



## P1690

## LINEAR INTEGRATED CIRCUIT

### 0.4A, 150KHZ 65V BUCK DC TO DC CONVERTER

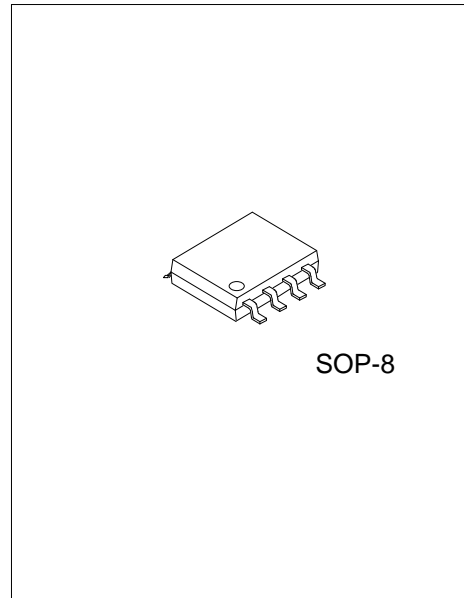
#### DESCRIPTION

The UTC **P1690** is a PWM buck (step-down) DC/DC converter, fixed frequency of 150KHz, capable of driving a 0.4A load with high efficiency, low ripple and excellent line and load regulation.

The P1690 built kinds of protect circuit inside. Such as OTP SCP and so on.

#### FEATURES

- \* Wide 5V~ 65V Operation Voltage
- \* Output Adjustable from 1.25V~25V
- \* High efficiency up to 85%
- \* Maximum Duty Cycle 100%
- \* Fixed 150KHz Switching Frequency
- \* Built in OTP
- \* Built in SCP
- \* Built in OCP



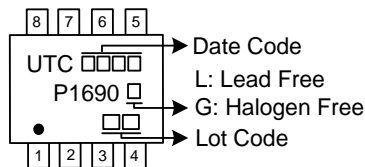
SOP-8

#### ORDERING INFORMATION

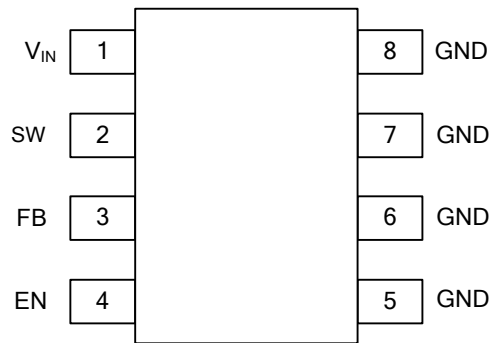
Ordering Number		Package	Packing
Lead Free	Halogen Free		
P1690L-S08-R	P1690G-S08-R	SOP-8	Tape Reel

<p>P1690G-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING



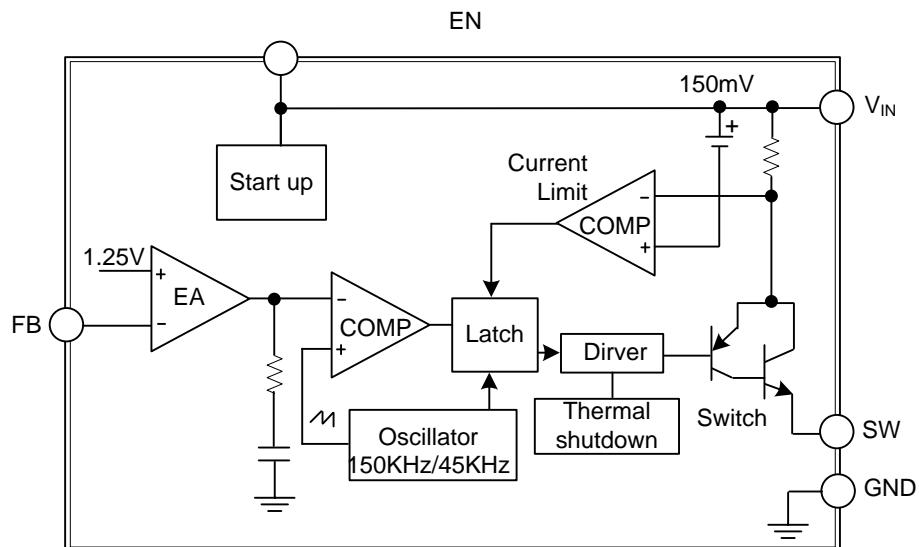
## ■ PIN CONFIGURATION



## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V <sub>IN</sub>	Supply Voltage Input Pin.
2	SW	Power Switch Output Pin (SW).
3	FB	Feedback voltage Pin (FB).
4	EN	Enable Pin.
5,6,7,8	GND	Ground Pin.

## ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	-0.3 ~ 70	V
Feedback Pin Voltage	$V_{FB}$	-0.3 ~ $V_{IN}$	V
EN Pin Voltage	$V_{EN}$	-0.3 ~ $V_{IN}$	V
Output Switch Pin Voltage	$V_{SW}$	-0.3 ~ $V_{IN}$	V
Power Dissipation	$P_D$	Internally limited	mW
Junction to Ambient, No Heatsink, Free Air	$\theta_{JA}$	60	°C/W
Operating Junction Temperature	$T_J$	-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.

### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>System Parameters Test Circuit Figure1</b>						
FB Voltage	$V_{FB}$	$V_{IN}=36\text{V}\sim 65\text{V}$ , $I_{load}=0.05\text{A}\sim 0.3\text{A}$	1.225	1.25	1.275	V
Efficiency	$\eta$	$V_{IN}=36\text{V}$ , $V_{OUT}=15\text{V}$ , $I_{OUT}=0.3\text{A}$		88		%
Efficiency	$\eta$	$V_{IN}=48\text{V}$ , $V_{OUT}=15\text{V}$ , $I_{OUT}=0.4\text{A}$		87		%
Efficiency	$\eta$	$V_{IN}=60\text{V}$ , $V_{OUT}=15\text{V}$ , $I_{OUT}=0.4\text{A}$		83		%

### ■ ELECTRICAL CHARACTERISTICS (DC PARAMETERS)

( $V_{IN}=48\text{V}$ ,  $\text{GND}=0\text{V}$ ,  $V_{IN}$  &  $\text{GND}$  parallel connect a 33uf/100V capacitor;  $I_{OUT}=0.2\text{A}$ ,  $T_A=25^\circ\text{C}$  the others floating unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Operation Voltage	$V_{IN}$		5		65	V
Shutdown Supply Current	$I_{STBY}$	$V_{EN}=2\text{V}$		85	200	uA
Quiescent Supply Current	$I_q$	$V_{ON/OFF}=0\text{V}$ , $V_{FB}=V_{IN}$		2.5	5	mA
Oscillator Frequency	$F_{OSC}$		120	150	180	KHz
Switch Current Limit	$I_L$	$V_{FB}=0$		0.4		A
EN Pin Threshold	$V_{EN}$	High (Regulator OFF)		1.6		V
		Low (Regulator ON)		0.8		V
EN Pin Input Leakage Current	$I_H$	$V_{EN}=2.5\text{V}$ (OFF)		6	20	uA
	$I_L$	$V_{EN}=0.5\text{V}$ (ON)		1	20	uA
Output Saturation Voltage	$V_{CE}$	$V_{FB}=0\text{V}$ , $I_{OUT}=0.4\text{A}$		0.85		V
Max. Duty Cycle	$D_{MAX}$	$V_{FB}=0\text{V}$		100		%

## ■ TYPICAL APPLICATION CIRCUIT

$V_{OUT}=15V$

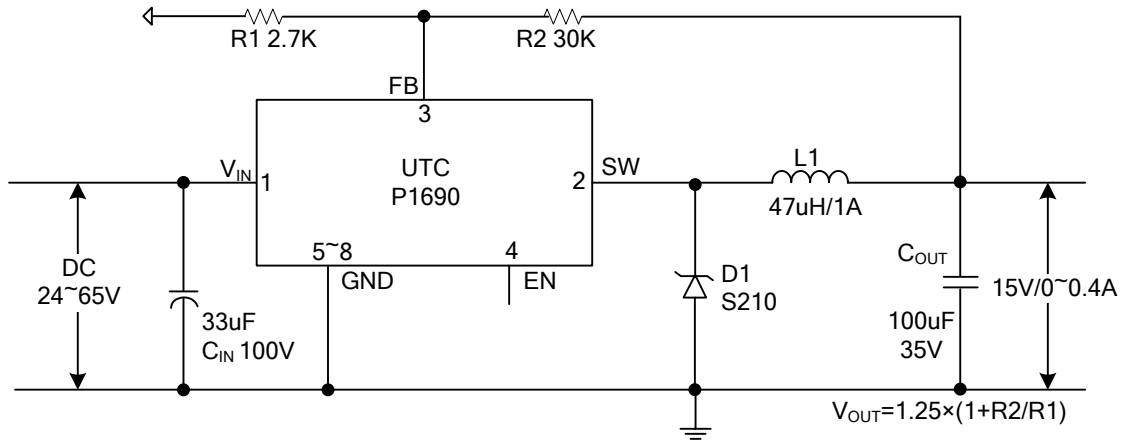


Figure 1.

$V_{OUT}=5V$

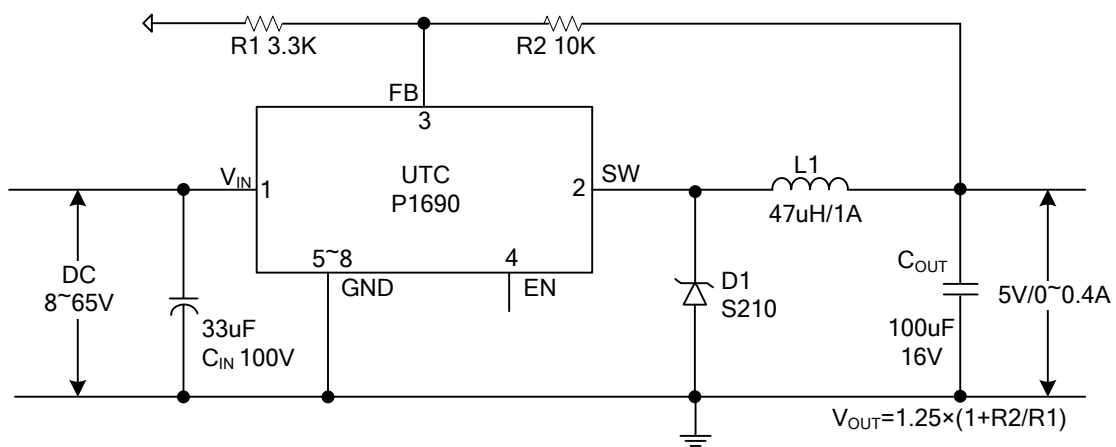
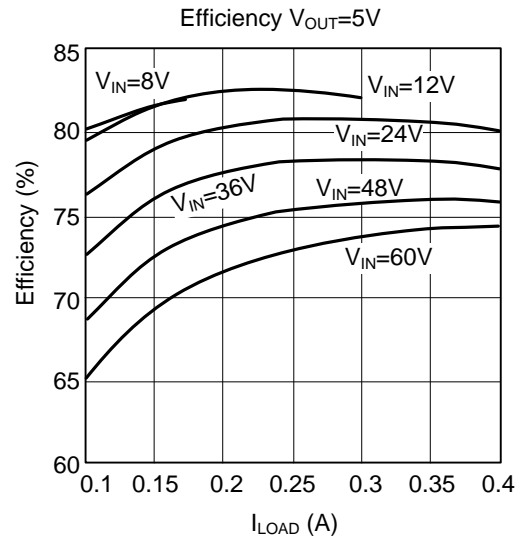
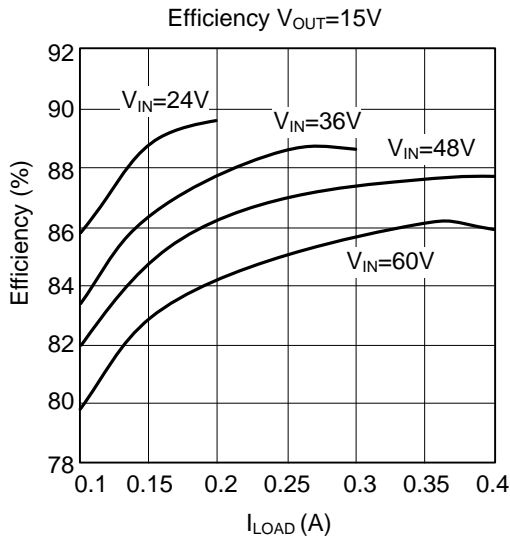


Figure 2

Note: Under different input and output voltage, in order to achieve loop stability, the need to use different capacity inductance.

■ TYPICAL CHARACTERISTICS



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