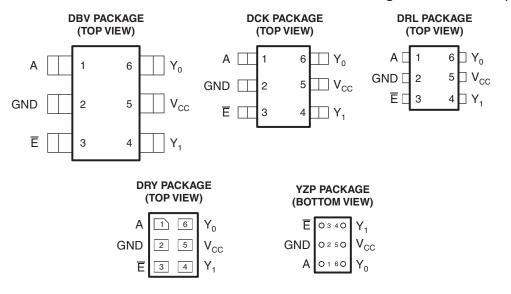


FEATURES

- Available in the Texas Instruments
 NanoFree[™] Package
- Supports 5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{nd} of 4 ns at 3.3 V
- Low Power Consumption, 10-μA Max I_{CC}
- ±24-mA Output Drive at 3.3 V
- V_{OLP} (Output Ground Bounce) <0.8 V Typ at V_{CC} = 3.3 V, T_A = 25°C

- V_{OHV} (Output V_{OH} Undershoot) >2 V Typ 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)



See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

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

The SN74LVC1G19 is a 1-of-2 decoder/demultiplexer. This device buffers the data on input A and passes it to the outputs Y_0 (true) and Y_1 (complement) when the enable (\overline{E}) input signal is low.

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.

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

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.

NanoFree is a trademark of Texas Instruments.



ORDERING INFORMATION

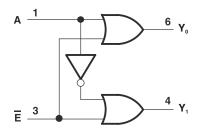
T _A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING(2)	
	NanoFree™ – WCSP (DSBGA)	Reel of 3000	SN74LVC1G19YZPR	CY	
	0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74LVC1G19YZPRB	01_	
	SON - DRY	Reel of 4000	SN74LVC1G19DRYR	CY_	
	SOT (SOT-23) – DBV	Reel of 3000	SN74LVC1G19DBVR	CY	
-40°C to 85°C			SN74LVC1G19DBVRE4	O1_	
-40 C to 83 C			SN74LVC1G19DCKR		
	SOT (SC-70) – DCK	Reel of 3000	SN74LVC1G19DCKRE4	CY_	
			SN74LVC1G19DCKRG4		
	COT (COT 553) DDI	Reel of 4000	SN74LVC1G19DRLR	CY	
	SOT (SOT-553) – DRL	Neel 01 4000	SN74LVC1G19DRLRG4	01_	

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

FUNCTION TABLE

INP	UTS	OUTPUTS			
Ē	Α	Y ₀	Y ₁		
L	L	L	Н		
L	Н	Н	L		
Н	X	Н	Н		

LOGIC DIAGRAM (POSITIVE LOGIC)



⁽²⁾ DBV/DCK/DRL 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).



SCES464E-JUNE 2003-REVISED FEBRUARY 2007

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⁾	Input voltage range (2)		6.5	V
Vo	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾		-0.5	6.5	V
Vo	Voltage range applied to any output in the 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		165	
		DCK package		259	
θ_{JA}	Package thermal impedance (4)	DRL package		142	°C/W
		DRY package		234	
		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.

The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed. 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.

SN74LVC1G19 1-OF-2 DECODER/DEMULTIPLEXER





Recommended Operating Conditions⁽¹⁾

			MIN	MAX	UNIT
\/	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	$0.65 \times V_{CC}$		
\ <i>/</i>	Lliab lovel input veltage	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	$0.7 \times V_{CC}$		
		V _{CC} = 1.65 V to 1.95 V		$0.35 \times V_{CC}$	
\ <i>/</i>	Low lovel 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		$0.3 \times V_{CC}$	
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}	High-level output current	evel 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 0V		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
	·	$V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$		5	
T _A	Operating free-air temperature	1 12	-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 CO	NDITIONS	V _{cc}	MIN	TYP ⁽¹⁾ MA	UNIT		
	$I_{OH} = -100 \mu A$		1.65 V to 5.5 V	V _{CC} – 0.1				
	I _{OH} = -4 mA		1.65 V	1.2				
V	I _{OH} = -8 mA		2.3 V	1.9		V		
V _{OH}	I _{OH} = -16 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 μA		1.65 V to 5.5 V		0.	.1		
	I _{OL} = 4 mA		1.65 V		0.4	į.		
	I _{OL} = 8 mA	2.3 V		0.	3 V			
V _{OL}	I _{OL} = 16 mA	3 V		0.				
	I _{OL} = 24 mA	3 V	0.55		5			
	I _{OL} = 32 mA		4.5 V		0.5	5		
I _I	$V_I = 5.5 \text{ V or GND}$		0 to 5.5 V		±	Ι μΑ		
l _{off}	V_I or $V_O = 5.5 \text{ V}$		0		±1	μΑ		
I _{cc}	$V_1 = 5.5 \text{ V or GND}, \qquad I_O = 0$		1.65 V to 5.5 V		1) μΑ		
ΔI_{CC}	One input at V_{CC} – 0.6 V, Other inputs at V_{CC} or GND		3 V to 5.5 V		50	μΑ		
C _I	$V_I = V_{CC}$ or GND		3.3 V		3.5	pF		

⁽¹⁾ All typical values are at $V_{CC} = 3.3 \text{ V}$, $T_A = 25^{\circ}\text{C}$.

Switching Characteristics

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)		V _{CC} = 1.8 V ± 0.15 V		V_{CC} = 2.5 V \pm 0.2 V		V _{CC} = 3.3 V ± 0.3 V		V _{CC} = 5 V ± 0.5 V	
	(INPOT)	(001701)	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	A or E	Υ	2.5	16.1	1.5	5.9	1	4	0.5	2.8	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} = 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
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	A or E	Y	3.2	16.1	1.5	6.5	1.1	5.2	0.5	3.9	ns

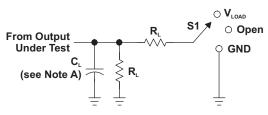
Operating Characteristics

 $T_A = 25^{\circ}C$

PARAMETER		TEST	V _{CC} = 1.8 V	V _{CC} = 2.5 V	V _{CC} = 3.3 V	V _{CC} = 5 V	UNIT
	FARAMETER	CONDITIONS	TYP	TYP	TYP	TYP	UNII
C_{pd}	Power dissipation capacitance	f = 10 MHz	15.5	16	16	18	pF



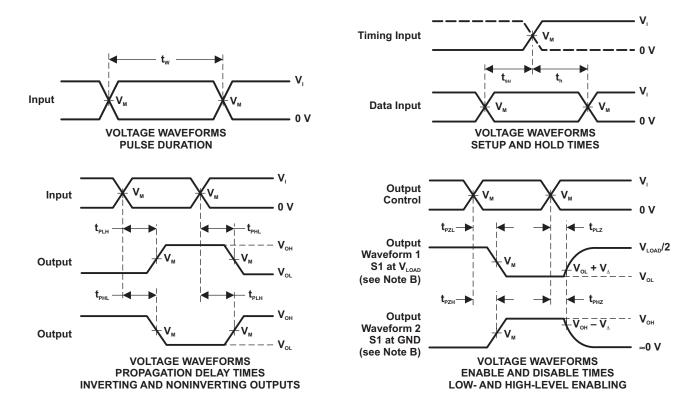
PARAMETER MEASUREMENT INFORMATION



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

LOAD CIRCUIT

.,	INI	PUTS		V	C,	-	.,	
V _{cc}	V,	t,/t,	V _M	V _M V _{LOAD}		R _L	$V_{_{\Delta}}$	
1.8 V ± 0.15 V	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	15 pF	1 M Ω	0.15 V	
$2.5 V \pm 0.2 V$	V _{cc}	≤2 ns	V _{cc} /2	2 × V _{cc}	15 pF	1 M Ω	0.15 V	
$3.3~V~\pm~0.3~V$	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	



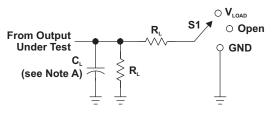
NOTES: A. C_L includes probe and jig capacitance.

- 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



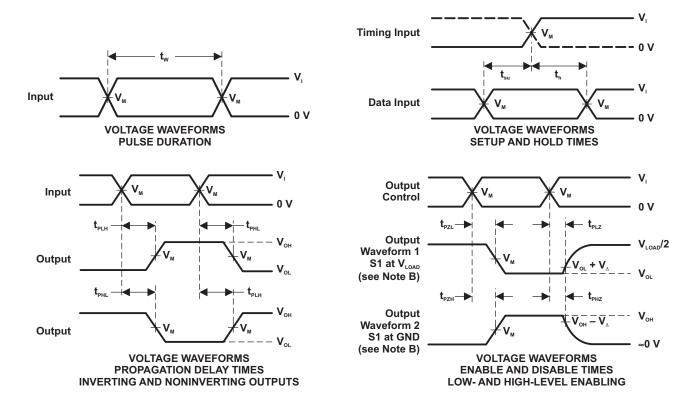
PARAMETER MEASUREMENT INFORMATION (continued)



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

LOAD CIRCUIT

	INI	PUTS	V V			-	W	
V _{cc}	V,	t,/t,	V _M	V _{LOAD}	C _L	R _L	$\mathbf{V}_{\scriptscriptstyle \Delta}$	
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	
$3.3~V~\pm~0.3~V$	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: $PRR \le 10 \text{ MHz}$, $Z_0 = 50 \Omega$.
- 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_{nd} .
- H. All parameters and waveforms are not applicable to all devices.

Figure 2. Load Circuit and Voltage Waveforms





com 22-Jul-2008

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Packag Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74LVC1G19DBVR	ACTIVE	SOT-23	DBV	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DBVRE4	ACTIVE	SOT-23	DBV	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DBVRG4	ACTIVE	SOT-23	DBV	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DBVT	PREVIEW	SOT-23	DBV	6	250	TBD	Call TI	Call TI
SN74LVC1G19DCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DCKRE4	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DCKRG4	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DCKT	PREVIEW	SC70	DCK	6	250	TBD	Call TI	Call TI
SN74LVC1G19DRLR	ACTIVE	SOT	DRL	6	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DRLRG4	ACTIVE	SOT	DRL	6	4000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DRYR	ACTIVE	SON	DRY	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19DRYRG4	ACTIVE	SON	DRY	6	5000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVC1G19YZPR	ACTIVE	DSBGA	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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PACKAGE OPTION ADDENDUM

22-Jul-2008

In no event shall TI's liability arising out of s to Customer on an annual basis.	such information exceed the	e total purchase price of the	TI part(s) at issue in this	document sold by T



TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
B0	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 Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LVC1G19DBVR	SOT-23	DBV	6	3000	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G19DBVR	SOT-23	DBV	6	3000	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G19DCKR	SC70	DCK	6	3000	180.0	9.2	2.24	2.34	1.22	4.0	8.0	Q3
SN74LVC1G19DRLR	SOT	DRL	6	4000	180.0	9.2	1.78	1.78	0.69	4.0	8.0	Q3
SN74LVC1G19DRYR	SON	DRY	6	5000	179.0	8.4	1.2	1.65	0.7	4.0	8.0	Q1



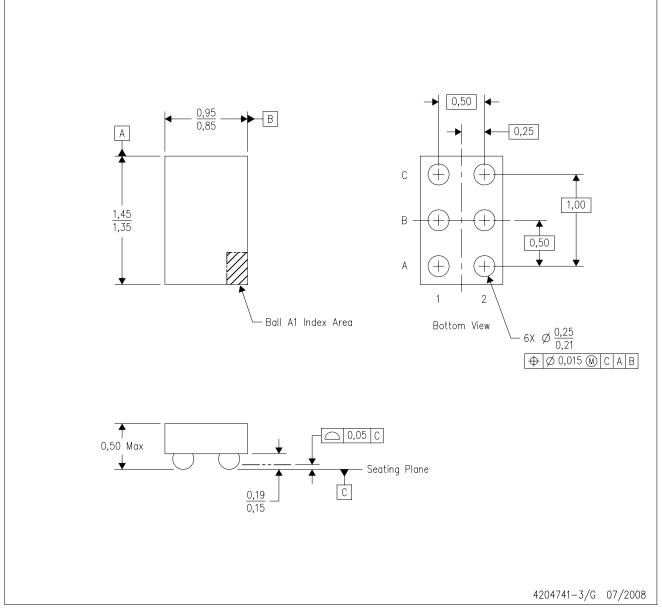


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G19DBVR	SOT-23	DBV	6	3000	202.0	201.0	28.0
SN74LVC1G19DBVR	SOT-23	DBV	6	3000	205.0	200.0	33.0
SN74LVC1G19DCKR	SC70	DCK	6	3000	205.0	200.0	33.0
SN74LVC1G19DRLR	SOT	DRL	6	4000	202.0	201.0	28.0
SN74LVC1G19DRYR	SON	DRY	6	5000	220.0	205.0	50.0

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.



DBV (R-PDSO-G6)

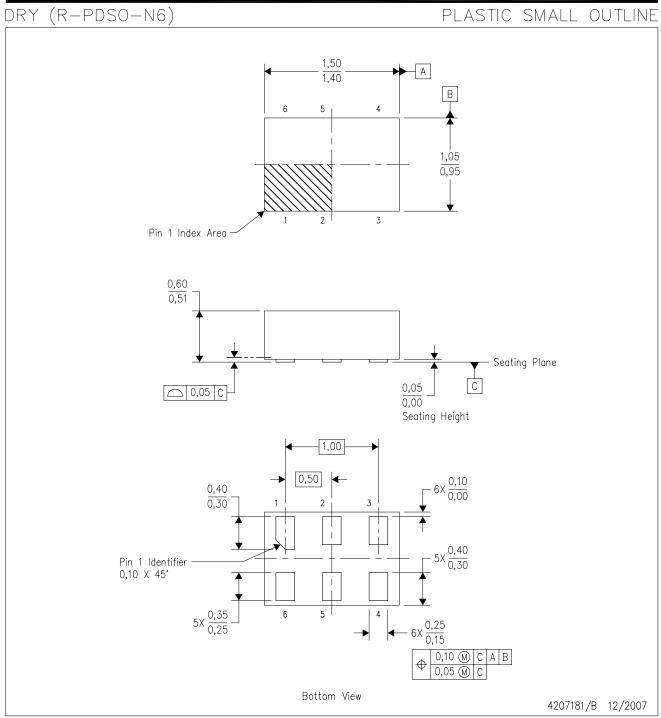
PLASTIC SMALL-OUTLINE PACKAGE



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.





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.



DRL (R-PDSO-N6)

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.



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.



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