

## 27 - Line SCSI Terminator With Split Disconnect

### FEATURES

- Complies with SCSI, SCSI-2, SCSI-3, SPI and FAST-20 (Ultra) Standards
- 2.5pF Channel Capacitance During Disconnect
- 100 $\mu$ A Supply Current in Disconnect Mode
- 4V To 7V Operation
- 110 $\Omega$  Termination
- Completely Meets SCSI Hot Plugging
- -900mA Sourcing Current for Termination
- +500mA Sinking Current for Active Negation
- Logic Command Disconnects all Termination Lines
- Split Disconnect Controls Lines 1 to 9 and 10 to 27 Separately
- Trimmed Impedance to 5%
- Current Limit and Thermal Shutdown Protection

### DESCRIPTION

The UCC5622 provides 27 lines of active termination for a SCSI (Small Computer Systems Interface) parallel bus. The SCSI standard recommends active termination at both ends of the cable.

The UCC5622 is ideal for high performance 5V SCSI systems. During disconnect the supply current is typically only 100 $\mu$ A, which makes the IC attractive for lower powered systems.

The UCC5622 features a split disconnect allowing the user to control termination lines 10 to 27 with disconnect one, DISCNCT1, and control termination lines 1 to 9 with disconnect two, DISCNCT2.

The UCC5622 is designed with a low channel capacitance of 2.5pF, which eliminates effects on signal integrity from disconnected terminators at interim points on the bus.

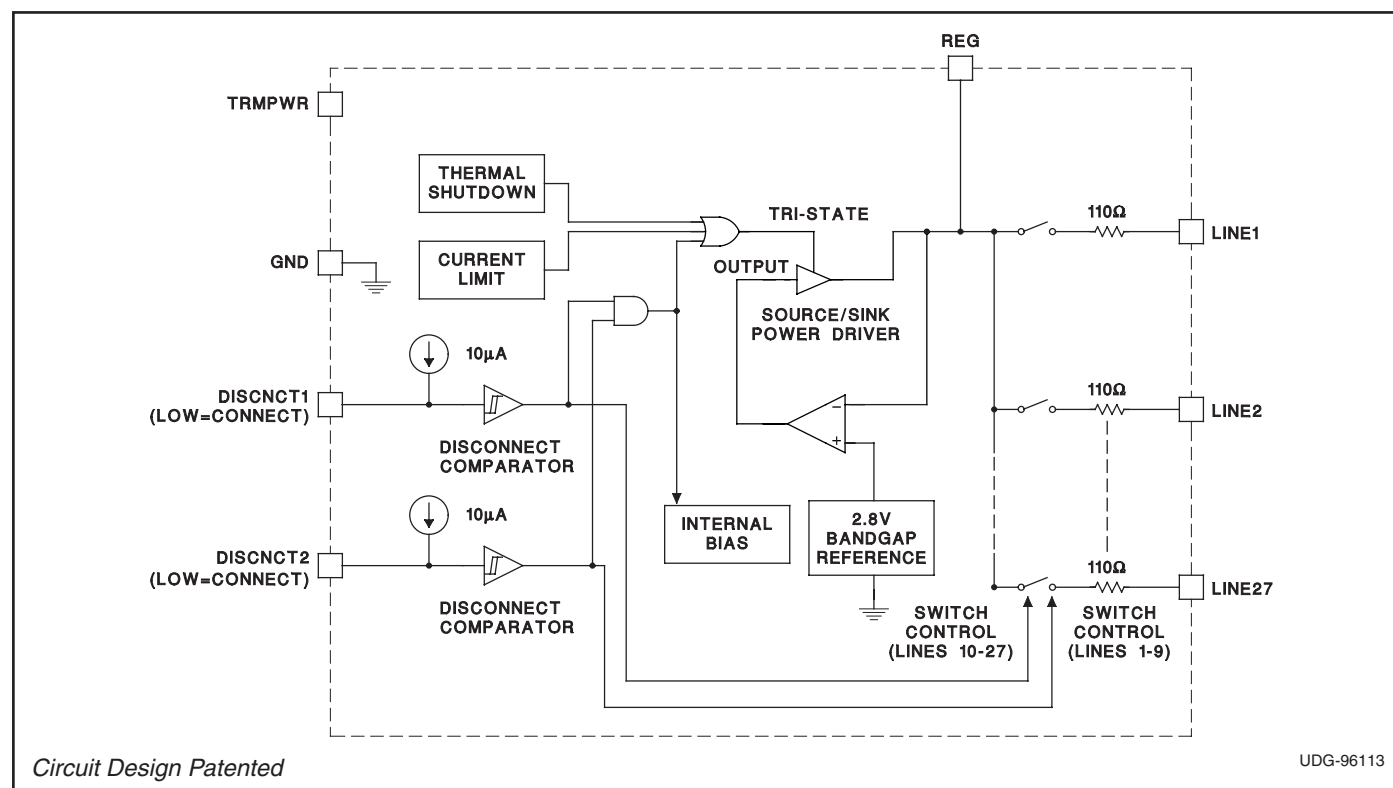
The power amplifier output stage allows the UCC5622 to source full termination current and sink active negation current when all termination lines are actively negated.

The UCC5622, as with all Unitrode terminators, is completely hot pluggable and appears as high impedance at the terminating channels with  $V_{TRMPWR} = 0V$  or open.

Internal circuit trimming is utilized, first to trim the 110 $\Omega$  impedance, and then most importantly, to trim the output current as close to the maximum SCSI-3 specification as possible, which maximizes noise margin in FAST-20 SCSI operation.

(continued)

### BLOCK DIAGRAM



Circuit Design Patented

UDG-96113

**DESCRIPTION (cont.)**

Other features include thermal shutdown and current limit. This device is offered in low thermal resistance versions of the industry standard 44 pin wide body QSOP (MWP). Consult QSOP-44 Packaging Diagram for exact dimensions.

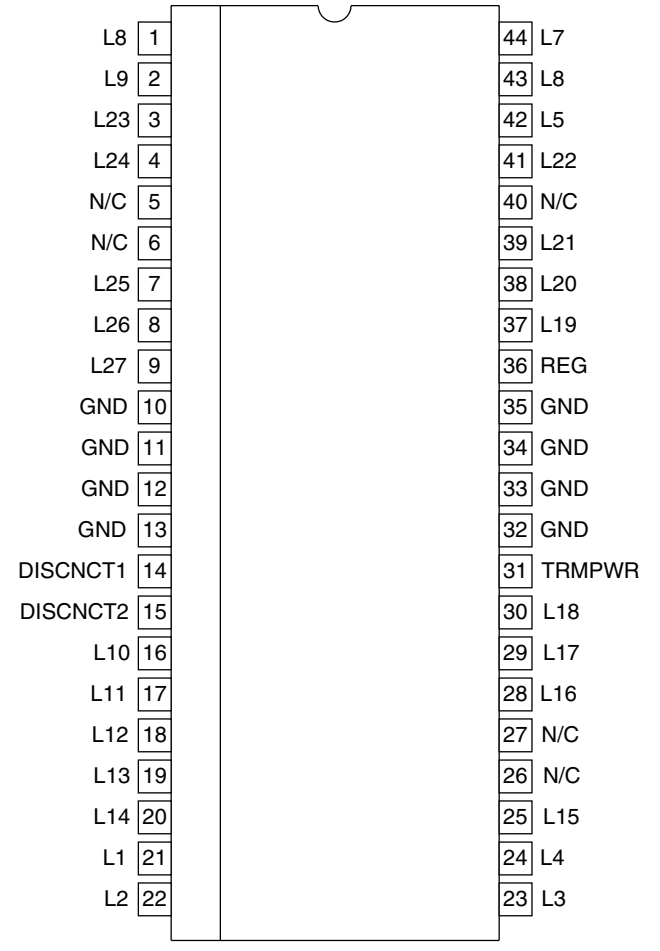
**ABSOLUTE MAXIMUM RATINGS**

TRMPWR Voltage . . . . . +7V  
 Signal Line Voltage . . . . . 0V to +7V  
 Regulator Output Current . . . . . 1.5A  
 Storage Temperature . . . . . -65°C to +150°C  
 Junction Temperature . . . . . -55°C to +150°C  
 Lead Temperature (Soldering, 10 Sec.) . . . . . +300°C

*Currents are positive into, negative out of the specified terminal. Consult Packaging Section of Databook for thermal limitations and considerations of packages.*

**CONNECTION DIAGRAM**

**QSOP-44 (Top View)  
MWP Package**



**ELECTRICAL CHARACTERISTICS** Unless otherwise stated, these specifications apply for  $T_A = 0^\circ\text{C}$  to  $70^\circ\text{C}$ , TRMPWR = 4.75V, DISCNCT1 = DISCNCT2 = 0V,  $T_A = T_J$ .

| PARAMETER                                 | TEST CONDITIONS  | MIN   | TYP   | MAX   | UNITS         |
|---|--|-------|-------|-------|---------------|
| <b>Supply Current Section</b>             |  |       |       |       |               |
| TRMPWR Supply Current                     | All Termination Lines = Open   |       | 1     | 2     | mA            |
|   | All Termination Lines = 0.2V   |       | 630   | 650   | mA            |
| Power Down Mode                           | DISCNCT1 = DISCNCT2 = TRMPWR   |       | 100   | 200   | $\mu\text{A}$ |
| <b>Output Section (Termination Lines)</b> |  |       |       |       |               |
| Termination Impedance                     | (Note 3)   | 104.5 | 110   | 115.5 | $\Omega$      |
| Output High Voltage                       | (Note 1)   | 2.6   | 2.8   | 3.0   | V             |
| Max Output Current                        | $V_{\text{LINE}} = 0.2\text{V}$ , $T_J = 25^\circ\text{C}$                       | -22.1 | -23.3 | -24   | mA            |
|   | $V_{\text{LINE}} = 0.2\text{V}$  | -20.7 | -23.3 | -24   | mA            |
|   | $V_{\text{LINE}} = 0.2\text{V}$ , TRMPWR = 4V, $T_J = 25^\circ\text{C}$ (Note 1) | -21   | -23   | -24   | mA            |
|   | $V_{\text{LINE}} = 0.2\text{V}$ , TRMPWR = 4V (Note 1)                           | -20   | -23   | -24   | mA            |
|   | $V_{\text{LINE}} = 0.5\text{V}$  |       |       | -22.4 | mA            |
| Output Leakage                            | DISCNCT1 = DISCNCT2 = 2.4V, TRMPWR = 0V to 5.25V                                 |       | 10    | 400   | nA            |
| Output Capacitance                        | DISCNCT1 = DISCNCT2 = 2.4V (Note 2)  |       | 2.5   | 4     | pF            |

**ELECTRICAL CHARACTERISTICS** Unless otherwise stated, these specifications apply for  $T_A = 0^\circ\text{C}$  to  $70^\circ\text{C}$ ,  $\text{TRMPWR} = 4.75\text{V}$ ,  $\text{DISCNCT1} = \text{DSCNCT2} = 0\text{V}$ ,  $T_A = T_J$ .

| PARAMETER                     | TEST CONDITIONS                | MIN  | TYP  | MAX   | UNITS            |
|-------------------------------|--------------------------------|------|------|-------|------------------|
| <b>Regulator Section</b>      |                                |      |      |       |                  |
| Regulator Output Voltage      |                                | 2.6  | 2.8  | 3.0   | V                |
| Drop Out Voltage              | All Termination Lines = 0.2V   |      | 0.4  | 0.8   | V                |
| Short Circuit Current         | $V_{\text{REG}} = 0\text{V}$   | -650 | -900 | -1300 | mA               |
| Sinking Current Capability    | $V_{\text{REG}} = 3.5\text{V}$ | 300  | 500  | 900   | mA               |
| Thermal Shutdown              |                                |      | 170  |       | $^\circ\text{C}$ |
| Thermal Shutdown Hysteresis   |                                |      | 10   |       | $^\circ\text{C}$ |
| <b>Disconnect Section</b>     |                                |      |      |       |                  |
| Disconnect Threshold DISCNCT1 | Controls Lines 10 to 27        | 0.8  | 1.5  | 2.0   | V                |
| Input Current DISCNCT1        | $\text{DISCNCT1} = 0\text{V}$  |      | -10  | -30   | $\mu\text{A}$    |
| Disconnect Threshold DISCNCT2 | Controls Lines 1 to 9          | 0.8  | 1.5  | 2     | V                |
| Input Current DISCNCT2        | $\text{DISCNCT2} = 0\text{V}$  |      | -10  | -30   | $\mu\text{A}$    |

Note 1: Measuring each termination line while other 26 are low (0.2V).

Note 2: Ensured by design. Not 100% tested in production.

Note 3: Tested by measuring  $I_{\text{OUT}}$  with  $V_{\text{OUT}} = 0.2\text{V}$  and  $V_{\text{OUT}}$  with no load, then calculate:

$$Z = \frac{V_{\text{OUT N.L.}} - 0.2\text{V}}{I_{\text{OUT at 2.0V}}}$$

## PIN DESCRIPTIONS

**DISCNCT1:** Disconnect one controls termination lines 10 – 27. Taking this pin high or leaving it open causes termination lines 10 - 27 to become high impedance, taking this pin low allows the channels to provide normal termination.

**DISCNCT2:** Disconnect two controls termination lines 1 – 9. Taking this pin high or leaving it open causes termination lines 1 - 9 to become high impedance. Taking this pin low allows the channels to provide normal termination. Taking both disconnect pins high or leaving

them open will put the chip in to sleep mode where it will be in low-power mode.

**GND:** Ground reference for the IC.

**L1 – L27:** 110 $\Omega$  termination channels.

**REG:** Output of the internal 2.7V regulator.

**TRMPWR:** Power for the IC.

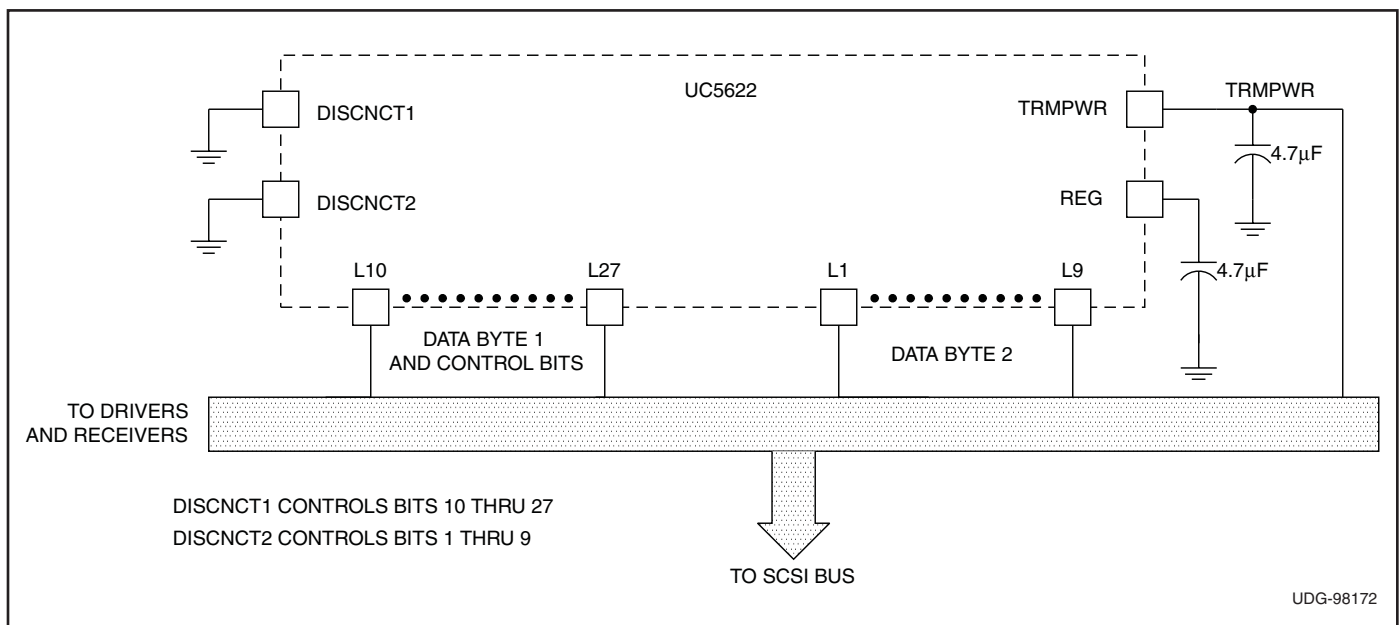


Figure 1. Typical Wide SCSI Bus Configuration Using the UCC5622

## PACKAGING INFORMATION

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|---------|
| UCC5622FQP       | OBSOLETE      | LQFP         | PT                 | 48   |                | TBD                        | Call TI          | Call TI              | 0 to 70      |                         |         |
| UCC5622FQPTR     | OBSOLETE      | LQFP         | PT                 | 48   |                | TBD                        | Call TI          | Call TI              | 0 to 70      |                         |         |
| UCC5622MWP       | LIFEBUY       | SSOP         | DCE                | 44   | 20             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | 0 to 70      | UCC5622MWP              |         |
| UCC5622MWPG4     | LIFEBUY       | SSOP         | DCE                | 44   | 20             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | 0 to 70      | UCC5622MWP              |         |

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

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(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

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(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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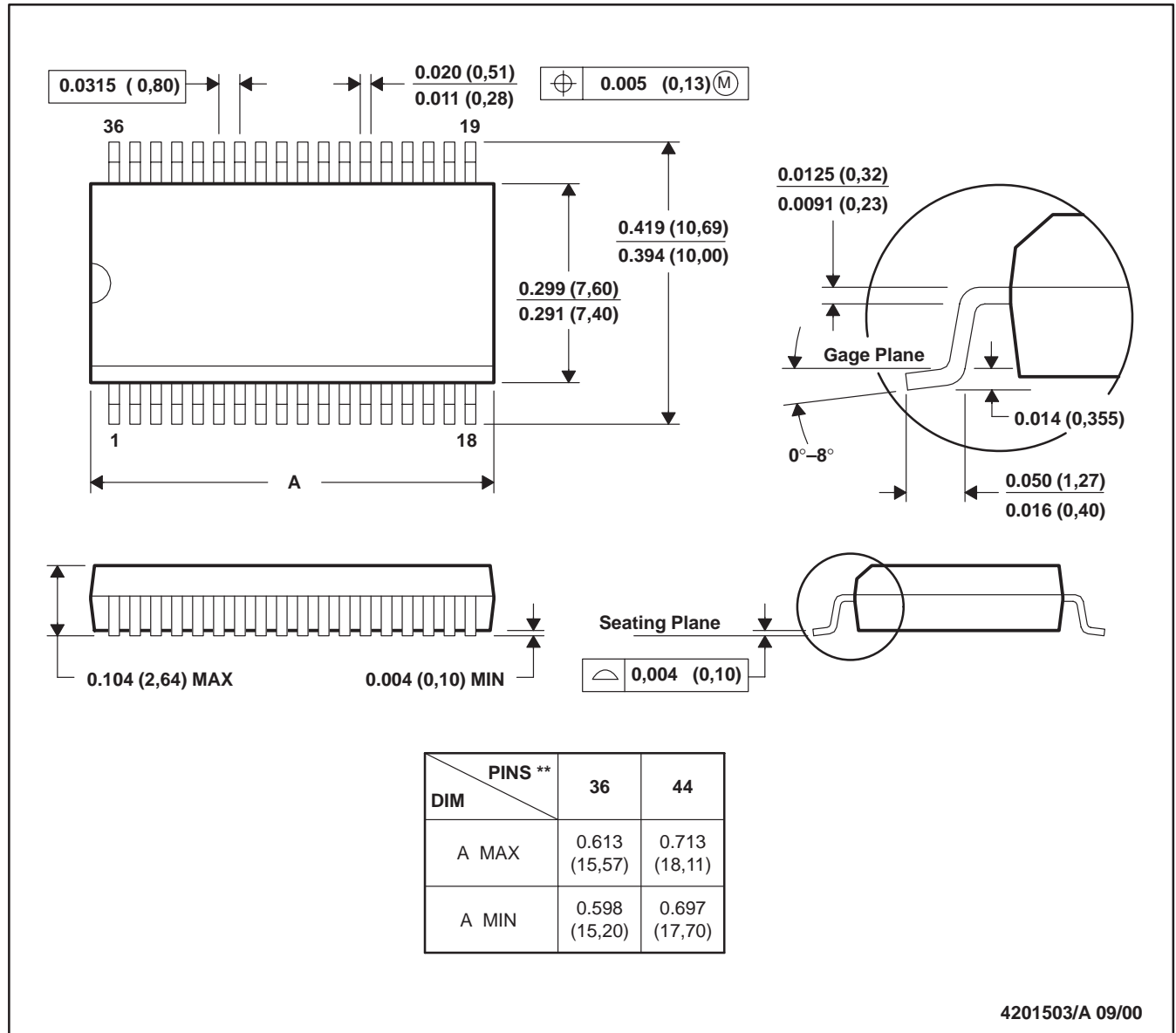
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DCE (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

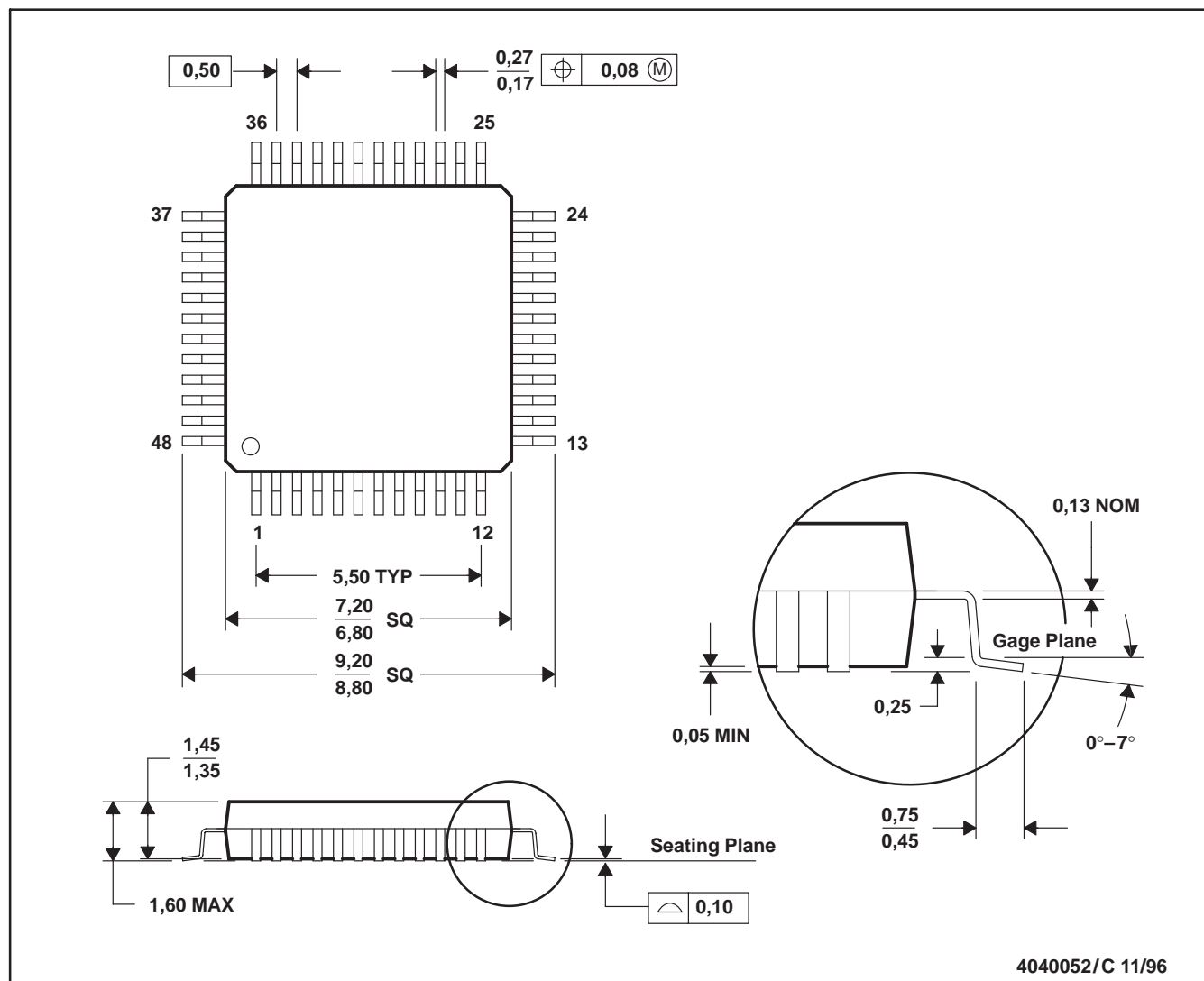
36 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).

## PT (S-PQFP-G48)

## PLASTIC QUAD FLATPACK



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Falls within JEDEC MS-026
  - This may also be a thermally enhanced plastic package with leads connected to the die pads.

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