2-Line, Uni-directional, Transient Voltage Suppressor

GND
3

1 **2**
I/O1 **I/O2**

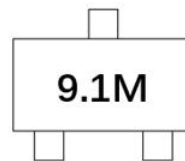**SOT-23**
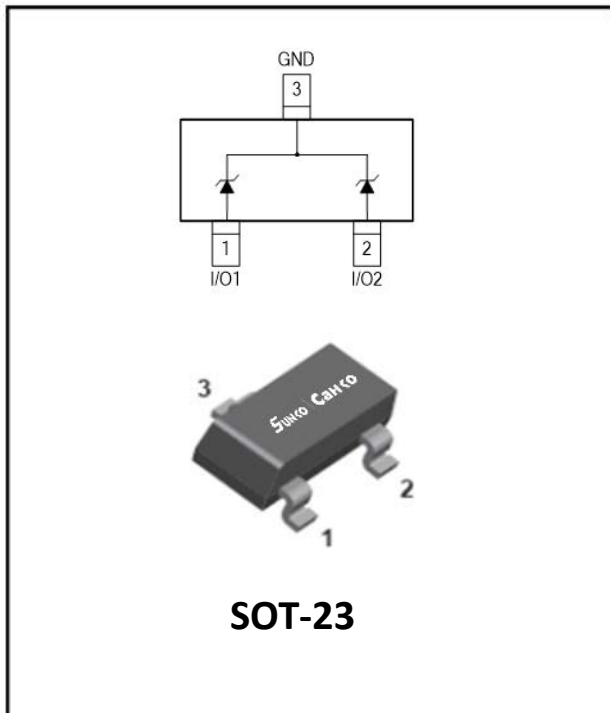
Features

- Stand-off voltage:6V
- Transient protection for each line according to
  IEC61000-4-2(ESD): ±30kV (contact)
  IEC61000-4-5(surge): 1.7A (10/1000µs)
- Low leakage current:
- Ultra low clamping voltage
- Compliant

Applications

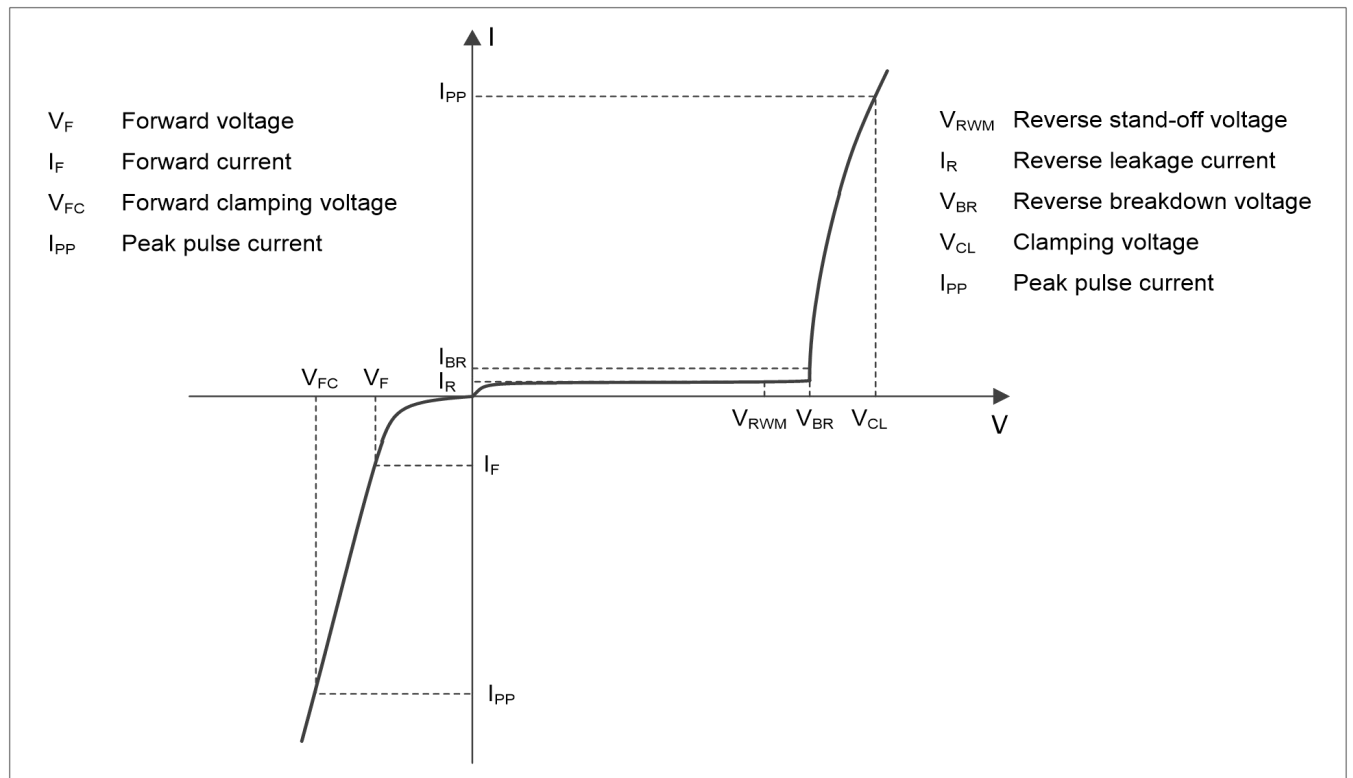- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC

Mechanical Data

- Package: SOT-23
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound
- Moisture Sensitivity: Level 1 per J-STD-020
- Marking Information: See Below

9.1M

■Definitions of electrical characteristics

V_F	Forward voltage	V_{RWM}	Reverse stand-off voltage
I_F	Forward current	I_R	Reverse leakage current
V_{FC}	Forward clamping voltage	V_{BR}	Reverse breakdown voltage
I_{PP}	Peak pulse current	V_{CL}	Clamping voltage
		I_{PP}	Peak pulse current

MMBZ9V1C

■Maximum Ratings

PARAMETER	SYMBOL	LIMITS	UNIT
Peak pulse power (tp = 10/1000μs)	P_{pk}	23.8	W
Peak pulse current (tp = 10/1000μs)	I_{PP}	1.4	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	KV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T_J	-55~150	℃
Storage temperature	T_{STG}	-55~150	℃

■Electrical Characteristics（T_a=25℃ Unless otherwise specified）

PARAMETER	Symbol	UNIT	Conditions	Min	Typ	Max
Reverse maximum working voltage	V_{RWM}	V				6
Reverse leakage current	I_R	uA	V_{RWM} = 6V			0.3
Reverse breakdown voltage	V_{BR}	V	I_{BR} = 1mA	8.65		9.56
Clamping voltage [2]	V_{CL}	V	I_{PP} = 1.7A, t_p = 10/1000μs			14
Junction Capacitance	CJ	pF	VR=0V,f=1MHz		185	

Notes:
(1). TLP parameter: Z_0 = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.
(2). Non-repetitive current pulse, according to IEC61000-4-5.

■Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(mg)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBZ9V1C	F2	Approximate 10	3000	30000	120000	7" reel

■ Characteristics (Typical)

Fig1: Pulse Waveform

tr=10μs

Peak Value
IPPM

Half Value - IPP
2

IPPM

TJ=25℃
Pulse Width(td) is defined as
the Point where the Peak
Current Decays to 50% of IPPM

10/1000μs Waveform as
Defined by R.E.A.

td

IPPM(%)

t（ms）
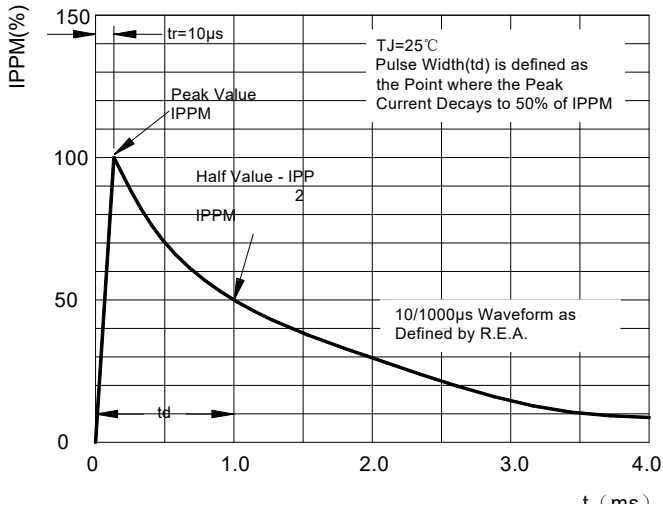
Fig 2:Contact discharge current waveform
per IEC61000-4-2

Current (%)

t_r = 0.7~1ns

30ns   60ns   t
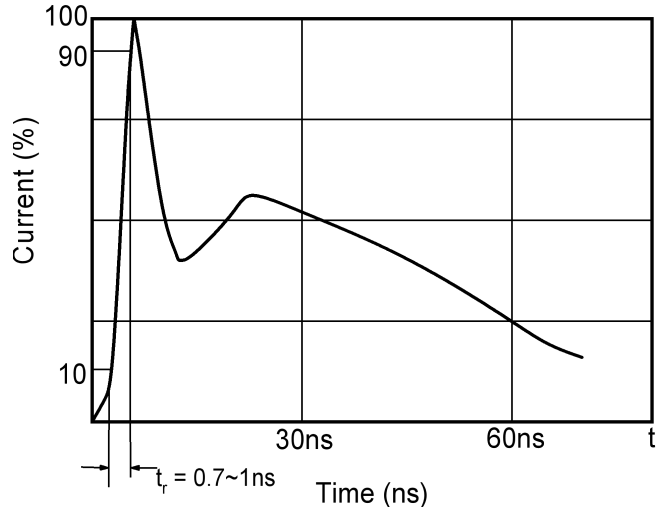
Time (ns)

Fig3： Clamping voltage vs. Peak pulse current

Pulse waveform: t_p = 10/1000μs

V_C - Clamping voltage (V)

I_{PP} - Peak pulse current (A)
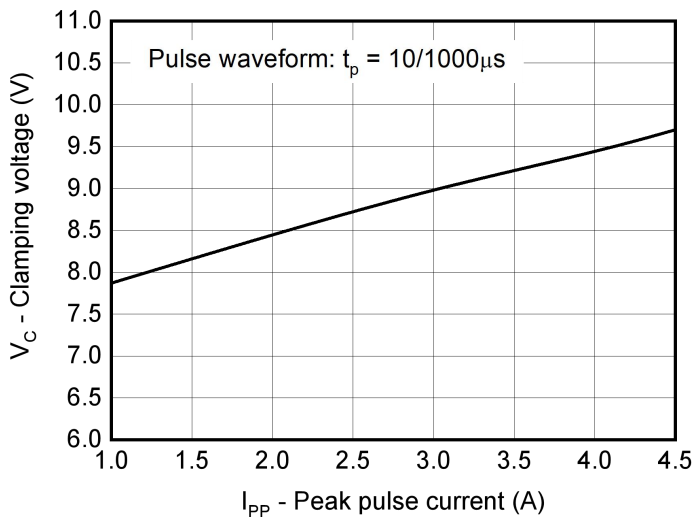
Fig4： Capacitance vs. Reverse voltage

f = 1MHz

C_J - Junction capacitance (Normalization)

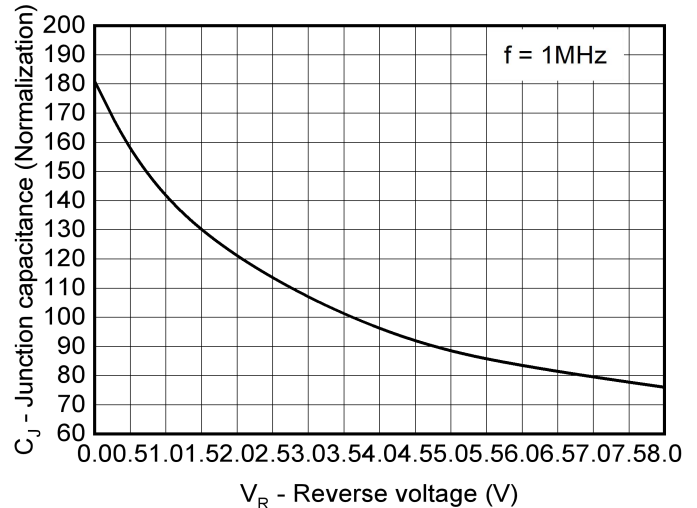V_R - Reverse voltage (V)
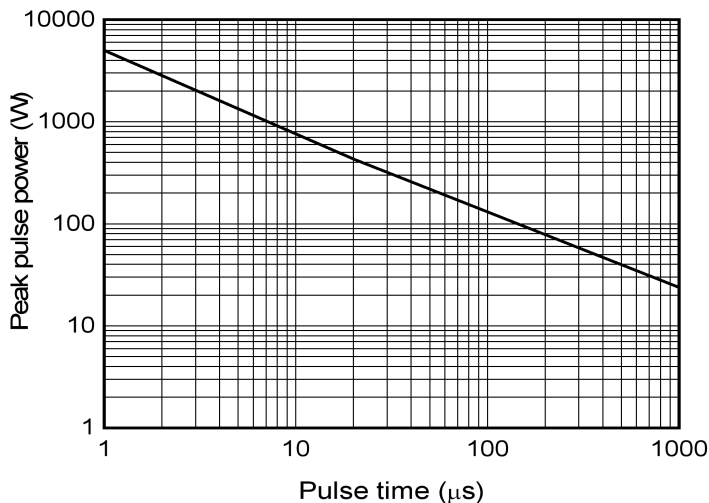
Fig5：Non-repetitive peak pulse power vs. Pulse time

Peak pulse power (W)

Pulse time (μs)

Fig6：Power derating vs. Ambient temperature

% of Rated power

T_A - Ambient temperature (℃)
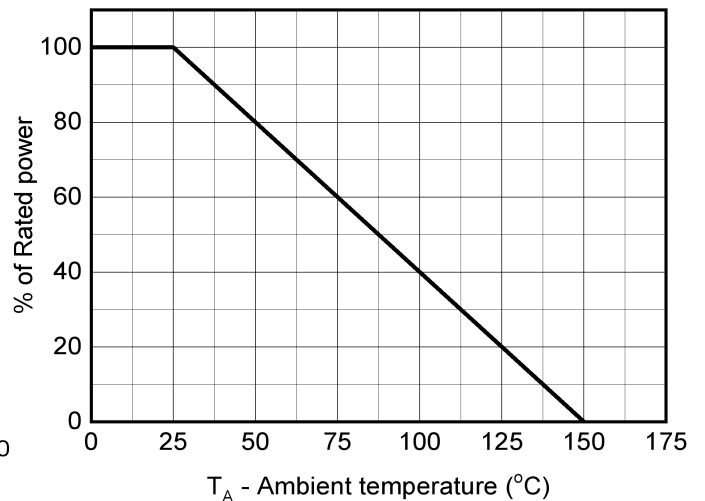
■ Outline Dimensions
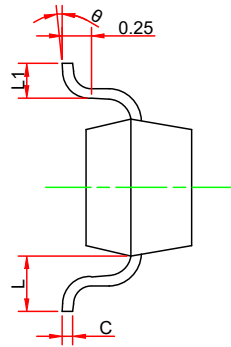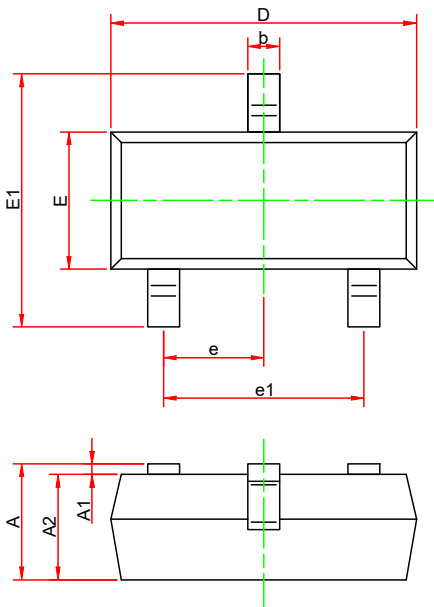
Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	0.900	-	1.150
A1	0.000	-	0.100
A2	0.900	-	1.050
b	0.300	-	0.500
c	0.100	-	0.200
D	2.800	-	3.000
E	1.200	-	1.400
E1	2.250	-	2.550
e	0.950TYP		
e1	1.800	-	2.000
L	0.550REF		
L1	0.300	-	0.500
θ	0°	-	8°

■ Soldering Footprint
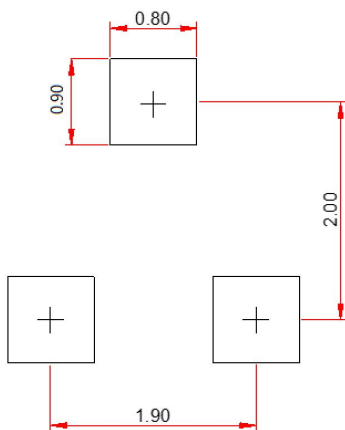
Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

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