

# What is a programmable capacitor

Are there digitally programmable capacitance standards?

Abstract: NIST has produced several digitally programmable capacitance standards based on a modification of a fixed commercial fused-silica capacitance standard.

How many programmable capacitance values are there?

There are 32 programmable capacitance values ranging from 6.4pF to 13.3pF in 0.22pF increments (Table 1). The quartz dielectric capacitance is highly stable and exhibits a very low volt-age coefficient. It has virtually no dielectric absorption and has a very low temperature drift coefficient ( $<33\text{ppm}/\text{C}$ ).

What is the quality factor of a trimmable capacitor?

Since the capacitors have the multiplexer series resistance associated with them, the quality factor of the trimmable capacitors is not high. For example, a 10pF capacitor only has a theoretical Q of about 10 at 315MHz with 5 series resistance.

What is a capacitive sensor?

A capacitive sensor is usually made of two capacitors. One capacitor (CM) changes with the sensed function, such as pressure, acceleration, or humidity. The second capacitor (CR) is used as a reference capacitance that does not vary with the sensed function.

What is a ncd2100 digital programmable capacitor?

IXYS Integrated Circuits NCD2100 Digital Programmable Capacitors feature an EEPROM-based, digitally programmable variable capacitor that provides capacitive offset trimming for capacitance-sensitive circuits.

What is a second capacitor?

The second capacitor (CR) is used as a reference capacitance that does not vary with the sensed function. In most applications, it is needed to detect the difference between these capacitance values. Due to manufacturing tolerances, there are normally offsets between CM and CR, which can easily be nulled out by the FLECAP as shown in Figure 4.

Qorvo offers a family of programmable capacitor arrays used in a variety of RF applications including tunable filters, matching networks, phase shifters and frequency sources. Products come in either a single tunable cap or a multiple tunable cap configuration in ...

Capacitances are measured using small AC signals or changed using larger pulses. Electrically variable or programmable capacitors based on the unique properties of thin perovskite films are undergoing development. These ...

The MAX1474 is a fine-line (geometry) electronically trimmable capacitor (FLECAP) programmable through

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capacitor in 3 sets (C1-1, C1-2 and C1-3) of unit capacitors ( $C_u$ ) as long as C2 is also set to be equal to  $C_u$ . By default  $C1-1 = 12C_u$  and  $C1-2 = 4C_u$  define the sampling capacitor, so  $(C1/C2) = 16$ . By adding  $C1-3 = 4C_u$  to the sampling capacitor, the amplifier gain becomes 20 whereas taking off C1-2 from the default value, the gain is set to 12.

Digitally programmable capacitors allow users to customize the release of stored charges to meet specific requirements for given electrical processes. For example, OCXO oscillators and ...

This paper describes a programmable capacitor intended for use as the reference impedance in an inductance measurement system. The capacitor is programmable from 1 pF to 39 uF with a resolution of 1 pF and consists of a parallel combination of commercially available capacitors with values that follow the Fibonacci series progression. This paper ...

programmable capacitor arrays (PCAs), which are essential components in various FPAs and programmable filters. The previous studies in [10, 40] discuss techniques to measure capacitor ratios for detecting parametric faults in switched-capacitor (SC) circuits. The method proposed in [10] converts capacitor ratios into voltage outputs. In order to have accurate capacitor ratio ...

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We describe a programmable capacitor technology under development at NCSU and its potential application in building programmable interconnect devices useful for system level connectivity functions, phased array beam steering, and RF switching. Crossbars are made from arrays of electrostatically controlled bistable MEMS-based capacitors. These new devices ...

cross capacitor with a precise value. This article reports a method to construct a digitally programmable capacitance standard by modifying a commercial fused-silica capacitor which consists of 23 approximately binary-weighted capacitors on a single fused-silica disk. The resultant variable capacitor can be programmed through a

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Been playing on and off (mostly off) with the AS3935 lightning detector that includes programmable (SPI) capacitors for antenna tuning. The available choices for ...

The block has a programmable capacitor in parallel with the feedback resistor,  $R_b$ . The value of the capacitor is configured for each gain selection to achieve guaranteed stability. Reassigning  $R_b$  values without also selecting the appropriate feedback capacitor value may result in PGA instability. The user is strongly advised to use the provided ...

Capacitances are measured using small AC signals or changed using larger pulses. Electrically variable or programmable capacitors based on the unique properties of thin perovskite films are undergoing development. These capacitors show promise of overcoming two important deficiencies of prior electrically programmable capacitors:

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