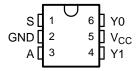
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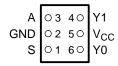
FEATURES

- Available in the Texas Instruments
 NanoStar[™] and NanoFree[™] Packages
- Supports 5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 3.4 ns at 3.3 V
- Low Power Consumption, 10-μA Max I_{CC}
- ±24-mA Output Drive at 3.3 V
- Typical V_{OLP} (Output Ground Bounce)
 < 0.8 V at V_{CC} = 3.3 V, T_A = 25°C
- Typical V_{OHV} (Output V_{OH} Undershoot)
 2 V at V_{CC} = 3.3 V, T_A = 25°C
- 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)

DBV OR DCK PACKAGE (TOP VIEW)



YEA, YEP, YZA, OR YZP PACKAGE (BOTTOM VIEW)



DESCRIPTION/ORDERING INFORMATION

This noninverting demultiplexer is designed for 1.65-V to 5.5-V V_{CC} operation.

The SN74LVC1G18 is a 1-of-2 noninverting demultiplexer with a 3-state output. This device buffers the data on input A and passes it to either output Y0 or Y1, depending on whether the state of the select (S) input is low or high, respectively.

ORDERING INFORMATION

T _A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽²⁾
	NanoStar™ – WCSP (DSBGA) 0.17-mm Small Bump – YEA		SN74LVC1G18YEAR	
	NanoFree™ - WCSP (DSBGA) 0.17-mm Small Bump - YZA (Pb-free)	Reel of 3000	SN74LVC1G18YZAR	CJ
-40°C to 85°C	NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YEP	Neel 01 3000	SN74LVC1G18YEPR	0
	NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)		SN74LVC1G18YZPR	
	SOT (SOT-23) - DBV	Reel of 3000	SN74LVC1G18DBVR	C18_
	SOT (SC-70) - DCK	Reel of 3000	SN74LVC1G18DCKR	CJ_

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

(2) DBV/DCK: The actual top-side marking has one additional character that designates the assembly/test site. YEA/YZA,YEP/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).

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.

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DESCRIPTION/ORDERING INFORMATION (CONTINUED)

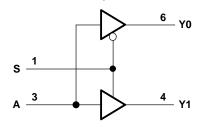
NanoStar[™] and NanoFree[™] package technology is a major breakthrough in IC packaging concepts, using the die as the package.

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.

FUNCTION TABLE

INP	UTS	OUTPUTS			
S	Α	Y0	Y1		
L	L	L	Z		
L	Н	Н	Z		
Н	L	Z	L		
Н	Н	Z	Н		

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	6.5	V	
VI	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 _I < 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		165		
0	Dealer at the model in a dealer (4)	DCK package		259	°C/W	
θ_{JA}	Package thermal impedance ⁽⁴⁾	YEA/YZA package		143		
		YEP/YZP package		123		
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 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.





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Recommended Operating Conditions⁽¹⁾

			MIN	MAX	UNIT
V	Cupply voltage	Operating	1.65	5.5	V
V_{CC}	Supply voltage	Data retention only	1.5		V
		V _{CC} = 1.65 V to 1.95 V	0.65 × V _{CC}		
.,	High level input valtage	V _{CC} = 2.3 V to 2.7 V	1.7		V
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 × V _{CC}		
		V _{CC} = 1.65 V to 1.95 V		0.35 × V _{CC}	
W	Low level input valtage	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 × V _{CC}	
V_{I}	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}	High-level output current	V 0 V		-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			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	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		ns/V	
		$V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$			
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.

SN74LVC1G18 1-OF-2 NONINVERTING DEMULTIPLEXER WITH 3-STATE DESELECTED OUTPUT

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Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V _{CC}	MIN	TYP ⁽¹⁾ MAX	UNIT
	$I_{OH} = -100 \mu A$	1.65 V to 5.5 V	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}	$I_{OH} = -16 \text{ mA}$	3 V	2.4		V
	$I_{OH} = -24 \text{ mA}$	3 V	2.3		
	$I_{OH} = -32 \text{ mA}$	4.5 V	3.8		
	$I_{OL} = 100 \mu A$	1.65 V to 5.5 V		0.1	
	$I_{OL} = 4 \text{ mA}$	1.65 V		0.45	
V	$I_{OL} = 8 \text{ mA}$	2.3 V		0.3	V
V _{OL}	I _{OL} = 16 mA	3 V		0.4	V
	I _{OL} = 24 mA	3 V		0.55	
	I _{OL} = 32 mA	4.5 V		0.55	
I_{\parallel}	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}	$V_0 = 0 \text{ to } 5.5 \text{ V}$	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
C _i	$V_I = V_{CC}$ or GND	3.3 V		4	pF
Co	$V_O = V_{CC}$ or GND	3.3 V		6	pF

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

Switching Characteristics

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

PARAMETER	PARAMETER FROM TO (OUTPUT)		V _{CC} = 1.8 V ± 0.15 V		V _{CC} = 2.5 V ± 0.2 V		V _{CC} = 3.3 V ± 0.3 V		V _{CC} = 5 V ± 0.5 V		UNIT
	(INPOT)	(001701)	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	A	Υ	2.3	8.4	1.1	4.2	1.1	3.4	0.8	2.7	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.	1.8 V 15 V	V _{CC} = ± 0.	2.5 V 2 V	V _{CC} = ± 0.		V _{CC} = ± 0.		UNIT
	(INFOT)	(001701)	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	Α	Υ	3.5	9.3	1.7	5	1.5	4.2	0.7	3.2	ns
t _{en}	S	Υ	3.6	10.2	1.7	5.6	1.5	4.6	0.9	3.4	ns
t _{dis}	S	Y	1.9	12.7	1	5.3	1.1	4.9	0.5	3.3	ns

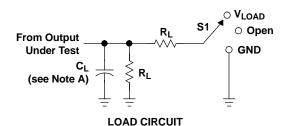
Operating Characteristics

 $T_A = 25^{\circ}C$

	PARAMETER	TEST	V _{CC} = 1.8 V	$V_{CC} = 2.5 \text{ V}$	$V_{CC} = 3.3 \text{ V}$	$V_{CC} = 5 V$	UNIT
	FARAMETER	CONDITIONS	TYP	TYP	TYP		
C _{pd}	Power dissipation capacitance	f = 10 MHz	17	17	18	21	pF

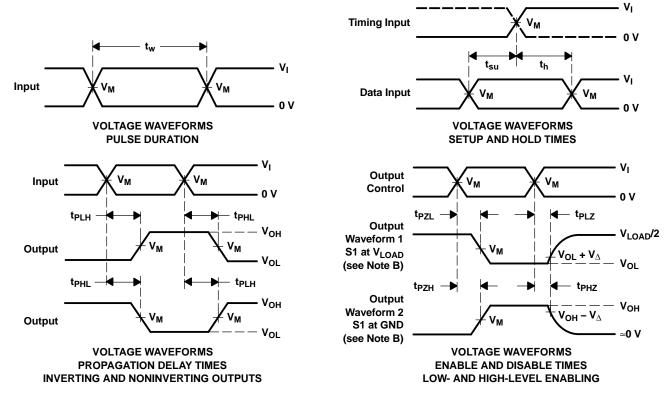


PARAMETER MEASUREMENT INFORMATION



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

	INPUTS		.,	.,		_	.,
V _{CC}	VI	t _r /t _f	V _M	V _{LOAD}	CL	RL	$oldsymbol{V}_\Delta$
1.8 V \pm 0.15 V	v _{cc}	≤2 ns	V _{CC} /2	2×V _{CC}	15 pF	1 ΜΩ	0.15 V
2.5 V \pm 0.2 V	V_{CC}	≤2 ns	V _{CC} /2	2×V _{CC}	15 pF	1 Μ Ω	0.15 V
3.3 V \pm 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	15 pF	1 Μ 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

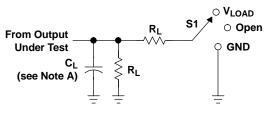


- NOTES: A. C₁ includes probe and jig capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 - C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, Z_0 = 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 1. Load Circuit and Voltage Waveforms



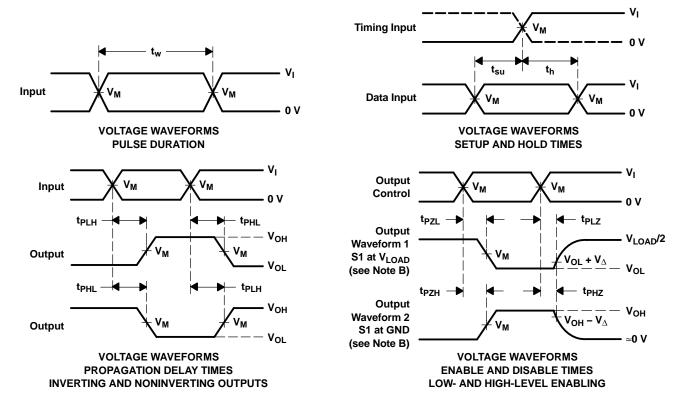
PARAMETER MEASUREMENT INFORMATION



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

1	0	Δ	n	CI	R	CI	П	ıT

.,	INPUTS		.,	.,	•	_	
V _{CC}	VI	t _r /t _f	V _M	V _{LOAD}	CL	R _L	$oldsymbol{V}_\Delta$
1.8 V \pm 0.15 V	v _{cc}	≤2 ns	V _{CC} /2	2×V _{CC}	30 pF	1 k Ω	0.15 V
2.5 V \pm 0.2 V	V_{CC}	≤2 ns	V _{CC} /2	2×V _{CC}	30 pF	500 Ω	0.15 V
3.3 V \pm 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V
5 V \pm 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 ≤ 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





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PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74LVC1G18DBVR	ACTIVE	SOT-23	DBV	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G18DBVRE4	ACTIVE	SOT-23	DBV	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G18DCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G18DCKRE4	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G18DCKRG4	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G18YEAR	NRND	WCSP	YEA	6	3000	TBD	SNPB	Level-1-260C-UNLIM
SN74LVC1G18YEPR	NRND	WCSP	YEP	6	3000	TBD	SNPB	Level-1-260C-UNLIM
SN74LVC1G18YZAR	NRND	WCSP	YZA	6	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM
SN74LVC1G18YZPR	ACTIVE	WCSP	YZP	6	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.

(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.

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DBV (R-PDSO-G6)

PLASTIC SMALL-OUTLINE PACKAGE



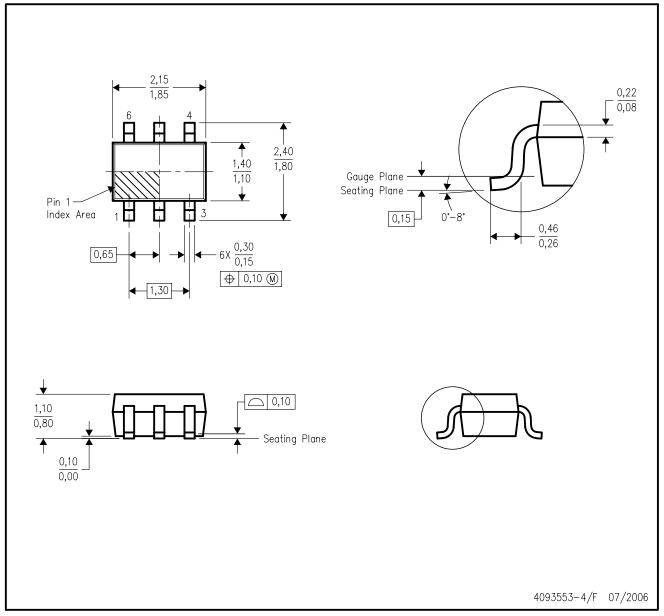
NOTES:

- 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. Leads 1,2,3 may be wider than leads 4,5,6 for package orientation.
- Falls within JEDEC MO-178 Variation AB, except minimum lead width.



DCK (R-PDSO-G6)

PLASTIC SMALL-OUTLINE PACKAGE



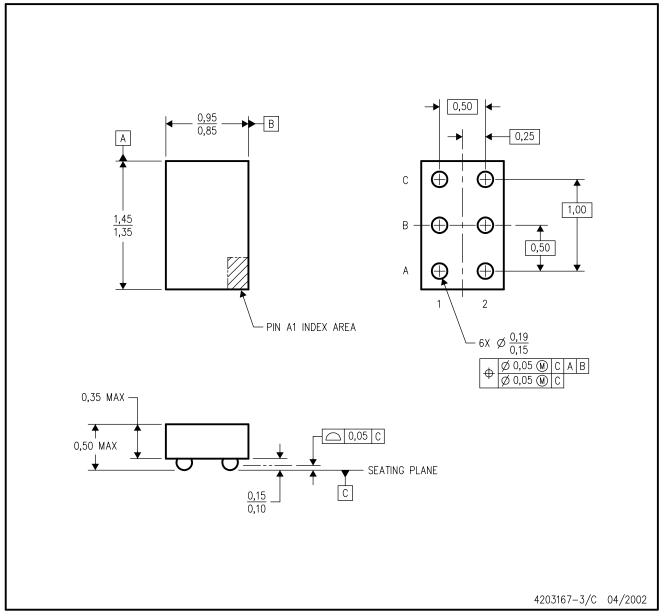
NOTES: A. All linear dimensions are in millimeters.

- 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 AB.



YEA (R-XBGA-N6)

DIE-SIZE BALL GRID ARRAY



NOTES: A. All linear dimensions are in millimeters.

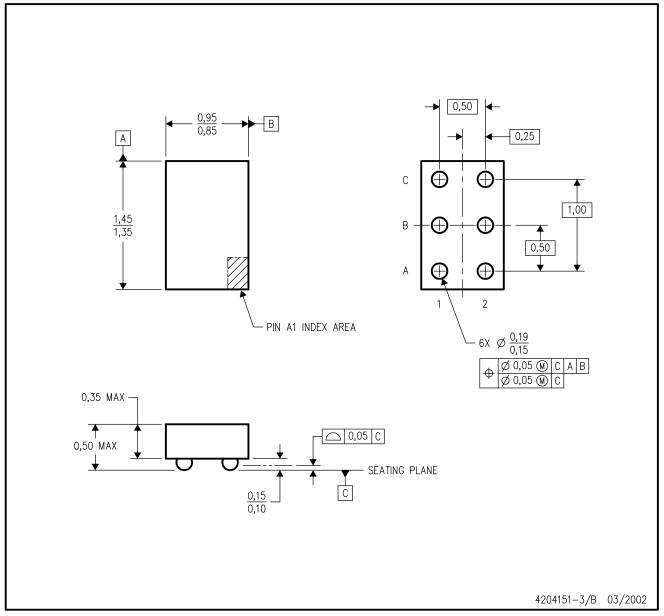
- B. This drawing is subject to change without notice.
- C. NanoStar \mathbf{M} package configuration.
- D. Package complies to JEDEC MO-211 variation EA.
- E. This package is tin-lead (SnPb). Refer to the 6 YZA package (drawing 4204151) for lead-free.

NanoStar is a trademark of Texas Instruments.



YZA (R-XBGA-N6)

DIE-SIZE BALL GRID ARRAY



NOTES: A. All linear dimensions are in millimeters.

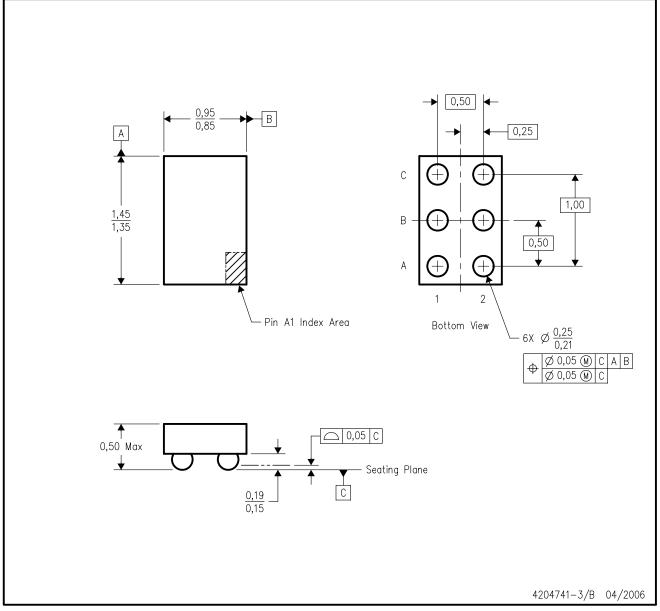
- B. This drawing is subject to change without notice.
- C. NanoFree $^{\text{TM}}$ package configuration.
- D. Package complies to JEDEC MO-211 variation EA.
- E. This package is lead-free. Refer to the 6 YEA package (drawing 4203167) for tin-lead (SnPb).

NanoFree is a trademark of Texas Instruments.



YZP (R-XBGA-N6)

DIE-SIZE BALL GRID ARRAY



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

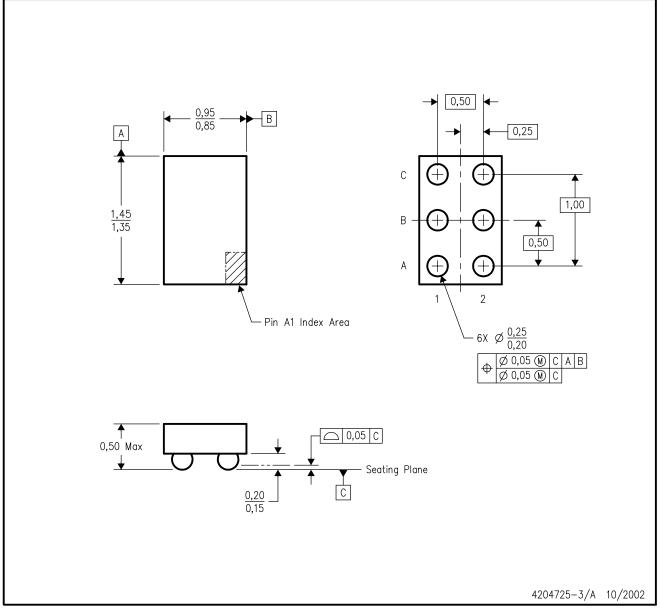
- B. This drawing is subject to change without notice.
- C. NanoFree $^{\text{TM}}$ package configuration.
- D. This package is lead-free. Refer to the 6 YEP package (drawing 4204725) for tin-lead (SnPb).

NanoFree is a trademark of Texas Instruments.



YEP (R-XBGA-N6)

DIE-SIZE BALL GRID ARRAY



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. NanoStar \mathbf{M} package configuration.
- D. This package is tin-lead (SnPb). Refer to the 6 YZP package (drawing 4204741) for lead-free.

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