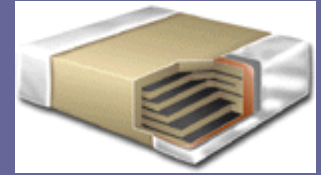




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Safety Certified Ceramic Capacitors SCC Series

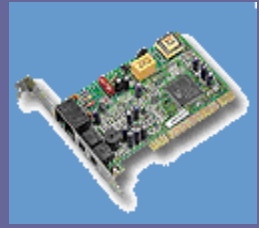


- Overview
- Safety Capacitor Definitions
- Product Characteristics and Features
- Applications
- How to Order
- Commonly used Terms and Definitions
- Other Definitions
- What is it required for Isolation



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Overview



- Safety Certified Capacitors are widely used in set top boxes, telecom and networking, data transmission (such as modems), analog modems, industrial controls, PC's, power adapters, etc...
- Certified to and meeting the requirements of UL 60950, IEC 60384-14, EN 132400 and EN 60950.



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Safety Capacitor Definitions

- X capacitors are suitable for applications where the failure of capacitor would not cause or lead to electrical shock.
- Y capacitors are suitable for applications where the failure of capacitor could cause or lead electrical shock.





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Product Characteristics and Features

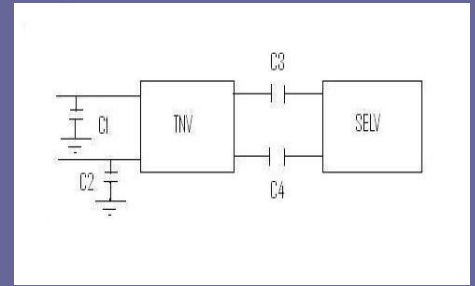


- Capacitance range: 2 pF to .056 μ F
- Rated voltage: 250 VAC and 305VAC (2220 X7R only)
- DWV : 1500 VAC, 2250 VDC
- Impulse capability:
 - X1: 4 KV (1.2/50 u-sec and 10/700 u-sec)
 - X2: 2.5 KV (1.2/50 u-sec and 10/700 u-sec)
 - Y2: 5 KV (1.2/50 u-sec and 10/700 u-sec)
- Available sizes: 1808, 1812, 2208, 2211, 2220, 2825
- Available materials: NPO and X7R
- Available with Superterm and proprietary Coating:
 - Superterm Polymer Termination for reduction of Mechanical crack risk
 - Proprietary Coating for Surface arc over prevention.
- Fully ROHS compliant and Pb Free.
- Available in Automotive Grade Certifications
 - AEC-Q200
 - TS16949



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Applications



- SCC series capacitors are mainly used for EMI suppression, surge protection, or isolation.
- Line to Ground (Y) or Line to Line (X) Lightning protection
- Isolation between TNV (Telecommunication Network Voltage) and SELV (Safety Extra Low Voltage) in modems



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How to Order

SCC	1808	X	102	K	302	T	S	A
Safety Certified Capacitor	EIA Size	Dielectrics	Capacitance	Tolerance	Voltage	Packaging	Special Requirement	Special Requirement
SCC	1808 1812 2208 2211 2220 2825	N: NPO X: X7R	1 st two digits are significant. 3 rd digit denotes number of zeros. R= Decimal 5R0: 5.0 pF 100: 10 pF 330: 33 pF 471: 470 pF 102: 1000 pF	J: ± 5% K: ±10% M: ±20%	202: X2 252: X2 (305VAC) 502: X1/Y2 602: X1/Y2 (2208, 2211, 2220 NPO)	T: Tape & Reel B: Bulk	Blank: Standard S: Arc prevention coating X: Super Term (flexible termination) Z: Arc coating and Superterm	Blank: Standard A: TS16949 Q: AEC-Q200



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Commonly used terms and Definitions

- What is SELV?
 - Safety Extra Low Voltage. It is a non-**hazardous** circuit and is defined as a secondary circuit which is designed and protected that under normal and single fault conditions, its voltage does not exceed a **safe value**.
- What is a **Hazardous** voltage level?
 - The hazardous voltage is defined as exceeding 42 V peak or 60 V DC.
- What is a **safe Value**?
 - Under normal condition, the safe voltage level is less than 42 V peak or 60 V DC. In the case of single fault condition, the safe voltage level is less than 71 V peak or 120 V DC for shorter than 0.2 S.



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Commonly used terms and Definitions

- What are the Telecom circuitry classification?
 - SELV: Safety Extra Low Voltage. Do not present a safety hazard. (30 VAC, 60 VDC). Typical applications are V.11, V.28, RS-530, 10 Base T, Unbalanced E1, E2, Analog Voice E&M, etc...
 - TNV-1: Telecom networks whose normal operating voltage is within the SELV limits. Over voltages from Telecom networks are possible. Typical applications are xDSL (Without feeding voltage), Balance E1, T1, etc...
 - TNV-2: Telecom networks whose normal operating voltage exceeds the SELV limit (Up to 120 VDC or telephone ringing voltage). There is no potential of over voltage from telecom networks. Can not be connected directly to external telephone or data lines. Typical applications are FXS (Foreign Exchange Subscriber), etc...
 - TNV-3: Telecom network whose normal operating voltage exceeds the SELV limit. There is a potential of over voltage from telecom network. Typical applications are FXO (Foreign Exchange Office), xDSL(With feeding voltage), ISDN



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Other Definitions

- What is the basis for this classification?
 - Telecom circuitry can sit between either safe voltages or hazardous levels, depending on the type of functions provided, such as ADSL, digital link, etc...
- Why is insulation necessary?
 - The product safety requires protection of the operator against electrical shocks. Every product, typically requires two layers of electrical insulation to the circuits or parts that are accessible by the operator.



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Other Definitions

- What are the grades or types of insulation?
 - Operational Insulation: The insulation needed for the proper operation of the product.
 - Basic Insulation: Network Isolation for Premise Equipment.
 - Supplementary Insulation: An additional insulation which needs to be provided in case of basic insulation's breakdown.
 - Double Insulation: Basic + Supplementary
 - Reinforced Insulation: Single layer of insulation which provide the same level of protection against electrical shock as Double insulation.



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What is it required for Isolation?

Type or grade of insulation	Typical Application	DWV and Insulation requirement	Creepage/Clearance requirement
<i>TNV1 to SELV isolation</i>	<i>Low voltage Telecomm (ISDN, HDSL, etc...)</i>	<i>1000-1500 VAC</i>	<i>NA</i>
<i>TNV3 to TNV2</i>	<i>Central office</i>	<i>1000-1500 VAC</i>	<i>NA</i>
<i>BASIC</i>	<i>Isolation for premise equipment</i>	<i>1500 VAC</i>	<i>1.6 mm</i>
<i>SUPPLEMENTARY</i>	<i>Isolation for premise equipment (N Europe)</i>	<i>1500 VAC</i>	<i>2.5 mm</i>
<i>BASIC + Ground</i>	<i>Power distribution Mains Isolation (power port)</i>	<i>1000 or 1500 VAC</i>	<i>2.5 mm</i>
<i>DOUBLE</i>	<i>Power distribution Mains Isolation (power port)</i>	<i>2000 or 3000 VAC</i>	<i>1.5 or 2.5 mm</i>
<i>REINFORCED</i>	<i>Power distribution Mains Isolation (power port)</i>	<i>2000 or 3000 VAC</i>	<i>3.2 or 5.0 mm</i>



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IEC 384-14 Requirement

- There are a variety of qualification tests for approval to IEC 384-14, such as: Damp heat, Resistance to Soldering heat, etc... However the most important one is the Endurance test which includes Impulse and subsequent special life test requirement:

