

# STUP06I - STUP5G4

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

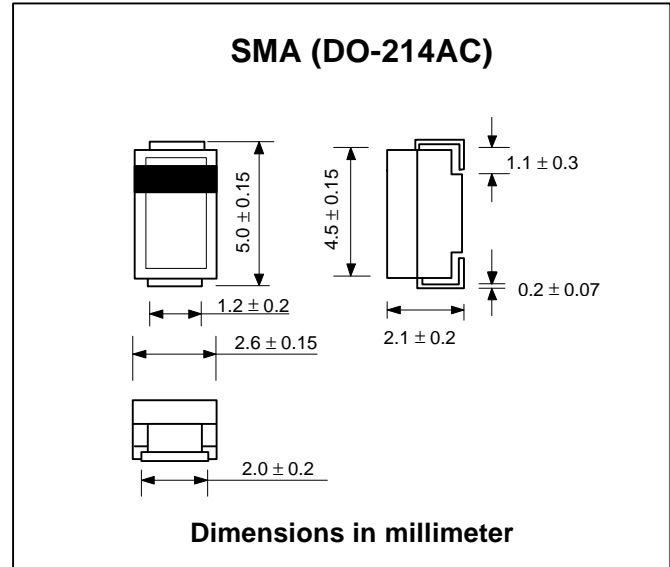
**V<sub>BR</sub> : 6.8 - 440 Volts**  
**P<sub>PK</sub> : 400 Watts**

### FEATURES :

- \* 400W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V
- \* **Pb / RoHS Free**

### MECHANICAL DATA

- \* Case : SMA Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead Formed for Surface Mount
- \* Polarity : Color band denotes cathode end except Bipolar.
- \* Mounting position : Any
- \* Weight : 0.064 grams



### DEVICES FOR BIPOLAR APPLICATIONS

For bi-directional altered the third letter of type from "U" to be "B".  
 Electrical characteristics apply in both directions

### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Unit
Peak Power Dissipation at T <sub>a</sub> = 25 °C, T <sub>p</sub> =1ms (Note1)	P <sub>PK</sub>	Minimum 400	W
Steady State Power Dissipation at T <sub>L</sub> = 75 °C	P <sub>D</sub>	1.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I <sub>FSM</sub>	40	A
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	- 55 to + 150	°C

### Note :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above T<sub>a</sub> = 25 °C per Fig. 1
- (2) Mounted on copper Lead area at 5.0 mm<sup>2</sup> ( 0.013 mm thick ).
- (3) 8.3 ms single half sine-wave, duty cycle = 4 pulses per Minutes maximum.

## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

TYPE	Breakdown Voltage @ $I_t$ ( Note 1 )		Working Peak Reverse Voltage	Maximum Reverse Leakage @ $V_{RWM}$	Maximum Reverse Current	Maximum Clamping Voltage @ $I_{RSM}$	Maximum Temperature Co-efficient of $V_{BR}$ (% / °C)
	$V_{BR}$ (V)						
	Min.	Max.	(mA)	(V)	( $\mu$ A)	(A)	(V)

STUP06I	6.12	7.48	10	5.50	1000	38.0	10.8	0.057
STUP56I	6.45	7.14	10	5.80	1000	40.0	10.5	0.057
STUP07F	6.75	8.25	10	6.05	500	36.0	11.7	0.061
STUP57F	7.13	7.88	10	6.40	500	37.0	11.3	0.061
STUP08C	7.38	9.02	10	6.63	200	33.0	12.5	0.065
STUP58C	7.79	8.61	10	7.02	200	35.0	12.1	0.065
STUP09B	8.19	10.0	1.0	7.37	50	30.0	13.8	0.068
STUP59B	8.65	9.55	1.0	7.78	50	31.0	13.4	0.068
STUP010	9.00	11.0	1.0	8.10	10	28.0	15.0	0.073
STUP510	9.50	10.5	1.0	8.55	10	29.0	14.5	0.073
STUP011	9.90	12.1	1.0	8.92	5.0	26.0	16.2	0.075
STUP511	10.5	11.6	1.0	9.40	5.0	27.0	15.6	0.075
STUP012	10.8	13.2	1.0	9.72	5.0	24.0	17.3	0.078
STUP512	11.4	12.6	1.0	10.2	5.0	25.0	16.7	0.078
STUP013	11.7	14.3	1.0	10.5	5.0	22.0	19.0	0.081
STUP513	12.4	13.7	1.0	11.1	5.0	23.0	18.2	0.081
STUP015	13.5	16.5	1.0	12.1	5.0	19.0	22.0	0.084
STUP515	14.3	15.8	1.0	12.8	5.0	20.0	21.2	0.084
STUP016	14.4	17.6	1.0	12.9	5.0	18.0	23.5	0.086
STUP516	15.2	16.8	1.0	13.6	5.0	19.0	22.5	0.086
STUP018	16.2	19.8	1.0	14.5	5.0	16.0	26.5	0.088
STUP518	17.1	18.9	1.0	15.3	5.0	17.0	25.5	0.088
STUP020	18.0	22.0	1.0	16.2	5.0	14.0	29.1	0.090
STUP520	19.0	21.0	1.0	17.1	5.0	15.0	27.7	0.090
STUP022	19.8	24.2	1.0	17.8	5.0	13.0	31.9	0.092
STUP522	20.9	23.1	1.0	18.8	5.0	14.0	30.6	0.092
STUP024	21.6	26.4	1.0	19.4	5.0	12.0	34.7	0.094
STUP524	22.8	25.2	1.0	20.5	5.0	13.0	33.2	0.094
STUP027	24.3	29.7	1.0	21.8	5.0	11.0	39.1	0.096
STUP527	25.7	28.4	1.0	23.1	5.0	11.2	37.5	0.096
STUP030	27.0	33.0	1.0	24.3	5.0	10.0	43.5	0.097
STUP530	28.5	31.5	1.0	25.6	5.0	10.0	41.4	0.097
STUP033	29.7	36.3	1.0	26.8	5.0	9.0	47.7	0.098
STUP533	31.4	34.7	1.0	28.2	5.0	9.0	45.7	0.098
STUP036	32.4	39.6	1.0	29.1	5.0	8.0	52.0	0.099
STUP536	34.2	37.8	1.0	30.8	5.0	8.4	49.9	0.099
STUP039	35.1	42.9	1.0	31.6	5.0	7.4	56.4	0.100
STUP539	37.1	41.0	1.0	33.3	5.0	7.8	53.9	0.100
STUP043	38.7	47.3	1.0	34.8	5.0	6.8	61.9	0.101
STUP543	40.9	45.2	1.0	36.8	5.0	7.1	59.3	0.101
STUP047	42.3	51.7	1.0	38.1	5.0	6.2	67.8	0.101
STUP547	44.7	49.4	1.0	40.2	5.0	6.5	64.8	0.101
STUP051	45.9	56.1	1.0	41.3	5.0	5.7	73.5	0.102
STUP551	48.5	53.6	1.0	43.6	5.0	6.0	70.1	0.102
STUP056	50.4	61.6	1.0	45.4	5.0	5.2	80.5	0.103
STUP556	53.2	58.8	1.0	47.8	5.0	5.5	77.0	0.103

## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

TYPE	Breakdown Voltage @ $I_t$ ( Note 1 )		Working Peak Reverse Voltage	Maximum Reverse Leakage @ $V_{RWM}$	Maximum Reverse Current	Maximum Clamping Voltage @ $I_{RSM}$	Maximum Temperature Co-efficient of $V_{BR}$ (% / °C)	
	$V_{BR}$ (V)							$I_t$
	Min.	Max.	(mA)	(V)	( $\mu$ A)	(A)	(V)	
STUP062	55.8	68.2	1.0	50.2	5.0	4.7	89.0	0.104
STUP562	58.9	65.1	1.0	53.0	5.0	5.0	85.0	0.104
STUP068	61.2	74.8	1.0	55.1	5.0	4.3	98.0	0.104
STUP568	64.6	71.4	1.0	58.1	5.0	4.6	92.0	0.104
STUP075	67.5	82.5	1.0	60.7	5.0	3.9	108	0.105
STUP575	71.3	78.8	1.0	64.1	5.0	4.1	103	0.105
STUP082	73.8	90.2	1.0	66.4	5.0	3.6	118	0.105
STUP582	77.9	86.1	1.0	70.1	5.0	3.7	113	0.105
STUP091	81.9	100	1.0	73.7	5.0	3.2	131	0.106
STUP591	86.5	95.5	1.0	77.8	5.0	3.4	125	0.106
STUP0B0	90.0	110	1.0	81.0	5.0	2.9	144	0.106
STUP5B0	95.0	105	1.0	85.5	5.0	3.1	137	0.106
STUP0B1	99.0	121	1.0	89.2	5.0	2.7	158	0.107
STUP5B1	105	116	1.0	94.0	5.0	2.8	152	0.107
STUP0B2	108	132	1.0	97.2	5.0	2.4	173	0.107
STUP5B2	114	126	1.0	102	5.0	2.5	165	0.107
STUP0B3	117	143	1.0	105	5.0	2.2	187	0.107
STUP5B3	124	137	1.0	111	5.0	2.3	179	0.107
STUP0B5	135	165	1.0	121	5.0	2.0	215	0.108
STUP5B5	143	158	1.0	128	5.0	2.0	207	0.108
STUP0B6	144	176	1.0	130	5.0	1.8	230	0.108
STUP5B6	152	168	1.0	136	5.0	1.9	219	0.108
STUP0B7	153	187	1.0	138	5.0	1.7	244	0.108
STUP5B7	162	179	1.0	145	5.0	1.8	234	0.108
STUP0B8	162	198	1.0	146	5.0	1.6	258	0.108
STUP5B8	171	189	1.0	154	5.0	1.7	246	0.108
STUP0D0	180	220	1.0	162	5.0	1.5	287	0.108
STUP5D0	190	210	1.0	171	5.0	1.53	274	0.108
STUP0D2	198	242	1.0	175	5.0	1.16	344	0.108
STUP5D2	209	231	1.0	185	5.0	1.22	328	0.108
STUP0D5	225	275	1.0	202	5.0	1.11	360	0.110
STUP5D5	237	263	1.0	214	5.0	1.16	344	0.110
STUP0E0	270	330	1.0	243	5.0	0.93	430	0.110
STUP5E0	285	315	1.0	256	5.0	0.97	414	0.110
STUP0E5	315	385	1.0	284	5.0	0.79	504	0.110
STUP5E5	332	368	1.0	300	5.0	0.83	482	0.110
STUP0G0	360	440	1.0	324	5.0	0.70	574	0.110
STUP5G0	380	420	1.0	342	5.0	0.73	548	0.110
STUP0G4	396	484	1.0	356	5.0	0.95	631	0.110
STUP5G4	418	462	1.0	376	5.0	1.00	602	0.110

**Note:**

- ( 1 )  $V_{BR}$  measured after  $I_t$  applied for 300  $\mu$ s.,  $I_t$  = square wave pulse or equivalent.
- ( 2 )  $V_F$  = 3.5  $V_{max.}$ ,  $I_F$  = 25 Amps. ( 6.8 Volts thru 91Volts )  
 $V_F$  = 5.0  $V_{max.}$ ,  $I_F$  = 25 Amps. ( 100 Volts thru 440 Volts ) per 1/2 square or equivalent sine wave.  
 PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.
- ( 3 ) For Bipolar types moving  $V_r$  of 10 Volts and under, the  $I_r$  limit is doubled.
- ( 4 ) "STU" or "STB" will be omitted in marking on the diode.

## RATING AND CHARACTERISTIC CURVES ( STUP06I - STUP5G4 )

FIG.1 - PULSE DERATING CURVE

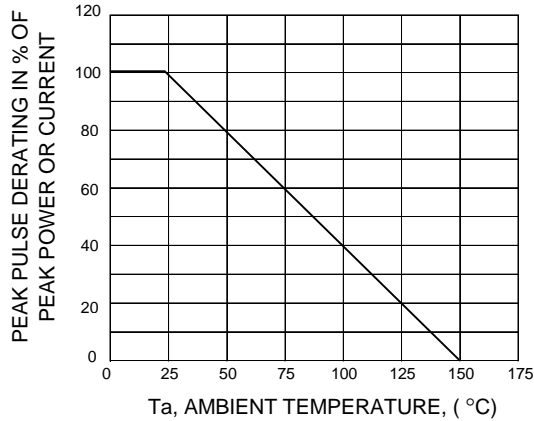


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

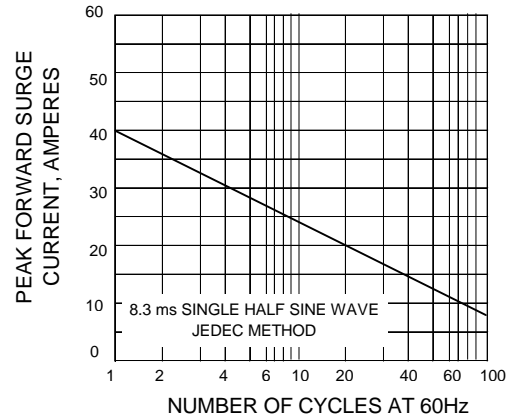


FIG.3 - STEADY STATE POWER DERATING

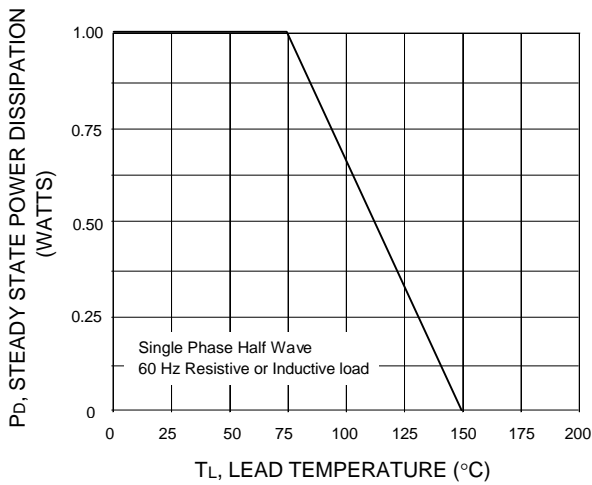


FIG.4 - PULSE RATING CURVE

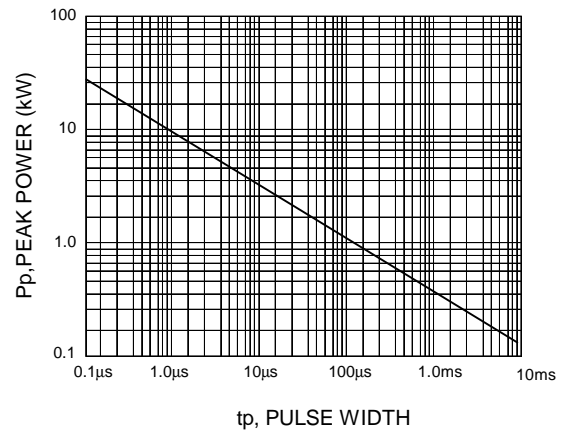


FIG.5 - PULSE WAVEFORM

