SN74LV4066A Quadruple Bilateral Analog Switches

1 Features

- 1.65V to 5.5V 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
- ESD protection exceeds JESD 22:
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 750-V Charged-Device Model (C101)

2 Applications

- Telecommunications
- eCall
- Infotainment

3 Description

This quadruple silicon-gate CMOS analog switch is designed for 1.65V to 5.5V V_{CC} operation.

These switches are designed to handle both analog and digital signals. Each switch permits signals with amplitudes up to 5.5V (peak) to be transmitted in either direction.

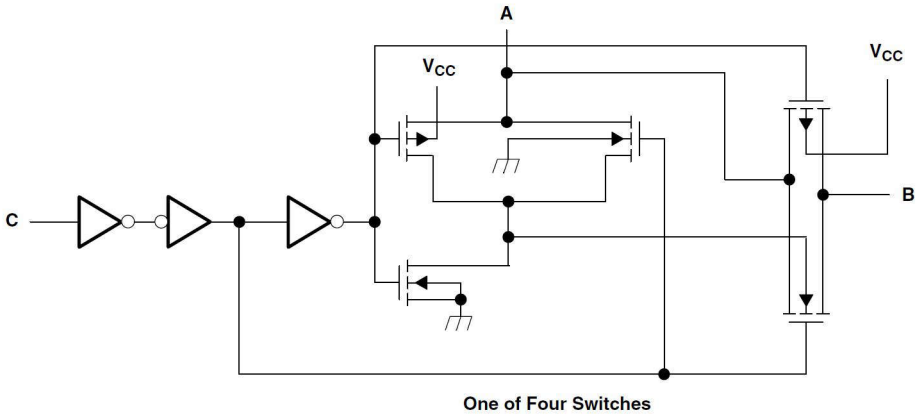
Each switch section has its own enable-input control (C). A high-level voltage applied to C turns on the associated switch section.

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

Package Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)
SN74LV4066A	D (SOIC, 14)	8.65mm × 6mm
	PW (TSSOP, 14)	5mm × 6.4mm
	RGY (QFN, 14)	3.5mm × 3.5mm

(1) For more information, see Section 10.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.



Logic Diagram (Positive Logic)

Table of Contents

4 Pin Configuration and Functions

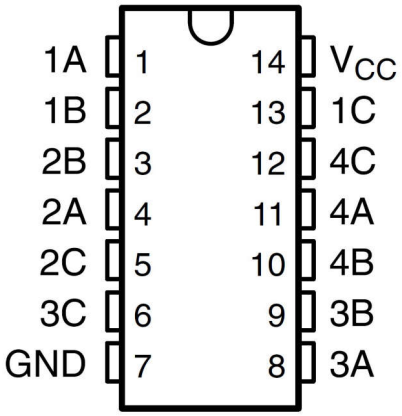


Figure 4-1. D or PW Package, 14-Pin SOIC or TSSOP (Top View)

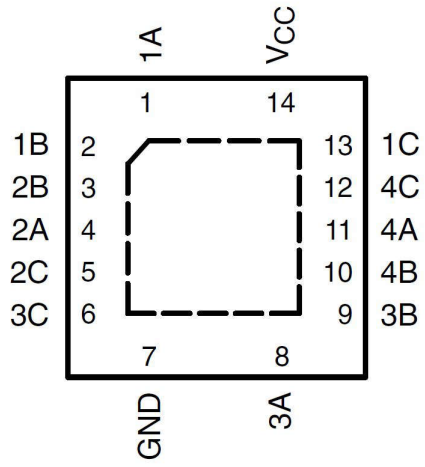


Figure 4-2. RGY Package, 14- Pin QFN (Top View)

Table 4-1. Pin Functions

PIN		TYPE[1]	DESCRIPTION
NAME	NO.		
1A	1	I/O	Input/Output to switch channel 1
1B	2	I/O	Input/Output to switch channel 1
2B	3	I/O	Input/Output to switch channel 2
2A	4	I/O	Input/Output to switch channel 2
2C	5	I	Control line for channel 2. Switch is ON when control pin is high.
3C	6	I	Control line for channel 3. Switch is ON when control pin is high.
GND	7	—	Ground (0V) reference
3A	8	I/O	Input/Output to switch channel 3
3B	9	I/O	Input/Output to switch channel 3
4B	10	I/O	Input/Output to switch channel 4
4A	11	I/O	Input/Output to switch channel 4
4C	12	I	Control line for channel 4. Switch is ON when control pin is high.
1C	13	I	Control line for channel 1. Switch is ON when control pin is high.
V_{CC}	14	—	Positive power supply. This pin is the most positive power-supply potential. For reliable operation, connect a decoupling capacitor ranging from 0.1µF to 10µF between VDD and GND.
Thermal pad		—	It is recommended to tie the pad to GND for the best performance.

(1) Signal types: I = input, O = output, I/O = input or output.

5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)(1) (3)

			MIN	MAX	UNIT
V_{CC}	Supply voltage		–0.5	7.0	V
V_I	Logic input voltage range		–0.5	7.0	V
V_{IO}	Switch I/O voltage range(2) (3)		–0.5	V_{CC} + 0.5	V
I_{IK}	Logic input clamp current	V_I < 0	–20		mA
I_{IOK}	Switch path diode clamp current	V_{IO} < 0 or V_{IO} > V_{CC}	–50	50	mA
I_T	Switch continuous current	V_{IO} = 0 to V_{CC}		±25	mA
	Continuous current through V_{CC} or GND			±50	mA
T_J	Junction temperature			150	°C
T_{stg}	Storage temperature		–65	150	°C

(1) Operation outside the *Absolute Maximum Ratings* may cause permanent device damage. Absolute maximum ratings do not imply functional operation of the device at these or any other conditions beyond those listed under *Recommended Operating Conditions*. If briefly operating outside the *Recommended Operating Conditions* but within the *Absolute Maximum Ratings*, the device may not sustain damage, but it may not be fully functional. Operating the device in this manner may affect device reliability, functionality, performance, and shorten the device lifetime.
(2) Pins are diode-clamped to the power-supply rails. Over voltage signals must be voltage and current limited to maximum ratings.
(3) This value is limited to 5.5V maximum

5.2 ESD Ratings

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins(1)	±2000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins(2)	±1000	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5.3 Thermal Information: SN74LV4066A

THERMAL METRIC(1)		SN74LV4066A			UNIT
		D (SOIC)	PW (TSSOP)	RGY (VQFN)	
		14 PINS	14 PINS	14 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	128.8	150.6	91.9	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	81.8	78.2	91.8	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	84.2	93.7	66.5	°C/W
Ψ_{JT}	Junction-to-top characterization parameter	39.5	24.6	20.0	°C/W
Ψ_{JB}	Junction-to-board characterization parameter	83.7	93.1	66.3	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	N/A	N/A	50.0	°C/W

(1) For more information about traditional and new thermal metrics, see the Semiconductor and IC Package Thermal Metrics application report.

5.4 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)(1)

			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		1.65		5.5	V
V_{IH}	High-level input voltage, logic control inputs	V_{CC} = 2V	1.5		5.5	V
		V_{CC} = 2.3V to 2.7V	V_{CC} x 0.7		5.5	
		V_{CC} = 3V to 3.6V	V_{CC} x 0.7		5.5	
		V_{CC} = 4.5V to 5.5V	V_{CC} x 0.7		5.5	
V_{IL}	Low-level input voltage, logic control inputs	V_{CC} = 2V	0		0.5	V
		V_{CC} = 2.3V to 2.7V	0		V_{CC} x 0.3	
		V_{CC} = 3V to 3.6V	0		V_{CC} x 0.3	
		V_{CC} = 4.5V to 5.5V	0		V_{CC} x 0.3	
V_I	Logic control input voltage		0		5.5	V
V_{IO}	Switch input or output voltage		0		V_{CC}	V
Δt/ΔV	Logic input transition rise or fall rate	V_{CC} = 2.3V to 2.7V			200	ns/V
		V_{CC} = 3V to 3.6V			100	
		V_{CC} = 4.5V to 5.5V			20	
T_A	Ambient temperature		–40		125	°C

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

5.5 Electrical Characteristics (LV)

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

PARAMETER		CONDITIONS	T_A	V_{CC}	MIN	TYP	MAX	UNIT
r_{ON}	ON-state switch resistance	I_T = 2mA, V_I = V_{CC} or GND, V_{INH} = V_{IL} (see Figure 6-1)	25°C	1.65V		60	150	Ω
			–40°C to 85°C				225	
			–40°C to 125°C				225	
			25°C	2.3V		38	180	
			–40°C to 85°C				225	
			–40°C to 125°C				225	
			25°C	3V		29	150	Ω
			–40°C to 85°C				190	
			–40°C to 125°C				190	
			25°C	4.5V		21	75	Ω
			–40°C to 85°C				100	
			–40°C to 125°C				100	

5.5 Electrical Characteristics (LV) (continued)

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

PARAMETER		CONDITIONS	T_A	V_{CC}	MIN	TYP	MAX	UNIT
$r_{ON(p)}$	Peak ON-state resistance	I_T = 2mA, V_I = GND to V_{CC}, V_{INH} = V_{IL}	25°C	1.65V		130	600	Ω
			–40°C to 85°C				700	
			–40°C to 125°C				700	
			25°C	2.3V		143	500	
			–40°C to 85°C				600	
			–40°C to 125°C				600	
			25°C	3V		57	180	Ω
			–40°C to 85°C				225	
			–40°C to 125°C				225	
			25°C	4.5V		31	100	Ω
			–40°C to 85°C				125	
			–40°C to 125°C				125	
Δr_{ON}	Difference in ON-state resistance between switches	I_T = 2mA, V_I = GND to V_{CC}, V_{INH} = V_{IL}	25°C	1.65V		2.5		Ω
			–40°C to 85°C			3		
			–40°C to 125°C			3		
			25°C	2.3V		3	30	
			–40°C to 85°C	2.3V			40	
			–40°C to 125°C	2.3V			40	
			25°C	3V		3	20	Ω
			–40°C to 85°C				30	
			–40°C to 125°C				30	
			25°C	4.5V		2	15	Ω
			–40°C to 85°C				20	
			–40°C to 125°C				20	
I_{IH} I_{IL}	Control input current	V_I = 5.5V or GND	25°C	0 to 5.5V			0.1	μA
			–40°C to 85°C				1	
			–40°C to 125°C				1	
$I_{S(off)}$	OFF-state switch leakage current	V_I = V_{CC} and V_O = GND, or V_I = GND and V_O = V_{CC}, V_{INH} = V_{IH} (see Figure 6-2)	25°C	5.5V			±0.1	μA
			–40°C to 85°C				±1	
			–40°C to 125°C				±1	
$I_{S(on)}$	ON-state switch leakage current	V_I = V_{CC} or GND, V_{INH} = V_{IL} (see Figure 6-3)	25°C	5.5V			±0.1	μA
			–40°C to 85°C				±1	
			–40°C to 125°C				±1	
I_{CC}	Supply current	V_I = V_{CC} or GND V_{INH} = 0V	25°C	5.5V		0.01		μA
			–40°C to 85°C				20	
			–40°C to 125°C				20	
C_{IC}	Control input capacitance	f = 10MHz	25°C	3.3V		4		pF
C_{IS}	Switch terminal capacitance	f = 10MHz	25°C	3.3V		5.5		pF
$C_{OS(on)}$	Common terminal ON-capacitance	f = 10MHz	25°C	3.3V		5.5		pF
C_F	Feedthrough capacitance	f = 10MHz	25°C	3.3V		0.5		pF

5.5 Electrical Characteristics (LV) (continued)

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

PARAMETER		CONDITIONS	T_A	V_{CC}	MIN	TYP	MAX	UNIT
C_{PD}	Power dissipation capacitance	C_L = 50pF, f = 10MHz	25°C	3.3V		4.5		pF

5.6 Timing Characteristics V_{CC} = 2.5V ± 0.2V

over recommended operating free-air temperature range (unless otherwise noted)
V_{cc} = 2V ± 0.2V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T_A	MIN	TYP	MAX	UNIT
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 15pF (see Figure 6-4)	25°C		1.2	10	ns
					–40°C to 85°C			16	
					–40°C to 125°C			18	
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		3.3	15	ns
					–40°C to 85°C			20	
					–40°C to 125°C			20	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		6	15	ns
					–40°C to 85°C			23	
					–40°C to 125°C			23	
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 50pF (see Figure 6-4)	25°C		2.6	12	ns
					–40°C to 85°C			18	
					–40°C to 125°C			18	
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		4.2	25	ns
					–40°C to 85°C			32	
					–40°C to 125°C			32	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		9.6	25	ns
					–40°C to 85°C			32	
					–40°C to 125°C			32	

5.7 Timing Characteristics V_{CC} = 3.3V ± 0.3V

over recommended operating free-air temperature range (unless otherwise noted)
V_{cc} = 3.3V ± 0.3V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T_A	MIN	TYP	MAX	UNIT
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 15pF (see Figure 6-4)	25°C		0.8	6	ns
					–40°C to 85°C			10	
					–40°C to 125°C			10	
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		2.3	11	ns
					–40°C to 85°C			15	
					–40°C to 125°C			15	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		4.5	11	ns
					–40°C to 85°C			15	
					–40°C to 125°C			15	
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 50pF (see Figure 6-4)	25°C		1.5	9	ns
					–40°C to 85°C			12	
					–40°C to 125°C			12	

5.7 Timing Characteristics V_{CC} = 3.3V ± 0.3V (continued)

over recommended operating free-air temperature range (unless otherwise noted)
V_{cc} = 3.3V ± 0.3V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T_A	MIN	TYP	MAX	UNIT
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		8	18	ns
					–40°C to 85°C			22	
					–40°C to 125°C			22	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		7.2	18	ns
					–40°C to 85°C			22	
					–40°C to 125°C			22	

5.8 Timing Characteristics V_{CC} = 5V ± 0.5V

over recommended operating free-air temperature range (unless otherwise noted)
V_{cc} = 5V ± 0.5V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T_A	MIN	TYP	MAX	UNIT
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 15pF (see Figure 6-4)	25°C		0.6	4	ns
					–40°C to 85°C			7	
					–40°C to 125°C			7	
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		3.5	8	ns
					–40°C to 85°C			10	
					–40°C to 125°C			11	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 15pF (see Figure 6-5)	25°C		4.4	8	ns
					–40°C to 85°C			10	
					–40°C to 125°C			10	
t_{PLH} t_{PHL}	Propagation delay time	COM or Yn	Yn or COM	C_L = 50pF (see Figure 6-4)	25°C		0.8	6	ns
					–40°C to 85°C			8	
					–40°C to 125°C			8	
t_{PZH} t_{PZL}	Enable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		7	13	ns
					–40°C to 85°C			16	
					–40°C to 125°C			16	
t_{PHZ} t_{PLZ}	Disable delay time	INH	COM or Yn	C_L = 50pF (see Figure 6-5)	25°C		6.2	13	ns
					–40°C to 85°C			16	
					–40°C to 125°C			16	

5.9 AC Characteristics

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	Device	CONDITIONS		MIN	TYP	MAX	UNIT
Frequency response (switch on)	COM or Yn	Yn or COM	4066	C_L = 50pF, R_L = 50Ω, F_{in} = 1MHz (sine wave) (see Figure 6-6) (1)	V_{CC} = 2.3V		60		MHz
					V_{CC} = 3V		75		
					V_{CC} = 4.5V		100		
Charge Injection (control input to signal output)	INH	COM or Yn	ALL	C_L = 50pF F_{in} = 1MHz (sine wave) (see Figure 6-7)	V_{CC} = 2.3V		15		mV
					V_{CC} = 3V		20		
					V_{CC} = 4.5V		50		

5.9 AC Characteristics (continued)

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	Device	CONDITIONS		MIN	TYP	MAX	UNIT
Feedthrough attenuation (switch off)	COM or Yn	Yn or COM	ALL	C_L = 50pF, R_L = 50Ω, F_{in} = 1MHz (sine wave) (see Figure 6-8(2)	V_{CC} = 2.3V		–40		dB
					V_{CC} = 3V		–40		
					V_{CC} = 4.5V		–40		
Crosstalk (between any switches)	COM or Yn	Yn or COM	ALL	C_L = 50pF, R_L = 50Ω, F_{in} = 1MHz (sine wave) (see Figure 6-9(2)	V_{CC} = 2.3V		–45		dB
					V_{CC} = 3V		–45		
					V_{CC} = 4.5V		–45		
Sine-wave distortion	COM or Yn	Yn or COM	ALL	C_L = 50pF, R_L = 10kΩ, F_{in} = 1kHz (sine wave) (see Figure 6-10)	V_I = $2V_{p-p}$ V_{CC} = 2.3V		0.1		%
					V_I = $2.5V_{p-p}$ V_{CC} = 3V		0.1		
					V_I = $4V_{p-p}$ V_{CC} = 4.5V		0.1		

6 Parameter Measurement Information

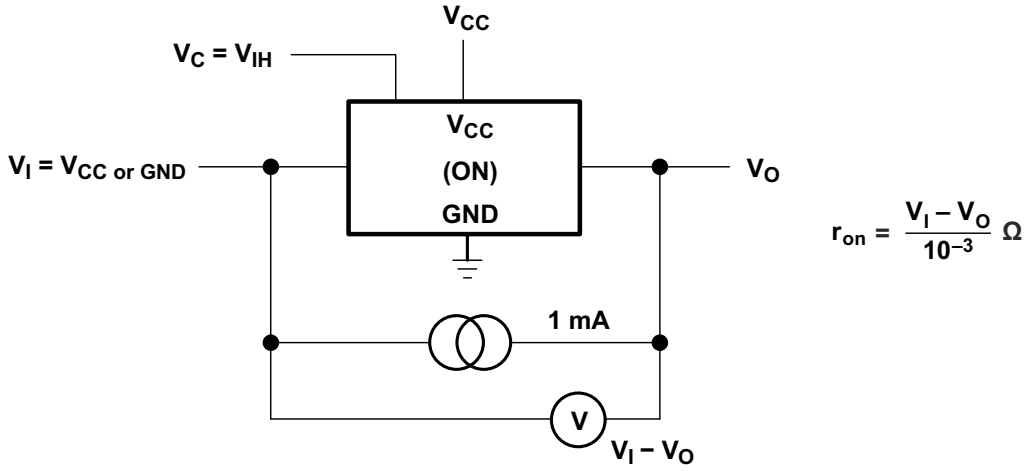
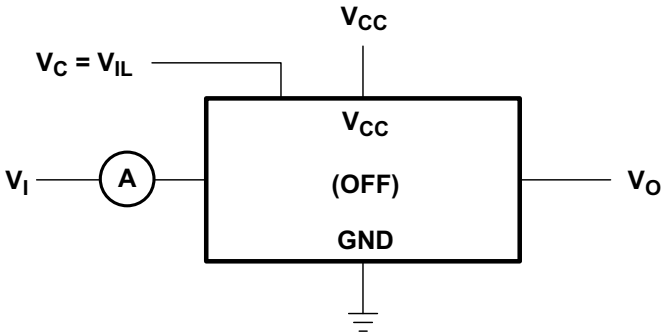
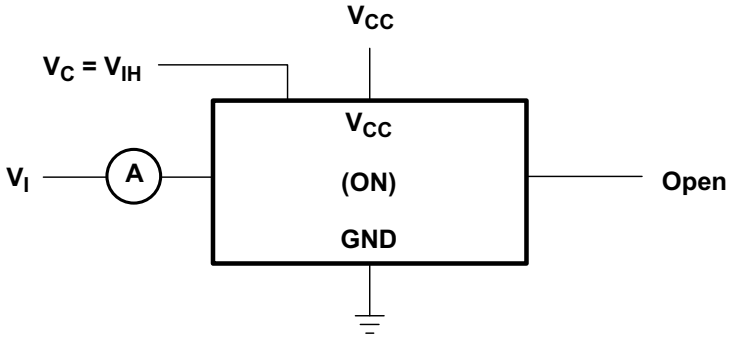


Figure 6-1. ON-State Resistance Test Circuit



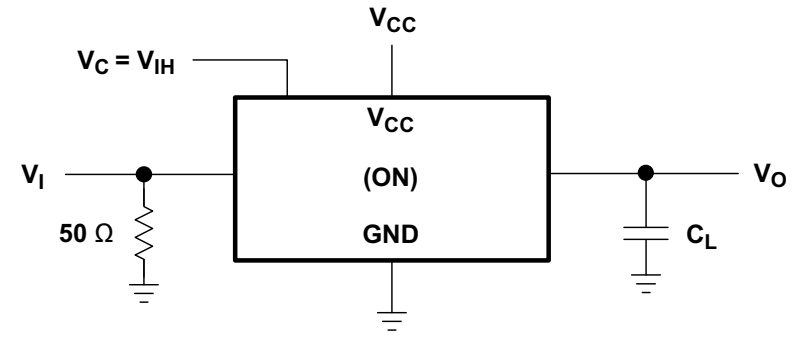
Condition 1: V_I = 0, V_O = V_{CC}
Condition 2: V_I = V_{CC}, V_O = 0

Figure 6-2. OFF-State Switch Leakage-Current Test Circuit

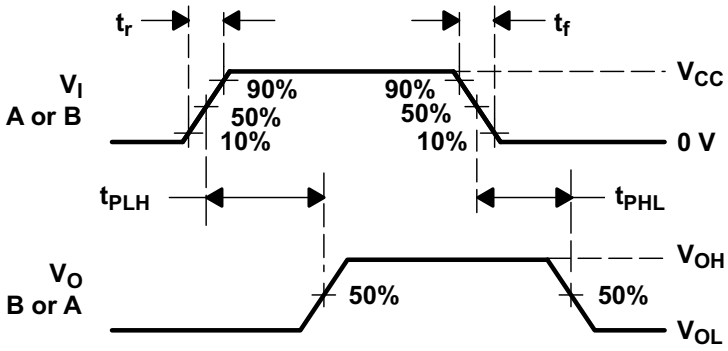


V_I = V_{CC} or GND

Figure 6-3. ON-State Leakage-Current Test Circuit

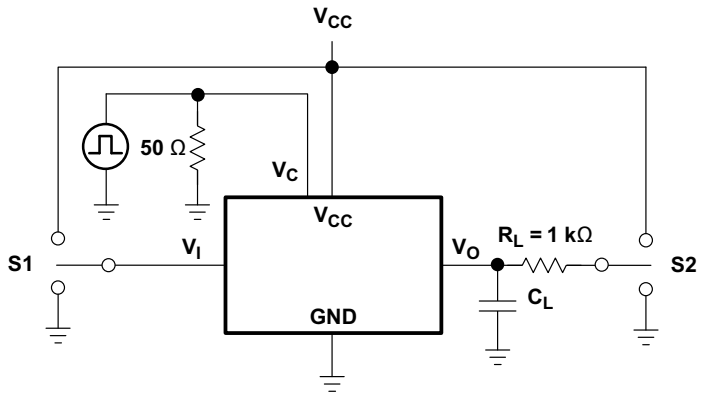


TEST CIRCUIT



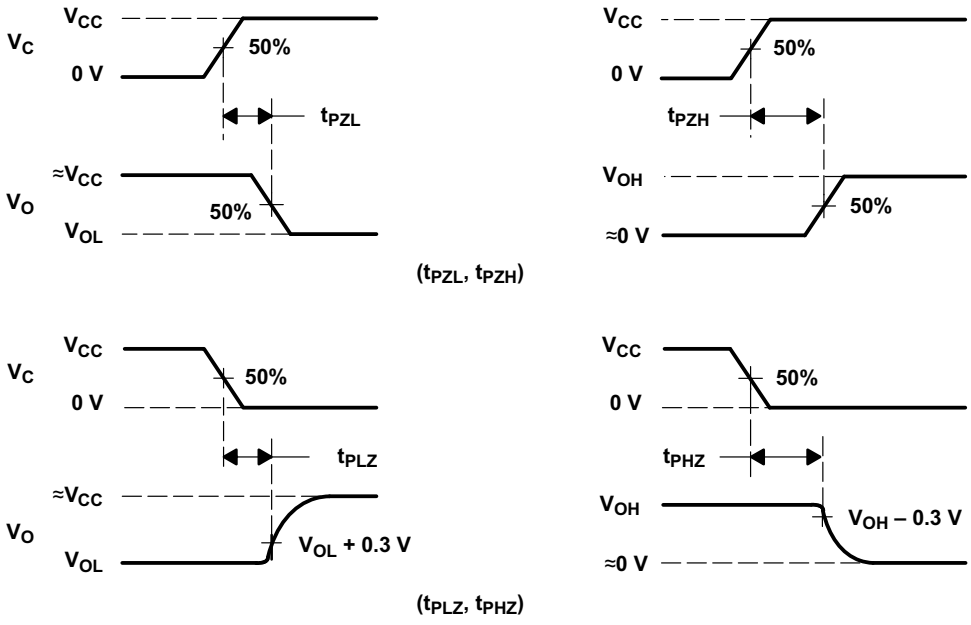
VOLTAGE WAVEFORMS

Figure 6-4. Propagation Delay Time, Signal Input to Signal Output



TEST	S1	S2
t_{PZL}	GND	V_{CC}
t_{PZH}	V_{CC}	GND
t_{PLZ}	GND	V_{CC}
t_{PHZ}	V_{CC}	GND

TEST CIRCUIT



VOLTAGE WAVEFORMS

Figure 6-5. Switching Time (t_{PZL}, t_{PLZ}, t_{PZH}, t_{PHZ}), Control to Signal Output

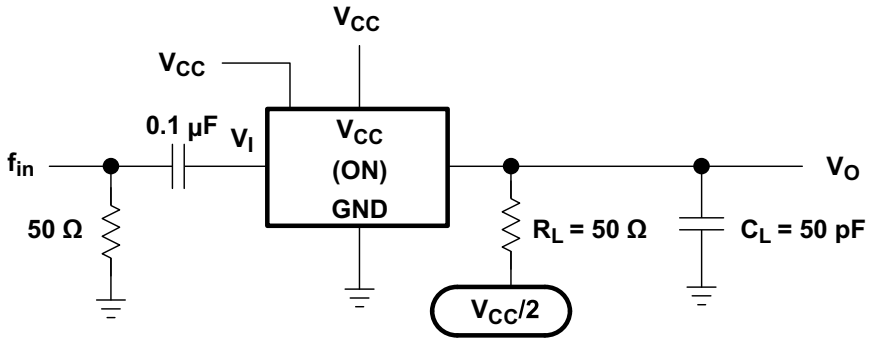


Figure 6-6. Frequency Response (Switch ON)

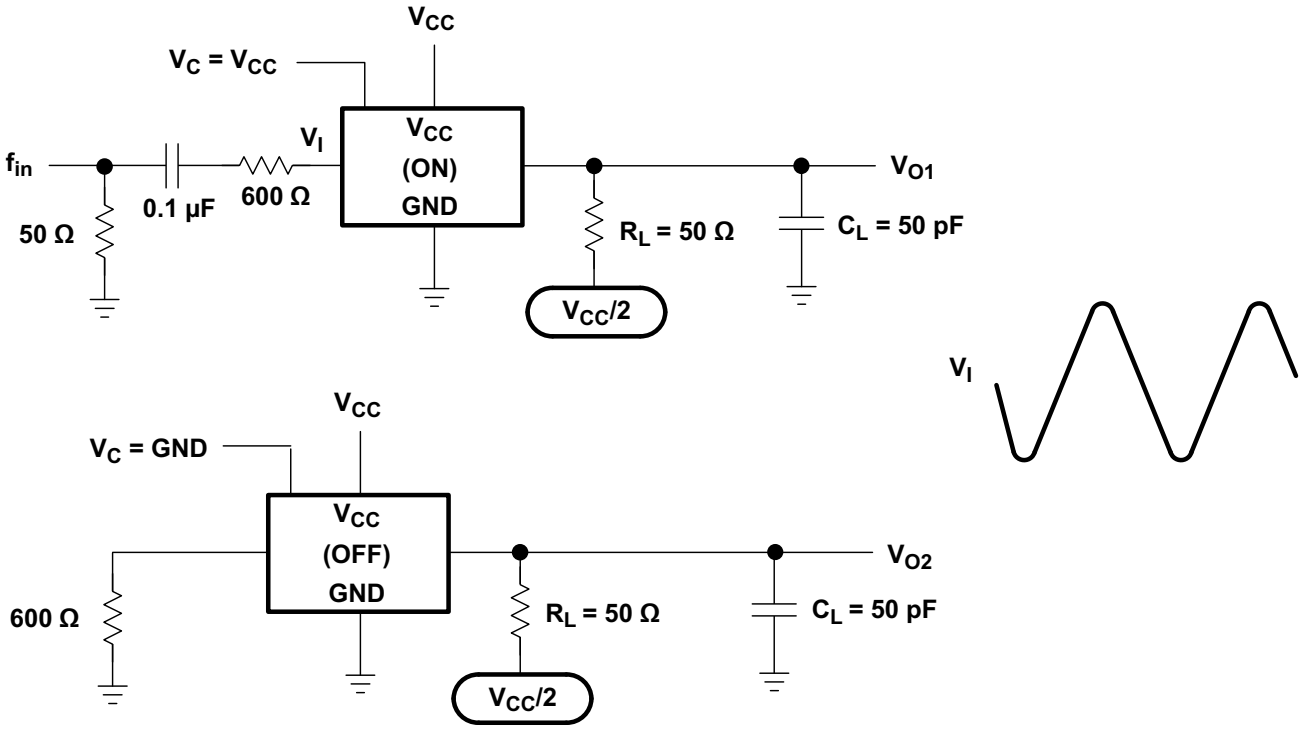


Figure 6-7. Crosstalk Between Any Two Switches

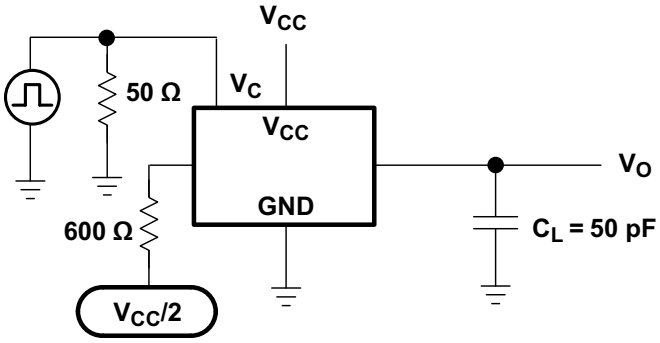


Figure 6-8. Crosstalk (Control Input − Switch Output)

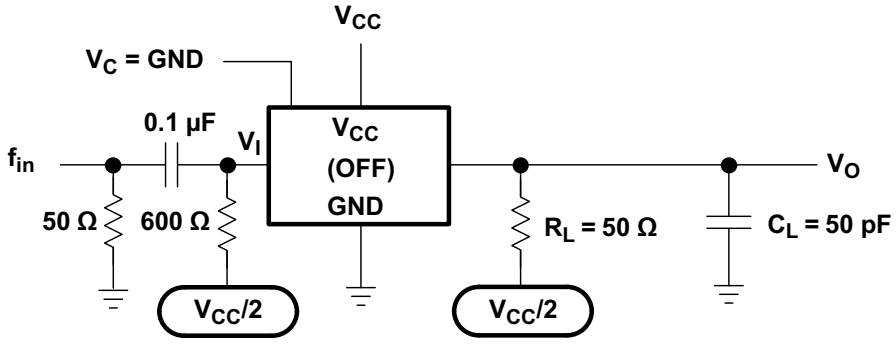


Figure 6-9. Feed-Through Attenuation (Switch OFF)

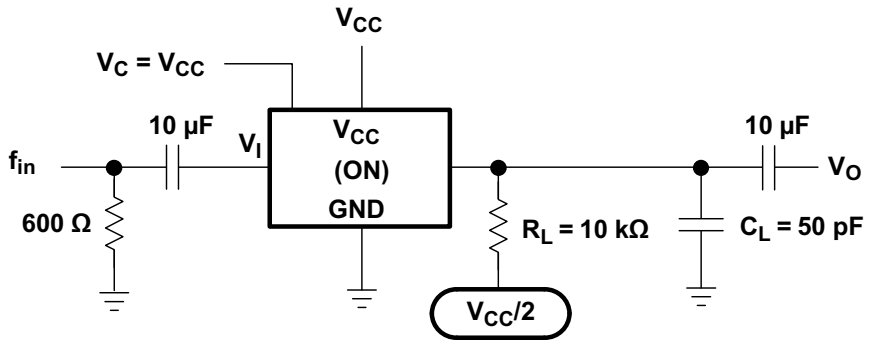


Figure 6-10. Sine-Wave Distortion

7 Detailed Description

7.1 Functional Block Diagram

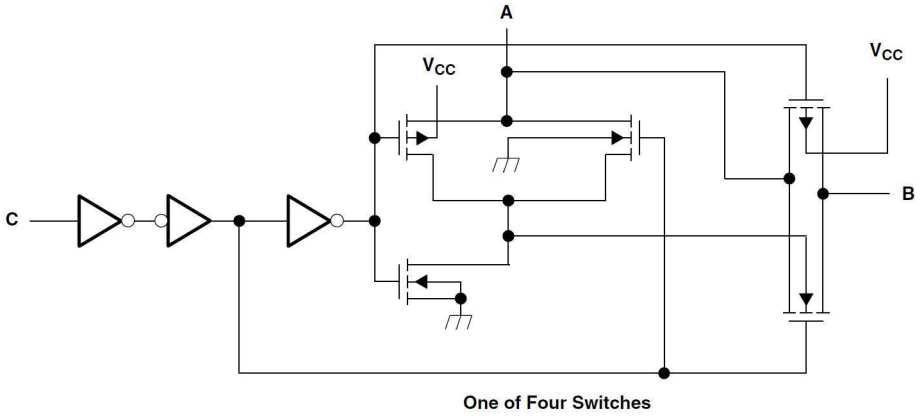


Figure 7-1. Logic Diagram (Positive Logic)

7.2 Device Functional Modes

Table 7-1. Function Table

Input Control (C)	Switch
L	OFF
H	ON

8 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

8.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

8.2 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

8.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.
All trademarks are the property of their respective owners.

8.4 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

8.5 Glossary

TI Glossary	This glossary lists and explains terms, acronyms, and definitions.

9 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision I (April 2006) to Revision J (February 2024)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document	1
• Removed the SN54LV4066A information from the data sheet	1
• Increased V_{CC} operation from: *2V to 5.5V* to: *1.65V to 5.5V*, and updated specifications such as r_{ON}, $r_{ON(p)}$ Δr_{ON} accordingly	1
• Changed RL value from: *600Ω* to: *50Ω* for frequency response, crosstalk, and feed-through attenuation, and their associated figures	10

10 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LV4066AD	LIFEBUY	SOIC	D	14	50	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV4066A	
SN74LV4066ADBR	ACTIVE	SSOP	DB	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	Samples
SN74LV4066ADGVR	ACTIVE	TVSOP	DGV	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	Samples
SN74LV4066ADR	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV4066A	Samples
SN74LV4066AN	ACTIVE	PDIP	N	14	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74LV4066AN	Samples
SN74LV4066ANSR	ACTIVE	SO	NS	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	74LV4066A	Samples
SN74LV4066APW	LIFEBUY	TSSOP	PW	14	90	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	
SN74LV4066APWR	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	Samples
SN74LV4066APWT	LIFEBUY	TSSOP	PW	14	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	
SN74LV4066ARGYR	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	LW066A	Samples
SN74LV4066ARGYRG4	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	LW066A	Samples

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

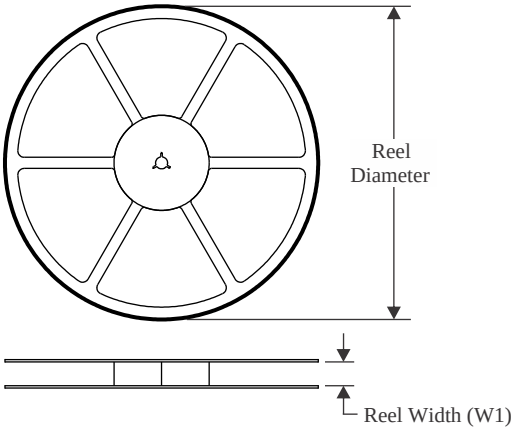
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device 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 Device Marking for that device.

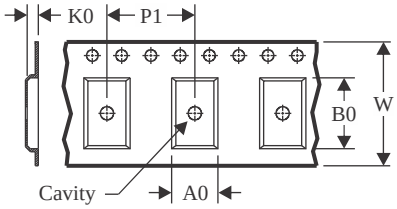
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

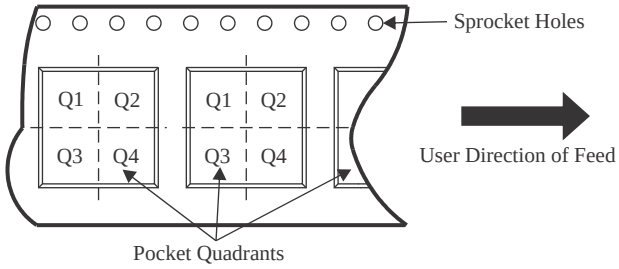


TAPE DIMENSIONS



A0	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

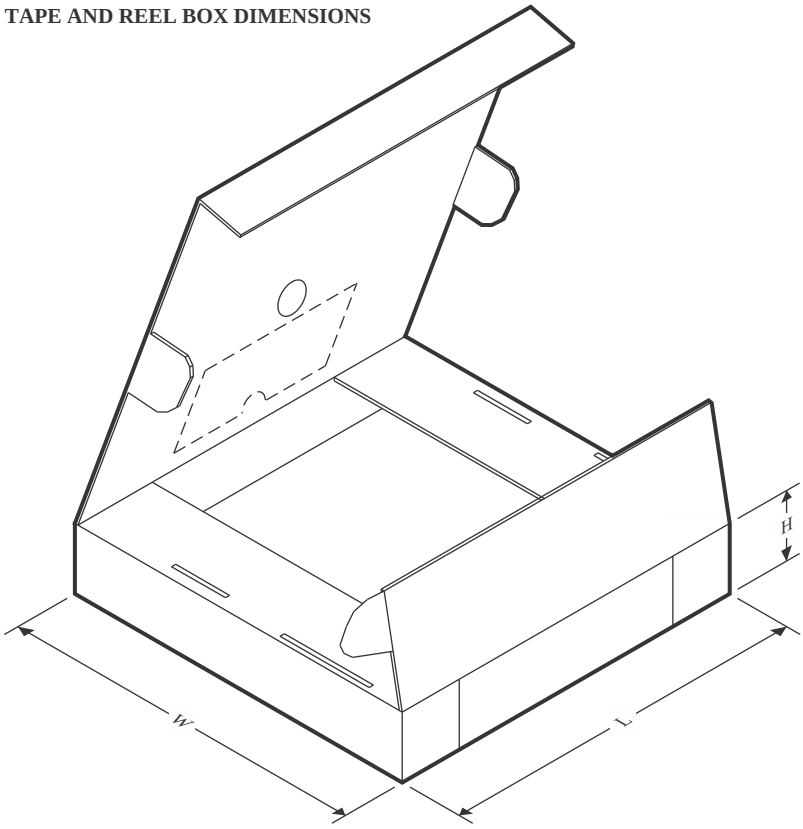
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV4066ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV4066ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV4066ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV4066ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LV4066APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4066APWT	TSSOP	PW	14	250	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4066ARGYR	VQFN	RGY	14	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1

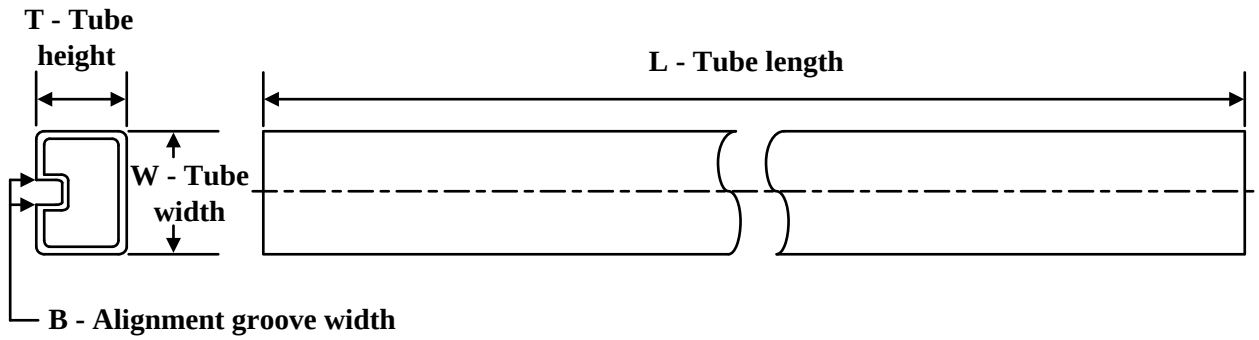
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV4066ADBR	SSOP	DB	14	2000	356.0	356.0	35.0
SN74LV4066ADGVR	TVSOP	DGV	14	2000	356.0	356.0	35.0
SN74LV4066ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV4066ANSR	SO	NS	14	2000	356.0	356.0	35.0
SN74LV4066APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV4066APWT	TSSOP	PW	14	250	356.0	356.0	35.0
SN74LV4066ARGYR	VQFN	RGY	14	3000	367.0	367.0	35.0

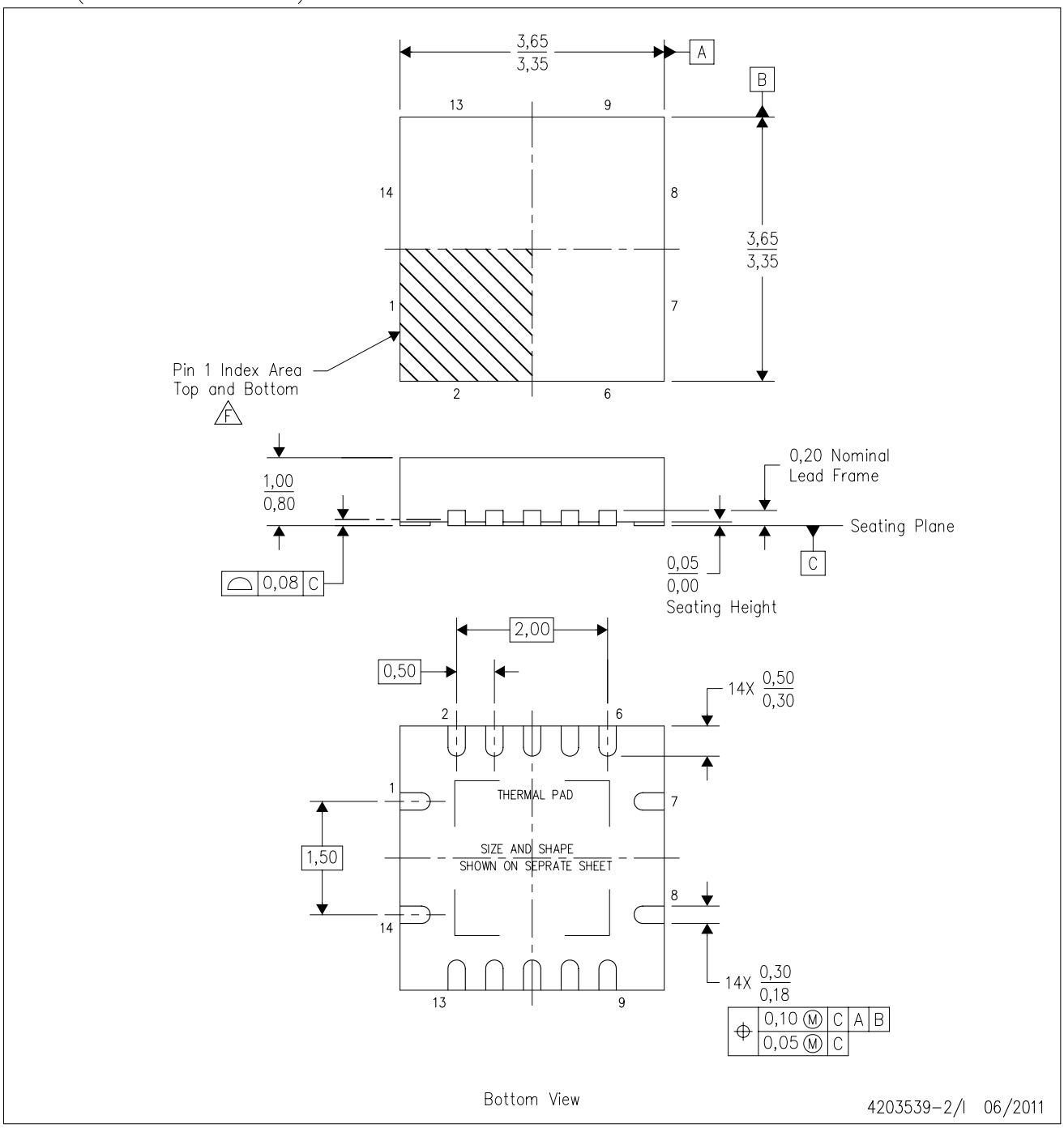
TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74LV4066AD	D	SOIC	14	50	506.6	8	3940	4.32
SN74LV4066AN	N	PDIP	14	25	506	13.97	11230	4.32
SN74LV4066AN	N	PDIP	14	25	506	13.97	11230	4.32
SN74LV4066APW	PW	TSSOP	14	90	530	10.2	3600	3.5

RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD



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.
F. 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.

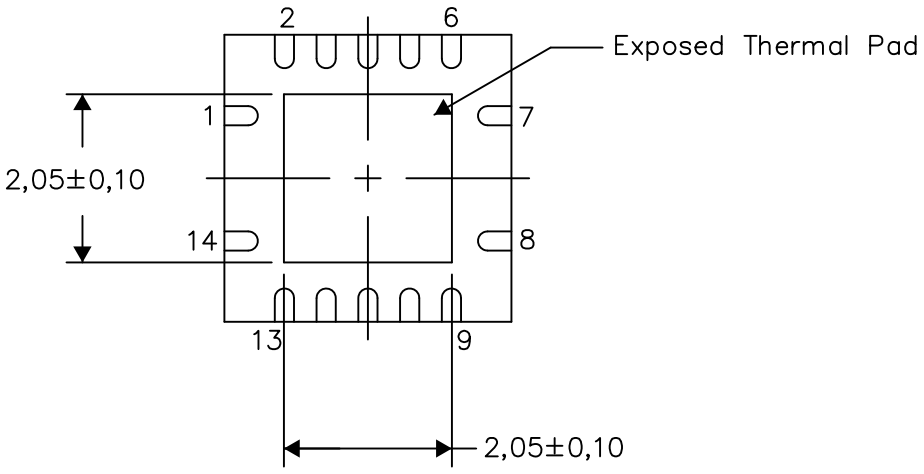
RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD

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.



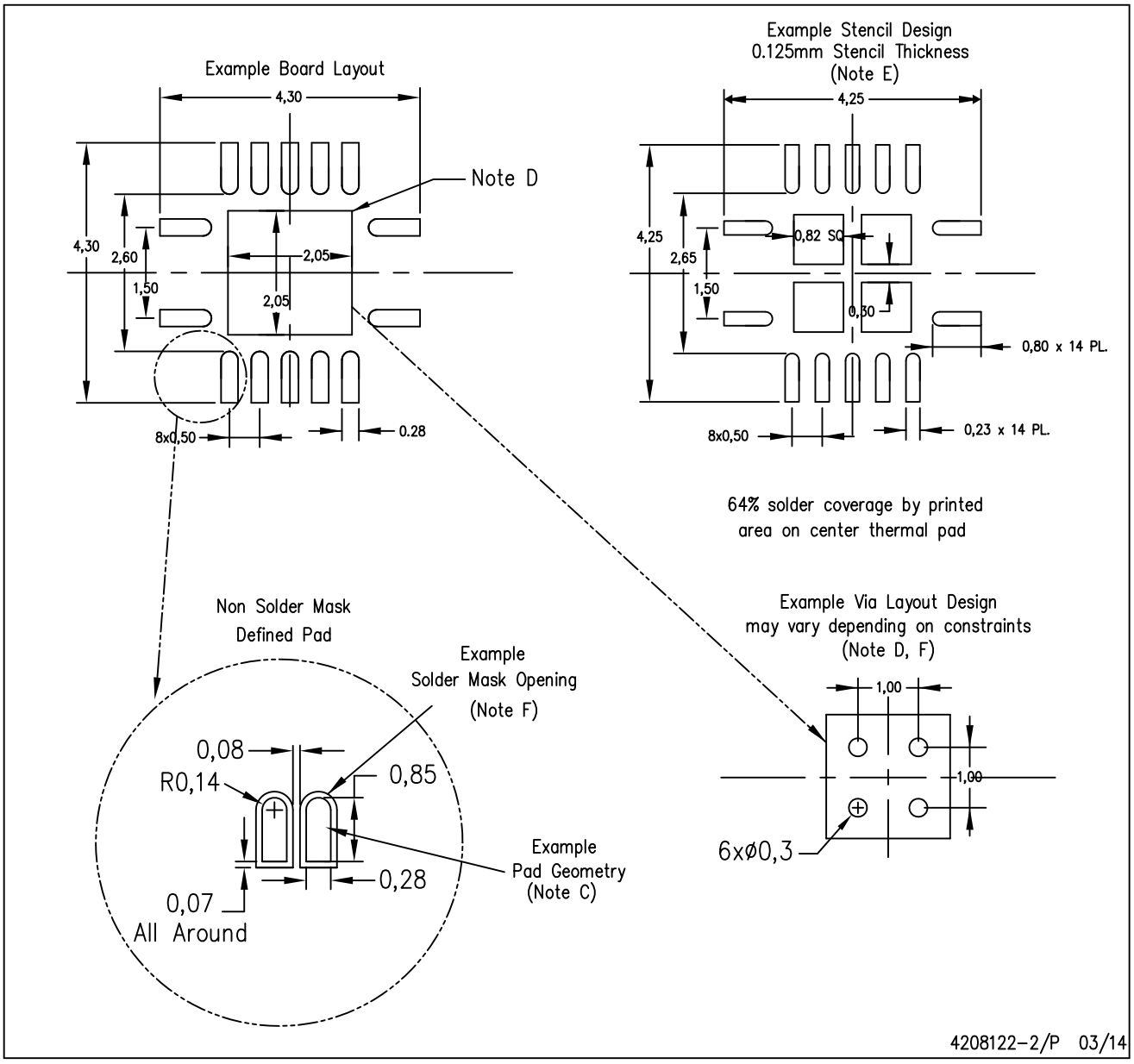
Bottom View

Exposed Thermal Pad Dimensions

4206353–2/P 03/14

NOTE: All linear dimensions are in millimeters

RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD

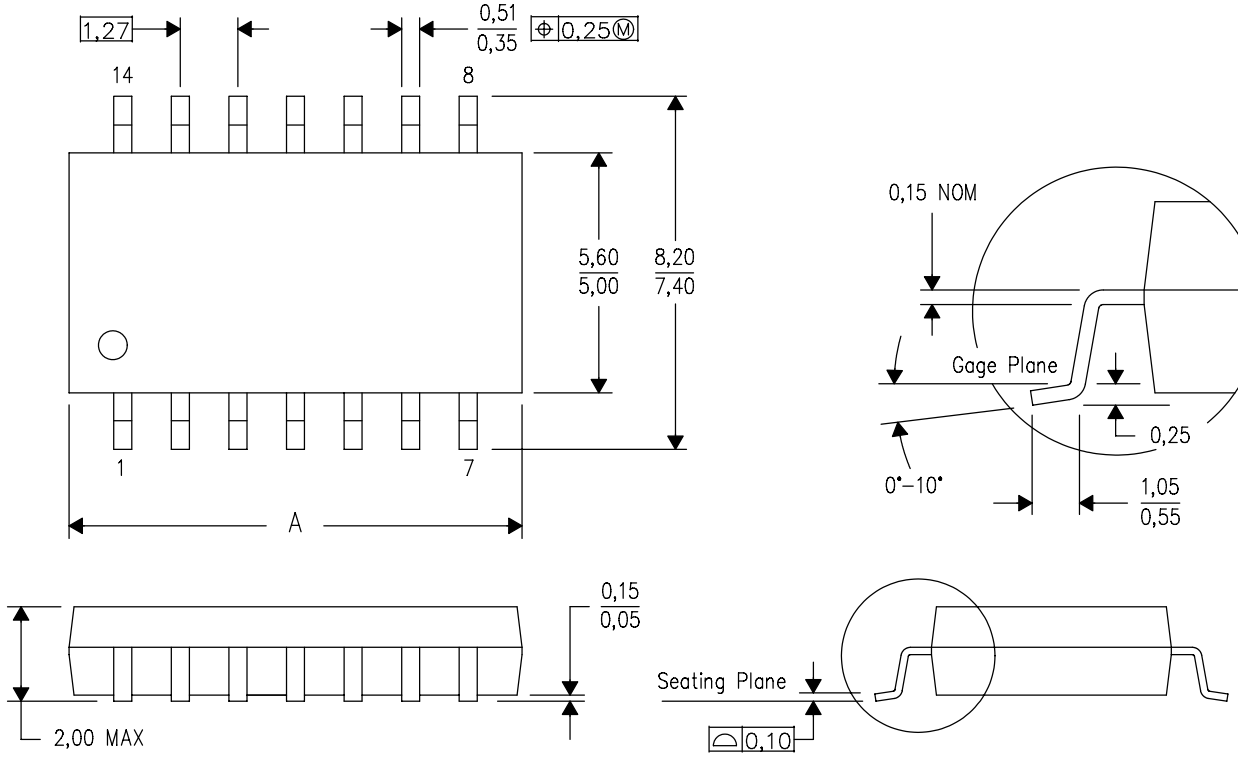


NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. This package is designed to be soldered to a thermal pad on the board. Refer to Application Note, Quad Flat–Pack QFN/SON PCB Attachment, 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)** **PLASTIC SMALL-OUTLINE PACKAGE**

14-PINS SHOWN



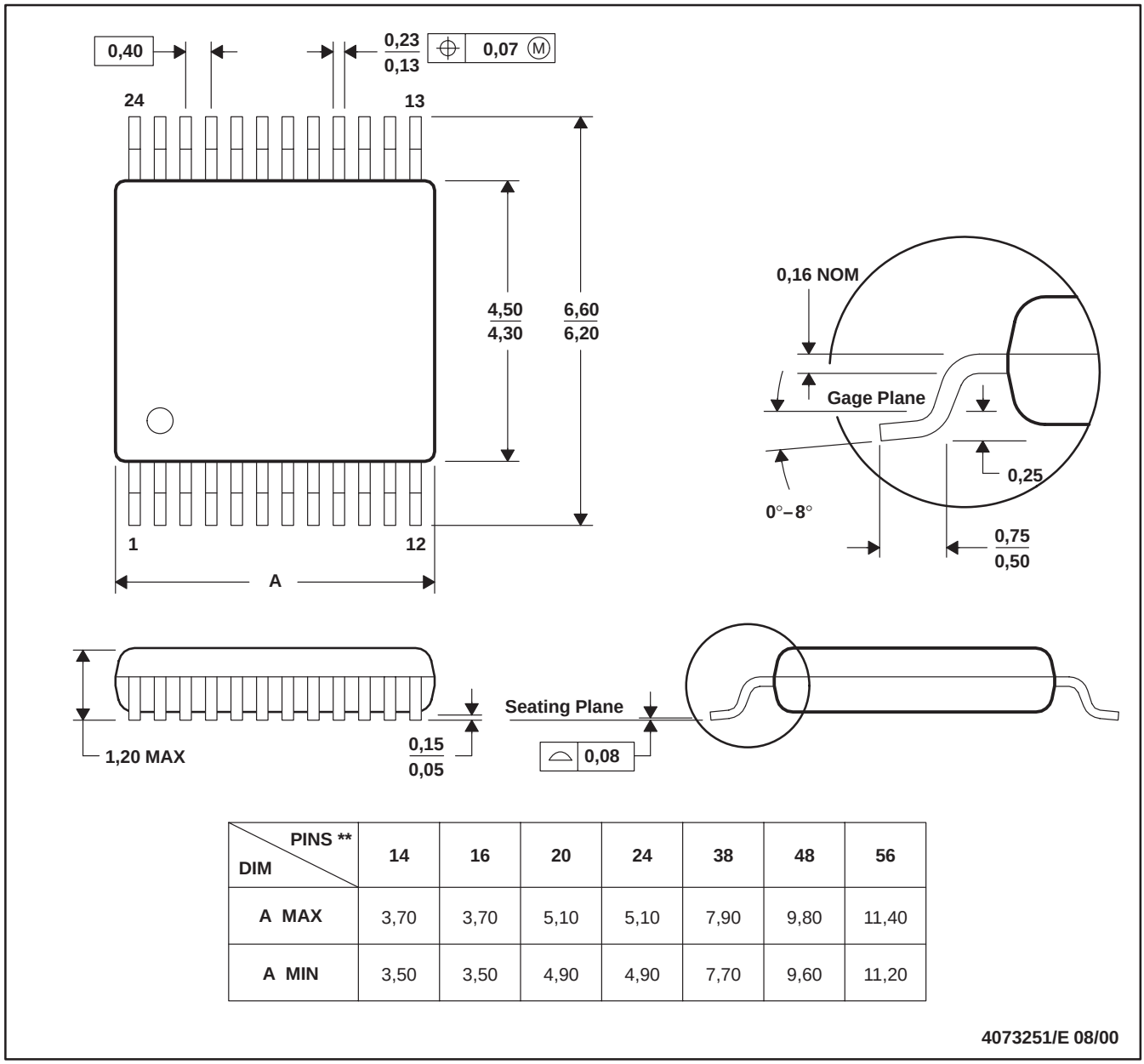
DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

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.

DGV (R-PDSO-G)** **PLASTIC SMALL-OUTLINE**

24 PINS SHOWN

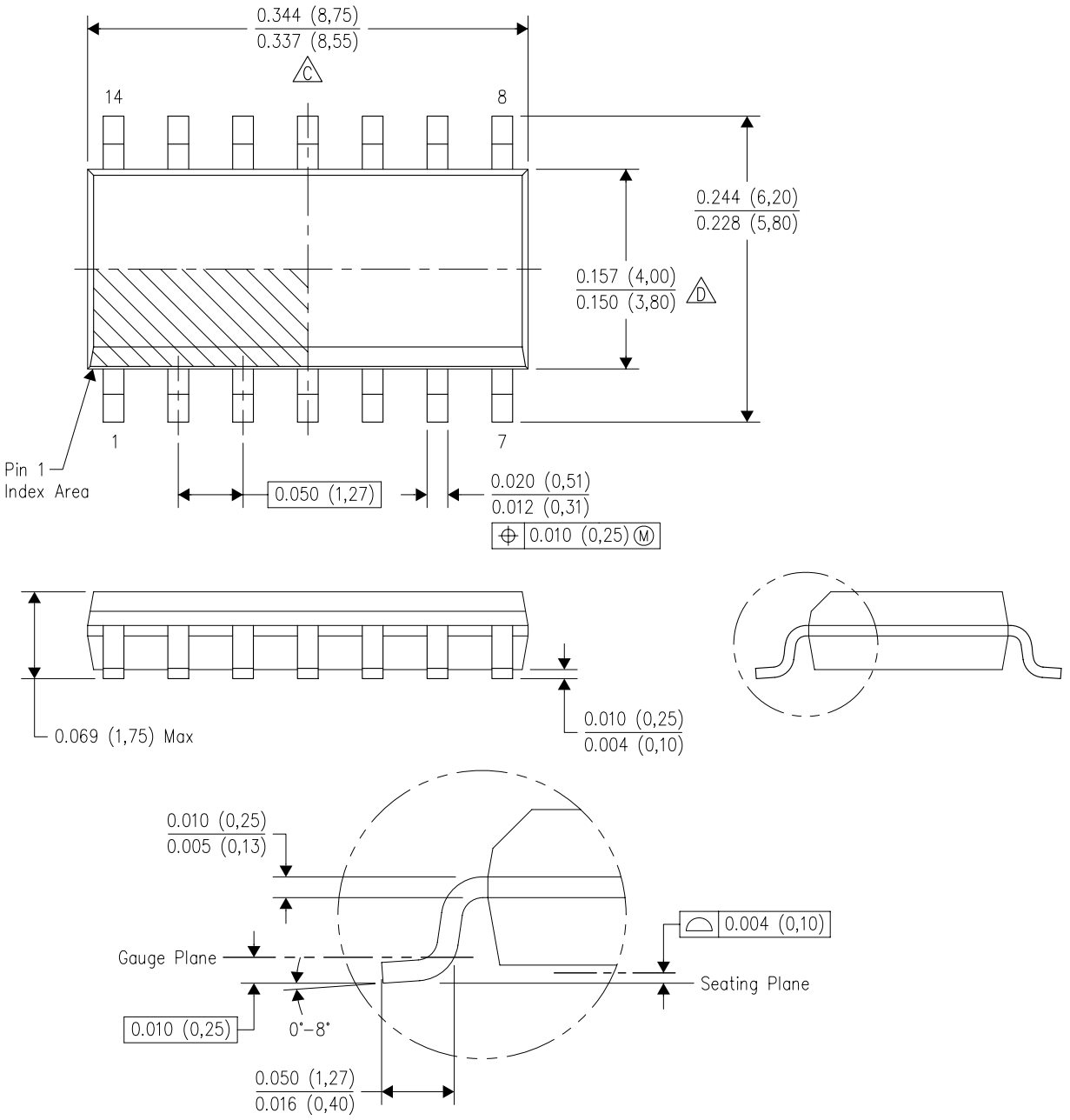


DIM \ PINS **	14	16	20	24	38	48	56
A MAX	3,70	3,70	5,10	5,10	7,90	9,80	11,40
A MIN	3,50	3,50	4,90	4,90	7,70	9,60	11,20

4073251/E 08/00

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

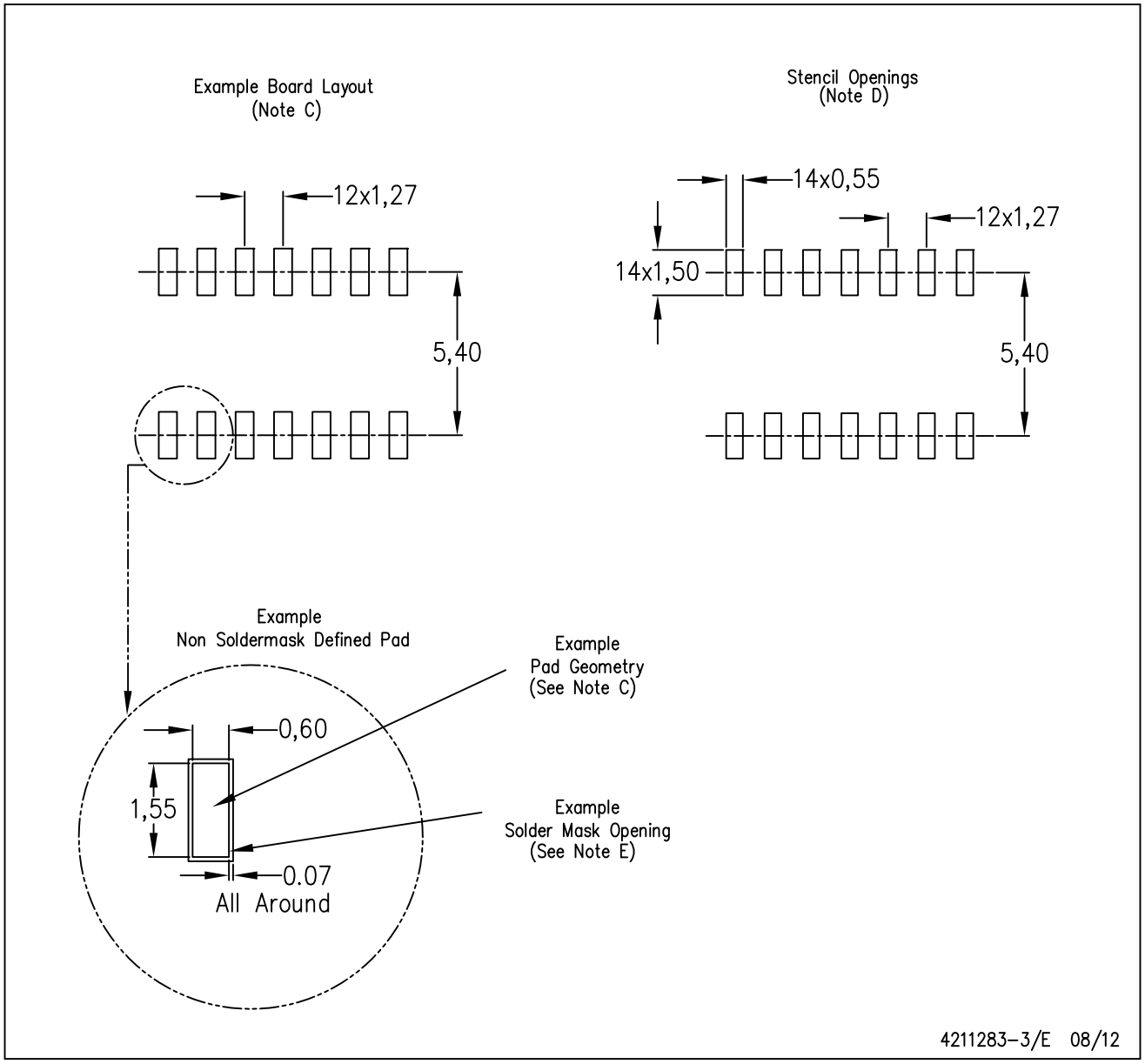
D (R–PDSO–G14) PLASTIC SMALL OUTLINE



4040047–5/M 06/11

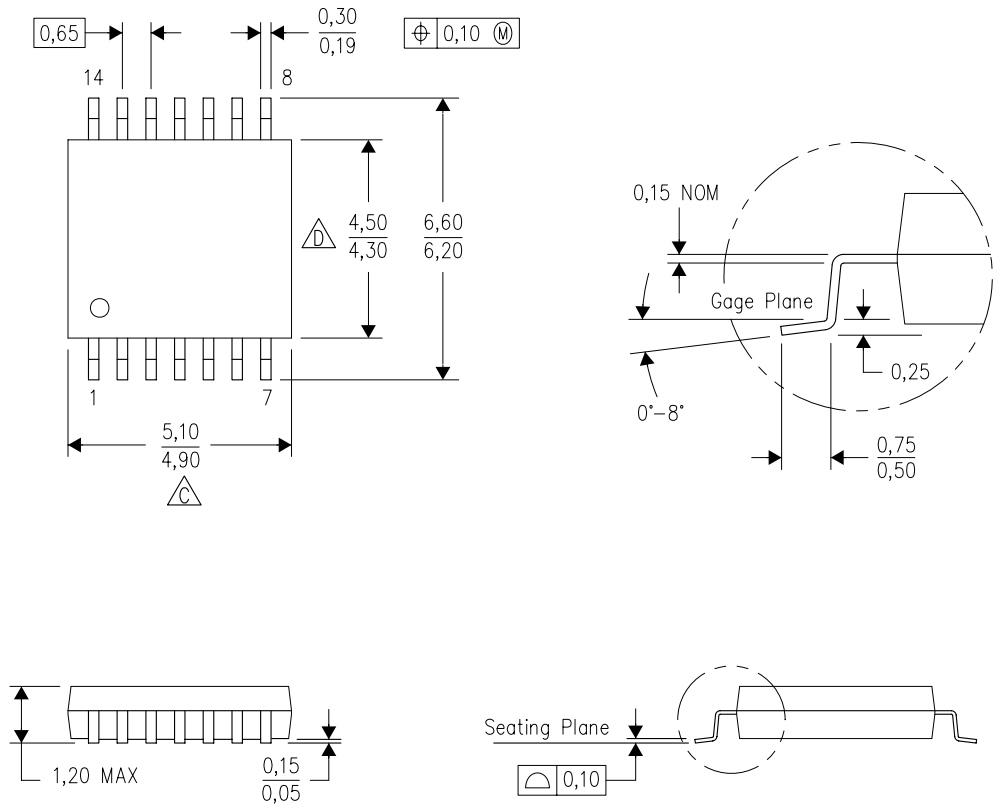
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
D. Body width does not include interlead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

D (R–PDSO–G14) PLASTIC SMALL OUTLINE



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. 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.

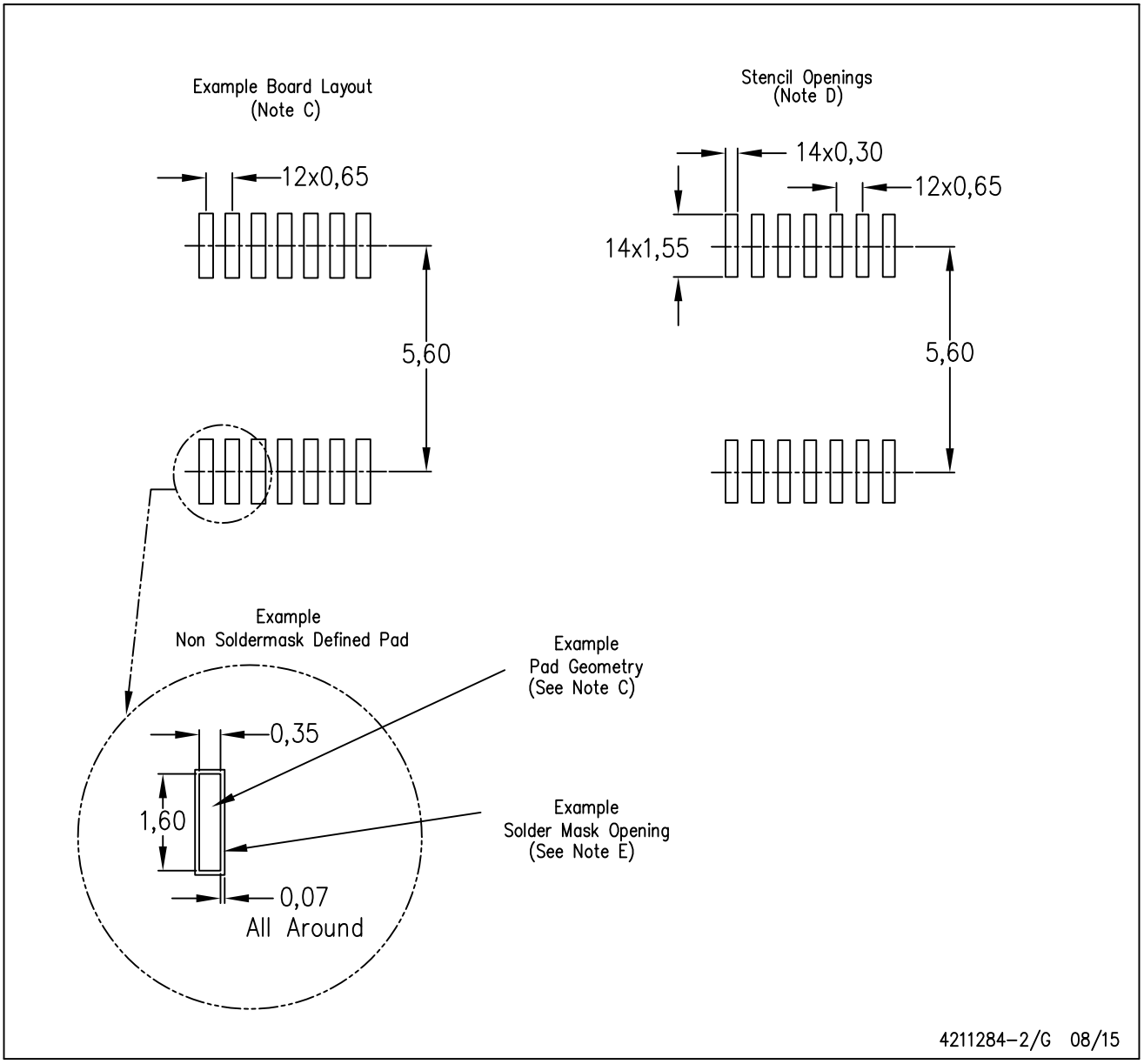
PW (R–PDSO–G14) PLASTIC SMALL OUTLINE



4040064–3/G 02/11

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 length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
D. 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–G14) PLASTIC SMALL OUTLINE

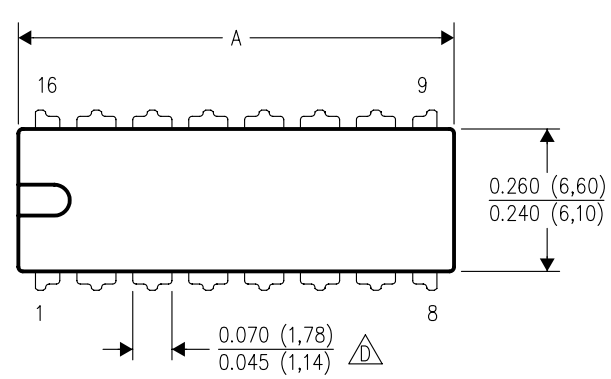


NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact 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.

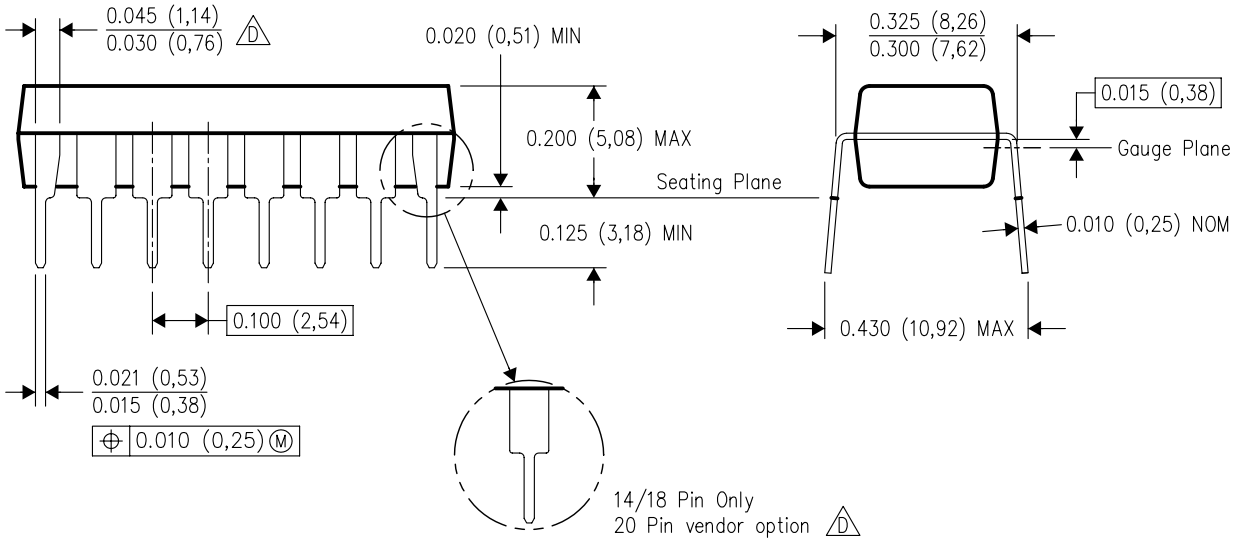
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS–001 VARIATION (C)	AA	BB	AC	AD



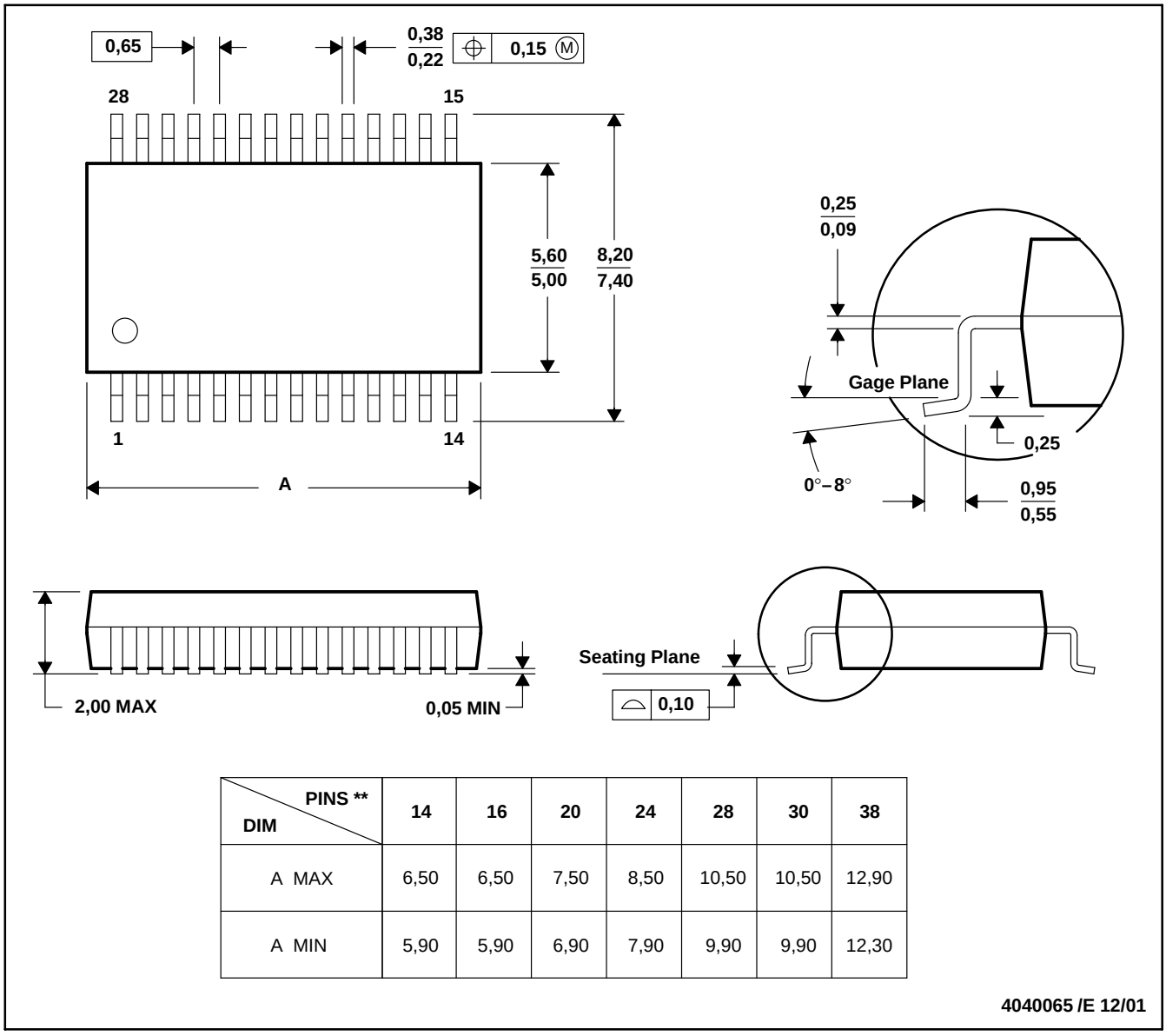
4040049/E 12/2002

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

MSSO002E – JANUARY 1995 – REVISED DECEMBER 2001

DB (R-PDSO-G)** **PLASTIC SMALL-OUTLINE**

28 PINS SHOWN



DIM \ PINS **	14	16	20	24	28	30	38
A MAX	6,50	6,50	7,50	8,50	10,50	10,50	12,90
A MIN	5,90	5,90	6,90	7,90	9,90	9,90	12,30

4040065 /E 12/01

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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