

Low power consumption, Low ESR Cap. Compatible HM6216 Series

General Description

HM6216 series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS technologies. The series provides large currents with a significantly small dropout voltage.

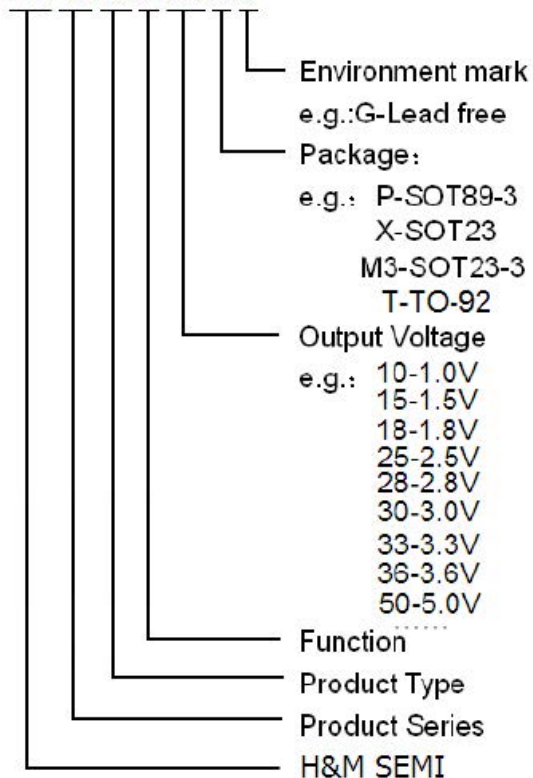
The series is compatible with low ESR ceramic capacitors. The current limiter's foldback circuit also operates as a short protect for the output current limiter and the output pin.

Features

- Highly Accurate: $\pm 1\%$
- Output voltage range: 1.0V~5.0V
- Low power consumption: 4 μ A(TYP.)
- Large output current: 300mA ($V_{IN}=4.3V, V_{OUT}=3.3V$)
- Input voltage: up to 6 V
- Dropout voltage:
0.11V at 100mA and 0.24V at 200mA
- Excellent Input Stability
- Be available to regulator and reference voltage
- Packages: SOT23-3, SOT89-3, SOT23, TO-92

Selection Guide

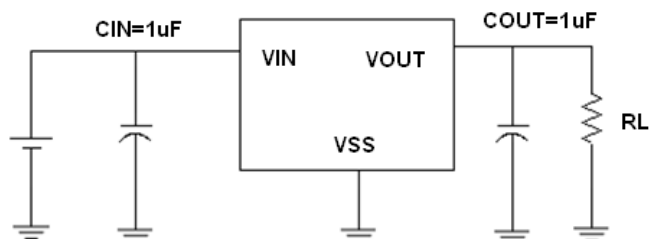
HM 6216 X XX X X



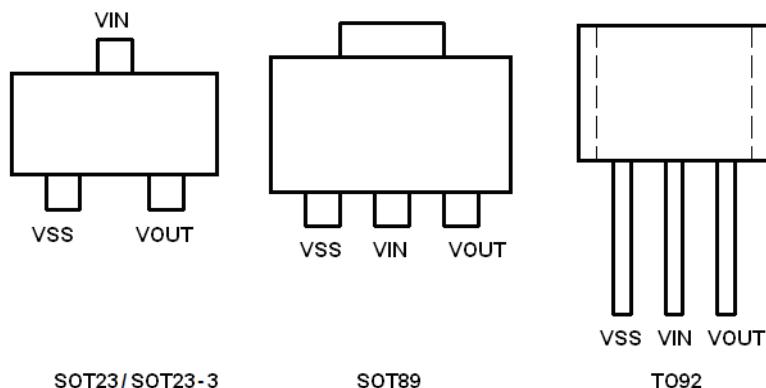
Typical Application

- Battery powered equipment
- Communication tools
- Mobile phones
- Portable games
- Portable AV systems
- Cameras, Video systems
- Reference voltage sources

Typical Application Circuit



Pin Configuration



Pin Assignment

HM6216Axx

Pin				Name	Function
M3	P	X	T		
SOT23-3	SOT89-3	SOT23	TO-92		
1	1	1	1	VSS	Ground
2	3	2	3	VOUT	Output
3	2	3	2	VIN	Input

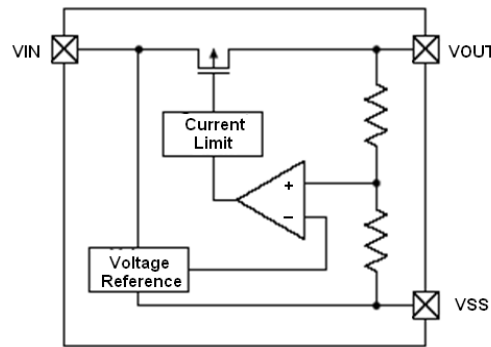
HM6216Bxx

Pin	Name	Function
P		
SOT89-3		
2	VSS	Ground
1	VOUT	Output
3	VIN	Input

Absolute Maximum Ratings

Parameter	Symbol	Description	Units
Input Voltage	V_{IN}	6.5	V
Output Current	I_{OUT}	390	mA
Output Voltage	V_{OUT}	$V_{SS}-0.3 \sim V_{OUT}+0.3$	V
Power Dissipation	SOT23-3	P_d	300 mW
	SOT89-3	P_d	500 mW
	SOT23	P_d	300 mW
	TO-92	P_d	500 mW
Operating Ambient Temperature	T_{Opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +125	°C

Block Diagram



Electrical Characteristics

HM6216-3.3V

($V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_a=25^{\circ}C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT}=10mA$, $V_{IN}=V_{OUT}+1V$	X 0.99	$V_{OUT}(T)$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN}= V_{OUT} +1V$		300	350	mA
Load Regulation	ΔV_{OUT}	$V_{IN}= V_{OUT} +1V$ $1mA \leq I_{OUT} \leq 100mA$		9	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} =80mA$		100	120	mV
	V_{dif2}	$I_{OUT} =200mA$		240	260	mV
Supply Current	I_{SS}	$V_{IN}= V_{OUT} +1V$		4	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} =40mA$ $V_{out}+1V \leq V_{IN} \leq 6V$		0.07	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{in}= [V_{OUT} +1]V$ $+1V_{p-pAC}$ $I_{OUT} =10mA, f=1kHz$		50		dB
Short Circuit Current	I_{short}	$V_{in}= V_{OUT} (T)+1V$ $V_{OUT} =V_{SS}$		30	60	mA
Over Current Protection	I_{limit}	$V_{IN}= V_{OUT} +1V$		420	450	mA

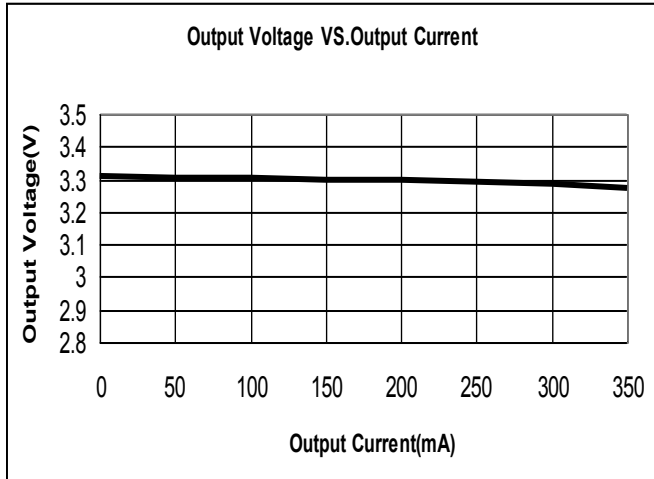
Note :

- $V_{OUT} (T)$: Specified Output Voltage
- $V_{OUT} (E)$: Effective Output Voltage (i.e. The output voltage when " $V_{OUT} (T)+1.0V$ " is provided at the Vin pin while maintaining a certain I_{OUT} value.)
- V_{dif} : $V_{IN1} - V_{OUT} (E)$
 V_{IN1} : The input voltage when $V_{OUT}(E)$ appears as input voltage is gradually decreased.
 $V_{OUT} (E)$ = A voltage equal to 98% of the output voltage whenever an amply stabilized $I_{OUT} \{V_{OUT} (T)+1.0V\}$ is input.

Type Characteristics (HM6216A33)

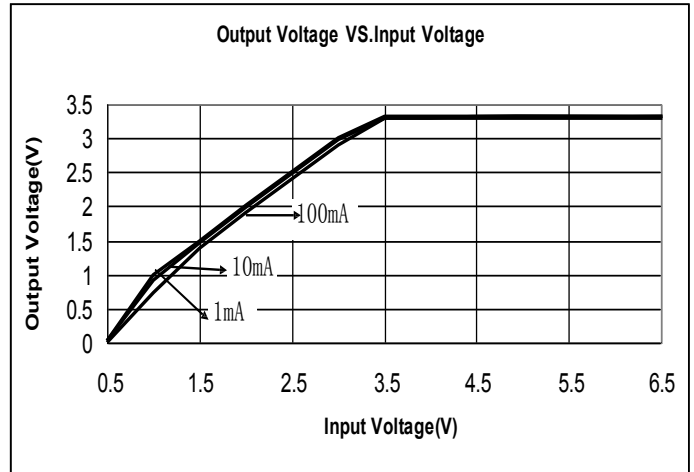
(1) Output Voltage VS. Output Current

($V_{IN}=V_{OUT}+1$, $T_a = 25\text{ }^\circ\text{C}$)



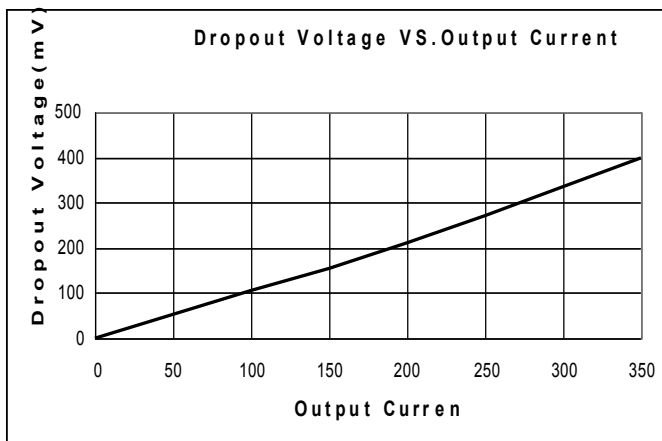
(2) Output Voltage VS. Input Voltage

($T_a = 25\text{ }^\circ\text{C}$)



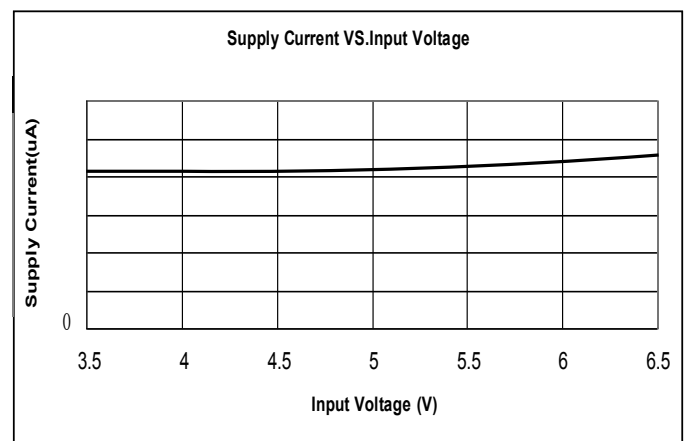
(3) Dropout Voltage VS. Output Current

($V_{IN}=V_{OUT}+1V$, $T_a = 25\text{ }^\circ\text{C}$)

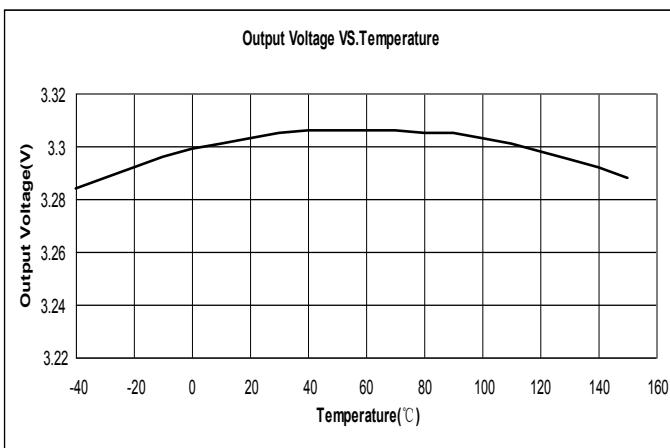


(4) Supply Current VS. Input Voltage

($T_a = 25\text{ }^\circ\text{C}$)

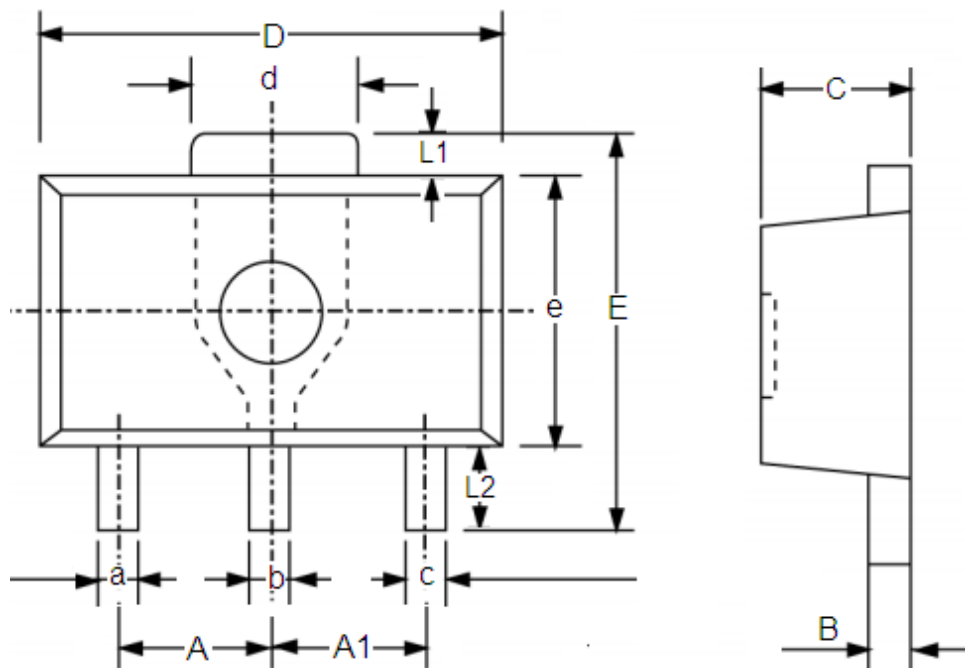


(5) Output Voltage VS. Temperature ($V_{IN}=V_{OUT}+1V$, $I_{OUT} = 10\text{mA}$)



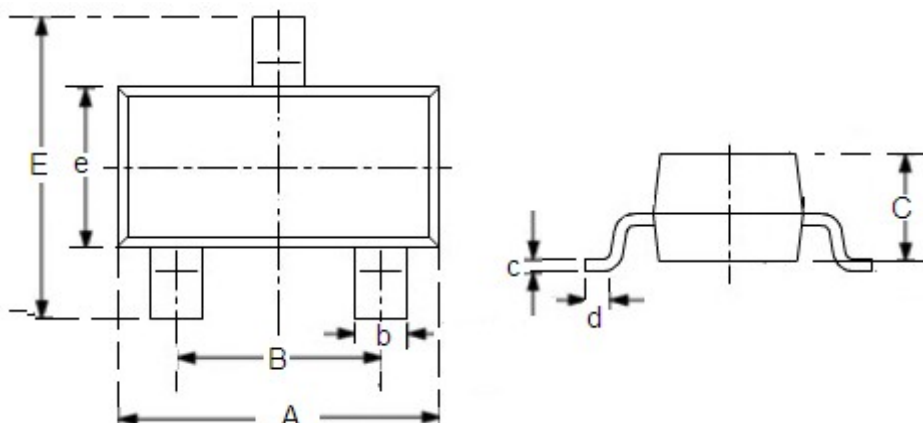
Packaging Information

● SOT89-3



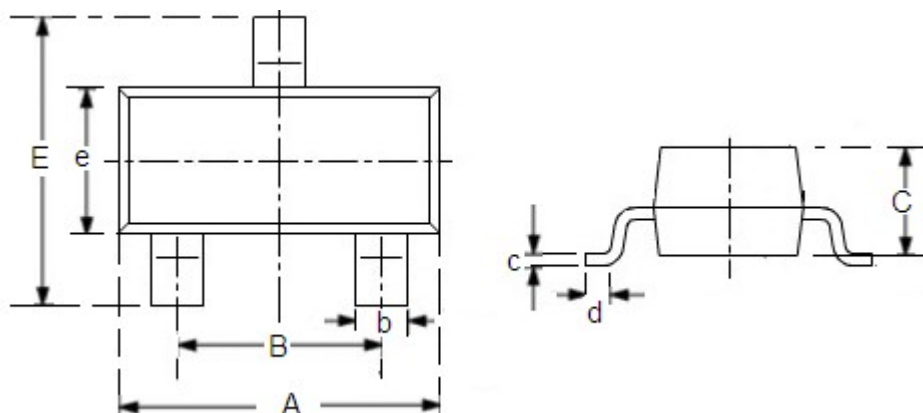
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945	0.1023
L1	0.4	-	0.0157	-
L2	0.8	-	0.0315	-

● SOT23-3



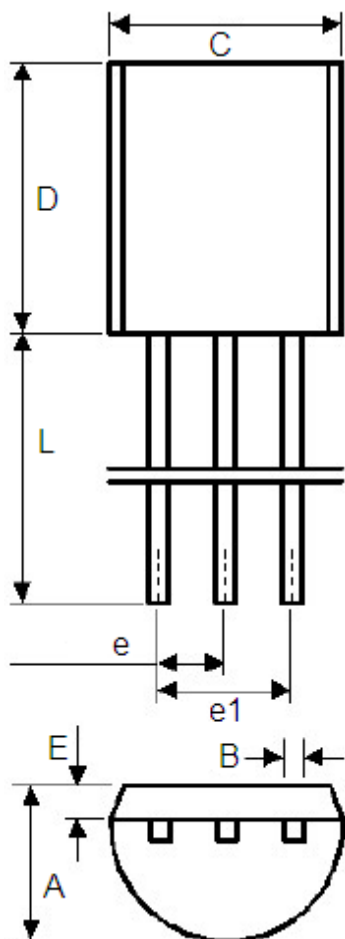
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.6	3.0	0.1023	0.1181
e	1.5	1.8	0.059	0.0708

● SOT23



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.1	2.64	0.0827	0.1039
e	1.2	1.4	0.0472	0.0551

● TO-92



	Min	Max	Min	Max
A	3.4	3.8	0.13386	0.1496
B	0.3	0.5	0.0118	0.0197
C	4.4	4.8	0.1732	0.189
D	4.4	4.8	0.1732	0.189
E	0.9	1.5	0.0354	0.059
e	1.17	1.37	0.046	0.0539
e1	2.39	2.69	0.094	0.1059
L	12	16	0.4724	0.6299