

DATA SHEET

NE521

High-speed dual-differential
comparator/sense amp

Product data
Supersedes data of 1994 Aug 31
File under Integrated Circuits, IC11 Handbook

2001 Aug 03

High-speed dual-differential comparator/sense amp

NE521

FEATURES

- 12 ns maximum guaranteed propagation delay
- 20 μ A maximum input bias current
- TTL compatible strobes and outputs
- Large common-mode input voltage range
- Operates from standard supply voltages

APPLICATIONS

- MOS memory sense amp
- A-to-D conversion
- High-speed line receiver

PIN CONFIGURATION

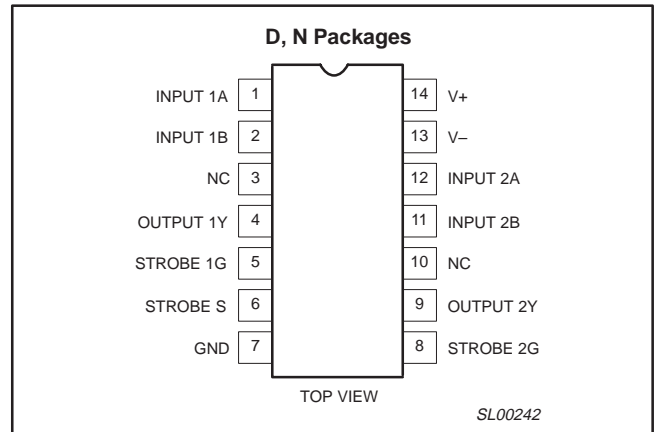


Figure 1. Pin Configuration

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic Dual In-Line Package (DIP)	0 °C to +70 °C	NE521N	SOT27-1
14-Pin SO Package	0 °C to +70 °C	NE521D	SOT108-1

EQUIVALENT SCHEMATIC

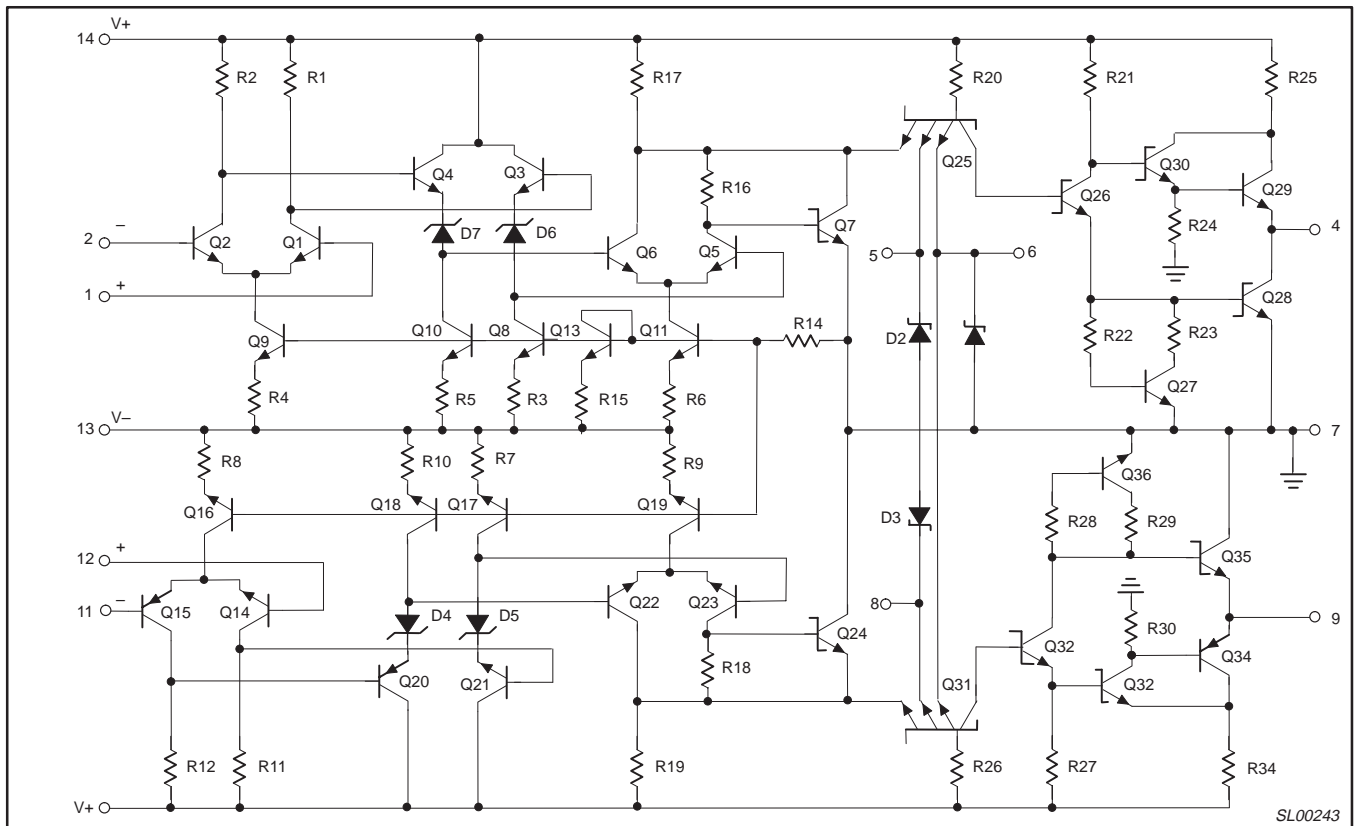


Figure 2. Equivalent Schematic

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BLOCK DIAGRAM

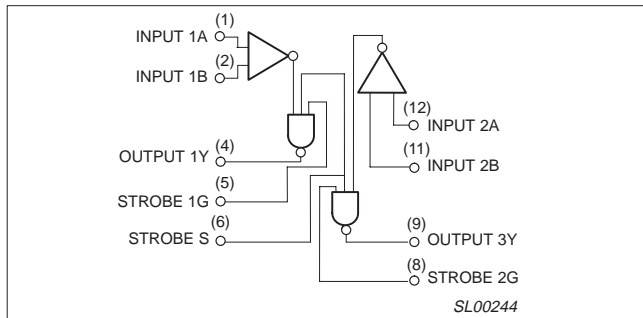


Figure 3. Block Diagram

LOGIC FUNCTIONS

V_{ID} A ⁺ , B ⁻	STROBE S	STROBE G	OUTPUT (Y)
$V_{ID} \leq -V_{OS}$	H	H	L
$-V_{OS} < V_{ID} < V_{OS}$	H	H	Undefined
$V_{ID} \geq V_{OS}$	H	H	H
X	L	X	H
X	X	L	H

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V ⁺	Supply voltage Positive	+7	V
V ⁻	Negative	-7	V
V _{IDR}	Differential input voltage	±6	V
V _{IN}	Input voltage Common mode Strobe/gate	±5 +5.25	V V
P _D	Maximum power dissipation ¹ T _{amb} = 25 °C (still-air) N package D package	1420 1040	mW mW
T _{amb}	Operating temperature range	0 to 70	°C
T _{stg}	Storage temperature range	-65 to +150	°C
T _{sld}	Lead soldering temperature (10 sec. max)	+230	°C

NOTES:

1. Derate above 25 °C at the following rates:
N package at 11.4 mW/°C
D package at 8.3 mW/°C

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DC ELECTRICAL CHARACTERISTICSV+ = +5 V; V- = -5 V, T_{amb} = 0 °C to +70 °C, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
V _{OS}	Input offset voltage At 25 °C Over temperature range	V+ = +4.75 V; V- = -4.75 V		6	7.5 10	mV mV
I _{BIAS}	Input bias current At 25 °C Over temperature range	V+ = +5.25 V; V- = -5.25 V		7.5	20 40	μA μA
I _{OS}	Input offset current At 25 °C Over temperature range	V+ = +5.25 V; V- = -5.25 V		1.0	5 12	μA μA
V _{CM}	Common-mode voltage range	V+ = +4.75 V; V- = -4.75 V	-3		+3	V
I _{IH}	Input current High	V+ = +5.25 V; V- = -5.25 V V _{IH} = 2.7 V 1G or 2G strobe Common strobe S			50 100	μA μA
I _{IL}	Input Current Low	V _{IL} = 0.5 V 1G or 2G strobe Common strobe S			-2.0 -4.0	mA mA
V _{OH} V _{OL}	Output voltage High Low	V _{I(S)} = 2.0 V V+ = +4.75 V; V- = -4.75 V; I _{LOAD} = -1 mA V+ = +5.25 V; V- = -5.25 V; I _{LOAD} = 20 mA	2.7	3.4	0.5	V V
V+ V-	Supply voltage Positive Negative		4.75 -4.75	5.0 -5.0	5.25 -5.25	V V
I _{CC+} I _{CC-}	Supply current Positive Negative	V+ = 5.25 V; V- = -5.25 V; T _{amb} = 25 °C		27 -15	35 -28	mA mA
I _{SC}	Short-circuit output current		-40		-100	mA

AC ELECTRICAL CHARACTERISTICST_{amb} = 25 °C; R_L = 280 Ω; C_L = 15 pF; V+ = 5 V; V- = 5 V

SYMBOL	PARAMETER	FROM INPUT	TO OUTPUT	LIMITS			UNIT
				Min	Typ	Max	
Large-signal switching speed							
t _{PLH(D)}	Propagation delay Low to high ¹	Amp	Output		8	12	ns
t _{PHL(D)}	High to low ¹	Amp	Output		6	9	
t _{PLH(S)}	Low to high ²	Strobe	Output		4.5	10	
t _{PHL(S)}	High to low ²	Strobe	Output		3.0	6	
f _{MAX}	Max. operating frequency			40	55		MHz

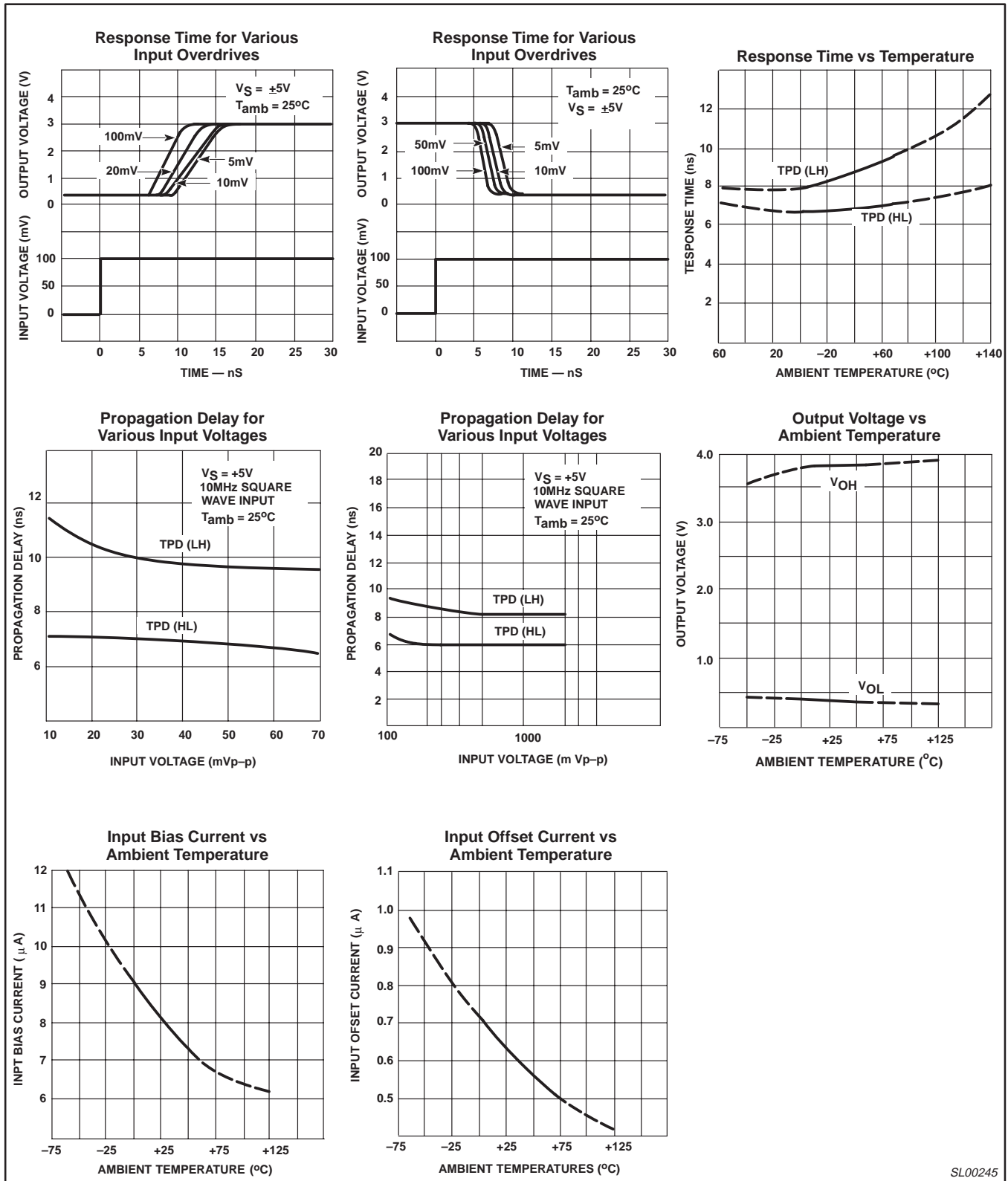
NOTES:

- Response time measured from 0 V point of ±100 mV_{p-p} 10 MHz square wave to the 1.5 V point of the output.
- Response time measured from 1.5 V point of input to 1.5 V point of the output.

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TYPICAL PERFORMANCE CHARACTERISTICS



SL00245

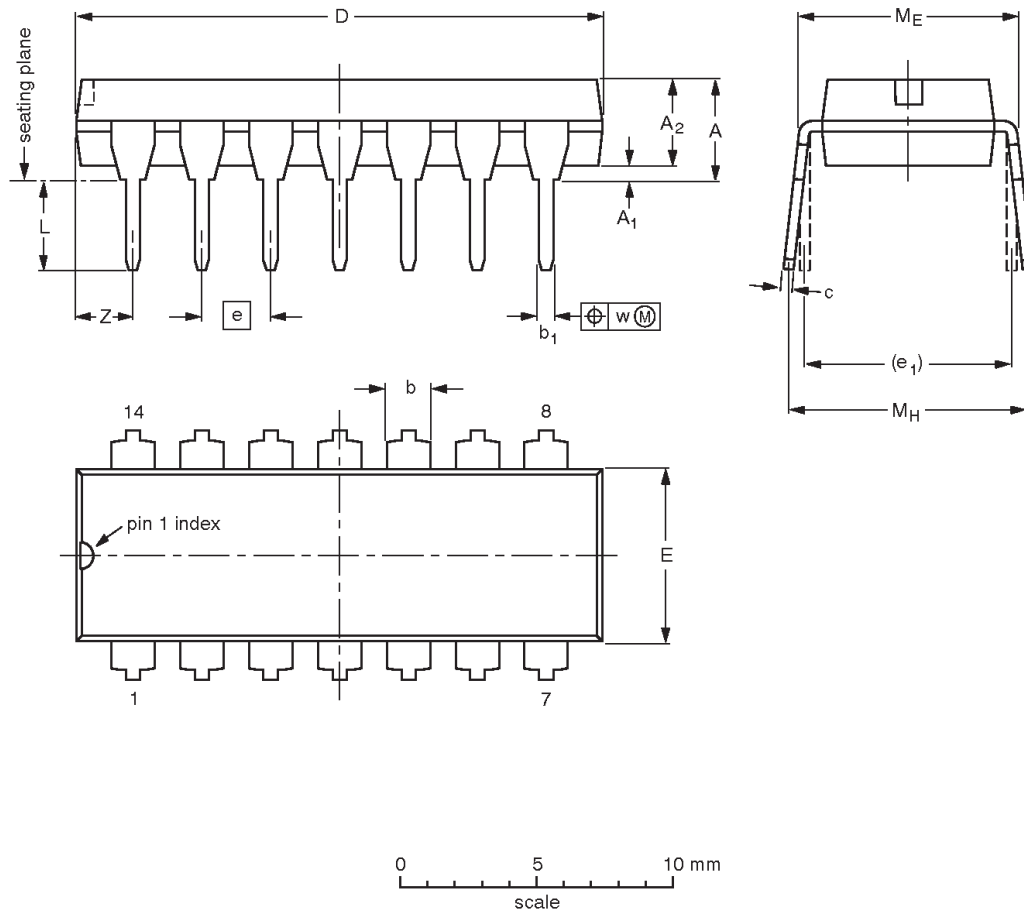
Figure 4. Typical Performance Characteristics

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DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A ₁ min.	A ₂ max.	b	b ₁	c	D ⁽¹⁾	E ⁽¹⁾	e	e ₁	L	M _E	M _H	w	Z ⁽¹⁾ max.
mm	4.2	0.51	3.2	1.73 1.13	0.53 0.38	0.36 0.23	19.50 18.55	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	2.2
inches	0.17	0.020	0.13	0.068 0.044	0.021 0.015	0.014 0.009	0.77 0.73	0.26 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.087

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

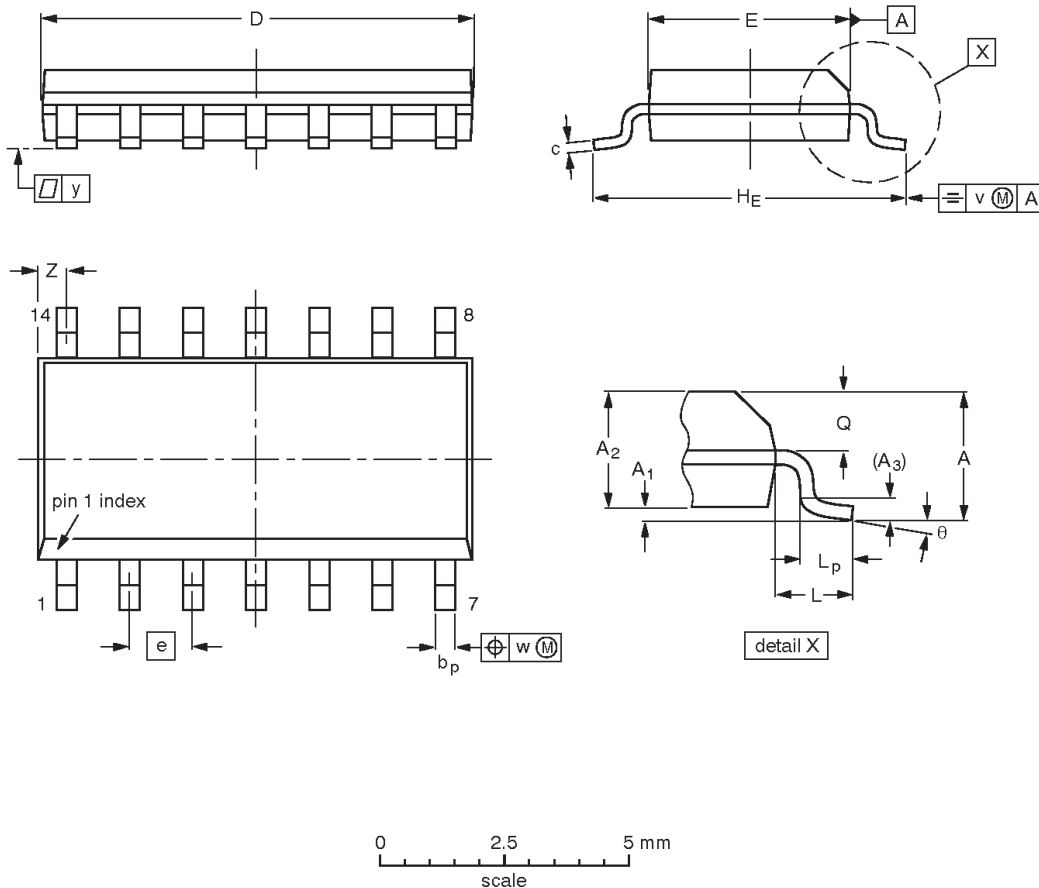
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT27-1	050G04	MO-001	SC-501-14			95-03-11 99-12-27

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SO14: plastic small outline package; 14 leads; body width 3.9 mm

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DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A ₁	A ₂	A ₃	b _p	c	D ⁽¹⁾	E ⁽¹⁾	e	H _E	L	L _p	Q	v	w	y	Z ⁽¹⁾	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	8.75 8.55	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.35 0.34	0.16 0.15	0.050	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT108-1	076E06	MS-012				97-05-22 99-12-27

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Data sheet status ^[1]	Product status ^[2]	Definitions
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