# DSC1101/21

## Low-Jitter Precision CMOS Oscillator

### Features

- Low RMS Phase Jitter: <1 ps (typ.)
- High Stability: ±10 ppm, ±20 ppm, ±25 ppm, ±50 ppm
- Wide Temperature Range:
  - Automotive: –55°C to +125°C
  - Ext. Industrial: –40°C to +105°C
  - Industrial: –40°C to +85°C
  - Commercial: –20°C to +70°C
- High Supply Noise Rejection: –50 dBc
- Wide Freq. Range: 2.3 MHz to 170 MHz
- Small Industry Standard Footprints
  - 2.5 mm x 2.0 mm, 3.2 mm x 2.5 mm, 5.0 mm x 3.2 mm, and 7.0 mm x 5.0 mm
- Excellent Shock and Vibration Immunity
  - Qualified to MIL-STD-883
- High Reliability
  - 20x Better MTF than Quartz Oscillators
- Low Current Consumption
- Supply Range of 2.25 to 3.6V
- Standby and Output Enable Function
- Lead-Free and RoHS Compliant

### Applications

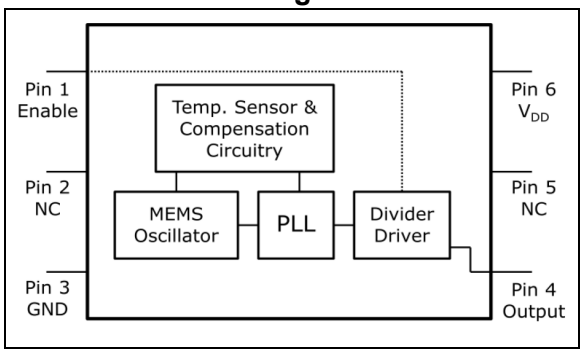
- Storage Area Networks
  - SATA, SAS, Fibre Channel
- Passive Optical Networks
  - EPON, 10G-EPON,V GPON, 10G-PON
- Ethernet
  - 1G, 10GBASE-T/KR/LR/SR, and FCoE
- HD/SD/SDI Video and Surveillance
- PCI Express
- Display Port

### General Description

The DSC1101 and DSC1121 series of high performance oscillators utilize a proven silicon MEMS technology to provide excellent jitter and stability over a wide range of supply voltages and temperatures. By eliminating the need for quartz or SAW technology, MEMS oscillators significantly enhance reliability and accelerate product development, while meeting stringent clock performance criteria for a variety of communications, storage, and networking applications.

DSC1101 has a standby feature that allows it to completely power-down when EN pin is pulled low; whereas for DSC1121, only the outputs are disabled when EN is low. Both oscillators are available in industry standard packages, including the small 2.5 mm x 2.0 mm, and are “drop-in” replacements for standard 4-pin CMOS quartz crystal oscillators.

### Functional Block Diagram



## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings †

Input Voltage, $V_{IN}$ .....–0.3V to $V_{DD}$ + 0.3V
Supply Voltage .....–0.3V to +4.0V
ESD Protection On All Pins .....4000V HBM, 1500V CDM (max.)

**† Notice:** Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability.

**Note:** 1000+ years of data retention on internal memory.

## DC CHARACTERISTICS

| **Electrical Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **Sym.** | **Min.** | **Typ.** | **Max.** | **Units** | **Conditions** |
| Supply Voltage (Note 1) | $V_{DD}$ | 2.25 | — | 3.6 | V | — |
| Supply Current | $I_{DD}$ | — | — | 0.095 | mA | DSC1101, EN pin low, output is disabled |
| | | — | 20 | 22 | | DSC1121, EN pin low, output is disabled |
| | | — | 31 | 35 | | Output enabled, $C_L$ = 15 pF, $F_0$ = 100 MHz |
| Frequency Stability (Including frequency variations due to initial tolerance, temp. and power supply voltage.) | Δf | — | — | ±10 | ppm | Ext Comm. & Ind. only |
| | | | | ±20 | | All temp ranges |
| | | — | — | ±25 | | All temp ranges |
| | | — | — | ±50 | | All temp ranges |
| Aging | Δf | — | — | ±5 | ppm | 1 year @ 25°C |
| Startup Time (Note 2) | $t_{SU}$ | — | — | 5 | ms | T = 25°C |
| Input Logic Levels<br>Input Logic High<br>Input Logic Low | $V_{IH}$ | 0.75×$V_{DD}$ | — | — | V | — |
| | $V_{IL}$ | — | — | 0.25×$V_{DD}$ | | |
| Output Disable Time (Note 3) | $t_{DS}$ | — | — | 5 | ns | — |
| Output Enable Time | $t_{EN}$ | — | — | 5 | ms | DSC1101 |
| | | — | — | 20 | ns | DSC1121 |
| Enable Pull-up Resistor (Note 4) | — | — | 40 | — | kΩ | Pull-up Resistor Exist |
| **CMOS Output** | | | | | | |
| Output Logic Levels<br>Output Logic High<br>Output Logic Low | $V_{OH}$ | 0.9×$V_{DD}$ | — | — | V | I = ±6 mA |
| | $V_{OL}$ | — | — | 0.1×$V_{DD}$ | | |

**Note 1:** Pin 6 $V_{DD}$ should be filtered with 0.1 µF capacitor.
**2:** $t_{SU}$ is time to 100 ppm of output frequency after $V_{DD}$ is applied and outputs are enabled.
**3:** Output Waveform and Test Circuit figures define the parameters.
**4:** Output is enabled if pad is floated or not connected.

## DC CHARACTERISTICS (CONTINUED)

| Electrical Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **Sym.** | **Min.** | **Typ.** | **Max.** | **Units** | **Conditions** |
| Output Transition Time<br>Rise Time<br>Fall Time | $t_R$ | — | 1.1 | 2 | ns | 20% to 80%<br>$C_L$ = 15 pF |
| | $t_F$ | — | 1.3 | 2 | | |
| Frequency | $f_0$ | 2.3 | — | 170 | MHz | $C_L$ = 15 pF, –20°C to +70°C and –40°C to +85°C |
| | | 3.3 | — | 170 | | $C_L$ = 15 pF, –40°C to +105°C and –55°C to +125°C |
| Output Duty Cycle | SYM | 45 | — | 55 | % | — |
| Period Jitter | $J_{PER}$ | — | 3 | — | $ps_{RMS}$ | $F_{OUT}$ = 125 MHz |
| Integrated Phase Noise | $J_{PH}$ | — | 0.3 | — | $ps_{RMS}$ | 200 kHz to 20 MHz @ 125 MHz |
| | | — | 0.38 | — | | 100 kHz to 20 MHz @ 125 MHz |
| | | — | 1.7 | 2 | | 12 kHz to 20 MHz @ 125 MHz |

**Note 1:** Pin 6 $V_{DD}$ should be filtered with 0.1 µF capacitor.

**2:** $t_{SU}$ is time to 100 ppm of output frequency after $V_{DD}$ is applied and outputs are enabled.

**3:** Output Waveform and Test Circuit figures define the parameters.

**4:** Output is enabled if pad is floated or not connected.

## TEMPERATURE SPECIFICATIONS

| Parameters | Sym. | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| **Temperature Ranges (Note 1)** | | | | | | |
| Operating Temperature Range (T) | $T_A$ | –20 | — | +70 | °C | Ordering Option E |
| | $T_A$ | –40 | — | +85 | °C | Ordering Option I |
| | $T_A$ | –40 | — | +105 | °C | Ordering Option L |
| | $T_A$ | –55 | — | +125 | °C | Ordering Option M |
| Junction Operating Temperature | $T_J$ | — | — | +150 | °C | — |
| Storage Temperature Range | $T_S$ | –55 | — | +150 | °C | — |
| Soldering Temperature Range | — | — | — | +260 | °C | 40 sec. max |

**Note 1:** The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction to air (i.e., $T_A$, $T_J$, $\theta_{JA}$). Exceeding the maximum allowable power dissipation will cause the device operating junction temperature to exceed the maximum +125°C rating. Sustained junction temperatures above +125°C can impact the device reliability.

## 2.0 NOMINAL PERFORMANCE CURVES

**Note:** The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only. The performance characteristics listed herein are not tested or guaranteed. In some graphs or tables, the data presented may be outside the specified operating range (e.g., outside specified power supply range) and therefore outside the warranted range.

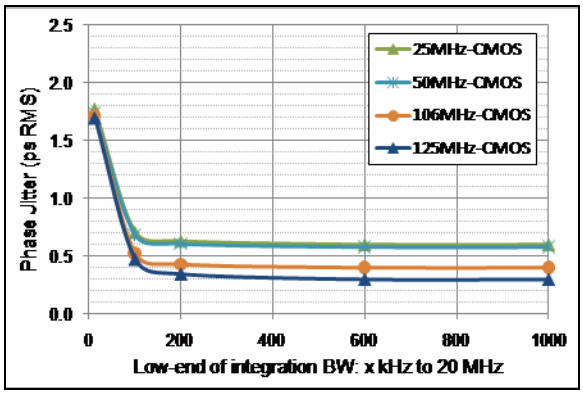



***FIGURE 2-1:*** *Phase Jitter (Integrated Phase Noise).*

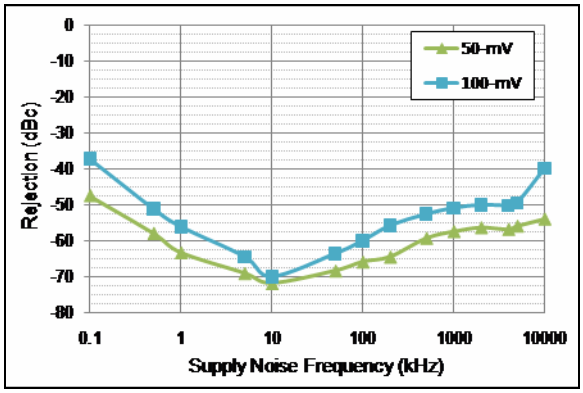



***FIGURE 2-2:*** *Power Supply Rejection Ratio.*

## 3.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 3-1. Pin order and descriptions apply across all package types.

**TABLE 3-1: PIN FUNCTION TABLE**

| Pin Number 7x5 w/ Pad | Pin Number 7x5 w/o Pad | Pin Number 5x3.2 | Pin Number 3.2x2.5 | Pin Number 2x2.5 | Pin Name | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | EN | Enable. |
| 2 | 2 | 2 | 2 | 2 | NC | Do not connect. |
| 3 | 3 | 3 | 3 | 3 | GND | Ground. |
| 4 | 4 | 4 | 4 | 4 | OUT | Output. |
| 5 | 5 | 5 | 5 | 5 | NC | Do not connect. |
| 6 | 6 | 6 | 6 | 6 | $V_{DD}$ | Supply voltage. |
| PAD | — | — | — | — | PAD | Tie to ground. |

**TABLE 3-2: OUTPUT ENABLE MODES**

| EN Pin | DSC1101 | DSC1121 |
|---|---|---|
| High | Output Active | Output Active |
| NC | Output Active | Output Active |
| Low | Standby | Output Disabled |

## 4.0 OUTPUT WAVEFORM

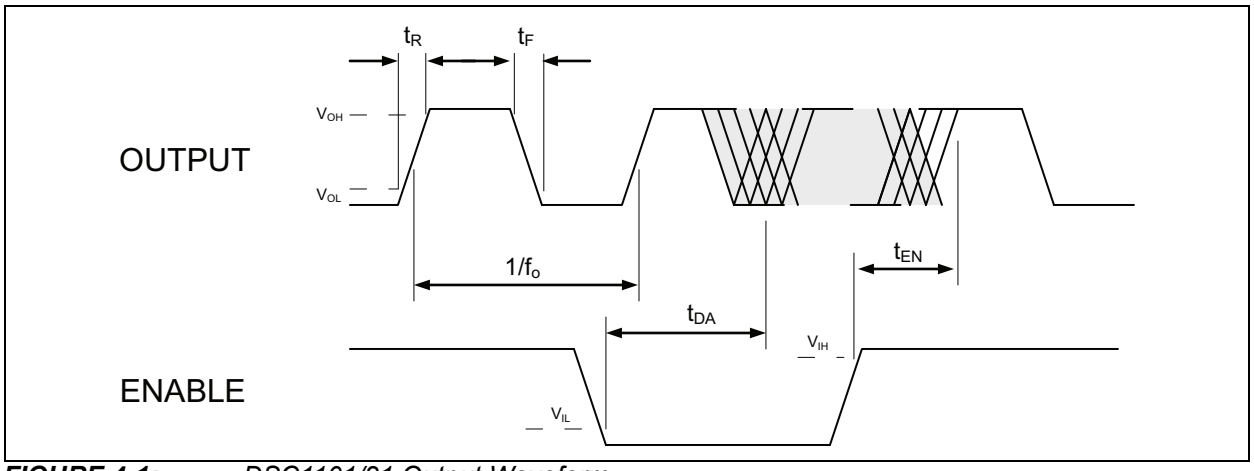



***FIGURE 4-1:*** *DSC1101/21 Output Waveform.*

## 5.0 TYPICAL TERMINATION SCHEME

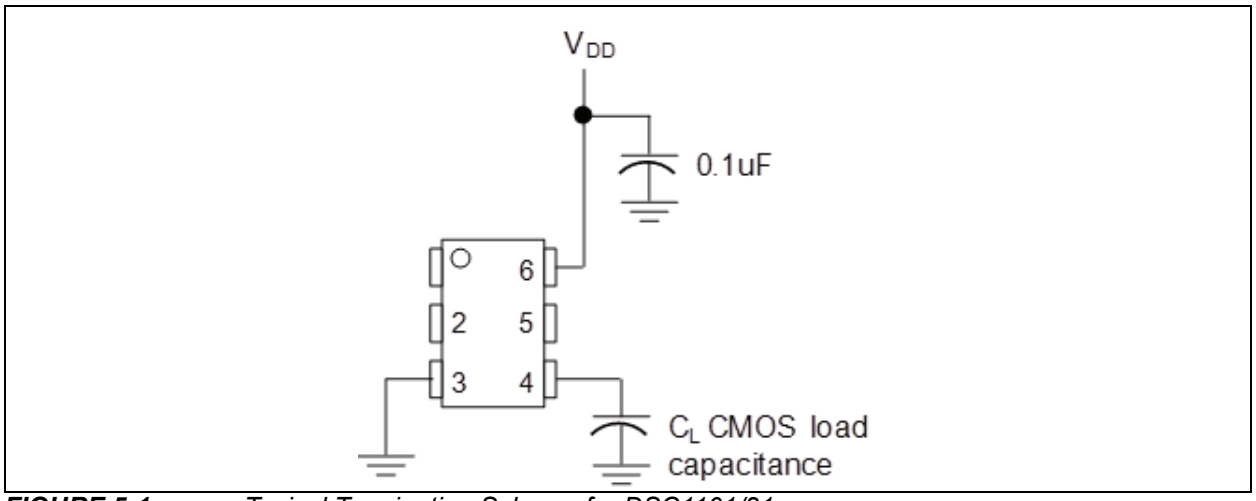



***FIGURE 5-1:*** *Typical Termination Scheme for DSC1101/21.*

## 6.0 BOARD LAYOUT (RECOMMENDED)

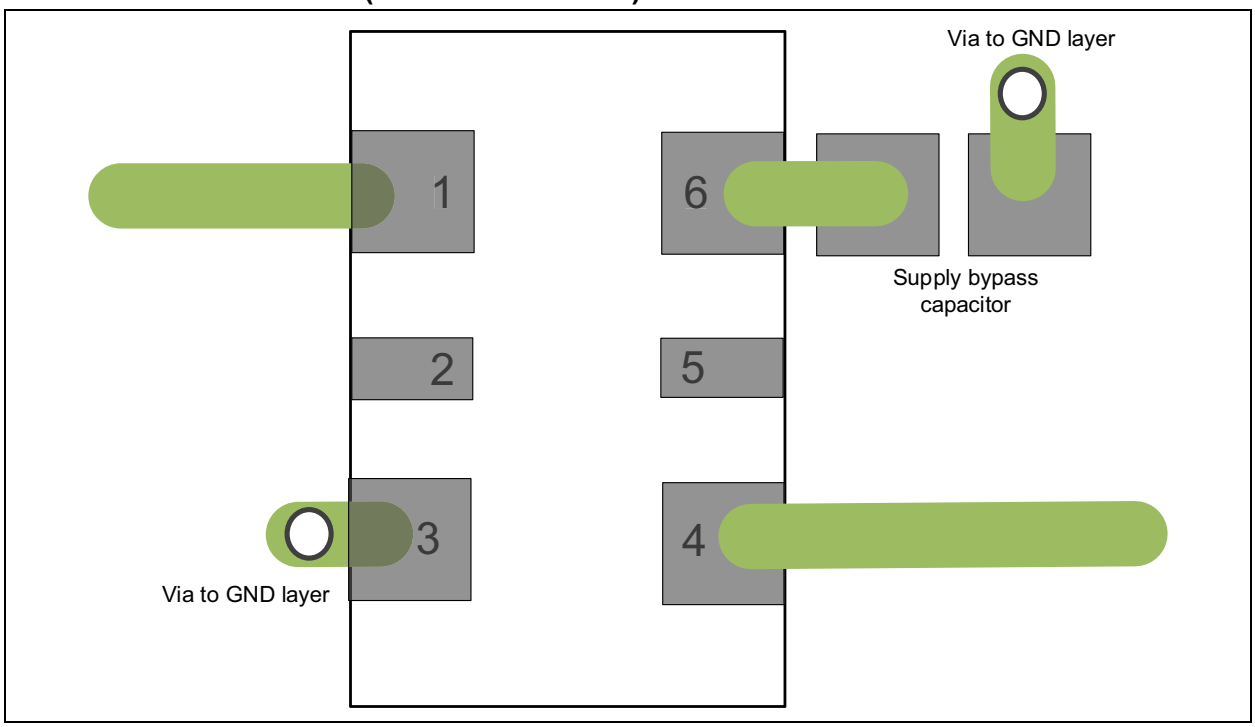
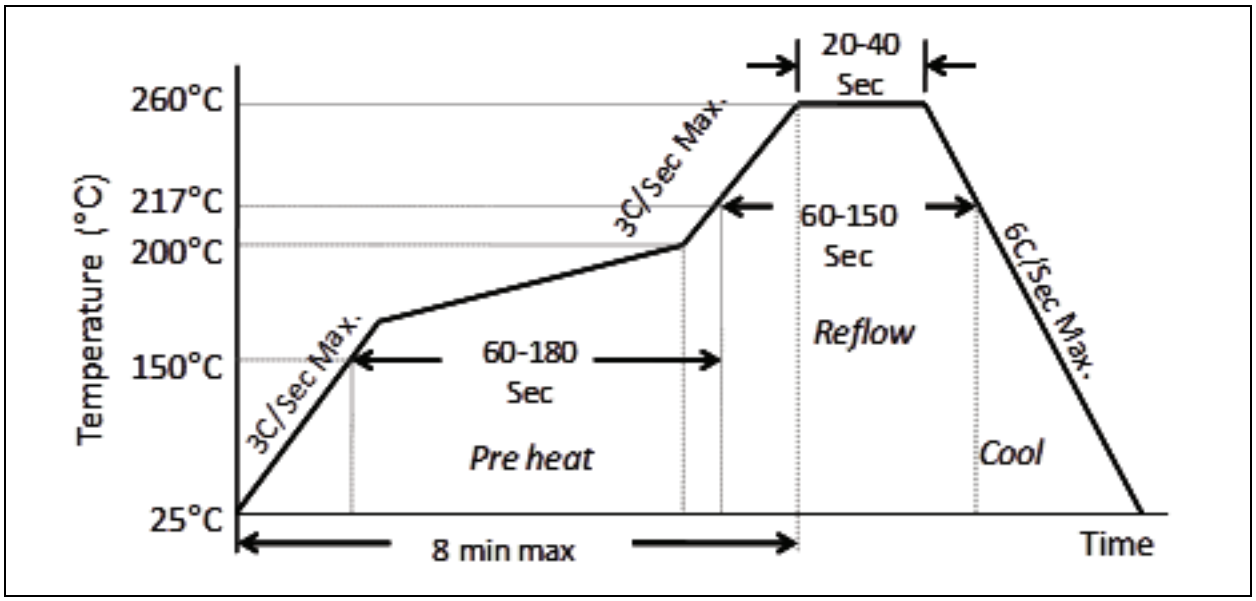



***FIGURE 6-1:*** *DSC1101/21 Recommended Board Layout.*

## 7.0 SOLDER REFLOW PROFILE

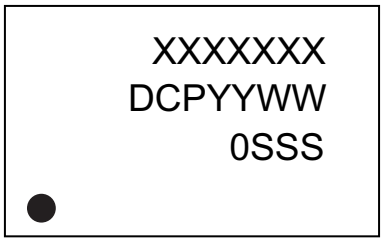



| MSL 1 @ 260°C refer to JSTD-020C | |
|---|---|
| Ramp-Up Rate (200°C to Peak Temp) | 3°C/Sec. Max. |
| Preheat Time 150°C to 200°C | 60-180 Sec. |
| Time Maintained Above 217°C | 60-150 Sec. |
| Peak Temperature | 255-260°C |
| Time within 5°C of Actual Peak | 20-40 Sec. |
| Ramp-Down Rate | 6°C/Sec. Max. |
| Time 25°C to Peak Temperature | 8 minutes Max. |

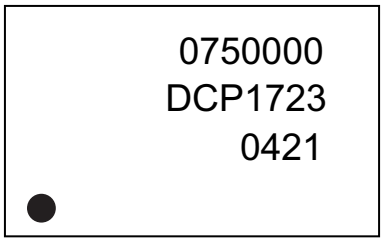
## 8.0 PACKAGING INFORMATION

### 8.1 Package Marking Information

6-Pin CDFN/VDFN*




Example




| | | |
|---|---|---|
| **Legend:** | XX...X | Product code, customer-specific information, or frequency in MHz without printed decimal point |
| | Y | Year code (last digit of calendar year) |
| | YY | Year code (last 2 digits of calendar year) |
| | WW | Week code (week of January 1 is week ‘01’) |
| | SSS | Alphanumeric traceability code |
| | (e3) | Pb-free JEDEC® designator for Matte Tin (Sn) |
| | * | This package is Pb-free. The Pb-free JEDEC designator ((e3)) can be found on the outer packaging for this package. |
| | ●, ▲, ▼ | Pin one index is identified by a dot, delta up, or delta down (triangle |

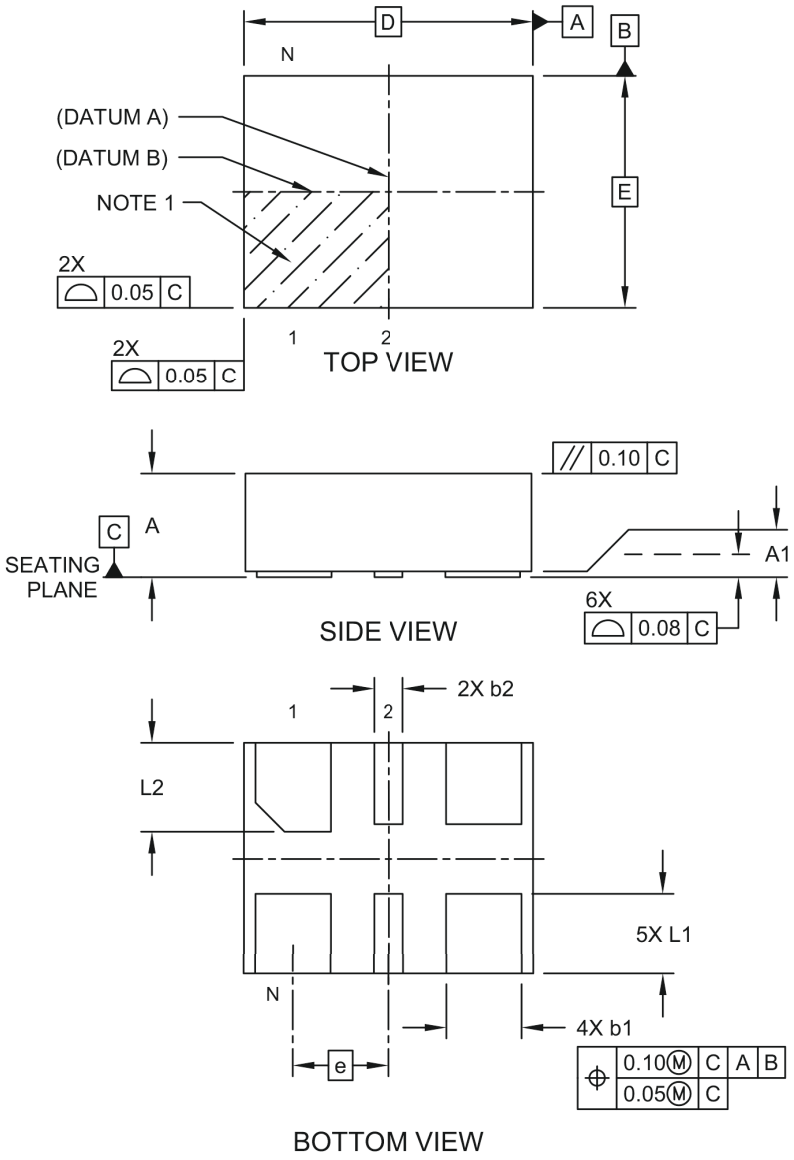
**Note**: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information. Package may or may not include the corporate logo.

Underbar (_) and/or Overbar (¯) symbol may not be to scale.

## 6-Lead VDFN 2.5 mm x 2.0 mm Package Outline and Recommended Land Pattern

### 6-Lead Very Thin Dual Flatpack No-Leads (J7A) - 2.5x2.0 mm Body [VDFN]

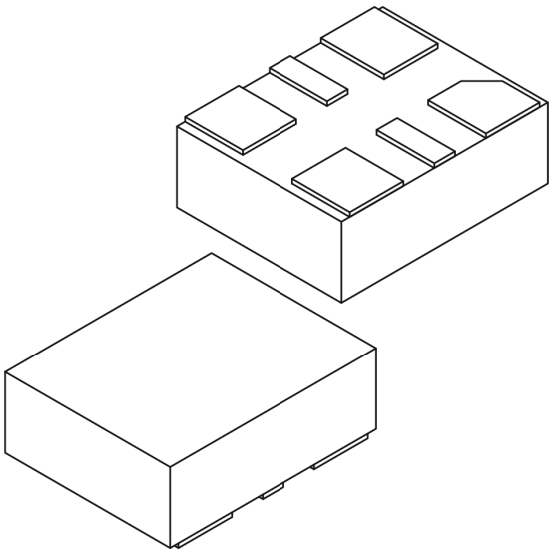
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




Microchip Technology Drawing C04-1005 Rev C Sheet 1 of 2

## 6-Lead Very Thin Dual Flatpack No-Leads (J7A) - 2.5x2.0 mm Body [VDFN]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Terminals | N | | 6 | |
| Pitch | e | | 0.825 BSC | |
| Overall Height | A | 0.80 | 0.85 | 0.90 |
| Standoff | A1 | 0.00 | 0.02 | 0.05 |
| Overall Length | D | | 2.50 BSC | |
| Overall Width | E | | 2.00 BSC | |
| Terminal Width | b1 | 0.60 | 0.65 | 0.70 |
| Terminal Width | b2 | 0.20 | 0.25 | 0.30 |
| Terminal Length | L1 | 0.60 | 0.70 | 0.80 |
| Terminal Length | L2 | 0.665 | 0.765 | 0.865 |

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

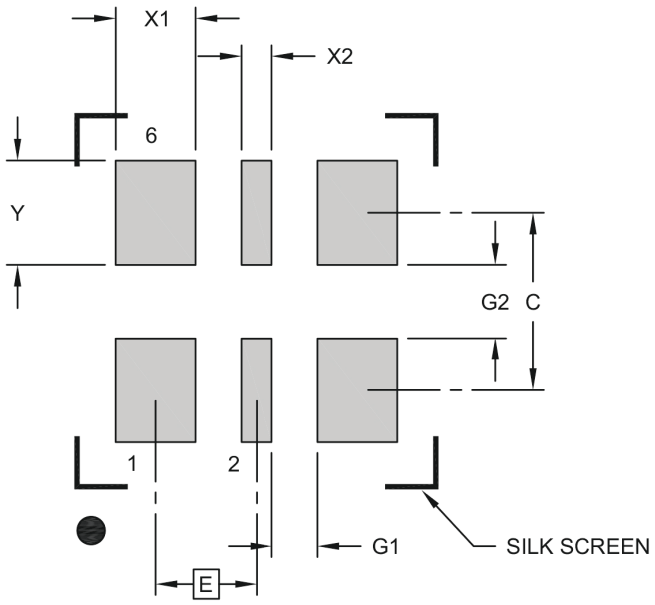
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1005 Rev C Sheet 2 of 2

### 6-Lead Very Thin Dual Flatpack No-Leads (J7A) - 2.5x2.0 mm Body [VDFN]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.825 BSC | |
| Contact Pad Width (X4) | X1 | | | 0.65 |
| Contact Pad Width (X2) | X2 | | | 0.25 |
| Contact Pad Length (X6) | Y | | | 0.85 |
| Contact Pad Spacing | C | | 1.45 | |
| Space Between Contacts (X4) | G1 | 0.38 | | |
| Space Between Contacts (X3) | G2 | 0.60 | | |

Notes:

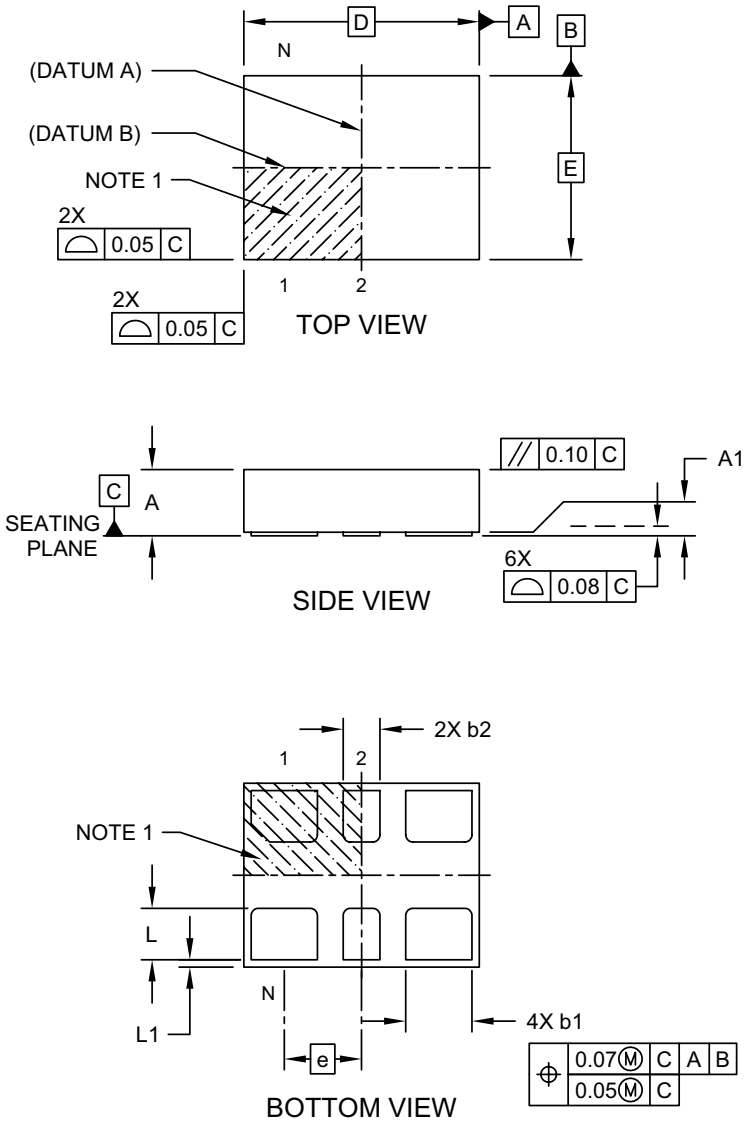
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

Microchip Technology Drawing C04-3005 Rev C

## 6-Lead VDFN 3.2 mm x 2.5 mm Package Outline and Recommended Land Pattern

### 6-Lead Very Thin Plastic Dual Flatpack No-Lead (H5A) - 3.2x2.5 mm Body [VDFN]

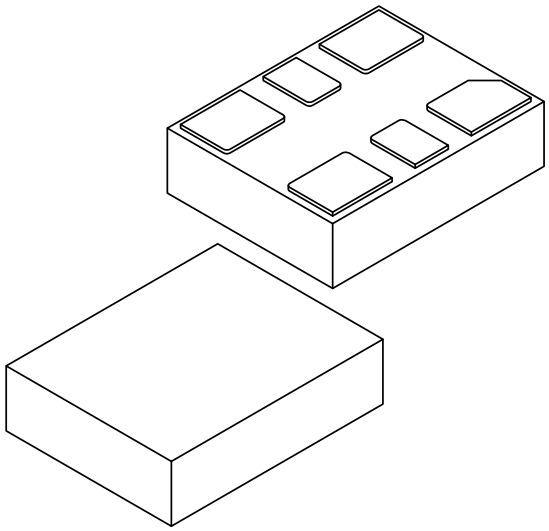
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




Microchip Technology Drawing C04-1007A Sheet 1 of 2

## 6-Lead Very Thin Plastic Dual Flatpack No-Lead (H5A) - 3.2x2.5 mm Body [VDFN]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Terminals | N | | 6 | |
| Pitch | e | | 1.05 BSC | |
| Overall Height | A | 0.80 | 0.85 | 0.90 |
| Standoff | A1 | 0.00 | 0.02 | 0.05 |
| Overall Length | D | | 3.20 BSC | |
| Overall Width | E | | 2.50 BSC | |
| Terminal Width | b1 | 0.85 | 0.90 | 0.95 |
| Terminal Width | b2 | 0.45 | 0.50 | 0.55 |
| Terminal Length | L | 0.65 | 0.70 | 0.75 |
| Terminal Pullback | L1 | | 0.10 REF | |

Notes:

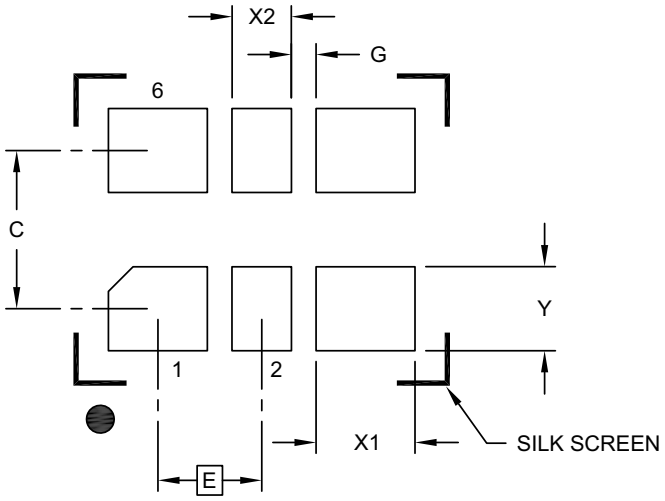
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1007A Sheet 2 of 2

## 6-Lead Very Thin Plastic Dual Flatpack No-Lead (H5A) - 3.2x2.5 mm Body [VDFN]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | 1.05 BSC | |
| Contact Pad Spacing | C | | 1.60 | |
| Contact Pad Width (X4) | X1 | | | 1.00 |
| Contact Pad Width (X2) | X2 | | | 0.60 |
| Contact Pad Length (X6) | Y | | | 0.85 |
| Space Between Contacts (X4) | G1 | 0.25 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

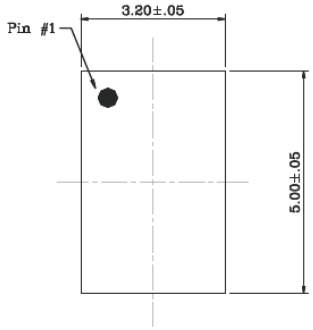
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-3007A

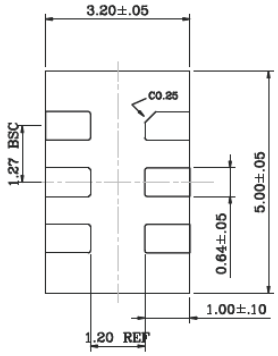
## 6-Lead CDFN 5.0 mm x 3.2 mm Package Outline and Recommended Land Pattern

**TITLE**
6 LEAD CDFN 5.0x3.2mm COL PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

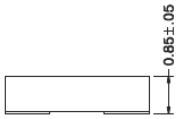
| DRAWING # | CDFN5032-6LD-PL-1 | UNIT | MM |
|---|---|---|---|



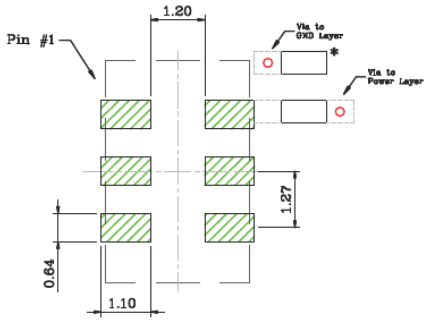

Top View




Bottom View




Side View




Recommended Land Pattern

NOTE:

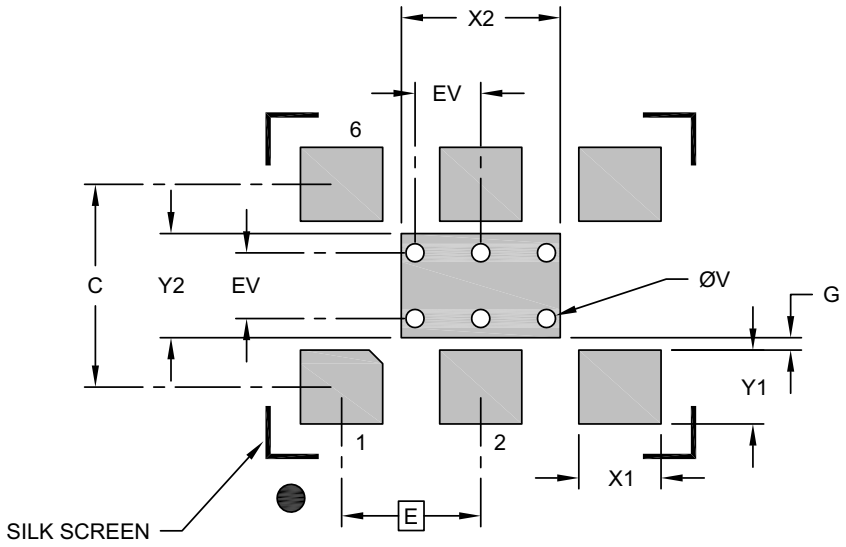
1. * Power Supply Decoupling Capacitor is required in Recommended Land Pattern.
2. Green shaded rectangles in Recommended Land Pattern are solder stencil opening.
3. Red circles in Recommended Land Pattern are thermal VIA.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging.

## 6-Lead VDFN 7.0 mm x 5.0 mm Package Outline and Recommended Land Pattern

### 6-Lead Very Thin Plastic Quad Flat, No Lead Package (H8A) - 7x5 mm Body [VDFN] With 2.8x1.8 mm Exposed Pad

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | 2.54 BSC | |
| Optional Center Pad Width | X2 | | | 2.90 |
| Optional Center Pad Length | Y2 | | | 1.90 |
| Contact Pad Spacing | C | | 3.70 | |
| Contact Pad Width (X6) | X1 | | | 1.50 |
| Contact Pad Length (X6) | Y1 | | | 1.35 |
| Contact Pad to Center Pad (X2) | G | 0.20 | | |
| Thermal Via Diameter (X6) | V | | 0.33 | |
| Thermal Via Pitch | EV | | 1.20 | |

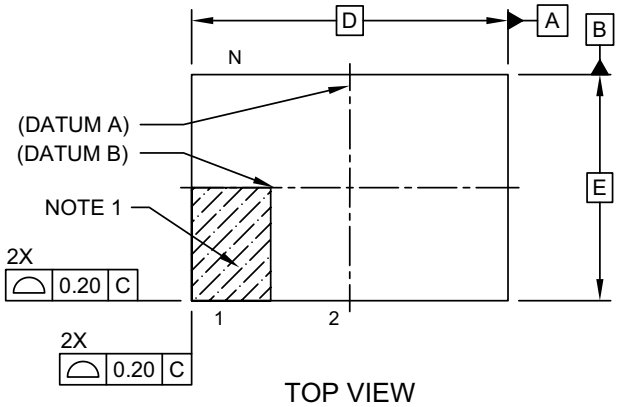
Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

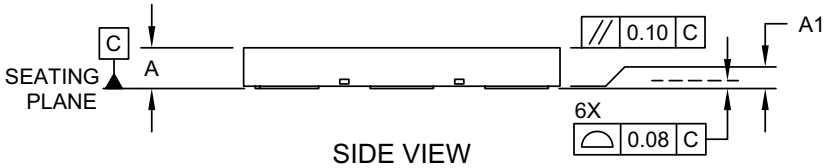
Microchip Technology Drawing C04-3010A

**6-Lead Very Thin Plastic Quad Flat, No Lead Package (H8A) - 7x5 mm Body [VDFN] With 2.8x1.8 mm Exposed Pad**

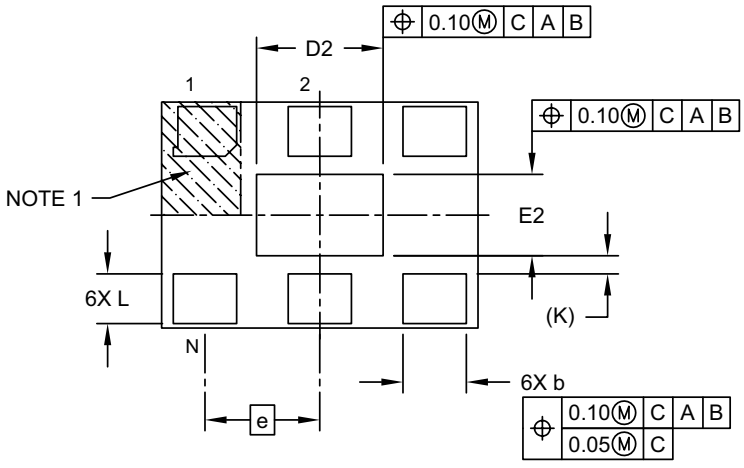
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging




TOP VIEW




SIDE VIEW

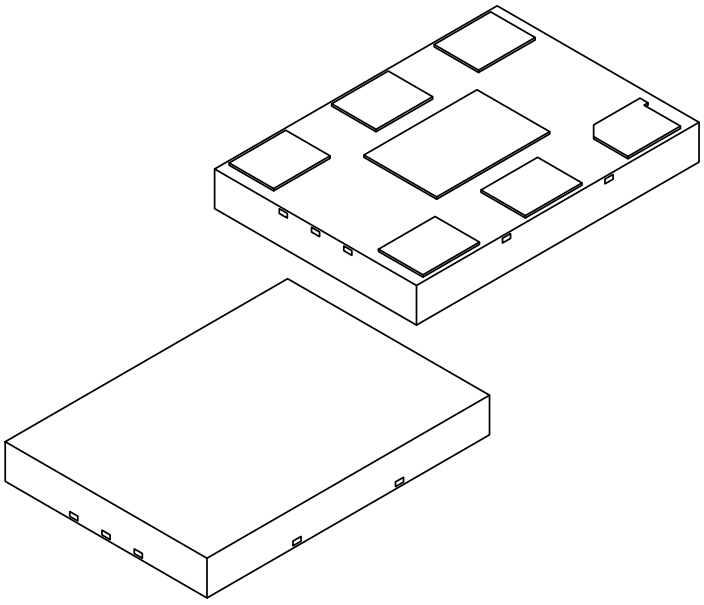



BOTTOM VIEW

Microchip Technology Drawing C04-1010A Sheet 1 of 2

## 6-Lead Very Thin Plastic Quad Flat, No Lead Package (H8A) - 7x5 mm Body [VDFN] With 2.8x1.8 mm Exposed Pad

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



| Units | | MILLIMETERS | | |
|---|---|---|---|---|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Terminals | N | | 6 | |
| Pitch | e | | 2.54 | |
| Overall Height | A | 0.80 | 0.85 | 0.90 |
| Standoff | A1 | 0.00 | 0.02 | 0.05 |
| Overall Length | D | | 7.00 BSC | |
| Exposed Pad Length | D2 | 2.70 | 2.80 | 2.90 |
| Overall Width | E | | 5.00 BSC | |
| Exposed Pad Width | E2 | 1.70 | 1.80 | 1.90 |
| Terminal Width | b | 1.35 | 1.40 | 1.45 |
| Terminal Length | L | 1.00 | 1.10 | 1.20 |
| Terminal-to-Exposed-Pad | K | | 0.20 REF | |

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

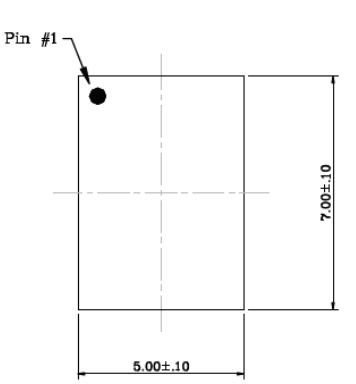
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1010A Sheet 2 of 2

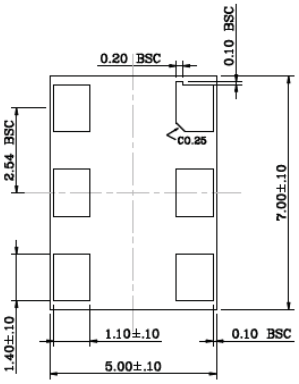
## 6-Lead CDFN 7.0 mm x 5.0 mm Package Outline and Recommended Land Pattern

**TITLE**
6 LEAD CDFN 7.0x5.0mm COL PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

| DRAWING # | CDFN75-6LD-PL-1 | UNIT | MM |
|---|---|---|---|

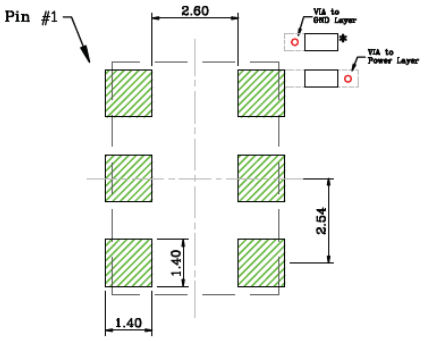



Top View




Bottom View


Side View




Recommended Land Pattern

NOTE:

1. * Power Supply Decoupling Capacitor is required in Recommended Land Pattern.
2. Green shaded rectangles in Recommended Land Pattern are solder stencil opening.
3. Red circles in Recommended Land Pattern are thermal VIA.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging.

# APPENDIX A: REVISION HISTORY

## Revision A (August 2017)

- Initial creation of document DSC1101/21 to Microchip data sheet template DS20005613A.
- Minor text changes throughout.

## Revision B (December 2017)

- Military temperature range changed to Automotive in Features and Product Identification System.
- Supply Current values updated in DC Characteristics table.
- Test Circuit section removed.
- Updated Figure 6-1, Recommended Board Layout.

## Revision C (December 2019)

- Corrected Input Logic Low value in DC Characteristics table.
- Updated 6-Lead VDFN 2.5 mm x 2.0 mm Package Outline and Recommended Land Pattern Package Drawing.

## Revision D (September 2020)

- Updated the minimum storage temperate value in the Temperature Specifications table to correctly read –55°C.

**NOTES:**

## PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

| PART NO. | X | X | X | -XXX.XXXX | X |
|---|---|---|---|---|---|
| Device | Package | Temperature Range | Stability | Frequency | Packaging Option |

| | | | |
|---|---|---|---|
| **Device:** | DSC1101: | | Low-Power Precision CMOS Oscillator with Standby |
| | DSC1121: | | Low-Power Precision CMOS Oscillator |
| **Package:** | A | = | 6-Lead 7.0 mm x 5.0 mm VDFN |
| | B | = | 6-Lead 5.0 mm x 3.2 mm CDFN |
| | C | = | 6-Lead 3.2 mm x 2.5 mm VDFN |
| | D | = | 6-Lead 2.5 mm x 2.0 mm VDFN |
| | N | = | 6-Lead 7.0 mm x 5.0 mm CDFN (no center pad) |
| **Temperature Range:** | E | = | –20°C to +70°C (Extended Commercial) |
| | I | = | –40°C to +85°C (Industrial) |
| | L | = | –40°C to +105°C (Extended Industrial) |
| | M | = | –55°C to +125°C (Automotive) |
| **Stability:** | 1 | = | ±50 ppm |
| | 2 | = | ±25 ppm |
| | 3 | = | ±20 ppm |
| | 5 | = | ±10 ppm |
| **Frequency:** | xxx.xxxx | = | 2.3 MHz to 170 MHz (user-defined) |
| **Packing Option:** | <blank>= | | 110/Tube |
| | T | = | 1,000/Reel |

**Examples:**

a) DSC1101AM1-010.0000T: Low-Power Precision CMOS Oscillator with Standby, 6-LD 7.0X5.0 VDFN, Automotive Temperature Range, ±50 ppm, 10 MHz Output Frequency, 1,000/Reel

b) DSC1101BL2-030.0000: Low-Power Precision CMOS Oscillator with Standby, 6-LD 5.0X3.2 CDFN, Extended Industrial Temperature Range, ±25 ppm, 30 MHz Output Frequency, 110/Tube

c) DSC1101DE5-150.0000: Low-Power Precision CMOS Oscillator with Standby, 6-LD 2.5X2.0 VDFN, Extended Commercial Temperature Range, ±10 ppm, 150 MHz Output Frequency, 110/Tube

d) DSC1101AI2-075.0000T: Low-Power Precision CMOS Oscillator with Standby, 6-LD 7.0X5.0 VDFN, Industrial Temperature Range, ±25 ppm, 75 MHz Output Frequency, 1,000/Reel

**Note 1:** Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.

**NOTES:**

**Note the following details of the code protection feature on Microchip devices:**

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods being used in attempts to breach the code protection features of the Microchip devices. We believe that these methods require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Attempts to breach these code protection features, most likely, cannot be accomplished without violating Microchip's intellectual property rights.
- Microchip is willing to work with any customer who is concerned about the integrity of its code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is "unbreakable." Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.



*For information regarding Microchip's Quality Management Systems, please visit www.microchip.com/quality.*

**Trademarks**



ISBN: 978-1-5224-6869-1

# Worldwide Sales and Service

## AMERICAS

**Corporate Office**
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
http://www.microchip.com/support
Web Address:
www.microchip.com

**Atlanta**
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

**Austin, TX**
Tel: 512-257-3370

**Boston**
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

**Chicago**
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

**Dallas**
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

**Detroit**
Novi, MI
Tel: 248-848-4000

**Houston, TX**
Tel: 281-894-5983

**Indianapolis**
Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453
Tel: 317-536-2380

**Los Angeles**
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608
Tel: 951-273-7800

**Raleigh, NC**
Tel: 919-844-7510

**New York, NY**
Tel: 631-435-6000

**San Jose, CA**
Tel: 408-735-9110
Tel: 408-436-4270

**Canada - Toronto**
Tel: 905-695-1980
Fax: 905-695-2078

## ASIA/PACIFIC

**Australia - Sydney**
Tel: 61-2-9868-6733

**China - Beijing**
Tel: 86-10-8569-7000

**China - Chengdu**
Tel: 86-28-8665-5511

**China - Chongqing**
Tel: 86-23-8980-9588

**China - Dongguan**
Tel: 86-769-8702-9880

**China - Guangzhou**
Tel: 86-20-8755-8029

**China - Hangzhou**
Tel: 86-571-8792-8115

**China - Hong Kong SAR**
Tel: 852-2943-5100

**China - Nanjing**
Tel: 86-25-8473-2460

**China - Qingdao**
Tel: 86-532-8502-7355

**China - Shanghai**
Tel: 86-21-3326-8000

**China - Shenyang**
Tel: 86-24-2334-2829

**China - Shenzhen**
Tel: 86-755-8864-2200

**China - Suzhou**
Tel: 86-186-6233-1526

**China - Wuhan**
Tel: 86-27-5980-5300

**China - Xian**
Tel: 86-29-8833-7252

**China - Xiamen**
Tel: 86-592-2388138

**China - Zhuhai**
Tel: 86-756-3210040

## ASIA/PACIFIC

**India - Bangalore**
Tel: 91-80-3090-4444

**India - New Delhi**
Tel: 91-11-4160-8631

**India - Pune**
Tel: 91-20-4121-0141

**Japan - Osaka**
Tel: 81-6-6152-7160

**Japan - Tokyo**
Tel: 81-3-6880- 3770

**Korea - Daegu**
Tel: 82-53-744-4301

**Korea - Seoul**
Tel: 82-2-554-7200

**Malaysia - Kuala Lumpur**
Tel: 60-3-7651-7906

**Malaysia - Penang**
Tel: 60-4-227-8870

**Philippines - Manila**
Tel: 63-2-634-9065

**Singapore**
Tel: 65-6334-8870

**Taiwan - Hsin Chu**
Tel: 886-3-577-8366

**Taiwan - Kaohsiung**
Tel: 886-7-213-7830

**Taiwan - Taipei**
Tel: 886-2-2508-8600

**Thailand - Bangkok**
Tel: 66-2-694-1351

**Vietnam - Ho Chi Minh**
Tel: 84-28-5448-2100

## EUROPE

**Austria - Wels**
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

**Denmark - Copenhagen**
Tel: 45-4485-5910
Fax: 45-4485-2829

**Finland - Espoo**
Tel: 358-9-4520-820

**France - Paris**
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

**Germany - Garching**
Tel: 49-8931-9700

**Germany - Haan**
Tel: 49-2129-3766400

**Germany - Heilbronn**
Tel: 49-7131-72400

**Germany - Karlsruhe**
Tel: 49-721-625370

**Germany - Munich**
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

**Germany - Rosenheim**
Tel: 49-8031-354-560

**Israel - Ra'anana**
Tel: 972-9-744-7705

**Italy - Milan**
Tel: 39-0331-742611
Fax: 39-0331-466781

**Italy - Padova**
Tel: 39-049-7625286

**Netherlands - Drunen**
Tel: 31-416-690399
Fax: 31-416-690340

**Norway - Trondheim**
Tel: 47-7288-4388

**Poland - Warsaw**
Tel: 48-22-3325737

**Romania - Bucharest**
Tel: 40-21-407-87-50

**Spain - Madrid**
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

**Sweden - Gothenberg**
Tel: 46-31-704-60-40

**Sweden - Stockholm**
Tel: 46-8-5090-4654

**UK - Wokingham**
Tel: 44-118-921-5800
Fax: 44-118-921-5820