BW9130HV 3A LED Driver with Dimming Control

Description

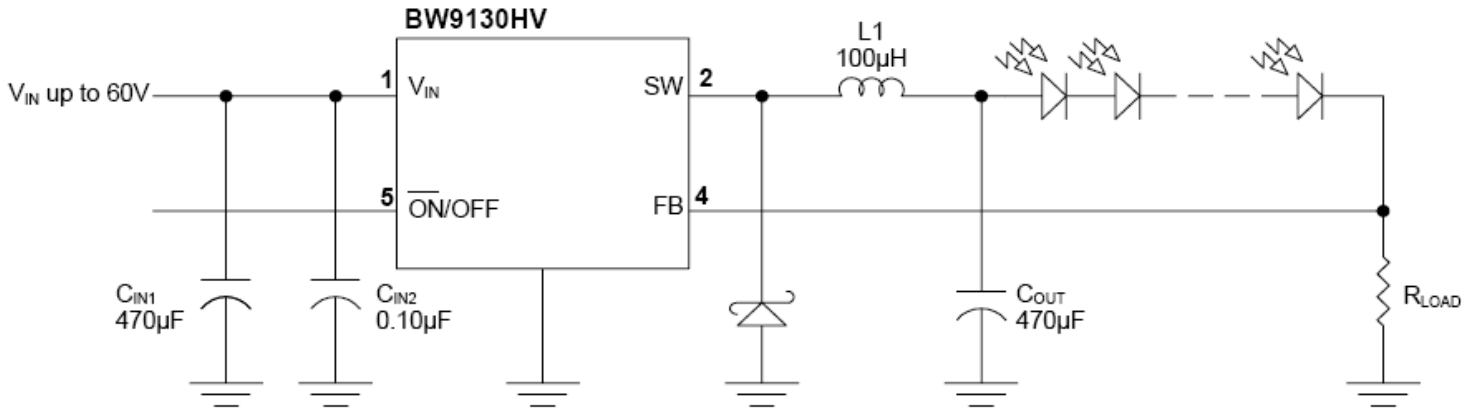
BW9130HV is the monolithic IC designed for a step-down DC/DC converter capable of driving 3A load without an additional transistor. The input voltage range is up to 60V. Its feedback voltage, VFB, is 200mV. The BW9130HV operates at a switching frequency of 52kHz. The external shutdown function is controlled by a logic level on the ON/OFF pin and then the circuit comes into the standby mode with ISTBY~50 μ A (typ.).

The ON/OFF pin may be used for the analog dimming. As the voltage on the ON/OFF pin is increased from 0.07V to 0.67V, the voltage on the FB pin falls from 200mV to 0. The self-protection features include a cycle-bicycles current limit and a thermal protection. The BW9130HV is available in standard 5LTO220, and 5L-TO263 packages.

Features

- Maximum input voltage up to 60V
- VFB: 200mV
- Frequency: 52KHz
- ILED = 3.0A maximum
- ON/OFF input may be used for the analog dimming
- Thermal protection
- Cycle by cycle current limit

Typical Application Circuits



Ordering Information

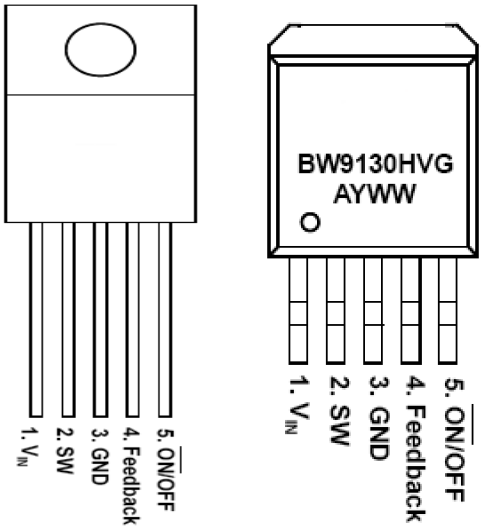
Ordering Number	Oscillation Frequency	Package	Shipping
BW9130HVTA5RG	52KHz	TO-263-5	800 Units / Reel
BW9130HVTB5TG		TO-220-5	50 Units / Tube

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Marking Information and Pin Configurations (Top View)

TO-220-5 **TO-263-5**



Absolute Maximum Ratings (Note 1)

Rating	Symbol	Value	Unit
Maximum Supply Voltage	V_{IN}	63	V
$\overline{ON}$/OFF Pin Input Voltage	$V_{ON/OFF}$	-0.3 to V_{IN}	V
Feedback Pin Voltage	V_{FB}	-0.3 to V_{IN}	V
Minimum SW Voltage	V_{SW}	-0.8	V
Power Dissipation	P_D	Internally Limited	-
Storage Temperature Range	T_{STG}	- 65 to 150	°C
Maximum Junction Temperature	T_J	+ 150	°C
Minimum EDS Rating (Note 2)		2	kV
Lead Temperature (Soldering, 10 sec)		+ 260	°C

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.

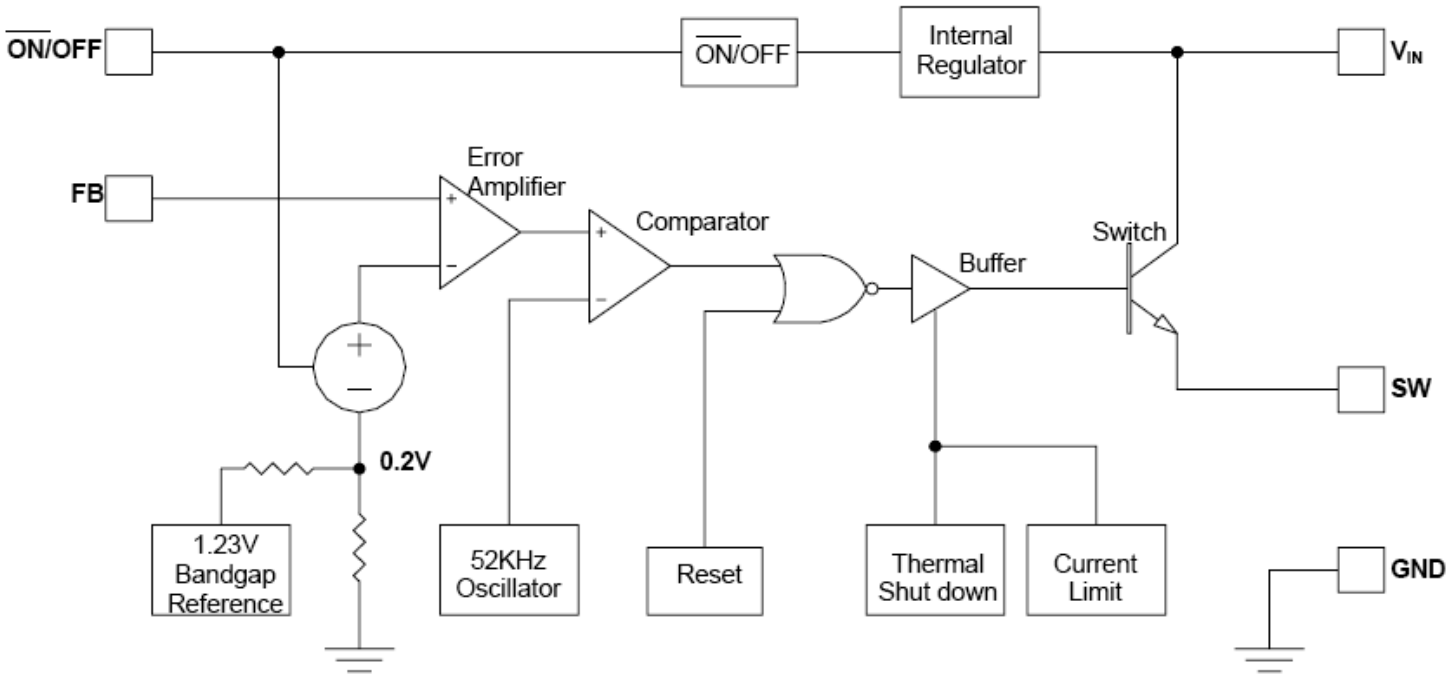
Recommended Operating Conditions

Rating	Symbol	Value	Unit
Maximum Supply Voltage	V_{IN}	60	V
Operating Temperature Range	T_{OPR}	- 40 to 125	°C

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Block Diagram



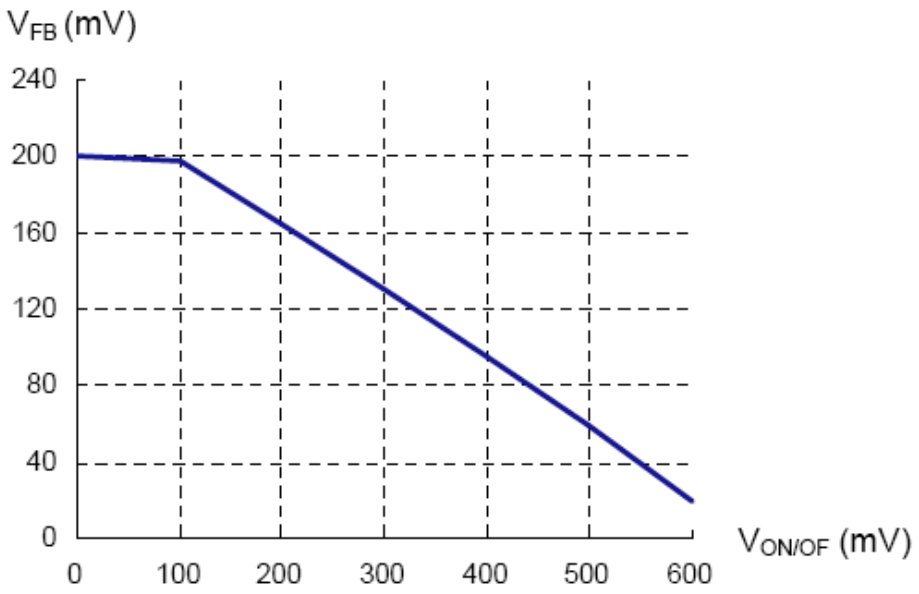


Fig 1 Dimming Voltage

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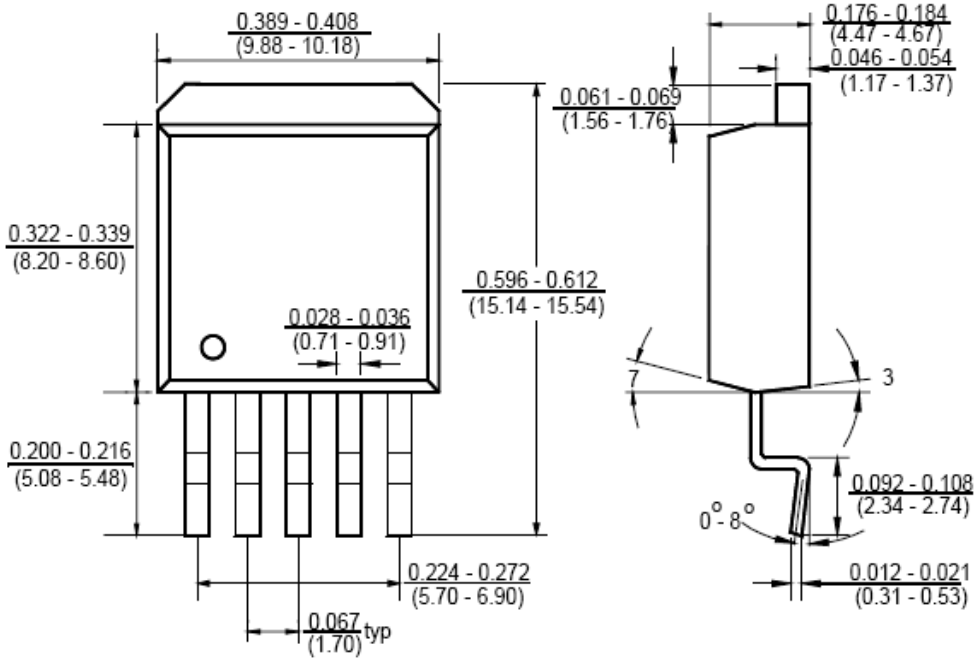
Electrical Characteristics Specifications with standard type face are for TJ=25°C, and those with Bold type apply over Full Operating Temperature Range

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Feedback Voltage	V_{IN} = 12V, I_{LOAD} = 350mA, $\overline{ON}$/OFF = 0V	V_{FB}	190	200	210	mV
	5.5V< V_{IN} < 12V, I_{LOAD} = 350mA, $\overline{ON}$/OFF = 0V (Note 2)		184		216	
			180		**220**	
Efficiency	V_{IN} =12V, I_{LOAD}=3.0A	η		65		%
FB input current	V_{FB} = 250mV, $\overline{ON}$/OFF = 0V	I_{FB}		50	150	nA
					500	
Oscillator Frequency		F_{OSC}	47	52	58	kHz
			42		**63**	
Saturation Voltage	I_{SW} = 3A	V_{SAT}		**1.35**	**1.5**	V
					1.7	
Current Limit		CL	3.7	5.0	6.7	A
Maximum Duty Cycle		DC_{MAX}	100			%
SW Leakage Current	V_{IN} = 60V, V_{SW} = 0V, V_{FB} = 1.5V	I_{LO}	-0.3	--0.07		mA
	V_{IN} = 60V, V_{SW} = -0.8V, V_{FB} = 1.5V		-30	-8		
Threshold Voltage $\overline{ON}$/OFF		$V_{TH\ ON/FF}$	1.0	1.4	2.0	V
			0.8		**2.2**	
Input Current $\overline{ON}$/OFF	$V_{\overline{ON}/OFF}$ = 2.5V	I_{IH}	-5	0.01	5	μA
	$V_{\overline{ON}/OFF}$ = 0V	I_{IL}	-2	-0.3		
Quiescent Current	VFB = 1.5V	I_Q		5.3	10	mA
Standby Current	$V_{\overline{ON}/OFF}$ = 5V, V_{IN} = 60V	I_{STBY}		50	200	μA
Dimming Voltage	I_{LED} = 0, V_{IN} = 12V, see Fig 1	$V_{ON/OFF}$	600	670	750	V

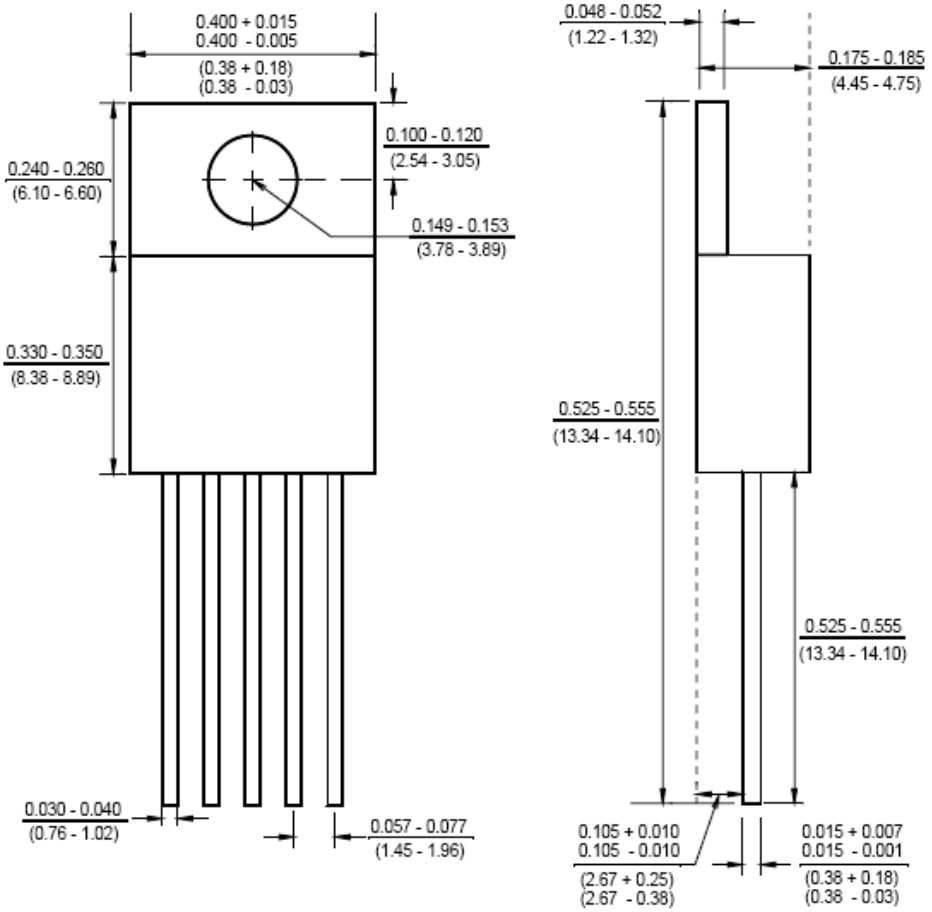
Note 2 LED must be ensured with load current (ILOAD) at $V_{IN\ MIN}$

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Package Outline Dimensions – TO-263-5



TO-220-5



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