

Description

The AP4341S is an output voltage detector for Primary Side Control System. It is a low power loss solution. It detects the output voltage and provides a periodical signal when the output voltage is lower than a certain threshold. The periodical signal can be coupled by the transformer to the primary side and provided as an awakening signal for the main primary side controller. By fast response to secondary side voltage, the AP4341S can effectively improve the transient performance of Primary Side Control System.

The AP4341S will enable a discharge circuit when it detects the output voltage is higher than a certain threshold.

The AP4341S can cooperate with some PSR ICs, such as AP3775, GP350H and GP350BX.

The AP4341S is available in SOT23 package.

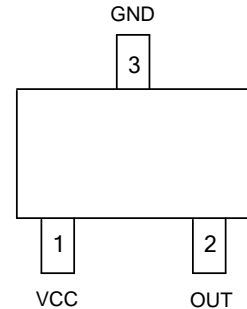
Features

- Fast Detector of Supply Voltages
- 33kHz Output Pulse
- No External Components
- Low Power Loss for Green Mode Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Pin Assignments

(Top View)

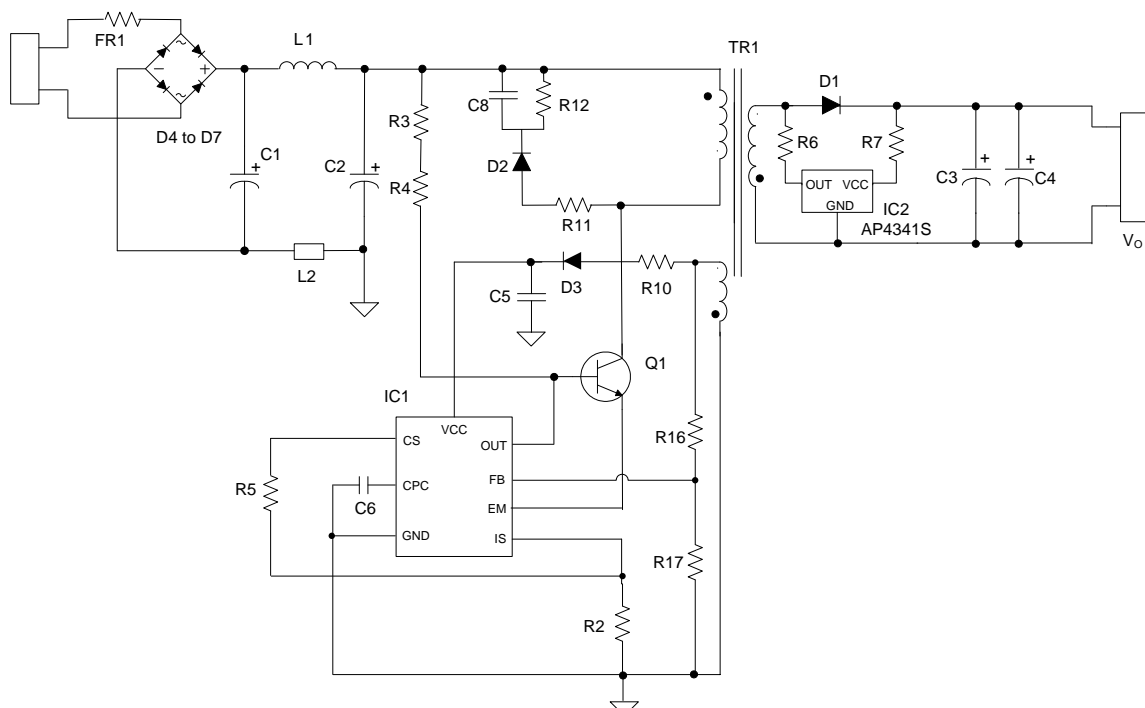


SOT23

Applications

- Adapters/Chargers for Cell/Cordless Phones, ADSL Modems, MP3 and Other Portable Apparatus
- Standby and Auxiliary Power Supplies

Typical Applications Circuit

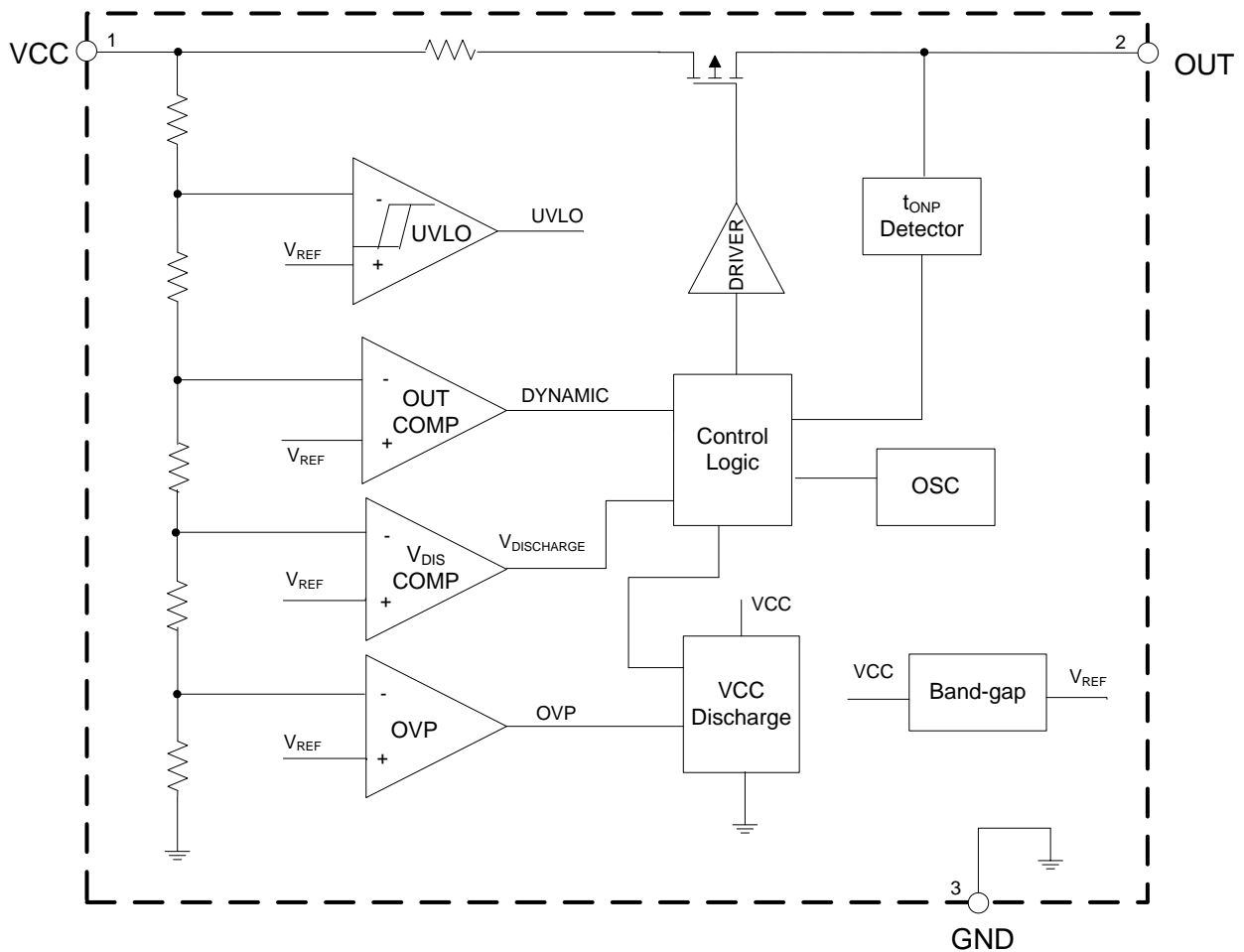


Pin Descriptions

| Pin Number | Pin Name | Function |
|------------|----------|--|
| 1 | VCC | Power supply pin, connected with one end of the secondary winding and the output capacitance |
| 2 | OUT | Secondary detecting pin, connected with the other end of the secondary winding |
| 3 | GND | Ground pin, connected with secondary side GND of the system |

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Functional Block Diagram



Absolute Maximum Ratings (Note 4)

| Parameter | Rating | Unit |
|--|--------------------|--------------------|
| Supply Voltage V_{CC} | -0.3 to 7 | V |
| Voltage at OUT | -40 to 9 | V |
| Output Current at OUT | Internally limited | A |
| Power Dissipation at $T_A = +25^\circ\text{C}$ | 0.4 | W |
| Operating Junction Temperature | +150 | $^\circ\text{C}$ |
| Storage Temperature | -65 to +150 | $^\circ\text{C}$ |
| Lead Temperature (Soldering, 10 sec) | +300 | $^\circ\text{C}$ |
| Thermal Resistance (Junction to Case) | 140 | $^\circ\text{C/W}$ |

Note: 4. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

| Symbol | Parameter | Min | Max | Unit |
|----------|---------------------|-----|-----|------------------|
| V_{CC} | Supply Voltage | 2 | 6 | V |
| T_A | Ambient Temperature | -40 | +85 | $^\circ\text{C}$ |

Electrical Characteristics ($V_{CC}=5\text{V}$, $T_A=+25^\circ\text{C}$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---------------------------------|---|------|------|------|---------------|
| Supply Voltage (VCC Pin) | | | | | | |
| V_{ON} | Power-on Voltage | – | 2.1 | 2.5 | 2.9 | V |
| I_{ST} | Startup Current | $V_{CC}=2.1\text{V}$ | 15 | 30 | 65 | μA |
| I_{OP} | Operating Current | OUT pin floating, $V_{CC}=V_{TRI}+20\text{mV}$ | 30 | 80 | 120 | μA |
| V_{OFF} | Power-off Voltage | – | 1.9 | 2.3 | 2.7 | V |
| V_{TRI} | Internal Trigger Voltage | – | 5.05 | 5.10 | 5.15 | V |
| Output Section/ Oscillator Section | | | | | | |
| – | Duty Cycle | $V_{CC}=4.9\text{V}$ | 1.5 | 5 | 6.5 | % |
| t_{OSC} | Oscillation Period | $V_{CC}=4.9\text{V}$ | 25 | 30 | 35 | μs |
| I_{OUT} | Output Maximum Current | $V_{CC}=4.9\text{V}$ | 26 | 31 | 36 | mA |
| t_{DIS} | Minimum Period | – | 55 | 70 | 80 | ms |
| V_{DIS} | Discharge Voltage | – | 5.10 | 5.15 | 5.20 | V |
| I_{DIS} | Discharge Current | – | 0.5 | 1 | 1.5 | mA |
| V_{OVP} | Overshoot Voltage for Discharge | – | 5.15 | 5.25 | 5.45 | V |
| I_{OVP} | Overshoot Current for Discharge | – | 40 | 100 | 160 | mA |

Note: 5. The system output voltage is 5V.

Operation Description

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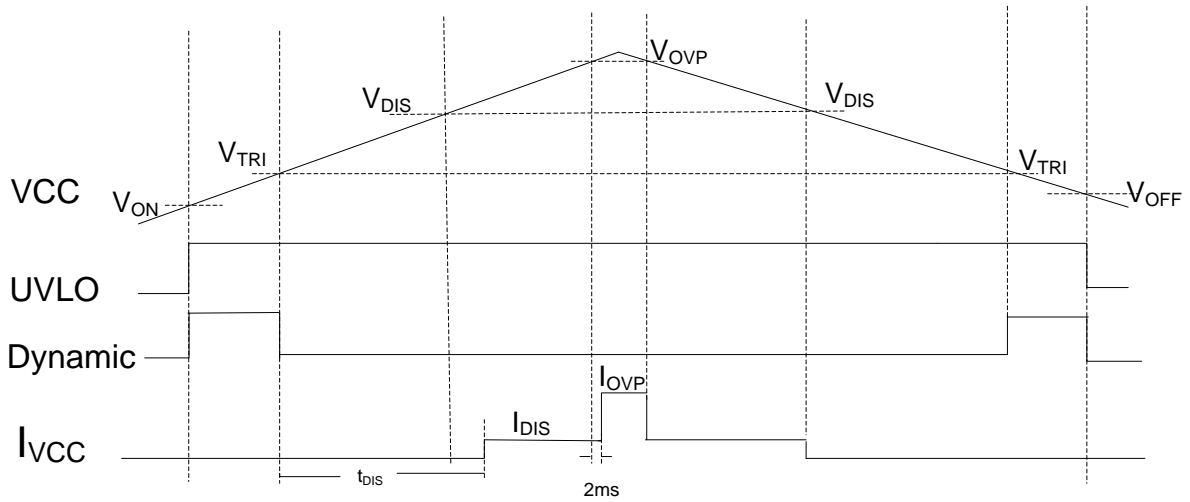
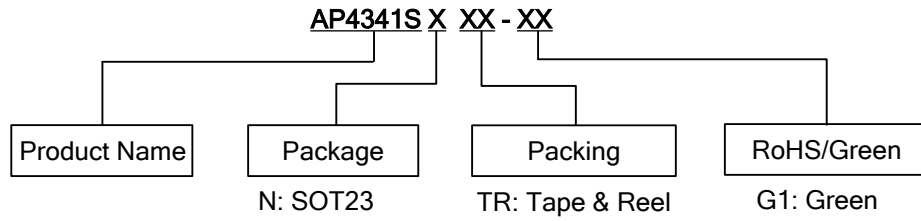


Figure 1. Typical Waveforms of AP4341S

When VCC voltage is beyond power-on voltage (V_{ON}), the AP4341S starts up. The OUT pin asserts a periodical pulse and oscillation period is t_{OSC} . When VCC voltage is beyond trigger voltage (V_{TRI}), the periodical pulse in OUT pin is discontinued. When VCC voltage is beyond discharge voltage (V_{DIS}), the discharge circuit will be enabled, a 1mA current will flow into VCC pin. When VCC voltage is higher than overshoot voltage (V_{OVP}), the AP4341S will enable a discharge circuit until the VCC voltage falls below the overshoot voltage. At the same time, the periodical pulse in OUT pin will be disabled.

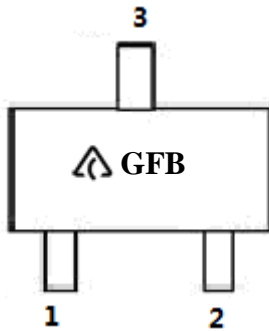
When the VCC voltage is below power-off voltage (V_{OFF}), the AP4341S will be shut down.


Ordering Information



| Package | Temperature Range | Part Number | Marking ID | Packing |
|---------|-------------------|---------------|------------|------------------|
| SOT23 | -40 to +85°C | AP4341SNTR-G1 | GFB | 3000/Tape & Reel |

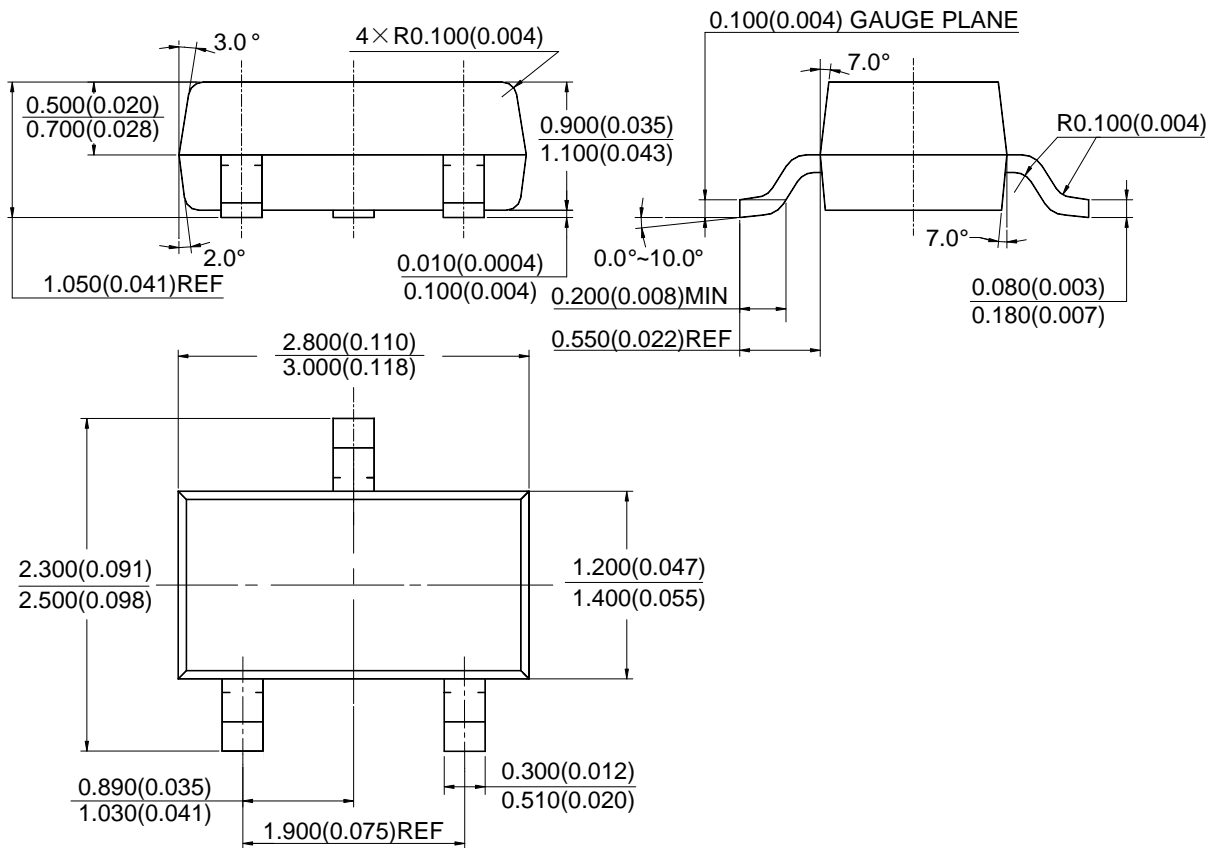
Marking Information



 : Logo
 GFB: Marking ID

Package Outline Dimensions (All dimensions in mm(inch).)

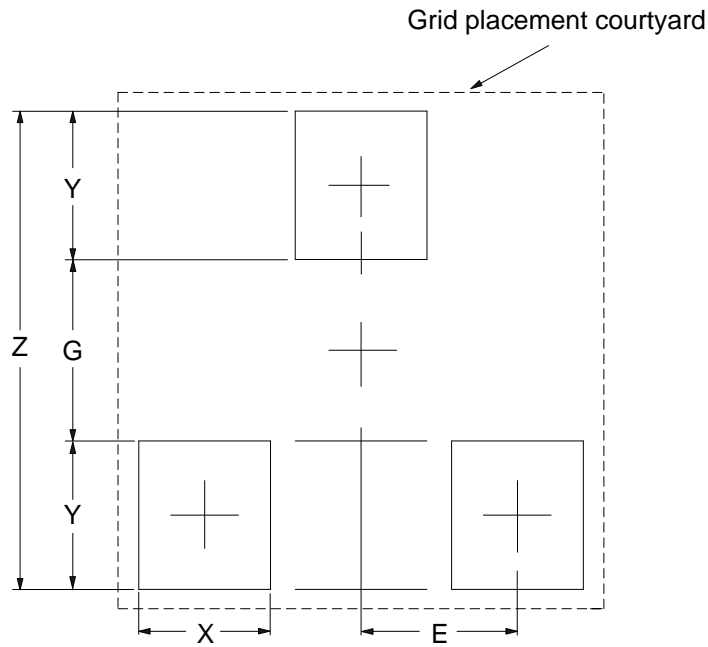
(1) Package Type: SOT23



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Suggested Pad Layout

(1) Package Type: SOT23



| Dimensions | Z (mm)/(inch) | G (mm)/(inch) | X (mm)/(inch) | Y (mm)/(inch) | E (mm)/(inch) |
|------------|------------------|------------------|------------------|------------------|------------------|
| Value | 2.900/0.114 | 1.100/0.043 | 0.800/0.031 | 0.900/0.035 | 0.950/0.037 |

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