

## Description

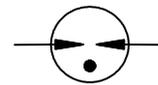
Gas discharge tubes (GDT) use noble gasses enclosed in ceramic tubes to provide an alternate circuit path for voltage spikes. The ceramic envelope and with nickel connectors allow for high loads. 2R090D-6SS Gas Discharge Tubes (GDT) has a surge rating of 20kA, 8/20 $\mu$ s. Offered in a Squared Surface 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.

2R090D-6SS Gas Discharge Tube (GDT) is specifically designed for protection of electrical, multimedia, and communication equipment against over voltage transients in surface mount assembly applications.



## Agency Approvals



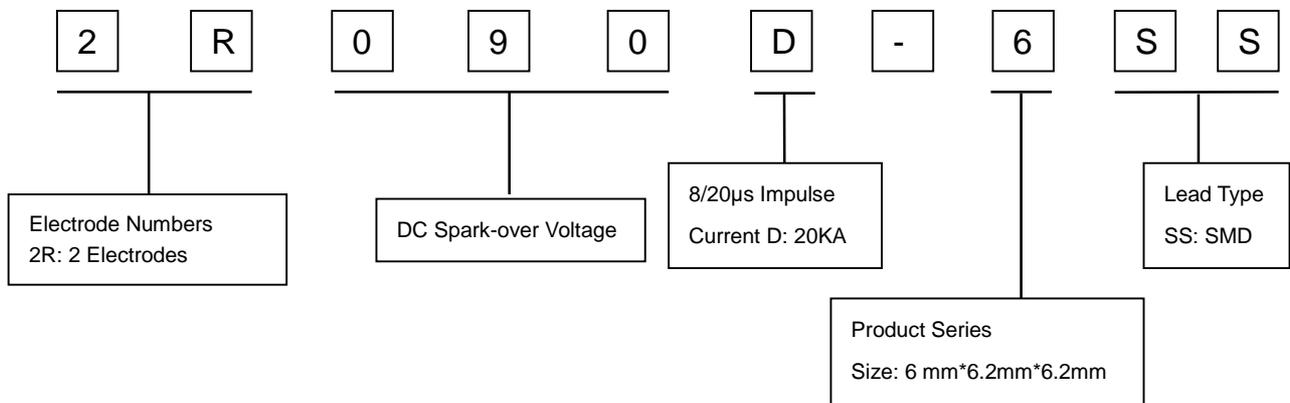
## Features

- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20 $\mu$ s Impulse current capability: 20KA
- I Non-Radioactive
- I Ultra Low capacitance (<1.5pF)
- I Size: 6 mm(L)\*6.2mm(W)\*6.2mm(H)
- I Storage and operational temperature: -40~+125°C

## Applications

- I MDF modules
- I xDSL equipment
- I RF systems
- I Antenna
- I Base stations
- I Repeaters, Modems
- I Telephone Interface, Line cards
- I Data communication equipment
- I Line test equipment
- I Power supplies
- I Surge protectors, Alarm systems

## Part Number Code



**Electrical Characteristics**

<b>DC Spark-over Voltage</b> <sup>1) 2)</sup>	at 100V/S		90 ± 20%	V
<b>Impulse Spark-over Voltage</b>	at 100V/μS		<500	V
	at 1KV/μS		<600	V
<b>Service life</b>				
Impulse Discharge Current	8/20μS	±5 times	20	KA
AC Discharge Current	50Hz, 1S	10 times	20	A
Impulse Life	10/1000μS	±300 times	200	A
<b>Insulation Resistance</b>	at DC 50V		>1	GΩ
<b>Capacitance</b>	at 1MHz		<1.5	pF
<b>Glow Voltage</b>	at 10mA		~60	V
<b>Arc Voltage</b>	at 1A		~10	V
<b>Glow to Arc transition current</b>			~1.0	A
<b>Weight</b>			~0.8	g
<b>Operation and storage temperature</b>			-40~+125	°C
<b>Climatic category (IEC60068-1)</b>			40/125/21	
<b>Marking, red negative</b>			<b>RUILON 090D Y</b> 090 -Nominal voltage Y -Year of production	
<b>Surface treatment</b>			Matte-tin plated	
<b>Moisture sensitivity level</b> <sup>4)</sup>			1	

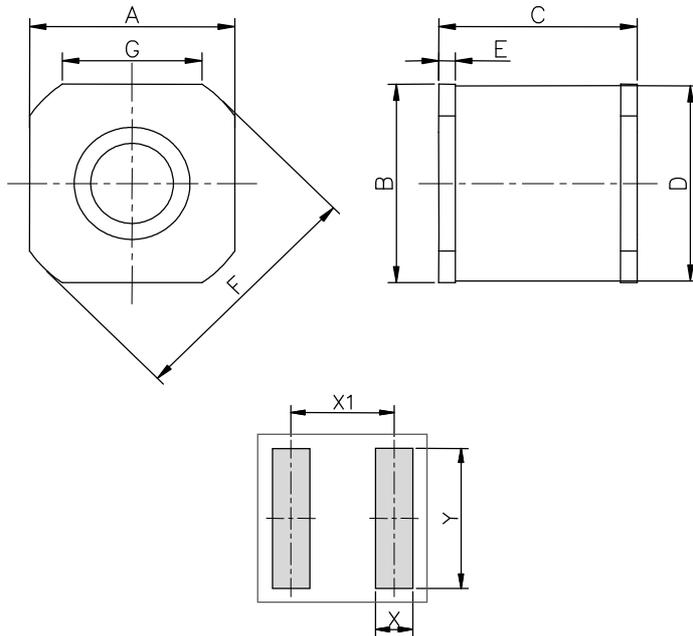
<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859.

<sup>2)</sup> In ionized mode.

<sup>3)</sup> Tests according to JEDEC J-STD-020.

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

## Dimensions

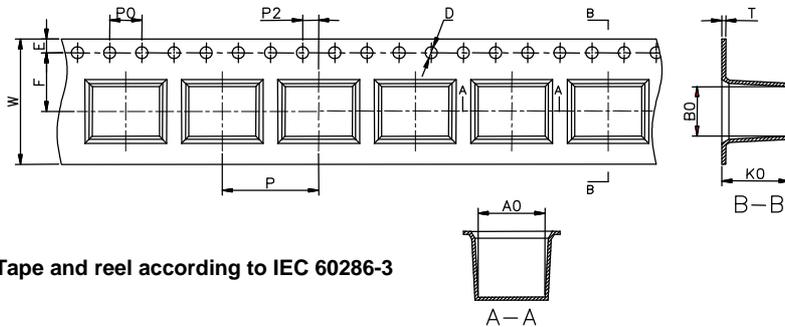


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	6.2±0.2	0.244±0.008
B	6.2±0.2	0.244±0.008
C	6.0±0.3	0.236±0.012
D	6.1±0.1	0.240±0.004
E	0.5±0.1	0.020±0.004
F	7.5±0.2	0.295±0.008
G	~4.2	~0.165
X	1.3	0.051
X1	5.8	0.228
Y	6.0	0.236

## Packaging Information

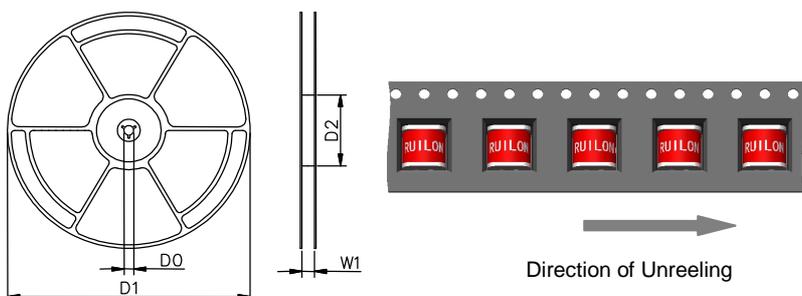
### Tape Specifications



Tape and reel according to IEC 60286-3

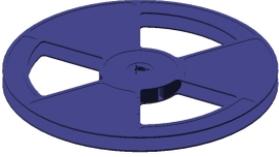
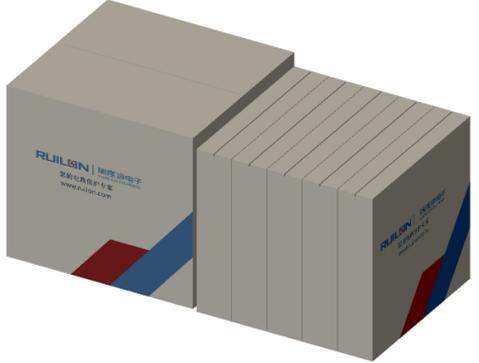
Symb	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	6.5±0.1	0.256±0.004
B0	6.5±0.1	0.256±0.004
K0	6.4±0.1	0.252±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.5±0.1	0.020±0.004
D0	13.3±0.15	0.524±0.006
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

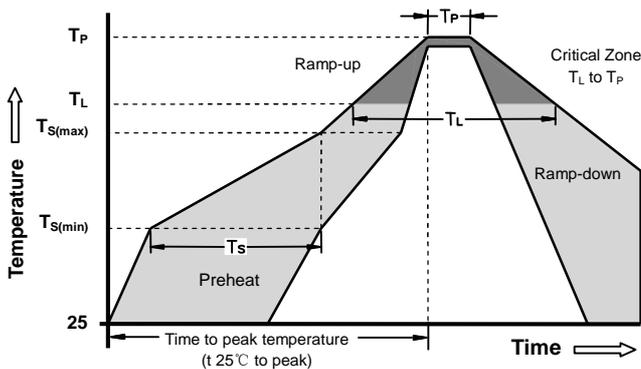


## Gas Discharge Tubes (GDT)

**2R090D-6SS**

	Reel	Inner Box	Carton
Size	330×17mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=800pcs	1 Inner Box=3 reels=2,400pcs	1 Carton=5 Inner boxes=12,000pcs
Photos			

### Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
<b>Preheat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 - 180 Seconds
<b>Average ramp up rate ( Liquids Temp <math>T_L</math> ) to peak</b>		3°C/second max
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		5°C/second max
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 - 150 Seconds
<b>Peak Temperature (<math>T_P</math>)</b>		260 +0/-5°C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		10 - 30 Seconds

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There are no quality defects or changes in protection level during the temporary change of DC spark-over voltage.

### Terms and definitions

NO.	Item	Definitions
1	<b>Gas discharge tube(GDT)</b>	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	<b>DC Spark-over Voltage</b>	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	<b>Impulse Spark-over Voltage</b>	Highest value of voltage attained by an impulse of a designated voltage rate-of-rise and polarity applied across the terminals of a GDT prior to the flow of the discharge current.
5	<b>Arc voltage</b>	Voltage drop across the GDT during arc current flow.
6	<b>Glow voltage</b>	Peak value of voltage drop across the GDT when a glow current is flowing.
7	<b>Impulse discharge current 8/20µs</b>	Current impulse with a nominal virtual front time of 8 µs and a nominal time to half-value of 20 µs.
8	<b>Alternating Discharge Current</b>	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	<b>Insulation Resistance</b>	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	<b>Capacitance</b>	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

### Cautions and warnings

- I Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- I Surge arresters 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.
- I Surge arresters must be handled with care and must not be dropped.
- I Do not continue to use damaged surge arresters.
- I 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.
- I SMD surge arresters should be soldered within 24 month after shipment.