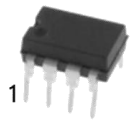
Product Features:

- Good Timing Accuracy
- Strong output driving ability
- Good temperature stability
- The maximum operating frequency can reach over 500KHZ
- Compatible with TTL circuits
- Packaging form:SOP8、DIP8、MSOP8
- The timing can range from microseconds to hours (can be precisely controlled through external resistors and capacitors)



DIP-8

SOP-8

MSOP-8

Package Information

Product Name	Packaging	Silk Printing Name	Package	Package Quantity
NE555N	DIP-8	NE555	Tube	2000 pcs/ctn
NE555M/TR	SOP-8	NE555	Reel	2500 pcs/reel
NE555MM/TR	MSOP-8	NE555	Reel	3000 pcs/reel
SA555N	DIP-8	SA555	Tube	2000 pcs/ctn
SA555M/TR	SOP-8	SA555	Reel	2500 pcs/reel
SA555MM/TR	MSOP-8	SA555	Reel	3000 pcs/reel

Product Introduction :

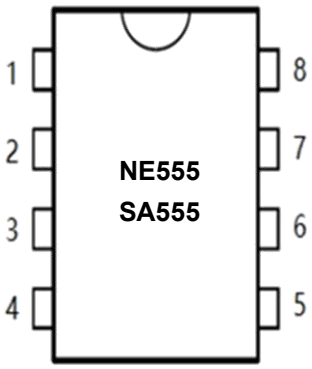
NE555/SA555 is a bipolar integrated circuit that can generate high-precision timing pulses. The internal circuit consists of four parts: threshold comparator, trigger comparator, RS trigger, and output circuit. It can be composed of timing trigger circuits, pulse width modulation circuits, audio oscillators, and other circuits by connecting a small number of external resistive and capacitive devices. Widely used in fields such as toys, signal transportation,automation control, etc.

Product Application :

- Audio pulse generator, frequency divider
- Equipment timing, traffic light control, access control
- Pulse width modulation,pulse phase modulation
- Industrial control

Packaging form :

DIP8/SOP8/MSOP8



Pin Function Definition :

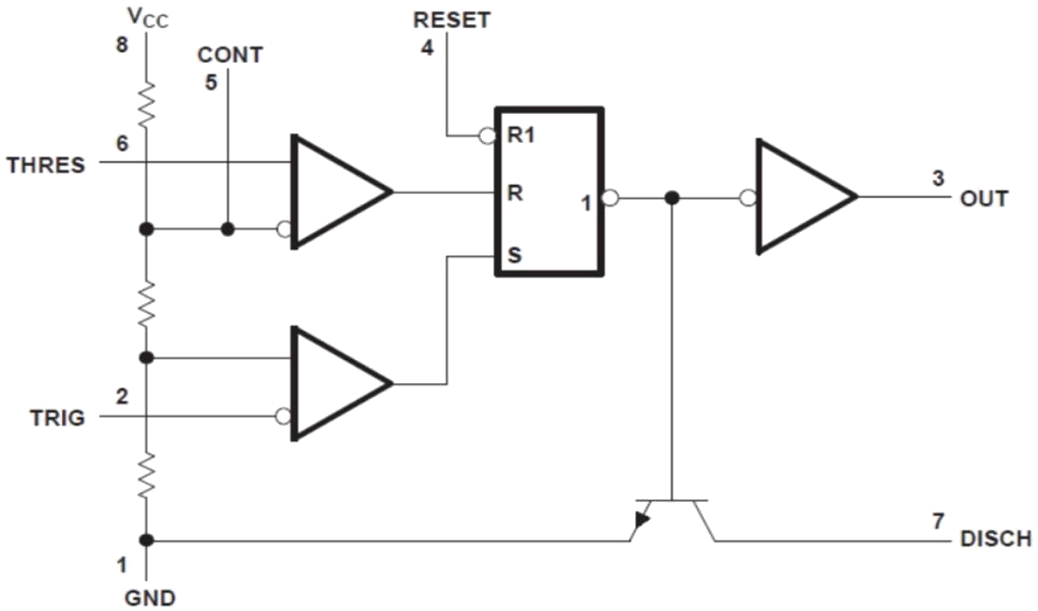
Pin serial number	Pin Definition	Pin Function Description
1	GND	Power supply ground
2	Trig	trigger
3	Output	Output
4	Reset	Reset
5	Cont	Control Voltage
6	Thres	Threshold
7	Disch	Discharge
8	VCC	Power supply positive

Limit Value

Parameter	Symbol	Limit Value	Unit
Power Supply Voltage	VCC	18	V
Input Voltage	VI(thre, trig, cont, reset)	VCC	V
Output Voltage	Io	±220	mA
Dissipated Power	P_D	400	mW
Operating Temperature NE555	T_A	0 ~ 70	℃
Operating Temperature SA555		-40 ~ 85	℃
Storage Temperature	T_S	-65 ~ 150	℃
Welding Temperature	T_W	260,10s	℃

Note: Limit parameters refer to the limit values that cannot be exceeded under any conditions. If this limit value is exceeded, it may cause physical damage such as product deterioration; At the same time, it cannot be guaranteed that the chip can operate normally when approaching the limit parameters.

Schematic Diagram



Recommended Electrical Parameters :

Item	Symbol	Parameter Value	Unit
Power Supply Voltage	VCC	4.5 ~ 15	V
Max Input Voltage	Vth, Vtrig, Vcont, Vreset	VCC	V
Output Current	Io	±200	mA

Electrical Characteristics ： TA=25℃，（Unless otherwise specified）

Item	Symbol	Condition		Min	Typ	Max	Unit
Operating Voltage	V_{CC}			4.5	-	15	V
Operating Current	I_{CC}	VCC =5V, RL =∝,VO=VOL		-	3	6	mA
		VCC =5V, RL =∝,VO=VOH		-	1.5	5	mA
		VCC =15V, RL =∝, VO=VOL		-	8	15	mA
		VCC =15V, RL =∝,VO=VOH		-	6	13	mA
Control Terminal Voltage	V_{CL}	VCC =15V		-	10.0	11	V
		VCC =5V		-	3.3	4	V
Threshold Voltage Terminal Voltage	V_{TH}	VCC =15V		-	10.0	11.2	V
		VCC =5V		-	3.3	4.2	V
Threshold voltage and current	I_{TH}*note1	VCC =15V, VTH =0V		-	-	250	nA
Trigger Terminal Voltage	V_{TRIG}	VCC =15V		-	5.0	5.6	V
		VCC =5V		-	1.6	2.2	V
Trigger terminal current	I_{TRIG}	VCC =15V, VTRIG =0V,		-	-	2	uA
Reset Terminal high voltage	V_{RESETH}	VCC =5V		1.5	-	VCC	V
Reset terminal Low Voltage	V_{RESETL}	VCC =5V		GND	-	0.5	V
Reset Terminal Current	I_{RESET}	VRESET =0.4V,VCC =15V		-	0.13	0.4	mA
		VRESET =0V,VCC =15V		-	O.3	1.5	mA
Output Low Voltage	V_{OL}	VCC =15V, IL =-5mA		-	0.02	0.25	V
		VCC =15V, IL =-50mA		-	0.04	0.75	
		VCC =15V, IL =-100mA		-	2.0	2.5	
		VCC =15V, IL =-200mA		-	2.8	-	
		VCC =5V, IL =-5mA		-	0.08	0.35	
		VCC =5V, IL =-8mA			0.15	0.4	
Output High Voltage	V_{OH}	VCC =15V, IL =-100mA		12.75	13.3	-	V
		VCC =15V, IL =-200mA		-	12.2	-	
		VCC =5V, IL =-100mA		2.75	3.3	-	
Discharge tube closing leakage current	Idis (off)	VO=VOH, Vdis = 10V		-	-	100	nA
Discharge Tube Saturation Voltage	Vdis(sat)	VO=VOL	VCC=15V,Idis=15mA	-	140	480	mV
			VCC=5V,Idis=4.5mA	-	100	200	mV
Output rising edge time	t_R	CL=15pF，		-	80	300	ns
Output falling edge time	t_F	CL=15pF		-	50	300	ns
Timing error (monostable state)	T_S*note2	RA=2kΩ至100kΩ C=0.1uF	VCC=15V,initial error	-	1	-	%
	Tv		Drift with power supply voltage（4.5V ~ 15V）	-	0.1	-	%/V
	Tt		VCC=15V,随温度漂移（0 ~ 60℃）	-	150	-	ppm℃
Timing error (non steady state)	T_S*note2	RA,RB=1kΩ至 100kΩ C=0.1uF	VCC=15V,initial error	-	1	-	%
	Tv		Drift with power supply voltage（4.5V ~ 15V）	-	0.1	-	%/V
	Tt		VCC=15V,随温度漂移（0 ~ 60℃）	-	150	-	ppm℃

Notes：

1. At Vcc=15V, the maximum value of Ra+Rb is 10M Ω; At Vcc=5V, the maximum value of Ra+Rb is 3.4M Ω.
2. Timing error is defined as the difference between the measured value and the average value of the random sample. At th e same time, timing errors are affected by errors in external capacitors and resistors.

Typical application lines

Monostable state: In monostable state mode, when the input level reaches 1/3 Vcc, the circuit triggers the output high l evel and maintains t=1.1 * RA * C for a time, the output becomes low level. During time t, regardless of the input level, t he output state is not affected. The circuit and waveform are shown in Figures 3 and 4.

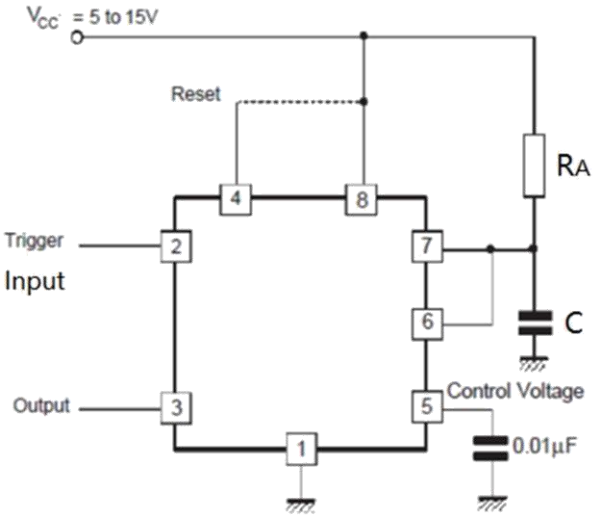


Fig 3 Monostable circuit

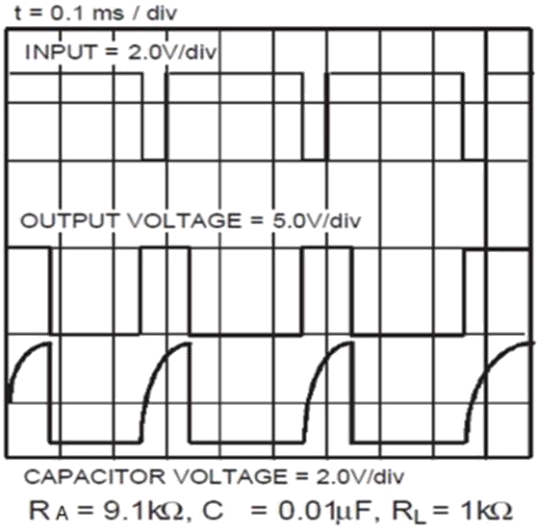


Fig 4 Monostable waveform

Non steady state: In non steady state mode, the circuit will automatically trigger and output as a square wave multi har monic oscillator. The output square wave frequency and duty cycle can be adjusted by the size of RA, RB, and C. The trig gering mode, charging and discharging time, and frequency are independent of the power supply voltage. The circuit an d waveform are shown in Figures 5 and 6.

Output high-level pulse width th=0.693*(RA+RB)*C; Low level pulse width tl=0.693*RB*C; T=th+tl=0.693(RA+ 2RB)C; Frequence f=1/T=1.44/(RA*C+2RB*C); Duty Cycle D=tl/T=RB/(RA+2RB)。

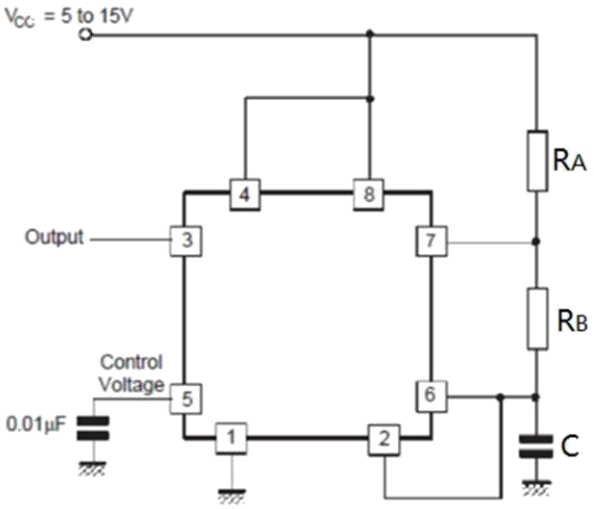


Fig 5 astable circuit

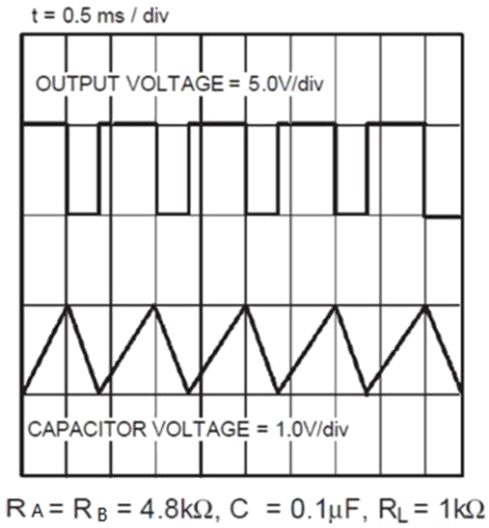


Fig 6 Non-stationary waveform

Pulse width modulation:

When the timer is connected in monostable mode and triggered by a continuous pulse train applied to pin 2, the output pulse width can be modulated by the signal applied to pin 5. See Figures 7 and 8.

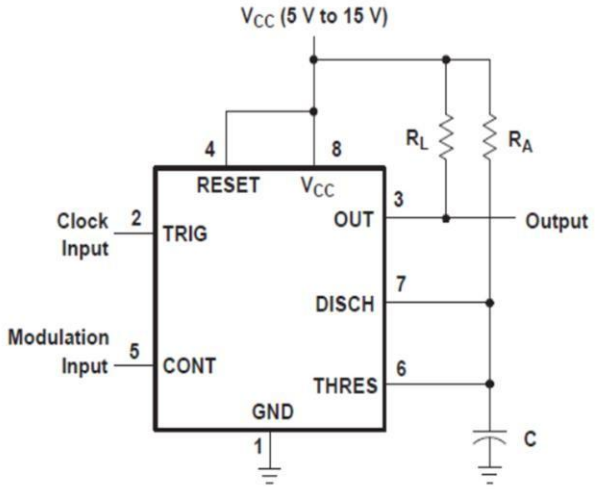


Fig 7 Pulse width modulation circuit

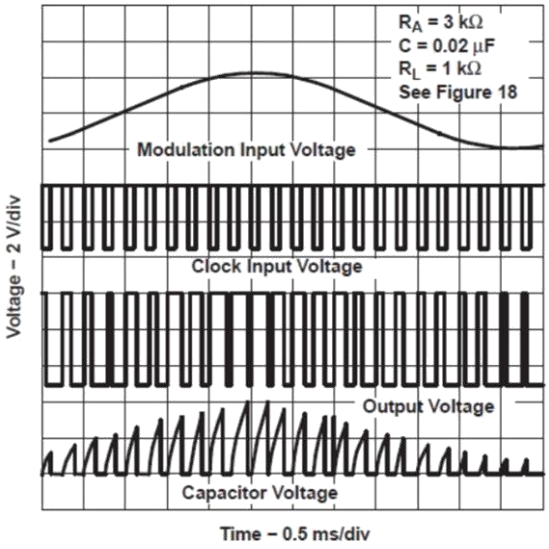


Fig 8 Pulse width modulation circuit waveform diagram

Pulse-position modulation: When the timer is connected by the way in Figure 9, the output pulse position can be modulated by the signal applied to pin 5. See Figures 9 and 10.

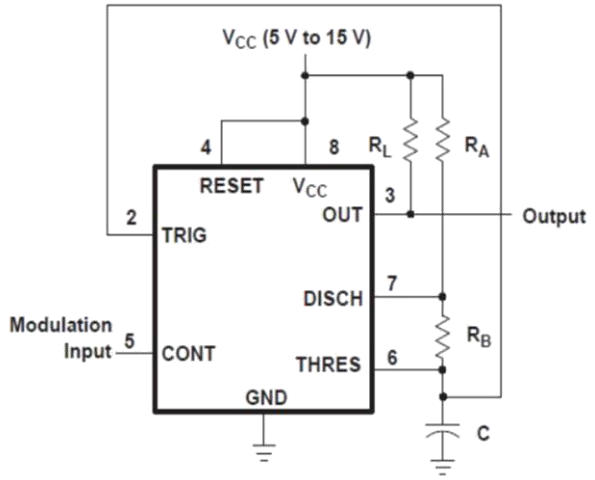


Fig 9 Pulse-position modulation circuit

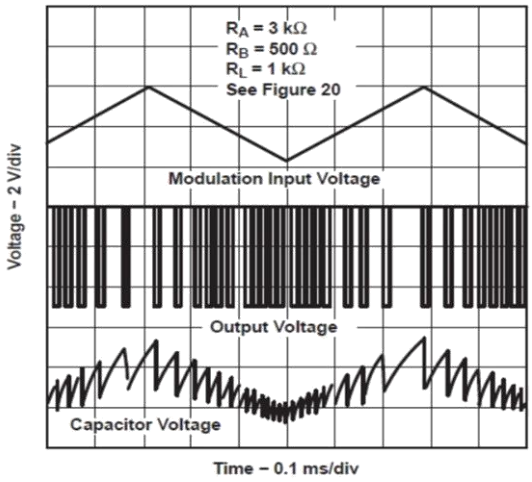
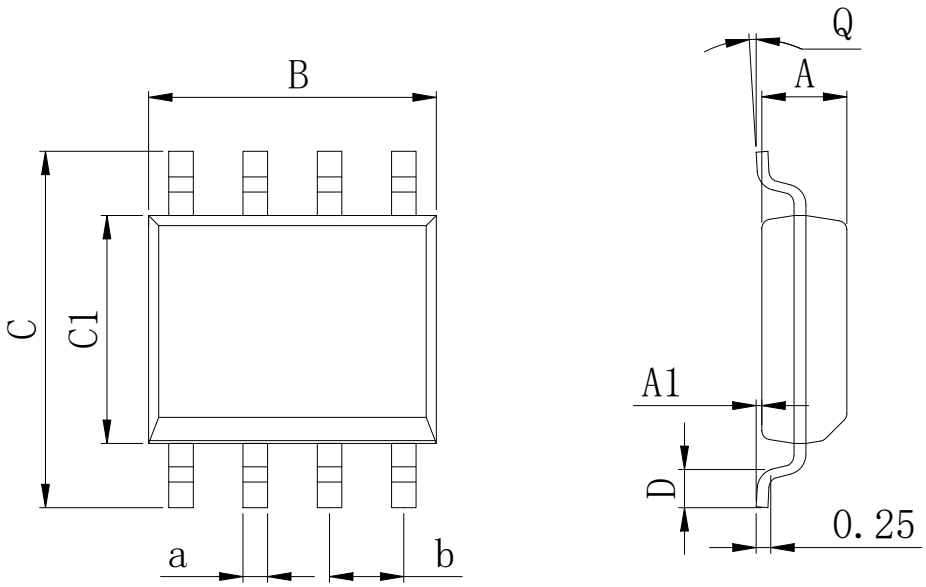


Fig 10 Pulse-position modulation circuit waveform diagram

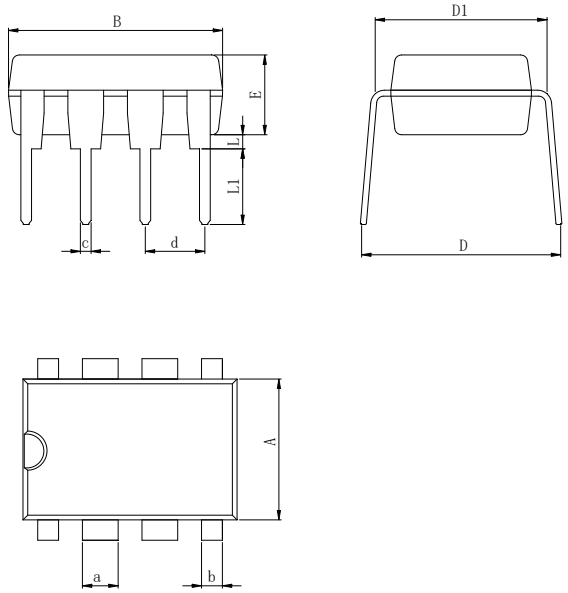
Packaging Dimensions

SOP8 （150mil）



Dimensions In Millimeters(SOP8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

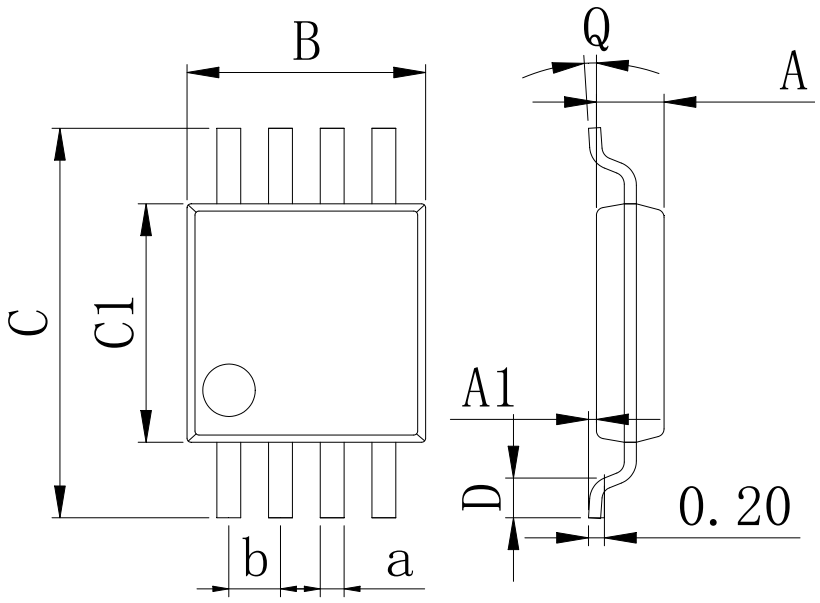
DIP8



Dimensions In Millimeters(DIP8)											
Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	9.00	8.40	7.42	3.10	0.50	3.00	1.50	0.85	0.40	2.54 BSC
Max:	6.68	9.50	9.00	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

Packaging Dimensions

MSOP8



Dimensions In Millimeters(MSOP8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

Important statement:

Huaguan Semiconductor reserves the right to make unauthorized changes to the products and services provided. Customers should obtain the latest relevant information and verify whether it is up-to-date and complete before placing an order. Huaguan Semiconductor assumes no responsibility or obligation for tampered documents. Customers are responsible for complying with safety standards and taking safety measures when using Huaguan Semiconductor products for system design and overall manufacturing. You will take full responsibility for: selecting the appropriate Huaguan Semiconductor product for your application; Design, validate, and test your application; Ensure that your application meets the corresponding standards and any other safety, security or other requirements. To avoid potential risks that may lead to personal injury or property damage. Huaguan Semiconductor products have not been licensed for applications in life support, military, aerospace and other fields, and Huaguan Semiconductor will not bear the consequences of product applications in these fields. All issues, liabilities, and losses arising from the user's use of the product beyond its applicable field shall be borne by the user, and shall not be related to Huaguan Semiconductor. The user shall not claim any compensation liability from Huaguan Semiconductor based on the terms of this agreement. The performance of semiconductor products produced by Huaguan Semiconductor provides technical and reliability data (including data sheets), design resources (including reference designs), application or other design suggestions, network tools, safety information, and other resources. We do not guarantee the absence of defects and do not make any express or implied warranties. The use of testing and other quality control technologies is limited to the quality assurance scope of Huaguan Semiconductor. Not all parameters of each device need to be detected. Huaguan Semiconductor's documentation authorizes you to only use these resources for the application of the products described in this document. You have no right to use any other Huaguan Semiconductor intellectual property or any third-party intellectual property. It is strictly prohibited to make other copies or displays of these resources. You should fully compensate Huaguan Semiconductor and its agents for any claims, damages, costs, losses, and debts caused by the use of these resources. Huaguan Semiconductor is not responsible for this.