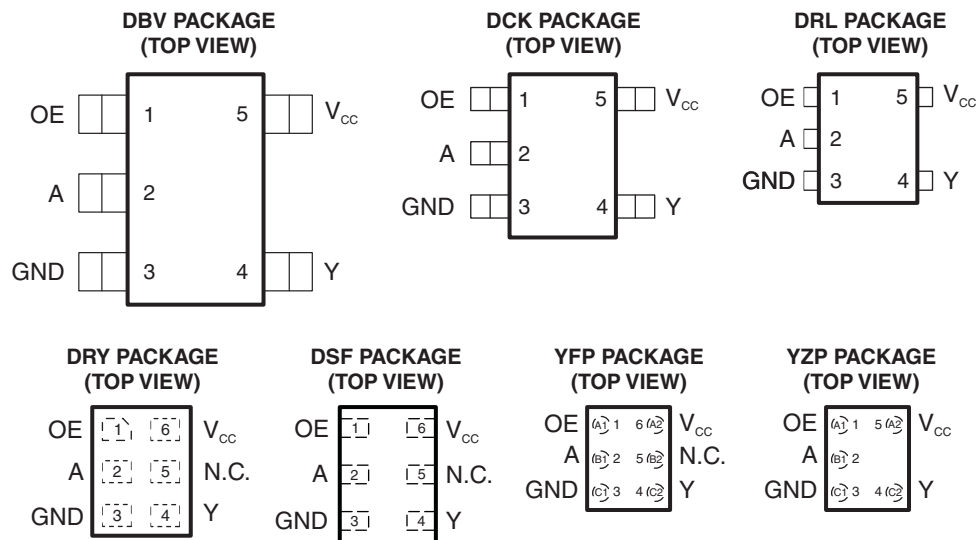


LOW-POWER SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

Check for Samples: [SN74AUP1G126](#)

FEATURES

- Available in the Texas Instruments NanoStar™ Package
- Low Static-Power Consumption ($I_{CC} = 0.9 \mu\text{A Max}$)
- Low Dynamic-Power Consumption ($C_{pd} = 4 \text{ pF Typ at } 3.3 \text{ V}$)
- Low Input Capacitance ($C_i = 1.5 \text{ pF Typ}$)
- Low Noise – Overshoot and Undershoot <math><10\% \text{ of } V_{CC}</math>
- Input-Disable Feature Allows Floating Input Conditions
- I_{off} Supports Partial-Power-Down Mode Operation
- Input Hysteresis Allows Slow Input Transition and Better Switching Noise Immunity at Input
- Wide Operating V_{CC} Range of 0.8 V to 3.6 V
- Optimized for 3.3-V Operation
- 3.6-V I/O Tolerant to Support Mixed-Mode Signal Operation
- $t_{pd} = 4.6 \text{ ns Max at } 3.3 \text{ V}$
- Suitable for Point-to-Point Applications
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Performance Tested Per JESD 22–
 - 2000-V Human-Body Model (A114-B, Class II)
 - 1000-V Charged-Device Model (C101)



N.C. – No internal connection.

See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

The AUP family is TI's premier solution to the industry's low-power needs in battery-powered portable applications. This family ensures a very low static and dynamic power consumption across the entire V_{CC} range of 0.8 V to 3.6 V, resulting in an increased battery life. This product also maintains excellent signal integrity (see [Figure 1](#) and [Figure 2](#)).



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

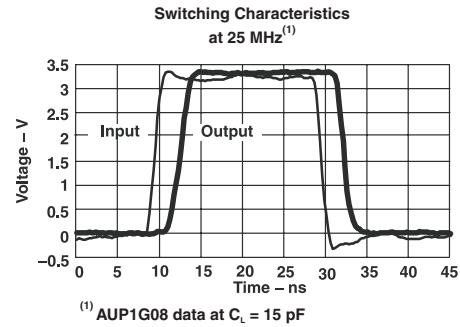
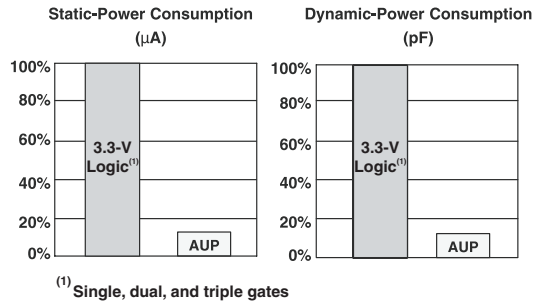


Figure 1. AUP – The Lowest-Power Family

Figure 2. Excellent Signal Integrity

This bus buffer gate is a single line driver with a 3-state output. The output is disabled when the output-enable (OE) input is low. This device has the input-disable feature, which allows floating input signals.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pulldown resistor; the minimum value of the resistor is determined by the current-sourcing capability of the driver.

NanoStar™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

ORDERING INFORMATION⁽¹⁾

T_A	PACKAGE ⁽²⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽³⁾
-40°C to 85°C	NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YFP	Reel of 3000	SN74AUP1G126YFPR	___ HN _
	NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74AUP1G126YZPR	___ HN _
	QFN – DRY	Reel of 5000	SN74AUP1G126DRYR	HN
	µQFN – DSF	Reel of 5000	SN74AUP1G126DSFR	HN
	SOT (SOT-23) – DBV	Reel of 3000	SN74AUP1G126DBVR	H26_
		Reel of 250	SN74AUP1G126DBVT	
	SOT (SC-70) – DCK	Reel of 3000	SN74AUP1G126DCKR	HN_
		Reel of 250	SN74AUP1G126DCKT	
SOT (SOT-553) – DRL	Reel of 4000	SN74AUP1G126DRLR	HN_	

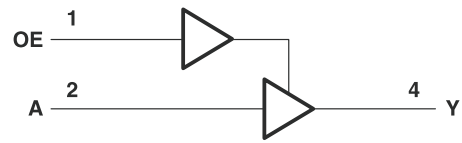
- (1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.
- (2) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
- (3) DBV/DCK/DRL: The actual top-side marking has one additional character that designates the wafer fab/assembly site.
YZP/YZT: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the wafer fab/assembly site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).

FUNCTION TABLE

INPUTS		OUTPUT Y
OE	A	
H	H	H
H	L	L
L	X ⁽¹⁾	Z

(1) Floating inputs allowed

LOGIC DIAGRAM (POSITIVE LOGIC)



ABSOLUTE MAXIMUM RATINGS⁽¹⁾

over operating free-air temperature range (unless otherwise noted)

		MIN	MAX	UNIT
V_{CC}	Supply voltage range	-0.5	4.6	V
V_I	Input voltage range ⁽²⁾	-0.5	4.6	V
V_O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	-0.5	4.6	V
V_O	Output voltage range in the high or low state ⁽²⁾	-0.5	$V_{CC} + 0.5$	V
I_{IK}	Input clamp current	$V_I < 0$	-50	mA
I_{OK}	Output clamp current	$V_O < 0$	-50	mA
I_O	Continuous output current		±20	mA
	Continuous current through V_{CC} or GND		±50	mA
θ_{JA}	Package thermal impedance ⁽³⁾	DBV package	206	°C/W
		DCK package	252	
		DRL package	142	
		DSF package	TBD	
		DRY package	234	
		YFP/YZP/YZT package	132	
T_{stg}	Storage temperature range	-65	150	°C

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The package thermal impedance is calculated in accordance with JESD 51-7.

RECOMMENDED OPERATING CONDITIONS⁽¹⁾

		MIN	MAX	UNIT	
V_{CC}	Supply voltage	0.8	3.6	V	
V_{IH}	High-level input voltage	$V_{CC} = 0.8\text{ V}$	V_{CC}	3.6	
		$V_{CC} = 1.1\text{ V to }1.95\text{ V}$	$0.65 \times V_{CC}$	3.6	
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	1.6	3.6	
		$V_{CC} = 3\text{ V to }3.6\text{ V}$	2	3.6	
V_{IL}	Low-level input voltage	$V_{CC} = 0.8\text{ V}$	0	V	
		$V_{CC} = 1.1\text{ V to }1.95\text{ V}$	0 $0.35 \times V_{CC}$		
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	0		0.7
		$V_{CC} = 3\text{ V to }3.6\text{ V}$	0		0.9
V_O	Output voltage	Active state	0	V_{CC}	
		3-state	0	3.6	
I_{OH}	High-level output current	$V_{CC} = 0.8\text{ V}$		-20	μA
		$V_{CC} = 1.1\text{ V}$		-1.1	mA
		$V_{CC} = 1.4\text{ V}$		-1.7	
		$V_{CC} = 1.65\text{ V}$		-1.9	
		$V_{CC} = 2.3\text{ V}$		-3.1	
		$V_{CC} = 3\text{ V}$		-4	
I_{OL}	Low-level output current	$V_{CC} = 0.8\text{ V}$		20	μA
		$V_{CC} = 1.1\text{ V}$		1.1	mA
		$V_{CC} = 1.4\text{ V}$		1.7	
		$V_{CC} = 1.65\text{ V}$		1.9	
		$V_{CC} = 2.3\text{ V}$		3.1	
		$V_{CC} = 3\text{ V}$		4	
$\Delta t/\Delta v$	Input transition rise or fall rate	$V_{CC} = 0.8\text{ V to }3.6\text{ V}$		200	ns/V
T_A	Operating free-air temperature	-40	85	°C	

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.

ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			T _A = –40°C to 85°C		UNIT
			MIN	TYP	MAX	MIN	MAX	
V _{OL}	I _{OH} = –20 μA	0.8 V to 3.6 V	V _{CC} – 0.1			V _{CC} – 0.1		V
	I _{OH} = –1.1 mA	1.1 V	0.75 × V _{CC}			0.7 × V _{CC}		
	I _{OH} = –1.7 mA	1.4 V	1.11			1.03		
	I _{OH} = –1.9 mA	1.65 V	1.32			1.3		
	I _{OH} = –2.3 mA	2.3 V	2.05			1.97		
	I _{OH} = –3.1 mA		1.9			1.85		
	I _{OH} = –2.7 mA	3 V	2.72			2.67		
	I _{OH} = –4 mA		2.6			2.55		
V _{OL}	I _{OL} = 20 μA	0.8 V to 3.6 V				0.1	0.1	V
	I _{OL} = 1.1 mA	1.1 V	0.3 × V _{CC}			0.3 × V _{CC}		
	I _{OL} = 1.7 mA	1.4 V	0.31			0.37		
	I _{OL} = 1.9 mA	1.65 V	0.31			0.35		
	I _{OL} = 2.3 mA	2.3 V	0.31			0.33		
	I _{OL} = 3.1 mA		0.44			0.45		
	I _{OL} = 2.7 mA	3 V	0.31			0.33		
	I _{OL} = 4 mA		0.44			0.45		
I _I	A or OE input	V _I = GND to 3.6 V	0 V to 3.6 V			0.1	0.5	μA
I _{off}		V _I or V _O = 0 V to 3.6 V	0 V			0.2	0.6	μA
ΔI _{off}		V _I or V _O = 0 V to 3.6 V	0 V to 0.2 V			0.2	0.6	μA
I _{OZ}		V _O = V _{CC} or GND	3.6 V				0.5	μA
I _{CC}		V _I = GND or (V _{CC} to 3.6 V), OE = GND, I _O = 0	0.8 V to 3.6 V			0.5	0.9	μA
ΔI _{CC}	A input	V _I = V _{CC} – 0.6 V ⁽¹⁾ , I _O = 0	3.3 V			40	50	μA
	OE input					110	120	
	All inputs	V _I = GND to 3.6 V, OE = V _{CC} ⁽²⁾	0.8 V to 3.6 V			0	0	
C _i		V _I = V _{CC} or GND	0 V			1.5		pF
			3.6 V			1.5		
C _O		V _O = V _{CC} or GND	3.6 V			3		pF

(1) One input at V_{CC} – 0.6 V, other input at V_{CC} or GND

(2) To show I_{CC} is very low when the input-disable feature is enabled

SWITCHING CHARACTERISTICS

 over recommended operating free-air temperature range, $C_L = 5$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C}$ to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A	Y	0.8 V		18.1				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	4.3	7.4	12.6	2.7	15.3	
			$1.5\text{ V} \pm 0.1\text{ V}$	3.3	5.2	8.5	1	10.2	
			$1.8\text{ V} \pm 0.15\text{ V}$	2.6	4.1	6.8	1.3	8.3	
			$2.5\text{ V} \pm 0.2\text{ V}$	2	2.9	4.7	1.1	5.8	
			$3.3\text{ V} \pm 0.3\text{ V}$	1.7	2.4	3.8	1	4.6	
t_{en}	OE	Y	0.8 V		19.1				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	5.1	9.3	15.9	3.6	19.2	
			$1.5\text{ V} \pm 0.1\text{ V}$	4.1	6.6	10.5	2.5	12.7	
			$1.8\text{ V} \pm 0.15\text{ V}$	3.2	5.3	8.7	2.1	10.3	
			$2.5\text{ V} \pm 0.2\text{ V}$	2.5	3.8	6	1.6	7.2	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.1	3.2	4.9	1.4	5.9	
t_{dis}	OE	Y	0.8 V		12.1				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	2.4	4.1	6.9	2.2	7.7	
			$1.5\text{ V} \pm 0.1\text{ V}$	1.8	2.9	4.5	1.7	5.1	
			$1.8\text{ V} \pm 0.15\text{ V}$	1	2.9	4.3	1.5	4.7	
			$2.5\text{ V} \pm 0.2\text{ V}$	1	1.8	2.7	1	3.3	
			$3.3\text{ V} \pm 0.3\text{ V}$	1.2	2.2	3.2	1.1	4	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $C_L = 10$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C}$ to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A or B	Y	0.8 V		20.5	13.7			ns
			$1.2\text{ V} \pm 0.1\text{ V}$	4.6	8.4	9.3	3.6	16.6	
			$1.5\text{ V} \pm 0.1\text{ V}$	3.5	5.9	7.5	2.4	11.1	
			$1.8\text{ V} \pm 0.15\text{ V}$	3.9	4.7	5.3	1.3	9.1	
			$2.5\text{ V} \pm 0.2\text{ V}$	2.3	3.4	4.3	1.6	6.4	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.1	2.8		1.4	5.2	
t_{en}	OE	Y	0.8 V		21.8	16.8			ns
			$1.2\text{ V} \pm 0.1\text{ V}$	4.9	10.2	11.2	4.4	20.2	
			$1.5\text{ V} \pm 0.1\text{ V}$	3.9	7.3	9.2	3.3	13.5	
			$1.8\text{ V} \pm 0.15\text{ V}$	3.4	5.8	6.4	2.7	11	
			$2.5\text{ V} \pm 0.2\text{ V}$	2.5	4.3	5.4	2.1	7.8	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.1	3.7		1.9	6.4	
t_{dis}	OE	Y	0.8 V		13				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	3.8	6.6	11.7	1.2	14	
			$1.5\text{ V} \pm 0.1\text{ V}$	2.2	4.7	7.9	1.3	9.3	
			$1.8\text{ V} \pm 0.15\text{ V}$	2.4	4.4	6.4	2.2	7.5	
			$2.5\text{ V} \pm 0.2\text{ V}$	1.3	3.1	4.9	1.2	5.4	
			$3.3\text{ V} \pm 0.3\text{ V}$	1.9	3.4	5	1.9	5.6	

SWITCHING CHARACTERISTICS

 over recommended operating free-air temperature range, $C_L = 15$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C}$ to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A or B	Y	0.8 V	22.5					ns
			$1.2\text{ V} \pm 0.1\text{ V}$	5.8	9.3	15.1	4.3	17.9	
			$1.5\text{ V} \pm 0.1\text{ V}$	4.4	6.6	10.2	3	12.1	
			$1.8\text{ V} \pm 0.15\text{ V}$	3.5	5.3	8.3	2.3	9.9	
			$2.5\text{ V} \pm 0.2\text{ V}$	2.7	3.9	5.8	1.9	7	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.4	3.2	4.7	1.8	5.7	
t_{en}	OE	Y	0.8 V	25.2					ns
			$1.2\text{ V} \pm 0.1\text{ V}$	7	11.3	18.1	5.4	21.4	
			$1.5\text{ V} \pm 0.1\text{ V}$	5.5	8.1	12.2	4.1	14.5	
			$1.8\text{ V} \pm 0.15\text{ V}$	4.3	6.5	10.1	3.3	12	
			$2.5\text{ V} \pm 0.2\text{ V}$	3.4	4.8	7.1	2.6	8.4	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.9	4.1	5.9	2.3	6.9	
t_{dis}	OE	Y	0.8 V	14					ns
			$1.2\text{ V} \pm 0.1\text{ V}$	3.7	5.8	8.2	3.3	11	
			$1.5\text{ V} \pm 0.1\text{ V}$	5.5	3.9	5.9	2.1	8	
			$1.8\text{ V} \pm 0.15\text{ V}$	3.3	4.5	6.6	2.9	7.4	
			$2.5\text{ V} \pm 0.2\text{ V}$	2.3	3.2	4.3	1.8	5.1	
			$3.3\text{ V} \pm 0.3\text{ V}$	2.4	4.8	6.2	3.1	6.7	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $C_L = 30$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C}$ to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A or B	Y	0.8 V		29				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	7.4	12	18.7	6.6	21.4	
			$1.5\text{ V} \pm 0.1\text{ V}$	5.7	8.6	12.5	4.9	14.7	
			$1.8\text{ V} \pm 0.15\text{ V}$	4.8	6.9	10.1	3.1	12	
			$2.5\text{ V} \pm 0.2\text{ V}$	3.9	5.1	7.2	3.3	8.7	
			$3.3\text{ V} \pm 0.3\text{ V}$	3.5	4.8	6	3	7	
t_{en}	OE	Y	0.8 V		33.4				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	8.8	14.1	21.8	7.4	25.5	
			$1.5\text{ V} \pm 0.1\text{ V}$	6.9	10.1	14.6	5.6	17.4	
			$1.8\text{ V} \pm 0.15\text{ V}$	5.6	8.1	12	4.7	14.1	
			$2.5\text{ V} \pm 0.2\text{ V}$	4.3	6.1	8.5	3.8	10	
			$3.3\text{ V} \pm 0.3\text{ V}$	3.7	5.2	7.1	3.4	8.3	
t_{dis}	OE	Y	0.8 V		17.7				ns
			$1.2\text{ V} \pm 0.1\text{ V}$	5.8	10	16	3.7	16	
			$1.5\text{ V} \pm 0.1\text{ V}$	5.7	7.7	10.9	1	10.7	
			$1.8\text{ V} \pm 0.15\text{ V}$	4.5	7.7	9.8	4.4	12.5	
			$2.5\text{ V} \pm 0.2\text{ V}$	3.9	5.6	7.4	3.2	9	
			$3.3\text{ V} \pm 0.3\text{ V}$	3.3	8.4	10.7	6.6	10.8	

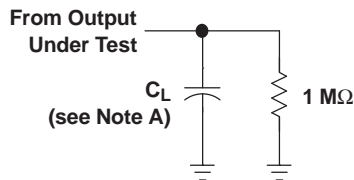
OPERATING CHARACTERISTICS

$T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS	V_{CC}	TYP	UNIT	
C_{pd}	Power dissipation capacitance	Outputs enabled	$f = 10\text{ MHz}$	0.8 V	3.8	pF
				$1.2\text{ V} \pm 0.1\text{ V}$	3.7	
				$1.5\text{ V} \pm 0.1\text{ V}$	3.7	
				$1.8\text{ V} \pm 0.15\text{ V}$	3.7	
				$2.5\text{ V} \pm 0.2\text{ V}$	3.9	
				$3.3\text{ V} \pm 0.3\text{ V}$	4	
	Outputs disable	$f = 10\text{ MHz}$	0.8 V	0		
			$1.2\text{ V} \pm 0.1\text{ V}$	0		
			$1.5\text{ V} \pm 0.1\text{ V}$	0		
			$1.8\text{ V} \pm 0.15\text{ V}$	0		
			$2.5\text{ V} \pm 0.2\text{ V}$	0		
			$2.5\text{ V} \pm 0.2\text{ V}$	0		
			$2.5\text{ V} \pm 0.2\text{ V}$	0		
			$3.3\text{ V} \pm 0.3\text{ V}$	0		

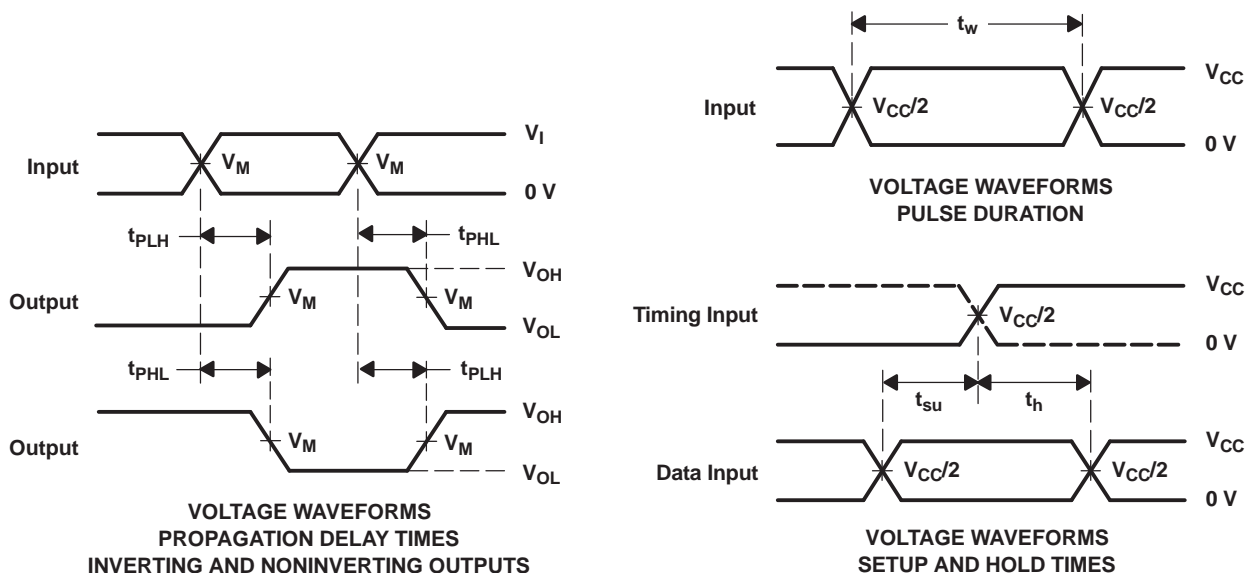
PARAMETER MEASUREMENT INFORMATION

(Propagation Delays, Setup and Hold Times, and Pulse Width)



LOAD CIRCUIT

	$V_{CC} = 0.8\text{ V}$	$V_{CC} = 1.2\text{ V} \pm 0.1\text{ V}$	$V_{CC} = 1.5\text{ V} \pm 0.1\text{ V}$	$V_{CC} = 1.8\text{ V} \pm 0.15\text{ V}$	$V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$	$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$
C_L	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF
V_M	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$
V_I	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}

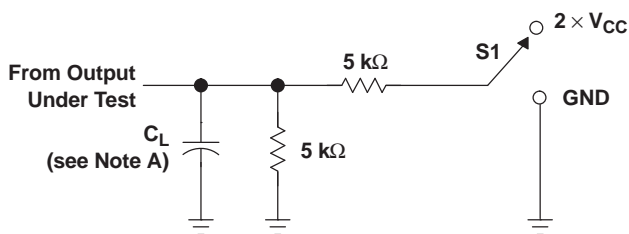


- NOTES:
- A. C_L includes probe and jig capacitance.
 - B. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r/t_f = 3\text{ ns}$.
 - C. The outputs are measured one at a time, with one transition per measurement.
 - D. t_{PLH} and t_{PHL} are the same as t_{pd} .
 - E. All parameters and waveforms are not applicable to all devices.

Figure 3. Load Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION (continued)

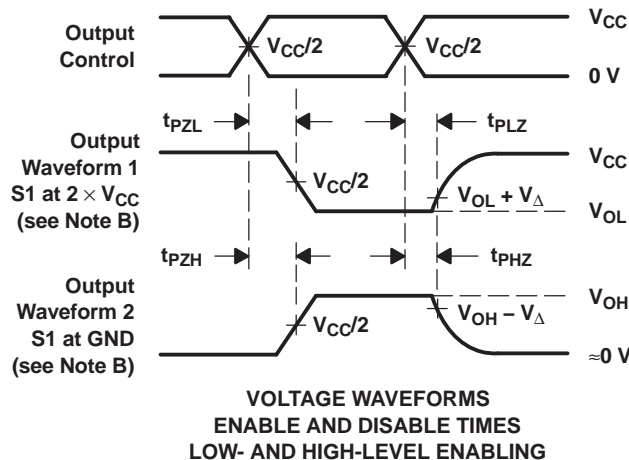
(Enable and Disable Times)



TEST	S1
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	GND

LOAD CIRCUIT

	$V_{CC} = 0.8 \text{ V}$	$V_{CC} = 1.2 \text{ V}$ $\pm 0.1 \text{ V}$	$V_{CC} = 1.5 \text{ V}$ $\pm 0.1 \text{ V}$	$V_{CC} = 1.8 \text{ V}$ $\pm 0.15 \text{ V}$	$V_{CC} = 2.5 \text{ V}$ $\pm 0.2 \text{ V}$	$V_{CC} = 3.3 \text{ V}$ $\pm 0.3 \text{ V}$
C_L	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF
V_M	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$
V_I	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}
V_{Δ}	0.1 V	0.1 V	0.1 V	0.15 V	0.15 V	0.3 V




- NOTES:
- A. C_L includes probe and jig capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 - C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r/t_f = 3 \text{ ns}$.
 - D. The outputs are measured one at a time, with one transition per measurement.
 - E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - F. t_{PZL} and t_{PZH} are the same as t_{en} .
 - G. All parameters and waveforms are not applicable to all devices.

Figure 4. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
74AUP1G126DBVRE4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
74AUP1G126DBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
74AUP1G126DBVTE4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
74AUP1G126DBVTG4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
74AUP1G126DCKRE4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNF ~ HNK ~ HNR)	Samples
74AUP1G126DCKRG4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNF ~ HNK ~ HNR)	Samples
74AUP1G126DCKTE4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNR)	Samples
74AUP1G126DCKTG4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNR)	Samples
74AUP1G126DRLRG4	ACTIVE	SOT	DRL	5	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN7 ~ HNR)	Samples
SN74AUP1G126DBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
SN74AUP1G126DBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	H26R	Samples
SN74AUP1G126DCKR	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNF ~ HNK ~ HNR)	Samples
SN74AUP1G126DCKT	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN5 ~ HNR)	Samples
SN74AUP1G126DRLR	ACTIVE	SOT	DRL	5	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(HN7 ~ HNR)	Samples
SN74AUP1G126DRYR	ACTIVE	SON	DRY	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HN	Samples
SN74AUP1G126DSFR	ACTIVE	SON	DSF	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HN	Samples
SN74AUP1G126YFPR	ACTIVE	DSBGA	YFP	6	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM		(HN2 ~ HNN)	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
SN74AUP1G126YZPR	ACTIVE	DSBGA	YZP	5	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(HN7 ~ HNN)	

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

ACTIVE: Product device recommended for new designs.

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

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

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

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

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

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

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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AUP1G126DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74AUP1G126DBVT	SOT-23	DBV	5	250	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74AUP1G126DCKR	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AUP1G126DCKR	SC70	DCK	5	3000	180.0	9.2	2.3	2.55	1.2	4.0	8.0	Q3
SN74AUP1G126DCKT	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AUP1G126DRLR	SOT	DRL	5	4000	180.0	9.5	1.78	1.78	0.69	4.0	8.0	Q3
SN74AUP1G126DRLR	SOT	DRL	5	4000	180.0	8.4	1.98	1.78	0.69	4.0	8.0	Q3
SN74AUP1G126DRYR	SON	DRY	6	5000	180.0	8.4	1.25	1.6	0.7	4.0	8.0	Q1
SN74AUP1G126DSFR	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74AUP1G126YFPR	DSBGA	YFP	6	3000	178.0	9.2	0.89	1.29	0.62	4.0	8.0	Q1
SN74AUP1G126YZPR	DSBGA	YZP	5	3000	178.0	9.2	1.02	1.52	0.63	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AUP1G126DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74AUP1G126DBVT	SOT-23	DBV	5	250	202.0	201.0	28.0
SN74AUP1G126DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AUP1G126DCKR	SC70	DCK	5	3000	205.0	200.0	33.0
SN74AUP1G126DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74AUP1G126DRLR	SOT	DRL	5	4000	180.0	180.0	30.0
SN74AUP1G126DRLR	SOT	DRL	5	4000	202.0	201.0	28.0
SN74AUP1G126DRYR	SON	DRY	6	5000	202.0	201.0	28.0
SN74AUP1G126DSFR	SON	DSF	6	5000	180.0	180.0	30.0
SN74AUP1G126YFPR	DSBGA	YFP	6	3000	220.0	220.0	35.0
SN74AUP1G126YZPR	DSBGA	YZP	5	3000	220.0	220.0	35.0

DBV (R-PDSO-G5)

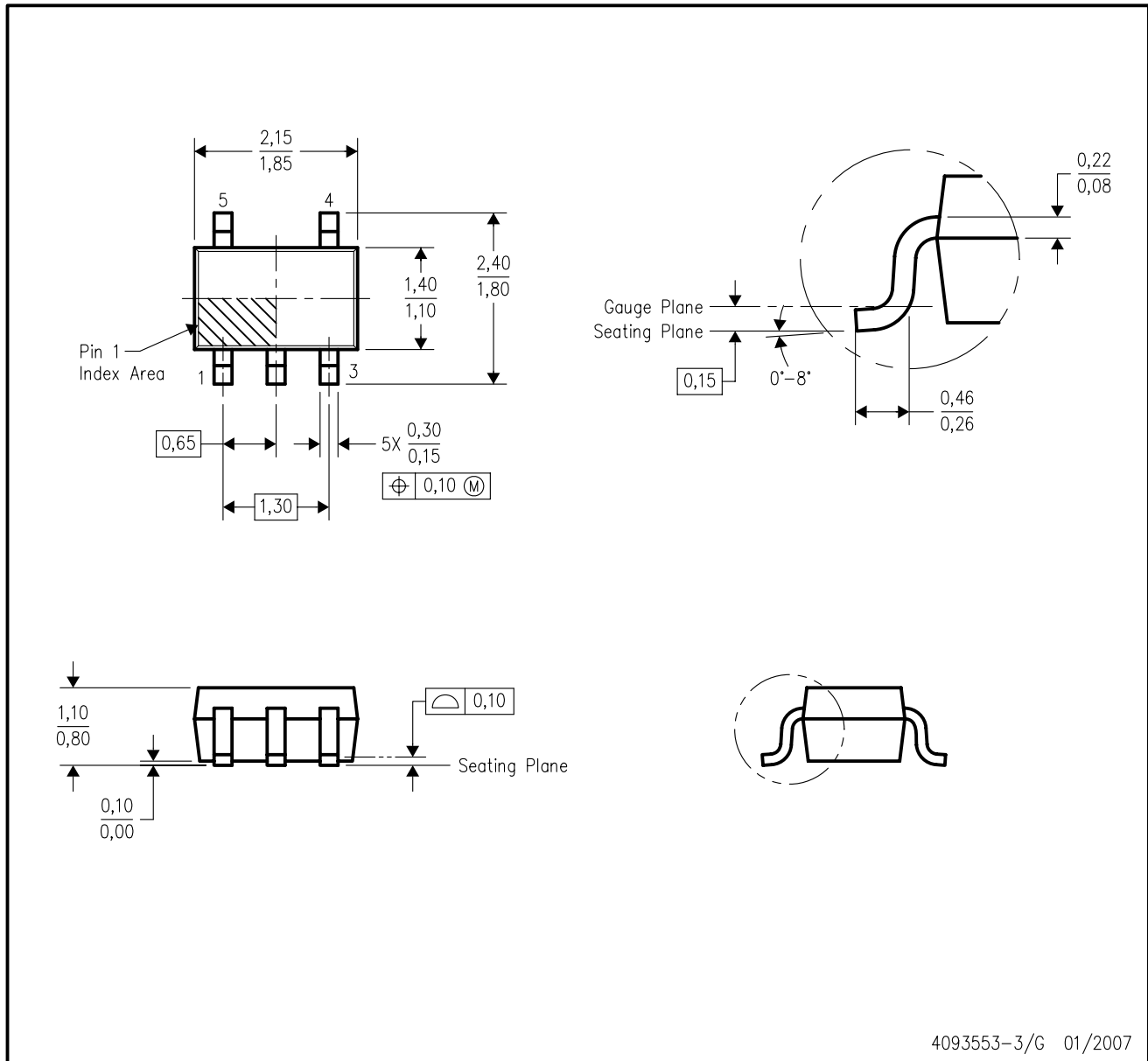
PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
 - D. Publication IPC-7351 is recommended for alternate designs.
 - E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.

DCK (R-PDSO-G5)

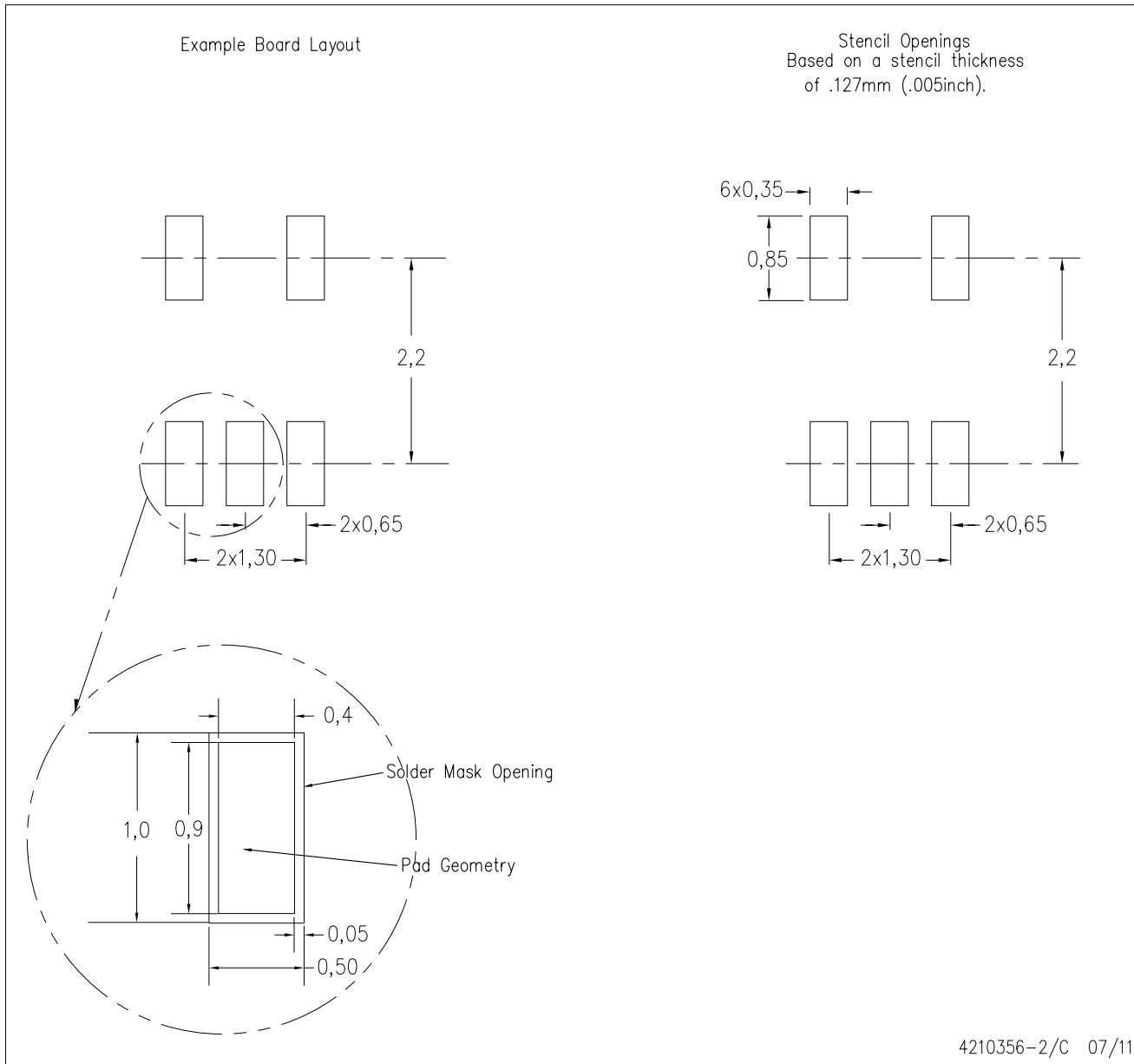
PLASTIC SMALL-OUTLINE PACKAGE



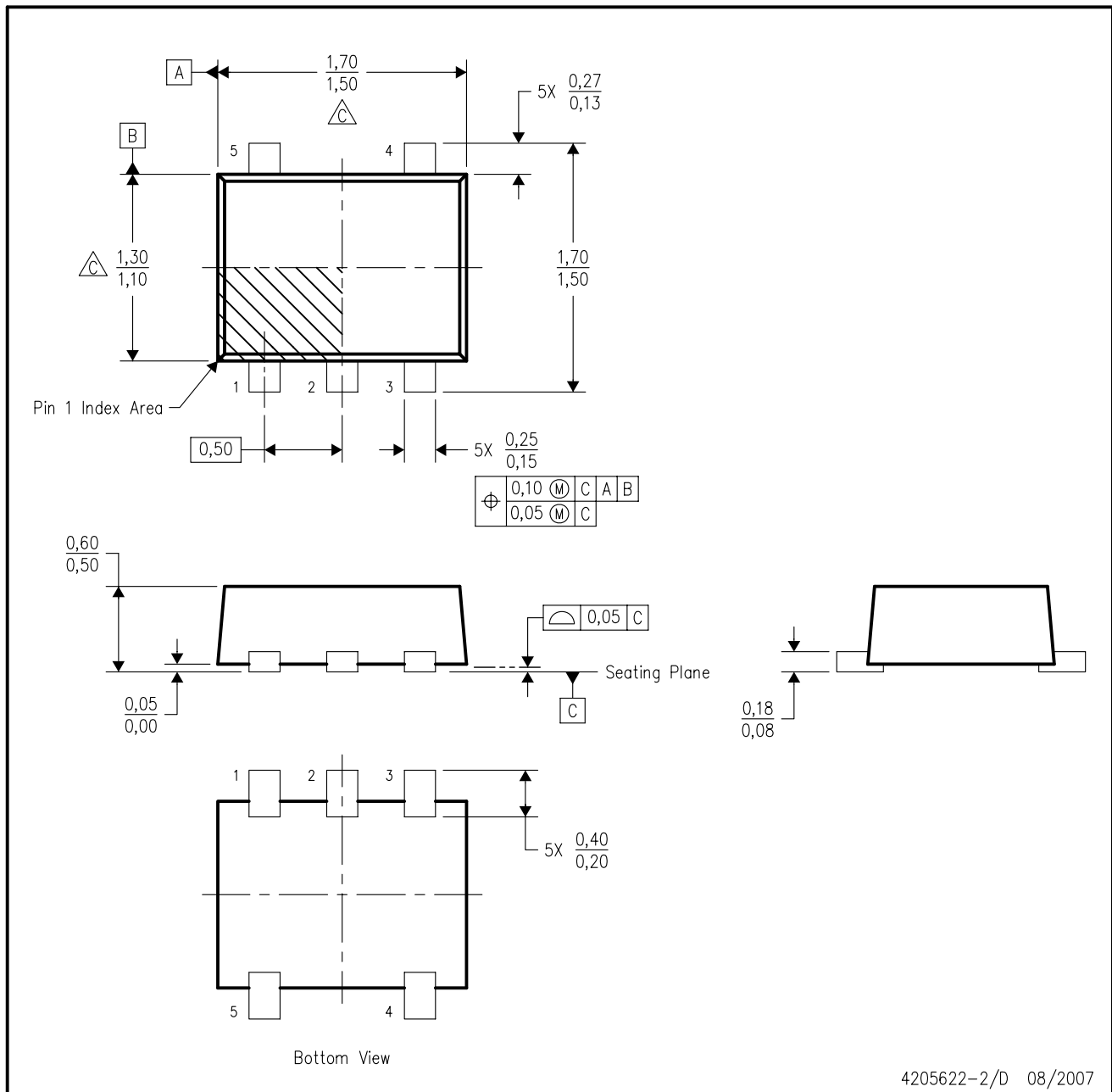
- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - D. Falls within JEDEC MO-203 variation AA.

DCK (R-PDSO-G5)

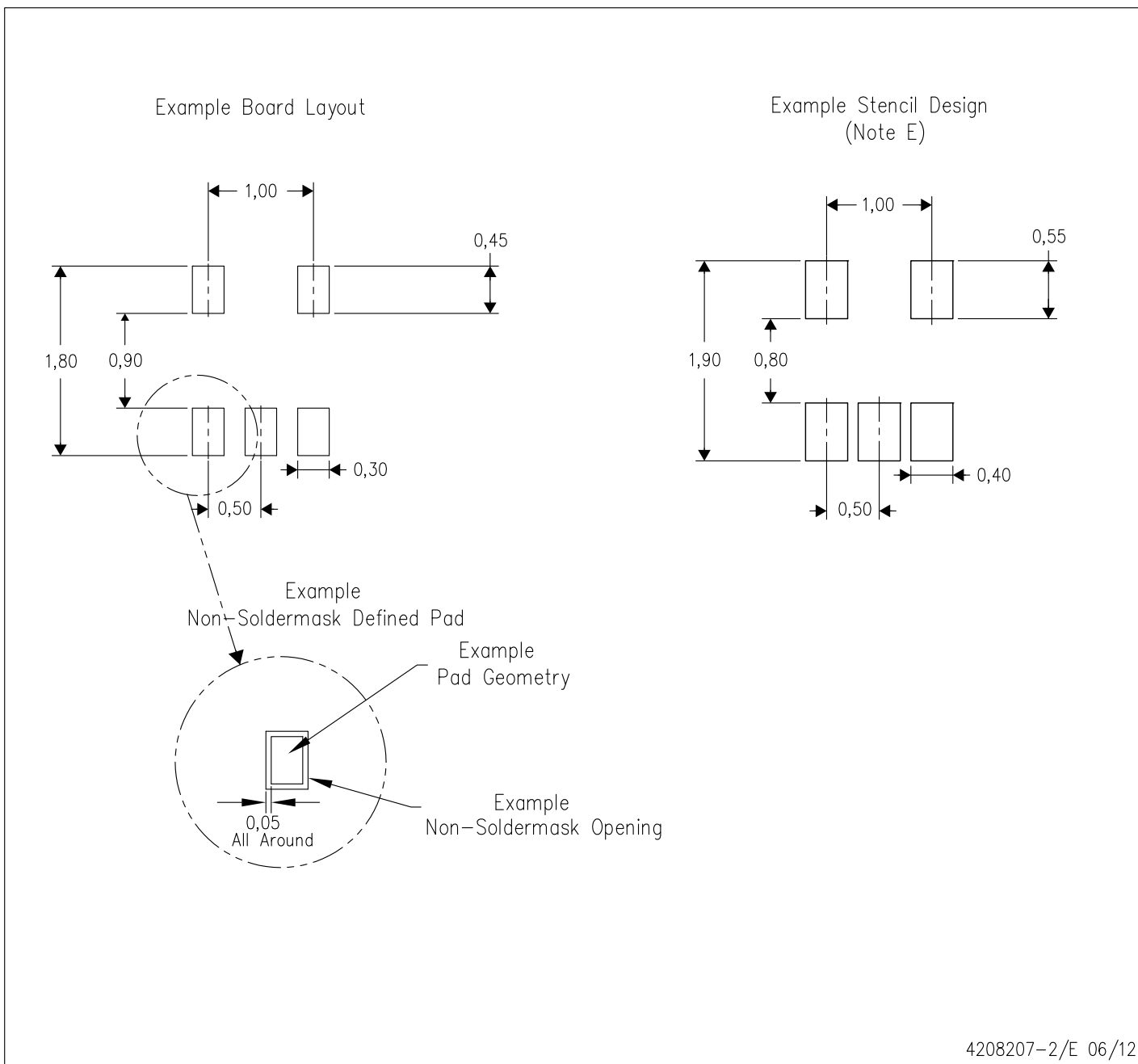
PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
 - Publication IPC-7351 is recommended for alternate designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.



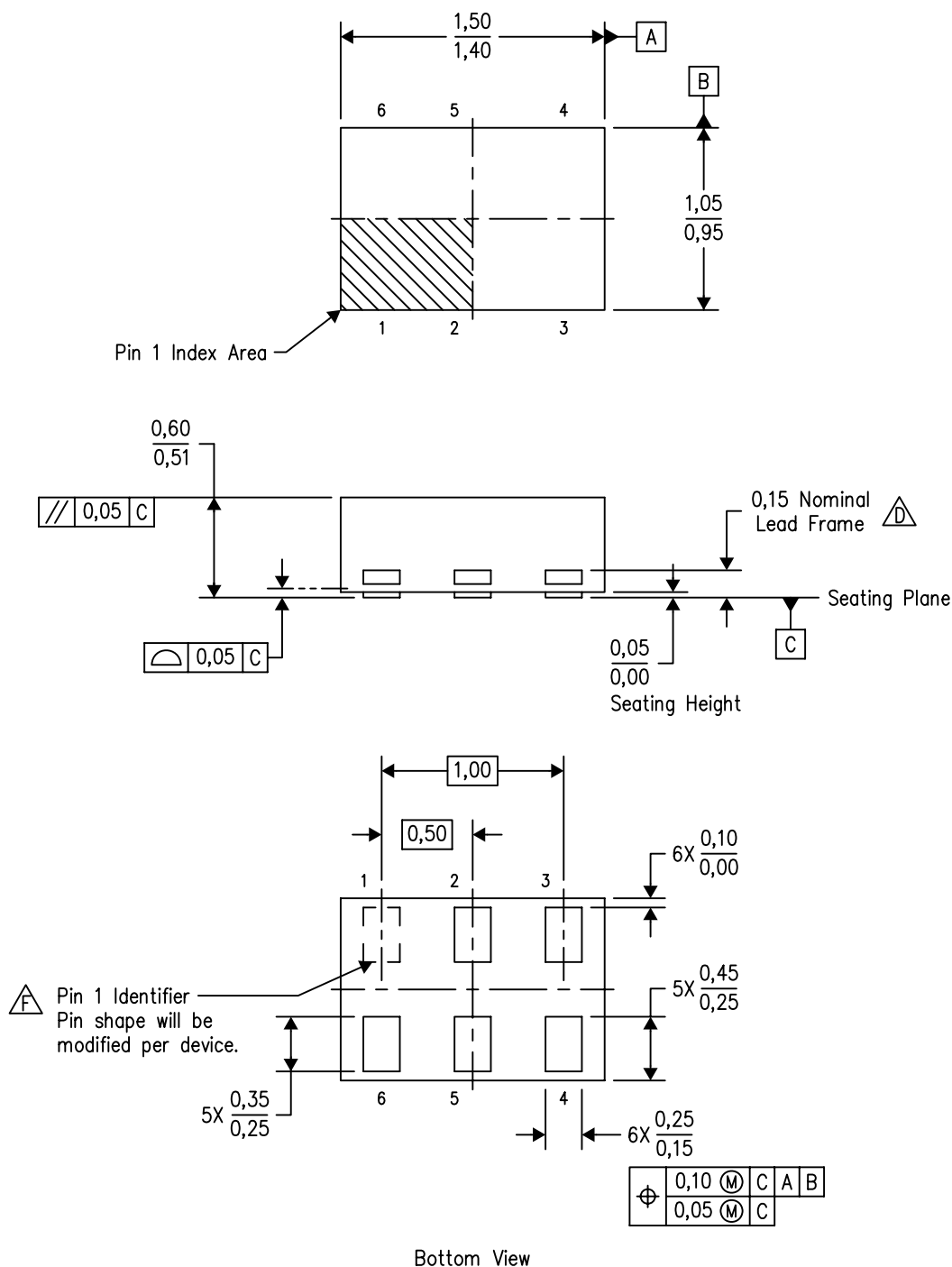
- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash, interlead flash, protrusions, or gate burrs. Mold flash, interlead flash, protrusions, or gate burrs shall not exceed 0,15 per end or side.
 - D. JEDEC package registration is pending.



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Publication IPC-7351 is recommended for alternate designs.
 - D. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.
 - E. Maximum stencil thickness 0,127 mm (5 mils). All linear dimensions are in millimeters.
 - F. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC 7525 for stencil design considerations.
 - G. Side aperture dimensions over-print land for acceptable area ratio > 0.66. Customer may reduce side aperture dimensions if stencil manufacturing process allows for sufficient release at smaller opening.

DRY (R-PUSON-N6)

PLASTIC SMALL OUTLINE NO-LEAD

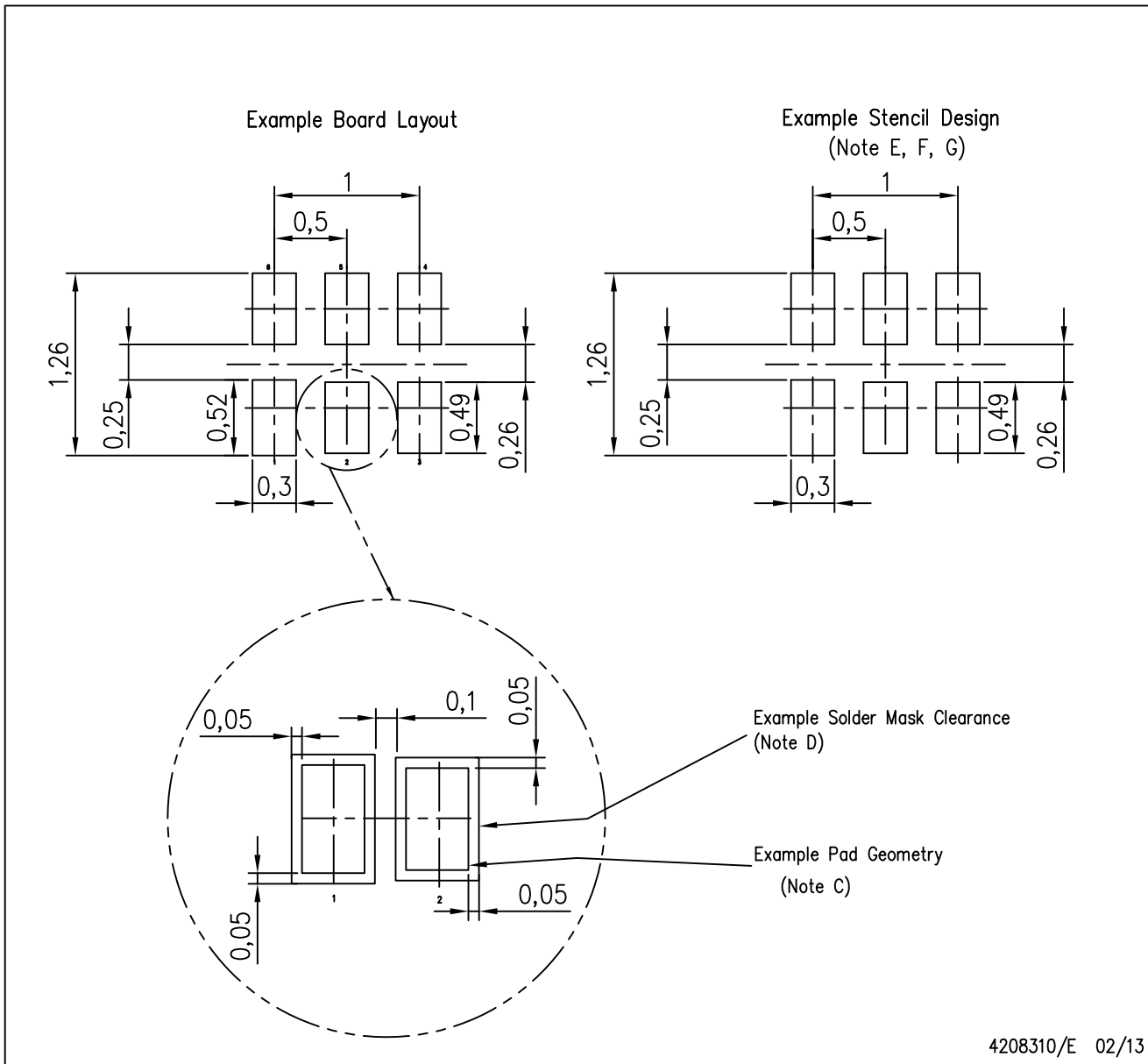


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- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. SON (Small Outline No-Lead) package configuration.
 - $\triangle D$ The exposed lead frame feature on side of package may or may not be present due to alternative lead frame designs.
 - E. This package complies to JEDEC MO-287 variation UFAD.
 - $\triangle F$ See the additional figure in the Product Data Sheet for details regarding the pin 1 identifier shape.

DRY (R-PUSON-N6)

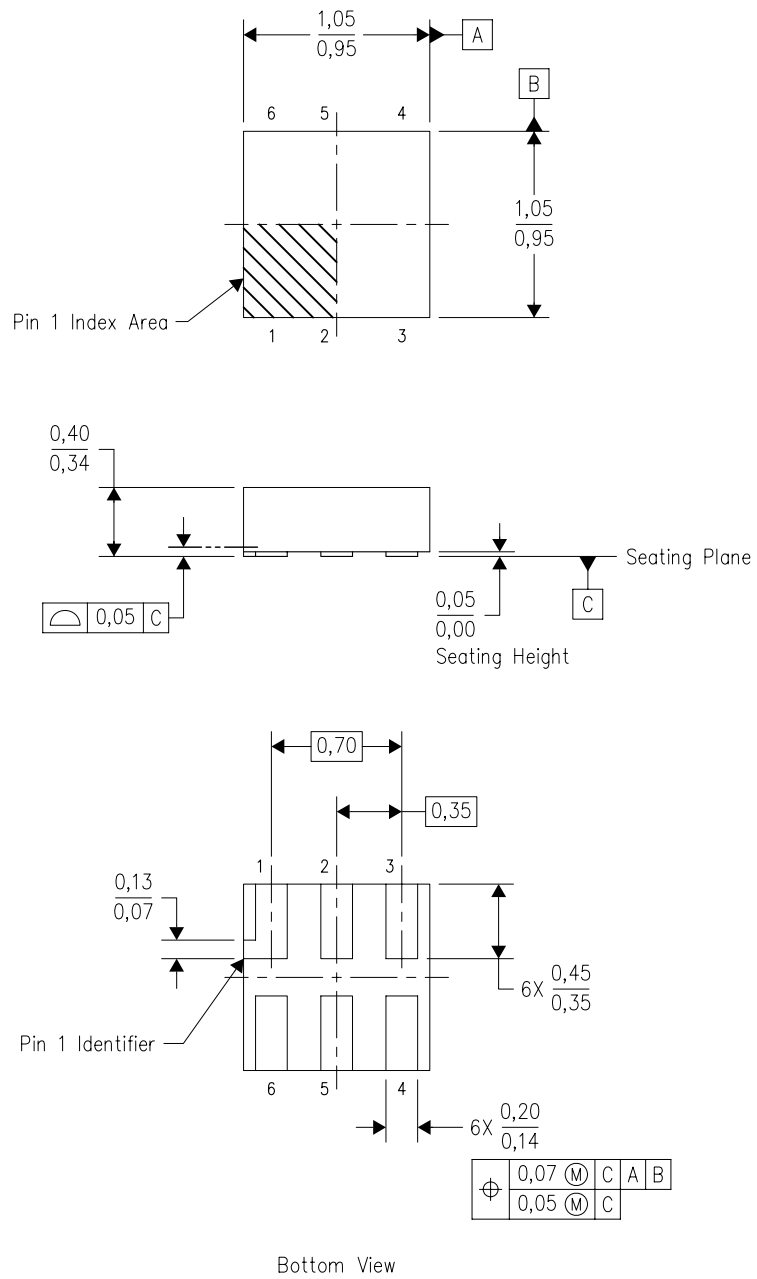
PLASTIC SMALL OUTLINE NO-LEAD



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.
 - Maximum stencil thickness 0,127 mm (5 mils). All linear dimensions are in millimeters.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC 7525 for stencil design considerations.
 - Side aperture dimensions over-print land for acceptable area ratio > 0.66. Customer may reduce side aperture dimensions if stencil manufacturing process allows for sufficient release at smaller opening.

DSF (S-PX2SON-N6)

PLASTIC SMALL OUTLINE NO-LEAD

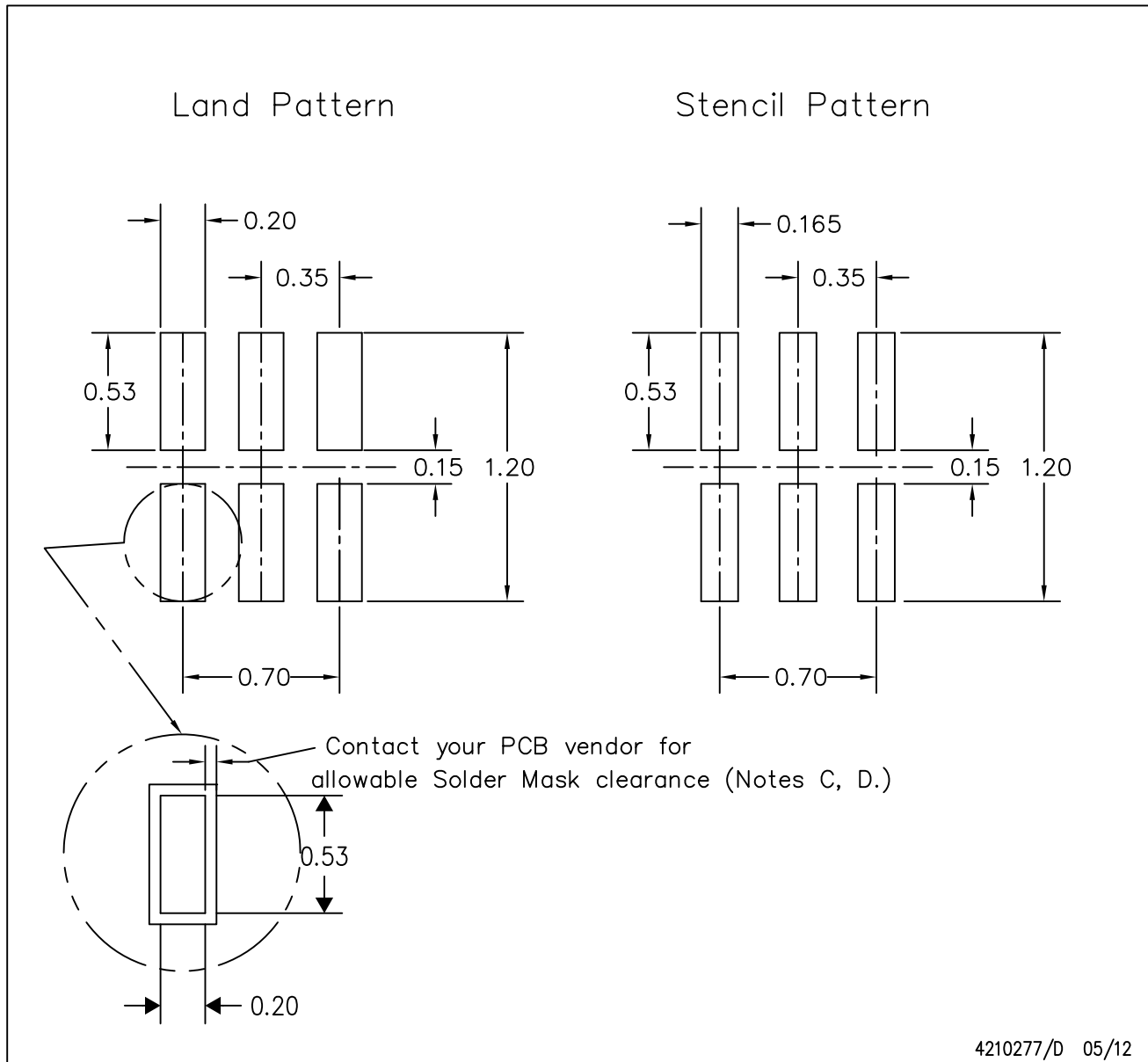


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- NOTES:
- All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - This drawing is subject to change without notice.
 - SON (Small Outline No-Lead) package configuration.
 - This package complies to JEDEC MO-287 variation X2AAF.

DSF (S-PX2SON-N6)

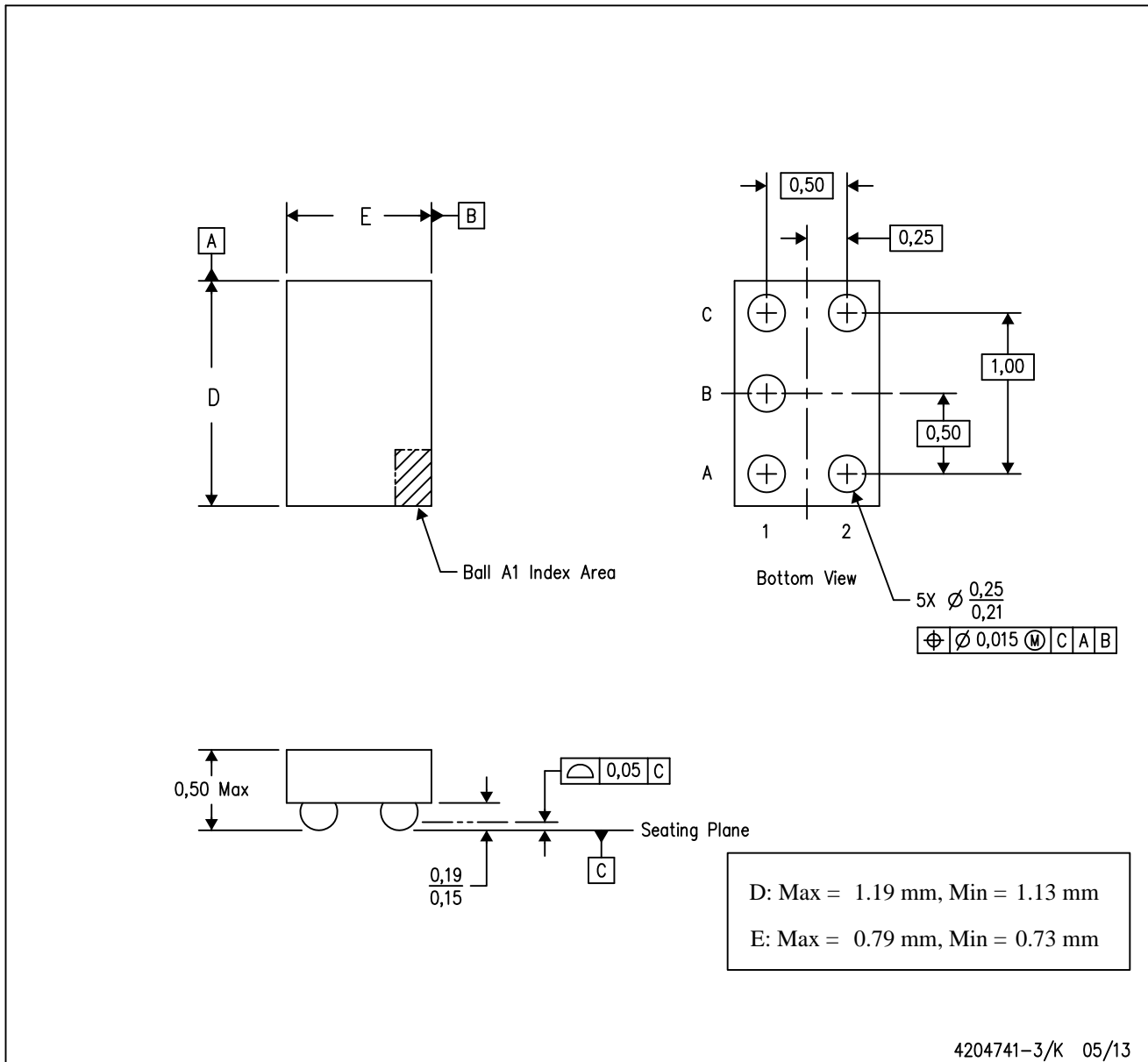
PLASTIC SMALL OUTLINE NO-LEAD



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads. If 2 mil solder mask is outside PCB vendor capability, it is advised to omit solder mask.
 - Maximum stencil thickness 0,1016 mm (4 mils). All linear dimensions are in millimeters.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC 7525 for stencil design considerations.
 - Suggest stencils cut with lasers such as Fiber Laser that produce the greatest positional accuracy.
 - Component placement force should be minimized to prevent excessive paste block deformation.

YZP (R-XBGA-N5)

DIE-SIZE BALL GRID ARRAY



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. NanoFree™ package configuration.

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