



# Gas Discharge Tube

## • Features

1. Size with dip type and surface mount type Surface Mount Design
2. High DC spark over voltage series up to 600V
3. High impulse discharge current up to 2500A
4. High impulse withstanding voltage capacity up to 4KV
5. Low Clamping Voltage
6. Bi-directional

## • Recommended Applications

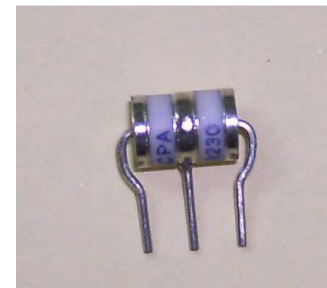
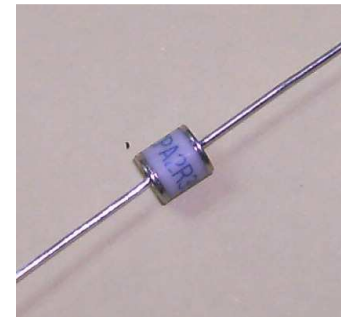
1. Modem、 Fax Machine、 ADSL...
2. Line Single, data transmission lines
3. Ground
4. Communication Lines
5. Power Distribution System
6. Power Supplier
7. Test Equipment
8. Instrumentation Circuits

## Part Number System

Example part number

2N 600 B 8 L A  
(1) (2) (3) (4) (5) (6)

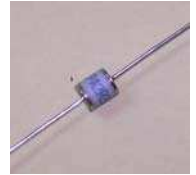
- (1) Series Code  
2RM = 2 elements mini series  
2R = 2 elements standard series  
2N = 2 elements high current series  
2T = 2 elements switching series  
2SM = 2 elements surface mount mini series  
2S = 2 elements surface mount series  
3RM = 3 elements mini series  
3R = 3 elements standard series  
3SM = 3 elements surface mount mini series  
3SSM = 3 elements surface mount symmetrical series  
4532 = 2 elements chip SMD series  
20B = 2 elements power protection arrester B series
- (2) DC Breakdown voltage  
70 = 70V 90 = 90V 145 = 145V ...6000 = 6000V
- (3) Diameter  
A = 5.5 mm B = 8mm
- (4) Length  
4 = 4mm 6 = 6mm 8 = 8mm 10 = 10mm
- (5) Lead Type  
B = No leads  
L = Axial Lead L1=1.0mm L2=0.8mm L3=0.6mm Diameter  
C = Radial lead clip-in style
- (6) Packing Type  
B = Box  
A = Taping and Ammo  
R = Taping and Reel1





# Gas Discharge Tube

## 2 Elements Mini Standard Series



### 2RM Ø5.5mm ,6mm long

Model Name	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 μs) (KA)		Normal Alternating Discharge Current (A)		Impulse Life (10/1000μs) (100A) times	DC Holdover Voltage (V)	Minimum Insulation Resistance Note2	Maximum Capacitance (pf) 1MHZ
		100V/μs	100V/μs	1000V/μs	1 time	10 times	50Hz, 1sec				
2RM-70	70 ±20%	700	800	10	5	5	15	300	52	1	1
2RM-75	75 ±20%	700	800						52	1	1
2RM-90	90 ±20%	600	700						52	1	1
2RM-120	120 ±20%	600	700						52	1	1
2RM-130	130 ±20%	600	700						52	1	1
2RM-145	145 ±20%	600	700						52	1	1
2RM-230	230 ±20%	600	700						80	1	1
2RM-250	250 ±20%	600	700						80	1	1
2RM-300	300 ±20%	700	900						150	1	1
2RM-350	350 ±20%	700	900						150	1	1
2RM-400	400 ±20%	800	1000						150	1	1
2RM-470	470 ±20%	900	1100						150	1	1
2RM-600	600 ±20%	1300	1500	5	2.5	2.5	5	300	150	1	1
2RM-800	800 ±20%	1500	1700						150	1	1

#### Note2 : DC Breakdown Voltage

70-90V  
120-400V  
470-800V

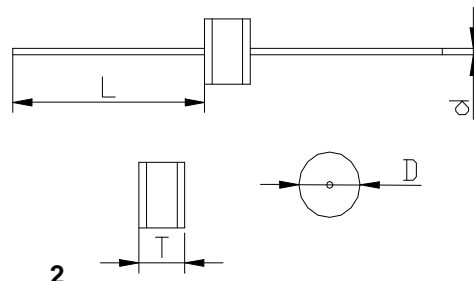
#### DC Measuring Voltage

50V  
100V  
250V

#### Dimensions

Unit: mm

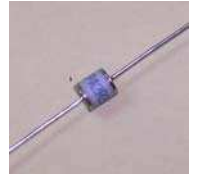
Item	Dimensions
D	5.5 +0.3,-0.5
T	6.0 +0.3,-0.5
d	0.8 ±0.05
L	20min.





# Gas Discharge Tube

## 2 Elements Mini High Voltage Series



### 2RM Ø5.5mm ,6mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current (8/20 μs) (KA)		Normal Alternating Discharge Current (A)		Impulse Life (10/1000μs) (100A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(GΩ)	(pf)
	100V/s	100V/μs	1000V/μs	1 time	10 times	50Hz, 1sec	Single 9cycles	times	<150ms	Note2	1MHZ
2RM-1000	1000 ±20%	1600	1800	3	1.5	2	4	300	150	1	1
2RM-1200	1200 ±20%	1800	2000						150	1	1
2RM-1400	1400 ±20%	2200	2400						150	1	1
2RM-1600	1600 ±20%	2400	2600						150	1	1
2RM-2000	2000 ±20%	2800	3000						150	1	1
2RM-2500	2500 ±20%	3300	3500						150	1	1
2RM-3000	3000 ±20%	3800	4000						150	1	1
2RM-3500	3500 ±20%	4300	4500						150	1	1
2RM-3600	3600 ±20%	4400	4600						150	1	1

**Note : DC Breakdown Voltage**

1000-2000V

2500-4000V

**DC Measuring Voltage**

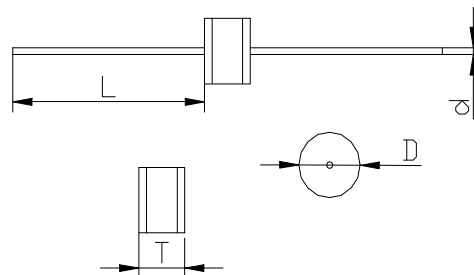
500V

1000V

**Dimensions**

Unit: mm

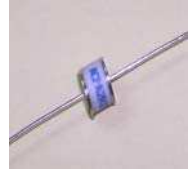
Item	Dimensions
D	5.5 +0.3,-0.5
T	6.0 +0.3,-0.5
d	0.8 ±0.05
L	20min.





# Gas Discharge Tube

## 2 Elements Standard Series



### 2R Ø8mm ,6mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current		Normal Alternating Discharge Current		Impulse Life	DC Holdover Voltage	Minimum Insulation Resistance	Maximum Capacitance
	(V)	(V)	(V)	(KA)	(KA)	(A)	(A)	(10/1000µs) (100A)	(V)	(GΩ)	(pf)
	100V/s	100V/µs	1000V/µs	1 time	10 times	50Hz, 1sec	Single 9cycles	times	<150ms	Note2	1MHZ
2R-70	70 ±20%	500	600	15	10	5	65	500	52	10	1.5
2R-75	75 ±20%	500	600						52	10	1.5
2R-90	90 ±20%	500	600						52	10	1.5
2R-120	120 ±15%	500	700						52	10	1.5
2R-130	130 ±15%	500	700						52	10	1.5
2R-145	145 ±15%	500	700						52	10	1.5
2R-230	230 ±15%	500	700						80	10	1.5
2R-250	250 ±15%	500	700						80	10	1.5
2R-300	300 ±15%	700	900						150	10	1.5
2R-350	350 ±15%	700	900						150	10	1.5
2R-400	400 ±15%	800	1000						150	10	1.5
2R-470	470 ±15%	900	1100						150	10	1.5
2R-600	600 ±15%	1100	1300	10	5	5	65	500	150	10	1.5
2R-800	800 ±20%	1300	1500						150	10	1.5

Note: DC Breakdown Voltage

DC Measuring Voltage

70-90V

50V

120-400V

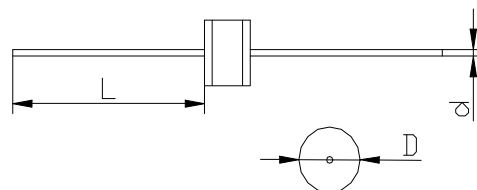
100V

470-800V

250V

### Dimensions Unit: mm

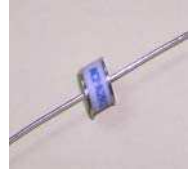
Item	Dimensions
D	8.0 + 0.3,-0.5
T	6.0 + 0.3,-0.5
d	0.8 or 1.0 ± 0.05
L	20min.





# Gas Discharge Tube

## 2 Elements High Current Series



### 2N Ø8mm ,6mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current		Normal Alternating Discharge Current		Impulse Life	DC Holdover Voltage	Minimum Insulation Resistance	Maximum Capacitance
	(V)	(V)	(V)	(8/20 μs) (KA)	(KA)	(A)	(A)	(10/1000μs) (100A)	(V)	(GΩ)	(pf)
	100V/s	100V/μs	1000V/μs	1 time	10 times	50Hz, 1sec	Single 9cycles	times	<150ms	Note2	1MHZ
2N-70	70 ±20%	500	600	20	15	20	65	500	52	10	1.5
2N-75	75 ±20%	500	600						52	10	1.5
2N-90	90 ±20%	500	600						52	10	1.5
2N-120	120 ±15%	500	700						52	10	1.5
2N-130	130 ±15%	500	700						52	10	1.5
2N-145	145 ±15%	500	700						52	10	1.5
2N-230	230 ±15%	500	700						80	10	1.5
2N-250	250 ±15%	500	700						80	10	1.5
2N-300	300 ±15%	700	900						150	10	1.5
2N-350	350 ±15%	700	900						150	10	1.5
2N-400	400 ±15%	800	1000						150	10	1.5
2N-470	470 ±15%	900	1100						150	10	1.5
2N-600	600 ±15%	1100	1300						150	10	1.5

**Note : DC Breakdown Voltage**

70-90V  
120-400V  
470-600V

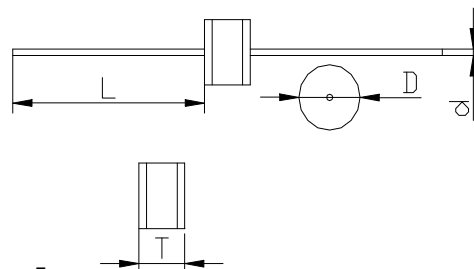
**DC Measuring Voltage**

50V  
100V  
250V

**Dimensions**

Unit: mm

Item	Dimensions
D	8.0 + 0.3,-0.5
T	6.0 + 0.3,-0.5
d	0.8 ± 0.05
L	20min.





# Gas Discharge Tube

## 2 Elements High Voltage Series



2R Ø8mm ,8mm long

### Specifications

Model Name	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 μs) (KA)		Normal Alternating Discharge Current (A)		Impulse Life (10/1000μs) (100A) times	Minimum Insulation Resistance (GΩ) Note2	Maximum Capacitance (pf) 1MH Z
		100V/μs	1000V/μs	1 time	10 times	50Hz, 1sec	Single 9cycles			
2R-600	600 ±15%	1000	1100	8	5	5	10	100	10	1.
2R-800	800 ±15%	1100	1200						10	1.
2R-1000	1000 ±20%	1300	1400						10	1.5
2R-1400	1400 ±20%	2100	2200						10	1.
2R-1600	1600 ±20%	2300	2400						10	1.
2R-2000	2000 ±20%	2700	2800						10	1.
2R-2500	2500 ±20%	3500	3600						10	1.
2R-2700	2340-2970	3600	3800	5	3	3	5	300*	10	1.
2R-3000	3000 ±20%	4100	4200	5	3	2.5	5	100	10	1.
2R-3500	3500 ±20%	4900	5000						10	1.
2R-4000	4000 ±20%	5300	5500						10	1.
2R-4500	4500 ±20%	5800	6000						10	1.
2R-5000	5000 ±20%	6000	6400						10	1.
2R-6000	6000 ±20%	7000	7800						10	1.
									10	1.

#### Note : DC Breakdown Voltage

600-1000V  
1400-2000V  
2500-6000V

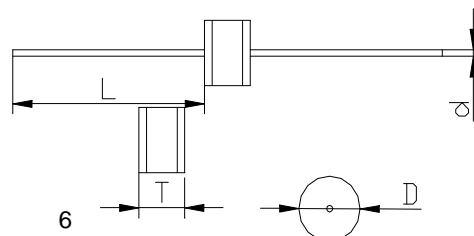
#### DC Measuring Voltage

250 V  
500V  
1000V

\* Measured with 8/20 μs waveform, 100A

#### Dimensions Unit: mm

Item	Dimensions
D	8.0 +0.3,-0.5
T	8.0 +0.6,-0.1
d	0.8or 1.0 ±0.05
L	20min.





# Gas Discharge Tube

## 2 Elements Switching Series



2T Ø8mm ,6mm long

### Specifications

Model Name	Switching Voltage (V)	Maximum Ignition Frequency (HZ)	Switching Operations (times)	Minimum Insulation Resistance (GΩ) Note1	Operation Temperature (°C)	Maximum Capacitance 0.1Vrms 1MHZ (pf)
2T-350	350±10%	400	1×10 <sup>5</sup>	1	-45~125	1
2T-400	400±10%	400	1×10 <sup>5</sup>			
2T-470	470±10%	400	1×10 <sup>5</sup>			
2T-600	600±10%	400	1×10 <sup>5</sup>			
2T-800	800±10%	400	1×10 <sup>5</sup>			
2T-1000	1000±10%	400	1×10 <sup>5</sup>			

#### Note: DC Breakdown Voltage

350-400V  
470-1000V

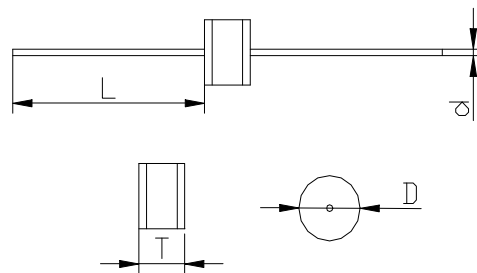
#### Measuring Voltage

100V  
250V

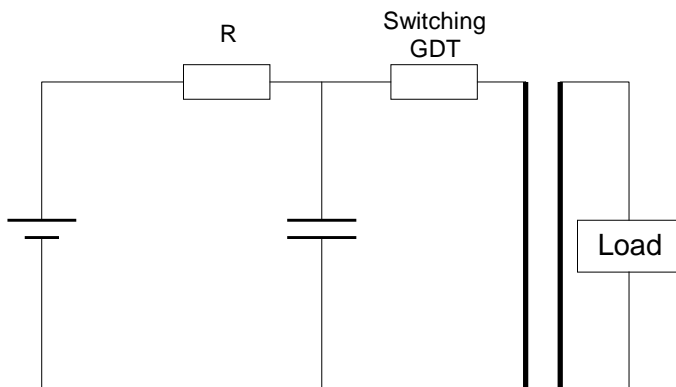
### Dimensions

Unit: mm

Item	Dimensions
D	8.0 + 0.3, -0.5
T	8.0 + 0.6, -0.1
d	0.8 or 1.0 ± 0.05
L	20min.



### Basic Application Circuit





# Gas Discharge Tube

## 2 Elements Surface Mount Mini Series(2SM & 2SSM)



### 2SM Ø4mm ,4.2mm long

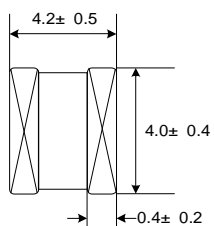
Model Name	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 μs) (KA)		Normal Alternating Discharge Current (A)		Impulse Life (10/1000μs) (100A) times	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
		100V/μs	1000V/μs	1 time	10 times	50Hz, 1sec	Single 9cycles				
2SM-75	75 ±20%	700	800	5	3	3	6	300	52	1	0.5
2SM-90	90 ±20%	700	800						52	1	0.5
2SM-145	145 ±20%	700	800						52	1	0.5
2SM-230	230 ±20%	600	700						80	1	0.5
2SM-250	250 ±20%	600	700						80	1	0.5
2SM-300	300 ±20%	600	700						150	1	0.5
2SM-350	350 ±20%	650	800						150	1	0.5
2SM-400	400 ±20%	700	800						150	1	0.5
2SM-470	470 ±20%	700	800						150	1	0.5
2SM-600	600 ±20%	900	1000						150	1	0.5

**Note1 : The 2SM is round and 2SSM is square**

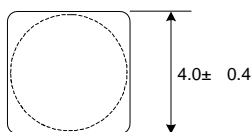
**Note2 : DC Breakdown Voltage      DC Measuring Voltage**

70-90V	50V
120-400V	100V
470-600V	250V

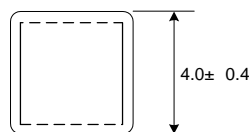
### Dimensions



### Round Type

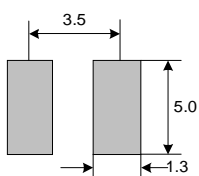


### Square Type



Unit : mm

### Recommended Pad Size







# Gas Discharge Tube

2 Elements Surface Mount Series(2S & 2SS)

2S Ø6.2mm ,4.2mm long The 2S is round and 2SS is square



Model Name	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (KA)		Normal Alternating Discharge Current (A)		Impulse Life (10/1000µs) (100A) times	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
		100V/µs	1000V/µs	1 time	10 times	50Hz, 1sec	Single 9cycles				
2S-75	75 ±20%	600	700	8	5	5	15	500	52	1	0.8
2S-90	90 ±20%	600	700						52	1	0.8
2S-145	145 ±20%	500	700						52	1	0.8
2S-230	230 ±20%	450	550						80	1	0.8
2S-250	250 ±20%	450	550						80	1	0.8
2S-300	300 ±20%	500	600						150	1	0.8
2S-350	350 ±20%	500	600						150	1	0.8
2S-400	400 ±20%	600	700						150	1	0.8
2S-470	470 ±20%	700	800						150	1	0.8
2S-600	600 ±20%	800	900						150	1	0.8
2S-800	800 ±20%	900	1000						150	1	0.8

Note2: DC Breakdown Voltage

DC Measuring Voltage

70-90V

50V

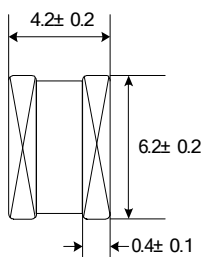
120-400V

100V

470-800V

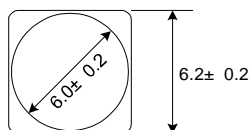
250V

## Dimensions

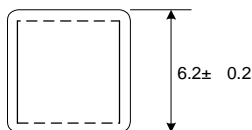


Unit :mm

Round Type



Square Type





# Gas Discharge Tube

## 2 Elements Surface Mount High Voltage Series



**2S Ø6.2mm ,4.2mm long**

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current		Normal Alternating Discharge Current		Impulse Life	Minimum Insulation Resistance	Maximum Capacitance
	(V)	(V)	(V)	(KA)	(KA)	(A)	(A)	(10/1000µs) (100A)	(GΩ)	(pf)
	5KV/s	100V/µs	1000V/µs	1 time	10 times	50Hz, 1sec	Single 9cycles	times	Note3	1MHZ
2S-1000	1000±20%	1500	1600	5	3	3	10	300	1	0.8
2S-1200	1200 ±20%	1700	1800						1	0.8
2S-1800	1800 ±20%	2500	2600						1	0.8
2S-2000	2000 ±20%	2700	2800						1	0.8
2S-2500	2500 ±20%	3100	3200						1	0.8
2S-2700	2700 ±20%	3300	3400						1	0.8
2S-3000	3000 ±20%	3600	3700						1	0.8

**Note1 : The 2S is round and 2SS is square**

**Note2 : DC Breakdown Voltage      DC Measuring Voltage**

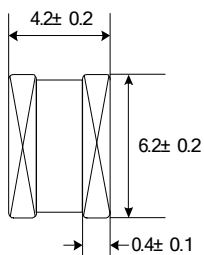
1000-2000V

500V

2500-3000V

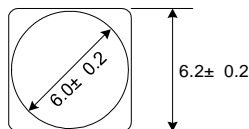
1000V

### Dimensions

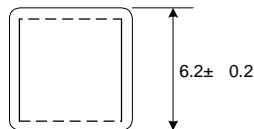


Unit :mm

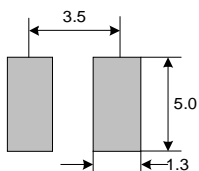
#### Round Type



#### Square Type



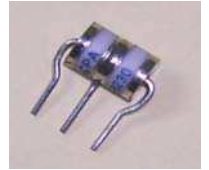
### Recommended Pad Size





# Gas Discharge Tube

## 3 Elements Mini Series



### 3RM Ø6mm ,8mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current (8/20 μs) (KA)	Alternating Discharge Current (A)	Impulse Life (10/1000μs) (200A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
	(V)	100V/μs	1000V/μs	10 times 5 times each polarity	50HZ, 1sec	times	<150ms	Note2	1MHZ
3RM-90	90±20%	750	850	5	5	100	52	10	2
3RM-145	145±20%	750	850	5	5	100	52	10	2
3RM-200	200±20%	600	700	10	10	100	135	10	2
3RM-230	230±20%	600	700	10	10	100	135	10	2
3RM-250	250±20%	600	700	10	10	100	135	10	2
3RM-350	350±20%	650	750	5	5	100	150	10	2
3RM-400	400±20%	700	800	5	5	100	150	10	2
3RM-420	420±20%	700	800	5	5	100	150	10	2
3RM-470	470±20%	800	900	5	5	100	150	10	2
3RM-600	600±20%	900	1000	5	5	100	150	10	2

#### Note : DC Breakdown Voltage

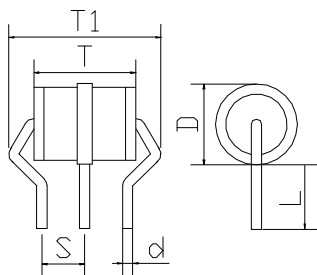
90V  
145-400V  
420-600V

#### DC Measuring Voltage

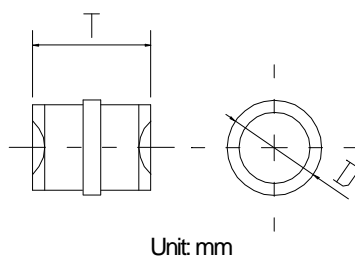
50V  
100V  
250V

## Dimensions

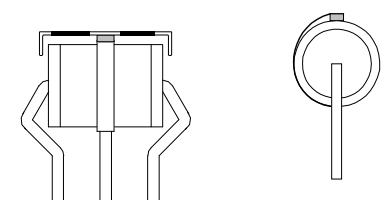
### C1 TYPE



### B TYPE



### CF1 TYPE



Item	Dimensions	
	Spec.	Tolerance
D	6.0	+0.2,-0.5
T	8.5	±0.5
T1	11.5	+0.8,-0.5
L	7.5	±0.5
S	3.8	±0.3
d	0.8	±0.05



# Gas Discharge Tube

## 3 Elements Standard Series



### 3R Ø8mm ,10mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current	Alternating Discharge Current	Impulse Life	DC Holdover Voltage	Minimum Insulation Resistance	Maximum Capacitance
	(V)	(V)	(V)	(KA)	(A)	(10/1000µs) (200A)	(V)	(GΩ)	(pf)
	100V/s	100V/µs	1000V/µs	10 times 5 times each polarity	50HZ, 1sec	times	<150ms	Note2	1MHZ
3R-75	75±20%	600	700	20	20	130	52	10	2
3R-90	90±20%	600	700	20	20	130	52	10	2
3R-145	145±20%	500	700	20	20	130	52	10	2
3R-200	200±20%	500	700	20	20	130	135	10	2
3R-230	230±20%	600	700	20	20	130	135	10	2
3R-250	250±20%	600	700	20	20	130	135	10	2
3R-350	350±20%	700	900	20	20	130	150	10	2
3R-400	400±20%	800	1000	20	20	130	150	10	2
3R-420	420±20%	800	1000	20	20	130	150	10	2
3R-470	470±20%	1100	1400	20	20	130	150	10	2
3R-600	600±20%	1200	1500	20	20	130	150	10	2

Note1 : DC Breakdown Voltage

DC Measuring Voltage

75-90V

50V

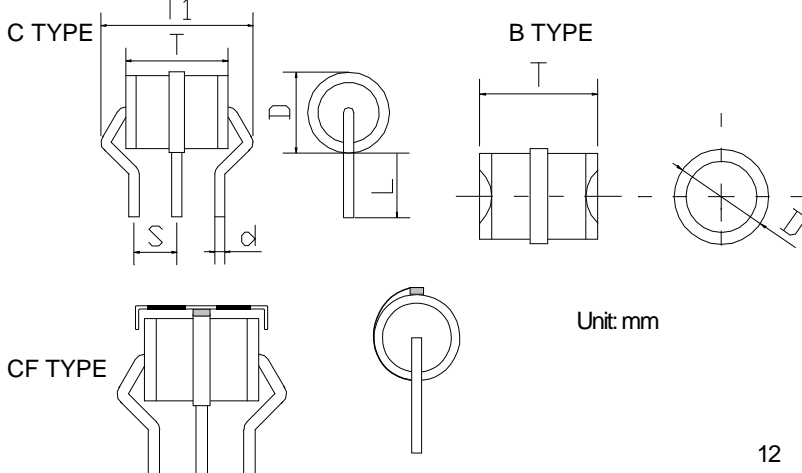
145-400V

100V

420-600V

250V

### Dimensions



Item	Dimensions	
	Spec.	Tolerance
D	8.0	+0.2,-0.8
T	10.0	±0.5
T1	13.4	+0.8,-0.5
L	7.5	±0.5
S	4.4	±0.4
d	1.0	±0.05



# Gas Discharge Tube

## 3 Elements Surface Mount Mini Series



### 3SM $\varnothing$ 5.0mm ,7.2mm long

Model Name	DC Breakdown Voltage	Maximum Impulse Breakdown Voltage		Maximum Impulse Discharge Current		Alternating Discharge Current		Impulse Life	DC Holdover Voltage	Minimum Insulation Resistance	Maximum Capacitance
	(V)	(V)	(V)	(KA)	(KA)	(A)	(A)	(10/1000 $\mu$ s) (200A)	(V)	(G $\Omega$ )	(pf)
	100V/s	100V/ $\mu$ s	1000V/ $\mu$ s	1 time	10 times 5 times each polarit	50HZ, 1sec	Single 9 cycle	times	<150ms	Note3	1MHZ
3SM-75	75 $\pm$ 20%	600	700	10	5	5	30	300	52	1	2
3SM-90	90 $\pm$ 20%	500	600	10	5	5	30	300	52	1	2
3SM-120	120 $\pm$ 20%	500	600	10	5	5	30	300	80	1	2
3SM-150	150 $\pm$ 20%	500	600	10	5	5	30	300	80	1	2
3SM-200	200 $\pm$ 20%	600	700	15	10	10	60	300	135	1	2
3SM-230	230 $\pm$ 20%	600	700	15	10	10	60	300	135	1	2
3SM-250	250 $\pm$ 20%	600	700	15	10	10	60	300	135	1	2
3SM-350	350 $\pm$ 20%	650	750	15	10	10	60	300	135	1	2
3SM-400	400 $\pm$ 20%	700	800	15	10	10	60	300	135	1	2
3SM-420	420 $\pm$ 20%	700	800	15	10	10	60	300	135	1	2
3SM-470	470 $\pm$ 20%	800	900	15	10	10	60	300	135	1	2
3SM-600	600 $\pm$ 20%	900	1000	10	5	5	60	300	135	1	2
3SM-800	800 $\pm$ 20%	1150	1400	10	5	5	30	300	135	1	2
3SM-1100	1100 $\pm$ 20%	1450	1750	10	5	5	30	300	135	1	2

#### Note : DC Breakdown Voltage

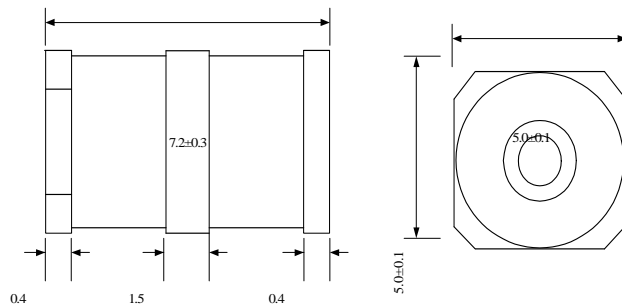
75-90V  
145-400V  
420-600V

#### DC Measuring Voltage

50V  
100V  
250V

#### Dimensions

Unit : mm





# Gas Discharge Tube

## 3 Elements Surface Mount Symmetrical Series



### 3SSM Ø5mm ,7.2mm long

Model Name	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 μs) (KA)		Alternating Discharge Current (A)		Impulse Life (10/1000μs) (200A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
		100V/μs	1000V/μs	1 time	10 times 5 times each polarit	50HZ, 1sec	Single 9 cycle				
3SSM-230	230±20%	600	700	10	5	5	20	300	135	1	2
3SSM-250	250±20%	600	700	10	5	5	20	300	135	1	2
3SSM-350	350±20%	650	750	10	5	5	20	300	135	1	2
3SSM-400	400±20%	700	800	10	5	5	20	300	135	1	2
3SSM-420	420±20%	700	800	10	5	5	20	300	135	1	2
3SSM-470	470±20%	800	900	10	5	5	20	300	135	1	2
3SSM-600	600±20%	900	1000	10	5	5	20	300	135	1	2
3SSM-800	800±20%	1150	1400	10	5	5	20	300	135	1	2
3SSM-1100	1100±20%	1450	1750	10	5	5	20	300	135	1	2

Note1 : 3SSM-800 & 1100 Voltage UL1449 3rd recognition, File E315423

Note2 : DC Breakdown Voltage      DC Measuring Voltage

145-400V

100V

420-600V

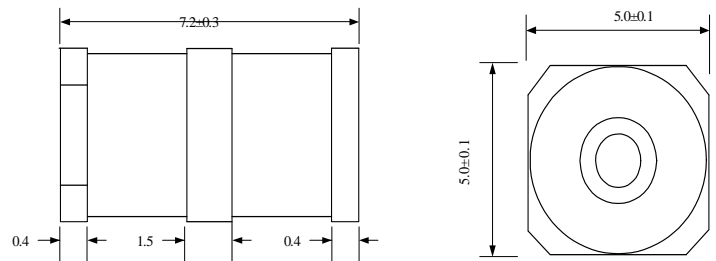
250V

Note3: DC Breakdown Voltage @ 100V/μs for L1 /IL2to ground and L1 to L2

Note4: Impulse Breakdown Voltage @ 100V/μs and 1000V/μs for L1 /L2 to ground

### Dimensions

Unit : mm





# Gas Discharge Tube

## 2 Elements Surface Mount Chip Series

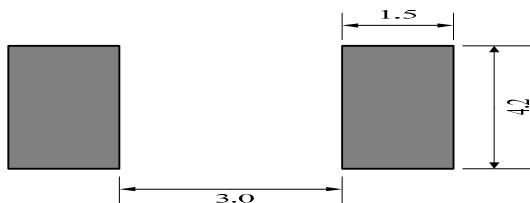
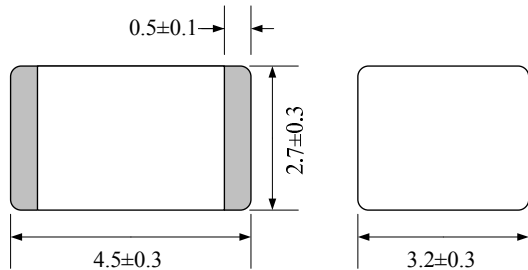


### 4532 4.5\*3.2mm

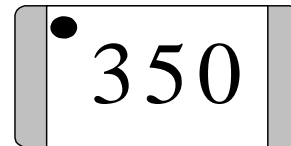
Model	DC Breakdown Voltage	Impulse Discharge Current	Impulse Withstanding Voltage Capacity	Impulse Life Test	Insulation Resistance	Capacitance (1MHz 1V)
4532 075 LF	75V 55~95	8/20 us 2000A	10/700 us 4kV Positive/Negative 5 Times	8/20 us 100A 300Times	100MΩ Min (DC 100V)	0.5pF Max.
4532 090 LF	90V 63~117					
4532 120 LF	120V 84~156					
4532 150 LF	150V 105~195					
4532 200 LF	200V 140~260					
4532 230 LF	230V 161~299					
4532 300 LF	300V 210~390					
4532 350 LF	350V 245~455					
4532 400 LF	400V 280~520					
4532 420 LF	420V 294~546					
4532 470 LF	470V 329~611					
4532 500 LF	500V 350~650					
4532 600 LF	600V 420~780					

### Dimensions

Unit : mm



### Marking



Type	Length	Width	Electrode
4532(mm)	4.5±0.30	3.2±0.30	2.7±0.30

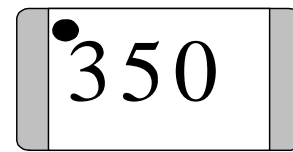
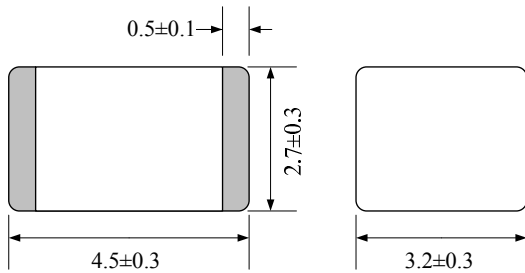


# Gas Discharge Tube

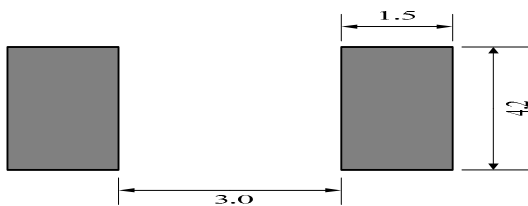
## 2 Elements Surface Mount Chip Series

### 321632\*1.6mm

Model	DC Breakdown Voltage	Impulse Discharge Current	Impulse Withstanding Voltage Capacity	Impulse Life Test	Insulation Resistance	Capacitance (1MHz 1V)
3216120 LF	120V 84~156	8/20 $\mu$ s 500A Positive /Negative 5 times	50Hz is 0.5A 10 times	8/20 $\mu$ s 50A 300 times	100M $\Omega$ Min (DC 100V)	0.3pf Max
3216150 LF	150V 105~195				100M $\Omega$ Min (DC 100V)	
3216200 LF	200V 140~260					
3216230 LF	230V 161~299					
3216300 LF	300V 210~390					
3216350 LF	350V 245~455					
3216400 LF	400V 280~520					
3216420 LF	420V 294~546					
3216470 LF	470V 329~611					
3216500 LF	500V 350~650					
3216600 LF	600V 420~780					



Type	Length	Width	Electrode
3216(mm)	3.2±0.30	1.6±0.20	1.6±0.20







# Gas Discharge Tube

## 2 Elements Power Protection arrester B Series



### 20B Ø20mm ,5.5mm long

Model Name	DC Breakdown Voltage (V)		Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 µs)		Normal Alternating Discharge Current		Impulse Life (10/1000µs) (300A) times	Minimum Insulation Resistance Note1	Maximum Capacitance (pf) 1MHZ
	100V/s	100V/µs	1000V/µs	1 time	10 times	50Hz, 1sec	Single 9cycles				
20B-300	300 ±20%	600	700	60	40	40	80	300	1	5	
20B-350	350 ±20%	700	800								
20B-400	600 ±20%	750	850								
20B-420	420 ±20%	750	850								
20B-470	470 ±20%	800	900								
20B-600	600 ±20%	900	1000								
20B-800	800 ±20%	1100	1200								

Note1 : DC Breakdown Voltage

DC Measuring Voltage

150-400V

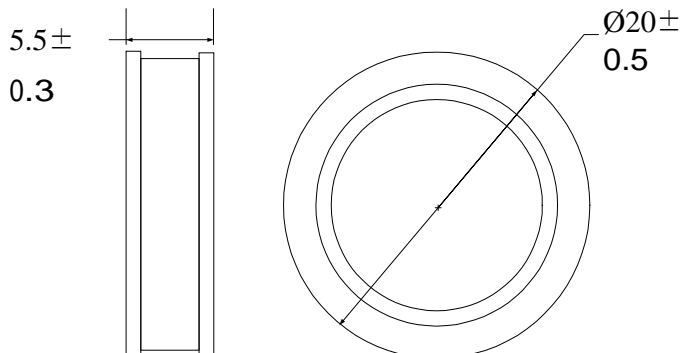
100V

470-800V

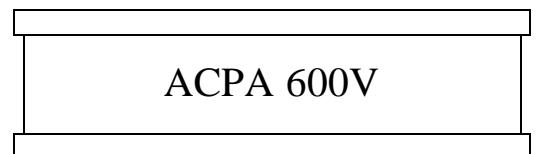
250V

### Dimensions

Unit : mm



### Marking :





# Gas Discharge Tube

## Appendix

### Standard Bulk Packaging

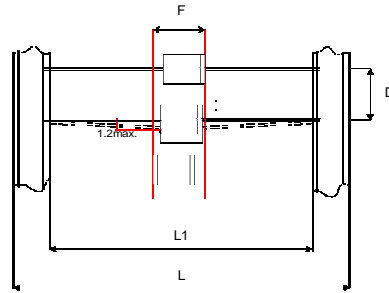
- § 100 pcs per plastic tray
- § 500 pcs per inner box
- § 10 inner boxes per carton
- § 5,000 pcs per full carton

### Taping & Reel Specifications

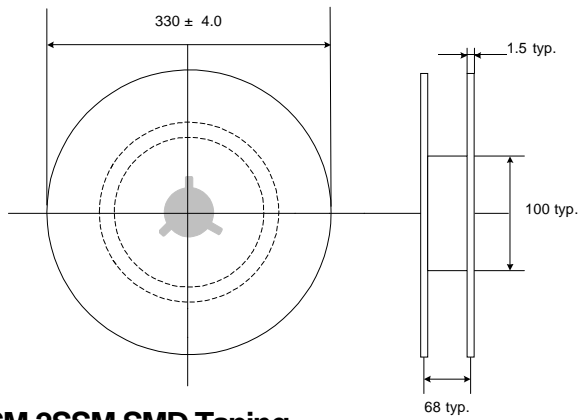
#### § 2RM, 2R, 2N Axial Lead Taping

unit : mm

Item	Dimension	
	Spec.	Tolerance
L1	64	±3
L	52	±2
D	10	±0.5
F	long+1.4	Max.



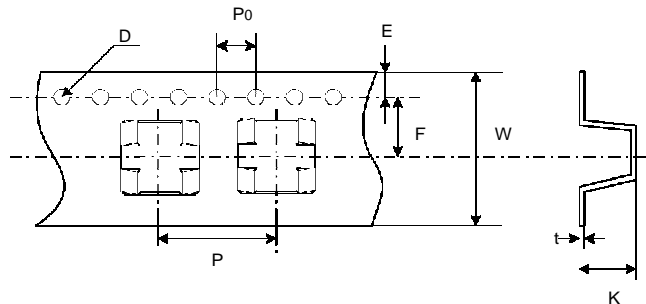
#### Reel



#### § 2SM 2SSM SMD Taping

unit :mm

Item	Spec
P	12.0±0.1
P0	4.0±0.1
W	16.0±0.3
F	7.5±0.1
E	1.75±0.1
D	Φ1.55±0.05
K	4.6±0.1
t	0.5±0.05



Quantity: 900 pcs per reel (13") 3 reels per inner box 5 inners box per carton 13,500 pcs per full carton

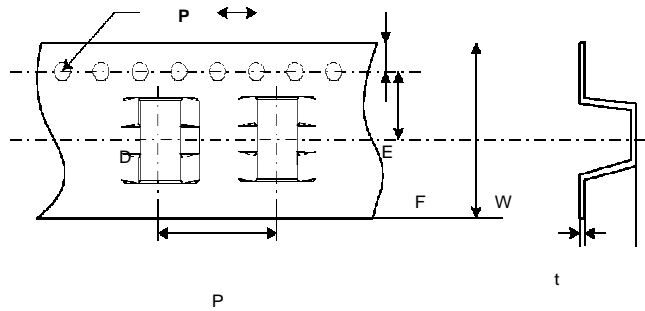


# Gas Discharge Tube

## 2S 2SS SMD Taping

unit:mm

Item	Spec
P	12.0±0.1
P0	4.0±0.1
W	16.0±0.3
F	7.5±0.1
E	1.75±0.1
D	Φ1.55±0.05
K	6.4±0.1
t	0.5±0.05



Quantity: 800 pcs per reel (13")

3 reels per inner box

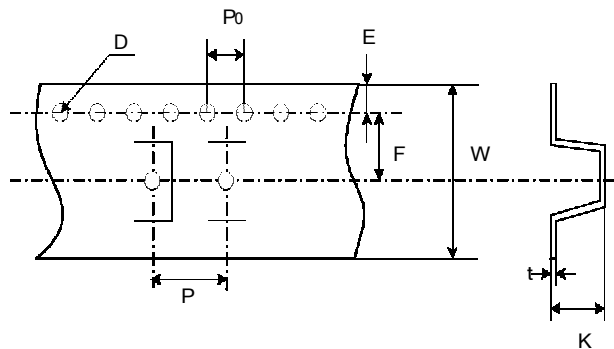
5 inners box per carton

12,000 pcs per full carton

## § Chip 4532 GDT Taping

unit:mm

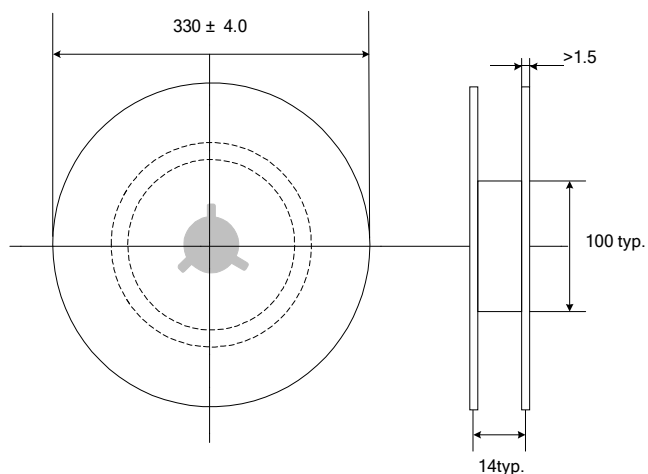
Item	Spec
P	8.0±0.1
P0	4.0±0.1
W	12.0±0.3
F	5.45±0.1
E	1.75±0.1
D	Φ1.55±0.05
K	3.5±0.2
t	0.3±0.1



Quantity: 2500 pcs per reel (13")

3 reels per inner box

5 inners box per car





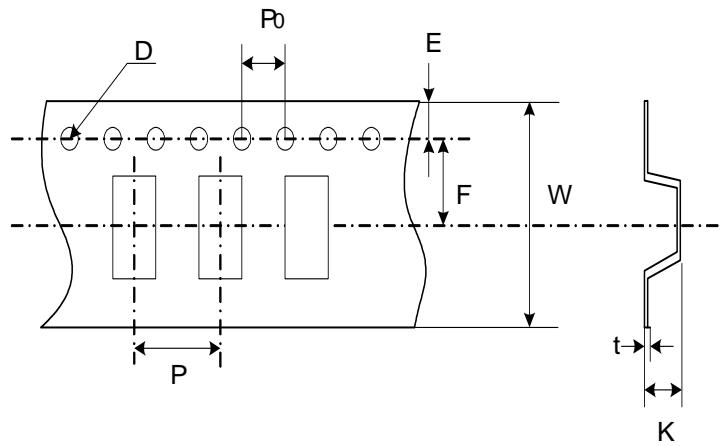
# Gas Discharge Tube

## 5. Package

### Taping & Reel Specifications

unit :mm

Item	Spec
P	8.0±0.1
P0	4.0±0.1
W	12.0±0.3
F	5.45±0.1
E	1.75±0.1
D	Φ1.55±0.05
K	1.8±0.1
t	0.3±0.05

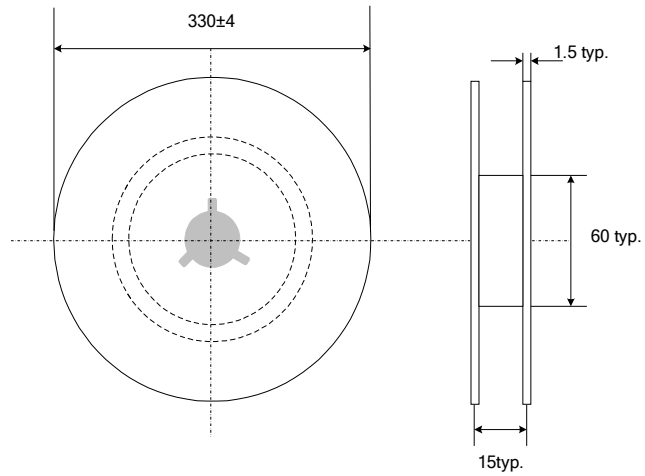


Quantity: 3000 pcs per reel

3 reels per inner box

5 inners box per carton

45,000 pcs per full carton



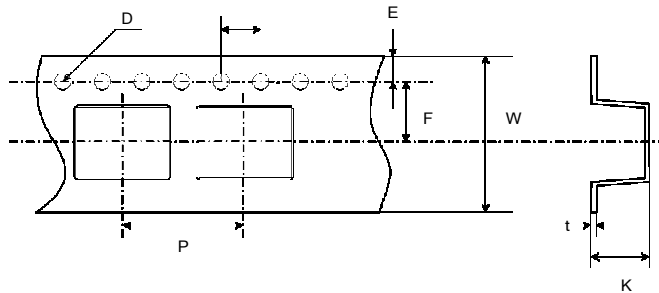


# Gas Discharge Tube

## Taping & Reel Specifications

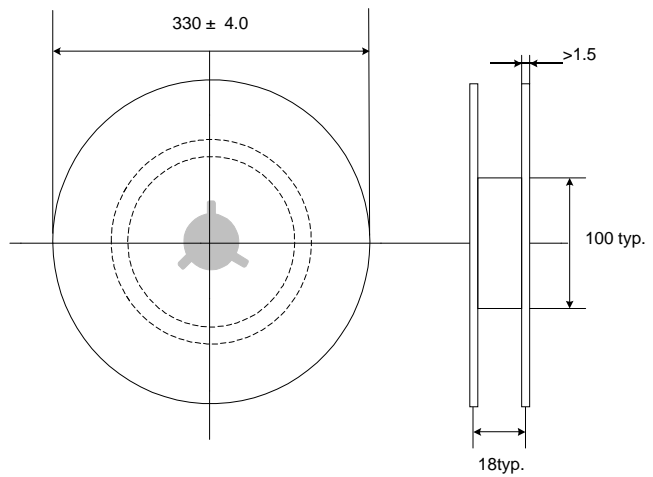
unit :mm

Item	Spec
P	12.0±0.1
P0	4.0±0.1
W	16.0±0.3
F	7.5±0.1
E	1.75±0.1
D	Φ1.55±0.05
K	5.5±0.1
t	0.5±0.05

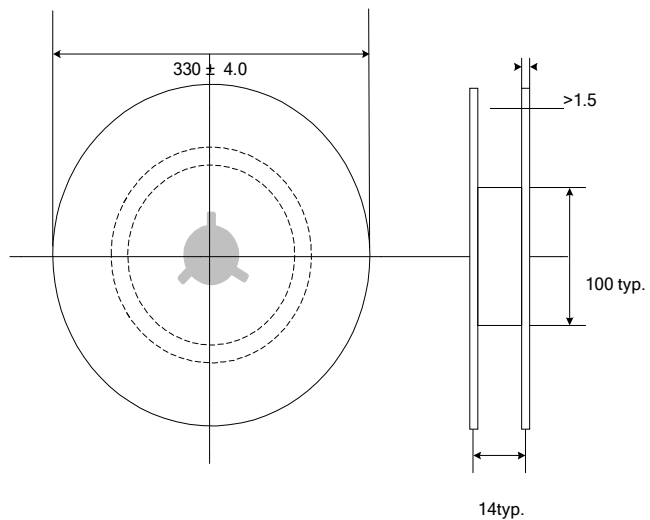


### Reel

Quantity: 900 pcs per reel (13")  
 3 reels per inner box  
 5 inners box per carton  
 13,500 pcs per full carton



Quantity: 2500 pcs per reel (13")  
 3 reels per inner box  
 5 inners box per car





# Gas Discharge Tube

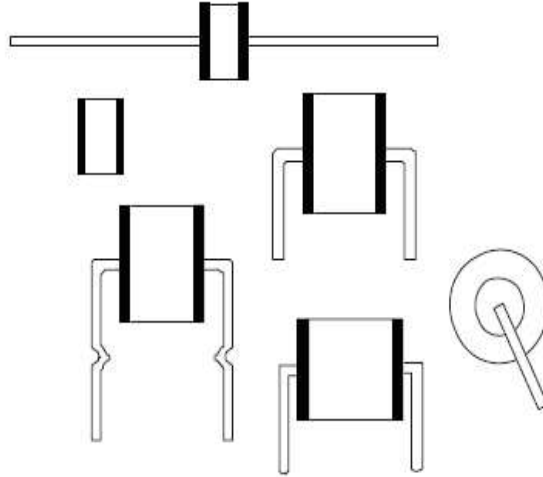
## Electrical Terms and Definitions

Item	Test Condition / Description	Requirement	
DC Breakdown Voltage	The voltage is measured with a low rate of rise $dv/dt \approx 100 \text{ v/s}$	To meet the specified value	
Maximum Impulse Breakdown Voltage	The maximum impulse breakdown voltage is measured with a rise time of $dv/dt \approx 100 \text{ v/}\mu\text{s}$ and $dv/dt \approx 1000 \text{ v/}\mu\text{s}$		
Maximum Impulse Discharge Current	The maximum current applying a waveform 8/20 $\mu\text{s}$ sec that can be applied across the terminals of the gas tube without causing the gas tube DC breakdown voltage to change more than $\pm 25\%$ from its initial measure voltage, $IR > 10^8 \text{ ohms}$ ( -20%,+30% for 70–90V )		
Impulse Life	The minimum number of impulses of a specified waveform and peak current which a gas tube conduct without causing the gas tube DC breakdown voltage to change more than $\pm 25\%$ from its initial measure voltage . Dwell time between pulses is 1.2 minutes		
Alternating Discharge Current	Rate RMS value of AC current at 50HZ, 1 sec or sine waveform 9 cycles, intervals: 3min. DC breakdown voltage may not change more than $\pm 25\%$ from its initial measure voltage, $IR > 10^8 \text{ ohms}$ ( -20%,+30% for 70–90V )		
DC Holdover Voltage	The maximum DC voltage across the two terminals of gas tube under which it may be expected to return to the high impedance state after the gas tube breakdown.		
Insulation Resistance	The resistance of gas tube shall be measured each terminal to each other terminal.		
	DC Breakdown Voltage		Measuring Voltage
	70-150V		50V
	151-400V		100V
	401V-1000V	250V	
1001-2000V	500V		
2001-6000V	1000V		
Capacitance	The capacitance of gas tube shall be measured each terminal to each other terminal. Test frequency : 1 MHZ In measurements involving 3-electrode gas tubes ,the terminal not being tested shall be connected to a ground plane.		



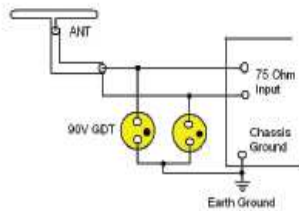
# Gas Discharge Tube

## GAS DISCHARGE TUBES

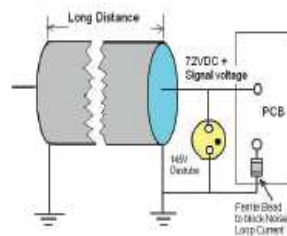


**Gas Discharge Tube** are designed to limit voltage surges on balanced or unbalanced communications circuits and on DC to 420 Hz power circuits. Although telephone circuits are a major application for gas tube surge arrestors, this guide will also provide useful information for other surge applications such as AC circuits.

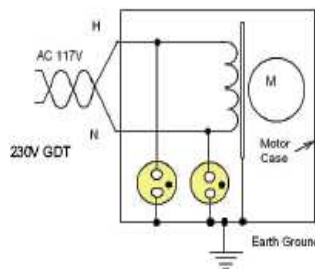
**Gas Tube in Antenna Protection**



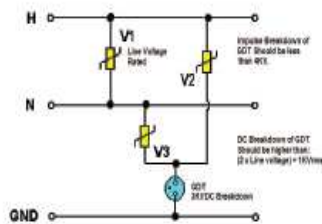
**GDT In Cable Protection**



**Motor (two wire System) Protection from Lightning**



**Gas Tube Application In AC Line Isolation**



**GDT & TVSD Telephone Line Protection**

