

## Description

The DIODES™ 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.

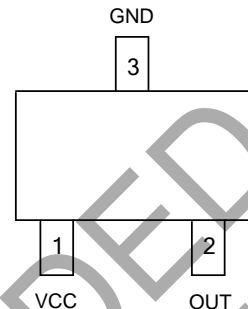
## Features

- 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](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)

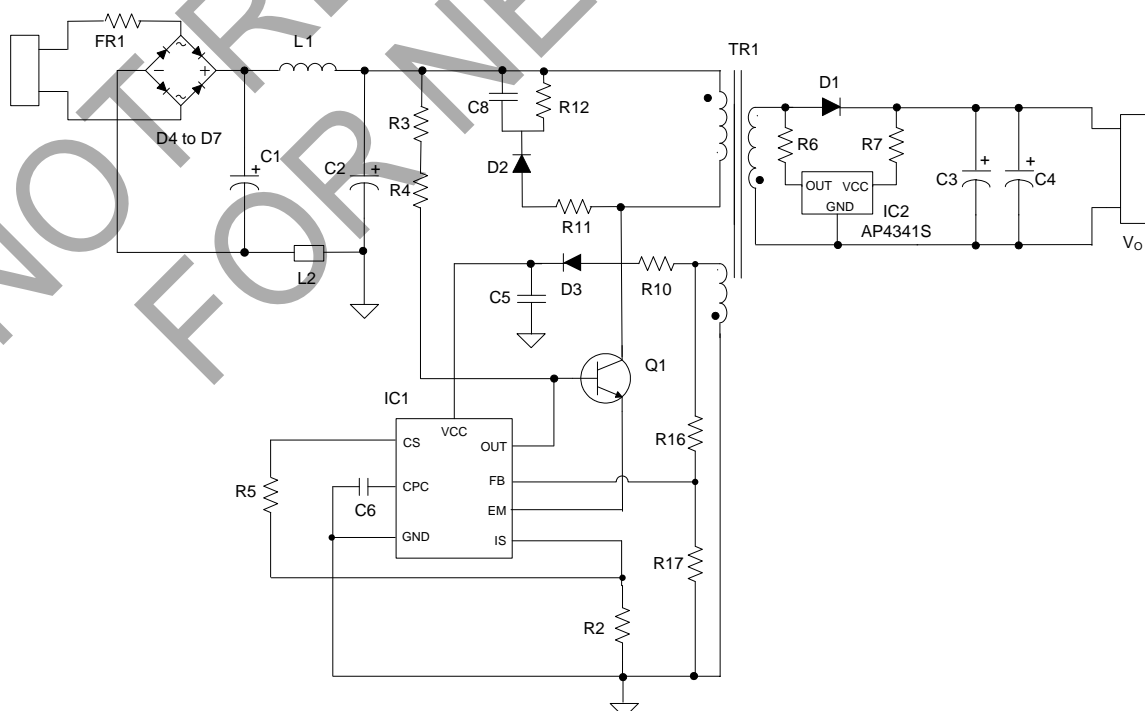


SOT23

## Applications

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

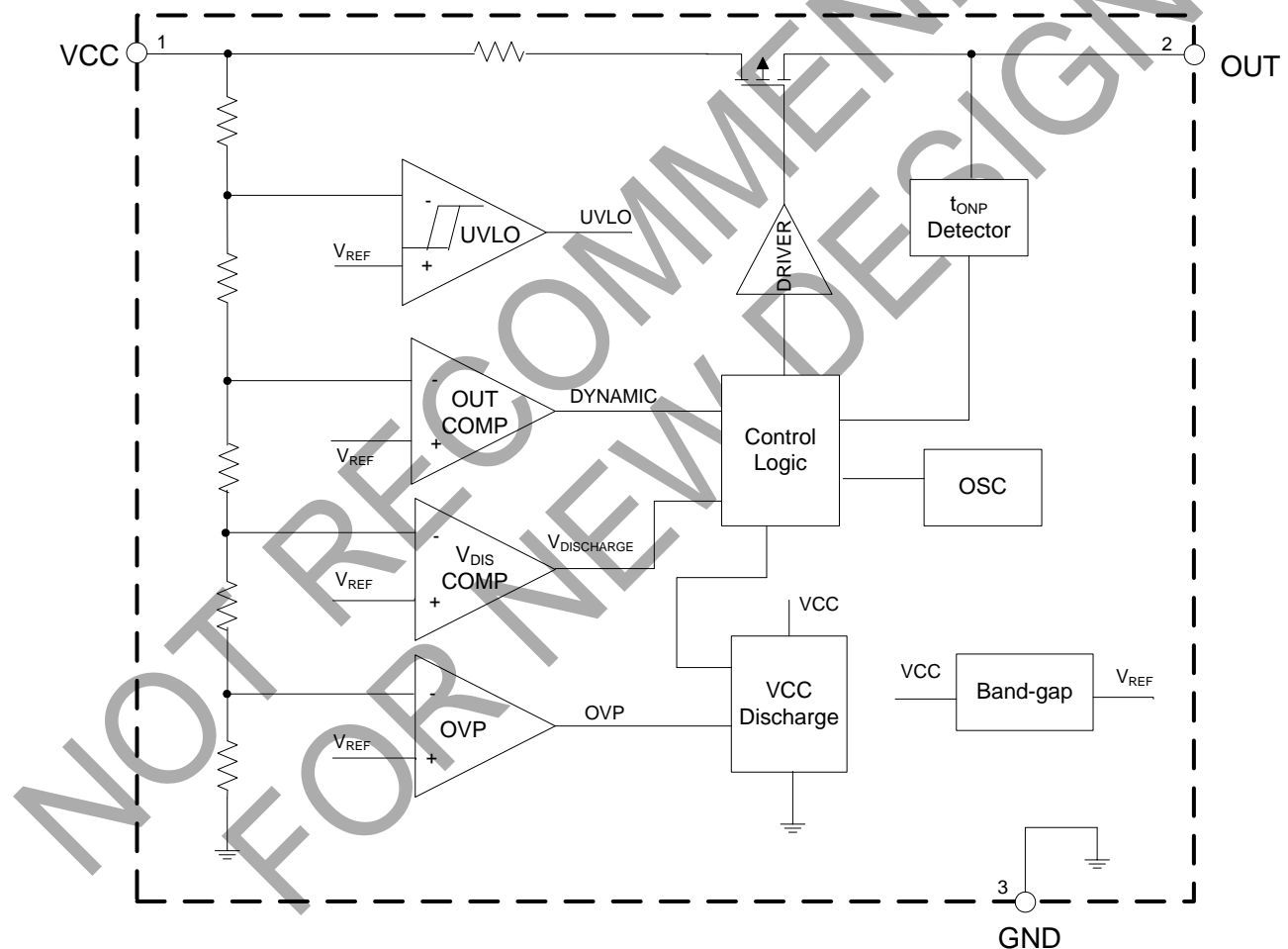
## Typical Applications Circuit



## 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

## 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
<b>Supply Voltage ( VCC Pin )</b>						
$V_{ON}$	Power-on Voltage	—	2.1	2.5	2.9	V
$I_{ST}$	Startup Current	$V_{CC} = 2.1\text{V}$	15	30	65	$\mu\text{A}$
$I_{OP}$	Operating Current	OUT pin floating, $V_{CC} = V_{TRI} + 20\text{mV}$	30	80	120	$\mu\text{A}$
$V_{OFF}$	Power-off Voltage	—	1.9	2.3	2.7	V
$V_{TRI}$	Internal Trigger Voltage	—	5.05	5.10	5.15	V
<b>Output Section/ Oscillator Section</b>						
—	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	$\mu\text{s}$
$I_{OUT}$	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

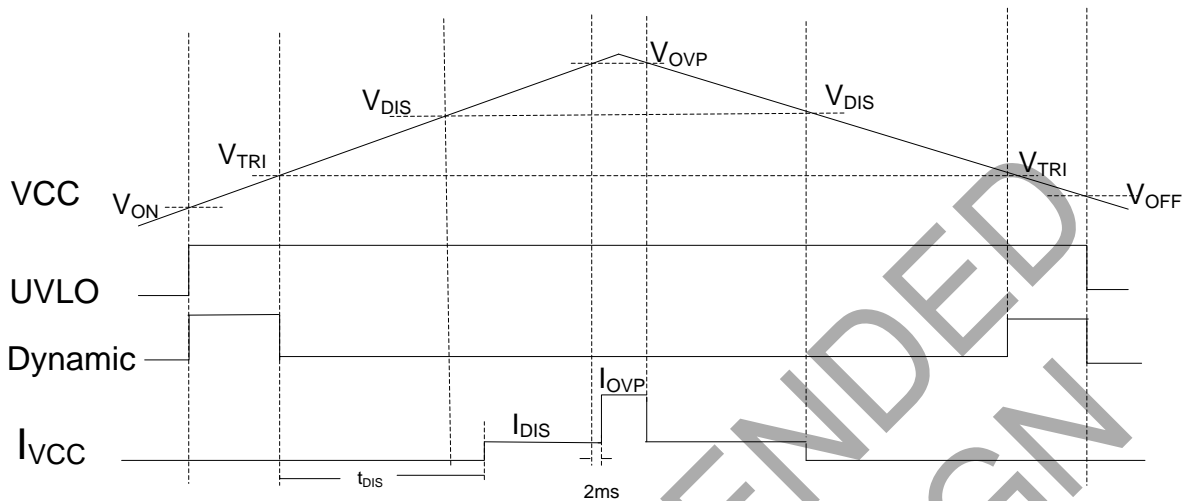
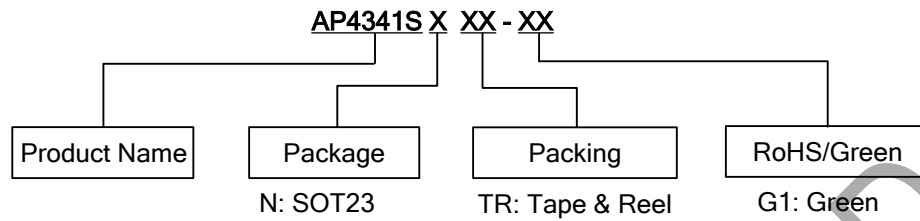


Figure 1. Typical Waveforms of AP4341S

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.

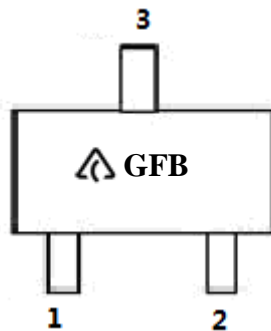
When the VCC voltage is below power-off voltage ( $V_{OFF}$ ), the AP4341S will be shut down.

## Ordering Information



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

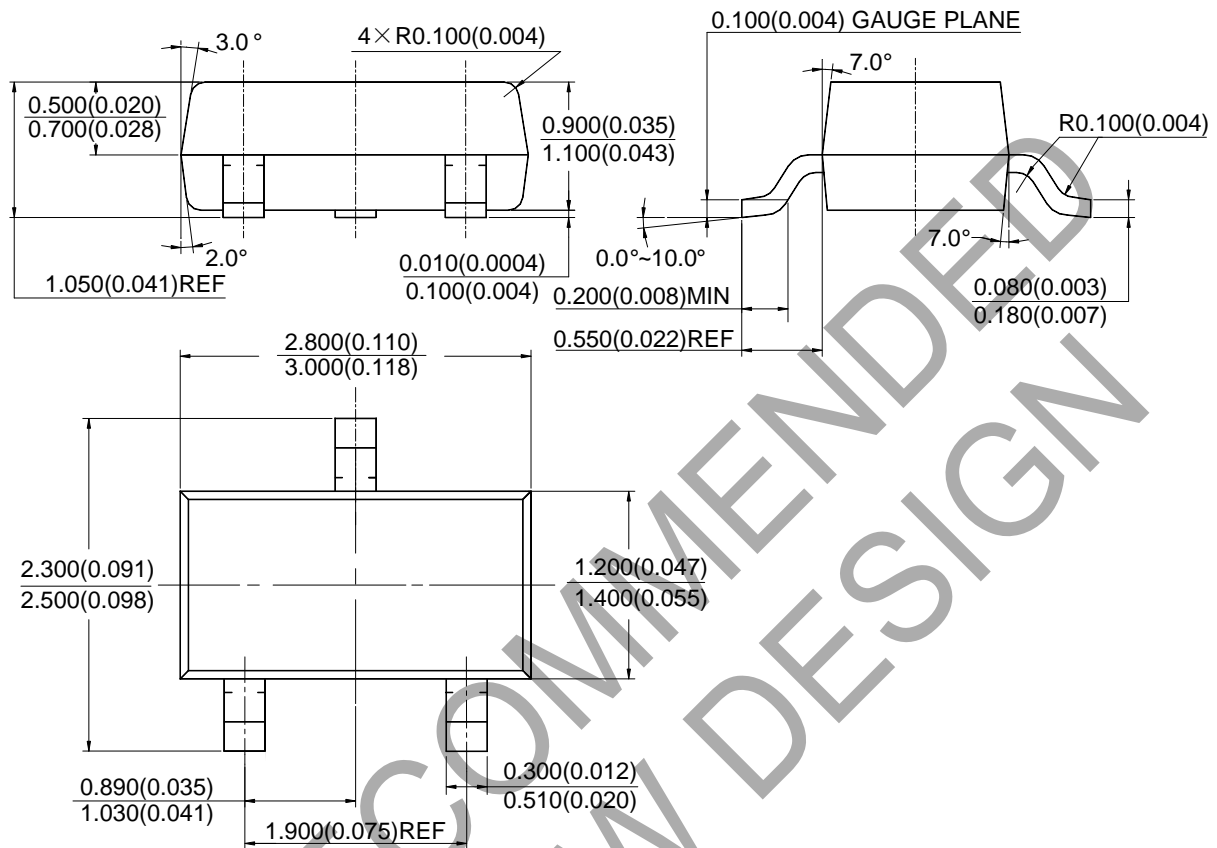
## Marking Information



 : Logo  
 GFB: Marking ID

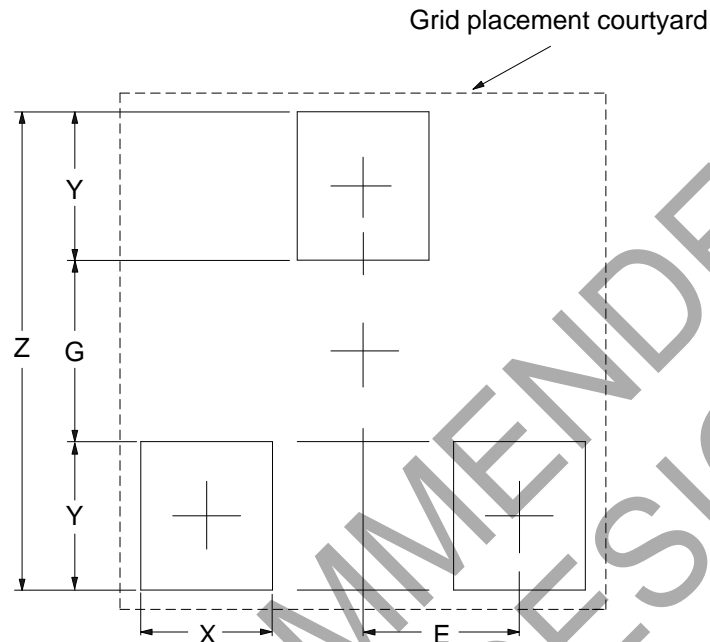
**Package Outline Dimensions** (All dimensions in mm(inch).)

(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

**IMPORTANT NOTICE**

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.
5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.
9. This Notice may be periodically updated with the most recent version available at <https://www.diodes.com/about/company/terms-and-conditions/important-notice>

DIODES is a trademark of Diodes Incorporated in the United States and other countries.  
The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.  
© 2022 Diodes Incorporated. All Rights Reserved.

[www.diodes.com](http://www.diodes.com)



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated:](#)

[AP4341SNTR-G1](#)