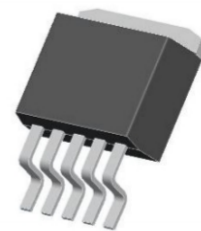


General Description Series

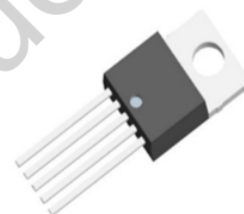
The LM2576 series is a monolithic IC designed for a step-down DC/DC converter, and own the ability of driving a 3A load without additional transistor. It saves board space. The external shutdown function can be controlled by logic level and then come into standby mode. The internal compensation makes feedback control having good line and load regulation without external design. Regarding protected function, thermal shutdown is to prevent over temperature operating from damage, and current limit is against over current operating of the output switch. If current limit function occurs and V_{FB} is down below 0.5V, the switching frequency will be reduced.

The LM2576 series operate at a switching frequency of 52KHz thus allow smaller sized filter components than what would be needed with lower frequency switching regulators. Other features include a guaranteed $\pm 4\%$ tolerance on output voltage under specified input voltage and output load conditions, and $\pm 10\%$ on the oscillator frequency.

The chips are available in TO263-5L package and TO220-5L package.



LM2576S



LM2576T

Features

- 3.3V, 5V, 12V and Adjustable Output Version
- Output Adjustable Voltage From 1.23V to 37V
- Fixed 52KHz Switching Frequency
- Voltage Mode Non-synchronous PWM Control
- ON/OFF Shutdown Control Input
- Wide 4.5V to 40V Input Voltage Range
- Output Load Current: 3A
- Low Power Standby Mode
- Built-in Switching Transistor on Chip
- Internal Short-Circuit Current Limiting Protections and OVP

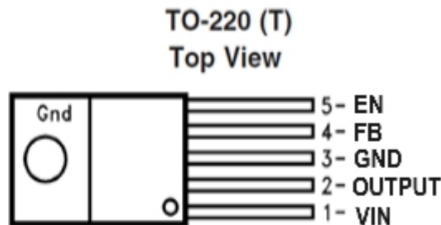
Application

- Simple High-Efficiency Step-down Regulator
- On-card Switching Regulators
- Positive to Negative Converter

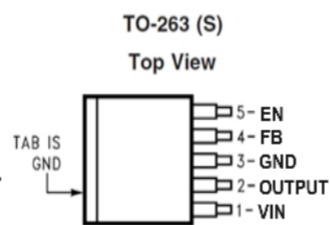
Series

LM2576S-3.3	T0-263-5
LM2576S-5.0	T0-263-5
LM2576S-ADJ	T0-263-5
LM2576S-12	T0-263-5
LM2576SX-3.3	T0-263-5
LM2576SX-5.0	T0-263-5
LM2576SX-ADJ	T0-263-5
LM2576SX-12	T0-263-5
LM2576T-ADJ	T0-220-5
LM2576T-12	T0-220-5
LM2576T-5.0	T0-220-5
LM2576T-3.3	T0-220-5

Pin Configuration



TO220-5L
(LM2576T)

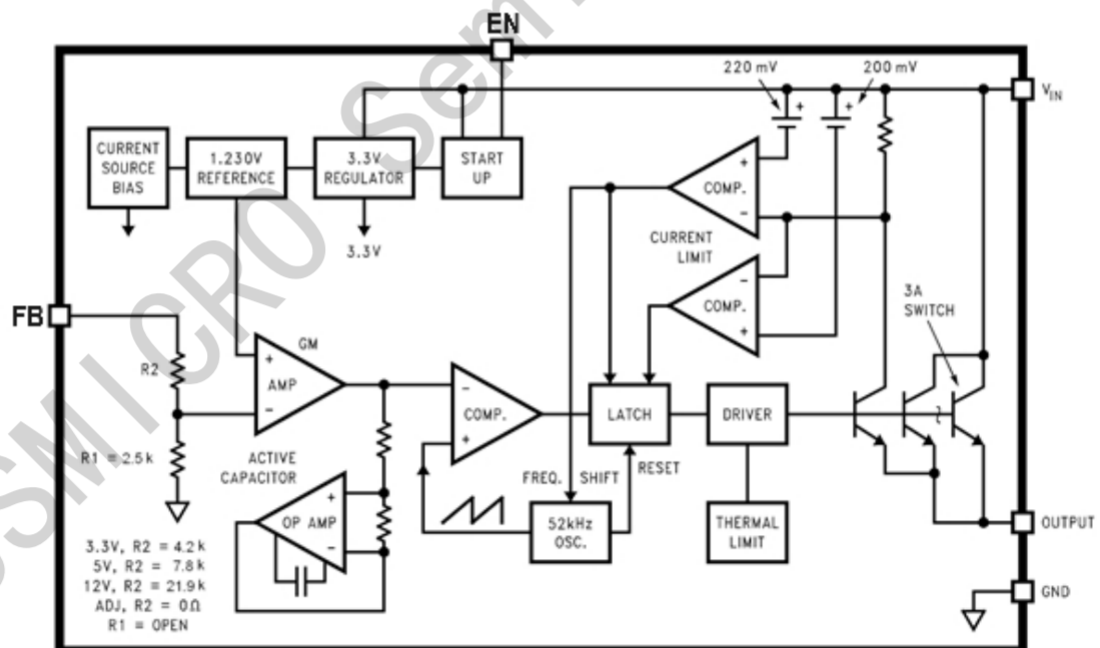


TO263-5L
(LM2576S)

Pin Descriptions

Name	Description
V_{IN}	Supply Voltage Input
Output	Power Switching Output
GND	Ground
FB	Output Voltage Feedback Control
EN	ON/OFF Shutdown

Block Diagram



Absolute Maximum Ratings

Characteristics	Symbol	Value	Unit
Supply Voltage	V _{IN}	+40	V
ON/OFF pin input voltage	V _{SD}	-0.3 ~ V _{IN}	V
Feedback pin voltage	V _{FB}	-0.3 ~ V _{IN}	V
Output voltage to ground	V _{OUT}	-1	V
Power dissipation	PD	Internally limited	W
Storage temperature	T _{stg}	-65 ~ +150	°C
Operating temperature	T _{opr}	-40 ~ +125	°C
Operating voltage	V _{OP}	+4.5 ~ +40	V

Electrical Characteristics

(Refer to the test circuit, V_{IN}=12V for 3.3V, 5V, adjustable version and V_{IN}=24V for the 12V version, I_{LOAD}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Feedback Bias Current	I _{FB}	V _{FB} =1.3V (Adjustable version only)		50	100	nA
Oscillator Frequency	F _{osc}		47	52	57	kHz
Saturation Voltage	V _{SAT}	I _{OUT} =2A, No outside circuit V _{FB} =0V force driver on		1.2	1.5	V
Max. Duty Cycle(ON)	DC	V _{FB} =0V force driver on	93	98		%
Min. Duty Cycle(OFF)		V _{FB} =12V force driver off		0		
Current Limit	I _{CL}	Peak current, No outside circuit V _{FB} =0V force driver on	3.0	4.0		A
Output Leakage Current (Output=0)	I _L	No outside circuit V _{FB} =12V force driver off		0.15	2	mA
Output Leakage Current (Output=-1)		V _{IN} =40V		4	20	mA
Quiescent Current	I _Q	V _{FB} =12V force driver off		4	10	mA
Standby Quiescent Current	I _{STBY}	ON/OFF pin=5V V _{IN} =40V		30	200	μA
ON/OFF pin Logic Input Threshold Voltage	V _{IL}	Low(regulator ON)			0.6	V
	V _{IH}	High(regulator OFF)	2.0			
ON/OFF pin Logic Input Current	I _H	V _{LOGIC} =5.0V(OFF)		6	30	μA
ON/OFF pin Input Current	I _L	V _{LOGIC} =0.5V(ON)		0.1	10	
Thermal Resistance	Θ _{JC}	Junction to case		15		°C/W
Thermal Resistance with Copper Area of Approximately 3 in ²	Θ _{JA}	Junction to ambient		70		°C/W

Continue:

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
LM2576-ADJ						
Output Feedback	V_{FB}	$4.5V \leq V_{IN} \leq 40V$ $0.2A \leq I_{LOAD} \leq 3A$ V_{OUT} programmed for 3V	1.193	1.230	1.267	V
Efficiency	η	$V_{IN}=12V, I_{LOAD}=3A$		74		%
LM2576-3.3V						
Output Voltage	V_{OUT}	$4.75V \leq V_{IN} \leq 40V$ $0.2A \leq I_{LOAD} \leq 3A$	3.168	3.300	3.432	V
Efficiency	η	$V_{IN}=12V, I_{LOAD}=3A$		76		%
LM2576-5V						
Output Voltage	V_{OUT}	$7V < V_{IN} < 40V$ $0.2A \leq I_{LOAD} \leq 3A$	4.80	5.00	5.20	V
Efficiency	η	$V_{IN}=12V, I_{LOAD}=3A$		83		%
LM2576-12V						
Output Voltage	V_{OUT}	$15V \leq V_{IN} \leq 40V$ $0.2A \leq I_{LOAD} \leq 3A$	11.52	12.00	12.48	V
Efficiency	η	$V_{IN}=25V, I_{LOAD}=3A$		90		%

Function Description

V_{IN}

This is the positive input supply for the IC switching regulator. A suitable input bypass capacitor must be presented at this pin to minimize voltage transients and to supply the switching currents needed by the regulator.

GND

Circuit ground.

Output

Internal switch. The voltage at this pin switches between $(+V_{IN} - V_{SAT})$ and approximately $-0.5V$, with a duty cycle of approximately V_{OUT} / V_{IN} . To minimize coupling to sensitive circuitry, the PC board copper area connected to this pin should be minimized.

FB

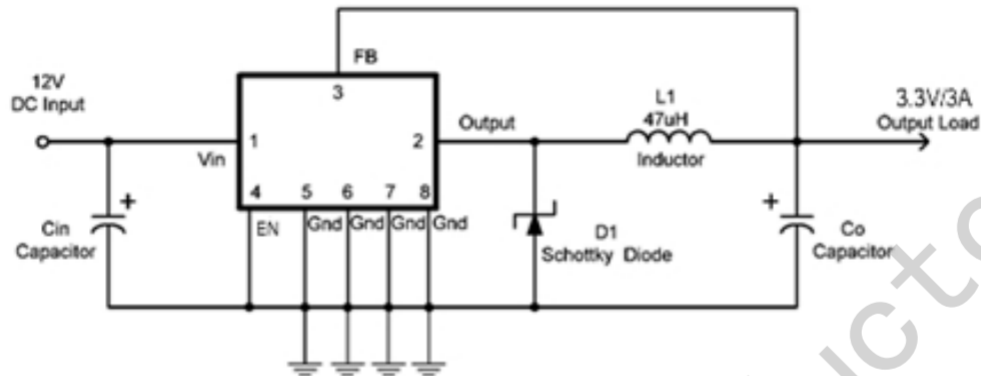
Senses the regulated output voltage to complete the feedback loop.

EN

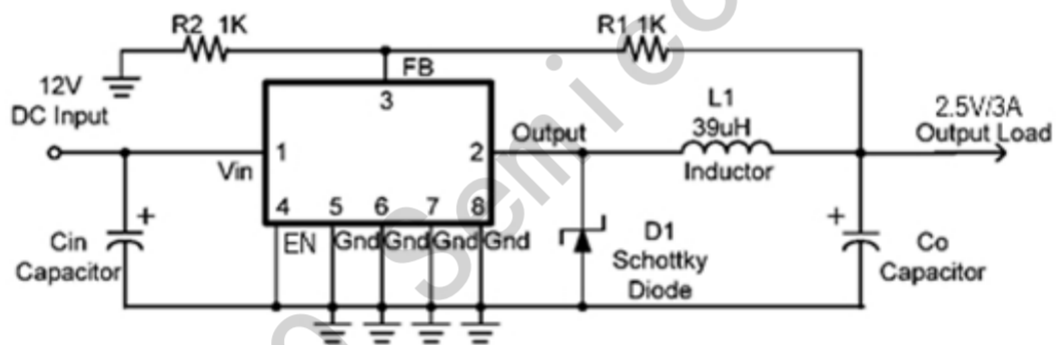
Allows the switching regulator circuit to be shutdown using logic level signals thus dropping the total input supply current to approximately 150uA. Pulling this pin below a threshold voltage of approximately 1.3V turns the regulator on, and pulling this pin above 1.3V shuts the regulator down. If this shutdown feature is not needed, the EN pin can be wired to the ground pin.

Application Circuit

Fixed Type Circuit



Adjustable Type Circuit

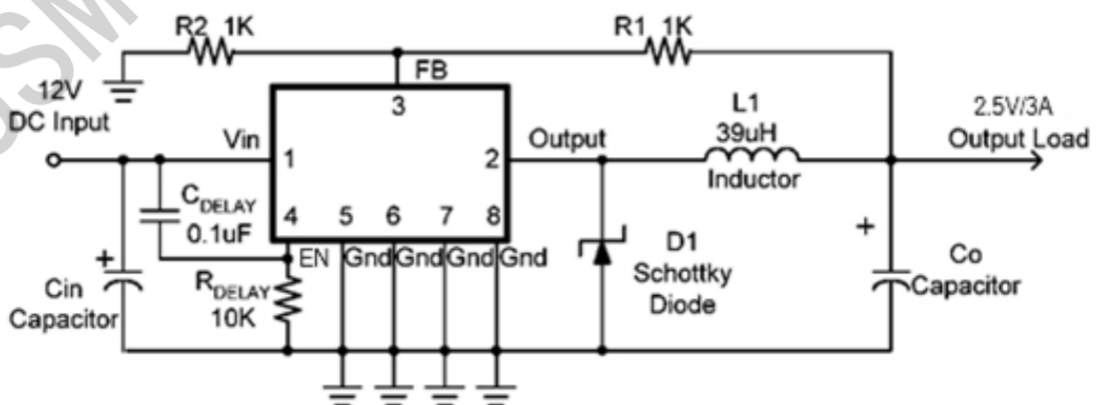


$$V_{out} = V_{FB} \times \left(1 + \frac{R1}{R2}\right)$$

$$V_{FB} = 1.23V$$

$$R2 = 1K \sim 3K$$

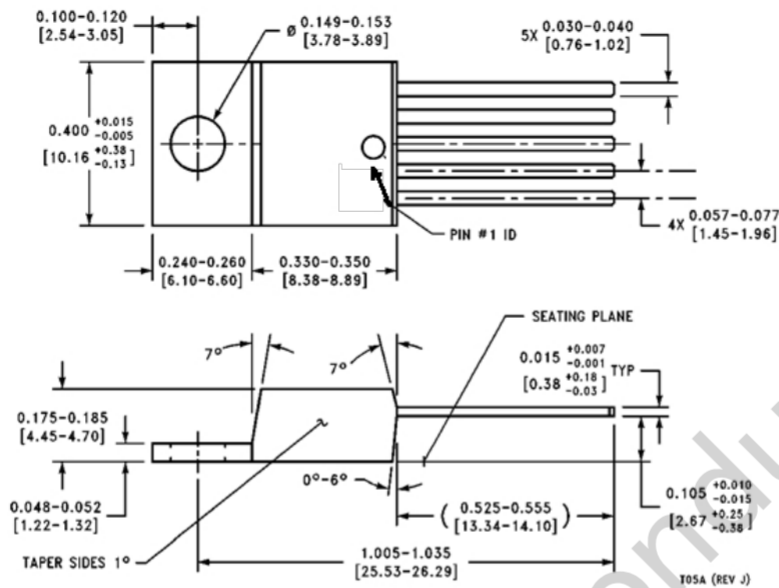
Delay Start Circuit



Outline Drawing

TO220-5L

Unit: mm



TO263-5L

Unit: mm

