



Features

- Wide 3.6V to 25V Input Voltage Range
- Output Adjustable from 0.8V to 24V
- Maximum Duty Cycle 100%
- Minimum Drop Out 0.6V
- Fixed 360KHz Switching Frequency
- 5A Constant Output Current Capability
- Internal Optimize Power MOSFET
- High efficiency up to 85~90%
- Excellent line and load regulation
- TTL shutdown capability
- EN pin with hysteresis function
- Built in thermal shutdown function
- Built in current limit function
- Built in output short protection function
- Package in TO-263/TO252 and TO220

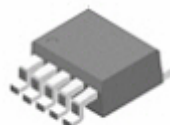
Applications

- LCD Monitor and LCD TV
- TO220 can supply 5A continues
- TO263 can supply 5A , TO252 can supply 4A
- ADSL Modem
- Telecom / Networking Equipment

General Description

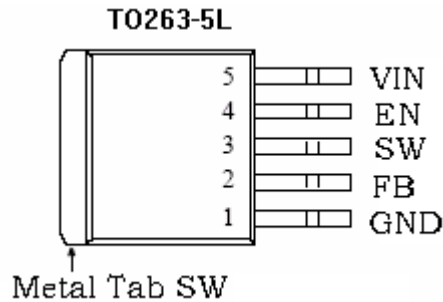
The AMS2566 is a 360 KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 5A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 100%. An enable function, an over current protection function is built inside. When short protection function happens, the operation frequency will be reduced from 360KHz to 70KHz. An internal compensation block is built in to minimize external component count.



TO263-5L

Pin Configurations for TO263/TO220/TO252 :



Important Note : Pin3 SW is shorted to Tab (heat -sink is not ground)

Table 1 Pin Description

| Pin Number | Pin Name | Description |
|------------|----------|---|
| 1 | GND | Ground Pin. Care must be taken in layout. This pin should be placed outside of the Schottky Diode to output capacitor ground path to prevent switching current spikes from inducing voltage noise into AMS2566. |
| 2 | FB | Feedback Pin (FB). Through an external resistor divider network, FB senses the output voltage and regulates it. The feedback threshold voltage is 0.8V . |
| 3 | SW | Power Switch Output Pin (SW). SW is the switch node that supplies power to the output. |
| 4 | EN | Enable Pin. Drive EN pin high to turn on the device, drive it low to turn it off. Floating is default high. |
| 5 | VIN | Supply Voltage Input AMS2566 operates from a 3.6V to 25V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input. |

Function Block

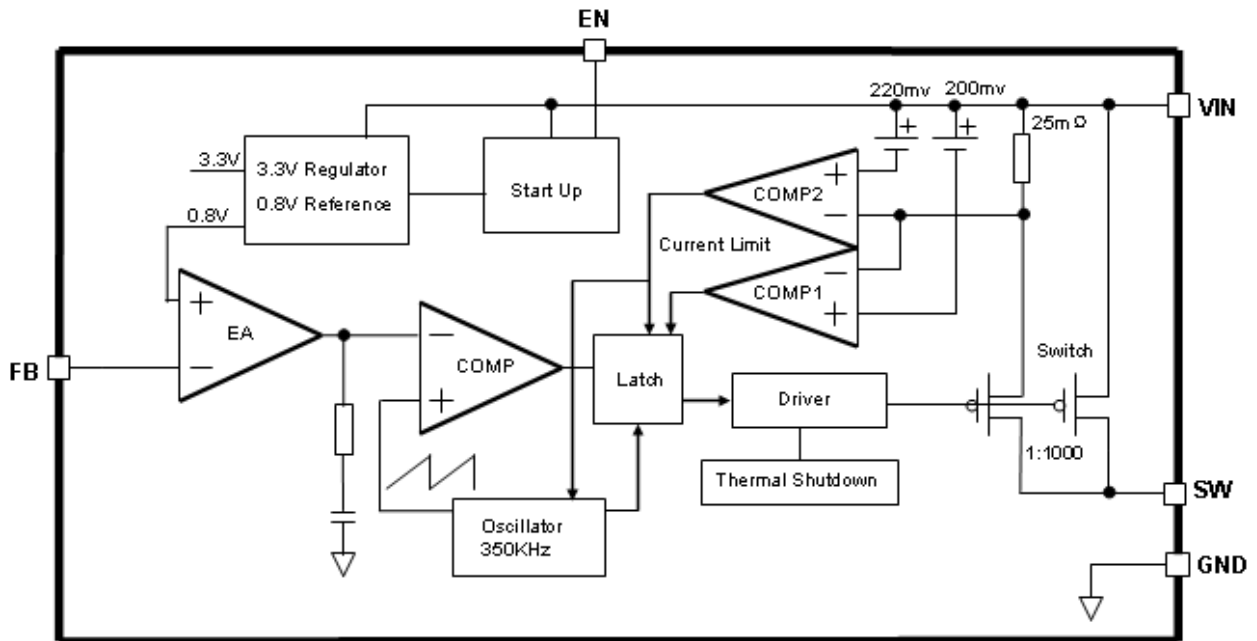
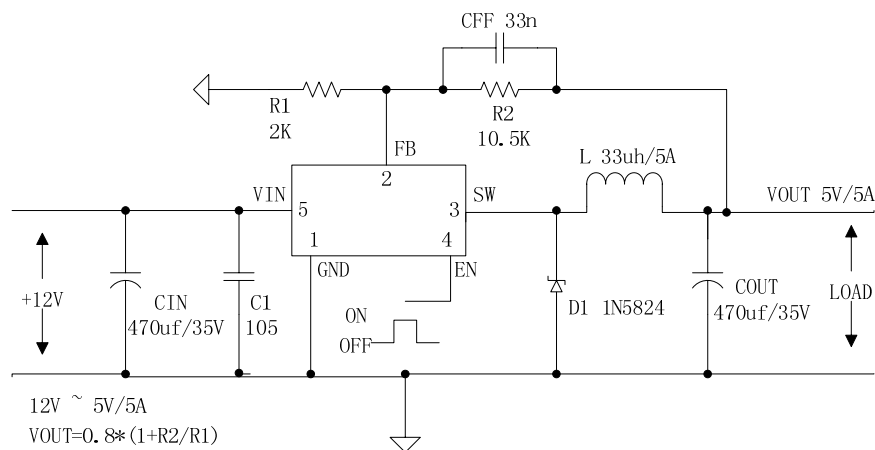


Figure3. Function Block Diagram of AMS2566

Typical Application Circuit





Ordering Information

| Package | Temperature Range | Part Number | FACT | voltage |
|---------|-------------------|-------------|--|---------|
| | | Lead Free | Lead Free | |
| | | AMS2566-XX | TO263-5/TO252-5 | XX |
| | | AMS2566L-XX | TO220-5 (two lines, two pins back three front) | |

Absolute Maximum Ratings (Note1)

| Parameter | Symbol | Value | Unit |
|--|--------------|--------------------|------|
| Input Voltage | V_{in} | -0.3 to 27 | V |
| Feedback Pin Voltage | V_{FB} | -0.3 to V_{in} | V |
| EN Pin Voltage | V_{EN} | -0.3 to V_{in} | V |
| Output Switch Pin Voltage | V_{Output} | -0.3 to V_{in} | V |
| Power Dissipation | P_D | Internally limited | mW |
| Thermal Resistance (TO263) (Junction to Ambient, No Heatsink, Free Air) | R_{JA} | 50 | °C/W |
| Operating Junction Temperature | T_J | -40 to 125 | °C |
| Storage Temperature | T_{STG} | -65 to 150 | °C |
| Lead Temperature (Soldering, 10 sec) | T_{LEAD} | 260 | °C |
| ESD (HBM) | | 2000 | V |

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

**Electrical Characteristics**T_a = 25°C; unless otherwise specified.

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|------------------|--|-------|------|-------|------|
| <i>System parameters test circuit figure4</i> | | | | | | |
| VFB | Feedback Voltage | V _{in} = 5V to 25V, V _{out} =5V I _{load} =0.5A to 5A | 0.776 | 0.8 | 0.824 | V |
| Efficiency | η | V _{in} =12V, V _{out} =5V I _{out} =4.0A | - | 89 | - | % |

Electrical Characteristics (DC Parameters)V_{in} = 12V, GND=0V, V_{in} & GND parallel connect a 220uf/50V capacitor; I_{out}=500mA, T_a = 25°C; the others floating unless otherwise specified.

| Parameters | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|------------------------------|-------------------|--|------|------------|------|------|
| Input operation voltage | V _{in} | | 3.6 | | 25 | V |
| Shutdown Supply Current | I _{STBY} | V _{EN} =0V | | 60 | 200 | uA |
| Quiescent Supply Current | I _q | V _{EN} =2V, V _{FB} =V _{in} | | 3 | 5 | mA |
| Oscillator Frequency | F _{osc} | | 298 | 360 | 402 | KhZ |
| Switch Current Limit | I _L | V _{FB} =0 | | 8 | | A |
| EN Pin Threshold | V _{EN} | High (Regulator ON) Low (Regulator OFF) | | 1.4 0.8 | | V |
| EN Pin Input Leakage Current | I _H | V _{EN} =2V (ON) | | 1 | 15 | uA |
| | I _L | V _{EN} =0V (OFF) | | 1 | 15 | uA |
| Max. Duty Cycle | D _{MAX} | V _{FB} =0V | | 100 | | % |

Test Circuit and Layout guidelines

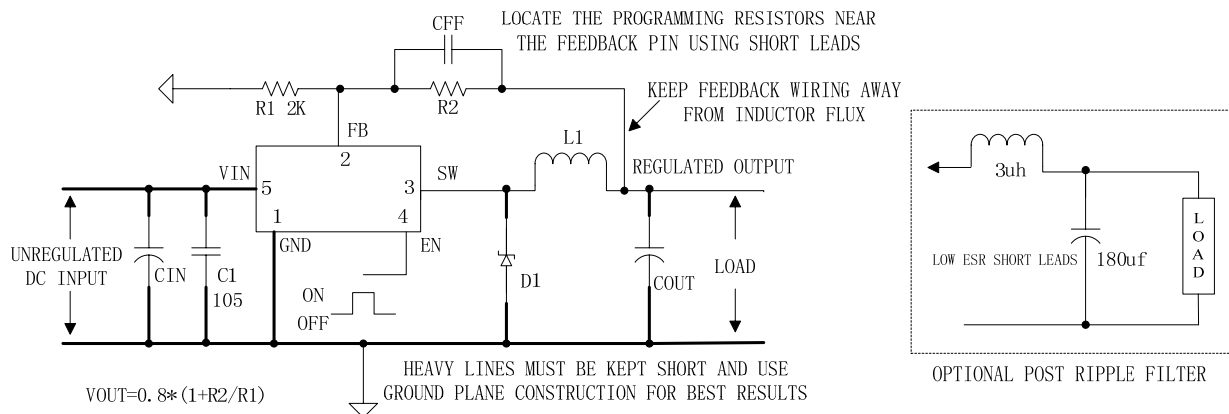


Figure5. Standard Test Circuits and Layout Guides

Select R1 to be approximately 2K, use a 1% resistor for best stability.

C1 and CFF are optional; in order to increase stability and reduce the input power line noise, CIN and C1 must be placed near to PIN1 and PIN3;

For output voltages greater than approximately 10V, an additional capacitor CFF is required. The compensation capacitor is typically between 100 pf and 33 nf, and is wired in parallel with the output voltage setting resistor, R2. It provides additional stability for high output voltage, low input-output voltages, and/or very low ESR output capacitors, such as solid tantalum capacitors. $CFF = 1 / (31 * 1000 * R2)$; This capacitor type can be ceramic, plastic, silver mica, etc. (Because of the unstable characteristics of ceramic capacitors made with Z5U material, they are not recommended.)



Schottky Diode Selection Table

| Current | Surface Mount | Through Hole | VR (The same as system maximum input voltage) | | | | |
|---------|---------------|--------------|---|--------|--------|--------|--------|
| | | | 20V | 30V | 40V | 50V | 60V |
| 1A | | ✓ | 1N5817 | 1N5818 | 1N5819 | | |
| 3A | | ✓ | 1N5820 | 1N5821 | 1N5822 | | |
| | | ✓ | MBR320 | MBR330 | MBR340 | MBR350 | MBR360 |
| | ✓ | | SK32 | SK33 | SK34 | SK35 | SK36 |
| | ✓ | | | 30WQ03 | 30WQ04 | 30WQ05 | |
| | | ✓ | | 31DQ03 | 31DQ04 | 31DQ05 | |
| | | ✓ | SR302 | SR303 | SR304 | SR305 | SR306 |
| 5A | | ✓ | 1N5823 | 1N5824 | 1N5825 | | |
| | | ✓ | SR502 | SR503 | SR504 | SR505 | SR506 |
| | | ✓ | SB520 | SB530 | SB540 | SB550 | SB560 |
| | ✓ | | | 50WQ03 | 50WQ04 | 50WQ05 | |

Typical System Application for 24V ~ 12V/3A Version

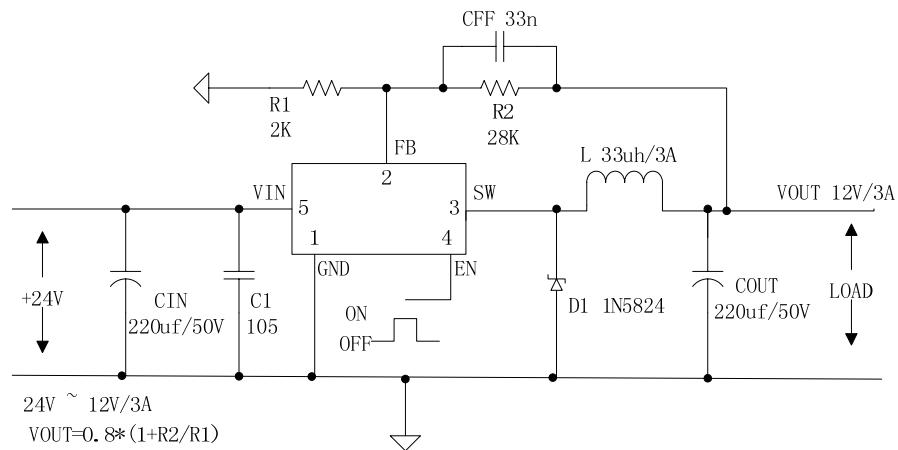


Figure6. AMS2566 System Parameters Test Circuit (24V ~ 12V/3A)

Typical System Application for 24V ~ 5V/5A

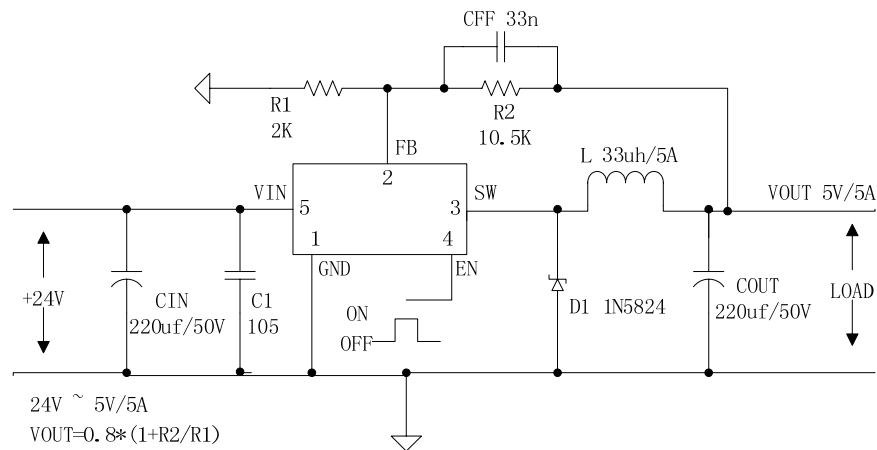
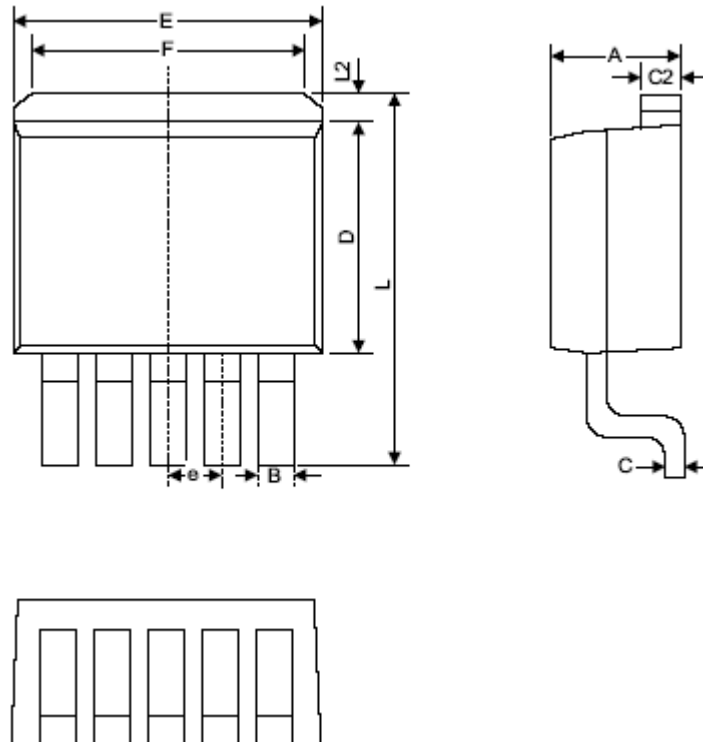


Figure7. AMS2566 System Parameters Test Circuit (24V ~ 5V/5A)

Package information:

(1) TO263-5L

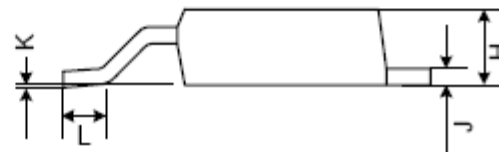
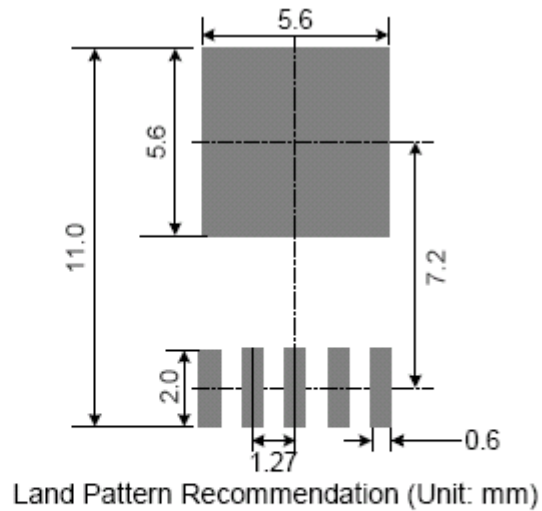
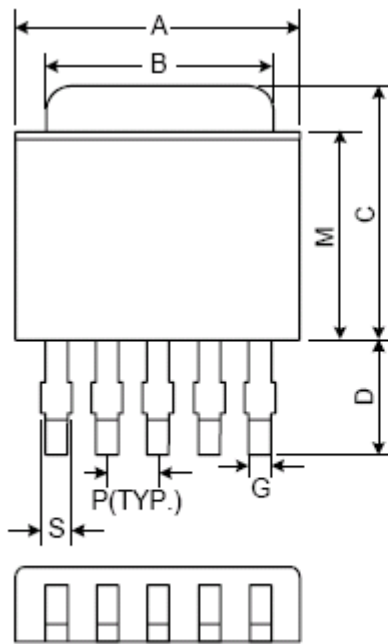


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.06 | 4.83 | 0.160 | 0.190 |
| B | 0.76 | 1.02 | 0.030 | 0.040 |
| C | 0.36 | 0.64 | 0.014 | 0.025 |
| C2 | 1.14 | 1.40 | 0.045 | 0.055 |
| D | 8.64 | 9.65 | 0.340 | 0.380 |
| E | 9.78 | 10.54 | 0.385 | 0.415 |
| e | 1.57 | 1.85 | 0.062 | 0.073 |
| F | 6.60 | 7.11 | 0.260 | 0.280 |
| L | 15.11 | 15.37 | 0.595 | 0.605 |
| L2 | - | 1.40 | - | 0.055 |

(2) TO220-5 is 3pins front and 2 back same as BM2596-L so , it will not be described here .

(3) Package Information

TO252-5L



| Symbol | Dimensions In Millimeters | | | Dimensions In Inches | | |
|--------|---------------------------|------|------|----------------------|-------|-------|
| | Min. | Nom. | Max. | Min. | Nom. | Max. |
| A | 6.35 | 6.60 | 6.85 | 0.250 | 0.260 | 0.270 |
| B | 5.20 | 5.35 | 5.50 | 0.205 | 0.211 | 0.217 |
| C | 6.80 | 7.00 | 7.30 | 0.268 | 0.276 | 0.287 |
| D | 2.20 | 2.50 | 2.80 | 0.087 | 0.098 | 0.110 |
| P | 1.27 REF. | | | 0.050 REF. | | |
| S | 0.50 | 0.65 | 0.80 | 0.020 | 0.026 | 0.031 |
| G | 0.40 | 0.50 | 0.63 | 0.016 | 0.020 | 0.025 |
| H | 2.20 | 2.30 | 2.40 | 0.087 | 0.091 | 0.094 |
| J | 0.45 | 0.52 | 0.58 | 0.018 | 0.020 | 0.023 |
| K | 0.00 | 0.08 | 0.15 | 0.000 | 0.003 | 0.006 |
| L | 0.90 | 1.20 | 1.63 | 0.035 | 0.047 | 0.064 |
| M | 5.40 | 5.80 | 6.20 | 0.213 | 0.228 | 0.244 |