

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.

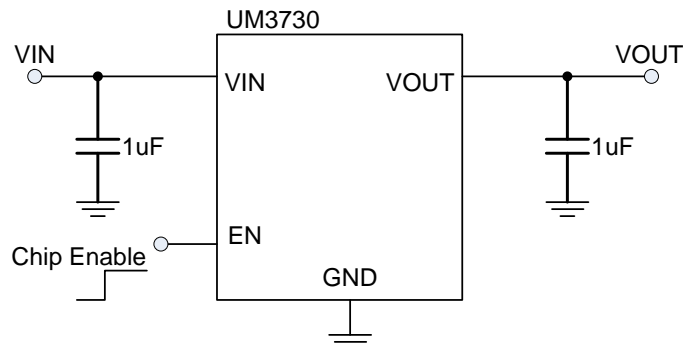
Applications

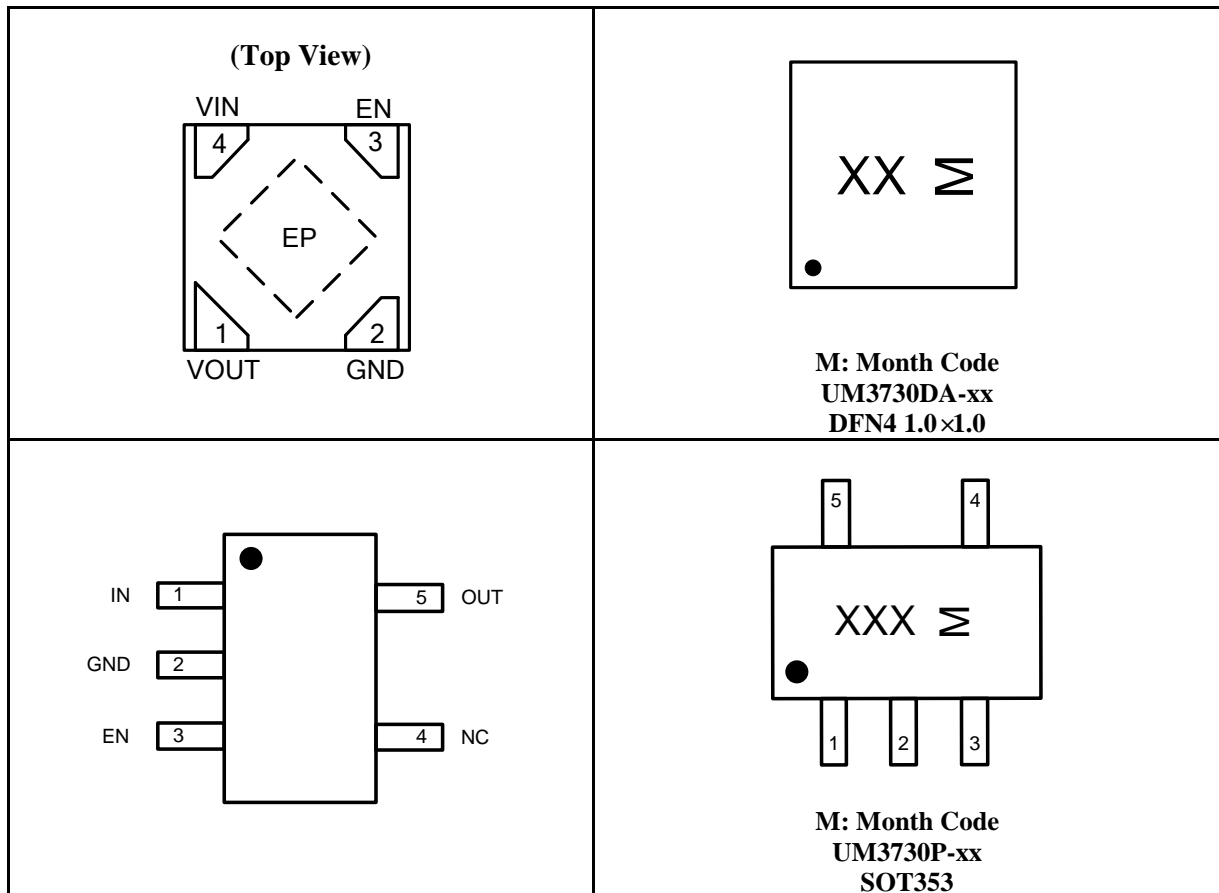
- Digital Camera
- PDAs and Notebook Computers
- Portable Instruments and Battery-Powered Systems
- Cellular Phones

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

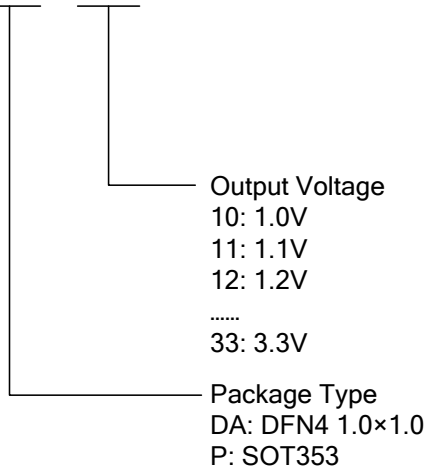


Pin Configurations
Top View

Pin Description

Pin Number	Pin Name DFN4 1.0×1.0	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

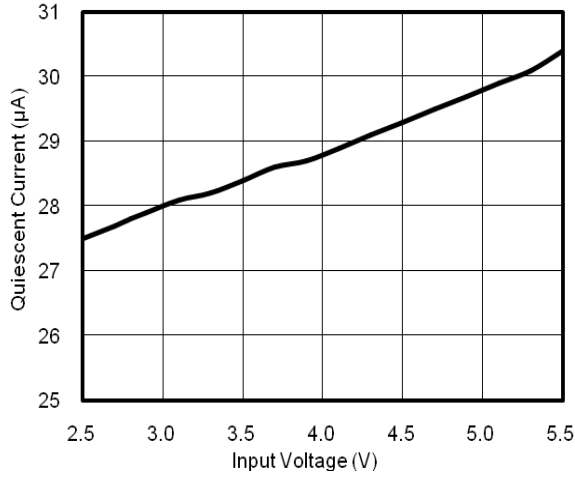
- Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.
- Note 2: The UM3730 is tested and specified under pulse load conditions such that $T_J \approx T_A$. Specifications over the -40 °C to 125 °C operating junction temperature range are assured by design, 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
 $V_{IN}=V_{EN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, T_A=25\text{ }^\circ\text{C}.$

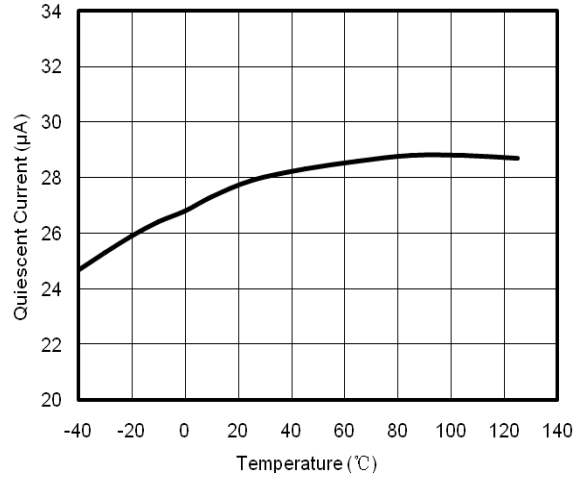
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage Range		2.5		5.5	V
V_{OUT}	Output Voltage Range		1.0		3.3	V
I_Q	Operating Quiescent Current	$I_{OUT}=0\text{mA}$		29	39	μA
I_{SHDN}	Shutdown Leakage Current				1	μA
I_{EN}	Enable Input Current	$V_{EN}=V_{IN}$ or GND			1	μA
I_{OUT}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

Typical Performance Characteristics

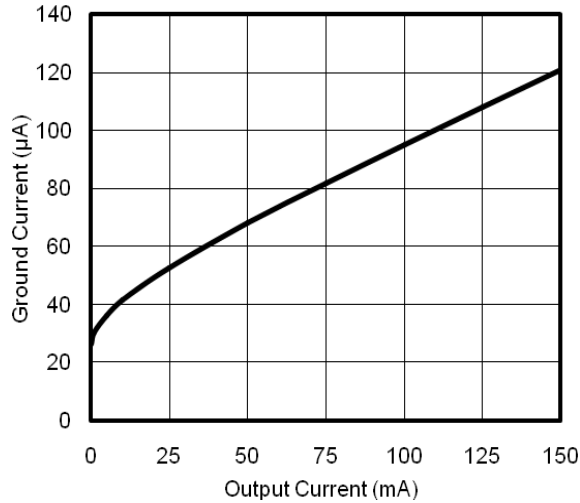
Quiescent Current vs Input Voltage
 $I_{OUT}=0mA$



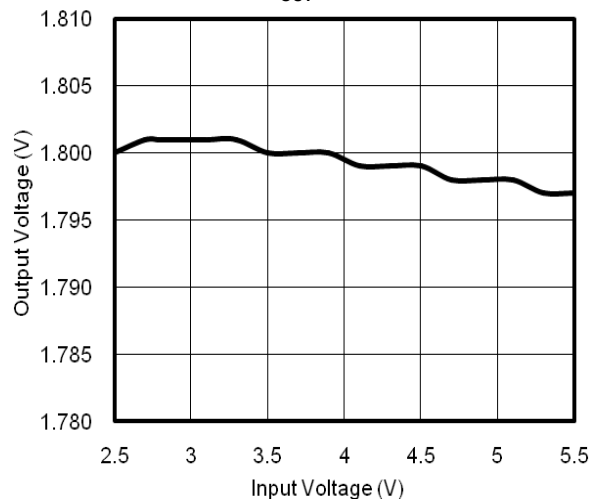
Quiescent Current vs Temperature
 $V_{IN}=2.8V, I_{OUT}=0mA$



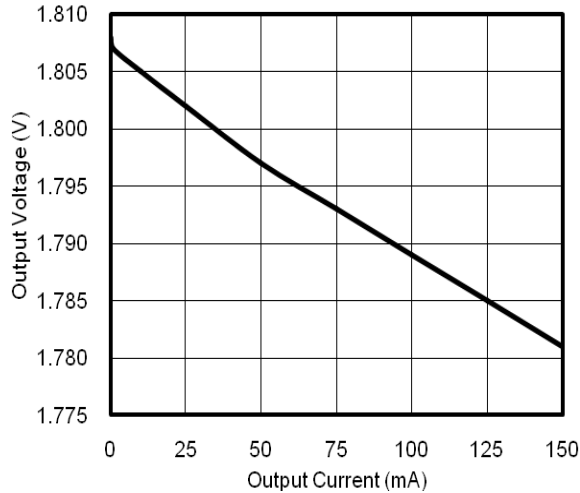
Ground Current vs Output Current
 $V_{IN}=2.8V$



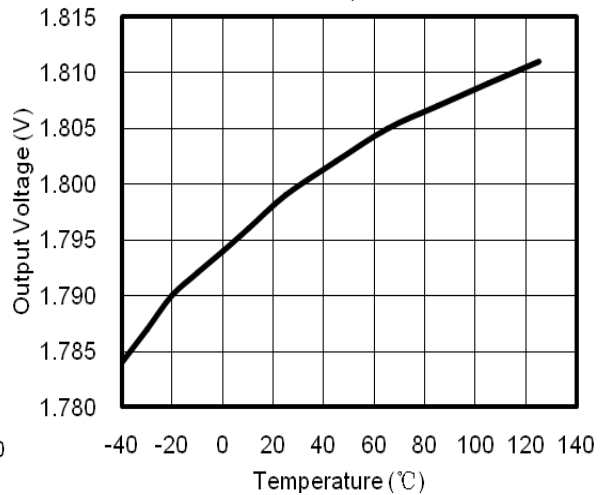
Output Voltage vs Input Voltage
 $I_{OUT}=150mA$



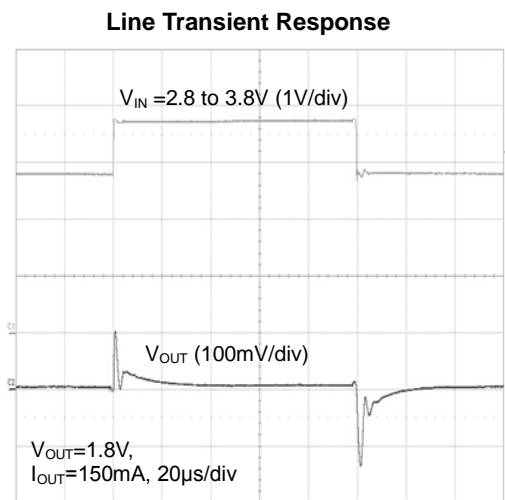
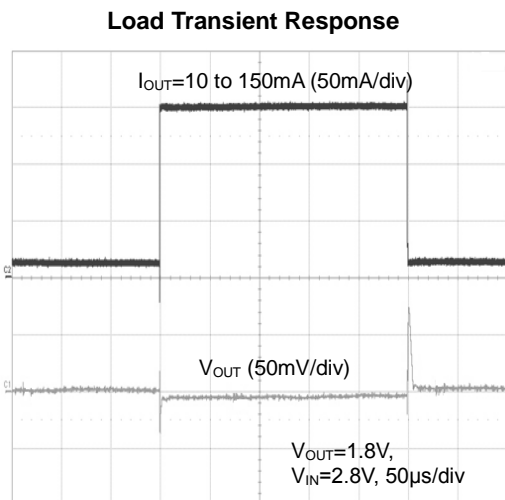
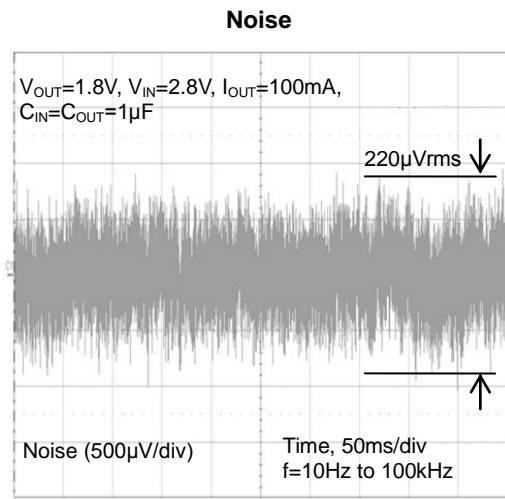
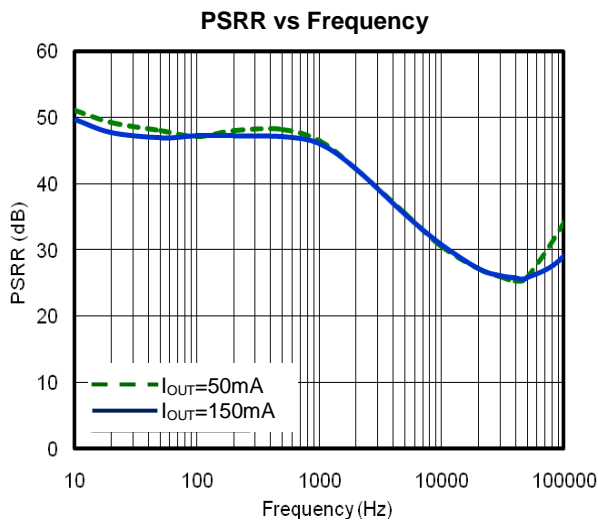
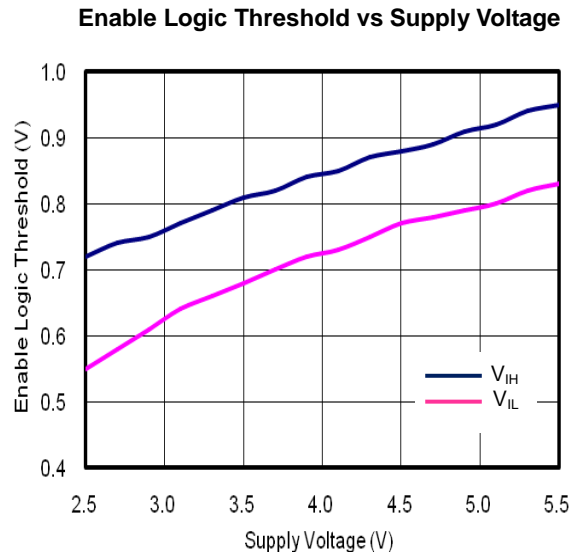
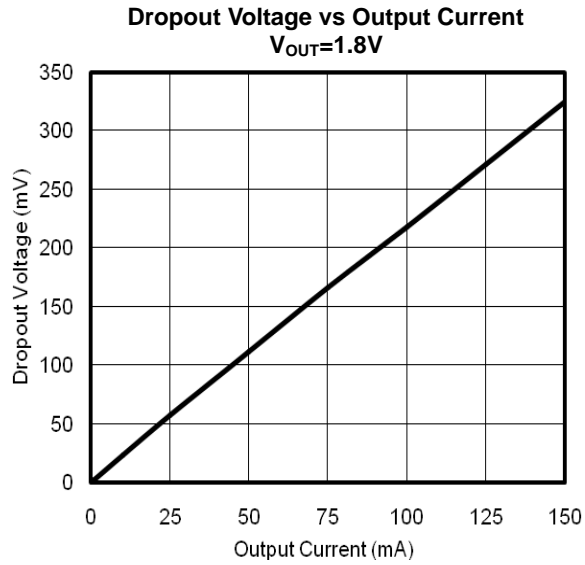
Output Voltage vs Output Current
 $V_{IN}=2.8V$



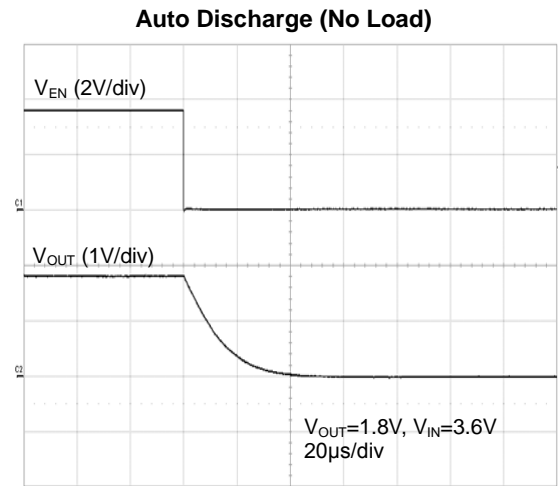
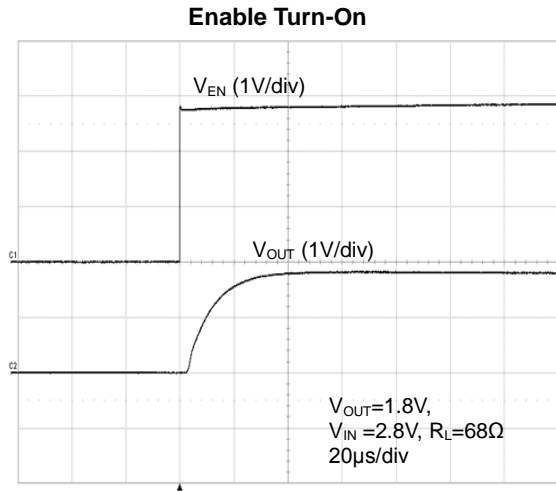
Output Voltage vs Temperature
 $V_{IN}=2.8V, I_{OUT}=1mA$

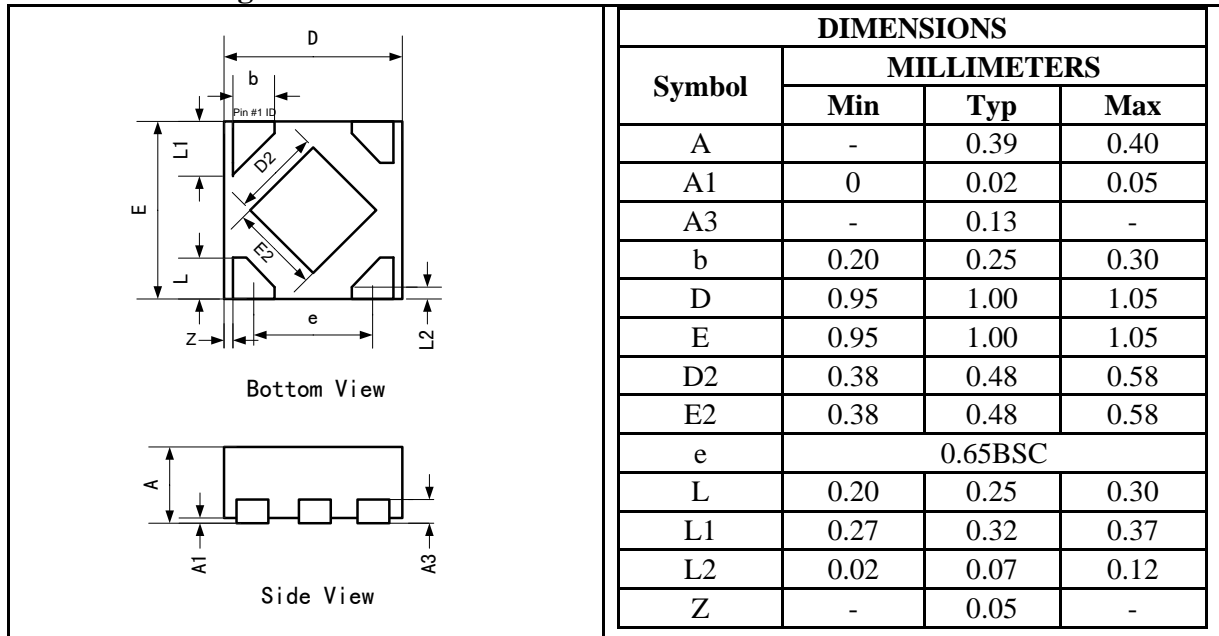
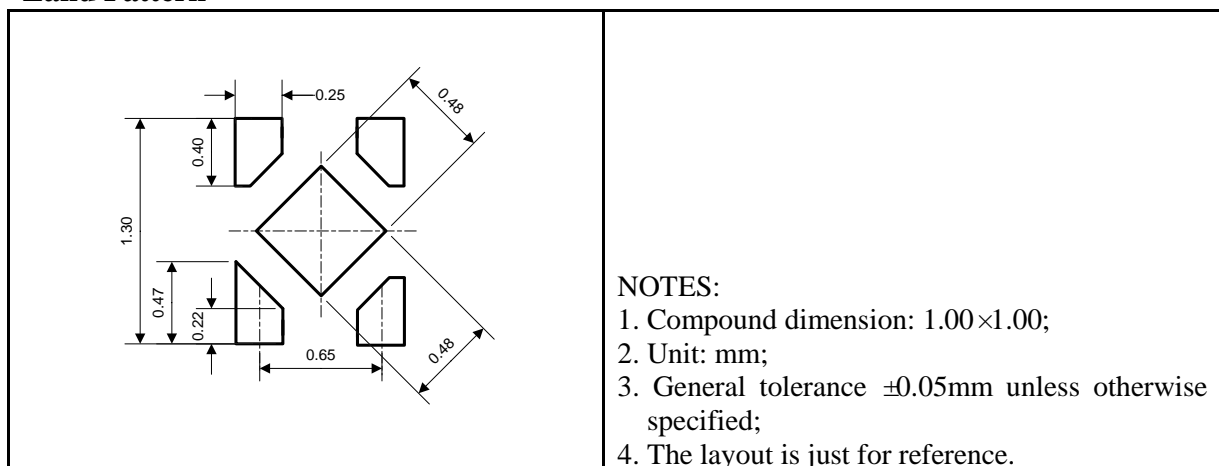


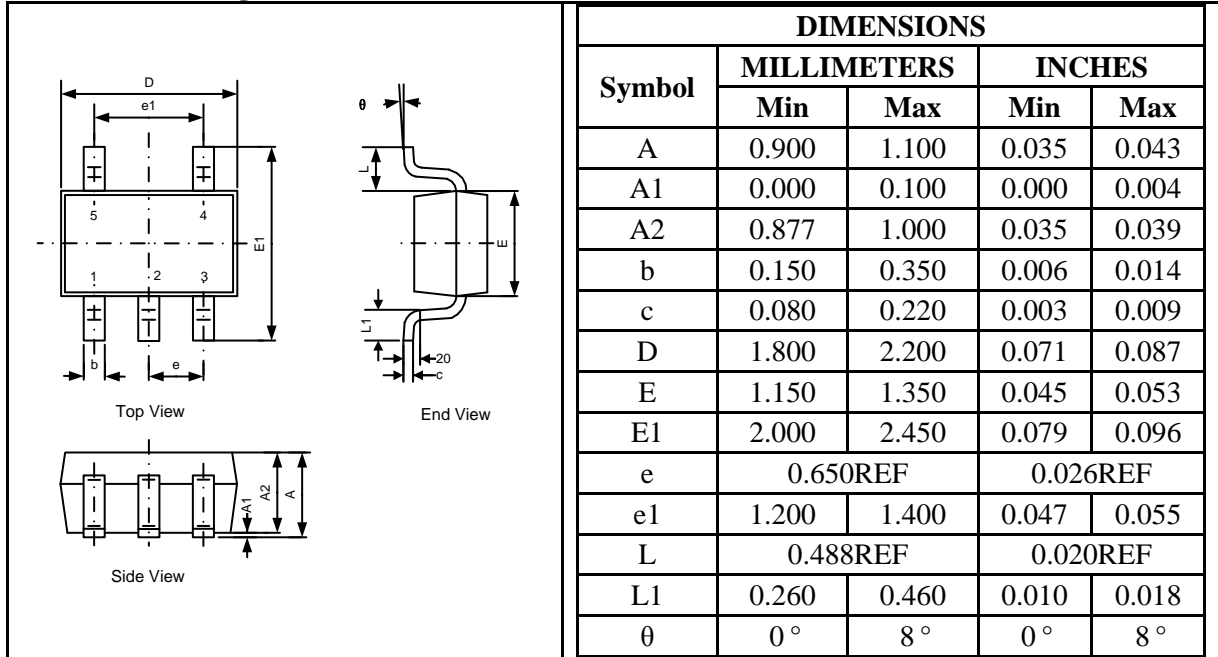
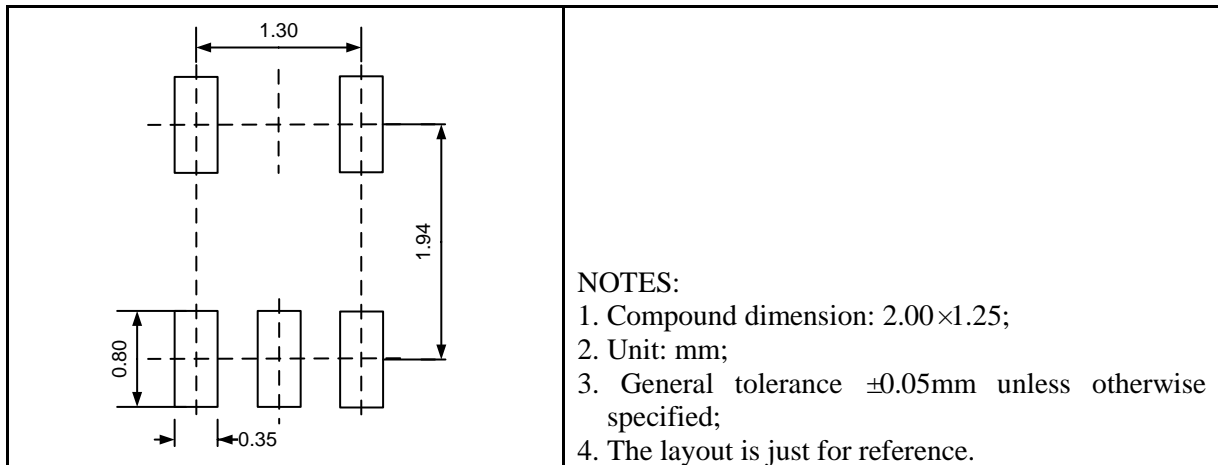
Typical Performance Characteristics (Continued)



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


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