Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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HIGH SPEED CMOS TIMER

GENERAL DESCRIPTION

The ALD555 timer is a high performance monolithic timing circuit built with advanced silicon gate CMOS technology. It offers the benefits of high input impedance, thereby allowing smaller timing capacitors and longer timing cycle; high speed, with typical cycle time of 500ns; low power dissipation for battery operated environment; reduced supply current spikes, allowing smaller and lower cost decoupling capacitors. It is capable of producing accurate time delays and oscillations in both monostable and astable operation. It operates in the one-shot (monostable) mode or 50% duty cycle free running oscillation mode with a single resistor and one capacitor. The inputs and outputs are fully compatible with CMOS, NMOS or TTL logic.

There are three matched internal resistors (approximately 200KΩ each) that set the threshold and trigger levels at two-thirds and one-third respectively of V+. These levels can be adjusted by using the control terminal (pin 5). When the trigger input is below the trigger level, the output is in the high state and sourcing 2mA. When threshold input is above the threshold level at the same time the trigger input is above the trigger level, the internal flip-flop is reset, the output goes to the low state and sinks up to 10mA. The reset input overrides all other inputs and when it is active (reset voltage less than 1V), the output is in the low state.

FEATURES

- Functional equivalent to NE555 with greatly expanded high and low frequency ranges
- High speed, low power, monolithic CMOS technology
- Low supply current: 100μA typical
- Extremely low trigger, threshold and reset currents:1pA typical
- High speed operation -- 2MHz oscillation
- Low operating supply voltage of 2 to 12V
- Operates in both monostable and astable modes
- Fixed 50% duty cycle or adjustable duty cycle
- CMOS, NMOS and TTL compatible input/output
- High discharge sinking current of 80mA
- Low supply current spikes

ORDERING INFORMATION ("L" suffix denotes lead-free (RoHS))

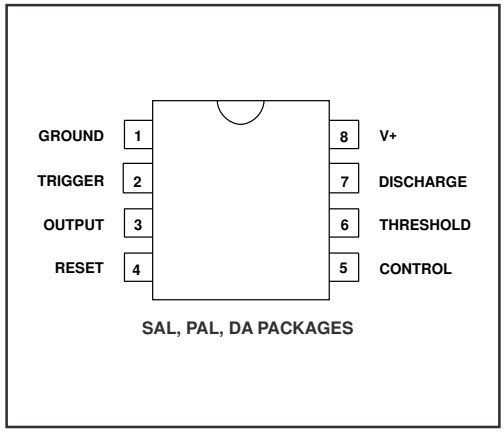
Operating Temperature Range *		
0°C to +70°C	0°C to +70°C	-55°C to +125°C
8-Pin Small Outline Package (SOIC)	8-Pin Plastic DIP Package	8-Pin CERDIP Package
ALD555SAL	ALD555PAL	ALD555DA

* Contact factory for leaded (non-RoHS) or high temperature versions.

APPLICATIONS

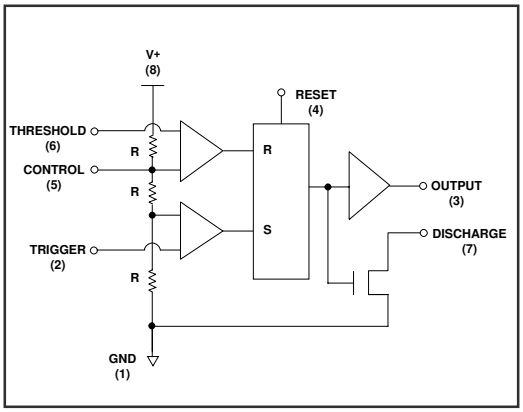
- High speed one-shot (monostable) pulse generation
- Precision timing
- Sequential timing
- Long delay timer
- Pulse width and pulse position modulation
- Missing pulse detector
- Frequency divider

PIN CONFIGURATION



SAL, PAL, DA PACKAGES

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Supply voltage, V+ ____ 13.2V
Input voltage range ____ -0.3V to V+ +0.3V
Power dissipation ____ 600 mW
Operating temperature range SAL, PAL packages ____ 0°C to + 70°C
DA package ____ -55°C to +125°C
Storage temperature range ____ -65°C to +150°C
Lead temperature, 10 seconds ____ +260°C

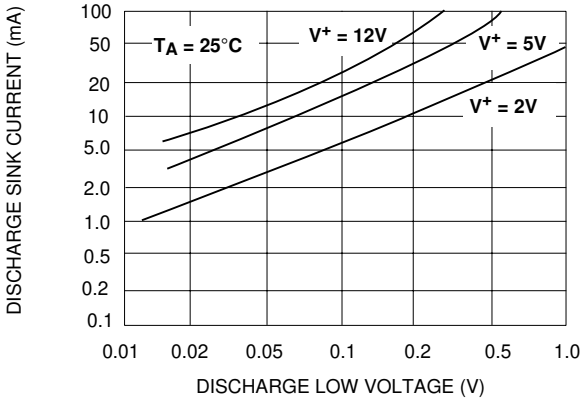
OPERATING ELECTRICAL CHARACTERISTICS
T_A = 25°C V+ = +5V unless otherwise specified

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Supply Voltage	V+	2		12	V	
Supply Current	I_S		100	180	μA	Outputs Unloaded
Timing error / Astable mode Initial Accuracy	t_{err}		1.0	2.2	%	C = 0.1μF
Drift with Temperature [1] Drift with Supply Voltage [1]	$\Delta t/\Delta T$ $\Delta t/\Delta V+$		10.0 0.1		ppm/°C %/V	R_A = 1KΩ R_B = 1KΩ
Threshold Voltage	V_{TH}	3.233	3.333	3.433	V	
Trigger Voltage	V_{TRIG}	1.607	1.667	1.737	V	
Trigger Current [2]	I_{TRIG}		.001	0.2	nA	
Reset Voltage	V_{RST}	0.4	0.7	1.0	V	
Reset Current [2]	I_{RST}		.001	0.2	nA	
Threshold Current [2]	I_{TH}		.001	0.2	nA	
Control Voltage Level	V_{CONT}	3.273	3.333	3.393	V	
Output Voltage Drop (Low)	V_{OL}		0.2	0.4	V	I_{SINK} = 10mA
Output Voltage Drop (High)	V_{OH}			4.2	V	I_{SOURCE} = -2mA
Rise Time of Output [1]	t_r		15	30	ns	R_L = 10MΩ
Fall Time of Output [1]	t_f		10	30	ns	C_L = 10pF
Discharge Transistor Leakage Current	I_{DL}		.01		nA	
Discharge Voltage Drop	V_{DISC}		0.5 0.2	1.0 0.4	V V	$I_{DISCHARGE}$ = 80mA $I_{DISCHARGE}$ = 30mA
Maximum Frequency Astable Mode	f_{MAX}	1.4	2		MHz	R_A = 470Ω R_B = 200Ω C_T = 200pF

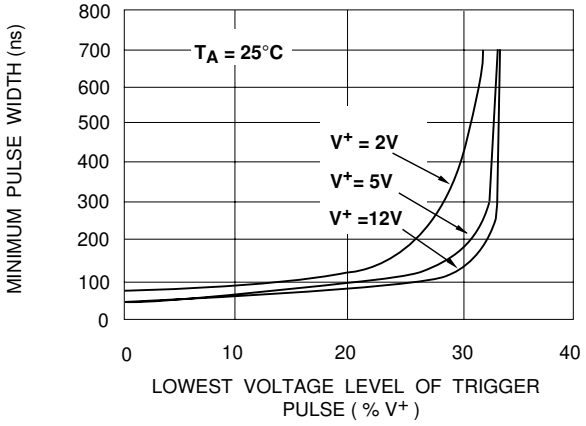
Notes: [1] Sample tested parameters.
[2] Consists of junction leakage currents with strong temperature dependence.

TYPICAL PERFORMANCE CHARACTERISTICS

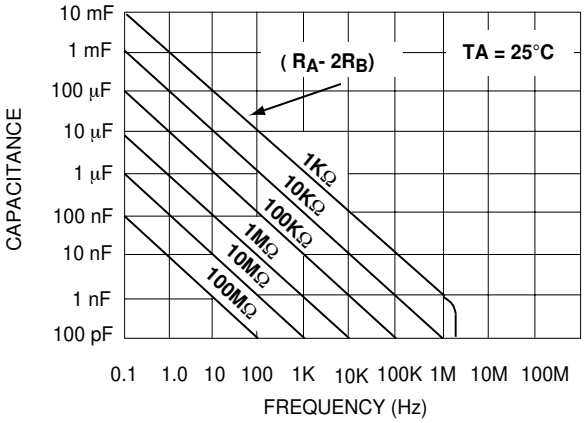
DISCHARGE OUTPUT SINK CURRENT AS A FUNCTION OF DISCHARGE LOW VOLTAGE



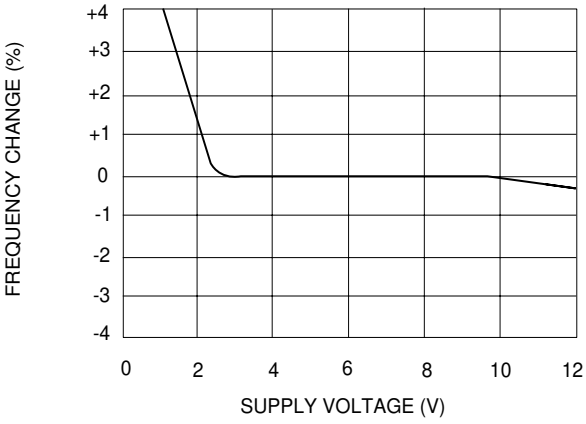
MINIMUM PULSE WIDTH REQUIRED FOR TRIGGERING



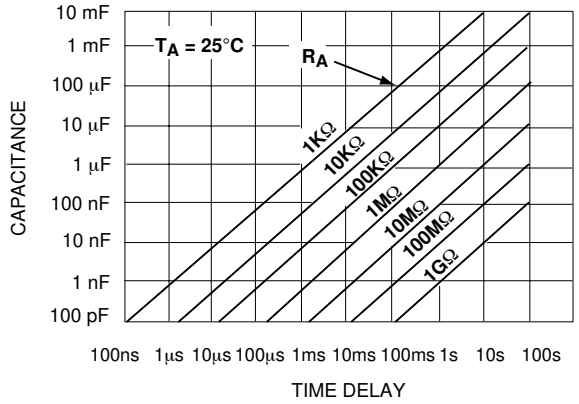
FREE RUNNING FREQUENCY AS A FUNCTION OF R_A, R_B AND C



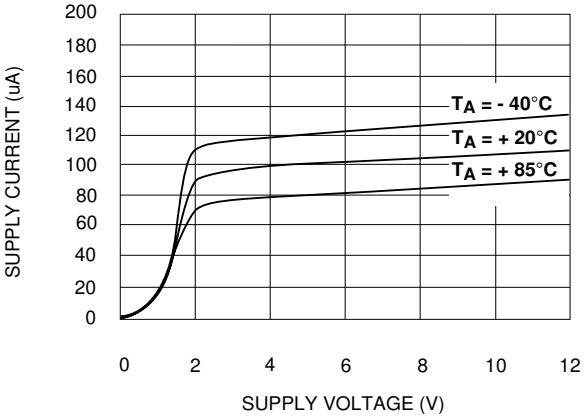
FREQUENCY CHANGE IN THE ASTABLE MODE AS A FUNCTION OF SUPPLY VOLTAGE



TIME DELAY IN THE MONOSTABLE MODE AS A FUNCTION OF R_A AND C

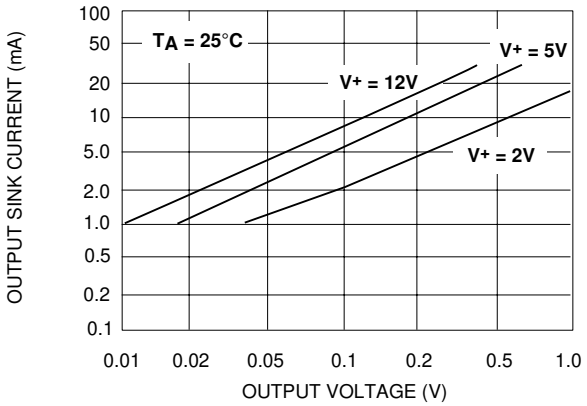


SUPPLY CURRENT AS A FUNCTION OF SUPPLY VOLTAGE

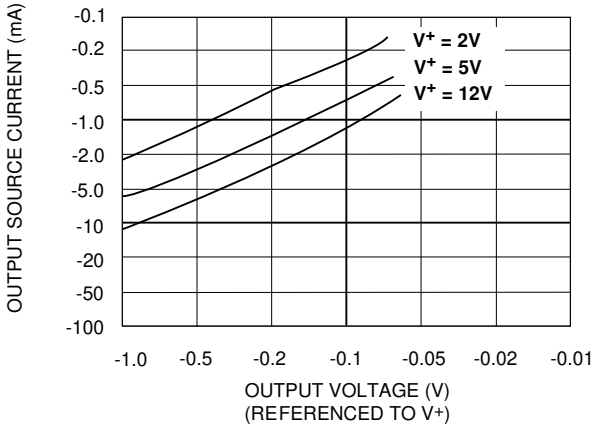


TYPICAL PERFORMANCE CHARACTERISTICS (cont'd)

OUTPUT SINK CURRENT AS A FUNCTION OF OUTPUT VOLTAGE

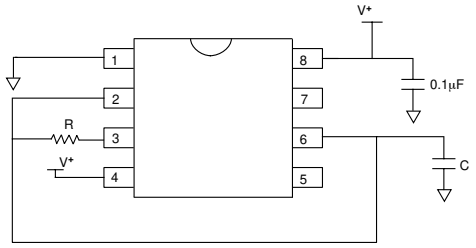


OUTPUT SOURCE CURRENT AS A FUNCTION OF OUTPUT VOLTAGE



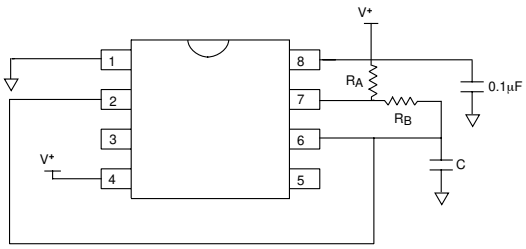
TYPICAL APPLICATIONS

ASTABLE MODE OPERATION 50% DUTY CYCLE



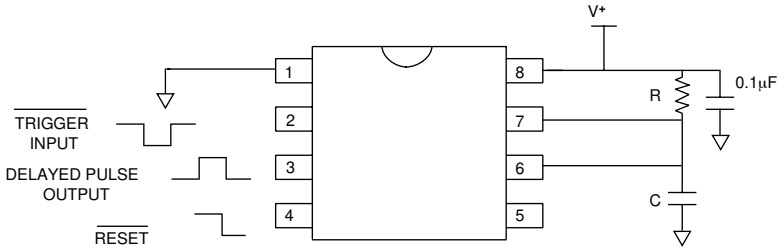
Frequency f = 1/ (1.4 R_C)

ASTABLE MODE OPERATION (FREE RUNNING OSCILLATOR)



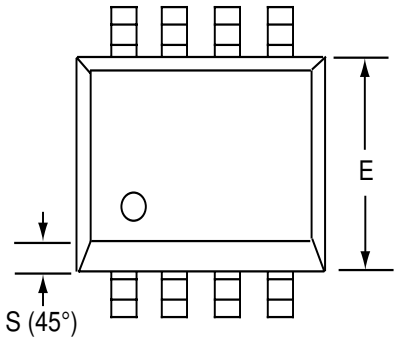
Frequency f = 1.46 / (R_A + 2R_B)C
Duty Cycle DC = R_B / (R_A + 2R_B)

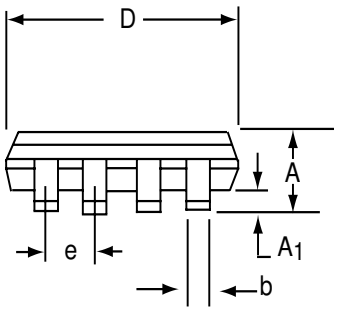
MONOSTABLE MODE OPERATION (ONE SHOT PULSE)
Pulse Delay t_d = 1.1 R_C

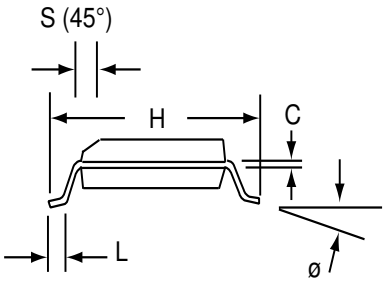


SOIC-8 PACKAGE DRAWING

8 Pin Plastic SOIC Package



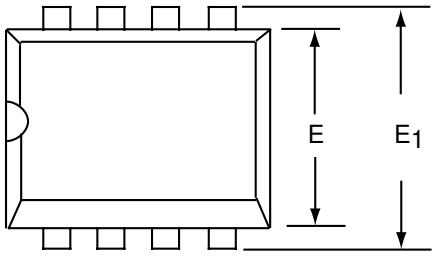


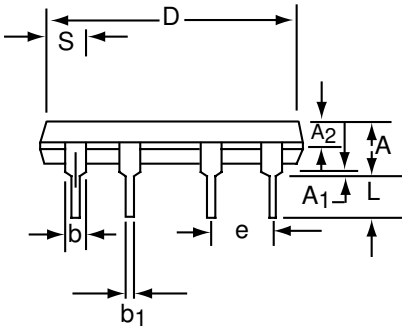


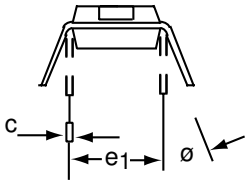
Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.25	0.004	0.010
b	0.35	0.45	0.014	0.018
C	0.18	0.25	0.007	0.010
D-8	4.69	5.00	0.185	0.196
E	3.50	4.05	0.140	0.160
e	1.27 BSC		0.050 BSC	
H	5.70	6.30	0.224	0.248
L	0.60	0.937	0.024	0.037
Ø	0°	8°	0°	8°
S	0.25	0.50	0.010	0.020

PDIP-8 PACKAGE DRAWING

8 Pin Plastic DIP Package



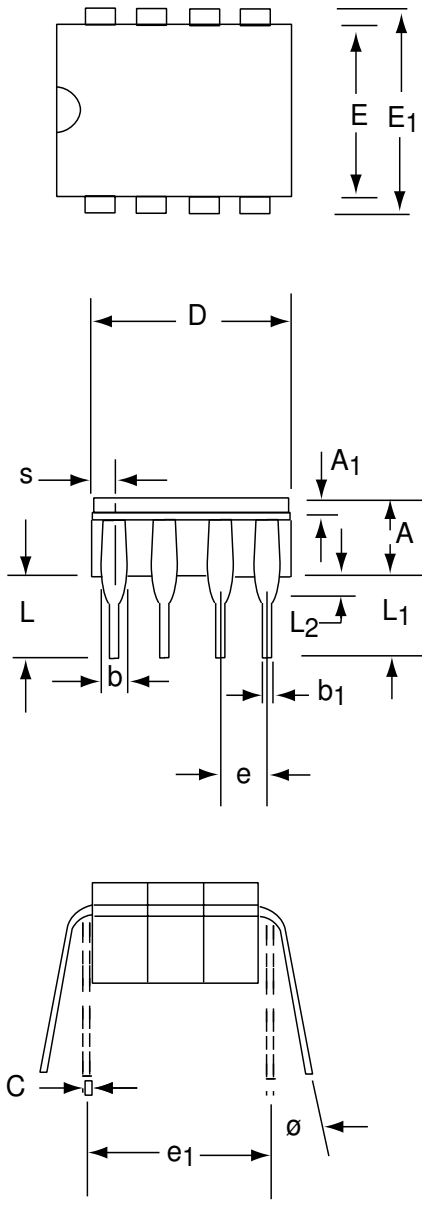




Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	3.81	5.08	0.105	0.200
A_1	0.38	1.27	0.015	0.050
A_2	1.27	2.03	0.050	0.080
b	0.89	1.65	0.035	0.065
b_1	0.38	0.51	0.015	0.020
c	0.20	0.30	0.008	0.012
D-8	9.40	11.68	0.370	0.460
E	5.59	7.11	0.220	0.280
E_1	7.62	8.26	0.300	0.325
e	2.29	2.79	0.090	0.110
e_1	7.37	7.87	0.290	0.310
L	2.79	3.81	0.110	0.150
S-8	1.02	2.03	0.040	0.080
ø	0°	15°	0°	15°

CERDIP-8 PACKAGE DRAWING

8 Pin CERDIP Package



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	3.55	5.08	0.140	0.200
A_1	1.27	2.16	0.050	0.085
b	0.97	1.65	0.038	0.065
b_1	0.36	0.58	0.014	0.023
C	0.20	0.38	0.008	0.015
D-8	--	10.29	--	0.405
E	5.59	7.87	0.220	0.310
E_1	7.73	8.26	0.290	0.325
e	2.54 BSC		0.100 BSC	
e_1	7.62 BSC		0.300 BSC	
L	3.81	5.08	0.150	0.200
L_1	3.18	--	0.125	--
L_2	0.38	1.78	0.015	0.070
S	--	2.49	--	0.098
Ø	0°	15°	0°	15°