CD40x7B CMOS Analog Multiplexers or Demultiplexers

1 Features

- High-voltage types (20V rating)
  - CD4067B – single 16-channel multiplexer or demultiplexer
- Low ON resistance: 125Ω (typ) over 15V_{p-p} signal-input range for V_{DD}–V_{SS} = 15V
- High OFF resistance: channel leakage of ±10pA (typ) at V_{DD} – V_{SS} = 10V
- Matched switch characteristics: R_{ON} = 5Ω (typ) for V_{DD} – V_{SS} = 15V
- Very low quiescent power dissipation under all digital-control input and supply conditions: 0.2µW (typ) at V_{DD} – V_{SS} = 10V
- Binary address decoding on chip
- 5V, 10V, and 15V parametric ratings
- 100% tested for quiescent current at 20V
- Standardized symmetrical output characteristics
- Maximum input current of 1µA at 18V over full package temperature range: 100nA at 18V and 25°C
- Meets all requirements of JEDEC tentative standard No. 13-B, *Standard Specifications for Description of "B" Series CMOS Devices*

2 Applications

- Analog signal and digital multiplexing
- Transmission-gate logic implementation
- A/DI and D/A conversion
- Signal gating

3 Description

CD40x7B CMOS analog multiplexers or demultiplexers are digitally controlled analog switches having low ON impedance, low OFF leakage current, and internal address decoding. When these devices are used as demultiplexers, the channel in or out terminals are the outputs and the common out or in terminals are the inputs. In addition, the ON resistance is relatively constant over the full input-signal range.

The CD4067B is a 16-channel multiplexer with four binary control inputs, A, B, C, D, and an inhibit input, arranged so that any combination of the inputs selects one switch.

A logic "1" present at the inhibit input turns all channels off.

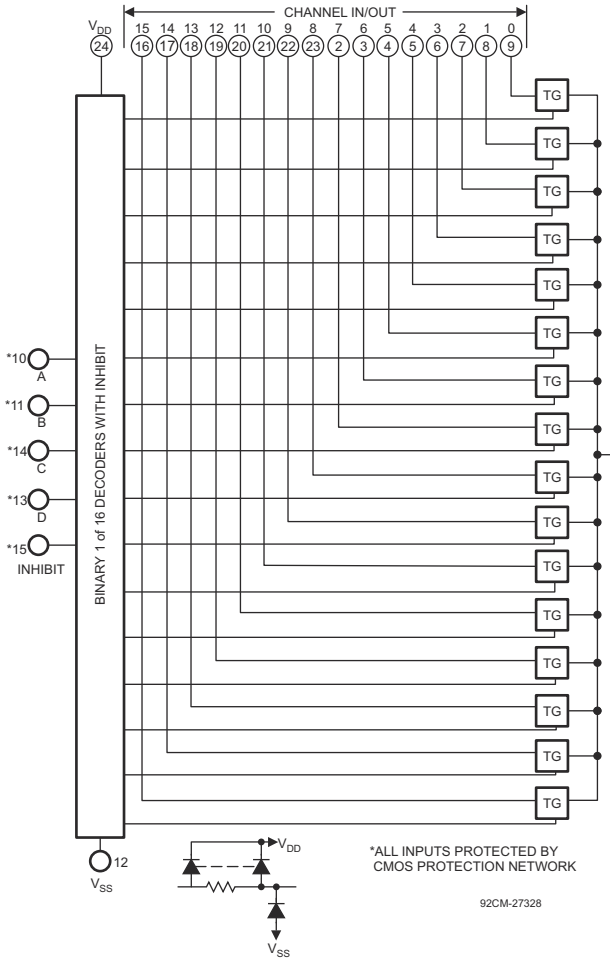
The CD40x7B types are supplied in 24-lead hermetic dual-in-line ceramic packages (F3A suffix), 24-lead dual-in-line plastic packages (E suffix), 24-lead small-outline packages (M, M96, and NSR suffixes), and 24-lead thin shrink small-outline packages (P and PWR suffixes).

Device Information

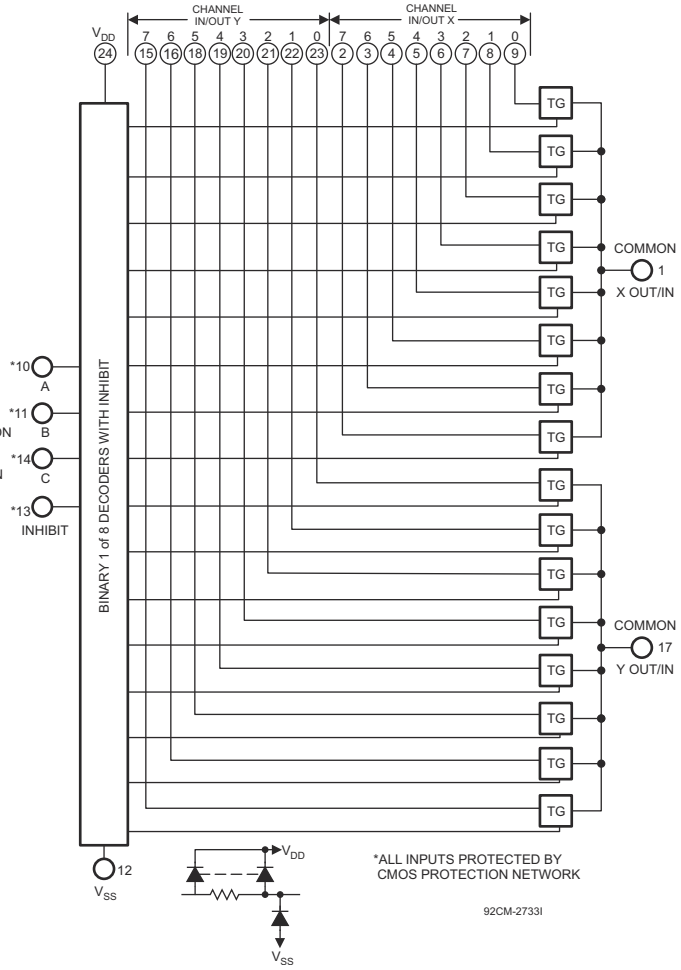
PART NUMBER	CHANNEL	PACKAGE (1)
CD4067B	2 channel 8:1 differential multiplexer	PW (TSSOP, 24)
		DW (SOIC, 24)

(1) For more information, see Section 11.

An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.



CD4067 Logic Diagram



CD4097 Logic Diagram

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4 Pin Configuration and Functions

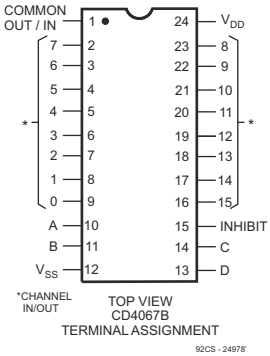

Figure 4-1. CD4067B 24 Pins (Top View)

Table 4-1. Function Table

CD4067 TRUTH TABLE					
A	**B**	**C**	**D**	**inh**	**Selected Channel**
X	X	X	X	1	None
0	0	0	0	0	0
1	0	0	0	0	1
0	1	0	0	0	2
1	1	0	0	0	3
0	0	1	0	0	4
1	0	1	0	0	5
0	1	1	0	0	6
1	1	1	0	0	7
0	0	0	1	0	8
1	0	0	1	0	9
0	1	0	1	0	10
1	1	0	1	0	11
0	0	1	1	0	12
1	0	1	1	0	13
0	1	1	1	0	14
1	1	1	1	0	15

Table 4-2. Function Table

CD4097 TRUTH TABLE				
A	**B**	**C**	**inh**	**Selected Channel**
X	X	X	1	None
0	0	0	0	0X, 0Y
1	0	0	0	1X, 1Y
0	1	0	0	2X, 2Y
1	1	0	0	3X, 3Y
0	0	1	0	4X, 4Y
1	0	1	0	5X, 5Y
0	1	1	0	6X, 6Y
1	1	1	0	7X, 7Y

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5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)(1) (2)

		MIN	MAX	UNIT
$V_{DD} - V_{SS}$	Supply voltage		20	V
V_{DD}		–0.5	20	V
V_{SS}		–20	0.5	V
I_{SEL} or I_{EN}	Logic control input pin current ($\overline{EN}$, Ax, SELx)	–30	30	mA
V_S or V_D	Source or drain voltage (Sx, D)	V_{SS}–0.5	V_{DD}+0.5	V
I_S or $I_{D\ (CONT)}$	Source or drain continuous current (Sx, D)	–20	20	mA
T_J	Junction temperature		150	°C
T_{stg}	Storage temperature	–65	150	°C

(1) Stresses beyond those listed under *Absolute Maximum Rating* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Condition*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) All voltages are with respect to ground, unless otherwise specified.

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)	±200	

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

5.3 Recommended Operating Conditions

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

		MIN	NOM	MAX	UNIT
$V_{DD} - V_{SS}$ (1)	Power supply voltage differential	3		18	V
V_{DD}	Positive power supply voltage	3		18	V
V_S or V_D	Signal path input/output voltage (source or drain pin) (Sx, D)	V_{SS}		V_{DD}	V
V_{SEL} or V_{EN}	Address or enable pin voltage	0		V_{DD}	V
I_S or $I_{D\ (CONT)}$	Source or drain continuous current (Sx, D)	-10		10	mA
T_A	Ambient temperature	–55		125	°C

(1) V_{DD} and V_{SS} can be any value as long as $3V \le (V_{DD} - V_{SS}) \le 24V$, and the minimum V_{DD} is met.

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5.4 Thermal Information

THERMAL METRIC(1)		CD406x D (SOIC) 14 PINS	CD406x PW (TSSOP) 14 PINS	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance	109.7	101.8	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	69.4	44.3	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	67.9	68.2	°C/W
Ψ_{JT}	Junction-to-top characterization parameter	25.8	3.2	°C/W
Ψ_{JB}	Junction-to-board characterization parameter	67.1	67.6	°C/W

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

5.5 Electrical Characteristics

Over operating free-air temperature range, V_{SUPPLY} = ±5V, and R_L = 100Ω, (unless otherwise noted)(1)

PARAMETER		TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SIGNAL INPUTS (V_{IS}) AND OUTPUTS (V_{OS})									
I_{DD}	Quiescent Device Current	V_{is} = 0 to 5V, V_{DD} = 5V	T_A = –55°C					13	µA
			T_A = –40°C					13	
			T_A = 25°C				5	14.5	
			T_A = 85°C					150	
			T_A = 125°C					150	
		V_{is} = 0 to 5V, V_{DD} = 10V	T_A = –55°C					14	
			T_A = –40°C					14	
			T_A = 25°C				6	15.5	
			T_A = 85°C					300	
			T_A = 125°C					300	
		V_{is} = 0 to 5V, V_{DD} = 15V	T_A = –55°C					20	
			T_A = –40°C					20	
			T_A = 25°C				6	20	
			T_A = 85°C					600	
			T_A = 125°C					600	
		V_{is} = 0 to 5V, V_{DD} = 20V	T_A = –55°C					100	
			T_A = –40°C					100	
			T_A = 25°C				7	100	
			T_A = 85°C					3000	
			T_A = 125°C					3000	
r_{ON}	ON Resistance r_{ON} Max	to (V_{DD}-V_{SS})/2, V_C = V_{DD}, RL = 10kΩ returned V_{is} = V_{SS} to V_{DD}	V_{DD} = 5V	T_A = –55°C				800	Ω
				T_A = –40°C				850	
				T_A = 25°C			470	1050	
				T_A = 85°C				1200	
				T_A = 125°C				1300	
			V_{DD} = 10V	T_A = –55°C				310	
				T_A = –40°C				330	
				T_A = 25°C			180	400	
				T_A = 85°C				520	
				T_A = 125°C				550	
			V_{DD} = 15V	T_A = –55°C				200	
				T_A = –40°C				210	
				T_A = 25°C			125	240	
				T_A = 85°C				300	
			V_{DD} = 15V	T_A = 125°C				320	

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5.5 Electrical Characteristics (continued)

Over operating free-air temperature range, V_{SUPPLY} = ±5V, and R_L = 100Ω, (unless otherwise noted)(1)

PARAMETER			TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
ΔR_{ON}	On-state resistance difference between any two switches		R_L = 10kΩ, V_C = VDD	V_{DD} = 5V				15		Ω
	On-state resistance difference between any two switches	On-state resistance difference between any two switches		V_{DD} = 10V				10		
	On-state resistance difference between any two switches	On-state resistance difference between any two switches		V_{DD} = 15V				5		
OFF Channel Leakage Current: Any Channel OFF (Max) or ALL Channels OFF (COMMON OUT/IN) (Max)				V_{DD} - V_{SS} = 18V	T_A = –55°C				± 100	nA
					T_A = –40°C				± 100	
					T_A = 25°C			± 0.1	± 100(2)	
					T_A = 85°C				± 1000(2)	
					T_A = 125°C				± 1000(2)	
C_{IS}	Input capacitance	V_S = 0V f = 1MHz CD4067	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V		5		pF
C_{OS}	Output capacitance	V_S = 0V f = 1MHz CD4067	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V		55		pF
C_{OS}	Output capacitance	V_S = 0V f = 1MHz CD4097	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V		35		pF
C_{IOS}	Feed through	V_S = 0V f = 1MHz	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V	V_{DD} = 5V, VC = V_{SS} = –5V		0.2		pF
V_{IHC}	Control input, high voltage		See Figure 6-1	V_{DD} = 5V					3.5	V
				V_{DD} = 10V					7	V
				V_{DD} = 15V					11	V
V_{ILC}	Control input, low voltage (max)			V_{DD} = 5V			1			V
				V_{DD} = 10V			1			V
				V_{DD} = 15V			1			V
I_{IN}	Input current (max)		$V_{is} \le V_{DD}$, V_{DD} – V_{SS} = 18V, $V_{CC} \le V_{DD} – V_{SS}$ V_{DD} = 18V	T_A = –55°C			-0.1		1	µA
				T_A = –40°C			-0.1		1	
				T_A = 25°C			-0.1	0.0001	1	
	Input current (max)	Input current (max)		T_A = 85°C			-1		1	
	Input current (max)	Input current (max)		T_A = 125°C			-1		1	
C_{IN}	Input Capacitance							5	7.5	pF
BW	–3dB cutoff frequency (switch on)	CD4067	V_C = V_{DD} = 5V, V_{SS} = –5V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 1kΩ Common Out/In					14		MHz
		CD4097						20		
	–3dB cutoff frequency (switch on)		V_C = V_{DD} = 5V, V_{SS} = –5V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 1kΩ Any channel					60		
THD	Total Harmonic Distortion	Total Harmonic Distortion	V_C = V_{DD} = 5V, V_{SS} = 0V, $V_{is(p-p)}$ = 2V (sine wave centered on 0V), R_L = 10kΩ, f_{is} = 1-kHz sine wave					0.3		%
			V_C = V_{DD} = 10V, V_{SS} = 0V, $V_{is(p-p)}$ = 3V (sine wave centered on 0V), R_L = 10kΩ, f_{is} = 1-kHz sine wave					0.2		
			V_C = V_{DD} = 15V, V_{SS} = 0V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 10kΩ, f_{is} = 1-kHz sine wave					0.12		
OISO	–40dB feed through frequency (switch off)	CD4067	V_C = V_{DD} = 5V, V_{SS} = –5V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 1kΩ Common Out/In					20		MHz
		CD4097						12		
	–40dB feed through frequency (switch off)		V_C = V_{DD} = 5V, V_{SS} = –5V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 1kΩ Any channel					8		
XTALK	–40dB crosstalk frequency	Any 2 Channels	V_C = V_{DD} = 5V, V_{SS} = –5V, $V_{is(p-p)}$ = 5V (sine wave centered on 0V), R_L = 1kΩ					1		MHz
		CD4097 on Common						10		
		CD4097 on Any						18		

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5.5 Electrical Characteristics (continued)

Over operating free-air temperature range, V_{SUPPLY} = ±5V, and R_L = 100Ω, (unless otherwise noted)(1)

PARAMETER		TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
	Crosstalk (control input to signal output)	V_C = 10V (square wave), R_L = 10kΩ V_{DD} = 10V					75		mV

(1) Peak-to-Peak voltage symmetrical about (V_{DD} – V_{EE}) / 2.
(2) Determined by minimum feasible leakage measurement for automatic testing.

5.6 AC Performance Characteristics

V_{DD} = +15V, V_{SS} = V_{EE} = 0V,
T_A = 25°C (unless otherwise noted)

PARAMETER	FROM	TO	TEST CONDITIONS	V_{CC}	MIN	TYP	MAX	UNIT
t_{pd}	Signal Input	Signal Output	V_{IN} = V_{DD}, C_L = 50 pF, R_L = 1kΩ	5V		30	60	ns
				10V		15	30	
				15V		7	20	
t_{plh}	Signal Input	Signal Output	V_{IN} = V_{DD}, C_L = 50 pF, R_L = 1kΩ	5V		325	650	ns
				10V		135	270	
				15V		95	190	
t_{phl}	Signal Input	Signal Output	V_{IN} = V_{DD}, C_L = 50 pF, R_L = 1kΩ	5V		220	440	ns
				10V		90	180	
				15V		65	130	

5.7 Typical Characteristics

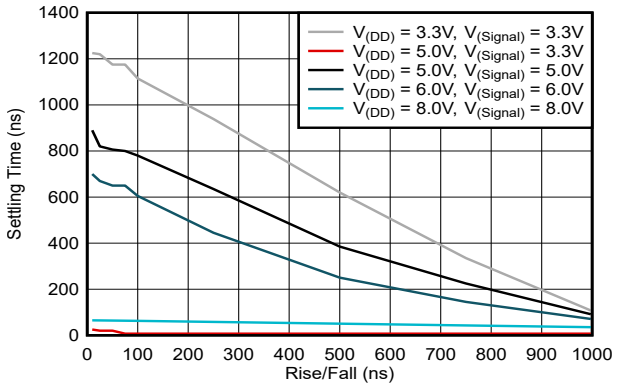

Figure 5-1. System Settling Time vs Signal Rise/Fall Time

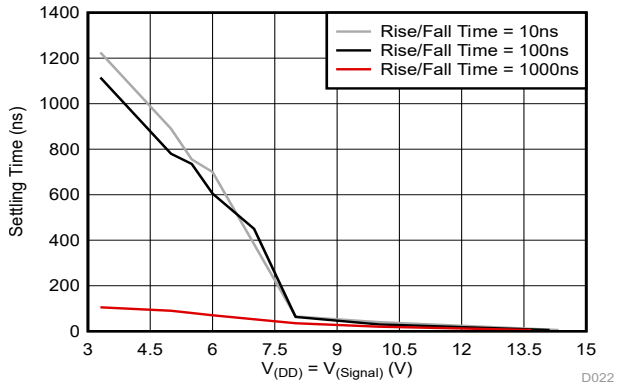

Figure 5-2. System Settling Time vs Signal Voltage

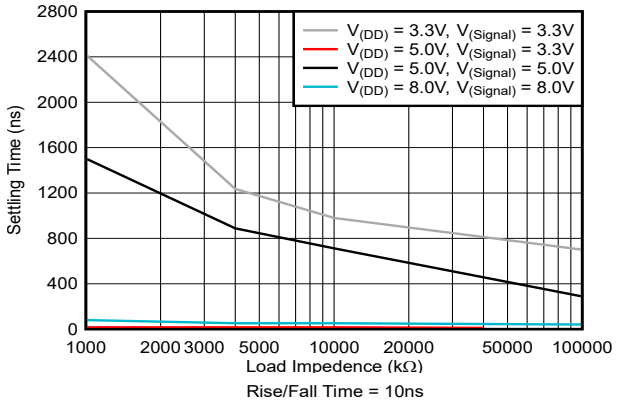

Figure 5-3. System Settling Time vs Signal Voltage

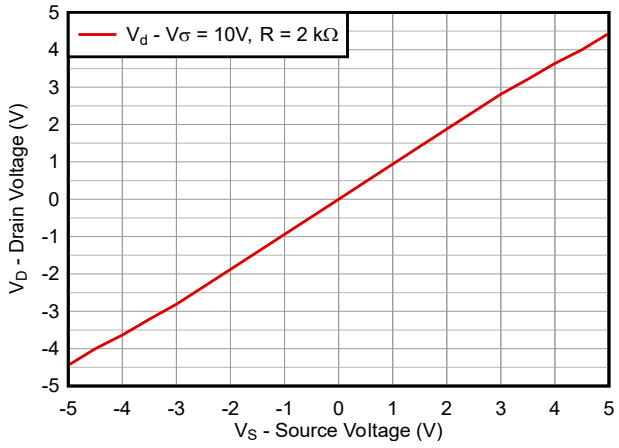

Figure 5-4. Source Voltage Input vs Drain Voltage Output

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6 Parameter Measurement Information

6.1 Test Circuits

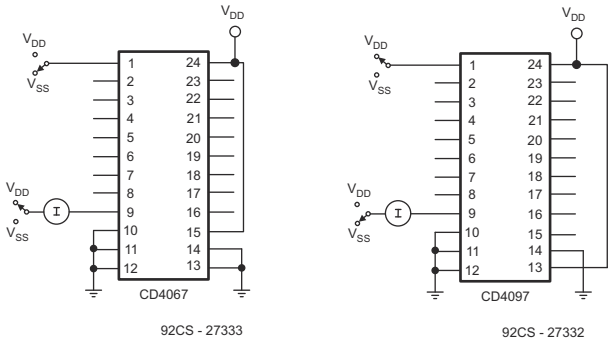

Figure 6-1. OFF Channel Leakage Current – Any Channel OFF

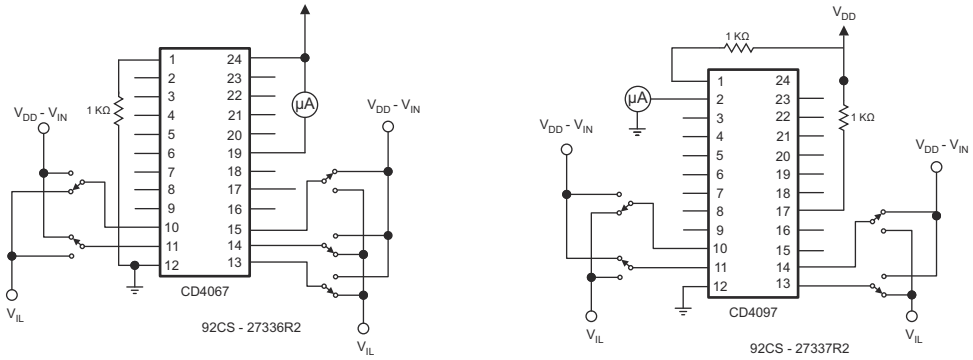

Figure 6-2. Input Voltage –Measure <2μA on all OFF Channels (For Example, Channel 12)

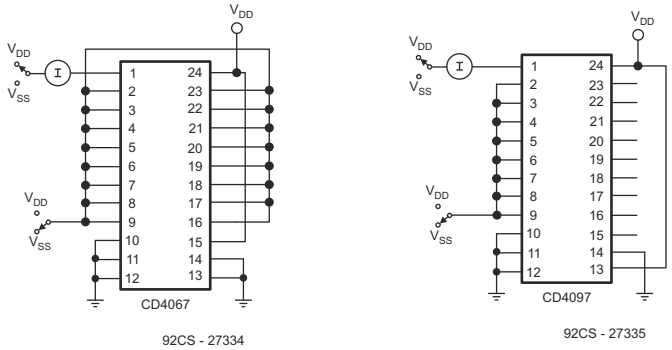

Figure 6-3. OFF Channel Leakage Current – All Channels OFF

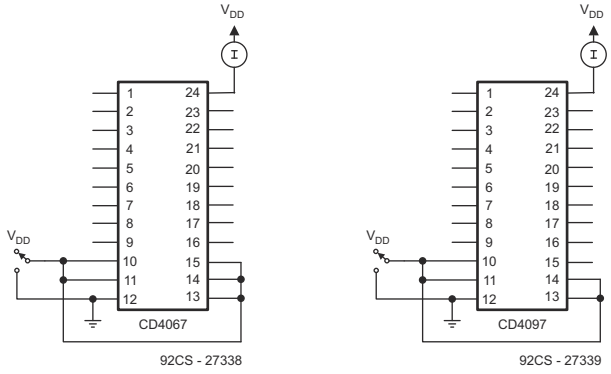

Figure 6-4. Quiescent Device Current

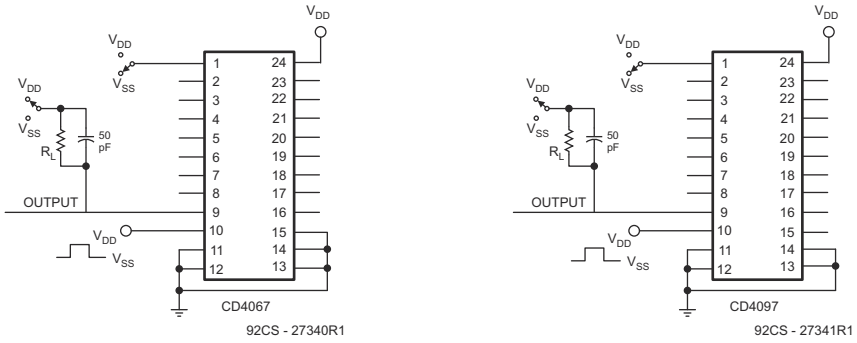

Figure 6-5. Turn-on and Turn-off Propagation Delay – Address Select Input to Signal Output (For Example,, Measured on Channel 0)

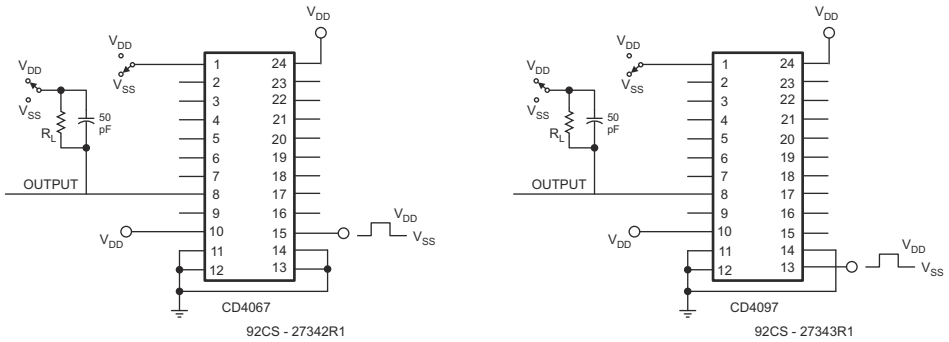

Figure 6-6. Turn-on and Turn-off Propagation Delay – Inhibit Input to Signal Output (For Example,, Measured on Channel 1)

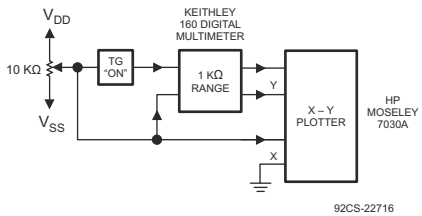

Figure 6-7. Channel ON Resistance Measurement Circuit

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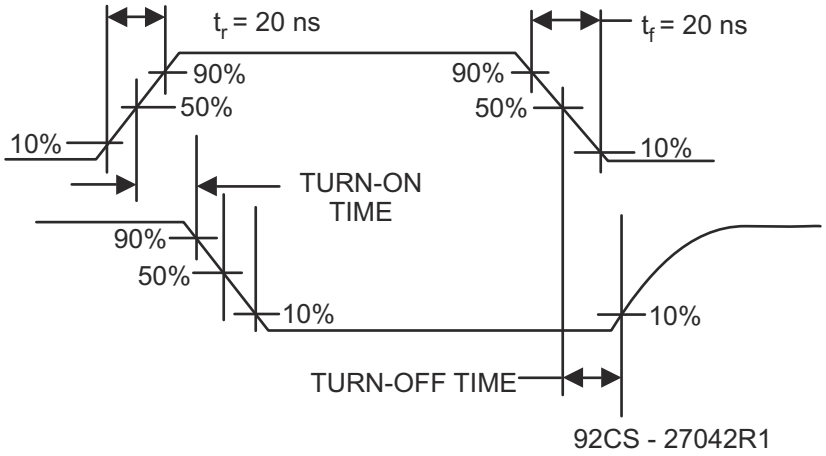

Figure 6-8. Propagation Delay Waveform Channel Being turned ON (R_L = 10kΩ, C_L = 50 pF)

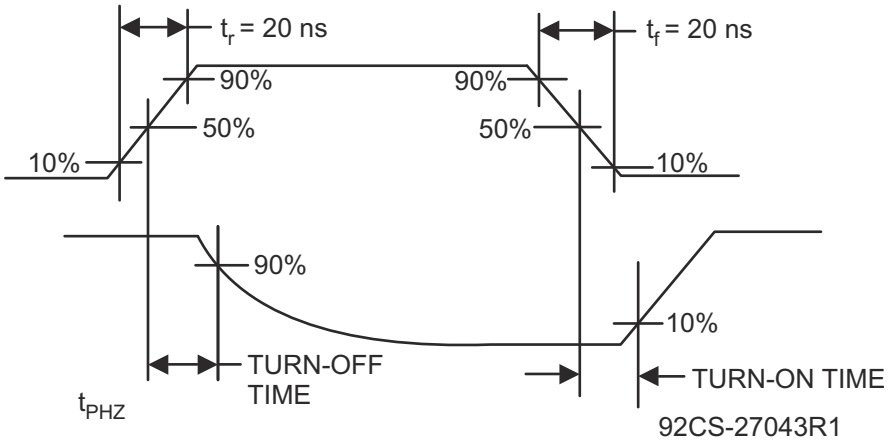

Figure 6-9. Propagation Delay Waveform Channel Being turned OFF (R_L = 300Ω, C_L = 50 pF)

7 Detailed Description

7.1 Functional Block Diagram

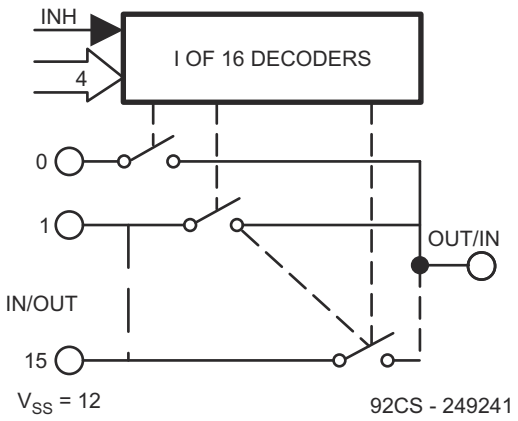

Figure 7-1. CD4067

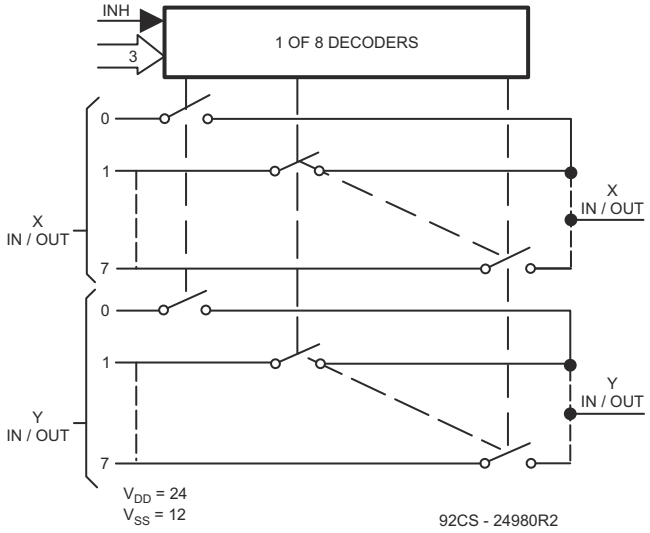

Figure 7-2. CD4097

7.2 Device Functional Modes

Table 7-1. Function Table

CD4067 TRUTH TABLE					
A	**B**	**C**	**D**	**inh**	**Selected Channel**
X	X	X	X	1	None
0	0	0	0	0	0
1	0	0	0	0	1
0	1	0	0	0	2
1	1	0	0	0	3
0	0	1	0	0	4
1	0	1	0	0	5
0	1	1	0	0	6
1	1	1	0	0	7
0	0	0	1	0	8
1	0	0	1	0	9
0	1	0	1	0	10
1	1	0	1	0	11
0	0	1	1	0	12
1	0	1	1	0	13
0	1	1	1	0	14
1	1	1	1	0	15

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Table 7-2. Function Table

CD4097 TRUTH TABLE				
A	**B**	**C**	**inh**	**Selected Channel**
X	X	X	1	None
0	0	0	0	0X, 0Y
1	0	0	0	1X, 1Y
0	1	0	0	2X, 2Y
1	1	0	0	3X, 3Y
0	0	1	0	4X, 4Y
1	0	1	0	5X, 5Y
0	1	1	0	6X, 6Y
1	1	1	0	7X, 7Y

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8 Application and Implementation

Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

8.1 Application Information

8.1.1 Special Considerations

In applications where separate power sources are used to drive V_{DD} and the signal inputs, the V_{DD} current capability should exceed V_{DD}/R_L (R_L = effective external load). This provision avoids permanent current flow or clamp action on the V_{DD} supply when power is applied or removed from the CD40x7B.

When switching from one address to another, some of the ON periods of the channels of the multiplexers will overlap momentarily, which may be objectionable in certain applications. Also, when a channel is turned on or off by an address input, there is a momentary conductive path from the channel to V_{SS}, which will dump some charge from any capacitor connected to the input or output of the channel. the inhibit input turning on a channel will similarly dump some charge to V_{SS}.

The amount of charge dumped is mostly a function of the signal lave above V_{SS}. Typically, at V_{DD}–V_{SS} = 10V, a 100pF capacitor connected to the input or output of the channel will lose 3-4% of its voltage at the moment the channel turns on or off. This loss of voltage is essentially independent of the address or inhibit signal transition time, if the transition time is less than 1-2µs. When the inhibit signal turns a channel off, there is no charge dumping to V_{SS}. Rather, there is a slight rise in the channel voltage level (65mV typical) due to capacitive coupling from inhibit input to channel input or output. Address inputs also couple some voltage steps onto the channel signal levels.

In certain applications, the external load-resistor current may include both V_{DD} and signal-line components. To avoid drawing V_{DD} current when switch current flows into the transmission gate inputs, the voltage drop across the bidirectional switch must not exceed 0.8V (calculated from RTON values shown in *Electrical Characteristics* tables). No V_{DD} current will flow through R_L if the switch current flows into terminal 1 on the CD4067B, terminals 1 and 17 on the CD4097B.

8.2 Typical Application

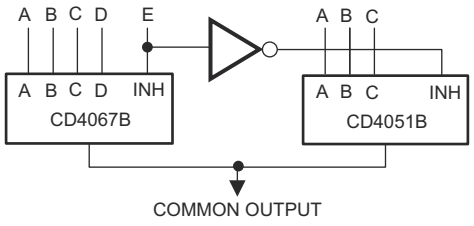

Figure 8-1. 18-24-to-1 MUX Addressing

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9 Device and Documentation Support

9.1 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.

9.2 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.

9.3 Trademarks

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9.4 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.

9.5 Glossary

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

10 Revision History

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

Changes from Revision C (July 2024) to Revision D (August 2024)	Page
• Added Settling Time plots	8

Changes from Revision B (June 2003) to Revision C (July 2024)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document	1
• Changed max and typ IDD for lower supply voltages	6
• Changed max IIN at low temperature	6

11 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.

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PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
CD4067BF	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4067BF
CD4067BF.A	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4067BF
CD4067BF3A	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4067BF3A
CD4067BF3A.A	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4067BF3A
CD4067BM	Obsolete	Production	SOIC (DW) | 24	-	-	Call TI	Call TI	-55 to 125	CD4067BM
CD4067BM96	Active	Production	SOIC (DW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4067BM
CD4067BM96.A	Active	Production	SOIC (DW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4067BM
CD4067BM96G4	Obsolete	Production	SOIC (DW) | 24	-	-	Call TI	Call TI	-55 to 125	CD4067BM
CD4067BPW	Obsolete	Production	TSSOP (PW) | 24	-	-	Call TI	Call TI	-55 to 125	CM067B
CD4067BPWR	Active	Production	TSSOP (PW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM067B
CD4067BPWR.A	Active	Production	TSSOP (PW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM067B
CD4097BF	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4097BF
CD4097BF.A	Active	Production	CDIP (J) | 24	15 | TUBE	No	Call TI	N/A for Pkg Type	-55 to 125	CD4097BF
CD4097BM	NRND	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4097BM
CD4097BM.A	NRND	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4097BM
CD4097BME4	NRND	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4097BM
CD4097BMG4	NRND	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4097BM
CD4097BPW	NRND	Production	TSSOP (PW) | 24	60 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM097B
CD4097BPW.A	NRND	Production	TSSOP (PW) | 24	60 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM097B
CD4097BPWR	NRND	Production	TSSOP (PW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM097B
CD4097BPWR.A	NRND	Production	TSSOP (PW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM097B
CD4097BPWRE4	NRND	Production	TSSOP (PW) | 24	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM097B

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) Lead finish/Ball material: Parts 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.

(5) MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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OTHER QUALIFIED VERSIONS OF CD4067B, CD4067B-MIL, CD4097B, CD4097B-MIL :

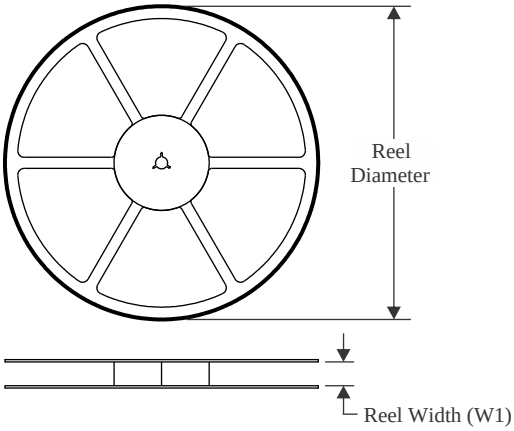
- Catalog : CD4067B, CD4097B
- Military : CD4067B-MIL, CD4097B-MIL

NOTE: Qualified Version Definitions:

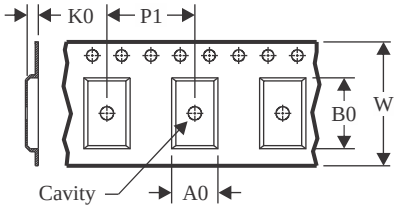
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

REEL DIMENSIONS

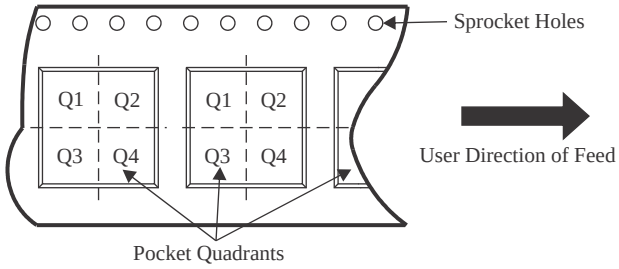


TAPE DIMENSIONS



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

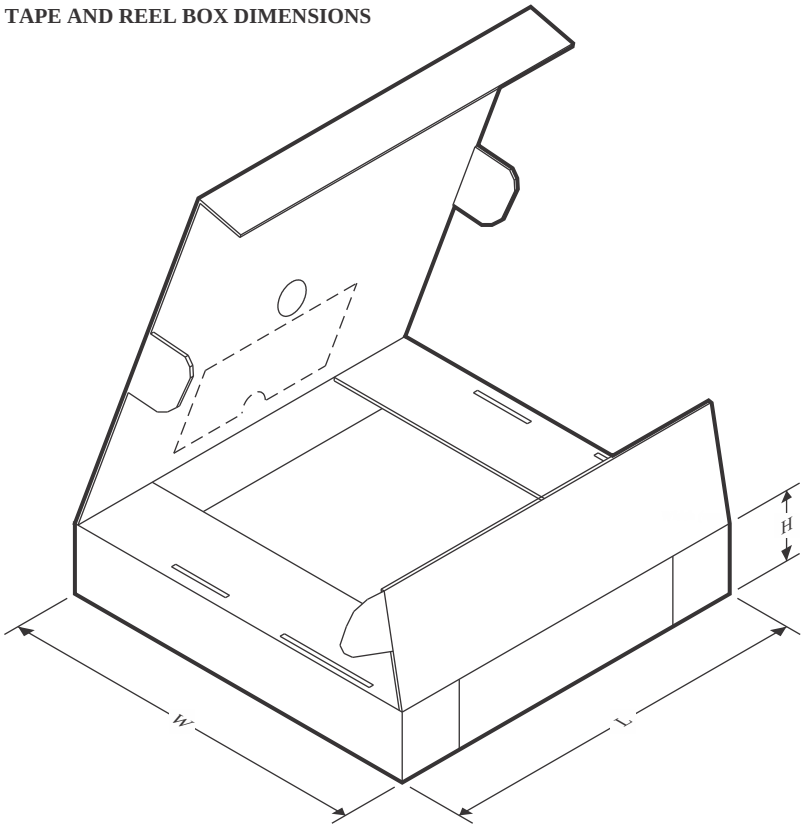
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
CD4067BM96	SOIC	DW	24	2000	330.0	24.4	10.75	15.7	2.7	12.0	24.0	Q1

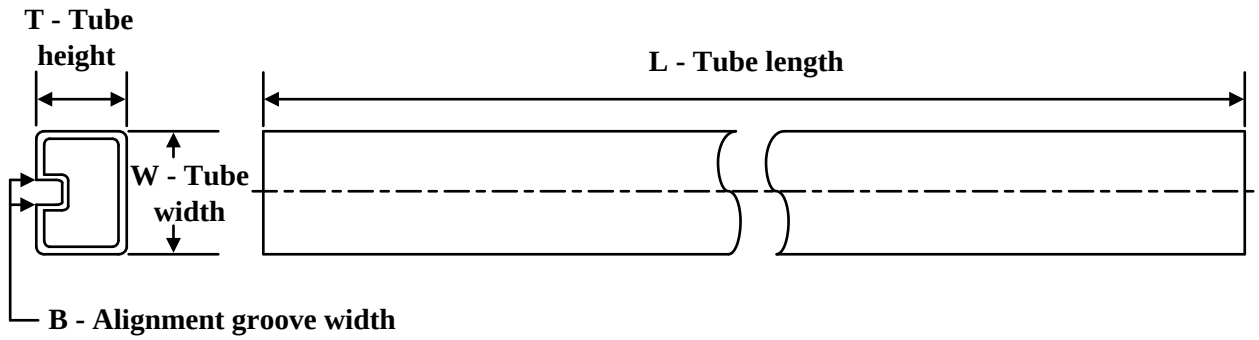
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD4067BM96	SOIC	DW	24	2000	350.0	350.0	43.0

TUBE



*All dimensions are nominal

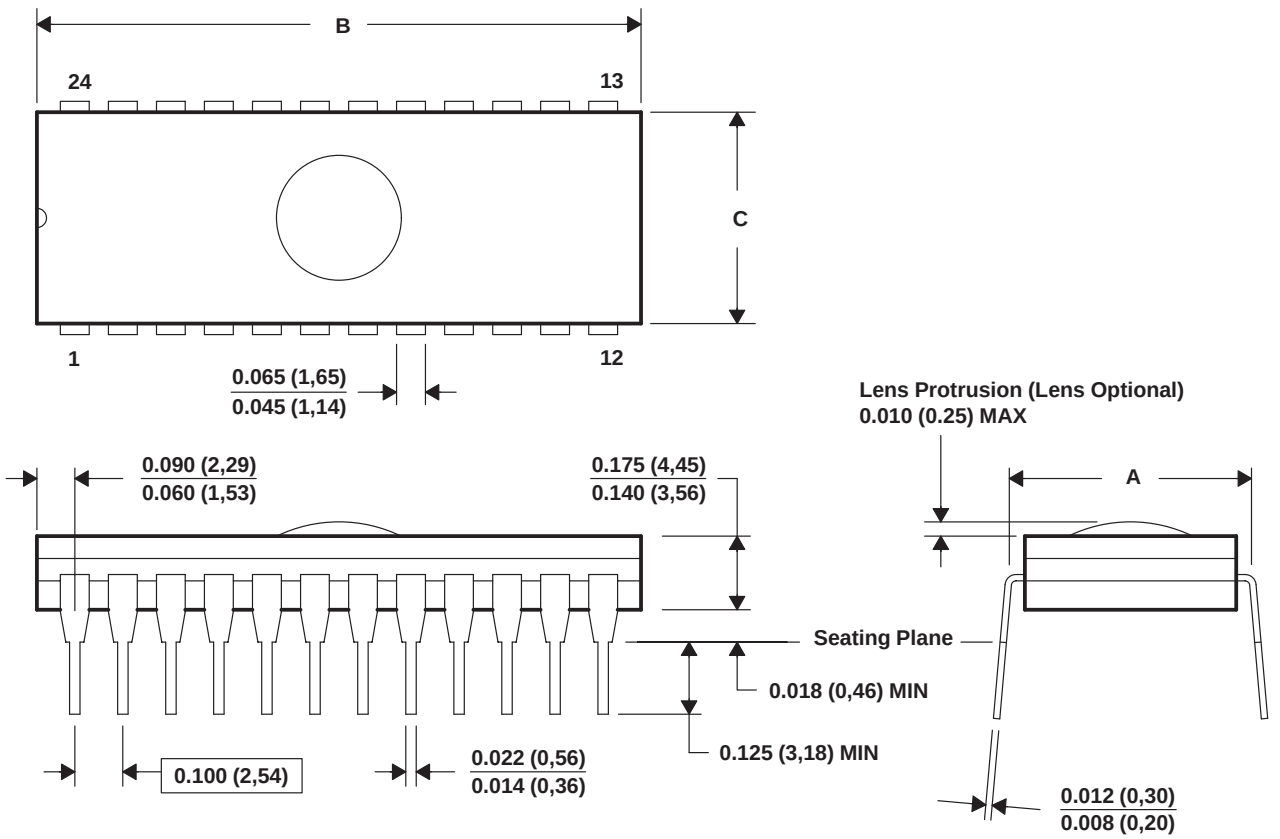
Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
CD4097BM	DW	SOIC	24	25	506.98	12.7	4826	6.6
CD4097BM.A	DW	SOIC	24	25	506.98	12.7	4826	6.6
CD4097BME4	DW	SOIC	24	25	506.98	12.7	4826	6.6
CD4097BMG4	DW	SOIC	24	25	506.98	12.7	4826	6.6
CD4097BPW	PW	TSSOP	24	60	530	10.2	3600	3.5
CD4097BPW.A	PW	TSSOP	24	60	530	10.2	3600	3.5

MCDI004A – JANUARY 1995 – REVISED NOVEMBER 1997

J (R-GDIP-T**)

CERAMIC DUAL-IN-LINE PACKAGE

24 PINS SHOWN



DIM \ PINS **		24		28		32		40	
		NARR	WIDE	NARR	WIDE	NARR	WIDE	NARR	WIDE
"A"	MAX	0.624(15,85)	0.624(15,85)	0.624(15,85)	0.624(15,85)	0.624(15,85)	0.624(15,85)	0.624(15,85)	0.624(15,85)
	MIN	0.590(14,99)	0.590(14,99)	0.590(14,99)	0.590(14,99)	0.590(14,99)	0.590(14,99)	0.590(14,99)	0.590(14,99)
"B"	MAX	1.265(32,13)	1.265(32,13)	1.465(37,21)	1.465(37,21)	1.668(42,37)	1.668(42,37)	2.068(52,53)	2.068(52,53)
	MIN	1.235(31,37)	1.235(31,37)	1.435(36,45)	1.435(36,45)	1.632(41,45)	1.632(41,45)	2.032(51,61)	2.032(51,61)
"C"	MAX	0.541(13,74)	0.598(15,19)	0.541(13,74)	0.598(15,19)	0.541(13,74)	0.598(15,19)	0.541(13,74)	0.598(15,19)
	MIN	0.514(13,06)	0.571(14,50)	0.514(13,06)	0.571(14,50)	0.514(13,06)	0.571(14,50)	0.514(13,06)	0.571(14,50)

4040084/C 10/97

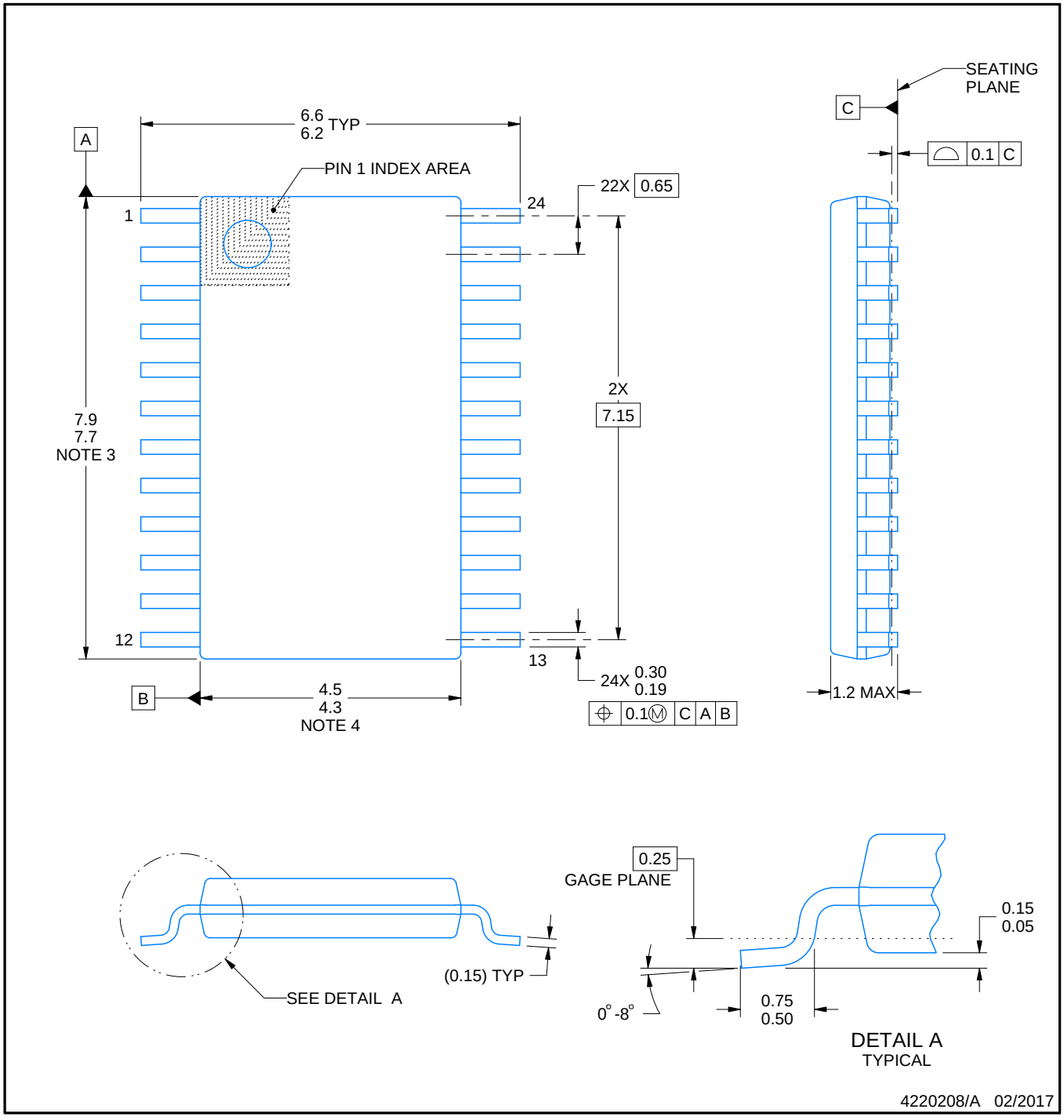
NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Window (lens) added to this group of packages (24-, 28-, 32-, 40-pin).
D. This package can be hermetically sealed with a ceramic lid using glass frit.
E. Index point is provided on cap for terminal identification.

PACKAGE OUTLINE

PW0024A

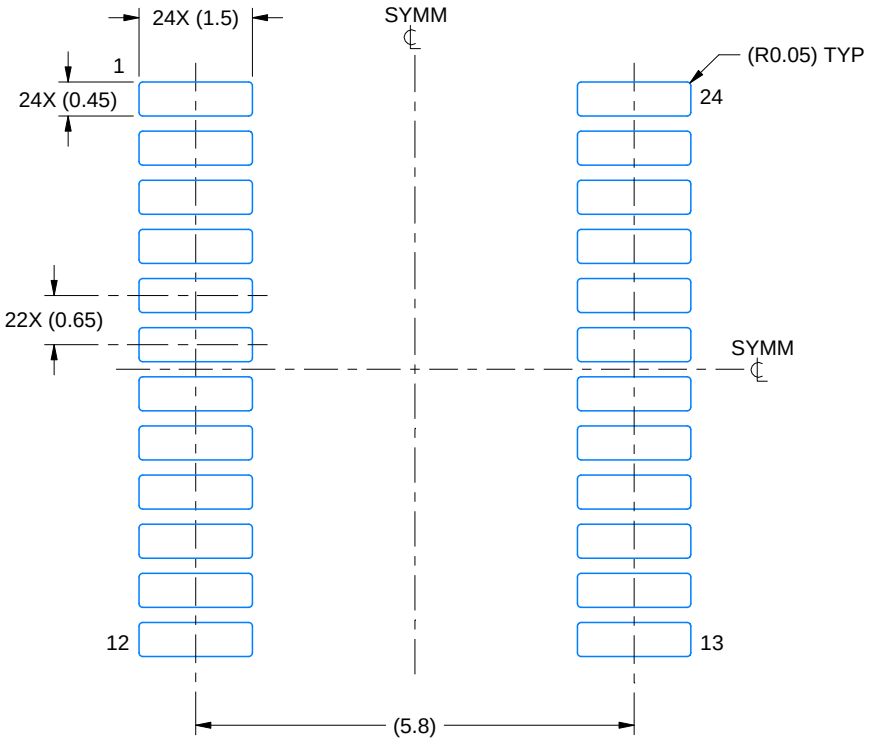
TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

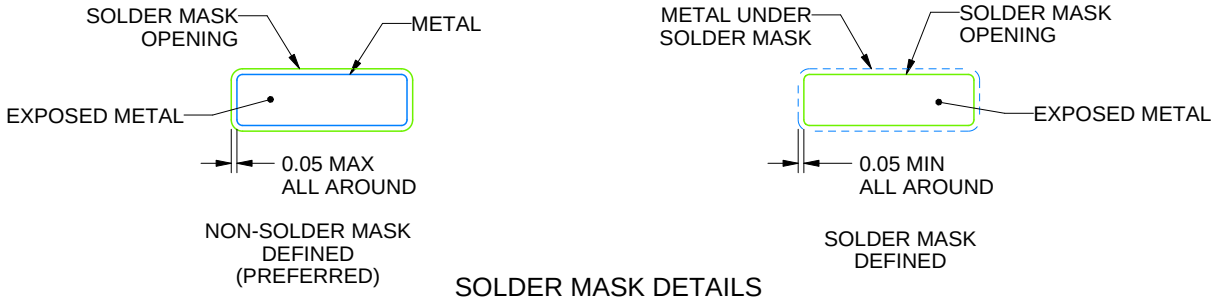


NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

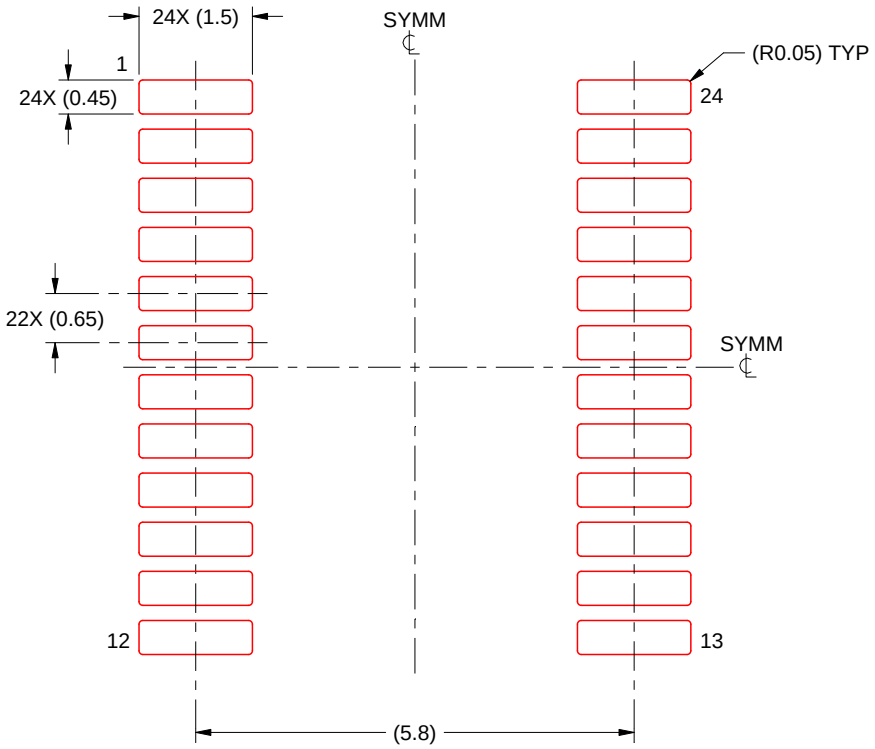


SOLDER MASK DETAILS

4220208/A 02/2017

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



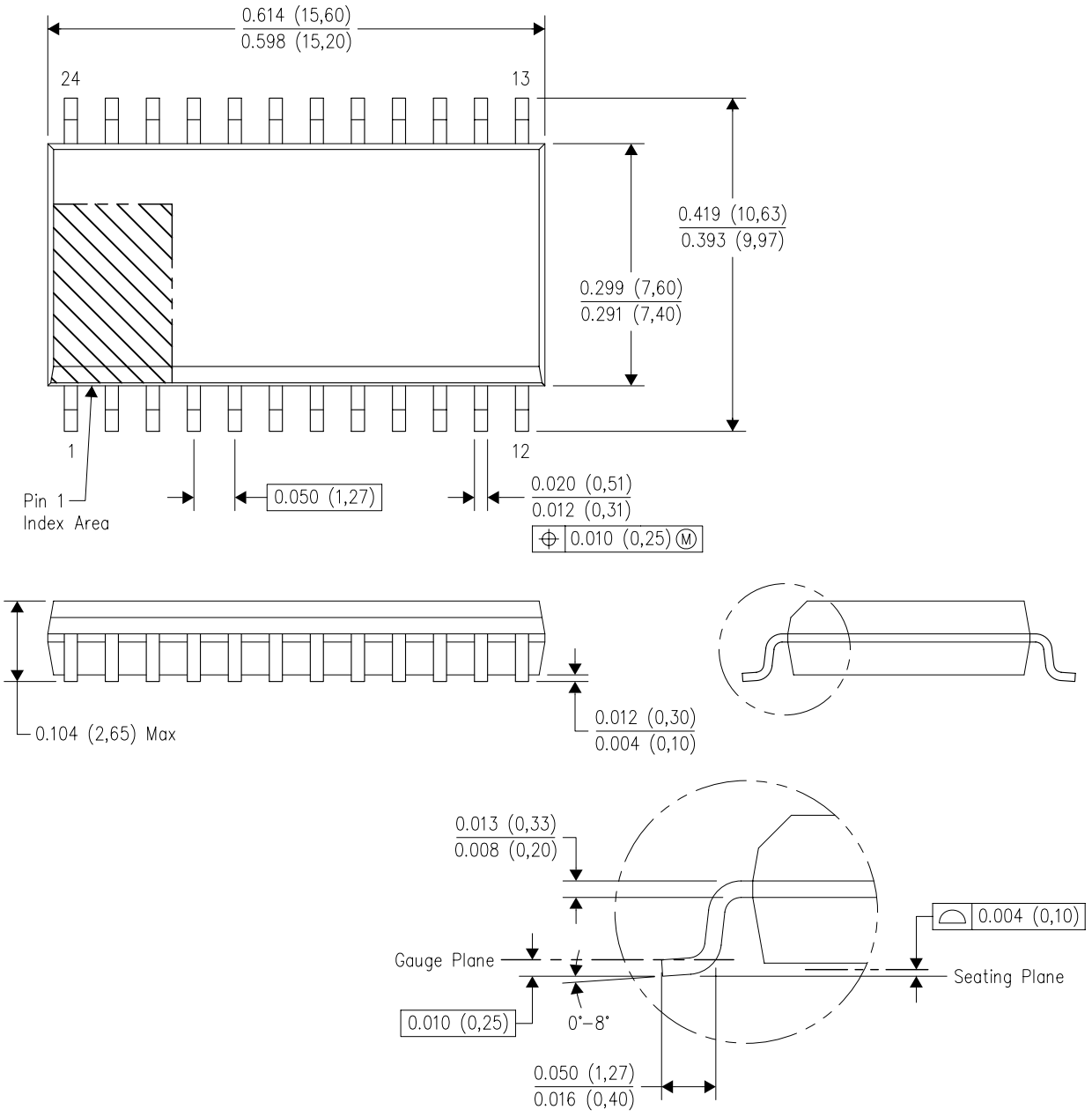
SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220208/A 02/2017

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

DW (R–PDSO–G24) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
D. Falls within JEDEC MS–013 variation AD.

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