. Output Current



Power ON

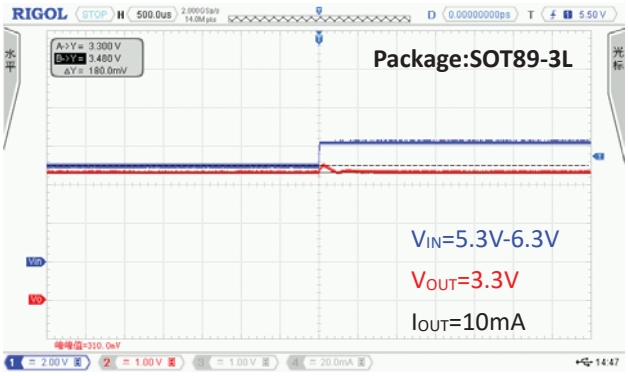
CH1：V_{IN} CH2：V_{OUT}

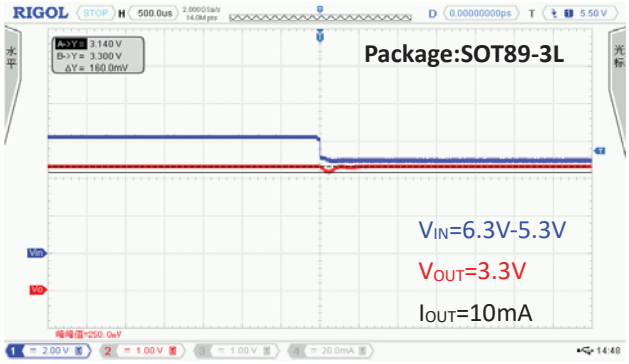


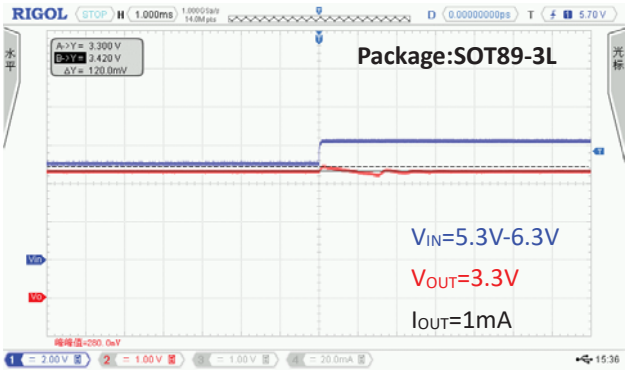


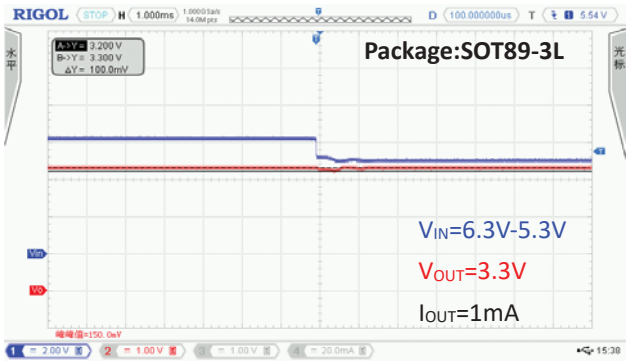
Line Transient

CH1：V_{IN} CH2：V_{OUT}



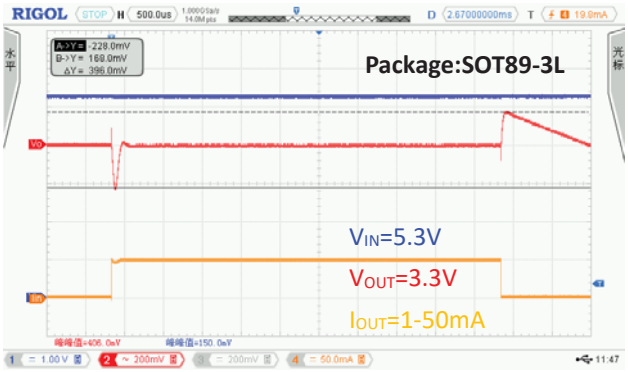


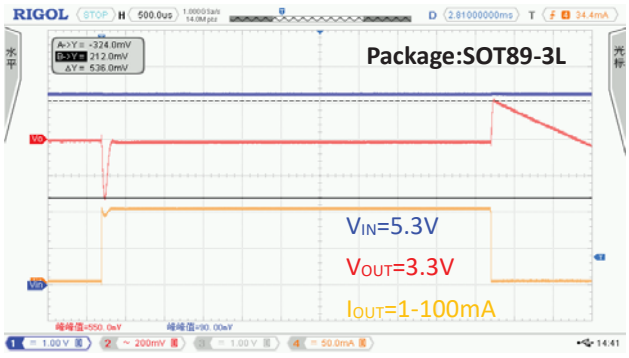




Load Transient

CH1：V_{IN} CH2：V_{OUT} CH4：I_{OUT}

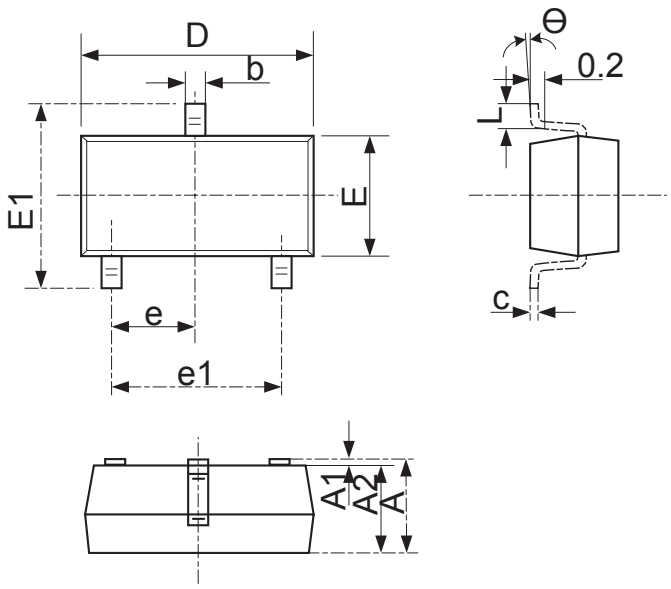




PACKAGE OUTLINE

Package	SOT23-3L	Devices per reel	3000Pcs	Unit	mm

Package Dimension：

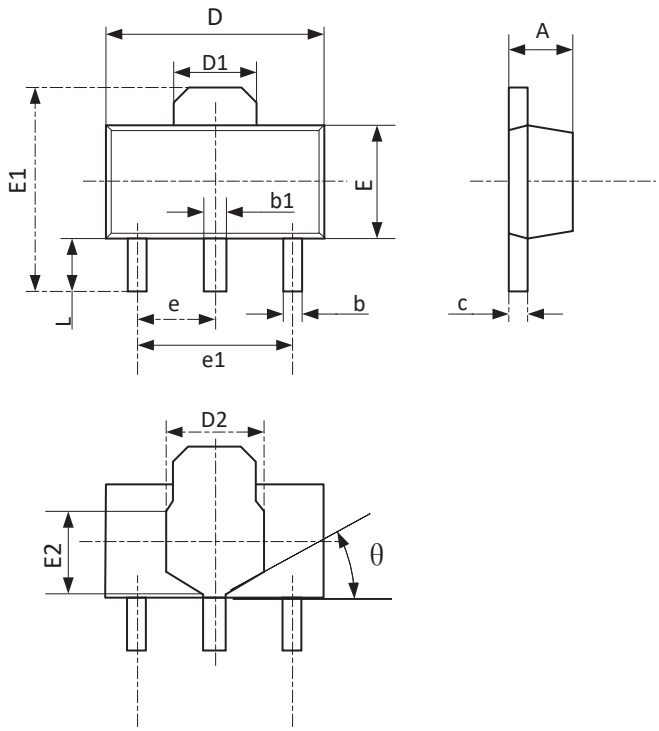


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
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	SOT89-3L	Devices per reel	1000Pcs	Unit	mm

Package Dimension：



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
D2	1.750 REF		0.069 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
E2	1.900 REF		0.075 REF	
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047
θ	45°		45°	