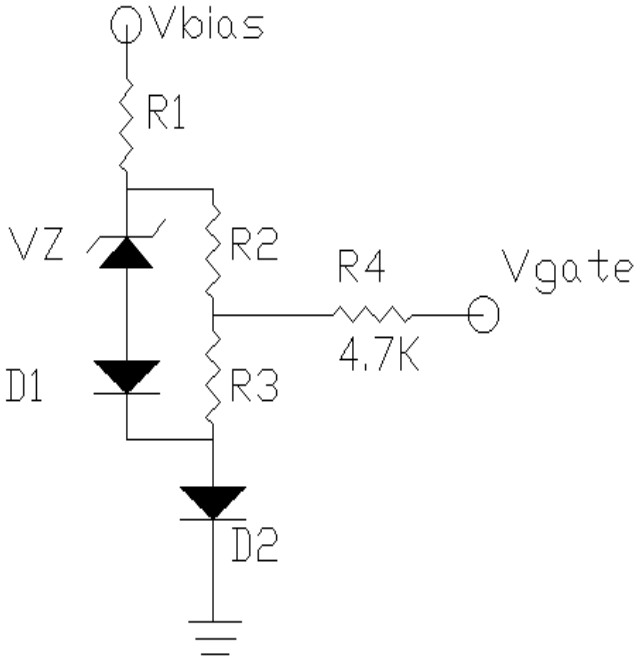
BIASING POLYFET RF TRANSISTORS

Polyfet RF Mosfet are enhancement mode devices. In order to cause drain current to flow, a positive voltage of about 3V needs to be applied to the Gate terminal. The higher the gate voltage applied the higher the drain current. The Mosfet transistor drain current will change with temperature. As the temperature goes up, so will the drain current. In order to prevent a runaway situation, the gate voltage needs to have a negative temperature coefficient. The following circuit describes a means to achieve a –2mv/ °C coefficient at the gate terminal.



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$$Vg = Vd + (Vz + Vd) * (R3/(R3 + R2))$$

$$\Delta Vg = \Delta Vd + (\Delta Vz + Vd) * (R3/(R3 + R2))$$

$$\Delta Vz = -\Delta Vd$$

$$\Delta Vg = -\Delta Vd = -2mv/C$$

- The temperature coefficient of a 6.8V zener is about + 2mv/ °C and the diode is about –2mv/ °C.
- The gate of a transistor draws no current, so there is no current flow in R4. R4 is used as a RF isolation resistor.
- R1 is adjusted to cause about 10ma of current flow into the circuit.
- R2 and R3 can be a potentiometer to adjust for the desired gate voltage. The total value of R2 and R3 should be high enough so that the current drawn in R2 and R3 is substantially less than 10ma. Recommend around 2ma