

## Low-Jitter Precision LVDS Oscillator

### Features

- Low RMS Phase Jitter: <1 ps (typ.)
- High Stability:  $\pm 10$  ppm,  $\pm 25$  ppm,  $\pm 50$  ppm
- Wide Temperature Range:
  - Ext. Industrial  $-40^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$
  - Industrial  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
  - Ext. Commercial  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- High Supply Noise Rejection:  $-50$  dBc
- Wide Frequency Range:
  - 2.3 MHz – 460 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
  - 7.0 mm x 5.0 mm
- Excellent Shock and Vibration Immunity
  - Qualified to MIL-STD-883
- High Reliability
  - 20x better MTF than quartz-based devices
- Low Current Consumption
- Supply Range of 2.25V to 3.63V
- Standby and Output Enable Functions
- Lead Free and RoHS-Compliant

### Applications

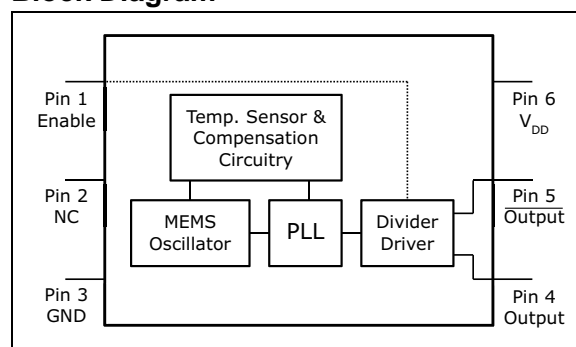
- Storage Area Networks
  - SATA, SAS, Fibre Channel
- Passive Optical Networks
  - EPON, 10G-EPON, GPON, 10G-PON
- HD/SD/SDI Video and Surveillance
- PCI Express Gen 1/Gen 2/Gen 3
- Display Port

### General Description

The DSC1103 and DSC1123 series of high performance oscillators utilizes 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.

DSC1103 has a standby feature allowing it to completely power-down when EN pin is pulled low. For DSC1123, only the outputs are disabled when EN is low. Both oscillators are available in industry standard packages, including the smallest 2.5 mm x 2.0 mm, and are drop-in replacements for standard 6-pin LVDS crystal oscillators.

### Block Diagram



# DSC1103/23

## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings †

|                            |                        |
|----------------------------|------------------------|
| Supply Voltage .....       | -0.3V to +4.0V         |
| Input Voltage .....        | -0.3V to $V_{DD}+0.3V$ |
| ESD Protection (HBM) ..... | .4 kV                  |
| ESD Protection (MM) .....  | 400V                   |
| ESD Protection (CDM) ..... | 1.5 kV                 |

† **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.

### ELECTRICAL CHARACTERISTICS

Specifications:  $V_{DD} = 3.3V$ ;  $T_A = +25^{\circ}C$  unless otherwise specified.

| Parameters                       | Sym.             | Min.                 | Typ. | Max.                 | Units      | Conditions   |
|----------------------------------|------------------|----------------------|------|----------------------|------------|--|
| Supply Voltage (Note 1)          | $V_{DD}$         | 2.25                 | —    | 3.63                 | V          | —  |
| Supply Current                   | $I_{DD}$         | —                    | —    | 0.095                | mA         | DSC1103, EN pin low; all outputs disabled.   |
|                                  |                  | —                    | 20   | 22                   |            | DSC1123, EN pin low; all outputs disabled.   |
| Frequency Stability              | $\Delta f$       | —                    | —    | $\pm 10$             | ppm        | Includes frequency variations due to initial tolerance, temp., and power supply voltage. |
|                                  |                  | —                    | —    | $\pm 25$             |            |  |
|                                  |                  | —                    | —    | $\pm 50$             |            |  |
| Aging - First Year               | $\Delta f_{Y1}$  | —                    | —    | $\pm 5$              | ppm        | One year at $+25^{\circ}C$   |
| Aging - After First Year         | $\Delta f_{Y2+}$ | —                    | —    | $< \pm 1$            | ppm/yr     | Year two and beyond at $+25^{\circ}C$  |
| Start-up Time (Note 2)           | $t_{SU}$         | —                    | —    | 5                    | ms         | $T = +25^{\circ}C$   |
| Input Logic Levels               | $V_{IH}$         | $0.75 \times V_{DD}$ | —    | —                    | V          | Input logic high   |
|                                  | $V_{IL}$         | —                    | —    | $0.25 \times V_{DD}$ |            | Input logic low  |
| Output Disable Time (Note 3)     | $t_{DA}$         | —                    | —    | 5                    | ns         | —  |
| Output Enable Time               | $t_{EN}$         | —                    | —    | 5                    | ms         | DSC1103  |
|                                  |                  | —                    | —    | 20                   | ns         | DSC1123  |
| Enable Pull-Up Resistor (Note 4) | $R_{PU}$         | —                    | 40   | —                    | k $\Omega$ | Pull-up resistor exist.  |
| <b>LVDS Outputs</b>              |                  |                      |      |                      |            |  |
| Supply Current                   | $I_{DD}$         | —                    | 29   | 32                   | mA         | Output enabled, $R_L = 100\Omega$  |
| Output Offset Voltage            | $V_{OS}$         | 1.125                | —    | 1.4                  | V          | $R = 100\Omega$ Differential   |
| Delta Offset Voltage             | $\Delta V_{OS}$  | —                    | —    | 50                   | mV         | —  |
| Peak-to-Peak Output Swing        | $V_{PP}$         | —                    | 350  | —                    | mV         | Single-Ended   |

- Note 1:**  $V_{DD}$  pin should be filtered with a 0.1  $\mu F$  capacitor.  
**Note 2:**  $t_{SU}$  is time to 100 ppm stable output frequency after  $V_{DD}$  is applied and outputs are enabled.  
**Note 3:** See the [Output Waveform](#) section and the [Test Circuit](#) for more information.  
**Note 4:** Output is enabled if pad is floated or not connected.

## ELECTRICAL CHARACTERISTICS (CONTINUED)

Specifications:  $V_{DD} = 3.3V$ ;  $T_A = +25^\circ C$  unless otherwise specified.

| Parameters                                | Sym.      | Min. | Typ. | Max. | Units             | Conditions   |
|---|-----------|------|------|------|-------------------|--|
| Output Transition Rise/Fall Time (Note 3) | $t_R/t_F$ | —    | 200  | —    | ps                | 20% to 80%<br>$R_L = 50\Omega$ , $C_L = 2\text{ pF}$ |
| Frequency                                 | $f_0$     | 2.3  | —    | 460  | MHz               | -20°C to +70°C &<br>-40°C to +85°C                   |
|   |           | 3.3  | —    | 460  |                   | -40°C to +105°C                                      |
| Output Duty Cycle                         | SYM       | 48   | —    | 52   | %                 | Differential   |
| Period Jitter                             | $J_{PER}$ | —    | 2.5  | —    | ps <sub>RMS</sub> | —  |
| Integrated Phase Noise                    | $J_{PH}$  | —    | 0.28 | —    | ps <sub>RMS</sub> | 200 kHz to 20 MHz<br>@156.25 MHz                     |
|   |           | —    | 0.4  | —    |                   | 100 kHz to 20 MHz<br>@156.25 MHz                     |
|   |           | —    | 1.7  | 2    |                   | 12 kHz to 20 MHz<br>@156.25 MHz                      |

- Note 1:**  $V_{DD}$  pin should be filtered with a 0.1  $\mu F$  capacitor.  
**Note 2:**  $t_{SU}$  is time to 100 ppm stable output frequency after  $V_{DD}$  is applied and outputs are enabled.  
**Note 3:** See the [Output Waveform](#) section and the [Test Circuit](#) for more information.  
**Note 4:** Output is enabled if pad is floated or not connected.

## TEMPERATURE SPECIFICATIONS (Note 1)

| Parameters                  | Sym.  | Min. | Typ. | Max. | Units | Conditions        |
|-----------------------------|-------|------|------|------|-------|-------------------|
| <b>Temperature Ranges</b>   |       |      |      |      |       |                   |
| Operating Temperature Range | $T_A$ | -20  | —    | +70  | °C    | Ordering Option E |
|                             | $T_A$ | -40  | —    | +85  | °C    | Ordering Option I |
|                             | $T_A$ | -40  | —    | +105 | °C    | Ordering Option L |
| Junction Temperature        | $T_J$ | —    | —    | +150 | °C    | —                 |
| Storage Temperature Range   | $T_S$ | -55  | —    | +150 | °C    | —                 |
| Soldering Temperature       | —     | —    | —    | +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 +150°C rating. Sustained junction temperatures above +150°C can impact the device reliability.

## 2.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in [Table 2-1](#).

**TABLE 2-1: PIN FUNCTION TABLE**

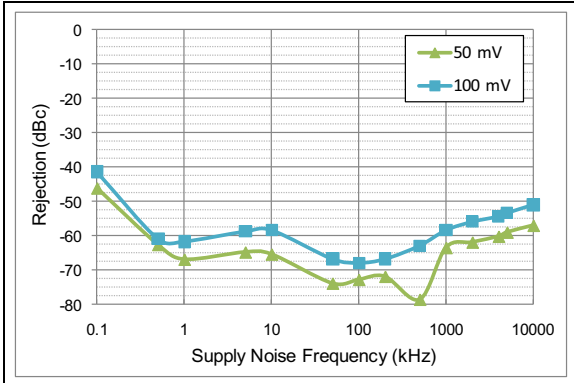
| Pin Number<br>7x5 with Pad | Pin Number<br>7x5 w/o Pad | Pin Number<br>5x3.2 | Pin Number<br>3.2x2.5 | Pin Number<br>2x2.5 | Pin<br>Name | Description         |
|----------------------------|---------------------------|---------------------|-----------------------|---------------------|-------------|---------------------|
| 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         | LVDS clock output + |
| 5                          | 5                         | 5                   | 5                     | 5                   | OUT-        | LVDS clock output - |
| 6                          | 6                         | 6                   | 6                     | 6                   | VDD         | Supply voltage      |
| PAD                        | —                         | —                   | —                     | —                   | PAD         | Tie to Ground       |

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

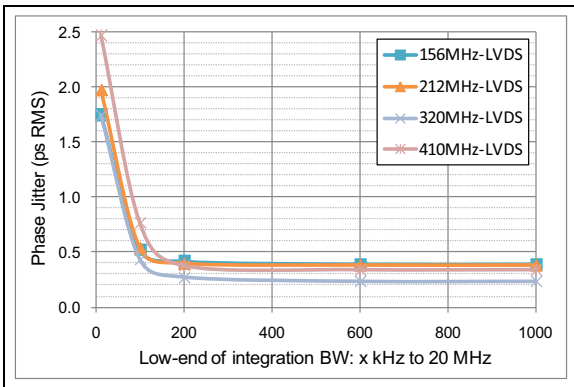
| EN Pin | DSC1103        | DSC1123          |
|--------|----------------|------------------|
| High   | Outputs Active | Outputs Active   |
| NC     | Outputs Active | Outputs Active   |
| Low    | Standby        | Outputs Disabled |

## 3.0 NOMINAL PERFORMANCE PARAMETERS

Unless otherwise specified,  $T = +25^{\circ}\text{C}$ ,  $V_{\text{DD}} = 3.3\text{V}$ .

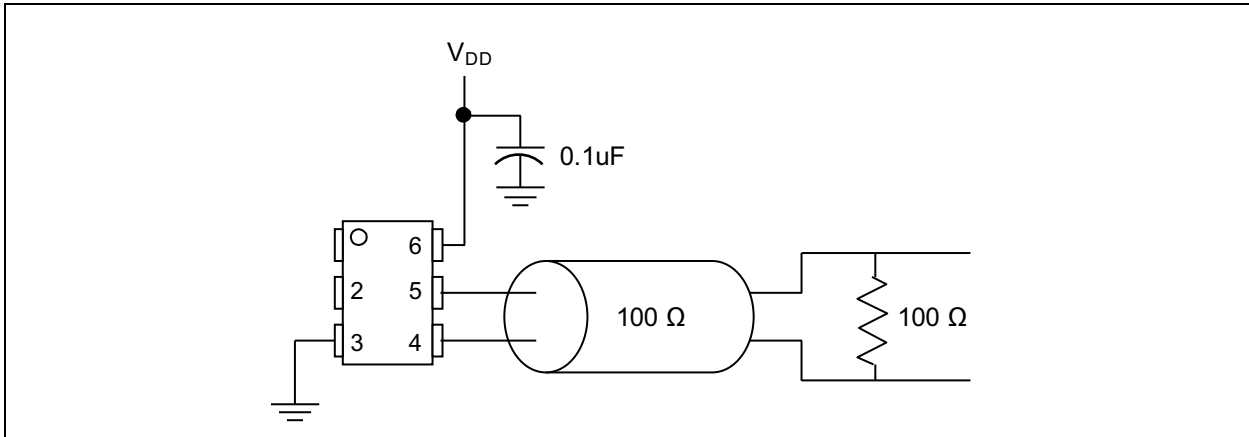


**FIGURE 3-1:** *Power Supply Rejection Ratio.*



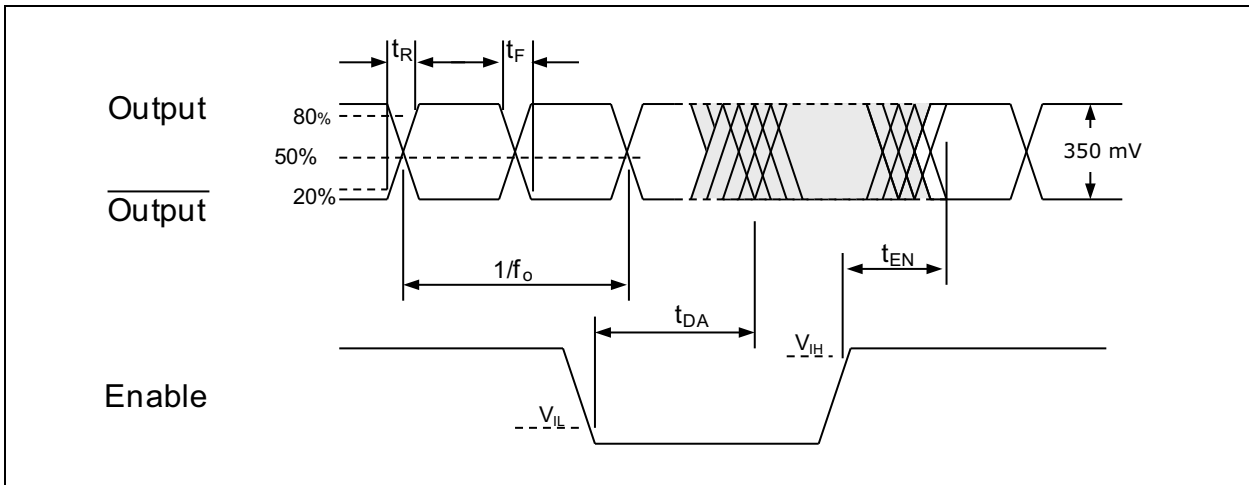
**FIGURE 3-2:** *Phase Jitter (Integrated Phase Noise).*

## 4.0 TERMINATION SCHEME



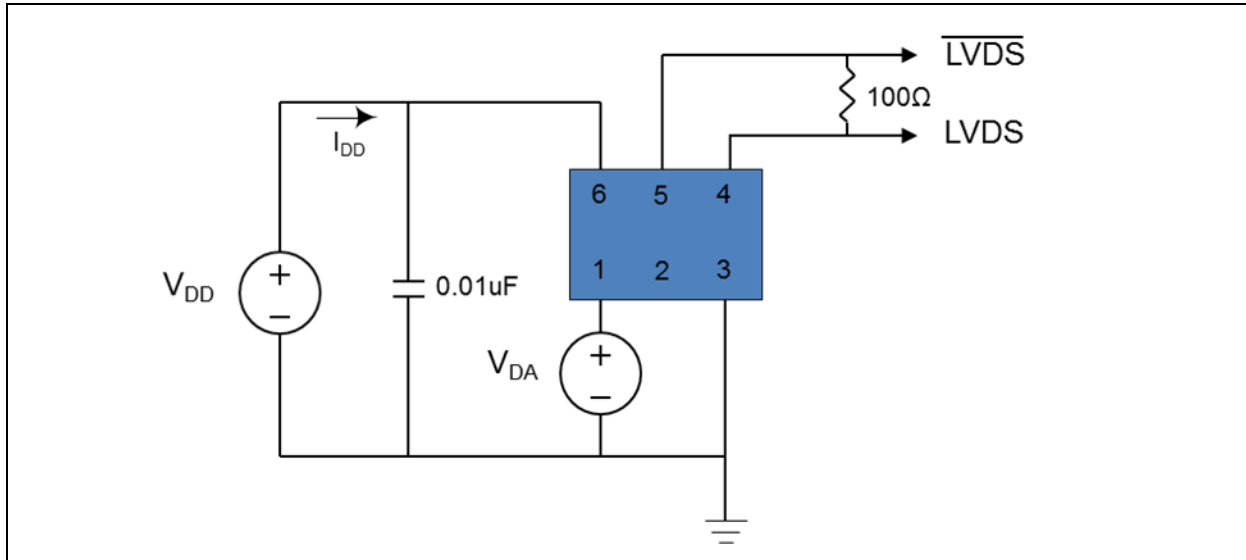
**FIGURE 4-1:** Typical Termination Scheme.

## 5.0 OUTPUT WAVEFORM



**FIGURE 5-1:** Output Waveform.

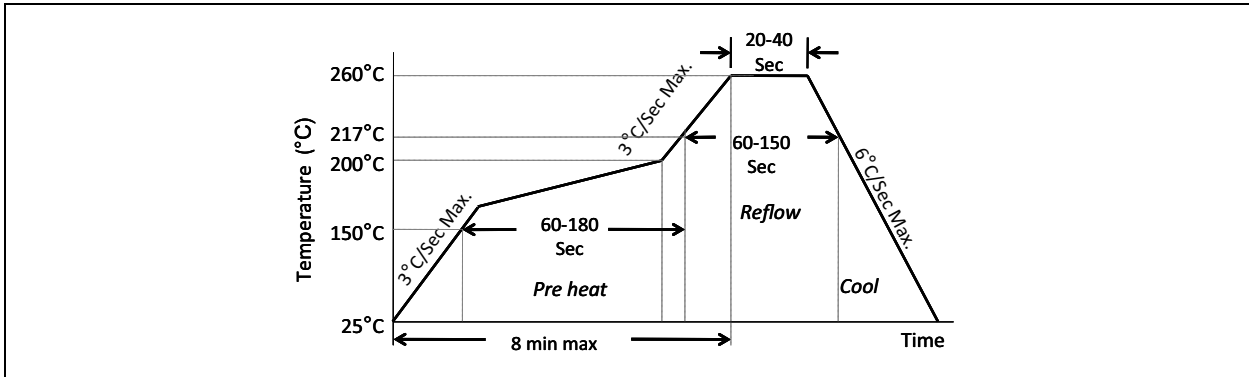
## 6.0 TEST CIRCUIT



**FIGURE 6-1:** Test Circuit.



## 7.0 SOLDER REFLOW PROFILE



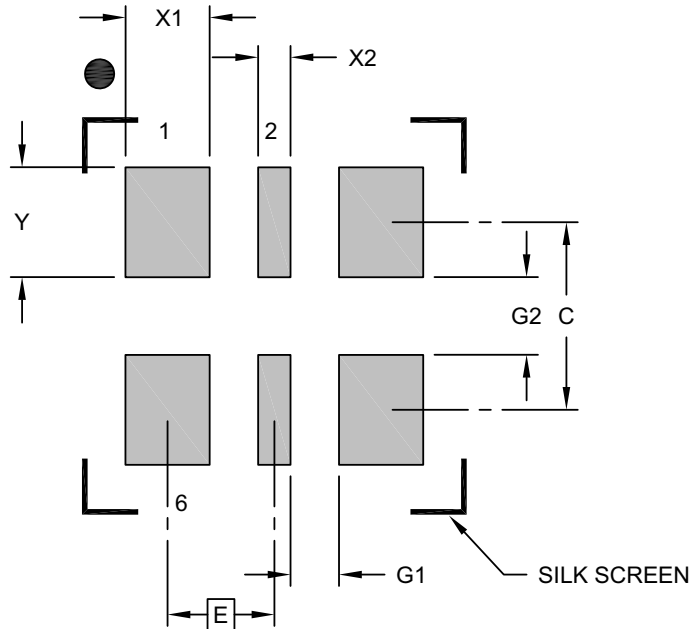
| MSL 1 @ 260°C refer to JSTD-020C  |                |
|-----------------------------------|----------------|
| Ramp-Up Rate (200°C to Peak Temp) | 3°C/sec. max.  |
| Preheat Time 150°C to 200°C       | 60-180 sec.    |
| Time Maintained above 217°C       | 60-150 sec.    |
| Peak Temperature                  | 255°C to 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 PACKAGE MARKING INFORMATION

### 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>



RECOMMENDED LAND PATTERN

| Dimension Limits            | Units | MILLIMETERS |      |      |
|-----------------------------|-------|-------------|------|------|
|                             |       | 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        |      |      |

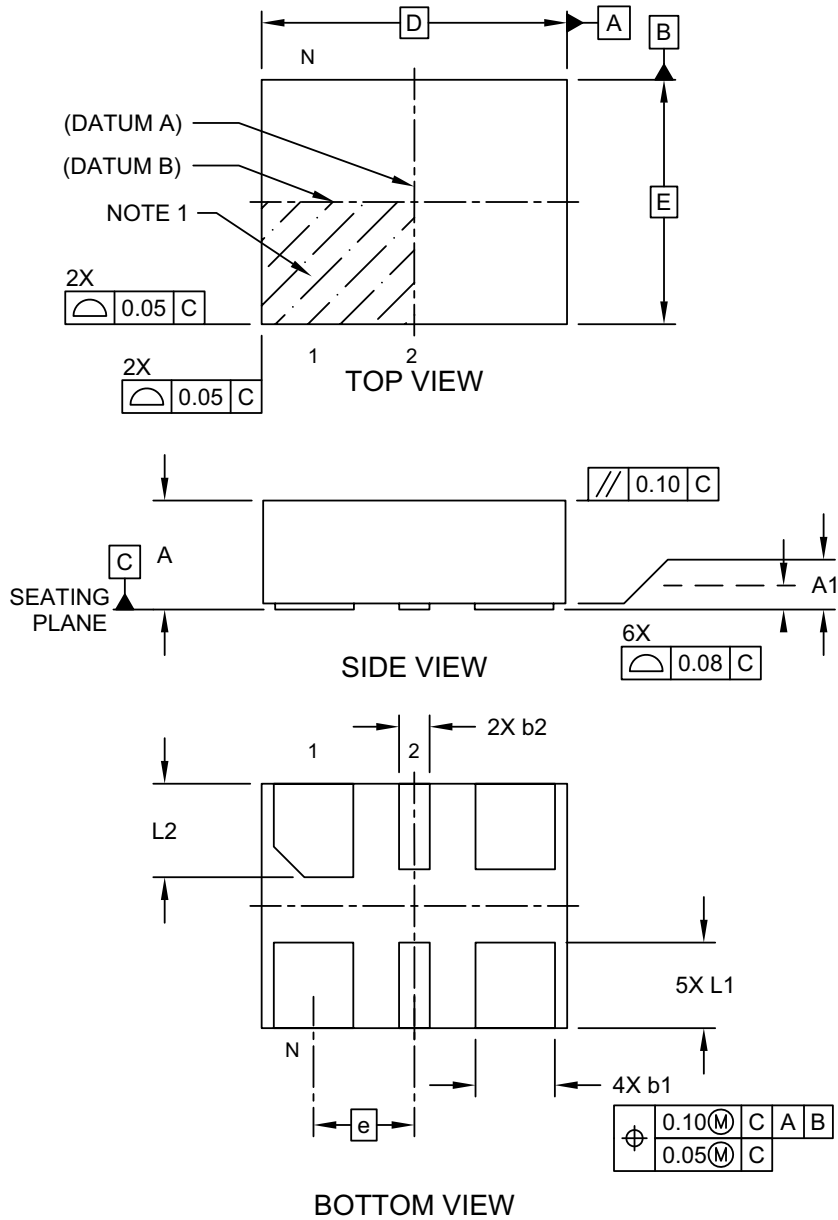
**Notes:**

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

Microchip Technology Drawing C04-3005A

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

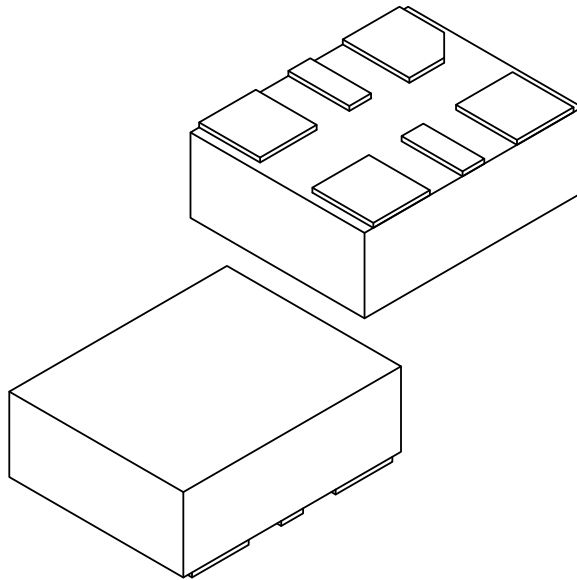
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Microchip Technology Drawing C04-1005A 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:**

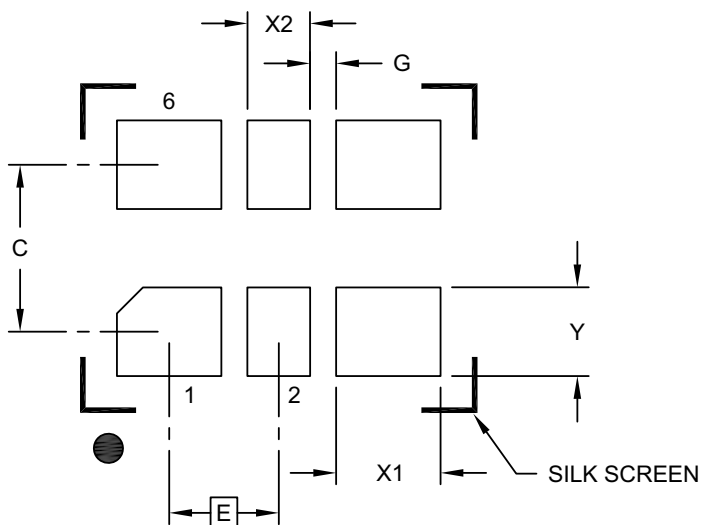
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M
  - BSC: Basic Dimension. Theoretically exact value shown without tolerances.
  - REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1005A Sheet 2 of 2

## 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>



RECOMMENDED LAND PATTERN

| Dimension Limits            | Units | MILLIMETERS |      |      |
|-----------------------------|-------|-------------|------|------|
|                             |       | 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

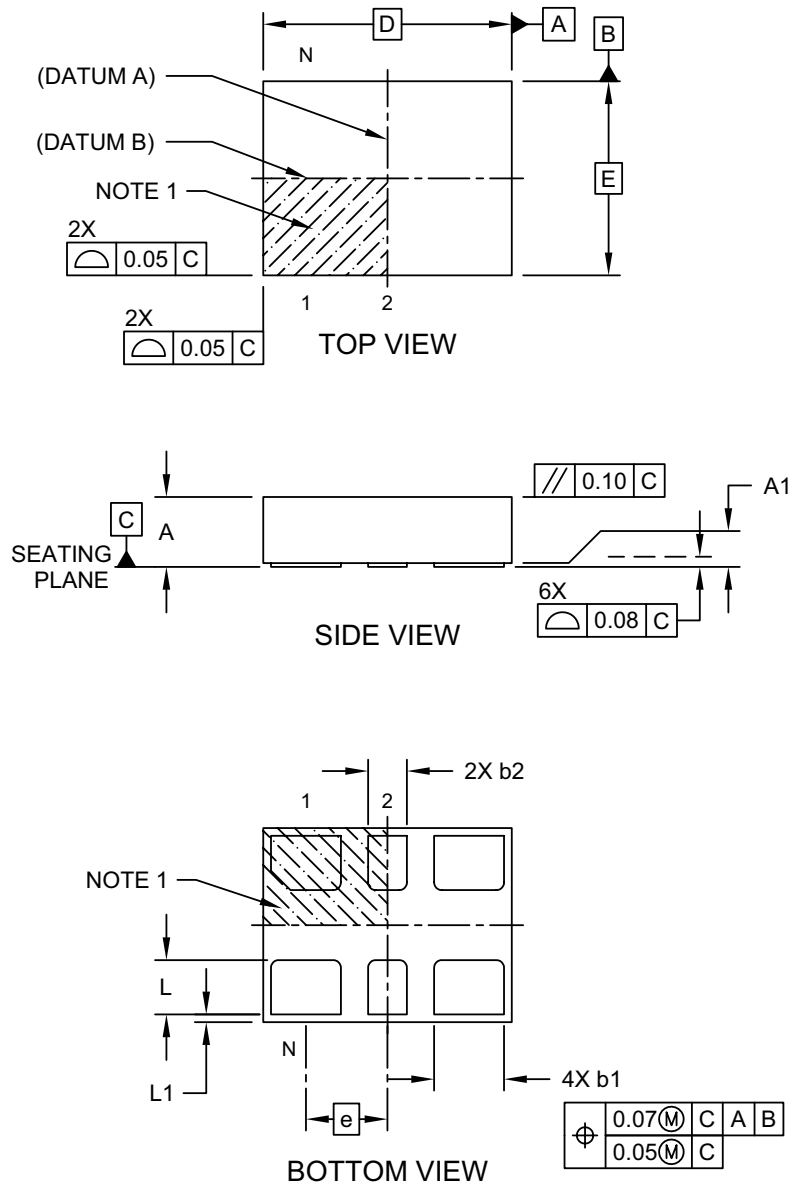
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-3007A

# DSC1103/23

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

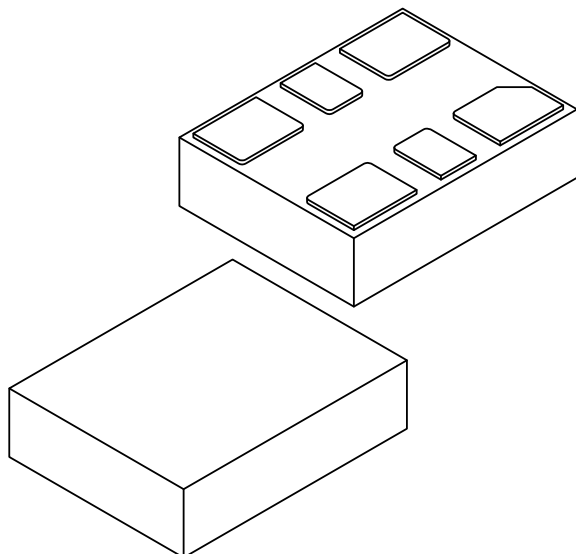
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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

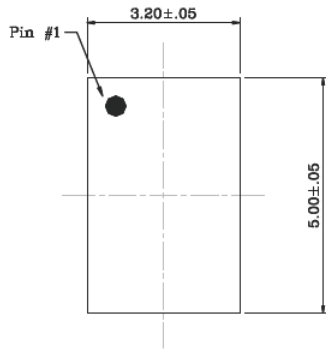
# DSC1103/23

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

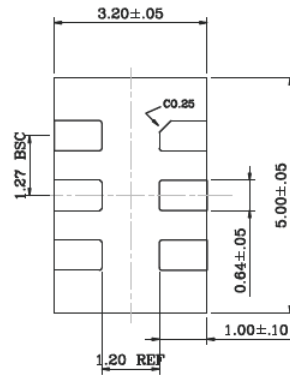
**TITLE**

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

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



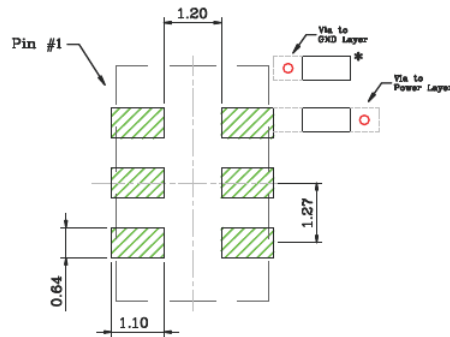
Top View



Bottom View



Side View



Recommended Land Pattern

**NOTE:**

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

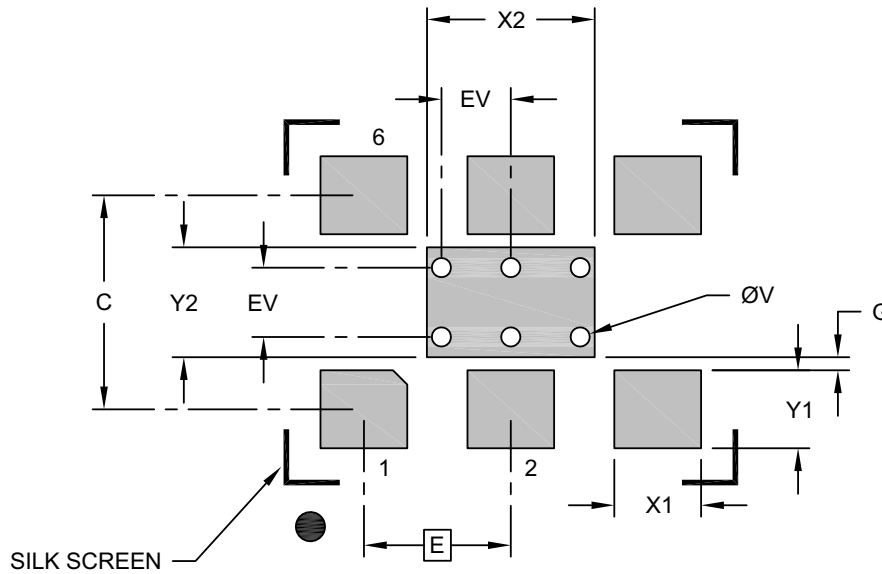
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>.



## 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

| Dimension Limits               | Units | MILLIMETERS |      |      |
|--------------------------------|-------|-------------|------|------|
|                                |       | 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:**

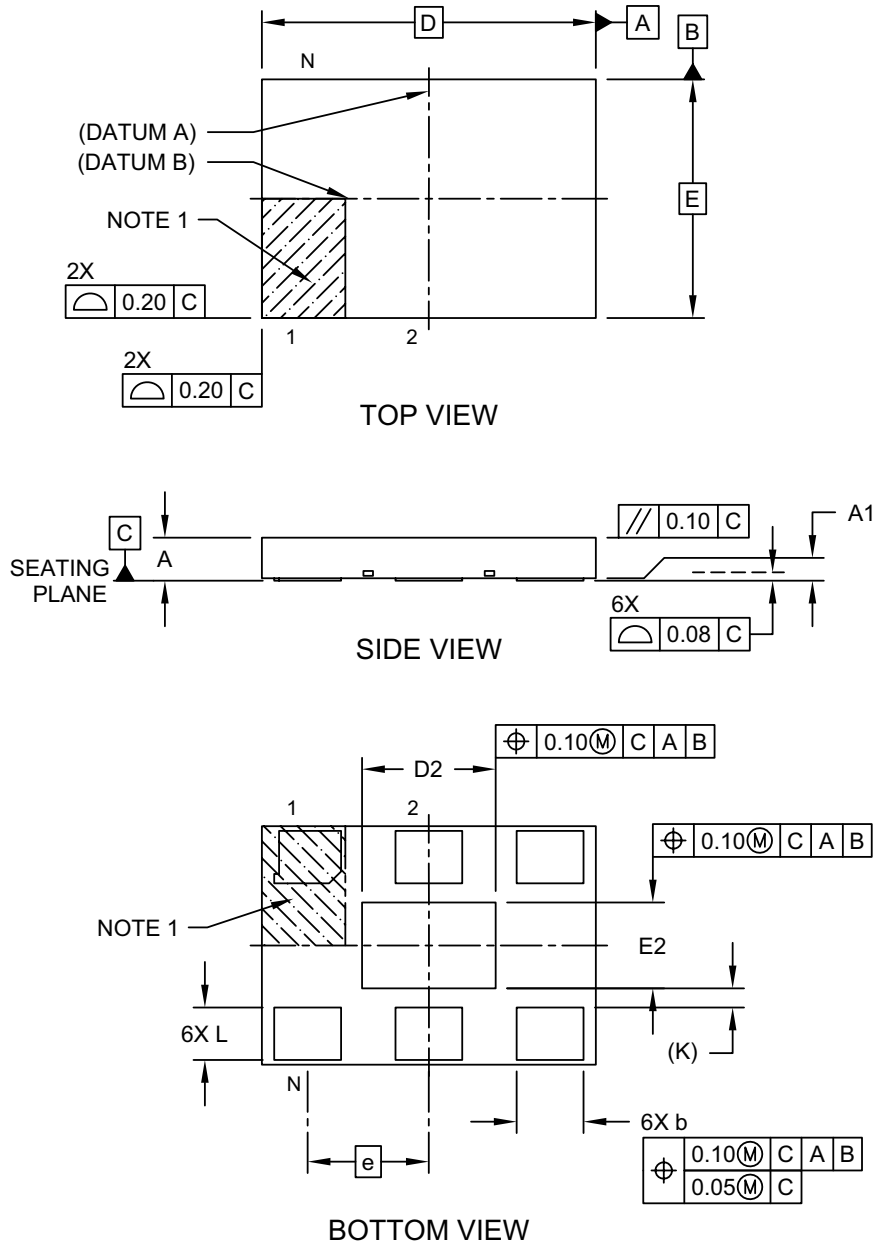
- Dimensioning and tolerancing per ASME Y14.5M  
BSC: Basic Dimension. Theoretically exact value shown without tolerances.
- For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

Microchip Technology Drawing C04-3010A

# DSC1103/23

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

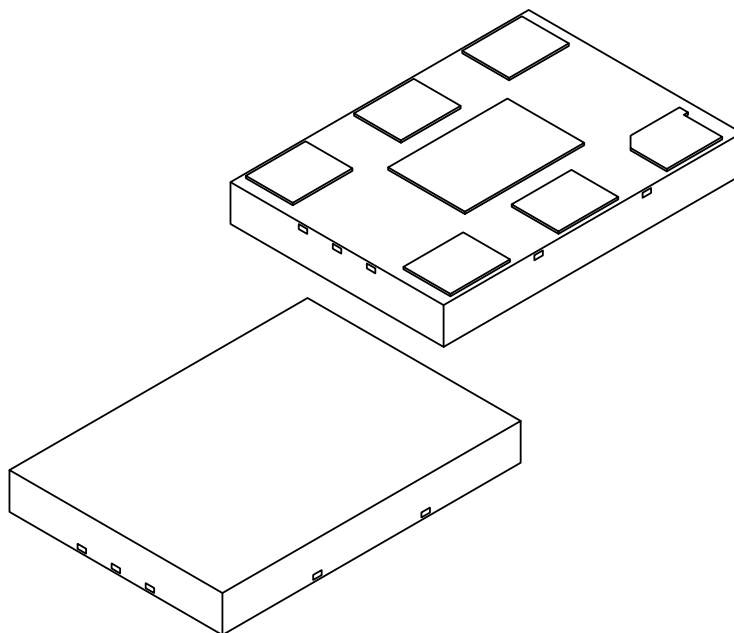
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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>



| Dimension Limits        | Units | MILLIMETERS |      |      |
|-------------------------|-------|-------------|------|------|
|                         |       | 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

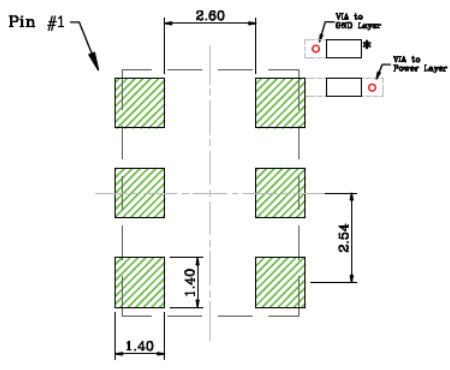
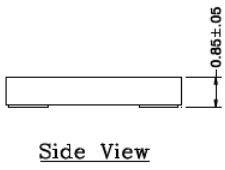
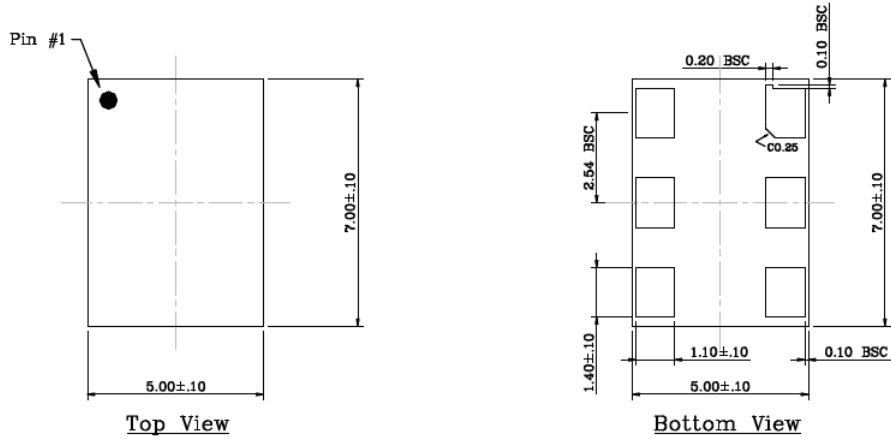
# DSC1103/23

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



**Recommended Land Pattern**

**NOTE:**

- \* Power Supply Decoupling Capacitor is required in Recommended Land Pattern.
- Green shaded rectangles in Recommended Land Pattern are solder stencil opening.
- 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 (March 2017)

- Converted Micrel data sheet DSC1103/23 to Microchip DS20005745A.
- Minor text changes throughout.
- Updated [Package Marking Information](#) to MCHP-standard drawings where available.

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               | 3                         | X       | X              | X         | —         | xxx,xxxx | X |
|---|-----------------|---------------------------|---------|----------------|-----------|-----------|----------|---|
| Device<br>(First 2<br>Digits)   | Enable<br>Modes | Device<br>(Last<br>Digit) | Package | Temp.<br>Range | Stability | Frequency | Packing  |   |
| <p><b>Device:</b> DSC11x3: Low-Jitter Precision LVDS Oscillator</p> <p><b>Enable Modes:</b> 0 = Enable/Standby<br/>2 = Enable/Disable</p> <p><b>Package:</b> A = 7.0 mm x 5.0 mm VDFN<br/>B = 5.0 mm x 3.2 mm CDFN<br/>C = 3.2 mm x 2.5 mm VDFN<br/>D = 2.5 mm x 2.0 mm VDFN<br/>N = 7.0 mm x 5.0 mm CDFN (no center pad)</p> <p><b>Temperature Range:</b> E = -20°C to +70°C<br/>I = -40°C to +85°C<br/>L = -40°C to +105°C</p> <p><b>Stability:</b> 1 = ±50 ppm<br/>2 = ±25 ppm<br/>5 = ±10 ppm</p> <p><b>Frequency Code:</b> xxx.xxxx = 2.3 MHz to 460 MHz (user-defined)</p> <p><b>Packing:</b> T = 1,000/Reel<br/>(blank) = 100/Tube</p>   |                 |                           |         |                |           |           |          |   |
| <p><b>Examples:</b></p> <p>a) DSC1103AE1-125.0000: Low-Jitter Precision LVDS Oscillator, Enable/Standby, 7x5 VDFN, -20°C to +70°C, ±50 ppm, 125 MHz, 100/Tube</p> <p>b) DSC1123BI2-400.0000T: Low-Jitter Precision LVDS Oscillator, Enable/Disable, 5x3.2 CDFN, -40°C to +85°C, ±25 ppm, 400 MHz, 1,000/Reel</p> <p>c) DSC1103CL5-074.2500: Low-Jitter Precision LVDS Oscillator, Enable/Standby, 3.2x2.5 VDFN, -40°C to +105°C, ±10 ppm, 74.25 MHz, 100/Tube</p> <p>d) DSC1123DE1-082.5000T: Low-Jitter Precision LVDS Oscillator, Enable/Disable, 2.5x2.0 VDFN, -20°C to +70°C, ±50 ppm, 82.5 MHz, 1,000/Reel</p> <p>e) DSC1103NI2-056.0000: Low-Jitter Precision LVDS Oscillator, Enable/Standby, 7x5 CDFN (no center pad), -40°C to +85°C, ±25 ppm, 56 MHz, 100/Tube</p> <p><b>Note 1:</b> 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.</p> |                 |                           |         |                |           |           |          |   |

NOTES:



---

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

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “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.

---

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

*Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELoC® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.*

**QUALITY MANAGEMENT SYSTEM  
CERTIFIED BY DNV  
= ISO/TS 16949 =**

**Trademarks**

The Microchip name and logo, the Microchip logo, AnyRate, AVR, AVR logo, AVR Freaks, BeaconThings, BitCloud, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KEELoC, KEELoC logo, Klear, LANCheck, LINK MD, maXStylus, maXTouch, MediaLB, megaAVR, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, Prochip Designer, QTouch, RightTouch, SAM-BA, SpyNIC, SST, SST Logo, SuperFlash, tinyAVR, UNI/O, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

ClockWorks, The Embedded Control Solutions Company, EtherSynch, Hyper Speed Control, HyperLight Load, IntelliMOS, mTouch, Precision Edge, and Quiet-Wire are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, CryptoAuthentication, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KlearNet, KlearNet logo, Mindi, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICKit, PICTail, PureSilicon, QMatrix, RightTouch logo, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., SQI, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2017, Microchip Technology Incorporated, All Rights Reserved.  
ISBN: 978-1-5224-1546-6



# MICROCHIP

## 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](http://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

**Asia Pacific Office**  
Suites 3707-14, 37th Floor  
Tower 6, The Gateway  
Harbour City, Kowloon

**Hong Kong**  
Tel: 852-2943-5100  
Fax: 852-2401-3431

**Australia - Sydney**  
Tel: 61-2-9868-6733  
Fax: 61-2-9868-6755

**China - Beijing**  
Tel: 86-10-8569-7000  
Fax: 86-10-8528-2104

**China - Chengdu**  
Tel: 86-28-8665-5511  
Fax: 86-28-8665-7889

**China - Chongqing**  
Tel: 86-23-8980-9588  
Fax: 86-23-8980-9500

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

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

**China - Hangzhou**  
Tel: 86-571-8792-8115  
Fax: 86-571-8792-8116

**China - Hong Kong SAR**  
Tel: 852-2943-5100  
Fax: 852-2401-3431

**China - Nanjing**  
Tel: 86-25-8473-2460  
Fax: 86-25-8473-2470

**China - Qingdao**  
Tel: 86-532-8502-7355  
Fax: 86-532-8502-7205

**China - Shanghai**  
Tel: 86-21-3326-8000  
Fax: 86-21-3326-8021

**China - Shenyang**  
Tel: 86-24-2334-2829  
Fax: 86-24-2334-2393

**China - Shenzhen**  
Tel: 86-755-8864-2200  
Fax: 86-755-8203-1760

**China - Wuhan**  
Tel: 86-27-5980-5300  
Fax: 86-27-5980-5118

**China - Xian**  
Tel: 86-29-8833-7252  
Fax: 86-29-8833-7256

### ASIA/PACIFIC

**China - Xiamen**  
Tel: 86-592-2388138  
Fax: 86-592-2388130

**China - Zhuhai**  
Tel: 86-756-3210040  
Fax: 86-756-3210049

**India - Bangalore**  
Tel: 91-80-3090-4444  
Fax: 91-80-3090-4123

**India - New Delhi**  
Tel: 91-11-4160-8631  
Fax: 91-11-4160-8632

**India - Pune**  
Tel: 91-20-3019-1500

**Japan - Osaka**  
Tel: 81-6-6152-7160  
Fax: 81-6-6152-9310

**Japan - Tokyo**  
Tel: 81-3-6880-3770  
Fax: 81-3-6880-3771

**Korea - Daegu**  
Tel: 82-53-744-4301  
Fax: 82-53-744-4302

**Korea - Seoul**  
Tel: 82-2-554-7200  
Fax: 82-2-558-5932 or  
82-2-558-5934

**Malaysia - Kuala Lumpur**  
Tel: 60-3-6201-9857  
Fax: 60-3-6201-9859

**Malaysia - Penang**  
Tel: 60-4-227-8870  
Fax: 60-4-227-4068

**Philippines - Manila**  
Tel: 63-2-634-9065  
Fax: 63-2-634-9069

**Singapore**  
Tel: 65-6334-8870  
Fax: 65-6334-8850

**Taiwan - Hsin Chu**  
Tel: 886-3-5778-366  
Fax: 886-3-5770-955

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

**Taiwan - Taipei**  
Tel: 886-2-2508-8600  
Fax: 886-2-2508-0102

**Thailand - Bangkok**  
Tel: 66-2-694-1351  
Fax: 66-2-694-1350

### EUROPE

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

**Denmark - Copenhagen**  
Tel: 45-4450-2828  
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

**France - Saint Cloud**  
Tel: 33-1-30-60-70-00

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

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

**Germany - Heilbronn**  
Tel: 49-7131-67-3636

**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: 47-7289-7561

**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

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Microchip:

[DSC1103AI2-100.0000](#) [DSC1103AI5-125.0000](#) [DSC1103AI5-156.2500](#) [DSC1103BE1-075.0000T](#) [DSC1103CE1-200.0000](#) [DSC1103BI2-100.0000](#) [DSC1123CI1-156.2500](#) [DSC1123CI2-150.0000T](#) [DSC1123DI2-155.5200T](#) [DSC1123DI2-200.0000T](#) [DSC1123DI2-156.2500T](#) [DSC1123DI2-212.5000T](#) [DSC1123AI1-120.0000](#) [DSC1123AI1-120.0000T](#) [DSC1123CE1-156.2500](#) [DSC1123CE1-200.0000T](#) [DSC1103AI2-100.0000T](#) [DSC1103BI1-120.0000](#) [DSC1103CI1-200.0000](#) [DSC1123CI2-148.5000T](#) [DSC1123CI2-156.2500T](#) [DSC1123AE2-200.0000](#) [DSC1123AE2-125.0000](#) [DSC1123BI5-148.3516](#) [DSC1123DI2-100.0000](#) [DSC1123AI1-150.0000](#) [DSC1123DI2-100.0000T](#) [DSC1123AI2-120.0000](#) [DSC1123CI2-156.2500](#) [DSC1123BI2-125.0000](#) [DSC1123CE1-050.0000](#) [DSC1123AI1-150.0000T](#) [DSC1123AI2-148.5000](#) [DSC1123CI2-150.0000](#) [DSC1103BE1-075.0000](#) [DSC1103CE1-156.2500](#) [DSC1123AI1-200.0000](#) [DSC1123AI2-100.0000](#) [DSC1123BI5-034.0000](#) [DSC1123CI2-100.0000](#) [DSC1123BL1-125.0000T](#) [DSC1103CI1-200.0000T](#) [DSC1103CI2-100.0000](#) [DSC1123AE1-125.0000T](#) [DSC1123AE1-156.2500T](#) [DSC1123AI2-148.5000T](#) [DSC1123AE2-200.0000T](#) [DSC1123AI2-090.0000](#) [DSC1123DI5-200.0000](#) [DSC1123AI2-212.5000T](#) [DSC1123BI2-068.0000](#) [DSC1123BI2-100.0000](#) [DSC1103BI2-125.0000](#) [DSC1103CE1-212.5000](#) [DSC1123AE2-050.0000](#) [DSC1123AE2-300.0000](#) [DSC1123AI1-100.0000](#) [DSC1123AE2-100.0000](#) [DSC1123AI2-100.0000T](#) [DSC1123AE1-150.0000T](#) [DSC1123AI2-150.0000](#) [DSC1123BL2-200.0000](#) [DSC1123CE1-156.2500T](#) [DSC1123CI2-050.0000](#) [DSC1123BI2-100.0000T](#) [DSC1123CI5-125.0000](#) [DSC1123AI2-250.0000T](#) [DSC1123BI2-025.0000T](#) [DSC1123BI2-125.0000T](#) [DSC1103CE5-100.0000T](#) [DSC1123CI2-100.0000T](#) [DSC1123CI5-233.2090](#) [DSC1103AI2-200.0000](#) [DSC1103CI5-100.0000](#) [DSC1103AE1-100.0000T](#) [DSC1123BI2-034.0000](#) [DSC1123BI5-148.3516T](#) [DSC1123CI2-125.0000](#) [DSC1123CI2-125.0000T](#) [DSC1123CI2-200.0000](#) [DSC1123CI2-200.0000T](#) [DSC1123BI2-212.5000T](#) [DSC1123AI2-200.0000](#) [DSC1123AI2-200.0000T](#) [DSC1123BI1-100.0000](#) [DSC1123BI1-100.0000T](#) [DSC1123BI2-068.0000T](#) [DSC1123AI2-125.0000](#) [DSC1103CI5-125.0000T](#) [DSC1103BI1-074.2129](#) [DSC1103CI5-106.2500](#) [DSC1123AI1-125.0000](#) [DSC1123AI2-125.0000T](#) [DSC1123AI2-155.5200T](#) [DSC1123AI1-100.0000T](#) [DSC1123AI2-156.2500T](#) [DSC1123BI2-034.0000T](#) [DSC1123BL2-125.0000T](#) [DSC1123CI1-200.0000](#) [DSC1123CI2-025.0000](#)