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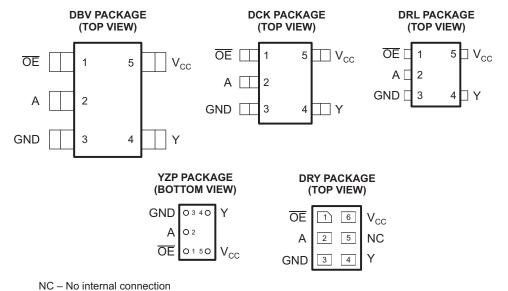
Jameco Part Number 1185668



FEATURES

- Available in the Texas Instruments
 NanoStar[™] and NanoFree[™] Packages
- Supports 5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{nd} of 3.7 ns at 3.3 V
- Low Power Consumption, 10-μA Max I_{CC}
- ±24-mA Output Drive at 3.3 V

- I_{off} Supports Partial-Power-Down Mode Operation
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)



NC – No internal connection

See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

This bus buffer gate is designed for 1.65-V to 5.5-V V_{CC} operation.

The SN74LVC1G125 is a single line driver with a 3-state output. The output is disabled when the output-enable (\overline{OE}) input is high.

NanoStar[™] and NanoFree[™] 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.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

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.

NanoStar, NanoFree are trademarks of Texas Instruments.



DESCRIPTION/ORDERING INFORMATION (CONTINUED)

ORDERING INFORMATION

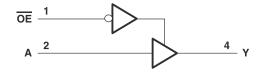
T _A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING(2)
	NanoFree [™] – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74LVC1G125YZPR	CM
	SON - DRY	Reel of 5000	SN74LVC1G125DRYR	CM_
	COT (COT 22)	Reel of 3000	SN74LVC1G125DBVR	C25
-40°C to 85°C	SOT (SOT-23) – DBV	Reel of 250	SN74LVC1G125DBVT	C25_
	COT (CC 70) DCK	Reel of 3000	SN74LVC1G125DCKR	CM
	SOT (SC-70) – DCK	Reel of 250	SN74LVC1G125DCKT	CM_
	SOT (SOT-553) – DRL	Reel of 4000	SN74LVC1G125DRLR	CM_

⁽¹⁾ Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE

INP	JTS	OUTPUT
ŌĒ	Α	Y
L	Н	Н
L	L	L
Н	Χ	Z

LOGIC DIAGRAM (POSITIVE LOGIC)



⁽²⁾ DBV/DCK/DRL/DRY: The actual top-side marking has one additional character that designates the assembly/test site. YZP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the assembly/test site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).

SN74LVC1G125



Absolute Maximum Ratings⁽¹⁾

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage range	-0.5	6.5	V	
V_{I}	Input voltage range ⁽²⁾		-0.5	6.5	V
Vo	Voltage range applied to any output in the	ne high-impedance or power-off state ⁽²⁾	-0.5	6.5	V
Vo	Voltage range applied to any output in the	ne high or low state (2)(3)	-0.5	V _{CC} + 0.5	V
I _{IK}	Input clamp current	V ₁ < 0		- 50	mA
I _{OK}	Output clamp current	V _O < 0		- 50	mA
Io	Continuous output current		±50	mA	
	Continuous current through V _{CC} or GND			±100	mA
		DBV package		206	
		DCK package		252	
θ_{JA}	Package thermal impedance (4)	DRL package		142	°C/W
		DRY package		234	
			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 and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

³⁾ The value of V_{CC} is provided in the recommended operating conditions table.

⁽⁴⁾ The package thermal impedance is calculated in accordance with JESD 51-7.

SN74LVC1G125 SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT





Recommended Operating Conditions⁽¹⁾

			MIN	MAX	UNIT	
.,	Complement	Operating	1.65	5.5		
V _{CC} Supply voltage		Data retention only			V	
		V _{CC} = 1.65 V to 1.95	V _{CC} = 1.65 V to 1.95 V	0.65 × V _{CC}		
.,	LP ob Java Canada adhana	V _{CC} = 2.3 V to 2.7 V	1.7			
V_{IH}	High-level input voltage	V _{CC} = 3 V to 3.6 V	2		V	
		V _{CC} = 4.5 V to 5.5 V	$0.7 \times V_{CC}$			
		V _{CC} = 1.65 V to 1.95 V		$0.35 \times V_{CC}$		
.,	Lave lavel in put valta na	V _{CC} = 2.3 V to 2.7 V		0.7	V	
V_{IL}	Low-level input voltage	V _{CC} = 3 V to 3.6 V		0.8	V	
		V _{CC} = 4.5 V to 5.5 V		$0.3 \times V_{CC}$		
VI	Input voltage		0	5.5	V	
Vo	Output voltage		0	V _{CC}	V	
		V _{CC} = 1.65 V		-4		
		V _{CC} = 2.3 V		-8		
I _{OH}	gh-level output current			-16	mA	
		V _{CC} = 3 V		-24		
		V _{CC} = 4.5 V		-32		
		V _{CC} = 1.65 V		4		
		V _{CC} = 2.3 V		8		
I_{OL}	Low-level output current	V 0 V		16	mA	
		V _{CC} = 3 V		24		
	V _{CC} = 4.5 V		32			
		$V_{CC} = 1.8 \text{ V} \pm 0.15 \text{ V}, 2.5 \text{ V} \pm 0.2 \text{ V}$		20		
Δt/Δν	Input transition rise or fall rate	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		10	ns/V	
		$V_{CC} = 5 V \pm 0.5 V$		5		
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.



SN74LVC1G125 SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V _{cc}	MIN TYP ⁽¹⁾	MAX	UNIT
	$I_{OH} = -100 \mu\text{A}$		V _{CC} – 0.1		
	$I_{OH} = -4 \text{ mA}$	1.65 V	1.2		
V	$I_{OH} = -8 \text{ mA}$	2.3 V	1.9		V
V _{OH}	I _{OH} = -16 mA	3 V	2.4		V
	I _{OH} = -24 mA	3 V	2.3		
	I _{OH} = -32 mA	4.5 V	3.8		
	I _{OL} = 100 μA	1.65 V to 5.5 V		0.1	
I _{OL} = 4 mA		1.65 V		0.45	
V	I _{OL} = 8 mA	2.3 V		0.3	V
V _{OL}	I _{OL} = 16 mA	2.1/		0.4	V
	I _{OL} = 24 mA	3 V		0.55	
	I _{OL} = 32 mA	4.5 V		0.55	
I _I A or OE inputs	V _I = 5.5 V or GND	0 to 5.5 V		±5	μΑ
I _{off}	V_I or $V_O = 5.5 \text{ V}$	0		±10	μΑ
I _{OZ}	V _O = 0 to 5.5 V	3.6 V		10	μΑ
I _{CC}	$V_I = 5.5 \text{ V or GND}, \qquad I_O = 0$	1.65 V to 5.5 V		10	μΑ
ΔI_{CC}	One input at V_{CC} – 0.6 V, Other inputs at V_{CC} or GND	3 V to 5.5 V		500	μΑ
Cı	V _I = V _{CC} or GND	3.3 V	4		pF

⁽¹⁾ All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

SN74LVC1G125 SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

SCES2230-APRIL 1999-REVISED FEBRUARY 2007



Switching Characteristics

over recommended operating free-air temperature range, $C_L = 15 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	TO (OUTPUT)	V _{CC} = ± 0.1		V _{CC} = ± 0.2		V _{CC} = ± 0.3		V _{CC} =		UNIT
	(INPUT) (C	(INPOT) (OUTPOT)	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	Α	Y	1.9	6.9	0.7	4.6	0.6	3.7	0.5	3.4	ns

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 30 \text{ pF}$ or 50 pF (unless otherwise noted) (see Figure 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = ± 0.1		V _{CC} = ± 0.2		V _{CC} = ± 0.3		V _{CC} =		UNIT
	(INPUT) (OUTPUT)	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX		
t _{pd}	Α	Υ	2.8	9	1.2	5.5	1	4.5	1	4	ns
t _{en}	ŌĒ	Υ	3.3	10.1	1.5	6.6	1	5.3	1	5	ns
t _{dis}	ŌĒ	Y	1.3	9.2	1	5	1	5	1	4.2	ns

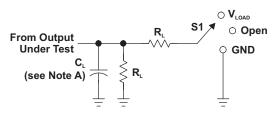
Operating Characteristics

 $T_A = 25^{\circ}C$

	PARAMETER		TEST CONDITIONS	V _{CC} = 1.8 V TYP	V _{CC} = 2.5 V TYP	V _{CC} = 3.3 V TYP	V _{CC} = 5 V TYP	UNIT
_	Power dissipation	Outputs enabled	f = 10 MHZ	18	18	19	21	ρF
Cpd	capacitance	Outputs disabled	I = IU WINZ	2	2	2	4	рг



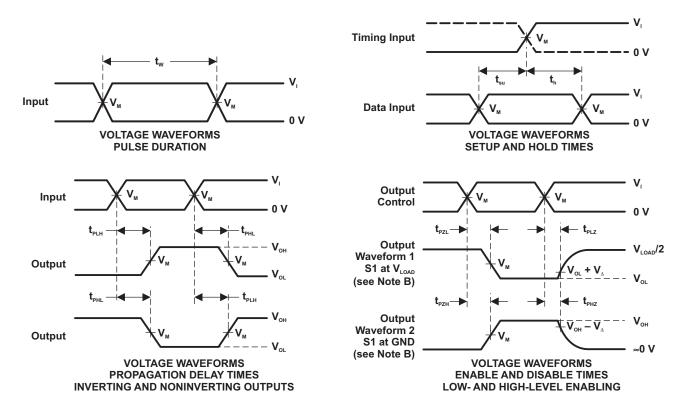
PARAMETER MEASUREMENT INFORMATION



TEST	S1
t _{PLH} /t _{PHL}	Open
t_{PLZ}/t_{PZL}	V _{LOAD}
t _{PHZ} /t _{PZH}	GND

LOAD CIRCUIT

.,	INF	PUTS	V	V		Б	V
V _{cc}	V,	t,/t,	V _M	V _{LOAD}	C _L	R _L	V _Δ
1.8 V ± 0.15 V	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	15 pF	1 M Ω	0.15 V
2.5 V ± 0.2 V	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	15 pF	1 M Ω	0.15 V
3.3 V ± 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	15 pF	1 M Ω	0.3 V
5 V ± 0.5 V	V _{cc}	≤2.5 ns	V _{cc} /2	2 × V _{cc}	15 pF	1 M Ω	0.3 V



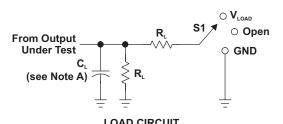
NOTES: A. C_L includes probe and jig capacitance.

- 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 MHz, Z_o = 50 Ω .
- D. The outputs are measured one at a time, with one transition per measurement.
- E. t_{PLZ} and \dot{t}_{PHZ} are the same as t_{dis} .
- F. t_{PZL} and t_{PZH} are the same as t_{en} .
- G. t_{PLH} and t_{PHL} are the same as t_{pd} .
- H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms



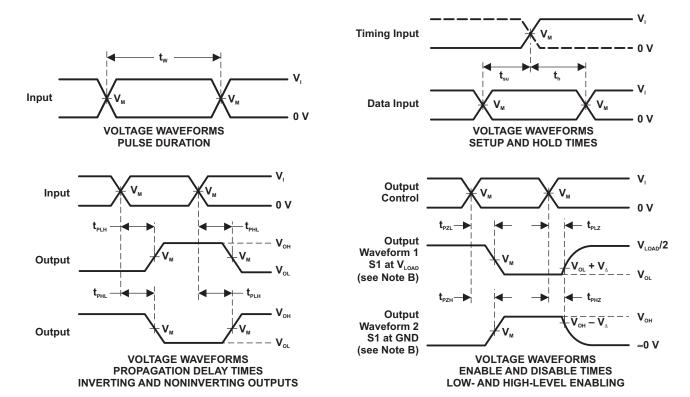
PARAMETER MEASUREMENT INFORMATION (continued)



TEST	S1
t _{PLH} /t _{PHL}	Open
t_{PLZ}/t_{PZL}	V _{LOAD}
$t_{_{PHZ}}/t_{_{PZH}}$	GND

LUAD	CINCUIT

	INF	PUTS		W		_	.,	
V _{cc}	V,	t,/t,	V _M	V _{LOAD}	C _L	R _L	V _Δ	
1.8 V ± 0.15 V	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	30 pF	1 k Ω	0.15 V	
2.5 V ± 0.2 V	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	30 pF	500 Ω	0.15 V	
3.3 V ± 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V	
5 V ± 0.5 V	V _{cc}	≤2.5 ns	V _{cc} /2	2 × V _{cc}	50 pF	500 Ω	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 MHz, Z_o = 50 Ω .
- 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. t_{PLH} and t_{PHL} are the same as t_{pd} .
- H. All parameters and waveforms are not applicable to all devices.

Figure 2. Load Circuit and Voltage Waveforms







PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
74LVC1G125DBVRE4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DBVTG4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DCKRE4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DCKRG4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DCKTE4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DCKTG4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DRLRG4	ACTIVE	SOT	DRL	5	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G125DRYRG4	ACTIVE	SON	DRY	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74LVC1G126DBVTE4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DCKR	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DCKT	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DRLR	ACTIVE	SOT	DRL	5	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125DRYR	ACTIVE	SON	DRY	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G125YZPR	ACTIVE	WCSP	YZP	5	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM

⁽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.

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

⁽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.



PACKAGE OPTION ADDENDUM

22-Oct-2007

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.

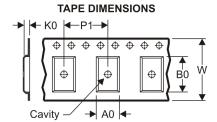
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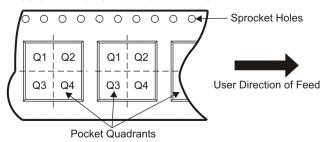
TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device		Package Drawing			Reel Diameter	Reel Width	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
					(mm)	W1 (mm)						
SN74LVC1G125DBVR	SOT-23	DBV	5	3000	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G125DBVR	SOT-23	DBV	5	3000	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G125DBVT	SOT-23	DBV	5	250	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G125DCKR	SC70	DCK	5	3000	180.0	9.2	2.24	2.34	1.22	4.0	8.0	Q3
SN74LVC1G125DCKT	SC70	DCK	5	250	180.0	9.2	2.24	2.34	1.22	4.0	8.0	Q3
SN74LVC1G125DRLR	SOT	DRL	5	4000	180.0	9.2	1.78	1.78	0.69	4.0	8.0	Q3
SN74LVC1G125DRYR	SON	DRY	6	5000	179.0	8.4	1.2	1.65	0.7	4.0	8.0	Q1
SN74LVC1G125YZPR	WCSP	YZP	5	3000	180.0	8.4	1.02	1.52	0.66	4.0	8.0	Q1





*All dimensions are nominal

7 til dilliciisions are nominal							
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G125DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G125DBVR	SOT-23	DBV	5	3000	205.0	200.0	33.0
SN74LVC1G125DBVT	SOT-23	DBV	5	250	205.0	200.0	33.0
SN74LVC1G125DCKR	SC70	DCK	5	3000	205.0	200.0	33.0
SN74LVC1G125DCKT	SC70	DCK	5	250	205.0	200.0	33.0
SN74LVC1G125DRLR	SOT	DRL	5	4000	202.0	201.0	28.0
SN74LVC1G125DRYR	SON	DRY	6	5000	220.0	205.0	50.0
SN74LVC1G125YZPR	WCSP	YZP	5	3000	220.0	220.0	34.0

DBV (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-178 Variation AA.



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.



DRL (R-PDSO-N5)

PLASTIC SMALL OUTLINE

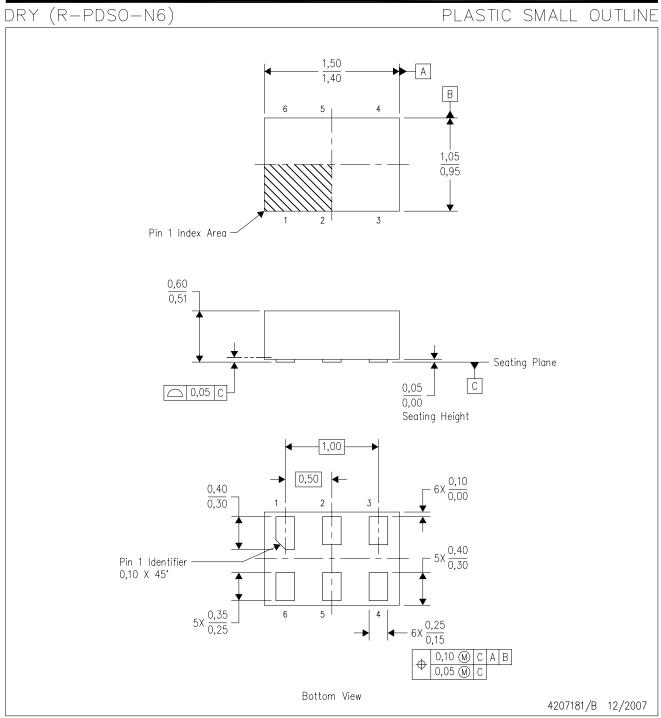


NOTES:

- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
- 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.





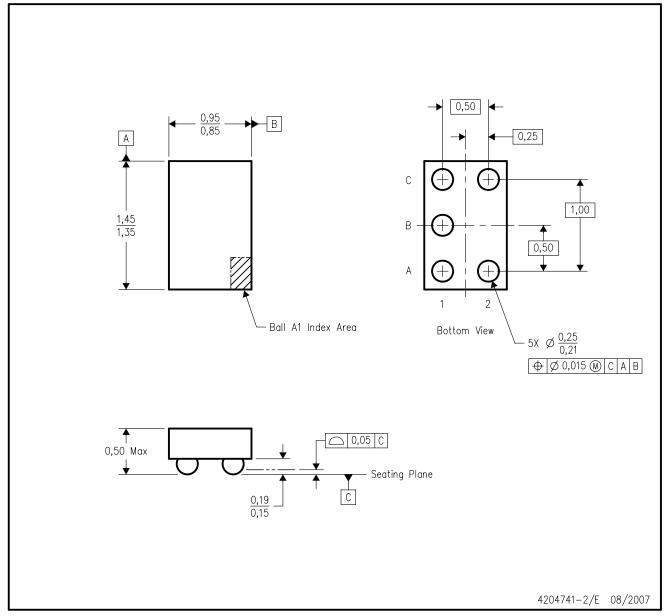
NOTES: All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
 C. SON (Small Outline No-Lead) package configuration.
 D. This package complies to JEDEC MO-287 variation UFAD.



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 $^{\text{TM}}$ package configuration.
- D. This package is lead-free. Refer to the 5 YEP package (drawing 4204725) for tin-lead (SnPb).

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