



Winbond
Bus Termination Regulator
W83310S-R2
W83310G-R2

W83310S-R2/W83310G-R2



W83310S-R2

Data Sheet Revision History

| | PAGES | DATES | VERSION | VERSION ON WEB | MAIN CONTENTS |
|---|-------|---------|---------|----------------|--|
| 1 | N.A. | 03/Mar. | 0.5 | N.A. | All versions before 0.5 are for internal use only |
| 2 | 4 | 03/Jul. | 0.51 | N.A. | Recommend circuit update |
| 3 | All | 05/Jan. | 0.52 | N.A. | Add Pb-free part no:W83310G-R2 |
| 4 | 1,2 | 06/Jan. | 0.53 | N.A. | Add description of supporting cont. 1.8 Amp driving and sinking current. |
| | | | | | |
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LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Winbond customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Winbond for any damages resulting from such improper use or sales.

W83310S-R2/W83310G-R2



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W83310S-R2/W83310G-R2



1. GENERAL DESCRIPTION

The W83310S-R2 is a linear regulator which provides achieves peak 2.0 Amp/cont. 1.8 Amp bi-directional sinking and driving capability for DDR SDRAM bus terminator application. The chip simply implement a stable power supply which can track half of input power dynamically for bus terminator with a single chip; that is the chip integrates two power MOSFETs. There is no any external power device needed. The W83310S-R2 is promoted with small footprint 8-SOP 150mil package. With W83301S-R2 design, a high integration, high performance, and cost-effective solution is promoted.

2. FEATURES

- Regulates a bi-directional power with driving and sinking capability
- Provides achieve peak 2.0 Amp/cont. 1.8 Amp driving and sinking current
- Power MOSFET integrated
- Low external component count
- Low output voltage offset
- Operates with +3.3V and +2.5V control power
- Small package
- Low cost and easy to use

3. APPLICATIONS

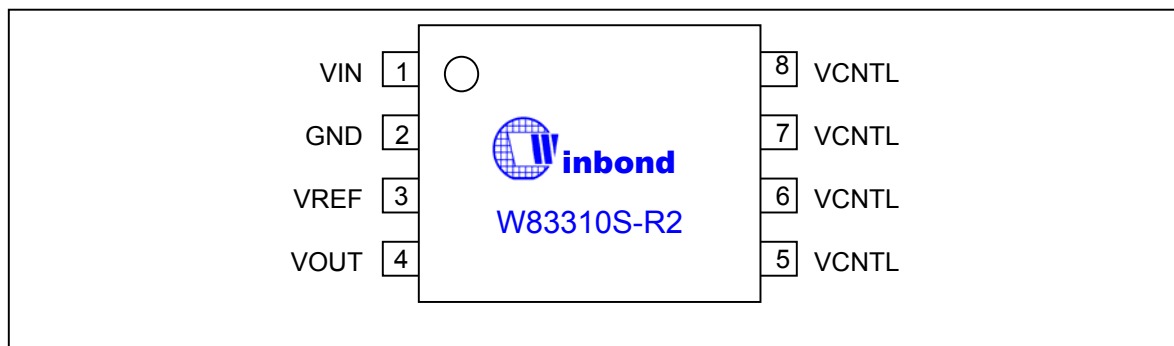
- DDR Bus Termination Regulator
- Active Termination Bus
- SSTL-2
- SSTL-3

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4. PIN CONFIGURATION AND DESCRIPTION

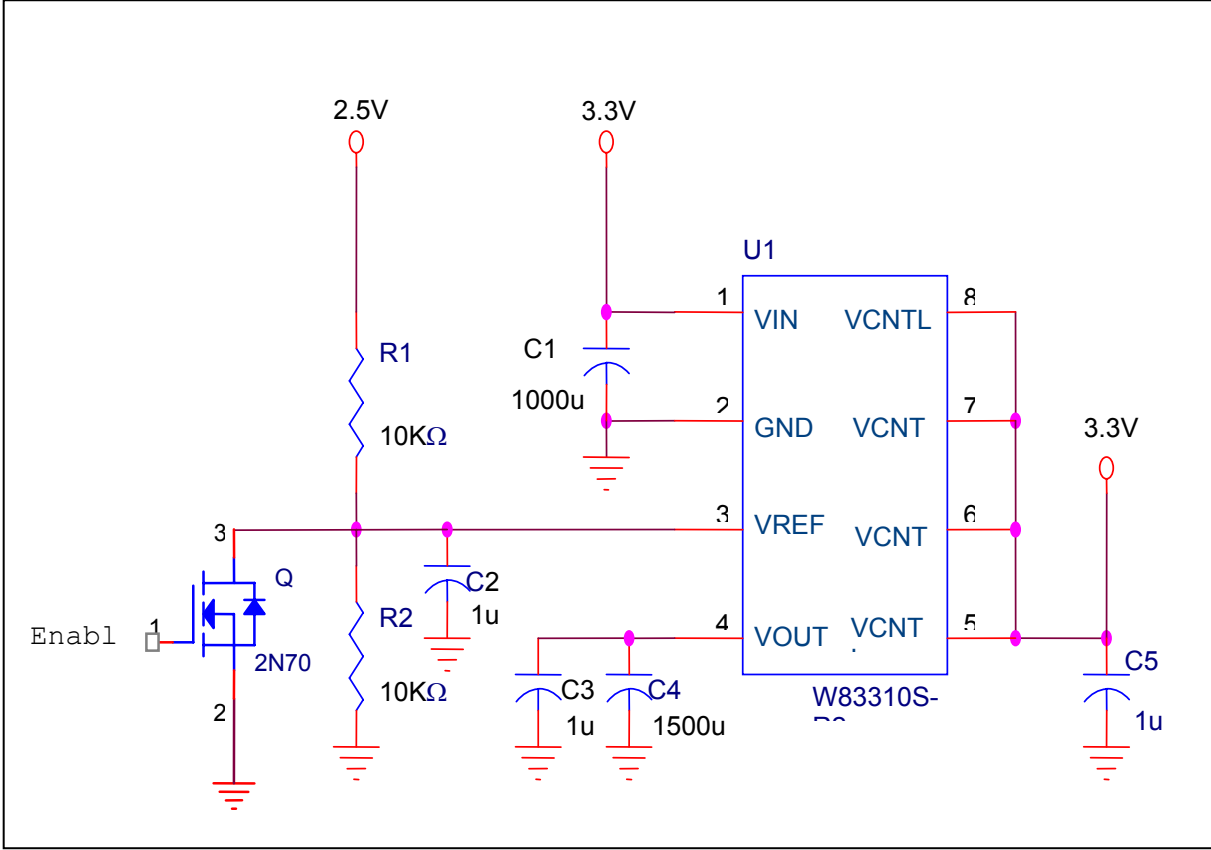
- W83310S-R2



| SYMBOL | PIN | FUNCTION |
|--------|-----|------------------------------------|
| VIN | 1 | Power input pin. |
| GND | 2 | Ground. |
| VREF | 3 | Reference voltage and Chip enable. |
| VOUT | 4 | Output voltage. |
| VCNTL | 5 | Gate drive voltage. |
| VCNTL | 6 | Gate drive voltage. |
| VCNTL | 7 | Gate drive voltage. |
| VCNTL | 8 | Gate drive voltage. |

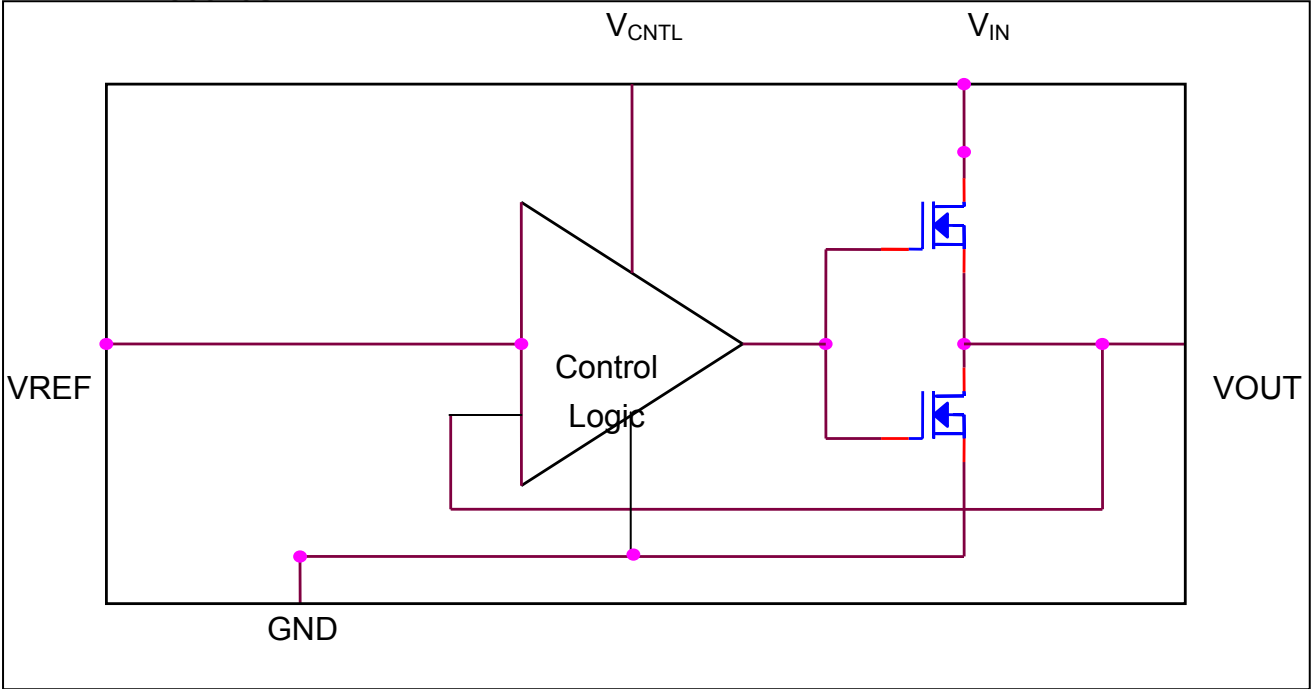


5. APPLICATION CIRCUIT





6. INTERNAL BLOCK DIAGRAM
- W83310S-R2



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7. ELECTRICAL CHARACTERISTICS

7.1 AC CHARACTERISTICS

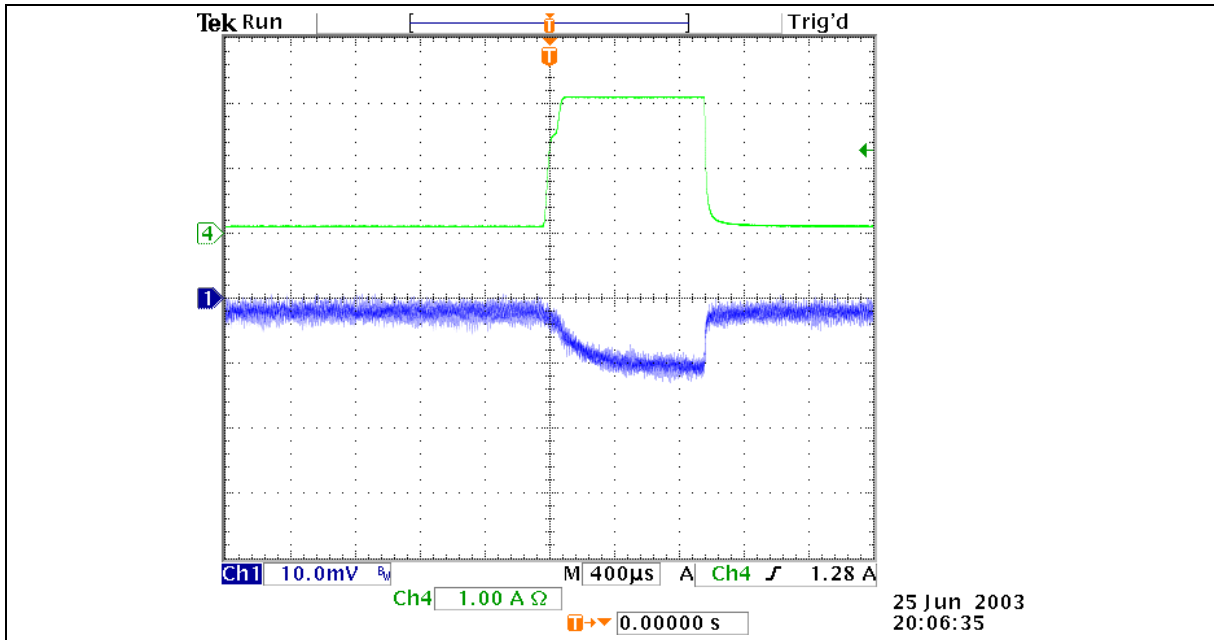
| W83310S-R2 | | | | | | |
|--|-------------------|-----|-----|------|-------|-------------------------------|
| VIN=2.5V,VCNTL=3.3V,VREF=1.25V,Cout=100uF, TA = 0 °C to +70 °C | | | | | | |
| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
| Output Offset Voltage | V _{OS} | -5 | 0 | +5 | mV | I _{OUT} =0A |
| Load Regulation | | | 1.0 | | % | Loading: 0A→2.0A |
| | | | 1.0 | | | Loading: 0A→-2.0A |
| Input Voltage Range | V _{IN} | | 2.5 | 3.63 | V | |
| | V _{CNTL} | | 3.3 | 3.63 | | |
| Operating Current of VCNTL | I _{CNTL} | | 0.5 | 1.0 | mA | No Load(I _{OUT} =0A) |
| Shutdown Threshold Trigger | | 0.8 | | | V | Output=High |
| | | | | 0.2 | V | Output=Low |
| Shutdown Current | I _{SHDN} | | 10 | | uA | VREF<0.2V Loading=0.7A |
| Short Current Limit | I _{LMT} | | 4.0 | | A | |

Note: Load regulation is tested with a 1ms duty pulse current and measuring V_{OUT}.

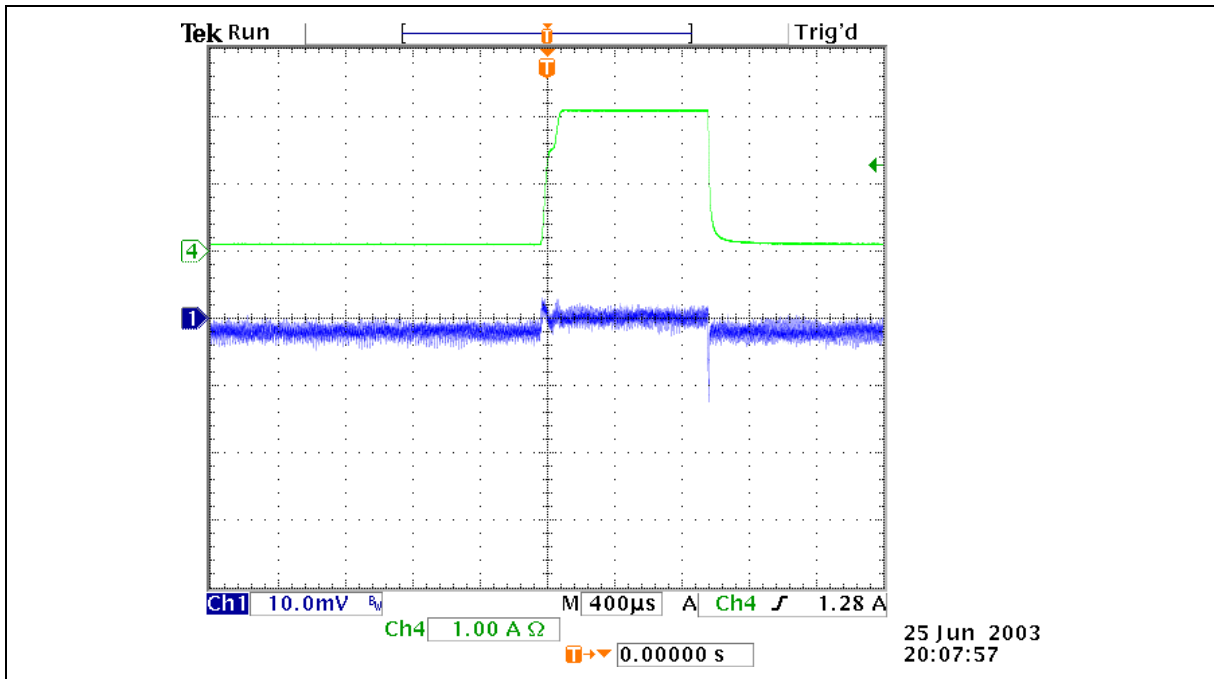


8. TYPICAL OPERATING WAVEFORM

Load regulation with test condition - $V_{CTRL}=3.3V$; $V_{IN}=2.5V$; $V_{OUT}=1.25V$; 2.0Amp 1ms duty pulse driving current. $\Delta V \approx 9mV$.



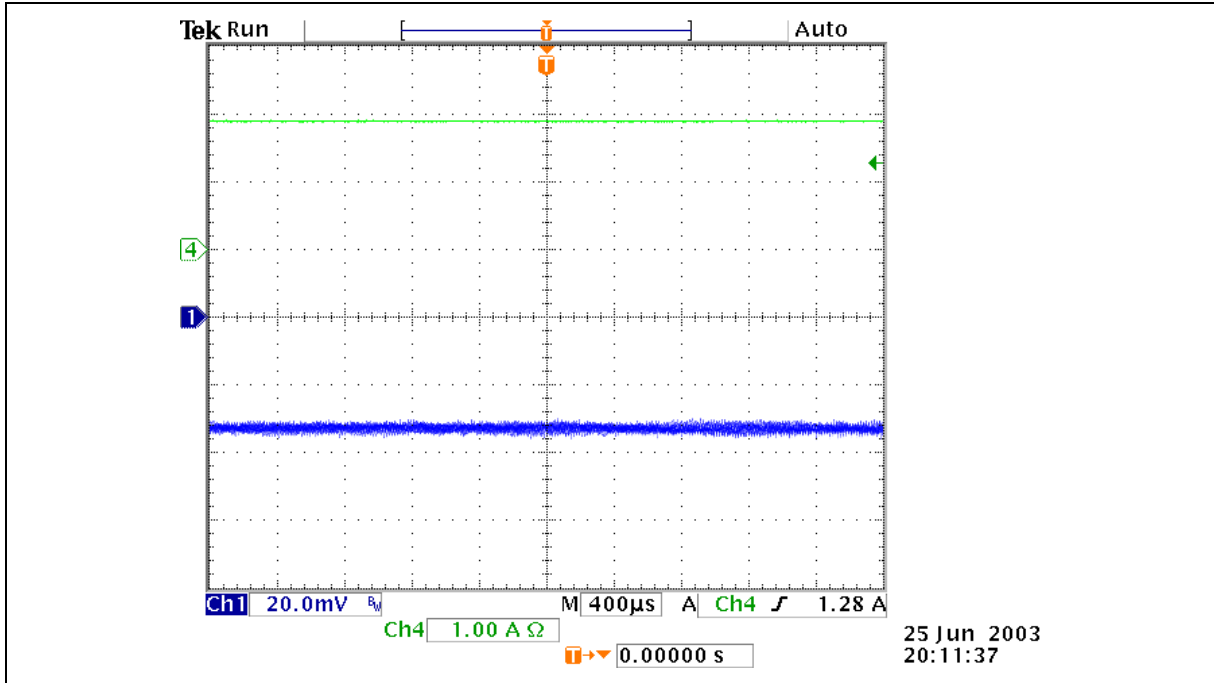
Load regulation with test condition - $V_{CTRL}=3.3V$; $V_{IN}=2.5V$; $V_{OUT}=1.25V$; 2.0Amp 1ms duty pulse sinking current. $\Delta V \approx 4mV$.



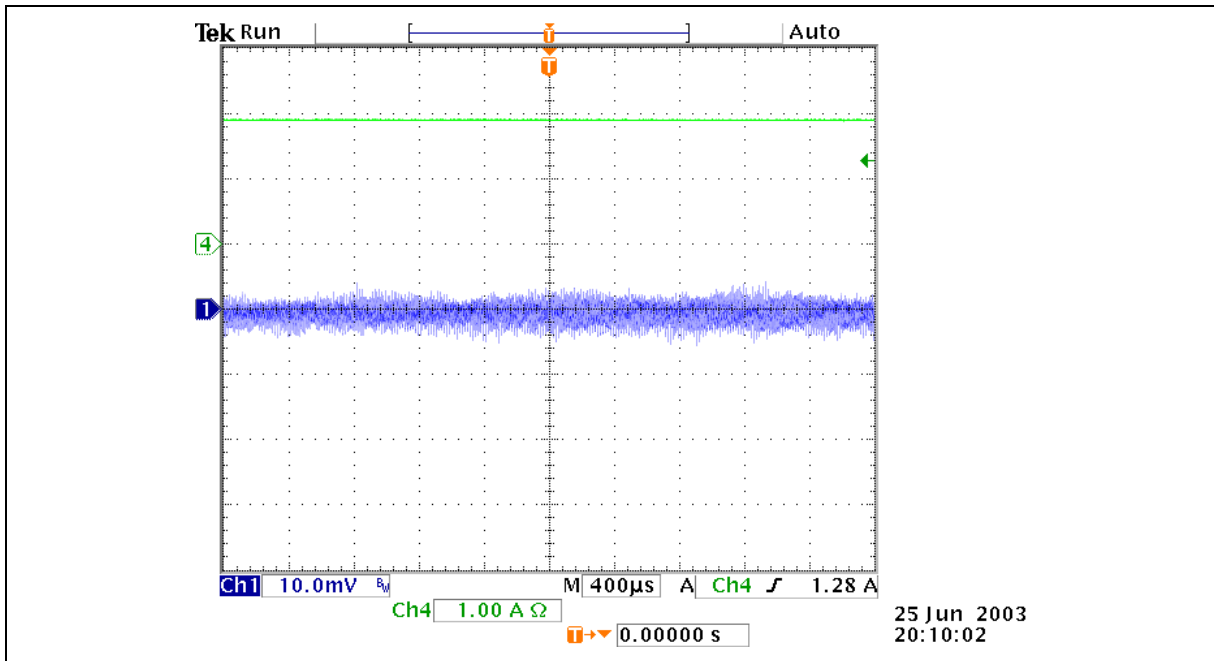
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Load regulation with test condition - $V_{CTRL}=3.3V$; $V_{IN}=2.5V$; $V_{OUT}=1.25V$; 1.8Amp cont. driving current.
 $\Delta V \approx 32mV @ \sim 85^{\circ}C$.



Load regulation with test condition - $V_{CTRL}=3.3V$; $V_{IN}=2.5V$; $V_{OUT}=1.25V$; 1.8Amp cont. sinking current.
 $\Delta V \approx 2mV @ \sim 85^{\circ}C$.

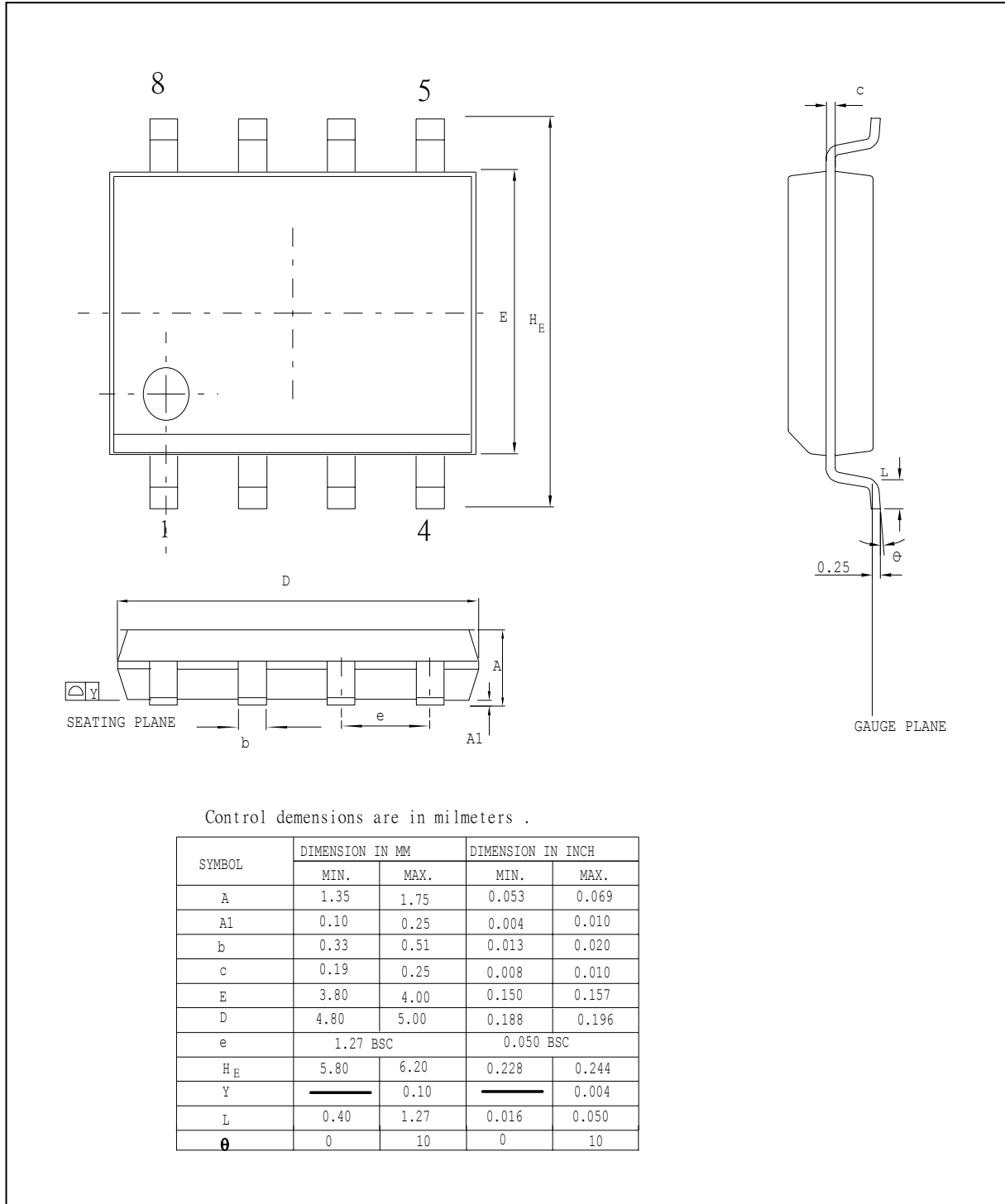


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9. PACKAGE DIMENSION

8L SOP 150mil



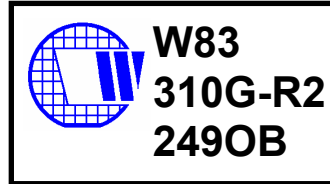
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10. ORDERING INFORMATION

| PART NUMBER | PACKAGE TYPE | PRODUCTION FLOW |
|-------------|----------------------------|--------------------------|
| W83310S-R2 | 8 PIN SOP | Commercial, 0°C to +70°C |
| W83310G-R2 | 8 PIN SOP(Pb-free package) | Commercial, 0°C to +70°C |

11. HOW TO READ THE TOP MARKING



Left line: Winbond logo

1st & 2nd line: W83310S-R2 – the part number , W83310G-R2-the Pb-free part number

3rd line: Tracking code Tracking code 249 O A

249: packages assembled in Year 02', week 49

O: assembly house ID; O means OSE, G means GR, etc.

B: the IC version

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