- **Designed Specifically for High-Speed:**
  Memory Decoders
  Data Transmission Systems

- **Two Fully Independent 2- to 4-Line**
  Decoders/Demultiplexers

- **Schottky Clamped for High Performance**

description

These Schottky-clamped TTL MSI circuits are designed to be used in high-performance memory-decoding or data-routing applications requiring very short propagation delay times. In high-performance memory systems, these decoders can be used to minimize the effects of system decoding. When employed with high-speed memories utilizing a fast-enable circuit, the delay times of these decoders and the enable time of the memory are usually less than the typical access time of the memory. This means that the effective system delay introduced by the Schottky-clamped system decoder is negligible.

The circuit comprises two individual two-line to four-line decoders in a single package. The active-low enable input can be used as a data line in demultiplexing applications.
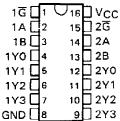
All of these decoders/demultiplexers feature fully buffered inputs, each of which represents only one normalized load to its driving circuit. All inputs are clamped with high-performance Schottky diodes to suppress line-ringing and to simplify system design. The SN54LS139A and SN54S139 are characterized for operation range of −55°C to 125°C. The SN74LS139A and SN74S139A are characterized for operation from 0°C to 70°C.

SN54LS139A, SN54S139 . . . J OR W PACKAGE
SN74LS139A, SN74S139A . . . D OR N PACKAGE
(TOP VIEW)

```
1G  [ 1   16 ] VCC
1A  [ 2   15 ] 2G
1B  [ 3   14 ] 2A
1Y0 [ 4   13 ] 2B
1Y1 [ 5   12 ] 2Y0
1Y2 [ 6   11 ] 2Y1
1Y3 [ 7   10 ] 2Y2
GND [ 8    9 ] 2Y3
```

SN54LS139A, SN54S139 . . . FK PACKAGE
(TOP VIEW)

```
        1A  1G  NC  VCC 2G
         3   2   1  20  19
1B  [ 4              18 ] 2A
1Y0 [ 5              17 ] 2B
NC  [ 6              16 ] NC
1Y1 [ 7              15 ] 2Y0
1Y2 [ 8              14 ] 2Y1
         9  10  11  12  13
        1Y3 GND NC  2Y3 2Y2
```

NC — No internal connection

logic symbols (alternatives)[†]

```
      X/Y
1A (2) ── 1      0 ──(4) 1Y0
1B (3) ── 2      1 ──(5) 1Y1
1G (1) ──▷ EN    2 ──(6) 1Y2
                 3 ──(7) 1Y3

2A (14) ──            (12) 2Y0
2B (13) ──            (11) 2Y1
2G (15) ──▷           (10) 2Y2
                       (9) 2Y3
```

```
      DMUX
1A (2) ──0       0 ──(4) 1Y0
1B (3) ──1  G 0  1 ──(5) 1Y1
1G (1) ──▷    3  2 ──(6) 1Y2
                 3 ──(7) 1Y3

2A (14) ──            (12) 2Y0
2B (13) ──            (11) 2Y1
2G (15) ──▷          (10) 2Y2
                      (9) 2Y3
```

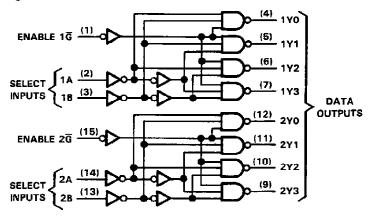[†]These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

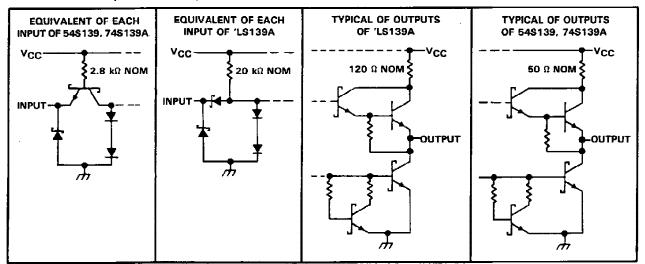### FUNCTION TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H = high level, L = low level, X = irrelevant

TEXAS
INSTRUMENTS

SN54LS139A, SN54S139, SN74LS139A, SN74S139A
DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

logic diagram (positive logic)

Pin numbers shown are for D, J, N, and W packages.

schematics of inputs and outputs

EQUIVALENT OF EACH INPUT OF 54S139, 74S139A	EQUIVALENT OF EACH INPUT OF 'LS139A	TYPICAL OF OUTPUTS OF 'LS139A	TYPICAL OF OUTPUTS OF 54S139, 74S139A

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

Supply voltage, V_{CC} (See Note 1) .... 7 V
Input voltage: 'LS139A .... 7 V
54S139, 74S139A .... 5.5 V
Operating free-air temperature range: SN54LS139A, SN54S139 .... −55°C to 125°C
SN74LS139A, SN74S139A .... 0°C to 70°C
Storage temperature range .... −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54LS139A			SN74LS139A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			−0.4			−0.4	mA
I_{OL}	Low-level output current			4			8	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS[†]			SN54LS139A			SN74LS139A			UNIT
				MIN	TYP[‡]	MAX	MIN	TYP[‡]	MAX	
V_{IK}	V_{CC} = MIN,	I_I = −18 mA				−1.5			−1.5	V
V_{OH}	V_{CC} = MIN, V_{IH} = 2 V, I_{OH} = −0.4 mA	V_{IL} = MAX,		2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN, V_{IL} = MAX	V_{IH} = 2 V,	I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
			I_{OL} = 8 mA					0.35	0.5	
I_I	V_{CC} = MAX,	V_I = 7 V				0.1			0.1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V				20			20	μA
I_{IL}	V_{CC} = MAX,	V_I = 0.4 V				−0.4			−0.4	mA
I_{OS}[§]	V_{CC} = MAX			−20		−100	−20		−100	mA
I_{CC}	V_{CC} = MAX,	Outputs enabled and open			6.8	11		6.8	11	mA

[†] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
[‡] All typical values are at V_{CC} = 5 V, T_A = 25°C.
[§] Not more than one output should be shorted at a time, and duration of the short circuit test should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Note 2)

PARAMETER[¶]	FROM (INPUT)	TO (OUTPUT)	LEVELS OF DELAY	TEST CONDITIONS	SN54LS139A SN74LS139A			UNIT
					MIN	TYP	MAX	
t_{PLH}	Binary Select	Any	2	R_L = 2 kΩ, C_L = 15 pF		13	20	ns
t_{PHL}						22	33	ns
t_{PLH}			3			18	29	ns
t_{PHL}						25	38	ns
t_{PLH}	Enable	Any	2			16	24	ns
t_{PHL}						21	32	ns

[¶] t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

recommended operating conditions

		SN54S139			SN74S139A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{OH}	High-level output current			−1			−1	mA
I_{OL}	Low-level output current			20			20	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS†			SN54S139 SN74S139A			UNIT
				MIN	TYP‡	MAX	
V_{IK}	V_{CC} = MIN,	I_I = −18 mA				−1.2	V
V_{OH}	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V,		SN54S'	2.5	3.4		V
	I_{OH} = −1 mA		SN74S'	2.7	3.4		
V_{OL}	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OL} = 20 mA					0.5	V
I_I	V_{CC} = MAX,	V_I = 5.5 V				1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V				50	μA
I_{IL}	V_{CC} = MAX,	V_I = 0.5 V				−2	mA
I_{OS}§	V_{CC} = MAX			−40		−100	mA
I_{CC}	V_{CC} = MAX,	Outputs enabled and open			60	90	mA

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡All typical values are at V_{CC} = 5 V, T_A = 25°C.
§Not more than one output should be shorted at a time, and duration of the short circuit test should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Note 2)

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	LEVELS OF DELAY	TEST CONDITIONS	SN54S139 SN74S139A			UNIT
					MIN	TYP	MAX	
t_{PLH}	Binary Select	Any	2	R_L = 280 Ω, C_L = 15 pF		5	7.5	ns
t_{PHL}						6.5	10	ns
t_{PLH}			3			7	12	ns
t_{PHL}						8	12	ns
t_{PLH}	Enable	Any	2			5	8	ns
t_{PHL}						6.5	10	ns

¶t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]	Samples (Requires Login)
76007012A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Call TI	
7600701EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Call TI	
7600701FA	ACTIVE	CFP	W	16	1	TBD	Call TI	Call TI	
7700401EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Call TI	
7700401FA	ACTIVE	CFP	W	16	1	TBD	Call TI	Call TI	
JM38510/30702B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
JM38510/30702BEA	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
JM38510/30702BFA	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	
JM38510/30702SEA	ACTIVE	CDIP	J	16	25	TBD	A42	N / A for Pkg Type	
JM38510/30702SFA	ACTIVE	CFP	W	16	25	TBD	A42	N / A for Pkg Type	
M38510/30702B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
M38510/30702BEA	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
M38510/30702BFA	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	
M38510/30702SEA	ACTIVE	CDIP	J	16	25	TBD	A42	N / A for Pkg Type	
M38510/30702SFA	ACTIVE	CFP	W	16	25	TBD	A42	N / A for Pkg Type	
SN54LS139AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
SN54S139J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
SN74LS139AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ADE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ADG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ADR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ADRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ADRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74LS139AN3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/ Ball Finish	MSL Peak Temp [3]	Samples (Requires Login)
SN74LS139ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74LS139ANSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ANSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LS139ANSRG4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74S139AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74S139ADE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74S139ADG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74S139AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74S139AN3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	
SN74S139ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SNJ54LS139AFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
SNJ54LS139AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
SNJ54LS139AW	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	
SNJ54S139FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
SNJ54S139J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	
SNJ54S139W	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	

[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.

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OTHER QUALIFIED VERSIONS OF SN54LS139A, SN54LS139A-SP, SN74LS139A :

- Catalog: SN74LS139A, SN54LS139A

- Military: SN54LS139A

- Space: SN54LS139A-SP
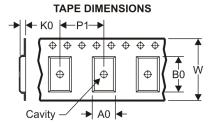
NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product

- Military - QML certified for Military and Defense Applications

- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

TAPE AND REEL INFORMATION

REEL DIMENSIONS

Reel Diameter

Reel Width (W1)

TAPE DIMENSIONS

Cavity

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

Sprocket Holes

User Direction of Feed

Pocket Quadrants

*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
SN74LS139ADR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS139ANSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LS139ADR	SOIC	D	16	2500	333.2	345.9	28.6
SN74LS139ANSR	SO	NS	16	2000	346.0	346.0	33.0

J (R−GDIP−T**)   CERAMIC DUAL IN−LINE PACKAGE
14 LEADS SHOWN

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)

B

14   8

C

1   7

0.065 (1,65)
0.045 (1,14)

0.005 (0,13) MIN

0.060 (1,52)
0.015 (0,38)

0.200 (5,08) MAX

Seating Plane

0.130 (3,30) MIN

0.026 (0,66)
0.014 (0,36)

0.100 (2,54)

A

0°−15°

0.014 (0,36)
0.008 (0,20)

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.

W (R–GDFP–F16)   CERAMIC DUAL FLATPACK

0.045 (1,14)
0.026 (0,66)

0.285 (7,24)
0.245 (6,22)

Base and Seating Plane

0.080 (2,03)
0.055 (1,40)

0.006 (0,15)
0.004 (0,10)

0.305 (7,75) MAX

1   16

0.019 (0,48)
0.015 (0,38)

0.430 (10,92)
0.370 (9,40)

0.050 (1,27)

0.005 (0,13) MIN
4 Places

8   9

0.360 (9,14)
0.250 (6,35)

0.360 (9,14)
0.250 (6,35)

4040180–3/D 07/03

NOTES: A.   All linear dimensions are in inches (millimeters).
         B.   This drawing is subject to change without notice.
         C.   This package can be hermetically sealed with a ceramic lid using glass frit.
         D.   Index point is provided on cap for terminal identification only.
         E.   Falls within MIL STD 1835 GDFP1–F16 and JEDEC MO–092AC

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FK (S−CQCC−N**)
28 TERMINAL SHOWN

LEADLESS CERAMIC CHIP CARRIER

NO. OF TERMINALS **	A		B	
	MIN	MAX	MIN	MAX
20	0.342 (8,69)	0.358 (9,09)	0.307 (7,80)	0.358 (9,09)
28	0.442 (11,23)	0.458 (11,63)	0.406 (10,31)	0.458 (11,63)
44	0.640 (16,26)	0.660 (16,76)	0.495 (12,58)	0.560 (14,22)
52	0.740 (18,78)	0.761 (19,32)	0.495 (12,58)	0.560 (14,22)
68	0.938 (23,83)	0.962 (24,43)	0.850 (21,6)	0.858 (21,8)
84	1.141 (28,99)	1.165 (29,59)	1.047 (26,6)	1.063 (27,0)

4040140/D 01/11

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a metal lid.
D. Falls within JEDEC MS−004

N (R−PDIP−T**)
16 PINS SHOWN

PLASTIC DUAL−IN−LINE PACKAGE

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

A

16   9

0.260 (6,60) / 0.240 (6,10)

1   8

0.070 (1,78) / 0.045 (1,14) △D

0.045 (1,14) / 0.030 (0,76) △D

0.020 (0,51) MIN

0.200 (5,08) MAX

Seating Plane

0.125 (3,18) MIN

0.100 (2,54)

0.021 (0,53) / 0.015 (0,38)

⊕ 0.010 (0,25) Ⓜ

14/18 Pin Only
20 Pin vendor option △D

0.325 (8,26) / 0.300 (7,62)

0.015 (0,38)

Gauge Plane

0.010 (0,25) NOM

0.430 (10,92) MAX

4040049/E 12/2002

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

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D (R−PDSO−G16)   PLASTIC SMALL OUTLINE

0.394 (10,00)
0.386 (9,80)
⟨C⟩

16   9

0.244 (6,20)
0.228 (5,80)

0.157 (4,00)
0.150 (3,80)   ⟨D⟩

1   8

Pin 1
Index Area

0.050 (1,27)

0.020 (0,51)
0.012 (0,31)

⊕ 0.010 (0,25) Ⓜ

0.010 (0,25)
0.004 (0,10)

0.069 (1,75) Max

0.010 (0,25)
0.005 (0,13)

0.004 (0,10)

Gauge Plane

Seating Plane

0.010 (0,25)   0°−8°

0.050 (1,27)
0.016 (0,40)

4040047−6/M   06/11

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

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Example Board Layout
(Note C)

Stencil Openings
(Note D)

|←— 14x1,27

16x0,55

←— 14x1,27

16x1,95

4,80

4,80

Example
Non Soldermask Defined Pad

Example
Pad Geometry
(See Note C)

—0,60

2,00

Example
Solder Mask Opening
(See Note E)

—0,07
All Around

4211283−4/D   06/11

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.

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NS (R-PDSO-G**)　　　　　　　　　　　　　　　　　　**PLASTIC SMALL-OUTLINE PACKAGE**

14-PINS SHOWN

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

4040062/C 03/03

NOTES:　A.　All linear dimensions are in millimeters.
　　　　　B.　This drawing is subject to change without notice.
　　　　　C.　Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

IMPORTANT NOTICE