

**Features**

- Wide 4.5V to 40V Input Voltage Range
- 3.3V,5V,12V, and adjustable versions
- Output Adjustable from 1.23V to 37V
- Maximum Duty Cycle 100%
- Minimum Drop Out 1.5V
- Fixed 190KHz Switching Frequency
- 1.5A Constant Output Current Capability
- Internal Optimize Power Transistor
- High efficiency
- Excellent line and load regulation
- TTL shutdown capability
- ON/OFF pin with hysteresis function
- Built in thermal shutdown function
- Built in current limit function
- Built in second current limit function

**General Description**

The LM2674 is a 190KHz fixed frequency PWM buck (step-down)DC/DC converter, capable of driving a 1.5A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

**Applications**

- LCD Monitor and LCD TV
- Digital Photo Frame
- Set-up Box
- ADSL Modem
- Telecom / Networking Equipment

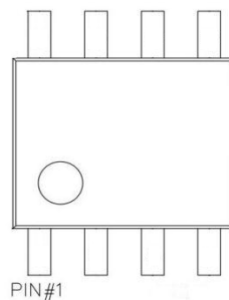


Figure1. Package Type of LM2674

**Pin Configurations**

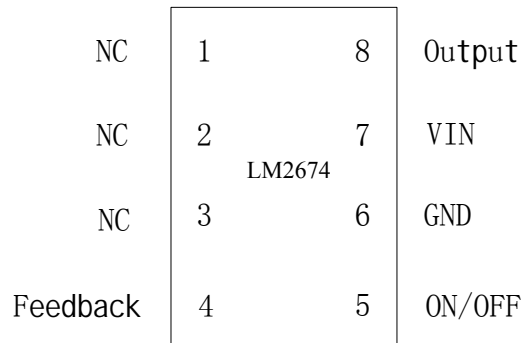


Figure2. Pin Configuration of LM2674 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1,2,3	NC	NO connection
7	VIN	Supply Voltage Input Pin, LM2674 operates from a
8	OUTPUT	Power Switch Output Pin (SW).Output is the switch Ground Pin
6	GND	Ground Pin.Care must be taken in layout.This pinFeedback Pin (FB).
4	FEEDBACK	Through an external resistordivider network, Feedback Through an external resistordivider network, Feedback feedback threshold voltage Enable Pin.
5	ON/OFF	Drive ON/OFFpin low to turn on the Enable Pin. Drive ON/OFFpin low to turn on the

**Function Block**

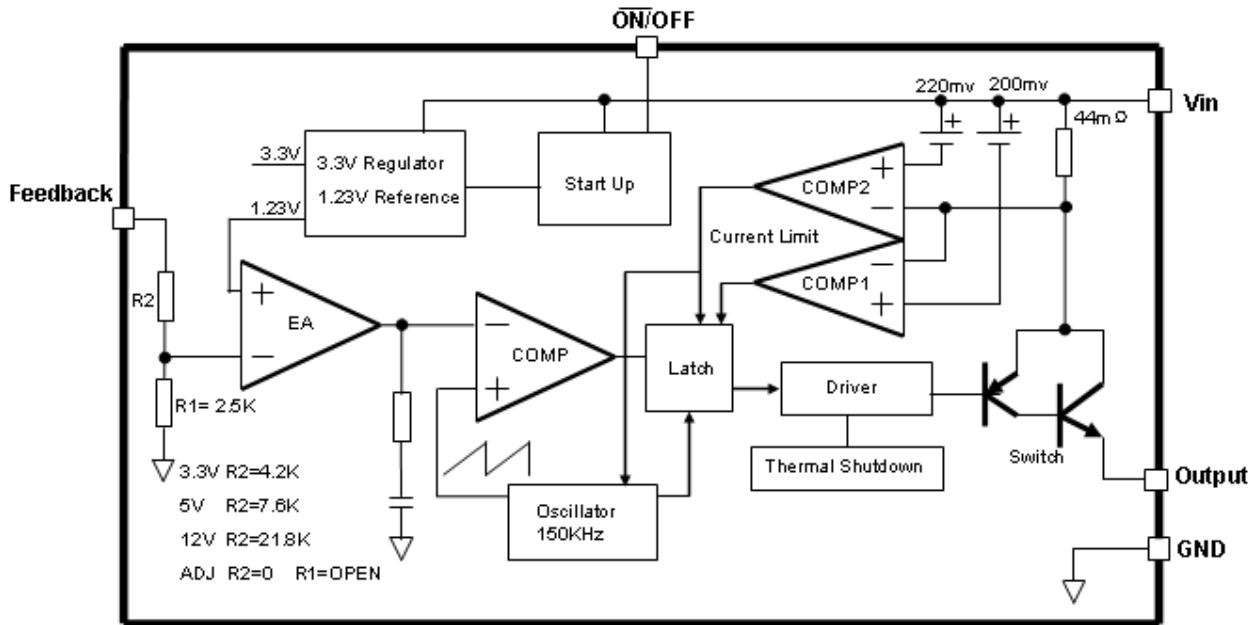


Figure3. Function Block Diagram of LM2674

**Typical Application Circuit**

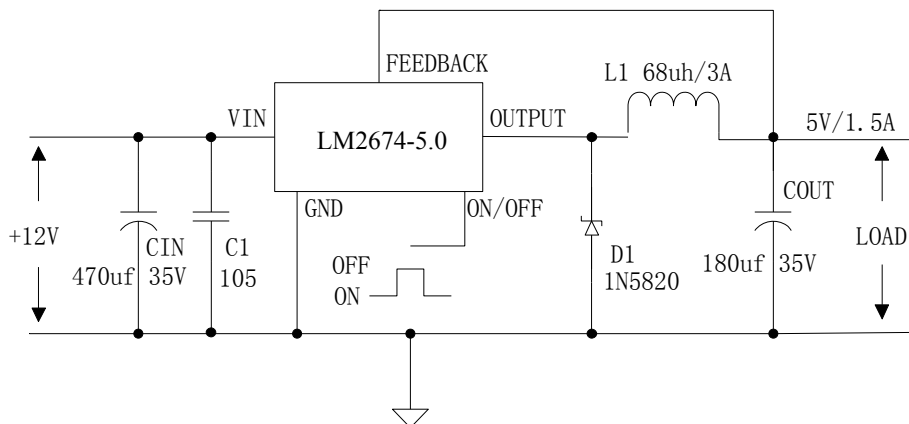


Figure4. LM2674 Typical Application Circuit 12V-5V/1.5A

**LM2674 Absolute Maximum Ratings (Note1)**

Parameter	Symbol		Value	Unit
Input Voltage	V <sub>in</sub>	LM2674	-0.3 to 45	V
Feedback Pin Voltage	VFB		-0.3 to V <sub>in</sub>	V
ON/OFF Pin Voltage	VON/OFF		-0.3 to V <sub>in</sub>	V
Output Switch Pin Voltage	VOutput		-0.3 to V <sub>in</sub>	V
Power Dissipation	PD			mW
Thermal Dissistance(SOP-8) (Junction to Ambient,No Heatsink,Free Air)	RJA		100	°C/W
Operating Junction Temp	TJ		-40 to 125	°C
Storage Temperature	TSTG		-65 to 150	°C
Lead Temperature (Soldering,10 sec)	TLEAD		260	°C
ESD(HBM)			2000	V

**Note1:** Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

**LM2674-3.3 Electrical Characteristics**
 $T_a = 25^\circ\text{C}$ ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>System parameters test circuit figure5</b>						
VOUT	Output Voltage	$V_{in} = 4.75\text{V to }40\text{V}$ $I_{load}=0.2\text{A to }1.5\text{A}$	3.168	3.3	3.432	V
Efficiency	$\eta$	$V_{in}=12\text{V}$ , $V_{out}=3.3\text{V}$ $I_{out}=1.5\text{A}$	-	75	-	%

**LM2674-5.0 Electrical Characteristics**
 $T_a = 25^\circ\text{C}$ ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>System parameters test circuit figure5</b>						
VOUT	Output Voltage	$V_{in} = 7\text{V to }40\text{V}$ $I_{load}=0.2\text{A to }1.5\text{A}$	4.8	5	5.2	V
Efficiency	$\eta$	$V_{in}=12\text{V}$ , $V_{out}=5\text{V}$ $I_{out}=1.5\text{A}$	-	82	-	%

**LM2674-12 Electrical Characteristics**
 $T_a = 25^\circ\text{C}$ ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>System parameters test circuit figure5</b>						
VOUT	Output Voltage	$V_{in} = 15\text{V to }40\text{V}$ $I_{load}=0.2\text{A to }1.5\text{A}$	11.52	12	12.48	V
Efficiency	$\eta$	$V_{in}=25\text{V}$ , $V_{out}=12\text{V}$ $I_{out}=1.5\text{A}$	-	90	-	%

**LM2674-ADJ Electrical Characteristics**
 $T_a = 25^\circ\text{C}$ ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>System parameters test circuit figure5</b>						
VOUT	Output Voltage	$V_{in} = 4.5\text{V to }40\text{V}$ $I_{load}=0.2\text{A to }1.5\text{A}$	1.193	1.23	1.267	V
Efficiency	$\eta$	$V_{in}=12\text{V}$ , $V_{out}=3\text{V}$ $I_{out}=1.5\text{A}$	-	74	-	%

**LM2674 Electrical Characteristics (DC Parameters)**

V<sub>in</sub> = 12V for the 3.3V,5V,and Adjustable versions and V<sub>in</sub>=24V for the 12V version, GND=0V, V<sub>in</sub> & GND parallel connect a 220uf/50V capacitor; I<sub>out</sub>=500mA, T<sub>a</sub> = 25°C; the others floating unless otherwise specified.

Parameter	Symbol		Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	V <sub>in</sub>	LM2674		4.5		40	V
Input operation voltage			VON/OFF-5V		80	200	uA
Quiescent Supply Current	ISTBY		VON/OFF=0V, VFB=V <sub>in</sub>		2	10	mA
Quiescent Supply Current	Fosc					190	Khz
Oscillator Frequency	IL		VFB =0		2		A
Switch Current Limit	VON/OFF		High (Regulator OFF) Low (Regulator ON)		1.4 0.8		V
ON/OFF Pin Threshold	IH		VON/OFF =2.5V(OFF)		5	15	uA
ON/OFF Pin Input Leakage Current	IL		VON/OFF=0.5V(ON)		0.2	5	uA
Output Saturation Voltage	V <sub>CE</sub>		VFB=0V I <sub>out</sub> =1.5A		1.2	1.4	V
Max.Duty Cycle	DMAX		VFB=0V		100		%

### Test Circuit and Layout guidelines

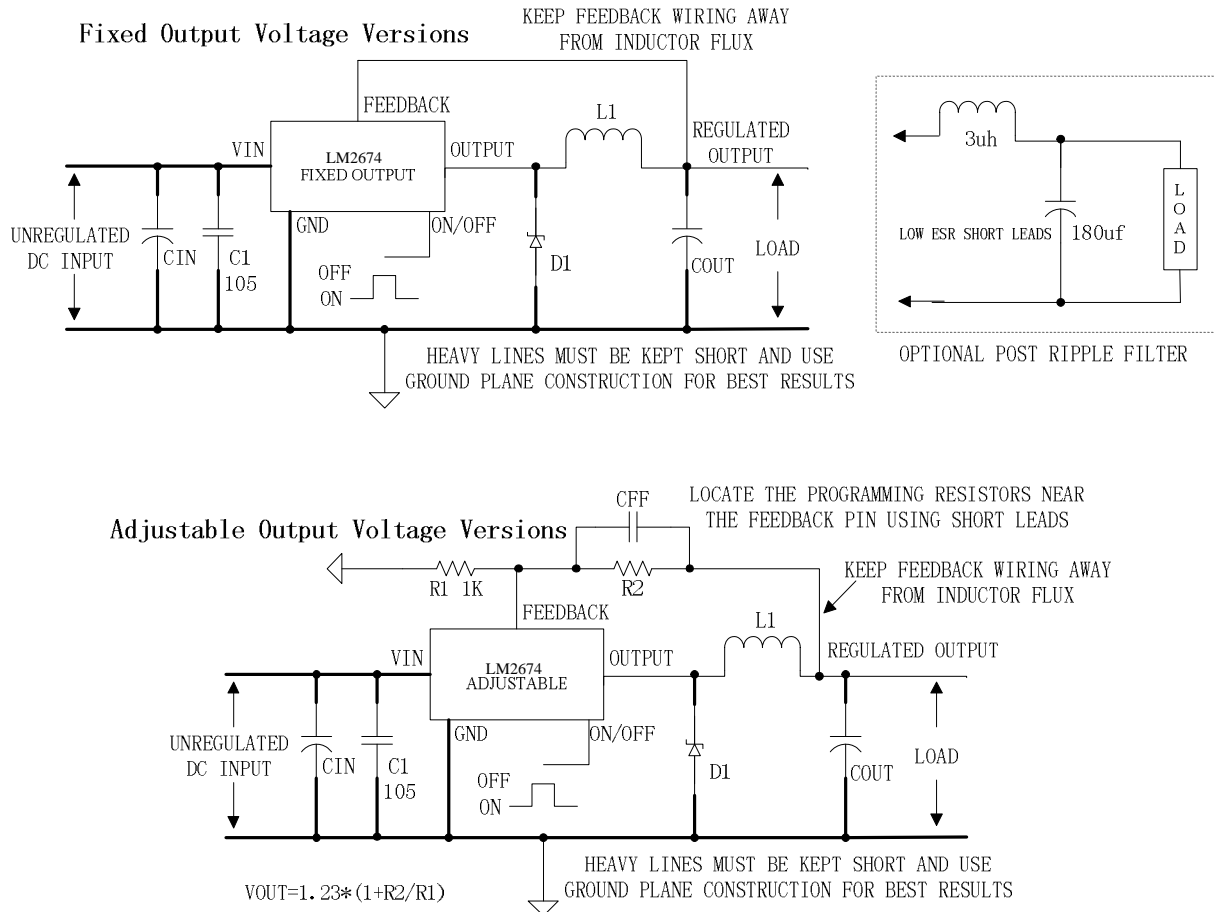


Figure5. Standard Test Circuits and Layout Guides

Select R1 to be approximately 1K, use a 1% resistor for best stability.

C1 and CFF are optional; in order to increase stability and reduce the input power line noise, CIN and C1 must be placed near to PIN1 and PIN5~8;

For output voltages greater than approximately 10V, an additional capacitor CFF is required. The compensation capacitor is typically between 100 pf and 33 nf, and is wired in parallel with the output voltage setting resistor, R2. It provides additional stability for high output voltage, low input-output voltages, and/or very low ESR output capacitors, such as solid tantalum capacitors.

$CFF = 1 / (31 * 1000 * R2)$ ; This capacitor type can be ceramic, plastic, silver mica, etc. (Because of the unstable characteristics of ceramic capacitors made with Z5U material, they are not recommended.)

**LM2674 Series Buck Regulator Design Procedure (Fixed Output)**

Conditions			Inductor (L1)	Output Capacitor (COUT)			
Output Voltage (V)	Load Current (A)	Max Input Voltage (V)		Inductance (uh)	Through Hole Electrolytic		Surface Mount Tantalum
				Panasonic HFQ Series (uf/V)	Nichicon PL Series (uf/V)	AVX TPS Series (uf/V)	Sprague 595D Series (uf/V)
3.3	1.5	6	22	470/25	470/35	330/6.3	390/6.3
		10	33	330/35	330/35	330/6.3	390/6.3
		40	47	330/35	270/50	220/10	330/10
5	1.5	9	22	470/25	560/16	220/10	330/10
		20	68	180/35	180/35	100/10	270/10
		40	68	180/35	180/35	100/10	270/10
12	1.5	15	33	330/25	330/25	100/16	180/16
		20	68	180/25	180/25	100/16	120/20
		40	150	82/25	82/25	68/20	68/25



**LM2674 Series Buck Regulator Design Procedure (Adjustable Output)**

Output Voltage (V)	Through Hole Output Electrolytic			Surface Mount Output Capacitor		
	Panasonic HFQ Series (uf/V)	Nichicon PL Series (uf/V)	Feedforward Capacitor	AVX TPS Series (uf/V)	Sprague 595D Series (uf/V)	Feedforward Capacitor
2	820/35	820/35	33nf	330/6.3	470/4	33nf
4	560/35	470/35	10nf	330/6.3	390/6.3	10nf
6	470/25	470/35	3.3nf	220/10	330/10	3.3nf
9	330/25	330/25	1.5nf	100/16	180/16	1.5nf
12	330/25	330/25	1nf	100/16	180/16	1nf
15	220/25	220/35	680pf	68/20	120/20	680pf
24	220/35	150/35	560pf	33/25	33/25	220pf
28	100/50	100/50	390pf	10/35	15/50	220pf

**Schottky Diode Selection Table**

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)		
			20V	30V	40V
1A		√	1N5817	1N5818	1N5819
3A		√	1N5820	1N5821	1N5822
		√	MBR320	MBR330	MBR340
	√	SK32	SK33	SK34	
	√			30WQ03	30WQ04
		√		31DQ03	31DQ04
		√	SR302	SR303	SR304

**Typical System Application for 3.3V Version**

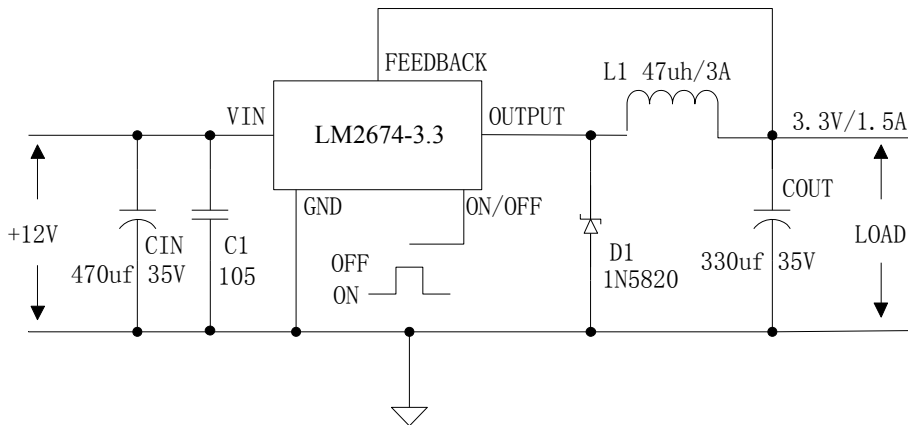


Figure6. LM2674-3.3 System Parameters Test Circuit

**Typical System Application for 5V Version**

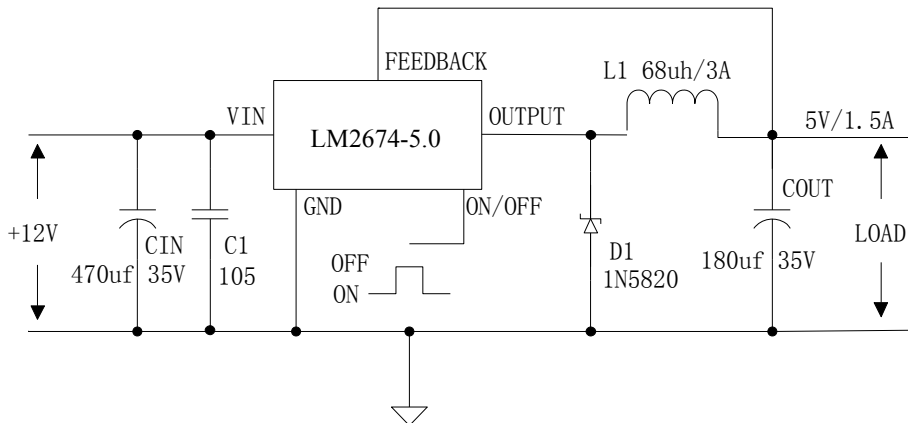


Figure7. LM2674-5.0 System Parameters Test Circuit

### Typical System Application for 12V Version

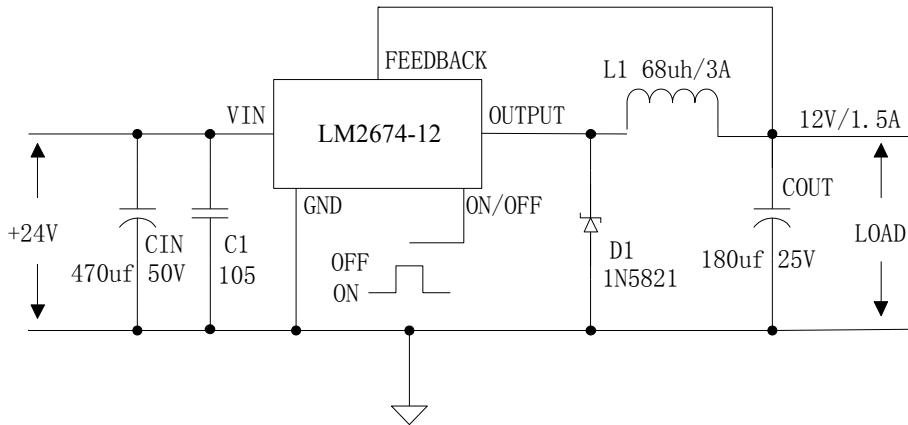


Figure8. LM2674-12 System Parameters Test Circuit

### Typical System Application for ADJ Version

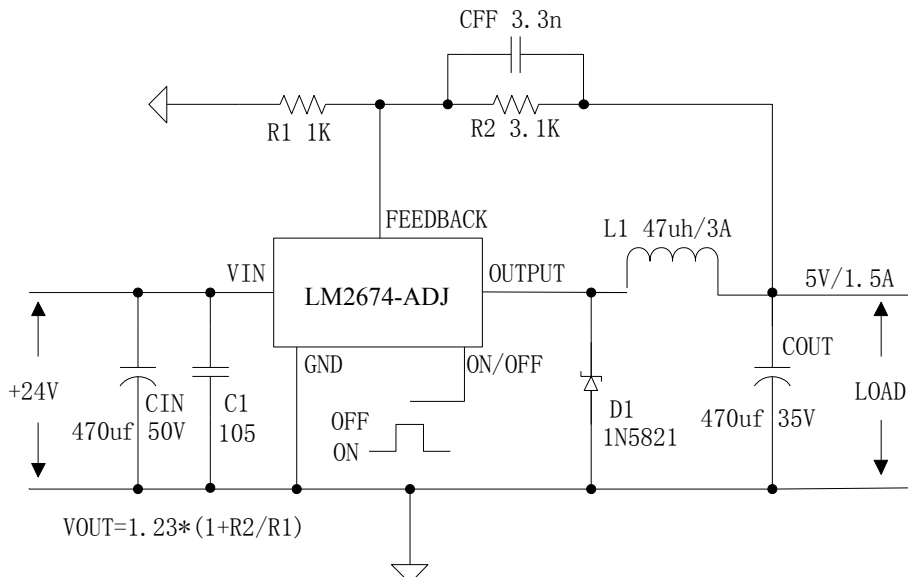
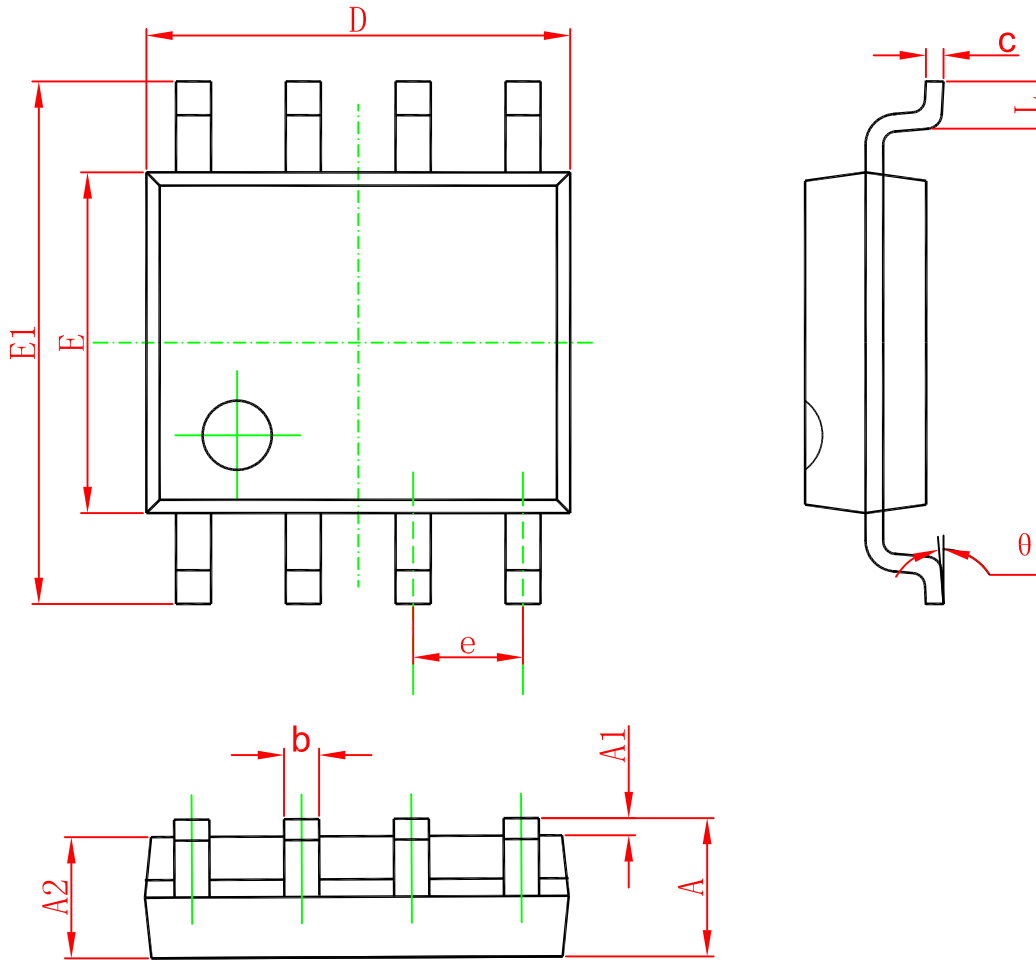


Figure9. LM2674-ADJ System Parameters Test Circuit

PACKAGE OUTLINE DIMENSIONS

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

### Ordering information

Order code	Package	Baseqty	Delivery mode	Operating temperature range
UMW LM2674M-3.3	SOP-8	2500	Tape and reel	-40°-+85°
UMW LM2674M-5.0	SOP-8	2500	Tape and reel	
UMW LM2674M-12	SOP-8	2500	Tape and reel	
UMW LM2674M-ADJ	SOP-8	2500	Tape and reel	