1. Record Nr. UNINA9910337622003321

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Titolo	Piezoelectric Sensors and Actuators : Fundamentals and Applications / / by Stefan Johann Rupitsch
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2019
ISBN	3-662-57534-5
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (XIV, 559 p. 302 illus., 139 illus. in color.)
Collana	Topics in Mining, Metallurgy and Materials Engineering, , 2364-3293
Disciplina	620.11295 620.11297
Soggetti	Optical materials Electronics - Materials Nanotechnology Automatic control Optical and Electronic Materials Nanotechnology and Microengineering Control and Systems Theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Part I Fundamentals -- Physics -- Materials Showing Piezoelectricity -- Modeling of Piezoelectric Materials -- Numerical Simulation of Piezoelectric Sensors and Actuators -- Phenomenological Modeling Approaches for the Large-Signal Behavior of Piezoceramics -- Simulation-based Characterization of Materials -- Part II Applications -- Piezoelectric Transducers -- Process Measurement Technology -- Nondestructive Material Testing -- Medicine -- Smart Structures -- Piezoelectric Positioning Elements and Transformers -- Energy Harvesting.
Sommario/riassunto	This book introduces physical effects and fundamentals of piezoelectric sensors and actuators. It gives a comprehensive overview of piezoelectric materials such as quartz crystals and polycrystalline ceramic materials. Different modeling approaches and methods to precisely predict the behavior of piezoelectric devices are described. Furthermore, a simulation-based approach is detailed which enables

the reliable characterization of sensor and actuator materials. One focus of the book lies on piezoelectric ultrasonic transducers. An optical approach is presented that allows the quantitative determination of the resulting sound fields. The book also deals with various applications of piezoelectric sensors and actuators. In particular, the studied application areas are · process measurement technology, · ultrasonic imaging, · piezoelectric positioning systems and · piezoelectric motors. The book addresses students, academic as well as industrial reseachers and development engineers who are concerned with piezoelectric sensors and actuators.