250mA, Low Consumption, Wide Input Voltage Linear Regulator

UM1450S-xx *SOT23-3*
UM1450Y-xx *SOT89-3*
UM1450B-xx *SOT89-3*
UM1460S-xx *SOT23-5*
UM1460SR-xx *SOT23-5*
UM1460Y-xx *SOT89-5*

General Description

The UM1450/UM1460 series are a group of positive voltage output, high precise and low power consumption voltage regulators. The maximum input voltage is 16V. The output voltages are available in 100mV steps within a range of 2.5V to 5V. It can also be customized on request.
The UM1450/UM1460 series have very low power consumption (I_Q=2μA) which can greatly extend battery life.
The UM1450 series are available in a low profile SOT23-3 & SOT89-3 packages. The UM1460 series are available in SOT23-5 & SOT89-5 packages.

Applications

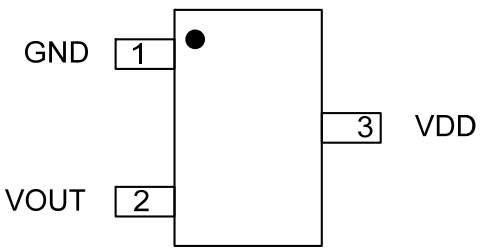
- Battery-Powered Equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Reference Voltage Source
- Hand-Hold Equipment

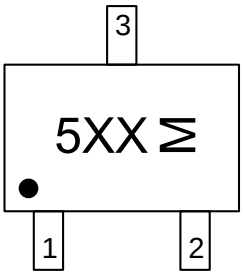
Features

- Maximum Input Voltage: 16V
- Low Quiescent Current: 2μA (Typ.)
- Maximum Output Current: 250mA
- Low Dropout:
  210mV@100mA (V_{OUT}=3.3V)
  420mV@200mA (V_{OUT}=3.3V)
- Low Temperature Coefficient: ±150ppm/°C
- Output Current Limit:
  330mA@ V_{OUT}=3.3V

Pin Configurations

Top View





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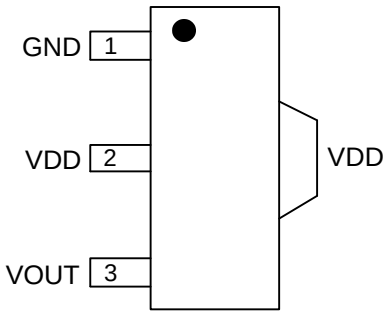
UM1450S-xx
SOT23-3



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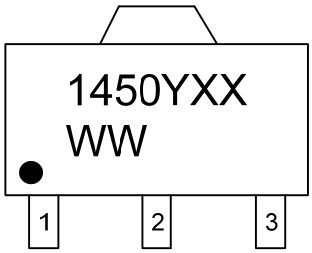

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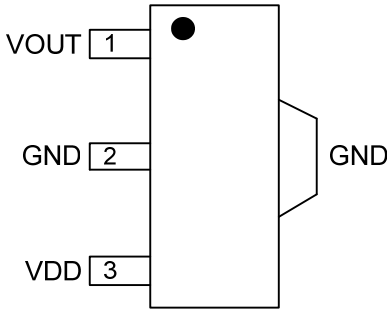
SOT89-3



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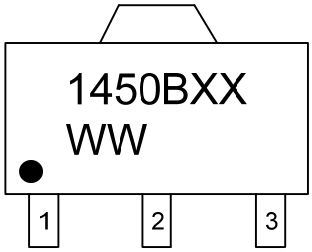

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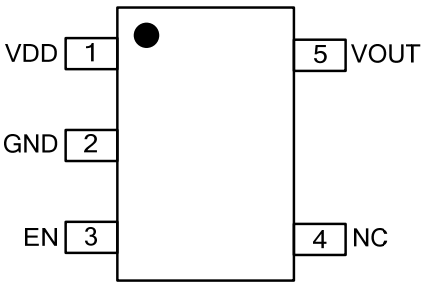
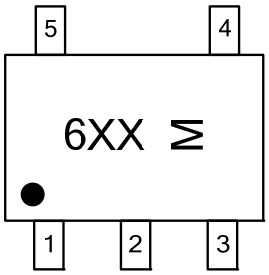
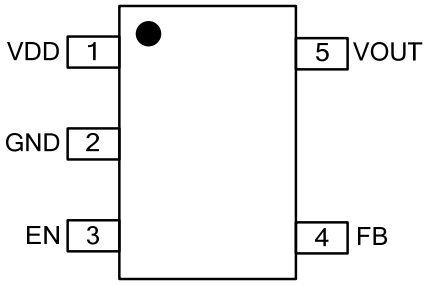
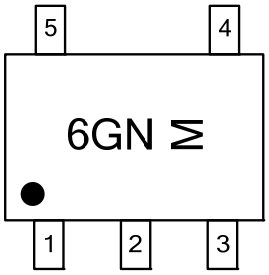
SOT89-3





M: Month Code
UM1460S-xx
SOT23-5





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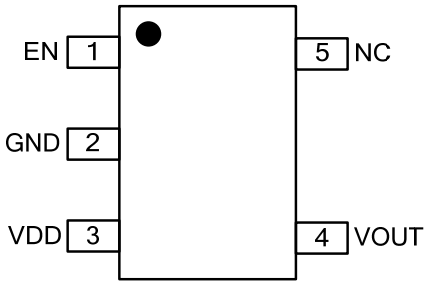

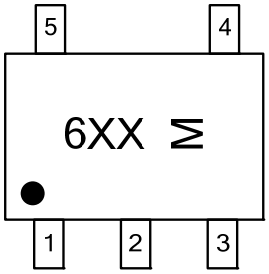

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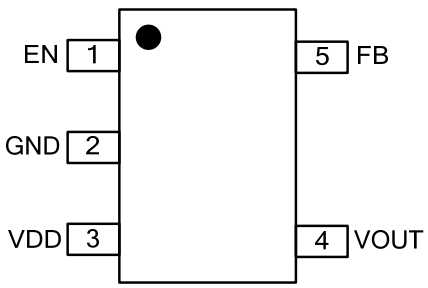

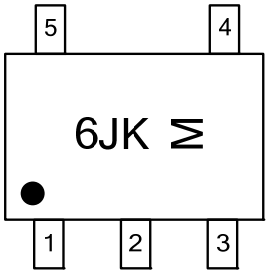

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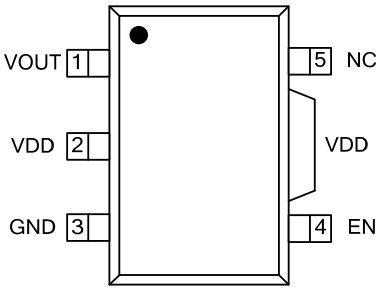
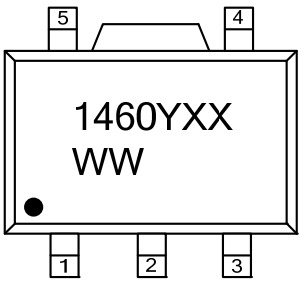
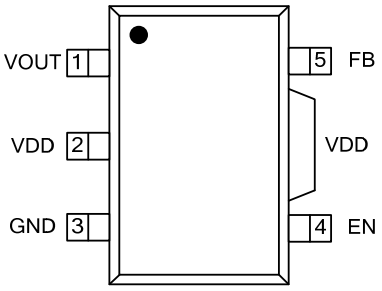
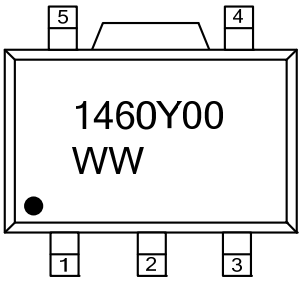




WW: Week Code
UM1460Y-xx
SOT89-5





WW: Week Code
UM1460Y-00
SOT89-5

Ordering Information

UM1450□-□□

- Output Voltage
  - 25=2.5V
  - 33=3.3V
- Package Type
  - S: SOT23-3
  - Y(B): SOT89-3

UM1460□-□□

- 00: Adjustable Output Voltage
  - Fixed Output Voltage
  - 25=2.5V
  - 33=3.3V
- Package Type
  - S: SOT23-5
  - Y: SOT89-5

Marking Information

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1450S-25	2.5V	SOT23-3	5LA	3000pcs/7Inch Tape & Reel
UM1450S-26	2.6V		5LB	
UM1450S-27	2.7V		5LC	
UM1450S-28	2.8V		5LD	
UM1450S-29	2.9V		5LE	
UM1450S-30	3.0V		5LF	
UM1450S-31	3.1V		5LH	
UM1450S-32	3.2V		5LL	
UM1450S-33	3.3V		5LM	
UM1450S-34	3.4V		5LJ	
UM1450S-35	3.5V		5LK	
UM1450S-36	3.6V		5LN	
UM1450S-37	3.7V		5LP	
UM1450S-38	3.8V		5LQ	
UM1450S-39	3.9V		5LR	
UM1450S-40	4.0V		5LS	
UM1450S-41	4.1V		5LT	
UM1450S-42	4.2V		5LY	
UM1450S-43	4.3V		5LU	
UM1450S-44	4.4V		5LZ	
UM1450S-45	4.5V		5M5	
UM1450S-46	4.6V		5M6	
UM1450S-47	4.7V		5M7	
UM1450S-48	4.8V		5M8	
UM1450S-49	4.9V		5M9	
UM1450S-50	5.0V		5MA	
UM1450Y-25	2.5V	SOT89-3 (Tab connected to VDD)	1450Y25	1000pcs/7Inch Tape & Reel
UM1450Y-26	2.6V		1450Y26	
UM1450Y-27	2.7V		1450Y27	
UM1450Y-28	2.8V		1450Y28	
UM1450Y-29	2.9V		1450Y29	
UM1450Y-30	3.0V		1450Y30	
UM1450Y-31	3.1V		1450Y31	
UM1450Y-32	3.2V		1450Y32	
UM1450Y-33	3.3V		1450Y33	
UM1450Y-34	3.4V		1450Y34	
UM1450Y-35	3.5V		1450Y35	
UM1450Y-36	3.6V		1450Y36	
UM1450Y-37	3.7V		1450Y37	
UM1450Y-38	3.8V		1450Y38	
UM1450Y-39	3.9V		1450Y39	
UM1450Y-40	4.0V		1450Y40	
UM1450Y-41	4.1V		1450Y41	
UM1450Y-42	4.2V		1450Y42	
UM1450Y-43	4.3V		1450Y43	
UM1450Y-44	4.4V		1450Y44	
UM1450Y-45	4.5V		1450Y45	
UM1450Y-46	4.6V		1450Y46	
UM1450Y-47	4.7V		1450Y47	
UM1450Y-48	4.8V		1450Y48	
UM1450Y-49	4.9V		1450Y49	
UM1450Y-50	5.0V		1450Y50	

Marking Information (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1450B-25	2.5V	SOT89-3 (Tab connected to GND)	1450B25	1000pcs/7Inch Tape & Reel
UM1450B-26	2.6V		1450B26	
UM1450B-27	2.7V		1450B27	
UM1450B-28	2.8V		1450B28	
UM1450B-29	2.9V		1450B29	
UM1450B-30	3.0V		1450B30	
UM1450B-31	3.1V		1450B31	
UM1450B-32	3.2V		1450B32	
UM1450B-33	3.3V		1450B33	
UM1450B-34	3.4V		1450B34	
UM1450B-35	3.5V		1450B35	
UM1450B-36	3.6V		1450B36	
UM1450B-37	3.7V		1450B37	
UM1450B-38	3.8V		1450B38	
UM1450B-39	3.9V		1450B39	
UM1450B-40	4.0V		1450B40	
UM1450B-41	4.1V		1450B41	
UM1450B-42	4.2V		1450B42	
UM1450B-43	4.3V		1450B43	
UM1450B-44	4.4V		1450B44	
UM1450B-45	4.5V		1450B45	
UM1450B-46	4.6V		1450B46	
UM1450B-47	4.7V		1450B47	
UM1450B-48	4.8V		1450B48	
UM1450B-49	4.9V		1450B49	
UM1450B-50	5.0V		1450B50	

Marking Information (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1460S-00	ADJ	SOT23-5	6GN	3000pcs/7Inch Tape & Reel
UM1460S-25	2.5V		6HC	
UM1460S-26	2.6V		6HD	
UM1460S-27	2.7V		6HE	
UM1460S-28	2.8V		6HF	
UM1460S-29	2.9V		6HH	
UM1460S-30	3.0V		6HL	
UM1460S-31	3.1V		6HM	
UM1460S-32	3.2V		6HJ	
UM1460S-33	3.3V		6HK	
UM1460S-34	3.4V		6HN	
UM1460S-35	3.5V		6HP	
UM1460S-36	3.6V		6HQ	
UM1460S-37	3.7V		6HR	
UM1460S-38	3.8V		6HS	
UM1460S-39	3.9V		6HT	
UM1460S-40	4.0V		6HY	
UM1460S-41	4.1V		6HU	
UM1460S-42	4.2V		6HZ	
UM1460S-43	4.3V		6JC	
UM1460S-44	4.4V		6JD	
UM1460S-45	4.5V		6JE	
UM1460S-46	4.6V		6JF	
UM1460S-47	4.7V		6JH	
UM1460S-48	4.8V		6JL	
UM1460S-49	4.9V		6JM	
UM1460S-50	5.0V		6JJ	

Marking Information (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1460SR-00	ADJ	SOT23-5	6JK	3000pcs/7Inch Tape & Reel
UM1460SR-25	2.5V		6JN	
UM1460SR-26	2.6V		6JP	
UM1460SR-27	2.7V		6JQ	
UM1460SR-28	2.8V		6JR	
UM1460SR-29	2.9V		6JS	
UM1460SR-30	3.0V		6JT	
UM1460SR-31	3.1V		6JY	
UM1460SR-32	3.2V		6K2	
UM1460SR-33	3.3V		6K3	
UM1460SR-34	3.4V		6K4	
UM1460SR-35	3.5V		6K5	
UM1460SR-36	3.6V		6K6	
UM1460SR-37	3.7V		6K7	
UM1460SR-38	3.8V		6K8	
UM1460SR-39	3.9V		6K9	
UM1460SR-40	4.0V		6KA	
UM1460SR-41	4.1V		6KB	
UM1460SR-42	4.2V		6KC	
UM1460SR-43	4.3V		6KD	
UM1460SR-44	4.4V		6KE	
UM1460SR-45	4.5V		6KF	
UM1460SR-46	4.6V		6KH	
UM1460SR-47	4.7V		6KL	
UM1460SR-48	4.8V		6KM	
UM1460SR-49	4.9V		6KJ	
UM1460SR-50	5.0V		6KK	

Marking Information (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1460Y-00	ADJ	SOT89-5 (Tab connected to VDD)	1460Y00	1000pcs/7Inch Tape & Reel
UM1460Y-25	2.5V		1460Y25	
UM1460Y-26	2.6V		1460Y26	
UM1460Y-27	2.7V		1460Y27	
UM1460Y-28	2.8V		1460Y28	
UM1460Y-29	2.9V		1460Y29	
UM1460Y-30	3.0V		1460Y30	
UM1460Y-31	3.1V		1460Y31	
UM1460Y-32	3.2V		1460Y32	
UM1460Y-33	3.3V		1460Y33	
UM1460Y-34	3.4V		1460Y34	
UM1460Y-35	3.5V		1460Y35	
UM1460Y-36	3.6V		1460Y36	
UM1460Y-37	3.7V		1460Y37	
UM1460Y-38	3.8V		1460Y38	
UM1460Y-39	3.9V		1460Y39	
UM1460Y-40	4.0V		1460Y40	
UM1460Y-41	4.1V		1460Y41	
UM1460Y-42	4.2V		1460Y42	
UM1460Y-43	4.3V		1460Y43	
UM1460Y-44	4.4V		1460Y44	
UM1460Y-45	4.5V		1460Y45	
UM1460Y-46	4.6V		1460Y46	
UM1460Y-47	4.7V		1460Y47	
UM1460Y-48	4.8V		1460Y48	
UM1460Y-49	4.9V		1460Y49	
UM1460Y-50	5.0V		1460Y50	

Pin Description

Symbol	Function
GND	Ground
VOUT	Voltage Regulated Output
EN	Enable Control Input: High=Activate LDO, Low=Shutdown LDO
VDD	Supply Voltage Input
FB	Output Voltage Feedback

Absolute Maximum Ratings (Note 1)

Symbol	Parameter		Value	Unit
V_{IN}	Max Input Voltage		20	V
P_D	Power Dissipation	SOT23-3	250	mW
		SOT23-5	300	
		SOT89-3	1000	
		SOT89-5	1200	
T_J	Operating Junction Temperature		+125	°C
T_A	Ambient Temperature		-40 to +85	°C
T_{STG}	Storage Temperature Range		-40 to +150	°C
T_L	Lead Temperature for Soldering 10 Seconds		+260	°C

Note 1: Exposure to absolute maximum rating conditions may affect device reliability.

Recommended Work Condition

Symbol	Parameter	Value	Unit
V_{IN}	Max Input Voltage	16	V

Electrical Characteristics

(Test conditions: C_{IN}=1.0μF, C_{OUT}=1.0μF, T_A=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage				16	V
V_{OUT}	Output Voltage	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤10mA	V_{OUT} ×0.98	V_{OUT}× 1.0	V_{OUT} ×1.02	V
V_{FB}	Feedback Reference Voltage	V_{IN}=2.5V to16V	1.176	1.2	1.224	V
I_{FB}	Feedback Reference Current	V_{FB}=1.2V			10	nA
I_{OUT} (Max) (Note 2)	Maximum Output Current	V_{IN} -V_{OUT}=1V	250			mA
V_{DROP}	Dropout Voltage	I_{OUT}=150mA		300		mV
	Output Voltage Accuracy	I_{OUT}=250mA	-3		+3	%
$\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot V_{OUT}}$	Line Regulation	I_{OUT}=10mA 4V≤V_{DD}≤6V		0.05	0.2	%/V
$\triangle V_{OUT}$	Load Regulation	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤250mA		20		mV
I_S	Supply Current	V_{IN}=Set V_{OUT}+1V V_{OUT} Floating		2	5	μA
	Shut Down Quiescent Current	V_{IN}=8V, EN= GND			1	μA
I_{EN}	EN Input Current	EN=V_{IN} or GND			1	μA
$\frac{\triangle V_{OUT}}{\triangle T \cdot V_{OUT}}$	Output Voltage Temperature Coefficient	I_{OUT}=10mA		±150		ppm/°C
V_{IL}	EN Input Low Voltage	V_{IN}=3.6V to 16V			0.8	V
V_{IH}	EN Input High Voltage	V_{IN}=3.6V to 16V	1.8			V
PSRR	Power Supply Ripple Rejection	f=100Hz, Ripple=0.5Vp-p V_{IN}=Set V_{OUT}+1V		40		dB
	Output Noise	BW=10Hz~100kHz		240		μV_{RMS}

Note 2: The maximum power rating of each package is constant, so along with the change of I_{LOAD}, the V_{IN}-V_{OUT} should be controlled to a certain range to ensure the normal operation.

Typical Application Circuit

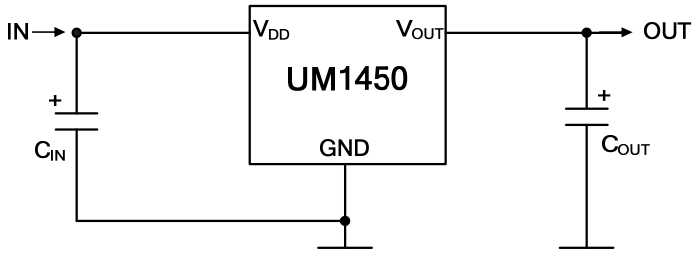


Figure 1

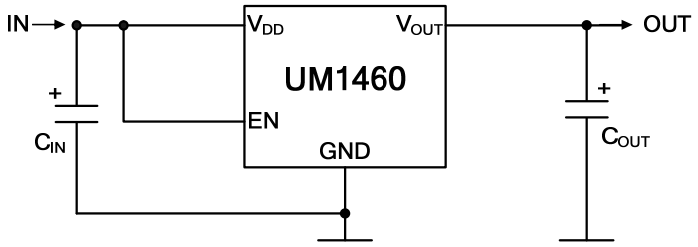


Figure 2

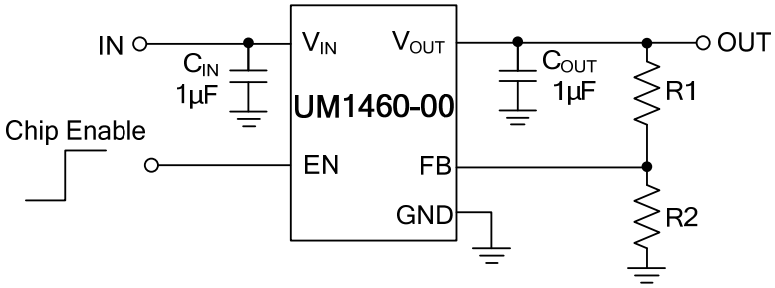


Figure 3

Note 3: Input Capacitor (C_{IN}=1μF) is recommended in all applications.
Note 4: Output Capacitor (C_{OUT}=4.7μF/6.8μF) is recommended in all applications to assure the stability of circuit.

UM1460S-00/UM1460SR-00/UM1460Y-00 Output Voltage Setting

The output voltage of the UM1460 adjustable regulator is programmed using an external resistor divider as shown in Figure 3. The output voltage is calculated using:

$$V_{OUT} = V_{FB}\left(1+\frac{R1}{R2}\right)$$

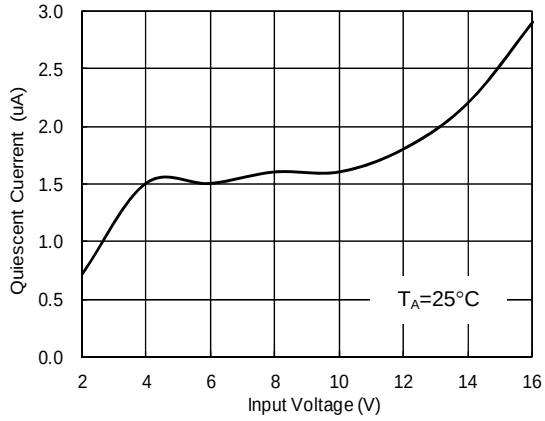
Where: V_{FB}=1.2V (Typ) (the internal reference voltage)
Resistors R1 and R2 should be chosen for approximately 3-5μA divider current. Lower value resistors can be used but offer no inherent advantage and waste more power. Higher values should be avoided, as leakage currents at FB increase the output voltage error. The recommended design procedure is to choose R2=200kΩ to set the divider current at 5μA and then calculate R1 using:

$$R1 = \left(\frac{V_{OUT}}{V_{FB}} - 1\right) \times R2$$

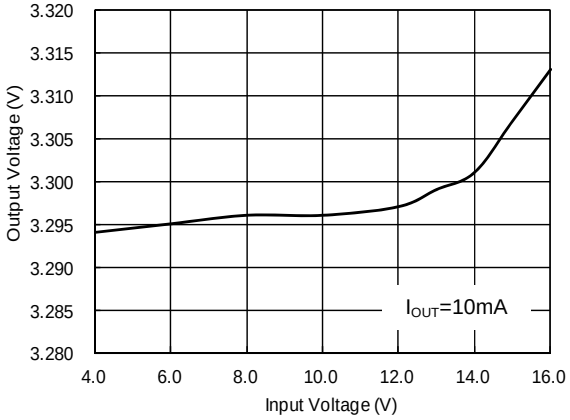
Where: V_{FB}=1.2V (Typ).

Typical Operating Characteristics

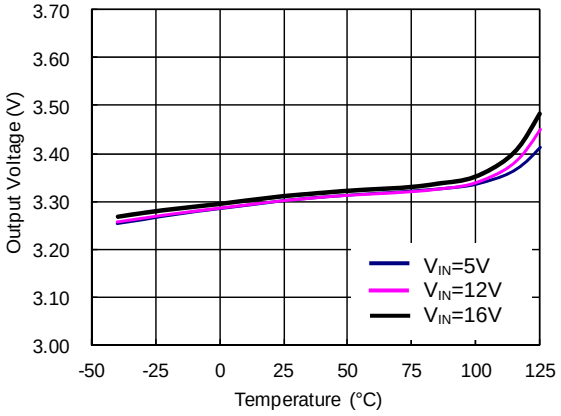
Quiescent Current vs. Input Voltage
I_{OUT}=0mA



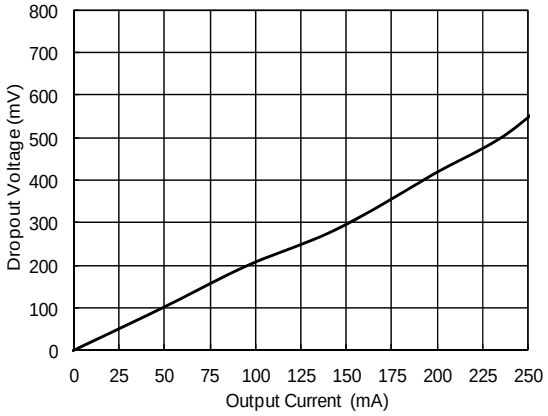
Output Voltage vs. Input Voltage



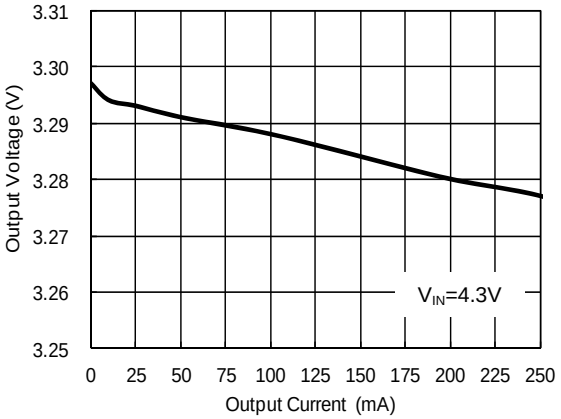
Output Voltage vs. Temperature
I_{OUT}=5mA



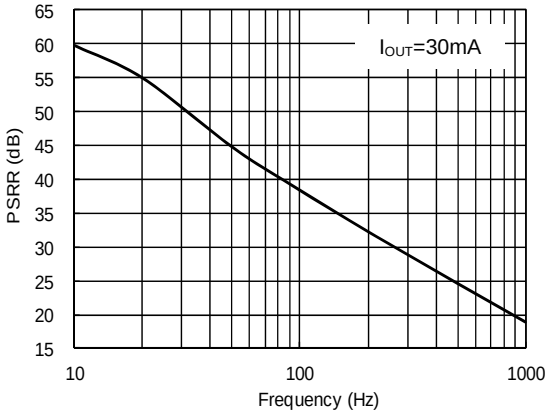
Dropout Voltage vs. Output Current
V_{OUT}=3.3V



Output Voltage vs. Output Current



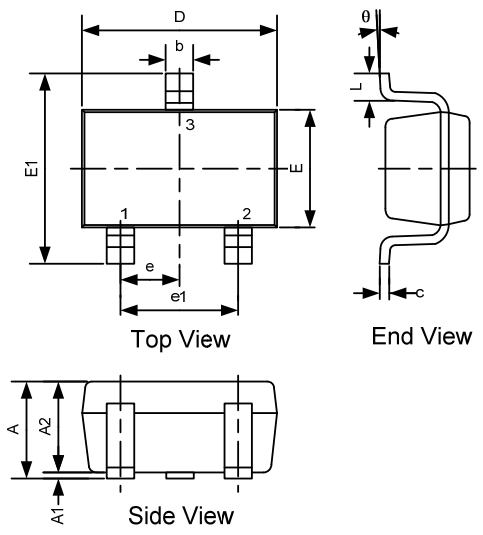
PSRR vs. Frequency



Package Information

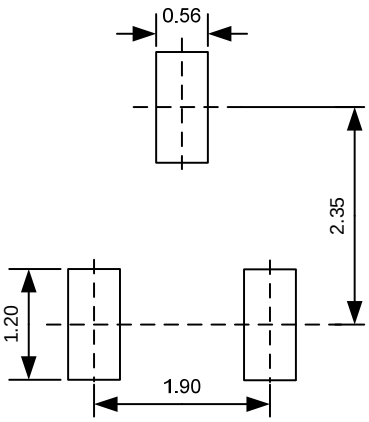
UM1450S-xx: SOT23-3

Outline Drawing



Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	2.60	2.80	3.00	0.102	0.110	0.118
e	0.95REF			0.037REF		
e1	1.90REF			0.075REF		
L	0.30	-	0.60	0.012	-	0.024
θ	0°	-	8°	0°	-	8°

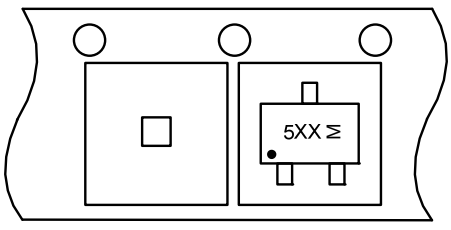
Land Pattern



NOTES:

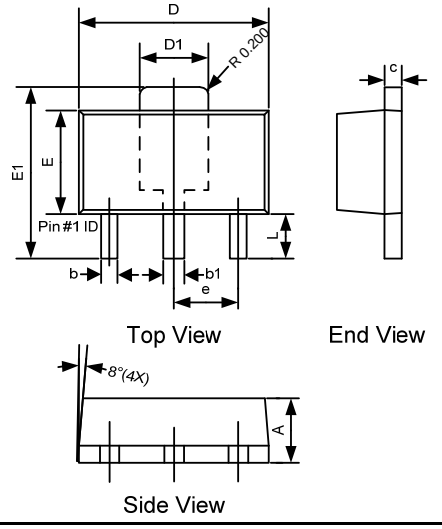
1. Compound dimension: 2.92×1.60 ;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



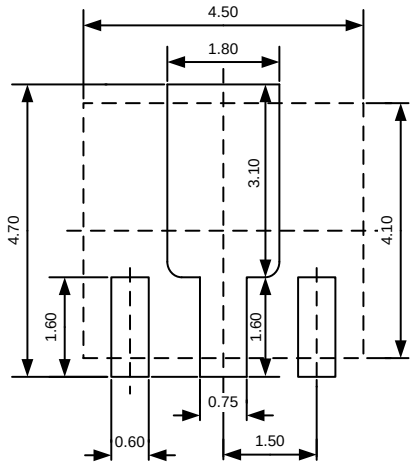
UM1450Y-xx: SOT89-3

Outline Drawing



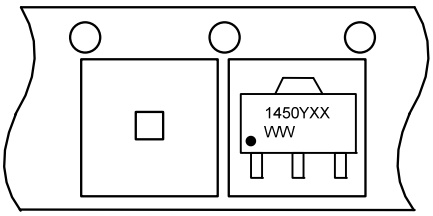
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.40	1.50	1.60	0.055	0.059	0.063
b	0.32	-	0.54	0.013	-	0.021
b1	0.40	-	0.62	0.016	-	0.024
c	0.35	-	0.44	0.014	-	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.50	-	1.83	0.059	-	0.072
E	2.30	2.50	2.60	0.091	0.098	0.102
E1	3.94	-	4.25	0.155	-	0.167
e	1.50TYP			0.059TYP		
L	0.89	-	1.20	0.035	-	0.047

Land Pattern



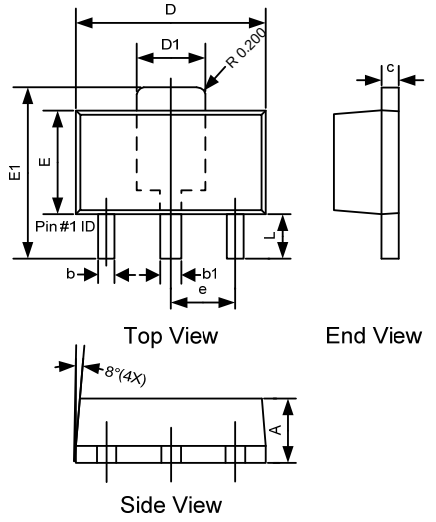
NOTES:
1. Compound dimension: 4.50×2.50 ;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



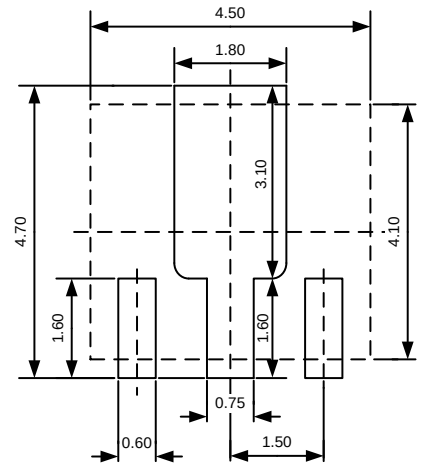
UM1450B-xx: SOT89-3

Outline Drawing



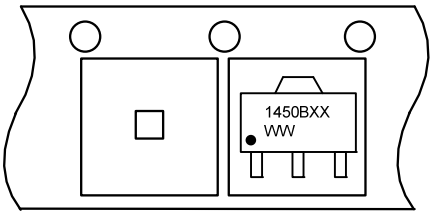
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.40	1.50	1.60	0.055	0.059	0.063
b	0.32	-	0.54	0.013	-	0.021
b1	0.40	-	0.62	0.016	-	0.024
c	0.35	-	0.44	0.014	-	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.50	-	1.83	0.059	-	0.072
E	2.30	2.50	2.60	0.091	0.098	0.102
E1	3.94	-	4.25	0.155	-	0.167
e	1.50TYP			0.059TYP		
L	0.89	-	1.20	0.035	-	0.047

Land Pattern



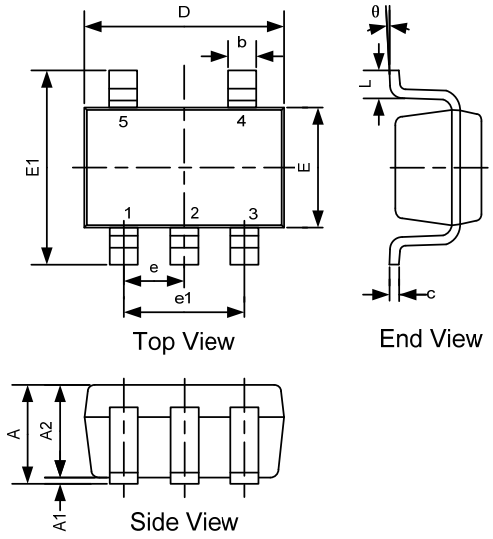
NOTES:
1. Compound dimension: 4.50×2.50 ;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



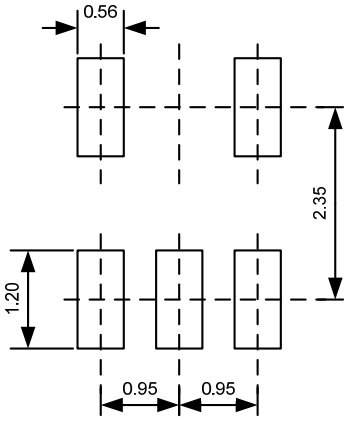
UM1460S/UM1460SR: SOT23-5

Outline Drawing



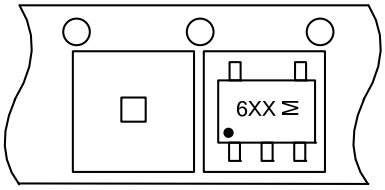
Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	2.60	2.80	3.00	0.102	0.110	0.118
e	0.95REF			0.037REF		
e1	1.90REF			0.075REF		
L	0.30	-	0.60	0.012	-	0.024
θ	0°	-	8°	0°	-	8°

Land Pattern



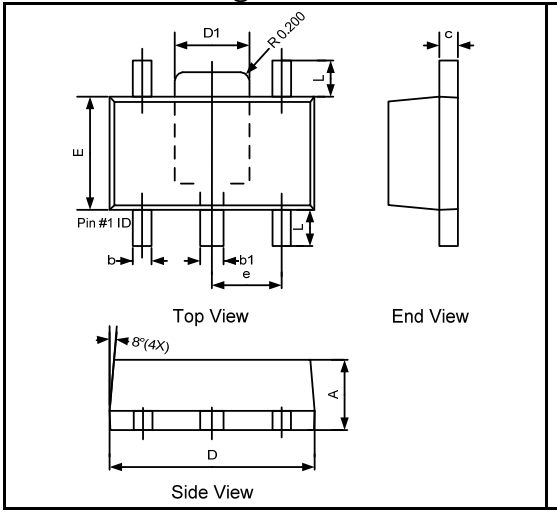
NOTES:
1. Compound dimension: 2.92×1.60;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



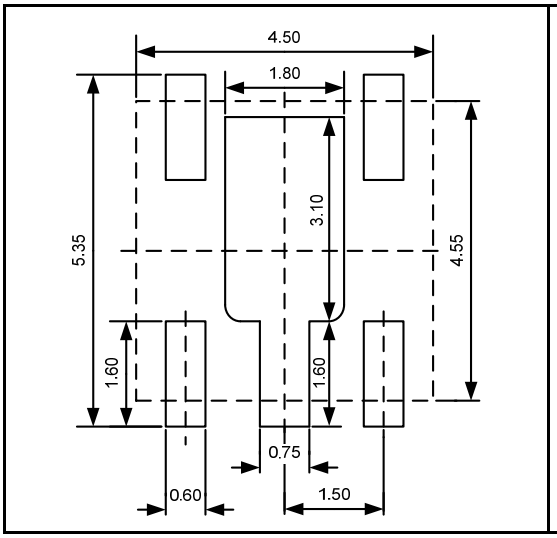
UM1460Y-xx: SOT89-5

Outline Drawing



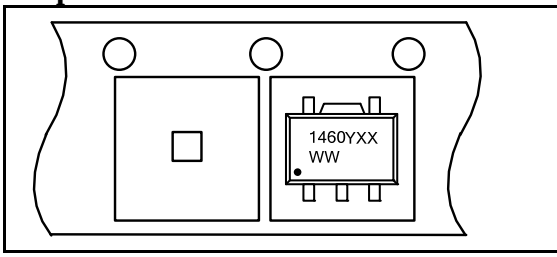
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.40	1.50	1.60	0.055	0.059	0.063
b	0.32	-	0.54	0.013	-	0.021
b1	0.38	-	0.62	0.015	-	0.024
c	0.35	-	0.44	0.014	-	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	-	1.83	0.055	-	0.072
E	2.30	2.50	2.60	0.091	0.098	0.102
e	1.50TYP			0.059TYP		
L	0.65	-	1.20	0.026	-	0.047

Land Pattern



NOTES:
1. Compound dimension: 4.50×2.50;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



GREEN COMPLIANCE

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