Device Modeling Report

COMPONENTS: Zener Diode
PART NUMBER: CMZB20
MANUFACTURER: TOSHIBA

Bee Technologies Inc.

SPICE MODEL

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*$
* PART NUMBER: CMZB20
* MANUFACTURER: TOSHIBA
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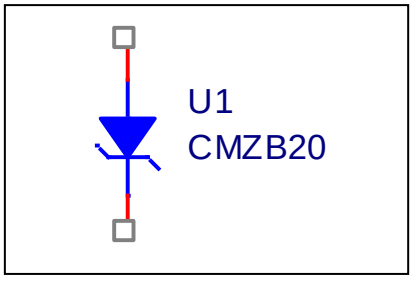
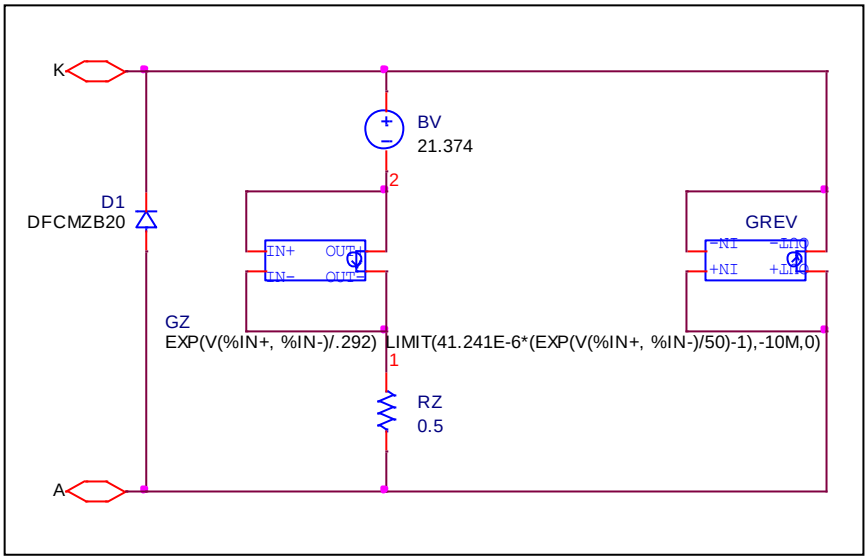
.SUBCKT CMZB20 A K
D_D1            A K DFCMZB20
G_GZ            2 1 VALUE { EXP(V(2, 1)/.292)}
R_RZ            A 1   0.5
G_GREV           A K VALUE {
+ LIMIT(41.241E-6*(EXP(V(A, K)/50)-1),-10M,0)}
V_BV            K 2 DC 21.374
.MODEL DFCMZB20 D
+ IS=3.071e-021
+ RS=0.1
+ IKF=0
+ N=1
+ XTI=3
.ENDS
*$
```

Circuit Configuration



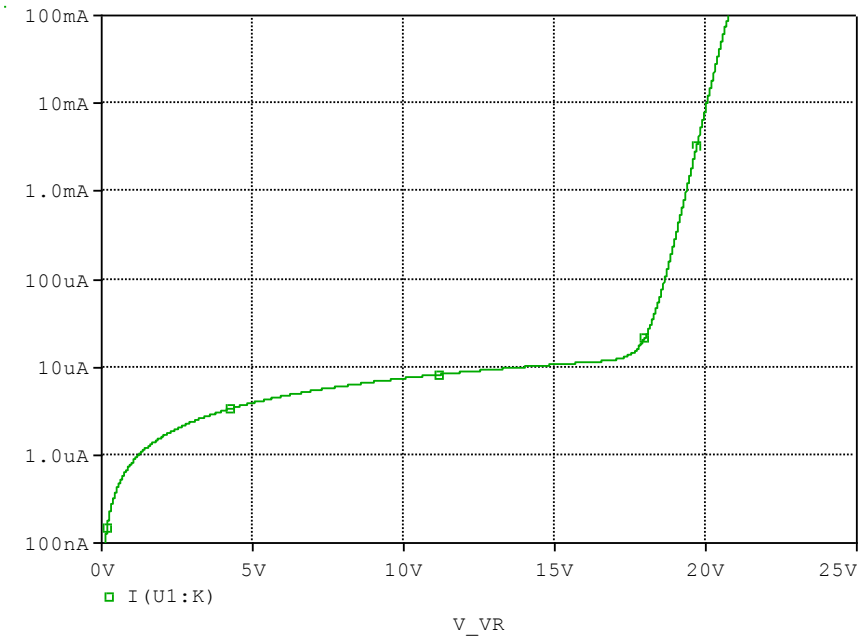
Equivalent circuit



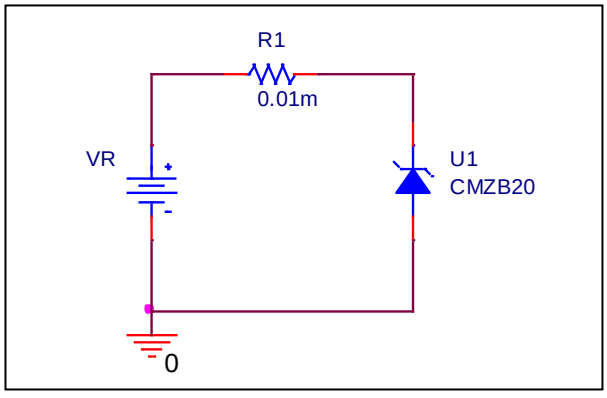
PSpice model parameter	Model description
IS	Saturation Current
RS	Series Resistance
IKF	High-injection Knee Current
M	Junction Grading Coefficient
N	Emission Coefficient
XTI	Saturation Current temp.exp

Reverse Characteristic

Circuit Simulation result



Evaluation circuit

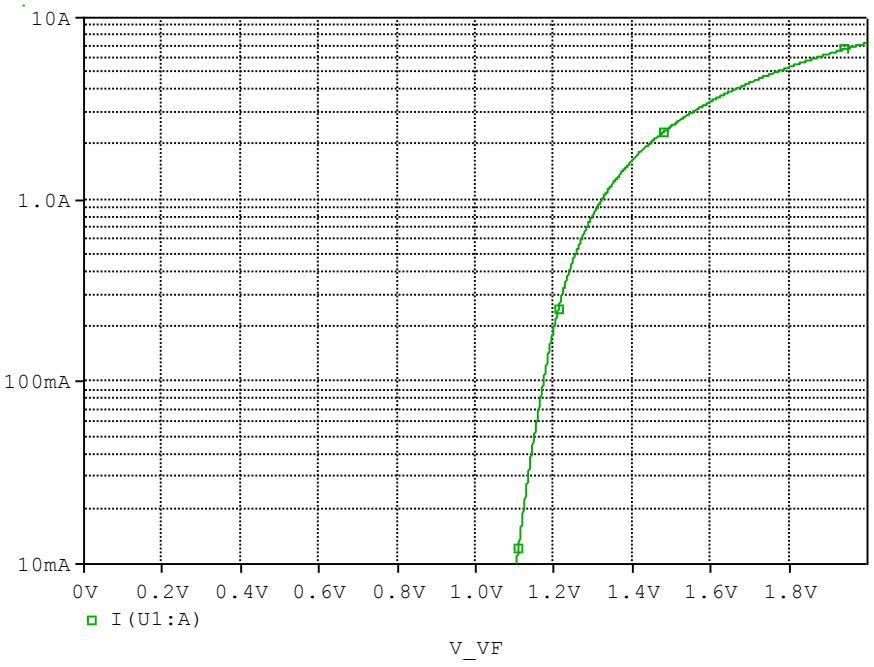


Comparison Measurement vs. Simulation

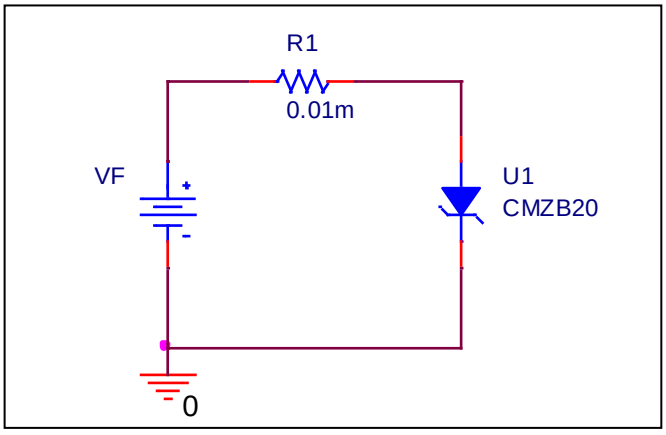
Parameter	Condition	Measurement	Simulation	%Error
V_Z(V)	I_Z=10(mA)	20.000	20.034	0.17
r_d(Ω)	I_Z=10(mA)	30.000	29.875	-0.42
I_R(uA)	V_R=14(V)	10.000	10.072	0.72

Forward Current Characteristics

Circuit Simulation result



Evaluation circuit



Comparison Measurement vs. Simulation: Condition I_F=0.2(A)

Parameter	Unit	Measurement	Simulation	%Error
V_F	V	1.200	1.200	0.00