



2.2MHz 3A Buck Converter

Features

- Input Voltage Range: 2.5V~5.5V
- Output Voltage Range: 0.6V~4.2V
- Maximum Output Current: 3A
- 2.2MHz PWM with Seamless PWM/PFM Switching for Light-load Efficiency
- Excellent Load and Line Transient
- Quiescent Current in PFM Tristate: 50uA
- Comprehensive Protection
 - Input Under-Voltage Lockout (UVLO)
 - Over Current and Short-Circuit Protection
 - Thermal Shut-down
- Active Discharge When Disabled
- Automatic PFM
- Enable Input
- Power Good Output
- Soft Start

- Over Current Protection
- 2mm x 2mm DFN-8 Package

Applications

- Memory, Hard Disk Drive and SSD
- Data Cards
- Smart Phones
- Tablets
- Handheld Devices
- LCD TV
- Set Top Box
- Access Point Router

Order Information

| Part Number | V _{OUT} | Max Load Current |
|-------------|------------------|------------------|
| HL7505FN35 | 3.500V | 3A |
| HL7505FN33 | 3.300V | 3A |
| HL7505FN24 | 2.400V | 3A |
| HL7505FN42 | 4.200V | 3A |
| HL7505FN06 | 0.600V | 3A |
| HL7505FN10 | 1.000V | 3A |
| HL7505FN12 | 1.200V | 3A |
| HL7505FN15 | 1.500V | 3A |
| HL7505FN18 | 1.800V | 3A |
| HL7505FN25 | 2.500V | 3A |
| HL7505SFN33 | 3.300V | 3A |

For other default output voltage and maximum load current options, contact a Halo Micro sales representative.



Typical Application Diagram

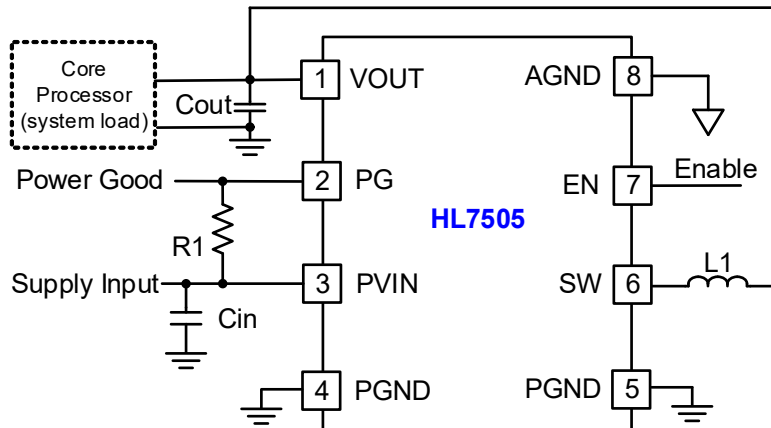


Figure 1 HL7505FN Typical Application Diagram

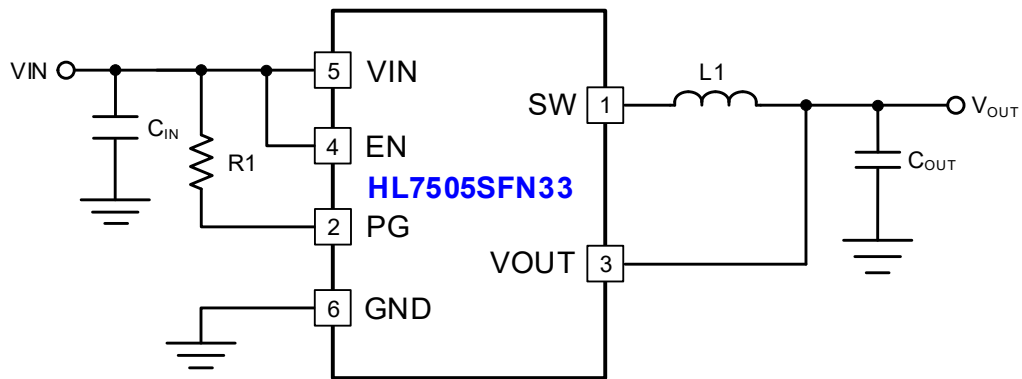


Figure 2 HL7505SFN33 Typical Application Diagram

| Component | Part Number | Value | Size | Vendor |
|-----------|----------------|----------------|------|------------|
| L1 | See Table2 | 1.0 or 0.47 uH | 2016 | See Table2 |
| R1 | -- | 10kΩ | -- | TDK |
| Cin, Cout | C1608X5R1A106M | 10uF/10V | 0603 | TDK |

Table 1 Recommended External Components

| Manufacturer | Part Number | L (nH) | R _{DC} (mΩ) | I _{MAXDC} ⁽¹⁾ (A) | Component Dimensions | | |
|--------------|----------------------|--------|----------------------|---------------------------------------|----------------------|-----|-----|
| | | | | | L | W | H |
| TDK | TFM201610ALM-1R0MTAA | 1000 | 56 | 4.3 | 2.0 | 1.6 | 1.0 |
| TDK | TFM201610ALM-R47MTAA | 470 | 34 | 5.8 | 2.0 | 1.6 | 1.0 |

Table 2 Recommended Inductors

Notes:

1. I_{MAXDC} is the smaller current to produce 40°C temperature rise or 30% effective inductance reduction.



Description

HL7505 is a synchronous buck converter optimized to supply different sub systems of portable applications. Its input voltage range is 2.5V to 5.5V.

HL7505 can deliver up to 3.0A with 80% efficiency, while maintaining over 80% efficiency at load currents as low as 10mA. It operates at a high frequency of 2.2MHz, which greatly reduces the value of the external components. A wide range of output capacitors can be used to optimize V_{OUT} stability during load transients. Inductors from 0.33uH to 1.0uH may be used without affecting loop stability.

At moderate to light loads, Pulse Frequency Modulation

(PFM) is used to maintain conversion efficiency with a typical non-switching quiescent current of 50uA. Even with such a low quiescent current, HL7505 maintains excellent load and line transient responses. At higher loads, the system automatically switches to fixed-frequency Pulse Width Modulation (PWM) operation at 2.2MHz for minimum V_{OUT} ripple and optimal load transient response. In Shutdown Mode, the supply current drops below 1uA, reducing power consumption.

The HL7505 is available in 8-Pin, 0.5mm pitch, 2mmx2mm DFN package.