150mA、低噪声、低压差稳压器

UM1330S-xx *SOT23-5*
UM1330P-xx *SOT353*
UM1330DA-xx *DFN6 2.0×2.0*

描述

UM1330系列是专为便携式应用设计的150mA低压差稳压器。输入电压范围为2.7V至5.5V，非常适合单节锂离子电池或固定的3.3V和5V系统。UM1330系列具有低输出噪声（56μV_{RMS}）和高 PSRR（-58dB@1kHz），适用于射频等对噪声敏感的应用。快速瞬态响应和主动关断电路使其非常适合为混合信号电路供电。

该器件还具有使用低至1μF的超低ESR陶瓷电容器实现稳定性、热过载保护、输出电流限制和禁用时输出电压自动放电的其他特性。UM1330系列采用扁平SOT23-5、SOT353和 DFN6 2.0×2.0封装。

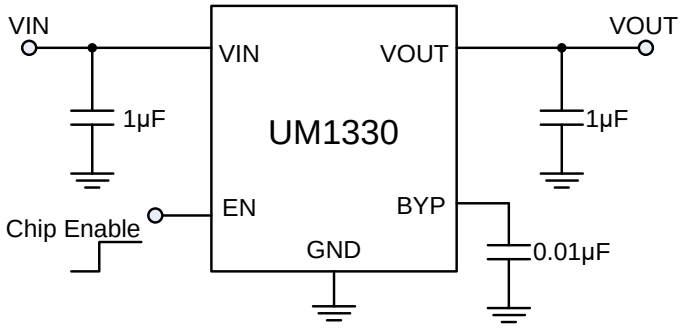
应用

- 蜂窝电话
- GPS 接收机
- 无线传感器网络
- 无线局域网

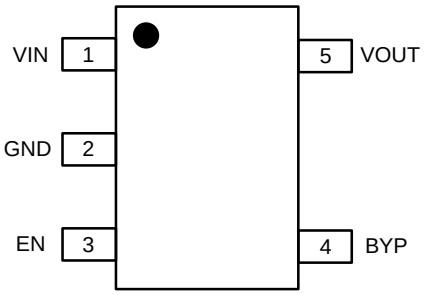
特性

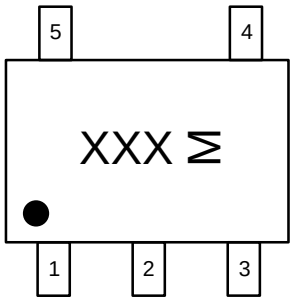
- 输入电压范围：2.7V 至 5.5V
- 低压差电压：150mA 负载电流下为 170mV
- 低静态电流：88μA
- 低噪声：56μV_{RMS}
- 高 PSRR：1kHz 下可达-58dB
- 快速瞬态响应
- 主动关断
- 利用陶瓷输出电容器保持稳定
- 采用扁平 SOT23-5、SOT353 和 DFN6 2.0×2.0 封装

典型应用电路

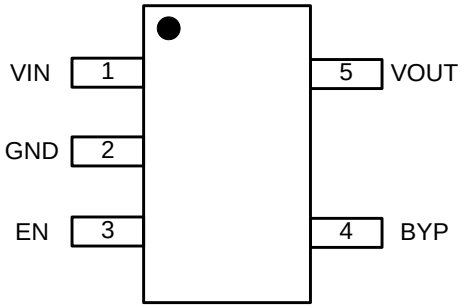


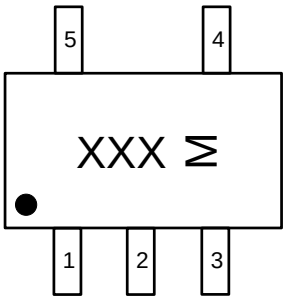
Pin Configurations **Top View**



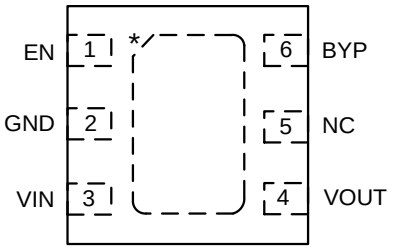


M: Month Code
UM1330S-xx
SOT23-5

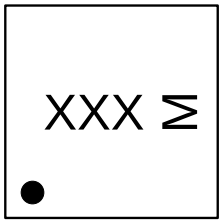




M: Month Code
UM1330P-xx
SOT353



(Top View)



M: Month Code
UM1330DA-xx
DFN6 2.0×2.0

* The tab on the bottom of the package enhances thermal performance and is electrically connected to GND (substrate level). It is recommended that the tab be connected to the ground plane on the board. If not, the tab can be left open.

Pin Description

Pin Number			Pin Name	Pin Function
UM1330S-xx	UM1330P-xx	UM1330DA-xx		
1	1	3	VIN	Supply Input
2	2	2	GND	Ground
3	3	1	EN	Enable/Shutdown (Input): CMOS Compatible Input. Logic High=Enable; Logic Low=Shutdown. Do not leave it open.
4	4	6	BYP	Reference Bypass: Connect external 0.01μF≤C_{BYP}≤1.0μF capacitor to GND to reduce output noise. May be left open.
5	5	4	VOUT	Output Voltage
-	-	5	NC	Not Connected.

Naming Information

UM1330 □□−□□

Output Voltage
15: 1.5V
16: 1.6V
17: 1.7V
.....
33: 3.3V

Package Type
S: SOT23-5
P: SOT353
DA: DFN6 2.0×2.0

Available Voltage Version

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1330S-15	1.5V	SOT23-5	5K2	3000pcs/7Inch Tape & Reel
UM1330S-16	1.6V		5K3	
UM1330S-17	1.7V		5K4	
UM1330S-18	1.8V		5K5	
UM1330S-19	1.9V		5K8	
UM1330S-20	2.0V		5K9	
UM1330S-21	2.1V		5KB	
UM1330S-22	2.2V		5KC	
UM1330S-23	2.3V		5KD	
UM1330S-24	2.4V		5KE	
UM1330S-25	2.5V		5KF	
UM1330S-26	2.6V		5KH	
UM1330S-27	2.7V		5KL	
UM1330S-28	2.8V		5KM	
UM1330S-29	2.9V		5KJ	
UM1330S-30	3.0V		5KK	
UM1330S-31	3.1V		5KN	
UM1330S-32	3.2V		5KP	
UM1330S-33	3.3V		5KQ	
UM1330P-15	1.5V	SOT353	UN5	
UM1330P-16	1.6V		UN6	
UM1330P-17	1.7V		UN7	
UM1330P-18	1.8V		UN8	
UM1330P-19	1.9V		UN9	
UM1330P-20	2.0V		UNA	
UM1330P-21	2.1V		UNC	
UM1330P-22	2.2V		UP2	
UM1330P-23	2.3V		UP3	
UM1330P-24	2.4V		UP4	
UM1330P-25	2.5V		UP5	
UM1330P-26	2.6V		UP6	
UM1330P-27	2.7V		UP7	
UM1330P-28	2.8V		UP8	
UM1330P-29	2.9V		UP9	
UM1330P-30	3.0V		UPA	
UM1330P-31	3.1V		UPB	
UM1330P-32	3.2V		UPC	
UM1330P-33	3.3V		UPD	

Available Voltage Version (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM1330DA-15	1.5V	DFN6 2.0×2.0	AA5	3000pcs/7Inch Tape & Reel
UM1330DA-16	1.6V		AA6	
UM1330DA-17	1.7V		AA7	
UM1330DA-18	1.8V		AA8	
UM1330DA-19	1.9V		AA9	
UM1330DA-20	2.0V		AAA	
UM1330DA-21	2.1V		AAB	
UM1330DA-22	2.2V		AF2	
UM1330DA-23	2.3V		AF3	
UM1330DA-24	2.4V		AF4	
UM1330DA-25	2.5V		AF5	
UM1330DA-26	2.6V		AF6	
UM1330DA-27	2.7V		AF7	
UM1330DA-28	2.8V		AF8	
UM1330DA-29	2.9V		AF9	
UM1330DA-30	3.0V		AFA	
UM1330DA-31	3.1V		AFB	
UM1330DA-32	3.2V		AFC	
UM1330DA-33	3.3V		AFD	

Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Value	Unit
V_{IN}	Supply Voltage on VIN Pin	-0.3 to +7	V
V_{EN}	Voltage on EN Pin	-0.3 to +7	V
P_D	Power Dissipation	Internally Limited (Note 2)	
T_J	Operating Junction Temperature	-40 to +125	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃
T_L	Lead Temperature for Soldering 10 Seconds	+260	℃
ESD	ESD Rating (Note 3)	±2	kV

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: The maximum allowable power dissipation of any T_A (ambient temperature) is $P_{D(max)}=(T_{J(max)}-T_A)/\theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown. The θ_{JA} of the UM1330S-xx, UM1330P-xx and UM1330DA-xx are 235℃/W, 256℃/W and 142℃/W respectively.

Note 3: Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

Recommended Operating Conditions (Note 4)

Symbol	Parameter		Value	Unit
V_{IN}	Supply Voltage on VIN Pin		+2.7 to +5.5	V
V_{EN}	Voltage on EN Pin		-0.3 to $+V_{IN}$	V
T_A	Ambient Temperature		-40 to +85	℃
θ_{JA}	Junction Thermal Resistance	SOT23-5	+235	℃/W
		SOT353	+256	
		DFN6 2.0×2.0	+142	

Note 4: The device is not guaranteed to function outside its operating rating.

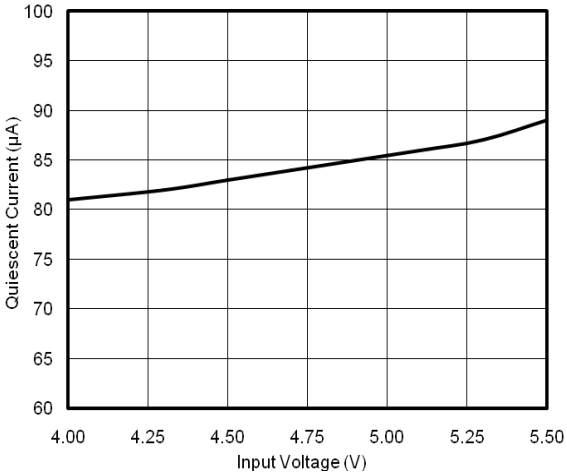
Electrical Characteristics

$V_{EN}=V_{IN}=V_{OUT}+1V$; $I_L=100\mu A$; $C_L=1.0\mu F$; $C_{BYP}=0.01\mu F$ per output; $T_A=25℃$, unless noted.

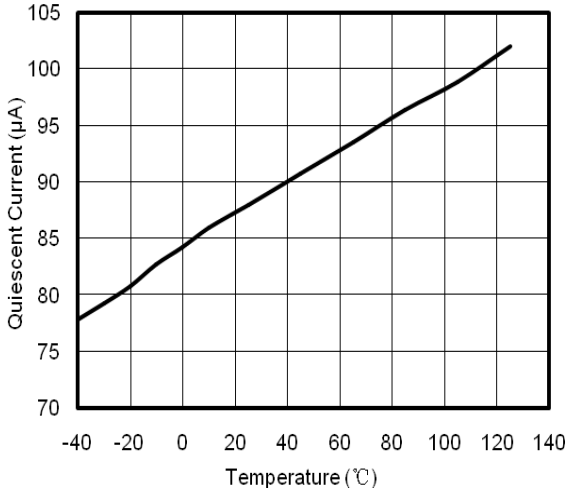
Symbol	Parameter	Test Conditions		Min	Typ	Max	Unit
V_{IN}	Input Voltage			2.7		5.5	V
UVLO	Under Voltage Lock			1.4		2.5	V
V_{OUT}	Output Voltage			1.5		3.3	V
I_{OUT}	Output Current				150		mA
I_{SHDN}	Shutdown Current	$V_{EN}<0.2V$			0.2	1	μA
	Ground Pin Current	$V_{IN}=4.3V$, $I_{OUT}=0mA$			88	103	μA
		$V_{IN}=4.3V$, $I_{OUT}=150mA$			230	320	
ΔV_{DO}	Dropout Voltage	$I_{OUT}=50mA$			55		mV
		$I_{OUT}=150mA$			170	220	
I_{LIMT}	Output Current Limit	$V_{OUT}=0V$		200	250	350	mA
	Output Voltage Accuracy	$I_{OUT}=100\mu A$, $T_A=25℃$		-2.0		+2.0	%
		$I_{OUT}=100\mu A$, $-40℃<T_A<+85℃$		-3.0		+3.0	
LNR	Line Regulation	$V_{IN}=V_{OUT}+1V$ to 5.5V			0.05	0.4	%/V
LDR	Load Regulation	$I_{OUT}=0.1mA$ to 150mA			0.2	1	%
	Output Voltage Noise	$C_{OUT}=1.0\mu F$,$C_{BYP}=0.1\mu F$, f=10Hz to 100kHz			56		μV_{RMS}
PSRR	Power Supply Ripple Rejection	$C_{BYP}=0.1\mu F$, $I_{LOAD}=50mA$	f=100Hz		67		dB
			f=1kHz		58		
			f=10kHz		37		
Enable Input							
V_{IL}	Enable Input Voltage Logic Low	$V_{IN}=2.7V$ to 5.5V, Regulator Shutdown				0.2	V
V_{IH}	Enable Input Voltage Logic High	$V_{IN}=2.7V$ to 5.5V, Regulator Enabled		1.4			
I_{EN}	Enable Input Current	$V_{IL}<0.4V$, Regulator Shutdown			0.01	1	μA
		$V_{IH}>1.6V$, Regulator Enabled			0.01	1	
Thermal Shutdown							
T_{SHDN}	Thermal Shutdown Temperature				155		℃
ΔT_{SHDN}	Thermal-Shutdown Hysteresis				15		℃
Turn-on/Turn-off Characteristics							
	Turn-on Time				30		μs
	Discharge Resistance				500		Ω

Typical Performance Characteristics

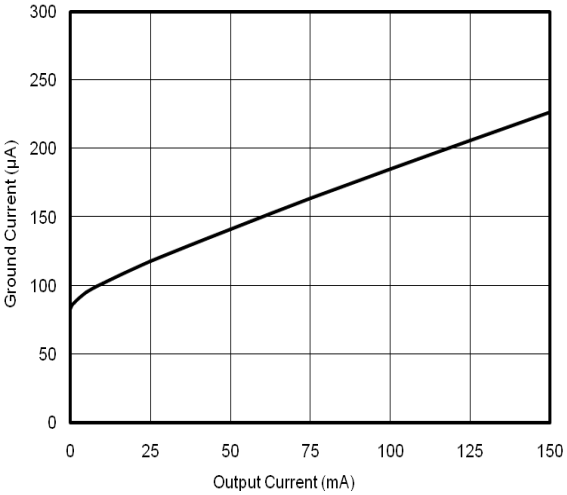
Quiescent Current vs. Input Voltage
V_{OUT}=3.3V, I_{OUT}=0mA, C_{BYP}=10nF



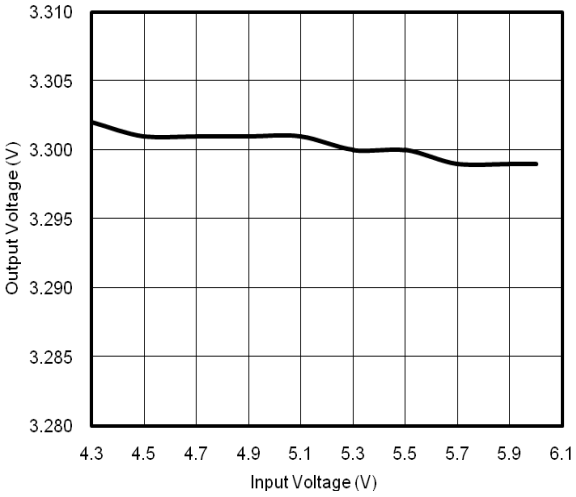
Quiescent Current vs. Temperature
V_{IN}=4.3V, I_{OUT}=0mA, C_{BYP}=10nF



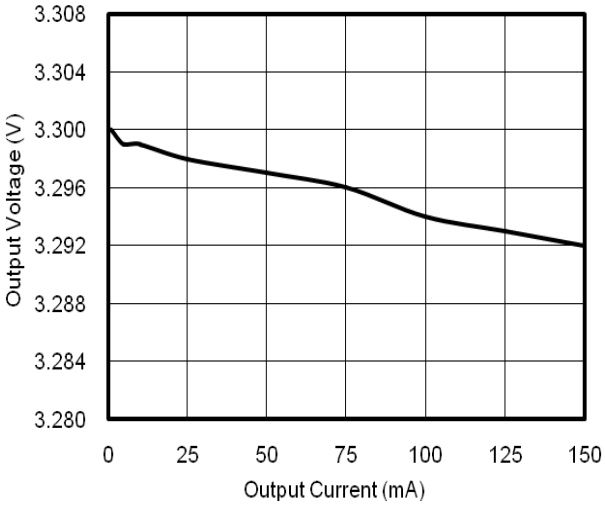
Ground Current vs. Output Current
V_{IN}=4.3V, C_{BYP}=10nF



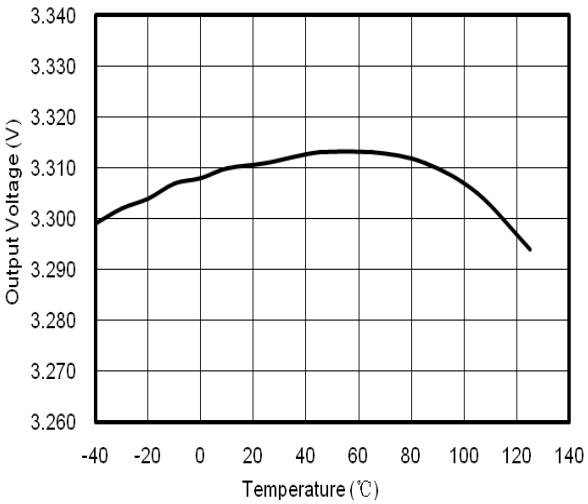
Output Voltage vs. Input Voltage
I_{OUT}=150mA, C_{BYP}=10nF



Output Voltage vs. Output Current
V_{IN}=4.3V

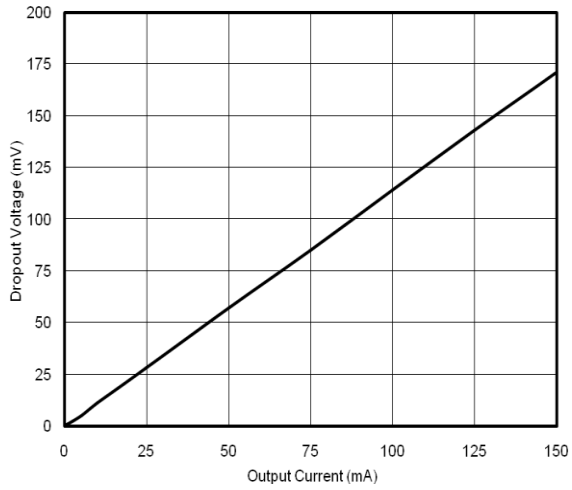


Output Voltage vs. Temperature
V_{IN}=4.3V, I_{OUT}=10mA, C_{BYP}=10nF

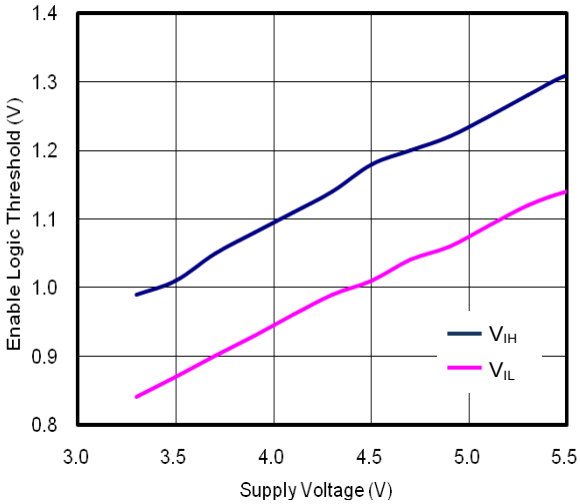


Typical Performance Characteristics (Continued)

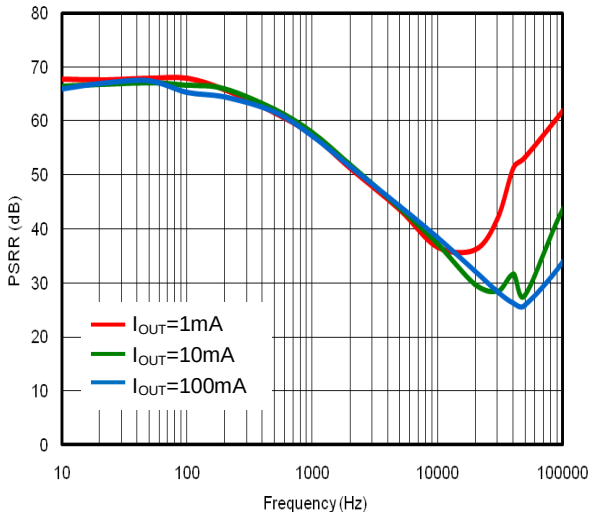
Dropout Voltage vs. Output Current
V_{OUT}=3.3V



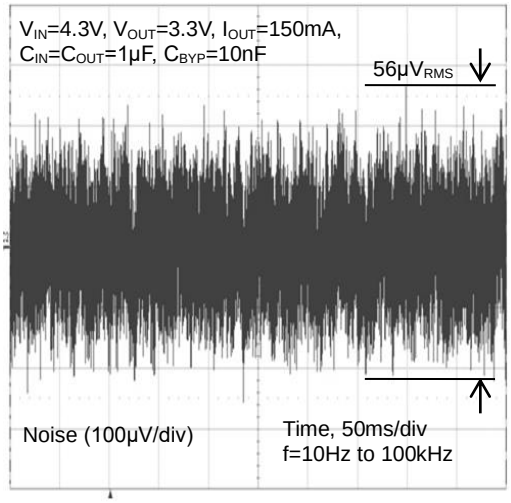
Enable Logic Threshold vs. Supply Voltage



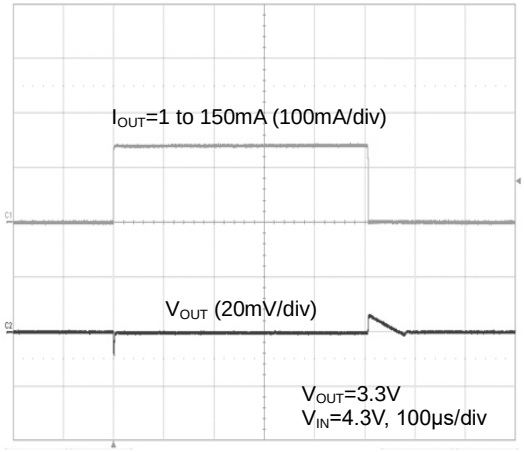
PSRR vs. Frequency



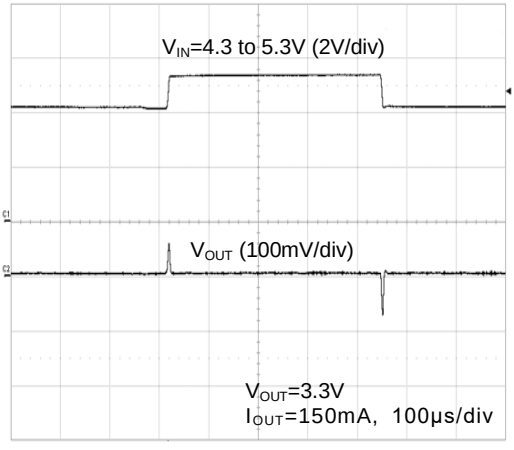
Noise



Load Transient Response

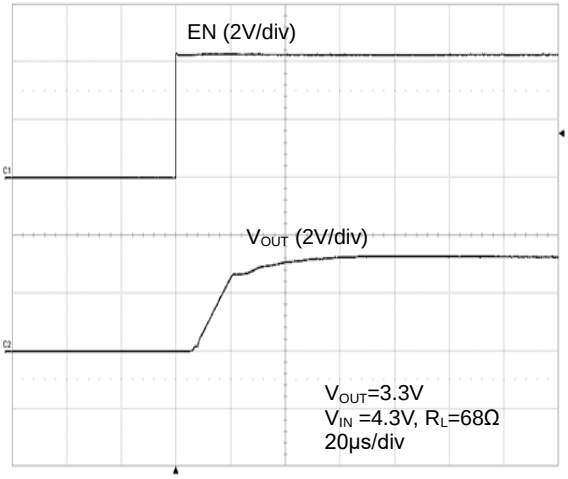


Line Transient Response

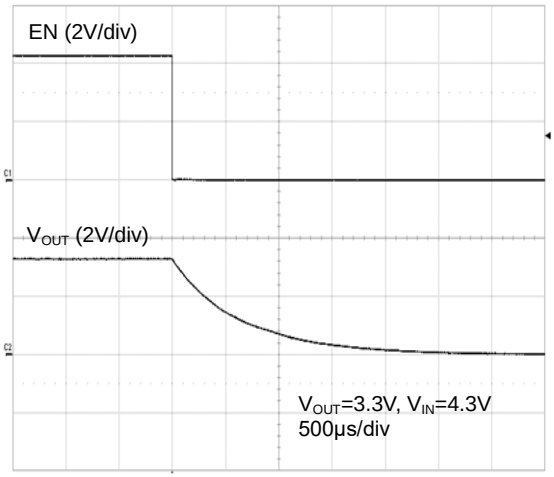


Typical Performance Characteristics (Continued)

Enable Turn-On



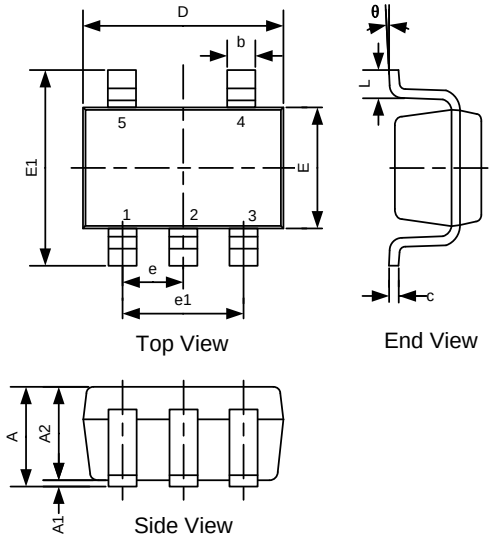
Auto Discharge (No Load)



Package Information

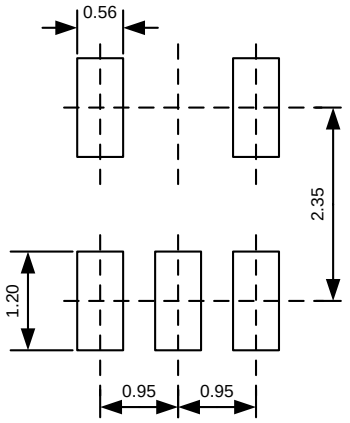
UM1330S-xx SOT23-5

Outline Drawing



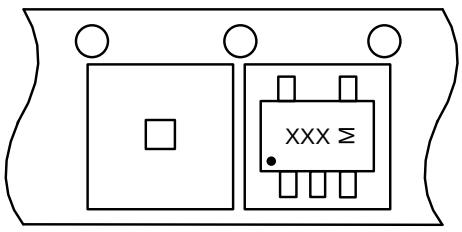
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067
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



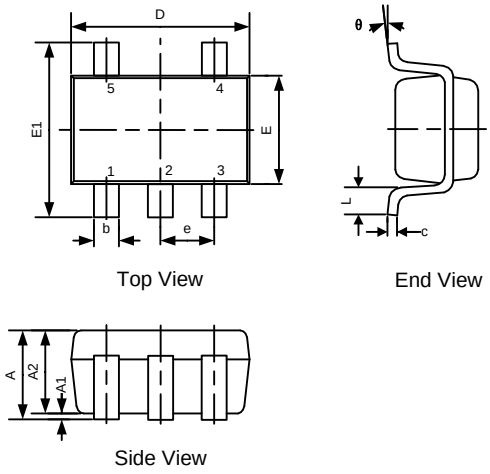
NOTES:
1. Compound dimension: 2.92×1.60;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



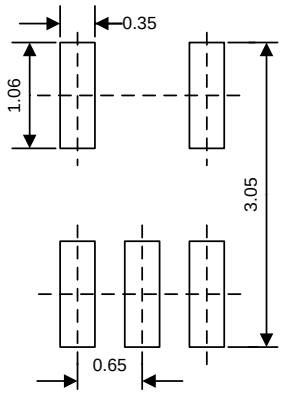
UM1330P-xx SOT353

Outline Drawing



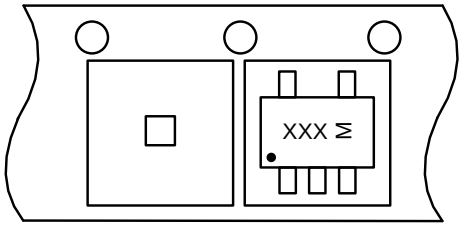
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.85	-	1.10	0.033	-	0.043
A1	0.00	-	0.10	0.000	-	0.004
A2	0.80	-	1.00	0.031	-	0.039
b	0.10	-	0.35	0.004	-	0.014
c	0.08	-	0.22	0.003	-	0.009
D	1.80	2.15	2.20	0.071	0.085	0.087
E	1.15	1.30	1.35	0.045	0.051	0.053
E1	2.00	-	2.45	0.079	-	0.096
e	0.65BSC			0.026REF		
L	0.25	-	0.46	0.010	-	0.018
θ	0°	-	8°	0°	-	8°

Land Pattern



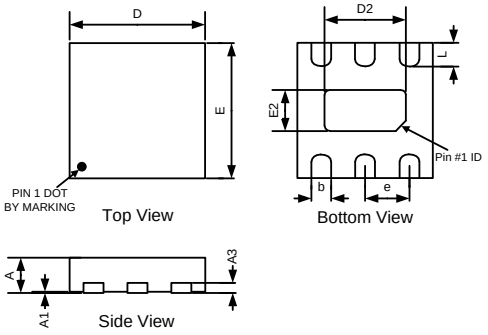
NOTES:
1. Compound dimension: 2.15×1.30;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



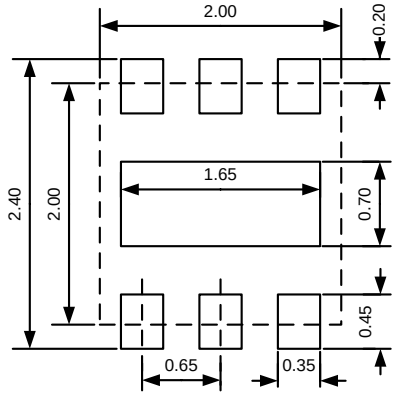
UM1330DA-xx DFN6 2.0×2.0

Outline Drawing



DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.55	-	0.80	0.022	-	0.031
A1	0.00	-	0.05	0.000	-	0.002
A3	0.20REF			0.008REF		
b	0.25	0.30	0.35	0.010	0.012	0.014
D	1.924	2.00	2.076	0.076	0.079	0.082
D2	1.35	-	1.75	0.053	-	0.069
E	1.924	2.00	2.076	0.076	0.079	0.082
E2	0.65	-	1.06	0.026	-	0.042
e	0.65BSC			0.026BSC		
L	0.224	-	0.45	0.009	-	0.018

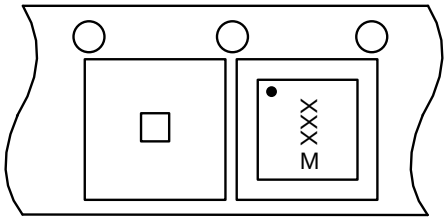
Land Pattern



NOTES:

1. Compound dimension: 2.00×2.00；
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



GREEN COMPLIANCE

Union Semiconductor is committed to environmental excellence in all aspects of its operations including meeting or exceeding regulatory requirements with respect to the use of hazardous substances. Numerous successful programs have been implemented to reduce the use of hazardous substances and/or emissions.
All Union components are compliant with the RoHS directive, which helps to support customers in their compliance with environmental directives. For more green compliance information, please visit:
http://www.union-ic.com/index.aspx?cat_code=RoHSDeclaration

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