

Ultra low noise, high PSRR, CMOS LDO

General Description

The WR0341 series are CMOS-based Ultra low noise, high PSRR linear regulators, offering 250mA with low dropout voltage, low quiescent current, and low line or load transient response figures. The WR0341 series consist of an accurate voltage-reference block, Pre-regulator block, LPF block, an error amplifier, a voltage-setting resistor net, a PMOSFET pass device, a thermal-shutdown circuit, and a current limit circuit .

The WR0341 series use a type of outstanding CMOS process to minimize the supply current. Using new innovative design techniques, the WR0341 offers class-leading noise performance without a noise bypass capacitor and the ability for remote output capacitor placement.

The device is designed to work with a 1 μ F input and a 1 μ F output ceramic capacitor (no separate noise bypass capacitor is required).The WR0341 regulators are available in SOT23-5 and DFN1x1-4 packages.

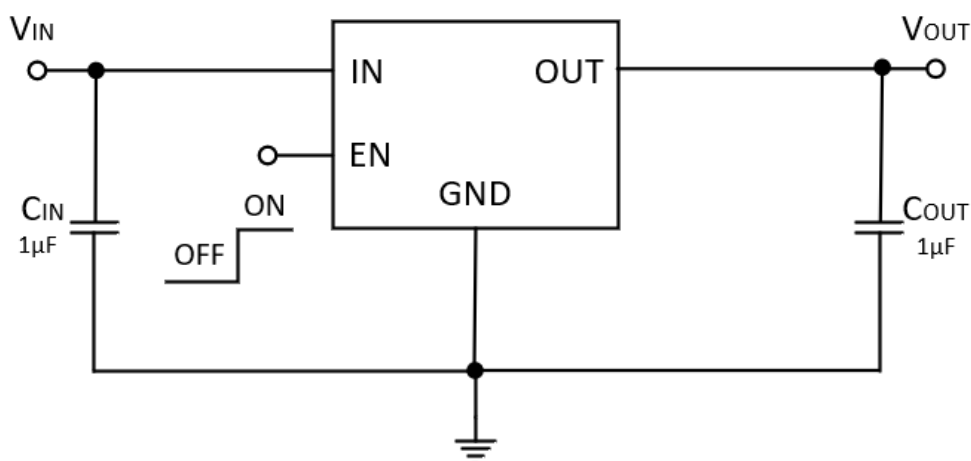
Features

- Wide Input Voltage Range: 2.2V to 5.5V
- Output Voltage Range: 1.2V to 4.5V
- Output Current: 250mA
- Very Low I_Q(enable): 12 μ A
- Excellent Load/Line Transient Response
- Line Regulation: 0.02% typical
- No Noise Bypass Capacitor Required
- PSRR: 82dB at 1KHZ
- Output Voltage Tolerance: \pm 2%
- Low Dropout: 120 mV (typical)

Applications

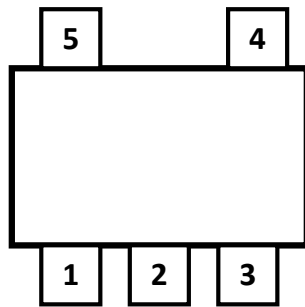
- Mobile Phones, Tablets
- Digital Cameras and Audio Devices
- Portable and Battery-Powered Equipment
- RF, PLL, VCO, and Clock Power Supplies
- Smart Meters and Field Transmitter

Typical Application

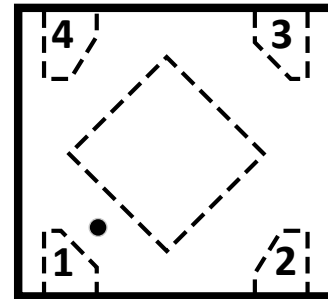


Pin Configurations

(Top View)



SOT23-5



DFN-4

Pin Description

Pin Number		Pin Name	Description
SOT23-5	DFN-4		
1	4	IN	Input Voltage
2	2	GND	Ground
3	3	EN	Enable, Active High
4	-	NC	NC
5	1	OUT	Output Voltage

Absolute Maximum Ratings

Parameter	Rating	Unit
Input Voltage (V_{IN} Pin)	-0.3 to 6.0	V
Input Voltage (EN Pin)	-0.3 to 6.0	V
Output Voltage	-0.3 to 6.0	V
Operating Temperature Range	-40 to 125	°C
Storage Temperature Range	-65 to 150	°C

Recommend Operating Ratings

Parameter	Rating	Unit
Operating Supply voltage	2.2 to 5.5	V
Operating Temperature Range	-40 to 85	°C

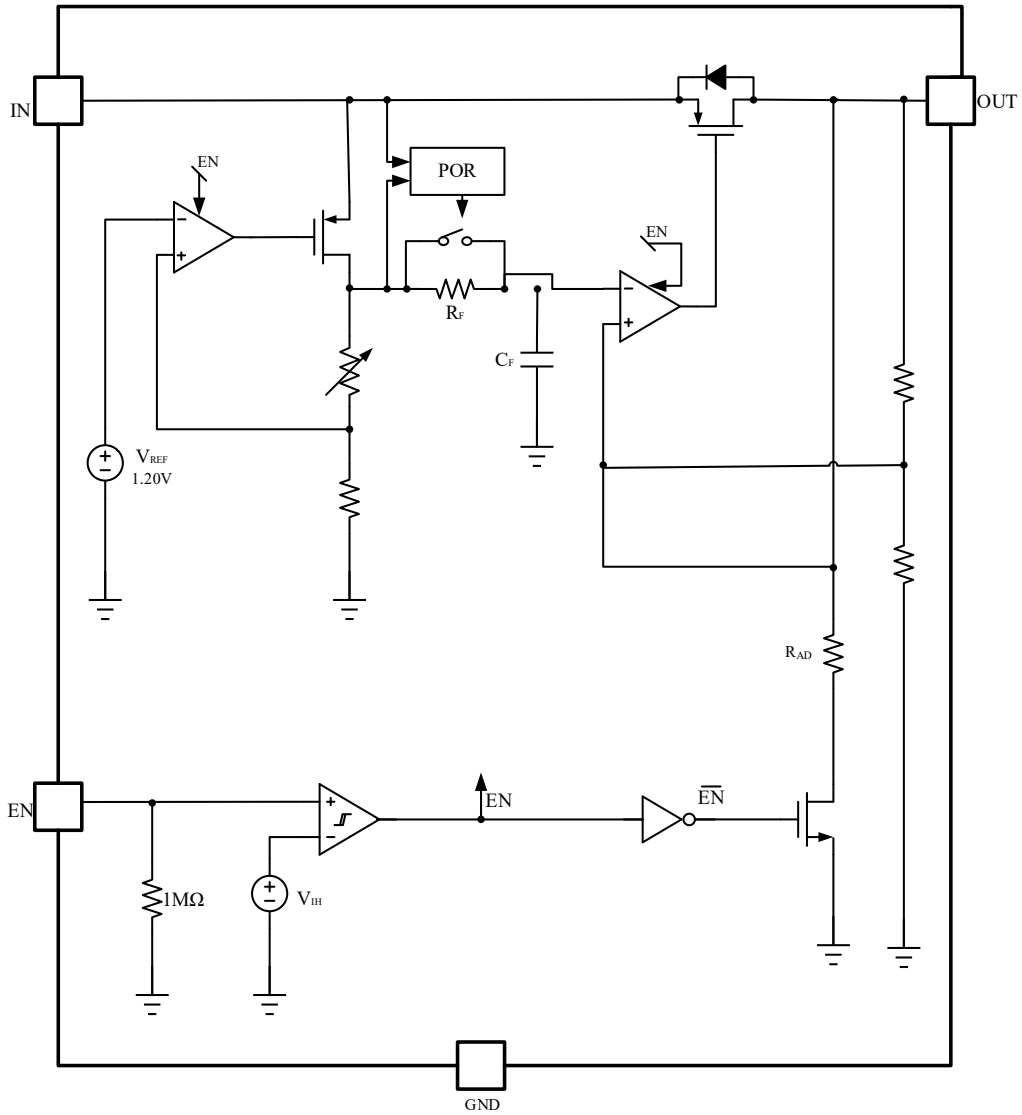
Electrical Characteristics

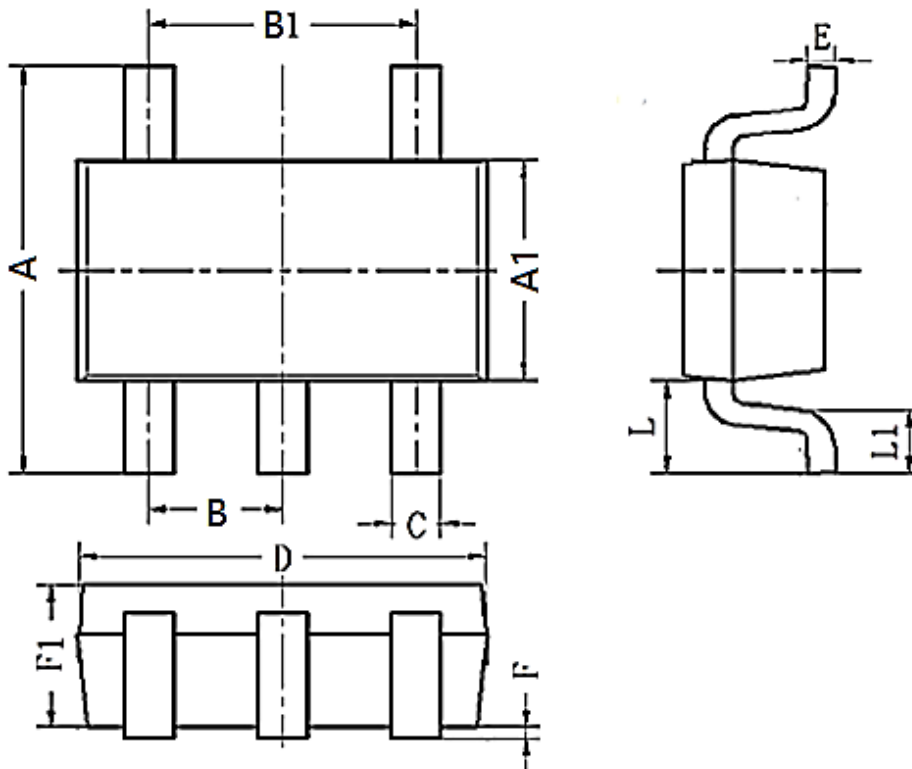
($T_A=25\text{ }^\circ\text{C}$, $V_{IN}=V_{OUT}+1.0\text{V}$, $I_{OUT}=1\text{mA}$, $C_{IN}=1\mu\text{F}$, $C_{OUT}=1\mu\text{F}$, $V_{EN}=1.2\text{V}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
V_{OUT}	Output Voltage	$T_A=25\text{ }^\circ\text{C}$	2.2		5.5	V
ΔV_{OUT}	Output voltage tolerance	$V_{IN}=V_{OUT}+1.0\text{V}$, $I_{OUT}=1\text{mA}$ to 250mA	-2		2	% V_{OUT}
LDR	Load Regulation	$I_{OUT}=1\text{mA}$ to 250mA	0.001			%mA
LNR	Line Regulation	$V_{IN}=V_{OUT}+1.0\text{V}$ to 5.5V , $I_{OUT}=1\text{mA}$	0.02			%V
I_{LOAD}	Load current		0		250	mA
	Maximum output current		250			
I_Q	Quiescent current	$V_{EN}=1.2\text{V}$, $I_{OUT}=0\text{mA}$		12	25	μA
		$V_{EN}=1.2\text{V}$, $I_{OUT}=250\text{mA}$		400	625	
I_{SHDN}	Shut down Current	$V_{EN}=0\text{V}$, $I_{OUT}=0\text{mA}$		0.2	1	μA
V_{DO}	Dropout voltage	$I_{OUT}=100\text{mA}$		50		mV
		$I_{OUT}=250\text{mA}$		120	250	
I_{SHORT}	Short-circuit current limit	$T_A=25\text{ }^\circ\text{C}$	250	500		mA
PSRR	Power Supply Ripple Rejection	$f=100\text{Hz}$, $I_{OUT}=20\text{mA}$		85		dB
		$f=1\text{KHz}$, $I_{OUT}=20\text{mA}$		82		
		$f=10\text{KHz}$, $I_{OUT}=20\text{mA}$		65		
		$f=100\text{KHz}$, $I_{OUT}=20\text{mA}$		60		
V_{NO}	Output noise voltage	$BW=10\text{Hz}$ to 100KHz , $I_{OUT}=1\text{mA}$		12		μV_{RMS}
		$BW=10\text{Hz}$ to 100KHz , $I_{OUT}=250\text{mA}$		6.5		
R_{dis}	Output automatic	$V_{EN} < V_{IL}$	230			Ω
T_{SD}	Thermal shutdown	Thermal shutdown threshold	162			$^\circ\text{C}$
		Thermal hysteresis	18			
t_{ON}	Turn-on time Limit	From $V_{EN} > V_{IL}$ to $V_{OUT} = 95\% V_{OUT(NOM)}$, $T_A=25\text{ }^\circ\text{C}$		120	220	μs
V_{IL}	Low input threshold	$V_{IN}= 2.2\text{V}$ to 5.5V , V_{EN} falling until the output is disabled			0.4	V
V_{IH}	High input threshold	$V_{IN}= 2.2\text{V}$ to 5.5V , V_{EN} rising until the output is disabled	1.2			

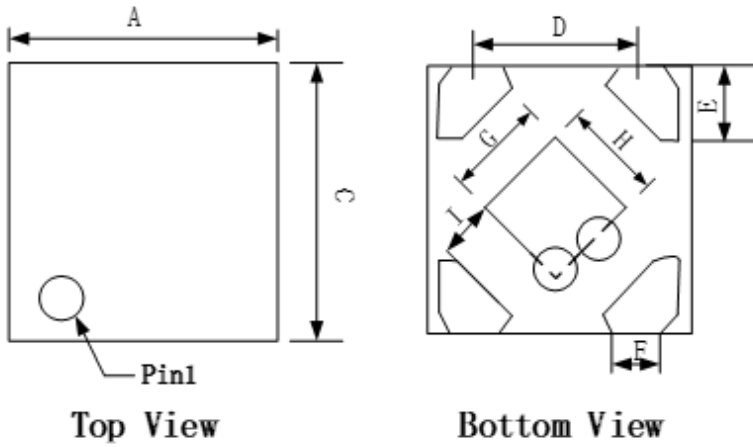
Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
I_{EN}	Input current at EN pin CE Input Voltage High	$V_{IN} = 5.5V, V_{EN} = 5.5V$	5.5			μA
		$V_{IN} = 5.5V, V_{EN} = 0V$	0.001			
ΔV_{OUT}	Line transient	$V_{IN} = (V_{OUT(NOM)} + 1V)$ to $(V_{OUT(NOM)} + 1.6V)$ in $30\mu s$	-1			mV
		$V_{IN} = (V_{OUT(NOM)} + 1.6V)$ to $(V_{OUT(NOM)} + 1V)$ in $30\mu s$			1	
	Load transient	$I_{OUT} = 1mA$ to $250mA$ in $10\mu s$	-40			
		$I_{OUT} = 250mA$ to $1mA$ in $10\mu s$			40	
	Overshoot on start-up	Stated as a percentage of $V_{OUT(NOM)}$			5%	
	Overshoot on start-up with EN	Stated as a percentage of $V_{OUT(NOM)}$, $V_{IN} = V_{OUT} + 1V$ to $5.5V$, $0.7\mu F < C_{OUT} < 10\mu F$, $0mA < I_{OUT} < 250mA$, EN rising until the output is enabled			1%	

Block Diagram



Package Information

SOT 23-5

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	2.60	2.80	3.00
A1	1.50	1.60	1.70
B	0.95BSC		
B1	1.90BSC		
C	0.25	0.40	0.50
D	2.82	2.92	3.02
E	0.10	0.15	0.20
F	0.00	0.08	0.15
L	0.59REF		
F1	0.90	1.10	1.30
L1	0.30	0.45	0.60



DETAIL A

Pin 1 ID and Tie Bar Mark Options

Note: The configuration of the Pin 1 identifier is optional, but must be located within the zone indicated.



Side View

DFN-4

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.950	1.000	1.050
B	0.320	0.370	0.420
C	0.950	1.000	1.050
D	0.650BSC		
E	0.170	0.270	0.370
F	0.130	0.235	0.300
G	0.430	0.485	0.540
H	0.430	0.485	0.540
I	0.200REF		

Ordering Information

Part Number	Output Voltage	Package	Packing Quantity	Marking*
WR0341-12A50R	1.2V	SOT23-5	3k/Reel	WR0341 12 XXXX
WR0341-15A50R	1.5V	SOT23-5	3k/Reel	WR0341 15 XXXX
WR0341-18A50R	1.8V	SOT23-5	3k/Reel	WR0341 18 XXXX
WR0341-25A50R	2.5V	SOT23-5	3k/Reel	WR0341 25 XXXX
WR0341-28A50R	2.8V	SOT23-5	3k/Reel	WR0341 28 XXXX
WR0341-285A50R	2.85V	SOT23-5	3k/Reel	WR0341 285 XXXX
WR0341-29A50R	2.9V	SOT23-5	3k/Reel	WR0341 29 XXXX
WR0341-30A50R	3.0V	SOT23-5	3k/Reel	WR0341 30 XXXX
WR0341-31A50R	3.1V	SOT23-5	3k/Reel	WR0341 31 XXXX
WR0341-32A50R	3.2V	SOT23-5	3k/Reel	WR0341 32 XXXX
WR0341-33A50R	3.3V	SOT23-5	3k/Reel	WR0341 33 XXXX
WR0341-45A50R	4.5V	SOT23-5	3k/Reel	WR0341 45 XXXX
WR0341-12FF4R	1.2V	DFN4	10k/Reel	341 12
WR0341-15FF4R	1.5V	DFN4	10k/Reel	341 15
WR0341-18FF4R	1.8V	DFN4	10k/Reel	341 18
WR0341-25FF4R	2.5V	DFN4	10k/Reel	341 25
WR0341-28FF4R	2.8V	DFN4	10k/Reel	341 28
WR0341-285FF4R	2.85V	DFN4	10k/Reel	341 285
WR0341-29FF4R	2.9V	DFN4	10k/Reel	341 29
WR0341-30FF4R	3.0V	DFN4	10k/Reel	341 30
WR0341-31FF4R	3.1V	DFN4	10k/Reel	341 31
WR0341-32FF4R	3.2V	DFN4	10k/Reel	341 32
WR0341-33FF4R	3.3V	DFN4	10k/Reel	341 33
WR0341-45FF4R	4.5V	DFN4	10k/Reel	341 45


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For additional information, please contact your local Sales Representative.

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Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.