SN54LV4051A, SN74LV4051A 8-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS

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- 2-V to 5.5-V V_{CC} Operation
- Support Mixed-Mode Voltage Operation on All Ports
- High On-Off Output-Voltage Ratio
- Low Crosstalk Between Switches
- Individual Switch Controls
- Extremely Low Input Current
- 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)

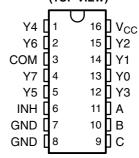
description/ordering information

These 8-channel CMOS analog multiplexers/ demultiplexers are designed for 2-V to 5.5-V $\rm V_{CC}$ operation.

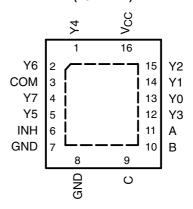
The 'LV4051A devices handle both analog and digital signals. Each channel permits signals with amplitudes up to 5.5 V (peak) to be transmitted in either direction.

Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

SN54LV4051A . . . J OR W PACKAGE SN74LV4051A . . . D, DB, DGV, N, NS, OR PW PACKAGE (TOP VIEW)



SN74LV4051A...RGY PACKAGE (TOP VIEW)



ORDERING INFORMATION

T _A	PACK	AGE [†]	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube of 25	SN74LV4051AN	SN74LV4051AN
	QFN – RGY Reel of 1000 SN74LV4051ARGYF		SN74LV4051ARGYR	LW051A
-40°C to 85°C	0010 D	Tube of 40	SN74LV4051AD	11/4054 A
	SOIC – D	Reel of 2500	SN74LV4051ADR	LV4051A
	SOP - NS	Reel of 2000	SN74LV4051ANSR	74LV4051A
-40°C to 85°C	SSOP – DB	Reel of 2000	SN74LV4051ADBR	LW051A
		Tube of 90	SN74LV4051APW	
	TSSOP - PW	Reel of 2000	SN74LV4051APWR	LW051A
		Reel of 250	SN74LV4051APWT	
	TVSOP - DGV	Reel of 2000	SN74LV4051ADGVR	LW051A
55°C to 125°C	CDIP – J	Tube of 25	SNJ54LV4051AJ	SNJ54LV4051AJ
_55°C to 125°C	CFP – W Tube of 150		SNJ54LV4051AW	SNJ54LV4051AW

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/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.

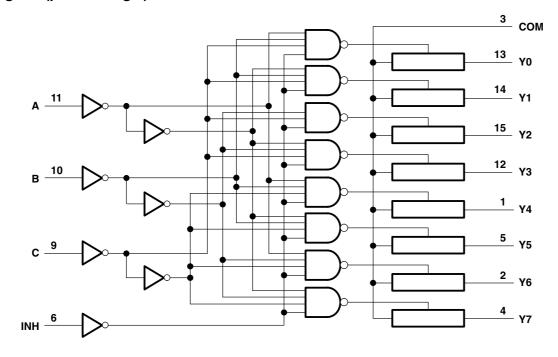


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FUNCTION TABLE

	INP	UTS		ON
INH	С	В	Α	CHANNEL
L	L	L	L	Y0
L	L	L	Н	Y1
L	L	Н	L	Y2
L	L	Н	Н	Y3
L	Н	L	L	Y4
L	Н	L	Н	Y5
L	Н	Н	L	Y6
L	Н	Н	Н	Y7
Н	Х	Х	Χ	None

logic diagram (positive logic)



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V _{CC}	
Input voltage range, V _I (see Note 1)	–0.5 V to 7.0 V
Switch I/O voltage range, V _{IO} (see Notes 1 and 2)	0.5 V to V _{CC} + 0.5 V
Input clamp current, I _{IK} (V _I < 0)	–20 mA
I/O diode current, I _{IOK} (V _{IO} < 0)	–50 mA
Switch through current, I_T ($V_{IO} = 0$ to V_{CC})	±25 mA
Continuous current through V _{CC} or GND	±50 mA
Package thermal impedance, θ _{JA} (see Note 3): D package	73°C/W
(see Note 3): DB package	82°C/W
(see Note 3): DGV package	120°C/W
(see Note 3): N package	67°C/W
(see Note 3): NS package	64°C/W
(see Note 3): PW package	108°C/W
(see Note 4): RGY package	39°C/W
Storage temperature range, T _{stg}	–65°C to 150°C

[†] 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.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

- 2. This value is limited to 5.5 V maximum.
- 3. The package thermal impedance is calculated in accordance with JESD 51-7.
- 4. The package thermal impedance is calculated in accordance with JESD 51-5.

recommended operating conditions (see Note 5)

			SN54L\	/4051A	SN74L	/4051A	
			MIN	MAX	MIN	MAX	UNIT
V_{CC}	Supply voltage		2 [‡]	5.5	2‡	5.5	V
		V _{CC} = 2 V	1.5		1.5		
.,	High-level input voltage,	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	$V_{CC} \times 0.7$		$V_{\text{CC}} \times 0.7$		\ ,,
V _{IH}	VIH control inputs	$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	$V_{\text{CC}} \times 0.7$		$V_{\text{CC}} \times 0.7$		V
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	$V_{\text{CC}} \times 0.7$	N.	$V_{\text{CC}} \times 0.7$		
		V _{CC} = 2 V		0.5		0.5	
.,	Low-level input voltage,	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		$V_{CC} \times 0.3$		$V_{\text{CC}} \times 0.3$	\ ,,
V_{IL}	control inputs	$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	ć	$V_{CC} \times 0.3$		$V_{\text{CC}} \times 0.3$	V
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	20	$V_{\text{CC}} \times 0.3$		$V_{\text{CC}} \times 0.3$	
VI	Control input voltage		0	5.5	0	5.5	V
V_{IO}	Input/output voltage		0	V _{CC}	0	V _{CC}	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		200		200	
Δt/Δν	Input transition rise or fall rate	V _{CC} = 3 V to 3.6 V		100		100	ns/V
		V _{CC} = 4.5 V to 5.5 V		20		20	
T _A	Operating free-air temperature		-55	125	-40	85	°C

[‡] With supply voltages at or near 2 V, the analog switch on-state resistance becomes very nonlinear. It is recommended that only digital signals be transmitted at these low supply voltages.

NOTE 5: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to TI application report *Implications* of Slow or Floating CMOS Inputs, literature number SCBA004.



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

	DADAMETED	TEST		T,	գ = 25°C	;	SN54LV	4051A	SN74LV	4051A	UNIT
	PARAMETER	CONDITIONS	v _{cc}	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
		I _T = 2 mA,	2.3 V		38	180		225		225	
r _{on}	On-state switch resistance	$V_I = V_{CC}$ or GND, $V_{INH} = V_{IL}$	3 V		30	150		190		190	Ω
	Switch resistance	(see Figure 1)	4.5 V		22	75		100		100	
		I _T = 2 mA,	2.3 V		113	500		600		600	
r _{on(p)}	Peak on-state resistance	$V_I = V_{CC}$ to GND,	3 V		54	180		225		225	Ω
		$V_{INH} = V_{IL}$	4.5 V		31	100		125		125	
	Difference in	I _T = 2 mA,	2.3 V		2.1	30		40		40	
Δr_{on}	on-state resistance	$V_I = V_{CC}$ to GND,	3 V		1.4	20		30		30	Ω
	between switches	$V_{INH} = V_{IL}$	4.5 V		1.3	15		20		20	
I _I	Control input current	V _I = 5.5 V or GND	0 to 5.5 V			±0.1		±1		±1	μΑ
I _{S(off)}	Off-state switch leakage current	$\begin{aligned} &V_I = V_{CC} \text{ and} \\ &V_O = \text{GND, or} \\ &V_I = \text{GND and} \\ &V_O = V_{CC}, \\ &V_{INH} = V_{IH} \\ &(\text{see Figure 2}) \end{aligned}$	5.5 V			±0.1	PROBUCTE	±1		±1	μА
I _{S(on)}	On-state switch leakage current	$V_I = V_{CC}$ or GND, $V_{INH} = V_{IL}$ (see Figure 3)	5.5 V			±0.1		±1		±1	μА
I _{CC}	Supply current	$V_I = V_{CC}$ or GND	5.5 V					20		20	μΑ
C _{IC}	Control input capacitance	f = 10 MHz	3.3 V		2						pF
C _{IS}	Common terminal capacitance		3.3 V		23.4						pF
Cos	Switch terminal capacitance		3.3 V		5.7						pF
C _F	Feedthrough capacitance		3.3 V		0.5						pF

switching characteristics over recommended operating free-air temperature range, V_{CC} = 2.5 V \pm 0.2 V (unless otherwise noted)

		FROM	то	TEST	Τμ	√ = 25°C		SN54LV	4051A	SN74LV4051A		
PAI	RAMETER	(INPUT)	(OUTPUT)	CONDITIONS	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 15 pF, (see Figure 4)		1.9	10		16		16	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		6.6	18		23		23	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		7.4	18		23		23	ns
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 50 pF, (see Figure 5)		3.8	12	Snac	18		18	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	C _L = 50 pF, (see Figure 5)		7.8	28	y _d	35		35	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Yn	C _L = 50 pF, (see Figure 5)		11.5	28		35		35	ns



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switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V \pm 0.3 V (unless otherwise noted)

D4.		FROM	то	TEST	T	∖ = 25°C	;	SN54LV	4051A	SN74LV	4051A	
PAI	RAMETER	(INPUT)	(OUTPUT)	CONDITIONS	MIN TYP MAX		MAX	MIN	MAX	MIN	MAX	UNIT
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 15 pF, (see Figure 4)		1.2	6		10		10	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		4.7	12		15		15	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		5.7	12	4	15		15	ns
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 50 pF, (see Figure 4)		2.5	9	nac	12		12	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	C _L = 50 pF, (see Figure 5)		5.5	20	Ha	25		25	ns
t _{PHZ}	Disable delay time	INH	COM or Yn	C _L = 50 pF, (see Figure 5)		8.8	20		25		25	ns

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V \pm 0.5 V (unless otherwise noted)

D4.		FROM	то	TEST	T	∖ = 25°C		SN54LV	4051A	SN74LV	4051A	
PAI	RAMETER	(INPUT)	(OUTPUT)	CONDITIONS	MIN TYP MAX		MIN	MAX	MIN	MAX	UNIT	
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 15 pF, (see Figure 4)		0.6	4		7		7	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		3.5	8		10		10	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Yn	C _L = 15 pF, (see Figure 5)		4.4	8	4	10		10	ns
t _{PLH} t _{PHL}	Propagation delay time	COM or Yn	Yn or COM	C _L = 50 pF, (see Figure 4)		1.5	6	Snac	8		8	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Yn	$C_L = 50 \text{ pF},$ (see Figure 5)		4	14	No.	18		18	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Yn	$C_L = 50 \text{ pF},$ (see Figure 5)		6.2	14		18		18	ns

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

DADAMETED	FROM	TO	TEOT 00	NOTIONO	.,	T,	√ = 25°C		UNIT	
PARAMETER	(INPUT)	(OUTPUT)	TEST CO	NDITIONS	v _{cc}	MIN	TYP	MAX	UNII	
		- L F.,		2.3 V		20				
Frequency response (switch on)	COM or Yn	Yn or COM	R_L = 600 Ω, f_{in} = 1 MHz (sin	e wave)	3 V		25		MHz	
(emilen em)			(see Note 6 and	,	4.5 V		35			
			$C_L = 50 \text{ pF},$	C _L = 50 pF,			20			
Crosstalk (control input to signal output)	INH	COM or Yn	COM or Yn	R_L = 600 Ω, f_{in} = 1 MHz (squ	iare wave)	3 V		35		mV
(control input to signal output)			(see Figure 7)	4.5 V		60				
			C _L = 50 pF,		2.3 V		-45			
Feedthrough attenuation (switch off)	COM or Yn	Yn or COM	$R_L = 600 \Omega$, $f_{in} = 1 MHz$		3 V		-45		dB	
(cimen on)			(see Note 7 and	d Figure 8)	4.5 V		-45			
			C _L = 50 pF,	$V_I = 2 V_{p-p}$	2.3 V		0.1			
Sine-wave distortion	COM or Yn	Yn or COM	$R_L = 10 \text{ k}\Omega,$ $f_{\text{in}} = 1 \text{ kHz}$	V _I = 2.5 V _{p-p}	3 V		0.1		%	
			(sine wave) (see Figure 9)	$V_I = 4 V_{p-p}$	4.5 V		0.1			

NOTES: 6. Adjust fin voltage to obtain 0-dBm output. Increase fin frequency until dB meter reads -3 dB.

operating characteristics, V_{CC} = 3.3 V, T_A = 25°C

	PARAMETER	TEST COI	TYP	UNIT	
C _{pd}	Power dissipation capacitance	$C_L = 50 \text{ pF},$	f = 10 MHz	5.9	pF

PARAMETER MEASUREMENT INFORMATION

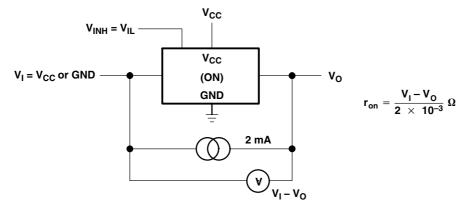
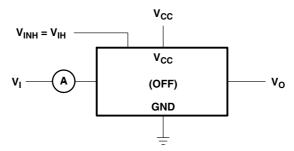


Figure 1. On-State Resistance Test Circuit

^{7.} Adjust fin voltage to obtain 0-dBm input.

PARAMETER MEASUREMENT INFORMATION



Condition 1: $V_I = 0$, $V_O = V_{CC}$ Condition 2: $V_I = V_{CC}$, $V_O = 0$

Figure 2. Off-State Switch Leakage-Current Test Circuit

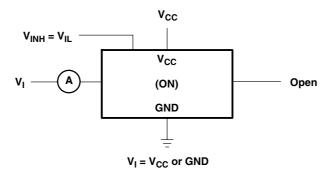


Figure 3. On-State Switch Leakage-Current Test Circuit

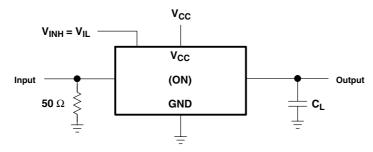


Figure 4. Propagation Delay Time, Signal Input to Signal Output

PARAMETER MEASUREMENT INFORMATION

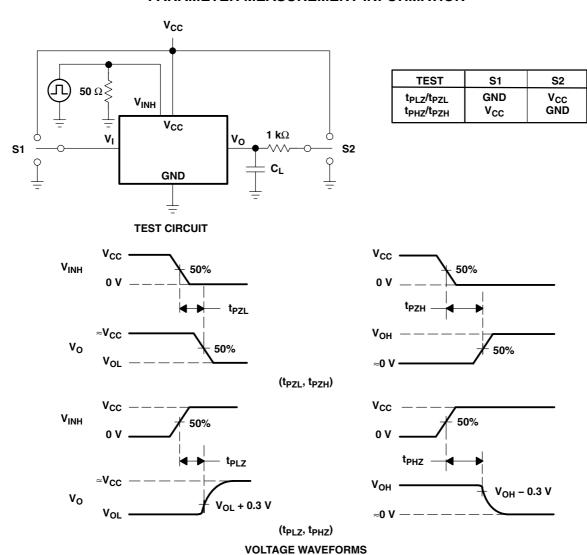


Figure 5. Switching Time (t_{PZL}, t_{PLZ}, t_{PZH}, t_{PHZ}), Control to Signal Output

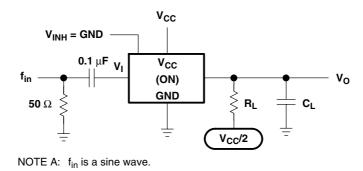


Figure 6. Frequency Response (Switch On)



PARAMETER MEASUREMENT INFORMATION

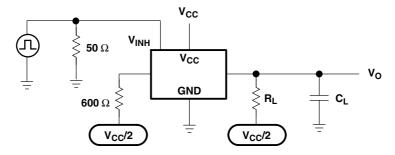


Figure 7. Crosstalk (Control Input, Switch Output)

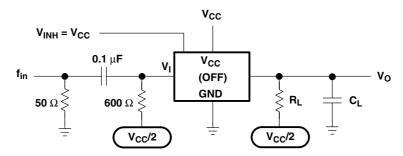


Figure 8. Feedthrough Attenuation (Switch Off)

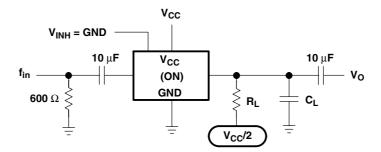


Figure 9. Sine-Wave Distortion



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PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Packag Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	n MSL Peak Temp ⁽³⁾
SN74LV4051AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADBR	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADBRE4	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADBRG4	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADGVR	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADGVRE4	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADGVRG4	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ADRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LV4051ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LV4051ANSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ANSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ANSRG4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APW	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWE4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWG4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWR	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWRE4	ACTIVE	TSSOP	PW	16	2000	-	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWRG3	PREVIEW	TSSOP	PW	16	2000	TBD	Call TI	Call TI
SN74LV4051APWRG4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS &	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWT	ACTIVE	TSSOP	PW	16	250	no Sb/Br) Green (RoHS &		Level-1-260C-UNLIM
SITTEVESOIAL WI	, CIIVL		. • •	10	200	no Sb/Br)	OO MI DAO	LOTOL 1 ZOOO OINLIN

PACKAGE OPTION ADDENDUM

www.ti.com 15-Mar-2010

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74LV4051APWTE4	ACTIVE	TSSOP	PW	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051APWTG4	ACTIVE	TSSOP	PW	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV4051ARGYR	ACTIVE	VQFN	RGY	16	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
SN74LV4051ARGYRG4	ACTIVE	VQFN	RGY	16	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR

⁽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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OTHER QUALIFIED VERSIONS OF SN74LV4051A:

• Automotive: SN74LV4051A-Q1

Enhanced Product: SN74LV4051A-EP

NOTE: Qualified Version Definitions:

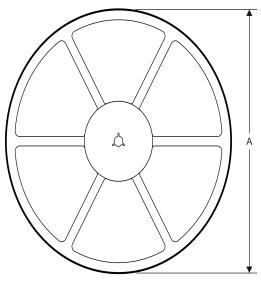
- Automotive Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product Supports Defense, Aerospace and Medical Applications

PACKAGE MATERIALS INFORMATION

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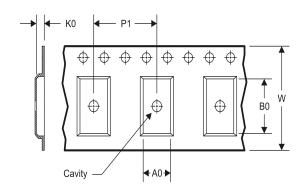
TAPE AND REEL INFORMATION

REEL DIMENSIONS





TAPE DIMENSIONS



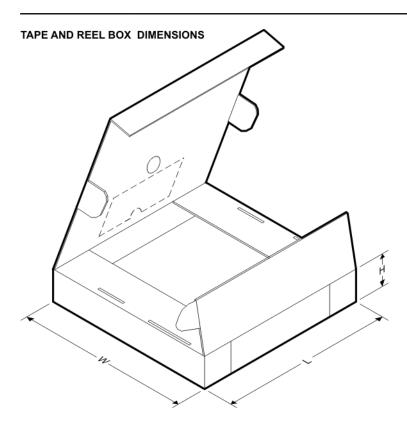
A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

TAPE AND REEL INFORMATION

*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
SN74LV4051ADBR	SSOP	DB	16	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1
SN74LV4051ADGVR	TVSOP	DGV	16	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV4051ANSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LV4051APWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4051APWR	TSSOP	PW	16	2000	330.0	12.4	7.0	5.6	1.6	8.0	12.0	Q1
SN74LV4051APWT	TSSOP	PW	16	250	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4051ARGYR	VQFN	RGY	16	3000	330.0	12.4	3.8	4.3	1.5	8.0	12.0	Q1

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*All dimensions are nominal

Device Package Type		Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV4051ADBR	SSOP	DB	16	2000	346.0	346.0	33.0
SN74LV4051ADGVR	TVSOP	DGV	16	2000	346.0	346.0	29.0
SN74LV4051ANSR	SO	NS	16	2000	346.0	346.0	33.0
SN74LV4051APWR	TSSOP	PW	16	2000	346.0	346.0	29.0
SN74LV4051APWR	TSSOP	PW	16	2000	364.0	364.0	27.0
SN74LV4051APWT	TSSOP	PW	16	250	346.0	346.0	29.0
SN74LV4051ARGYR	VQFN	RGY	16	3000	346.0	346.0	29.0

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.



DGV (R-PDSO-G**)

24 PINS SHOWN

PLASTIC SMALL-OUTLINE



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, not to exceed 0,15 per side.

D. Falls within JEDEC: 24/48 Pins – MO-153 14/16/20/56 Pins – MO-194

D (R-PDS0-G16)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AC.



PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE

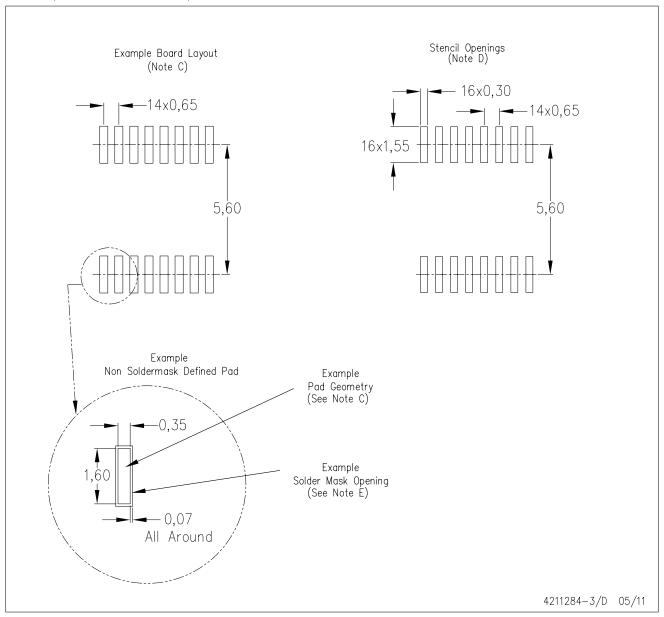


- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



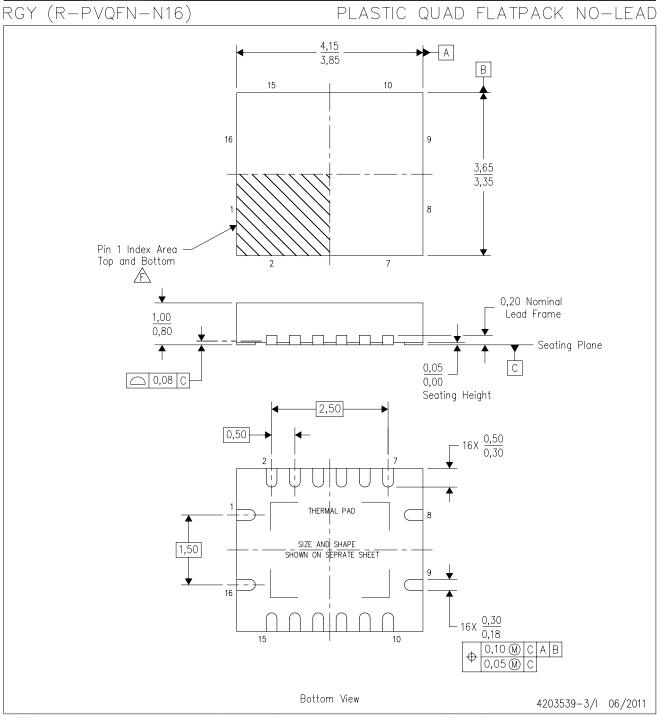
PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- 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. 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 other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.





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. QFN (Quad Flatpack No-Lead) package configuration.
- D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
- E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
- Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
- G. Package complies to JEDEC MO-241 variation BA.



RGY (R-PVQFN-N16)

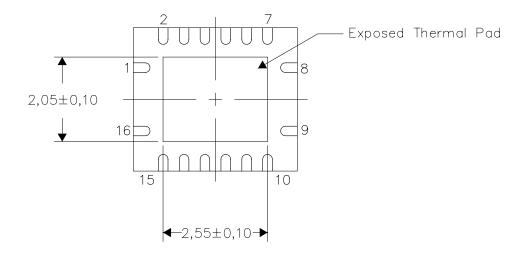
PLASTIC QUAD FLATPACK NO-LEAD

THERMAL INFORMATION

This package incorporates an exposed thermal pad that is designed to be attached directly to an external heatsink. The thermal pad must be soldered directly to the printed circuit board (PCB). After soldering, the PCB can be used as a heatsink. In addition, through the use of thermal vias, the thermal pad can be attached directly to the appropriate copper plane shown in the electrical schematic for the device, or alternatively, can be attached to a special heatsink structure designed into the PCB. This design optimizes the heat transfer from the integrated circuit (IC).

For information on the Quad Flatpack No-Lead (QFN) package and its advantages, refer to Application Report, QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271. This document is available at www.ti.com.

The exposed thermal pad dimensions for this package are shown in the following illustration.



Bottom View

Exposed Thermal Pad Dimensions

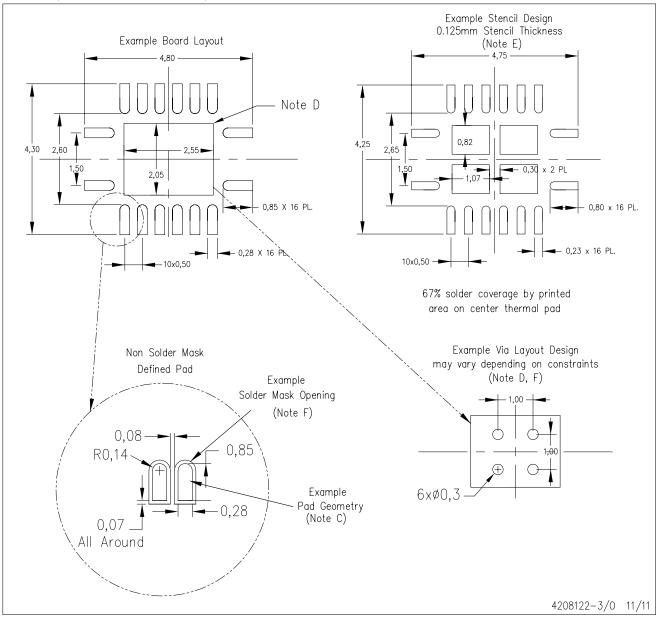
4206353-3/0 11/11

NOTE: All linear dimensions are in millimeters



RGY (R-PVQFN-N16)

PLASTIC QUAD FLATPACK NO-LEAD



- 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. This package is designed to be soldered to a thermal pad on the board. Refer to Application Note, Quad Flat—Pack QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271, and also the Product Data Sheets for specific thermal information, via requirements, and recommended board layout. These documents are available at www.ti.com http://www.ti.com.
- 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. Refer to IPC 7525 for stencil design considerations.
- F. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- 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, not to exceed 0,15.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



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 not to exceed 0,15.

D. Falls within JEDEC MO-150

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