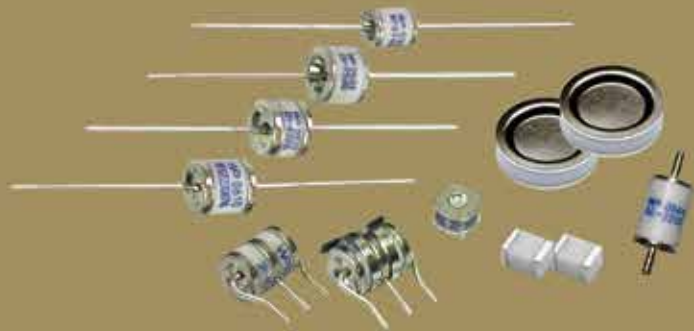




**WORLD PRODUCTS INC.**

# GAS DISCHARGE TUBES



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## 2 & 3 Electrode Surface Mount Series

### Part Numbering System

Example part number:

WPGT - 3SSM 230 D TR  
 (1) (2) (3) (4) (5)

(1) **World Products Gas Discharge Tubes**

(2) **Series Code**

- 2SM = 2 Electrode Surface Mount Mini Series
- 2S = 2 Electrode Surface Mount Standard Series
- 2SS = 2 Electrode Surface Mount Mini Square Series
- 2SR = 2 Electrode Surface Mount Standard Low Profile Series
- 2SN = 2 Electrode Surface Mount Super Mini Series
- 2SF = 2 Electrode Surface Mount Ultra Super Mini Series
- 3216\* = 2 Electrode Surface Mount Chip Series
- 4532\* = 2 Electrode Surface Mount Chip Series
- 3SM = 3 Electrode Surface Mount Mini Series
- 3SSM = 3 Electrode Surface Mount Symmetrical Series

(3) **DC Breakdown Voltage**

(Please reference specification to determine available voltage options for each series.)

- 70 = 70V
- 75 = 75V
- 90 = 90V
- 120 = 120V
- 145 = 145V
- 150 = 150V
- 200 = 200V
- 230 = 230V
- 250 = 250V
- 300 = 300V
- 350 = 350V
- 400 = 400V
- 420 = 420V
- 470 = 470V
- 500 = 500V
- 600 = 600V
- 800 = 800V
- 1100 = 1100V
- 1200 = 1200V
- 1800 = 1800V
- 2000 = 2000V
- 2500 = 2500V
- 2700 = 2700V
- 3000 = 3000V

(4) **D** = Special DC Voltage Breakdown - 3SSM Series Only

(5) **Taping Specifications**

TR = Tape & Reel

\* 3216 and 4532 only available on tape and reel "TR" suffix.

## 2 Electrode Surface Mount Mini Series (2SM)

### Specifications

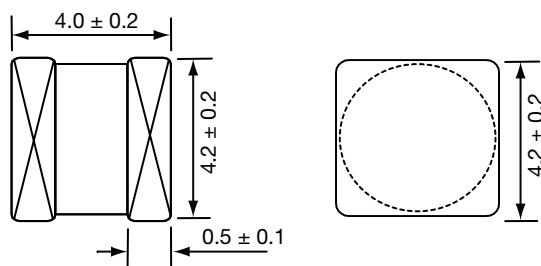
Base Part Number	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20 $\mu$ s) (KA)		Alternating Discharge Current (A)		Impulse Life (10/1000 $\mu$ s) (100A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (G $\Omega$ )	Maximum Capacitance (pf)
	100V/s	100V/ $\mu$ s	1000V/ $\mu$ s	1 time	10 times (5 times each polarity)	50Hz, 1 sec	Single 9 cycles	times	<150ms	*	1MHz
WPGT-2SM75	75 $\pm$ 20%	700	800	5	3	3	6	300	52	1	0.5
WPGT-2SM90	90 $\pm$ 20%	700	800	5	3	3	6	300	52	1	0.5
WPGT-2SM145	145 $\pm$ 20%	700	800	5	3	3	6	300	52	1	0.5
WPGT-2SM230	230 $\pm$ 20%	600	700	5	3	3	6	300	135	1	0.5
WPGT-2SM250	250 $\pm$ 20%	600	700	5	3	3	6	300	135	1	0.5
WPGT-2SM300	300 $\pm$ 20%	600	700	5	3	3	6	300	135	1	0.5
WPGT-2SM350	350 $\pm$ 20%	650	800	5	3	3	6	300	135	1	0.5
WPGT-2SM400	400 $\pm$ 20%	700	800	5	3	3	6	300	135	1	0.5
WPGT-2SM470	470 $\pm$ 20%	700	800	5	3	3	6	300	135	1	0.5
WPGT-2SM600	600 $\pm$ 20%	900	1000	5	3	3	6	300	135	1	0.5

#### UL497B Recognized, File #E135015

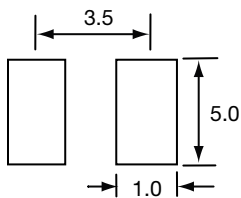
<b>*DC Breakdown Voltage</b>	<b>DC Measuring Voltage</b>
75-145V	50V
230-400V	100V
470-600V	250V

### Dimensions

Unit: mm



### Recommended Pad Size



## Packaging

### Standard Bulk Packaging

<b>Axial or Radial Lead</b> 100 pieces per plastic tray 500 pieces per inner box 10 inner boxes per carton 5000 pieces per full carton	<b>Axial or Radial Lead (2RF and 2RN)</b> 200 pieces per plastic tray 1600 pieces per inner box 10 inner boxes per carton 16000 pieces per full carton	<b>Surface Mount</b> 100 pieces per plastic tray 500 pieces per inner box 10 inner boxes per carton 5000 pieces per full carton	<b>20B ONLY</b> 40 pieces per plastic tray 200 pieces per inner box 10 inner boxes per carton 2000 pieces per full carton
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### 2RM, 2R, 2N, 2T, 2RC Axial Lead Taping

**Unit: mm**  
Complies to EIA-296-E and EN60286-1.

Item	Dimensions
L1	52.2 ± 2.0
L	64.0 ± 3.0
D	10 ± 0.5
F	Length + 1.4 Max.

### 2RM, 2R, 2N, 2T Axial Lead Ammo Box

**Unit: mm**  
**Quantity: 500 pieces**

Item	Dimensions
A	255 Max.
B	75 ± 5.0
C	68 ± 5.0

### 2RM, 2R, 2RS, 2RN, 2RF, 2N, 2T, 2RC Axial Lead Reel

**Unit: mm**  
**Quantity: 500 pieces**

### 2S, 2SM, 2SS, 2SN, 2SF, 3SM, 3SSM, 3216 & 4532 SMD Reel

**Unit: mm**  
**Quantity: See SMD Taping**

\* for 3216 this dimension is 60 typ.  
\*\* for 3216 this dimension is 15 typ.

### 20B and AE Standard Bulk Packaging

**Unit: mm**

<b>20B=</b> 40 Pieces per Plastic Tray	200 Pieces per Inner Box	2000 Pieces per Full Carton
<b>AE=</b> 60 Pieces per Plastic Tray (Standard & High Current Series)	180 Pieces per Inner Box	1800 Pieces per Full Carton
(Ultra High Current & Screw Lead Series)	105 Pieces per Inner Box	1050 Pieces per Full Carton

**NOTE: For Series Types:**

12D8	18D7
12D12	20D6
12D17	25D10W
12D18	25D21
16D5	30D12

Please consult World Products Inc.

## Packaging (continued)

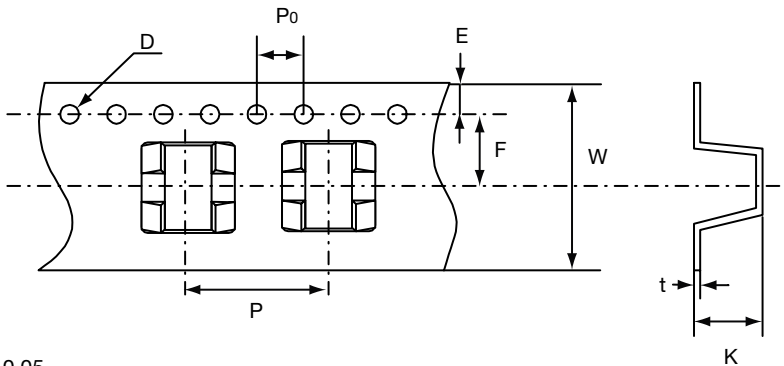
### 2S and 2SR SMD Taping

Unit: mm

Quantity: 800 pieces per reel (13") - [Beginning March 2007]  
 3 reels per inner box  
 5 inner boxes per carton  
 12,000 pieces per full carton - [Beginning March 2007]

Item	Dimensions
P	12.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1
W	16.0 ± 0.3
F	7.5 ± 0.1

Item	Dimensions
E	1.75 ± 0.1
D	1.55 ± 0.1
K*	6.4 ± 0.1
t*	0.4 ± 0.05



\*For 2SR: "K" dimension is 5.4 ± 0.1 and "t" dimension is 0.5 ± 0.05

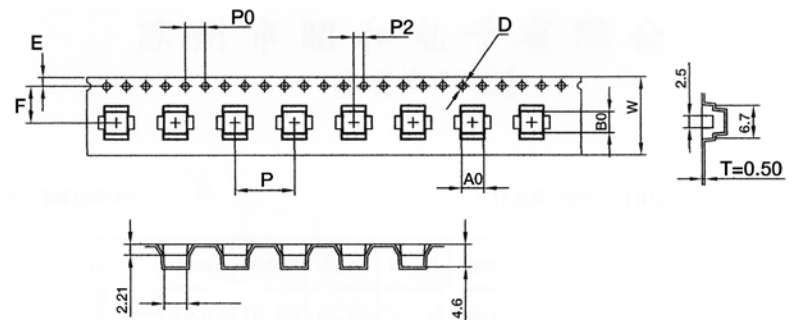
### 2SM and 2SS SMD Taping

Unit: mm

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

Item	Dimensions
P	12.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1
W	16.0 ± 0.3
F	7.5 ± 0.1
B <sub>0</sub>	4.3 ± 0.1

Item	Dimensions
E	1.75 ± 0.1
D	1.5 ± 0.1
t	0.5 typ
A <sub>0</sub>	4.5 ± 0.1
K <sub>0</sub>	4.6 ± 0.1
K <sub>1</sub>	0 ± 0.1
D <sub>1</sub>	0 ± 0.1
P <sub>2</sub>	2 ± 0.1



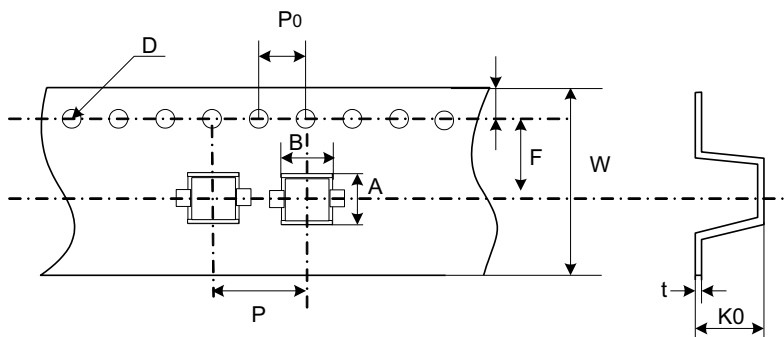
### 2SN and 2SF Taping

Unit: mm

Quantity: 2000 pieces per reel (13")  
 3 reels per inner box  
 5 inner boxes per carton  
 30,000 pieces per full carton

Item	Dimensions
P	8.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1
A	3.9 ± 0.3
B*	4.3 ± 0.1

Item	Dimensions
D	1.55 ± 0.05
W	16.0 ± 0.3
K <sub>0</sub>	3.9 ± 0.1
t	0.4 ± 0.05



\*For 2SF this dimension is 3.2mm ± 0.1mm.

## Packaging (continued)

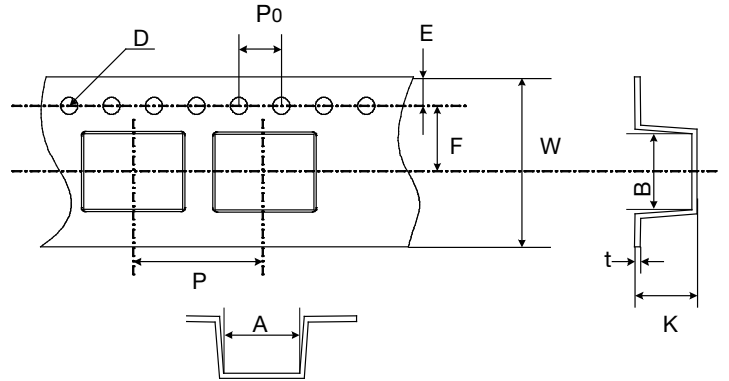
### 3SM & 3SSM SMD Taping

Unit: mm

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

Item	Dimensions
P	12.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1
W	16.0 ± 0.3
F	7.5 ± 0.1
B	5.4 ± 0.1

Item	Dimensions
E	1.75 ± 0.1
D	1.55 ± 0.05
K	5.5 ± 0.1
t	0.5 ± 0.05
A	7.28 ± 0.1



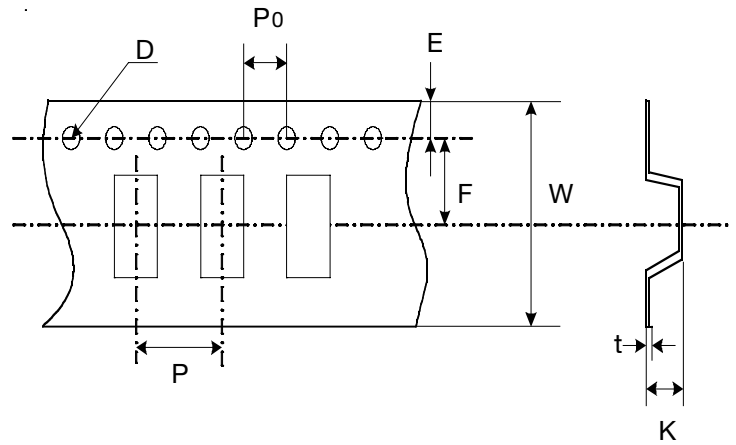
### 3216 and 4532 Taping

Unit: mm

Quantity: 3,000 pieces per reel (13") - 3216 size  
 2,500 pieces per reel (13") - 4532 size  
 3 reels per inner box - 3216 and 4532 size  
 5 inner boxes per carton - 3216 and 4532 size  
 45,000 pieces per full carton - 3216 size  
 37,500 pieces per full carton - 4532 size

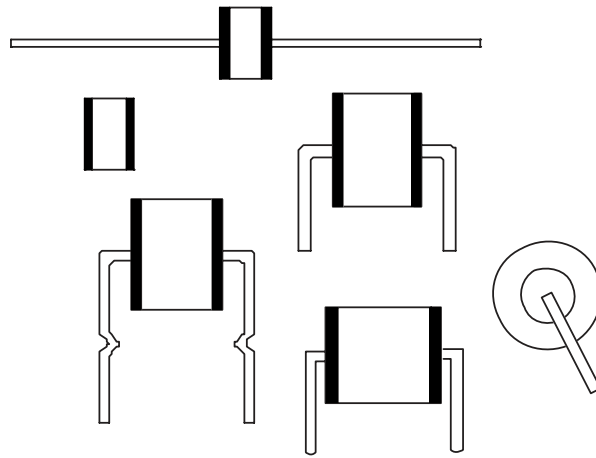
Item	Dimensions
P	8.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1
W	12.0 ± 0.3
F	5.45 ± 0.1
E	1.75 ± 0.1

Item	Dimensions
D	1.55 ± 0.05
K*	3.0 ± 0.1
t	0.3 ± 0.05



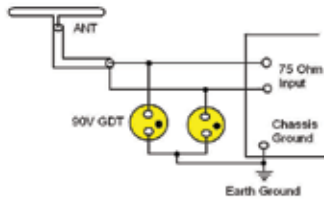
\* for 3216 this dimension is 1.8 ± 0.1

# GAS DISCHARGE TUBES

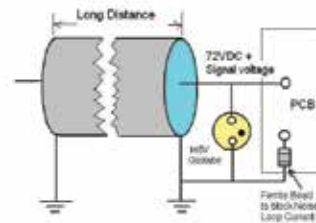


**Gas Discharge Tube** are designed to limit voltage surges on balanced or unbalanced communications circuits and on DC to 420 Hz power circuits. Although telephone circuits are a major application for gas tube surge arrestors, this guide will also provide useful information for other surge applications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

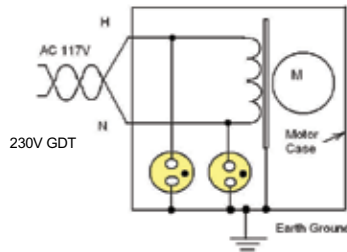
**Gas Tube in Antenna Protection**



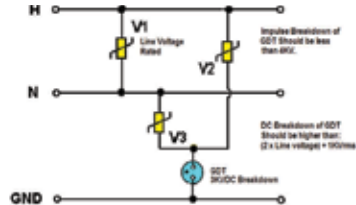
**GDT in Cable Protection**



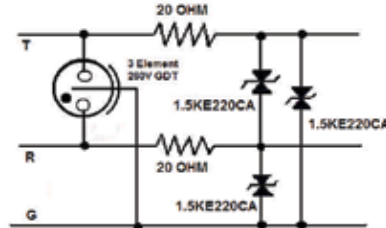
**Motor (two wire System) Protection from Lightning**



**Gas Tube Application In AC Line Isolation**



**GDT & TVSD Telephone Line Protection**



*All application notes/circuits are shown as examples only. It is the responsibility of the purchaser to insure that the application meets purchaser's specifications. No representation or warranty, whether express or implied, is given and no liability is assumed by WPI with respect to the use of such examples.*

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