Low Capacitance, Super Low Clamping Voltage Transient Voltage Suppressors

MB6C Series

MERITEK

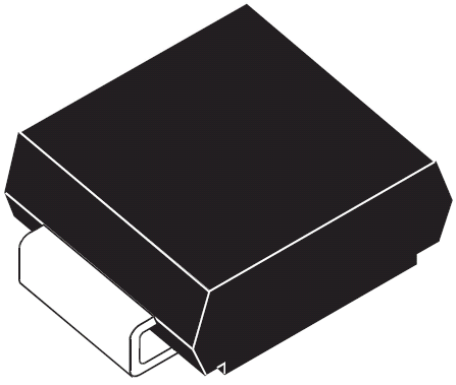
Abstract: It describes characteristics' advantage of MB6C, structure graphics, compliant to surge standard test system, electrical characteristics index, 4KV lightning surge comparing test and related application.

Keywords: SMB package, clamping voltage, comparing test, placement graphics

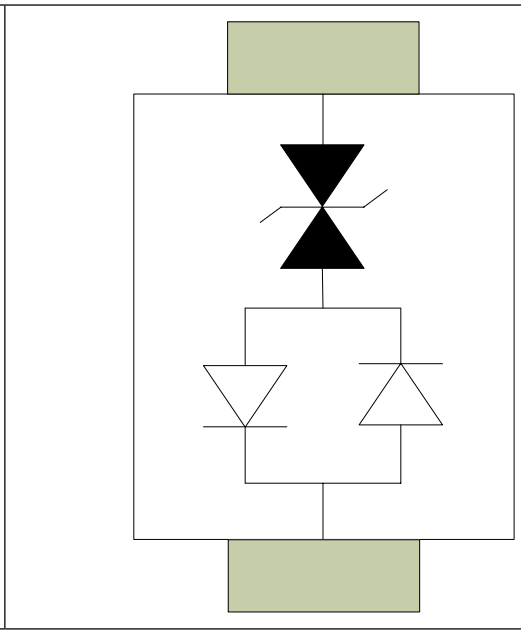
MB6C is bidirectional transient voltage suppressor of low profile package (SMB). It has several advantages such as responding less than 1 picosecond, low clamping voltage and super low capacitance. Compared to TSS P0080SX series products which have disadvantage of high clamping voltage, MB6C can protect the next circuit directly.

Because MB6C responds very rapidly and lower clamping voltage, low capacitance, it is ideal for protecting communication I/O data line which has high frequency.

STRUCTURE GRAPHICS



SMB



STANDARDS COMPLIANCE

Standard	Peak Surge Voltage(V)	Voltage Waveform	Required Peak Current (A)	Current Waveform	Minimum serial Resistor to meet Standard(Ω)
GR-1089 Core Intrabuilding	—	—	40	10/1000 μ S	—
ITU-T-K20/K21	4000	10/700 μ S	100	5/310 μ S	40
ITU-T-K20 (IEC61000-4-2)	30000	1/30nS	ESD contact discharge		—
	30000	1/60nS	ESD air discharge		—
IEC61000-4-5	4000	10/700 μ S	100	5/310 μ S	40
FCC Part 68	—	—	90	10/160 μ S	—
			50	10/560 μ S	

SPECIFICATIONS

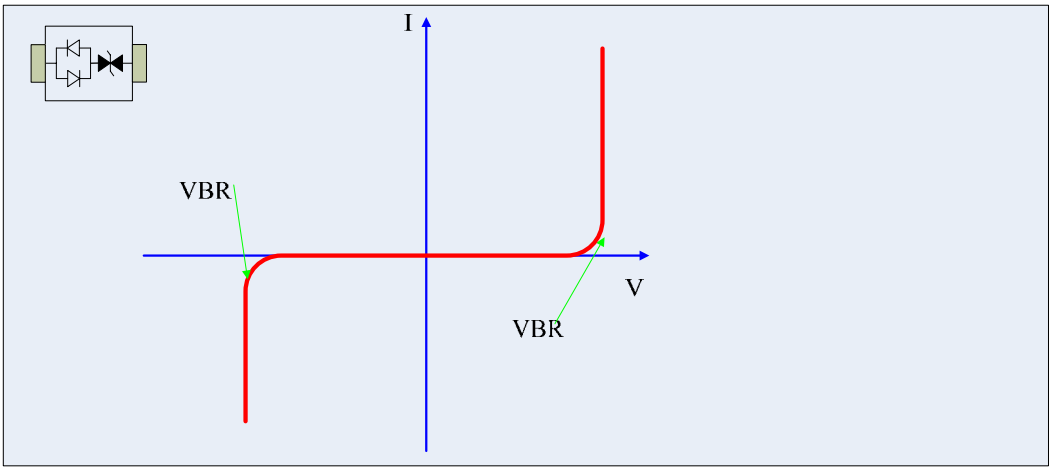
Part Number	I_{RM}@V_{RM} MAX.		I_{RM}@V_{RM} MAX.		I_{RM}@V_{RM} MAX.		I_{RM}@V_{RM} MAX.		I_{RM}@V_{RM} MAX.	
	V	μA	V	μA	V	μA	V	μA	V	μA
MB6C	5	200	4	50	3	10	2.5	5	1.5	1

Part Number	V_{BR} Min @ I_t	I_t	Vc @ I_{PP}	I_{PP}	Ctype at 1MHz 0V	T_J	T_S
	V	mA	V	A	pF	(°C)	(°C)
MB6C	6	1	15	40	35	-40~150	-65~150

Note:

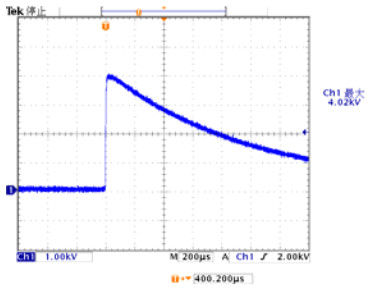
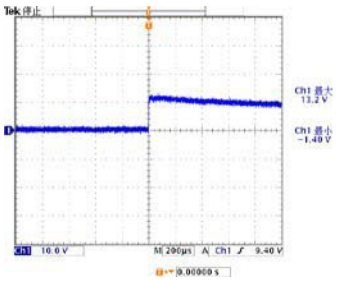
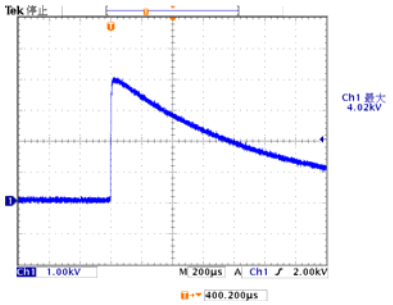
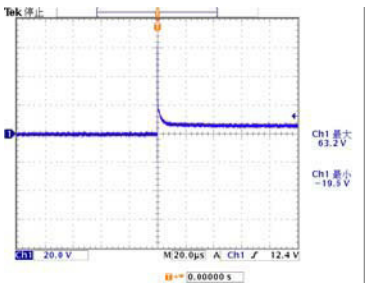
V_{RM}	Reverse Stand-Off Voltage or Working Voltage	V_C	Maximum Clamping Voltage
I_{RM}	Reverse Maximum Leakage	I_{PP}	Peak Pulse Current@10/1000μs Wave
V_{BR}	Breakdown Voltage @ 1mA	Ctype	Capacitance is measured at 1MHz with a 0V
T_J	Operating Temperature	T_S	Storage Temperature

V-I CHARACTERISTICS



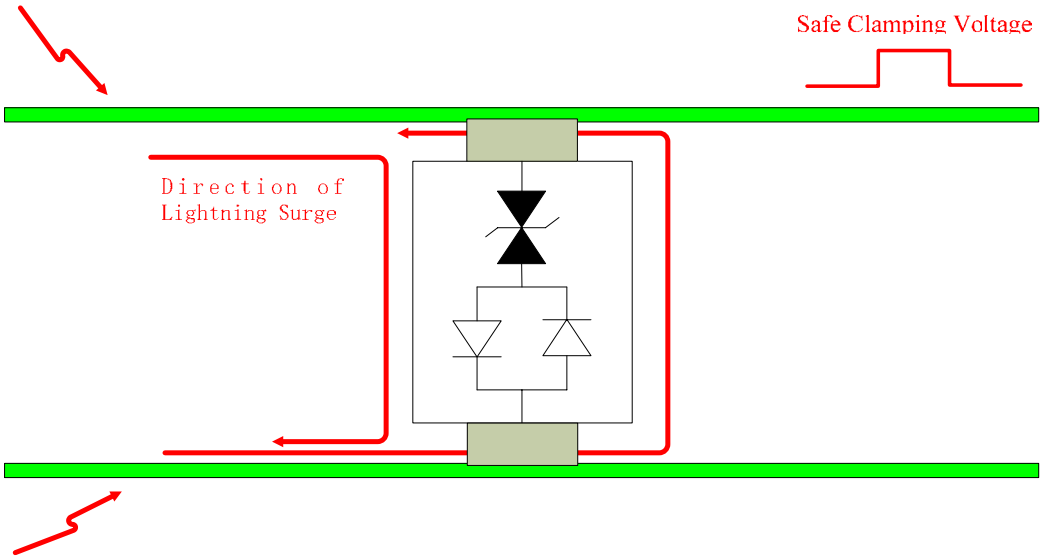
CLAMPING ABILITY

Compare with TSS P0080SX surge test, which is compliant with ITU K21 10/700 μs 4KV lightning surge. Here are the results:

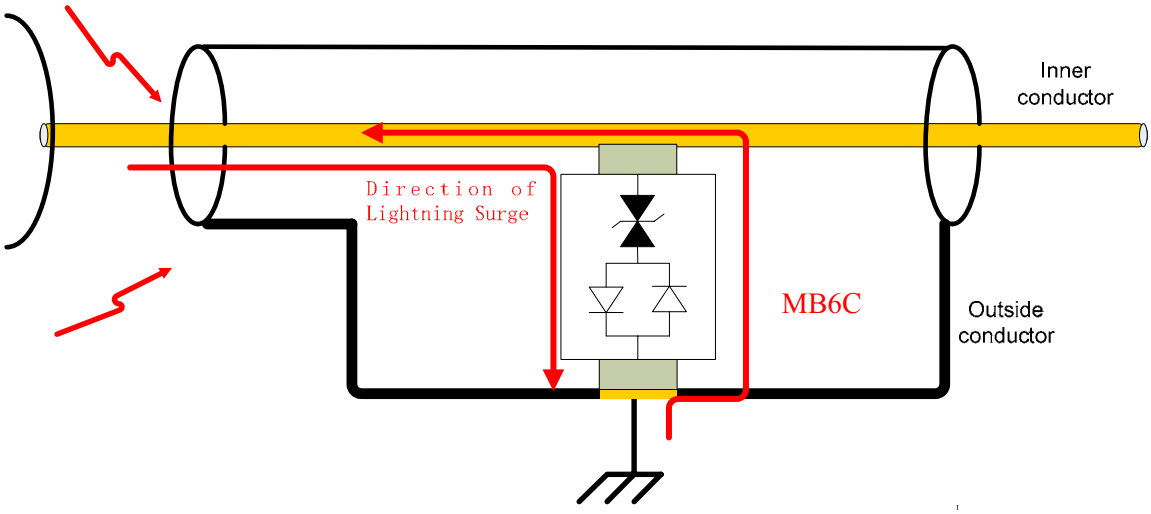
PART NUMBER	10/700μs 4KV lightning surge wave	Clamping Voltage Wave	Result
MB6C			Very low clamping voltage about 13V, excellent clamping ability
P0080SX			Clamping voltage up to 63V, if the protected circuit's withstanding voltage is not enough, the protected chip is easy to be damaged

Because MB6C responds very rapidly and lower clamping voltage, low capacitance, it is ideal for protecting communication I/O data line, which has high frequency, such as CATV, COAX, T1/E1, Line cards, I/O Interfaces Industrial and Consumer electronic applications.

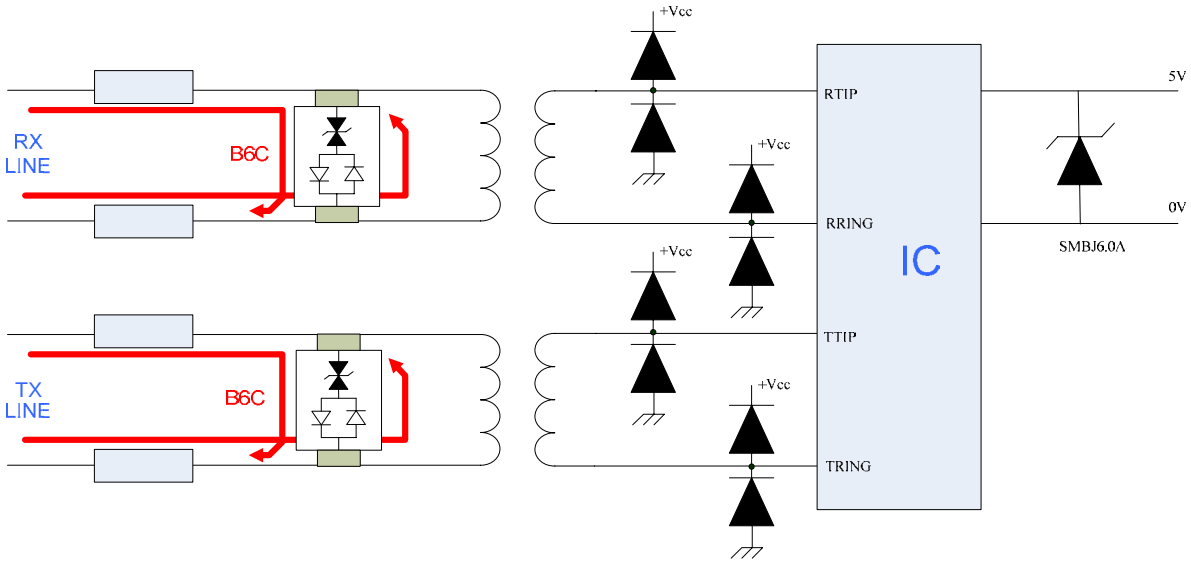
1. Placement Graphics of Realizing Bidirectional Protection



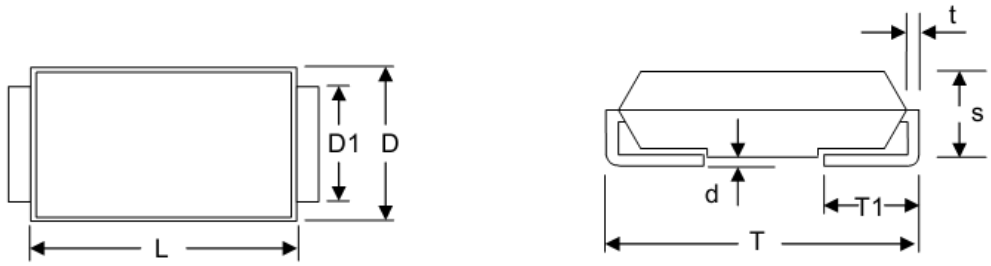
2. Graphics of Realizing Protection at COAX or CATV BNC



3. Surge protection of T1/E1



PACKAGE DIMENSIONS



SMB/DO-214AA

Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	4.06	4.57	0.160	0.180
D	3.30	3.94	0.130	0.155
D1	1.95	2.20	0.077	0.086
T	5.21	5.59	0.205	0.220
T1	0.76	1.52	0.030	0.060
d	-	0.203	-	0.008
s	2.13	2.47	0.084	0.097
t	0.152	0.305	0.006	0.012