



# THE DATASHEET OF P4SMAJ27CA



**SURFACE MOUNT GPP  
TRANSIENT VOLTAGE SUPPRESSOR  
400 WATT PEAK POWER 1.0 WATTS STEADY STATE**

**FEATURES**

- \* Plastic package has underwriters laboratory
- \* Glass passivated chip construction
- \* 400 watt surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time
- \* P/N suffix V means AEC-Q101 qualified, e.g:P4SMAJ6.8V
- \* P/N suffix V means Halogen-free

**MECHANICAL DATA**

- \* Epoxy: Device has UL flammability classification 94V-O
- \* UL file No.:E211196

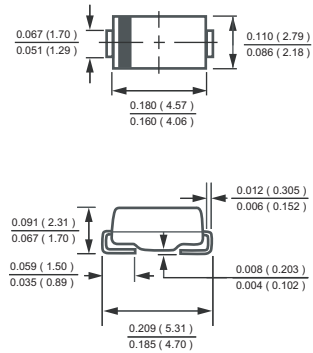
**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25 °C ambient temperature unless otherwise specified.

Single phase, half wave, 60 Hz, resistive or inductive load,  
For capacitive load, derate current by 20%.



**DO-214AC**



Dimensions in inches and (millimeters)

**MAXIMUM RATINGS (@ TA=25 °C unless otherwise noted)**

RATINGS	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A = 25^\circ\text{C}$ , $T_P = 1\text{mS}$ (Note 1)	$P_{PPM}$	Minimum 400	W
Peak Pulse Current with a 10/1000uS waveform ( Note 1, Fig.3 )	$I_{PPM}$	SEE TABLE 1	A
Steady State Power Dissipation at $T_L = 75^\circ\text{C}$ lead length, .375" (9.5 mm) (Note 2)	$P_{M(AV)}$	1.0	W
Peak Forward Surge Current, 8.3ms single half sine wave-superimposed on rated load ( JEDEC METHOD ) (Note 3)	$I_{FSM}$	40	A
Typical Current Squared Time	$i^2t$	6.64	A <sup>2</sup> /Sec
Maximum Instantaneous Forward Voltage @25A for unidirectional only ( Note 5 )	$V_F$	3.5/6.5	V
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to + 150	°C

- NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^\circ\text{C}$  per Fig.2.  
 2. Mounted on 0.2 X 0.2" (5.0 X 5.0mm) copper pad to each terminal.  
 3. Measured on 8.3mS single half Sine-Wave or equivalent wave, duty cycle = 4 pulses per minute maximum.  
 4. " ROHS compliant".  
 5.  $V_F = 3.5\text{V}$  max. for devices of  $V(\text{BR}) \leq 200\text{V}$  and  $V_F = 6.5\text{V}$  max. for devices of  $V(\text{BR}) \geq 200\text{V}$ .

2023-02  
REV:E

# RATING AND CHARACTERISTICS CURVES (P4SMAJxx)

FIG. 1 - PEAK PULSE POWER RATING CURVE

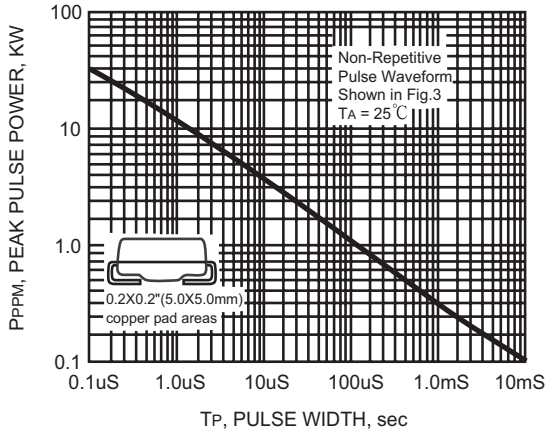


FIG. 3 - PULSE WAVEFORM

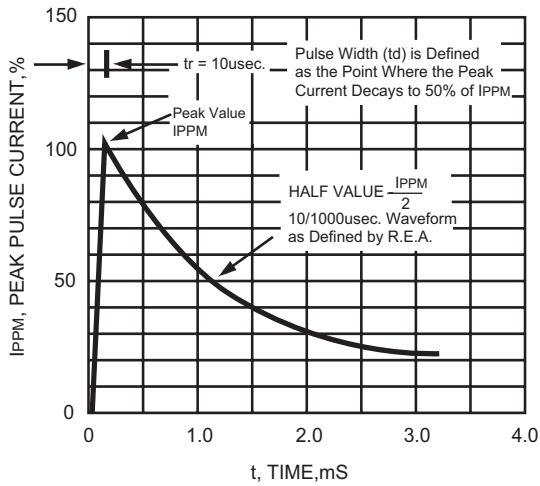


FIG. 2 - PULSE DERATING CURVE

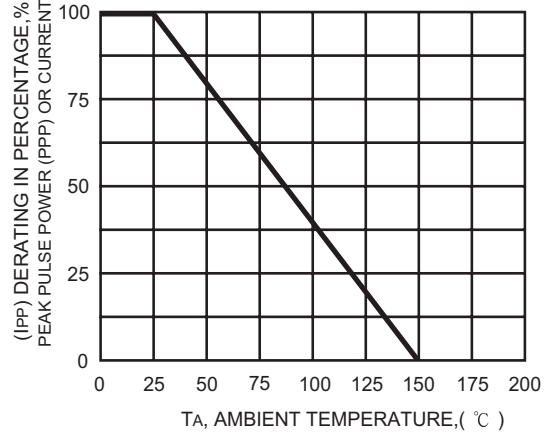
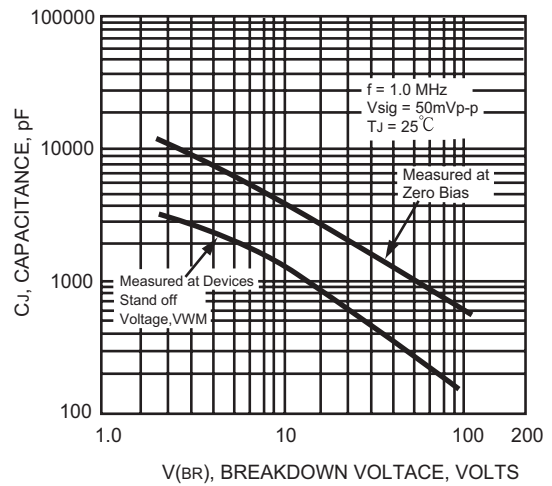


FIG. 4 - TYPICAL JUNCTION CAPACITANCE



## RATING AND CHARACTERISTICS CURVES (P4SMAJxx)

FIG. 5 - STEADY STATE POWER DERATING CURVE

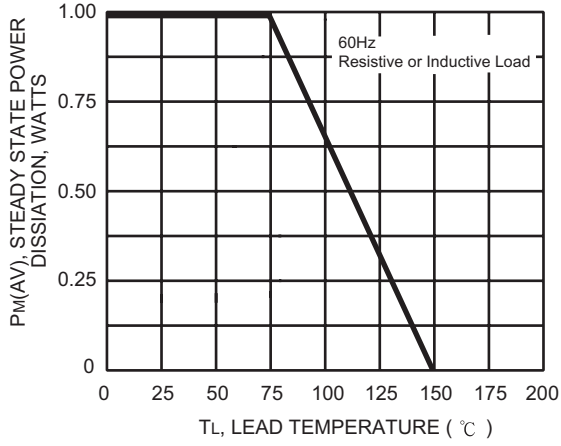


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

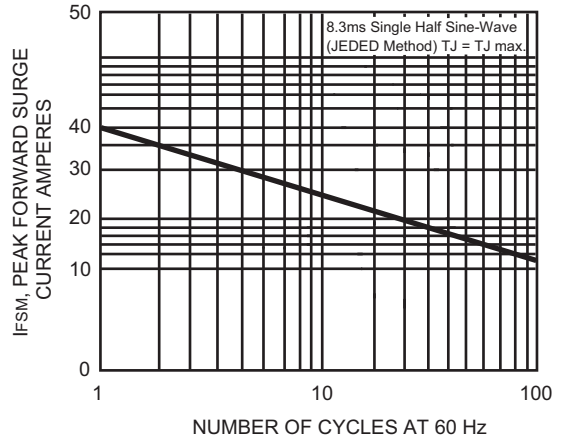
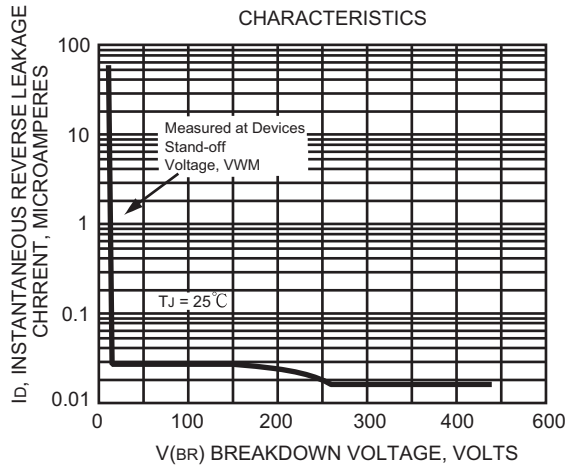


FIG. 7 - TYPICAL REVERSE LEAKAGE CHARACTERISTICS



## TRANSIENT VOLTAGE SUPPRESSORS

400W SERIES TVS DIODES / DO-214AC ( CASE 2 ) 400W

Rectron House No.	Rectron Industry No.	Breakdown Voltage			Reverse Stand off Voltage $V_{WM}$ (Volts)	Maximum Reverse Leakage at $V_{WM}$ $I_D(\mu A)$	Maximum Peak Pulse Current $I_{PPM}$ (Amps)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts)
		$V_{BR}$ (Volts)		@ $I_T$ (mA)				
		MIN.	MAX.					
P4FMAJ6.8	P4SMAJ6.8	6.12	7.48	10	5.50	1000	37	10.8
P4FMAJ6.8A	P4SMAJ6.8A	6.45	7.14	10	5.80	1000	38.1	10.5
P4FMAJ7.5	P4SMAJ7.5	6.75	8.25	10	6.05	500	34.2	11.7
P4FMAJ7.5A	P4SMAJ7.5A	7.13	7.88	10	6.40	500	35.4	11.3
P4FMAJ8.2	P4SMAJ8.2	7.38	9.02	10	6.63	200	32	12.5
P4FMAJ8.2A	P4SMAJ8.2A	7.79	8.61	10	7.02	200	33.1	12.1
P4FMAJ9.1	P4SMAJ9.1	8.19	10.0	1.0	7.37	50	29	13.8
P4FMAJ9.1A	P4SMAJ9.1A	8.65	9.55	1.0	7.78	50	29.9	13.4
P4FMAJ10	P4SMAJ10	9.00	11.0	1.0	8.10	10	26.7	15.0
P4FMAJ10A	P4SMAJ10A	9.50	10.5	1.0	8.55	10	27.6	14.5
P4FMAJ11	P4SMAJ11	9.90	12.1	1.0	8.92	5.0	24.7	16.2
P4FMAJ11A	P4SMAJ11A	10.5	11.6	1.0	9.40	5.0	25.6	15.6
P4FMAJ12	P4SMAJ12	10.8	13.2	1.0	9.72	1.0	23.1	17.3
P4FMAJ12A	P4SMAJ12A	11.4	12.6	1.0	10.2	1.0	24	16.7
P4FMAJ13	P4SMAJ13	11.7	14.3	1.0	10.5	1.0	21.1	19.0
P4FMAJ13A	P4SMAJ13A	12.4	13.7	1.0	11.1	1.0	22	18.2
P4FMAJ15	P4SMAJ15	13.5	16.3	1.0	12.1	1.0	18.2	22.0
P4FMAJ15A	P4SMAJ15A	14.3	15.8	1.0	12.8	1.0	18.9	21.2
P4FMAJ16	P4SMAJ16	14.4	17.6	1.0	12.9	1.0	17	23.5
P4FMAJ16A	P4SMAJ16A	15.2	16.8	1.0	13.6	1.0	17.8	22.5
P4FMAJ18	P4SMAJ18	16.2	19.8	1.0	14.5	1.0	15.1	26.5
P4FMAJ18A	P4SMAJ18A	17.1	18.9	1.0	15.3	1.0	15.9	25.2
P4FMAJ20	P4SMAJ20	18.0	22.0	1.0	16.2	1.0	13.7	29.1
P4FMAJ20A	P4SMAJ20A	19.0	21.0	1.0	17.1	1.0	14.4	27.7
P4FMAJ22	P4SMAJ22	19.8	24.2	1.0	17.8	1.0	12.5	31.9
P4FMAJ22A	P4SMAJ22A	20.9	23.1	1.0	18.8	1.0	13.1	30.6
P4FMAJ24	P4SMAJ24	21.6	26.4	1.0	19.4	1.0	11.5	34.7
P4FMAJ24A	P4SMAJ24A	22.8	25.2	1.0	20.5	1.0	12	33.2
P4FMAJ27	P4SMAJ27	24.3	29.7	1.0	21.8	1.0	10.2	39.1
P4FMAJ27A	P4SMAJ27A	25.7	28.4	1.0	23.1	1.0	10.7	37.5
P4FMAJ30	P4SMAJ30	27.0	33.0	1.0	24.3	1.0	9.2	43.5
P4FMAJ30A	P4SMAJ30A	28.5	31.5	1.0	25.6	1.0	9.7	41.4
P4FMAJ33	P4SMAJ33	29.7	36.3	1.0	26.8	1.0	8.4	47.7
P4FMAJ33A	P4SMAJ33A	31.4	34.7	1.0	28.2	1.0	8.8	45.7
P4FMAJ36	P4SMAJ36	32.4	39.6	1.0	29.1	1.0	7.7	52.0
P4FMAJ36A	P4SMAJ36A	34.2	37.8	1.0	30.8	1.0	8	49.9
P4FMAJ39	P4SMAJ39	35.1	42.9	1.0	31.6	1.0	7.1	56.4
P4FMAJ39A	P4SMAJ39A	37.1	41.0	1.0	33.3	1.0	7.4	53.9
P4FMAJ43	P4SMAJ43	38.7	47.3	1.0	34.8	1.0	6.5	61.9
P4FMAJ43A	P4SMAJ43A	40.9	45.2	1.0	36.8	1.0	6.7	59.3
P4FMAJ47	P4SMAJ47	42.3	51.7	1.0	38.1	1.0	5.9	67.8
P4FMAJ47A	P4SMAJ47A	44.7	49.4	1.0	40.2	1.0	6.2	64.8
P4FMAJ51	P4SMAJ51	45.9	56.1	1.0	41.3	1.0	5.4	73.5
P4FMAJ51A	P4SMAJ51A	48.5	53.6	1.0	43.6	1.0	5.7	70.1
P4FMAJ56	P4SMAJ56	50.4	61.6	1.0	45.4	1.0	5.0	80.5
P4FMAJ56A	P4SMAJ56A	53.2	58.8	1.0	47.8	1.0	5.2	77.0

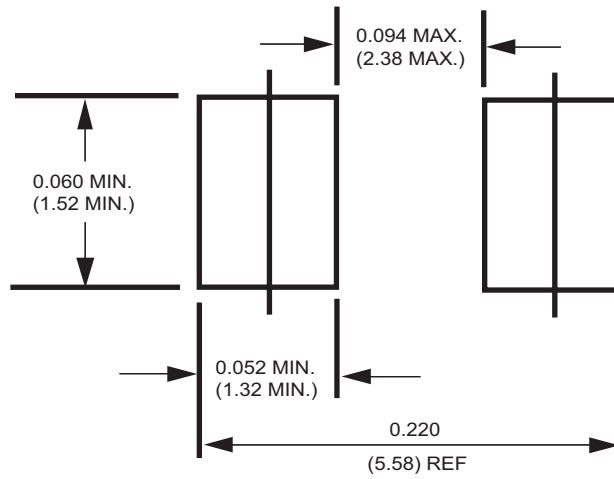
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Rectron House No.	Rectron Industry No.	Breakdown Voltage			Reverse Stand off Voltage $V_{WM}$ (Volts)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu$ A)	Maximum Peak Pulse Current IPPM (Amps)	Maximum Clamping Voltage at IPPM $V_C$ (Volts)
		$V_{BR}$ (Volts)		$@I_T$ (mA)				
		MIN.	MAX.					
P4FMAJ62	P4SMAJ62	55.8	68.2	1.0	50.2	1.0	4.7	89.0
P4FMAJ62A	P4SMAJ62A	58.9	65.1	1.0	53.0	1.0	5.0	85.0
P4FMAJ68	P4SMAJ68	61.2	74.8	1.0	55.1	1.0	4.2	98.0
P4FMAJ68A	P4SMAJ68A	64.6	71.4	1.0	58.1	1.0	4.5	92.0
P4FMAJ75	P4SMAJ75	67.5	82.5	1.0	60.7	1.0	3.8	108
P4FMAJ75A	P4SMAJ75A	71.3	78.8	1.0	64.1	1.0	4.0	103
P4FMAJ82	P4SMAJ82	73.8	90.2	1.0	66.4	1.0	3.5	118
P4FMAJ82A	P4SMAJ82A	77.9	86.1	1.0	70.1	1.0	3.7	113
P4FMAJ91	P4SMAJ91	81.9	100	1.0	73.7	1.0	3.2	131
P4FMAJ91A	P4SMAJ91A	86.5	95.5	1.0	77.8	1.0	3.3	125
*P4FMAJ100	*P4SMAJ100	90.0	110	1.0	81.0	1.0	2.1	144
*P4FMAJ100A	*P4SMAJ100A	95.0	105	1.0	85.5	1.0	2.2	137
*P4FMAJ110	*P4SMAJ110	99.0	121	1.0	89.2	1.0	1.9	158
*P4FMAJ110A	*P4SMAJ110A	105	116	1.0	94.0	1.0	2.0	152
*P4FMAJ120	*P4SMAJ120	108	132	1.0	97.2	1.0	1.7	173
*P4FMAJ120A	*P4SMAJ120A	114	126	1.0	102	1.0	1.8	165
*P4FMAJ130	*P4SMAJ130	117	143	1.0	105	1.0	1.6	187
*P4FMAJ130A	*P4SMAJ130A	124	137	1.0	111	1.0	1.7	179
*P4FMAJ150	*P4SMAJ150	135	165	1.0	121	1.0	1.4	215
*P4FMAJ150A	*P4SMAJ150A	143	158	1.0	128	1.0	1.4	207
*P4FMAJ160	*P4SMAJ160	144	176	1.0	130	1.0	1.3	230
*P4FMAJ160A	*P4SMAJ160A	152	168	1.0	136	1.0	1.4	219
*P4FMAJ170	*P4SMAJ170	153	187	1.0	138	1.0	1.2	244
*P4FMAJ170A	*P4SMAJ170A	162	179	1.0	145	1.0	1.3	234
*P4FMAJ180	*P4SMAJ180	162	198	1.0	146	1.0	1.2	258
*P4FMAJ180A	*P4SMAJ180A	171	189	1.0	154	1.0	1.2	246
*P4FMAJ200	*P4SMAJ200	180	220	1.0	162	1.0	1.0	287
*P4FMAJ200A	*P4SMAJ200A	190	210	1.0	171	1.0	1.1	274
*P4FMAJ220	*P4SMAJ220	198	242	1.0	175	1.0	0.9	344
*P4FMAJ220A	*P4SMAJ220A	209	231	1.0	185	1.0	0.9	328
*P4FMAJ250	*P4SMAJ250	225	275	1.0	202	1.0	0.83	360
*P4FMAJ250A	*P4SMAJ250A	237	263	1.0	214	1.0	0.87	344
*P4FMAJ300	*P4SMAJ300	270	330	1.0	243	1.0	0.70	430
*P4FMAJ300A	*P4SMAJ300A	285	315	1.0	256	1.0	0.73	414
*P4FMAJ350	*P4SMAJ350	315	385	1.0	284	1.0	0.60	504
*P4FMAJ350A	*P4SMAJ350A	332	368	1.0	300	1.0	0.62	482
*P4FMAJ400	*P4SMAJ400	360	440	1.0	324	1.0	0.53	574
*P4FMAJ400A	*P4SMAJ400A	380	420	1.0	342	1.0	0.55	548
*P4FMAJ440A	*P4SMAJ440A	418	462	1.0	376	1.0	0.7	602
*P4FMAJ480A	*P4SMAJ480A	456	504	1.0	408	1.0	0.6	658
*P4FMAJ510A	*P4SMAJ510A	485	535	1.0	434	1.0	0.6	698
*P4FMAJ530A	*P4SMAJ530A	503.5	556.5	1.0	477	1.0	0.6	725
*P4FMAJ540A	*P4SMAJ540A	513	567	1.0	459	1.0	0.5	740
*P4FMAJ550A	*P4SMAJ550A	522.5	577.5	1.0	495	1.0	0.5	760

- Notes :
1.  $V_{BR}$  measured after  $I_T$  applied for 300ms.  $I_T$  = square pulse or equivalent.
  2. For bidirectional use C or CA suffixs for all types (ex. P4FMAJ6.8C,P4FMAJ400CA) electrical characteristics apply in both directions.
  3. For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled.
  4. Mark "\*" reverse power rating are 300w .

### Mounting Pad Layout



Dimensions in inches and (millimeters)



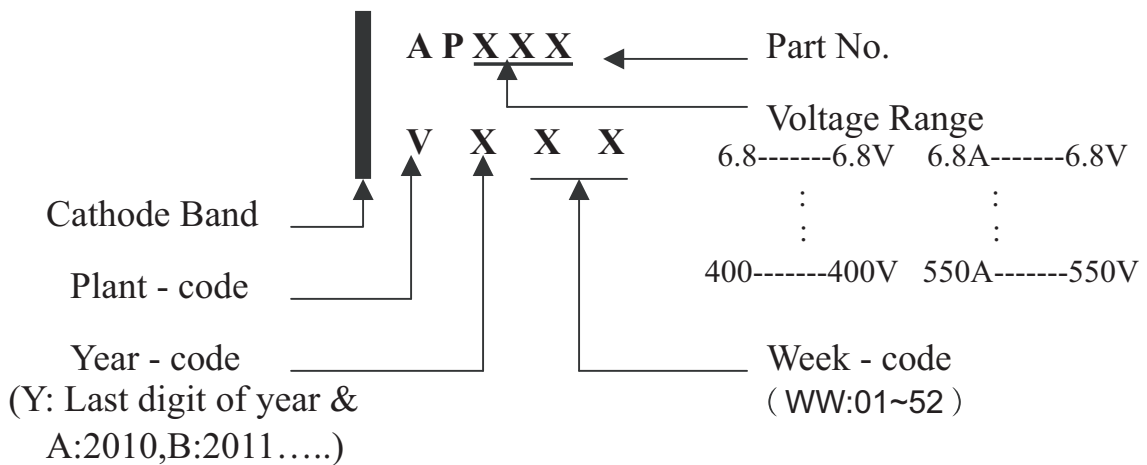
## Attachment information about P4SMAJ/ P4F MAJ

### 1. Internal Circuit

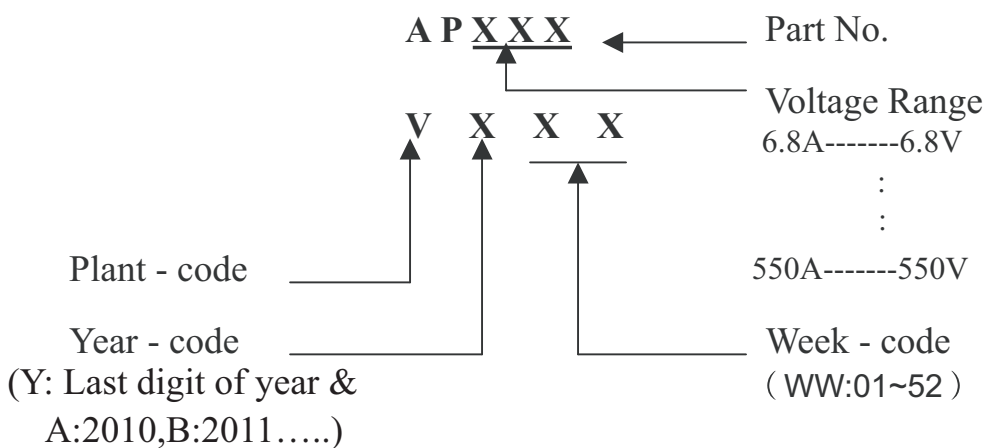


### 2. Marking on the body

#### 1) P4SMAJxx/P4SMAJxxA



#### 2) P4SMAJxxCA



## PACKAGING OF DIODE AND BRIDGE RECTIFIERS

### REEL PACK

PACKAGE	PACKING CODE	EA PER REEL	EA PER INNER BOX	COMPONENT SPACE (mm)	TAPE SPACE (mm)	REEL DIA (mm)	CARTON SIZE (mm)	EA PER CARTON	GROSS WEIGHT(Kg)
SMA	-W	7,500	15,000	---	---	330	360*355*360	120,000	15.2

PACKAGE	PACKING CODE	EA PER REEL	EA PER INNER BOX	COMPONENT SPACE (mm)	TAPE SPACE (mm)	REEL DIA (mm)	CARTON SIZE (mm)	EA PER CARTON	GROSS WEIGHT(Kg)
SMA	-T	2,000	8,000	---	---	178	390*205*310	64,000	7.8



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