Magnetic Ceramic Substrate Power Module   (MCS DC-DC Converter)
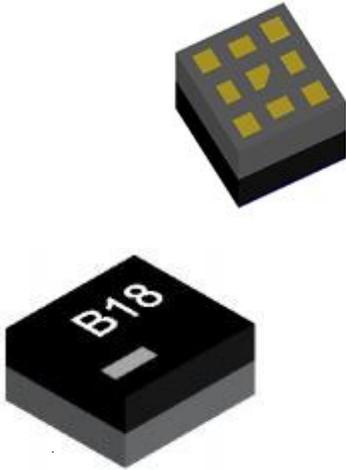
1 Features

- Ferrite Ceramic Substrate with Integrated Power Inductor and Capacitors, Low EMI Noise, Ultra-Compact

- Synchronous Rectification Technology for High Efficiency

- Control Mode Selection: Automatic PFM/PWM Switching or Forced PWM Mode

- Light Load Operation with Low Ripple Voltage PFM Mode

- Voltage Accuracy of ±2.5% Over Full Load Current Range

- Wide Input Voltage Range: 2.7V to 5.5V

- Maximum Load Current: 1.5A (800mA for Output Voltages of 2.5V or 3.3V)

- Fixed Output Voltage: 1.0V to 3.3V (Factory Set)

- Internal Soft Start and Over current Protection

2 Description

The UDM2826I series is designed for space-constrained or noise-sensitive low-power buck DC-DC converters. The device uses an inductor-embedded ferrite substrate to reduce radiated EMI noise and conducted noise. It is encapsulated in a plastic package to enhance mounting reliability.

By adding an output capacitor, it can be used as an LDO alternative. Its low noise and easy-to-use features ensure reliable power quality.

The device, when set to automatic PFM/PWM switching mode (MODE=L), operates in PFM mode at light loads to extend battery life. Under heavier loads, it automatically switches to PWM mode using synchronous rectification technology to maintain high efficiency.

When set to forced PWM mode (MODE=H), the device provides excellent output voltage accuracy over the entire load range. It maintains a voltage accuracy of ±2.5% over the current range of 0 to 1.5A.

When used as a reference voltage source, it is recommended to set the device to forced PWM mode (MODE=H). This can be achieved by directly connecting the MODE pin to VIN.

3 Typical Application Circuit

UDM2826I Typical Application Circuit

DC DC POWER MODULES
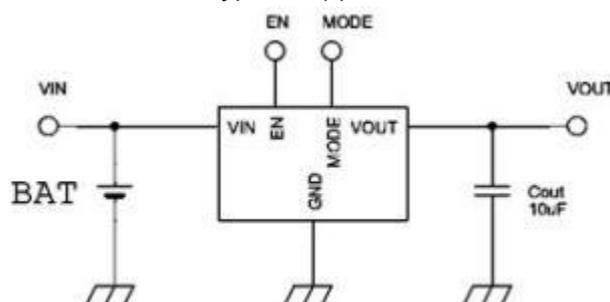
4 PIN CONFIGURATION

4.1 Dimensions

Side View

Top View

Top View (Scenograph)

Device Code
① ② ③
Pin1 Mark
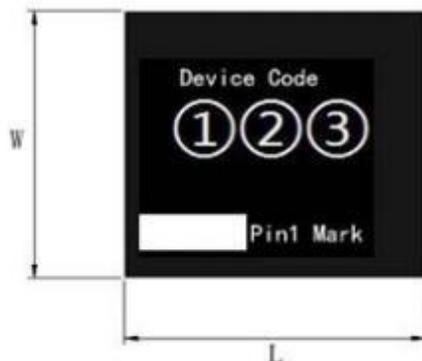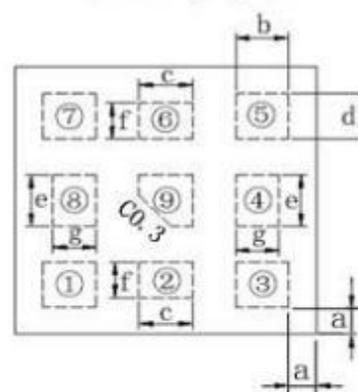
Symbol	Dimension（mm）	Symbol	Dimension（mm）
W	2.6±0.2	c	0.5±0.1
L	2.8±0.2	d	0.44±0.1
T	1.35 MAX	e	0.5±0.1
a	0.26±0.2	f	0.35±0.1
b	0.49±0.1	g	0.4±0.1

4.2 Pin Functions

Pin	Symbol	I/O	description
1	MODE	Input	Mode Selection Pin (MODE) The MODE pin must not be left floating. MODE=H: Low-noise mode, forces the device to operate in PWM mode. MODE=L: Automatic switching mode, the device operates in PFM mode at light loads and switches to PWM mode at heavy loads.
2,3	Vout	Output	Regulated Output Pin (Vout) Connect the output load between this pin and GND.
4,8,9	GND	-	Ground Pin (GND)
5,6	Vin	Input	The Vin pin provides current to the internal regulator of the UDM2826I.
7	EN	Input	This is the on/off control pin for the device. Connecting the pin to GND: Keeps the device in the off mode. Pulling the pin to VIN: Enables the device with soft-start functionality. Do Not Leave Floating: The EN pin must not be left floating. If the pin is left open, the device may turn off at an output current of 100mA. Control States: EN = H: Device is enabled (on). EN = L: Device is disabled (off).

5 Ordering Information

Model	Output Voltage	Device Specific Features	MOQ
UDM2826I1V0K15A	1.0V	**Standard Types**	T/R,3000pcs/R
UDM2826I1V2K15A	1.2V	**Standard Types**	T/R,3000pcs/R
UDM2826I1V6K15A	1.6V	**Standard Types**	T/R,3000pcs/R
UDM2826I1V8K15A	1.8V	**Standard Types**	T/R,3000pcs/R
UDM2826I2V5K08A	2.5V	**Standard Types**	T/R,3000pcs/R
UDM2826I3V3K08A	3.3V	**Standard Types**	T/R,3000pcs/R

The output voltage can be set from 1.0V to 3.3V. For detailed information, please contact us .

6 Electrical Characteristics

6.1 Absolute Maximum Ratings

Parameter	Symbol	Range	Unit
Input Voltage	Vin,EN	6.2	V
Operating Ambient Temperature	Ta	-40 to +85	℃
IC Operating Temperature	T_{IC}	-40 to +105	℃
Storage Temperature	T_{STO}	-40 to +85	℃

6.2 Electrical Characteristics（T_a = 25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Voltage	V_{in}		2.7	3.7	5.5	V
UVLO Voltage	UVLO		1.0	1.4	1.8	V
Input Leakage Current	Iin-off	Vin=3.7V,		0	2	µA

DC DC POWER MODULES

		EN=0V					
Output Voltage Accuracy	V_{out}				1	2.5	%
Output Voltage Range	V_{out}	V_{in}-V_{out}>0.7V	UDM2826I1V0K15A	0.975	1.000	1.025	V
			UDM2826I1V2K15A	1.170	1.200	1.230	
			UDM2826I1V6K15A	1.560	1.600	1.640	
			UDM2826I1V8K15A	1.755	1.800	1.845	
			UDM2826I2V5K08A	2.438	2.500	2.563	
			UDM2826I3V3K08A	3.218	3.300	3.383	
Load Current Range Overview	I_{out}	UDM2826I1V0K15A		0		1500	mA
		UDM2826I1V2K15A					
		UDM2826I1V6K15A					
		UDM2826I1V8K15A					
		UDM2826I2V5K08A		0		800	
		UDM2826I3V3K08A					
Ripple Voltage	V_{rpl}	V_{in}=3.7V, I_{out}=1500mA, BW=20MHz	UDM2826I1V0K15A		15		mV
			UDM2826I1V2K15A				
			UDM2826I1V6K15A				
			UDM2826I1V8K15A				
		Vin=5V,Iout=1500mA, BW=20MHz	UDM2826I2V5K08A				
		V_{in}=5V,I_{out}=800mA, BW=20MHz	UDM2826I3V3K08A				
Efficiency	EFF	V_{in}=3.7V, I_{out}=300mA	UDM2826I1V0K15A		85		%
			UDM2826I1V2K15A		86		
			UDM2826I1V6K15A		88		
			UDM2826I1V8K15A		90		
			UDM2826I2V5K08A		93		
		V_{in}=5V,I_{out}=300mA	UDM2826I3V3K08A		93		
EN Control Voltage	V_{ENH}	ON: Enable		1.4		V_{in}	V
	V_{ENL}	OFF:Disable		0		0.3	V
Switching Frequency (SW Frequency)	F_{osc}			2.5	3.0	3.5	MHz
Overcurrent Protection	OCP	UDM2826I1V0K15A		1500			mA
		UDM2826I1V2K15A					
		UDM2826I1V6K15A					
		UDM2826I1V8K15A		800			
		UDM2826I2V5K08A					
		UDM2826I3V3K08A					
Soft Start Time	T_{on}				1		ms

1 The external capacitor (Cout: 10μF) should be placed near the device to ensure proper operation.

2 The above characteristics were tested using the test circuit described in Section 8.

7 Detailed description

PFM/PWM Modes

If the load current decreases, the converter will automatically enter PFM (Pulse Frequency Modulation) mode. In PFM mode, the device operates in discontinuous current mode with sporadic switching pulses to maintain high efficiency under light load conditions.

The device uses constant on-time control in PFM operation, which produces low ripple voltage and precise output voltage compared to other PFM architectures. Due to this architecture, the DC output voltage can be maintained within ±2.5% of the nominal voltage. By increasing the output capacitance, the output ripple voltage in PFM mode can be further reduced.

The transition between PFM and PWM modes is also smooth. The current threshold for transitioning between PFM and PWM modes depends on factors such as Vin and Vout, but the approximate threshold is around (100~200) mA.
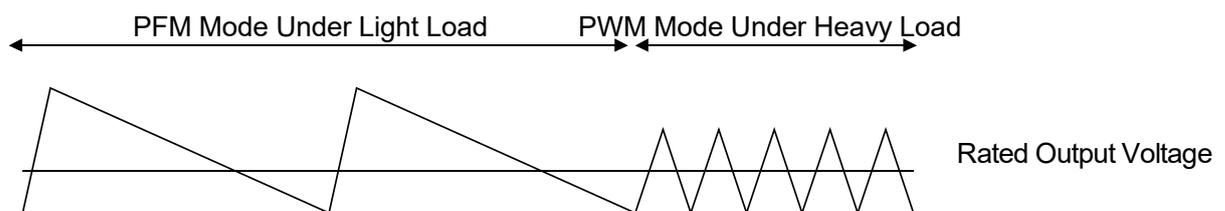
UVLO(Undervoltage Lockout)

Even if the EN pin is held high, the input voltage (Vin) must reach or exceed the UVLO voltage (2.0V typical) before the device starts up. The UVLO feature prevents uncertain operation at low Vin levels.

Soft Start

The device features an internal soft start function to limit inrush current during startup. The soft start system gradually increases the switch time from the minimum pulse width to normal operation. Due to this feature, the output voltage gradually increases from zero to the rated voltage during startup. The nominal soft start time is 0.3ms.

EN

When the EN pin is set to a high logic level, the device begins operation and starts up with a soft start. The EN pin must not be left floating; if it is open-circuit, the device may work under light load but fail to operate under heavy load.

Pulling the EN pin to a low logic level will force the device to shut down.

100% Duty Cycle Operation

The device can operate in a 100% duty cycle mode, where the high-side switch is always on, providing a lower voltage drop from input to output.

When Vin and Vout become close and the duty cycle approaches 100%, the switching pulses will skip the nominal switching cycle, and the output voltage ripple may be greater than under other conditions. However, this does not indicate a fault in the device.

8 Test Circuit
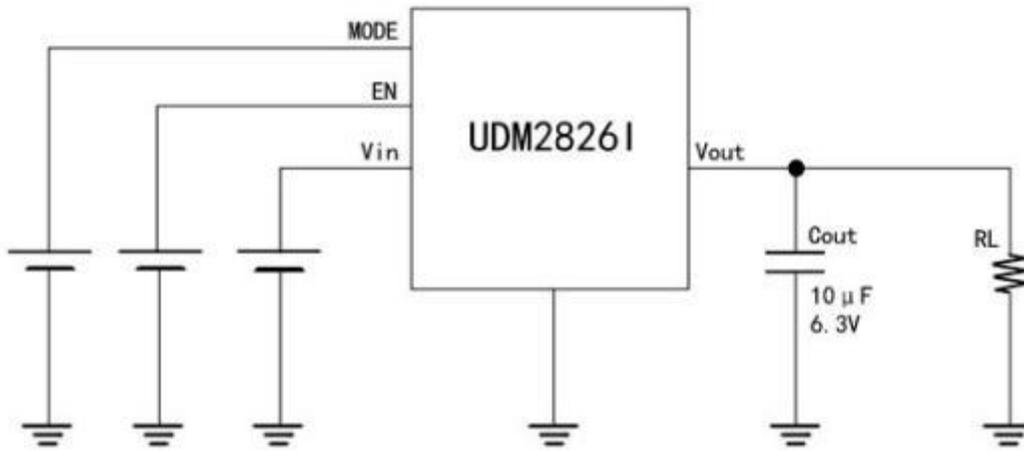
9 PCB Pad Recommendations
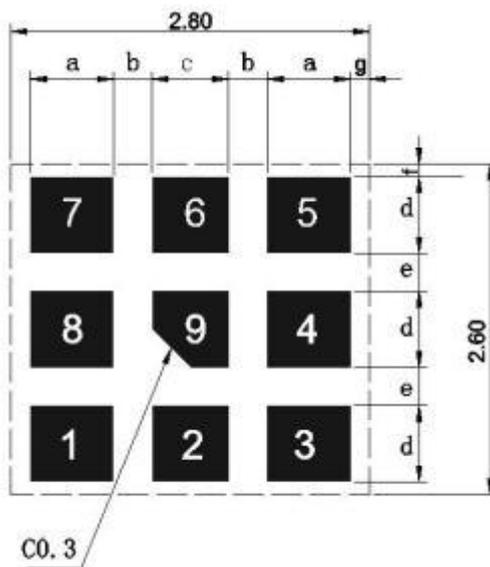
Symbol	Dimension（mm）
a	0.65
b	0.3
c	0.6
d	0.6
e	0.3
f	0.1
g	0.15

10 Mark information

①：产品系列

UDM2826I
B

②：输出电压首位

0.XX	1.XX	2.XX	3.XX	4.XX	5.XX
0	1	2	3	4	5

③：输出电压末位

输出电压	标识	输出电压	标识
X.00	0	X.05	a
X.10	1	X.15	b
X.20	2	X.25	c
X.30	3	X.35	d
X.40	4	X.45	e
X.50	5	X.55	f
X.60	6	X.65	g
X.70	7	X.75	h
X.80	8	X.85	i
X.90	9	X.95	j

11 Recommended Soldering Process

Recommended Reflow Soldering Profile
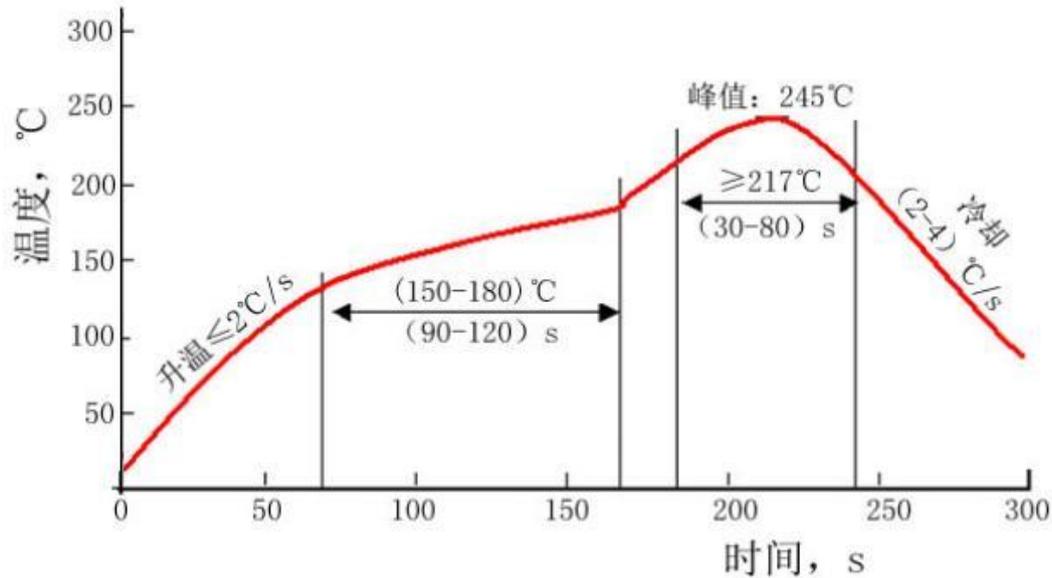
Note: For bulk and opened original packaging products, store them in a dry cabinet (the relative humidity in the dry cabinet should be kept below 10%). For unopened original packaging products, store them in a dry cabinet whenever possible.

12 Packaging Information
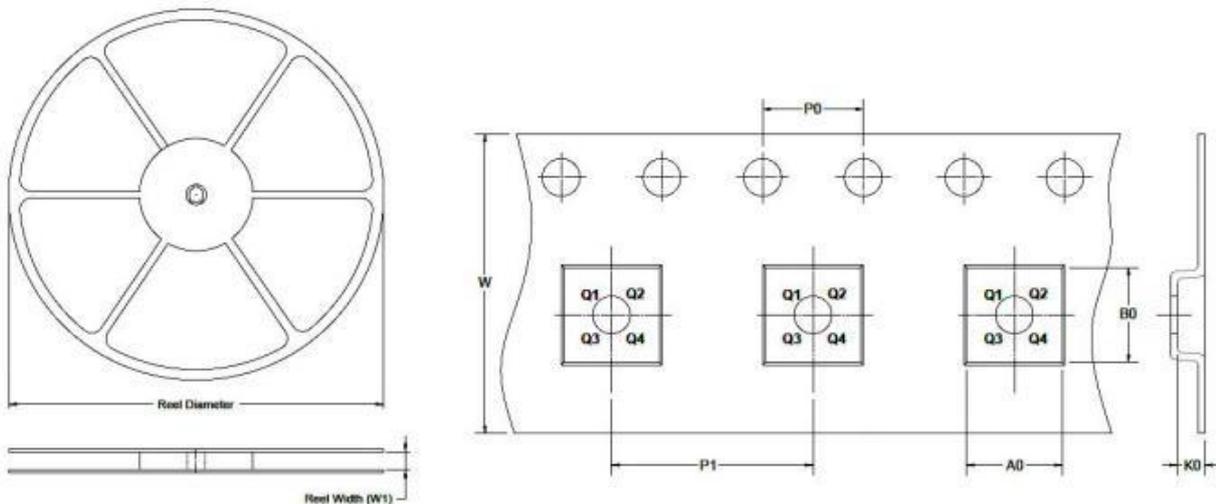
Reel and Tape Main Dimensions

Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant	MOQ
7″	8.8	2.80	3.10	1.40	4.0	4.0	8.0	Q1	T/R,3000pcs/R