

SMBG5.0(C)(A) THRU SMBG170(C)(A)

Transient Voltage Suppressor 5.0 to 170 Volts 600 Watt

Features

- For surface mount applications (flat handing surface for accurate Placement)
- Available as a unidirectional or bi-directional device
- Fast response time: typical less than 1.0ps from 0 volts to V_{BR} minimum
- Suppresses transients up to 600W @1.0ms including ESD per Human body model test above 16kv (class 3)
- Available on tape and reel

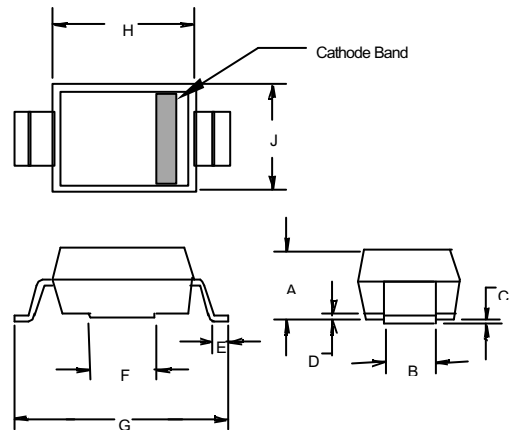
Mechanical Data

- CASE: JEDEC DO-215AA
- Terminals: solderable per MIL-STD-750, Method 2026
- Polarity: is indicated by cathode band. Bidirectional devices Have no polarity band
- Maximum soldering temperature: 260°C for 10 seconds

Maximum Ratings @ 25°C Unless Otherwise Specified

Peak Pulse Current on 10/1000us waveform	I_{PP}	See Table 1	Note: 1
Peak Pulse Power Dissipation	P_{PP}	600W	Note: 1, 5
Peak Forward Surge Current	I_{FSM}	40A	Note: 3
Steady State Power Dissipation	$P_{(AV)}$	1.0W	Note: 2, 4
Operation And Storage Temperature Range	T_J, T_{STG}	-55°C to +150°C	
Thermal Resistance	R	25°C/W	

DO-215AA (SMBG) (Lead Frame)

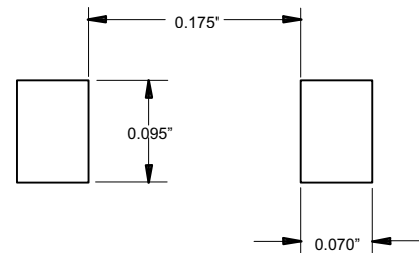


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.075	.095	1.91	2.41	
B	.077	.083	1.96	2.10	
C	.004	.008	.10	.20	
D	—	.02	—	.51	
E	.015	.03	.38	.76	
F	.065	.084	1.65	2.13	
G	.235	.255	5.97	6.48	
H	.160	.185	4.06	4.70	
J	.130	.155	3.30	3.94	

NOTES:

1. Non-repetitive current pulse, per Fig.2 and derated above $T_A=25^\circ C$ per Fig.1.
2. Mounted on 4.0mm² copper pads to each terminal.
3. 8.3ms, single half sine wave duty cycle=4 pulses per. Minute maximum. Peak forward voltage at 40A is 3.5 volts(unipolar only)
4. Lead temperature at 75°C= T_L
5. Peak pulse current waveform is 10/1000us, with maximum duty Cycle of 0.01%.

SUGGESTED SOLDER PAD LAYOUT



SMBG5.0(A) thru SMBG170(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE			MAXIMUM CLAMPING VOLTAGE@I _{PP}	PEAK PULSE CURRENT I _{PP}	MAXIMUM REVERSE LEAKAGE @V _{WM}	MARKING CODE		
	V _{WM}	V _(BR) @I _T		I _T (mA)					VOLTS	(uA)
	VOLTS	MIN	MAX							
SMBG5.0	5.0	6.40	7.30	10	9.6	62.5	800	5.0		
SMBG5.0A	5.0	6.40	7.00	10	9.2	65.2	800	5.0A		
SMBG6.0	6.0	6.67	8.15	10	11.4	52.6	800	6.0		
SMBG6.0A	6.0	6.67	7.37	10	10.3	58.3	800	6.0A		
SMBG6.5	6.5	7.22	8.82	10	12.3	48.7	500	6.5		
SMBG6.5A	6.5	7.22	7.98	10	11.2	53.6	500	6.5A		
SMBG7.0	7.0	7.78	9.51	10	13.3	45.1	200	7.0		
SMBG7.0A	7.0	7.78	8.60	10	12.0	50.0	200	7.0A		
SMBG7.5	7.5	8.33	10.2	1	14.3	42.0	100	7.5		
SMBG7.5A	7.5	8.33	9.21	1	12.9	46.5	100	7.5A		
SMBG8.0	8.0	8.89	10.9	1	15.0	40.0	50	8.0		
SMBG8.0A	8.0	8.89	9.83	1	13.6	44.1	50	8.0A		
SMBG8.5	8.5	9.44	11.5	1	15.9	37.7	10	8.5		
SMBG8.5A	8.5	9.44	10.4	1	14.4	41.7	10	8.5A		
SMBG9.0	9.0	10.0	12.2	1	16.9	35.5	5	9.0		
SMBG9.0A	9.0	10.0	11.1	1	15.4	39.0	5	9.0A		
SMBG10	10	11.1	13.6	1	18.8	31.9	5	10		
SMBG10A	10	11.1	12.3	1	17.0	35.3	5	10A		
SMBG11	11	12.2	14.9	1	20.1	29.9	5	11		
SMBG11A	11	12.2	13.5	1	18.2	33.0	5	11A		
SMBG12	12	13.3	16.3	1	22.0	27.3	5	12		
SMBG12A	12	13.3	14.7	1	19.9	30.2	5	12A		
SMBG13	13	14.4	17.6	1	23.8	25.2	5	13		
SMBG13A	13	14.4	15.9	1	21.5	27.9	5	13A		
SMBG14	14	15.6	19.1	1	25.8	23.3	5	14		
SMBG14A	14	15.6	17.2	1	23.2	25.8	5	14A		
SMBG15	15	16.7	20.4	1	26.9	22.3	5	15		
SMBG15A	15	16.7	18.5	1	24.4	24.0	5	15A		
SMBG16	16	17.8	21.8	1	28.8	20.8	5	16		
SMBG16A	16	17.8	19.7	1	26.0	23.1	5	16A		
SMBG17	17	18.9	23.1	1	30.5	19.7	5	17		
SMBG17A	17	18.9	20.9	1	27.6	21.7	5	17A		
SMBG18	18	20.0	24.4	1	32.2	18.6	5	18		
SMBG18A	18	20.0	22.1	1	29.2	20.5	5	18A		
SMBG20	20	22.2	27.1	1	35.8	16.7	5	20		
SMBG20A	20	22.2	24.5	1	32.4	18.5	5	20A		
SMBG22	22	24.4	29.8	1	39.4	15.2	5	22		
SMBG22A	22	24.4	26.9	1	35.5	16.9	5	22A		
SMBG24	24	26.7	32.6	1	43.0	14.0	5	24		
SMBG24A	24	26.7	29.5	1	38.9	15.4	5	24A		
SMBG26	26	28.9	35.3	1	46.6	12.4	5	26		
SMBG26A	26	28.9	31.9	1	42.1	14.2	5	26A		

SMBG5.0(A) thru SMBG170(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE			MAXIMUM CLAMPING VOLTAGE@I _{PP}	PEAK PULSE CURRENT I _{PP}	MAXIMUM REVERSE LEAKAGE @V _{WM}	MARKING CODE
	V _{WM}	V _(BR) @I _T		I _T (mA)				
	VOLTS	MIN	MAX					
SMBG28	28	31.1	38.0	1	50.0	12.0	5	28
SMBG28A	28	31.1	34.4	1	45.4	13.2	5	28A
SMBG30	30	33.3	40.7	1	53.5	11.2	5	30
SMBG30A	30	33.3	36.8	1	48.4	12.4	5	30A
SMBG33	33	36.7	44.9	1	59.0	10.2	5	33
SMBG33A	33	36.7	40.6	1	53.3	11.3	5	33A
SMBG36	36	40.0	48.9	1	64.3	9.3	5	36
SMBG36A	36	40.0	44.2	1	58.1	10.3	5	36A
SMBG40	40	44.4	54.3	1	71.4	8.4	5	40
SMBG40A	40	44.4	49.1	1	64.5	9.3	5	40A
SMBG43	43	47.8	58.4	1	76.7	7.8	5	43
SMBG43A	43	47.8	52.8	1	69.4	8.6	5	43A
SMBG45	45	50.0	61.1	1	80.3	7.5	5	45
SMBG45A	45	50.0	55.3	1	72.7	8.3	5	45A
SMBG48	48	53.3	65.1	1	85.5	7.0	5	48
SMBG48A	48	53.3	58.9	1	77.4	7.7	5	48A
SMBG51	51	56.7	69.3	1	91.1	6.6	5	51
SMBG51A	51	56.7	62.7	1	82.4	7.3	5	51A
SMBG54	54	60.0	73.3	1	96.3	6.2	5	54
SMBG54A	54	60.0	66.3	1	87.1	6.9	5	54A
SMBG58	58	64.4	78.7	1	103	5.8	5	58
SMBG58A	58	64.4	71.2	1	93.6	6.4	5	58A
SMBG60	60	66.7	81.5	1	107	5.6	5	60
SMBG60A	60	66.7	73.7	1	96.8	6.2	5	60A
SMBG64	64	71.1	86.9	1	114	5.3	5	64
SMBG64A	64	71.1	78.6	1	103	5.8	5	64A
SMBG70	70	77.8	95.1	1	125	4.8	5	70
SMBG70A	70	77.8	86.0	1	113	5.3	5	70A
SMBG75	75	83.3	102	1	134	4.5	5	75
SMBG75A	75	83.3	92.1	1	121	4.9	5	75A
SMBG78	78	86.7	106	1	139	4.3	5	78
SMBG78A	78	86.7	95.8	1	126	4.7	5	78A
SMBG85	85	94.4	115	1	151	3.9	5	85
SMBG85A	85	94.4	104	1	137	4.4	5	85A
SMBG90	90	100	122	1	160	3.8	5	90
SMBG90A	90	100	111	1	146	4.1	5	90A
SMBG100	100	111	136	1	179	3.4	5	100
SMBG100A	100	111	123	1	162	3.7	5	100A
SMBG110	110	122	149	1	196	3.0	5	110
SMBG110A	110	122	135	1	177	3.4	5	110A
SMBG120	120	133	163	1	214	2.8	5	120
SMBG120A	120	133	147	1	193	3.1	5	120A

SMBG5.0(A) thru SMBG170(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ (VOLTS)			MAXIMUM CLAMPING VOLTAGE @ I_{PP}	PEAK PULSE CURRENT I_{PP} (AMPS)	MAXIMUM REVERSE LEAKAGE @ V_{WM} I_b (uA)	MARKING CODE
	VOLTS	MIN	MAX	I_T (mA)	VOLTS	(AMPS)	(uA)	
SMBG130	130	144	176	1	231	2.6	5	130
SMBG130A	130	144	159	1	209	2.9	5	130A
SMBG150	150	167	204	1	268	2.2	5	150
SMBG150A	150	167	185	1	243	2.5	5	150A
SMBG160	160	178	218	1	287	2.1	5	160
SMBG160A	160	178	197	1	259	2.3	5	160A
SMBG170	170	189	231	1	304	2.0	5	170
SMBG170A	170	189	209	1	275	2.2	5	170A

SMBG5.0(C)(A) thru SMBG170(C)(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE			MAXIMUM CLAMPING VOLTAGE@I _{PP}	PEAK PULSE CURRENT I _{PP}	MAXIMUM REVERSE LEAKAGE @V _{WM} I _b	MARKING CODE
	V _{WM}	V _(BR) @I _T		I _T (mA)				
	VOLTS	MIN	MAX					
SMBG5.0C	5.0	6.40	7.30	10	9.6	62.5	800	5.0C
SMBG5.0CA	5.0	6.40	7.00	10	9.2	65.2	800	5.0CA
SMBG6.0C	6.0	6.67	8.15	10	11.4	52.6	800	6.0C
SMBG6.0CA	6.0	6.67	7.37	10	10.3	58.3	800	6.0CA
SMBG6.5C	6.5	7.22	8.82	10	12.3	48.7	500	6.5C
SMBG6.5CA	6.5	7.22	7.98	10	11.2	53.6	500	6.5CA
SMBG7.0C	7.0	7.78	9.51	10	13.3	45.1	200	7.0C
SMBG7.0CA	7.0	7.78	8.60	10	12.0	50.0	200	7.0CA
SMBG7.5C	7.5	8.33	10.2	1	14.3	42.0	100	7.5C
SMBG7.5CA	7.5	8.33	9.21	1	12.9	46.5	100	7.5CA
SMBG8.0C	8.0	8.89	10.9	1	15.0	40.0	50	8.0C
SMBG8.0CA	8.0	8.89	9.83	1	13.6	44.1	50	8.0CA
SMBG8.5C	8.5	9.44	11.5	1	15.9	37.7	10	8.5C
SMBG8.5CA	8.5	9.44	10.4	1	14.4	41.7	10	8.5CA
SMBG9.0C	9.0	10.0	12.2	1	16.9	35.5	5	9.0C
SMBG9.0CA	9.0	10.0	11.1	1	15.4	39.0	5	9.0CA
SMBG10C	10	11.1	13.6	1	18.8	31.9	5	10C
SMBG10CA	10	11.1	12.3	1	17.0	35.3	5	10CA
SMBG11C	11	12.2	14.9	1	20.1	29.9	5	11C
SMBG11CA	11	12.2	13.5	1	18.2	33.0	5	11CA
SMBG12C	12	13.3	16.3	1	22.0	27.3	5	12C
SMBG12CA	12	13.3	14.7	1	19.9	30.2	5	12CA
SMBG13C	13	14.4	17.6	1	23.8	25.2	5	13C
SMBG13CA	13	14.4	15.9	1	21.5	27.9	5	13CA
SMBG14C	14	15.6	19.1	1	25.8	23.3	5	14C
SMBG14CA	14	15.6	17.2	1	23.2	25.8	5	14CA
SMBG15C	15	16.7	20.4	1	26.9	22.3	5	15C
SMBG15CA	15	16.7	18.5	1	24.4	24.0	5	15CA
SMBG16C	16	17.8	21.8	1	28.8	20.8	5	16C
SMBG16CA	16	17.8	19.7	1	26.0	23.1	5	16CA
SMBG17C	17	18.9	23.1	1	30.5	19.7	5	17C
SMBG17CA	17	18.9	20.9	1	27.6	21.7	5	17CA
SMBG18C	18	20.0	24.4	1	32.2	18.6	5	18C
SMBG18CA	18	20.0	22.1	1	29.2	20.5	5	18CA
SMBG20C	20	22.2	27.1	1	35.8	16.7	5	20C
SMBG20CA	20	22.2	24.5	1	32.4	18.5	5	20CA
SMBG22C	22	24.4	29.8	1	39.4	15.2	5	22C
SMBG22CA	22	24.4	26.9	1	35.5	16.9	5	22CA
SMBG24C	24	26.7	32.6	1	43.0	14.0	5	24C
SMBG24CA	24	26.7	29.5	1	38.9	15.4	5	24CA
SMBG26C	26	28.9	35.3	1	46.6	12.4	5	26C
SMBG26CA	26	28.9	31.9	1	42.1	14.2	5	26CA

SMBG5.0(C)(A) thru SMBG170(C)(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE			MAXIMUM CLAMPING VOLTAGE@I _{PP}	PEAK PULSE CURRENT I _{PP}	MAXIMUM REVERSE LEAKAGE @V _{WM}	MARKING CODE
	V _{WM}	V _(BR) @I _T (VOLTS)		I _T (mA)				
	VOLTS	MIN	MAX		VOLTS		(uA)	
SMBG28C	28	31.1	38.0	1	50.0	12.0	5	28C
SMBG28CA	28	31.1	34.4	1	45.4	13.2	5	28CA
SMBG30C	30	33.3	40.7	1	53.5	11.2	5	30C
SMBG30CA	30	33.3	36.8	1	48.4	12.4	5	30CA
SMBG33C	33	36.7	44.9	1	59.0	10.2	5	33C
SMBG33CA	33	36.7	40.6	1	53.3	11.3	5	33CA
SMBG36C	36	40.0	48.9	1	64.3	9.3	5	36C
SMBG36CA	36	40.0	44.2	1	58.1	10.3	5	36CA
SMBG40C	40	44.4	54.3	1	71.4	8.4	5	40C
SMBG40CA	40	44.4	49.1	1	64.5	9.3	5	40CA
SMBG43C	43	47.8	58.4	1	76.7	7.8	5	43C
SMBG43CA	43	47.8	52.8	1	69.4	8.6	5	43CA
SMBG45C	45	50.0	61.1	1	80.3	7.5	5	45C
SMBG45CA	45	50.0	55.3	1	72.7	8.3	5	45CA
SMBG48C	48	53.3	65.1	1	85.5	7.0	5	48C
SMBG48CA	48	53.3	58.9	1	77.4	7.7	5	48CA
SMBG51C	51	56.7	69.3	1	91.1	6.6	5	51C
SMBG51CA	51	56.7	62.7	1	82.4	7.3	5	51CA
SMBG54C	54	60.0	73.3	1	96.3	6.2	5	54C
SMBG54CA	54	60.0	66.3	1	87.1	6.9	5	54CA
SMBG58C	58	64.4	78.7	1	103	5.8	5	58C
SMBG58CA	58	64.4	71.2	1	93.6	6.4	5	58CA
SMBG60C	60	66.7	81.5	1	107	5.6	5	60C
SMBG60CA	60	66.7	73.7	1	96.8	6.2	5	60CA
SMBG64C	64	71.1	86.9	1	114	5.3	5	64C
SMBG64CA	64	71.1	78.6	1	103	5.8	5	64CA
SMBG70C	70	77.8	95.1	1	125	4.8	5	70C
SMBG70CA	70	77.8	86.0	1	113	5.3	5	70CA
SMBG75C	75	83.3	102	1	134	4.5	5	75C
SMBG75CA	75	83.3	92.1	1	121	4.9	5	75CA
SMBG78C	78	86.7	106	1	139	4.3	5	78C
SMBG78CA	78	86.7	95.8	1	126	4.7	5	78CA
SMBG85C	85	94.4	115	1	151	3.9	5	85C
SMBG85CA	85	94.4	104	1	137	4.4	5	85CA
SMBG90C	90	100	122	1	160	3.8	5	90C
SMBG90CA	90	100	111	1	146	4.1	5	90CA
SMBG100C	100	111	136	1	179	3.4	5	100C
SMBG100CA	100	111	123	1	162	3.7	5	100CA
SMBG110C	110	122	149	1	196	3.0	5	110C
SMBG110CA	110	122	135	1	177	3.4	5	110CA
SMBG120C	120	133	163	1	214	2.8	5	120C
SMBG120CA	120	133	147	1	193	3.1	5	120CA

SMBG5.0(C)(A) thru SMBG(C)170(A)

Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC PART NUMBER	REVERSE STAND-OFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ (VOLTS)			MAXIMUM CLAMPING VOLTAGE @ I_{PP}	PEAK PULSE CURRENT I_{PP} (AMPS)	MAXIMUM REVERSE LEAKAGE @ V_{WM} I_b (uA)	MARKING CODE
	VOLTS	MIN	MAX	I_T (mA)	VOLTS	(AMPS)	(uA)	
SMBG130C	130	144	176	1	231	2.6	5	130C
SMBG130CA	130	144	159	1	209	2.9	5	130CA
SMBG150C	150	167	204	1	268	2.2	5	150C
SMBG150CA	150	167	185	1	243	2.5	5	150CA
SMBG160C	160	178	218	1	287	2.1	5	160C
SMBG160CA	160	178	197	1	259	2.3	5	160CA
SMBG170C	170	189	231	1	304	2.0	5	170C
SMBG170CA	170	189	209	1	275	2.2	5	170CA

MAXIMUM RATINGS AND CHARACTERISTIC CURVE SMBG SERIES

Figure 1
Derating Curve

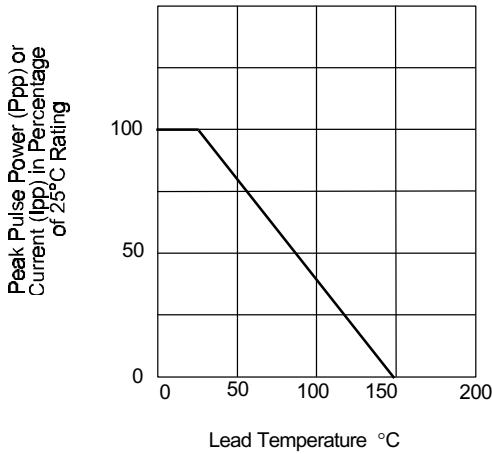


Figure 2
Pulse Waveform For Exponential Surge

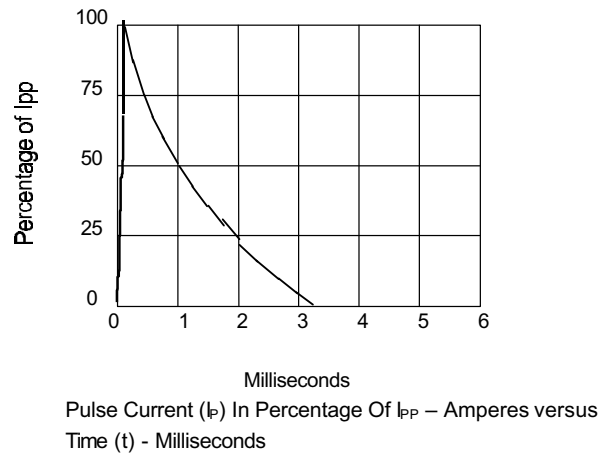
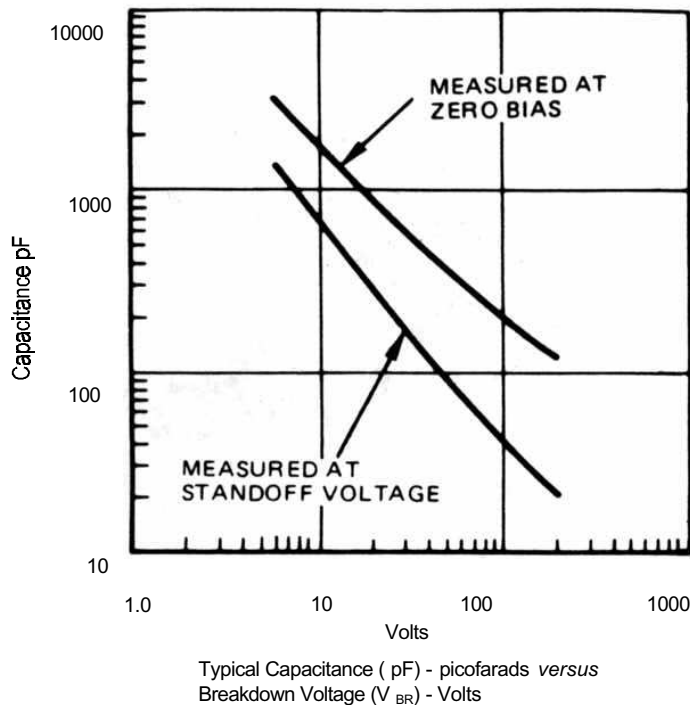


Figure 3
Typical Capacitance versus Breakdown Voltage





Micro Commercial Components

Ordering Information

Device	Packing
(Part Number)-TP	Tape&Reel;3Kpcs/Reel

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