MACOM™

Partners from RF to Light

Temperature and Process Compensation in MADT-011000

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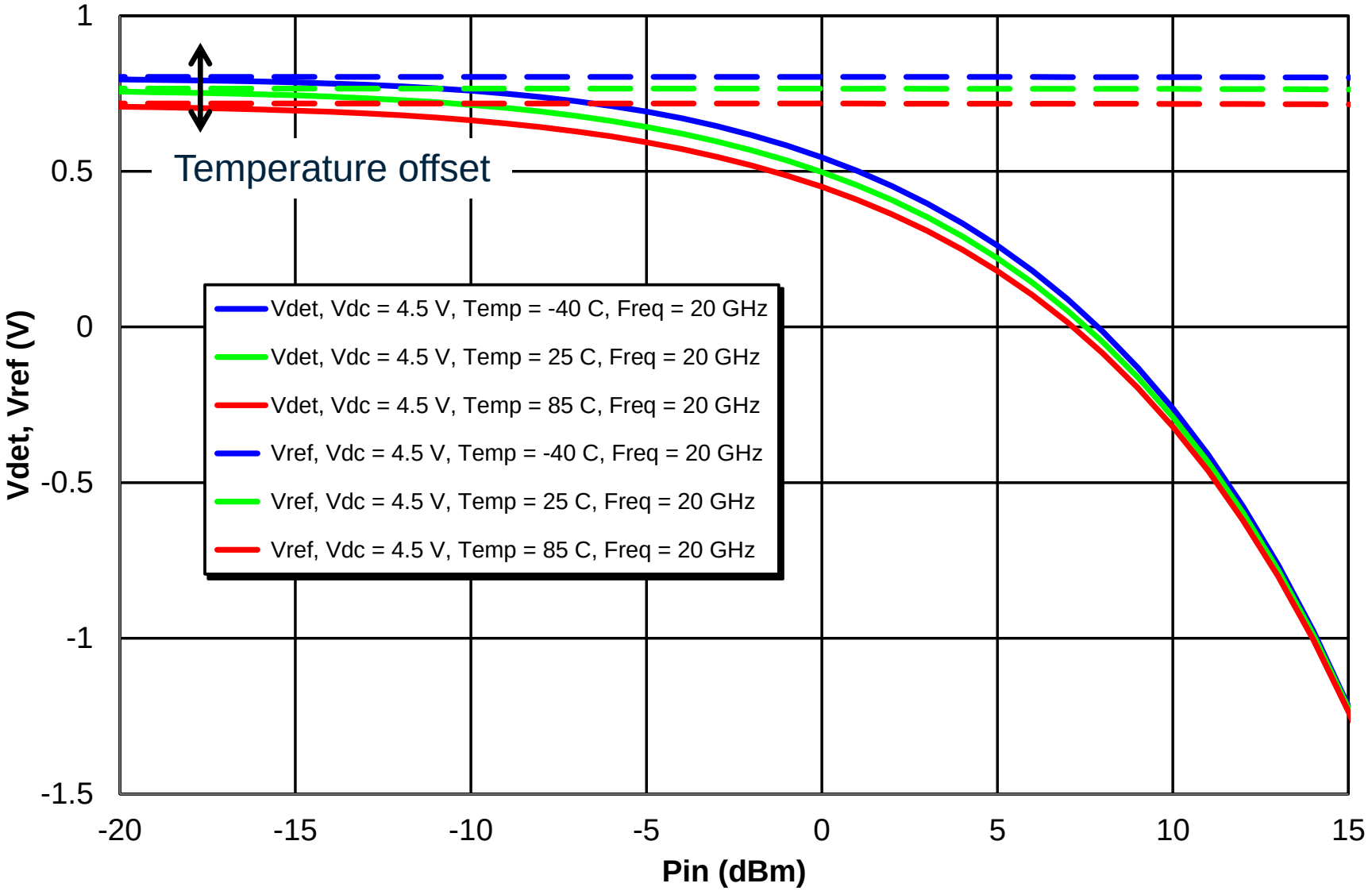
Overview

- MADT-011000 has two voltage outputs: Vdet and Vref.
- The voltage Vdet varies between approximately +0.75 V with no RF input, to -1.25 V with +15 dBm RF input level. The voltage Vref does not vary with input power level.
- Temperature changes introduce a small voltage offset to Vdet (approximately +/-25 mV), which might need to be accounted for if high accuracy is needed at low power levels.
- Similarly, fabrication tolerances result in part-to-part variation in quiescent Vdet levels that must be accounted for to maximise the dynamic range of the detector.
- The two outputs Vdet and Vref have the same temperature-related voltage offset, and are matched in terms of fabrication tolerances. Therefore, the difference voltage Vdelta = Vref – Vdet is insensitive to changes in temperature as well as manufacturing variations.

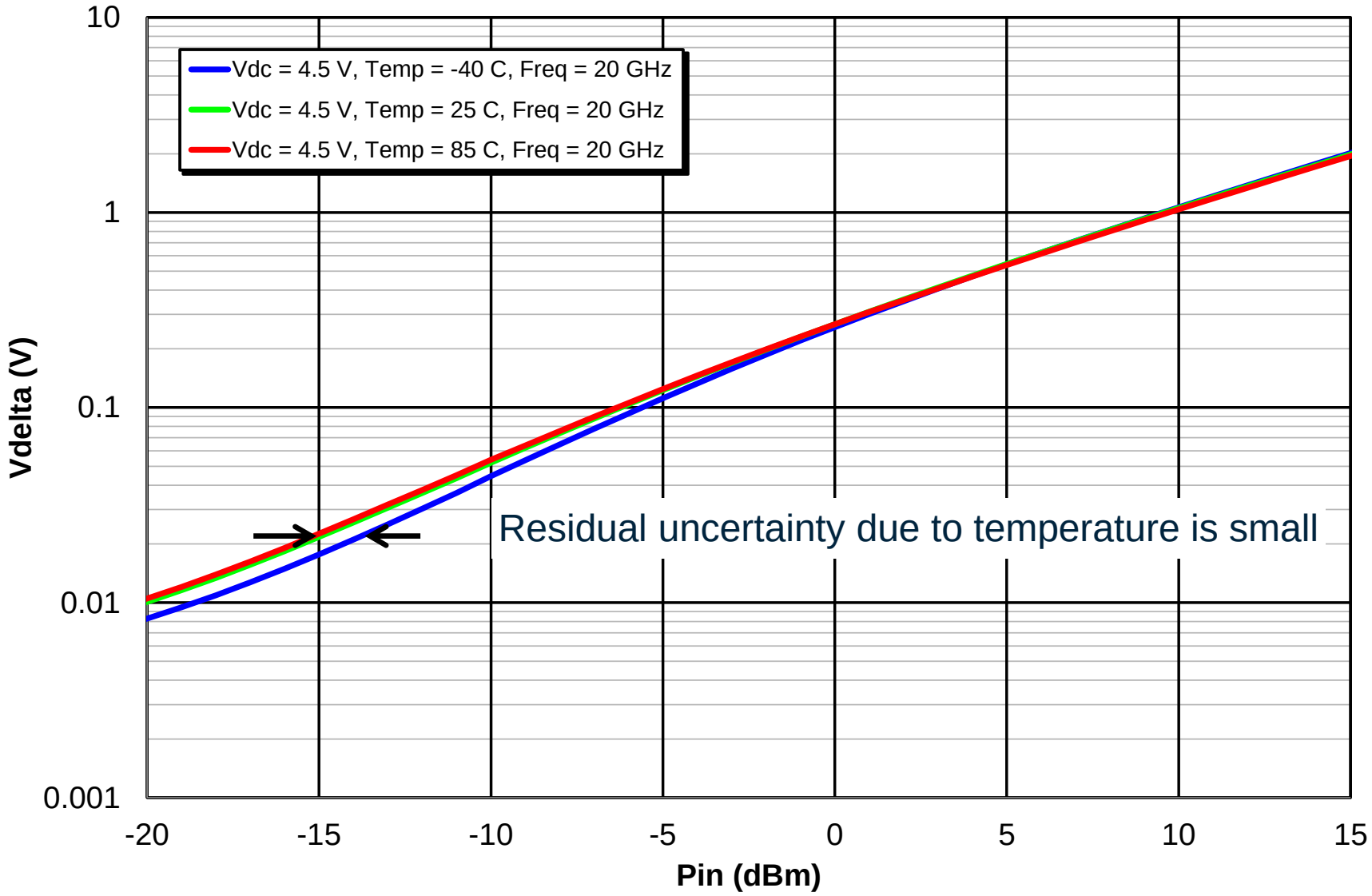
Vdet and Vref vs. Input Power

-40, +25 & +85 °C shown



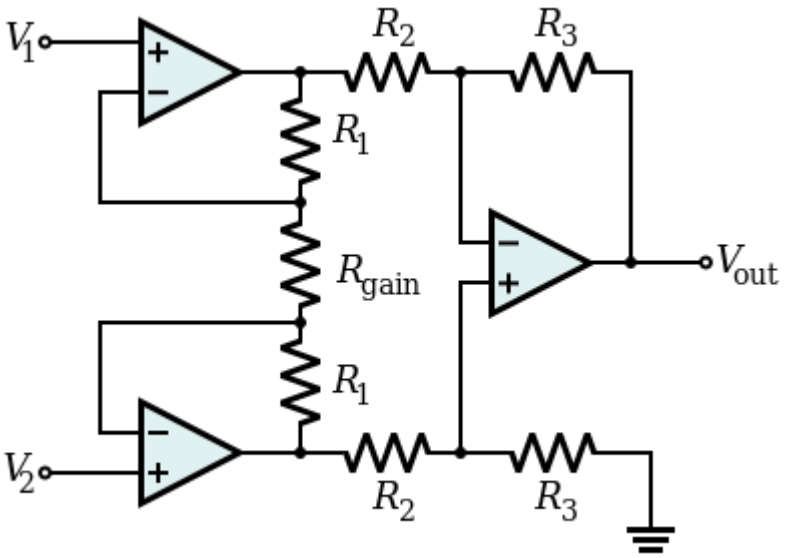
Vdelta vs. Input Power

-40, +25 & +85 °C shown



Application circuit

- It is recommended to use a high input impedance differencing circuit, such as an instrumentation amplifier, to generate Vdelta.



- Alternatively, Vdet and Vref can be directly applied to the differential inputs of an ADC, or to two separate ADCs with the subtraction implemented digitally.