

■ Description

The WD34063 is a monolithic, switching regulator, control circuit which contains the primary functions required for DC-DC converters. This device consists of an internal temperature compensated reference, voltage comparator, controlled duty-cycle oscillator with active current-limit circuit, driver, and high-current output switch. The WD34063 is specifically designed as a general DC-DC converter to be used in Step-Down, Step-Up, and Voltage-Inverting applications with a minimum number of external components. The WD34063 is available in two packages: SOP-8 and DIP-8.

■ Features and Benefits

- Operation from 3.0V to 32V Input
- Low Standby Current
- Current Limiting
- Output Switch Current to 1.2A
- Output Voltage Adjustable
- Operation Frequency up to 100kHz
- Precision 2% Reference

■ Applications

- Battery Chargers
- ADSL Modems
- Hubs
- Negative Voltage Power Supplies

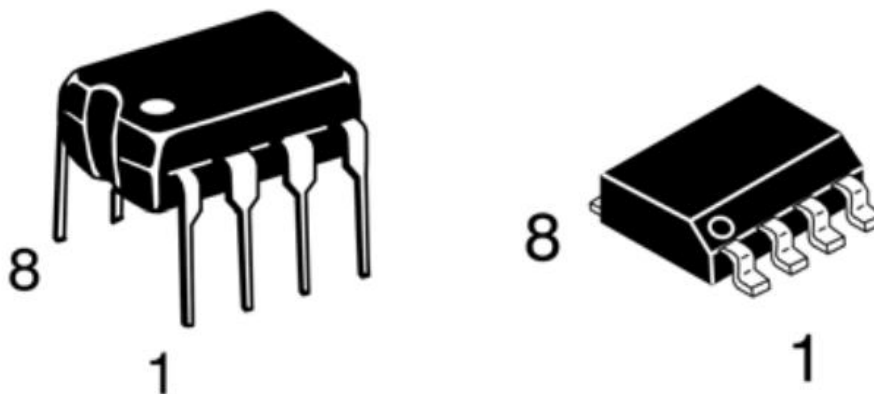


Figure 1. Package Type of WD34063

■ Pin Configuration

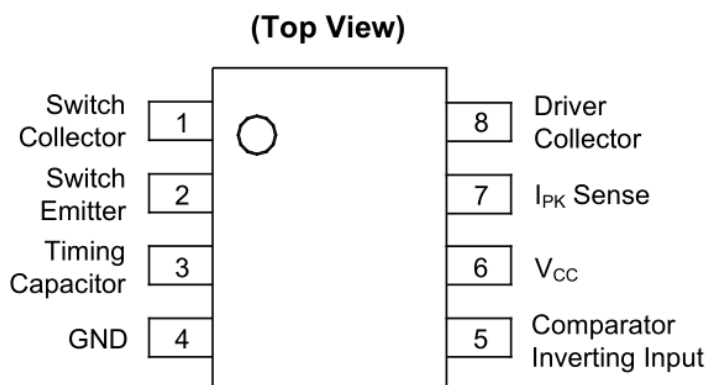


Figure 2. Pin Configuration of WD34063

■ Pin Description

Pin No.	Symbol	Function
1	Switch Collector	Internal switch transistor collector
2	Switch Emitter	Internal switch transistor emitter
3	Timing Capacitor	Timing Capacitor to control the switching frequency
4	GND	Ground pin for all internal circuits
5	Comparator Inverting Input	Inverting input pin for internal comparator
6	V _{CC}	Voltage supply
7	I _{PK} Sense	Peak Current Sense Input by monitoring the voltage drop across an external current sense resistor to limit the peak current through the switch
8	Driver Collector	Voltage driver collector

Functional Block Diagram

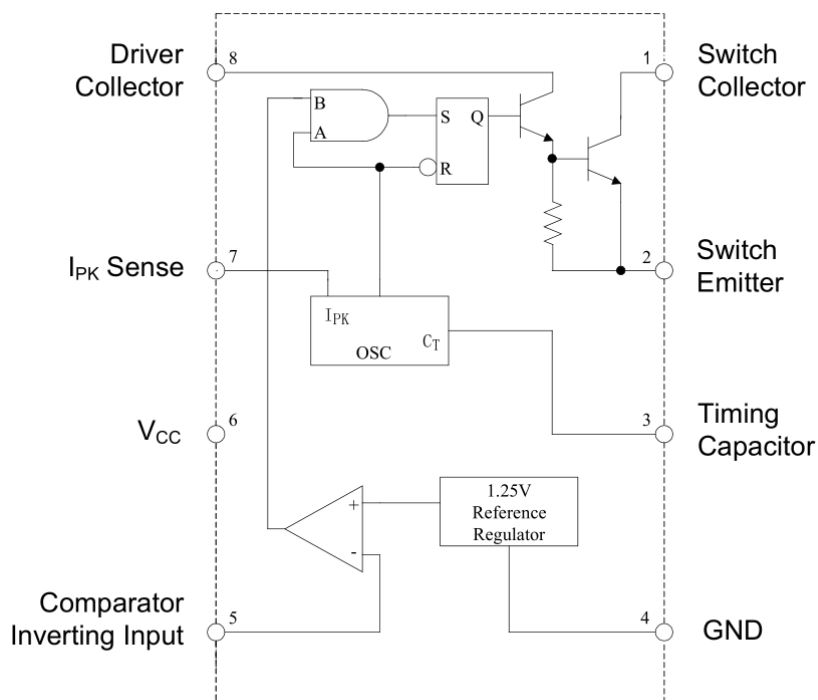
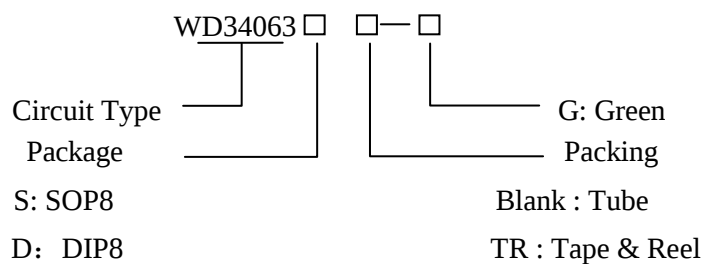


Figure 3. Functional Block Diagram of WD34063

Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
		Green	Green	
SOP8	-40 to 85 °C	WD34063STR-G	WD34063	Tape & Reel
DIP8	-40 to 85 °C	WD34063D-G	WD34063	Tube

WADE's Products with "G" suffix are available in green package. are RoHS compliant.

■ Absolute Maximum Ratings (Ta= 25°C)

Parameter	Symbol	Value		Unit
Power Supply Voltage	V _{CC}	32		V
Comparator Input Voltage Range	V _{IR}	-0.3 to 30		V
Switch Collector Voltage	V _{C(switch)}	32		V
Switch Emitter Voltage (V PIN 1 = 40V)	V _{E(switch)}	32		V
Switch Collector to Emitter Voltage	V _{CE(switch)}	32		V
Driver Collector Voltage	V _{C(driver)}	32		V
Driver Collector Current	I _{C(driver)}	100		mA
Switch Current	I _{SW}	1.2		A
Power Dissipation (T _A = 25 °C)	P _D	DIP8	1.25	W
		SOP8	780	mW
Thermal Resistance	θ _{JA}	DIP8	100	°C/W
		SOP8	160	
Operating Junction Temperature	T _J	150		°C
Lead Temperature (Soldering, 10s)	T _{LEAD}	260		°C
Storage Temperature Range	T _{STG}	-65 to +150		°C
ESD (Human Body Model)	—	2000		V

Note 1: Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

■ Recommended Operating Conditions ($T_A=25\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	V_{CC}	3	32	V
Operating Temperature	T_A	0	70	$^{\circ}\text{C}$

■ Electrical Characteristics

$V_{CC} = 5.0\text{V}$, $T_A = 0\text{ to }70\text{ }^{\circ}\text{C}$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Current	I_{CC}	$V_{CC} = 5.0\text{V to }32\text{V}$, $C_T = 1.0\text{nF}$, $V_{PIN7} = V_{CC}$, $V_{PIN5} > V_{TH}$, $V_{PIN2} = \text{GND}$, other pins open		2.5	4	mA
Frequency	f_{OSC}	$V_{PIN5} = 0\text{V}$, $C_T = 1.0\text{nF}$ $T_A = 25\text{ }^{\circ}\text{C}$	24	33	42	KHz
Charge Current	I_{CHG}	$V_{CC} = 5.0\text{V to }32\text{V}$, $T_A = 25\text{ }^{\circ}\text{C}$	24	33	42	μA
Discharge Current	I_{DISCHG}	$V_{CC} = 5.0\text{V to }32\text{V}$, $T_A = 25\text{ }^{\circ}\text{C}$	140	200	260	μA
Discharge to Charge Current Ratio	I_{DISCHG} / I_{CHG}	Pin 7 to V_{CC} , $T_A = 25\text{ }^{\circ}\text{C}$	5.2	6.2	7.5	—
Current Limit Sense Voltage	$V_{IPK}(\text{sense})$	$I_{DISCHG} = I_{CHG}$ $T_A = 25\text{ }^{\circ}\text{C}$	250	300	350	mV
Saturation Voltage, Dalington Connection	$V_{CE(\text{sat})}$	$I_{SW} = 1.0\text{A}$, Pins 1, 8 connected, Common Emitter		1.0	1.3	V
Saturation Voltage	$V_{CE(\text{sat})}$	$I_{SW} = 1.0\text{A}$, $R_{PIN8} = 82\Omega$ to V_{CC} , Forced $\beta = 20$, Common Emitter		0.45	0.7	V
DC Current Gain	h_{FE}	$I_{SW} = 1.0\text{A}$, $V_{CE} = 5.0\text{V}$, $T_A = 25\text{ }^{\circ}\text{C}$	50	120		—
Collector Off-State Current	$I_{C(\text{off})}$	$V_{CE} = 36\text{V}$		0.01	100	μA
Threshold Voltage	V_{TH}	$T_A = 25\text{ }^{\circ}\text{C}$	1.23	1.250	1.27	V
		$T_A = 0\text{ to }70\text{ }^{\circ}\text{C}$	1.21	1.250	1.29	V
Threshold Voltage Line Regulation	REG_{LINE}	$V_{CC} = 3.0\text{V to }36\text{V}$		1.4	5	mV
Input Bias Current	I_{IB}	$V_{IN} = 0\text{V}$		-40	-400	nA

Typical Performance Characteristics

$V_{CC} = 5.0V$, $T_A = 25^\circ C$, unless otherwise specified.

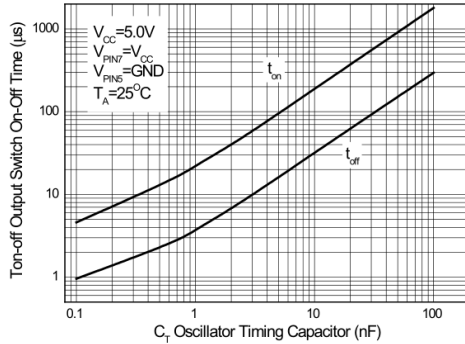


Figure 4. Output Switch On-Off Time vs. Oscillator Timing Capacitor

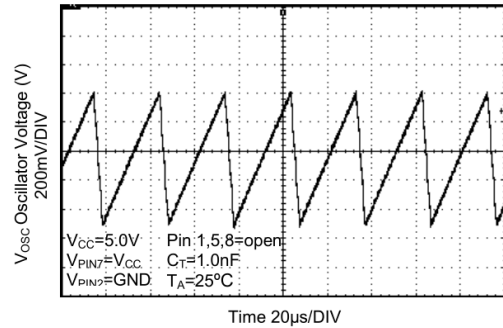


Figure 5. Timing Capacitor Waveform

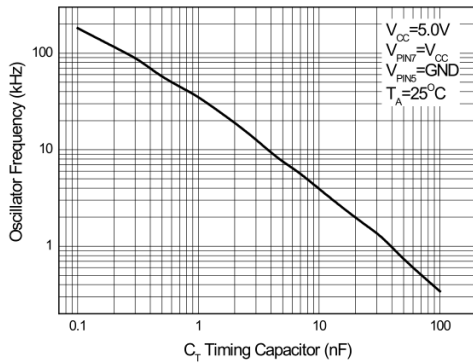


Figure 6. Oscillator Frequency vs. Timing Capacitor

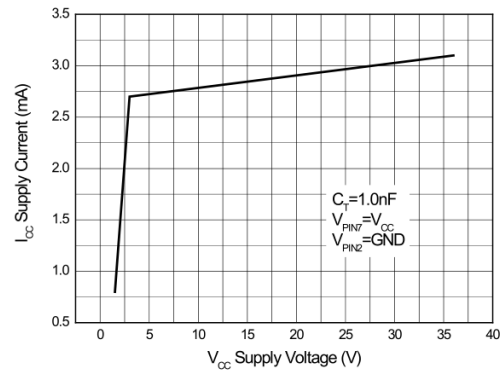


Figure 7. Standard Supply Current vs. Supply Voltage

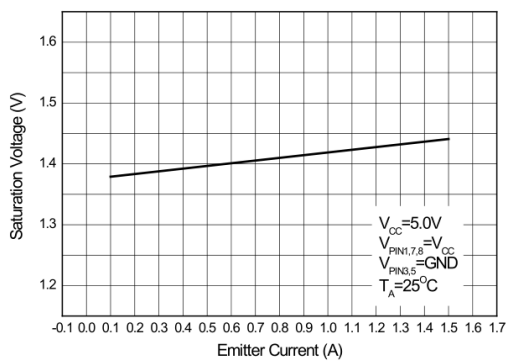


Figure 8. Emitter Follower Configuration Output

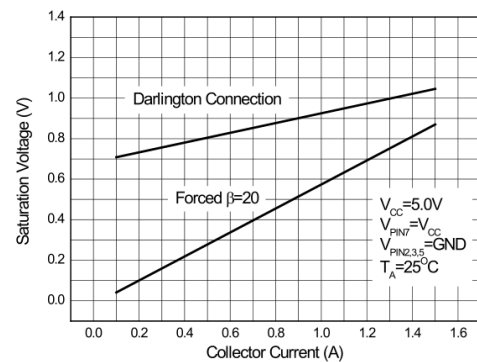


Figure 9. Common Emitter Configuration Output Switch

■ Typical Performance Characteristics (Continued)

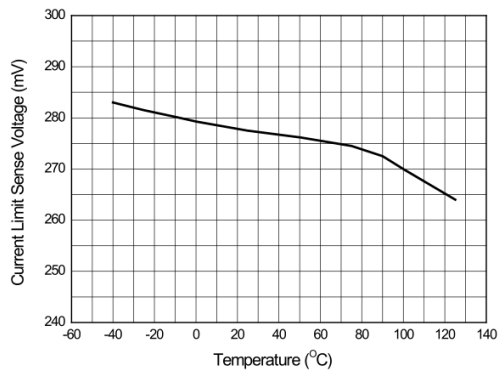


Figure 10. Current Limit Sense Voltage vs. Temperature

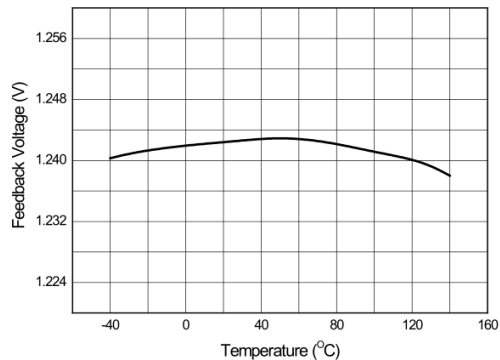


Figure 11. Feedback Voltage vs. Temperature Switch

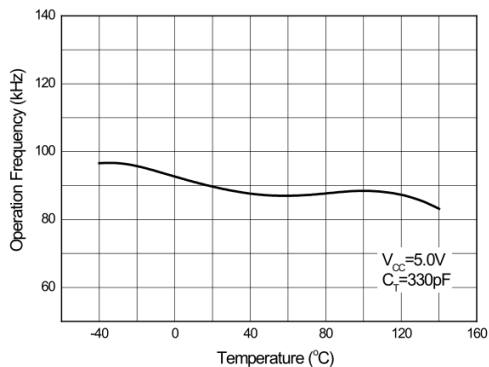


Figure 12. Operation Frequency vs. Temperature

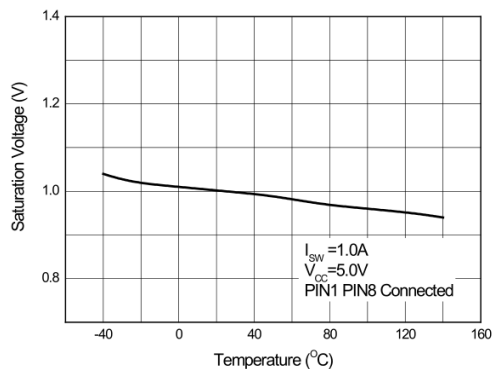


Figure 13. Saturation Voltage vs. Temperature

Typical Applications Circuit

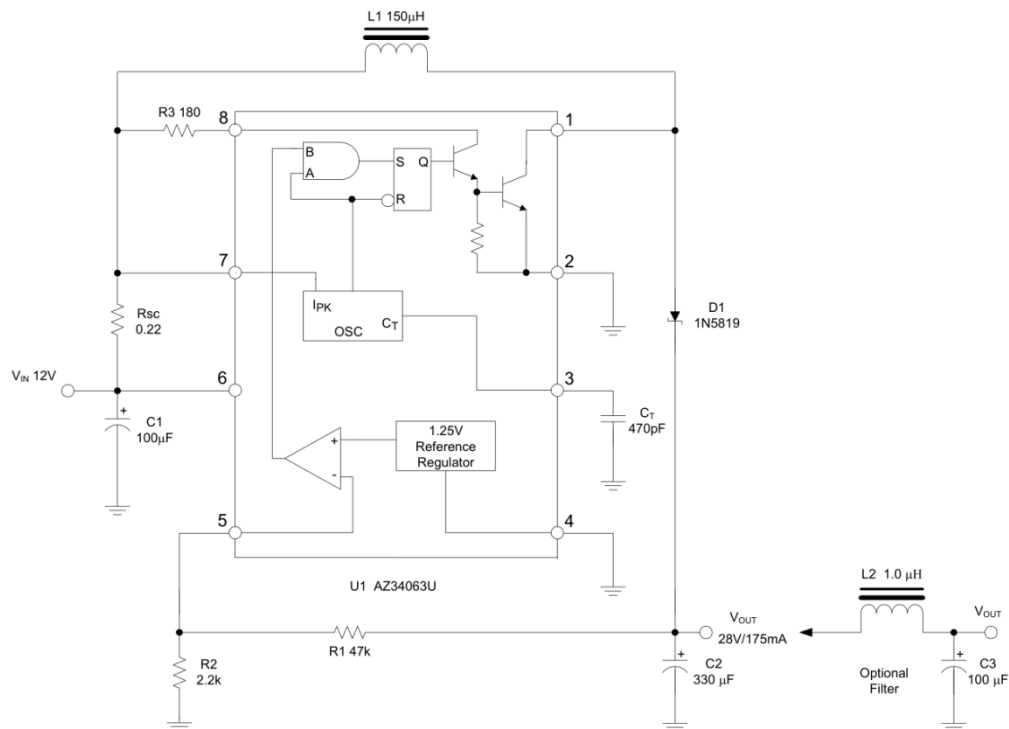


Figure 14. Step-Up Converter

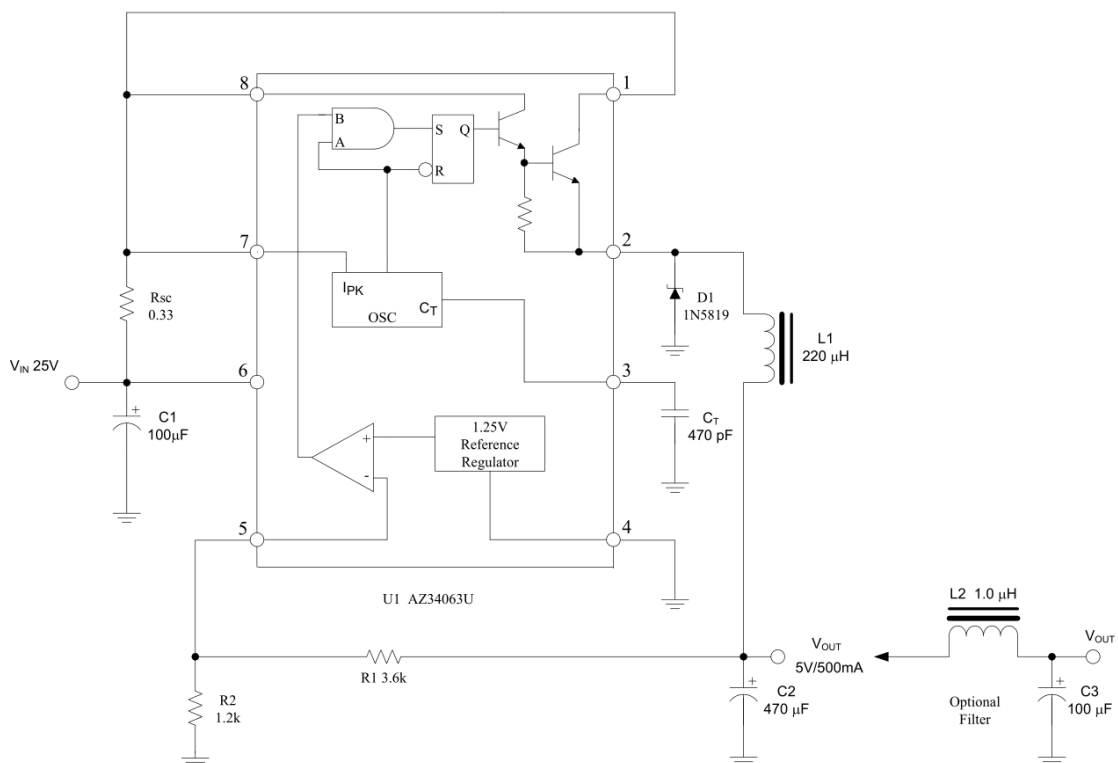


Figure 15. Step-Down Converter

Typical Applications Circuit(Continued)

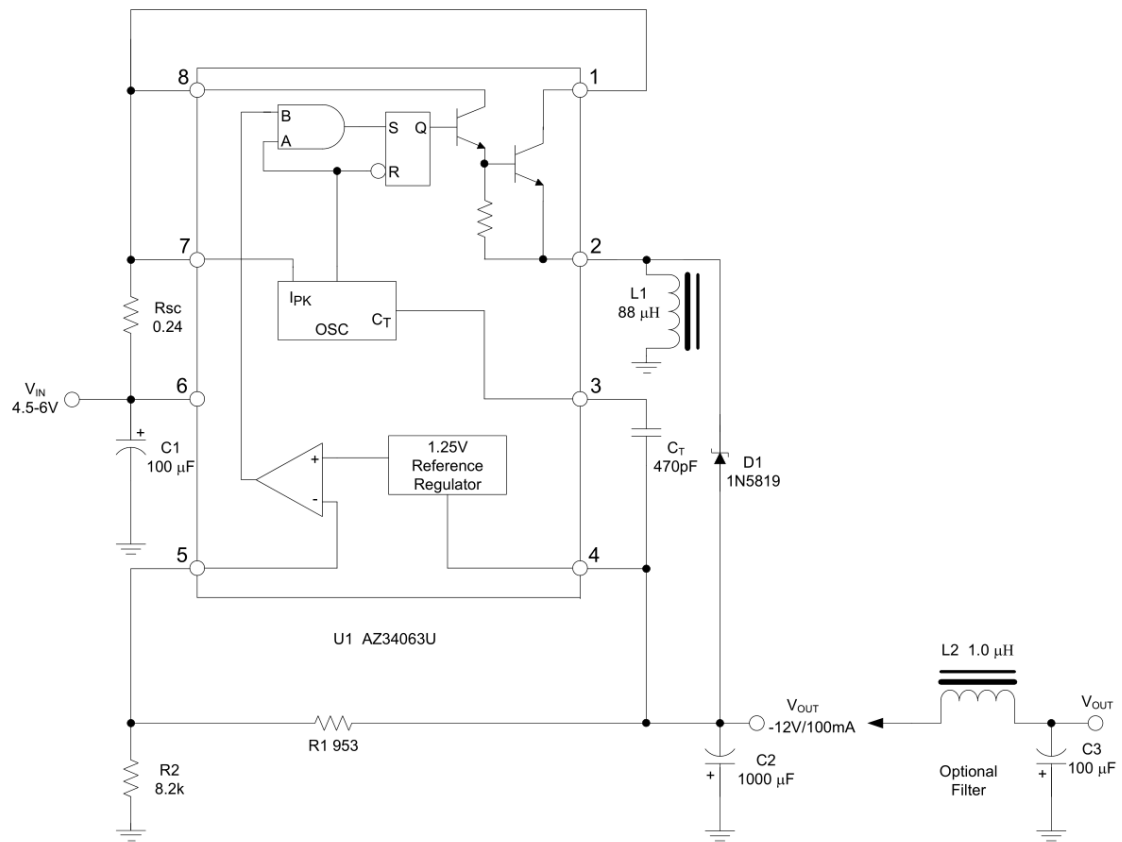
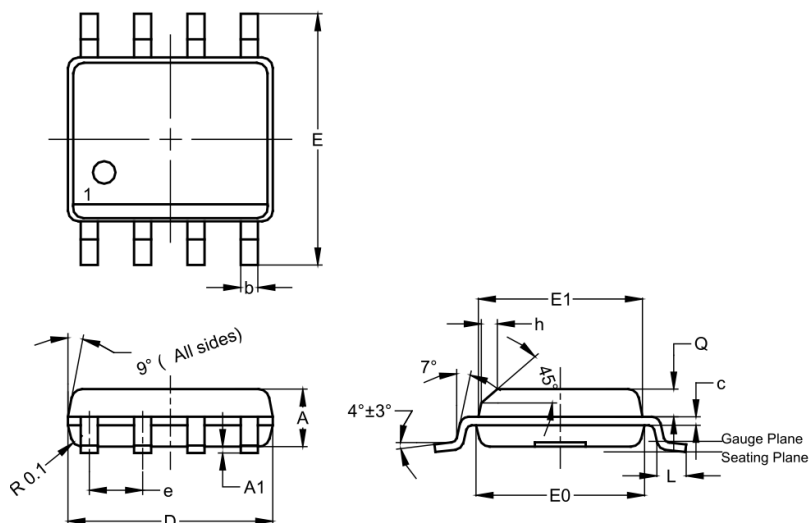


Figure 16. Voltage Inverting Converter

Package Outline Dimensions

SOP8

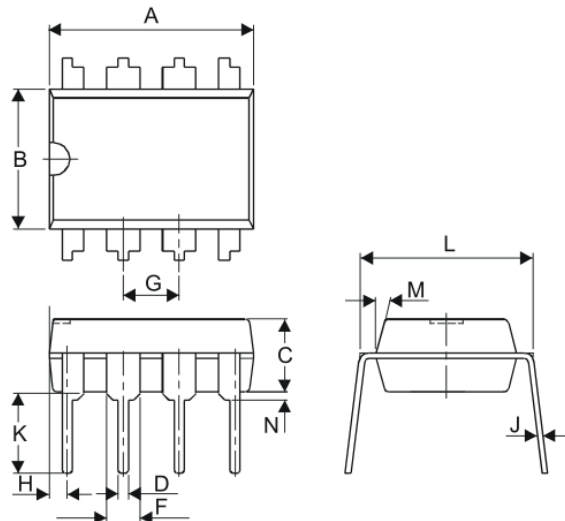
Unit: mm



Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

DIP8

Unit: mm



Dim	Min	Max
A	9.02	9.53
B	6.15	6.35
C	3.10	3.50
D	0.36	0.56
F	1.40	1.65
G	2.54 typ.	
H	0.71	0.97
J	0.20	0.36
K	2.92	3.81
L	7.62	8.26
M	-	15°
N	0.38 (min)	
All Dimensions in mm		