CD4009A, CD4010A Types

T-52-11-00

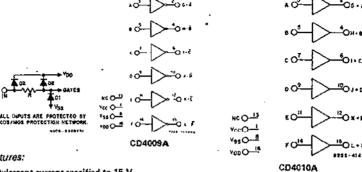
CMOS Hex Buffers/Converters

Inverting Type: CD4009A Non-Inverting Type: CD4010A

The RCA-CD4009A and CD4010A Hex Buffer/Converters may be used as COS/MOS to TTL or DTL logic-level converters or CMOS high sink-current drivers.

The CD4049A and CD4050A ere preferred hex buffer replacements for the CD4009A and GD4010A, respectively, in all applications except multiplexers. For applications not requiring high sink current or voltage conversion, the CD40698 Hex Inverter is recommended.

These types are supplied in 16-lead hermetic dual-in-line ceramic packages (D and F suffixes), 16-lead dual-in-line plastic package (E suffix), 16-lead ceramic flat packages (K suffix), and in chip form (H suffix).



Features:

- Quiescent current specified to 15 V
- Meximum input leakage of 1 µA at 15 V (full package-temperature range)
- High sink current for driving 2 TTL loads
- # High-to-low level togle conversion

Applications:

- CMOS to DTL/TTL hex converter
- CMOS current "sink" or "source" driver
- CMOS high-to-low logic-fevel converter
- Multiplexer 1 to 6 ar 6 to 1

RECOMMENDED OPERATING CONDITIONS at $T_A=25^{\circ}C$, Except as Noted. For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIM	LIMITS		
Other Control of the	Mio.	Мах.	UNITS	
Supply-Voltage Range (For TA = Full Package- Temperature Range : VDD , VCC)	3	12	٧ .	
Input Voltage Range (V _I)	vcc.	12	٧	

^{*} The CD4009 and CD4010 have high-to-low level voltage conversion capability but not low-to-high level, therefore it is recommended that $V_{OO} \ge V_1 \ge V_{CC}$.

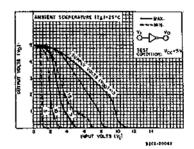


Fig. 1 - Logic diagrams.

Fig. 2 — Minimum & maximum voltage transfer characteristics — CD4009A.

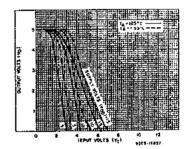
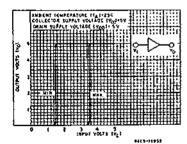
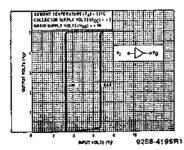


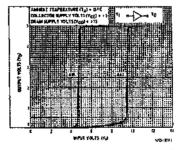
Fig. 3 — Typical voltage transfer characteristal as function of temp: — CD4009A.



Minimum & maximum voltage transfer characteristics ($V_{DD} = B$) - CD4010A.



Minimum & maximum voltage transfer characteristics (V_{DD} = 10) — CD4010A.



Minimum & maximum voltage transfer characteristics (V_{DD}= 15) — CD4010A.

3681

3875081 G E SOLID STATE

01E 13542

T-52-11-00

CD4009A, CD4010A Types

STATIC ELECTR	ICAL	CHA	RACT	ERIS	TICS								
	C	onditio	0016		L/m	its at In	dicated	Tempe	erature	s (°C)		Τ	
Characteristic), F, K,	H Pack	ages		E P	sckege		Unite	
	۷o		vcc*	-65	_	2€	+125	-40		26		10,,,,,,,	
	(V)	(V)	(V)		Тур.	Limit	*120		Тур.	Limit	+85		
Quiescent Device		<u> - </u>	6	0,3	0,01	0.3	20	_3	0.03	3	42	Ţ	
Current, L Max.	<u> </u>	_	10	0.5	0,01	0,5	30	5	0.05	5	70	μA	
2	<u> -</u>	<u> -</u>	15	10	0.02	10	100	50	0.5	50	500]	
Output Voltage: Low-Level.	_	0,5	5			0 Тур	.; 0.05	Max.					
VOL.		0,10	10	-			., 0.05					1	
High Level		0,5	5	4.95 Min.; 5 Typ.						٧ ا			
<u> Vон</u>	_	0,10	10			9.95 (Min.; 10	Typ,				1	
Noise Immunity: Inputs Low, VNL	3,6	_	5		1.5 Min.; 2.26 Typ.								
CD4010A	7,2	_	10			3 Mjn	.; 4.5 T	yp.				1	
Inputs High VNH	1,4	~-	6			1.5 M	in.; 2.2!	Тур.				Į,	
All Types	2.8	_	10			3 Min	.; 4.5 T	γp.					
Inputs Low, VNL	3,6		8			1 Min	.; 1.5 Ty	/p.			1		
CD4009A	7,2		10			2 Min.	.; З Тур	,				†	
Noise Margin: Inputs Low, VNML	4.5	-	6				Min.						
CD4010A	9	-	10			1	Min.				-] _v	
Inputs High, VNMH	0.5		5			1	Min.					, ,	
CD4010A	t		10			1	Min.	•					
Output Drive Current ! N-Channel (Sink),	0.4	ſ	5	3.75	4	3	2.1	3.6	4	3	2,4		
I _D N Min,	0.6	-	10	10	10 ·	8	5.6	9.6	10	8	6.4] _{mA}	
P-Channet	4,6		Б	0.31	√0.5	-0.25	-0.175	-0.3	-0.5	-0.25	-0.2	mA	
(Source),	2.6		6	-1.85	-1.76	-1.25	-0.9	-1.6	-1.75	-1.25	-1	i	
IDP Min.	9.5]	10	-0.9	-Q.8	-0,6	-0.4	-0.72	-0,8	-0.6	0.48		
Input Leakage Current, ILLIH	Any I	nput	16			±10 ⁶	Тур.;	t1 Max				μΑ	

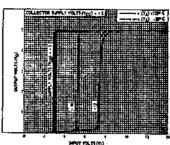
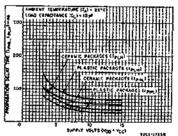


Fig. 7 - Typical voltage transfer characteristics ss a function of temperature - CD4010A,



-- Maximum propagation delay time ya. VDD - CD4010A.

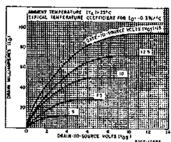
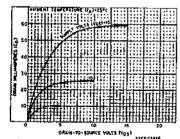
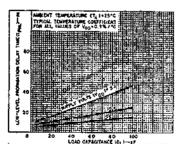


Fig. 9 - Typical n-channel drain characteristics.



Flg. 10 - Minimum n-channel drain characteristics.



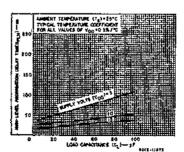


Fig. 12 - Typical law-to-high level propagation

* Vcc = VDD

3875081 G E SOLID STATE

01E 13543

T-5Z-11-00

CD4009A, CD4010A Types

DYNAMIC ELECTRICAL CHARACTERISTICS at T_A = 25°C; Input t_s , t_f = 20 nt, C_L = 15 pF,

					₽Ĺ	= 200 K
<u> </u>	CC	NDITIO	N	Lil	MIT	UNITS
CHARACTERISTIC	VDD (V)	V ₁ (V)	Vcc (V)	Тур.	Max.	Citi
D, F, K, H Paokages						<u> </u>
	5	5	5	50	80]
Propagation Dalay Time: Low-to-High, tp_H	10	10	10	25	55	
and to constitute of Life	10	10	5	15	30	
	5	5	5	15	55	ns ns
High-to-Low, tpHL	10	10	10	10	30	
	10	10	5	10	25	
Transition Time:	5	Б	5	80	125	
Low-to-High, tTLH	10	10	10	50	100	- DS
Ittata and annual	5	6	5	20	45] ""
High-to-Low, tTHL	10	10	10	16	40	7
Input Capacitance, C ₁ CD4009A	_			15	_	рF
CD4010A	<u> </u>	<u> </u>		5	<u> </u>	<u> </u>
E Package		,	,		,	
Propagation Delay Time:	5	5	5	50	100	1
Low-to-high, tpLH	10	10	10	26	70	_
	10	10	5	15	40	 – ns
	5	5	5	15	70	
High-to-Low, tpHL	10	10	10	10	40	_[
	10	10	5	10	35	
Transition Time:	5	6	5	80	180	
Low-to-High, tpl.H	10	18	10_	50	120	ns
High-to-Low, tTHL	5	5	5	20	60	
	10	10	10	16	50	
Input Capacitance, C; CD4009A	-	-	_	15		₽F
CD4010A		<u> </u>	<u> </u>	5		

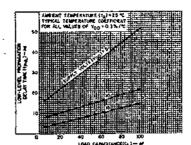


Fig. 13 – Typical high-to-low level propagation delay time vs. C_L (driving TTL, DTL).

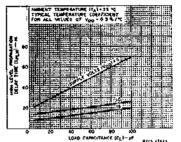


Fig. 14 — Typical low-to-figh level propagation delay time vs. CL (driving TTL, DTL)

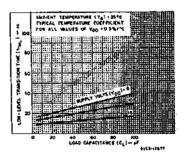


Fig. 15 - Typical high-to-low level transition time
vs. Co.

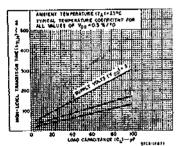


Fig. 16 — Typical low-to-high level transition time vs. C_L.

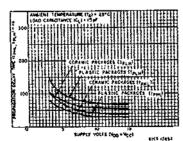


Fig. 17 — Maximum propagation delay time vi VDD — CD4809A.

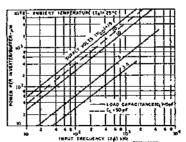
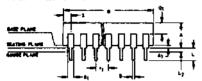
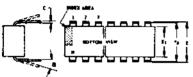


Fig. 18 - Typical dissipation characteristics.

Dimensional Outlines

Dual-In-Line Welded-Seal Ceramic Packages





NOTES

Refer to Rules for Dimensioning LJEDEC Publication No. 951 for Axial Lead Product Outlines

- 1. When this device is supplied solder-dipped, the maximum lead thickness (narrow portion) will not exceed 0.013" (0.33 mm).

 2. Leads within 0.005" (0.12 mm) radius of True Position (VP) at
- 3, e_A applies in zone L_2 when unit installed.
- 4. a applies to spread leads prior to installation
- 5. Nas the maximum quantity of lead positions.
- 6. Ny is the quantity of allowable missing leads.

(D) SUFFIX (JEDEC MO-001-AD) 14-Lead Dual-In-Line Welded-Seal Ceramic Package

	196	CHES		MILLH	WETERS
SYMBOL	MIN.	MAX.	NOTE	MIN.	MAX.
Α	0.120	0.160		3.06	4.06
<u>A</u> 1	0.020	0.005		0.51	1.66
В	0.014	0.020		0.358	0.509
B1	0.050	0.066		1.27	1.66
С	0.008	0.012	1	0.204	0.304
٥	0.745	0.770		18.93	19.55
E	0.300	0.326		7.82	8.25
Eı	0.240	0.260		6.10	6.60
41	0.10	MO TP	2	2.54 TP	
V A	0.30	NG TP	2, 3	7.62 TP	
L	0.126	0.150		3.18	3.61
Lz	0.000	0.030		0.000	0.76
а	ò	150	4	0o	160
N	1	4	6		4
N ₁	0		8		0
Q1	D. 050	0.085		1.27	2.15
8	0.085	0.090	l i	1.86	2.25

(D) SUFFIX (JEDEC MO-001-AE) 16-Lead Dual-In-Line Welded-Seal

	INC	HES		MILLO	METERS	
SYMBOL	MIN.	MAX.	NOTE	MIN.	MAX.	
A	0.120	0.160		3.06	4.06	
A ₁	0.020	0.065		0.51	1.65	
- 6	0.014	0.020		0.356	0.508	
81	0.035	0.065		0.89	1.66	
C	0.008	0.012	1	0.204	0.304	
D	0.745	0.785		18.93	19.93	
E	0.300	0.325		7.62	8.25	
£ ₁	0.240	0.260		6.10	6.60	
e ₁	0.1	00 TP	2	2.54 TP		
*A	Q.3	QO TP	2, 3	7.63	TP	
٦	0.125	0.150		3.18	3.81	
L ₂	0.000	0.030		0.000	0.76	
a	Oo	15 ⁰	4	O _O	15 ⁰	
N		16	5		6	
N ₁	0		6		0	
01	0.050	0.085		1.27	2.15	
s	0.015	0.060		0.39	1.52	

9255-428685

(D) SUFFIX (JEDEC MO-015-AG) 24-Lead Dual-In-Line Welded-Seal Caramic Package

SYMBOL	iNo	HES	NOTE	MILLIN	AETER\$	
31 MBOL	MIN.	MAX.	Z.	MIN.	MAX.	
A	0.090	0.200		2.29	5.08	
A1	0.020	0.070	ł	0.51	1.78	
В	0.015	0.020		0.381	0.508	
B ₁	0.045	0.055		1.143	1.397	
С	0.008	0.012	1	0.204	0.304	
D	1.15	1.22		29.21	30.98	
E	0.600	0.625		15.24	15.87	
E1	0.480	0.520		12.20	13.20	
91	0.10	O TP	2	2.54 TP		
e _A	0.60	O TP	2,3	15.24 TP		
L	0.100	0.180	Γ	2.54	4.57	
L2	0.000	0.030		0.00	9.76	
8	O _O	150	4	D _O	150	
N	2	24		2	4	
N ₁	0		6		0	
01	0.020	0.080		0.51	2.03	
s	0.020	0.060	I	0.51	1.52	
			•			

92CS-19948R4

(D) SUFFIX (JEDEC MO-015-AH) 28-Lead Dual-In-Line Welded-Seal Caramic Package

	-					
SYMBOL	INC	HES	NOTE	MILLIMETERS		
STMBUL	MIN.	MAX.	MOTE	MIN.	MAX.	
Α	0.090	0.200		2.29	5	
L A1	0	0.070	2	0	1.77	
В	0.015	0.020		0.391	0.508	
Bj	0.015	0.065		0.39	1.39	
<u>c</u>	0.008	0.012	1	0.204	0.304	
<u> </u>	1.380	1.420	L	35.06	36.06	
E	0.600	0.625		15.24	15.87	
Εį		0.515	L	12.32	13.08	
ė1	0.10	O TP	2	2.54 TP		
eA .	0.60	O TP	2,3	15.2	4 TP	
L		0.200		2.6	5	
L ₂	0	0.030		٥	0.76	
8	9	150	4	8	150	
N	2	8	5	2	8	
N ₁	•	0	6			
Q ₁	0.020	0.070		0.51	1.77	
S	0.040	9.070		1.02	1.77	

92CM-20260R2

NOTES:

- Refer to Rules for Dimensioning (JEDEC Publication No. 95) for Axial Lead Product Outlines. When this device is supplied solder-dipped, the maximum lead thickness [narrow portion] will not exceed 0.013"
- (0.33 mm).
 Leads within 0.005" (0.12 mm) radius of True Position (TP) at gauge plane with maximum material condition and unit installed.

- and unit installed.

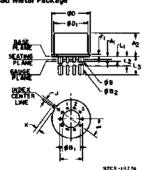
 4. a applies in zone £2 when unit installed.

 5. N is the maximum quentity of lead positions.

 6. Ng is the quentity of allowable missing leads.

TO-5 Style Package

(T) SUFFIX (JEDEC MO-006-AG) 12-Lead Metal Package



SYMBOL	INC	HE\$	NOTE	MILLIN	MAX.			
STMBUL	MIN.	MAX.	HOIL	MIN.	MAX.			
	0.3	230	2	5.84	I TP			
A ₁	0	0		_ o	0			
A ₂	0.165	0.185		4.19	4.70			
øв	0.018	0.019	3	0.407	0.482			
øB1	.0	0		0	o			
φB ₂	0.016	0.021	. 3	0.407	0.533			
φD	0.335	0.370		8.51	9.39			
φD1	0.306	0.335		7.75	8.50			
F ₁	0.020	0.040		0.61	1.01			
j	0.029	0.034		0.712	0.863			
k	0.029	0.045	4	0.74	1.14			
L ₁	0.000	0.050	_3	0.00	1.27			
L2	0.250	0.500	3	6.4	12.7			
Lg	0.500	0.562	3	12.7	14,27			
	30° TP			30	T P			
N	1	2	6		2			
N ₁		1	5		1			

- 1. Refer to Rules for Dimensioning Axial Lead Product Out-
- Leads at gauge place within 0.007" (0.178 mm) radius of True Position (TP) at maximum material condition.
- 3, oB applies between L₂ and L₂, oB₂ applies between C₂ and 0.500" (12.70 mm) from sealing plane. Diameter is uncontrolled in L₁ and beyond 0.500" (12.70 mm).
- 4. Measure from Max. ¢O.
- 5. 26) is the quantity of allow
- 8. N is the maximum quantity of lead positions.

702

E-08

this material copyrighted by its respective manufacturer

The second with the most felling be

THE STATE OF THE S

3875081 G E SOLID STATE

01E 13755

Dimensional Outlines (Cont'd)

DUAL-IN-LINE SIDE-BRAZED CERAMIC (D) SUFFIX 18-Lead Dust-in-Line ACKAGES

NOTES: Leads within 0.006" (0.13 mm) radius of True Position at maximum material condition.

2. Dimension "L" to center of leads when formed

Ulmansion "L" to conter of leads when formed parallel.
 When this device is supplied solder-dipped, the maximum lead thickness (narrow portion) will not exceed 0.013" [0.33 mm).

Side-Brazed Ceramic Package

SYMBOL	INC	HES	NOTE	MILLIMETERS			
	MIN.	MAX.		MIN.	MAX.		
A	0890	0.915]	22.606	23,241		
С	_	0.200		_	5.080		
D	0.015	0.021	1	0.381	0.533		
F	0.054	0.054 REF.		1.371	AEF.		
G	0.100	BSC	1	2.54	8SC .		
н	0.035	0.065		0.889	1,651		
J	0,008	0.012	Э	0.203	0,304		
K	0.125	0.150		3.175	3.810		
L	0.290	0.310	2	7.366	7.874		
M	On-	150	1	0¢	150		
₽	0.025	0.045		0.635	1,143		
N		18			18		

92CS-27231R1

(D) SUFFIX 22-Lead Dual-In-Line Side-Brazed Geramic Package

SYMBOL	INC	HES	NOTE	MILLI	METERS	
21 MOOT	MIN	MAX.	MOLE	MIN.	MAX.	
A	1.065	1.100		27.05	27.94	
C	0.085	0.145		2.18	3.68	
D	0.017	0.023		0.43	0.58	
F	0.040	REF.	1	1.02 REF.		
G	0.100	BSC	1	2.5	8SC	
R	0.030	10.070		0.78	1.78	
4	0.008	0.012	3	0.20	0.30	
K	0.125	0.175		3,18	4.45	
L	0.380	0.420	2	9.65	10.67	
M	-	70	 		70	
P	0.025	0.050		0.64	1.27	
N	2	2			22	

92CS-25186R2

(D) SUFF:X 24-Lead Dual-In-Line Side-Brezed Ceramic Package

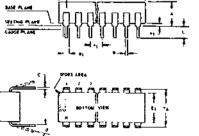
JOBKY2	INC	HES	NOTE	MILLI	AETERS
a - moot	MIN.	MAX.	1,000	MRN.	MAX.
_Α	1.180	1.220		29.98	30.98
C	0.085	0.145		2.16	3.68
Ď	0.015	9.023	i	0.39	0.58
F	0.04	REF.	Γ	1.02	REF.
3	0.10	0 BSC	1	2.54	BSC
н	0.030	0.070		0.77	3.77
3	0.008	0.012	3	8.21	0.30
K	0.126	0,175		3.18	4.44
- L	0.5BQ	0.629	2	16.74	16.74
ч		7	i	-	7°
P	0.025	0.050	i	0.84	1.27
N	- :	4		:	24
				92CS	30986FI

(D) SUFFIX 40-Lead Dual-In-Line Side-Brazed Ceramic Package

SYMBOL	INCHES		NOTE	MILLIMETERS		
	MIN.	MAK.]	MIN.	MAX.	
A	1.980	2.020		50.10	51.30	
C	0.095	0.155		2.43	3.93	
D	0.017	0.023		0.43	0.56	
F	0.050	REF.		1,27	REF.	
G .	0.100	BSC	1	2.54 BSC		
н	0.030	0.070		0.76	1.78	
Ţ	0.008	0.012	3	0.20	0.30	
К	0.125	0.175	<u> </u>	3.18	4.45	
Ļ	0.580	0.620	2	24.74	15.74	
м	- 1	70			79	
ρ	0,025	0.050	Ī	0.64	1.27	
N	_ 4	ю		4		

Dual-In-Line Plastic and Frit-Seat Ceramic Packages

(E) SUFFIX (JEDEC MO-001-AN) B-Lead Dual-In-Line Plastic (Mini-DIP) Package



SYMBOL	LNC	4ES		MILLIN	ETERS
SYMBOL	MIN.	MAX.	NOTE	MIN.	MAX.
A	0.155	0.200		3.94	5,08
At	0.020	0.050		0.508	1.27
В	0.014	0.020		0.356	0.568
61	9.035	0.065		0.869	1.65
C .	0.008	0.012	1	0.203	0.304
0	0.370	0.480	i	9.40	10.18
€	0.300	0.326	1	7.62	8.25
E:	0.240	0.260		8.10	6.60
e ş	0.	100 TP	2	2.54 TP	
¢ _A) o.	300 TP	2, 3	7.82 TP	
Ļ	0.125	0.150	 	3.18	3.81
L2	0.000	0.030	}	0.000	0.762
8	0	15		0	15
N.	6		5		8
N ₇	0		6	<u> </u>	٥
Oı	0.040 0.076		1	1.02	1.90
s	0.015	0.060	1	0.381	1.52

92CS - 24G26 #1

NOTES:

Refer to Rules for Dimensioning (JEBEC Publication No. 95) for Arrell Lead Product Outlines.

- When this device is supplied solder-dipped, the maximum lead-thickness (nerrow postion) will not exceed 0.013".
- Leads within 0.005" (0.12 mm) radius of Erue Portion (TP) at guage plane with maximum material condition and unit installed.
- 3. aA applies in zone L2 when unit installed.
- 4 in applies to spread leads prior to installation.
- 5. N is the maximum quantity of lead positions.
- 6. No is the quantity of allowable missing leads.

MILLIMETERS

MAX.

1,27

0.606

1.65

0.304

19.65

A 25

6.60

0.78

1.90

150

7 62 TP

MIN.

3.94

0.61

0.356

1.27

0.704

18.93

7.62

6.10

3 18 3.81

0.000

1.02

00

3875081 G E SOLID STATE

01E 13756

T-90-20

Dimensional Outlines (Cont'd)

Dual-in-Line Plastic and Frit-Seal Ceramic Packages (Cont'd)

MILLIMETERS

MAX.

5.68

0.508

1.65

0.304

22.47

6 60

3.81

15°

1.52

9208-30630

54 TP

7 62 TP

MIN.

3.94

0.508

0.356

0.89

0.204

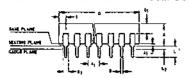
21,47

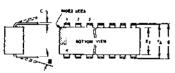
6.10

3,18

03

0.39





NOTES:

Refer to Rules for Dimensioning IJEDEC Publication No. 95) for Aurel Lead Product Outlines

- 1. When this device is supplied solder digged, the maximum lead
- when the obvious is uppered solder dispose, the maximum lead thickness instruou portional will not exceed 9.013" [0.33 mm].
 Leads within 0.905" (0.12 mm] radius of True Position (TP) at gauge place with maximum material condition and unit smalled.

NOTE

4

- 3. eg applies in zone L2 when unit installed.
- 4. a applies to spread leads prior to installation.
- 5. N is the maximum quantity of feed positions,
- 8. No is the quantity of allowable missing leads.

INCHES

MIN. MAX.

0.155 0.200

8.020 0.050

0.014 0.020

0.035 0.065

0.008 6.012

0.845 | 0.886

0.240 0.260

0.125 0.150

0° 16°

18

0.015 0.060

0.100 TP

0.300 TP

(E) SUFFIX 18-Lead Dual-In-Line

Plastic Package

SYMBOL

A₁

Θ.

c

ŏ

E٠

ŝ

(E) SUFFIX 22-Lead Dual-In-Line Plastic Package

	1		r		
SYMBOL	MCHES		NOTE	MILLIMETERS	
G I MAQE	MIN.	MAX.	LINOTE	MIN.	MAX.
A	0.155	0.200		3.94	5.08
A ₁	0.020	0,050		0.608	1.27
8	0.015	0.020		0.381	0.588
81	0.035	0.065	ļ	0.89	1.65
C	0.008	0.0\$2	1	0.204	0.384
<u> </u>	l.,	1,120			28.44
Ε	0.390	0.420	:	9.91	10.68
LE1	0.346	0.355	1	8.77	9.01
01	0.10	O TP	2	2.54 TP	
<u> •</u>	0.40	O TP	Z, 3	10,16 TP	
L L	0.126	0.160		3.18	3.81
L ₂	9	0.030	1	0	0.762
_ 8	20	150	4	20	150
N	22		6		22
N.	, o		8	L	9
Q1	0.055	0.085		7.40	2.15
S	0.015	0.060	j	0.381	1.27

(E) and (F) SUFFIXES (JEDEC MO-001-AB)

NOTE

14-Lead Duel-In-Line Plastic of

INCHES

MIN. I MAX

0.200

0.050

0.020

0.088

0.012

0.270

0.325

0.075

0.300 TP

0.125 0.150

0.065 0.090

Frit-Seal Ceramic Package

0.165

0.020

0.014

0.050

6.00A

0.745

0.300

0.240 0.280

0.000 0.030

00 150

SYMBOL

R

84

Ċ

٥

Ε

+1

L

L2

.

Nı a,

92CS-30830

(E) and (F) SUFFIXES (JEDEC MO-015-AA) 24-Lead Dual-In-Line Plastic or

Frit-Seal Ceramic Package

SYMBOL	INC	HES	NOTE	MILLIMETERS	
STRIBUL	MIN.	MAX.	MOTE	MIN.	MAX.
A	0.120	0.250		3.10	6.30
Aş	0.020	0.070		0.51	1.77
8		0.020		0.407	0.508
81		0.070	L	0.72	1.77
C		0.012	1	0.204	0.304
D	1.20	1.29	L	30.48	32.76
E	0.600	0.625	Ι	15.24	15,87
Εį	0.515	0.580		13.09	14.73
81	0.10	Ç TP	2	2.54 TP	
40	0.60	G TP	2,3	15.24 TP	
L		0.200	-	2.54	5.00
L2	0.000	0.030	1	0.00	0.76
8	00	150	4	00	150
N	2	4	5	2	
Nη	c		6	} 0	;
<u> </u>		0.075	[1.02	1.90
S	0.040	8.100		1.02	2.54

92CS26938R2

(E) and (F) SUFFIXES (JEDEC MO-001-AC) 16-Lead Dual-in-Line Flastic or Frit-Seel Ceramic Package

SYMBOL	INC	HES	NOTE	MILLU	RETERS
STRBUL	MIN.	MAX.	NOIE	MIN.	MAX.
A	0.165	0.200		3.94	5.08
Αı	0.020	0.050		0.51	1.27
8	0.014	0.020		0.356	0.508
B ₁	0.035	0.065		0.69	1,85
C	0.008	0.012	3	0.204	0.304
D	0.745	0.785		18.93	19.93
E	0.300	0.325		7.62	8.25
Ei	0.240	0.260	ŀ	6.10	8,50
81	0.1	00 TP	2	2.54 TP	
•A	0.3	00 TP	2, 3	7.62 TP	
Ł	0.125	0.150		3.18	3.81
Ł2	0.000	0.030		6.000	0.78
8	C _O	150	4	00	15 ⁰
N.	16		5	16	
Ni	0		6	L	C
a,	0.040	0.075		1.02	1.90
_ s	0.015	0.060		0.39	1.52

92CM-15967R4 (F) SUFFIX (JEDEC MO-001-AG) 16-Lead Qual-In-Line Frit-Seal Caramie Package

SYMBOL	(N	CHES	NOTE	MILLIMETERS	
01 W BOL	MIN.	MAX.	INOTE	MIN.	MAX.
A	0.165	0.210		4.20	5.33
A ₁	0.015	0.045	l	0.381	1.14
В	0.015	0.020		0,381	0.508
B ₁	0.045	0.070	Ì	1.15	1.77
	0.009	0.011	1	0.229	0.278
D	0.750	0.795		19.05	20,19
Ē	0.295	0.325	-	7.50	8.26
_ E ₃	0.245	0.300		6.23	7.62
a 1	0.1	00 TP	2	2.54 TP	
ÐΑ	0,30	H TP	2, 3	7.62 TP	
- (0.120	0.160		3.05	4.06
L ₂	0.000	0,030		0.000	0.76
<u>a</u>	20	15°	_ 4, ;	20	150
N	16		5	1	6
N ₇	0		6		5
D ₁	0.050			1.27	2.03
S	0.010	0.060		0.254	1.52

(E) SUFFIX 40-Lead Dual-In-Line

SYMBOL	fNC	HES	NOTE	MILLIMETERS	
3 I MEDE	MIN.	MAX.	MOIE	MIN.	MAX.
Α	0.120	0.250		3.10	6,30
Αį	0.020	0.070	[_	0.51	1.77
В	0.018	0.020	T	0.407	0.508
B ₁		0.070	l	0.72	1.77
C	0.008	0.012	1	0.204	0.304
_ D	2.000	2.090	L	50.80	53.09
E1		0.580	1	13.09	14.73
91	0.10	OTP.	2	2.54 TP	
8A	0.60	O TP	2,3	15.24 TP	
Ļ		0.200		2.54	5.00
L ₂	0.000		l .	0.00	0.78
8	00	150	4	.00	150
N Nt	40 0		5	43. C	
Oj i	0.065	0.095		1.66	2,41
s [*]	0.040	0.100	ļ	1.02	2.54

854 T 24

92CS-30959

transmin -] _{[*}
MATTERS PLANE	00000000	2 (4)
ATTACK MARKET TOWNS		
	alen aleiai ka AAAAAAA	,
	SOTTON (VIEW	{ i }
	 • • • • • • • • •	<u> </u>
NOTES.		

- NOTES.

 Rater to Nuise for Omerstoning (IEDEC Publication No. 96)

 for Acut Lead Peoding Coutings.

 1. When this source is sespicial enders disped, the maximum field
 bitchings "narrow portions will not except 0.013."

 Lead restain 0.055." (0.12 mind states of Treap Populon IEP) at
 quing place with maximum material conditions and unit sixtailed.

 8. a popular to Igned Land prior to nixtailution.

 8. Augitas to Igned Isade prior to nixtailution.

 8. Nixt the maximum genoticy of lead postsons.

 8. Nixt the quantity of tilorebile missing leads.

704

3896 E-13

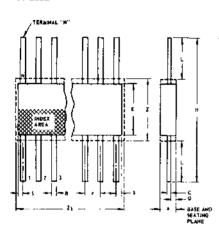
01E 13757 D

T-90-20

Dimensional Outlines (Cont'd)

Ceramic Flat Packs

(K) SUFFIX (JEDEC MO-004-AF) 14-Lead



INCHES		NOTE	MILLIN	AETERS
MIN.	MAX.	MUTE	MIN,	MAX
0.008	0.100		0.21	2.54
0.015	0.019	- 1	0.381	0.482
0.003	0.006	1	0.077	0.162
0.060 TP		2	1.2	7 TP
0.200	0.300		5.1	7.6
0.600	1.000		15.3	25.4
0.160	0.360		3.9	B.8
1	4	3	14	
0.006	0.060		0.13	1.27
0.000	0.050		0.00	1.27
0.300		4		7.62
0	.400	4	1	0.16
	0.008 0.015 0.003 0.0 0.200 0.600 0.160 1 0.006 0.000	0.008 0.100 0.015 0.019 0.003 0.006 0.050 TP 0.200 0.300 0.600 1.000 0.160 0.360 14 0.006 0.060 0.000 0.050	MIN. MAX. 0.008 0.100 0.015 0.019 1 0.003 0.006 1 0.060 TP 2 0.200 0.300 0.600 1.000 0.160 0.360 14 3 0.006 0.060 0.000 0.050	MIN. MAX. MIN. 0.008 0.100 0.2381 0.003 0.006 1 0.077 0.050 TP 2 1.2 0.200 0.300 5.1 0.800 1.000 15.3 0.160 0.360 3.9 14 3 1 0.006 0.060 0.13 0.000 0.050 0.000 0.300 4

NOTES:

- 1. Rafer to JEDEC Publication No. 95 for Rules for Dimensioning Peripheral Lead Outlines.
 2. Leads within 0.005" (0.12 mm) radius of True
- Position (TP) at maximum material condition.
- 3. N is the maximum quantity of lead positions.
- Z and Z1 determine a zone within which all body and lead irregularities lie.

(K) SUFFIX (JEDEC MO-004-AG) 16-Lead

SYMBOL	INCHES		NOTE	MILLIN	IETERS
31 MIDUL	MIN.	MAX.	MUIE	MIN.	MAX,
A	0.008	0.100		0.21	2.54
В	0.015	0.019	1	0.391	0.482
C	0.003	0.006	1	0.077	0.152
e	0.050 TP		2	1.27 TP	
E	0.200	0.300		5.1	7.6
н	0.600	1.000	l	15.3	25.4
Ł	0.150	0.350		3.9	8.8
N		16	3	16	
Q	0.005	0.050		0.13	1,27
S	0.000	0.025	l	0.00	0.63
z	0.300		4		7.62
z ₁	q	.400	4	1	0.16

9209-1727183

(K) SUFFIX 24-Lead

SYMBOL	INCHES		NOTE	MILLIMETERS	
	MIN.	MAX.	INCIE	MIN,	MAX.
Α	0.075	0.120		1.91	3.04
В	0.01B	0.022	1	0.458	0.558
C	0.004	0.007	1	D.102	0,177
	0.050 TP		2	1.27	TP
E	0.600	0.700		15.24	17.78
Н	1.150	1.350		29.21	34.29
L	0.225	0.325		5.72	8.25
N	2	4	3	24	
a	0.035	0,070		0.89	1.77
\$	0.060	0.110	1	1.53	2.79
Z	0.700		4	17	.78
Z1	0.7	0.750		19	.05

92CS-1994982

(K) SUFFIX 26-Lead

SYMBOL	INCHES		NOTE	MILLIMETERS		
SYMBOL	MIN.	MAX.	X MO'E	MIN.	MAX	
Α .	0.075	0.120		191	3.04_	
8	0.018	0.022	1	0.458	0.558	
С	0.004	0.007	7	0.102	0.177	
·	0.05	O TP	2	1.27 TP		
E	0.600	0.700	ŧ	15.24	12.78	
н	1.150	1.350		29.21	34.29	
. 1	0.225	0.325		5.72	8.25	
N	7	e	3	28		
<u> </u>	0.035	0.070	1	0.89	1.77	
S	0	0.060	1	0	1.53	
2	0.	0.700		17	7.78	
Z ₁	0.1	750	4	15	1.05	

9205-20972