Crystal Table Capacitor

How many PF should a capacitor be in a crystal?

A commonly tossed around rule of thumb is to start with a pair of capacitors two times the CL of the crystal,which will get you to CL. In this case,that would be 2*8 pF = 16pFfor the capacitors. Unfortunately,this ignores the stray capacitance (Cstray),and won't give you the best results.

What is the optimum load capacitance for a crystal?

The optimum load capacitance for the crystal,CL,is given in the crystal datasheet and C1 and C2 should be matched to this value according to Where,Cx is the sum of the capacitance in Cx,the parasitic capacitance in the PCB trace and the capacitance in the terminal of the crystal. The sum of the two latter parts will typically be in the range of

What is a good capacitance for a crystal?

For example, an application could use near minimum on-chip capacitance of approximately 2 pF and an off chip capacitance of 7 pF to provide CL=9pF to the crystal. Table 3-1 shows using external caps this way gives slightly worse frequency stability with temperature than using internal capacitors.

What happens if a crystal has a higher load capacitance?

A higher-load capacitance decreases the negative resistance of the oscillator and increases the start-up time. The maximum drive level of a crystal is often specified in the data sheet of the crystal in uW. Exceeding this value can damage or reduce the lifetime the crystal.

How does a crystal oscillator work?

Correct operation of the crystal oscillator is dependent on the values of the two external capacitors,C1 and C2 in Figure 1. These capacitors together with any parasitic capacitance in the PCB and the crystal terminals compose the total load capacitance seen by the crystal.

Which crystal oscillator is used for a CC device?

For this low-frequency oscillator,typically a 32-kHz crystal oscillator (XOSC-LF) is used. The scope of this application report is to discuss the requirements and trade-offs of the crystal oscillators for this CC devices and provide information on how to select an appropriate crystal.

Table 2 · specifies how to choose R2 for a given crystal. The lowest valid R2 resistance in Table 2 · should be chosen to achieve the best output clock jitter performance. The value of capacitors ...

I''m trying to understand why the Duemilanove reference design uses 22pf capacitors for the crystal oscillator circuit. As far as I know, the crystal is designed for a 20pf load capacitance. The equation for this is: Cl = ((C1 * C2) / (C1 + C2)) + Cs Where Cl is load capacitance, C1 and C2 are the capacitor values, and Cs is the stray capacitance of the ...

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Table 2 · specifies how to choose R2 for a given crystal. The lowest valid R2 resistance in Table 2 · should be chosen to achieve the best output clock jitter performance. The value of capacitors C1 and C2 are chosen to achieve a crystal load capacitance (CL) of 10pF. C1 is chosen such that the total capacitance on pin XA/XIN is 20pF.

Crystals used for PIC oscillators operate in the parallel-resonant mode and the PIC and associated wiring will introduce some capacitance. If the frequency of operation is critical (which is usually not the case for a microcontroller clock) then choice of a crystal with compatible capacitances which can be applied to the PIC oscillator is ...

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These capacitors together with any parasitic capacitance in the PCB and the crystal terminals compose the total load capacitance seen by the crystal. The optimum load capacitance for the ...

Cp is the input capacitance plus stray capacitance. You can use a few pF (3-5pF) for the value unless something is really strange. So, for a crystal rated with a 10pF load, Cl = (10pF-Cp) ? ? 2, so if we use 4pF for Cp, we get 12pF for the load capacitors.

To do so a suitable crystal needs to be chosen in accordance with load capacitors. The crystal specification is usually given in the module''s ... The above table gives 4pF as input capacitance and we might want to guestimate 1-2pF as capacitance from the signal traces (this depends on the particular layout...). A commonly stated rule of thumb is to start with two capacitors of twice ...

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