Datasheet

Switching Spark Gap (SSG)

Series / Models	2RK-8 Series
Product Code	10.12.84.XXXX 10.12.85.XXXX
Version	A2
Date	2025-06-13
File Number	SP-GDT-036

Version History

Version	Date	Page	Description	Author
A0	2016-06-25	/	Initial draft	George Hu
A1	2023-02-07	Page 4,5	Update Electrical Characteristics	George Hu
A2	2025-06-13	Page 1,2,3,4	1. Add cover and version history 2. Update Description 3. Delete some models	Xia Wu

Description

The principle of gas discharge is used not only for overvoltage protection but also in switching applications. Ignition performance is determined to a large degree by the properties of the switching component. An extremely fast switch is called for, which operates virtually without loss and with high insulation resistance in the non-conducting state. It should also be as compact as possible, rugged, highly reliable, and capable of operating over a wide temperature range.

The 2RK-8 series switching spark gap (SSG) is a device that offers axial leads or surface mount packaging. It is not only small in size and easy to install on various compact printed circuit boards (PCBs), but also has excellent performance. Unlike gas discharge tubes, switching spark gaps (SSGs) are active components that work reliably even after igniting hundreds of thousands of times. They can be used in all applications where high voltage pulses are generated, for example to ignite modern high-pressure gas discharge lamps such as xenon lamps in automotive headlights.

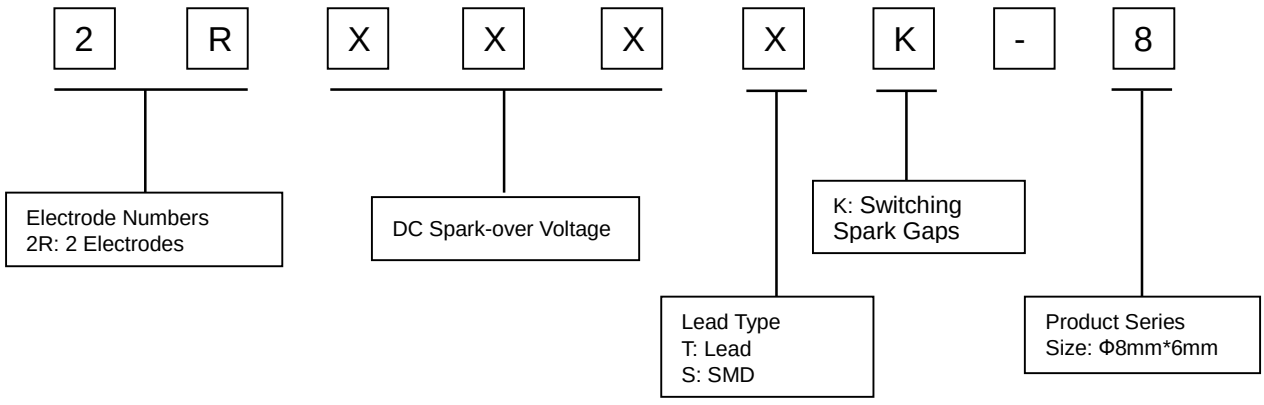
Features

- Extremely long life time
- Stable performance over life
- Insensitive performance against variations in temperature
- Low switching losses
- Very short breakdown time
- High reliability by robust design
- Non-Radioactive

Applications

- Igniters for architectural and automotive Xenon discharge lamps
- Electronic igniters for gas heating and gas domestic appliances, e.g., cookers
- Ignition of ultra-high pressure gas discharge lamps for data and video projectors

Part Number Code



Electrical Characteristics

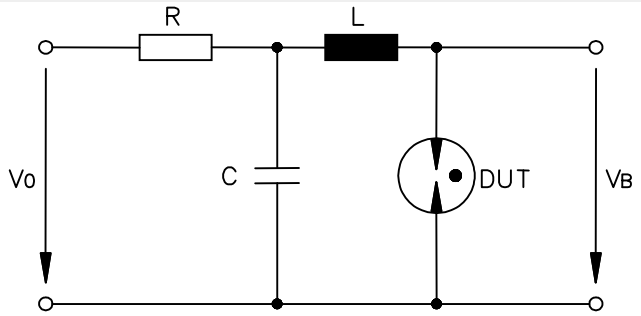
Part Number	2R230TK-8 2R230SK-8	2R300TK-8 2R300SK-8	2R350TK-8 2R350SK-8	2R400TK-8 2R400SK-8	Units
Initial Values					
Static Breakdown Voltage V_S @100V/S [1]					
First ignition Value after 24 hours in darkness	<275	<360	<420	<470	V
Following Ignition Values	207~253	270~330	315~385	360~440	V
Electrical Life Time					
Breakdown Voltage V_B [2]					
First ignition Value after 24 hours in darkness	<285	<370	<435	<500	V
Following Ignition Values	196~265	255~350	300~405	340~460	V
Switching Operations @ +25°C	2×10^5	2×10^5	2×10^5	2×10^5	Ignitions
Breakdown Time	<50	<50	<50	<50	ns
Maximum Switching Frequency	100	200	200	200	Hz
Test Circuit Parameters					
Open Circuit Voltage V_0	230 V_{AC}	400	450	520	V
Loading Resistance R	15	10	10	10	KΩ
Discharge Capacitance C	2200	680	680	680	nF
Inductance L	10	0.5	0.5	0.5	μH
Discharge Peak Current I_P	~300	~500	~500	~500	A
Insulation Resistance @100 V	>10^8	>10^8	>10^8	>10^8	Ω
Capacitance @1MHz	<1.5	<1.5	<1.5	<1.5	pF
Weight DIP	~1.50	~1.50	~1.50	~1.50	g
SMD	~1.25	~1.25	~1.25	~1.25	g
Operation and storage temperature	-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)	40/125/21	40/125/21	40/125/21	40/125/21	
Marking, red negative	**RUILON 230K Y**	**RUILON 300K Y**	**RUILON 350K Y**	**RUILON 400K Y**	
Surface treatment DIP	Nickel Plated				
SMD	Matte-tin plated				
Moisture sensitivity level [3]	1				

Switching Spark Gap (SSG) 2RK-8 Series

Part Number		2R470TK-8 2R470SK-8	2R500TK-8 2R500SK-8	2R600TK-8 2R600SK-8	2R800TK-8 2R800SK-8	Units
Initial Values						
Static Breakdown Voltage V_S @100V/S [1]						
First ignition Value after 24 hours in darkness		<560	<600	<720	<950	V
Following Ignition Values		423~517	450~550	540~660	720~880	V
Electrical Life Time						
Breakdown Voltage V_B [2]						
First ignition Value after 24 hours in darkness		<585	<625	<750	<1000	V
Following Ignition Values		400~540	425~575	510~690	680~920	V
Switching Operations @ +25°C		2×10^5	2×10^5	2×10^5	2×10^5	Ignitions
Breakdown Time		<50	<50	<50	<50	ns
Maximum Switching Frequency		200	200	200	200	Hz
Test Circuit Parameters						
Open Circuit Voltage V_0		600	630	750	1000	V
Loading Resistance R		10	13	13	68	KΩ
Discharge Capacitance C		680	470	470	100	nF
Inductance L		0.5	0.1	0.1	0.5	μH
Discharge Peak Current I_P		~500	~600	~600	~400	A
Insulation Resistance @100 V		$>10^8$	$>10^8$	$>10^8$	$>10^8$	Ω
Capacitance @1MHz		<1.5	<1.5	<1.5	<1.5	pF
Weight	DIP	~1.50	~1.50	~1.50	~1.50	g
	SMD	~1.25	~1.25	~1.25	~1.25	g
Operation and storage temperature		-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)		40/125/21	40/125/21	40/125/21	40/125/21	
Marking, red negative		**RUILON 470K Y**	**RUILON 500K Y**	**RUILON 600K Y**	**RUILON 800K Y**	
Surface treatment	DIP	Nickel Plated				
	SMD	Matte-tin plated				
Moisture sensitivity level [3]		1				

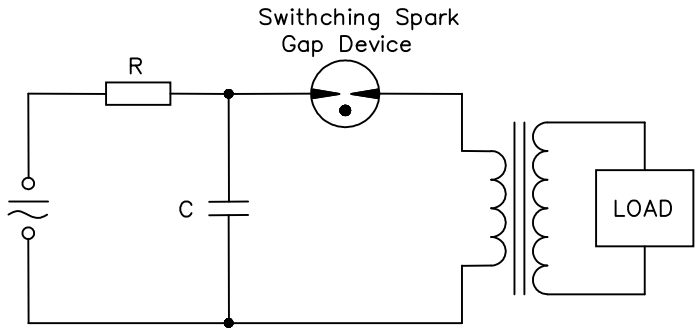
1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) Fig. 1.
3) Tests according to JEDEC J-STD-020.

Test Circuit Fig. 1



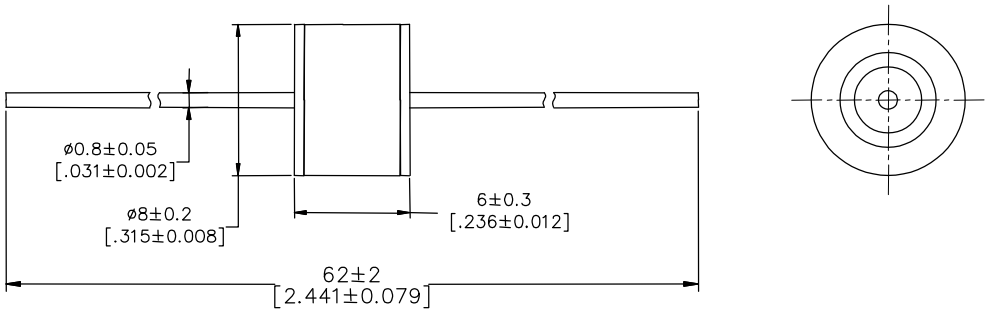
DUT Device under test
V_B Breakdown voltage
V_0, R, L and C Parameters see above table

Basic Application Circuit Fig. 2

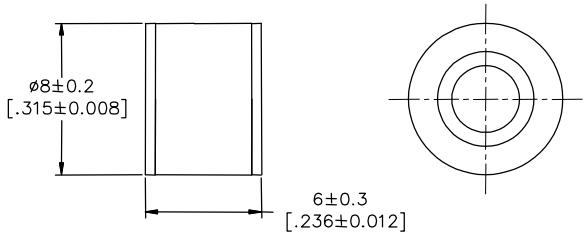


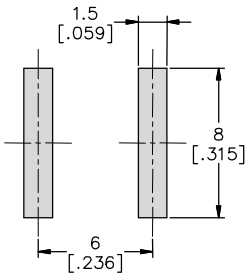
Dimensions (Unit: mm/inch)

DIP axial leads series (2RxxxTK-8)



SMD Series (2RxxxSK-8)



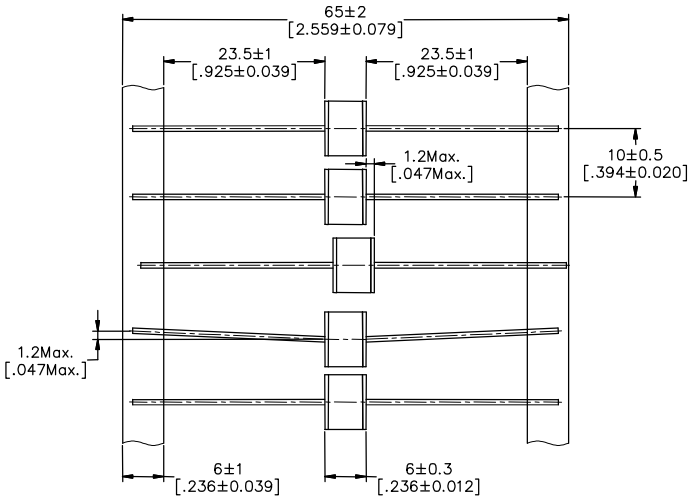


Recommended Soldering Pad Layout

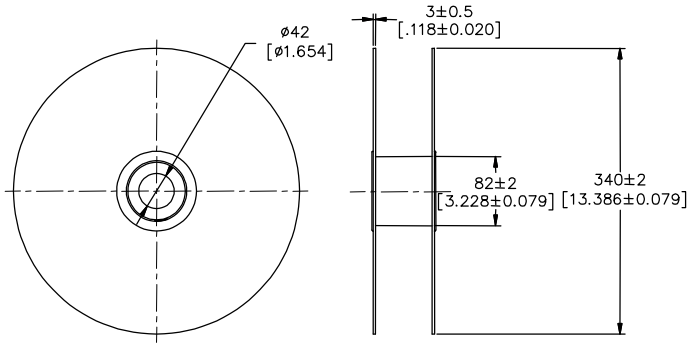
Packaging Information (Unit: mm/inch)

DIP axial leads series packaging (Default packaging)

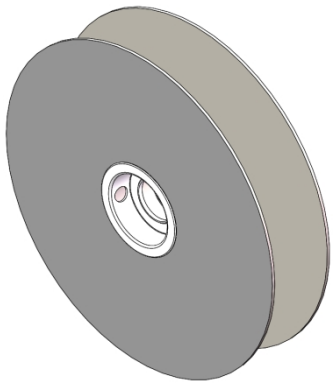
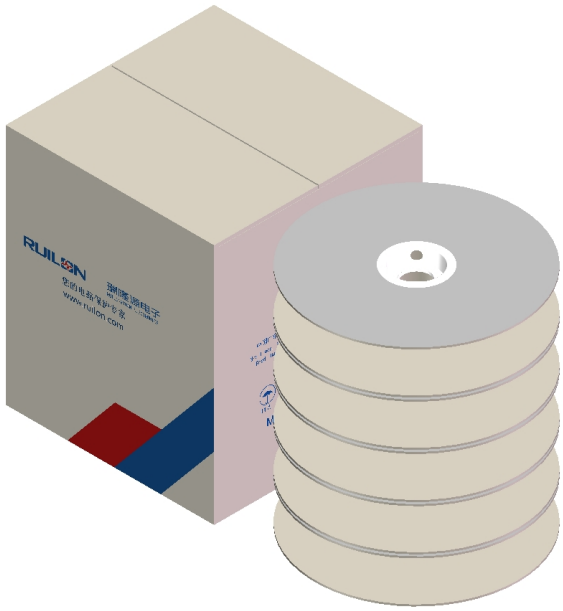
Tape



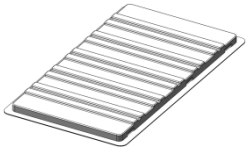
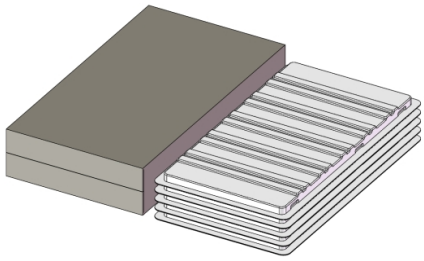
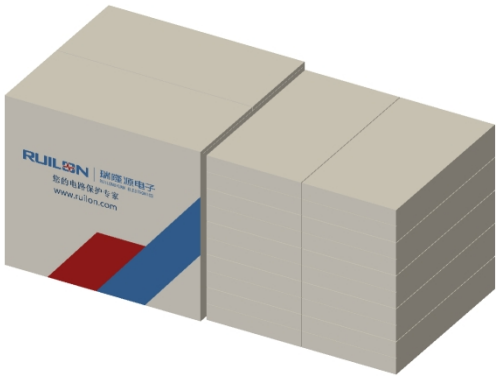
Reel



According to IEC 60286-1

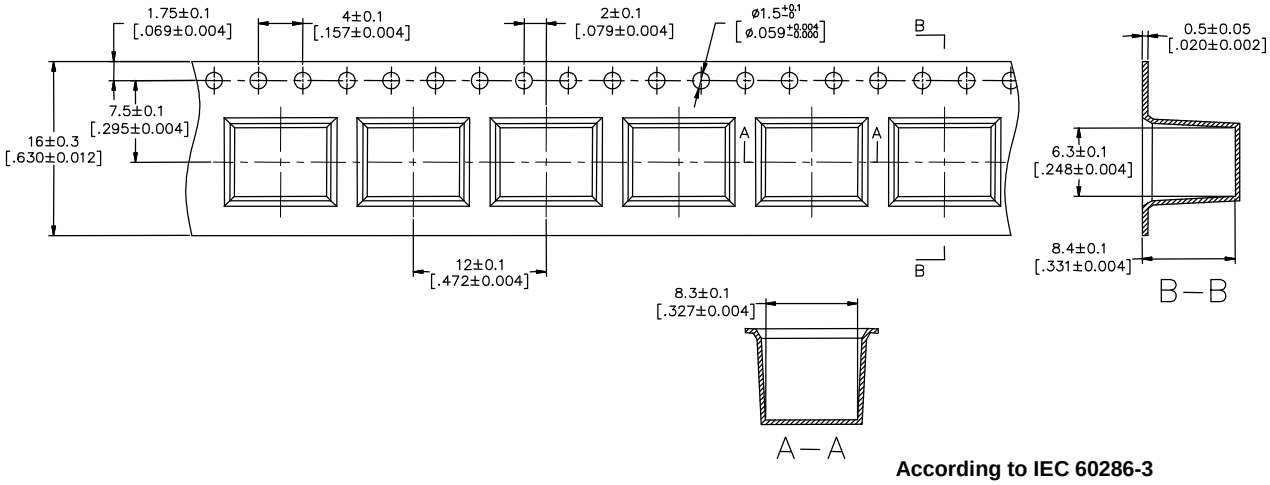
	Reel	Carton
Size	340×78mm	350×350×407mm
Quantity	MPQ/MOQ: 1 reel=800pcs	1 Carton=5 reels =4,000pcs
Photos		

DIP axial leads series packaging (Bulk)

	PVC tray	Inner Box	Carton
Size	265×148×10mm	275×150×50mm	315×290×272mm
Quantity	MPQ: 1 tray=100pcs	MOQ: 1 Inner Box=5 trays=500pcs	1 Carton=10 Inner boxes=5,000pcs
Photos			

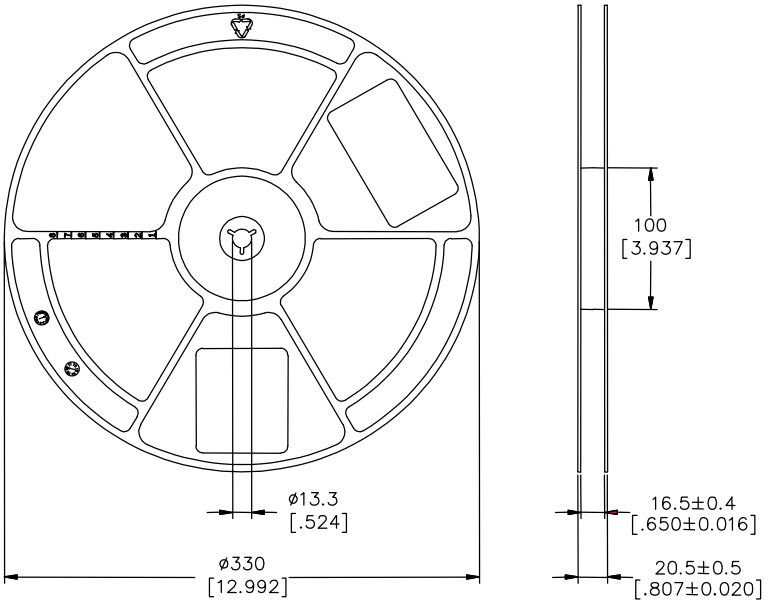
SMD Packaging (Tape & Reel)

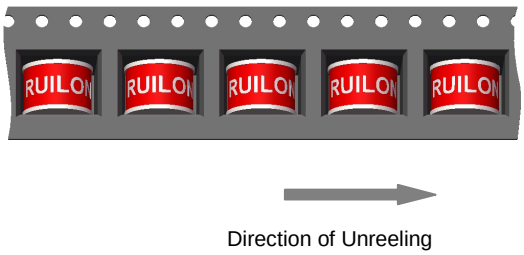
Tape

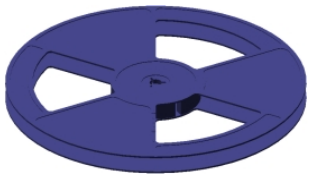
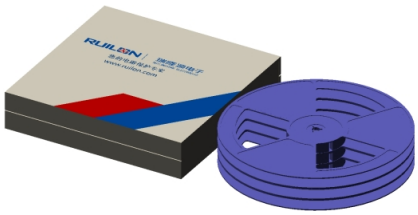
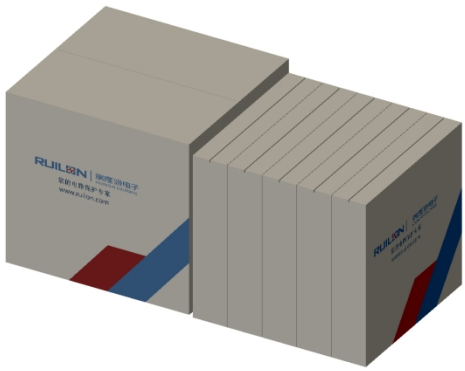


According to IEC 60286-3

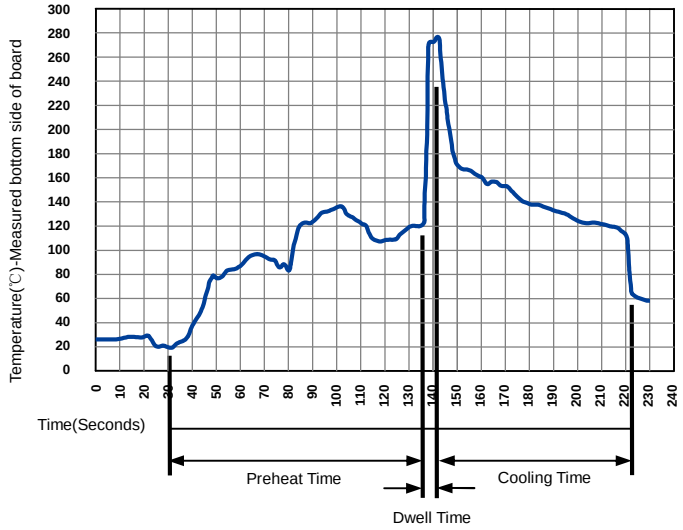
Reel





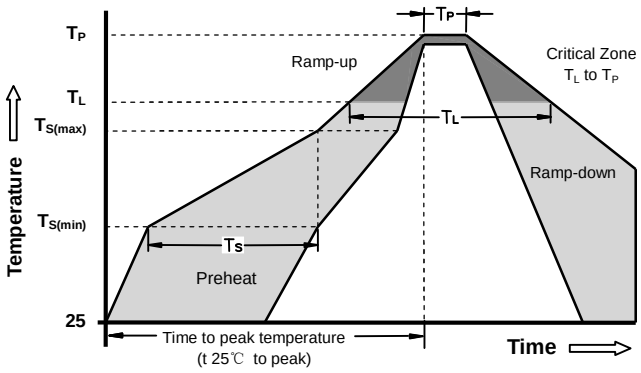
	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=500pcs	1 Inner Box=3 reels=1,500pcs	1Carton=5 Inner boxes=7,500pcs
Photos			

Soldering Parameters - Wave soldering (Thru-Hole Devices)



Wave Soldering Condition		Pb-Free assembly
Preheat	Temperature Min	100°C
	Temperature Max	150°C
	Time (Min to Max)	60-180 Seconds
Solder Pot Temperature		280°C Max
Solder Dwell Time		2-5 Seconds

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Preheat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquids Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquids)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		10 - 30 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		260°C

Cautions

- Switching spark gaps may be used only within their specified values.
- Damaged switching spark gaps must not be re-used.
- The electrical characteristics described in this datasheet are only typical characteristics, and all of these characteristics have been confirmed through testing and inspection. If the customer's usage requirements are different from this or have special requirements, please contact Ruilongyuan Electronics Co., Ltd. If protection failure or circuit damage occurs as a result, our company is not responsible for it.
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