NEW PRODUCT

AP4340S

DYNAMIC PSR ACCELERATOR

Description

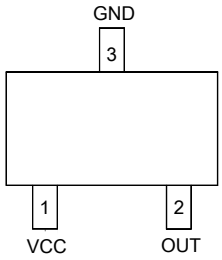
The AP4340S is an output voltage detector for Primary Side Control System. It is a low power loss solution. It detects the output voltage and provides a periodical signal when the output voltage is lower than a certain threshold. The periodical signal can be coupled by the transformer to the primary side and provided as an awakening signal for the main primary side controller. By fast response to secondary side voltage, the AP4340S can effectively improve the transient performance of Primary Side Control System.

AP4340S will enable a discharge circuit when it detects the output voltage is higher than a certain threshold.

The AP4340S is available in SOT23 package.

Pin Assignments

(Top View)



SOT23

Features

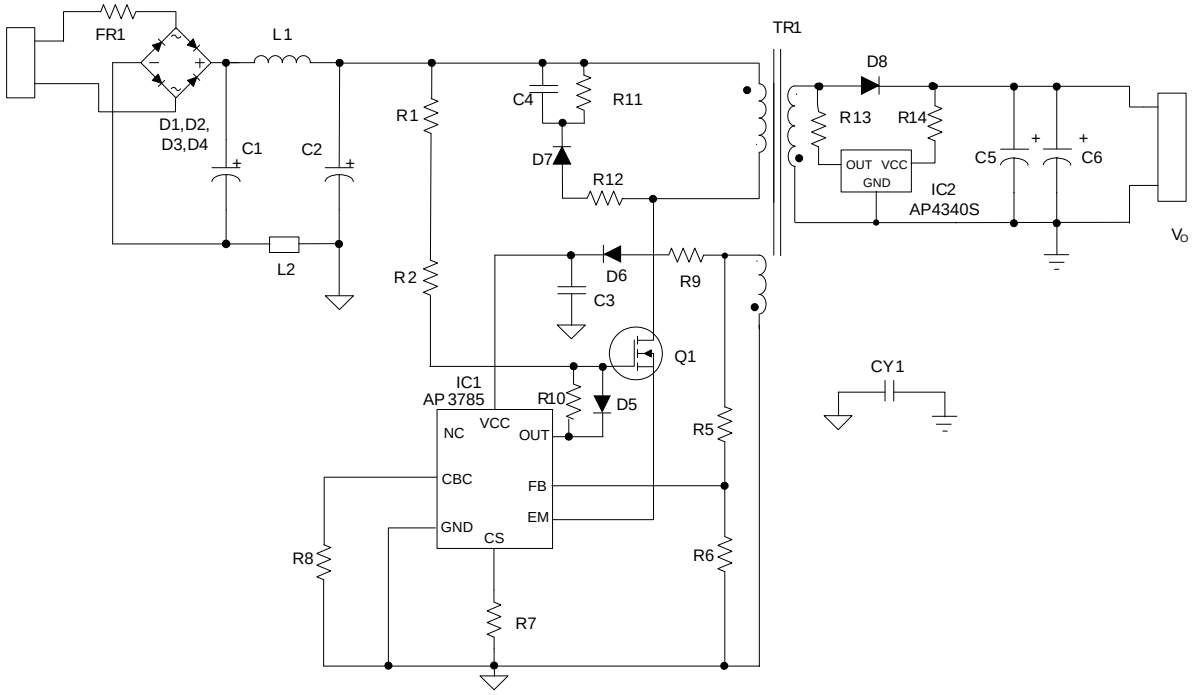
- Fast Detector of Supply Voltages
- 33kHz Output Pulse
- No External Components
- Low Power Loss for Green Mode Applications
- **Totally Lead-free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Applications

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

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



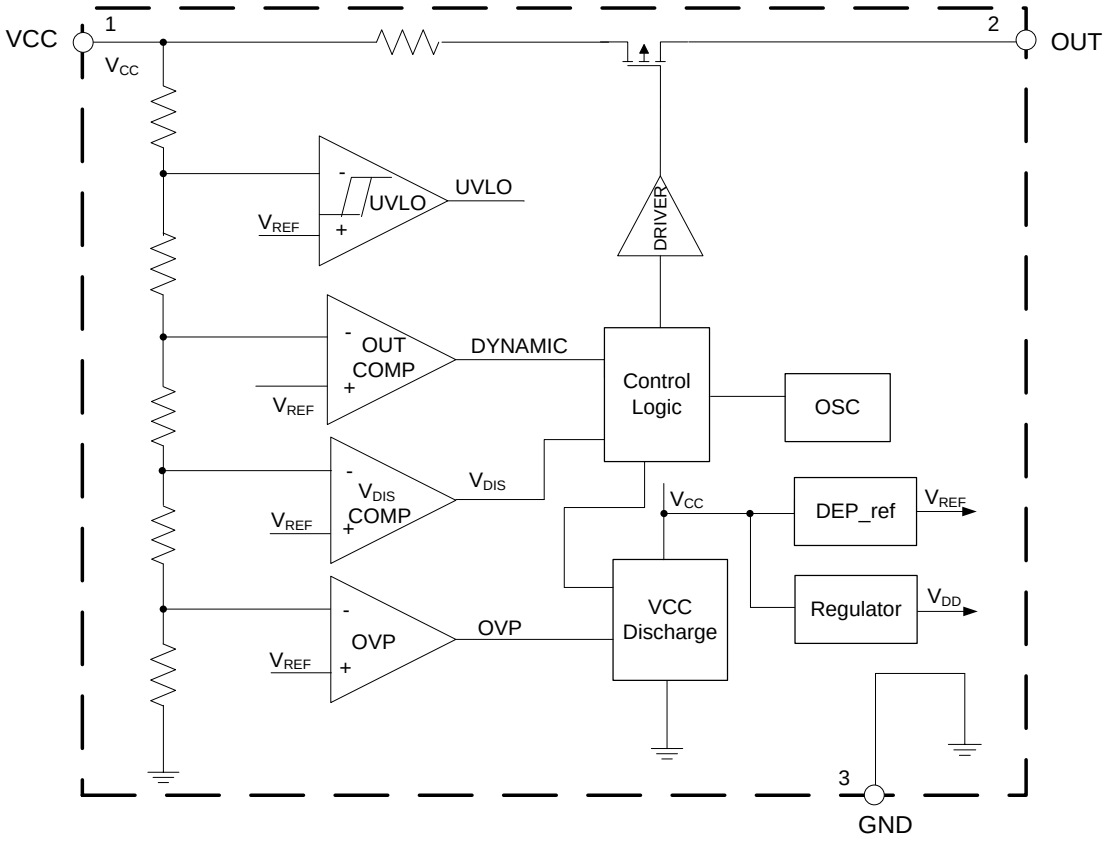
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Pin Descriptions

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

Functional Block Diagram



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Absolute Maximum Ratings (Note 4)

Parameter	Rating	Unit
Supply Voltage	-0.3 to 9	V
Voltage at OUT	-40 to 7	V
Voltage from VCC to OUT	-7 to 49	V
Output Current at OUT	Internally limited	A
Power Dissipation at T_A=+25ºC	1.4	W
Operating Junction Temperature	+150	ºC
Storage Temperature	-65 to +150	ºC
Lead Temperature (Soldering, 10 sec)	+300	ºC
Thermal Resistance (Junction to Case)	140	ºC/W
Thermal Resistance (Junction to Ambient)	200	ºC/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	4	5.5	V
T_A	Ambient Temperature Range	-40	+85	°C

Electrical Characteristics (@V_{CC}=5V, T_A=+25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Supply Voltage (VCC Pin)						
V_{ON}	Power-on Voltage	–	2.5	3.1	4.6	V
I_{ST}	Startup Current	V_{CC}=V_{ON}-0.2V	–	5	10	μA
I_{OP}	Operating Current	OUT pin floating, V_{CC}=5V	10	15	20	μA
V_{OFF}	Power-off Voltage	–	2	2.8	4.2	V
V_{TRI}	Internal Trigger Voltage	–	4.65	4.73	4.8	V
Output Section/Oscillator Section						
DUTY	Duty Cycle	V_{CC}=4.5V	5	8.5	12	%
t_{OSC}	Oscillation Period	V_{CC}=4.5V	25	30	35	μs
I_{OUT}	Output Maximum Current	V_{CC}=4.5V	27	34	38	mA
V_{DIS}	Discharge Voltage	–	5.15	5.35	5.55	V
I_{DIS}	Discharge Current	–	1.5	3	4.5	mA
V_{OVP}	Overshoot Voltage for Discharge	–	5.6	5.78	5.95	V
I_{OVP}	Overshoot Current for Discharge	–	120	170	240	mA

Note 5: The system output voltage is 5V.

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Operation Description

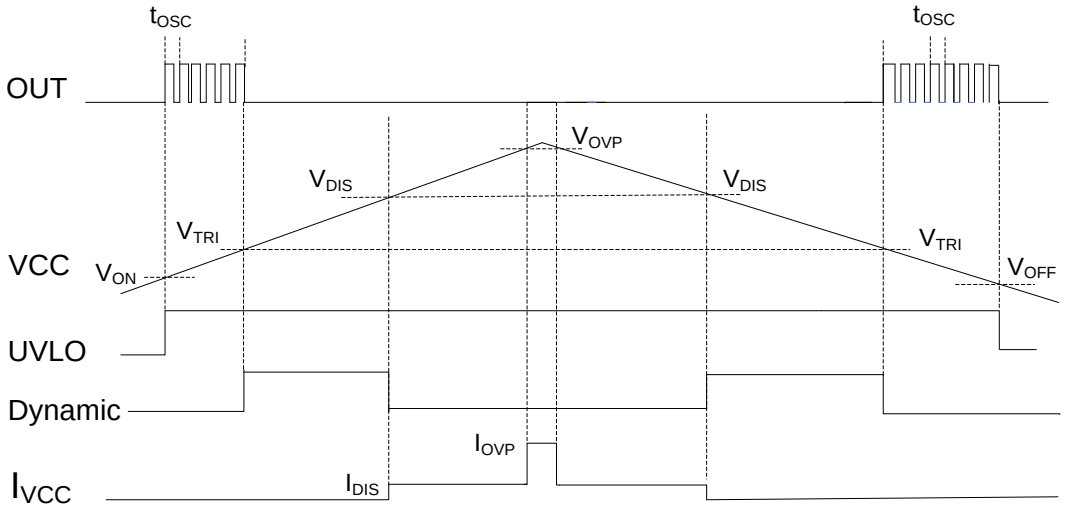


Figure 1. Typical Waveforms of AP4340S

When VCC voltage is beyond power-on voltage (V_{ON}), the AP4340S starts up. The OUT pin asserts a periodical pulse and oscillation period is t_{OSC}. When VCC voltage is lower than trigger voltage (V_{TRI}), the periodical pulse in OUT pin is discontinued. When VCC voltage exceeds 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}), AP4340S 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.

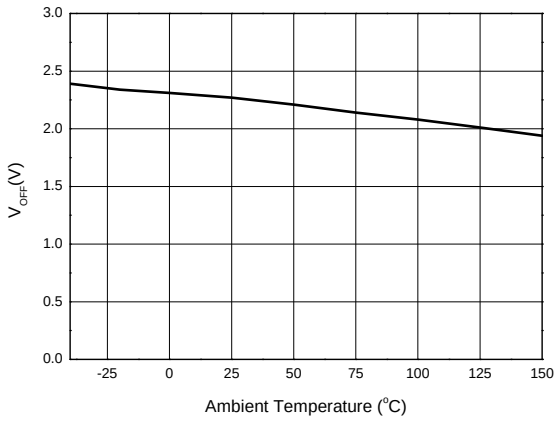
When the VCC voltage is below power-off voltage (V_{OFF}), the AP4340S will be shut down.

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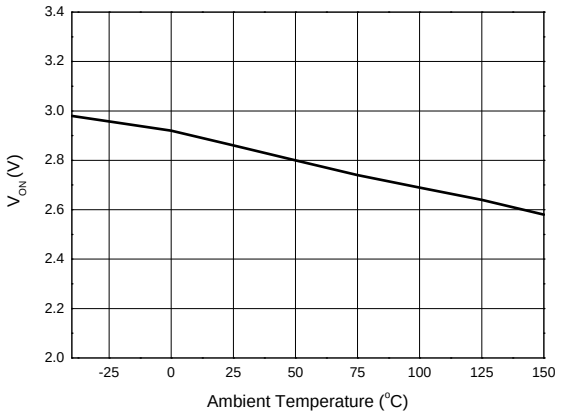
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Performance Characteristics

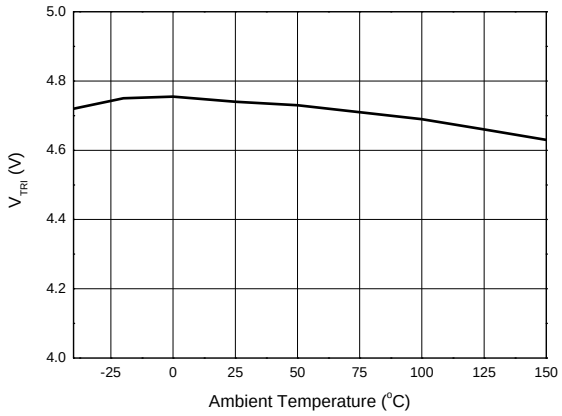
Power-off Voltage vs. Ambient Temperature



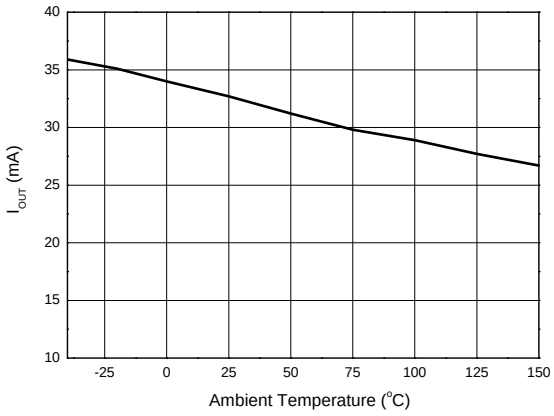
Power-on Voltage vs. Ambient Temperature



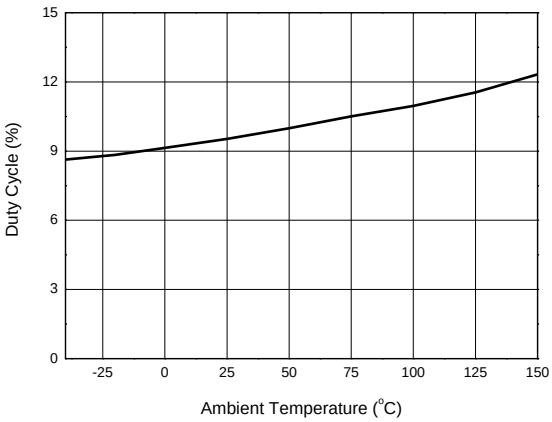
Trigger Voltage vs. Ambient Temperature



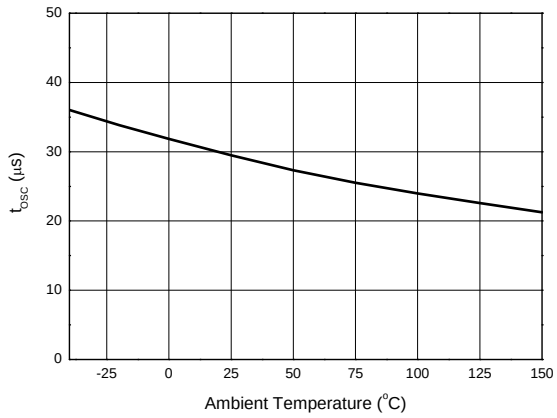
Output Current vs. Ambient Temperature



Duty Cycle vs. Ambient Temperature



Oscillation Period vs. Ambient Temperature

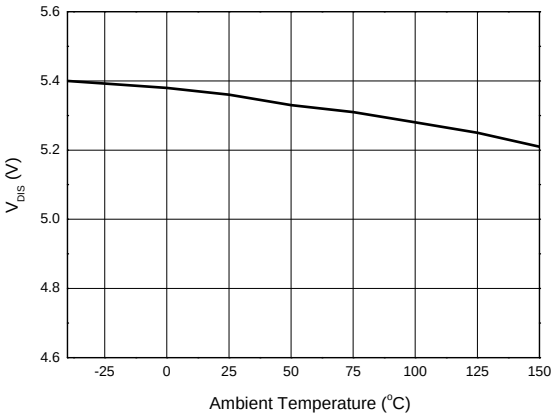


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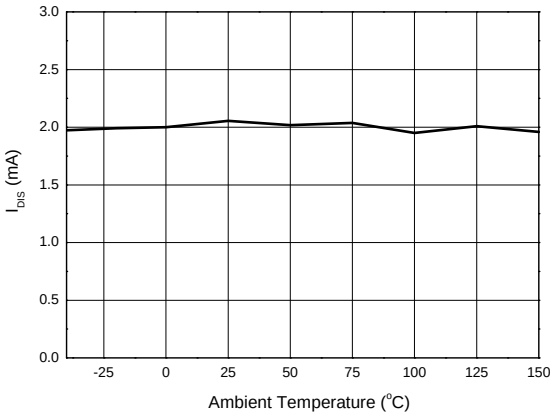
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Performance Characteristics (Cont.)

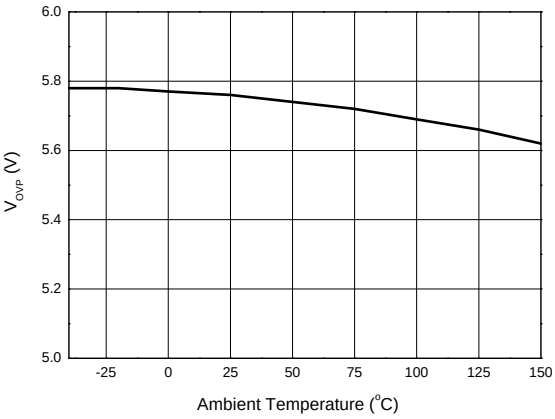
Discharge Voltage vs. Ambient Temperature



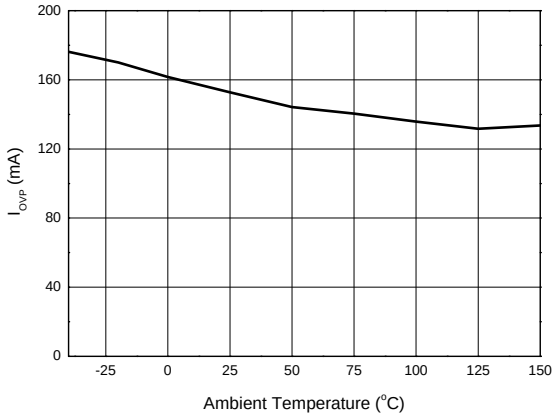
Discharge Current vs. Ambient Temperature



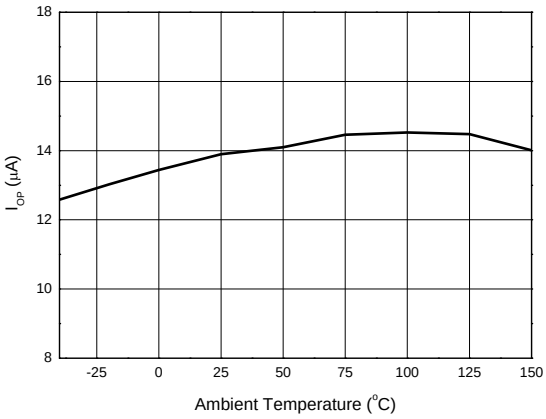
Overshoot Voltage for Discharge vs. Ambient Temperature



Overshoot Current for Discharge vs. Ambient Temperature



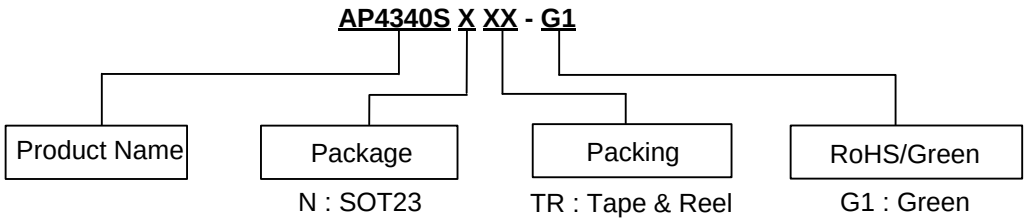
Operating Current vs. Ambient Temperature



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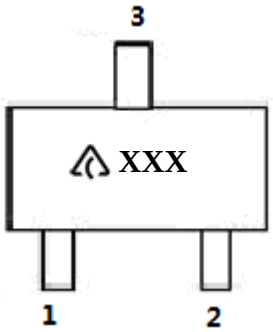
Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing
SOT23	-40 to +150°C	AP4340SNTR-G1	GTA	3000/Tape & Reel

Marking Information

(Top View)



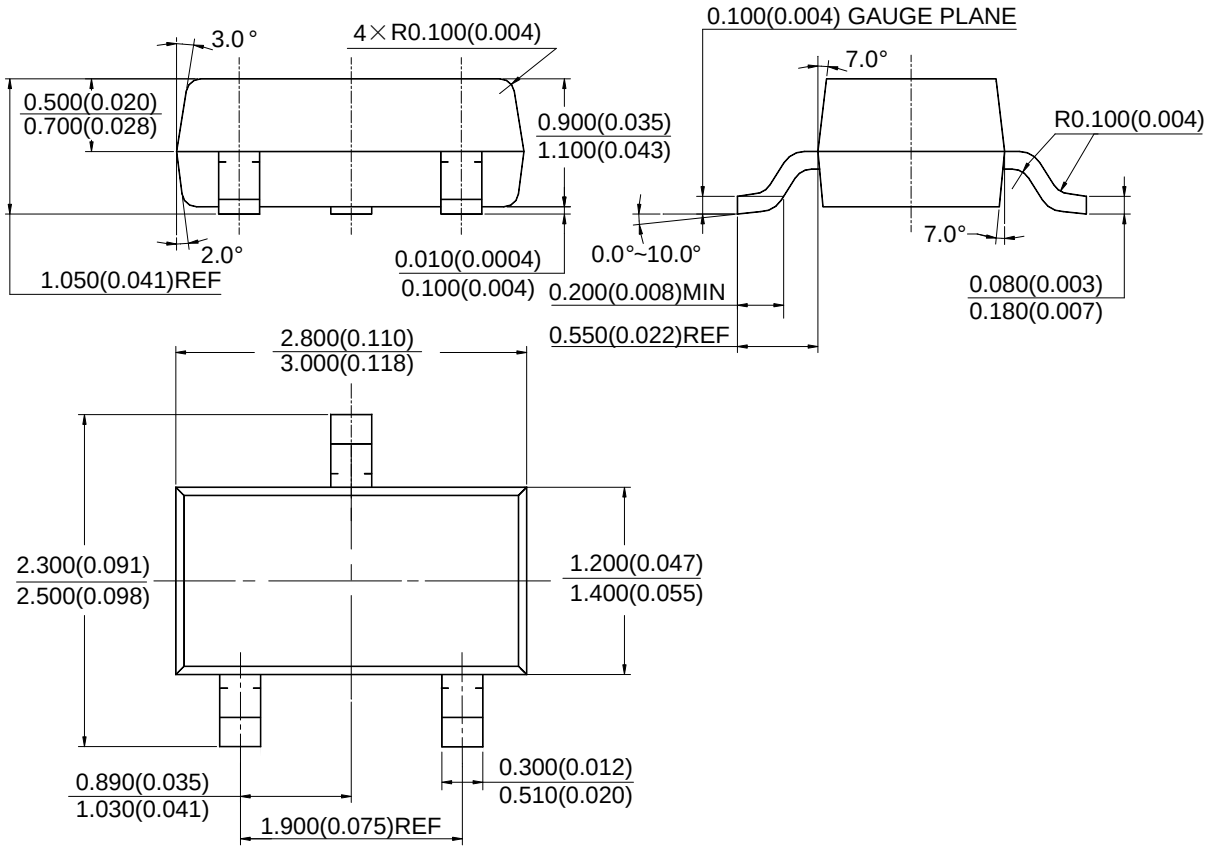
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XXX: Marking ID

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

(1) Package Type: SOT23

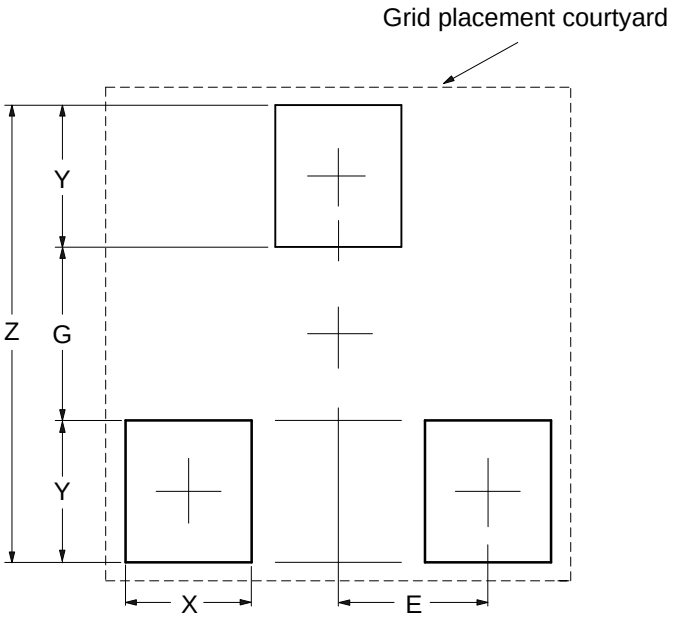


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Suggested Pad Layout

(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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