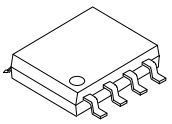
P3576 *LINEAR INTEGRATED CIRCUIT*

50KHz, 2A PWM BUCK DC/DC CONVERTER



SOP-8

■ 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
* 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

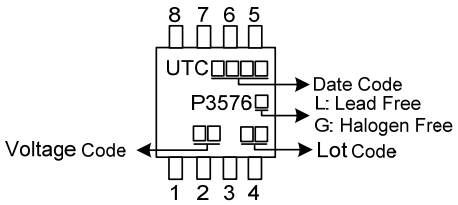
Ordering Number		Package	Packing
Lead Free	Halogen Free		
P3576L-xx-S08-R	P3576G-xx-S08-R	SOP-8	Tape Reel

Note: xx: Output Voltage, Refer to Marking Information

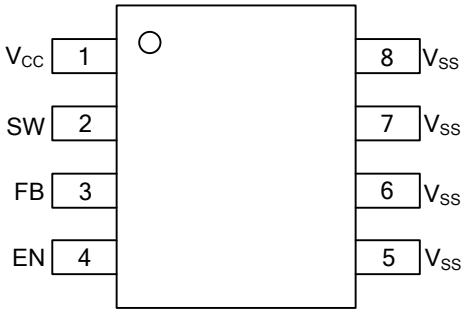
P3576G-xx-S08-R
(1) Packing Type
(2) Package Type
(3) Output Voltage Code
(4) Green Package

(1) R: Tape Reel
(2) S08: SOP-8
(3) xx: refer to Marking information
(4) G: Halogen Free and Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOP-8	12: 12V 33 : 3.3V 50 : 5.0V AD: ADJ	

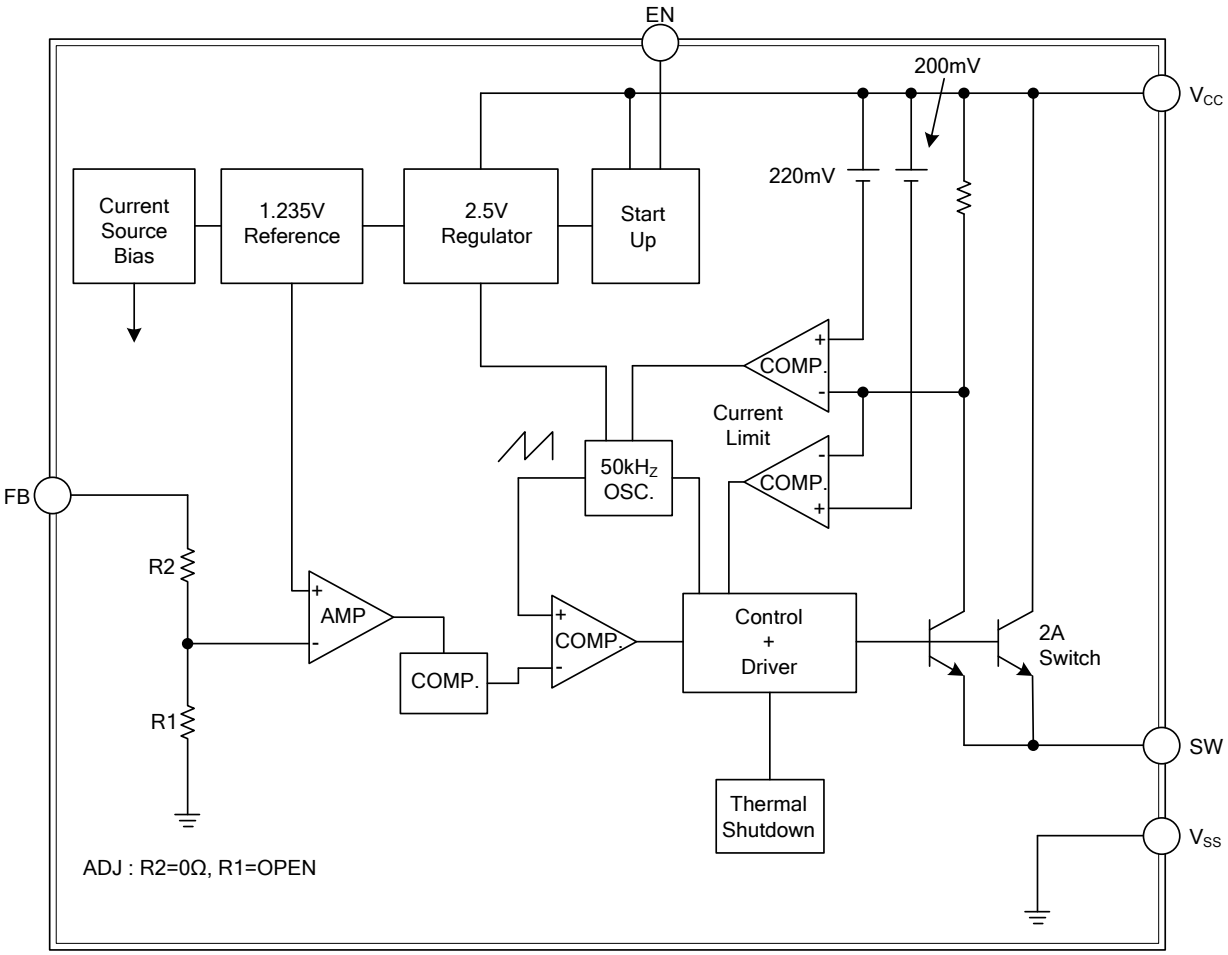
■ PIN CONFIGURATION



■ 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

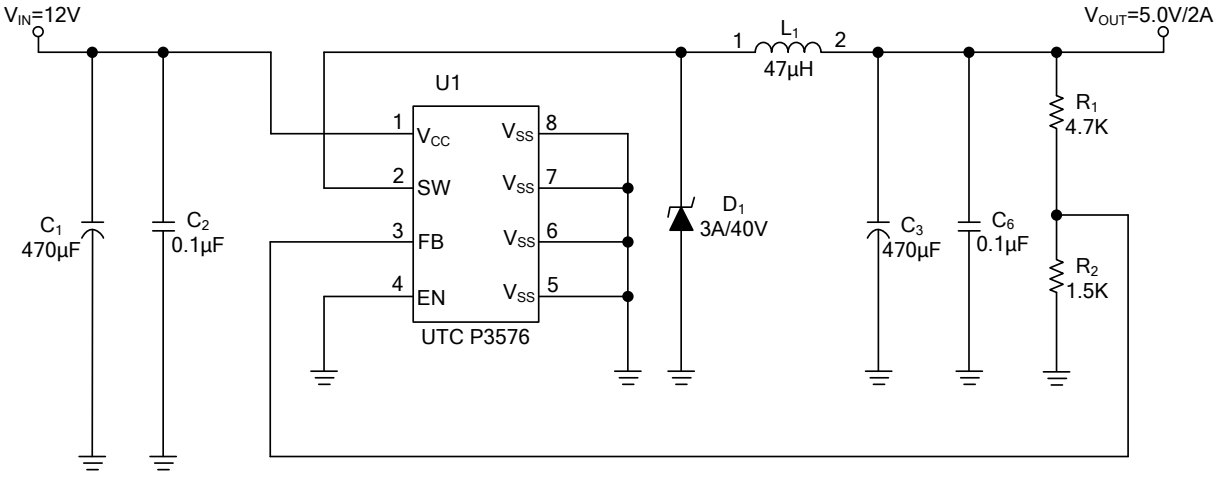
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	60	°C/W
Junction to Case	θ_{JC}	20	°C/W

Note: θ_{JA} is measured with the PCB copper area(need connect to SW pins) of approximately 1.5 in^2(Multi-layer).

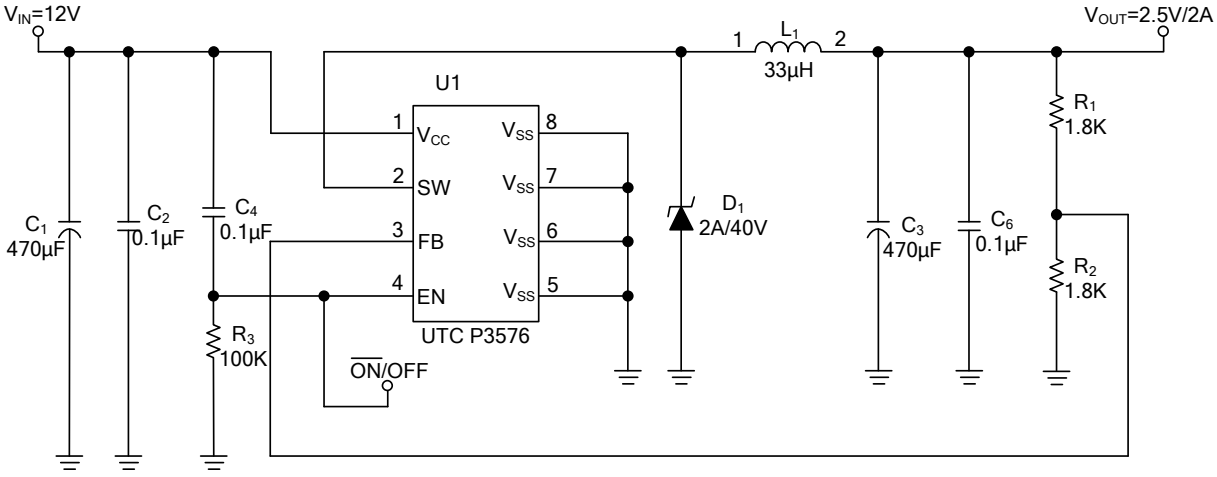
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified, V_{CC}=12V for 3.3V, 5V, adjustable version and V_{CC}=18V for the 12V version. I_{LOAD}=0.2A.)

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,V_{FB}=18V for the 12V version.		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, V_{FB}=18V for the 12V version.			-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}=18V, I_{LOAD}=2A		90		

■ TYPICAL APPLICATION CIRCUIT



(1) Adjustable Output Voltage Version



(2) Adjustable Output Voltage Version With Delayed Startup

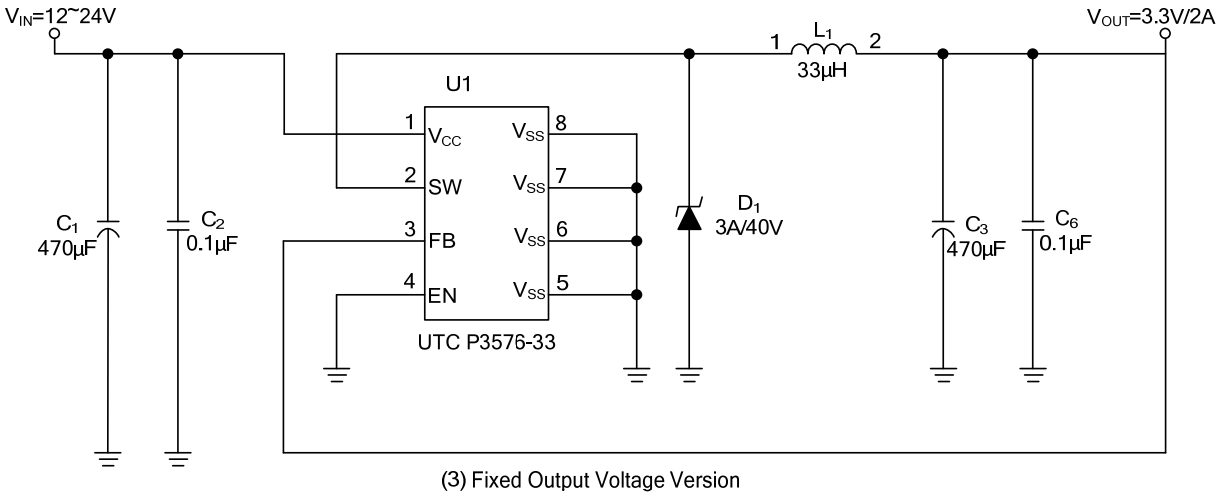
$V_{OUT}=V_{FB}\times(1+R_1/R_2)$, V_{FB}=1.23V, R_2=0.47K ~ 3K

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