

1. Record Nr.	UNINA9910134876003321
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Titolo	Thermoelectrics : design and materials / / HoSung Lee
Pubbl/distr/stampa	Chichester, UK ; ; Hoboken, NJ : , : John Wiley & Sons, , 2017
ISBN	1-118-84893-4 1-118-84892-6 1-118-84894-2
Descrizione fisica	1 online resource (437 p.)
Disciplina	621.31/243
Soggetti	Thermoelectric apparatus and appliances - Design and construction Thermoelectric materials Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Thermoelectrics: Design and Materials; Contents; Preface; 1: Introduction; 1.1 Introduction; 1.2 Thermoelectric Effect; 1.2.1 Seebeck Effect; 1.2.2 Peltier Effect; 1.2.3 Thomson Effect; 1.2.4 Thomson (or Kelvin) Relationships; 1.3 The Figure of Merit; 1.3.1 New-Generation Thermoelectrics; Problems; References; 2: Thermoelectric Generators; 2.1 Ideal Equations; 2.2 Performance Parameters of a Thermoelectric Module; 2.3 Maximum Parameters for a Thermoelectric Module; 2.4 Normalized Parameters; Example 2.1 Exhaust Waste Heat Recovery; 2.5 Effective Material Properties 2.6 Comparison of Calculations with a Commercial ProductProblems; Computer Assignment; References; 3: Thermoelectric Coolers; 3.1 Ideal Equations; 3.2 Maximum Parameters; 3.3 Normalized Parameters; Example 3.1 Thermoelectric Air Conditioner; 3.4 Effective Material Properties; 3.4.1 Comparison of Calculations with a Commercial Product; Problems; Reference; 4: Optimal Design; 4.1 Introduction; 4.2 Optimal Design for Thermoelectric Generators; Example 4.1 Exhaust Thermoelectric Generators; 4.3 Optimal Design of Thermoelectric Coolers; Example 4.2 Automotive Thermoelectric Air Conditioner ProblemsReferences; 5: Thomson Effect, Exact Solution, and Compatibility Factor; 5.1 Thermodynamics of Thomson Effect; 5.2 Exact

Solutions; 5.2.1 Equations for the Exact Solutions and the Ideal Equation; 5.2.2 Thermoelectric Generator; 5.2.3 Thermoelectric Coolers; 5.3 Compatibility Factor; 5.4 Thomson Effects; 5.4.1 Formulation of Basic Equations; 5.4.2 Numeric Solutions of Thomson Effect; 5.4.3 Comparison between Thomson Effect and Ideal Equation; Problems; Projects; References; 6: Thermal and Electrical Contact Resistances for Micro and Macro Devices; 6.1 Modeling and Validation 6.2 Micro and Macro Thermoelectric Coolers 6.3 Micro and Macro Thermoelectric Generators; Problems; Computer Assignment; References; 7: Modeling of Thermoelectric Generators and Coolers With Heat Sinks; 7.1 Modeling of Thermoelectric Generators With Heat Sinks; 7.2 Plate Fin Heat Sinks; 7.3 Modeling of Thermoelectric Coolers With Heat Sinks; Problems; References; 8: Applications; 8.1 Exhaust Waste Heat Recovery; 8.1.1 Recent Studies; 8.1.2 Modeling of Module Tests; 8.1.3 Modeling of a TEG; 8.1.4 New Design of a TEG; 8.2 Solar Thermoelectric Generators; 8.2.1 Recent Studies 8.2.2 Modeling of a STEG 8.2.3 Optimal Design of a STEG (Dimensional Analysis); 8.2.4 New Design of a STEG; 8.3 Automotive Thermoelectric Air Conditioner; 8.3.1 Recent Studies; 8.3.2 Modeling of an Air-to-Air TEAC; 8.3.3 Optimal Design of a TEAC; 8.3.4 New Design of a TEAC; Problems; References; 9: Crystal Structure; 9.1 Atomic Mass; 9.1.1 Avogadro's Number; Example 9.1 Mass of One Atom; 9.2 Unit Cells of a Crystal; 9.2.1 Bravais Lattices; Example 9.2 Lattice Constant of Gold; 9.3 Crystal Planes; Example 9.3 Indices of a Plane; Problems; 10: Physics of Electrons; 10.1 Quantum Mechanics 10.1.1 Electromagnetic Wave

2. Record Nr.	UNINA9910522971903321
Autore	Tong Xingcun Colin
Titolo	Advanced materials for printed flexible electronics / / Colin Tong
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-79804-6
Descrizione fisica	1 online resource (641 pages)
Collana	Springer Series in Materials Science ; ; v.317
Classificazione	XZLUXA
Disciplina	621.381
Soggetti	Flexible electronics Printed electronics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.