DATA SHEET

NE522
High-speed dual-differential comparator/sense amp

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

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Philips
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High-speed dual-differential comparator/sense amp NE522

FEATURES

- 15 ns maximum guaranteed propagation delay
- 20 µA 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

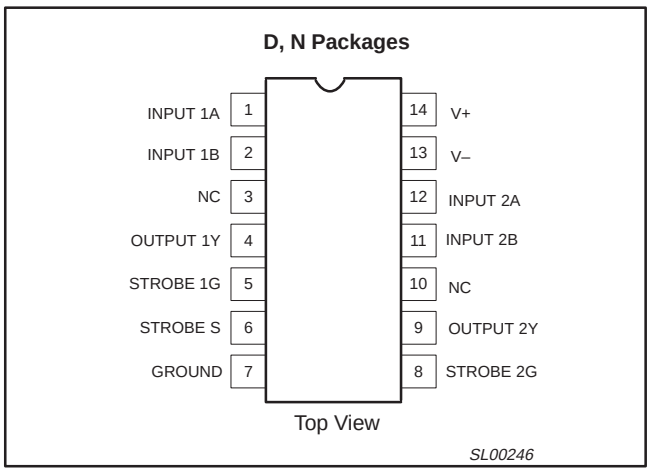


Figure 1. Pin Configuration

BLOCK DIAGRAM

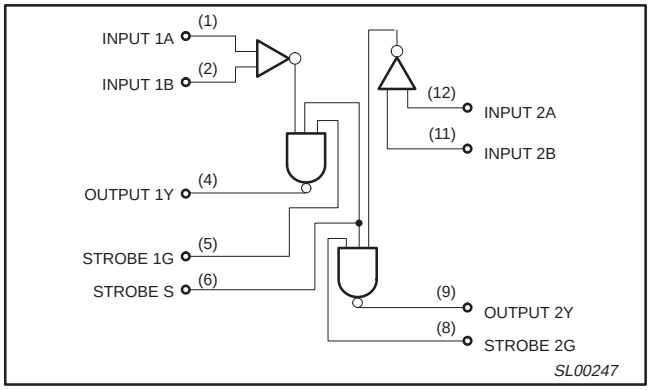


Figure 2. Block Diagram

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic DIP	0 °C to +70 °C	NE522N	SOT27-1
14-Pin Plastic SO	0 °C to +70 °C	NE522D	SOT108-1

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNITS
	Single supply voltage		
V+	Positive	+7	V
V–	Negative	–7	V
V_{IDR}	Differential input voltage	±6	V
V_{IN}	Input voltage		
	Common-mode	±5	V
	Strobe/gate	+5.25	V
P_D	Power dissipation	600	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

EQUIVALENT SCHEMATIC

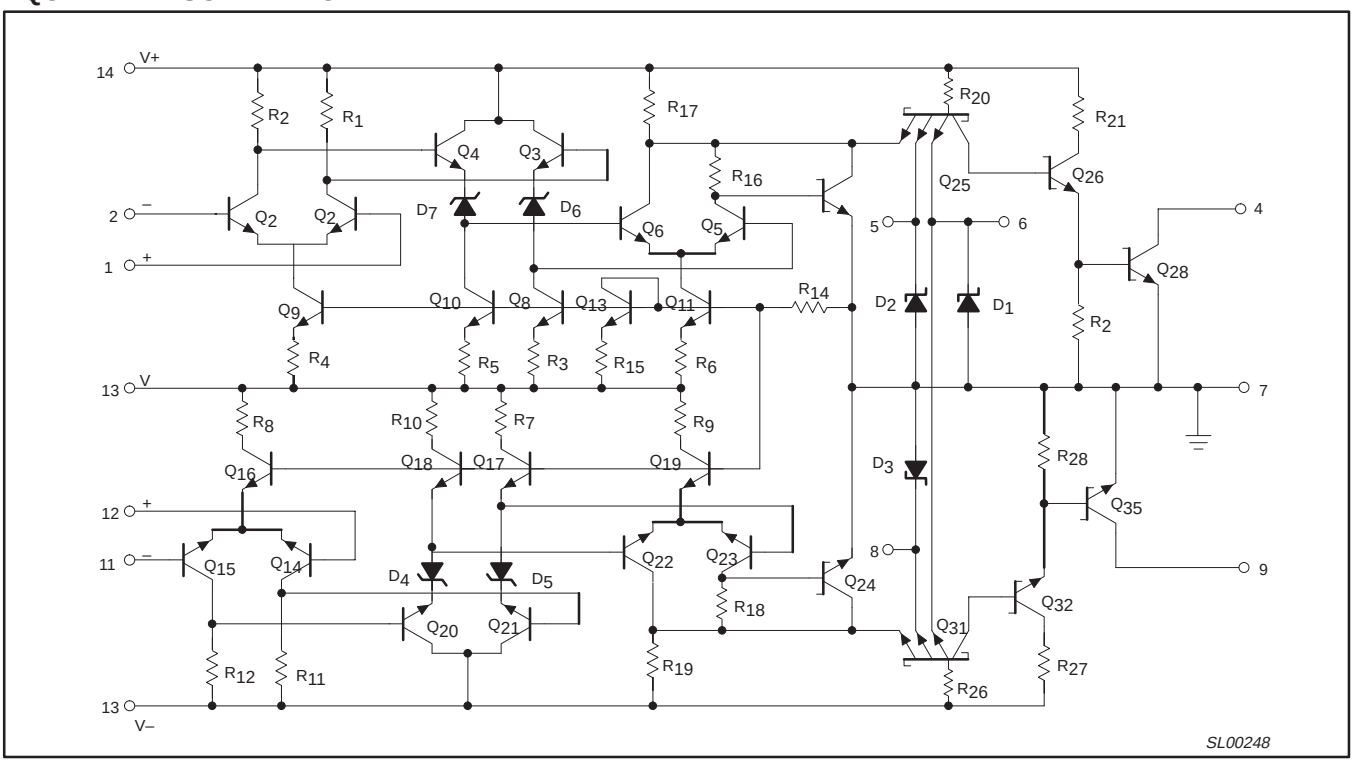


Figure 3. Equivalent Schematic

DC ELECTRICAL CHARACTERISTICS

$V\pm = \pm5$ V ±5%; T_{amb} = 0 °C to +70 °C, unless otherwise stated.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
V_{OS}	Input offset voltage	V+ = +4.75 V; V– = –4.75 V				
	At 25 °C			6	7.5	mV
	Over temperature range				10	mV
I_{BIAS}	Input bias current	V+ = +5.25 V; V– = –5.25 V				
	At 25 °C			7.5	20	µA
	Over temperature range				40	µA
I_{OS}	Input offset current	V+ = +5.25 V; V– = –5.25 V				
	At 25 °C			1.0	5	µA
	Over temperature range				12	µA
V_{CM}	Common-mode voltage range	V+ = +4.75 V; V– = –4.75 V	–3		+3	V
V_{IL}	LOW-level input voltage					
	At 25 °C				0.8	V
	Over temperature range				0.7	V
V_{IH}	High level temperature		2.0			V
I_{IH}	HIGH-level input current	V+ = +5.25 V; V– = –5.25 V; V_{IH} = 2.7 V				
	1G or 2G strobe				50	µA
	Common strobe S				100	µA
I_{IL}	LOW-level input current	V_{IL} = 0.5 V				
	1G or 2G strobe				–2.0	mA
	Common strobe S				–4.0	mA
V_{OL}	LOW-level output voltage	V+ = +5.25 V; V– = –5.25 V; $V_{I(S)}$ = 2.0 V; I_{LOAD} = 20 mA			0.5	V
I_{OH}	HIGH-level output current	V+ = +4.75 V; V– = –4.75 V; V_{OH} = 5.25 V			250	µA
	Supply voltage					
V+	Positive		4.75	5.0	5.25	V
V–	Negative		–4.75	–5.0	–5.25	V
	Supply current	V+ = +5.25 V; V– = –5.25 V; T_{amb} = 25 °C				
I_{CC+}	Positive			27	35	mA
$I_{CC–}$	Negative			–15	–28	

AC ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; R_L = 280 Ω; C_L = 15 pF; unless otherwise stated.

SYMBOL	PARAMETER	FROM INPUT	TO OUTPUT	LIMITS			UNITS
				MIN	TYP	MAX	
I_R	Input resistance				4		kΩ
I_C	Input capacitance				3		pF
Large-signal switching speed							
	Propagation delay						
$t_{PLH(D)}$	Low to high[1]	Amp	Output		10	15	
$t_{PHL(D)}$	High to low[1]	Amp	Output		8	12	ns
$t_{PLH(S)}$	Low to high[2]	Strobe	Output		6	13	
$t_{PHL(S)}$	High to low[2]	Strobe	Output		5	9	
I_{MAX}	Maximum operating frequency			25	35		MHz

NOTES:
1. 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.
2. Response time measured from 1.5 V point of the input to 1.5 V point of the output.

LOGIC FUNCTION TABLE

V_{ID} (A^+, B^-)	STRS	STRG	OUTPUT TRANSISTOR
$< -V_{OS}$	H	H	ON
$-V_{OS} < V_{ID} < V_{OS}$	H	H	Undefined
$> V_{OS}$	H	H	OFF
X	L	X	OFF
X	X	L	OFF

TYPICAL PERFORMANCE CHARACTERISTICS

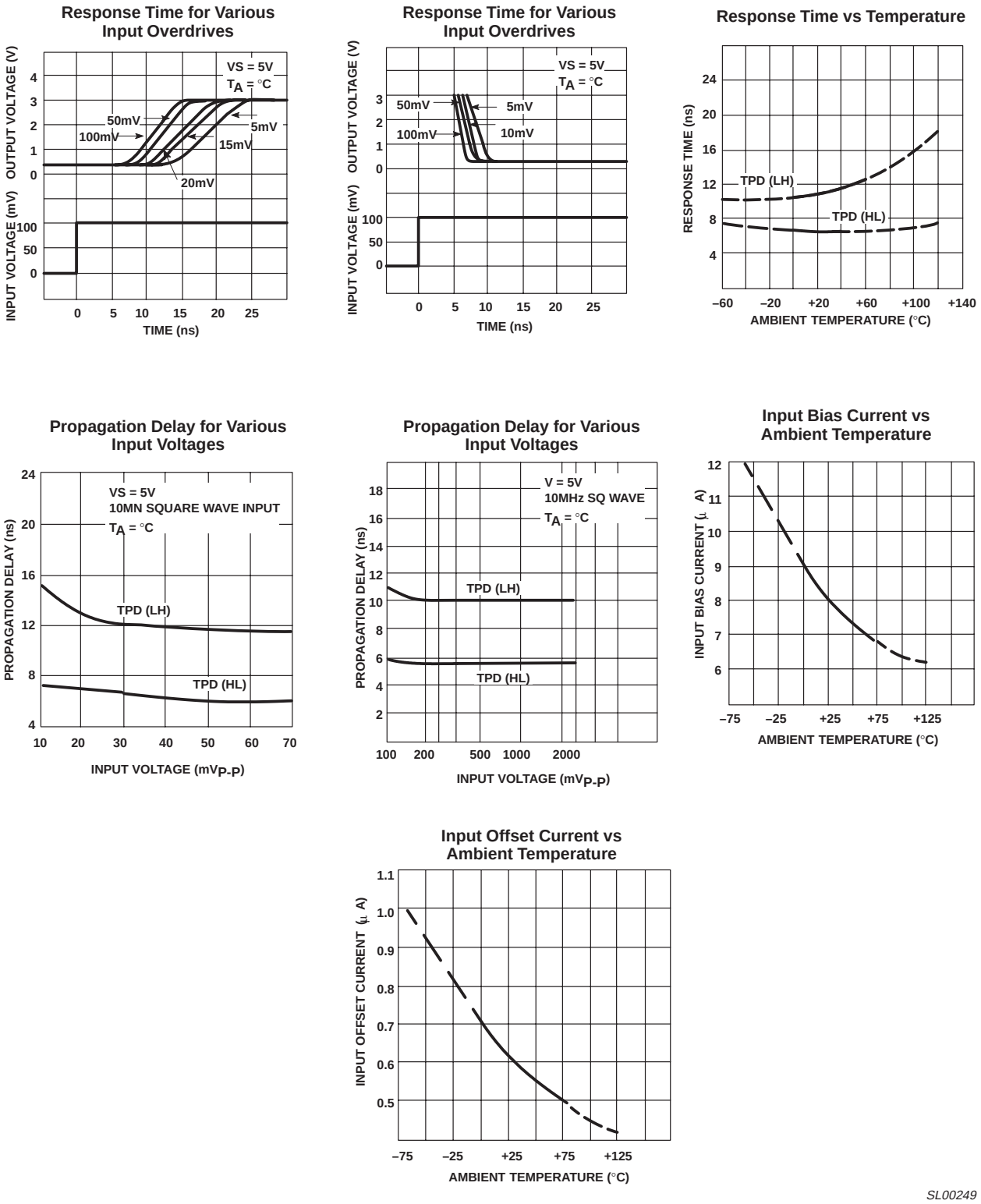
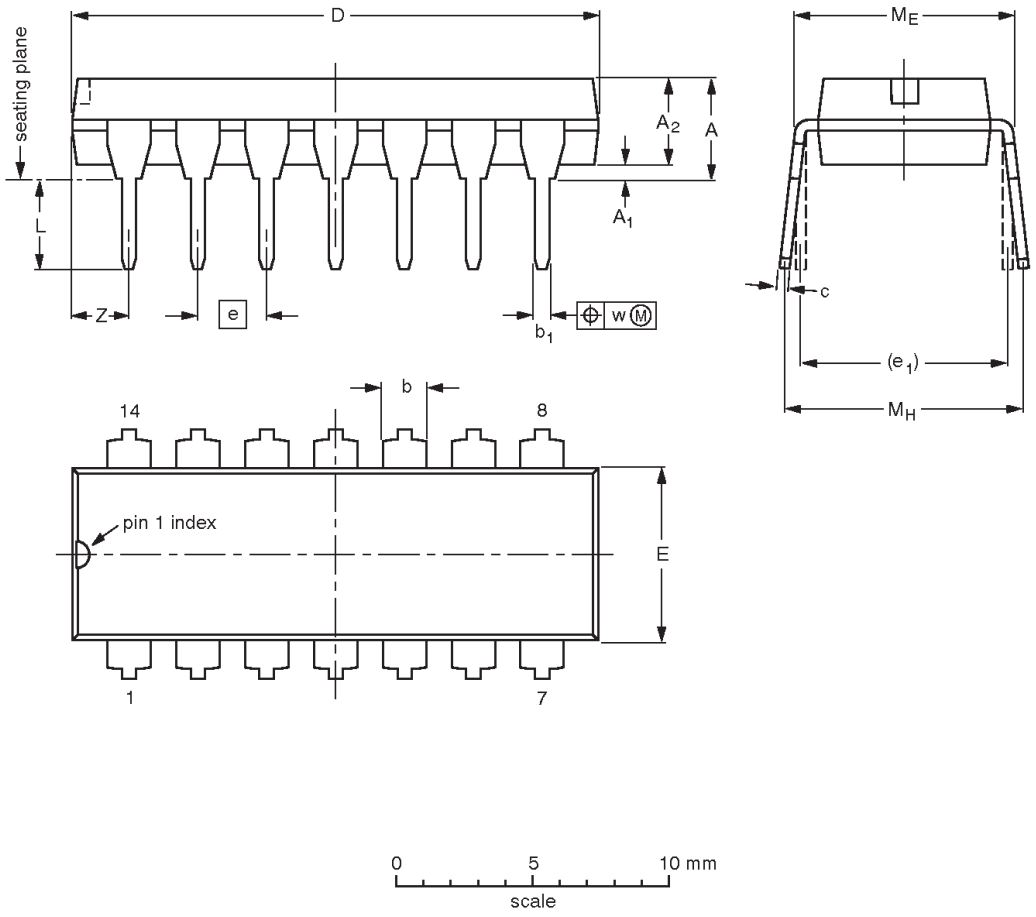


Figure 4. Typical Performance Characteristics

DIP14: plastic dual in-line package; 14 leads (300 mil) **SOT27-1**



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

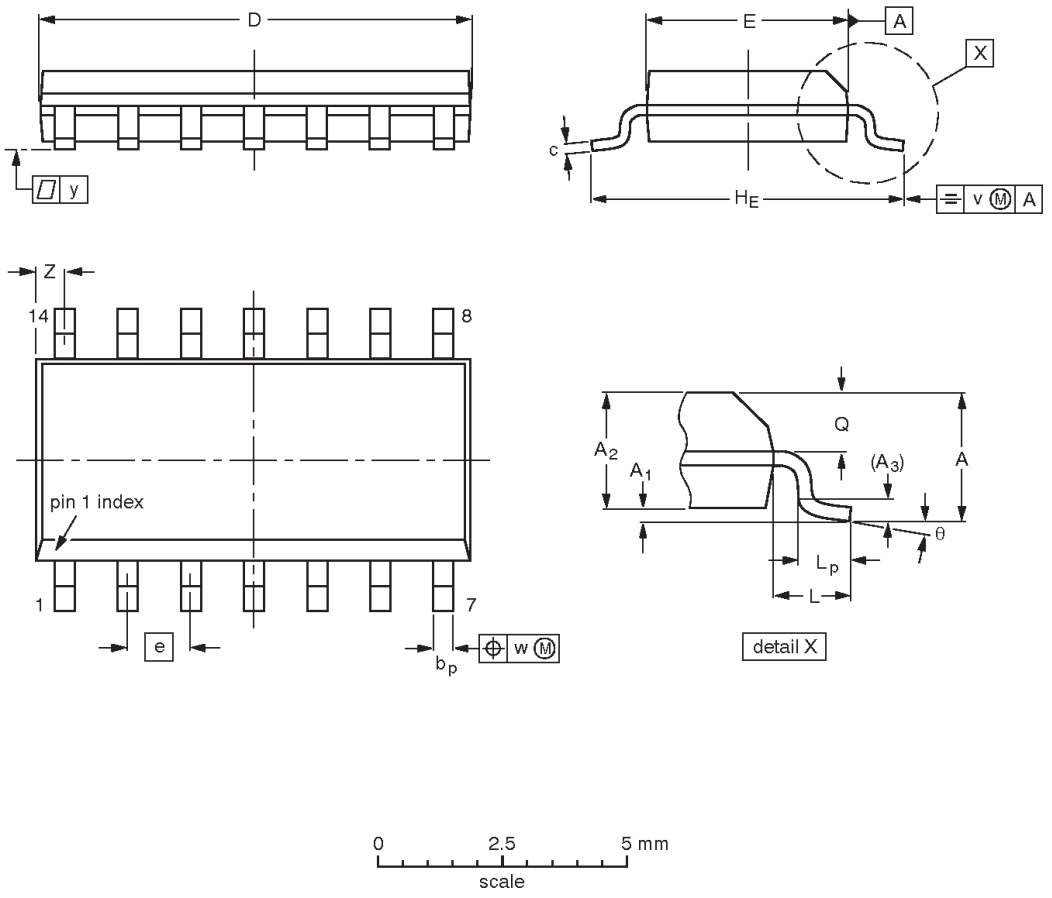
UNIT	A max.	A_1 min.	A_2 max.	b	b_1	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.2	0.51	3.2	1.73 1.13	0.53 0.38	0.36 0.23	19.50 18.55	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	2.2
inches	0.17	0.020	0.13	0.068 0.044	0.021 0.015	0.014 0.009	0.77 0.73	0.26 0.24	0.10	0.30	0.14 0.12	0.32 0.31	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

SO14: plastic small outline package; 14 leads; body width 3.9 mm **SOT108-1**



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^o 0^o
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

NOTES

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