



P1690

LINEAR INTEGRATED CIRCUIT

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

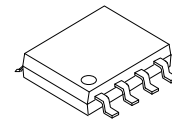
DESCRIPTION

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



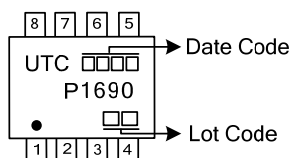
SOP-8

ORDERING INFORMATION

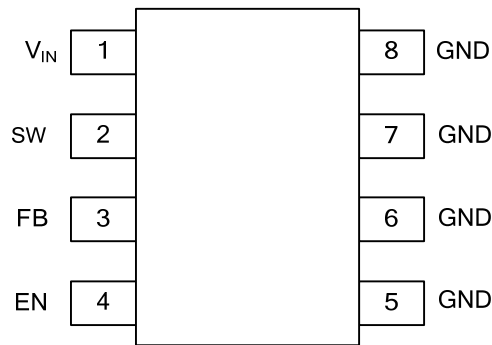
| Ordering Number | | Package | Packing |
|-----------------|--------------|---------|-----------|
| Lead Free | Halogen Free | | |
| P1690L-S08-R | P1690G-S08-R | SOP-8 | Tape Reel |

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

MARKING



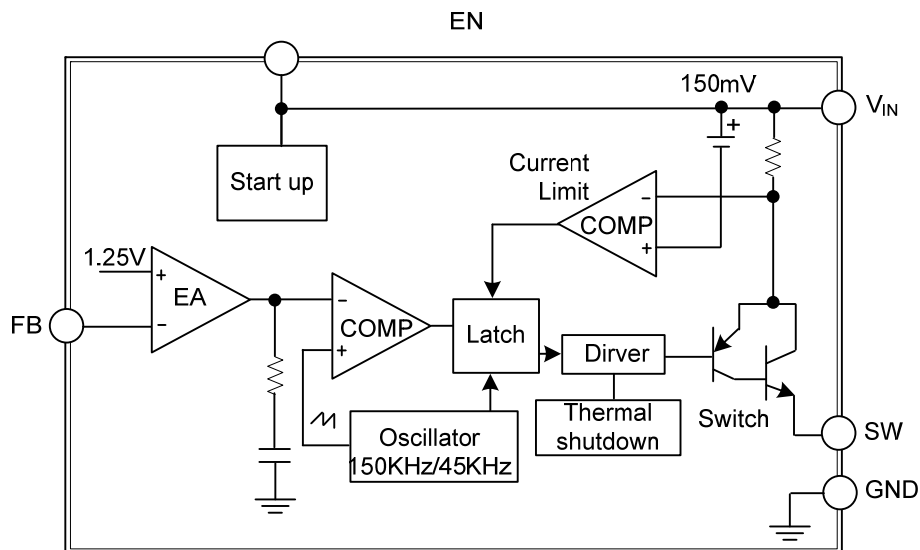
■ PIN CONFIGURATION



■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---------|-----------------|-------------------------------|
| 1 | V _{IN} | 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 | θ_{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 |
|---|----------|--|-------|------|-------|------|
| System Parameters Test Circuit Figure1 | | | | | | |
| 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 | η | $V_{IN}=36\text{V}$, $V_{OUT}=15\text{V}$, $I_{OUT}=0.3\text{A}$ | | 88 | | % |
| Efficiency | η | $V_{IN}=48\text{V}$, $V_{OUT}=15\text{V}$, $I_{OUT}=0.4\text{A}$ | | 87 | | % |
| Efficiency | η | $V_{IN}=60\text{V}$, $V_{OUT}=15\text{V}$, $I_{OUT}=0.4\text{A}$ | | 83 | | % |

■ ELECTRICAL CHARACTERISTICS (DC PARAMETERS)

($V_{IN}=48\text{V}$, $\text{GND}=0\text{V}$, V_{IN} & 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 | μA |
| 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 | μA |
| | I_L | $V_{EN}=0.5\text{V}$ (ON) | | 1 | 20 | μA |
| 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

$V_{OUT}=15V$

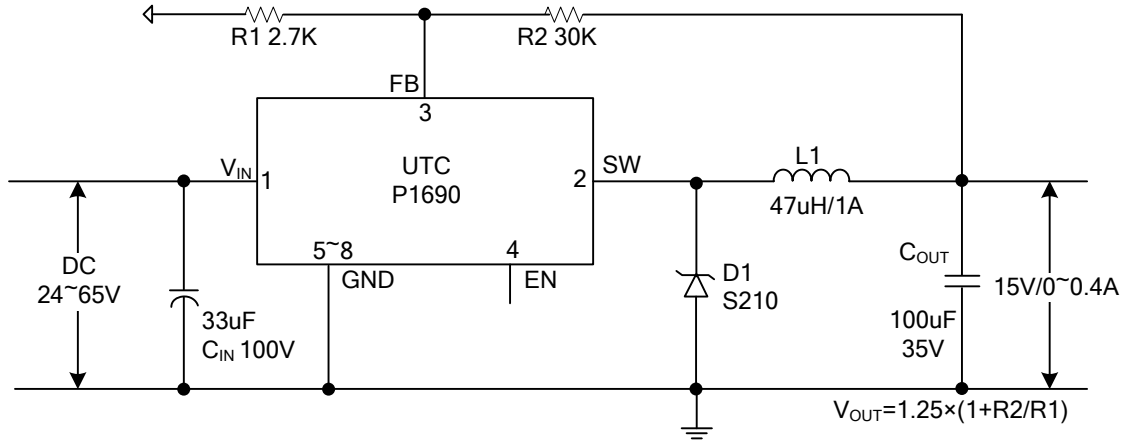


Figure 1.

$V_{OUT}=5V$

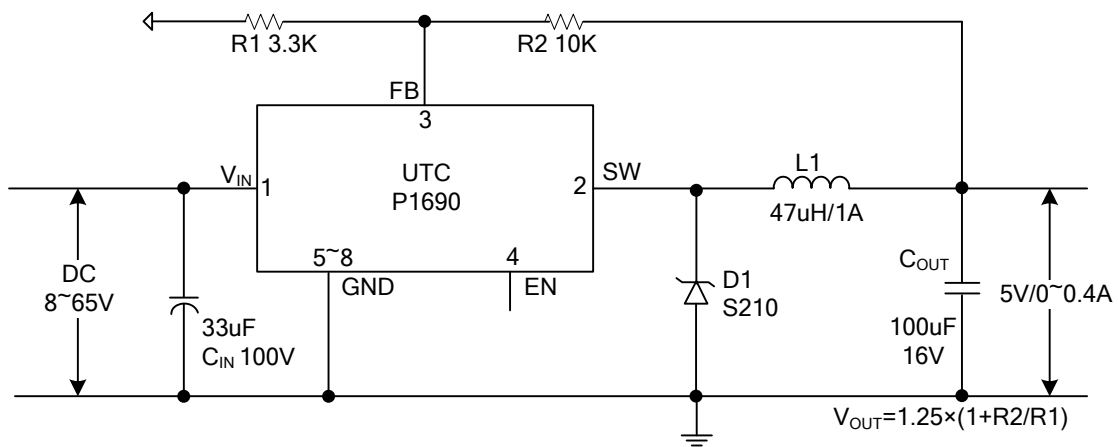
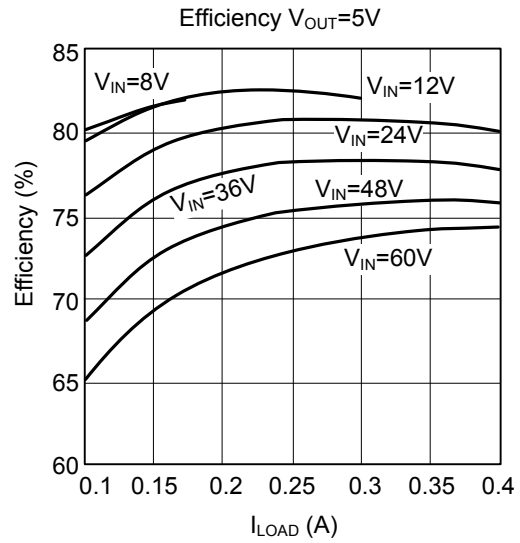
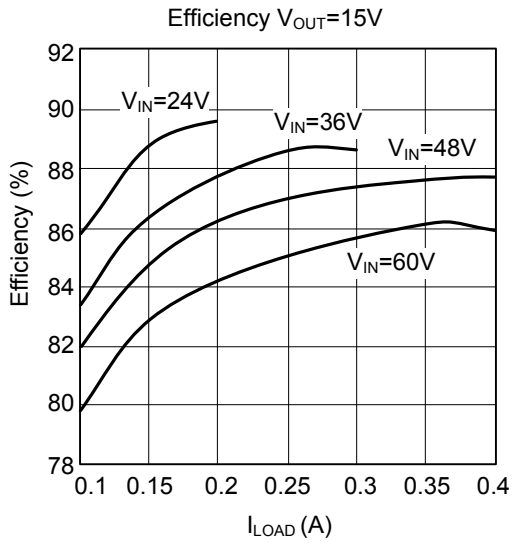


Figure 2

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

■ TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.