5V Input, Low Quiescent Current Linear Regulator

UM1530S *SOT23-3*
UM1530DA *DFN6 2.0×2.0*
UM1530DB *DFN4 1.0×1.0*
UM1540S *SOT23-5*
UM1540DA *DFN6 2.0×2.0*
UM1540DB *DFN4 1.0×1.0*

General Description

The UM1530/1540 series is a set of high input voltage low quiescent current regulator implemented in CMOS technology. They can deliver 300mA output current and allow an input voltage as high as 6V. They are available with several fixed output voltages ranging from 1.2V to 5.0V. CMOS technology ensures low voltage drop and low quiescent current.
The UM1530 is available in SOT23-3, DFN6 2.0×2.0 and DFN4 1.0×1.0 packages. The UM1540 is available in SOT23-5, DFN6 2.0×2.0 and DFN4 1.0×1.0 packages.

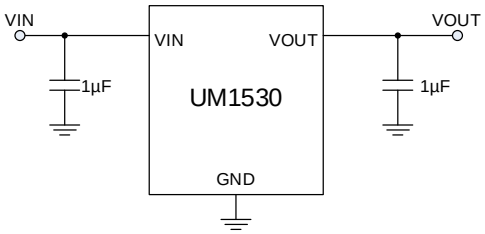
Applications

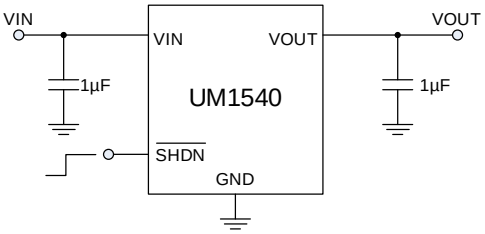
- Communication Equipments
- Audio/Video Equipments
- Portable Games
- Portable AV Equipments
- Battery-Powered Equipments

Features

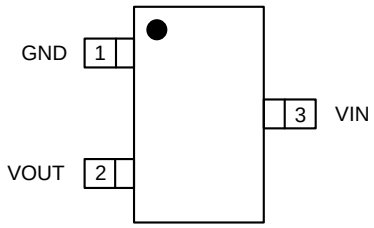
- Input Voltage Range: 1.8V to 6V
- 300mA Guaranteed Output Current
- Low Dropout Voltage:
  250mV (Typical) at 200mA
- Low Quiescent Current:
  1μA@V_{IN}=5V (Typical)
- Low Noise: 500μV_{RMS} (10Hz to 100kHz)
- Available Fixed Output Voltage from 1.2V to 5.0V with 0.1V Step
- With Shutdown Control (UM1540)
- Output Current Limit
- Low Profile SOT23-3, SOT23-5,
  DFN6 2.0×2.0 and DFN4 1.0×1.0 Packages

Typical Application Circuits

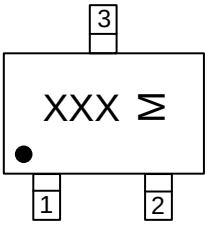




Pin Configurations **Top View**

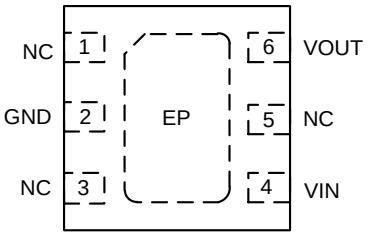


UM1530S

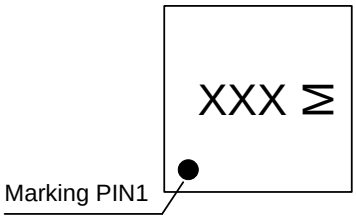


M: Month Code
UM1530S
SOT23-3

(Top View)

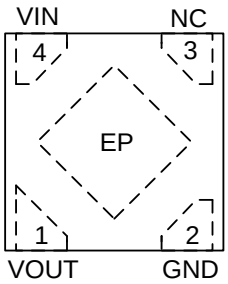


UM1530DA

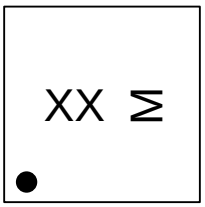


M: Month Code
UM1530DA
DFN6 2.0×2.0

(Top View)

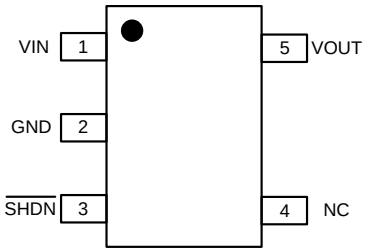


UM1530DB

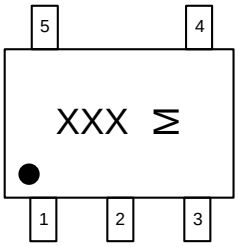


M: Month Code
UM1530DB
DFN4 1.0×1.0

Pin Configurations **Top View**

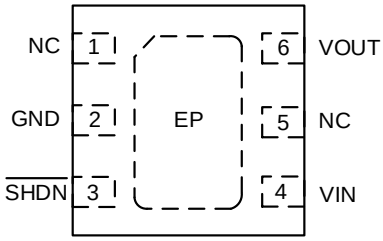


UM1540S

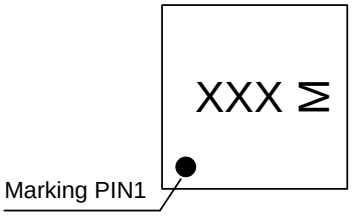


M: Month Code
UM1540S
SOT23-5

(Top View)

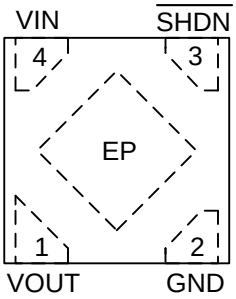


UM1540DA

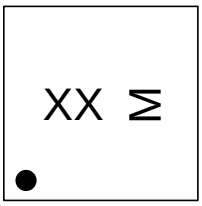


M: Month Code
UM1540DA
DFN6 2.0×2.0

(Top View)



UM1540DB

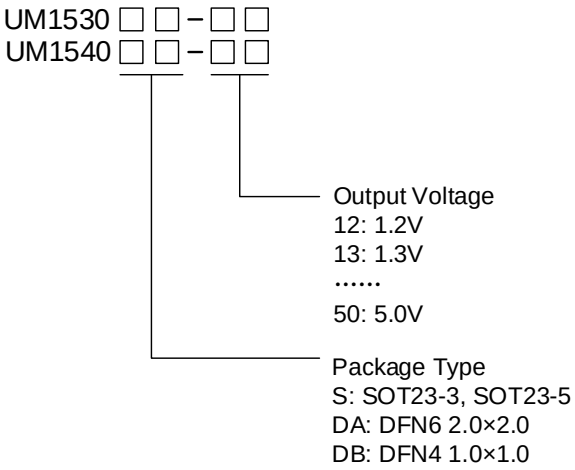


M: Month Code
UM1540DB
DFN4 1.0×1.0

Pin Description

Name	Pin						Description
	SOT23-3	SOT23-5	DFN6		DFN4		
	UM1530S	UM1540S	UM1530DA	UM1540DA	UM1530DB	UM1540DB	
GND	1	2	2	2	2	2	Ground
V_{OUT}	2	5	6	6	1	1	Voltage Regulated Output
V_{IN}	3	1	4	4	4	4	Supply Input
NC	-	4	1,3,5	1,5	3	-	Not Connected
$\overline{SHDN}$	-	3	-	3	-	3	Shutdown Control Input: High=Activate LDO, Low=Shutdown LDO
EP	-	-					Exposed Pad. Connect to ground

Naming Information



Absolute Maximum Ratings (Note 1)

Symbol	Parameter		Value	Unit
V_{IN}	Supply Voltage on V_{IN} Pin		-0.3 to +6.5	V
V_{OUT}	Voltage on V_{OUT} Pin		-0.3 to +6.5	V
T_J	Operating Junction Temperature (Note 2, 3)		-40 to +125	℃
T_{STG}	Storage Temperature Range		-65 to +150	℃
T_L	Lead Temperature for Soldering 10 Seconds		+260	℃
P_D (Note 4)	Power Dissipation@25℃	SOT23-3	0.40	W
		SOT23-5	0.43	
		DFN6 2.0×2.0	0.9	
		DFN4 1.0×1.0	0.4	
θ_{JA}	Package Thermal Resistance	SOT23-3	250	℃/W
		SOT23-5	230	
		DFN6 2.0×2.0	110	
		DFN4 1.0×1.0	250	

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

Note 2: The UM1530/1540 is tested and specified under pulse load conditions such that $T_J \approx T_A$. Specifications over the -40℃ to 125℃ operating junction temperature range are assured by design, characterization and correlation with statistical process controls.

Note 3: This IC includes over temperature protection that is intended to protect the device during momentary overload conditions. Junction temperature will exceed 125℃ when over temperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

Note 4: The maximum allowable power dissipation of any T_A (ambient temperature) is $P_{DMAX}=(T_{JMAX}-T_A)/\theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature and the regulator will go into thermal shutdown.

Electrical Characteristics

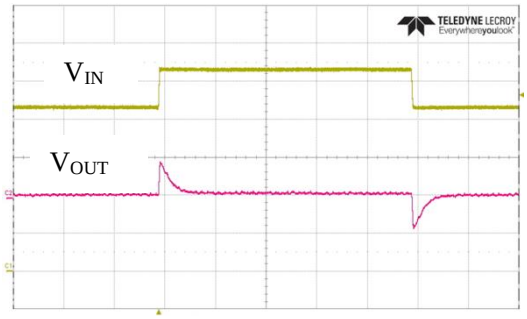
V_{IN}= V_{OUT}+1V, C_{IN}=C_{OUT}=1μF, T_A=25℃.

Symbol	Parameter	Test Conditions		Min	Typ	Max	Unit
V_{IN}	Input Voltage Range			1.8		6	V
V_{OUT}	Output Voltage Range			1.2		5.0	V
I_Q	Operating Quiescent Current	V_{IN}=5V, I_{OUT}=0mA			1	1.5	μA
	Shut Down Quiescent Current	V_{IN}=5V, $\overline{SHDN}$= GND				1	μA
$I_{\overline{SHDN}}$	$\overline{SHDN}$ Input Current	$\overline{SHDN}$=V_{IN} or GND				1	μA
I_{OUT}	Output Current			300			mA
	Output Voltage Accuracy	1mA≤I_{OUT}≤250mA		-2.5		+2.5	%
ΔV_{DO}	Dropout Voltage	I_{OUT}=200mA			250	330	mV
I_{LIMIT}	Output Current Limit	R_L=1Ω		350	450	550	mA
t	Startup Time Response	V_{OUT}=3.3V, R_L=68Ω, C_{OUT}=1μF			150		μs
V_{IL}	$\overline{SHDN}$ Input Low Voltage	V_{IN}=1.8V to 5V				0.4	V
V_{IH}	$\overline{SHDN}$ Input High Voltage	V_{IN}=1.8V to 5V		1.2			V
	Output Voltage TC	-40℃ to +125℃			60		ppm/℃
	Line Regulation	V_{OUT}+0.3V≤V_{IN}≤5V or V_{IN}>1.8V I_{OUT}=10mA				0.3	%/V
	Load Regulation	V_{IN}=V_{OUT}+1V or V_{IN}>1.8V 1mA≤I_{OUT}≤250mA				0.6	%
	Output Voltage Noise	V_{OUT}=3.0V, f=10Hz to 100kHz, C_{IN}=1μF, I_{OUT}=100mA			500		μV_{RMS}
PSRR	Power Supply Ripple Rejection	V_{IN}=V_{OUT}+1V I_{OUT}=100mA	f=100Hz		56		dB
			f=1kHz		42		
	ESD Rating	Human Body Mode		2			kV

Typical Performance Characteristics

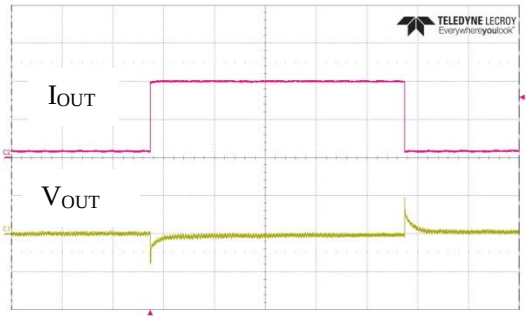
T_A = +25°C, V_{IN} = $V_{OUT(NOM)}$ + 1V, C_{IN} = 1μF and C_{OUT} = 1μF, unless otherwise noted.

Line Transient Response



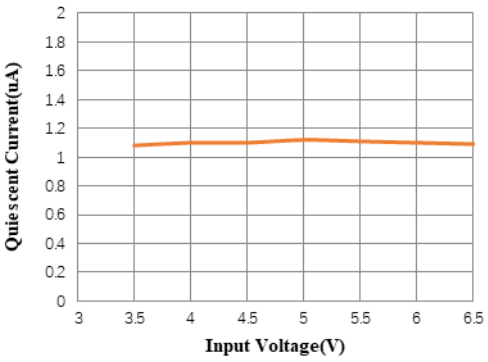
V_{IN}: 1V/div, V_{OUT}: 100mV/div, Time: 50us/div
V_{IN}=4.3V to 5.3V , I_{OUT}= 110mA

Load Transient Response

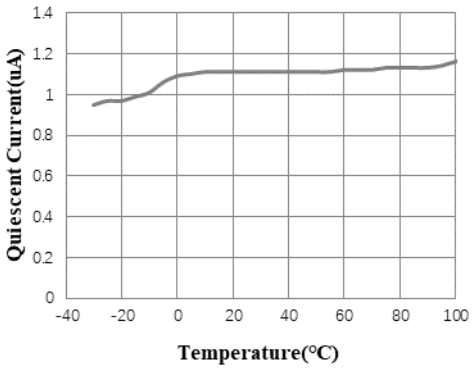


I_{OUT}: 100mA/div, V_{OUT}: 100mV/div, Time: 1ms/div
V_{IN}=4.3V , I_{OUT}= 20mA to 200mA

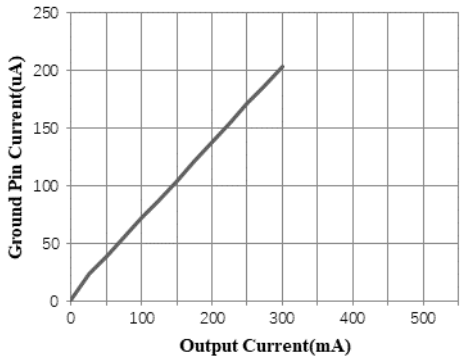
Quiescent Current vs. Input Voltage



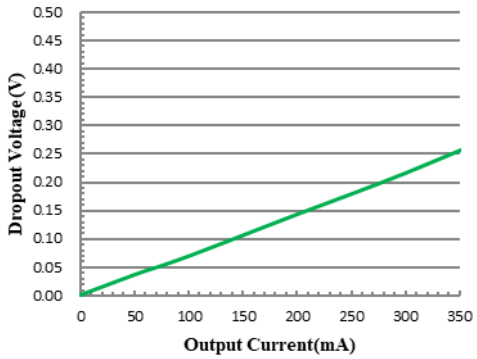
Quiescent Current vs. Temperature



Ground Pin Current vs. Output Current

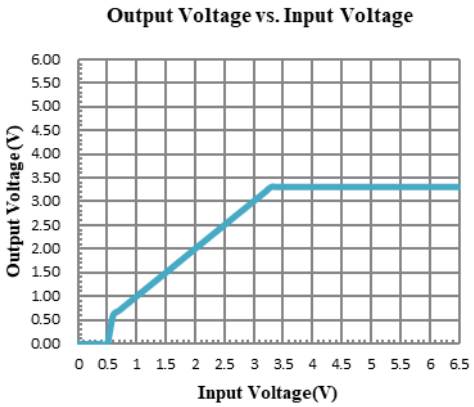


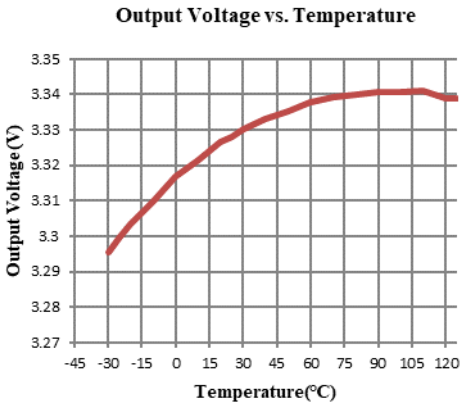
Dropout Voltage vs. Output Current



Typical Performance Characteristics (continued)

T_A = +25℃, V_{IN} = $V_{OUT(NOM)}$ + 1V, C_{IN} = 1μF and C_{OUT} = 1μF, unless otherwise noted.

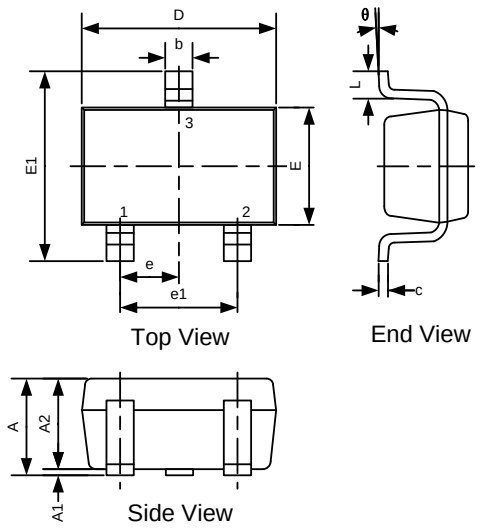




Package Information

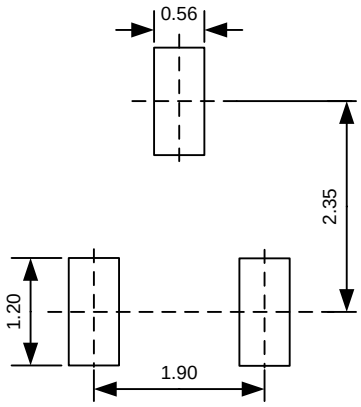
SOT23-3

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 °

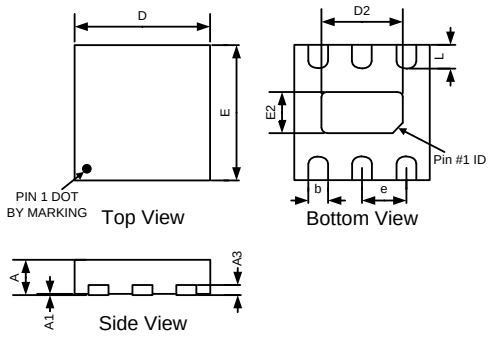
Land Pattern



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.

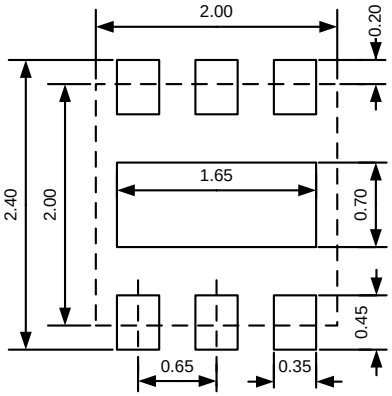
DFN6 2.0×2.0

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

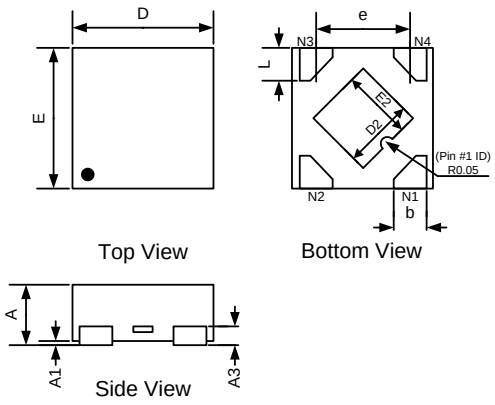


NOTES:

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.

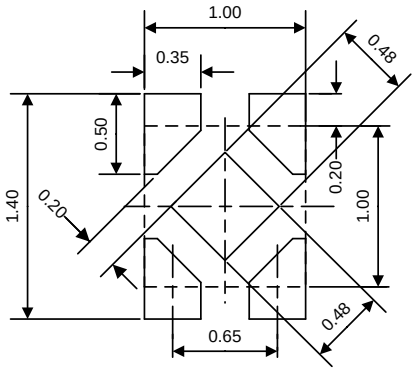
DFN4 1.0×1.0

Outline Drawing



DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.32	-	0.40	0.013	-	0.016
A1	0.00	0.02	0.05	0.000	0.0008	0.002
A3	0.13REF			0.005REF		
b	0.18	-	0.30	0.007	-	0.012
D	0.95	1.00	1.05	0.037	0.039	0.041
D2	0.43	0.48	0.53	0.017	0.019	0.021
E	0.95	1.00	1.05	0.037	0.039	0.041
E2	0.43	0.48	0.53	0.017	0.019	0.021
e	0.65TYP			0.026TYP		
L	0.20	0.25	0.30	0.008	0.010	0.012

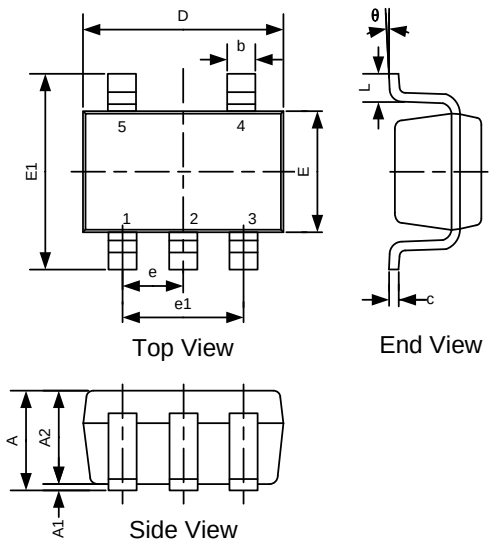
Land Pattern



NOTES:
1. Compound dimension: 1.00×1.00;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

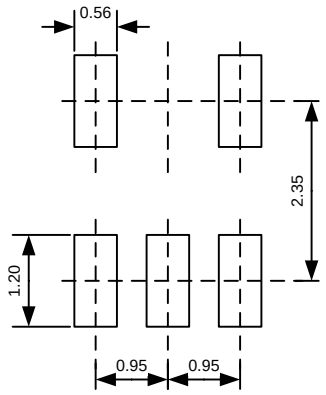
SOT23-5

Outline Drawing



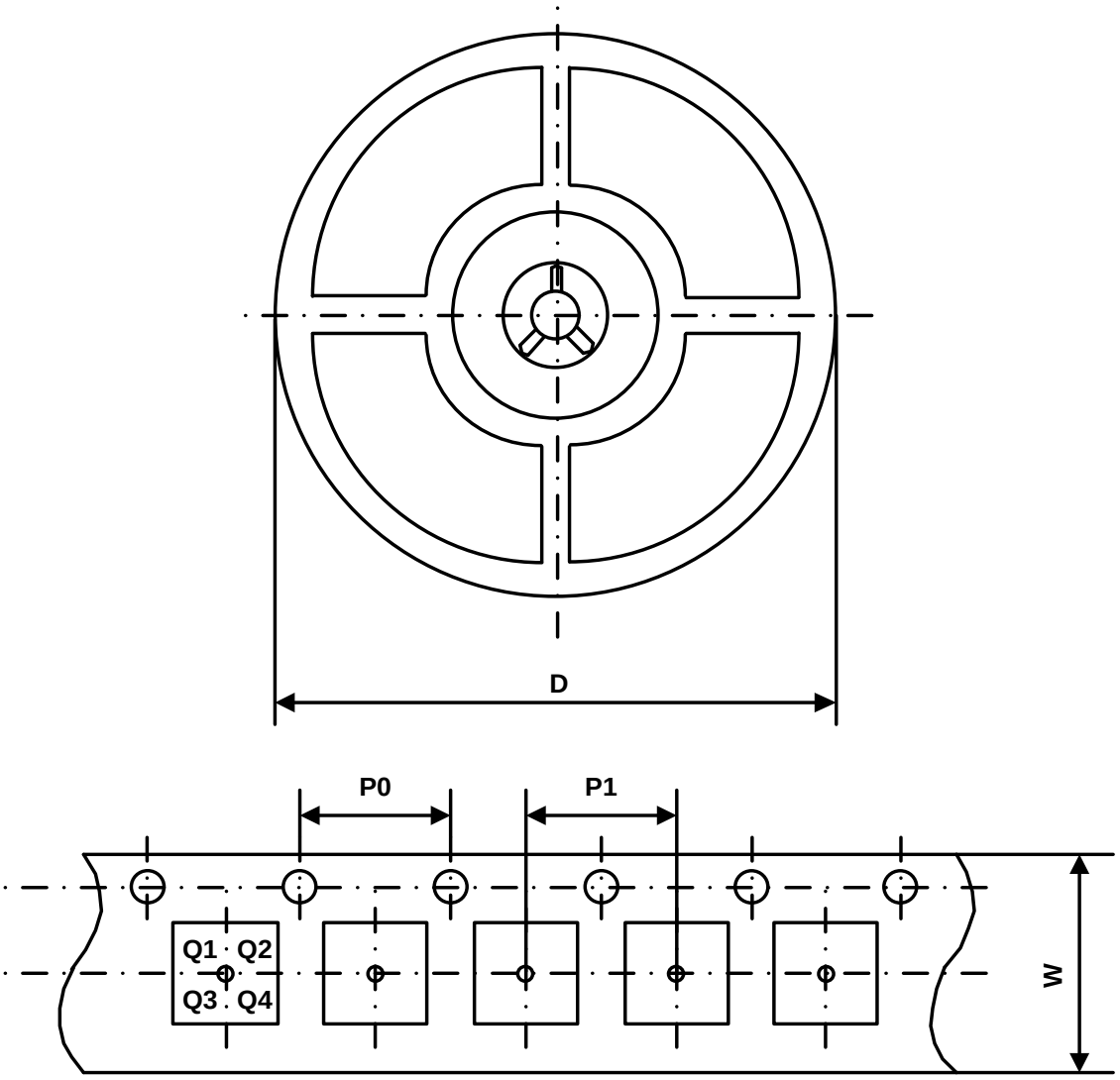
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067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

Packing Information



Part Number	Package Type	Carrier Width (W)	Pitch (P0)	Pitch (P1)	Reel Size (D)	PIN 1 Quadrant
UM1530S	SOT23-3	8 mm	4 mm	4 mm	180 mm	Q3
UM1530DA	DFN6 2.0×2.0	8 mm	4 mm	4 mm	180 mm	Q1
UM1530DB	DFN4 1.0×1.0	8 mm	4 mm	2 mm	180 mm	Q1
UM1540S	SOT23-5	8 mm	4 mm	4 mm	180 mm	Q3
UM1540DA	DFN6 2.0×2.0	8 mm	4 mm	4 mm	180 mm	Q1
UM1540DB	DFN4 1.0×1.0	8 mm	4 mm	2 mm	180 mm	Q1

Ordering Information

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1530S-12	1.2V	UC2	SOT23-3	3000pcs/7Inch Tape & Reel
UM1530S-13	1.3V	UC3		
UM1530S-15	1.5V	UC5		
UM1530S-18	1.8V	UC8		
UM1530S-25	2.5V	UD5		
UM1530S-27	2.7V	UD7		
UM1530S-28	2.8V	UD8		
UM1530S-30	3.0V	UDA		
UM1530S-31	3.1V	UGB		
UM1530S-33	3.3V	UG3		
UM1530S-35	3.5V	UG5		
UM1530S-36	3.6V	UG6		
UM1530S-38	3.8V	UG8		
UM1530S-40	4.0V	UGA		
UM1530S-42	4.2V	UI2		
UM1530S-43	4.3V	UI3		
UM1530S-45	4.5V	UI5		
UM1530S-47	4.7V	UI7		
UM1530S-48	4.8V	UI8		
UM1530S-50	5.0V	UIA		

Ordering Information (Continued)

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1530DA-12	1.2V	BFC	DFN6 2.0×2.0	3000pcs/7Inch Tape & Reel
UM1530DA-13	1.3V	AND		
UM1530DA-15	1.5V	ANE		
UM1530DA-18	1.8V	ANF		
UM1530DA-25	2.5V	ANG		
UM1530DA-27	2.7V	ANH		
UM1530DA-28	2.8V	ANJ		
UM1530DA-30	3.0V	ANK		
UM1530DA-31	3.1V	BFB		
UM1530DA-33	3.3V	ANL		
UM1530DA-35	3.5V	ANN		
UM1530DA-36	3.6V	ANP		
UM1530DA-38	3.8V	ANQ		
UM1530DA-40	4.0V	ANR		
UM1530DA-42	4.2V	ANS		
UM1530DA-43	4.3V	ANT		
UM1530DA-45	4.5V	ANU		
UM1530DA-47	4.7V	ANV		
UM1530DA-48	4.8V	ANZ		
UM1530DA-50	5.0V	BFD		

Ordering Information (Continued)

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1530DB-12	1.2V	NA	DFN4 1.0×1.0	3000pcs/7Inch Tape & Reel
UM1530DB-13	1.3V	DC		
UM1530DB-15	1.5V	DD		
UM1530DB-18	1.8V	DE		
UM1530DB-25	2.5V	DF		
UM1530DB-27	2.7V	DG		
UM1530DB-28	2.8V	DH		
UM1530DB-30	3.0V	DJ		
UM1530DB-31	3.1V	NJ		
UM1530DB-33	3.3V	DK		
UM1530DB-35	3.5V	DL		
UM1530DB-36	3.6V	DN		
UM1530DB-38	3.8V	DP		
UM1530DB-40	4.0V	DQ		
UM1530DB-42	4.2V	DR		
UM1530DB-43	4.3V	DS		
UM1530DB-45	4.5V	DT		
UM1530DB-47	4.7V	DU		
UM1530DB-48	4.8V	DV		
UM1530DB-50	5.0V	DZ		

Ordering Information (Continued)

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1540S-12	1.2V	5F3	SOT23-5	3000pcs/7Inch Tape & Reel
UM1540S-13	1.3V	5FB		
UM1540S-15	1.5V	5FC		
UM1540S-18	1.8V	5FD		
UM1540S-25	2.5V	5FE		
UM1540S-27	2.7V	5FF		
UM1540S-28	2.8V	5FH		
UM1540S-30	3.0V	5FL		
UM1540S-31	3.1V	5HH		
UM1540S-33	3.3V	5FM		
UM1540S-35	3.5V	5FJ		
UM1540S-36	3.6V	5FK		
UM1540S-38	3.8V	5FN		
UM1540S-40	4.0V	5FP		
UM1540S-42	4.2V	5FQ		
UM1540S-43	4.3V	5FR		
UM1540S-45	4.5V	5FS		
UM1540S-47	4.7V	5FT		
UM1540S-48	4.8V	5FY		
UM1540S-50	5.0V	5FU		

Ordering Information (Continued)

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1540DA-12	1.2V	AA4	DFN6 2.0×2.0	3000pcs/7Inch Tape & Reel
UM1540DA-13	1.3V	AG2		
UM1540DA-15	1.5V	AG3		
UM1540DA-18	1.8V	AG4		
UM1540DA-25	2.5V	AG5		
UM1540DA-27	2.7V	AG6		
UM1540DA-28	2.8V	AG7		
UM1540DA-30	3.0V	AG8		
UM1540DA-31	3.1V	AGS		
UM1540DA-33	3.3V	AG9		
UM1540DA-35	3.5V	AGA		
UM1540DA-36	3.6V	AGB		
UM1540DA-38	3.8V	AGC		
UM1540DA-40	4.0V	AGD		
UM1540DA-42	4.2V	AGE		
UM1540DA-43	4.3V	AGF		
UM1540DA-45	4.5V	AGG		
UM1540DA-47	4.7V	AGH		
UM1540DA-48	4.8V	AGJ		
UM1540DA-50	5.0V	AGK		

Ordering Information (Continued)

Part Number	Output Voltage	Marking Code	Package	Shipping Qty
UM1540DB-12	1.2V	HC	DFN4 1.0×1.0	3000pcs/7Inch Tape & Reel
UM1540DB-13	1.3V	FC		
UM1540DB-15	1.5V	FD		
UM1540DB-18	1.8V	FE		
UM1540DB-25	2.5V	FF		
UM1540DB-27	2.7V	FG		
UM1540DB-28	2.8V	FH		
UM1540DB-30	3.0V	FJ		
UM1540DB-31	3.1V	N4		
UM1540DB-33	3.3V	FK		
UM1540DB-35	3.5V	FL		
UM1540DB-36	3.6V	FN		
UM1540DB-38	3.8V	FP		
UM1540DB-40	4.0V	FQ		
UM1540DB-42	4.2V	FR		
UM1540DB-43	4.3V	FS		
UM1540DB-45	4.5V	FT		
UM1540DB-47	4.7V	FU		
UM1540DB-48	4.8V	FV		
UM1540DB-50	5.0V	FZ		

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.
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