

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.

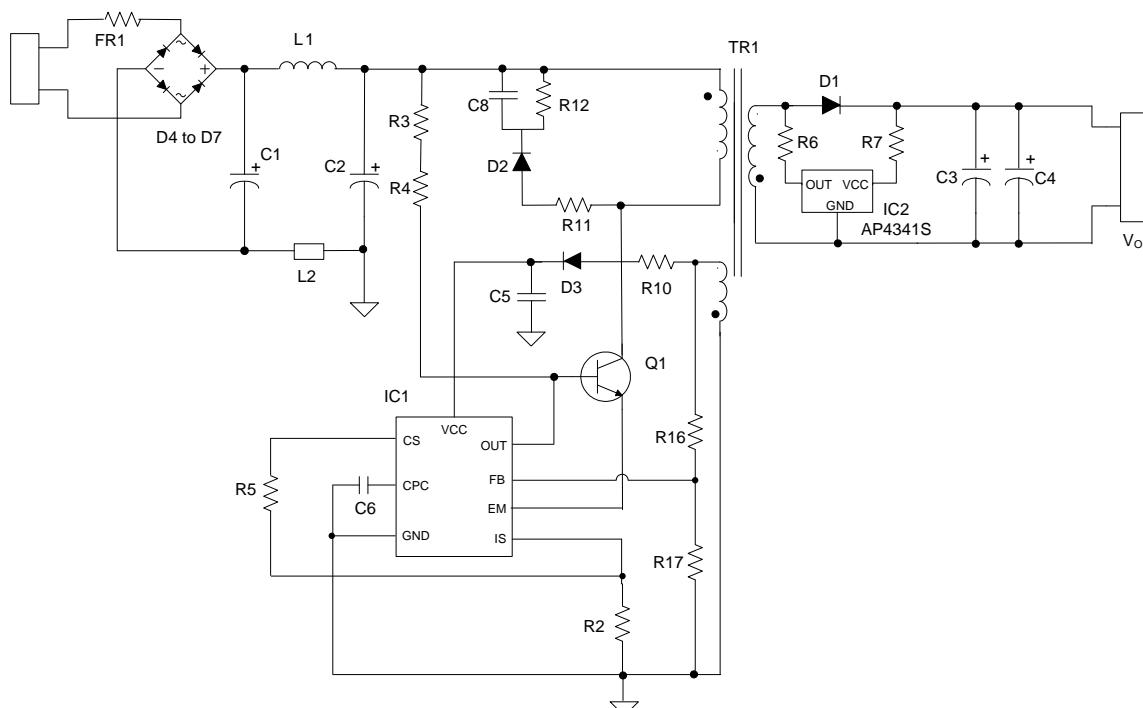
Features

- 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.

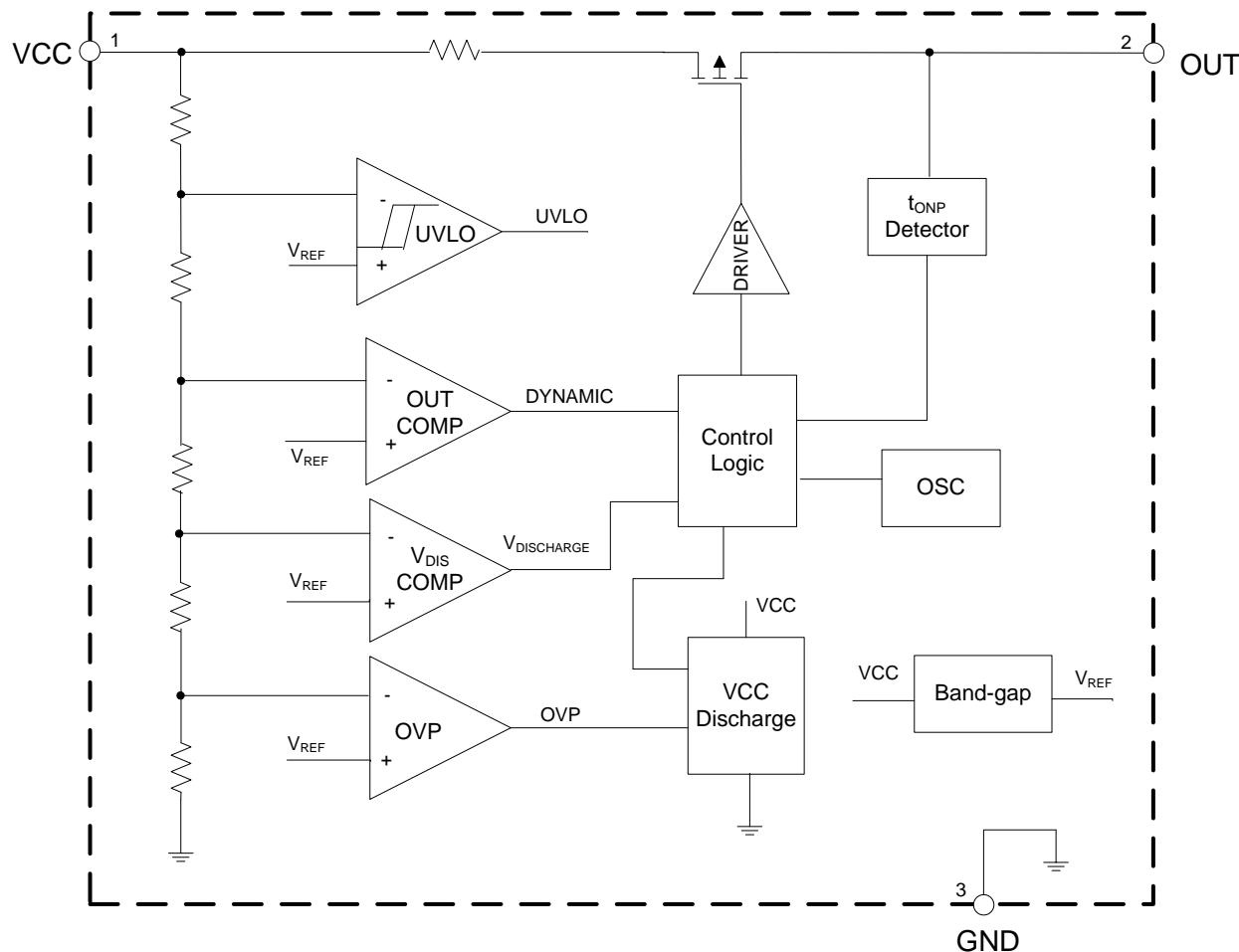
Typical Applications Circuit



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

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 $T_A = +25^\circ C$	0.4	W
Operating Junction Temperature	+150	$^\circ C$
Storage Temperature	-65 to +150	$^\circ C$
Lead Temperature (Soldering, 10 sec)	+300	$^\circ C$
Thermal Resistance (Junction to Case)	140	$^\circ C/W$

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	$^\circ C$

Electrical Characteristics ($V_{CC} = 5V$, $T_A = +25^\circ C$, 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	$V_{CC} = 2.1V$	15	30	65	μA
I_{OP}	Operating Current	OUT pin floating, $V_{CC} = V_{TRI} + 20mV$	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	$V_{CC} = 4.9V$	1.5	5	6.5	%
t_{osc}	Oscillation Period	$V_{CC} = 4.9V$	25	30	35	μs
I_{OUT}	Output Maximum Current	$V_{CC} = 4.9V$	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

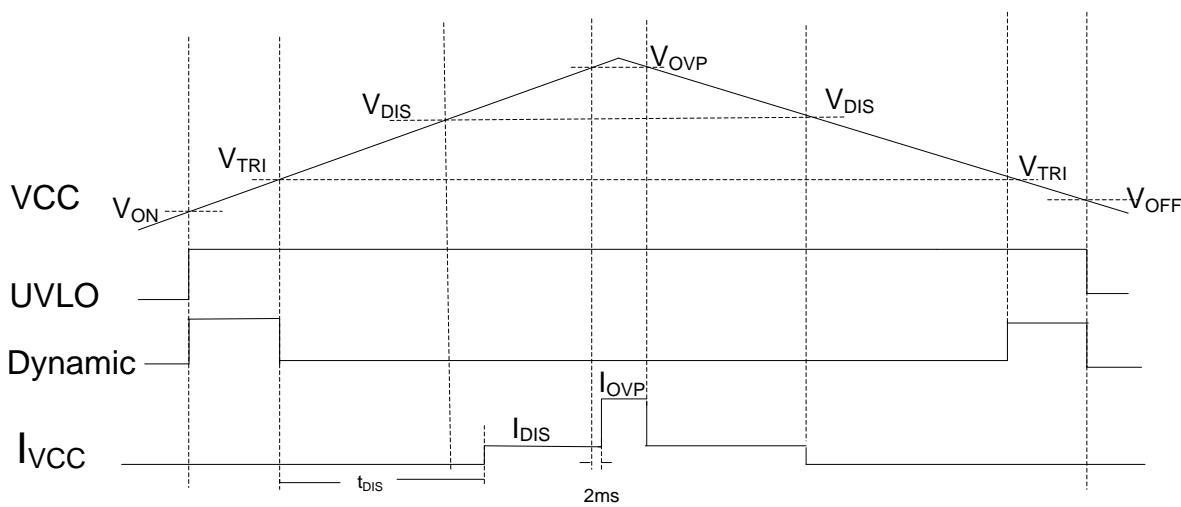
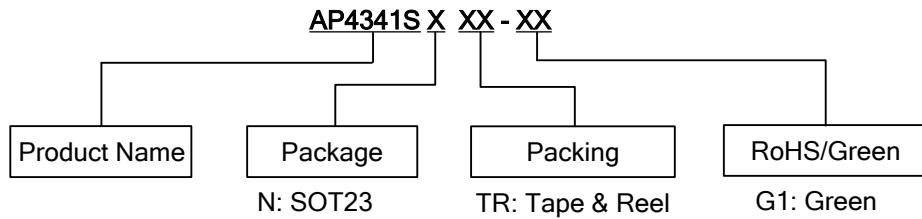


Figure 1. Typical Waveforms of AP4341S

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.

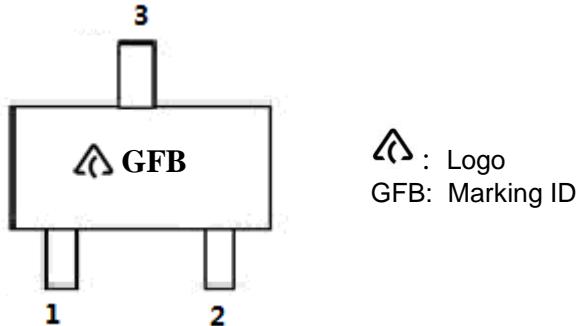
When the VCC voltage is below power-off voltage (V_{OFF}), the AP4341S will be shut down.

Ordering Information



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

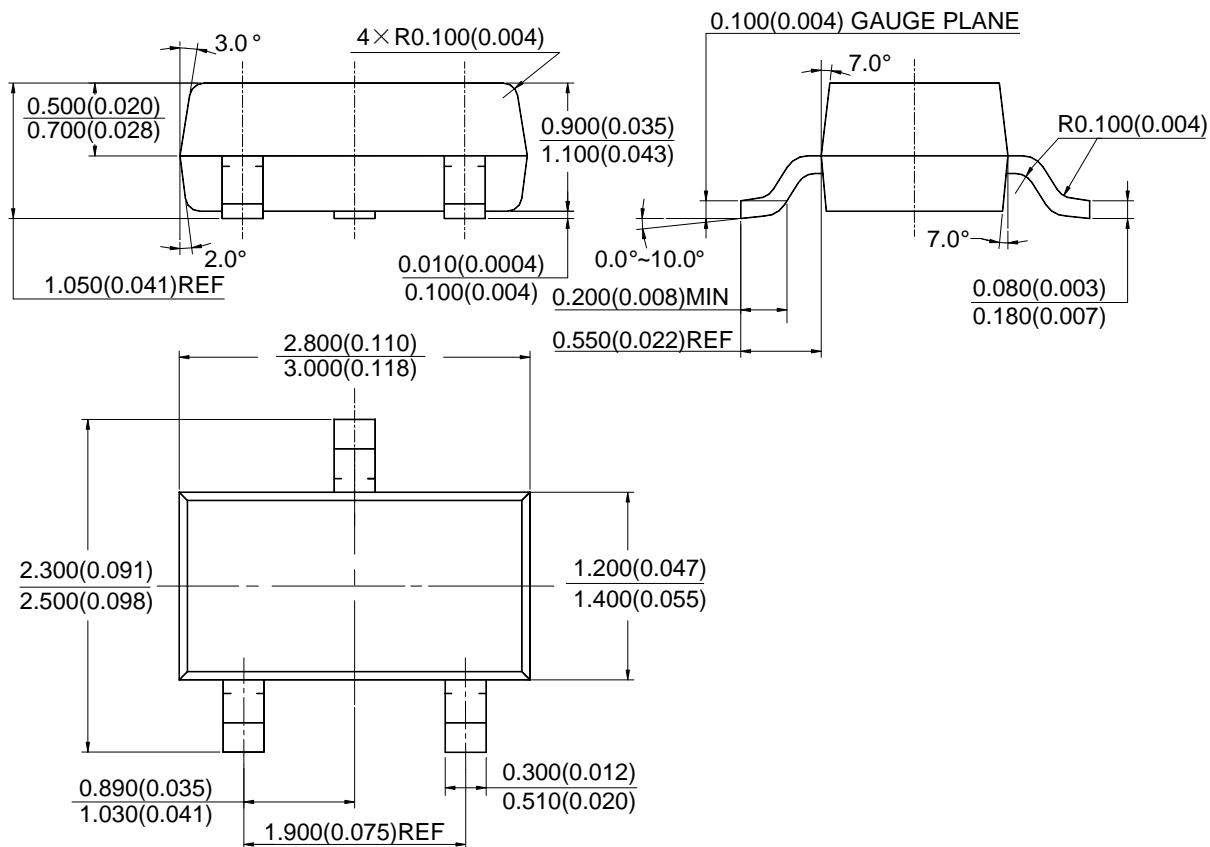
Marking Information



▲ : Logo
GFB: Marking ID

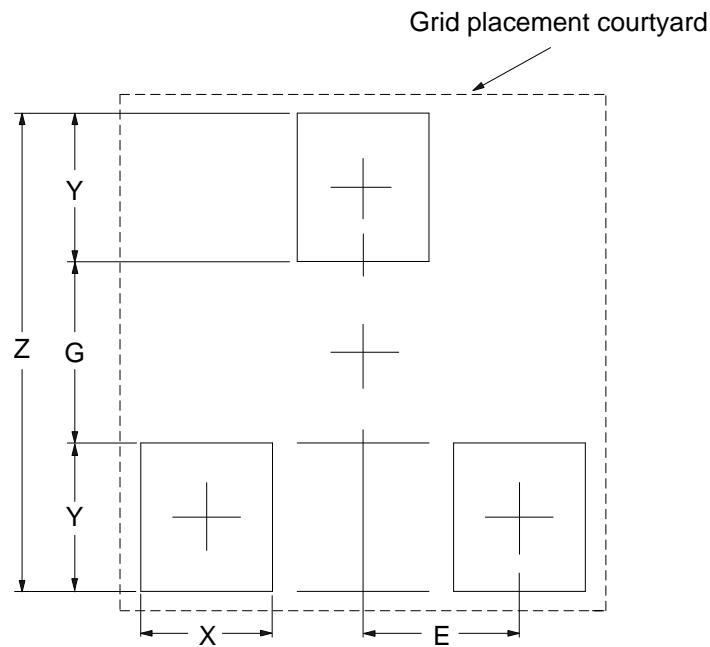
Package Outline Dimensions (All dimensions in mm(inch).)

(1) Package Type: SOT23



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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