

DSA12X2/3/4

High Performance Differential MEMS Oscillators for Automotive

Features

- · Automotive AEC-Q100 Qualified
- Any Frequency between 2.5 MHz and 450 MHz
- Supports LVPECL, LVDS, or HCSL Differential Outputs
- Very Low RMS Phase Jitter: <650 fs (typ.)
- Complies with PCIe Gen1/2/3/4/5 Common Clock Spec
- High Stability: ±20 ppm, ±25 ppm, ±50 ppm
- Wide Temperature Range:
 - Automotive Grade 1: –40°C to +125°C (DSA12x3 LVDS Output Only)
 - Automotive Grade 2: -40°C to +105°C
 - Automotive Grade 3: -40°C to +85°C
- · 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 Oscillators
- Supply Range of 2.25V to 3.63V
- Standby, Frequency Select, and Output Enable Functions
- · Lead-Free and RoHS-Compliant

Applications

- · Automotive Infotainment
- Automotive ADAS
- · In-Vehicle Networking, CAN Bus, Ethernet

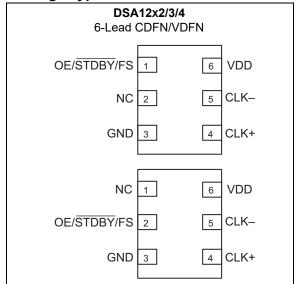
General Description

The DSA12x2/3/4 family of high performance oscillators utilizes the latest generation of silicon MEMS technology that reduces close-in noise and provides 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 automotive applications.

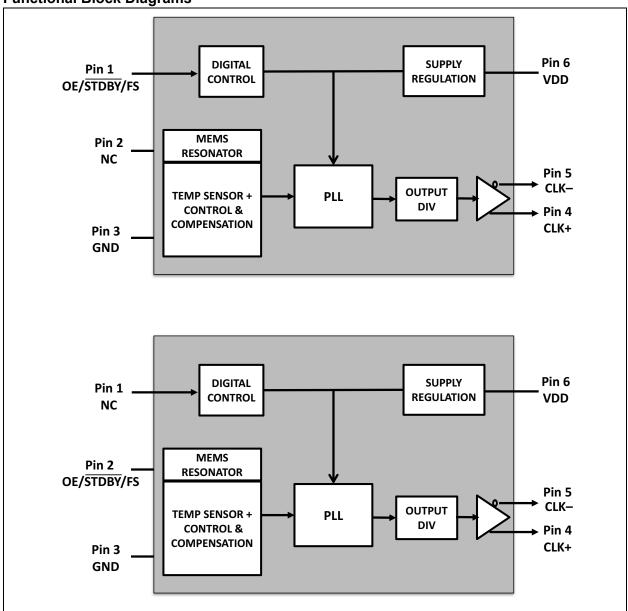
The DSA12x2/3/4 family features a control function on pin 1 or pin 2 that permits either a standby feature (complete power down when $\overline{\text{STDBY}}$ is low), output enable (output is tri-stated with OE low), or a frequency select (choice of two frequencies selected by FS high/low). See the Product Identification System section for detailed information.

All oscillators are available in industry-standard packages, including the small 2.5 mm x 2.0 mm, and are "drop-in" replacements for standard 6-pin LVPECL/LVDS/HCSL crystal oscillators.

Package Types



Functional Block Diagrams



1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings †

Supply Voltage	
Input Voltage	
ESD Protection (HBM)	22
ESD Protection (MM)	
ESD Protection (CDM)	

† 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

Electrical Characteristics: $V_{DD} = 2.5V \pm 10\%$ or $3.3V \pm 10\%$; $T_A = -40^{\circ}C$ to $\pm 105^{\circ}C$, unless noted.

Parameter	Symbol	Min.	Тур.	Max.	Units	Conditions	
Supply Voltage	V_{DD}	2.25	_	3.63	V	Note 1	
		_	50	_		LVPECL, f _{OUT} = 100 MHz	
		_	32	_		LVDS, f _{OUT} = 100 MHz	
Supply Current	I_{DD}	_	40	_	mA	HCSL, f _{OUT} = 100 MHz	
			23	1		Output disabled (tri-state), f _{OUT} = 100 MHz	
Standby Current	I _{STDBY} _		2.5	5	μΑ	Input pin = STDBY = Asserted (V _{DD} = 3.3V)	
		_		±20		Includes frequency variations due	
Frequency Stability	Δf	_		±25	ppm	to initial tolerance, temp., and	
		_		±50		power supply voltage	
Aging	Δf	_		±5	nnm	First year @ 25°C	
Aging	Δι	_	_	±1	ppm	Per year after first year	
Startup Time	t _{SU}	_	5.5	6	ms	From 90% V _{DD} to valid clock output, T = +25°C, Note 2	
Input Logic Levels	V _{IH}	0.75 x V _{DD}	_	_	V	Input logic high	
Imput Logic Levels	V _{IL}		_	0.25 x V _{DD}	V	Input logic low	
Output Disable Time	t _{DA}	_	_	25	ns	Note 3	
Output Enable Time		_	_	6	ms	STDBY	
Output Enable Time	t _{EN}	_		350	ns	OE	
Enable Pull-Up Resistor	_	_	1.5		МΩ	Pull-up resistor on pin 1, Note 4	
LVPECL (DSA12x2)							
Frequency	f_0	2.5		450	MHz	_	
Output Logic Levels	V _{OH}	V _{DD} – 1.145		_	V	$R_L = 50\Omega$	
Output Logic Levels	V _{OL}	_	_	V _{DD} – 1.695	V	11(- 3012	
Peak-to-Peak Output Swing	V_{PP}	_	800		mV	Single-Ended	
Output Transition Time	t _R	_	200	250	ps	20% to 80%, $R_1 = 50\Omega$	
Output Hansidon Hille	t _F	_	250	300	ρo	20% to 60%, KL - 5012	

DSA12X2/3/4

ELECTRICAL CHARACTERISTICS (CONTINUED)

Electrical Characteristics: V_{DD} = 2.5V ±10% or 3.3V±10%; T_A = -40°C to +105°C, unless noted.

Parameter	Symbol	Min.	Тур.	Max.	Units	Conditions	
Output Duty Cycle	SYM	48	_	52	%	Differential	
Period Jitter RMS	J _{PER}	_	2.0	_	ps	f ₀ = 156.25 MHz, 10k cycles	
Period Jitter Peak-to-Peak	J_{PTP}	_	20	_	ps	f ₀ = 156.25 MHz, 10k cycles	
Integrated Phase Noise (Random)	J _{PH}	_	0.65	_	ps _{RMS}	12 kHz to 20 MHz @156.25 MHz	
LVDS Integrated Phase Noise	(DSA12x3)						
Frequency	f0	2.3	_	450	MHz	_	
Output Offset Voltage	Vos	1.15	1.25	1.35	V	R = 100Ω Differential	
Peak-to-Peak Output Swing	V_{PP}	250	350	450	mV	Single-Ended	
Output Transition Time	t _R	120	170	220	ps	20% to 80%, R _L = 100Ω	
Output Duty Cycle	SYM	48	_	52	%	Differential	
Period Jitter RMS	J _{PER}	_	2.5	_	ps	f ₀ = 156.25 MHz, 10k cycles	
Period Jitter Peak-to-Peak	J _{PTP}	_	20	_	ps	f ₀ = 156.25 MHz, 10k cycles	
Period Jitter RMS	J _{PER}	_	3	_	ps	f ₀ = 156.25 MHz, T _A = -40°C to +125°C	
Period Jitter Peak-to-Peak	J_{PTP}	_	25	_	ps	f ₀ = 156.25 MHz, T _A = -40°C to +125°C	
Integrated Phase Noise		_	0.65	_	20	12 kHz to 20 MHz @156.25 MHz T _A = -40°C to +105°C	
(Random)	J _{PH}	_	0.9	_	ps _{RMS}	2 kHz to 20 MHz @156.25 MHz TA = -40°C to +125°C	
HCSL (DSA12x4)							
Frequency	f ₀	2.3	_	450	MHz	_	
Output Logic Levels	V _{OH}	0.64	_		V	R _L = 50Ω	
Output Logic Levels	V_{OL}	_	_	0.1	V	NL - 3022	
Peak-to-Peak Output Swing	V_{PP}	_	750		mV	Single-Ended	
Output Transition Time	t _R	200	260	400	ne	20% to 80%, $R_1 = 50Ω$	
Output Transition Time	t _F	250	370	500	ps	20% to 80%, K _L = 30Ω	
Output Duty Cycle	SYM	48	_	52	%	Differential	
Period Jitter RMS	J_{PER}	_	2	_	ps	f ₀ = 100.00 MHz, 10k cycles	
Period Jitter Peak-to-Peak	J_{PTP}	_	16	_	ps	f ₀ = 100.00 MHz, 10k cycles	
Internated Dhar- Nois-			0.617			12 kHz to 20 MHz @100 MHz	
Integrated Phase Noise (Random)	J_PH		0.460		ps _{RMS}	100 kHz to 20 MHz @100 MHz	
()		_	0.212	-		1.875 MHz to 20 MHz @100 MHz	

ELECTRICAL CHARACTERISTICS (CONTINUED)

Electrical Characteristics: V_{DD} = 2.5V ±10% or 3.3V±10%; T_A = -40°C to +105°C, unless noted.

Parameter	Symbol	Min.	Тур.	Max.	Units	Conditions
Phase Jitter	T _J		23	86	ps _{PP}	PCIe Gen 1.1, $T_J = D_J + 14.069 x$ R_J (BER 10 ⁻¹²), Note 5
	J _{RMS-CCHF}	_	2.230	3.1	ps _{RMS}	PCIe Gen 2.1, 1.5 MHz to Nyquist, Note 5
	J _{RMS-CCLF}	_	0.08	3.0	ps _{RMS}	PCIe Gen 2.1, 10 kHz to1.5 MHz, Note 5
			0.107	1.0		PCIe Gen 3.0, Note 5
	J _{RMS-CC}		0.107	0.30	ps _{RMS}	PCle Gen 4.0, 16 GHz
		_	0.043	0.12		PCIe Gen 5.0, 32 GHz

- Note 1: V_{DD} pin should be filtered with a 0.1 μF capacitor.
 - 2: t_{SU} is the time to 100 ppm stable output frequency after V_{DD} is applied and outputs are enabled.
 - 3: t_{DA}: See the Output Waveform and the Test Circuits sections for more information.
 - 4: Output is enabled if pad is floated (not connected).
 - 5: Jitter limits established by Gen1.1, Gen 2.1, and Gen 3.0 PCle standards.

TEMPERATURE SPECIFICATIONS Note 1

Parameters	Symbol	Min.	Тур.	Max.	Units	Conditions
Temperature Ranges						
Maximum Junction Temperature	T_J	_	_	+150	°C	_
Storage Temperature Range	T _S	-55	_	+150	°C	_
Lead Temperature	_		_	+260	°C	Soldering, 40s

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, θ_{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: DSA120X/1X/2X PIN FUNCTION TABLE

Pin Number	Pin Name	Description
1	OE/STDBY/FS	Control pin: Output enable/standby/frequency select. External 10 k Ω pull up recommended when not actively driven.
2	NC	No connect.
3	GND	Power supply ground.
4	CLK+	Clock output +.
5	CLK-	Clock output –.
6	VDD	Power supply.

TABLE 2-2: DSA123X/4X/5X PIN FUNCTION TABLE

Pin Number	Pin Name	Description
1	NC	No connect.
2	OE/STDBY/FS	Control pin: Output enable/standby/frequency select. External 10 k Ω pull up recommended when not actively driven.
3	GND	Power supply ground.
4	CLK+	Clock output +.
5	CLK-	Clock output –.
6	VDD	Power supply.

3.0 TERMINATION SCHEME

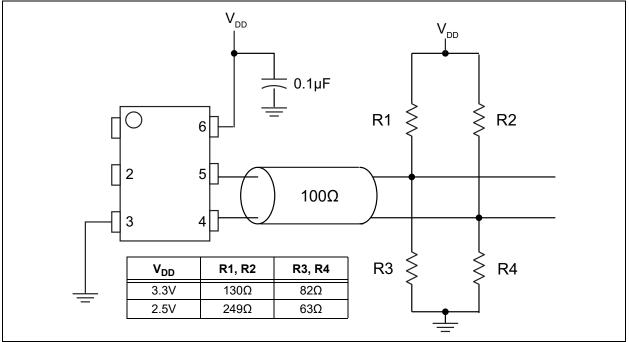


FIGURE 3-1: LVPECL Termination (DSA12x2).

In Figure 3-1, Thevenin termination for 3.3V operation. Values will differ for V_{DD} = 2.5V.

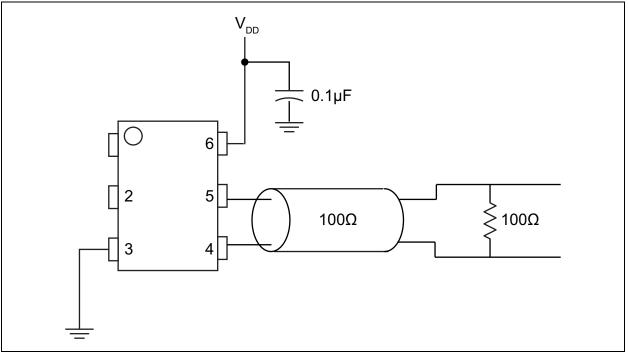


FIGURE 3-2: LVDS Termination (DSA12x3).

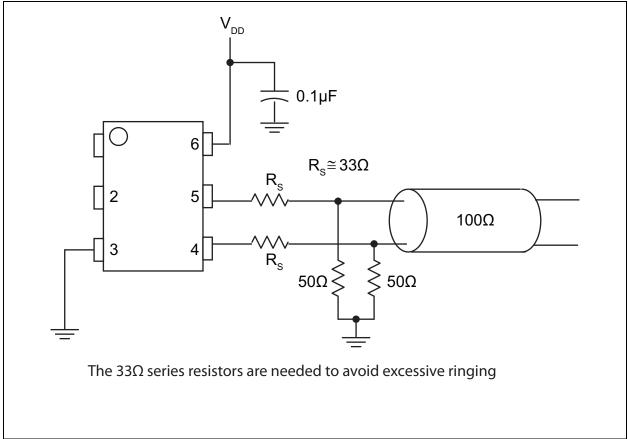


FIGURE 3-3: HCSL Termination (DSA12x4).

4.0 OUTPUT WAVEFORM

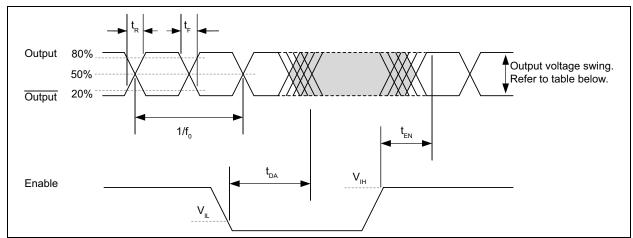


FIGURE 4-1: LVPECL, LVDS, and HCSL Output Waveform.

TABLE 4-1: OUTPUT VOLTAGE SWING BY LOGIC TYPE

Output Logic Protocol	Typical Peak-to-Peak Output Swing
LVPECL	830 mV
LVDS	350 mV
HCSL	675 mV

5.0 TEST CIRCUITS

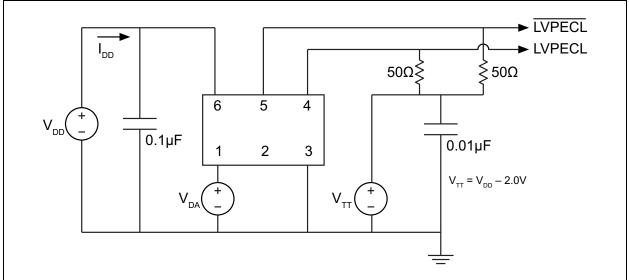


FIGURE 5-1: LVPECL Test Circuit.

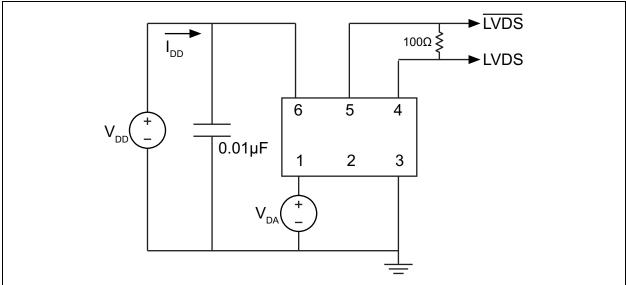


FIGURE 5-2: LVDS Test Circuit.

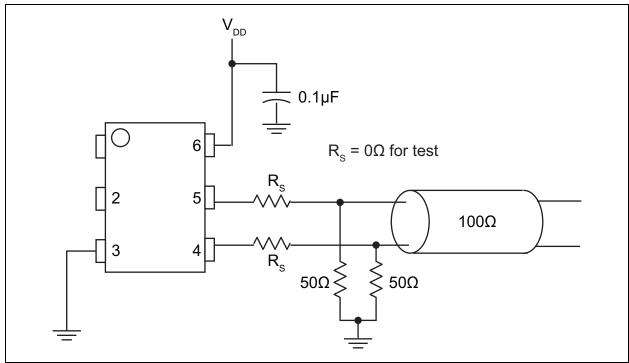


FIGURE 5-3: HCSL Test Circuit.

6.0 SOLDER REFLOW PROFILE

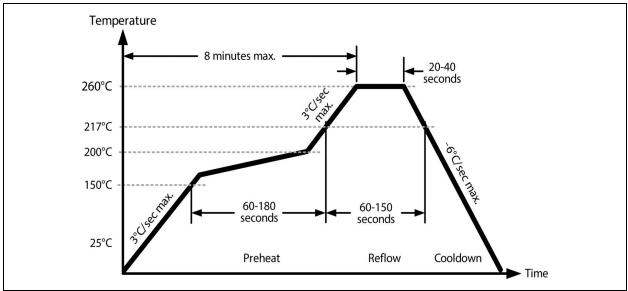


FIGURE 6-1: Solder Reflow Profile.

TABLE 6-1: SOLDER REFLOW

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 to 180 sec.					
Time Maintained above 217°C	60 to 150 sec.					
Peak Temperature	255°C to 260°C					
Time within 5°C of Actual Peak	20 to 40 sec.					
Ramp-Down Rate	−6°C/sec. max.					
Time 25°C to Peak Temperature	8 minutes max.					

7.0 BOARD LAYOUT (RECOMMENDED)

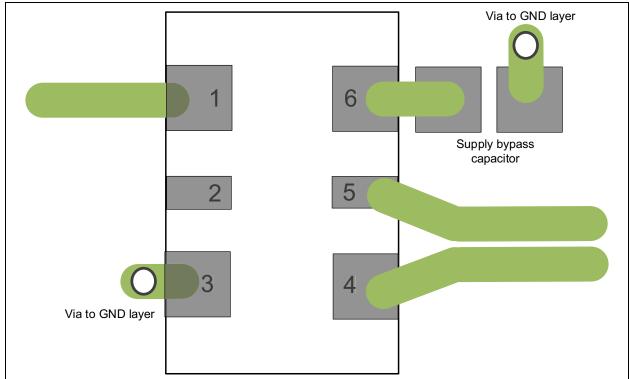


FIGURE 7-1: DSA12x2/3/4 Recommended Board Layout.

8.0 PHASE NOISE

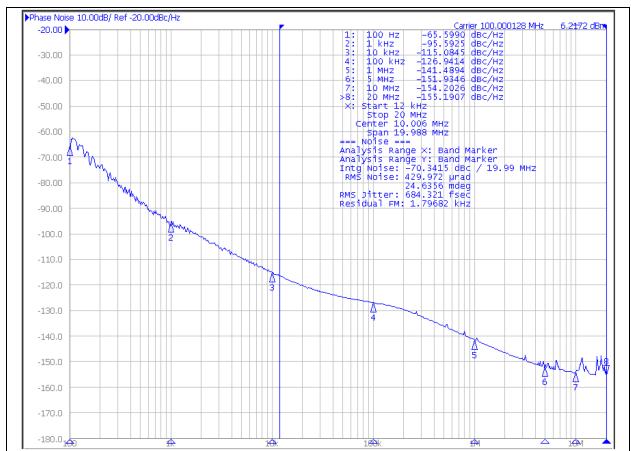


FIGURE 8-1: DSA12x4 Phase Noise at 100 MHz.

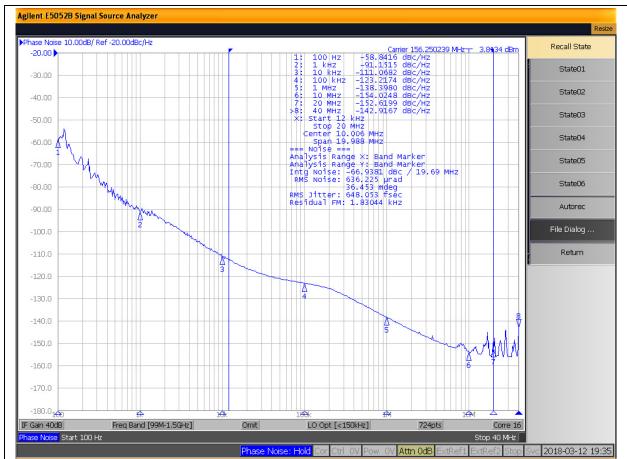


FIGURE 8-2: DSA12x2 Phase Noise at 156.25 MHz.

9.0 PACKAGING INFORMATION

9.1 **Package Marking Information**

6-Pin CDFN/VDFN*

XXXXXXX **XXXYYWW** 0SSS

Example

75M00000 **DCP1723** 0421

Legend: XX...X Product code or customer-specific information Year code (last digit of calendar year)

ΥY Year code (last 2 digits of calendar year) WW Week code (week of January 1 is week '01')

SSS Alphanumeric traceability code

Pb-free JEDEC® designator for Matte Tin (Sn) (e3)

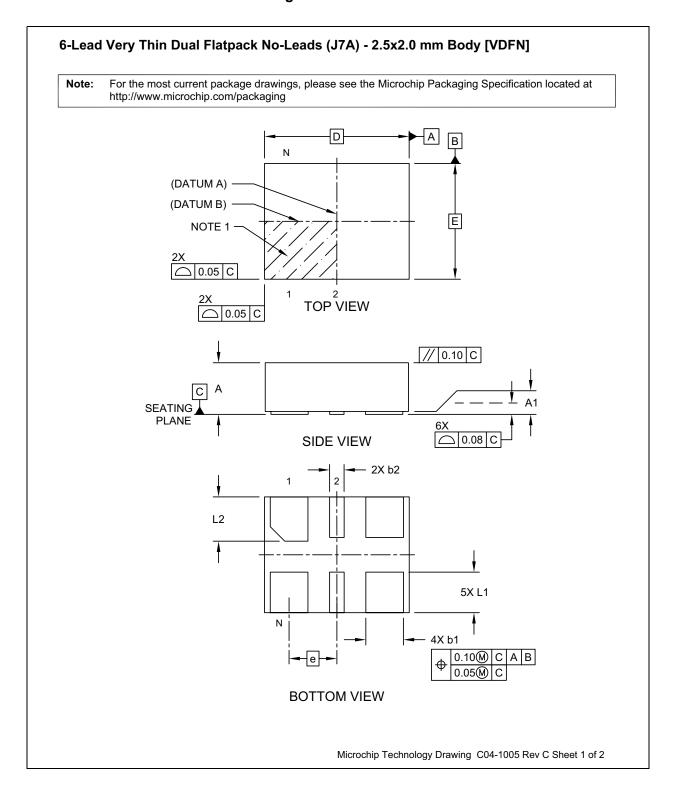
This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package.

•, ▲, ▼ Pin one index is identified by a dot, delta up, or delta down (triangle mark).

In the event the full Microchip part number cannot be marked on one line, it will Note: 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.

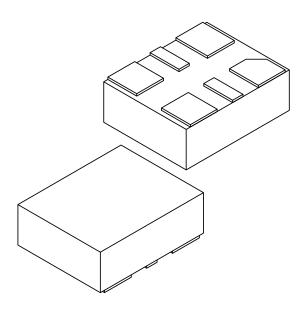
Underbar (_) and/or Overbar (¯) symbol may not be to scale.

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



	Units	MILLIMETERS			
Dimension	Limits	MIN	NOM	MAX	
Number of Terminals	N		6		
Pitch	е		0.825 BSC		
Overall Height	Α	0.80 0.85 0.90			
Standoff	A1	0.00 0.02 0.05			
Overall Length	D	2.50 BSC			
Overall Width	Е	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 $\,$

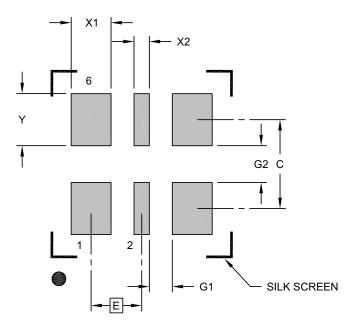
 ${\it BSC: Basic \ Dimension. \ Theoretically \ exact \ value \ shown \ without \ tolerances.}$

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]

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



RECOMMENDED LAND PATTERN

	Units			S
Dimension	Limits	MIN	NOM	MAX
Contact Pitch	Е	E 0.825 BSC		
Contact Pad Width (X4)	X1			0.65
Contact Pad Width (X2)	X2			0.25
Contact Pad Length (X6)	Υ			0.85
Contact Pad Spacing	С		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.
- 2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

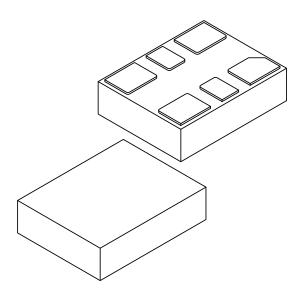
Microchip Technology Drawing C04-3005 Rev C

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 D Ν (DATUM A) (DATUM B) NOTE 1 ○ 0.05 C **TOP VIEW** 0.05 0.10 C **SEATING PLANE** 0.08 SIDE VIEW 2X b2 NOTE 1 4X b1 L1 •|e|• 0.07M C A B 0.05M C **BOTTOM VIEW** 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		е	1.05 BSC				
Overall Height		Α	0.80 0.85 0.90				
Standoff		A1	0.00	0.02	0.05		
Overall Length		D	3.20 BSC				
Overall Width		Е		2.50 BSC			
Terminal Width		b1	0.85	0.90	0.95		
Terminal Width		b2	0.45 0.50 0.55				
Terminal Length		L	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.

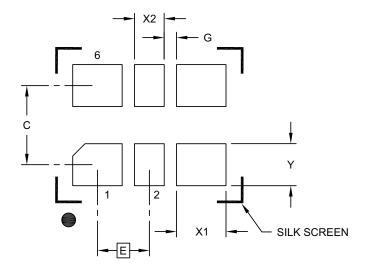
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1007A Sheet 2 of 2

Note:

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

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



RECOMMENDED LAND PATTERN

	MILLIMETERS			
Dimension	MIN	NOM	MAX	
Contact Pitch	Е	1.05 BSC		
Contact Pad Spacing	С		1.60	
Contact Pad Width (X4)	X1			1.00
Contact Pad Width (X2)	X2			0.60
Contact Pad Length (X6)	Υ			0.85
Space Between Contacts (X4)	G1	0.25		

Notes:

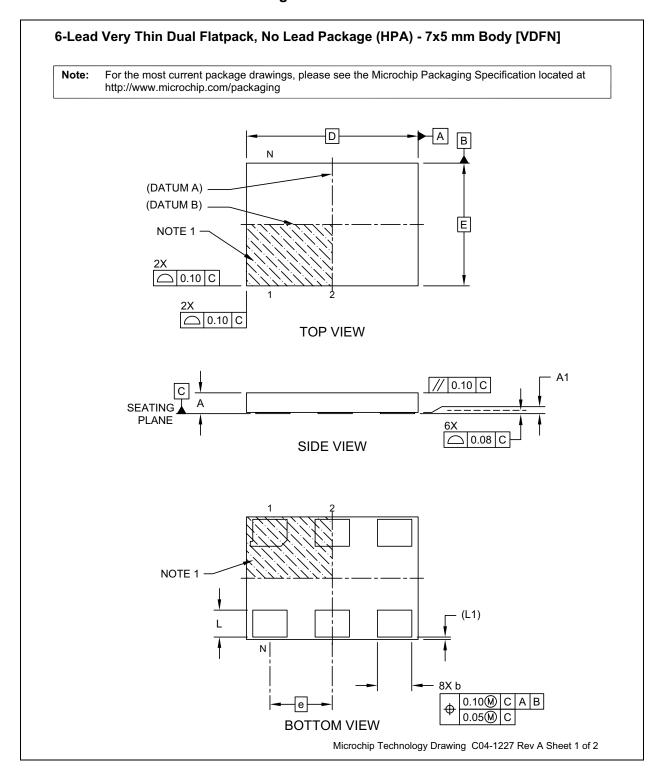
Dimensioning and tolerancing per ASME Y14.5M
 BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-3007A

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

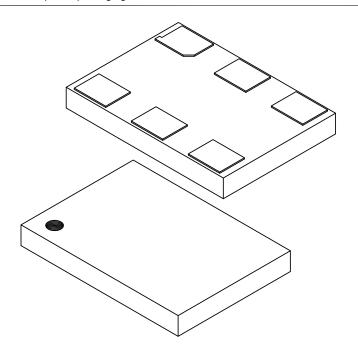
TITLE 6 LEAD CDFN 5.0x3.2mm COL PACKAGE OUTLINE & RECOMMENDED LAND PATTERN DRAWING # | CDFN5032-6LD-PL-1 UNIT MM 3.20±.05 3.20±.05 Pin #1 5.00±.05 $0.64 \pm .05$ 1.00±.10 1.20 REF Top View Bottom View 0.85±.05 Side View Recommended Land Pattern NOTE: * Power Supply Decoupling Capacitor is required in Recommended Land Pattern. 2. Green shaded rectangles in Recommended Land Pattern are solder stencil opening. Red circles in Recommended Land Pattern are thermal VIA. 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 Dual Flatpack, No Lead Package (HPA) - 7x5 mm Body [VDFN]

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



	U	nits	MILLIMETERS			
D	imension Lir	nits	MIN	NOM	MAX	
Number of Terminals		N	6			
Pitch		е	2.54 BSC			
Overall Height		Α	0.80	0.85	0.90	
Standoff	A	A1	0.00	0.02	0.05	
Overall Length		D	7.00 BSC			
Overall Width		E	5.00 BSC			
Terminal Width		b	1.30	1.40	1.50	
Terminal Length		L	1.00	1.10	1.20	
Pullback	L	_1	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

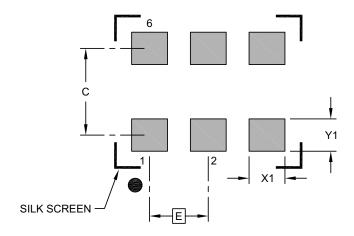
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Microchip Technology Drawing C04-1227 Rev A Sheet 2 of 2

6-Lead Very Thin Dual Flatpack, No Lead Package (HPA) - 7x5 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

	MILLIMETERS			
Dimension	MIN	NOM	MAX	
Contact Pitch	E		2.54 BSC	
Contact Pad Spacing	С		3.90	
Contact Pad Width (X6)	X1			1.55
Contact Pad Length (X6)	Y1			1.40

Notes:

- 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 C04-3227 Rev A

APPENDIX A: REVISION HISTORY

Revision A (June 2020)

 Initial release of DSA12x2/3/4 as Microchip data sheet DS20006378A.

Revision B (March 2021)

- Updated Phase Jitter maximum values for J_{RMS-CC} in the Electrical Characteristics table and added a sixth note.
- Updated package drawing for 6-Lead VDFN 2.5 mm x 2.0 mm Package Outline and Recommended Land Pattern.
- Updated Figure 3-1.

Revision C (March 2021)

Removed Note 6 from the Electrical Characteristics table.

DSA12X2/3/4

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 Device	X Control Pin	X Output Format	X Package	X Temperature	X Freq. Stability	-XXXXXXXX Output Frequency	X Media Type	XXX Automotive Suffix
Device:	DS	A12:	High Performance Differential MEMS Oscillators for Automotive		MS	a) DSA1202NI1-25M00000TVAO: Pin 1 STDBY with		

Pin 1 STDBY with Pull-up **Control Pin:**

Pin 1 Frequency Select with Pull-up 2

Pin 1 OE with Pull-up Pin 2 STDBY with Pull-up 3 = 4 =

Pin 2 Frequency Select with Pull-up

Pin 2 OE with Pull-up

Output Format: 2 **LVPECL** 3 = LVDS

4 **HCSL**

Package: 7 mm x 5 mm 6-Lead VDFN

В 5 mm x 3.2 mm 6-Lead CDFN С 3.2 mm x 2.5 mm 6-Lead VDFN D 2.5 mm x 2 mm 6-Lead VDFN

-40°C to +125°C (Grade 1) Temperature:

-40°C to +105°C (Grade 2) -40°C to +85°C (Grade 3)

Frequency ±50 ppm Stability: 2 ±25 ppm ±20 ppm

Output Frequency: xMxxxxxx = <10 MHz xxMxxxxx= <100 MHz

xxxMxxxx= >100 MHz

with Frequency Select CCCCC=

PROG = TimeFlash

Media Type: <black>= Bulk

1,000/Reel = = 3.000/Reel

Automotive Suffix: VXX = Automotive Suffix in which "XX" is assigned by

Microchip. Default value is "AO" for standard automo-

Please visit the Microchip ClockWorks Configurator® website to configure the part number for customized frequency select settings.

http://clockworks.microchip.com/timing

- -20°C to +85°C, ±50 ppm, 25 MHz Output Frequency, 1,000/Reel, Standard Automotive
- b) DSA1243CL3-C0013VAO: Pin 2 Frequency Select with Pull-up, LVDS Output, 3.2x2.5 VDFN, -40°C to +105°C, ±20 ppm, Multiple Output Frequency, Bulk, Standard Automotive
- c) DSA124BI2-19M50000BVAO: Pin 1 OE with Pull-up, HCSL Output, 5x3.2 CDFN, -40°C to +85°C, ±25 ppm, 19.5 MHz Output Frequency, 3,000/Reel, Standard Automotive
- d) DSA1232DL3-55M82000TVAO: Pin 2 STDBY with Pull-up, LVPECL Output, 2.5x2 VDFN, -40°C to +105°C, ±20 ppm, 55.82 MHz Output Frequency, 1,000/Reel, Standard Automotive
- e) DSA1213NI1-C0014BVAO: Pin 1 Frequency Select with Pull-up, LVDS Output, 7x5 VDFN, –40°C to +85°C, ±50 ppm, Multiple Output Frequency, 3,000/Reel, Standard Automotive

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.

DSA12X2/3/4

NOTES:

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ISBN: 978-1-5224-7949-9



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