

1. Description

LM2674M 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 500mA 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

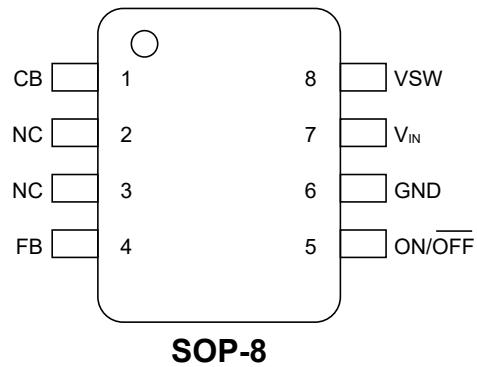
- LCD and LCD TV
- ADSL modem
- LED lights, LED backlight

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: 500mA
 - Minimum linear drop voltage drop: 1.5V
 - Package form: SOP-8
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- Digital photo frame
 - Telecommunication/network equipment



4. Pinning Information

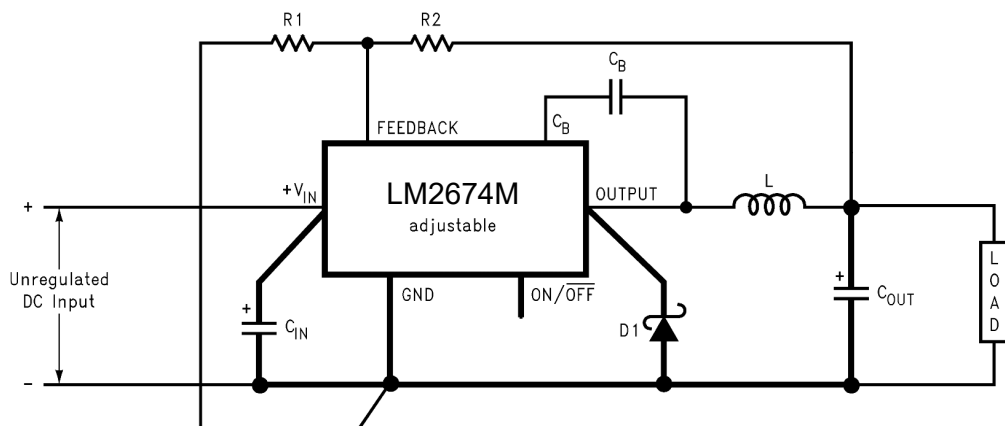
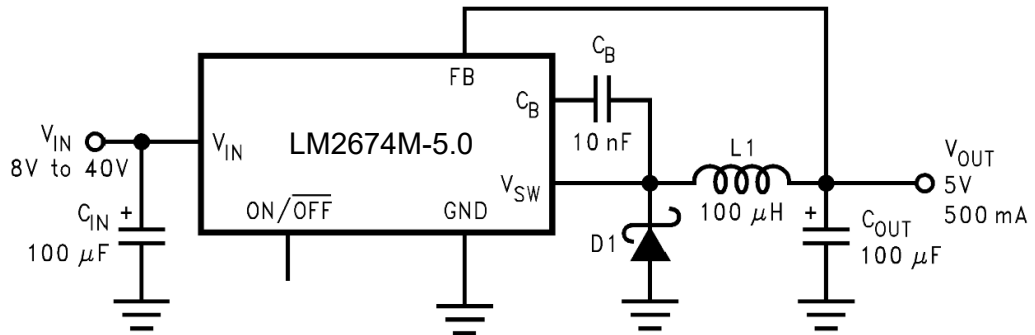


Pin Descriptions

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 ~ V_{IN}	V
Switch output terminal voltage		V_{VSW}	-1 ~ V_{IN}	V
Enable enabling terminal voltage		V_{ON-OFF}	-0.3 ~ 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, $T_A=25^\circ\text{C}$ (LM2674M-3.3V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{MA to }500\text{MA}$	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		1.2		A
Output Leakage Current	I_{OL}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$				
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}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=500\text{MA}$		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	$V_{IN}=12\text{V}$, $V_{OUT}=3.3\text{V}$, $I_{OUT}=500\text{MA}$		80		%
Input Voltage	V_{IN}		7		40	V



7.2 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2674M-5.0V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{MA to }500\text{MA}$	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		1.2		A
Output Leakage Current	I_{OL}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$				
Enable Enable Terminal Current	$I_{ON-OFFL}$	$V_{IN}=12\text{V}$, $V_{ON-OFF}=0.5\text{V}$		4	15	μA
		$V_{IN}=12\text{V}$, $V_{ON-OFF}=2.5\text{V}$		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}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=500\text{MA}$		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	$V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_{OUT}=500\text{MA}$		80		%
Input Voltage	V_{IN}		7		40	V



7.3 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2674M-12V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$V_{IN}=14\text{V to }40\text{V}$, $I_{OUT}=20\text{MA to }500\text{MA}$	11.76	12	12.24	V
Enable Shutdown Current	I_{STB}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$		100	200	μA
Quiescent Current	I_q	$V_{IN}=15\text{V}$, $V_{FB}=13\text{V}$, $V_{ON-OFF}=5\text{V}$		3	7	mA
Output Peak Current	I_{CL}	$V_{IN}=15\text{V}$, $V_{ON-OFF}=5\text{V}$, $V_{FB}=0$, no L1 and D1		1.2		A
Output Leakage Current	I_{OL}	$V_{IN}=40\text{V}$, $V_{ON-OFF}=0\text{V}$ no L1 and D1			10	μA
		$V_{VSW}=0\text{V}$				
Enable Enable Terminal Current	$I_{ON-OFFL}$	$V_{IN}=15\text{V}$, $V_{ON-OFF}=0.5\text{V}$		4	15	μA
	$I_{ON-OFFH}$	$V_{IN}=15\text{V}$, $V_{ON-OFF}=2.5\text{V}$		1.5	15	μA
Enable Effective Voltage of Enable Terminal	$V_{ON-OFFH}$	$V_{IN}=15\text{V(ON)}$	1.5			V
	$V_{ON-OFFL}$	$V_{IN}=15\text{V(OFF)}$			0.8	V
Output Saturation Voltage	V_{CE}	$V_{IN}=15\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=500\text{MA}$		1	1.5	V
Switching Frequency	fosc	$V_{IN}=15\text{V}$	225	260	275	kHz
Duty Cycle	D_{MAX}	$V_{IN}=15\text{V}$, $V_{FB}=0\text{V}$	0		100	%
Efficiency	η	$V_{IN}=15\text{V}$, $V_{OUT}=12\text{V}$, $I_{OUT}=500\text{MA}$		85		%
Input Voltage	V_{IN}		13.5		40	V



7.4 Electrical Characteristics, $T_A=25^\circ\text{C}$ (LM2674M-ADJ)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reference Voltage	V_{REF}	$V_{IN}=7\text{V to }40\text{V}$, $I_{OUT}=20\text{MA to }500\text{MA}$	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		1.2		A
Output Leakage Current	I_{OL}	$V_{IN}=V_{FB}$, $V_{ON-OFF}=5\text{V}$ no L1 and D1			10	μA
			$V_{VSW}=0\text{V}$			
				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}	$V_{IN}=12\text{V}$, $V_{FB}=0\text{V}$, $I_{OUT}=500\text{MA}$		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	$V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_{OUT}=500\text{MA}$		80		%
Input Voltage	V_{IN}		7		40	V



8.1 Typical Characteristic

<p>Output Voltage Change (%)</p> <p>Junction Temperature (°C)</p> <p>$V_{IN} = 20V$ Normalized at $T_J = 25^\circ C$</p>	<p>Output Voltage Change (%)</p> <p>Input Voltage (V)</p> <p>$V_{OUT} = 5V$ $I_L = 100 mA$ $T_J = 25^\circ C$</p>
<p>Figure 1: Normalized Output Voltage</p>	<p>Figure 2: Line Regulation</p>
<p>Efficiency (%)</p> <p>Input Voltage (V)</p> <p>$I_L = 500 mA$</p>	<p>$R_{DS(ON)}$ (Ω)</p> <p>Junction Temperature (°C)</p> <p>$I_L = 500 mA$</p>
<p>Figure 3: Efficiency</p>	<p>Figure 4: Drain-to-Source Resistance</p>
<p>Current (A)</p> <p>Junction Temperature (°C)</p> <p>$V_{IN} = 20V$</p>	<p>Supply Current (mA)</p> <p>Junction Temperature (°C)</p> <p>$V_{IN} = 12V$ $I_{SWITCH} = 0$</p> <p>SWITCH ON</p> <p>SWITCH OFF</p>
<p>Figure 5: Switch Current init</p>	<p>Figure 6: Operating Quiescent Current</p>



8.2 Typical Characteristic

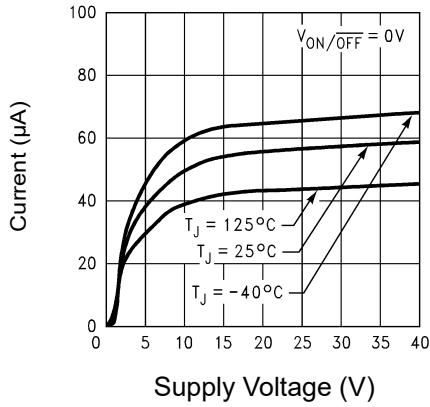


Figure 7: Standby Quiescent Current

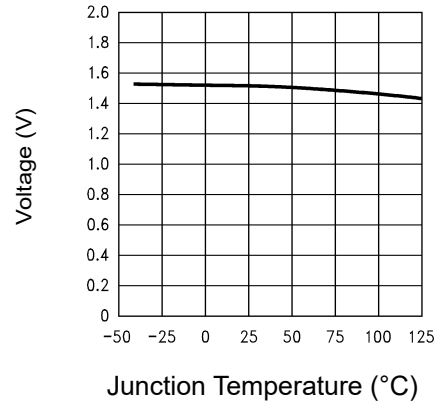


Figure 8: ON/OFF Threshold Voltage

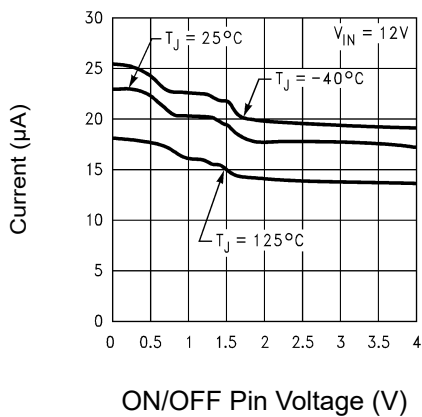


Figure 9: ON/OFF Pin Current (Sourcing)

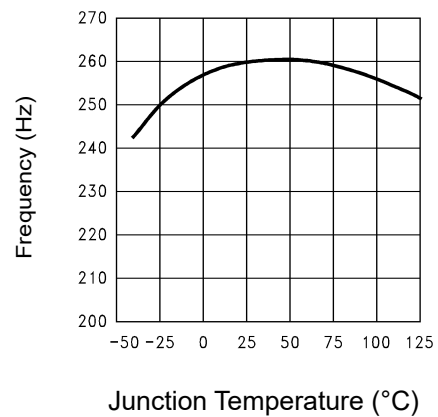


Figure 10: Switching Frequency

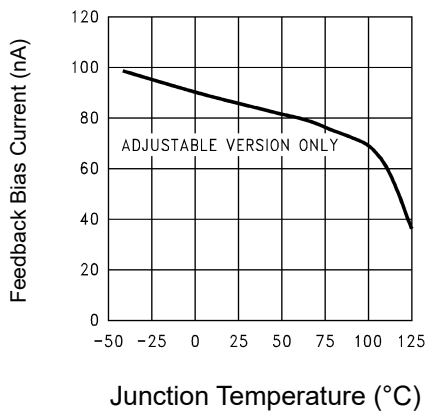


Figure 11: Feedback Pin Bias Current

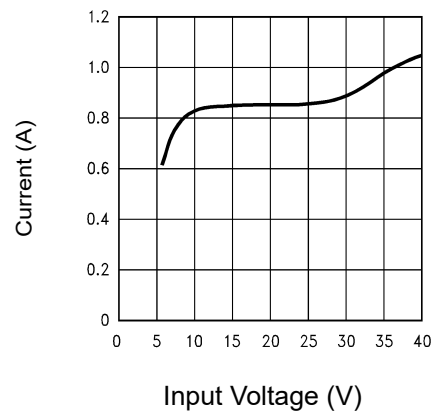


Figure 12: Peak Switch Current



8.3 Typical Characteristic

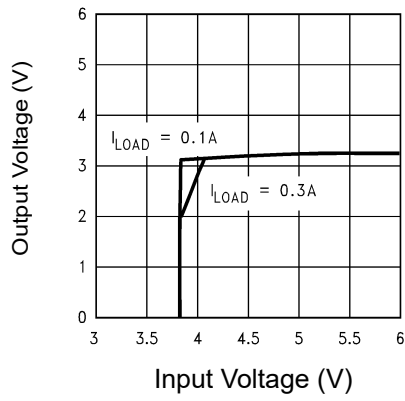


Figure 13: Dropout Voltage, 3.3-V Version

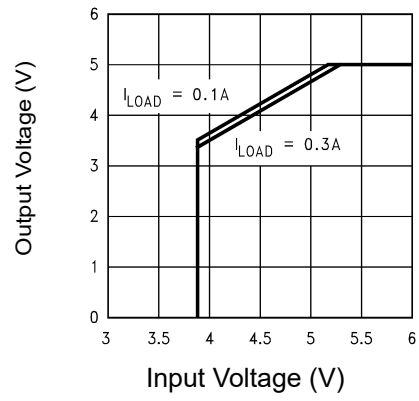
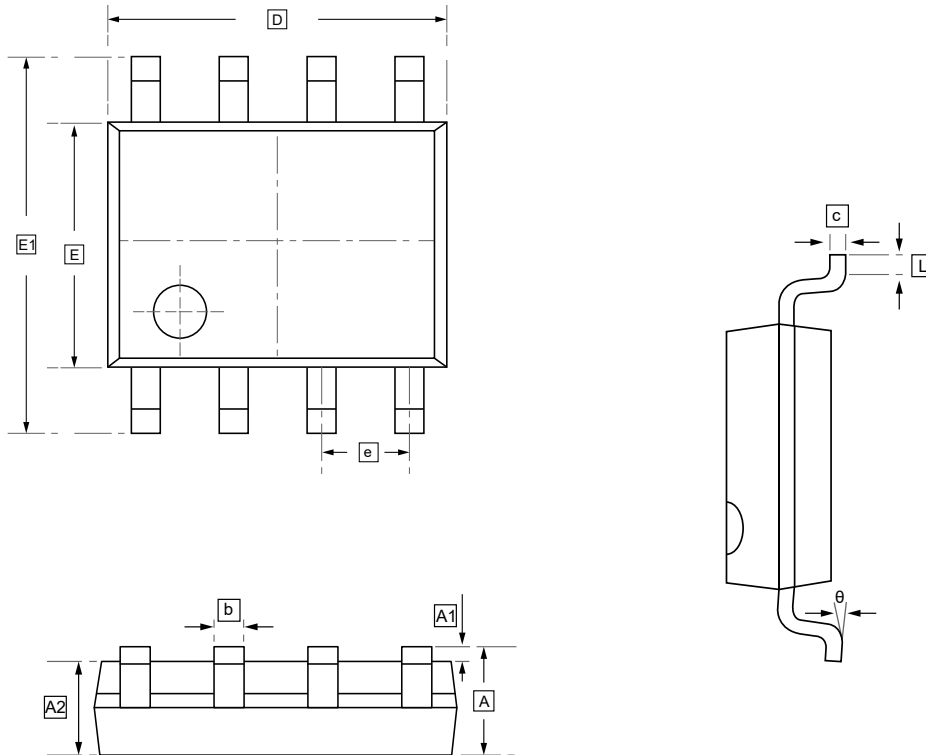


Figure 14: Dropout Voltage, 5-V Version



9.SOP-8 Package Outline Dimensions

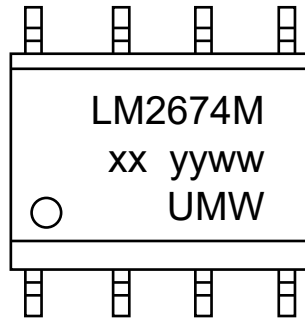


DIMENSIONS (mm are the original dimensions)

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 LM2674M-5.0	LM2674M-5.0	SOP-8	2500	Tape and reel
UMW LM2674M-ADJ	LM2674M-ADJ	SOP-8	2500	Tape and reel
UMW LM2674M-3.3	LM2674M-3.3	SOP-8	2500	Tape and reel
UMW LM2674M-12	LM2674M-12	SOP-8	2500	Tape and reel



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