Quad timer — NE558

DESCRIPTION

The 558 Quad Timers are monolithic timing devices which can be used to produce four independent timing functions. The 558 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.

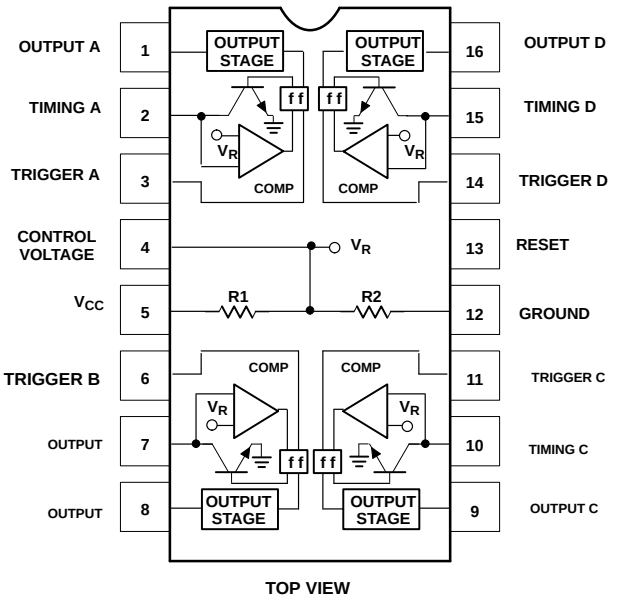
The four timer sections in the 558 are edge-triggered; therefore, when connected in tandem for sequential timing applications, no coupling capacitors are required. Output current capability of 100mA is provided in both devices.

FEATURES

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

PIN CONFIGURATION

D[1], N Packages



TOP VIEW

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

APPLICATIONS

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

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
16-Pin Plastic Small Outline Large (SOL) Package	0 to +70°C	NE558D	0171B
16-Pin Plastic Dual In-Line Package (DIP)	0 to +70°C	NE558N	0406C

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	+16	V
P_D	Maximum power dissipation T_A=25°C ambient (still-air)[1]		
	N package	1450	mW
	D package	1090	mW
T_A	Operating ambient temperature range	0 to +70	°C
T_{STG}	Storage temperature range	-65 to +150	°C
T_{SOLD}	Lead soldering temperature (10sec max)	+300	°C

NOTES:
1. Derate above 25°C, at the following rates:
   N package at 11.6mW/°C
   D package at 8.7mW/°C

DC AND AC ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	TEST CONDITIONS	NE558			UNIT
			Min	Typ	Max	
V_{CC}	Supply voltage		4.5		16	V
I_{CC}	Supply current	V_{CC}=Reset=15V		16	36	mA
	Timing accuracy (t=RC)	R=2kΩ to 100kΩ, C=1μF				
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}=15V	0.8		2.4	V
I_{TRIG}	Trigger current	Trigger=0V		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}
	Threshold leakage			15		nA
V_{OUT}	Output voltage[3]	I_L=10mA		0.1	0.4	V
		I_L=100mA		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=100mA		100		ns
t_F	Fall time of output	I_L=100mA		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 0.8V, outputs set low and trigger inhibited. For reset above 2.4V, trigger enabled.
3. The 558 output structure is open-collector which requires a pull-up resistor to V_{CC} to sink current. The output is normally low sinking current.

558 EQUIVALENT CIRCUIT

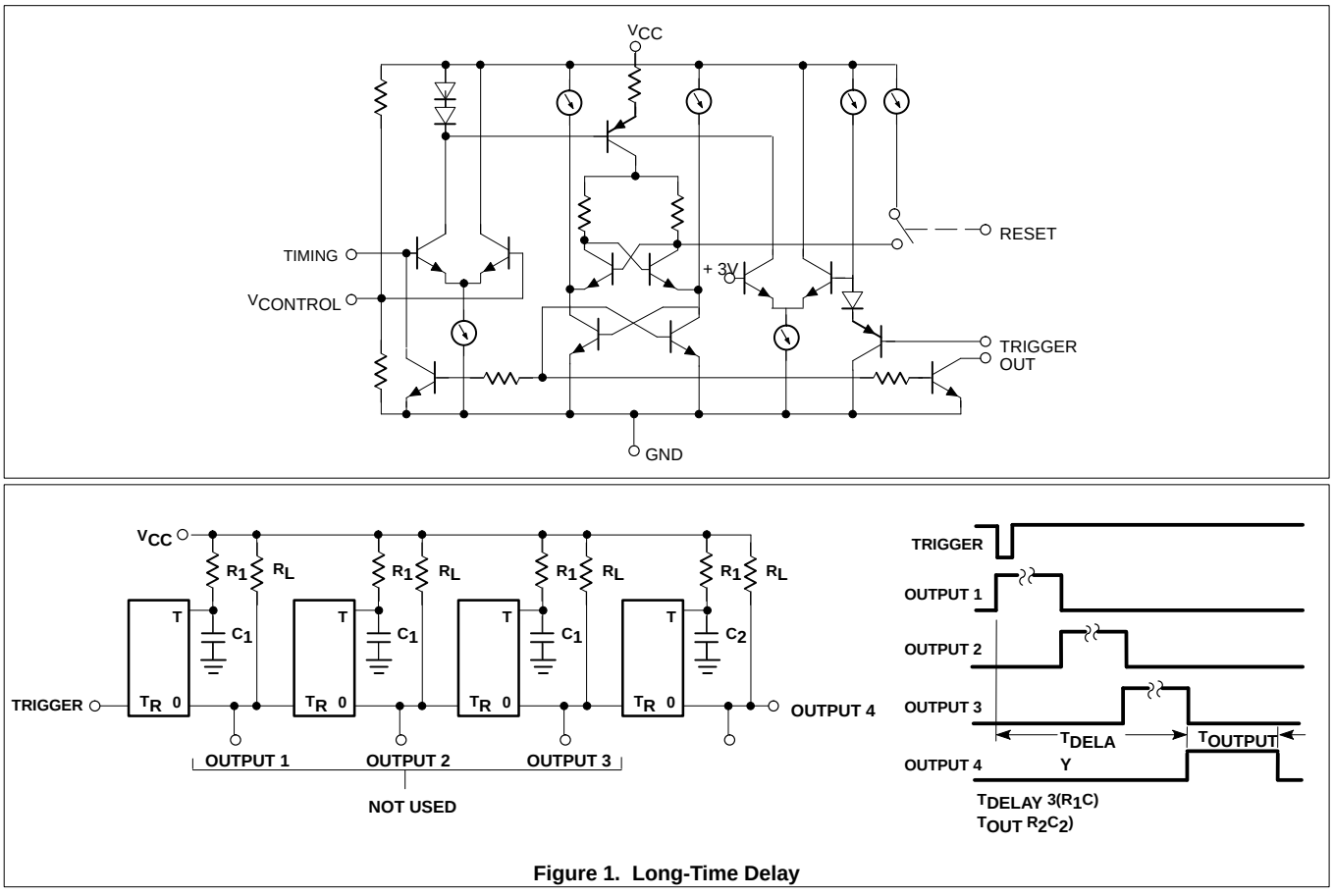
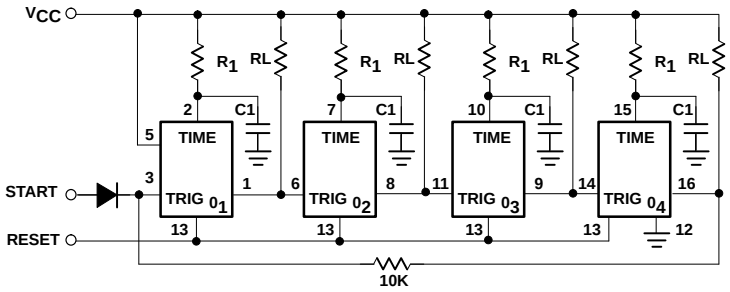
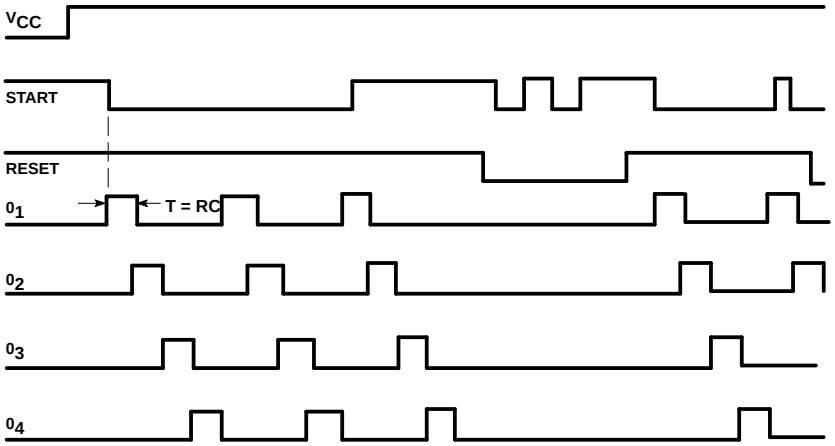


Figure 1. Long-Time Delay



a. Ring Counter



b. Expected Waveforms

Figure 2.