RUMENTS Data sheet acquired from Harris Semiconductor

SCHS087D - Revised October 2003

CMOS Dual Binary to 1 of 4 **Decoder/Demultiplexers**

High-Voltage Types (20-Volt Rating) CD45558: Outputs High on Select CD4556B: Outputs Low on Select

CD4555B and CD4556B are dual one-of-four decoders/demultiplexers. Each decoder has two select inputs (A and B), an Enable input (E), and four mutually exclusive outputs. On the CD4555B the outputs are high on select; on the CD4556B the outputs are low on select.

When the Enable input is high, the outputs of the CD4555B remain low and the outputs of the CD4556B remain high regardless of the state of the select inputs A and B. The CD4555B and CD4556B are similar to types MC14555 and MC14556, respectively.

The CD4555B and CD4556B types are supplied in 16-lead hermetic dual-in-line ceramic packages (F3A suffix), 16-lead dual-in-line plastics packages (E suffix), and 16-lead small-outline packages (M, M96, and MT suffixes). The CD4555B is also supplied in 16-lead small-outline packages (NSR suffix) and 16-lead thin shrink small-outline packages (PW and PWR suffixes.)

RECOMMENDED OPERATING CONDITIONS

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges.

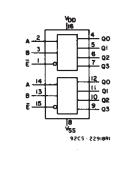
CHARACTERISTIC	v _{DD}	MIN.	MAX.	UNITS
Supply Voltage Range (For T _A = Full Package Temp. Range)	_	3	18	v

MAXIMUM RATINGS. Absolute-Maximum Values:

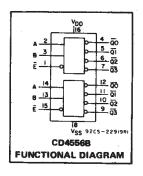
DC SUPPLY-VOLTAGE RANGE, (VDD)
Voltages referenced to VSS Terminal)0.5V to +20V
INPUT VOLTAGE RANGE, ALL INPUTS
DC INPUT CURRENT, ANY ONE INPUT ±10mA
POWER DISSIPATION PER PACKAGE (PD):
For $T_A = -55^{\circ}C$ to $+100^{\circ}C$
For $T_A = +100^{\circ}C$ to $+125^{\circ}C$ Derate Linearity at $12mW/^{\circ}C$ to $200mW$
DEVICE DISSIPATION PER OUTPUT TRANSISTOR
FOR TA = FULL PACKAGE-TEMPERATURE RANGE (All Package Types) 100mW
OPERATING-TEMPERATURE RANGE (T _A)
STORAGE TEMPERATURE RANGE (Tstg)
LEAD TEMPERATURE (DURING SOLDERING):

Features:

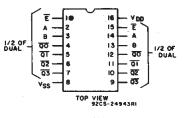
- Expandable with multiple packages
- Standard, symmetrical output characteristics
- 100% tested for quiescent current at 20 V
- Maximum input current of 1 µA at 18 V over full package temperature range; 100 nA at 18 V and 25°C -
- Noise margin (full package-temperature range): $1 \vee at \vee_{DD} = 5 \vee$ 2 V at V_{DD} = 10 V
- 2.5 V at VDD = 15 V 5-V, 10-V, and 15-V parametric ratings
- Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices'' Applications:
- Decoding Code conversion
- Demultiplexing (using Enable input as a data input)
- Memory chip-enable selection
- Function selection



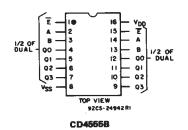
CD45558 FUNCTIONAL DIAGRAM



TERMINAL ASSIGNMENTS



CD4556B



CD4555B, CD4556B Types

CD4555B, CD4556B Types

STATIC ELECTRICAL CHARACTERISTICS

4

14

CHARACTER-	CONE		IS	LIMI	TS AT	INDICA'	TED TE	MPER	TURES	(°C)	UNITS
ISTIC	Vo	VIN	VDD						+25		UNITS
	(V).	(V)	(V)	55	-40	+85	+125	Min.	Тур.	Max.	
Quiescent Device	_ +	0,5	-5	5	5	150	150		. 0.04	5	· .
Current,	. –	0,10	10	10	10	300	300		0.04	10	
IDD Max.	·	0,15	15	20	20	600	600	10774	0.04	20	μΑ
	_	0,20	20	100	100	3000	3000	ي م تعليد (0.08	100	N States
Output Low	0,4	0,5	5	0.64	0.61	0.42	.0.36	0.51	1	$\sim n_{\rm eff} = 1$	1. 1. ¹ .
(Sink) Current	. ev Q.5	0,10	10	1.6	1.5	1.1	0.9	1.3	. 2.6	í :	$(a_1) \in \mathbb{R}^n$
IOL Min.	28 1.5	0,15	15	4.2	4	2.8	2.4	34	6.8	<u> </u>	
Output High (Source) Current, IOH Mi n	-4,6	0,5	5	-0.64	-0.61	-0.42	-0.36	-0.51	-1	_	mA
	2.5	0,5	5	-2	-1.8	-1.3	-1.15	-1.6	-3.2		
	9.5	0,10	10	-1.6	-1.5	-1.1	-0.9	-1.3	-2.6	5 mm	See. 1
	13.5	0,15	15	-4.2	-4	-2.8		3.4	-6.8	1 <u>-</u>	1997 - S.C.
Output Voltage:	· –	0,5	5		0	.05		-	0	0.05	· · ·
Low-Level, Voi Max.	-	0,10	10		0	.05	1.10		0	0.05	
VUL Max.	_	0,15	15		0	.05	at i	-	0	0.05	v
Output Voltage:		0,5	5		4	.95		4.95	5	7	
High-Level,	-	.0,10	10		9	.95		9,95	10		1.11
VOH Min.	-	0,15	15		14	1.95		14.95	15	-	
Input Low	0.5,4.5	-	5		1	.5		-	-	1.5	
Voltage,	1,9	-	10			3		-	_	3	
VIL Max.	1.5,13.5	· - ·	15			4		-		4	
Input High	0.5,4.5	_	5		3	3.5		3.5		-	
Voltage,	1,9	-	10			7		7		_	
VIH Min.	1.5,13.5	-	15			11		11	-	-	
Input Current IIN Max.		0,18	18	±0.1	±0.1	±1	±1	-	±10 ⁻⁵	±0.1	μA

DIENT TEMPERATURE (TA)- 25 °C ł 4 LOW (SINK) CU DUTPUT DRAIN-TO-SOURCE VOLTAGE (VDS)-V -----Fig. 1 – Typical output low (sink) current characteristics. AMBIENT TEMPERATURE (TA)-25°C (SINK) CURRENT (I OL) TO- 90 No. DRAIN-TO-SOURCE VOLTAGE (VDS) 92C5 - 243198 Fig. 2 — Minimum output low (sink) current characteristics.

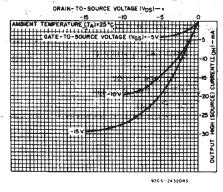
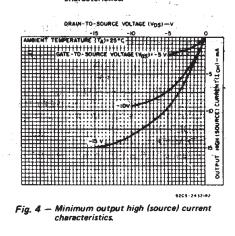


Fig. 3 - Typical output high (source) current characteristics.

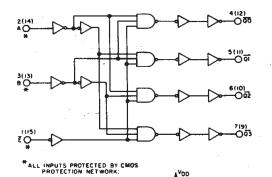


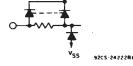
fri fyn y graet

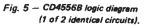
DYNAMIC ELECTRICAL CHARACTERISTICS at $T_A = 25^{\circ}C$; Input t_p , $t_f = 20$ ns, $C_L = 50 \ pF$, $R_L = 200 \ K\Omega$

199 199 6

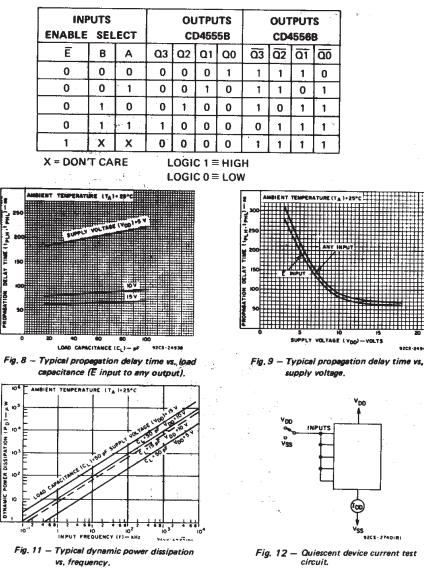
	TEST COND	TIONS	LIM	ITS	
CHARACTERISTIC		V _{DD} Volts	TYP.	MAX.	UNITS
Propagation Delay Time, tpHL,		5	220	440	
A or B Input to ^t PLH		10	95	190	ns
Any Output		15	70	140	
and a second sec	· .		200	400	
E Input to Any		10	85	170	ns
Output		15	65	130	
		5.5	100	200	
Transition Time tTHL, tTLH		10	50	100	ns
$\frac{1}{2} = \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)^2$		1.5	. 40	80	the second second
Input Capacitance C _{IN}	Any Input		5	7.5	pF







TRUTH TABLE



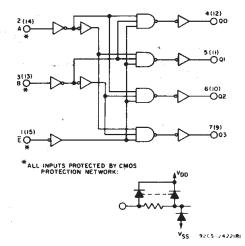


Fig. 6 — CD45558 logic diagram (1 of 2 identical circuits).

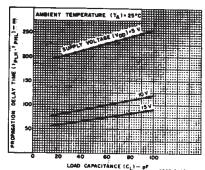


Fig. 7 - Typical propagation delay time vs. load capacitance (A or B input to any output).

9205-24938

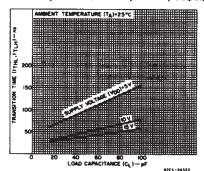


Fig. 10 - Typical transition time vs. load capacitance.

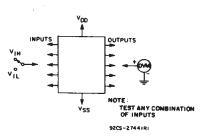


Fig. 13 - Input voltage test circuit.



'D0

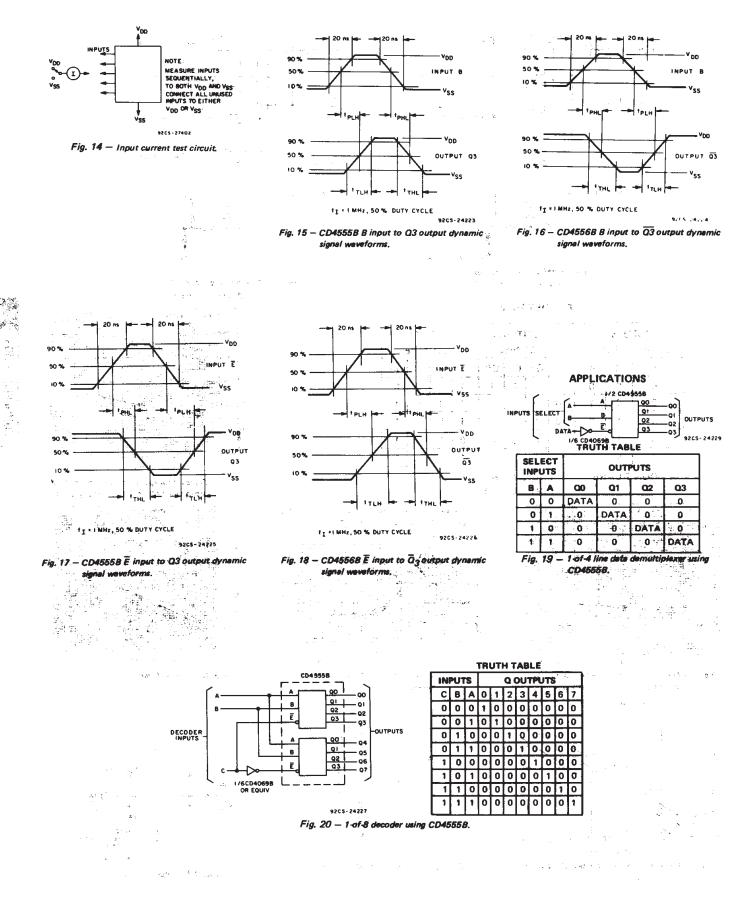
600

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92CS-2740IR

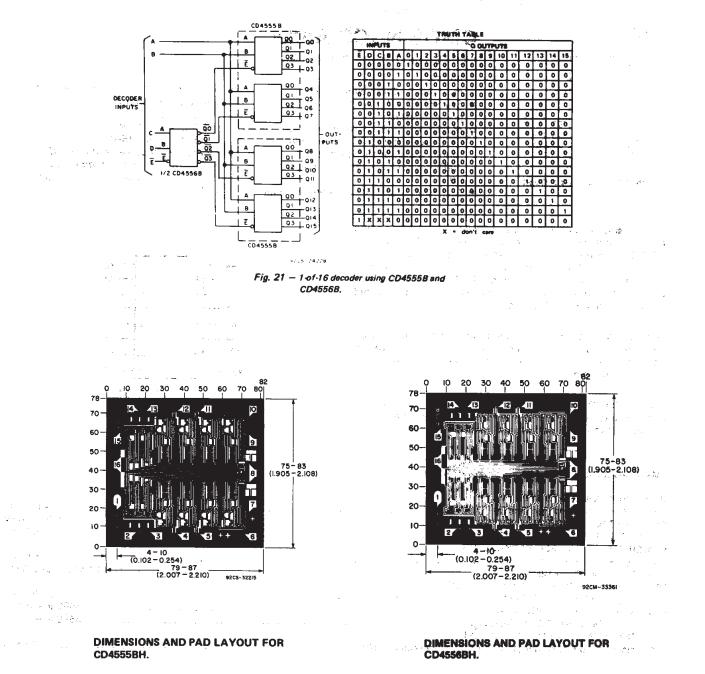
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CD4555B, CD4556B Types



2

CD4555B, CD4556B Types



1

19-94

3

COMMERCIAL CMOS HIGH VOLTAGE ICs

Dimensions in parentheses are in millimeters and are derived from the basic inch dimensions as indicated. Grid graduations are in mils (10⁻³ inch).

3-339



24-Jan-2013

PACKAGING INFORMATION

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
7704701EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Call TI	-55 to 125	7704701EA CD4555BF3A	Samples
7704801EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Call TI	-55 to 125	7704801EA CD4556BF3A	Samples
CD4555BE	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD4555BE	Samples
CD4555BEE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD4555BE	Samples
CD4555BF3A	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	7704701EA CD4555BF3A	Samples
CD4555BM	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BM96	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BM96E4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BM96G4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BME4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BMG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BMT	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BMTE4	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BMTG4	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555BM	Samples
CD4555BNSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555B	Samples
CD4555BNSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555B	Samples
CD4555BNSRG4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4555B	Samples



PACKAGE OPTION ADDENDUM

24-Jan-2013

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings	Sample
CD4555BPW	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4555BPWE4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4555BPWG4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4555BPWR	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4555BPWRE4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4555BPWRG4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CM555B	Sampl
CD4556BE	ACTIVE	PDIP	Ν	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD4556BE	Sampl
CD4556BEE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD4556BE	Samp
CD4556BF	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	CD4556BF	Samp
CD4556BF3A	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type		7704801EA CD4556BF3A	Sampl
CD4556BF3AS2283	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI			
CD4556BM	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Sampl
CD4556BM96	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samp
CD4556BM96E4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samp
CD4556BM96G4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Sampl
CD4556BME4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samp
CD4556BMG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samp
CD4556BMT	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samp



24-Jan-2013

Orderable Device	Status (1)	Package Type	Package Drawing		Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
CD4556BMTE4	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	Samples
CD4556BMTG4	ACTIVE	SOIC	D	16	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	CD4556BM	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⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

⁽⁴⁾ Only one of markings shown within the brackets will appear on the physical device.

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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 CD4555B, CD4555B-MIL, CD4556B, CD4556B-MIL :

• Catalog: CD4555B, CD4556B

• Military: CD4555B-MIL, CD4556B-MIL





www.ti.com

24-Jan-2013

NOTE: Qualified Version Definitions:

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

PACKAGE MATERIALS INFORMATION

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Texas Instruments

TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



All dimensions are nominal Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD4555BM96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD4555BNSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
CD4555BPWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
CD4556BM96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1

TEXAS INSTRUMENTS

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PACKAGE MATERIALS INFORMATION

26-Jan-2013



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD4555BM96	SOIC	D	16	2500	333.2	345.9	28.6
CD4555BNSR	SO	NS	16	2000	367.0	367.0	38.0
CD4555BPWR	TSSOP	PW	16	2000	367.0	367.0	35.0
CD4556BM96	SOIC	D	16	2500	333.2	345.9	28.6

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

CERAMIC DUAL IN-LINE PACKAGE



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.

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

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



D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters).

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



4211283-4/E 08/12

D (R-PDSO-G16) PLASTIC SMALL OUTLINE Stencil Openings (Note D) Example Board Layout (Note C) –16x0,55 -14x1,27 -14x1,27 16x1,50 5,40 5.40 Example Non Soldermask Defined Pad Example Pad Geometry (See Note C) 0,60 .55 Example 1. Solder Mask Opening (See Note E) -0,07 All Around

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-G16)

PLASTIC SMALL OUTLINE



NOTES:

A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994. β . This drawing is subject to change without notice.

Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.

Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.

E. Falls within JEDEC MO-153



PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- 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.



MECHANICAL DATA

PLASTIC SMALL-OUTLINE PACKAGE

0,51 0,35 ⊕0,25⊛ 1,27 8 14 0,15 NOM 5,60 8,20 5,00 7,40 \bigcirc Gage Plane ₽ 0,25 7 1 1,05 0,55 0°-10° Δ 0,15 0,05 Seating Plane — 2,00 MAX 0,10PINS ** 14 16 20 24 DIM 10,50 10,50 12,90 15,30 A MAX A MIN 9,90 9,90 12,30 14,70 4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.

NS (R-PDSO-G**)

14-PINS SHOWN

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



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