

WL2837D

Low noise, High PSRR, High speed, CMOS LDO

[Http://www.ovt.com](http://www.ovt.com)

Descriptions

The WL2837D series are high accuracy, low noise, high speed, high PSRR, low dropout CMOS Linear regulators with high ripple rejection. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The WL2837D has the fold-back maximum output current which depends on the output voltage. So the current limit functions both as a short circuit protection and as an output current limiter.

The WL2837D regulators are available in standard DFN1x1-4L Package. Standard products are Pb-free and Halogen-free.

Features

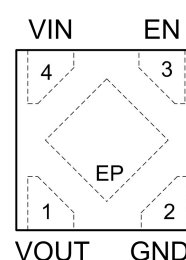
- Input Voltage Range : 1.4V~5.5V
- Output Voltage Range : 0.9V~3.3V
- Output current : 500mA
- Quiescent current : 50μA Typ.
- Shut-down current : < 1μA
- Dropout voltage : 526mV @ $V_{OUT}=1.1V, I_{OUT}=0.5A$
- PSRR : 78dB @ 1kHz, $V_{OUT}=1.05V$
- Low Output Voltage Noise : 20 μV_{RMS} Typ
- Output Voltage Tolerance : ±1% @ $V_{OUT}>2V$
- Recommend capacitor : 1μF
- Thermal-Overload and Short-Circuit Protection

Applications

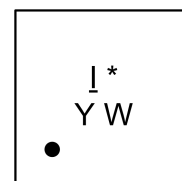
- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronics device



DFN1x1-4L



Pin Configuration (Top View)



I : Device Code
***** : Voltage Code
Y : Year Code
W : Week Code

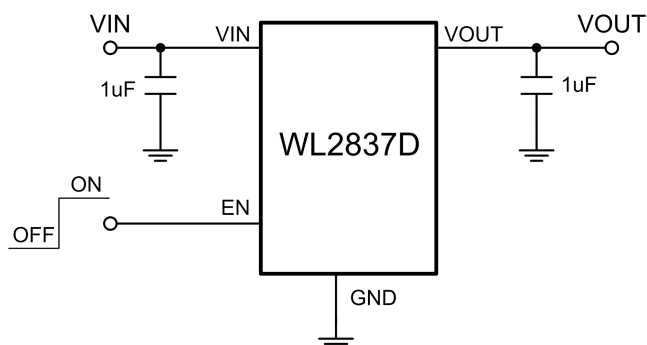
For detail marking information, please see page 11.

Marking

Order Information

For detail order information, please see page 11.

Typical Application

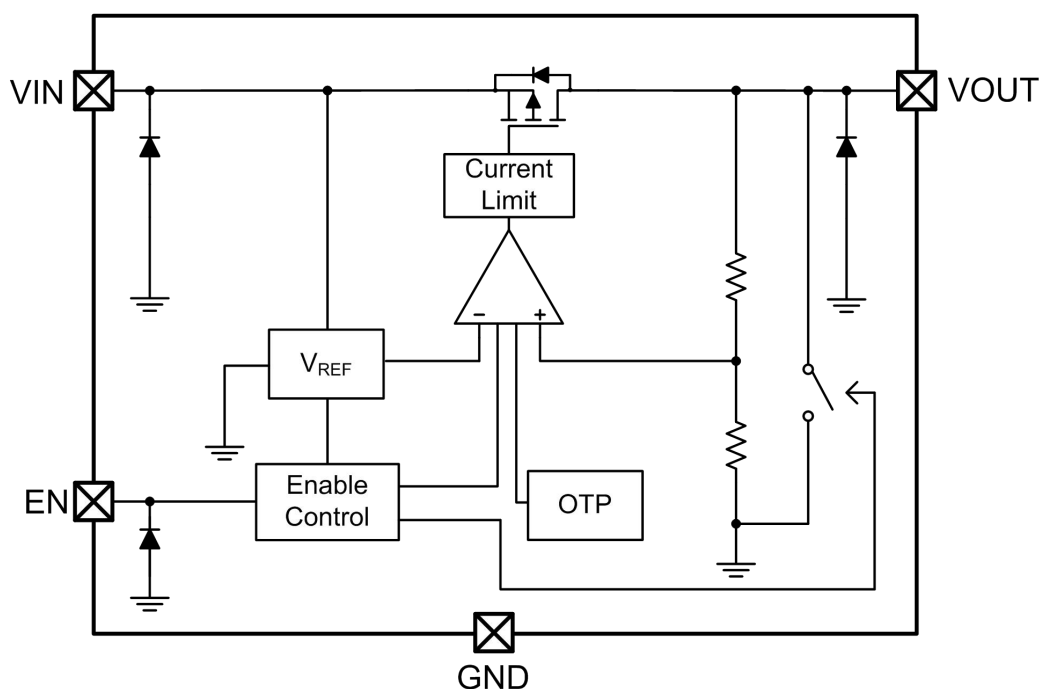


Pin Description

DFN1x1-4L

PIN	Symbol	Description
1	V_{OUT}	Output
2	GND	Ground
3	EN	Enable (Active high)
4	V_{IN}	Input
EP		GND level, this pin must connect to GND.

Block Diagram



Absolute Maximum Ratings

Parameter		Value	Unit
Power Dissipation, $P_D@T_A=25^{\circ}\text{C}$		400	mW
V_{IN} Range		-0.3~6.5	V
V_{EN} Range		-0.3~ V_{IN}	V
V_{OUT} Range		-0.3~ V_{IN}	V
I_{OUT}		Internally Limited	mA
Lead Temperature Range		260	$^{\circ}\text{C}$
Storage Temperature Range		-55 ~ 150	$^{\circ}\text{C}$
Operating Junction Temperature Range		150	$^{\circ}\text{C}$
MSL		Level-1	
ESD Ratings	HBM	2000	V
	CDM	2000	V

Recommend Operating Ratings

Parameter	Value	Unit
Operating Supply voltage	1.4~5.5	V
Operating Temperature Range	-40~85	$^{\circ}\text{C}$
Thermal Resistance, $R_{\theta JA}$ (DFN1x1-4L)	250	$^{\circ}\text{C/W}$

Electronics Characteristics

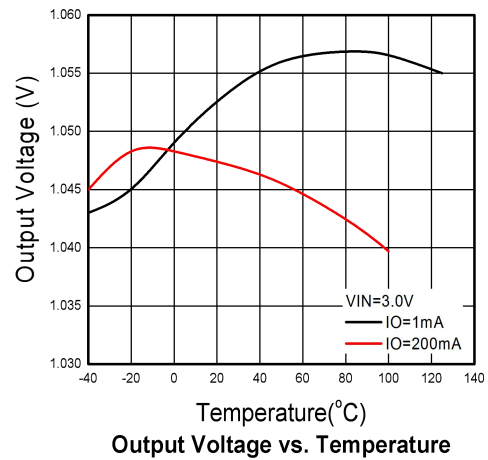
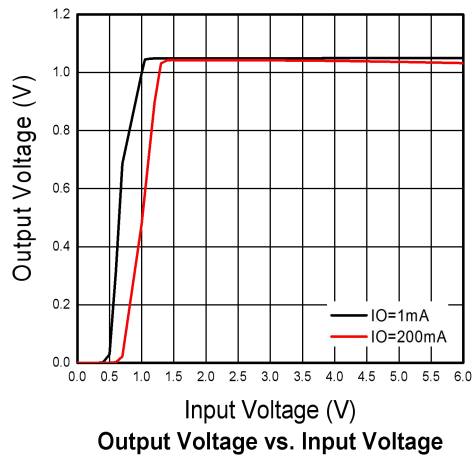
($T_a=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}}+1\text{V}$, $C_{\text{IN}}=C_{\text{OUT}}=1\ \mu\text{F}$, $I_{\text{OUT}}=1\text{mA}$, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{\text{OUT}} \leq 2\text{V}$	-20		+20	mV
		$V_{\text{OUT}} > 2\text{V}$	-1%		+1%	V
Input Voltage	V_{IN}		1.4		5.5	V
Current Limit	I_{LIM}	$V_{\text{EN}}=V_{\text{IN}}$	500			mA
Dropout Voltage**1	V_{DROP}	$V_{\text{OUT}}=1.05\text{V}$, $I_{\text{OUT}}=500\text{mA}$		554	720	mV
		$V_{\text{OUT}}=1.1\text{V}$, $I_{\text{OUT}}=500\text{mA}$		526	684	mV
Line Regulation	ΔV_{LINE}	$V_{\text{IN}}=V_{\text{OUT}}+0.5\text{V} \sim 5.5\text{V}$		1	5	mV
Load Regulation	ΔV_{Load}	$I_{\text{OUT}}=1 \sim 500\text{mA}$		25	47	mV
Quiescent Current	I_{Q}	$V_{\text{OUT}}=1.2\text{V}$, $I_{\text{OUT}}=0$		50	90	μA
Short Current	I_{SHORT}	$V_{\text{EN}}=V_{\text{IN}}$, V_{OUT} Short to GND		120		mA
Shut-down Current	I_{SHDN}	$V_{\text{EN}}=0\text{V}$			1.0	μA
Power Supply Rejection Rate	PSRR	$V_{\text{IN}}=(V_{\text{OUT}}+1\text{V})_{\text{DC}}+0.5\text{V}_{\text{P-P}}$ $I_{\text{OUT}}=10\text{mA}$, $V_{\text{OUT}}=1.05\text{V}$	$f=100\text{Hz}$		79	dB
			$f=1\text{kHz}$		78	dB
			$f=10\text{kHz}$		73	dB
			$f=100\text{kHz}$		55	dB
			$f=1\text{MHz}$		45	dB
EN logic high voltage	V_{ENH}	$V_{\text{IN}}=5.5\text{V}$, $I_{\text{OUT}}=1\text{mA}$	1			V
EN logic low voltage	V_{ENL}	$V_{\text{IN}}=5.5\text{V}$, $V_{\text{OUT}}=0\text{V}$			0.4	V
EN Input Current	I_{EN}	$V_{\text{EN}}=0$ to 5.5V		120		nA
Output Noise Voltage	e_{NO}	10Hz to 100KHz, $C_{\text{OUT}}=1\mu\text{F}$		20		μV_{RMS}
Thermal shutdown threshold	T_{SD}			160		$^{\circ}\text{C}$
Thermal shutdown hysteresis	ΔT_{SD}			30		$^{\circ}\text{C}$
Auto-discharge Nch Tr, ON Resistance	R_{LOW}	$V_{\text{IN}}=4\text{V}$, $V_{\text{CE}}=0\text{V}$, $V_{\text{OUT}}=2.8\text{V}$		120		Ω

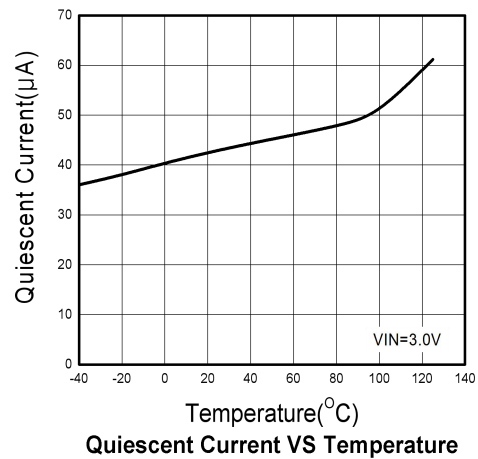
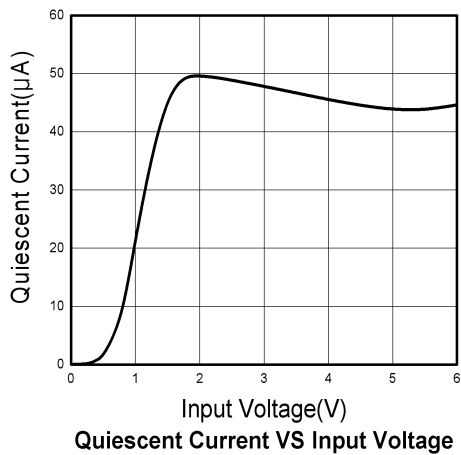
*1. Dropout voltage is the voltage difference between the input and output at which the output voltage drops 2% below its nominal value.

Typical characteristics ($T_a=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}}+1\text{V}$, $I_{\text{OUT}}=1\text{mA}$, $C_{\text{IN}}=C_{\text{OUT}}=1\ \mu\text{F}$, unless otherwise noted)

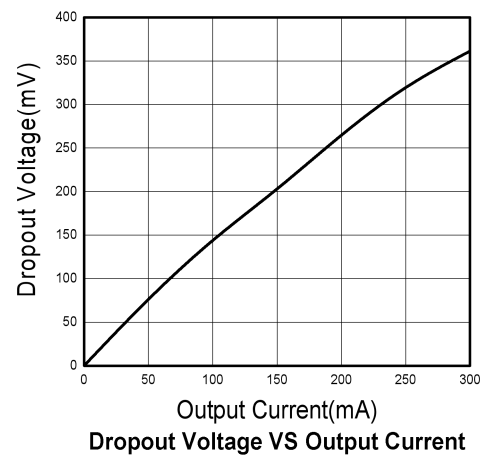
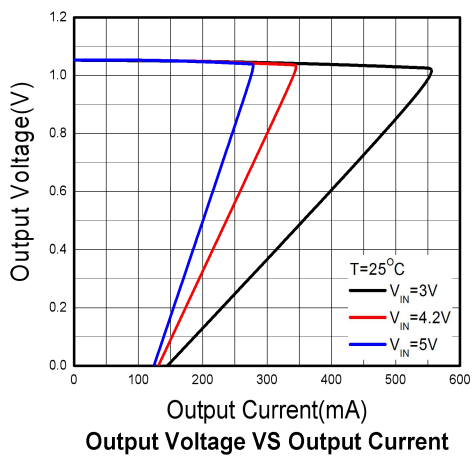
$V_{\text{OUT}}=1.05\text{V}$

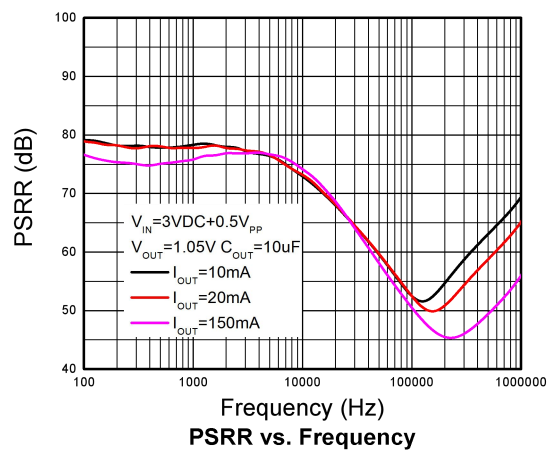
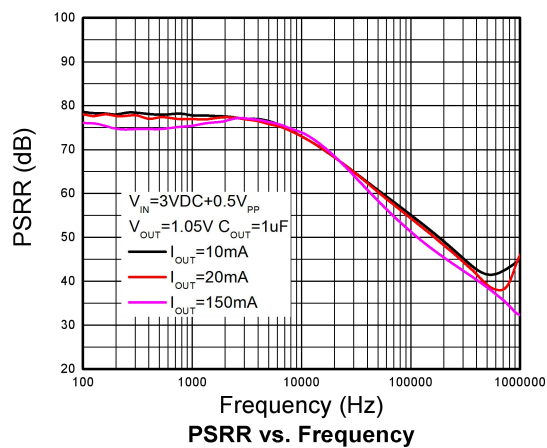


$V_{\text{out}}=1.05\text{V}$



$V_{\text{out}}=1.05\text{V}$

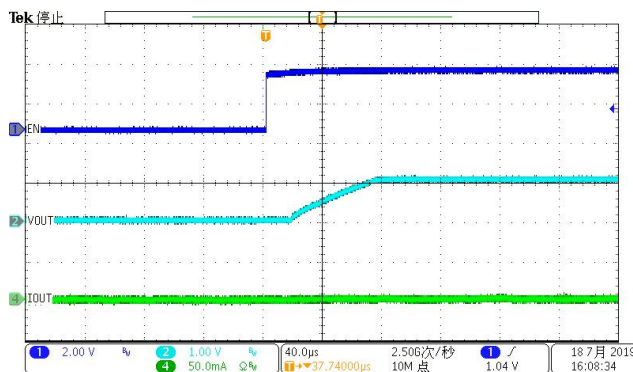


$V_{OUT}=1.05V$


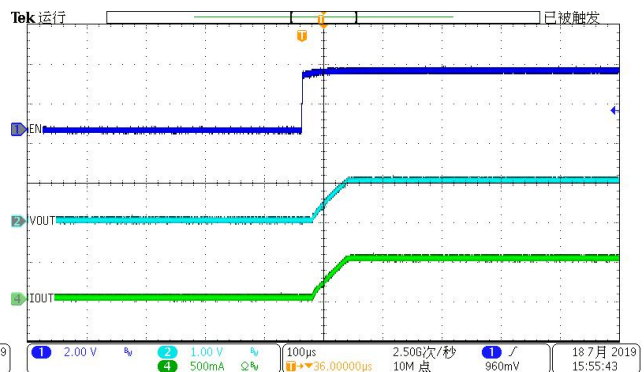
1.Start up (Soft Start from EN)

$V_{OUT}=1.05V$

$V_{IN}=2.05V, C_{OUT}=1\mu F, I_{OUT}=1mA$



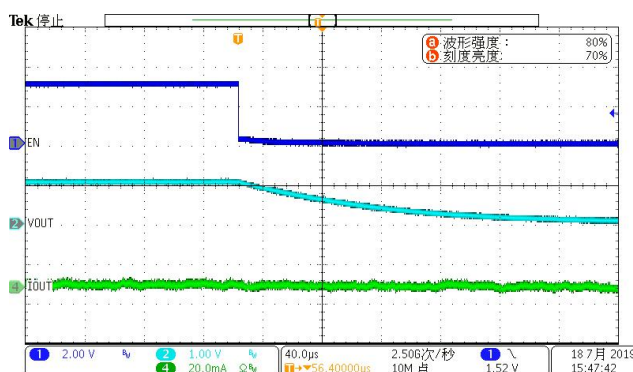
$V_{IN}=2.05V, C_{OUT}=1\mu F, I_{OUT}=500mA$



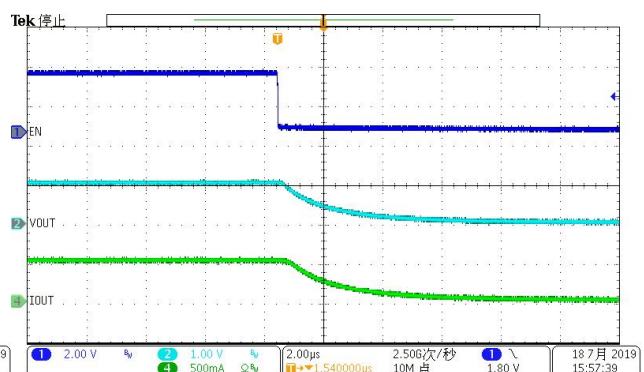
2.Shutdown (Shutdown from EN)

$V_{OUT}=1.05V$

$V_{IN}=2.05V, C_{OUT}=1\mu F, I_{OUT}=1mA$



$V_{IN}=2.05V, C_{OUT}=1\mu F, I_{OUT}=500mA$

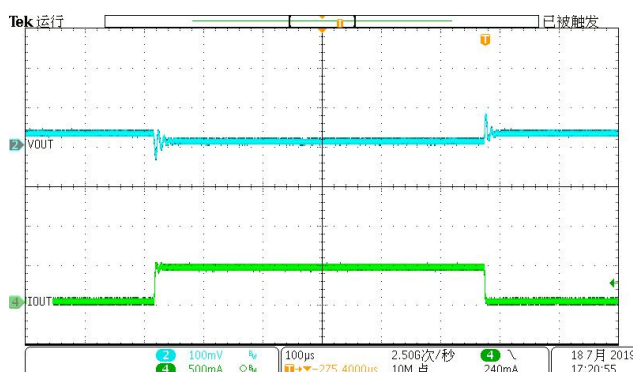


3.Load & Line Transient

Load Transient

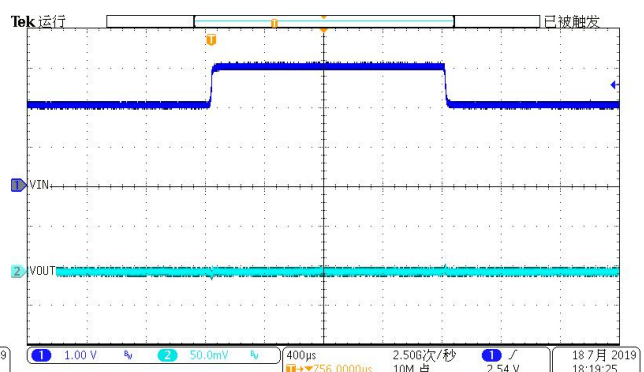
$V_{OUT}=1.05V$

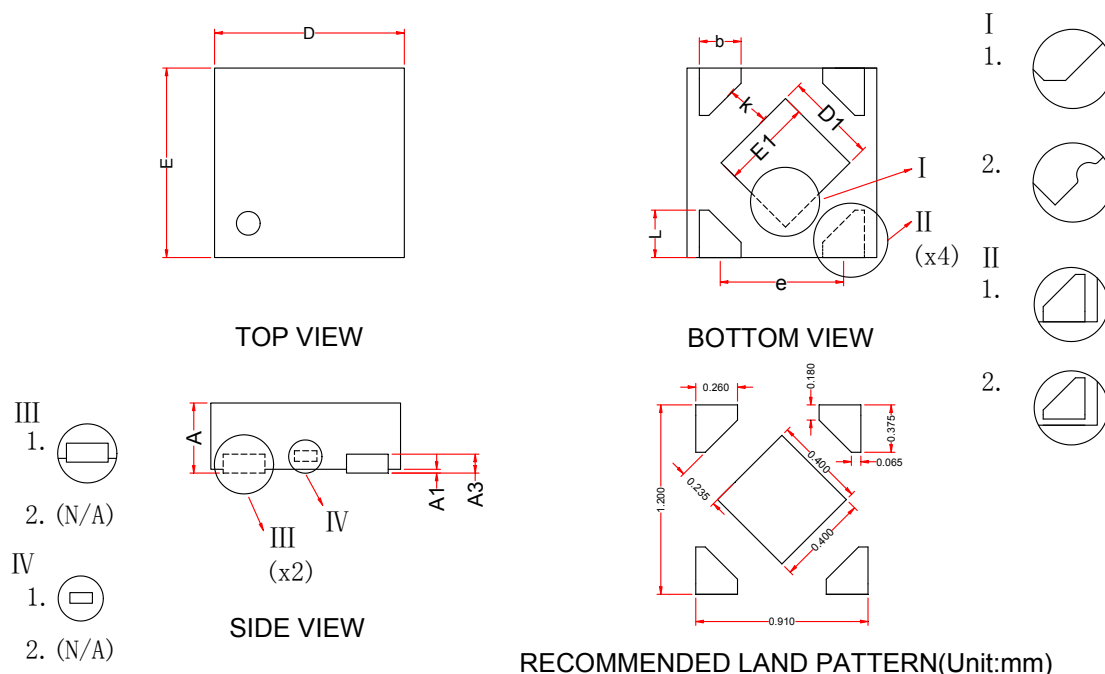
$V_{IN}=2.05V, C_{OUT}=1\mu F, I_{OUT}=1mA-500mA$



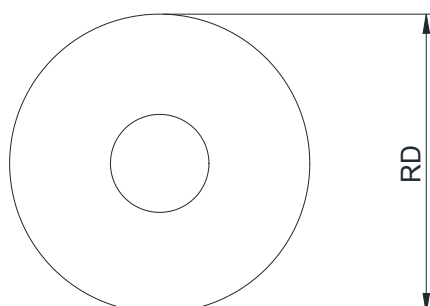
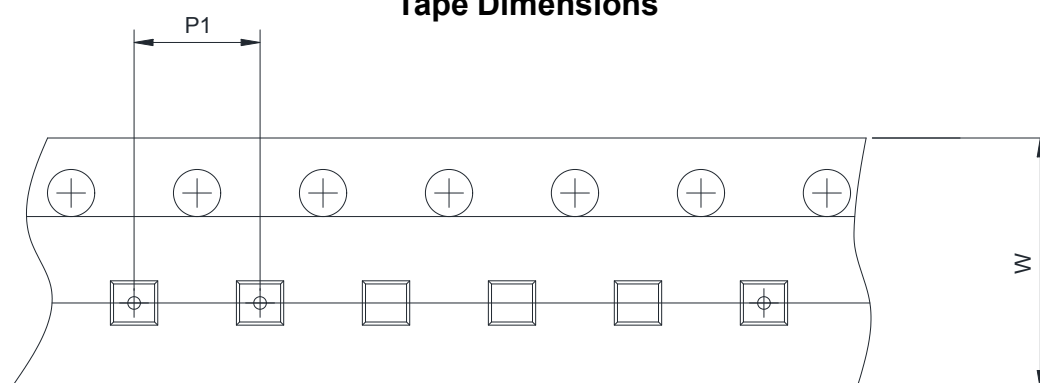
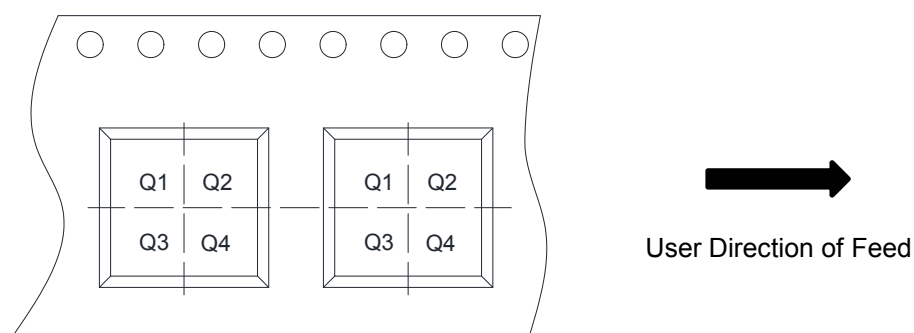
Line Transient

$V_{IN}=2.05V-3.05V$ in 20μs, $C_{OUT}=1\mu F, I_{OUT}=1mA$



PACKAGE OUTLINE DIMENSIONS
DFN1x1-4L


Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.32	0.37	0.42
A1	-	-	0.05
A3	0.10 Ref.		
b	0.17	0.22	0.28
L	0.17	-	0.30
D	0.95	1.00	1.05
E	0.95	1.00	1.05
D1	0.43	0.48	0.54
E1	0.43	0.48	0.54
K	0.14	-	-
e	0.65BSC		

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	☒ 7inch	☐ 13inch
W	Overall width of the carrier tape	☒ 8mm	☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☒ 2mm	☐ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☒ Q1	☐ Q2 ☐ Q3 ☐ Q4

ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2837D105-4/TR	1.05	DFN1x1-4L	-40~+85°C	<u>I</u> C YW	Tape and Reel, 10000
WL2837D11-4/TR	1.1	DFN1x1-4L	-40~+85°C	<u>I</u> D YW	Tape and Reel, 10000
WL2837D115-4/TR	1.15	DFN1x1-4L	-40~+85°C	<u>I</u> p YW	Tape and Reel, 10000