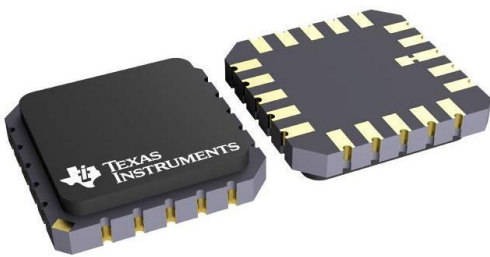


# 8103610RA Datasheet

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<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	8103610RA-DG
Manufacturer	<a href="#">Texas Instruments</a>
Manufacturer Product Number	8103610RA
Description	STANDARD HIGH-SPEED PAL CIRCUITS
Detailed Description	PAL® Programmable Logic Device (PLD) IC 4 Macrocells 20-CDIP

This model 8103610RA is available at DiGi Electronics.

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## Purchase and inquiry

Manufacturer Product Number:

8103610RA

Series:

PAL®

Programmable Type:

PAL

Voltage - Input:

4.5V ~ 5.5V

Mounting Type:

Through Hole

Supplier Device Package:

20-CDIP

Manufacturer:

Texas Instruments

Product Status:

Active

Number of Macrocells:

4

Speed:

30 ns

Package / Case:

20-CDIP (0.300", 7.62mm)

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

Moisture Sensitivity Level (MSL):

Not Applicable

**PAL16L8AM, PAL16L8A-2M, PAL16R4AM, PAL16R4A-2M  
PAL16R6AM, PAL16R6A-2M, PAL16R8AM, PAL16R8A-2M  
STANDARD HIGH-SPEED PAL® CIRCUITS**

SRPS016 – D2705, FEBRUARY 1984 – REVISED MARCH 1992

- **Choice of Operating Speeds**  
High-Speed, A Devices . . . 25 MHz Min  
Half-Power, A-2 Devices . . . 16 MHz Min
- **Choice of Input/Output Configuration**
- **Package Options Include Both Ceramic DIP and Chip Carrier in Addition to Ceramic Flat Package**

DEVICE	I INPUTS	3-STATE O OUTPUTS	REGISTERED Q OUTPUTS	I/O PORTS
PAL16L8	10	2	0	6
PAL16R4	8	0	4 (3-state buffers)	4
PAL16R6	8	0	6 (3-state buffers)	2
PAL16R8	8	0	8 (3-state buffers)	0

### description

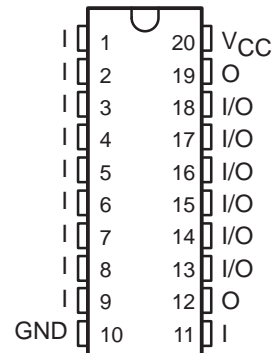
These programmable array logic devices feature high speed and a choice of either standard or half-power devices. They combine Advanced Low-Power Schottky technology with proven titanium-tungsten fuses. These devices will provide reliable, high-performance substitutes for conventional TTL logic. Their easy programmability allow for quick design of "custom" functions and typically results in a more compact circuit board. In addition, chip carriers are available for further reduction in board space.

The Half-Power versions offer a choice of operating frequency, switching speeds, and power dissipation. In many cases, these Half-Power devices can result in significant power reduction from an overall system level.

The PAL16' M series is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ .

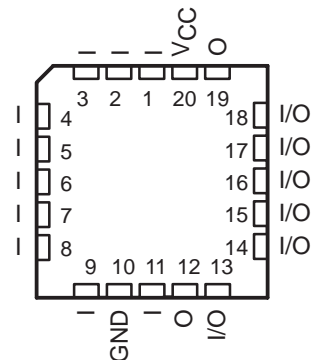
**PAL16L8'**  
**J OR W PACKAGE**

(TOP VIEW)



**PAL16L8'**  
**FK PACKAGE**

(TOP VIEW)



PAL is a registered trademark of Advanced Micro Devices Inc.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

**TEXAS**  
**INSTRUMENTS**

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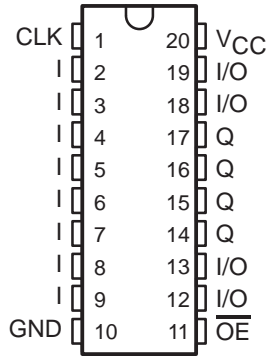
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8103610RA Texas Instruments STANDARD HIGH-SPEED PAL CIRCUITS  
**PAL16R4AM, PAL16R4A-2M, PAL16R6AM, PAL16R6A-2M, PAL16R8AM, PAL16R8A-2M**  
**STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS**

SRPS016 – D2705, FEBRUARY 1984 – REVISED MARCH 1992

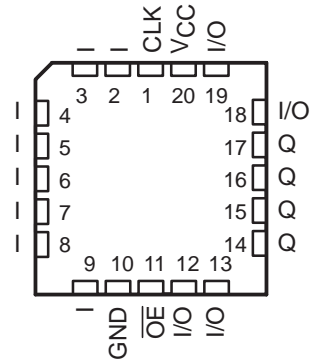
**PAL16R4'**  
**J OR W PACKAGE**

(TOP VIEW)



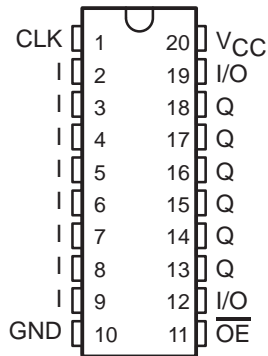
**PAL16R4'**  
**FK PACKAGE**

(TOP VIEW)



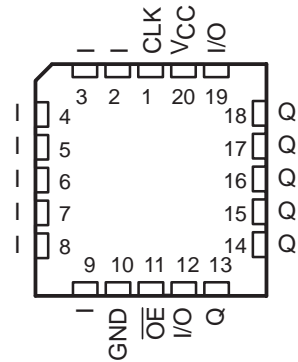
**PAL16R6'**  
**J OR W PACKAGE**

(TOP VIEW)



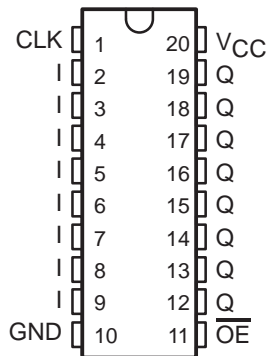
**PAL16R6'**  
**FK PACKAGE**

(TOP VIEW)



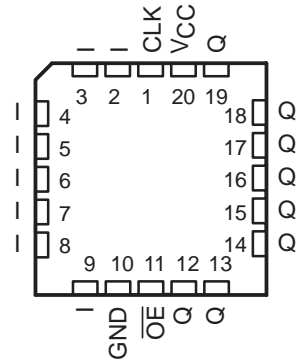
**PAL16R8'**  
**J OR W PACKAGE**

(TOP VIEW)



**PAL16R8'**  
**FK PACKAGE**

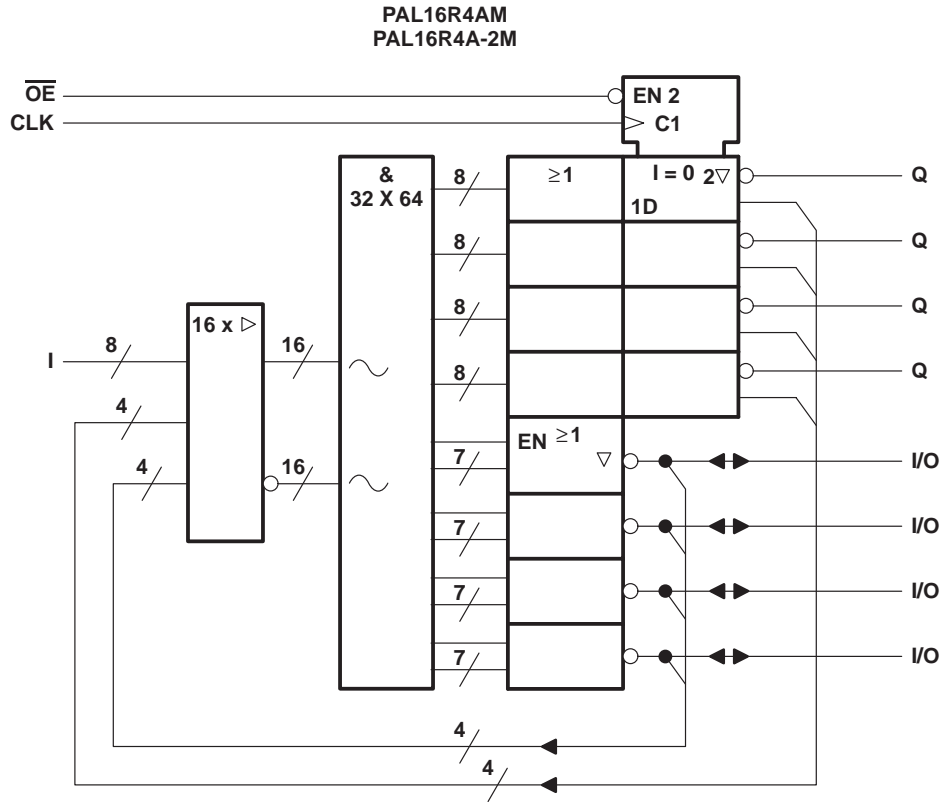
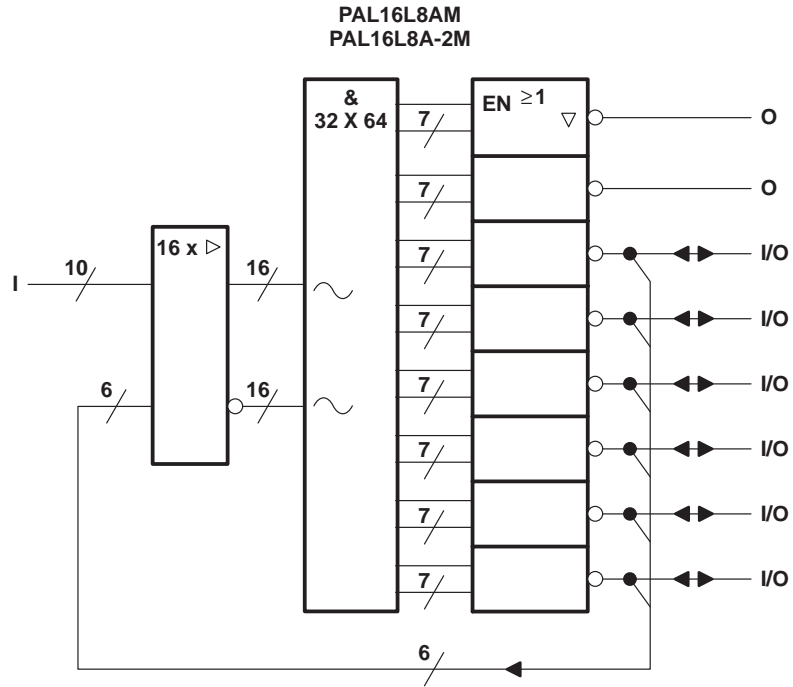
(TOP VIEW)



**PAL16L8AM, PAL16L8A-2M, PAL16R4AM, PAL16R4A-2M**  
**STANDARD HIGH-SPEED PAL® CIRCUITS**

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**functional block diagrams (positive logic)**

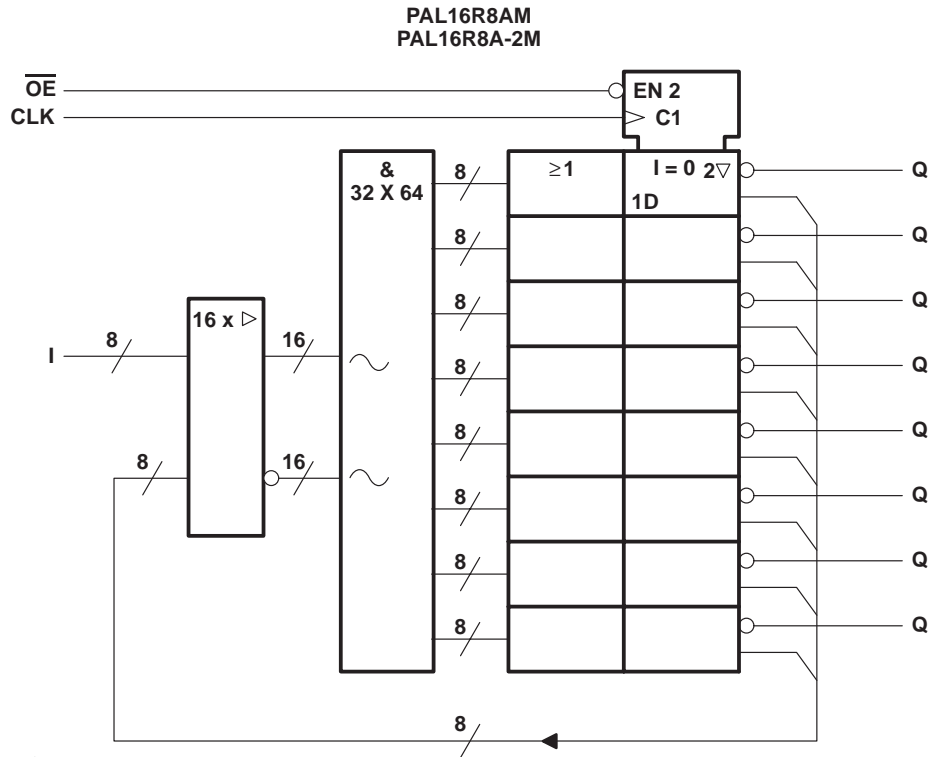
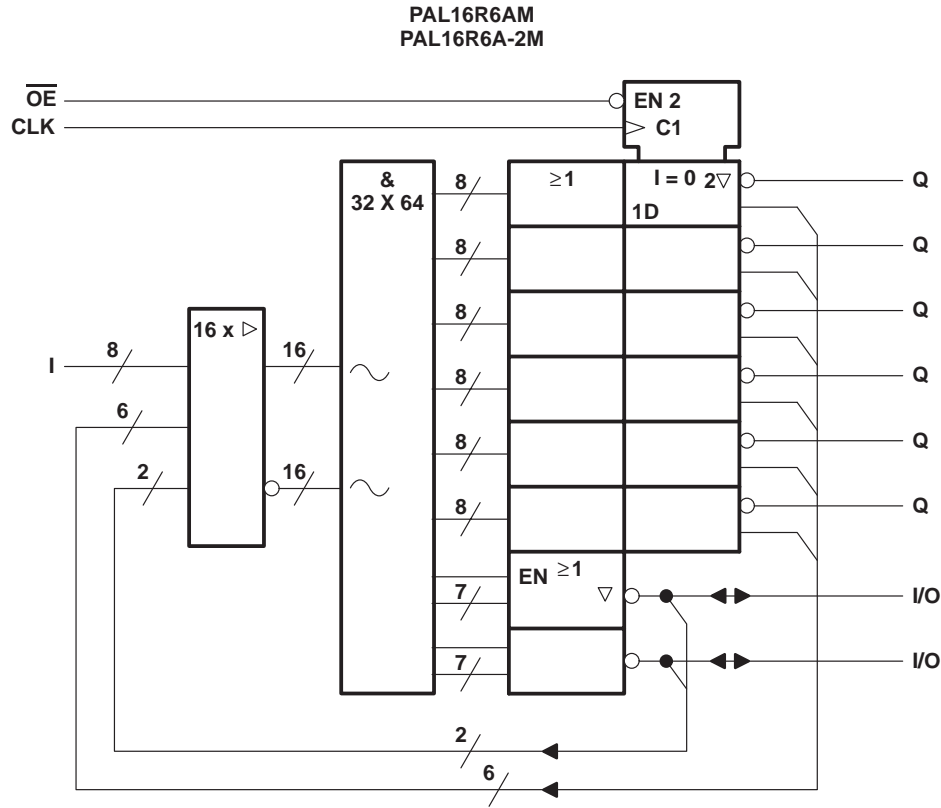


~ denotes fused inputs

8103610RA Texas Instruments STANDARD HIGH-SPEED PAL CIRCUITS  
**PAL16R6AM, PAL16R6A-2M, PAL16R8AM, PAL16R8A-2M**  
**STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS**

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**functional block diagrams (positive logic)**



~ denotes fused inputs

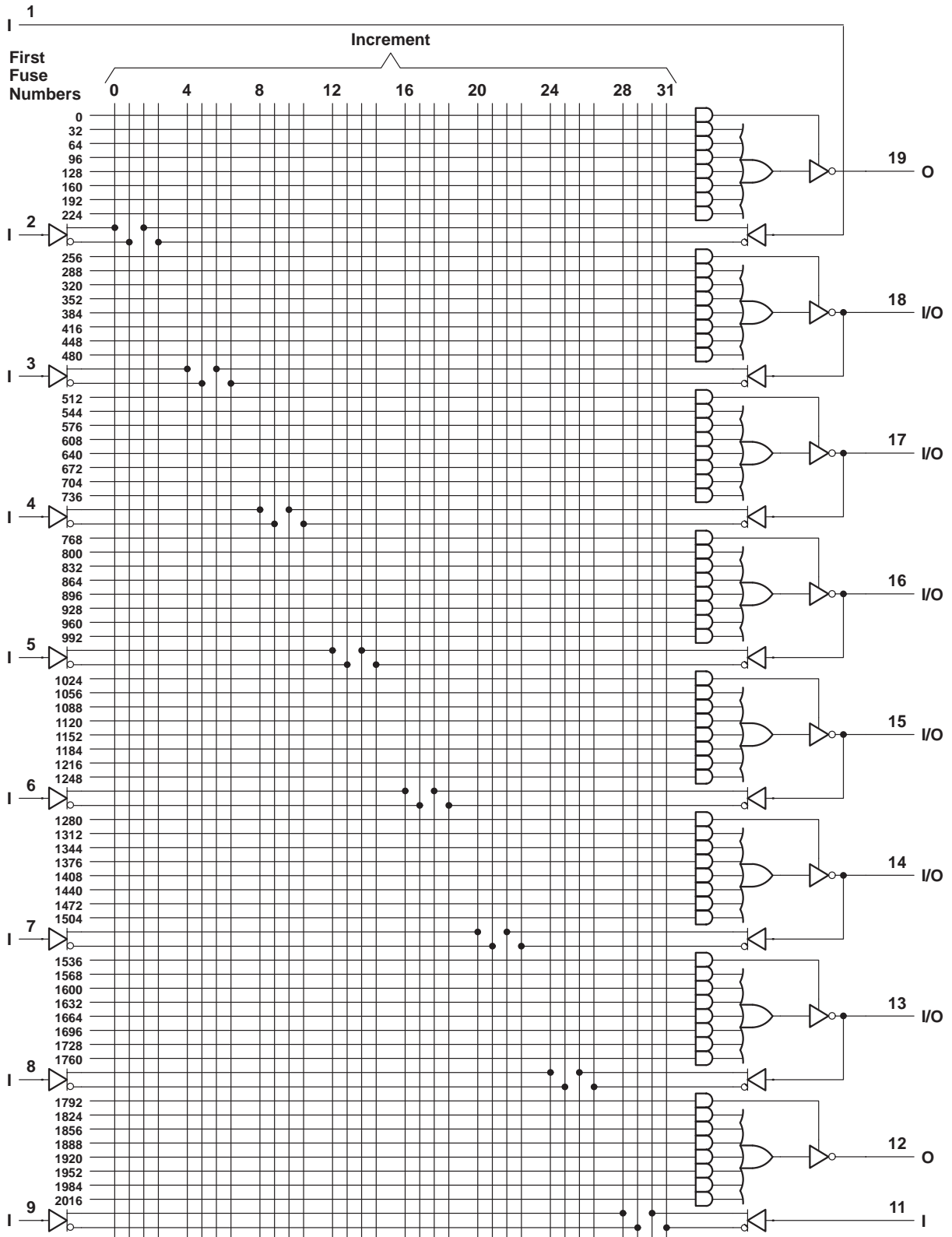


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# PAL16L8AM, PAL16L8A-2M STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS

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## logic diagram (positive logic)



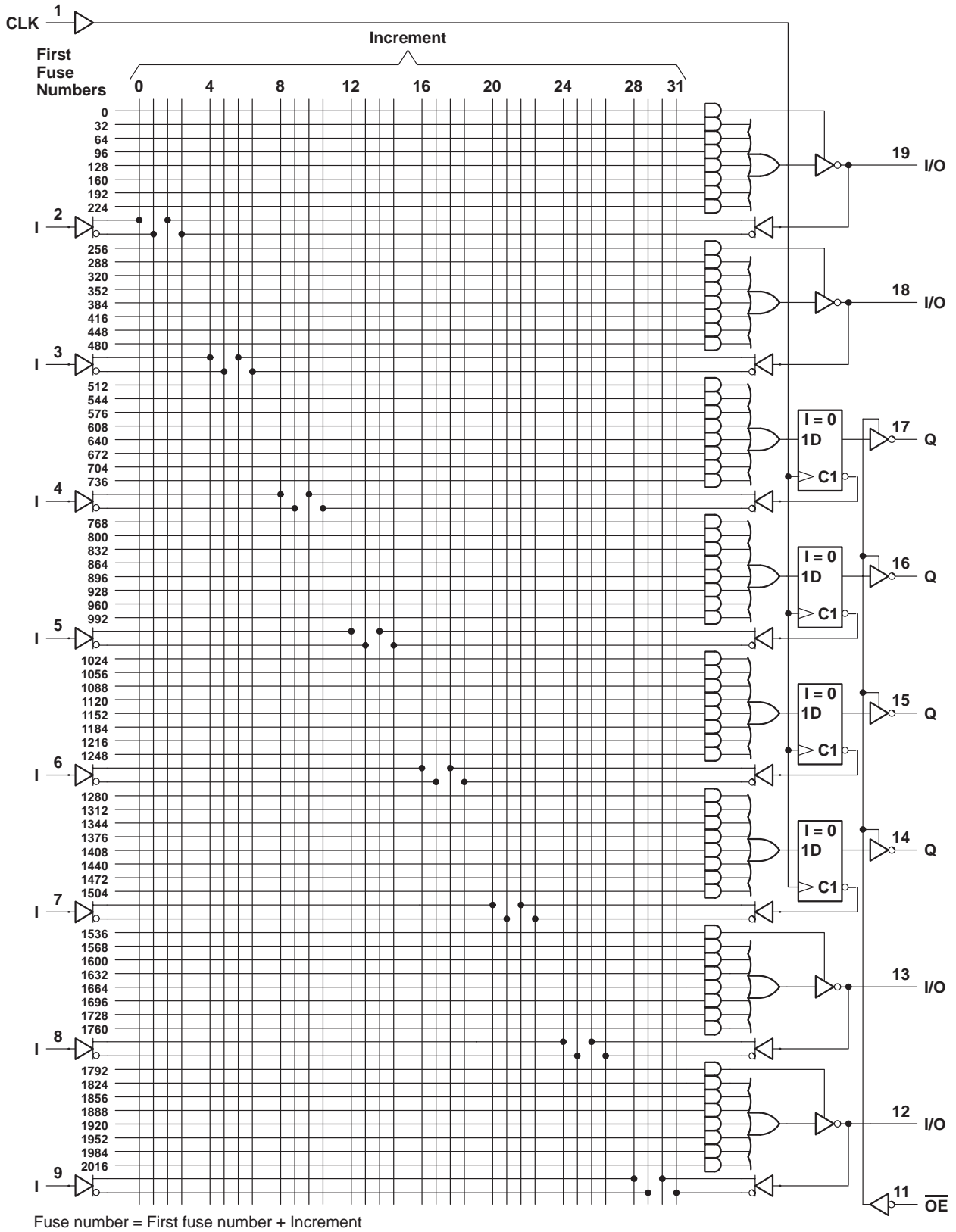
Fuse number = First fuse number + Increment



# PAL16R4AM, PAL16R4A-2M STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS

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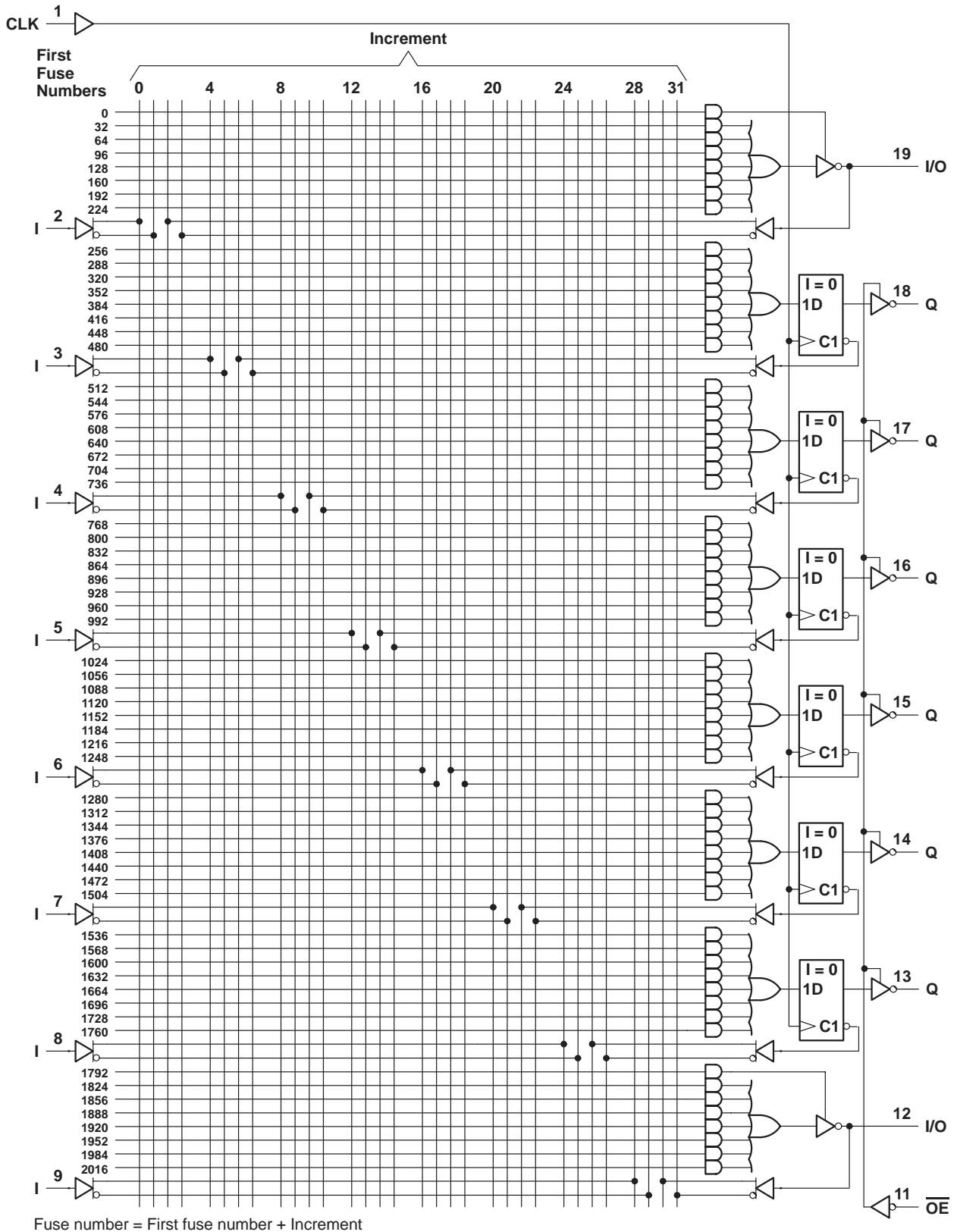
## logic diagram (positive logic)



# PAL16R6AM, PAL16R6A-2M STANDARD HIGH-SPEED PAL® CIRCUITS

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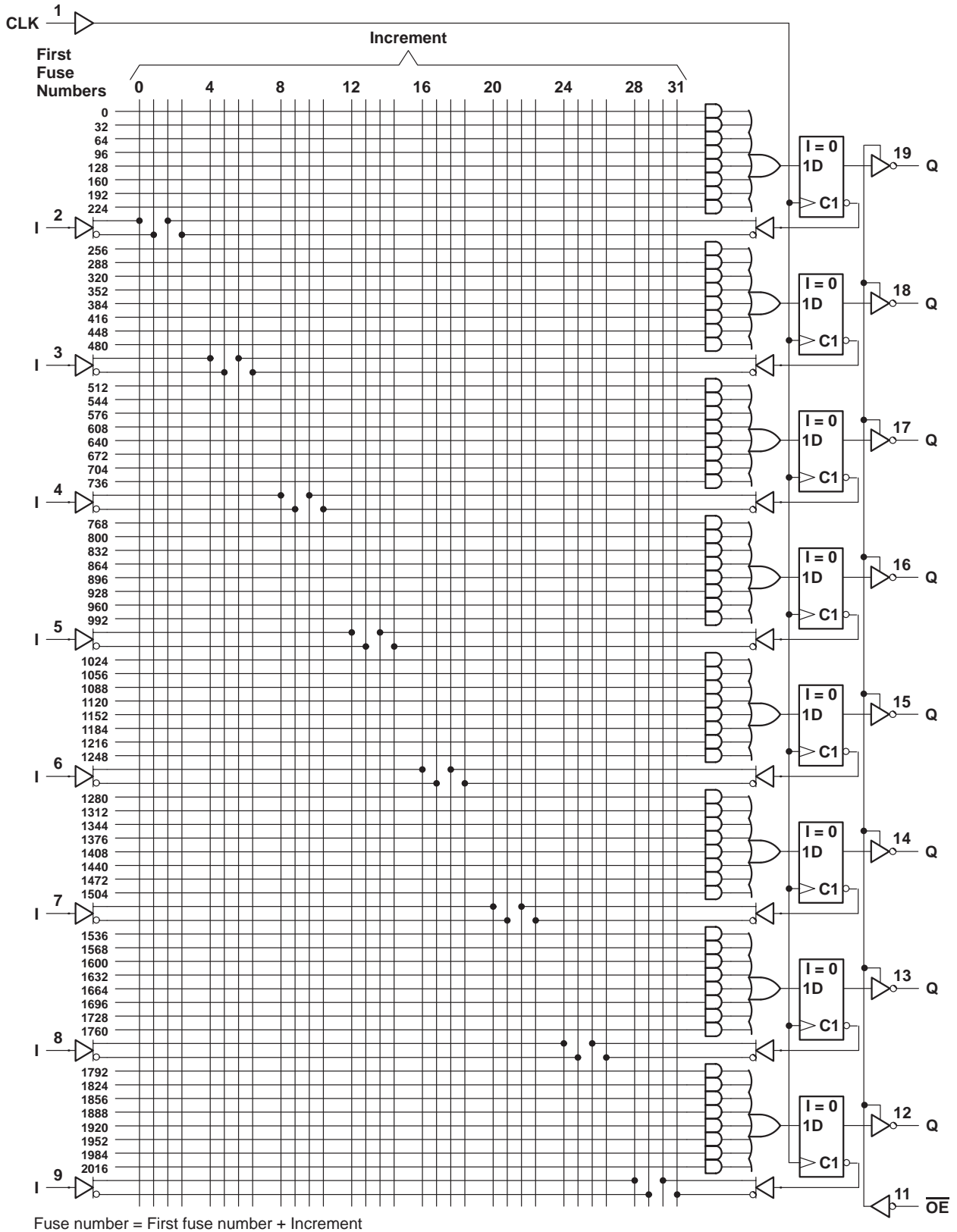
## logic diagram (positive logic)



# PAL16R8AM, PAL16R8A-2M STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS

SRPS016 – D2705, FEBRUARY 1984 – REVISED MARCH 1992

## logic diagram (positive logic)



**PAL16L8AM, PAL16L8A-2M, PAL16R4AM, PAL16R4A-2M  
PAL16R6AM, PAL16R6A-2M, PAL16R8AM, PAL16R8A-2M  
STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS**

SRPS016 – D2705, FEBRUARY 1984 – REVISED MARCH 1992

## programming information

Texas Instruments programmable logic devices can be programmed using widely available software and inexpensive device programmers.

Complete programming specifications, algorithms, and the latest information on hardware, software, and firmware are available upon request. Information on programmers capable of programming Texas Instruments programmable logic is also available, upon request, from the nearest TI field sales office, local authorized TI distributor, or by calling Texas Instruments at (214) 997-5666.

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

Supply voltage, $V_{CC}$ (see Note 1) .....	7 V
Input voltage (see Note 1) .....	5.5 V
Voltage applied to disabled output (see Note 1) .....	5.5 V
Operating free-air temperature range .....	–55°C to 125°C
Storage temperature range .....	–65°C to 150°C

NOTE 1: These ratings apply except for programming pins during a programming cycle.

## recommended operating conditions

		MIN	NOM	MAX	UNIT
$V_{CC}$	Supply voltage	4.5	5	5.5	V
$V_{IH}$	High-level input voltage	2		5.5	V
$V_{IL}$	Low-level input voltage			0.8	V
$I_{OH}$	High-level output current			–2	mA
$I_{OL}$	Low-level output current			12	mA
$T_A$	Operating free-air temperature	–55	25	125	°C

# PAL16L8AM, PAL16R4AM, PAL16R6AM, PAL16R8AM STANDARD HIGH-SPEED PAL<sup>®</sup> CIRCUITS

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## electrical characteristics over recommended operating free-air temperature range

PARAMETER		TEST CONDITIONS		MIN	TYP <sup>†</sup>	MAX	UNIT	
V <sub>IK</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>I</sub> = -18 mA			-1.5	V	
V <sub>OH</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>OH</sub> = -2 mA	2.4	3.2		V	
V <sub>OL</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>OL</sub> = 12 mA		0.25	0.4	V	
I <sub>OZH</sub>	Outputs	V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 2.7 V			20	μA	
	I/O ports					100		
I <sub>OZL</sub>	Outputs	V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 0.4 V			-20	μA	
	I/O ports					-100		
I <sub>I</sub>		V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 5.5 V			0.2	mA	
I <sub>IH</sub>	I/O Ports	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 2.7 V			100	μA	
	All others					25		
I <sub>IL</sub>	$\overline{\text{OE}}$ input	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0.4 V			-0.2	mA	
	All others					-0.1		
I <sub>OS</sub> <sup>‡</sup>		V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 0.5 V	-30		-250	mA	
I <sub>CC</sub>		V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0, Outputs open			75	180	mA

## timing requirements

		MIN	MAX	UNIT
f <sub>clock</sub>	Clock Frequency	0	25	MHz
t <sub>w</sub>	Pulse duration (see Note 2)	Clock high	15	ns
		Clock low	20	
t <sub>su</sub>	Setup time, input or feedback before CLK <sup>↑</sup>	25		ns
t <sub>h</sub>	Hold time, input or feedback after CLK <sup>↑</sup>	0		ns

NOTE 2: The total clock period of clock high and clock low must not exceed clock frequency, f<sub>clock</sub>. The minimum pulse durations specified are only for clock high or low, but not for both simultaneously.

## switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITION	MIN	TYP <sup>†</sup>	MAX	UNIT	
f <sub>max</sub>			R1 = 390 Ω, R2 = 750 Ω, See Figure 1	25	45		MHz	
t <sub>pd</sub>	I, I/O	O, I/O				15	30	ns
t <sub>pd</sub>	CLK <sup>↑</sup>	Q				10	20	ns
t <sub>en</sub>	$\overline{\text{OE}}$ ↓	Q				15	25	ns
t <sub>dis</sub>	$\overline{\text{OE}}$ ↑	Q				10	25	ns
t <sub>en</sub>	I, I/O	O, I/O				14	30	ns
t <sub>dis</sub>	I, I/O	O, I/O				13	30	ns

<sup>†</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>‡</sup> Not more than one output should be shorted at a time and the duration of the short circuit should not exceed one second. Set V<sub>O</sub> at 0.5 V to avoid test equipment degradation.

**electrical characteristics over recommended operating free-air temperature range**

PARAMETER		TEST CONDITIONS		MIN	TYP <sup>†</sup>	MAX	UNIT
V <sub>IK</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>I</sub> = -18 mA			-1.5	V
V <sub>OH</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>OH</sub> = -2 mA	2.4	3.2		V
V <sub>OL</sub>		V <sub>CC</sub> = 4.5 V,	I <sub>OL</sub> = 12 mA		0.25	0.4	V
I <sub>OZH</sub>	Outputs	V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 2.7 V			20	μA
	I/O ports					100	
I <sub>OZL</sub>	Outputs	V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 0.4 V			-20	μA
	I/O ports					-100	
I <sub>I</sub>		V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 5.5 V			0.2	mA
I <sub>IH</sub>	I/O Ports	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 2.7 V			100	μA
	All others					25	
I <sub>IL</sub>	$\overline{\text{OE}}$ input	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0.4 V			-0.2	mA
	All others					-0.1	
I <sub>OS</sub> <sup>‡</sup>		V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 0.5 V	-30		-250	mA
I <sub>CC</sub>		V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0, Outputs open		75	90	mA

**timing requirements**

			MIN	MAX	UNIT
f <sub>clock</sub>	Clock Frequency		0	16	MHz
t <sub>w</sub>	Pulse duration (see Note 2)	Clock high	25		ns
		Clock low	25		
t <sub>su</sub>	Setup time, input or feedback before CLK <sup>↑</sup>		35		ns
t <sub>h</sub>	Hold time, input or feedback after CLK <sup>↑</sup>		0		ns

NOTE 2: The total clock period of clock high and clock low must not exceed clock frequency, f<sub>clock</sub>. The minimum pulse durations specified are only for clock high or low, but not for both simultaneously.

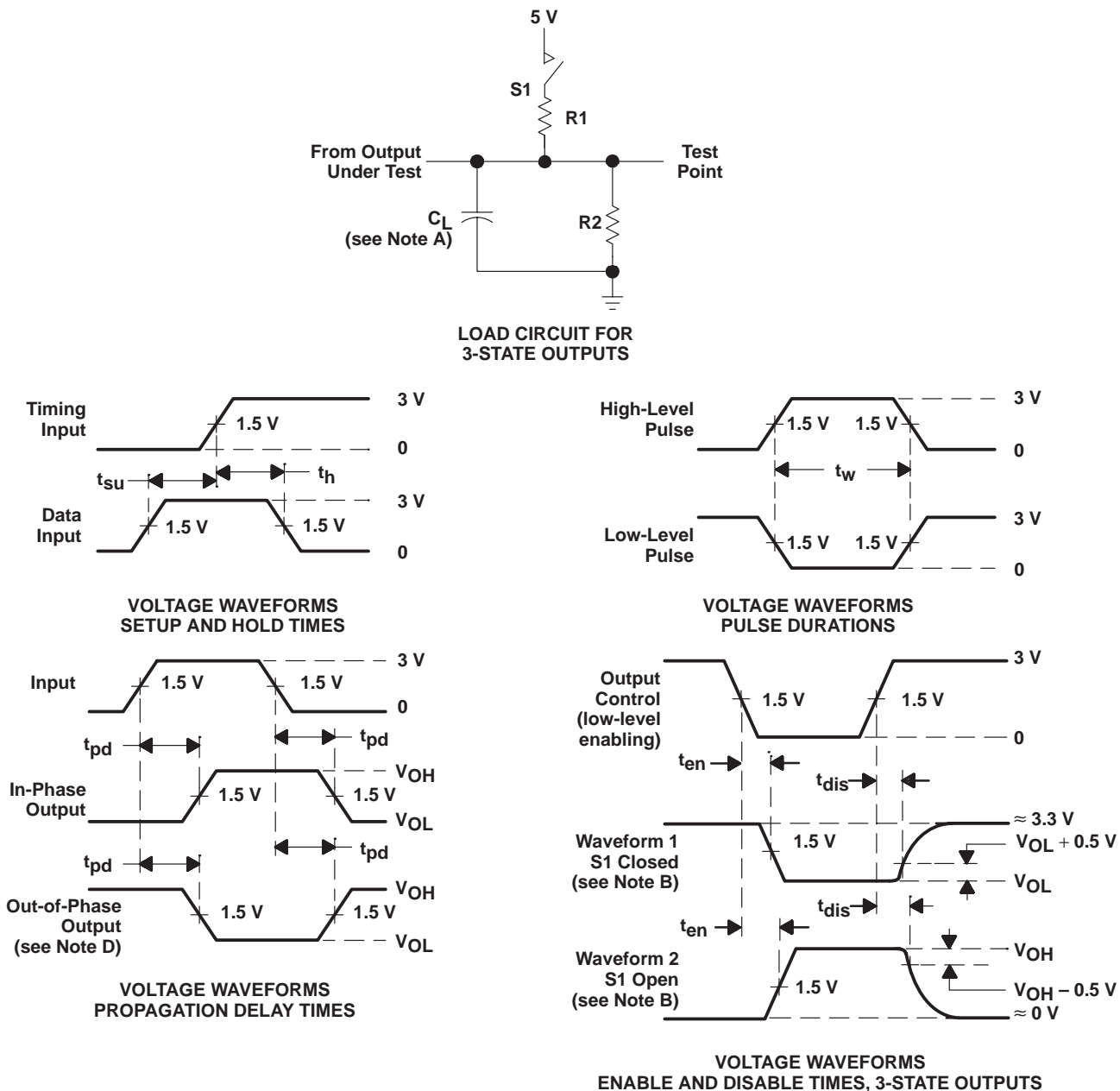
**switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITION	MIN	TYP <sup>†</sup>	MAX	UNIT	
f <sub>max</sub>			R1 = 390 Ω, R2 = 750 Ω, See Figure 1	16	25		MHz	
t <sub>pd</sub>	I, I/O	O, I/O				25	40	ns
t <sub>pd</sub>	CLK <sup>↑</sup>	Q			11	25	ns	
t <sub>en</sub>	$\overline{\text{OE}}$ ↓	Q			20	25	ns	
t <sub>dis</sub>	$\overline{\text{OE}}$ ↑	Q			11	25	ns	
t <sub>en</sub>	I, I/O	O, I/O			25	40	ns	
t <sub>dis</sub>	I, I/O	O, I/O			25	35	ns	

<sup>†</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>‡</sup> Not more than one output should be shorted at a time and the duration of the short circuit should not exceed one second. Set V<sub>O</sub> at 0.5 V to avoid test equipment degradation.

**PARAMETER MEASUREMENT INFORMATION**



- NOTES: A.  $C_L$  includes probe and jig capacitance and is 50 pF for  $t_{pd}$  and  $t_{en}$ , 5 pF for  $t_{dis}$ .  
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.  
 C. All input pulses have the following characteristics:  $PRR \leq 10$  MHz,  $t_r$  and  $t_f \leq 2$  ns, duty cycle = 50%  
 D. When measuring propagation delay times of 3-state outputs, switch S1 is closed.  
 E. Equivalent loads may be used for testing.

**Figure 1. Load Circuit and Voltage Waveforms**

**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
81036072A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036072A PAL16L8A MFKB	<a href="#">Samples</a>
8103607RA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103607RA PAL16L8AMJB	<a href="#">Samples</a>
8103607SA	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103607SA PAL16L8AMWB	<a href="#">Samples</a>
81036082A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036082A PAL16R8A MFKB	<a href="#">Samples</a>
8103608RA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103608RA PAL16R8AMJB	<a href="#">Samples</a>
81036092A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036092A PAL16R6A MFKB	<a href="#">Samples</a>
8103609RA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103609RA PAL16R6AMJB	<a href="#">Samples</a>
81036102A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036102A PAL16R4A MFKB	<a href="#">Samples</a>
8103610RA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103610RA PAL16R4AMJB	<a href="#">Samples</a>
8103610SA	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103610SA PAL16R4AMWB	<a href="#">Samples</a>
81036112A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036112A PAL16L8A- 2MFKB	<a href="#">Samples</a>
8103611RA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103611RA PAL16L8A-2MJB	<a href="#">Samples</a>
81036142A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036142A PAL16R4A- 2MFKB	<a href="#">Samples</a>
PAL16L8A-2MFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036112A PAL16L8A-	<a href="#">Samples</a>

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
										2MFKB	
PAL16L8A-2MJ	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16L8A-2MJ	<a href="#">Samples</a>
PAL16L8A-2MJB	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103611RA PAL16L8A-2MJB	<a href="#">Samples</a>
PAL16L8AMFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036072A PAL16L8A MFKB	<a href="#">Samples</a>
PAL16L8AMJ	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16L8AMJ	<a href="#">Samples</a>
PAL16L8AMJB	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103607RA PAL16L8AMJB	<a href="#">Samples</a>
PAL16L8AMWB	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103607SA PAL16L8AMWB	<a href="#">Samples</a>
PAL16R4A-2MFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036142A PAL16R4A- 2MFKB	<a href="#">Samples</a>
PAL16R4A-2MJ	NRND	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16R4A-2MJ	
PAL16R4AMFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036102A PAL16R4A MFKB	<a href="#">Samples</a>
PAL16R4AMJ	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16R4AMJ	<a href="#">Samples</a>
PAL16R4AMJB	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103610RA PAL16R4AMJB	<a href="#">Samples</a>
PAL16R4AMWB	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103610SA PAL16R4AMWB	<a href="#">Samples</a>
PAL16R6AMFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036092A PAL16R6A MFKB	<a href="#">Samples</a>
PAL16R6AMJ	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16R6AMJ	<a href="#">Samples</a>
PAL16R6AMJB	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103609RA PAL16R6AMJB	<a href="#">Samples</a>

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
PAL16R8AMFKB	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	81036082A PAL16R8A MFKB	<a href="#">Samples</a>
PAL16R8AMJ	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	PAL16R8AMJ	<a href="#">Samples</a>
PAL16R8AMJB	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8103608RA PAL16R8AMJB	<a href="#">Samples</a>

(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.

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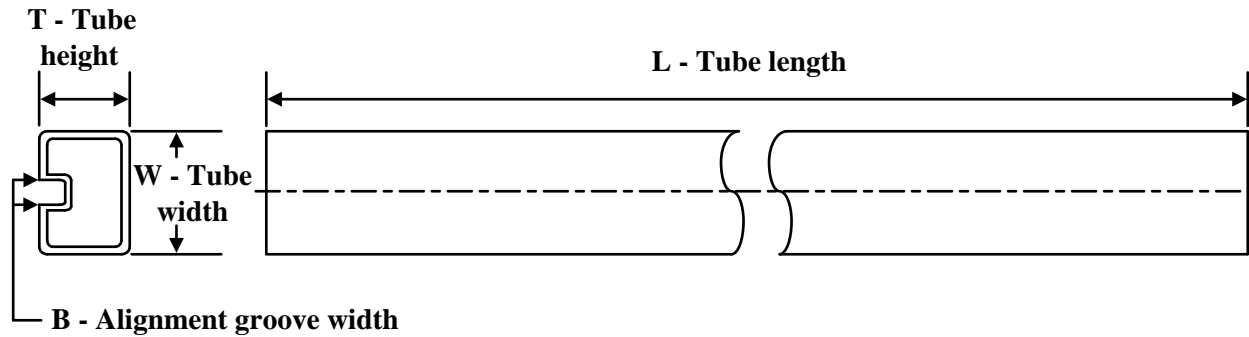
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF PAL16L8A-2M, PAL16L8AM, PAL16R4AM, PAL16R6AM, PAL16R8AM :**

- Catalog : [PAL16L8A-2](#), [PAL16L8A](#), [PAL16R4A](#), [PAL16R6A](#), [PAL16R8A](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product

**TUBE**

\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
81036072A	FK	LCCC	20	55	506.98	12.06	2030	NA
8103607SA	W	CFP	20	25	506.98	26.16	6220	NA
81036082A	FK	LCCC	20	55	506.98	12.06	2030	NA
81036092A	FK	LCCC	20	55	506.98	12.06	2030	NA
81036102A	FK	LCCC	20	55	506.98	12.06	2030	NA
8103610SA	W	CFP	20	25	506.98	26.16	6220	NA
81036112A	FK	LCCC	20	55	506.98	12.06	2030	NA
81036142A	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16L8A-2MFKB	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16L8AMFKB	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16L8AMWB	W	CFP	20	25	506.98	26.16	6220	NA
PAL16R4A-2MFKB	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16R4AMFKB	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16R4AMWB	W	CFP	20	25	506.98	26.16	6220	NA
PAL16R6AMFKB	FK	LCCC	20	55	506.98	12.06	2030	NA
PAL16R8AMFKB	FK	LCCC	20	55	506.98	12.06	2030	NA

## GENERIC PACKAGE VIEW

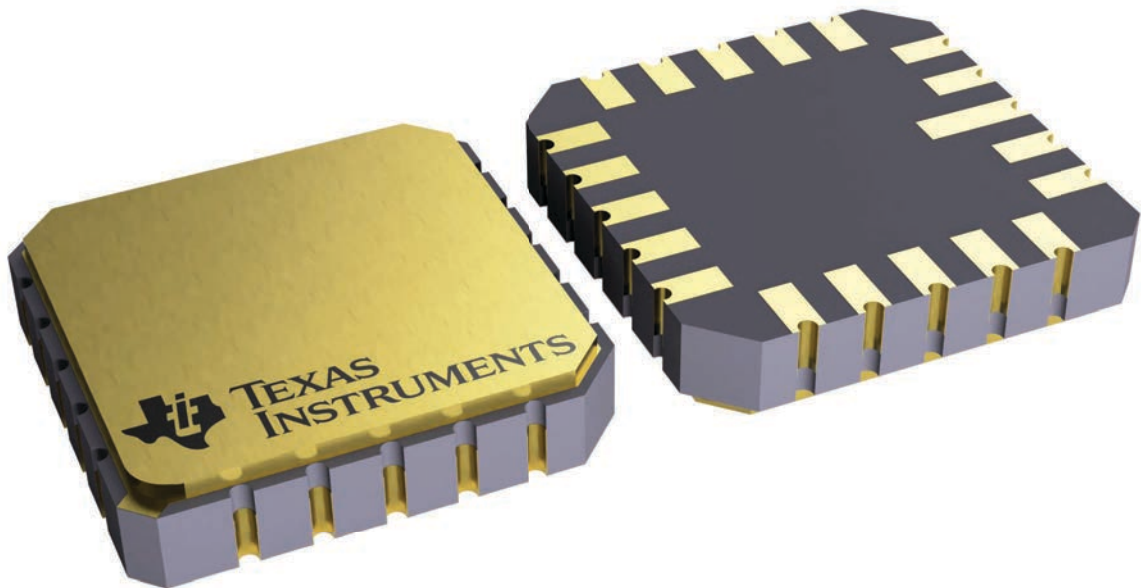
**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

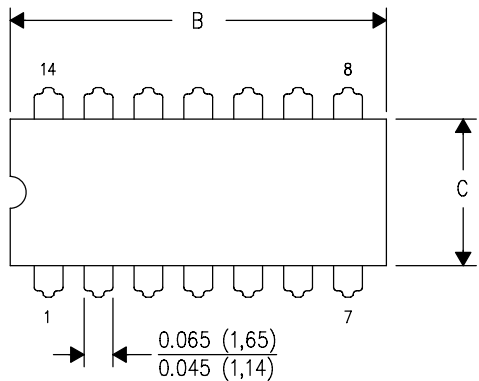
This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



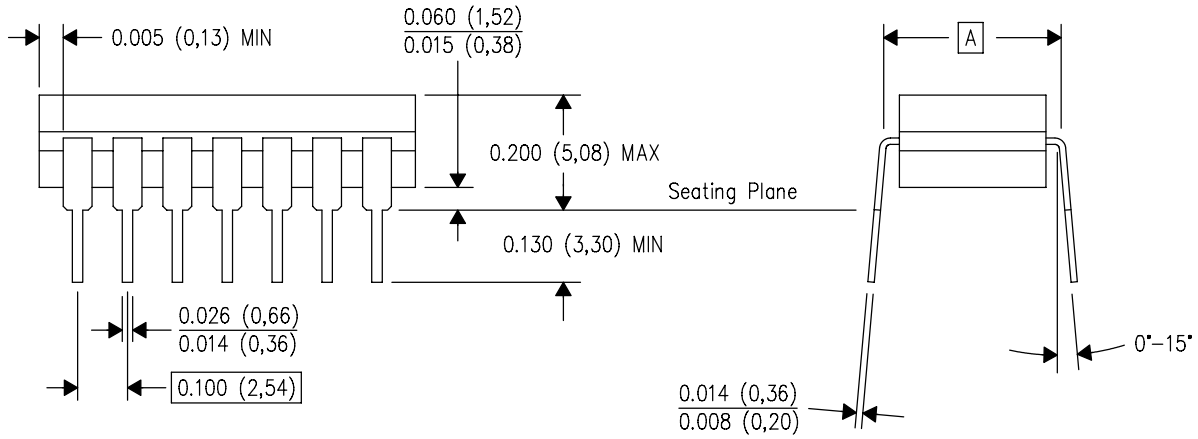
4229370VA\

J (R-GDIP-T\*\*)  
 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



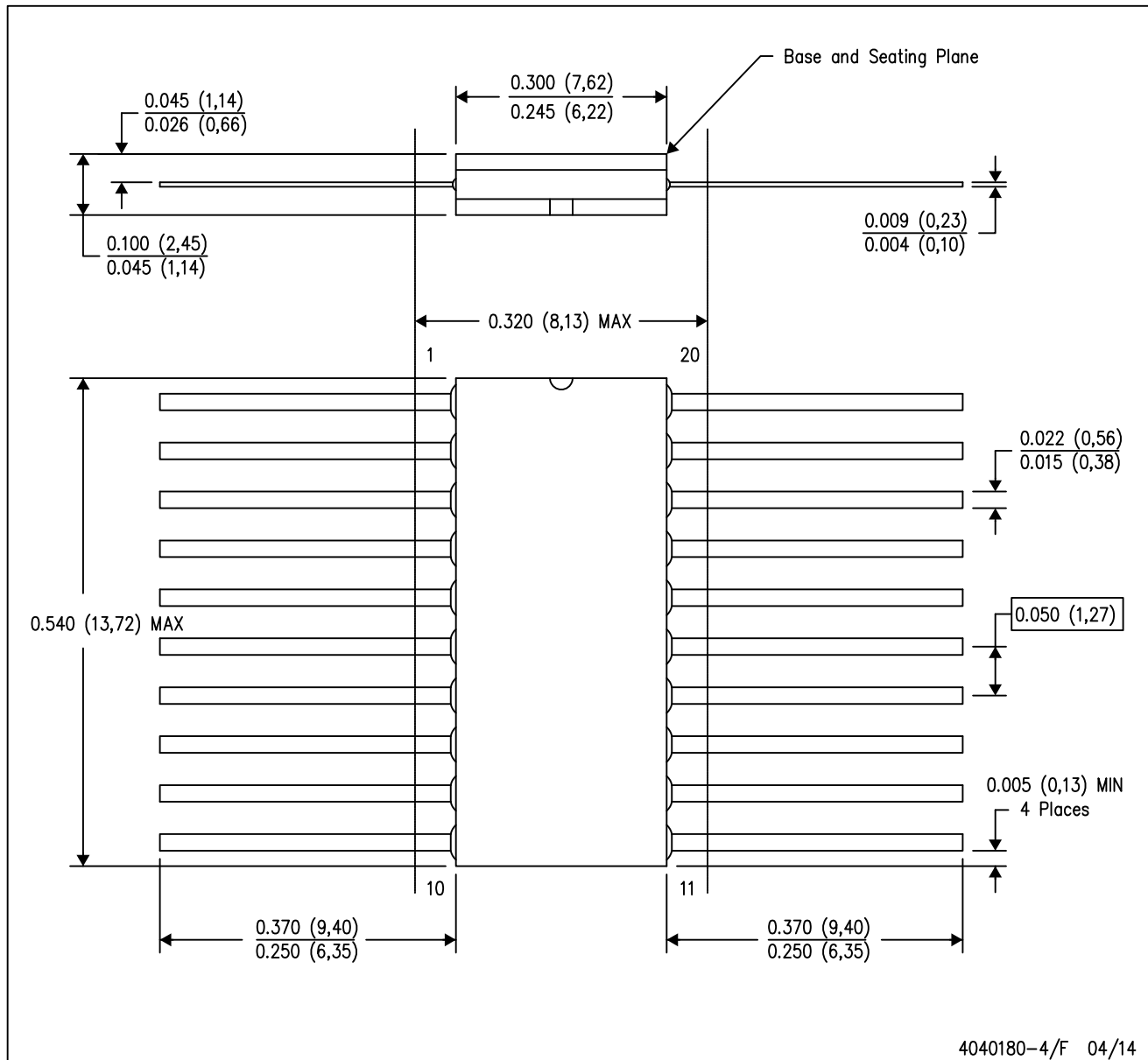
4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

## MECHANICAL DATA

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only.
  - Falls within Mil-Std 1835 GDFP2-F20

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