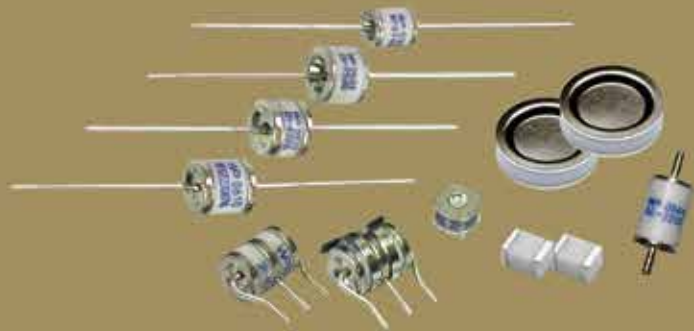




WORLD PRODUCTS INC.

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 Standard Series (2S)

Specifications

Base Part Number	DC Breakdown Voltage (V)	Maximum Impulse Breakdown Voltage (V)		Maximum Impulse Discharge Current (8/20µs) (KA)		Alternating Discharge Current (A)		Impulse Life (10/1000µs) (100A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
	100V/s	100V/µs	1000V/µs	1 time	10 times (5 times each polarity)	50Hz, 1 sec	Single 9 cycles	times	<150ms	*	1MHz
WPGT-2S75	75 ± 20%	600	700	8	5	5	15	1000	52	1	1
WPGT-2S90	90 ± 20%	600	700	8	5	5	15	1000	52	1	1
WPGT-2S145	145 ± 20%	500	700	8	5	5	15	1000	52	1	1
WPGT-2S230	230 ± 20%	450	550	8	5	5	15	1000	135	1	1
WPGT-2S250	250 ± 20%	450	550	8	5	5	15	1000	135	1	1
WPGT-2S300	300 ± 20%	500	600	8	5	5	15	1000	135	1	1
WPGT-2S350	350 ± 20%	500	600	8	5	5	15	1000	135	1	1
WPGT-2S400	400 ± 20%	600	700	8	5	5	15	1000	135	1	1
WPGT-2S470	470 ± 20%	700	800	8	5	5	15	1000	135	1	1
WPGT-2S600	600 ± 20%	800	900	8	5	5	15	1000	135	1	1
WPGT-2S800	800 ± 20%	1000	1100	8	5	5	15	500	150	1	0.8
WPGT-2S1000	1000 ± 20%	1500	1600	5	3	3	10	300	150	1	0.8
WPGT-2S1200	1200 ± 20%	1700	1800	5	3	3	10	300	150	1	1
WPGT-2S1800	1800 ± 20%	2500	2600	5	3	3	10	300	150	1	1
WPGT-2S2000	2000 ± 20%	2700	2800	5	3	3	10	300	150	1	1
WPGT-2S2500	2500 ± 20%	3100	3200	5	3	3	10	300	150	1	1
WPGT-2S2700	2700 ± 20%	3300	3400	5	3	3	10	300	150	1	1
WPGT-2S3000	3000 ± 20%	3600	3700	5	3	3	10	300	150	1	1

UL497B Recognized, File #E135015 (WPGT-2S75 through WPGT-2S600)

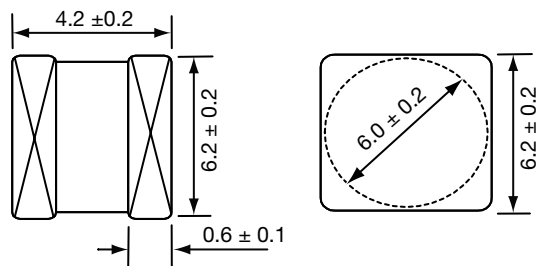
UL1449 and CUL 4th Edition Recognized, File #E321567 (WPGT-2S1200 through WPGT-2S3000)

VDE Certified File #40040434 for the following voltages: 75, 90, 145, 230, 250, 300, 350, 400, 470, and 600.

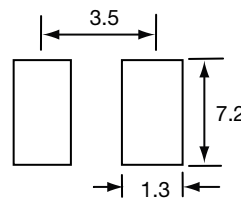
*DC Breakdown Voltage	DC Measuring Voltage
75-145V	50V
230-400V	100V
470-1000V	250V
1200-2000V	550V
2500-3000V	1000V

Dimensions

Unit: mm



Recommended Pad Size



Packaging

Standard Bulk Packaging

Axial or Radial Lead 100 pieces per plastic tray 500 pieces per inner box 10 inner boxes per carton 5000 pieces per full carton	Axial or Radial Lead (2RF and 2RN) 200 pieces per plastic tray 1600 pieces per inner box 10 inner boxes per carton 16000 pieces per full carton	Surface Mount 100 pieces per plastic tray 500 pieces per inner box 10 inner boxes per carton 5000 pieces per full carton	20B ONLY 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

20B= 40 Pieces per Plastic Tray	200 Pieces per Inner Box	2000 Pieces per Full Carton
AE= 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)	35 Pieces per Plastic Tray	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)

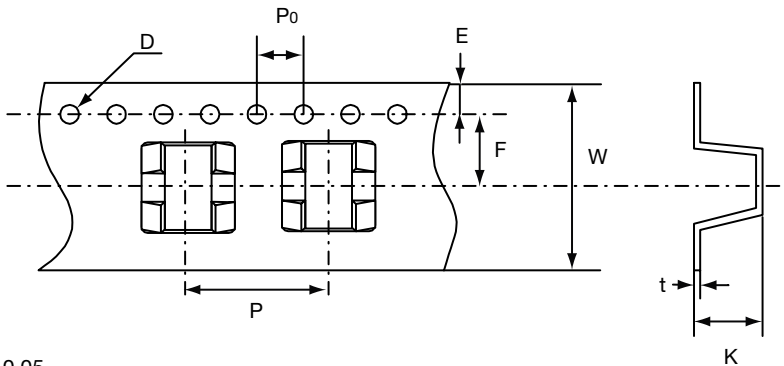
2S and 2SR SMD Taping

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 ₀	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

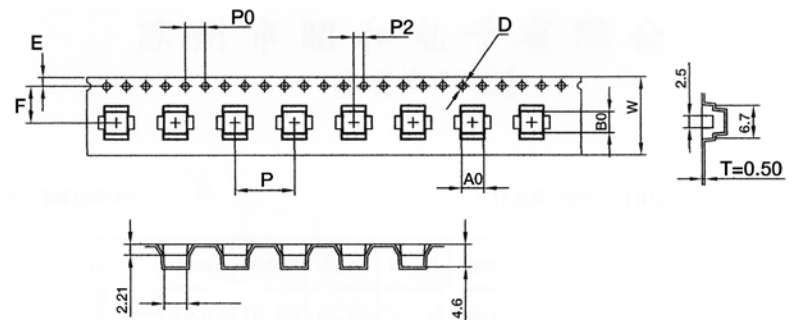
2SM and 2SS SMD Taping

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 ₀	4.0 ± 0.1
W	16.0 ± 0.3
F	7.5 ± 0.1
B ₀	4.3 ± 0.1

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



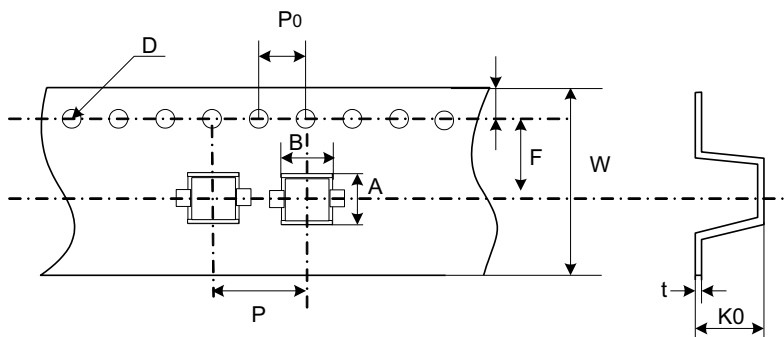
2SN and 2SF Taping

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 ₀	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 ₀	3.9 ± 0.1
t	0.4 ± 0.05



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

Packaging (continued)

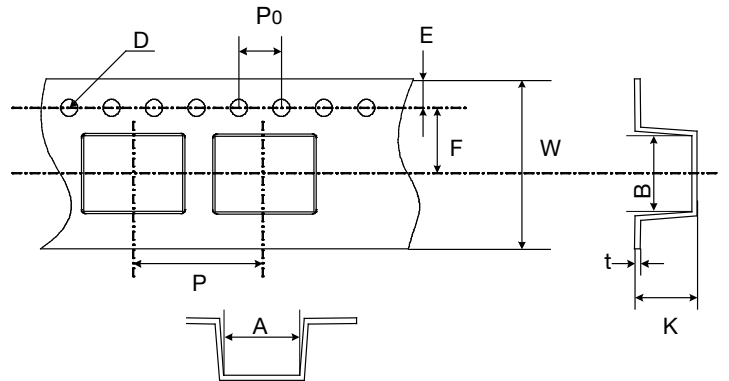
3SM & 3SSM SMD Taping

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 ₀	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



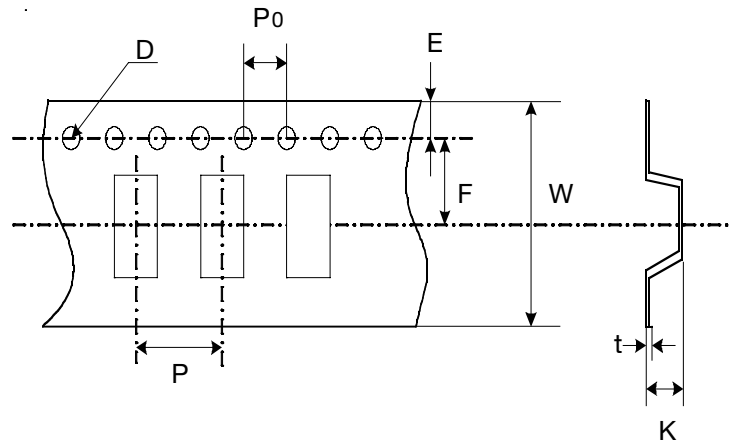
3216 and 4532 Taping

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

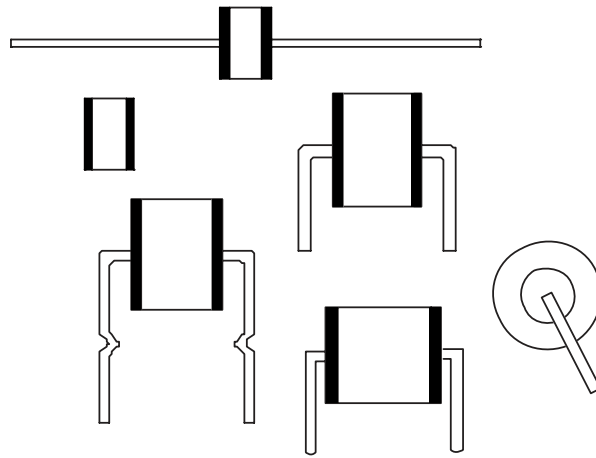
Item	Dimensions
P	8.0 ± 0.1
P ₀	4.0 ± 0.1
W	12.0 ± 0.3
F	5.45 ± 0.1
E	1.75 ± 0.1

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



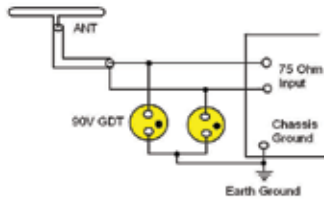
* for 3216 this dimension is 1.8 ± 0.1

GAS DISCHARGE TUBES

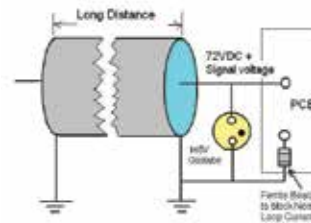


Gas Discharge Tube are designed to limit voltage surges on balanced or unbalanced communications circuits and on DC to 420 Hz power circuits. Although telephone circuits are a major application for gas tube surge arrestors, this guide will also provide useful information for other surge applications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

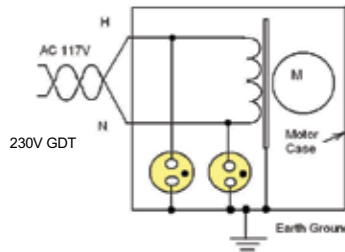
Gas Tube in Antenna Protection



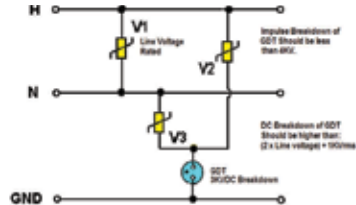
GDT in Cable Protection



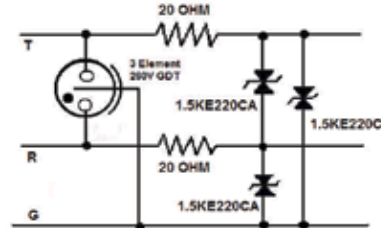
Motor (two wire System) Protection from Lightning



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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