DATA SHEET

NE558
Quad timer

Product data
Supersedes data of 2001 Aug 03

2003 Feb 14

Philips
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Quad timer NE558

DESCRIPTION

The NE558 Quad Timers are monolithic timing devices which can be used to produce four independent timing functions. The NE558 output sinks current. These highly stable, general purpose controllers can be used in a monostable mode to produce accurate time delays—from microseconds to hours. In the time delay mode of operation, the time is precisely controlled by one external resistor and one capacitor. A stable operation can be achieved by using two of the four timer sections.

The four timer sections in the NE558 are edge-triggered; therefore, when connected in tandem for sequential timing applications, no coupling capacitors are required. Output current capability of 100 mA is provided in both devices.

FEATURES

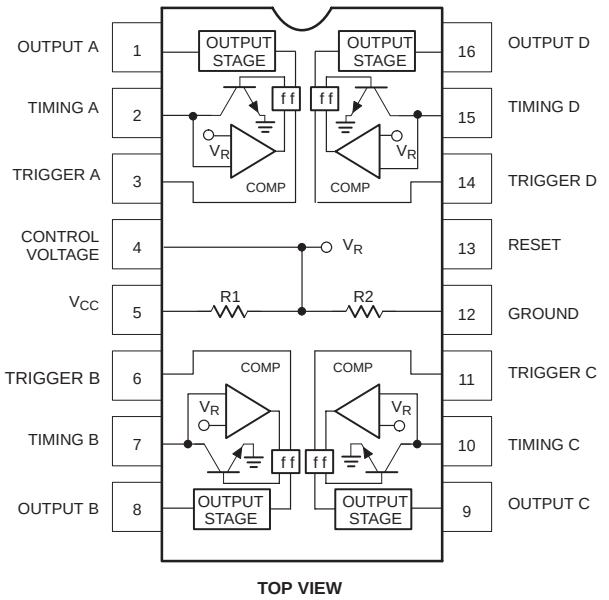
- 100 mA output current per section
- Edge-triggered (no coupling capacitor)
- Output independent of trigger conditions
- Wide supply voltage range 4.5 V to 16 V
- Timer intervals from microseconds to hours
- Time period equals RC
- Military qualifications pending.

APPLICATIONS

- Sequential timing
- Time delay generation
- Precision timing
- Industrial controls
- Quad one-shot.

PIN CONFIGURATION

D[1], N Packages



TOP VIEW

NOTE:
1. SOL released in large SO package only.

SL00442

Figure 1. Pin configuration.

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
16-Pin Plastic Small Outline Large (SOL) Package	0 to +70 °C	NE558D	SOT162–1
16-Pin Plastic Dual In-Line Package (DIP)	0 to +70 °C	NE558N	SOT38–4

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	+16	V
P_D	Maximum power dissipation T_{amb} = 25 °C ambient (still-air)[1] N package D package	 1450 1090	 mW mW
T_{amb}	Operating ambient 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 11.6 mW/°C
   D package at 8.7 mW/°C

DC AND AC ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C, V_{CC} = +5 V to +15 V, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	Min	Typ	Max	UNIT
V_{CC}	Supply voltage		4.5		16	V
I_{CC}	Supply current	V_{CC} = Reset = 15 V		16	36	mA
	Timing accuracy (t = RC)	R = 2 kΩ to 100 kΩ; C = 1 μF				
t_A	Initial accuracy			±2	5	%
$\Delta t_A/\Delta T$	Drift with temperature			30	150	ppm/°C
$\Delta t_A/\Delta V_S$	Drift with supply voltage			0.1	0.9	%/V
V_{TRIG}	Trigger voltage[1]	V_{CC} = 15 V	0.8		2.4	V
I_{TRIG}	Trigger current	Trigger = 0 V		5	100	μA
V_{RESET}	Reset voltage[2]		0.8		2.4	V
I_{RESET}	Reset current	Reset		50	500	μA
V_{TH}	Threshold voltage			0.63×V_{CC}		V
	Threshold leakage			15		nA
V_{OUT}	Output voltage[3]	I_L = 10 mA		0.1	0.4	V
		I_L = 100 mA		1.0	2.0	V
	Output leakage			10	500	nA
t_{PD}	Propagation delay			1.0		μs
t_R	Rise time of output	I_L = 100 mA		100		ns
t_F	Fall time of output	I_L = 100 mA		100		ns

NOTES:

1. The trigger functions only on the falling edge of the trigger pulse only after previously being HIGH. After reset, the trigger must be brought HIGH and then LOW to implement triggering.
2. For reset below 0.8 V, outputs set LOW and trigger inhibited. For reset above 2.4 V, trigger enabled.
3. The NE558 output structure is open-collector, which requires a pull-up resistor to V_{CC} to sink current. The output is normally LOW sinking current.

NE558 EQUIVALENT CIRCUIT

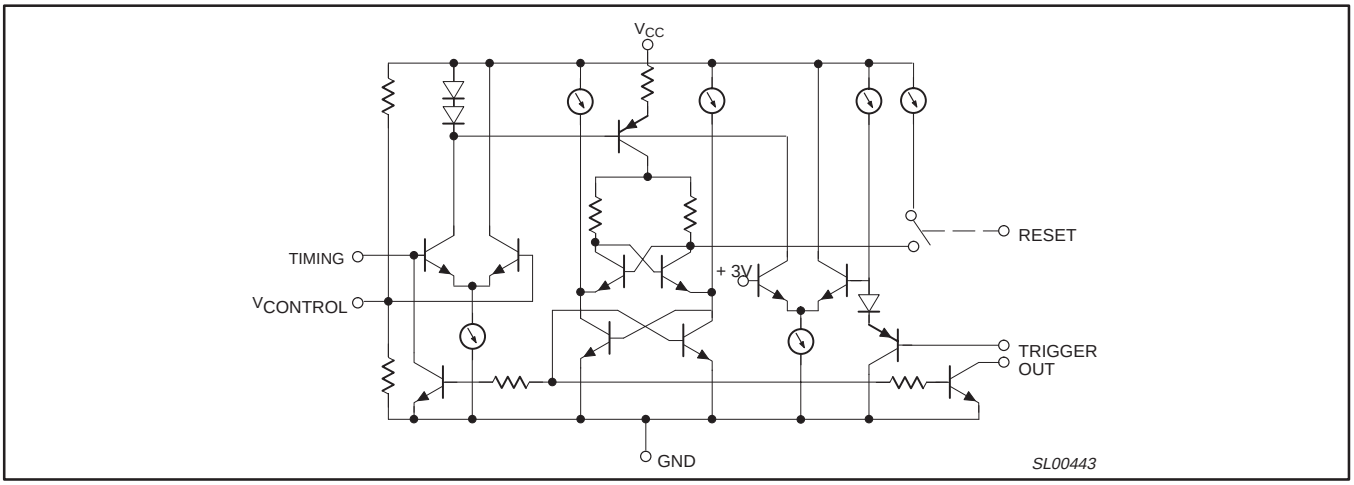


Figure 2. NE558 equivalent circuit.

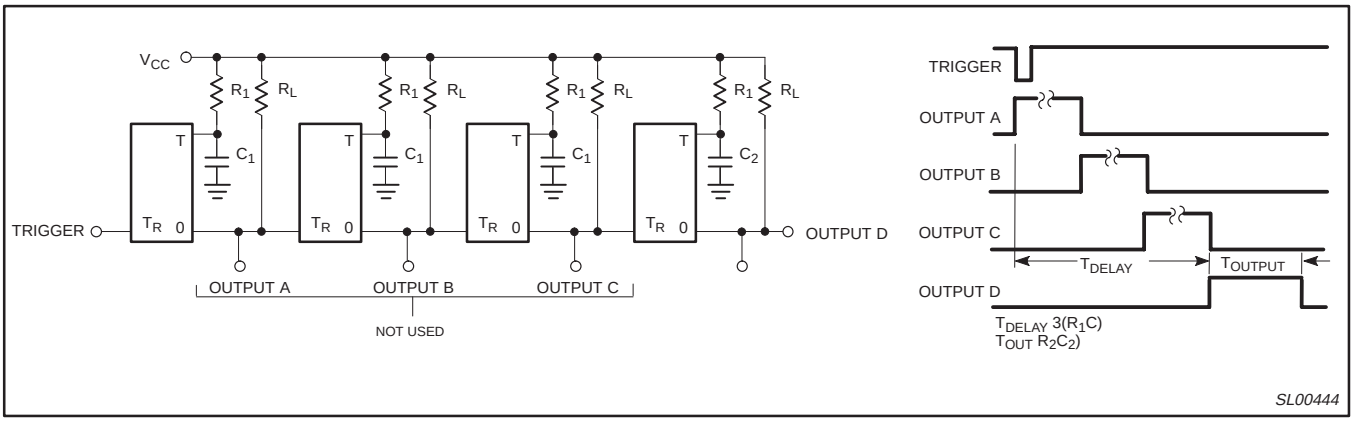
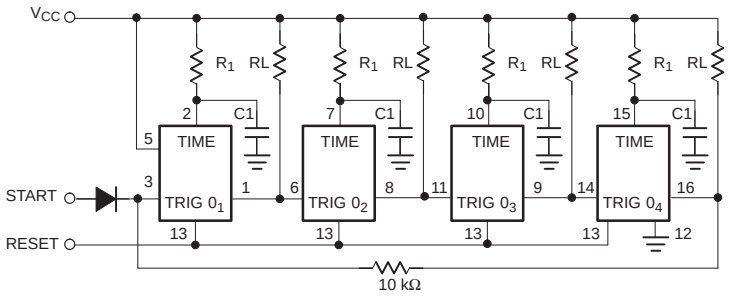
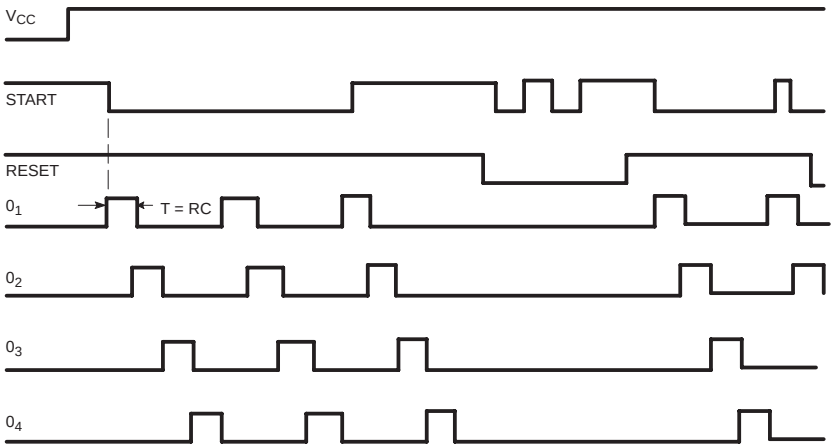


Figure 3. Long-time delay.



a. Ring Counter

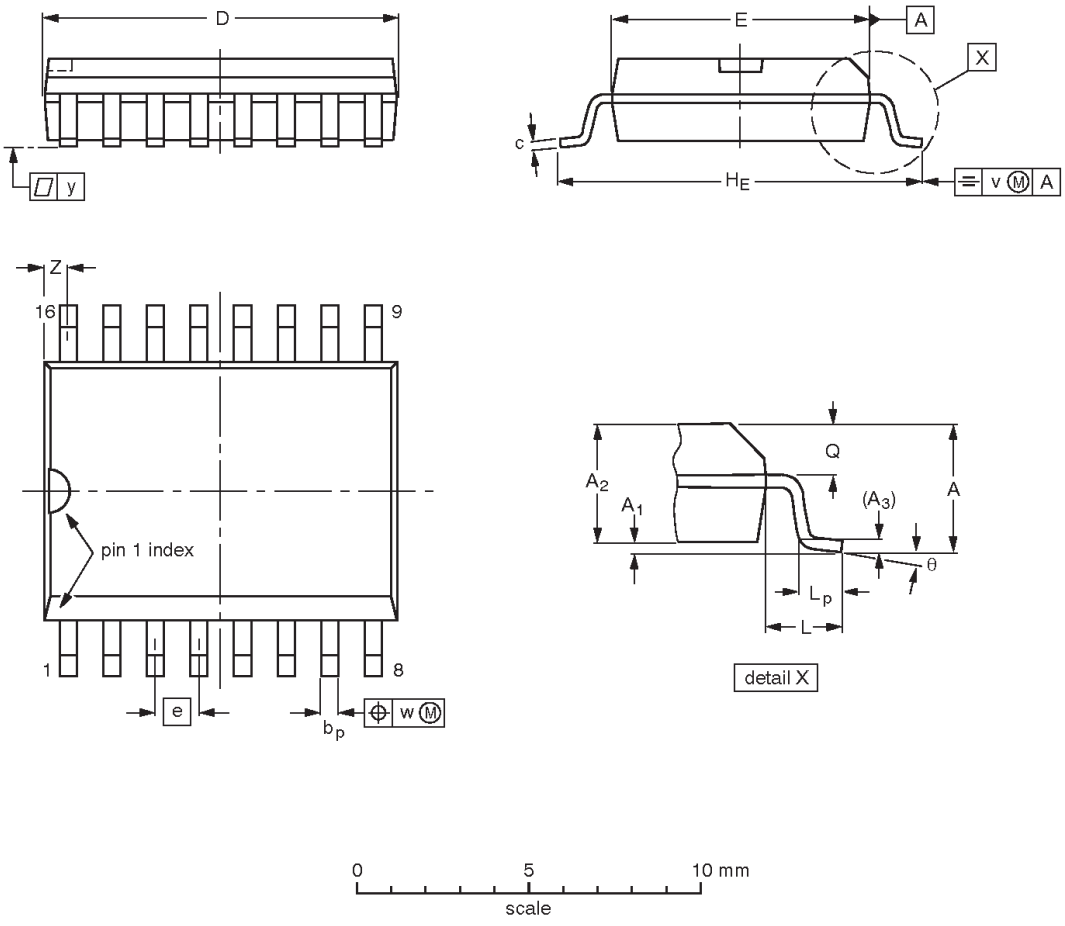


b. Expected Waveforms

SL00445

Figure 4.

SO16: plastic small outline package; 16 leads; body width 7.5 mm **SOT162-1**



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

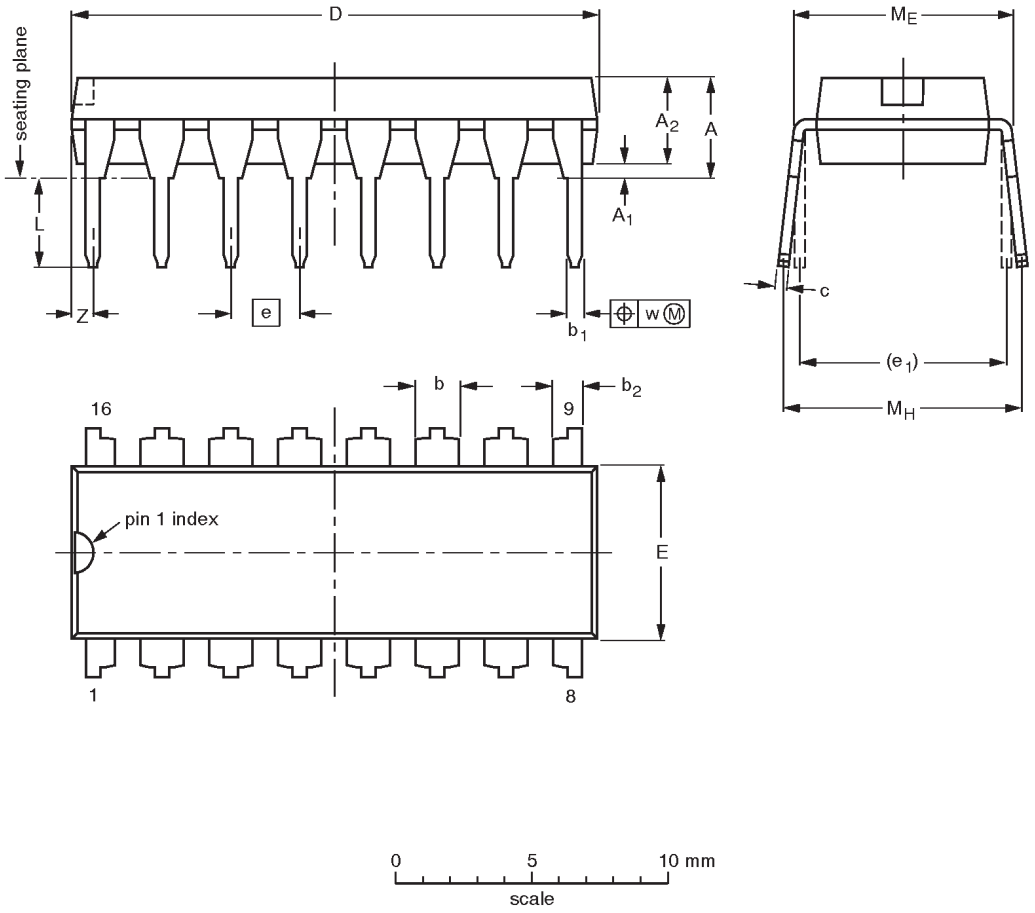
UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	10.5 10.1	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8^o 0^o
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.41 0.40	0.30 0.29	0.050	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

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			
SOT162-1	075E03	MS-013				~~97-05-22~~ 99-12-27

DIP16: plastic dual in-line package; 16 leads (300 mil) **SOT38-4**



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

UNIT	A max.	A_1 min.	A_2 max.	b	b_1	b_2	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 1.30	0.53 0.38	1.25 0.85	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	0.76
inches	0.17	0.020	0.13	0.068 0.051	0.021 0.015	0.049 0.033	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	0.030

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			
SOT38-4						~~92-11-17~~ 95-01-14

REVISION HISTORY

Rev	Date	Description
_3	20030214	**Product data (9397 750 11125). ECN 853-0150 29399 of 21 January 2003. Supersedes data of 2001 Aug 03 (9397 750 09164).** Modifications: ● Change description of pin 7 from ‘OUTPUT’ to ‘TIMING B’. ● Change description of pin 8 from ‘OUTPUT’ to ‘OUTPUT B’. ● Figure 3, ‘Long-time delay’: signals OUTPUT 1–4 renamed to OUTPUT A–D.
_2	20010803	**Product data (9397 750 09164). ECN 853-0150 26833 of 03 August 2001. Supersedes data of 1994 Aug 31.**

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Level	Data sheet status [1]	Product status [2] [3]	Definitions
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Contact information

For additional information please visit
http://www.semiconductors.philips.com. Fax: **+31 40 27 24825**

For sales offices addresses send e-mail to:
sales.addresses@www.semiconductors.philips.com.

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