WL2834CA

1A, 5.5V, Ultra Low Dropout Linear Regulator

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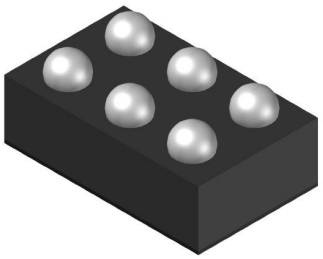
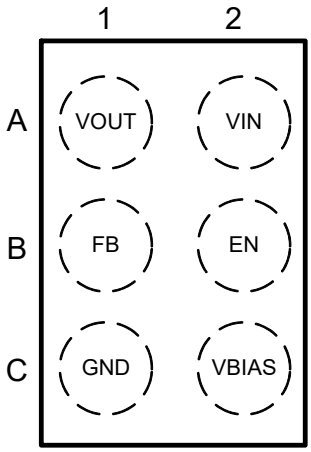
Descriptions

The WL2834CA is a 1 A VLDO equipped with NMOS pass transistor and a separate bias supply voltage (V_{BIAS}). The device provides very stable, accurate output voltage with low noise suitable for space constrained, noise sensitive applications. In order to optimize performance for battery operated portable applications, the WL2834CA features low I_Q consumption.

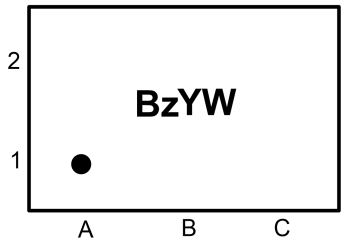
The WL2834CA is available in 0.8x1.2mm 6-Ball wafer level Chip-Scale-Package. Standard products are Pb-free and Halogen-free.



CSP-6L (Bottom View)



Pin Configuration (Top View)



Marking

Bz = Device code
Y = Year code
W = Week code

Features

- Input Voltage Range : 0.5~5V
- Bias Voltage Range : 3.0~5.5V
- Output Voltage Range : 0.5V~3.6V
- Low Dropout : 85mV Typ. @ 1 A
- Bias Input Current : 44μA Typ.@enable
- Bias Input Current : 0.5μA Typ.@disable
- Output voltage accuracy : ±0.5%@25°C
- Logic Level Enable Input for ON/OFF Control
- Output Active Discharge Function
- Stable with a 10μF Output Ceramic Capacitor

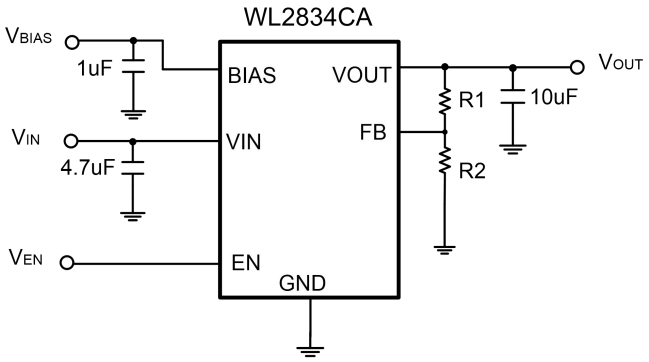
Applications

- Battery−powered Equipment
- Smart phones , Tablets
- Cameras, DVRs, STB and Camcorders

Order Information

Ordering No.	V_{OUT} (V)	Marking	Shipping
WL2834CA-6/TR	ADJ	BzYW	Tape and Reel, 3000

Typical Application



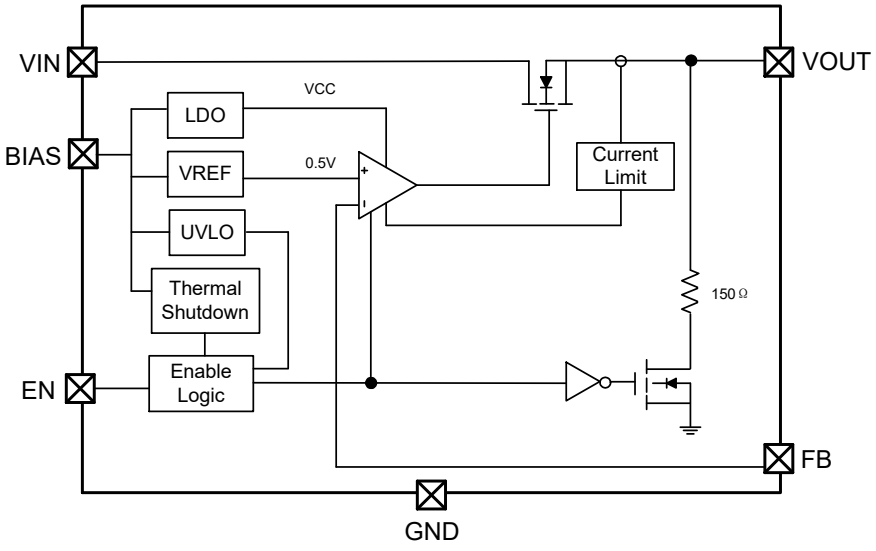
$$V_{OUT}= V_{REF} \times (1+R1/R2)$$

Note: It is recommended to keep the total serial resistance of resistors (R1 + R2) no greater than 100kΩ .

PIN Functions

PIN	Symbol	Description
A1	VOUT	Regulated Output Voltage pin
A2	VIN	Input Voltage Supply pin
B1	FB	Adjustable Regulator Feedback Input. Connect to output voltage resistor divider central node
B2	EN	Enable pin. Driving this pin high enables the regulator. Driving this pin low puts the regulator into shutdown mode.
C1	GND	Ground pin
C2	VBIAS	Bias voltage supply for internal control circuits. This pin is monitored by internal Under-Voltage Lockout Circuit.

Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	−0.3 to 6	V
Output Voltage	V_{OUT}	−0.3 to (VIN+0.3) ⩽ 6	V
Chip Enable, Bias, FB Input	V_{EN}, V_{BIAS}, V_{FB}	−0.3 to 6	V
Output Short Circuit Duration	t_{SC}	unlimited	S
Maximum Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	−55 to 150	°C
ESD Capability, Human Body Model	ESD_{HBM}	2000	V
ESD Capability, Machine Model	ESD_{MM}	200	V

These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Recommended Operating Conditions

Parameter	Value	Unit
Supply Input Voltage, V_{IN}	V_{OUT} +V_{DO} to 5	V
Supply Input Voltage, V_{BIAS} (Note 1)	3.0 to 5.5	V
Junction Temperature Range	−40 to 125	°C
Ambient Temperature Range	−40 to 85	°C
Thermal Resistance, $R_{\theta JA}$ (Note 2)	114	°C/W

Note 1 . V_{BIAS} has to be equal or bigger than V_{OUT}+1.6V

Note 2 . $R_{\theta JA}$ is measured under natural convection (still air) at TA = 25° C with the component mounted on 1.5*1.5 $inch^2$ FR-4 , copper (1 $inch^2$/2oz)

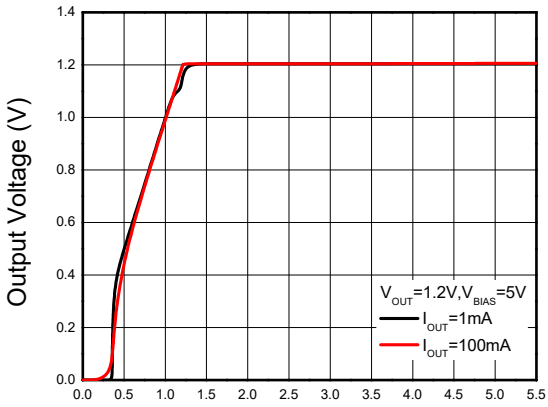
Electronics Characteristics (V_{BIAS} = 3V, or (V_{OUT} + 1.6V), whichever is greater, V_{IN} = $V_{OUT(Normal)}$ + 0.3V, I_{OUT} = 1mA, V_{EN} = 2.2V, C_{IN} = 4.7μF, C_{OUT} = 10μF, C_{BIAS} = 1μF, T_A = 25°C, unless otherwise specified).

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Input Voltage Range	V_{IN}		V_{OUT} +V_{DO}		5 & <V_{BIAS}	V
Operating Bias Voltage Range	V_{BIAS}		(V_{OUT} + 1.60) ≥ 3.0		5.5	V
Under-Voltage Lockout	V_{UVLO}	V_{BIAS} Rising		1.65		V
		Hysteresis		0.2		
Reference Voltage	V_{REF}	WL2834CA,T_A= 25°C	0.495	0.5	0.505	V
Output Voltage Accuracy	V_{OUT}	T_A=25°C		±0.5		%
Output Voltage Accuracy	V_{OUT}	V_{OUT} + 0.3 V ≤ V_{IN} ≤V_{OUT} + 1.0 V, 3.0 V or (V_{OUT} +1.6 V), whichever is greater < V_{BIAS} < 5.5 V, 1mA < I_{OUT} < 1.0 A T_J= -40~85°C (note 3)	−1.0		+1.0	%
V_{IN} Line Regulation	$Line_{Reg}$	V_{OUT} + 0.3 V ≤ V_{IN} ≤ V_{BIAS}		0.1		mV
V_{BIAS} Line Regulation	$Line_{Reg}$	3.0 V or (V_{OUT} + 1.6 V), whichever is greater < V_{BIAS} < 5.5 V		0.1		mV
Load Regulation	$Load_{Reg}$	I_{OUT} = 1mA to 1.0 A		2.0		mV
V_{IN} Dropout Voltage	V_{DO}	I_{OUT} = 1.0 A		85	106	mV
V_{BIAS} Dropout Voltage	V_{DO}	I_{OUT} = 1.0 A, V_{IN} = V_{BIAS}		1.0	1.5	V
Short Current	I_{SHORT}	V_{OUT} = 0V	300		610	mA
Output Current Limit	I_{LIM}	V_{OUT} = 90% V_{OUT}	5.0* I_{SHORT}	5.2* I_{SHORT}		mA
FB Pin Operating Current	I_{FB}	V_{FB}=0.5V,V_{EN} =V_{IN}=V_{BIAS}=3.6V		0.01	0.5	μA
Bias Pin Quiescent Current	I_{BIASQ}	V_{BIAS} = 3.0 V, I_{OUT} = 0mA		44	60	μA
Bias Pin Disable Current	$I_{BIAS(DIS)}$	V_{EN} ≤ 0.4V		0.5	1	μA
V_{IN} Pin Disable Current	$I_{VIN(DIS)}$	V_{EN} ≤ 0.4V		0.07	1	μA

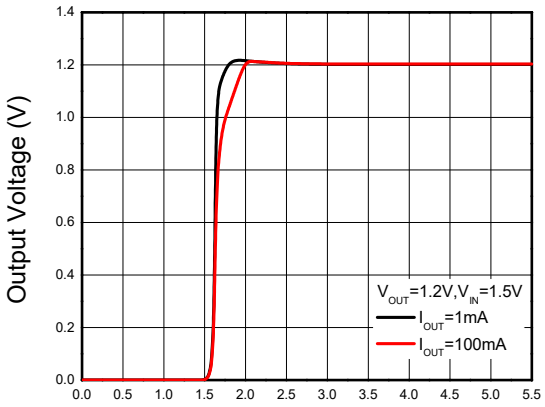
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
EN Pin Threshold Voltage	$V_{EN(H)}$	EN Input Voltage “H”	1.4			V
	$V_{EN(L)}$	EN Input Voltage “L”			0.4	
EN Pull Down Current	I_{EN}	V_{EN} = 5.5 V		0.4	1	μA
Turn−On Time	t_{ON}	From assertion of V_{EN} to V_{OUT} =98% V_{OUT},V_{OUT} = 1.2 V, C_{OUT} = 10μF		180	320	μS
Power Supply Rejection Ratio	$PSRR_{(VIN)}$	V_{IN} to V_{OUT}, f = 1 kHz, I_{OUT} = 10mA, V_{IN} ≥ V_{OUT} +0.5 V, V_{OUT} = 1.2 V, C_{OUT} = 10μF		80		dB
	$PSRR(V_{BIAS})$	V_{BIAS} to V_{OUT}, f = 1 kHz, I_{OUT} = 10mA, V_{IN} ≥ V_{OUT} +0.5 V, V_{OUT} = 1.2 V, C_{OUT} = 10μF		77		
Output Noise Voltage	V_N	f = 10kHz to 100Hz, V_{IN} = V_{OUT}+0.5 V, V_{OUT}=1.2V, C_{OUT} = 10μF, I_{OUT} = 0mA		50		μV_{RMS}
		f = 10kHz to 100Hz, V_{IN} = V_{OUT}+0.5 V, V_{OUT}=1.2V, C_{OUT} = 10μF, I_{OUT} = 10mA		28		
Thermal Shutdown Threshold	T_{SDH}	Temperature rising (note 3)		165		°C
	T_{SDL}	Temperature falling (note 3)		135		
Output Discharge Pull−Down	R_{DISCH}	V_{EN} ≤ 0.4 V, V_{OUT} = 0.5 V		150	220	Ω

Note 3 . Guaranteed by design.

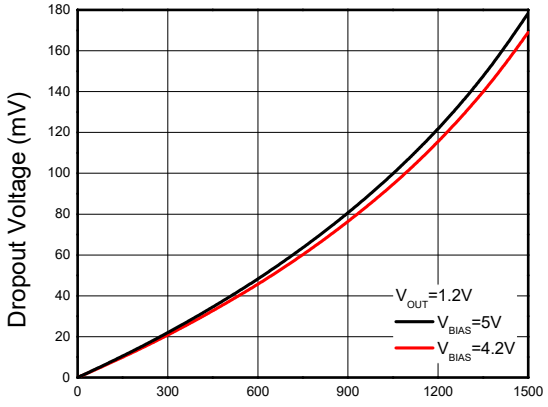
Typical Characteristics



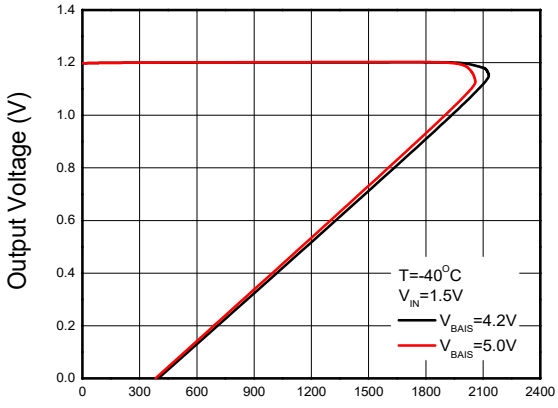
Output Voltage VS Input Voltage



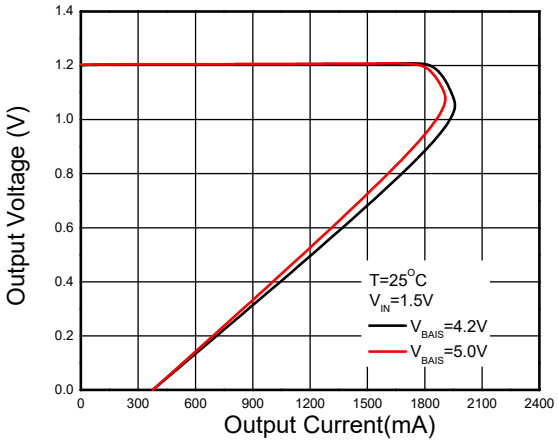
Output Voltage VS Bias Voltage



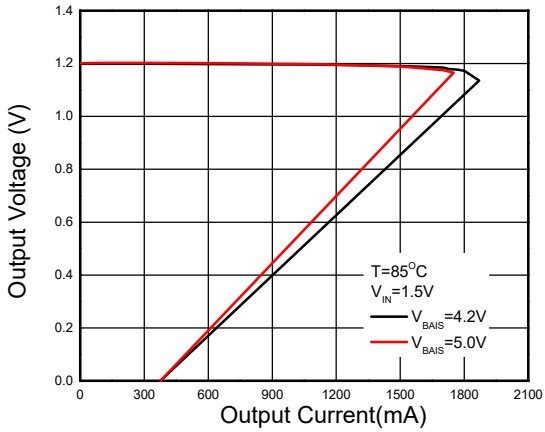
Dropout Voltage vs Output Current



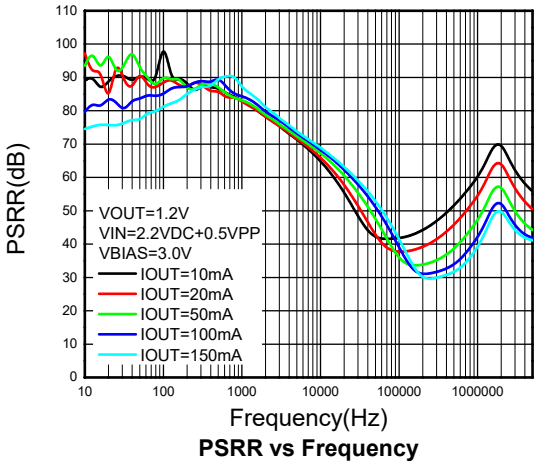
Output Voltage vs Output Current



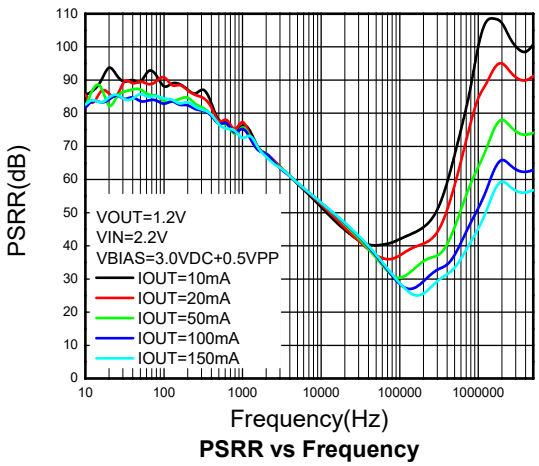
Output Voltage vs Output Current



Output Voltage vs Output Current



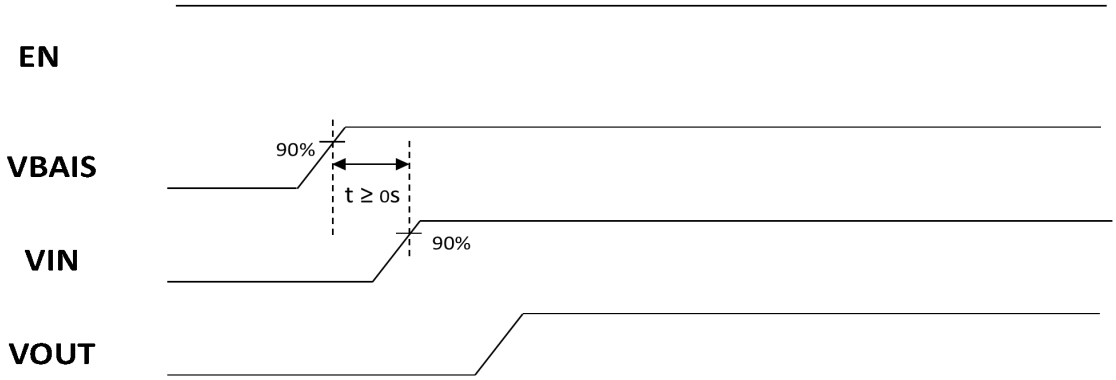
PSRR vs Frequency



PSRR vs Frequency

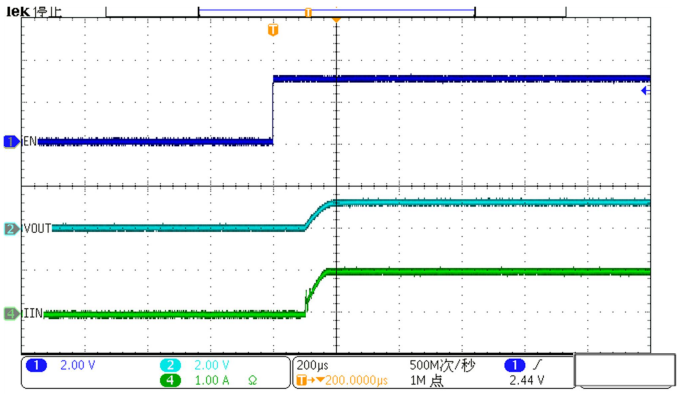
Power on sequence

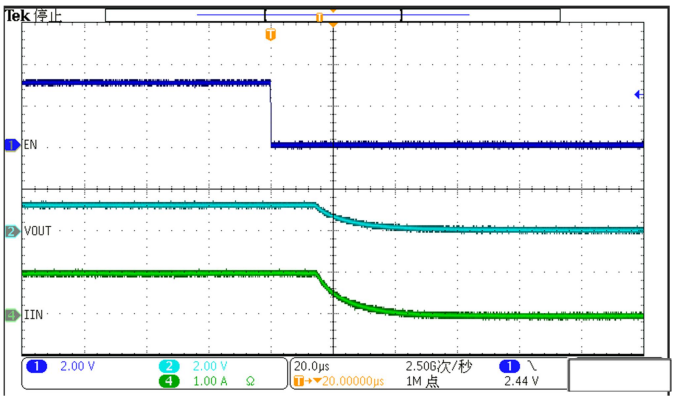
The Power on sequence of V_{BIAS} is no later than V_{IN} , or else ,the V_{OUT} will fail to output .



EN Soft-Start & Shutdown

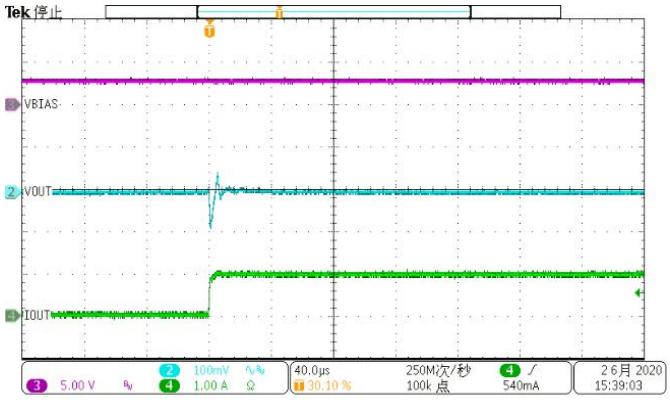
V_{IN}=1.5V, V_{BAIS}=3V, V_{OUT}=1.2V,I_{OUT}=1A



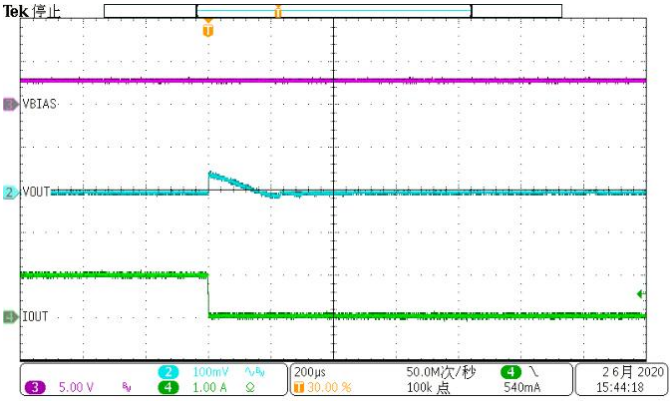


Load Transient

V_{IN}=1.35V, V_{BIAS}=3.3V, V_{OUT}=1.2V, I_{OUT}=1mA~1A in 1us

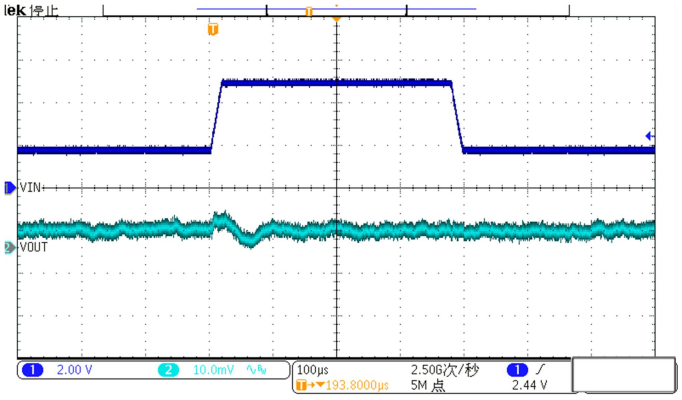


V_{IN}=1.35V, V_{BIAS}=3.3V, V_{OUT}=1.2V, I_{OUT}=1A~1mA in 1us

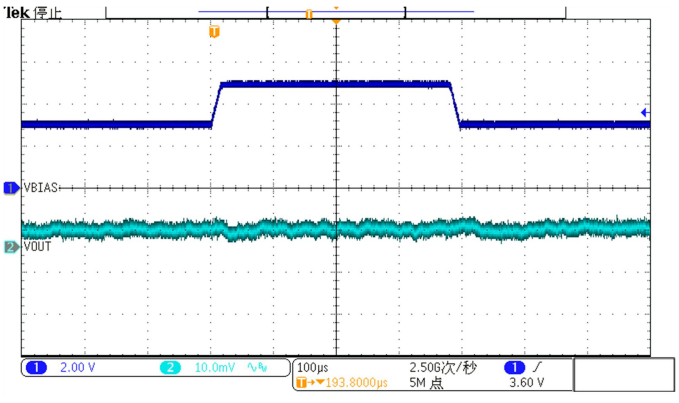


Line Transient

V_{IN}=1.5V -5V in 20us,V_{BIAS}=5.0V， V_{OUT}=1.2V, I_{OUT}=1mA

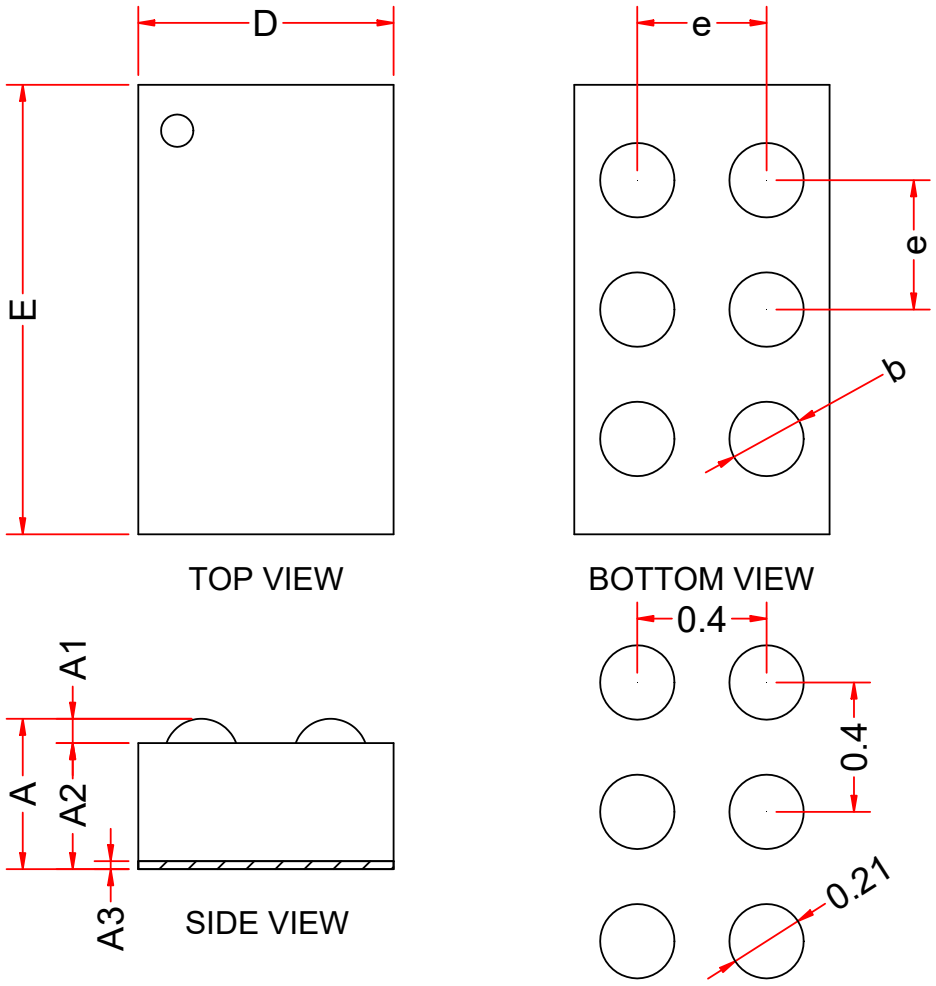


V_{IN}=1.5V,V_{BIAS}=3V~5V in 20us， V_{OUT}=1.2V, I_{OUT}=1mA



PACKAGE OUTLINE DIMENSIONS

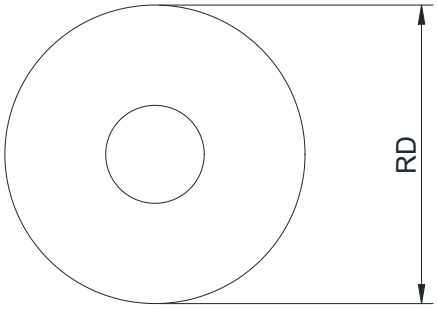
WLCSP-6L



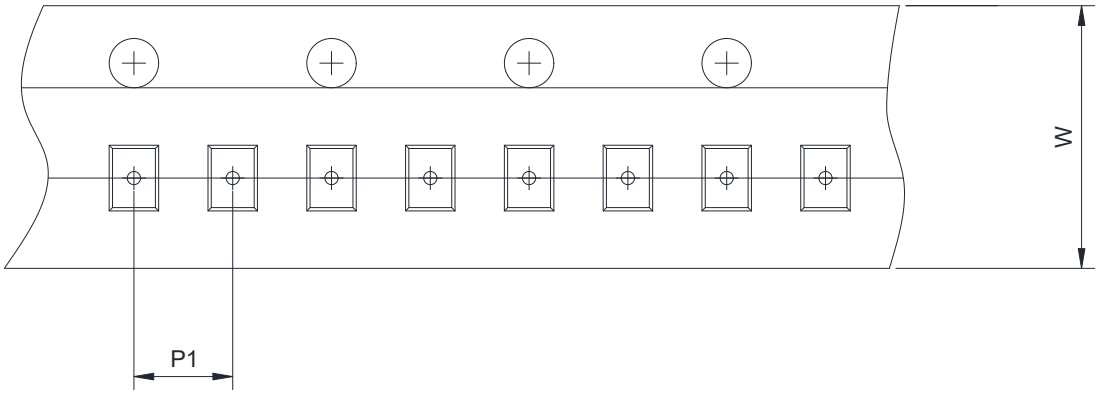
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.26	0.31	0.35
A1	0.04	0.06	0.08
A2	0.22	0.25	0.27
A3		0.025 Typ.	
D	0.74	0.77	0.80
E	1.14	1.17	1.20
e		0.40 BSC.	
b	0.25	0.27	0.29

TAPE AND REEL INFORMATION

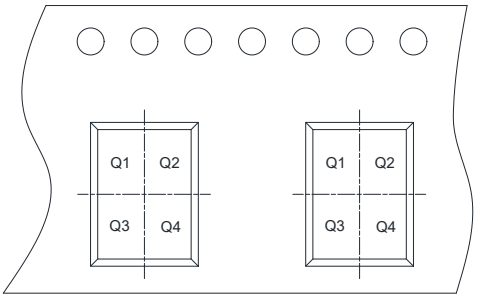
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

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

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