

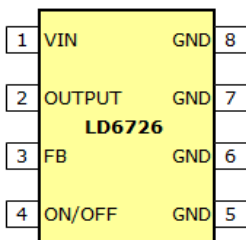
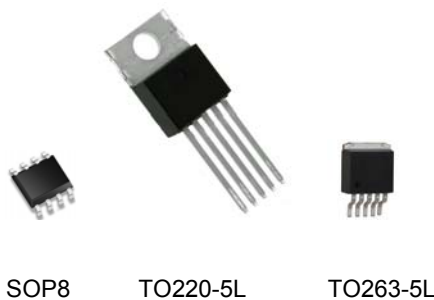
Features

- 3.3V, 5V, 12V, 15V and adjustable output versions
- Adjustable version output voltage range,
- 1.23~37V±3% max over line and load conditions
- Guaranteed 3A output current
- Wide input voltage range
- Requires only 4 external components
- 52KHz fixed frequency oscillator
- TTL shutdown capability, low power standby mode
- Uses readily available standard inductors
- Thermal shutdown and current limit protection

Applications

- Simple high-efficiency step-down (buck) regulator
- Efficient pre-regulator for linear regulators
- On-card switching regulators
- Positive-to-negative converter (buck-boost)

Package Pin Out



Pin Assignment of TO220 and TO263

Pin	Name
1	VIN
2	OUTPUT
3	GND
4	FB
5	ON/OFF

General Description

The LD6726 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving 3A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, 15V and adjustable output versions. Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The LD6726 series offers a high-efficiency replacement for popular three-terminal linear regulators. It substantially reduces the size of the heat sink, and in some cases no heat sink is required. A standard series of inductors optimized for use with the LD6726 are available from several different manufacturers. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed ± 4% tolerance on output voltage within specified input voltages and output load conditions, and ±10% on the oscillator frequency. External shutdown is included, featuring 50µA (typical) standby current. The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

Ordering Information

Part No.	Package	Packing Options	
		Tube (TU)	Tape & Reel (TR)
LD6726	SOP-8	LD6726S1-000-TU	LD6726S1-000-TR
	TO220-5L	LD6726T4-000-TU	LD6726T4-000-TR
	TO263-5L	LD6726T9-000-TU	LD6726T9-000-TR

- Package material default is "Green" package.

Output Voltage Selection

Part No.	V _{OUT}
LD6726S1-000-XX	Adjustable
LD6726S1-033-XX	3.3V
LD6726S1-050-XX	5.0V
LD6726S1-120-XX	12V
LD6726S1-150-XX	15V

Product Marking

LD8888	◇ Line 1 – "LD" is a fixed character 8888: product name
SSSSS...	

Absolute Maximum Ratings*1

Parameter	Maximum	Unit
V _{IN} supply voltage	45	V
Operating V _{IN} supply voltage	6 to 40	V
ON/OFF pin voltage	-0.3 ≤ V ≤ V _{IN}	V
FB pin voltage	-0.3 ≤ V ≤ V _{IN}	V
OUTPUT pin to GND	-0.8	V
Operating current load	3.0	A
Junction temperature	150	°C
Operating temperature range	-40 to +125	°C
Storage temperature range	-65 to +150	°C
Power dissipation	Internal limited	

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

Electrical Characteristics

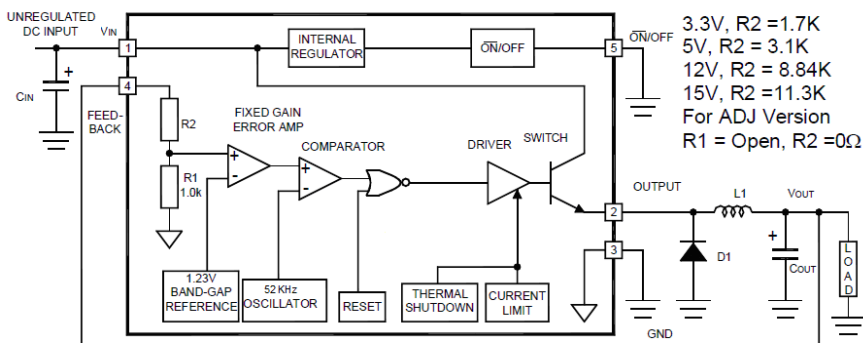
V_{IN}=12V for 3.3V, 5V; V_{IN}=25V for 12V, 15V and adjustable version, I_{LOAD}=0.5A, T_A=25°C unless specified

Parameter	Symbol	Condition	Min	Typ. ²	Max	Unit		
System Parameters³								
Output voltage range LD6726-033	V _{OUT}	V _{IN} =12V, I _{LOAD} =0.5A, V _{OUT} =>3.3V	3.234	3.300	3.366	V		
		6V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>3.3V	3.168	3.300	3.432			
		6V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>3.3V ⁹	3.135	3.300	3.465			
V _{IN} =12V, I _{LOAD} =0.5A, V _{OUT} =>5V		4.900	5.000	5.100				
8V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>5V		4.800	5.000	5.200				
8V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>5V ⁹		4.750	5.000	5.250				
Output voltage range LD6726-050	V _{OUT}	V _{IN} =25V, I _{LOAD} =0.5A, V _{OUT} =>12V	11.76	12.00	12.24	V		
		15V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>12V	11.52	12.00	12.48			
		15V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>12V ⁹	11.40	12.00	12.60			
V _{IN} =25V, I _{LOAD} =0.5A, V _{OUT} =>15V		14.70	15.00	15.30				
18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V		14.40	15.00	15.60				
18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V ⁹		14.25	15.00	15.75				
Output voltage range LD6726-120	V _{OUT}	V _{IN} =25V, I _{LOAD} =0.5A, V _{OUT} =>15V	14.70	15.00	15.30	V		
		18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V	14.40	15.00	15.60			
		18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V ⁹	14.25	15.00	15.75			
V _{IN} =12V, I _{LOAD} =0.5A, V _{OUT} =>1.23V		1.217	1.230	1.243				
7V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>1.23V		1.193	1.230	1.267				
7V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>1.23V ⁹		1.180	1.230	1.280				
Output voltage range LD6726-150	V _{OUT}	V _{IN} =12V, I _{LOAD} =0.5A, V _{OUT} =>12V	11.76	12.00	12.24	V		
		15V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>12V	11.52	12.00	12.48			
		15V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>12V ⁹	11.40	12.00	12.60			
		V _{IN} =25V, I _{LOAD} =0.5A, V _{OUT} =>15V	14.70	15.00	15.30			
		18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V	14.40	15.00	15.60			
18V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>15V ⁹		14.25	15.00	15.75				
Output voltage range LD6726-000	V _{OUT}	V _{IN} =12V, I _{LOAD} =0.5A, V _{OUT} =>1.23V	1.217	1.230	1.243	V		
		7V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>1.23V	1.193	1.230	1.267			
		7V ≤ V _{IN} ≤ 40V, 0.5A ≤ I _{LOAD} ≤ 3A, V _{OUT} =>1.23V ⁹	1.180	1.230	1.280			
Efficiency of LD6726-033		η	V _{IN} =12V, I _{LOAD} =3A, V _{OUT} =>3.3V	–	75		–	%
			V _{IN} =12V, I _{LOAD} =3A, V _{OUT} =>5V	–	77		–	
			V _{IN} =12V, I _{LOAD} =3A, V _{OUT} =>12V	–	88		–	
	V _{IN} =18V, I _{LOAD} =3A, V _{OUT} =>15V		–	88	–			
	V _{IN} =12V, I _{LOAD} =3A, V _{OUT} =>1.23V		–	77	–			
V _{IN} =12V, I _{LOAD} =3A, V _{OUT} =>1.23V ⁹	–		77	–				
Device Parameters								
Feedback bias current	I _{FB}	V _{OUT} =5V	–	50	100	nA		
		V _{OUT} =5V ⁹	–	–	500			
Oscillator frequency	F _{OSC}	*8	47	52	58	KHz		
		*8*9	42	–	63			
Saturation voltage	V _{SAT}	V _{FB} =0V, I _{LOAD} =3A ⁴	–	1.4	1.6	V		
		V _{FB} =0V, I _{LOAD} =3A ^{4*9}	–	–	1.8			
Maximum duty cycle	DC _{MAX}	V _{FB} =0V (driver on) ^{5*9}	93	98	–	%		
Current limit	I _{CL}	V _{FB} =0V, peak current	4.2	5.8	6.9	A		
		V _{FB} =0V, peak current ⁹	3.5	–	7.5			
Output leakage current	I _L	V _{OUT} =-0.8V ^{6*7}	–	7.5	30	mA		
		V _{OUT} =0V ^{6*7}	–	0.4	2			
Quiescent current	I _Q	*6	–	5	10	μA		
Standby current	I _{STB}	V _{ON/OFF} =5V, V _{IN} =40V	–	50	200	μA		
		V _{ON/OFF} =5V, V _{IN} =40V ⁹	–	–	250			
ON/OFF Control								
ON/OFF pin input level	V _{IH}	V _{OUT} =0V	2.2	1.4	–	V		
		V _{OUT} =0V ⁹	2.4	–	–			
	V _{IL}	V _{OUT} =normal output	–	1.2	1.0	V		
		V _{OUT} =normal output ⁹	–	–	0.8			
ON/OFF pin input current	I _{IH}	V _{ON/OFF} =5V(off)	–	12	30	μA		
	I _{IL}	V _{ON/OFF} =0V(on)	–	0	10	μA		

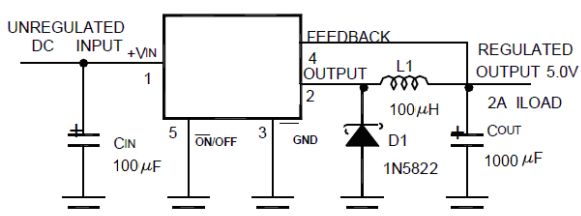
Notes:

1. The Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. The Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics.
2. All the Limits are guaranteed at room temperature (standard type face) and at temperature extremes (boldface type).
3. External components such as catch diode, inductor, input and output capacitors can affect the switching regulator system performance. When the 2576M3K is used as shown in the Figure 2 test circuit, the system performance will be as shown in the system parameters section of the Electrical Characteristics.
4. OUTPUT pin sourcing current. No diode, inductor or capacitor connected to the OUTPUT.
5. FEEDBACK pin is removed from the output and connected to 0V.
6. FEEDBACK pin is removed from the output and connected to +12V for the adjustable, 3.3V, and 5V, versions, and +25V for the 12V and 15V versions, to force the output transistor OFF.
7. VIN =40V.
8. The oscillator frequency reduces to approximately 11 kHz in the event of an output short or an overload, which causes the regulated output voltage to drop approximately 40% from the nominal output voltage. This self-protection feature lowers the average power dissipation of the IC by lowering the minimum duty cycle from 5% down to approximately 2%.
9. This applied over full operation temperature range.

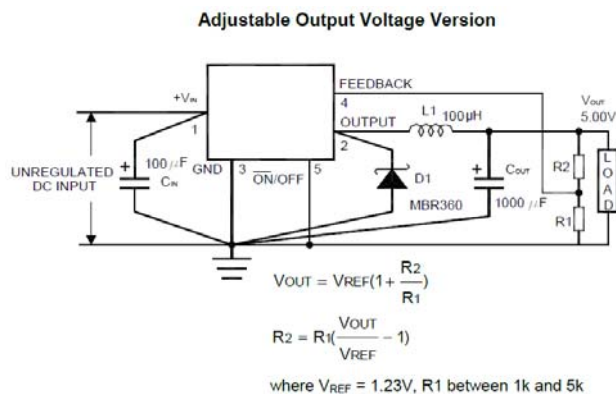
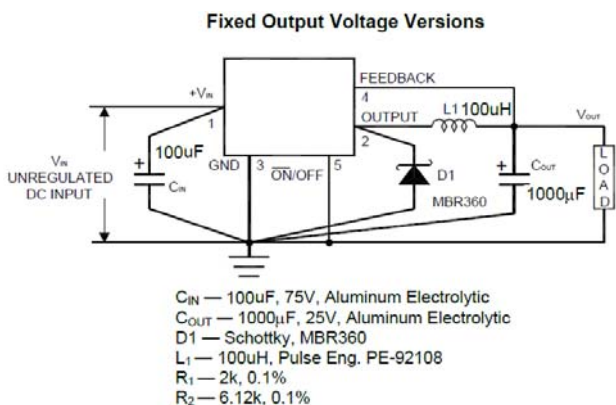
Block Diagram



Typical Application Circuit

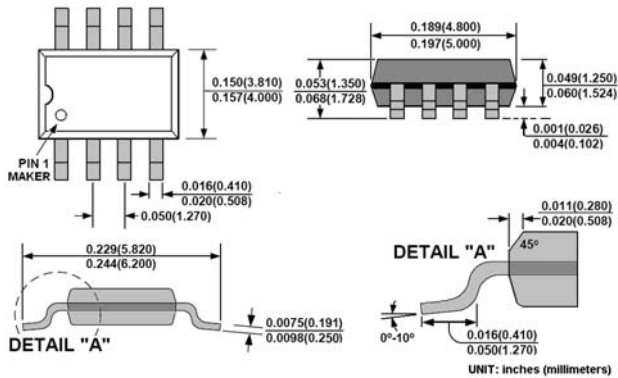


Test Circuit and Layout Guidelines

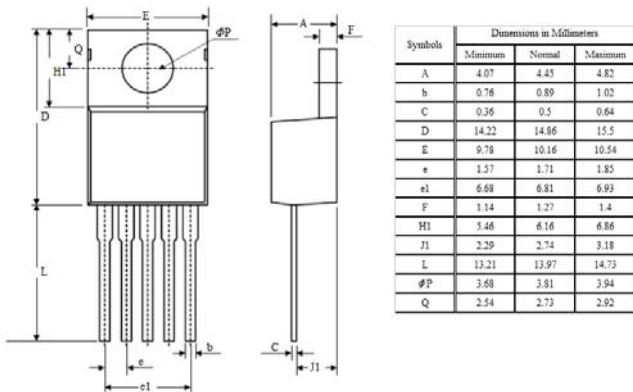


Package Outline

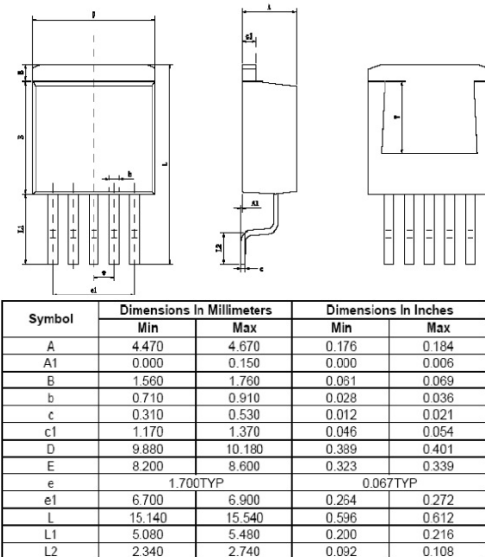
SOP8:



TO220-5L:



TO263-5L:



LD Tech Corporation

Tel: +886-3-567-8806

Fax: +886-3-567-8706

E-mail: sales@ldtech.com.tw

Website: www.ldtech.com.tw