



### 概述：

SA555DR是一块精确时间脉冲控制电路。当工作在单稳态模式时，延迟可通过外接的一只电阻和一只电容来控制；当工作在多谐振荡模式时，频率和占空比可通过外接的两只电阻和一只电容来控制。

SA555DR采用DIP-8、SOP-8(SOIC-8)的封装形式封装。

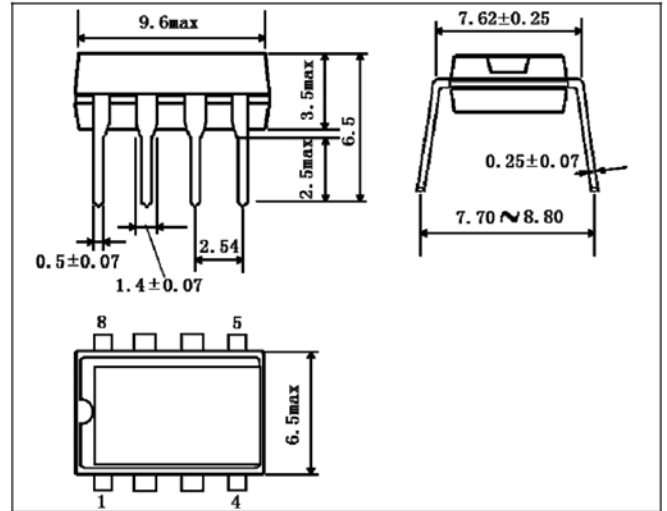
### 主要特点：

- 👉 输出电流大 (200mA)
- 👉 占空比可调
- 👉 温度稳定性高：0.005%/°C
- 👉 定时可从微秒级至小时级
- 👉 关闭时间小于 2微秒

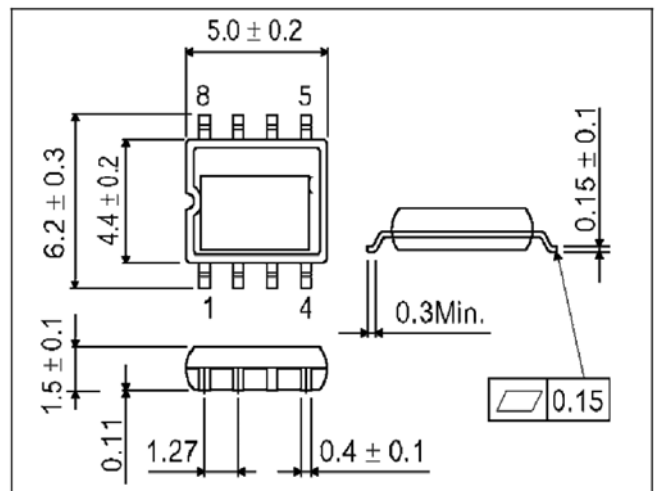
### 应用：

- 👉 精密计时器
- 👉 脉冲发生器
- 👉 延时发生器
- 👉 顺序计时器

### 封装外形图：



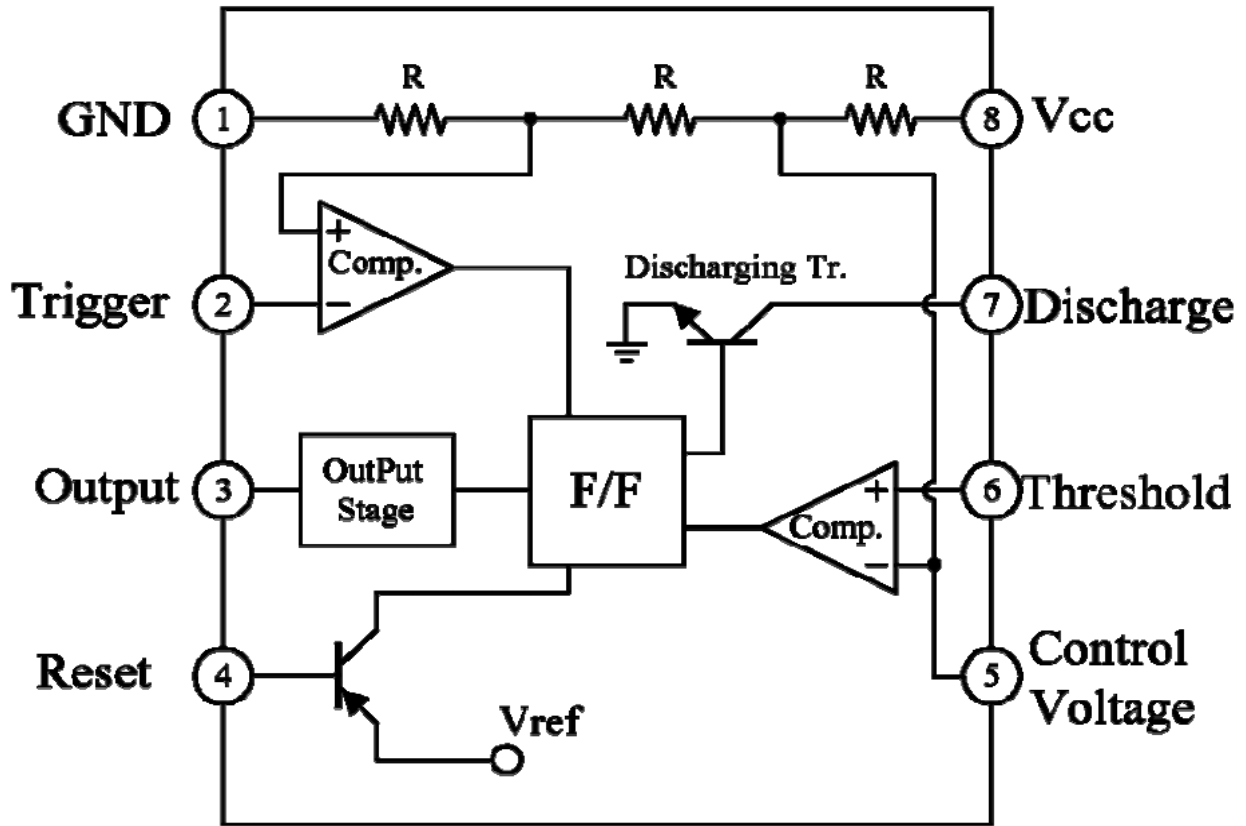
DIP-8



SOP-8(SOIC-8)



功能框图与管脚排列图:



极限值: (Ta=25 °C)

参数名称	符号	数值	单位
电源电压	Vcc	16	V
功耗	Pd	600	mW
工作温度	Topr	- 0 ~+ 70	°C
贮存温度	Tstg	- 65 ~+ 150	°C
焊接温度 (10 秒焊接)	T <sub>LEAD</sub>	300	°C



电特性:

(若无其它规定:  $V_{CC}=5\sim 15V$ ,  $T_a=25^\circ C$ )

参数名称	符号	测试条件	最小	典型	最大	单位
电源电压	$V_{CC}$		4.5		16	V
静态电流(输出低电平)*	$I_{CC}$	$V_{CC}=5V, R_L = \infty$		3	6	mA
		$V_{CC}=15V, R_L = \infty$		7.5	15	
计时误差(单稳态)初始精度** 温度漂移 电源电压漂移	ACCUR $\Delta t / \Delta T$ $\Delta t / \Delta V_{CC}$	$R_A=1k\Omega$ to $100k\Omega$ $C=0.1\mu F$		1.0 50 0.1	3.0 0.5	% ppm/ $^\circ C$ %/V
计时误差(多谐振荡)初始精度** 温度漂移**** 电源电压漂移****	ACCUR $\Delta t / \Delta T$ $\Delta t / \Delta V_{CC}$	$R_A=1k\Omega$ to $100k\Omega$ $C=0.1\mu F$		2.25 150 0.3		% ppm/ $^\circ C$ %/V
控制电压	$V_C$	$V_{CC}=15V$	9.0	10.0	11.0	V
		$V_{CC}=5V$	2.6	3.33	4.0	
阈值电压	$V_{TH}$	$V_{CC}=15V$		10.0		V
		$V_{CC}=5V$		3.33		
阈值电流***	$I_{TH}$			0.1	0.25	$\mu A$
触发电压	$V_{TR}$	$V_{CC}=5V$	1.1	1.67	2.2	V
		$V_{CC}=15V$	4.5	5	5.6	
触发电流	$I_{TR}$	$V_{TR}=0V$		0.01	2.0	$\mu A$
复位电压	$V_{RST}$		0.4	0.7	1.0	V
复位电流	$I_{RST}$			0.1	0.4	mA
输出低电平	$V_{OL}$	$V_{CC}=15V$ $I_{SINK}=10mA$ $I_{SINK}=50mA$		0.06 0.3	0.25 0.75	V
		$V_{CC}=5V$ $I_{SINK}=5mA$		0.05	0.35	
输出高电平	$V_{OH}$	$V_{CC}=15V$ $I_{SOURCE}=200mA$ $I_{SOURCE}=100mA$	12.75	12.5 13.3		V
		$V_{CC}=5V$ $I_{SOURCE}=100mA$	2.75	3.3		
输出上升时间	tR			100		ns
输出下降时间	tF			100		ns
卸放端漏电流	$I_{LKG}$			20	100	nA

\* 当输出高电平时, 电流比  $V_{CC}=5V$  时的输出低电平电流小 1mA 左右。

\*\* 测试条件为  $V_{CC}=5.0V$  及  $V_{CC}=15V$ 。

\*\*\* 该值将决定  $R_A + R_B$  在 15V 工作条件下的最大值, 最大总电阻  $R=20M\Omega$ , 在 5V 工作条件下, 最大总电阻  $R=6.7M\Omega$ 。



应用概要:

下表为 SA555DR 计时器基本工作表:

阈值电压 (Vth)(PIN6)	触发电压 (Vtr)(PIN2)	复位(PIN4)	输出(PIN3)	卸放端三极管 (PIN7)
—	—	低	低	开
$V_{th} > 2 V_{cc} / 3$	$V_{tr} > 2 V_{cc} / 3$	高	低	开
$V_{cc} / 3 < V_{th} < 2 V_{cc} / 3$	$V_{cc} / 3 < V_{tr} < 2 V_{cc} / 3$	高		
$V_{th} < V_{cc} / 3$	$V_{tr} < V_{cc} / 3$	高	高	关

当复位端加低电平信号时，电路输出为低，且不受阈值电压和触发电压的控制。仅当复位端加高电平信号时，电路输出才受阈值电压和触发电压的控制。

当电路输出高电平时，在阈值电压端加上超过电源电压  $2/3$  的电压值时，电路内部卸放端三极管开启，阈值电压被拉低到电源电压的  $1/3$ 。在此期间，电路保持输出低电平，稍后，若触发电压端加上低于电源电压  $1/3$  的电压值时，电路内部卸放端三极管关闭，从而升高阈值电压，并使电路再一次输出高电平。

应用图:

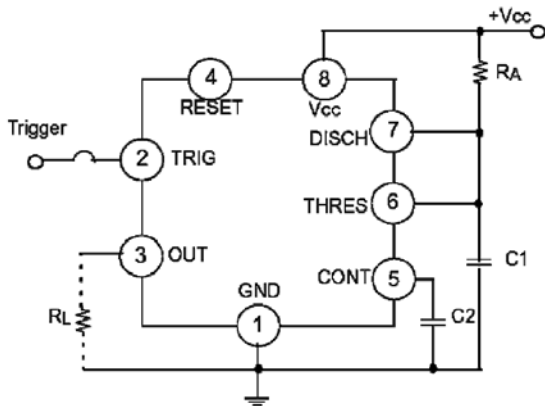


图1: 单稳态电路

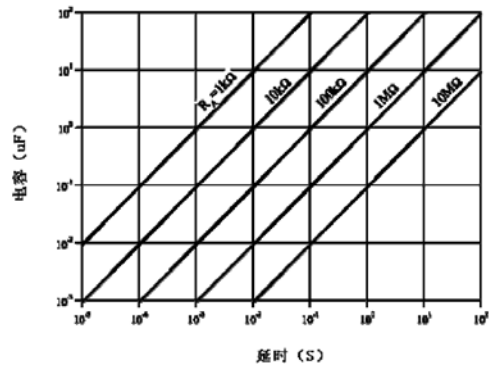


图2: 电阻、电容与延时 (td)

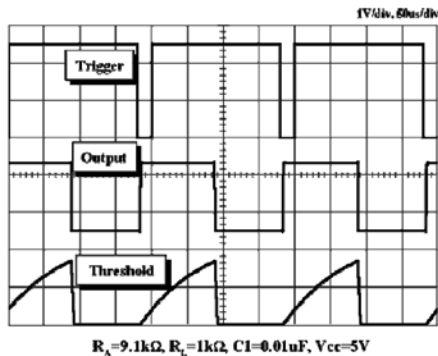


图3 单稳态工作时波形

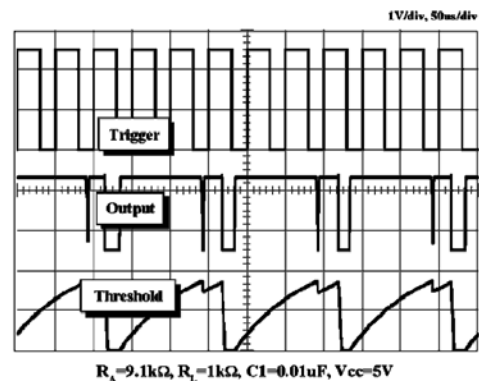


图4 单稳态工作波形 (非正常)

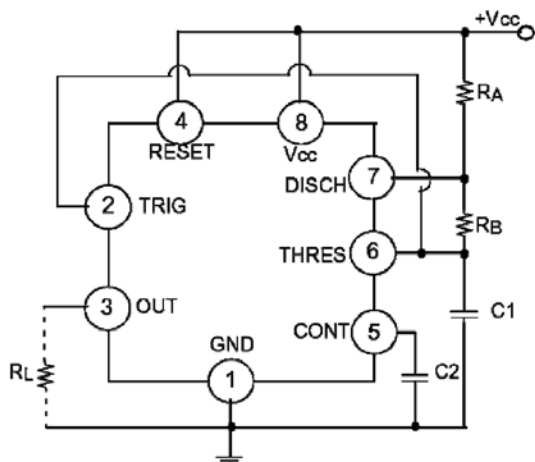


图5 多谐振荡电路

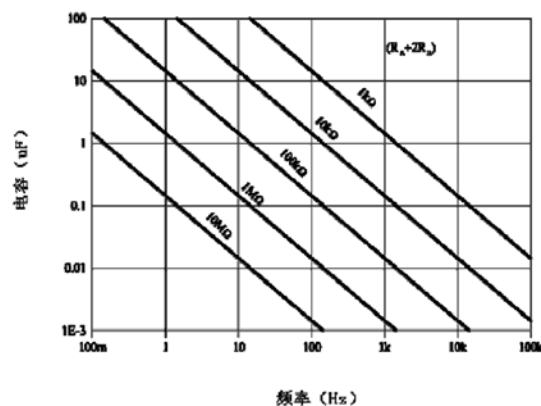
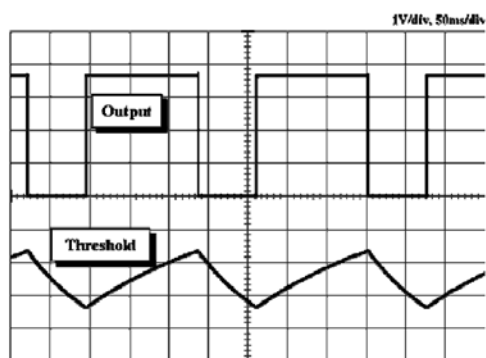
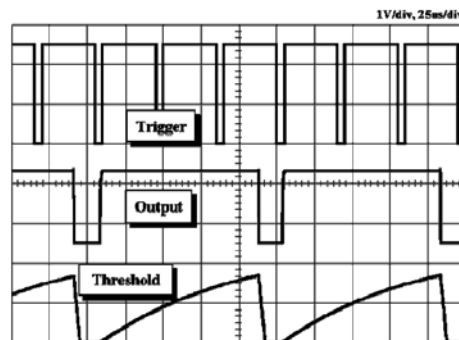


图6 电容、电阻与频率



$R_A=1k\Omega, R_B=1k\Omega, R_L=1k\Omega, C_1=1\mu F, V_{CC}=5V$

图7 多谐振荡工作波形



$R_A=9.1k\Omega, R_L=1k\Omega, C_1=0.01\mu F, V_{CC}=5V$

图8 分频器工作波形

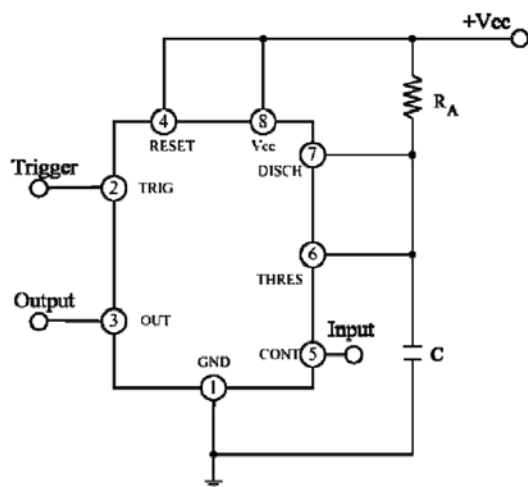
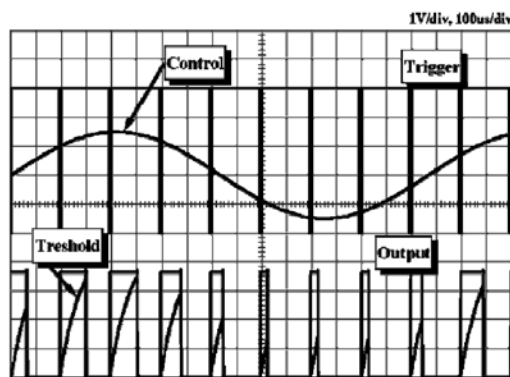


图9 脉宽调制电路



$R_A=9.1k\Omega, R_L=1k\Omega, C_1=0.01\mu F, V_{CC}=5V$

图10 脉宽调制工作波形

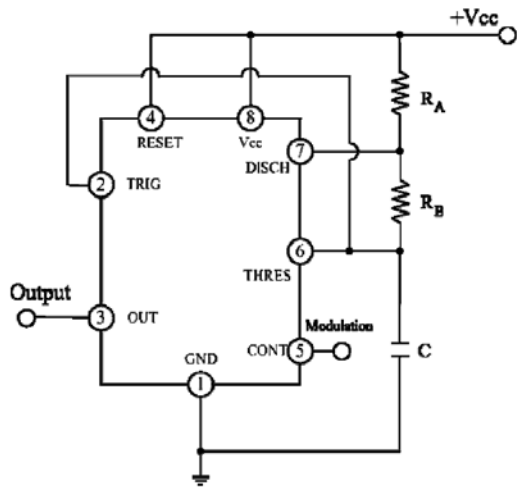


图11 脉位调制电路

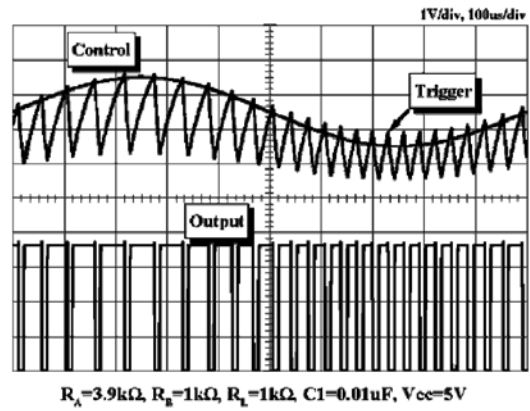


图12 脉位调制工作波形

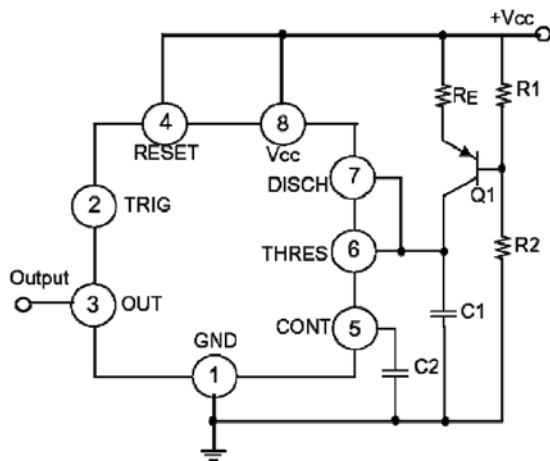


图13 线性斜坡电路

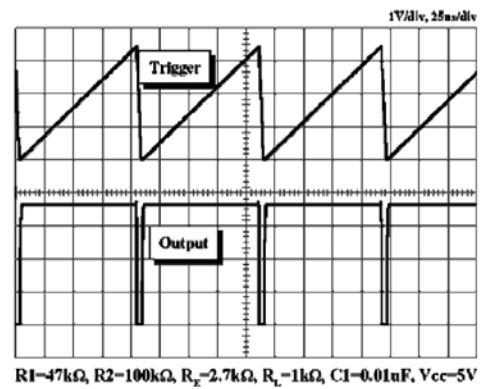


图14 线性斜坡工作波形



### Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.