

GeTe thermal characterization with 3-omega and Raman thermometry methods

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Radiofrequency commutators (RF-Switches) are key components of front-end modules. This statement is reinforced with the introduction of 5G that implies selective propagation over a growing number of communications norms. Thus, switches of various power and extended frequency ranges are needed. Recently, Phase-Change Material technologies are emerging as a potential solution [1-3]. These switches leverage the high electrical conductivity contrast (10^6) between the amorphous and crystalline phases of a chalcogenide material such as GeTe. Their performance could increase the metric $fc=1/(2\pi R_{ON}C_{OFF})$ by a factor 5 with respect to RF-SOI technologies. In order to have more accurate thermal phase transitions representations for the modeling of those devices, it is important to measure the thermal properties of the materials used. In this work, we present the 3-omega electrothermal and Raman thermometry measurement results, both allowing the extraction of the thermal conductivities of phase-change materials such as GeTe or GeSbTe.

References

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