

LTspice Model

ESD Protection Diode (TVS)

Littlefuse

SMCJ78CA

Functional Diagram



Model Information

Model	A macro model based on general SPICE diode model		
Call Name	MDC_SMCJ78CA_LT		
Pin Assign	1:A 2:A		
File List	Model Library	MDC_SMCJ78CA_LT01.lib	
	Model Report	MDC_SMCJ78CA_LT.pdf (this file)	
Verified Simulator Version	LTspice version XVII		
Note			

References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 05/30/23
- Product name SMCJ78CA
- Company name Littlefuse, Inc.
- Characteristics IrVr[Temp],BreakdownVoltage,ClampingVoltage,LekageCurrent,CjVr,IfVf[Temp],SurgeCurrentWaveform

Simulation Range

This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

Item	Range			Unit
	Min.		Max.	
Reverse Breakdown Voltage (typ)	0	to	91.25(at 1mA)	V
Reverse Clamping Voltage (max)	0	to	126(at 11.9A)	V
Temperature	-65	to	175	deg C

Diode

○ : Implemented
× : Not Implemented
— : Not applicable

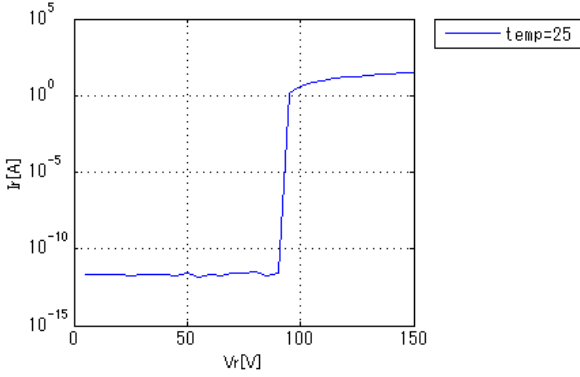
Model Functions Table

RANK=1

Functions	RANK	Implemented
IF-VF(Temp)	1	○
IR-VR(Temp)	1	○
Capacitance	1	○
Reverse recovery characteristics	1	—
Zz-Iz	1	—
Rectification characteristics(Bridge)	1	—
Surge-Transient	1	○
tlp	1	—

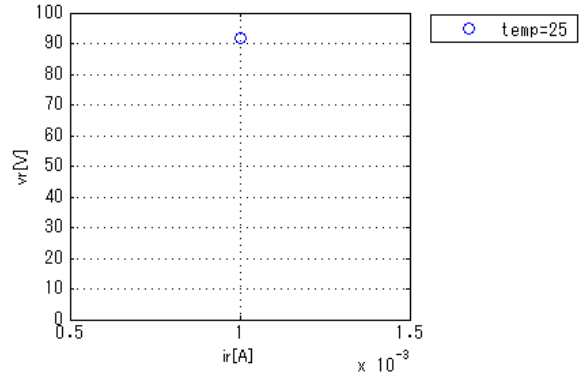
Simulation results are following.
 Explanatory notes — : simulated

IrVr[Temp]



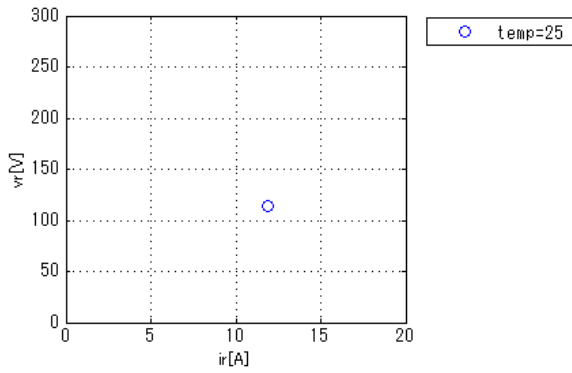
VBR(Breakdown Voltage)

at IR=0.001A



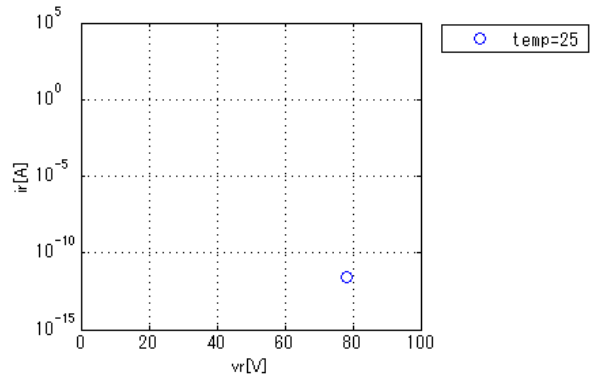
VC(Clamping Voltage)

at IPPM=11.9A max-10%



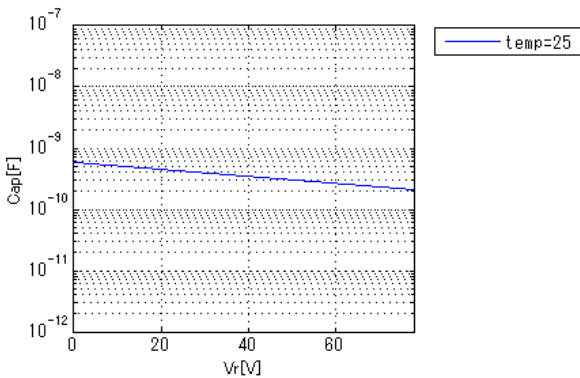
Leakage Current

at VWM(StandOff)=78V max(1uA)/1000 under

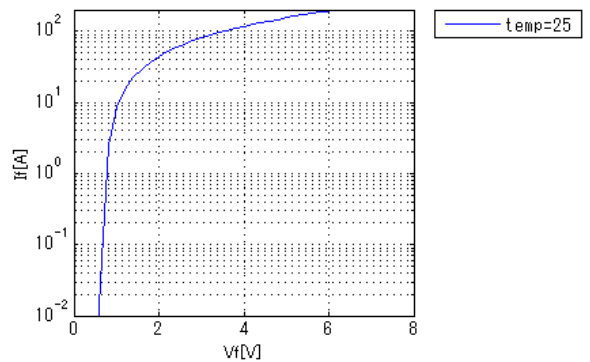


CjVr

Freq = 1000000Hz

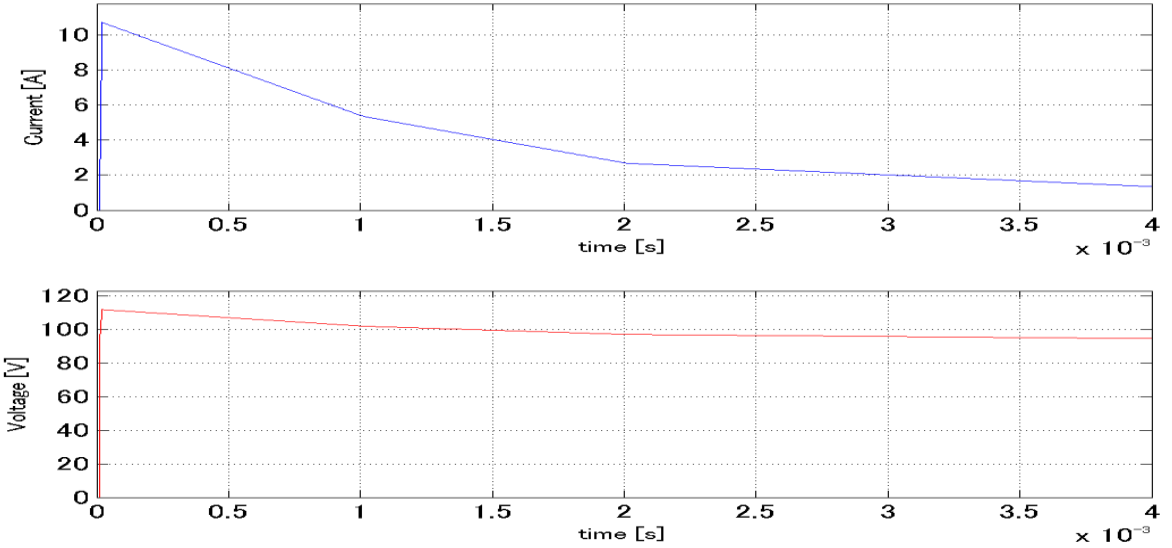


IfVf[Temp]



Simulation results are following.
Explanatory notes — : simulated

Surge Current Waveform (Reverse 10u/1000u)



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