1. Record Nr. UNINA9910132211803321

Autore	Lalanne Christian
Titolo	Mechanical shock / / Christian Lalanne
Pubbl/distr/stampa	London, England ; ; Hoboken, New Jersey : , : ISTE Ltd : , : John Wiley & Sons, , 2014 ©2014
ISBN	1-5231-1092-9 1-118-93114-9 1-118-93112-2 1-118-93113-0
Edizione	[Third edition.]
Descrizione fisica	1 online resource (466 p.)
Collana	Mechanical Vibrations and Shock Analysis ; ; Volume 2
Disciplina	620.1125
Soggetti	Mechanical engineering Condensed matter - Computer simulation
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	Cover; Title Page; Contents; Foreword to Series; Introduction; List of Symbols; Chapter 1. Shock Analysis; 1.1. Definitions; 1.1.1. Shock; 1.1.2. Transient signal; 1.1.3. Jerk; 1.1.4. Simple (or perfect) shock; 1.1.5. Half-sine shock; 1.1.6. Versed sine (or haversine) shock; 1.1.7. Terminal peak sawtooth (TPS) shock (or final peak sawtooth (FPS)); 1.1.8. Initial peak sawtooth (IPS) shock; 1.1.9. Square shock; 1.1.10. Trapezoidal shock; 1.1.11. Decaying sinusoidal pulse; 1.1.12. Bump test; 1.1.13. Pyroshock; 1.2. Analysis in the time domain; 1.3. Temporal moments; 1.4. Fourier transform 1.4.1. Definition1.4.2. Reduced Fourier transform; 1.4.3. Fourier transforms of simple shocks; 1.4.4. What represents the Fourier transform of a shock?; 1.4.5. Importance of the Fourier transform; 1.5. Energy spectrum; 1.5.1. Energy according to frequency; 1.5.2. Average energy spectrum; 1.6. Practical calculations of the Fourier transform; 1.6.1. General; 1.6.2. Case: signal not yet digitized; 1.6.3. Case: signal already digitized; 1.6.4. Adding zeros to the shock signal before the calculation of its Fourier transform; 1.6.5. Windowing; 1.7. The interest of time-frequency analysis

1.7.1. Limit of the Fourier transform1.7.2. Short term Fourier transform (STFT); 1.7.3. Wavelet transform; Chapter 2. Shock Response Spectrum; 2.1. Main principles; 2.2. Response of a linear one-degree-of-freedom system; 2.2.1. Shock defined by a force; 2.2.2. Shock defined by an acceleration; 2.2.3. Generalization; 2.2.4. Response of a one-degree-of-freedom system to simple shocks; 2.3. Definitions; 2.3.1. Response spectrum; 2.3.2. Absolute acceleration SRS; 2.3.3. Relative displacement shock spectrum; 2.3.4. Primary (or initial) positive SRS; 2.3.5. Primary (or initial) negative SRS
2.3.6. Secondary (or residual) SRS2.3.7. Positive (or maximum positive) SRS; 2.3.8. Negative (or maximum negative) SRS; 2.3.9. Maximax SRS; 2.4. Standardized response spectra; 2.4.1. Definition; 2.4.2. Half-sine pulse; 2.4.3. Versed sine pulse; 2.4.4. Terminal peak sawtooth pulse; 2.4.5. Initial peak sawtooth pulse; 2.4.6. Square pulse; 2.4.7. Trapezoidal pulse; 2.5. Choice of the type of SRS; 2.6. Comparison of the SRS of the usual simple shapes; 2.7. SRS of a shock defined by an absolute displacement of the support; 2.8. Influence of the amplitude and the duration of the shock on its SRS
2.9. Difference between SRS and extreme response spectrum (ERS)2.10. Algorithms for calculation of the SRS; 2.11. Subroutine for the calculation of the SRS; 2.12. Choice of the sampling frequency of the signal; 2.13. Example of use of the SRS; 2.14. Use of SRS for the study of systems with several degrees of freedom; 2.15. Damage boundary curve; Chapter 3. Properties of Shock Response Spectra; 3.1. Shock response spectra domains; 3.2. Properties of SRS at low frequencies; 3.2.1. General properties; 3.2.2. Shocks with zero velocity change

Sommario/riassunto

This volume considers the shock response spectrum, its various definitions, properties and the assumptions involved in its calculation. In developing the practical application of these concepts, the forms of shock most often used with test facilities are presented together with their characteristics and indications of how to establish test configurations comparable with those in the real, measured environment. This is followed by a demonstration of how to meet these specifications using standard laboratory equipment - shock machines, electrodynamic exciters driven by a time signal or a respons