

# Summary of changes from BSIM-CMG 111.2.0 to BSIM-CMG\_111.2.1

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## A. Summary of bug fixes

1. 2022bug7(Cadence): Code implementation issue in junction\_cap macro

## B. Description of bug fixes

1. 2022bug7(Cadence): Code implementation issue in junction\_cap macro

The following portion of the code of junction\_cap macro in **BSIM-CMG 111.2.0** has an implementation issue.

For  $T1 = vex/PB \geq 0.9$

```
T4 = T2 * (T1 - 1.0) * (5.0 * MJ * (T1 - 1.0) + (1.0 + MJ)); \
if (MJ != 1) begin \
    if (MJ == 0.5) begin \
        T2 = 1.0 / sqrt(0.1); \
    end else begin \
        T2 = pow(0.1, -MJ); \
    end \
    T3 = 1.0 / (1.0 - MJ); \
    T5 = T3 * (1.0 - 0.05 * MJ * (1.0 + MJ) * T2); \
end else begin \
    T5 = 1.5 - ln(0.1); \
end \
Qej = PB * Cz * (T4 + T5); \
```

Here, T4 requires T2 but appears before T2 calculation. Further, T2 is missing for MJ=1.

The following shows the correct implementation in **BSIM-CMG 111.2.1**

```

if (MJ != 1) begin \
    if (MJ == 0.5) begin \
        T2 = 1.0 / sqrt(0.1); \
    end else begin \
        T2 = pow(0.1, -MJ); \
    end \
    T3 = 1.0 / (1.0 - MJ); \
    T5 = T3 * (1.0 - 0.05 * MJ * (1.0 + MJ) * T2); \
end else begin \
    T2 = 10.0; \
    T5 = 1.5 - ln(0.1); \
end \
T4 = T2 * (T1 - 1.0) * (5.0 * MJ * (T1 - 1.0) + (1.0 + MJ)); \
Qej = PB * Cz * (T4 + T5); \

```