

1.Description

LM2675 series is a DC/DC switching buck converter controlled by a fixed frequency of 260kHz PWM. It is mainly composed of internal frequency compensation, fixed frequency oscillator, built-in overcurrent protection, power switch control and other circuits. It can drive 1A load with high efficiency, low ripple, good linearity and load adjustment ability. Only a few external components are needed to realize the function of DC/DC voltage reduction and stabilization, which is very simple and practical. PWM control circuit can adjust the duty cycle from 0 according to the load To 100% to achieve high work efficiency. It has an external enabling control opening function, which can realize the controllable switch between standby and work, making the application more flexible.

3.Product Use

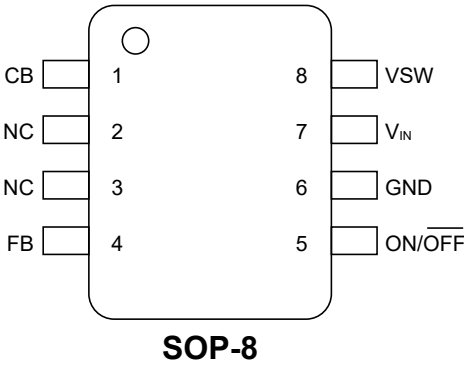
- LCD and LCD TV
- ADSL modem
- LED lights, LED backlight

2.Features

- Built in overtemperature shutdown function
 - Built in overcurrent protection function
 - Internal integrated efficient power switch
 - Good linearity and load adjustment capability
 - ON/OFF pin with hysteresis function
 - TTL shutdown capability
 - high efficiency
 - Simple periphery
 - Wide input voltage range: 7V~40V
 - Fixed output voltage: 3.3V, 5V, 12V
 - Adjustable output voltage range: 1.21V~37V (adjustable)
 - High precision output: $\pm 2\%$
 - Fixed switching frequency: 260 kHz
 - Maximum output current capacity: 1A
 - Minimum linear drop voltage drop: 1.5V
 - Package form: SOP-8
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- Digital photo frame
 - Telecommunication/network equipment



4.Pinning Information

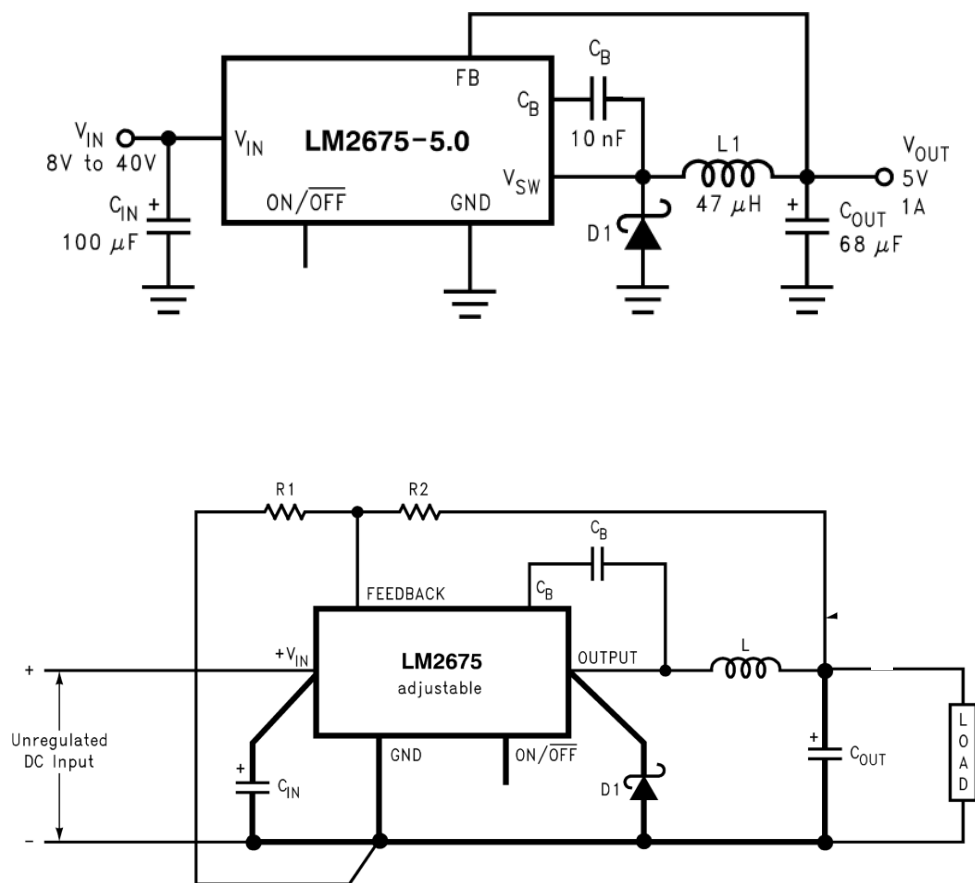


Pin Descriptions

Pin Number	Pin Name	Description
1	CB	Boost capacitance terminal
2	NC	Empty port
3	NC	Empty port
4	FB	Feedback control terminal
5	ON/OFF	Enable terminal High=ON and low=OFF
6	GND	Power supply ground terminal
7	V _{IN}	Positive terminal of power supply
8	VSW	Power switch output terminal (SW)



5. Application circuit



$$V_{OUT} = V_{REF}(1 + R2/R1)$$

C_B : 103/50V



6.Limit Parameter

Explain	Project	Symbol	Limit Value	Company
Input terminal voltage	Voltage	V_{IN}	45	V
FB feedback terminal voltage		V_{FB}	$-0.3 \sim V_{IN}$	V
Switch output terminal voltage		V_{VSW}	$-1 \sim V_{IN}$	V
Enable enabling terminal voltage		V_{ON-OFF}	$-0.3 \sim 6$	V
SOP8 package	Maximum power consumption	P_D	Internally Limited	mW
Put in air without external heat sink	Thermal resistance	R_{JA}	30	°C/W
Operating temperature range	Temperature	T_J	-40 to 125	°C
Storage temperature range		T_C	-40 to 150	°C
Welding temperature		T_H	260	°C, 10s

Note: Limit parameter refers to the limit value that cannot be exceeded under any conditions. Once the limit value is exceeded, it may cause physical damage such as product deterioration; At the same time, the chip can not be guaranteed to work normally under the limit parameters.



7.1 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2675-3.3V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{mA to }1\text{A}$	3.234	3.3	3.366	V
Enable Shutdown Current	I_{STB}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$		100	200	μA
Quiescent Current	I_q	$V_{IN}=12\text{V}$, $V_{FB}=8\text{V}$, $V_{ON-OFF}=5\text{V}$		3	7	mA
Output Peak Current	I_{CL}	$V_{IN}=12\text{V}$, $V_{ON-OFF}=5\text{V}$, $V_{FB}=0$, no L1 and D1		2		A
Output Leakage Current	I_{OL}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$ $V_{VSW}=-1\text{V}$			2.5	10 mA
Enable Enable Terminal Current	$I_{ON-OFFL}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=0.5\text{V}$		4	15	μA
	$I_{ON-OFFH}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=2.5\text{V}$		1.5	15	μA
Enable Effective Voltage of Enable Terminal	$V_{ON-OFFH}$	$V_{IN}=12\text{V(ON)}$	1.5			V
	$V_{ON-OFFL}$	$V_{IN}=12\text{V(OFF)}$			0.8	V
Output Saturation Voltage	V_{CE}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=1\text{A}$		1	1.5	V
Switching Frequency	fosc	$V_{IN}=12\text{V}$	225	260	275	kHz
Duty Cycle	D_{MAX}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$	0		100	%
Efficiency	η	$V_{IN}=12\text{V}$, $V_{OUT}=3.3\text{V}$, $I_{OUT}=1\text{A}$		80		%
Input Voltage	V_{IN}		7		40	V



7.2 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2675-5.0V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{mA to }1\text{A}$	4.9	5	5.1	V
Enable Shutdown Current	I_{STB}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$		100	200	μA
Quiescent Current	I_q	$V_{IN}=12\text{V}$, $V_{FB}=8\text{V}$, $V_{ON-OFF}=5\text{V}$		3	7	mA
Output Peak Current	I_{CL}	$V_{IN}=12\text{V}$, $V_{ON-OFF}=5\text{V}$, $V_{FB}=0$, no L1 and D1		2		A
Output Leakage Current	I_{OL}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$ $V_{VSW}=-1\text{V}$			2.5	10 mA
Enable Enable Terminal Current	$I_{ON-OFFL}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=0.5\text{V}$		4	15	μA
	$I_{ON-OFFH}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=2.5\text{V}$		1.5	15	μA
Enable Effective Voltage of Enable Terminal	$V_{ON-OFFH}$	$V_{IN}=12\text{V(ON)}$	1.5			V
	$V_{ON-OFFL}$	$V_{IN}=12\text{V(OFF)}$			0.8	V
Output Saturation Voltage	V_{CE}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=1\text{A}$		1	1.5	V
Switching Frequency	fosc	$V_{IN}=12\text{V}$	225	260	275	kHz
Duty Cycle	D_{MAX}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$	0		100	%
Efficiency	η	$V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_{OUT}=1\text{A}$		80		%
Input Voltage	V_{IN}		7		40	V



7.3 Electrical Characteristics, $T_A=25^{\circ}\text{C}$ (LM2675-12V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{\text{IN}}=14\text{V}$ to 40V , $I_{\text{OUT}}=20\text{mA}$ to 1A	11.76	12	12.24	V
Enable Shutdown Current	I_{STB}	$V_{\text{IN}}=40\text{V}$, $V_{\text{ON-OFF}}=0\text{V}$		100	200	μA
Quiescent Current	I_{q}	$V_{\text{IN}}=15\text{V}$, $V_{\text{FB}}=13\text{V}$, $V_{\text{ON-OFF}}=5\text{V}$		3	7	mA
Output Peak Current	I_{CL}	$V_{\text{IN}}=15\text{V}$, $V_{\text{ON-OFF}}=5\text{V}$, $V_{\text{FB}}=0$, no L1 and D1		2		A
Output Leakage Current	I_{OL}	$V_{\text{IN}}=40\text{V}$, $V_{\text{ON-OFF}}=0\text{V}$ no L1 and D1			10	μA
		$V_{\text{VSW}}=0\text{V}$ $V_{\text{VSW}}=-1\text{V}$			2.5	10 mA
Enable Enable Terminal Current	$I_{\text{ON-OFFL}}$	$V_{\text{IN}}=15\text{V}$, $V_{\text{ON-OFF}}=0.5\text{V}$		4	15	μA
	$I_{\text{ON-OFFH}}$	$V_{\text{IN}}=15\text{V}$, $V_{\text{ON-OFF}}=2.5\text{V}$		1.5	15	μA
Enable Effective Voltage of Enable Terminal	$V_{\text{ON-OFFH}}$	$V_{\text{IN}}=15\text{V}(\text{ON})$	1.5			V
	$V_{\text{ON-OFFL}}$	$V_{\text{IN}}=15\text{V}(\text{OFF})$			0.8	V
Output Saturation Voltage	V_{CE}	$V_{\text{IN}}=15\text{V}$, $V_{\text{FB}}=0\text{V}$, $I_{\text{OUT}}=1\text{A}$		1	1.5	V
Switching Frequency	fosc	$V_{\text{IN}}=15\text{V}$	225	260	275	kHz
Duty Cycle	D_{MAX}	$V_{\text{IN}}=15\text{V}$, $V_{\text{FB}}=0\text{V}$	0		100	%
Efficiency	η	$V_{\text{IN}}=15\text{V}$, $V_{\text{OUT}}=12\text{V}$, $I_{\text{OUT}}=1\text{A}$		85		%
Input Voltage	V_{IN}		13.5		40	V



7.4 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2675-ADJ)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reference Voltage	V_{REF}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{mA to }1\text{A}$	1.185	1.21	1.234	V
Enable Shutdown Current	I_{STB}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=V_{VSW}$		100	200	μA
Quiescent Current	I_q	$V_{ON-OFF}=0\text{V}$, $V_{FB}=V_{IN}$		3	7	mA
Output Peak Current	I_{CL}	$V_{ON-OFF}=V_{FB}=0$, no L1 and D1		2		A
Output Leakage Current	I_{OL}	$V_{IN}=V_{FB}$, $V_{ON-OFF}=5\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$ $V_{VSW}=-1\text{V}$		2.5	10	mA
Enable Enable Terminal Current	$I_{ON-OFFL}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=0.5\text{V}$		4	15	μA
	$I_{ON-OFFH}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=2.5\text{V}$		1.5	15	μA
Enable Effective Voltage of Enable Terminal	$V_{ON-OFFH}$	$V_{IN}=12\text{V(OFF)}$	1.5			V
	$V_{ON-OFFL}$	$V_{IN}=12\text{V(ON)}$			0.8	V
Feedback Terminal Current	I_{FB}	$V_{IN}=12\text{V}$, $V_{FB}=1.3\text{V}$		85		nA
Output Saturation Voltage	V_{CE}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=1\text{A}$		1	1.5	V
Switching Frequency	fosc	$V_{IN}=12\text{V}$	225	260	275	kHz
Duty Cycle	D_{MAX}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$	0		100	%
Efficiency	η	$V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_{OUT}=1\text{A}$		80		%
Input Voltage	V_{IN}		7		40	V



8.1 Typical Characteristic

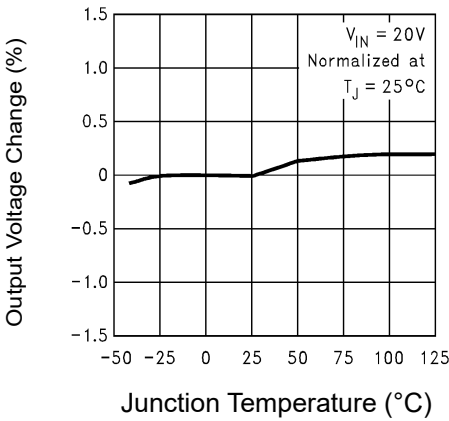


Figure 1: Normalized Output Voltage

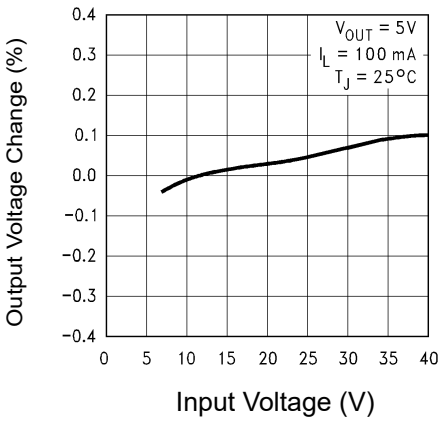


Figure 2: Line Regulation

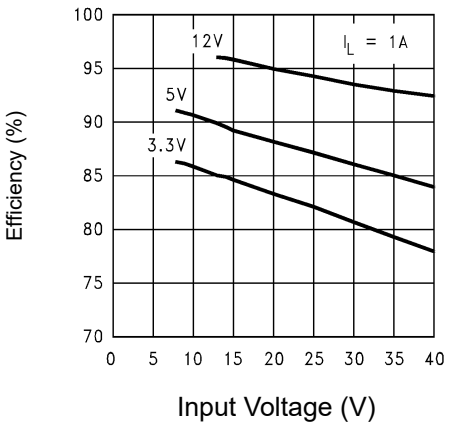


Figure 3: Efficiency

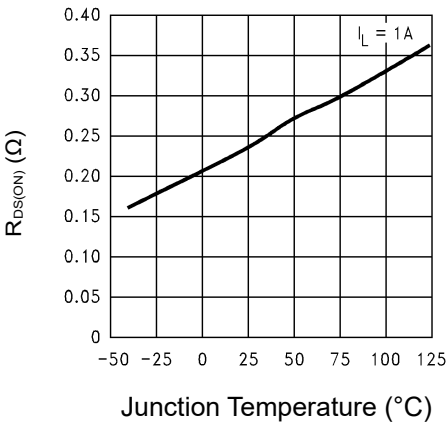


Figure 4: Drain-to-Source Resistance

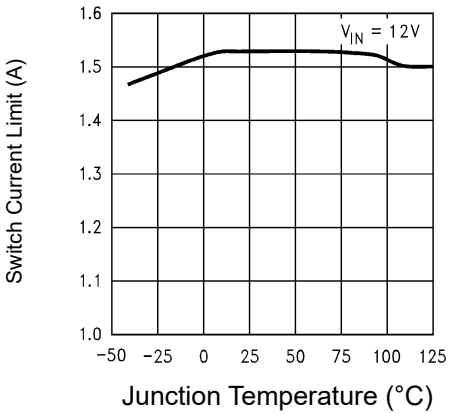


Figure 5: Switch Current limit

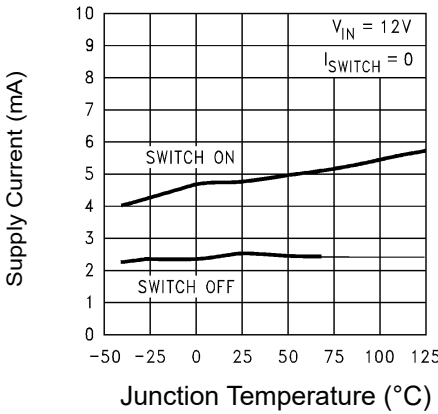
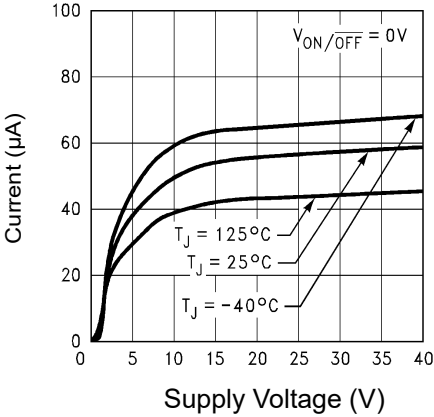
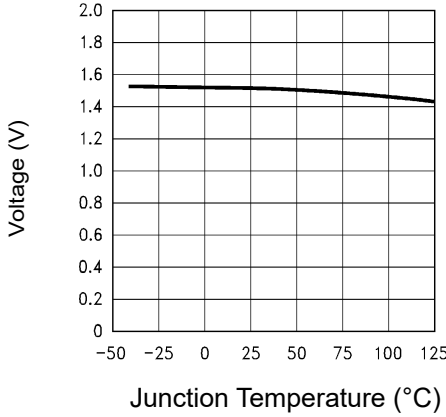
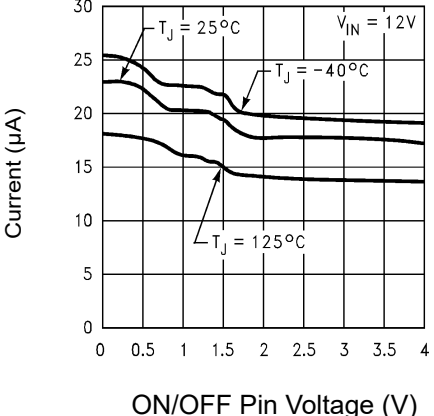
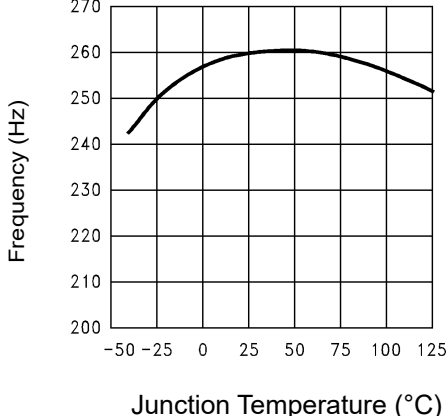
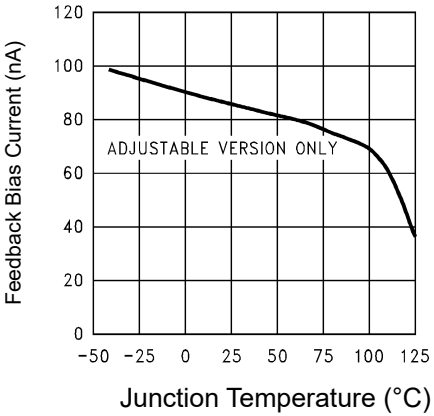
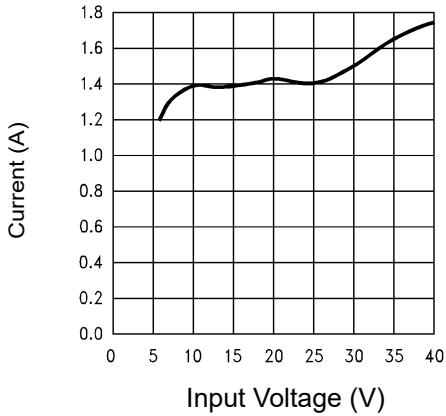


Figure 6: Operating Quiescent Current



8.2 Typical Characteristic

	
Figure 7: Standby Quiescent Current	Figure 8: ON/ OFF Threshold Voltage
	
Figure 9: ON/OFF Pin Current (Sourcing)	Figure 10: Switching Frequency
	
Figure 11: Feedback Pin Bias Current	Figure 12: Peak Switch Current



8.3 Typical Characteristic

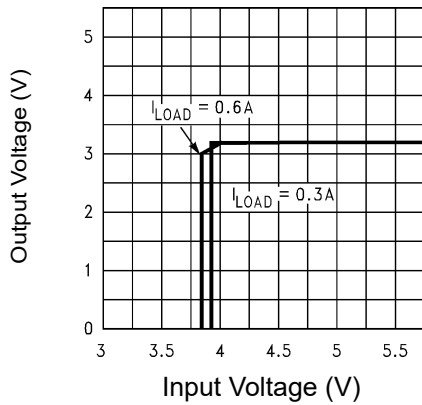


Figure 13: Dropout Voltage, 3.3-V Option

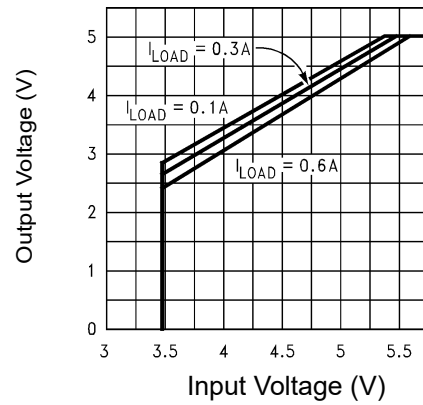
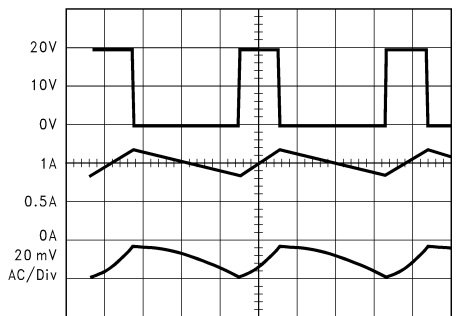
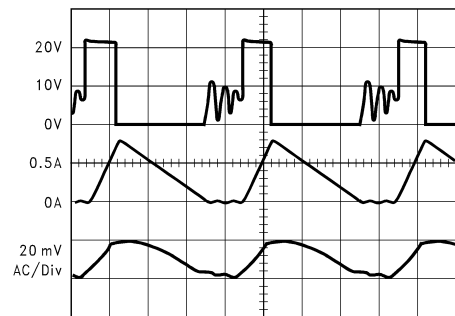


Figure 14: Dropout Voltage, 5-V Option



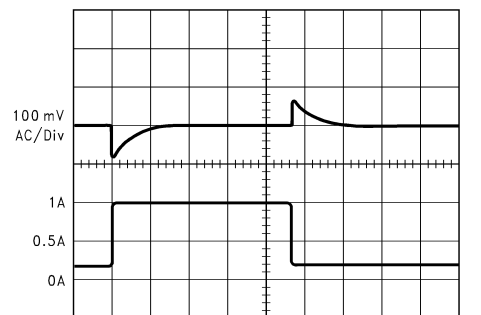
V_{SW} pin voltage, 10V/div
Inductor current, 0.5 A/div
Output ripple voltage, 20 mV/div AC-coupled

$V_{IN}=20V$, $V_{OUT}=5V$
 $I_{LOAD}=1A$, $L=47\mu H$
 $C_{OUT}=68\mu F$
 $C_{OUT}ESR=50m\Omega$



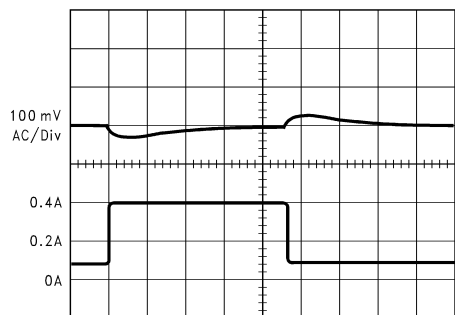
V_{SW} pin voltage, 10V/div
Inductor current, 0.5 A/div
Output ripple voltage, 20 mV/div AC-coupled

$V_{IN}=20V$, $V_{OUT}=5V$
 $I_{LOAD}=300mA$, $L=15\mu H$
 $C_{OUT}=68\mu F(2\times)$
 $C_{OUT}ESR=25m\Omega$

Figure 15: Continuous Mode Switching Waveforms, Horizontal Time Base: 1 μs /divFigure 16: Discontinuous Mode Switching Waveforms, Horizontal Time Base: 1 μs /div

Output voltage, 100mV/div
AC-coupled
Load current: 200-mA to 1-A
load pulse

$V_{IN}=20V$, $V_{OUT}=5V$
 $I_{LOAD}=1A$, $L=47\mu H$
 $C_{OUT}=68\mu F$
 $C_{OUT}ESR=50m\Omega$

Figure 17: Load Transient Response for Continuous Mode, Horizontal Time Base: 50 μs /div

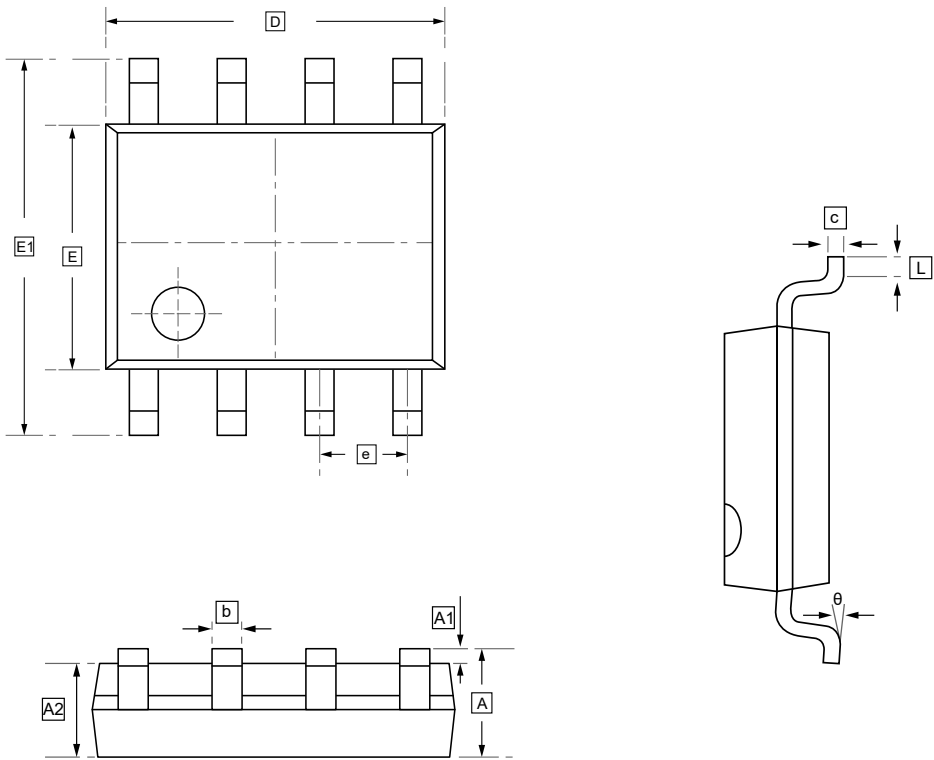
Output voltage, 100mV/div
AC-coupled
Load current: 100-mA to
400-mA load pulse

$V_{IN}=20V$, $V_{OUT}=5V$
 $L=47\mu H$
 $C_{OUT}=68\mu F(2\times)$
 $C_{OUT}ESR=50m\Omega$

Figure 18: Load Transient Response for Discontinuous Mode, Horizontal Time Base: 200 μs /div



9.SOP-8 Package Outline Dimensions

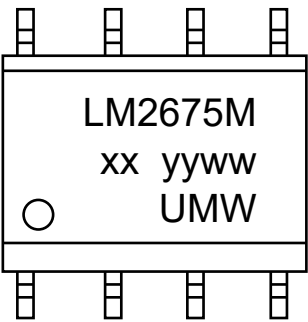


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



10.Ordering Information



yy: Year Code
ww: Week Code
xx: Voltage

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW LM2675M-ADJ	LM2675M-ADJ	SOP-8	2500	Tape and reel
UMW LM2675M-5.0	LM2675M-5.0	SOP-8	2500	Tape and reel
UMW LM2675M-3.3	LM2675M-3.3	SOP-8	2500	Tape and reel
UMW LM2675M-12	LM2675M-12	SOP-8	2500	Tape and reel



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