

40V Input, 500mA Output Current, Low Dropout, Low Quiescent Current LDO

General Description

The BL9153 series is a high accuracy, high input voltage low quiescent current, high speed, and low dropout Linear regulator with high ripple rejection. The device is manufactured with Bi-CMOS process.

The BL9153 offers over-current limit and over temperature protection to ensure the device working in well conditions.

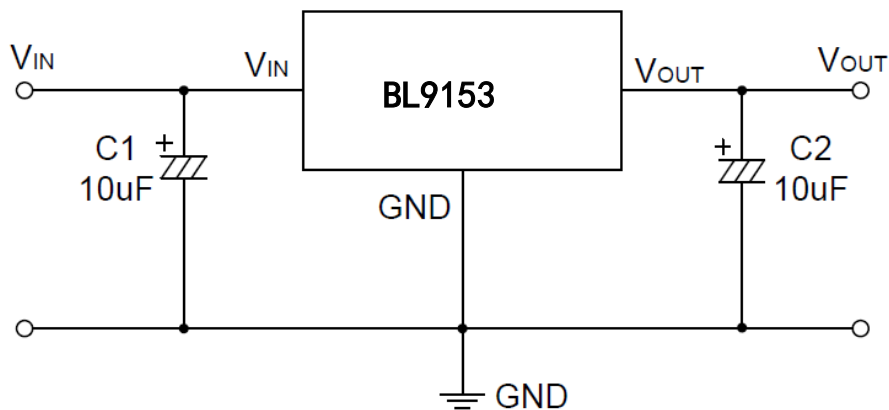


The BL9153 regulators are available in standard SOT-89-3L packages. Standard products are Pb-free and Halogen-free.

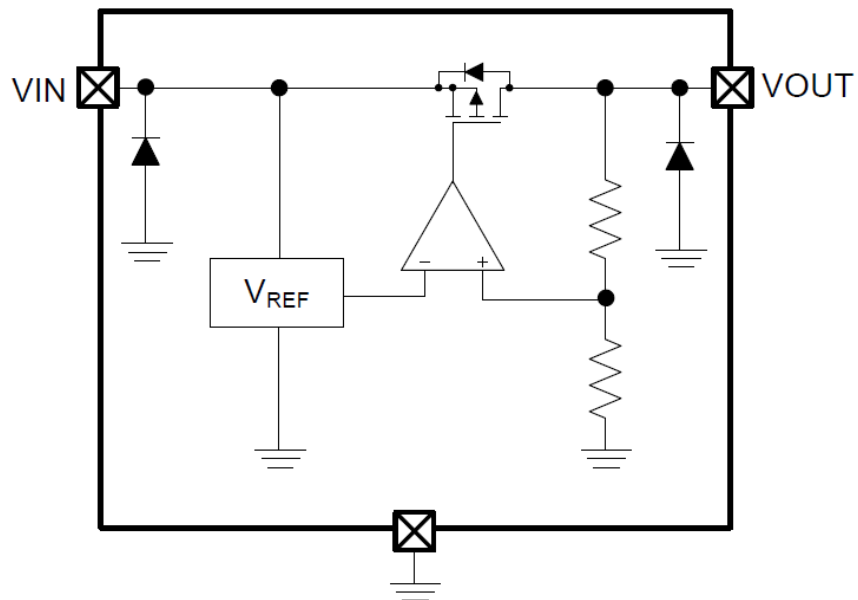
Features

- Supply Voltage : 4.75V~40V
- Output Range : 1.8V~12V
- Output Accuracy : <+/-2%
- Output Current : 100mA (Up to 500mA Typ.)
- PSRR : 45dB @ 100Hz
- Dropout Voltage : 300mV @ $I_{OUT}=100mA$
- Quiescent Current : $6\mu A @ V_{IN}=7V$ (Typ.)
- Recommend Capacitor : 10uF

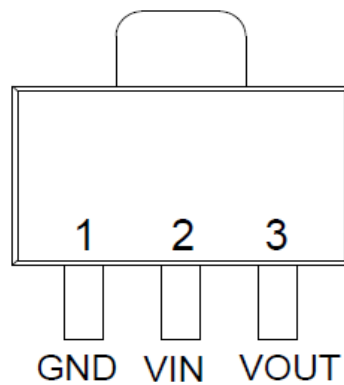
Typical Application



Functional Block Diagram



Pin Configuration



Pin Description

Pin Number	Pin Name	Function Description
1	GND	Ground
2	V_{IN}	Voltage Input
3	V_{OUT}	Voltage Output

Absolute Maximum Ratings (Ta=25 °C)

Parameter Name	Rating	Unit
Power Dissipation	Internal limited	mW
V _{IN} Range	-0.3~45	V
V _{OUT} Range	-0.3~12	V
Lead Temperature Range	260	°C
Storage Temperature Range	-55~150	°C
Operating Junction Temperature Range	125	°C
ESD MM	400	V
ESD HBM	4K	V

Recommended Operating Conditions (Ta=25°C)

Parameter Name	Rating	Unit
Operating Supply voltage	4.75~40	V
Operating Temperature Range	-40~85	°C
Thermal Resistance(On PCB),R _{θJA}	43.5	°C/W
Power Dissipation	1000	mW

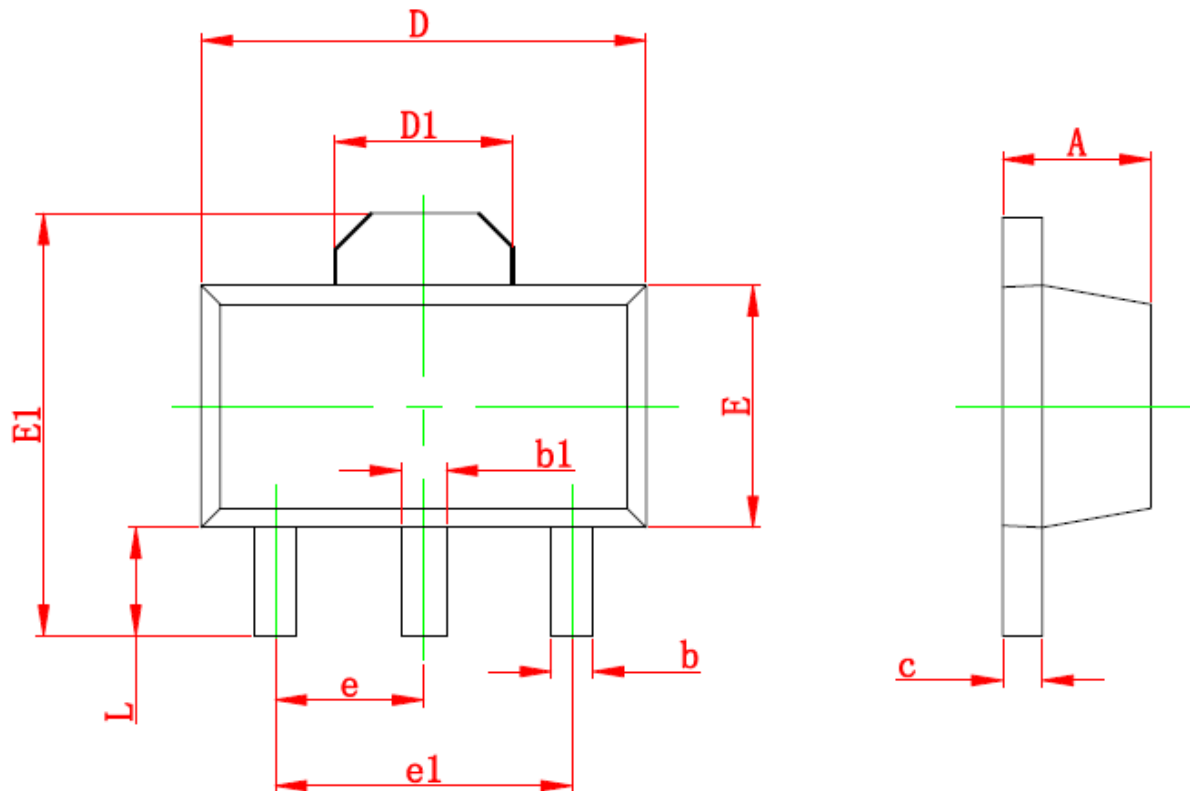
Electrical Characteristics (Ta=25°C, V_{IN}=12V, C_{IN}=C_{OUT}=10uF, unless otherwise noted)

Parameter Name	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Range	V _{IN}	I _{OUT} =10mA	4.75		40	V
Output Voltage	V _{OUT}	V _{IN} =12V, I _{OUT} =10mA	4.9	5.0	5.1	V
Maximum Output Current	I _{OUT_PK}	V _{IN} =12V, R _L =1Ω		500		mA
Quiescent Current	I _Q	V _{IN} =7V, No load		6	10	uA
		V _{IN} =24V, No load		7.5	12	
		V _{IN} =40V, No load		10	18	
Dropout Voltage	V _{DROP}	I _{OUT} =1mA		2	12	mV
		I _{OUT} =100mA		300	400	
Line Regulation	LNR	V _I = 7~24V, V _{OUT} =5V, I _{OUT} =1mA		0.02		% / V
		V _{IN} =7~45V, V _{OUT} =5V, I _{OUT} =1mA		0.1		
Load Regulation	LDR	V _{IN} =12V, I _{OUT} =1~100mA		0.6		%
Output Noise	e _{NO}	I _{OUT} =10mA	-100		100	μV
Ripple Rejection	PSRR	V _{IN} =10V V _{PP} =0.5V I _{OUT} =1mA	f=100Hz		50	dB
			f=1KHz		40	
			f=10KHz		30	
Thermal Protection	T _{SD}	V _{IN} =12V, I _{OUT} =1mA		165		°C
Thermal Protection Hys	T _{SD_HYS}	V _{IN} =12V, I _{OUT} =1mA		30		°C
Temperature Coefficient	ΔV _O /ΔT	V _{IN} =12V, I _{OUT} =1mA		±0.1		mV/°C

Outline Dimensions

SOT-89-3L

Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
Δ	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.200	0.035	0.047