

P3P2043B

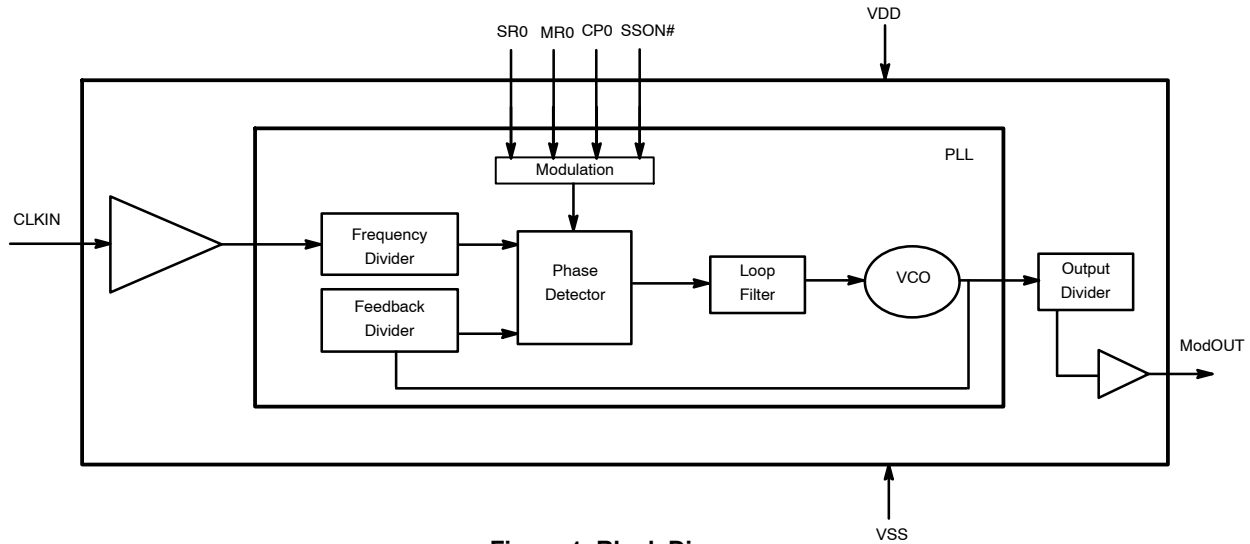


Figure 1. Block Diagram

Table 1. PIN DESCRIPTION

| Pin# | Pin Name | Type | Description |
|------|----------|--------|--|
| 1 | CLKIN | Input | External reference frequency input. Connect to externally generated reference signal. |
| 2 | CP0 | Input | Digital logic input used to select Spreading Range. This pin has an internal pull-up resistor. Refer <i>Modulation Selection Table</i> . |
| 3 | MR | Input | Digital logic input used to select two different Modulation Rate. This pin has an internal pull-up resistor. Refer <i>Modulation Selection Table</i> . |
| 4 | VSS | Power | Ground to entire chip. Connect to system ground. |
| 5 | SSON# | Input | Digital logic input used to enable Spread Spectrum function (Active LOW). Spread Spectrum function enabled when LOW, disabled when HIGH. This pin has an internal pull-low resistor. |
| 6 | ModOUT | Output | Spread spectrum clock output. |
| 7 | SR0 | Input | Digital logic input used to select Spreading Range. This pin has an internal pullup resistor. Refer <i>Modulation Selection Table</i> . |
| 8 | VDD | Power | Power supply for the entire chip |

Table 2. MODULATION SELECTION

| MR | CP0 | SR0 | Spreading Range (\pm %) | | | | | Modulation Rate (kHz) |
|----|-----|-----|----------------------------|--------|--------|--------|---------|-------------------------|
| | | | 32.5 MHz | 54 MHz | 65 MHz | 81 MHz | 108 MHz | |
| 0 | 0 | 0 | 1.47 | 1.19 | 1.08 | 0.96 | 0.88 | $(F_{IN} / 40) * 94.33$ |
| 0 | 0 | 1 | 2.26 | 1.82 | 1.66 | 1.48 | 1.31 | |
| 0 | 1 | 0 | 0.75 | 0.59 | 0.55 | 0.50 | 0.46 | |
| 0 | 1 | 1 | 3.03 | 2.43 | 2.20 | 1.98 | 1.74 | |
| 1 | 0 | 0 | 1.39 | 1.21 | 1.11 | 0.98 | 0.86 | $(F_{IN} / 40) * 62.89$ |
| 1 | 0 | 1 | 2.06 | 1.85 | 1.67 | 1.47 | 1.27 | |
| 1 | 1 | 0 | 0.74 | 0.61 | 0.56 | 0.50 | 0.43 | |
| 1 | 1 | 1 | 2.88 | 2.49 | 2.26 | 2.00 | 1.71 | |

P3P2043B

Spread Spectrum Selection

The *Modulation Selection Table* defines the possible spread spectrum options. The optimal setting should minimize system EMI to the fullest without affecting system performance. The spreading is described as a percentage deviation of the center frequency. (Note: The center frequency is the frequency of the external reference input on CLKIN, pin1).

For example, P3P2043B is designed for high-resolution, flat panel applications and is able to support an XGA (1024 x 768) flat panel operating at 65 MHz (F_{IN}) clock speed. A spreading selection of $CP0 = 0$, $CP1 = 1$ and $SR0 = 0$ provides a percentage deviation of $\pm 1.00\%$ from F_{IN} . This results in the frequency on ModOUT being swept from 65.65 to 64.35 MHz at a modulation rate of 102.19 kHz. *Refer Modulation Selection Table*. The example in the following illustration is a common EMI reduction method for a notebook LCD panel and has already been implemented by most of the leading OEM and mobile graphic accelerator manufacturers.

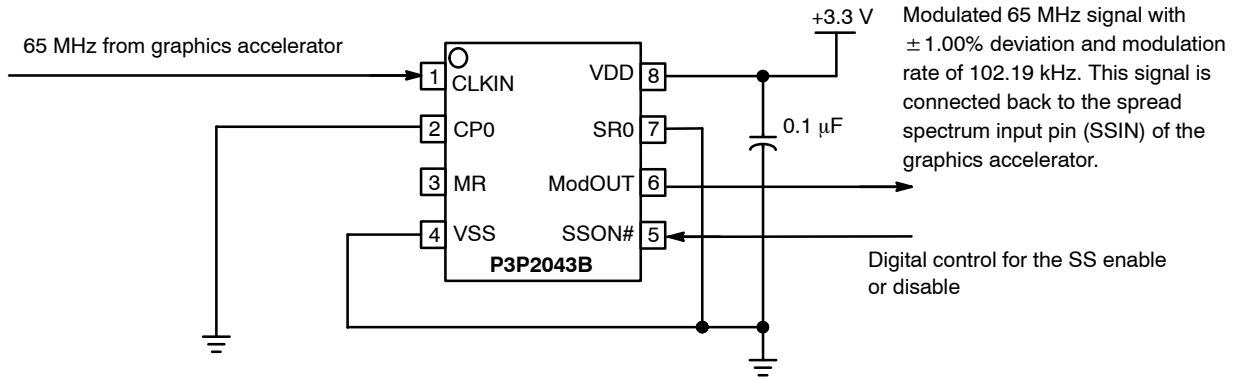


Figure 2. Application Schematic for Mobile LCD Graphics Controllers

Table 3. ABSOLUTE MAXIMUM RATING

| Symbol | Parameter | Rating | Unit |
|---------------------|--|--------------|------|
| V_{DD} , V_{IN} | Voltage on any input pin with respect to Ground | -0.5 to +4.6 | V |
| T_{STG} | Storage temperature | -65 to +125 | °C |
| T_A | Operating temperature | -40 to +85 | °C |
| T_s | Max. Soldering Temperature (10 sec) | 260 | °C |
| T_J | Junction Temperature | 150 | °C |
| T_{DV} | Static Discharge Voltage (As per JEDEC STD22-A114-B) | 2 | kV |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 4. OPERATING CONDITIONS

| Symbol | Parameter | Min | Typ | Max | Unit |
|---------------|---------------------------------------|-----|-------|-------|------|
| V_{DD} | Supply Voltage with respect to Ground | 3.0 | 3.3 | 3.6 | V |
| T_A | Operating temperature | 0 | | +70 | °C |
| T_J | Junction temperature (0°C to +70°C) | | | 82.39 | °C |
| θ_{JC} | SOIC | | 156.5 | | °C/W |

P3P2043B

Table 5. DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Min | Typ | Max | Unit |
|-----------|--|----------------|-----|----------------|----------|
| V_{IL} | Input low voltage | $V_{SS} - 0.3$ | | 0.8 | V |
| V_{IH} | Input high voltage | 2.0 | | $V_{DD} + 0.3$ | V |
| I_{IL} | Input low current (pullup resistor on inputs CP0, CP1 and SR0) | | | -50 | μA |
| I_{IH} | Input high current (pulldown resistor on input SSON#) | | | 50 | μA |
| V_{OL} | Output low voltage ($I_{OL} = 8\text{ mA}$) | | | 0.4 | V |
| V_{OH} | Output high voltage ($I_{OH} = -8\text{ mA}$) | 2.5 | | | V |
| I_{DD} | Static supply current (CLKIN pulled LOW) | | | 300 | μA |
| I_{CC} | Dynamic supply current (3.3 V and 10 pF loading) | 6 | 15 | 22 | mA |
| V_{DD} | Operating voltage | 3.0 | 3.3 | 3.6 | V |
| t_{ON} | Power-up time (first locked cycle after power up) | | | 3 | ms |
| Z_{OUT} | Clock output impedance | | 35 | | Ω |

Table 6. AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Min | Typ | Max | Unit |
|------------|--|----------------------|-----|-----------|------|
| f_{IN} | Input Clock frequency | 30 | 74 | 110 | MHz |
| f_{OUT} | Output Clock frequency | 30 | 74 | 110 | MHz |
| t_{LH}^* | Output rise time (measured between 20% to 80%) | 1.1 | 1.5 | 2 | ns |
| t_{HL}^* | Output fall time (measured between 80% to 20%) | 0.8 | 1.2 | 1.8 | ns |
| t_{JC} | Jitter (cycle-to-cycle) | < 50 MHz | | ± 250 | ps |
| | | $\geq 50\text{ MHz}$ | | ± 200 | |
| t_D | Output duty cycle | 45 | 50 | 55 | % |

* t_{LH} and t_{HL} are measured into a capacitive load of 10 pF.

ORDERING INFORMATION

| Part Number | Top Marking | Temperature | Package Type | Shipping [†] |
|----------------|-------------|--------------|---------------------|-----------------------|
| P3P2043BG-08SR | CML | 0°C to +70°C | SOIC-8 (Pb-Free) | 2500 / Tape & Reel |

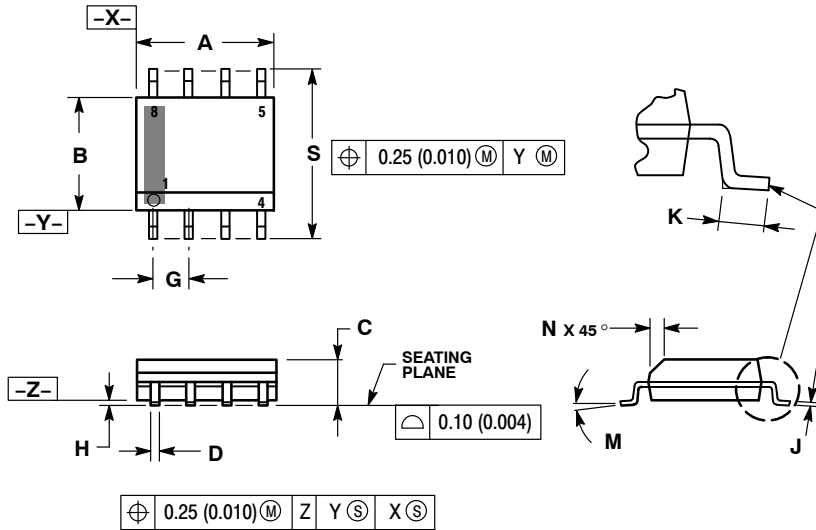
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*A "microdot" placed at the end of last row of marking or just below the last row toward the center of package indicates Pb-Free.

P3P2043B

PACKAGE DIMENSIONS

SOIC-8 NB
CASE 751-07
ISSUE AK

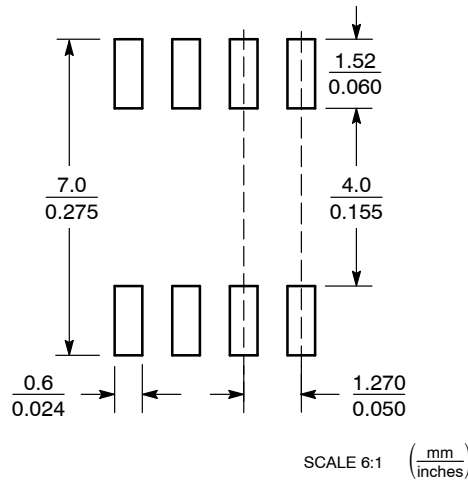


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.197 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.053 | 0.069 |
| D | 0.33 | 0.51 | 0.013 | 0.020 |
| G | 1.27 BSC | | 0.050 BSC | |
| H | 0.10 | 0.25 | 0.004 | 0.010 |
| J | 0.19 | 0.25 | 0.007 | 0.010 |
| K | 0.40 | 1.27 | 0.016 | 0.050 |
| M | 0° | 8° | 0° | 8° |
| N | 0.25 | 0.50 | 0.010 | 0.020 |
| S | 5.80 | 6.20 | 0.228 | 0.244 |

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

P3P2043B/D