



P3576

LINEAR INTEGRATED CIRCUIT

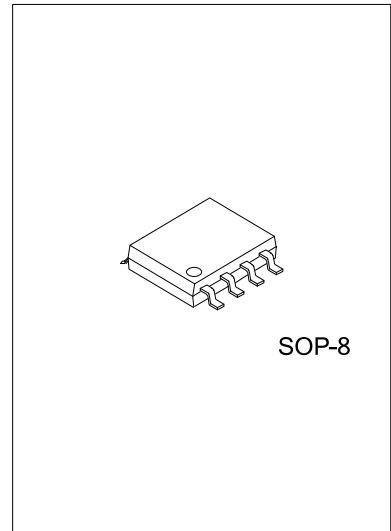
50KHz, 2A PWM BUCK DC/DC CONVERTER

DESCRIPTION

The UTC **P3576** series is a step-down switching regulator which is able to provide 2A output current. The available versions of output voltage are 2.5V, 3.3V, 5V, 12V and adjustable.

FEATURES

- * Output load current: 2A
- * Adjustable version output voltage range, 1.23V ~ 38.5V±4%
- * Operating voltage can be up to 40V
- * Low power standby mode
- * High efficiency
- * Internal current and thermal limit
- * Built-in Switching Transistor On Chip.



ORDERING INFORMATION

Ordering Number	Package	Packing
P3576G-xx-S08-R	SOP-8	Tape Reel

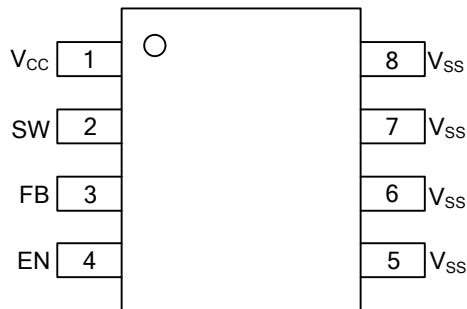
Note: xx: Output Voltage, Refer to Marking Information

<p>P3576G-xx-S08-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Output Voltage Code (4) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S08: SOP-8 (3) xx: refer to Marking information (4) G: Halogen Free and Lead Free
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOP-8	15 : 1.5V 33 : 3.3V 50 : 5.0V AD: ADJ	

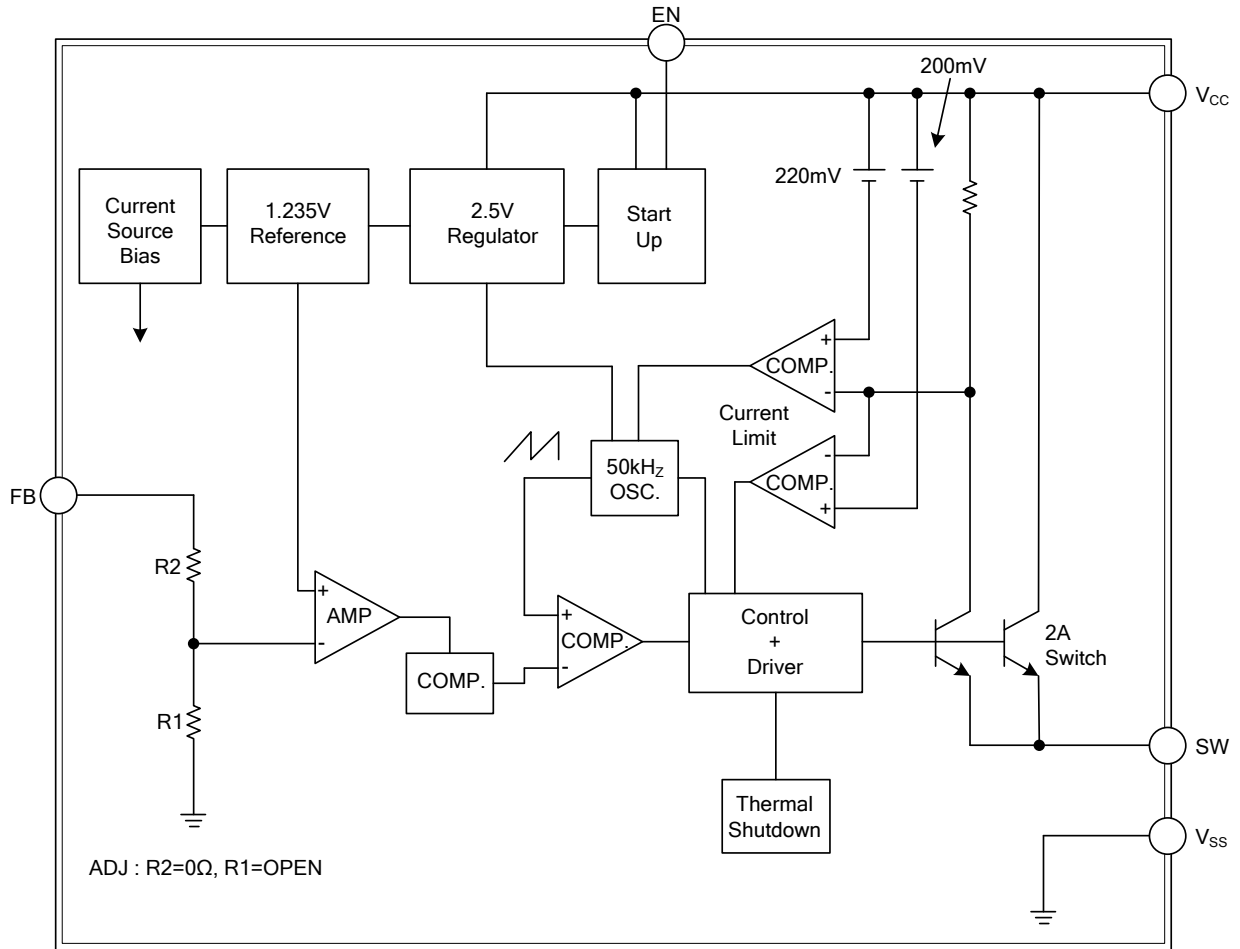
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{CC}	Operating voltage input
2	SW	Switching output
3	FB	Output voltage feedback control
4	EN	ON/OFF Shutdown
5~8	V _{SS}	GND pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	+45	V
ON/OFF Pin Input Voltage	V _{EN}	-0.3 ~ 40	V
Feedback Pin Voltage	V _{FB}	-0.3 ~ 12	V
Output Voltage to Ground	V _{OUT}	-0.8	V
Operating Supply Voltage	V _{OP}	+4.5 ~ +40	V
Power Dissipation	P _D	Internally Limited	W
Junction Temperature	T _J	+125	°C
Operating Temperature	T _{OPR}	-40~+125	°C
Storage Temperature	T _{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

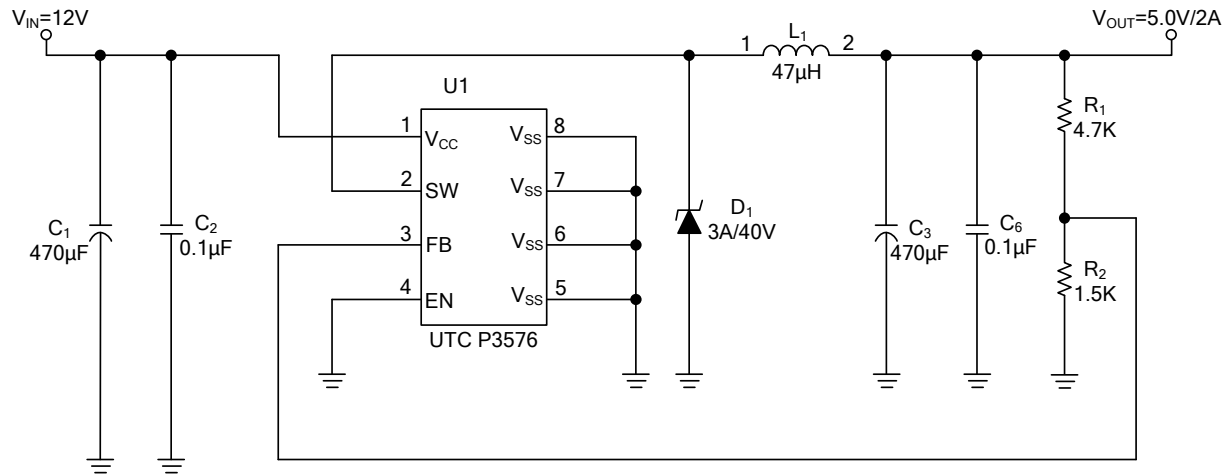
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	60	°C/W
Junction to Case	θ _{JC}	20	°C/W

Note: θ_{JA} is measured with the PCB copper area(need connect to SW pins) of approximately 1.5 in²(Multi-layer).

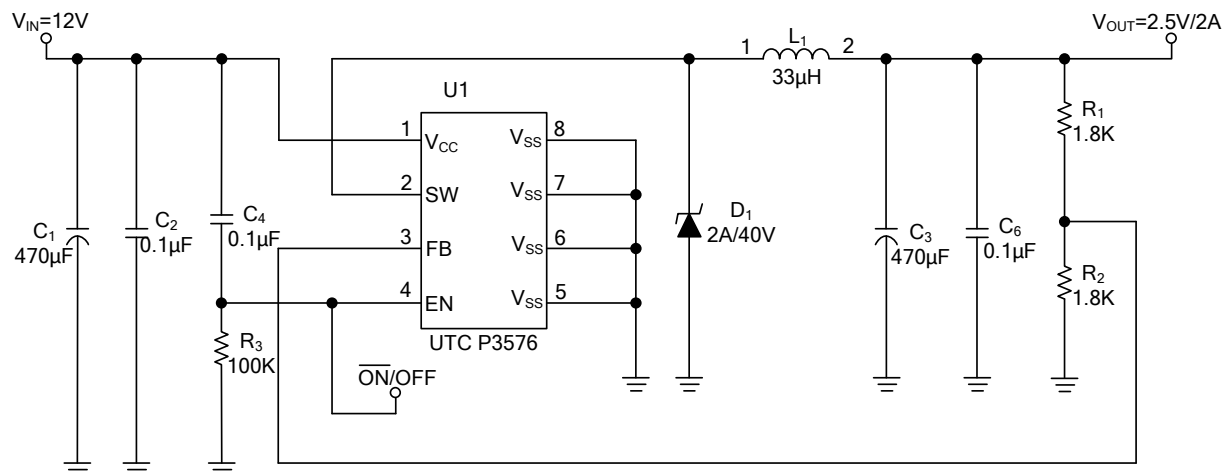
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified, V_{CC}=12V for 3.3V, 5V, adjustable version and V_{CC}=18V for the 12V version. I_{LOAD}=0.2A.)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Current		I _Q	V _{FB} =12V force driver off		4	8	mA
Feedback Bias Current	ADJ	I _{FB}	V _{FB} =1.3V		-10	-50	nA
Shutdown Supply Current		I _{SD}	EN pin=5V, V _{CC} =40V		100	200	μA
Oscillator Frequency		f _{OSC}		44	50	56	KHz
Oscillator Frequency of Short Circuit Protect	ADJ	f _{SCP}	V _{FB} <0.5V		25		KHz
	Fixed		V _{OUT} < V _{OUT} *40%		25		KHz
Duty Cycle	MAX	DC	V _{FB} =0V force driver ON		100		%
	MIN	DC	V _{FB} =12V force driver OFF		0		%
Current Limit		I _{CL}	Pear current, No outside circuit V _{FB} =0V force driver on	2.5			A
Load Regulation(ΔV _{OUT} /V _{OUT})		ΔV _{OUT}	I _{OUT} =0.2 ~ 2A		0.6	1.2	%
Saturation Voltage		V _{SAT}	I _{OUT} =2A, No outside circuit V _{FB} =0V force driver on		1.2	1.4	V
SW pin Leakage Current	SW pin=0V	I _{SWL}	No outside circuit V _{FB} =12V force driver off			-200	μA
	SW pin=-0.8V		V _{CC} =40V force driver off		-5		mA
EN pin Logic Input Threshold Voltage	Low	V _{IL}	regulator ON		1.3	0.6	V
	High	V _{IH}	regulator OFF	2.0	1.3		V
EN pin Logic Input Current		I _H	V _{EN} =2.5V (OFF)		-0.1	-10	μA
EN pin Input Current		I _L	V _{EN} =0.5V (ON)		-0.01	-1	μA
Thermal shutdown Temp		TSD			135		°C
Output Feedback Voltage	ADJ	V _{FB}	I _{LOAD} =0.2A, V _{OUT} programmed for 3.3V	1.193	1.23	1.267	V
	3.3V		I _{LOAD} =0.2A	3.20	3.30	3.40	
	5.0V		I _{LOAD} =0.2A	4.85	5.00	5.15	
	12V		I _{LOAD} =0.2A	11.64	12.0	12.36	
Efficiency	ADJ	η	V _{CC} =12V, I _{LOAD} =2A		79		%
	3.3V		V _{CC} =12V, I _{LOAD} =2A		80		
	5.0V		V _{CC} =12V, I _{LOAD} =2A		84		
	12V		V _{CC} =15V, I _{LOAD} =2A		90		

■ TYPICAL APPLICATION CIRCUIT



(1) Adjustable Output Voltage Version



(2) Adjustable Output Voltage Version With Delayed Startup

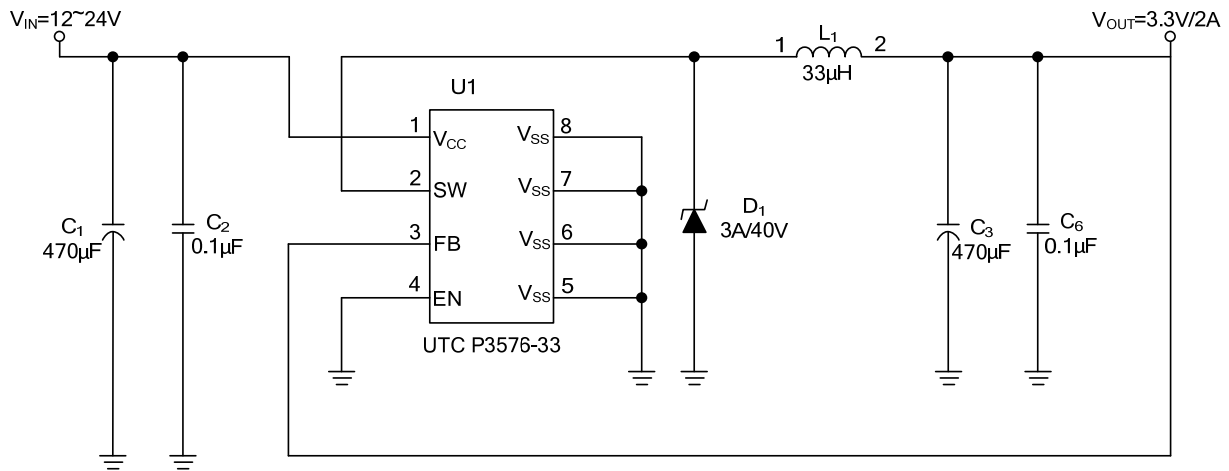
$$V_{OUT} = V_{FB} \times (1 + R_1/R_2), \quad V_{FB} = 1.23V, \quad R_2 = 0.47K \sim 3K$$

Table 1 Resistor select for output voltage setting

V _{OUT}	R2	R1
5V	1.5K	4.7K
	1.8K	5.6K
3.3V	1.5K	2.5K
	1.8K	3.0K
2.5V	1.8K	1.8K
1.8V	1.8K	0.82K

L1 recommend value (I _{OUT} =2A)				
V _{OUT}	2.5V	3.3V	5V	12V
V _{IN} =12V	33µH	33µH	47µH	NA
V _{IN} =24V	33µH	33µH	47µH	68µH

■ TYPICAL APPLICATION CIRCUIT (Cont.)



(3) Fixed Output Voltage Version

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