

### GENERAL DESCRIPTION

The HP6215 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 HP6215 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 HP6215 regulators are available in standard SOT89-3L and SOT23-3L packages. Standard products are Pb-free and Halogen-free.

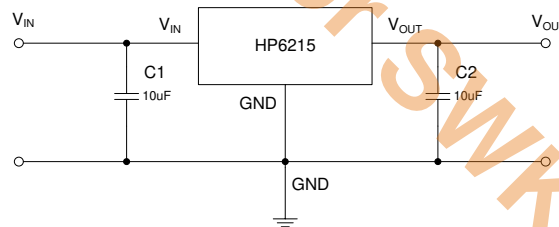
### FEATURES

- 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 ≤  $I_O$  ≤ 50mA
- Low temperature coefficient: 0.07mV/°C
- Soft start

### APPLICATIONS

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

### TYPICAL APPLICATION CIRCUIT

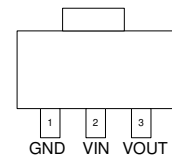


### PIN ASSIGNMENT



HP6215T3

SOT89-3L

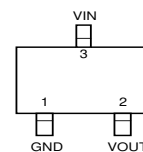


SOT89-3L (Top View)



HP6215S3

SOT23-3L



SOT23-3L (Top View)

## ORDER INFORMATION

PART NO	ACCURACY	PACAKGE	TEMPERATURE	TAPE & REEL
HP6215S3-XX	±2%	SOT23-3L	-40 ~ +85°C	3000/REEL
HP6215S3-XX-A	±1%	SOT23-3L	-40 ~ +85°C	3000/REEL
HP6215T3-XX	±2%	SOT89-3L	-40 ~ +85°C	1000/REEL

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

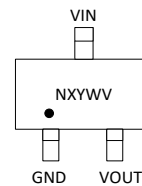
## PART NUMBER RULES

HP6215 [1] - [2] - [3]

Code	Description
[1]	Package: S3: SOT23-3L T3: 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
[3]	Voltage accuracy code: Blank: 2% A: 1%

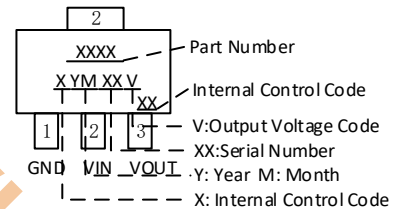
## MARKING DESCRIPTION:

SOT23-3L:



- “N”: product code, here use “T” stands for “HP6215”.
- “X”: Internal Control Code
- “Y”: Internal Control Code
- “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 <sub>OUT</sub>	CODE	V <sub>OUT</sub>	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	DESCRIPTION
HP6215T3	HP6215S3			
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	SOT23-3L	0.2	W
		SOT89-3L	0.7	
$R_{\theta JA}$	Thermal Resistance of Junction to Ambient	SOT23-3L	400	°C/W
		SOT89-3L	160	°C/W
$T_J$	Junction Temperature		-40~150	°C
$T_A$	Ambient Temperature		-40~85	°C
$T_{STG}$	Storage Temperature		-55~150	°C
$T_{SOLDER}$	Package Lead Soldering Temperature		260°C, 10s	
ESD	HBM		±2	KV

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

## RECOMMENDED OPERATING RANGE

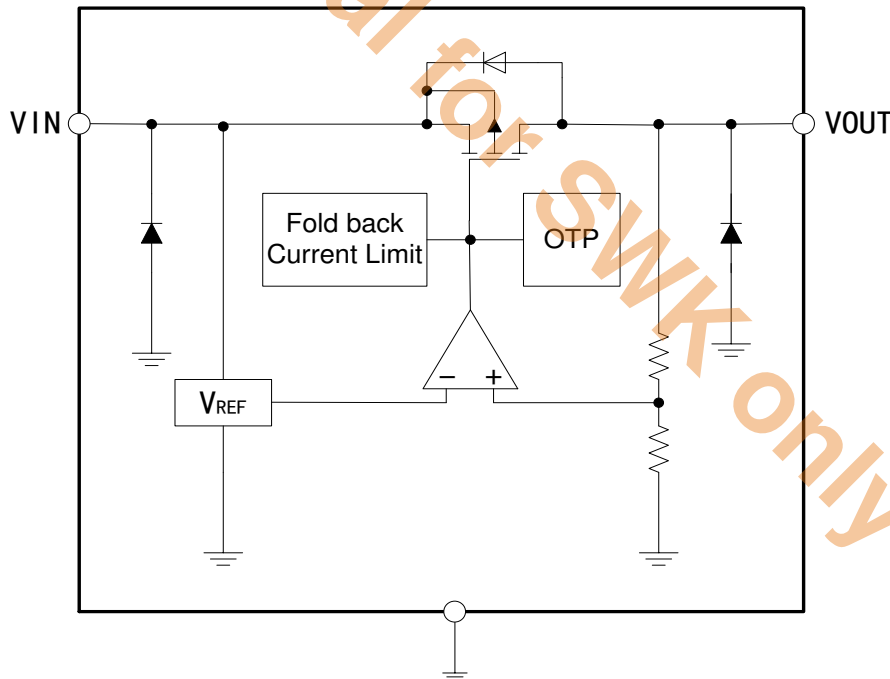
SYMBOL	ITEMS	VALUE	UNIT
$V_{IN}$	$V_{IN}$ Supply Voltage	3~16	V
$C_{IN}$	Input Capacitor	10	μF
$C_{OUT}$	Output Capacitor	10	μF

## ELECTRICAL CHARACTERISTICS

The following specifications apply for  $V_{OUT}=3.3V$   $T_A=25^{\circ}C$ , unless specified otherwise.

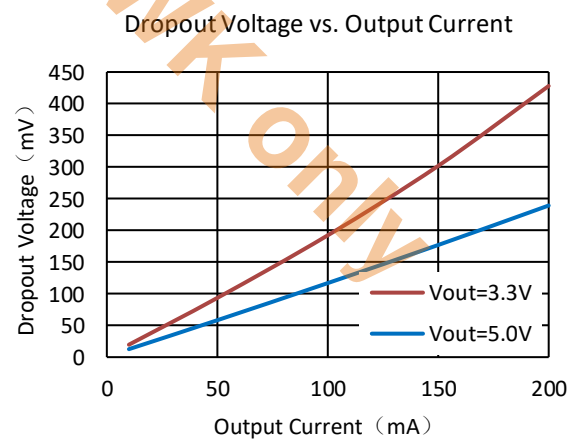
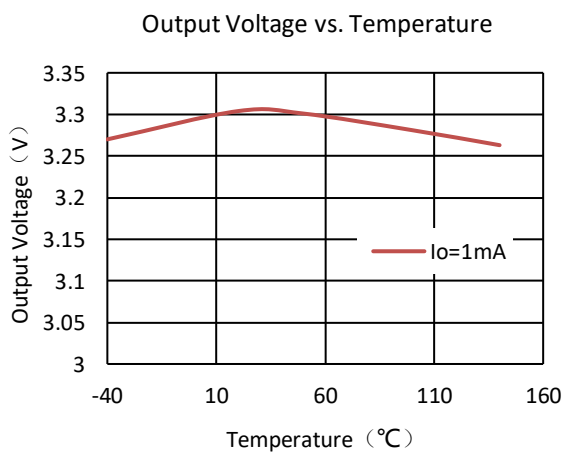
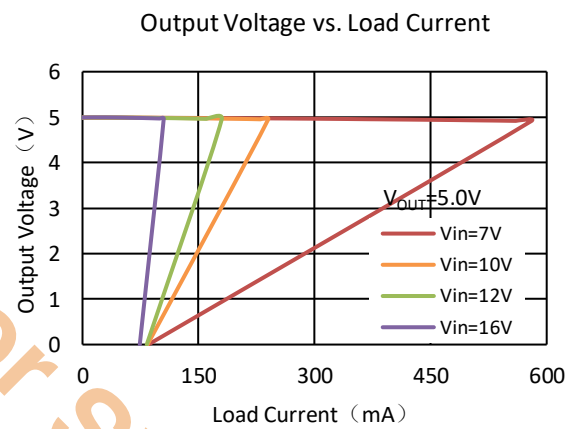
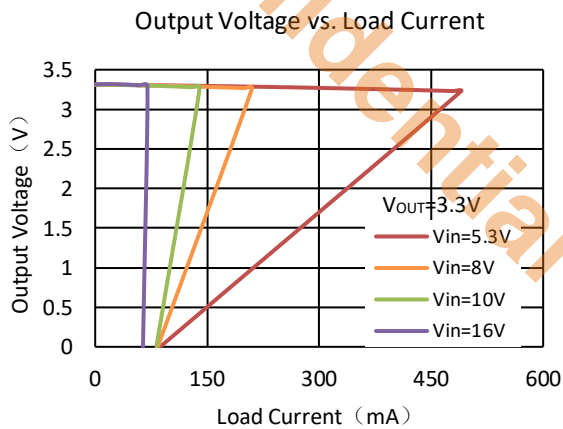
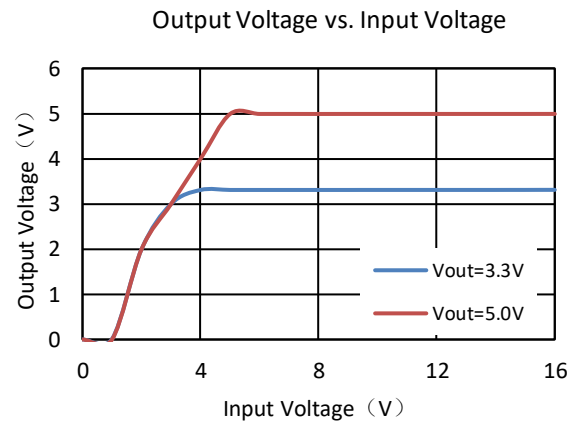
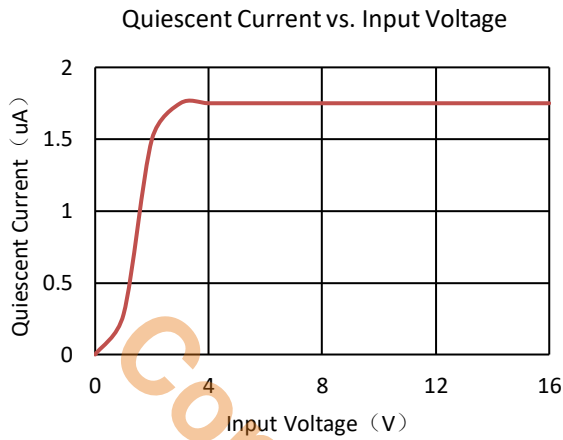
SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT	
V <sub>IN</sub>	Input Voltage		3	5	16	V	
V <sub>OUT</sub>	V <sub>OUT</sub> Range	V <sub>IN</sub> = V <sub>OUT</sub> + 2 V, I <sub>OUT</sub> = 1 mA	HP6215S3-XX-A	V <sub>OUT</sub> *0.99	V <sub>OUT</sub>	V <sub>OUT</sub> *1.01	V
			Others	V <sub>OUT</sub> *0.98	V <sub>OUT</sub>	V <sub>OUT</sub> *1.02	V
I <sub>OUT</sub>	Output Current	Within Maximum Power Dissipation			500	mA	
I <sub>Q</sub>	Quiescent Current	No Load		2	3	μA	
V <sub>DROP</sub>	Dropout Voltage	V <sub>OUT</sub> = 3.3 V, I <sub>OUT</sub> = 100 mA, ΔV=2%		200	215	mV	
		V <sub>OUT</sub> = 5.0 V, I <sub>OUT</sub> = 100 mA, ΔV=2%		115	130		
ΔV <sub>LINE</sub>	Line Regulation	V <sub>IN</sub> = 5~12V, I <sub>OUT</sub> = 1 mA		0	6	mV	
ΔV <sub>LOAD</sub>	Load Regulation	V <sub>IN</sub> = 12V, I <sub>OUT</sub> = 1~100 mA		7	36	mV	
I <sub>SHORT</sub>	Short Current	V <sub>OUT</sub> Short to GND with 3Ω		90	200	mA	
ΔV <sub>OUT</sub> /ΔT <sub>a</sub>	Temperature coefficient	I <sub>OUT</sub> =1mA, 0 ≤ T <sub>a</sub> ≤ 70 °C		0.07	0.2	mV/°C	
PSRR	Power Supply Rejection Rate	V <sub>IN</sub> =5V <sub>DC</sub> +0.5V <sub>P-P</sub> F=100Hz, I <sub>OUT</sub> =1mA		40		dB	
T <sub>SD</sub>	Thermal Shutdown Protection (OTP)	V <sub>IN</sub> = V <sub>OUT</sub> + 2 V, I <sub>OUT</sub> = 1 mA	140	160	180	°C	
T <sub>SD_HYS</sub>	OTP Hysteresis			25		°C	

### SIMPLIFIED BLOCK DIAGRAM



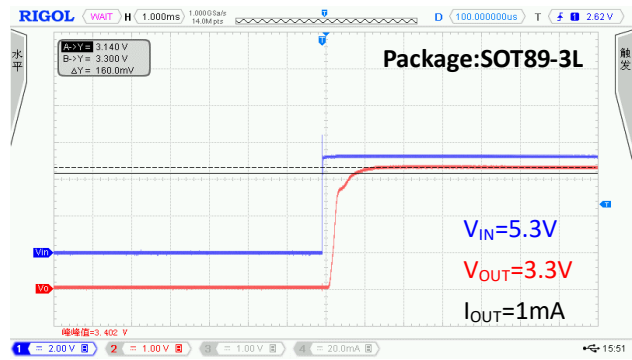
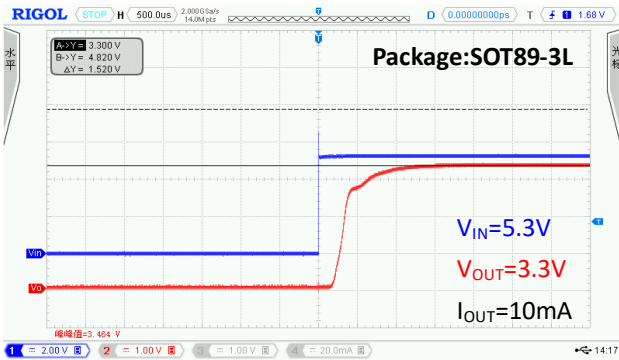
## TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}=10\mu F$ ,  $C_{OUT}=10\mu F$ ,  $T_{OPT}=25^{\circ}C$ ,  $V_{IN}=5.3V$ ,  $V_{OUT}=3.3V$ , unless specified otherwise. (Package: SOT89-3L)



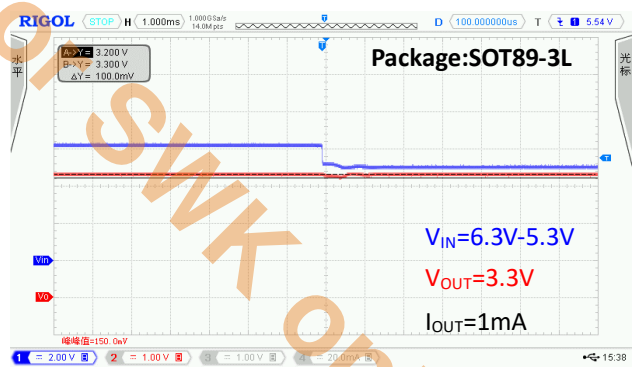
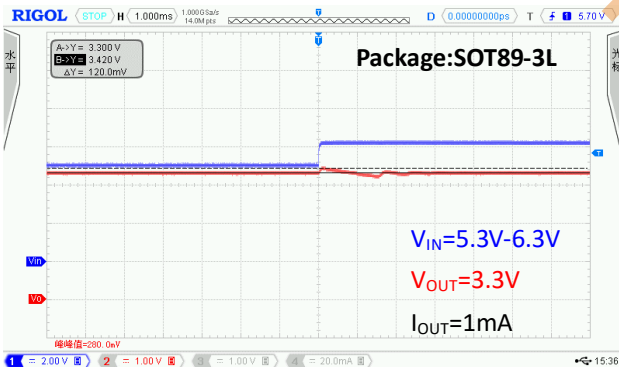
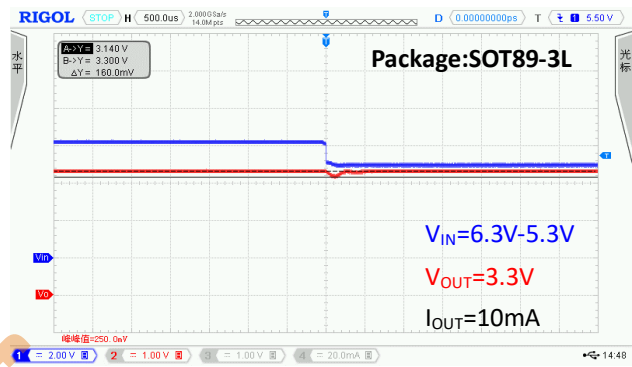
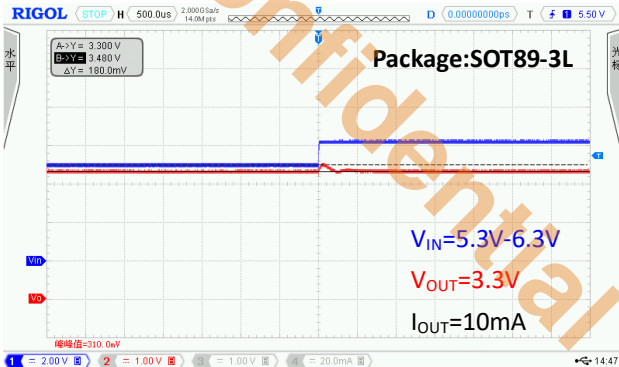
### Power ON

CH1:  $V_{IN}$  CH2:  $V_{OUT}$



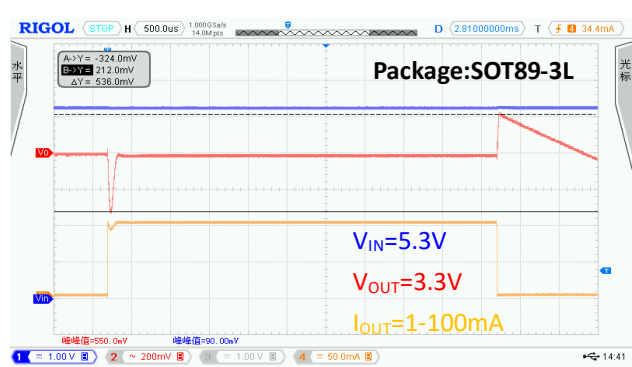
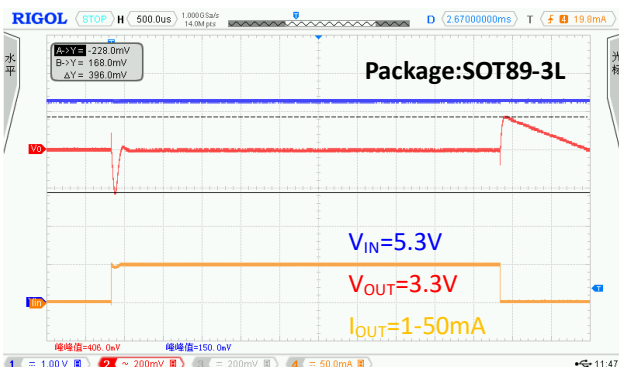
### Line Transient

CH1:  $V_{IN}$  CH2:  $V_{OUT}$



### Load Transient

CH1:  $V_{IN}$  CH2:  $V_{OUT}$  CH4:  $I_{OUT}$



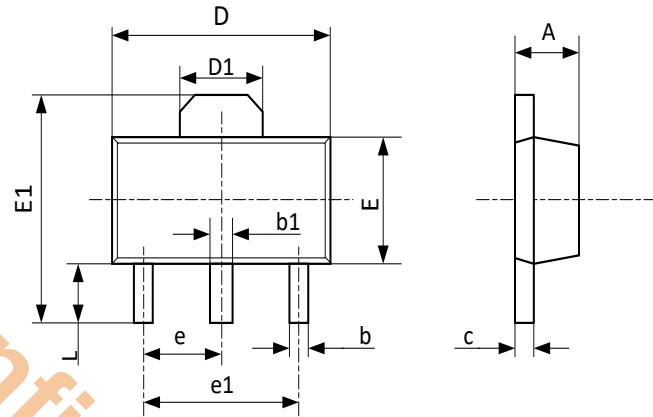
## PACKAGE OUTLINE

Package	SOT23-3L	Devices per reel	3000Pcs	Unit	mm
Package Dimension:					
DIMENSIONS IN MILLIMETERS					
SYMBOL	MINIMUM	NOMINAL	MAXIMUM		
A	-	-	1.35		
A1	0.00	-	0.15		
A2	1.00	1.10	1.20		
b	0.35 REF				
c	0.1	-	0.2		
D	2.82	2.92	3.02		
E	2.60	2.80	3.00		
E1	1.50	1.60	1.726		
e	0.95 REF				
e1	1.90 REF				
L	0.30	0.45	0.60		
L1	0.60 REF				
L2	0.25 REF				
R	0.10	-	-		
R1	0.10	-	0.25		
θ	0°	4°	8°		
θ1	5°	10°	15°		

## PACKAGE OUTLINE

Package	SOT89-3L	Devices per reel	1000Pcs	Unit	mm
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Package Dimension:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
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	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.100	0.035	0.047