

# STU606I - STU65G4

# SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

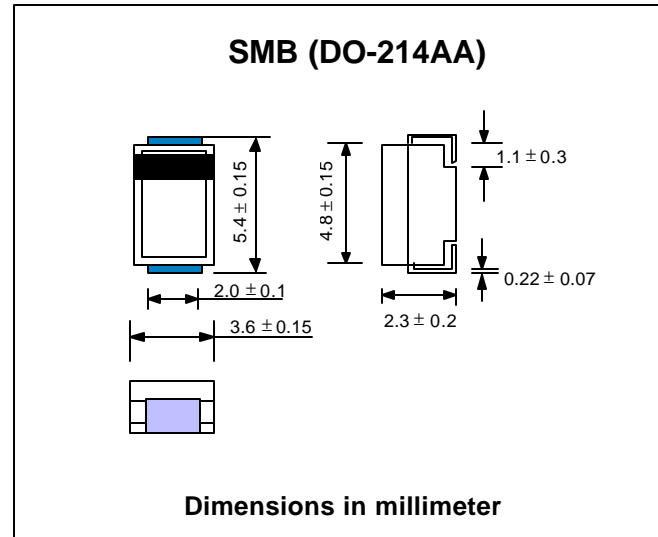
**V<sub>BR</sub> : 6.8 - 440 Volts**  
**P<sub>PK</sub> : 600 Watts**

### FEATURES :

- \* 600W 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

### MECHANICAL DATA

- \* Case : SMB 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 : 0.093 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> =1 ms (Note1)	P <sub>PK</sub>	Minimum 600	Watts
Steady State Power Dissipation at T <sub>L</sub> = 75 °C	P <sub>D</sub>	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I <sub>FSM</sub>	100	Amps.
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.

**UPDATE : JULY 13, 1998**

## 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)	
STU6061	6.12	7.48	10	5.50	1000	55.5	10.8	0.057
STU6561	6.45	7.14	10	5.80	1000	57.0	10.5	0.057
STU607F	6.75	8.25	10	6.05	500	51.0	11.7	0.061
STU657F	7.13	7.88	10	6.40	500	53.0	11.3	0.061
STU608C	7.38	9.02	10	6.63	200	48.0	12.5	0.065
STU658C	7.79	8.61	10	7.02	200	50.0	12.1	0.065
STU609B	8.19	10.0	1.0	7.37	50	44.0	13.8	0.068
STU659B	8.65	9.55	1.0	7.78	50	45.0	13.4	0.068
STU6010	9.00	11.0	1.0	8.10	10	40.0	15.0	0.073
STU6510	9.50	10.5	1.0	8.55	10	41.0	14.5	0.073
STU6011	9.90	12.1	1.0	8.92	5.0	37.0	16.2	0.075
STU6511	10.5	11.6	1.0	9.40	5.0	38.0	15.6	0.075
STU6012	10.8	13.2	1.0	9.72	5.0	35.0	17.3	0.078
STU6512	11.4	12.6	1.0	10.2	5.0	36.0	16.7	0.078
STU6013	11.7	14.3	1.0	10.5	5.0	32.0	19.0	0.081
STU6513	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
STU6015	13.5	16.5	1.0	12.1	5.0	27.0	22.0	0.084
STU6515	14.3	15.8	1.0	12.8	5.0	28.0	21.2	0.084
STU6016	14.4	17.6	1.0	12.9	5.0	26.0	23.5	0.086
STU6516	15.2	16.8	1.0	13.6	5.0	27.0	22.5	0.086
STU6018	16.2	19.8	1.0	14.5	5.0	23.0	26.5	0.088
STU6518	17.1	18.9	1.0	15.3	5.0	24.0	25.2	0.088
STU6020	18.0	22.0	1.0	16.2	5.0	21.0	29.1	0.090
STU6520	19.0	21.0	1.0	17.1	5.0	22.0	27.7	0.090
STU6022	19.8	24.2	1.0	17.8	5.0	19.0	31.9	0.092
STU6522	20.9	23.1	1.0	18.8	5.0	20.0	30.6	0.092
STU6024	21.6	26.4	1.0	19.4	5.0	17.0	34.7	0.094
STU6524	22.8	25.2	1.0	20.5	5.0	18.0	33.2	0.094
STU6027	24.3	29.7	1.0	21.8	5.0	15.0	39.1	0.096
STU6527	25.7	28.4	1.0	23.1	5.0	16.0	37.5	0.096
STU6030	27.0	33.0	1.0	24.3	5.0	14.0	43.5	0.097
STU6530	28.5	31.5	1.0	25.6	5.0	14.4	41.4	0.097
STU6033	29.7	36.3	1.0	26.8	5.0	12.6	47.7	0.098
STU6533	31.4	34.7	1.0	28.2	5.0	13.2	45.7	0.098
STU6036	32.4	39.6	1.0	29.1	5.0	11.6	52.0	0.099
STU6536	34.2	37.8	1.0	30.8	5.0	12.0	49.9	0.099
STU6039	35.1	42.9	1.0	31.6	5.0	10.6	56.4	0.100
STU6539	37.1	41.0	1.0	33.3	5.0	11.2	53.9	0.100
STU6043	38.7	47.3	1.0	34.8	5.0	9.6	61.9	0.101
STU6543	40.9	45.2	1.0	36.8	5.0	10.1	59.3	0.101
STU6047	42.3	51.7	1.0	38.1	5.0	8.9	67.8	0.101
STU6547	44.7	49.4	1.0	40.2	5.0	9.3	64.8	0.101
STU6051	45.9	56.1	1.0	41.3	5.0	8.2	73.5	0.102
STU6551	48.5	53.6	1.0	43.6	5.0	8.6	70.1	0.102
STU6056	50.4	61.6	1.0	45.4	5.0	7.4	80.5	0.103
STU6556	53.2	58.8	1.0	47.8	5.0	7.8	77.0	0.103
STU6062	55.8	68.2	1.0	50.2	5.0	6.8	89.0	0.104

## 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)	
STU6562	58.9	65.1	1.0	53.0	5.0	7.1	85.0	0.104
STU6068	61.2	74.8	1.0	55.1	5.0	6.1	98.0	0.104
STU6568	64.6	71.4	1.0	58.1	5.0	6.5	92.0	0.104
STU6075	67.5	82.5	1.0	60.7	5.0	5.5	108	0.105
STU6575	71.3	78.8	1.0	64.1	5.0	5.8	103	0.105
STU6082	73.8	90.2	1.0	66.4	5.0	5.1	118	0.105
STU6582	77.9	86.1	1.0	70.1	5.0	5.3	113	0.105
STU6091	81.9	100	1.0	73.7	5.0	4.5	131	0.106
STU6591	86.5	95.5	1.0	77.8	5.0	4.8	125	0.106
STU60B0	90.0	110	1.0	81.0	5.0	4.2	144	0.106
STU65B0	95.0	105	1.0	85.5	5.0	4.4	137	0.106
STU60B1	99.0	121	1.0	89.2	5.0	3.8	158	0.107
STU65B1	105	116	1.0	94.0	5.0	4.0	152	0.107
STU60B2	108	132	1.0	97.2	5.0	3.5	173	0.107
STU65B2	114	126	1.0	102	5.0	3.6	165	0.107
STU60B3	117	143	1.0	106	5.0	3.2	187	0.107
STU65B3	124	137	1.0	111	5.0	3.3	179	0.107
STU60B5	135	165	1.0	121	5.0	2.8	215	0.108
STU65B5	143	158	1.0	128	5.0	2.9	207	0.108
STU60B6	144	176	1.0	130	5.0	2.6	230	0.108
STU65B6	152	168	1.0	136	5.0	2.7	219	0.108
STU60B7	153	187	1.0	138	5.0	2.5	244	0.108
STU65B7	162	179	1.0	145	5.0	2.6	234	0.108
STU60B8	162	198	1.0	146	5.0	2.3	258	0.108
STU65B8	171	189	1.0	154	5.0	2.4	246	0.108
STU60D0	180	220	1.0	162	5.0	2.1	287	0.108
STU65D0	190	210	1.0	171	5.0	2.2	274	0.108
STU60D2	198	242	1.0	175	5.0	1.75	344	0.108
STU65D2	209	231	1.0	185	5.0	1.83	328	0.108
STU60D5	225	275	1.0	202	5.0	1.67	360	0.110
STU65D5	237	263	1.0	214	5.0	1.75	344	0.110
STU60E0	270	330	1.0	243	5.0	1.40	430	0.110
STU65E0	285	315	1.0	256	5.0	1.45	414	0.110
STU60E5	315	385	1.0	284	5.0	1.20	504	0.110
STU65E5	332	368	1.0	300	5.0	1.25	482	0.110
STU60G0	360	440	1.0	324	5.0	1.05	574	0.110
STU65G0	380	420	1.0	342	5.0	1.10	548	0.110
STU60G4	396	484	1.0	356	5.0	0.95	631	0.110
STU65G4	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 )  $V_F = 3.5 V_{max.}$ ,  $I_F = 50$  Amps. ( 6.8 Volts thru 91 Volts )  
 $V_F = 5.0 V_{max.}$ ,  $I_F = 50$  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 ( STU606I - STU65G4 )

FIG.1 - PULSE DERATING CURVE

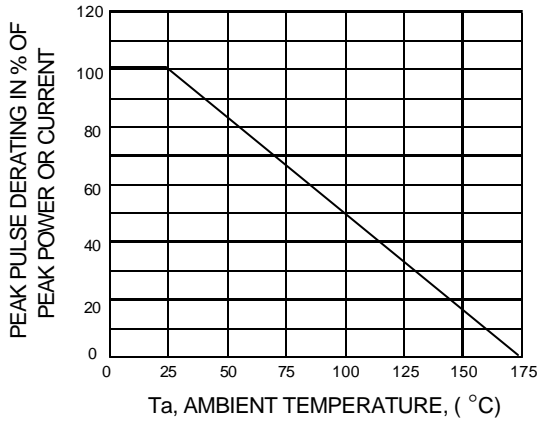


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

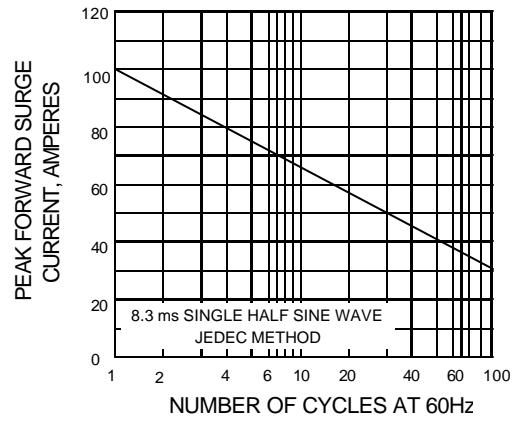


FIG.3 - STEADY STATE POWER DERATING

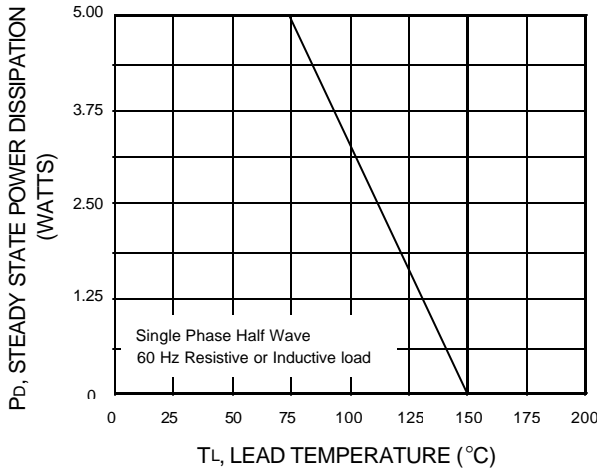


FIG.4 - PULSE RATING CURVE

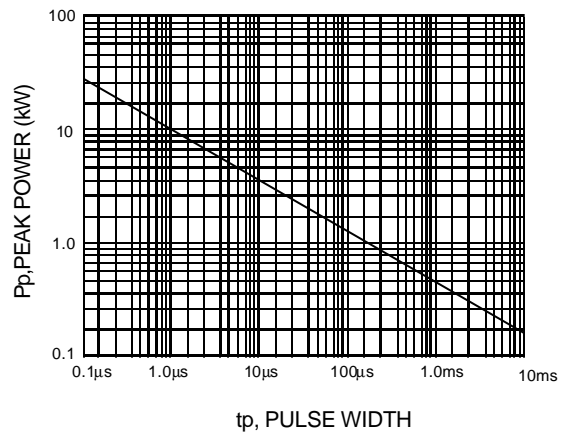


FIG.5 - PULSE WAVEFORM

