



DESCRIPTION

The RS2576 is Monolithic IC that design for a step-down DC/DC Converter, and own the ability of driving a 3A load without additional transistor component.

The output version is an adjustable type. It operates at a switching frequency of 52KHz and include internal frequency compensation. 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. 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.

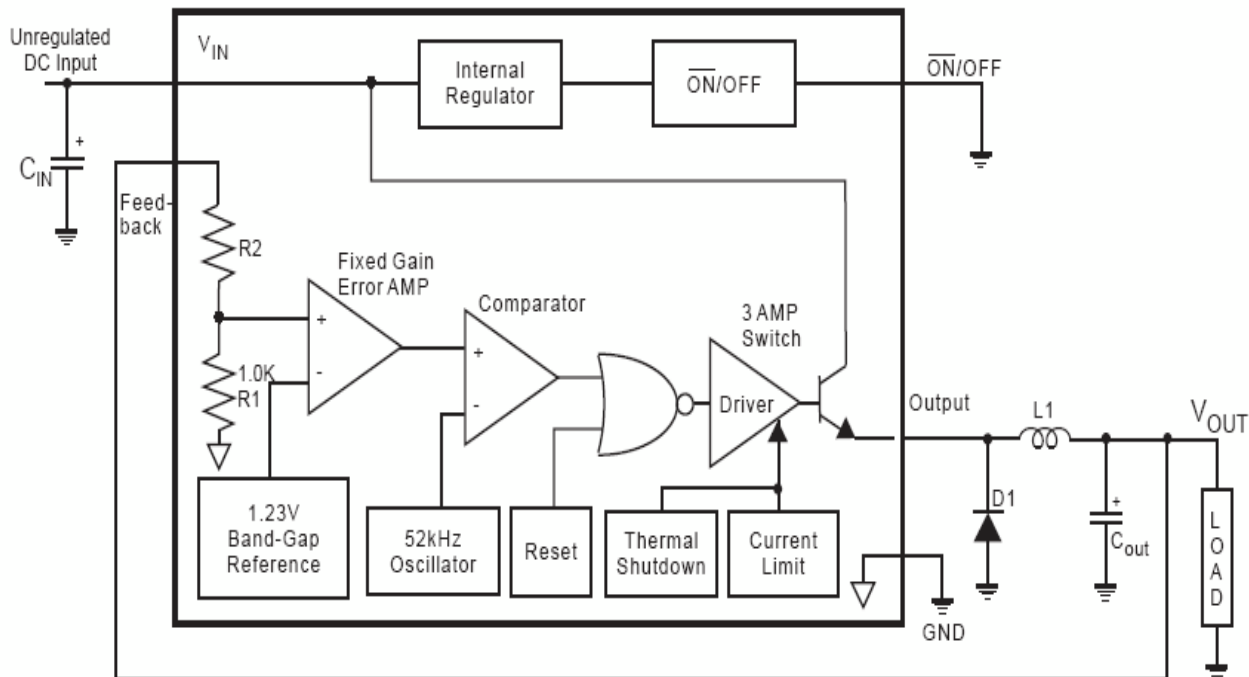
FEATURES

- Adjustable version output voltage range: 1.23-37V $\pm 4\%$ max over line and load conditions
- 52KHz $\pm 10\%$ fixed switching frequency
- TTL shutdown capability
- Operating voltage can be up to 40V
- Output load current: 3A
- TO263-5 package
- Low power standby mode
- Thermal-shunt down and current-limit protection
- Built-in switching a transistor on chip, requires only 4 external components

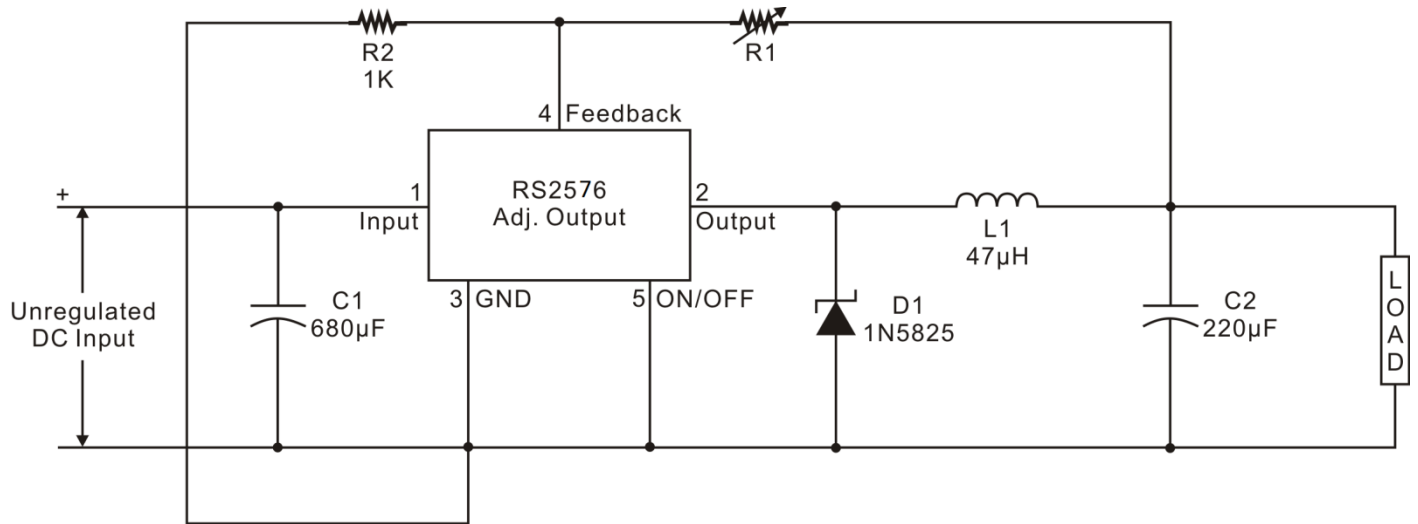
APPLICATIONS

- Simple High-efficiency step-down regulator
- Positive to negative converter
- On-card switching regulators

BLOCK DIAGRAM



APPLICATION CIRCUIT



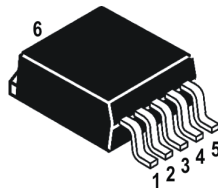


ORDER INFORMATION

Device	Device Code
RS2576-XX Y Z	XX is nominal output voltage AD=ADJ Y is package designator: U: TO-263-5 Z is Lead Free designator: P: Commercial Standard, Lead (Pb) Free and Phosphorous (P) Free Package G: Green (Halogen Free with Commercial Standard)

PIN CONFIGURATION

TO-263-5



PIN DESCRIPTION

Pin Name	Description	Pin No.
VIN	Regulator Input Pin	1
VOUT	Regulator Output Pin	2
GND	Ground Pin	3, 6
FB	Output Voltage Feed Back Control Pin	4
SD	ON/OFF Shutdown Pin	5



ABSOLUTE MAXIMUM RATINGS (Note1)

Parameter	Symbol	Range	Units
Supply voltage	V_{CC}	45	V
On/Off pin input voltage	V_{SD}	$-0.3 \sim +V_{IN}$	V
Feedback pin voltage	V_{FB}	$-0.3 \sim +25$	V
Output voltage to ground	V_{OUT}	-1	V
Power dissipation	P_D	Internally Limited	W
Storage temperature	T_{stg}	$-40 \sim +150$	$^{\circ}\text{C}$
Operating junction temperature range	T_J	$-40 \sim +125$	$^{\circ}\text{C}$
Operating voltage	V_{OP}	$+4.5 \sim +40$	V

ELECTRICAL CHARACTERISTICS (CONTINUED)

Specifications with boldface type apply over for full operating temperature range, the other type are for $T_J=25^{\circ}\text{C}$ (Note 2)

Part No.	Parameter	Symbol	Conditions	Min.	Typ. (Note3)	Max. (Note4)	Unit
RS2576-ADJ	Reference voltage	V_{FB}	$8\text{V} \leq V_{IN} \leq 40\text{V}$, $0.5\text{A} \leq I_{LOAD} \leq 3\text{A}$ $V_{OUT} = 5\text{V}$	1.193	1.230	1.267	V
	Efficiency	η	$V_{IN}=12\text{V}$, $V_{OUT} = 5\text{V}$, $I_{LOAD}=3\text{A}$	-	77	-	%

ALL OUTPUT VOLTAGE VERSIONS ELECTRICAL CHARACTERISTICS

Specifications with **boldface type** apply over for full operating temperature range, the other type are for $T_J=25^{\circ}\text{C}$
(Unless otherwise specified, $V_{IN}=12\text{V}$, $I_{LOAD}=500\text{mA}$)

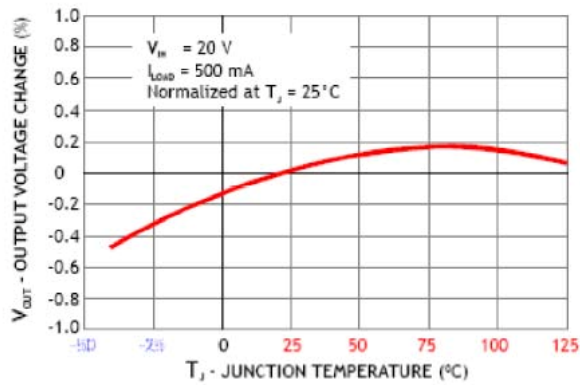
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Device Parameters						
Feedback bias current	I_b	Adjustable version only, $V_{OUT}=5\text{V}$	-	50	100	nA
Oscillator frequency	F_o	(Note 5)	47	52	58	KHz
Saturation voltage	V_{SAT}	$I_{OUT}=3\text{A}$ (Note 6, 7)	-	1.5	1.8	V
Max. duty cycle (ON)	DC	(Note 7)	93	98	-	%
Min. duty cycle (OFF)		(Note 8)	-	0	-	
Current limit	I_{CL}	Peak current (Note 6, 7)	3.5	4.5	5.5	A
Output leakage current	I_L	Output=0V (Note 6, 8)	-	7.5	2.3	mA
		Output=-1VV (Note 6, 8)	-		30	
Quiescent current	I_Q	(Note 8)	-	5	10	mA
Standby quiescent current	I_{STBY}	ON/OFF pin=5V (Note 9)	-	50	200	μA
Thermal resistance	θ_{JC}	TO263-5 Junction to case	-	3.5	-	$^{\circ}\text{C}/\text{W}$
	θ_{JA} (Note 10)	TO263-5 Junction to ambient	-	30	-	$^{\circ}\text{C}/\text{W}$
ON/OFF Control						
ON/OFF pin logic input threshold voltage	V_{IH}	$V_{OUT}=0\text{V}$	-	-	0.6	V
	V_{IL}	$V_{OUT}=\text{nominal output voltage}$	2.0		-	
ON/OFF pin input current	I_{IH}	$V_{LOGIC}=5\text{V}$ (Regulator OFF)	-	4	30	μA
	I_{IL}	$V_{LOGIC}=0\text{V}$ (Regulator ON)	-	0.01	10	

Notes:

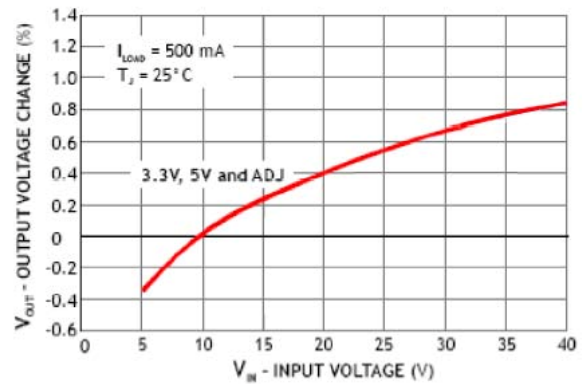
1. Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics.
2. External components such as the catch diode, inductor, input and output capacitors, and voltage programming resistors can affect switching regulator system performance.
3. Typical numbers are at 25°C and represent the most likely norm.
4. The switching frequency is reduced when the second stage current limit is activated.
5. No diode, inductor or capacitor connected to output pin.
6. Feedback pin removed from output and connected to 0V to force the output transistor switch ON.
7. Feedback pin removed from output and connected to 12V to force the output transistor switch OFF.
8. $V_{IN}=40\text{V}$.
9. Junction to ambient thermal resistance. (With copper area of approximately 3in^2)

CHARACTERISTICS CURVE

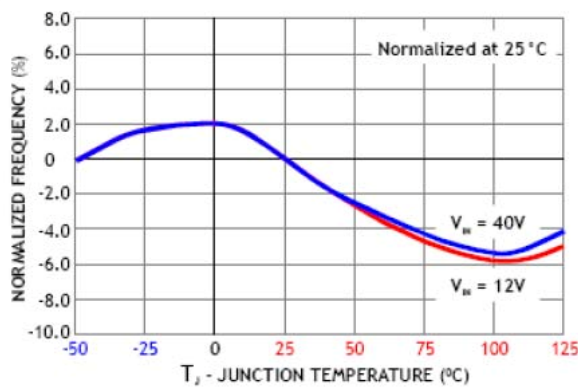
NORMALIZED OUTPUT VOLTAGE



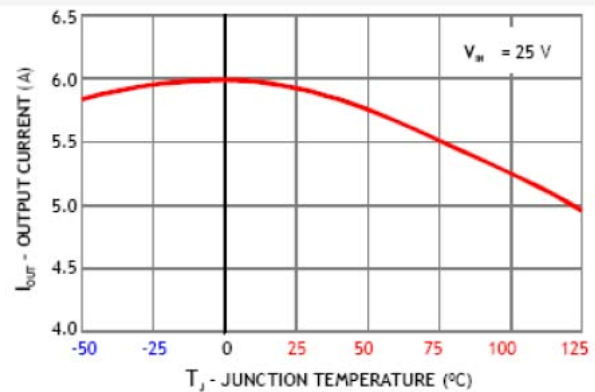
LINE REGULATION



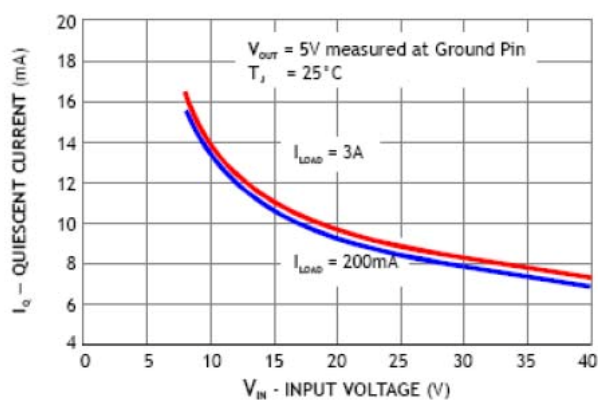
OSCILLATOR FREQUENCY



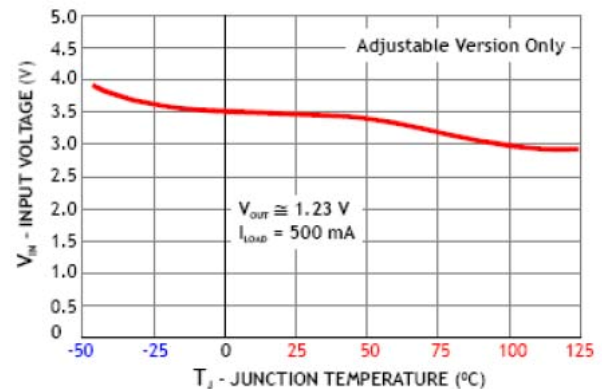
CURRENT LIMIT



QUIESCENT CURRENT

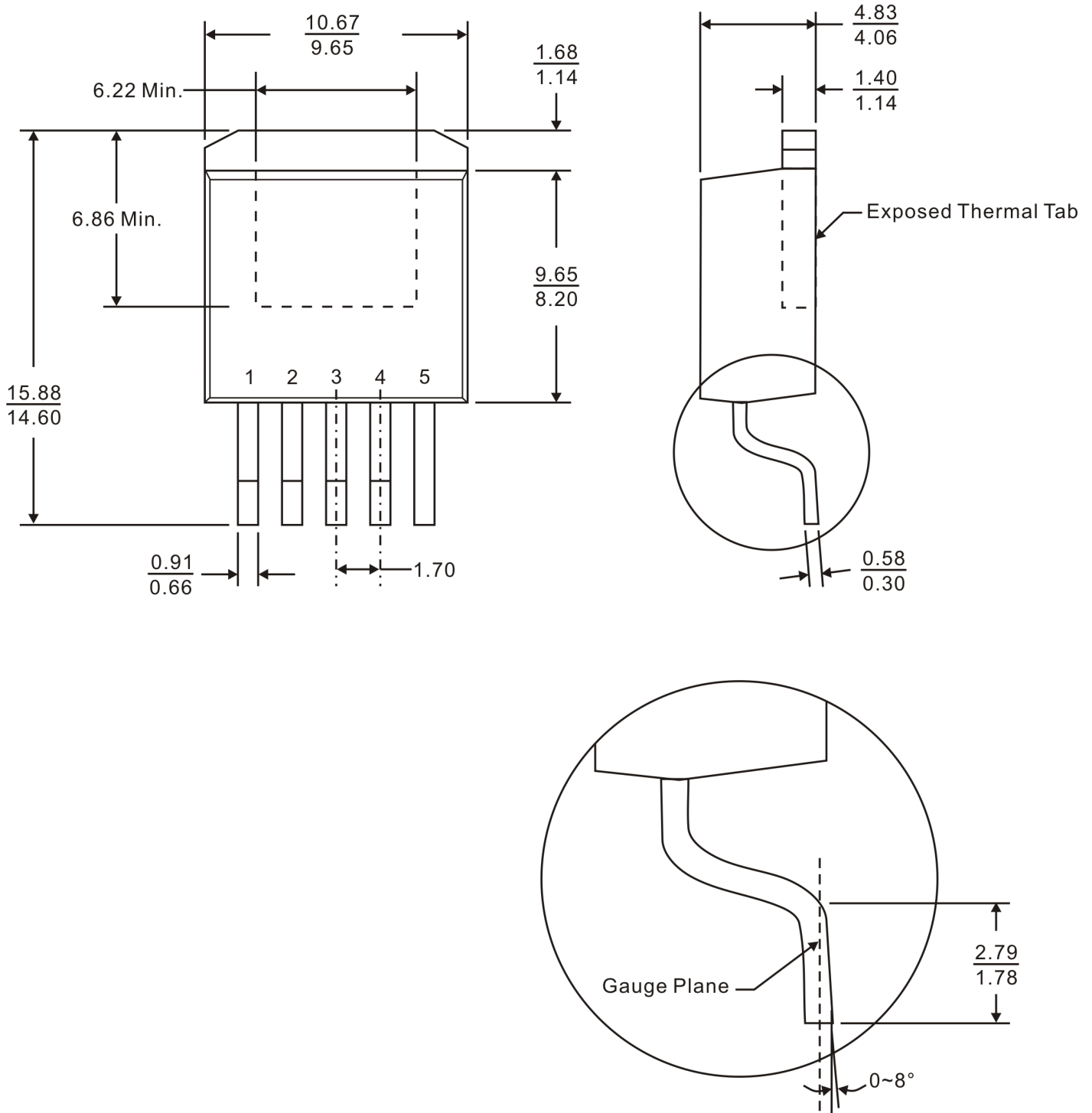


MINIMUM OPERATING VOLTAGE



PACKAGE INFORMATION

TO-263-5



Notes:

1. Refer to JEDEC TO-263 BA.
2. All dimensions are in millimeter.



IMPORTANT NOTICE

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