Datasheet

Gas Discharge Tubes (GDT)

Series / Models	SMD4042-600E
Product Code	10.12.03.6000
Version	A0
Date	2025-01-02
File Number	SP-GDT-248

修订历史记录

版本	日期	制/修订页次	制/修订内容	制/修订者
A0	2025-01-02	/	新发行	吴霞

Gas Discharge Tubes (GDT)

SMD4042-600E

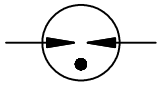
Description

Gas discharge tubes (GDT) use noble gasses enclosed in ceramic tubes to provide an alternate circuit path for voltage spikes. The ceramic envelope and with nickel connectors allow for high loads. SMD4042 Gas Discharge Tubes (GDT) series has a surge rating of 3kA, 8/20μs.Offered in a Squared Surface Mount package, which helps to make pick and place on PCB process easier.

This GDT series is perfectly suited for broadband equipment applications. The GDT's low off-state capacitance is compatible with high bandwidth applications and this capacitance loading value does not vary if the voltage across the GDT changes.

SMD4042 Gas Discharge Tube (GDT) series are specifically designed for protection of electrical, multimedia, and communication equipment against over voltage transients in surface mount assembly applications.

Electrical symbol



Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability:3KA
- Surface Mount package
- Non-Radioactive
- Ultra Low capacitance (<0.8pF)
- Size: 4.0mm*4.2mm*4.2mm

Applications

- CATV equipment
- Antennas
- RS 485
- Telecom Base Station
- Power Supply AC Main
- EV power Charging
- Inverter/Variable
- Frequency Drivers (VFDs)
- IEEE 802.3 compliant Ethernet interfaces
- Broad Band equipment
- xDSL, ADSL, ADSL2, VDSL, and VDSL2
- Medical Electronics
- Test Equipment
- General Telecom Equipment
- Renewable Energy

Part Number Code

S	M	D	4	0	4	2	-	6	0	0	E

- S M D: Surface Mount Package
- 4 0 4 2: Product Series; Size: 4.0mm*4.2mm*4.2mm
- 6 0 0: DC Spark-over Voltage
- E: 8/20μs Impulse Current; E: 3KA

Electrical Characteristics

DC Spark-over Voltage [1) 2)]	at 100V/S		600±20%	V
Impulse Spark-over Voltage	at 100V/μS		<900	V
	at 1KV/μS		<1000	V
Service life				
Impulse Discharge Current	8/20μS	±5 times	3	KA
	8/20μS	1 time	6	KA
Impulse Life	10/1000μS	300 times	100	A
AC Discharge Current	50Hz,1S	10 times	3	A
Insulation Resistance	at DC 100V		>1	GΩ
Capacitance	at 1MHz		<0.8	pF
Glow Voltage	at 10mA		~135	V
Arc Voltage	at 1A		~15	V
Glow to Arc transition current			<0.3	A
Weight			~0.28	g
Operation temperature			-40~+125	°C
Recommended storage [3)]				
- Temperature			+5~+35°C	
- Humidity			45~+80%	
- Period			≤ 2 years	
Climatic category (IEC60068-1)			40/125/21	
Marking			Without	
Surface treatment			Matte-tin plated	
Moisture sensitivity level [4)]			1	

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) Specified in terms of corrosion against tin plating.
4) Tests according to JEDEC J-STD-020.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T18802.311, GB/T 9043.

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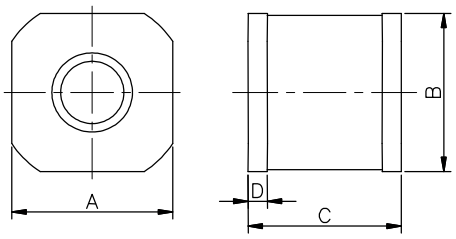
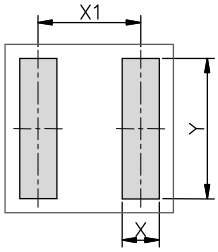
Dimensions(unit: mm/inch)



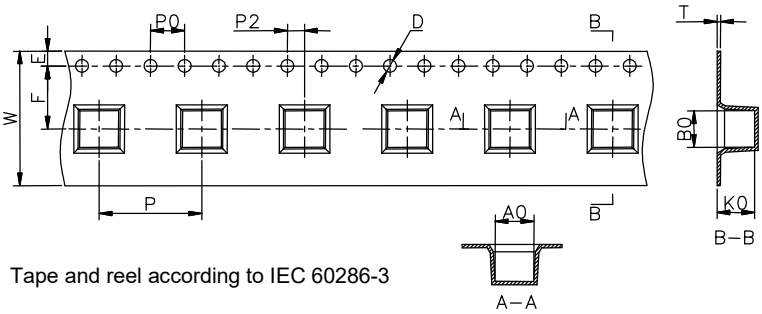


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	4.2±0.2	0.165±0.008
B	4.2±0.2	0.165±0.008
C	4.0±0.2	0.157±0.008
D	0.5±0.1	0.020±0.004
X	1.3	0.051
X1	3.6	0.142
Y	5.0	0.197

Packaging Information

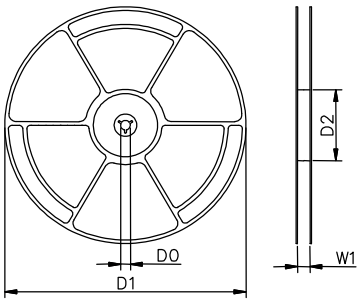
Tape Specifications

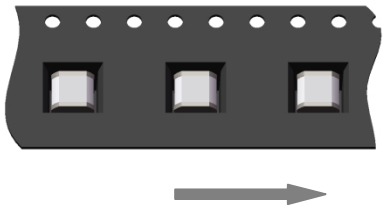


Tape and reel according to IEC 60286-3

Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	4.5±0.1	0.177±0.004
B0	4.3±0.1	0.17±0.004
K0	4.4±0.1	0.173±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.4±0.1	0.016±0.004
D0	13.3±0.15	0.524±0.006
D1	330±2	12.992±0.079
D2	100+1/-2	3.937+0.039/-0.079
W1	16.5±0.4	0.65±0.016

Reel Specifications





Direction of Unreeling

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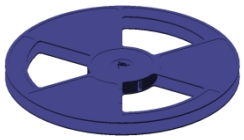
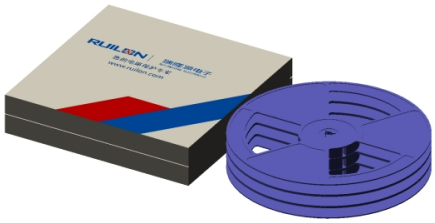
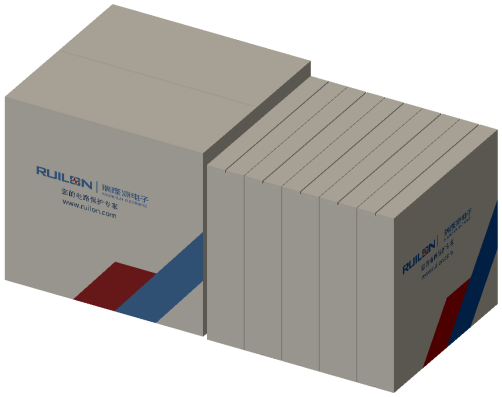
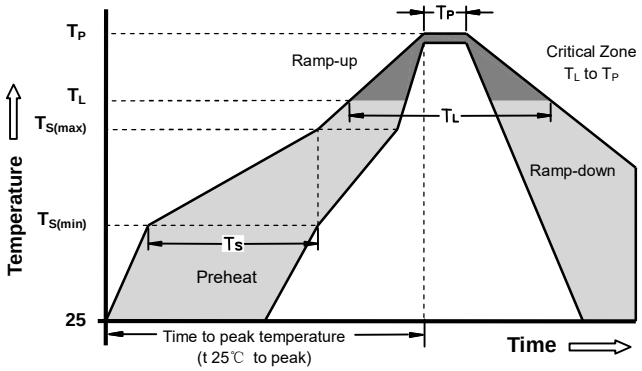
	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=1,000pcs	1 Inner Box=3 reels=3,000pcs	1Carton=5 Inner boxes=15,000pcs
Photos			

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Pre Heat	-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

Terms and definitions

NO.	Item	Definitions
1	**Gas discharge tube(GDT)**	A gap, or several gaps, in an enclosed discharge medium, other than air at atmospheric pressure, designed to protect apparatus or personnel, or both, from high transient voltages. Also referred to as "gas tube surge arrester".
2	**DC Spark-over Voltage**	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	**Impulse Spark-over Voltage**	The highest voltage which appears across the terminals of a gas discharge tube in the period between the application of an impulse of given wave-shape and the time when current begins to flow.
5	**Arc voltage**	Voltage drop across the GDT during arc current flow.
6	**Glow voltage**	Peak value of voltage drop across the GDT when a glow current is flowing.
7	**Impulse discharge current 8/20μs**	Current impulse with a nominal virtual front time of 8 μs and a nominal time to half-value of 20 μs.
8	**Alternating Discharge Current**	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	**Insulation Resistance**	Insulation resistance shall be measured from each terminal to every other terminal of the GDT. The test is performed with DC50V when normal spark-over Voltage 70~150V, others with DC100V.
10	**Capacitance**	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

Cautions

- Do not operate gas discharge tubes in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the gas discharge tubes.
- Gas discharge tubes may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- Gas discharge tubes must be handled with care and must not be dropped.
- Do not continue to use damaged gas discharge tubes.
- The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- SMD gas discharge tubes should be soldered within 24 month after shipment.
- 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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