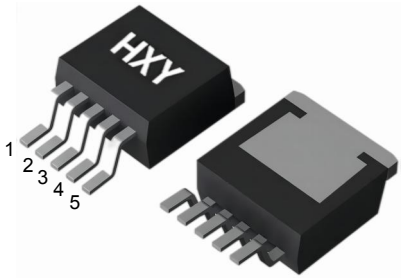
General Description

The LM2575S is a series of easy to use fixed and adjustable step-down (buck) switch-mode voltage regulators. These devices are available in fixed output voltage of 3.3V, 5V, and an adjustable output version. Both versions are capable of driving a 3A load with excellent lineand load regulation.

Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation, and a fixed-frequency oscillator.

The output voltage is guaranteed to ±3% tolerance under specified input voltage and output load conditions. The oscillator frequency is guaranteed to ±15%. External shutdown is included, featuring typically 80 μA standby current. Self protection features include a two stage frequency reducing current limit for the output switch and an over temperature shutdown for complete protection under fault conditions.



5 ON/OFF
4 Feedback
3 Gnd
2 Output
1 Vin

TO263-5L

Features

- 3,3V,5V and adjustable output versions
- Output adjustable from 1.23v to 37V
- Fixed 52KHz frequency internal oscillator
- Guaranteed 3A output load current
- Input voltage range up to 40V
- Low power standby mode, I_Q typically 80 μA
- TTL shutdown capability
- Excellent line and load regulation
- Requires only 4 external components
- High efficiency
- Thermal shutdown and current limit protection

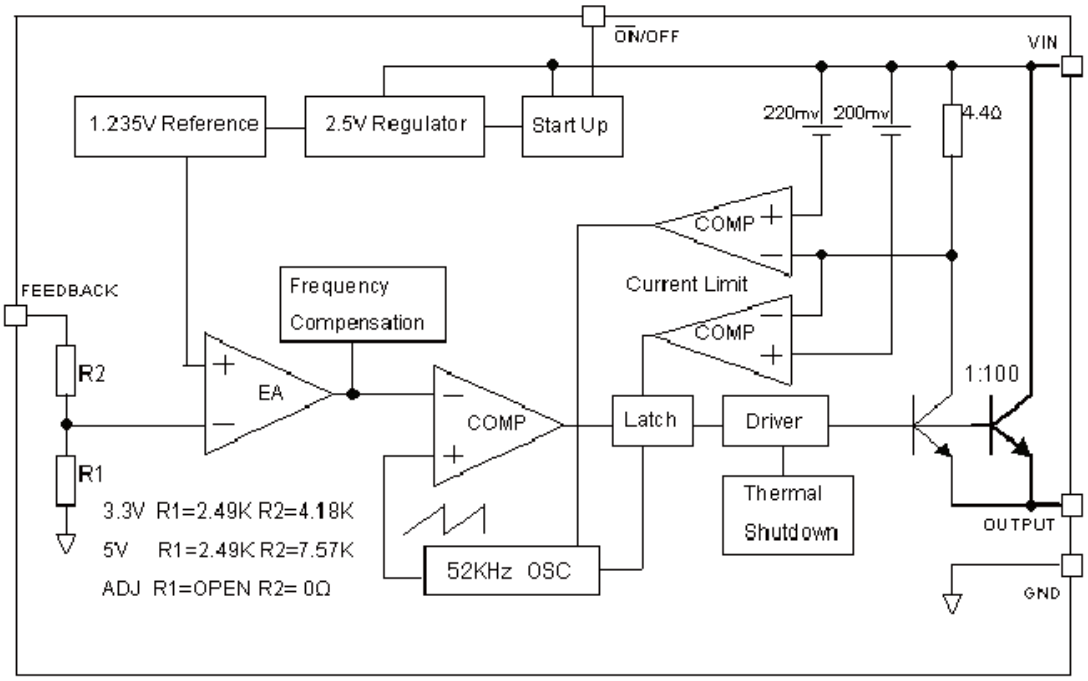
Name	Description
Vin	Input supply voltage
Output	Switching output
Gnd	Ground
Feedback	Output voltage feedback
ON/OFF	ON/OFF shutdown Active is “Low” or floating

Pin Descriptions

Applications

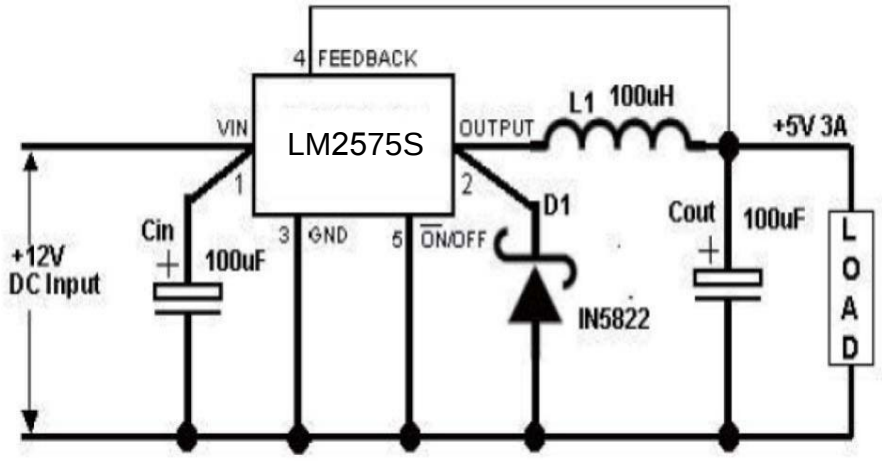
- Simple High-efficiency step-down regulator
- On-card switching regulators
- Positive to negative converter
- LCD monitor and LCD TV
- DVD recorder and PDP TV
- Battery charger
- Step-down to 3.3V for microprocessors

Functional Block Diagram



Functional Block Diagram of LM2575S

Typical Application (Fixed Output Voltage Versions)



Typical Application of LM2575S

Absolute Maximum Ratings

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Parameter	Value	Unit
Supply Voltage Vin	-0.3 to 40	V
Feedback VFB pin voltage	-0.3 to Vin+0.3	V
ON/OFF Pin voltage	-0.3 to Vin+0.3	V
Output pin voltage	-0.3 to Vin+0.3	V
Output Voltage to Ground (Steady State)	-1	V
Power Dissipation	Internally limited	W
Operating Temperature Range	-40 to +125	°C
Storage Temperature	-65 to +150	°C
Lead Temperature (Soldering, 10 sec)	260	°C
ESD(HM)	2000	V
Thermal Resistance-Junction to Ambient(RθJA)	85	ºC / W
Thermal Resistance-Junction to Case(RθJC)	45	ºC / W

Electrical Characteristics (All Output Voltage Versions)

Unless otherwise specified, Ta = 25℃.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_b	Feedback bias current	Adjustable only, V_{FB}=1.3V		10	50	nA
I_Q	Quiescent current	V_{FB}=12V force driver off		5	10	mA
I_{STBY}	Standby quiescent current	ON/OFF=5V, V_{IN}=36V		80	200	uA
F_{OSC}	Oscillator frequency		47	52	58	KHz
V_{SAT}	Saturation voltage	I_{OUT}=3A		1.2	1.4	V
I_{CL}	Current Limit	Peak Current (V_{FB}=0V)		4.5	5.5	A
I_L	Output leakage current	Output=0V (V_{FB}=12V)			50	uA
I_L	Output leakage current	Output=-1V (V_{IN}=36V)		2	30	mA
V_{IL}	ON/OFF pin logic input	Low (Regulator ON)		1.3	1.6	V

V_{IH}	Threshold voltage	High (Regulator OFF)	2.0	1.3		V
I_H I_L	ON/OFF pin input current	V_{LOGIC}=2.5V(Regulator OFF)		5	15	uA
		V_{LOGIC}=0.5V(Regulator ON)		0.02	5	uA
θ_{JC}	Thermal Resistance Junction to Case			3.5		^{O}C/W
θ_{JA}	Thermal Resistance Junction to Ambient (Note1)			23		^{O}C/W
LM2576 S-ADJ	Vout: Output Voltage	11V $\leqslant V_{IN} \leqslant$ 40V, 0.2A $\leqslant I_{LOAD} \leqslant$3A, V_{OUT} for 9V	1.193	1.23	1.267	V
	η : Efficiency	V_{IN}=12V,V_{OUT}=9V,I_{LOAD}=3A		88		%
LM2576 S-3.3V	Vout: Output Voltage	4.75V $\leqslant V_{IN} \leqslant$ 40V, 0.2A $\leqslant I_{LOAD} \leqslant$3A	3.168	3.3	3.432	V
	η : Efficiency	V_{IN}=12V, I_{LOAD}=3A		76		%
LM2576 S-5V	Vout: Output Voltage	7V$\leqslant V_{IN} \leqslant$40V, 0.2A$\leqslant I_{LOAD} \leqslant$3A	4.800	5.0	5.200	V
	η : Efficiency	V_{IN}=12V, I_{LOAD}=3A		83		%

Specifications with **boldface type** are for full operationg temperature range, the other type are for T_J=25^{O}C.

Note1: Thermal resistance with copper area of approximately 3 in^2.

Typical Performance Characteristics

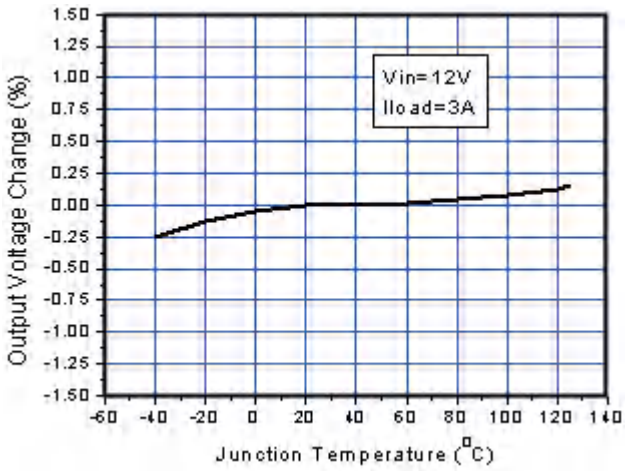


Figure 1. Output Voltage vs. Temperature

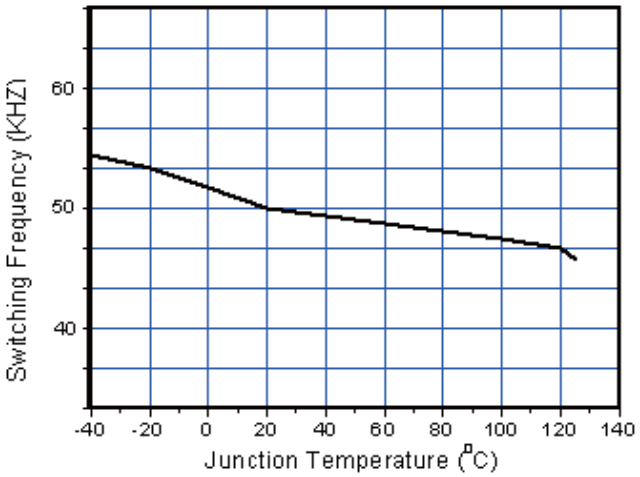


Figure 2. Switching Frequency vs. Temperature

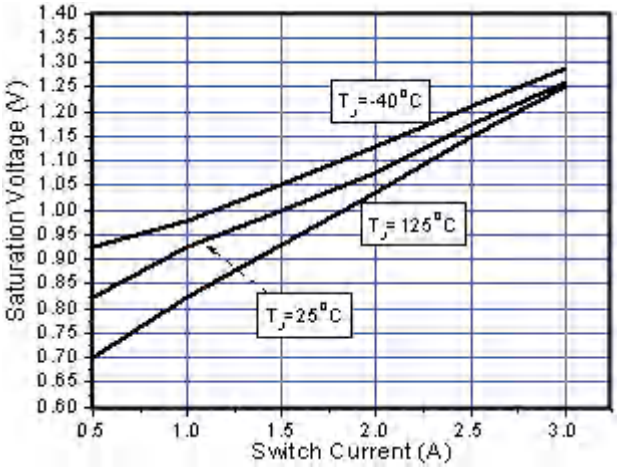


Figure 3. Output Saturation Characteristics

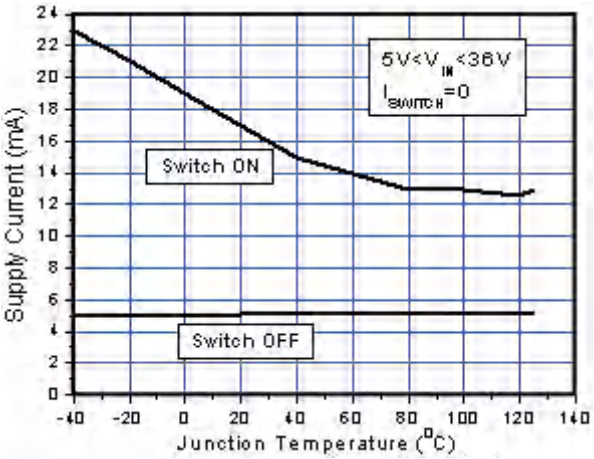


Figure 4. Quiescent Current vs. Temperature

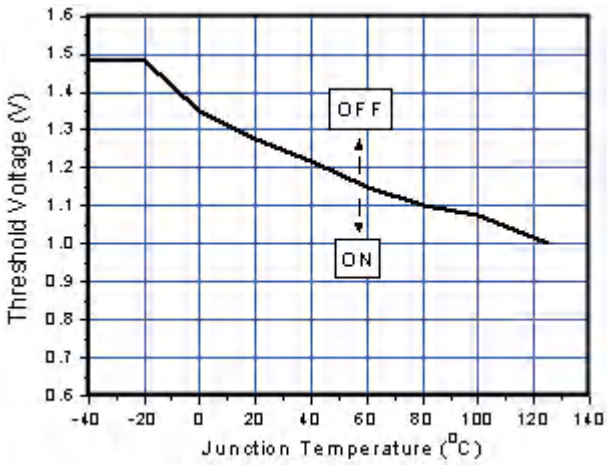


Figure 5. ON/OFF Pin Voltage

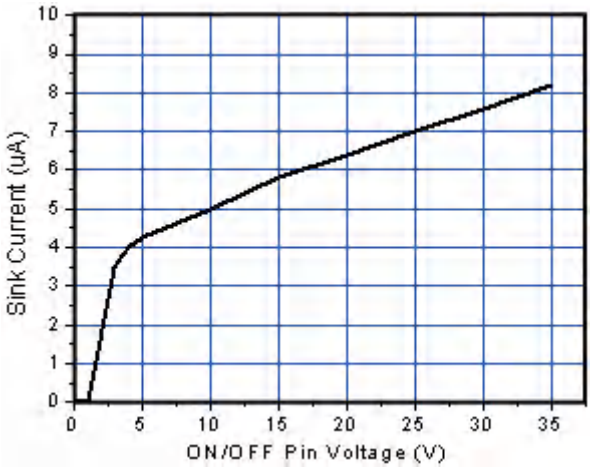


Figure 6. ON/OFF Pin Sink Current

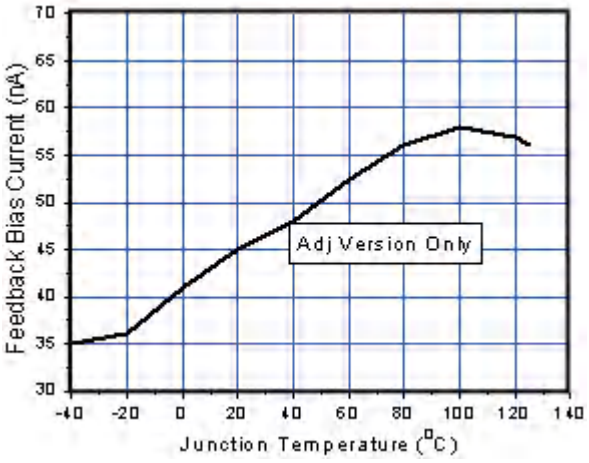
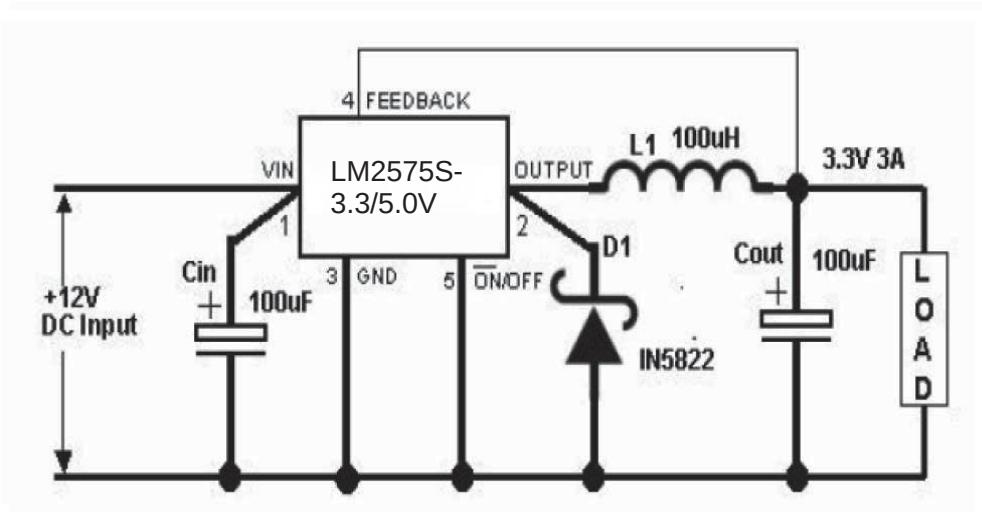
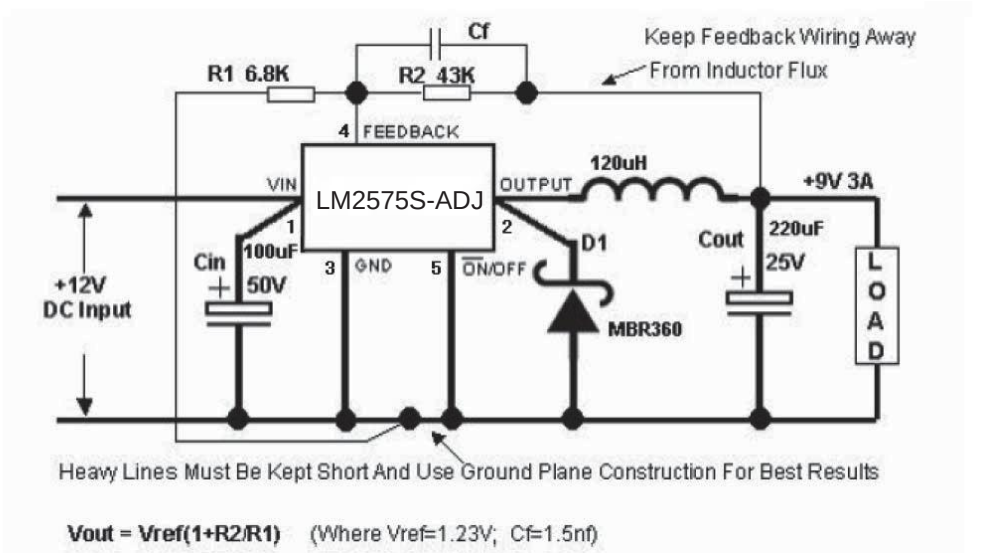


Figure 7. Output Saturation Characteristics

Typical Application Circuit

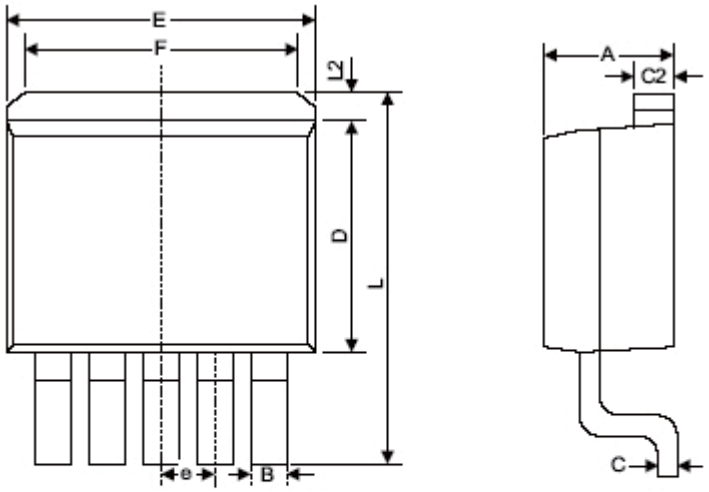


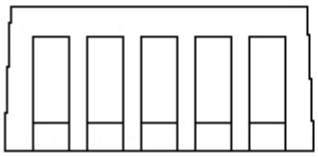
Typical Application of LM2575S For 3.3V,5.0V



Typical Application of LM2575S For ADJ

Package Information (TO263-5L)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	0.160	0.190
B	0.76	1.02	0.030	0.040
C	0.36	0.64	0.014	0.025
C2	1.14	1.40	0.045	0.055
D	8.64	9.65	0.340	0.380
E	9.78	10.54	0.385	0.415
e	1.57	1.85	0.062	0.073
F	6.60	7.11	0.260	0.280
L	15.11	15.37	0.595	0.605
L2	-	1.40	-	0.055

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