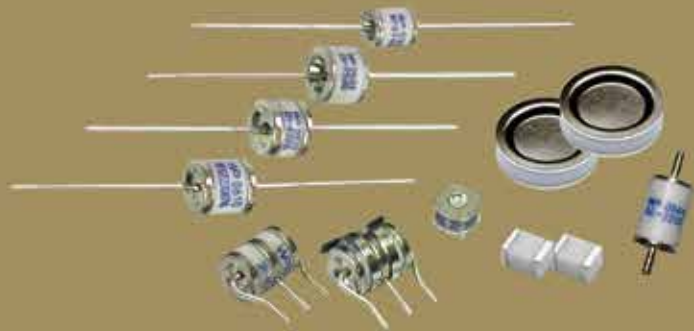




WORLD PRODUCTS INC.

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.

3 Electrode Surface Mount Mini Series (3SM)

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) (200A)	DC Holdover Voltage (V)	Minimum Insulation Resistance (GΩ)	Maximum Capacitance (pf)
	100V/s NOTE 1	100V/µs NOTE 2	1000V/µs NOTE 2	1 time	10 times (5 times each polarity)	50Hz, 1 sec	Single 9 cycles	times	<150ms	*	1MHz
WPGT-3SM75	75 ± 20%	300	550	10	5	5	30	300	52	1	2
WPGT-3SM90	90 ± 20%	300	550	15	10	10	60	300	52	1	2
WPGT-3SM120	120 ± 20%	350	550	15	10	10	60	300	52	1	2
WPGT-3SM150	150 ± 20%	400	500	15	10	10	60	300	52	1	2
WPGT-3SM200	200 ± 20%	500	600	15	10	10	60	300	135	1	2
WPGT-3SM230	230 ± 20%	550	650	15	10	10	60	300	135	1	2
WPGT-3SM250	250 ± 20%	550	650	15	10	10	60	300	135	1	2
WPGT-3SM300	250 ± 20%	600	700	20	10	10	60	300	150	1	2
WPGT-3SM350	350 ± 20%	650	750	20	10	10	60	300	150	1	2
WPGT-3SM400	400 ± 20%	700	800	20	10	10	60	300	150	1	2
WPGT-3SM420	420 ± 20%	700	800	10	5	5	30	300	150	1	2
WPGT-3SM470	470 ± 20%	800	900	10	5	5	30	300	150	1	2
WPGT-3SM600	600 ± 20%	900	1000	10	5	5	30	300	150	1	2
WPGT-3SM800	800 ± 20%	1150	1400	10	5	5	30	300	150	1	2
WPGT-3SM1100	1100 ± 20%	1450	1750	10	5	5	30	300	150	1	2

UL 497B Recognized, File #E135015 (WPGT-3SM75 through WPGT-3SM600).

UL 1449 and CUL 4th Edition Recognition, File #E321567 (WPGT-3SM800 and WPGT-3SM1100)

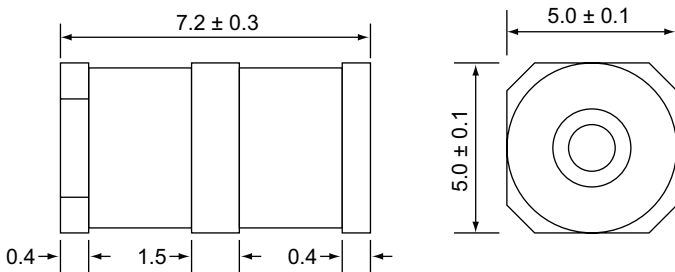
*DC Breakdown Voltage	DC Measuring Voltage
75 - 150V	50V
200 - 400V	100V
420 - 800V	250V
1100V	500V

NOTE 1: DC Breakdown Voltage @ 100V/s for L1/L2 to ground.

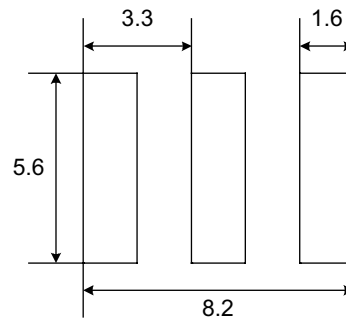
NOTE 2: Impulse Breakdown Voltage @ 100V/µs and 1000V/µs for L1/L2 to ground.

Dimensions

Unit: mm



Recommended Pad Size



Note: Max coplanarity is 0.2mm. If tighter requirements are needed please contact World Products Inc.

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=	AE=	(Ultra High Current & Screw Lead Series)
	40 Pieces per Plastic Tray	60 Pieces per Plastic Tray	35 Pieces per Plastic Tray
	200 Pieces per Inner Box	180 Pieces per Inner Box	105 Pieces per Inner Box
	2000 Pieces per Full Carton	1800 Pieces per Full Carton	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)

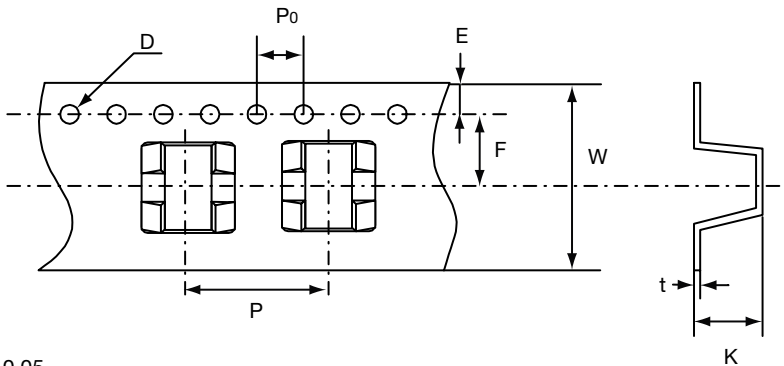
2S and 2SR SMD Taping

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

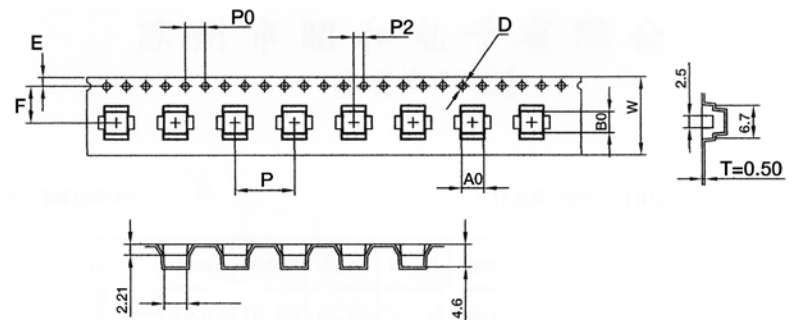
2SM and 2SS SMD Taping

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



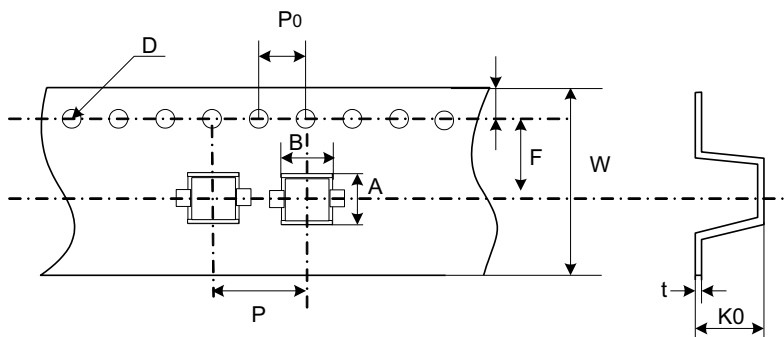
2SN and 2SF Taping

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)

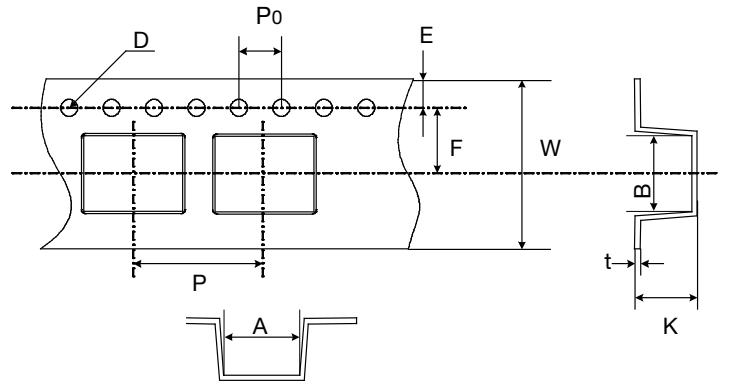
3SM & 3SSM SMD Taping

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



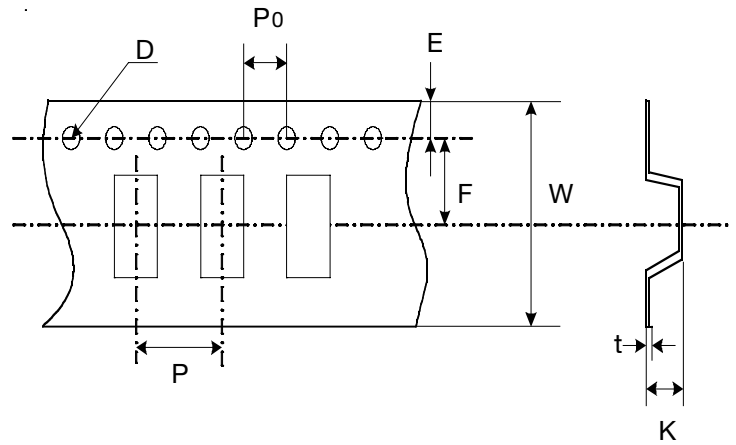
3216 and 4532 Taping

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

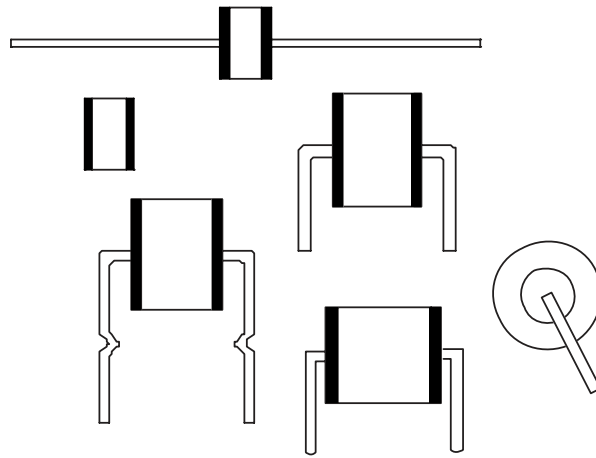
Item	Dimensions
P	8.0 ± 0.1
P ₀	4.0 ± 0.1
W	12.0 ± 0.3
F	5.45 ± 0.1
E	1.75 ± 0.1

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



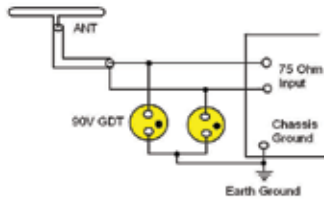
* for 3216 this dimension is 1.8 ± 0.1

GAS DISCHARGE TUBES

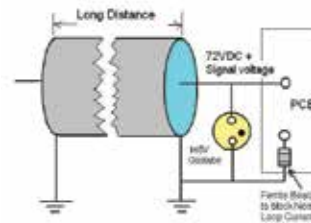


Gas Discharge Tube are designed to limit voltage surges on balanced or unbalanced communications circuits and on DC to 420 Hz power circuits. Although telephone circuits are a major application for gas tube surge arrestors, this guide will also provide useful information for other surge applications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

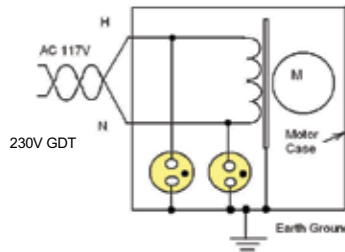
Gas Tube in Antenna Protection



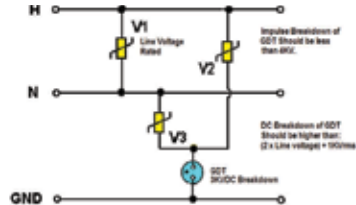
GDT in Cable Protection



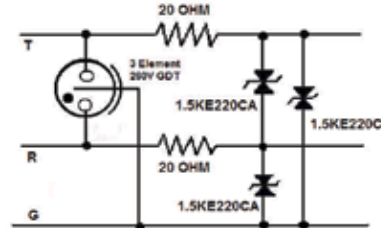
Motor (two wire System) Protection from Lightning



Gas Tube Application In AC Line Isolation



GDT & TVSD Telephone Line Protection



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