

150mA, Micropower, Low Dropout Linear Regulator

UM3730DA-xx DFN4 1.0×1.0

UM3730P-xx SOT353

General Description

The UM3730 series are low dropout linear regulators designed for low power portable applications. Typical output noise is only $220\mu\text{V}_{\text{RMS}}$ and typical dropout voltage is 155mV at the load current of 150mA. Ideal for battery powered applications, the UM3730 draws only $29\mu\text{A}$ current during no load operation. The UM3730 includes an auto-discharge feature that is activated when the enable pin is low.

Other features include 2% output voltage accuracy, excellent transient response, stability with ultra low ESR ceramic capacitors as small as $1\mu\text{F}$, thermal overload protection and output current limiting.

The UM3730 series are available in low profile DFN4 1.0×1.0 and SOT353 packages.

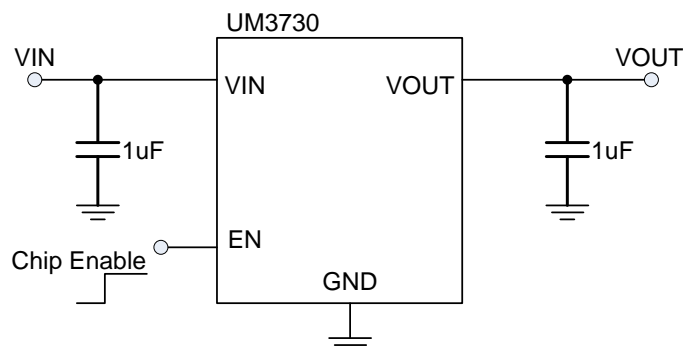
Applications

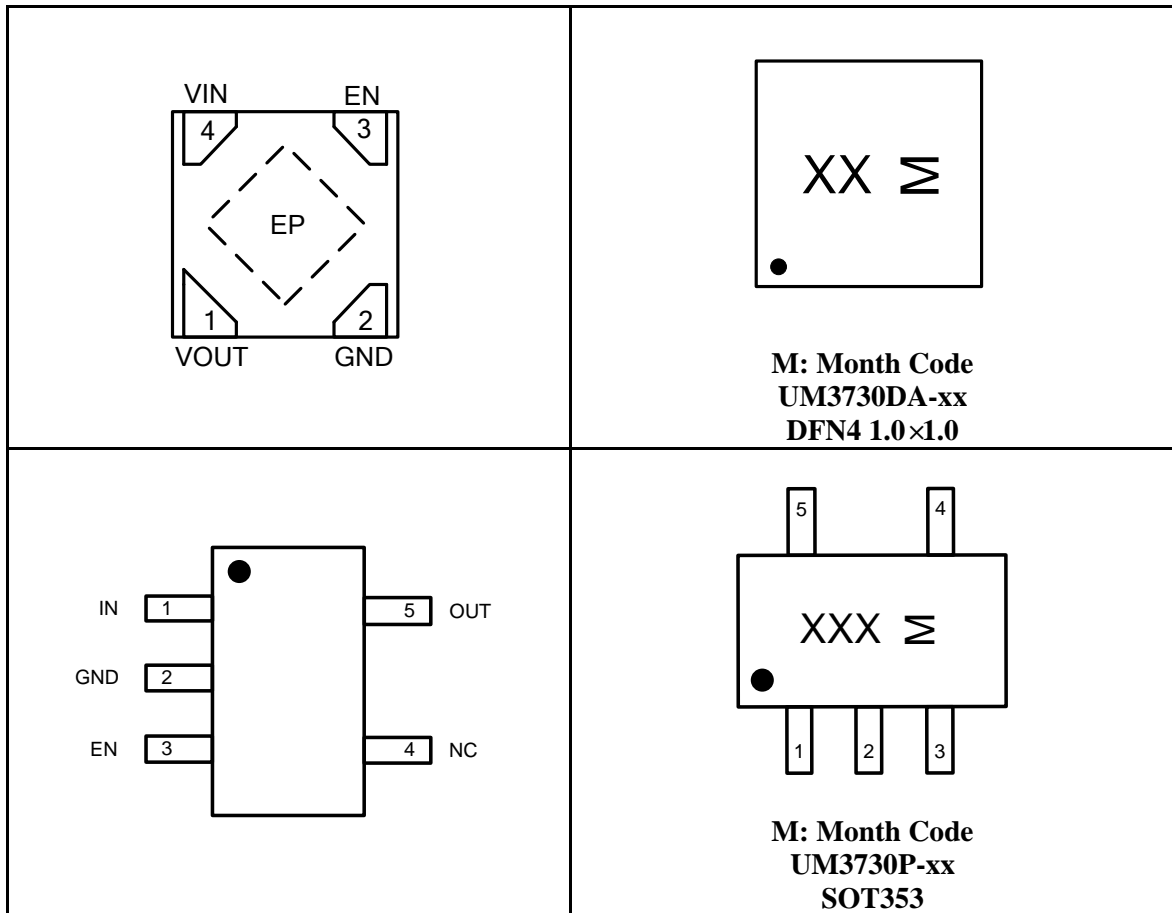
- Digital Camera
- PDAs and Notebook Computers
- Portable Instruments and Battery-Powered Systems
- Cellular Phones

Features

- Input voltage range: 2.5V to 5.5V
- Guaranteed 150mA output current
- $\pm 2\%$ voltage accuracy at 150mA
- Low dropout voltage: 155mV(typical) at 150mA
- Low quiescent current: $29\mu\text{A}$ (typical)
- Low noise: $220\mu\text{V}_{\text{RMS}}$ (10Hz to 100kHz)
- Available fixed output voltage from 1.0V to 3.3V with 0.1V step
- Output current limit
- Thermal overload protection
- Stable with $1\mu\text{F}$ output capacitor
- Low profile DFN4 1.0×1.0 and SOT353 packages

Typical Application Circuit

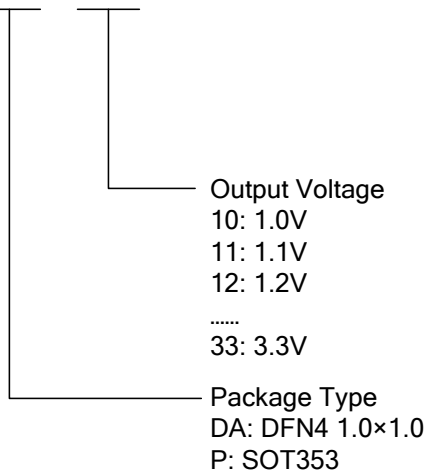


Pin Configurations
Top View

Pin Description

Pin Number	Pin Name DFN4 1.0x1.0	Pin Name SOT353	Pin Function
1	VOUT	-	Output Voltage
1	-	IN	Supply Input
2	GND	GND	Ground
3	EN	EN	Enable Input: Active High. High=ON, Low=Off
4	VIN	-	Supply Input
4	-	NC	No connect.
5	-	OUT	Output Voltage
EP	HS Pad	-	Exposed Heat Sink Pad

Naming Information

UM3730 □ □ - □ □


Available Voltage Version

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM3730DA-10	1.0V	DFN4 1.0×1.0	JA	3000pcs/7Inch Tape & Reel
UM3730DA-11	1.1V		JB	
UM3730DA-12	1.2V		J2	
UM3730DA-13	1.3V		J3	
UM3730DA-14	1.4V		J4	
UM3730DA-15	1.5V		J5	
UM3730DA-16	1.6V		J6	
UM3730DA-17	1.7V		J7	
UM3730DA-18	1.8V		J8	
UM3730DA-19	1.9V		J9	
UM3730DA-20	2.0V		JC	
UM3730DA-21	2.1V		KB	
UM3730DA-22	2.2V		K2	
UM3730DA-23	2.3V		K3	
UM3730DA-24	2.4V		K4	
UM3730DA-25	2.5V		K5	
UM3730DA-26	2.6V		K6	
UM3730DA-27	2.7V		K7	
UM3730DA-28	2.8V		K8	
UM3730DA-29	2.9V		K9	
UM3730DA-30	3.0V		KC	
UM3730DA-31	3.1V		NB	
UM3730DA-32	3.2V		N2	
UM3730DA-33	3.3V		N3	

Available Voltage Version (Continued)

Part Number	Output Voltage	Packaging Type	Marking Code	Shipping Qty
UM3730P-10	1.0V	SOT353	UJA	3000pcs/7Inch Tape & Reel
UM3730P-11	1.1V		UJB	
UM3730P-12	1.2V		UJ2	
UM3730P-13	1.3V		UJ3	
UM3730P-14	1.4V		UJ4	
UM3730P-15	1.5V		UJ5	
UM3730P-16	1.6V		UJ6	
UM3730P-17	1.7V		UJ7	
UM3730P-18	1.8V		UJ8	
UM3730P-19	1.9V		UJ9	
UM3730P-20	2.0V		UJC	
UM3730P-21	2.1V		UKB	
UM3730P-22	2.2V		UK2	
UM3730P-23	2.3V		UK3	
UM3730P-24	2.4V		UK4	
UM3730P-25	2.5V		UK5	
UM3730P-26	2.6V		UK6	
UM3730P-27	2.7V		UK7	
UM3730P-28	2.8V		UK8	
UM3730P-29	2.9V		UK9	
UM3730P-30	3.0V		UKC	
UM3730P-31	3.1V		UNB	
UM3730P-32	3.2V		UN2	
UM3730P-33	3.3V		UN3	

Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Value	Unit
V _{IN}	Supply Voltage on VIN Pin	-0.3 to +7.5	V
V _{OUT}	Voltage on VOUT Pin	-0.3 to +7.5	V
T _J	Operating Junction Temperature (Notes 2, 3)	-40 to +125	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
T _L	Lead Temperature for Soldering 10 seconds	+260	°C
θ _{JA} (Notes 4)	Package Thermal Resistance	DFN4 1.0×1.0	250
		SOT353	256

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

Note 2: The UM3730 is tested and specified under pulse load conditions such that $T_J \approx T_A$. Specifications over the -40°C to 125°C 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.

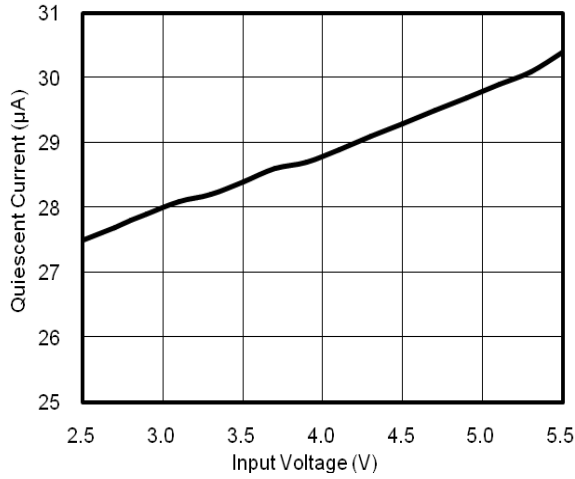
Note 4: The maximum allowable power dissipation of any T_A(ambient temperature) is $P_{DMAX} = (T_{JMAX} - T_A) / \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature and the regulator will go into thermal shutdown.

Electrical Characteristics
 $V_{IN}=V_{EN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25^\circ C$.

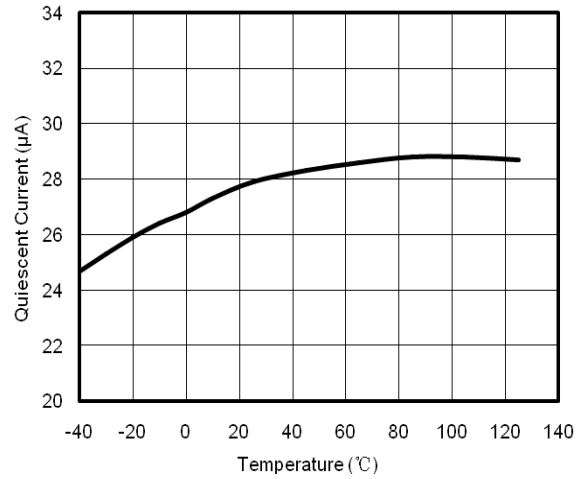
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage Range		2.5		5.5	V
V_{OUT}	Output Voltage Range		1.0		3.3	V
I_Q	Operating Quiescent Current	$I_{OUT}=0mA$		29	39	μA
I_{EN}	Enable Input Current	$V_{EN}=V_{IN}$ or GND			1	μA
I_{OUT}	Output Current		150			mA
	Output Voltage Accuracy	$I_{OUT}=150mA$	-2.0		+2.0	%
ΔV_{DO}	Dropout Voltage	$I_{OUT}=50mA, V_{OUT}\geq 2.8V$		55	110	mV
		$I_{OUT}=150mA, V_{OUT}\geq 2.8V$		155	310	mV
		$I_{OUT}=50mA, V_{OUT}< 2.8V$		60	135	mV
		$I_{OUT}=150mA, V_{OUT}< 2.8V$		180	380	mV
I_{LIMIT}	Output Current Limit	$V_{OUT}=0V$	200	325	500	mA
t	Startup Time Response	$I_{OUT}=150mA, C_{OUT}=1\mu F$		30		μs
V_{IL}	Enable Input Low Voltage	$V_{IN}=2.5V$ to $5.5V$			0.4	V
V_{IH}	Enable Input High Voltage	$V_{IN}=2.5V$ to $5.5V$	1.2			V
	Output Voltage TC			100		ppm/ $^\circ C$
T_{SHDN}	Thermal-Shutdown Temperature			160		$^\circ C$
ΔT_{SHDN}	Thermal-Shutdown Hysteresis			20		$^\circ C$
LNR	Line Regulation	$V_{OUT}+1V\leq V_{IN}\leq 5.5V$ ($V_{IN}\geq 2.5V$) $I_{OUT}=10mA$		0.1	0.3	%/V
LDR	Load Regulation	$V_{IN}=V_{OUT}+1V$ ($V_{IN}\geq 2.5V$) $1mA\leq I_{OUT}\leq 150mA$		0.8	1.5	%
	Output Voltage Noise	$V_{OUT}=1.8V$, 10Hz to 100kHz $C_{IN}=1\mu F, I_{OUT}=100mA$		220		μV_{RMS}
PSRR	Power Supply Ripple Rejection	$V_{IN}=V_{OUT}+1V$ ($V_{IN}\geq 2.5V$) $I_{OUT}=100mA$	F=1kHz		45	dB
			F=10kHz		30	
	Auto-Discharge Resistance	$V_{IN}=3.6V$, $V_{EN}=0V$		10		Ω

Typical Performance Characteristics

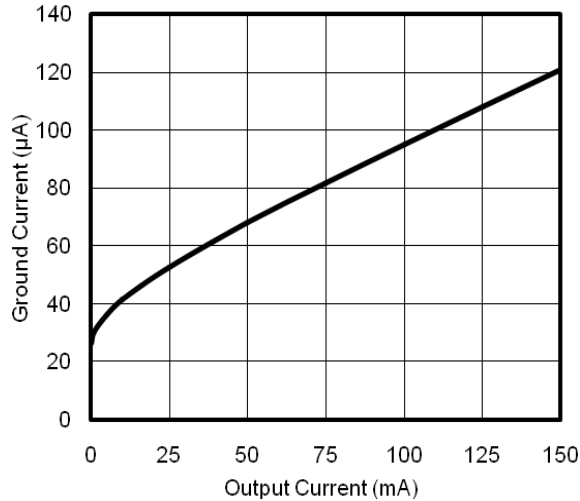
Quiescent Current vs Input Voltage
 $I_{out}=0mA$



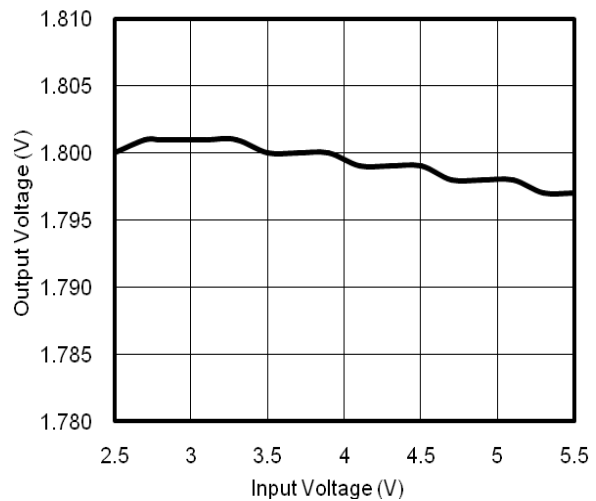
Quiescent Current vs Temperature
 $V_{in}=2.8V, I_{out}=0mA$



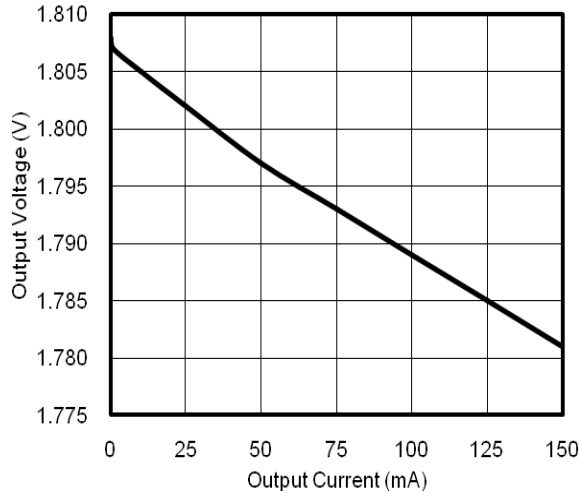
Ground Current vs Output Current
 $V_{in}=2.8V$



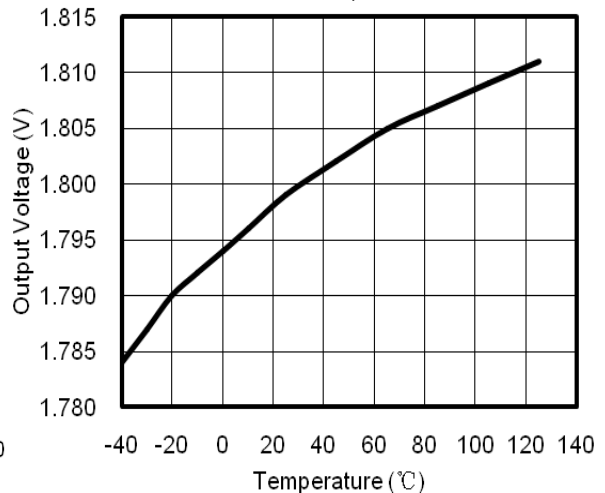
Output Voltage vs Input Voltage
 $I_{out}=150mA$



Output Voltage vs Output Current
 $V_{in}=2.8V$

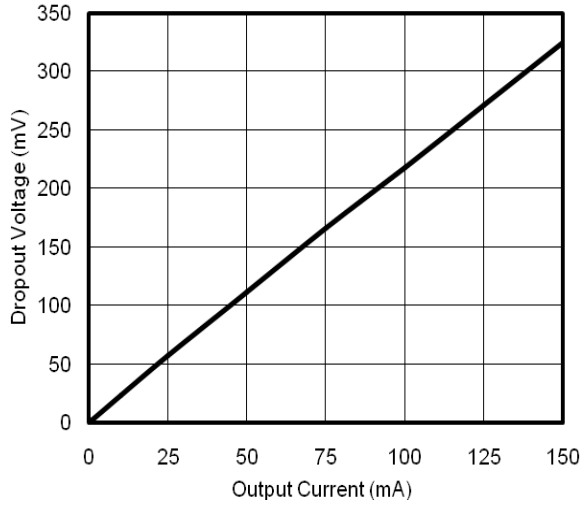


Output Voltage vs Temperature
 $V_{in}=2.8V, I_{out}=1mA$

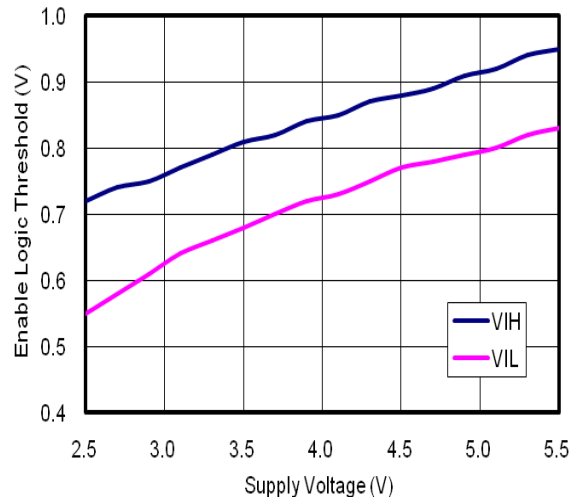


Typical Performance Characteristics (Continued)

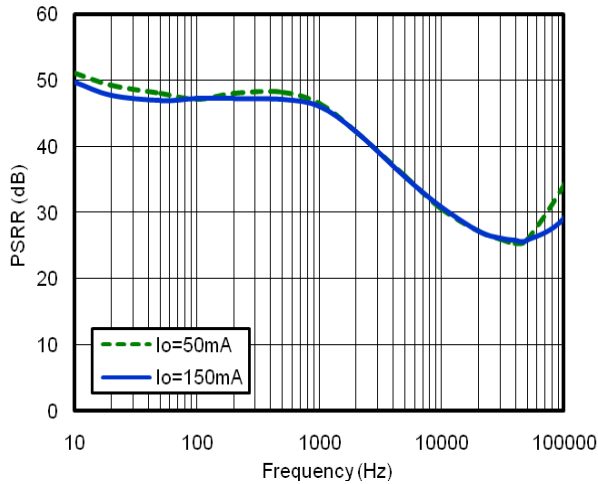
Dropout Voltage vs Output Current
Vout=1.8V



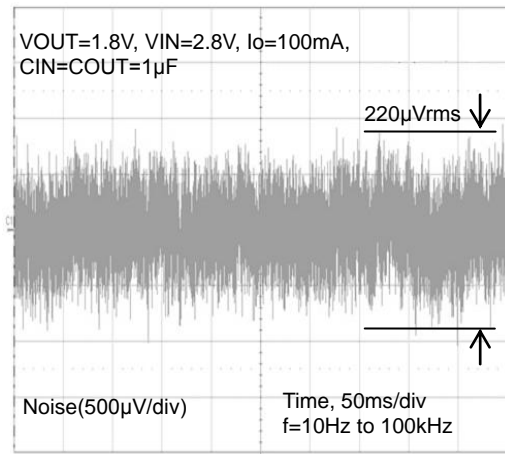
Enable Logic Threshold vs Supply Voltage



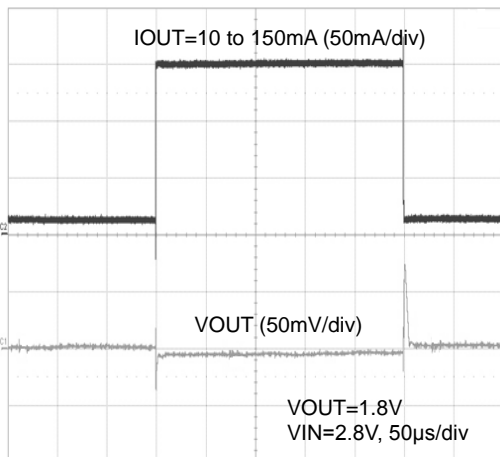
PSRR vs Frequency



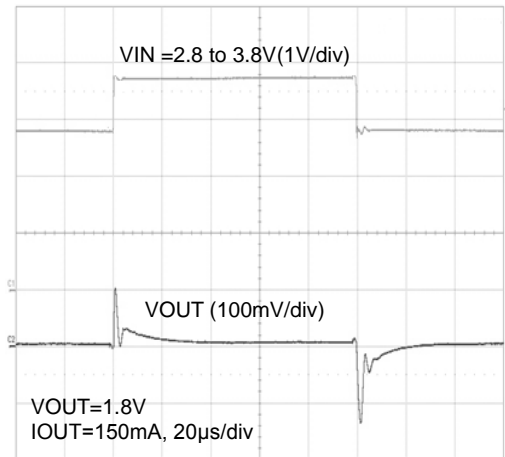
Noise



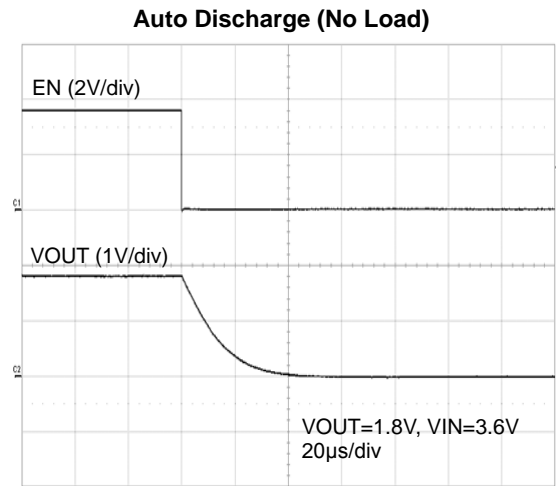
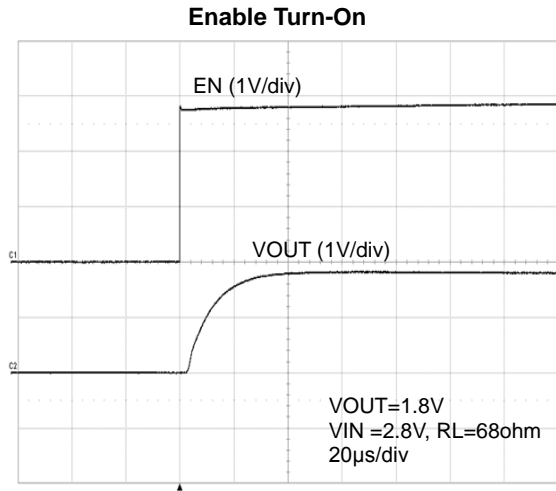
Load Transient Response



Line Transient Response



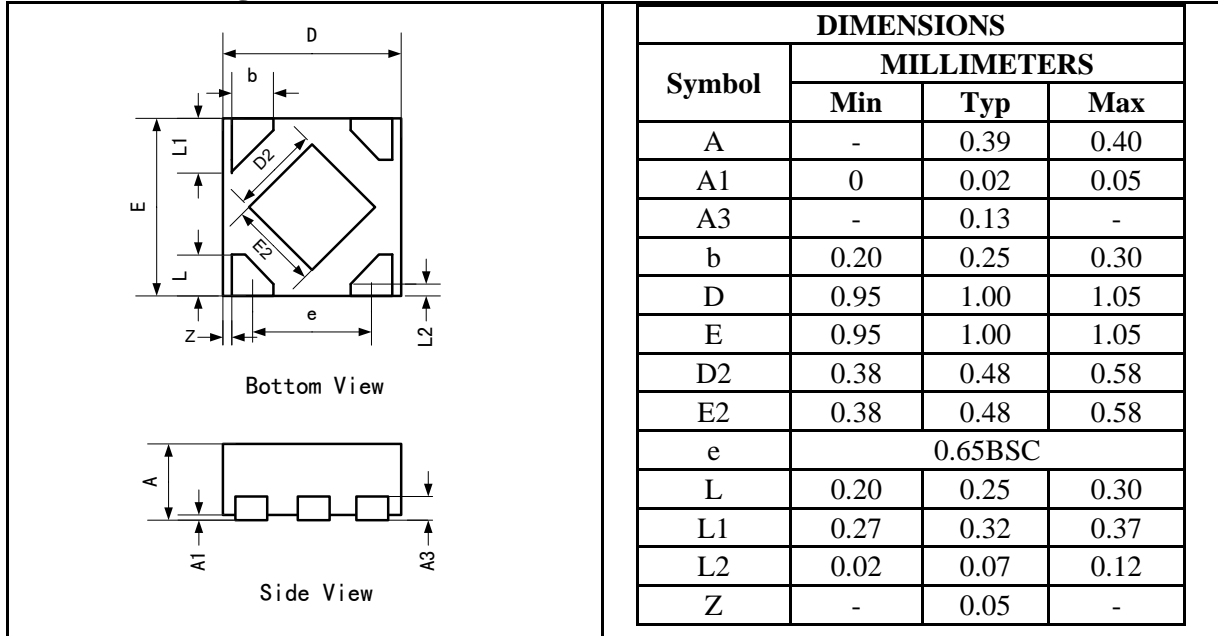
Typical Performance Characteristics (Continued)



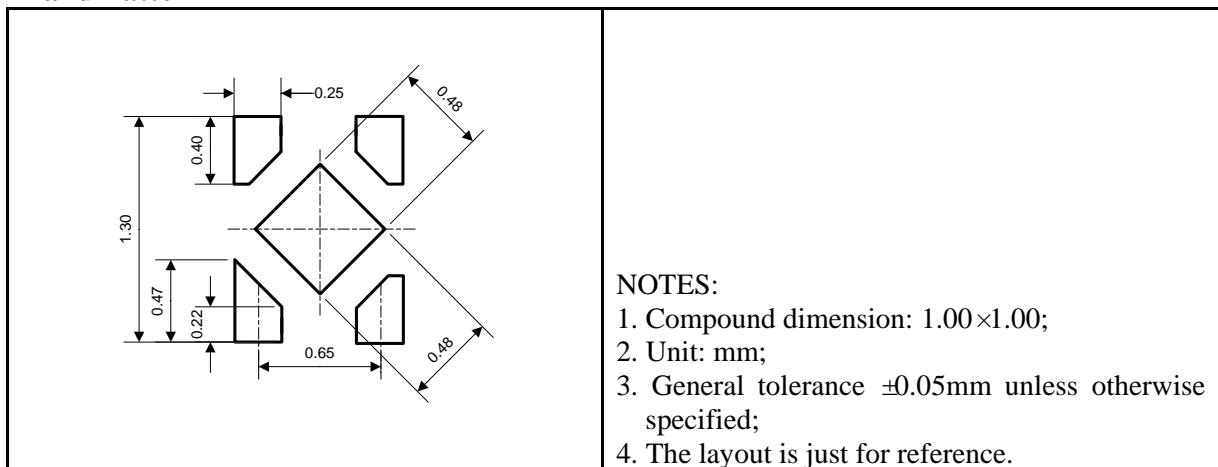
Package Information

UM3730DA-xx DFN4 1.0×1.0

Outline Drawing

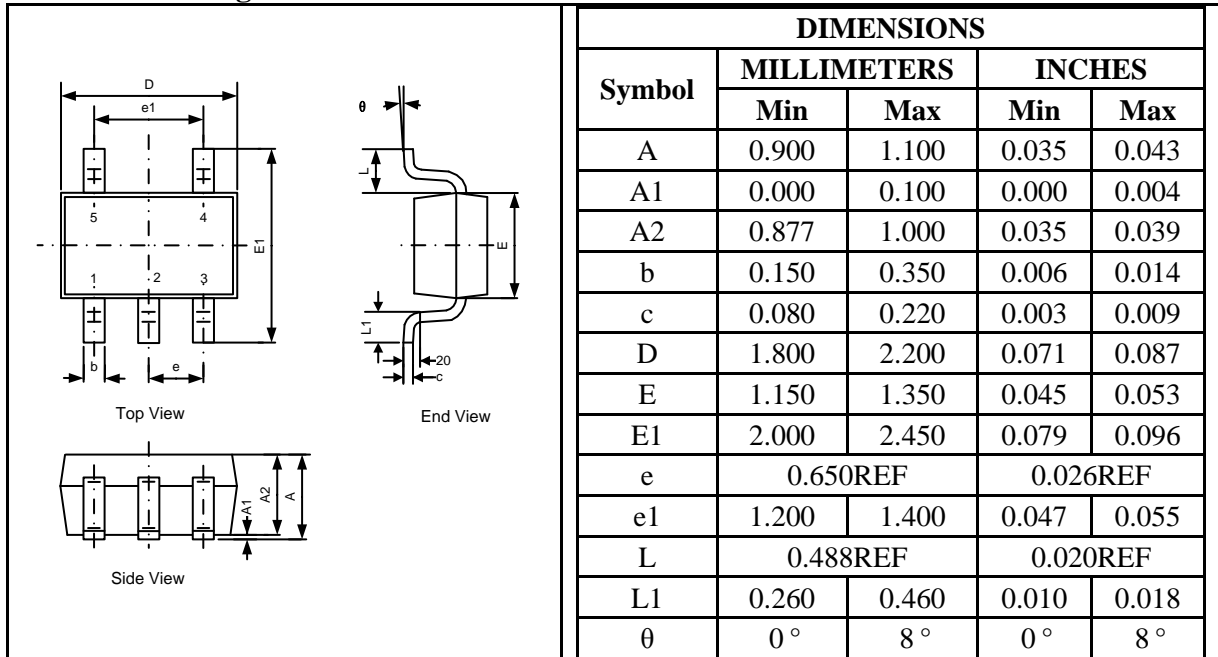
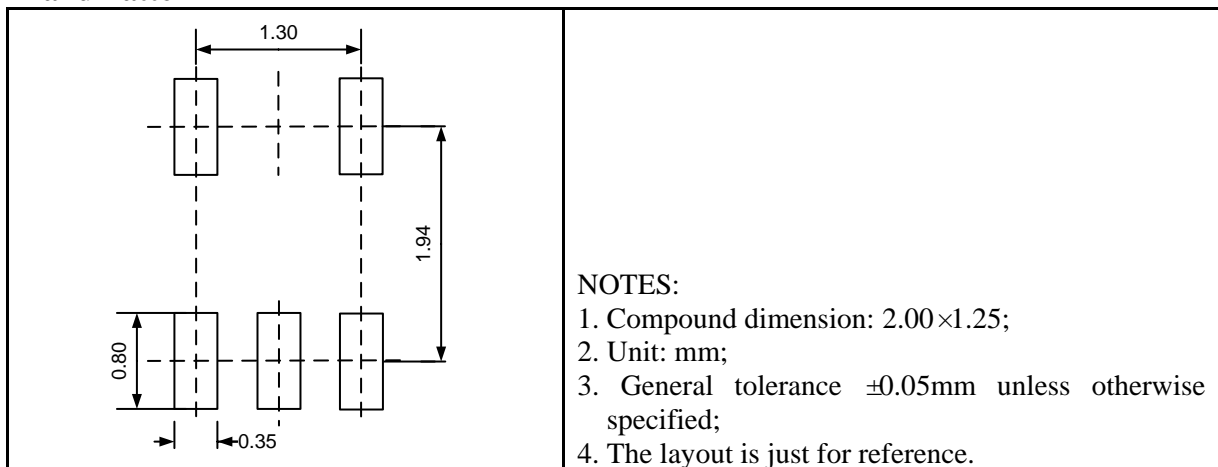
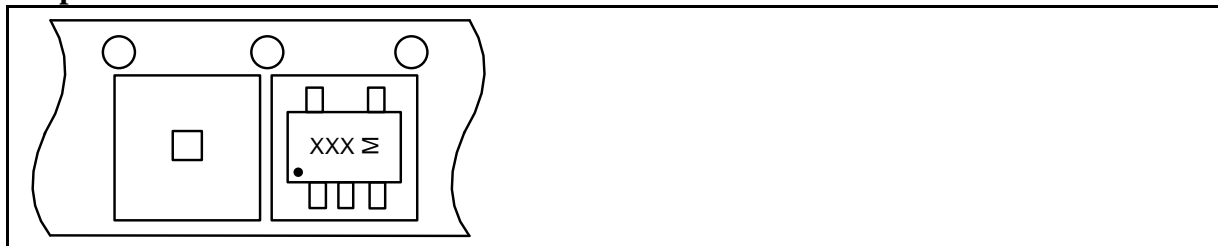


Land Pattern



Tape and Reel Orientation



UM3730P-xx SOT353
Outline Drawing

Land Pattern

Tape and Reel Orientation


IMPORTANT NOTICE

The information in this document has been carefully reviewed and is believed to be accurate. Nonetheless, this document is subject to change without notice. Union assumes no responsibility for any inaccuracies that may be contained in this document, and makes no commitment to update or to keep current the contained information, or to notify a person or organization of any update. Union reserves the right to make changes, at any time, in order to improve reliability, function or design and to attempt to supply the best product possible.



Union Semiconductor, Inc

Add: 2F, No. 3, Lane 647 Songtao Road, Shanghai 201203

Tel: 021-51093966

Fax: 021-51026018

Website: www.union-ic.com