

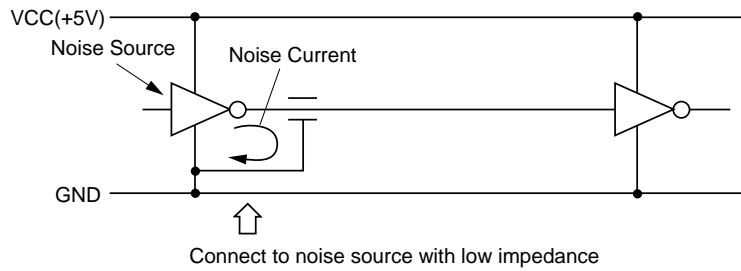
2 Suppressing EMI Noise Emission

2.3 EMI Suppression Filters

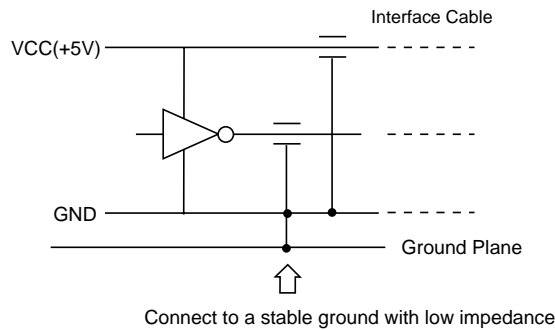
How to Use Capacitor Type EMI Suppression Filter (1)

Capacitor Type EMI Suppression Filter: EMI suppression filter that has capacitor built-in (Examples: Three-terminal capacitors, EMI suppression filters for signal lines)

(a) Application at Noise Source



(b) Application on Noise Transfer Route



Capacitor type EMI suppression filter is inserted between the line through which noise is transferring and the ground. The filter's ground terminal is attached as follows:

(a) When used at noise source

On a line through which harmonic wave, (i.e., the normal mode noise) is flowing, capacitor type EMI suppression filter's ground terminal is connected to the noise source side's ground. This enables bypassing of normal mode noise to the ground, thereby returning it to the noise source and eliminating it.

(b) When used on conductive noise path

In the case of conductive noise path where common mode noise is the problem, capacitor type EMI sup-

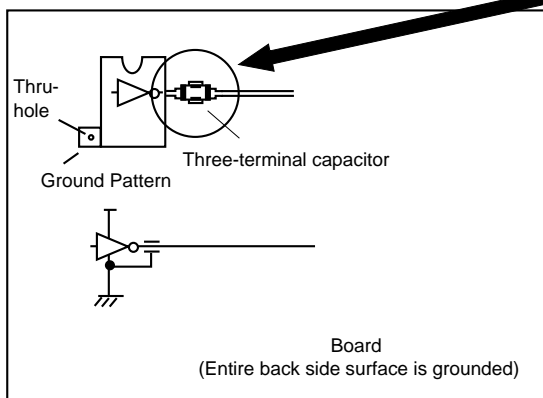
pression filter's ground terminal is connected to a ground that is very stable. This couples the line with high noise level to a ground that is stable against high-frequency, thereby bypassing the noise to ground.

2 Suppressing EMI Noise Emission

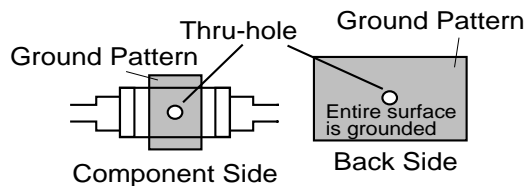
2.3 EMI Suppression Filters

How to Use Capacitor Type EMI Suppression Filter (2)

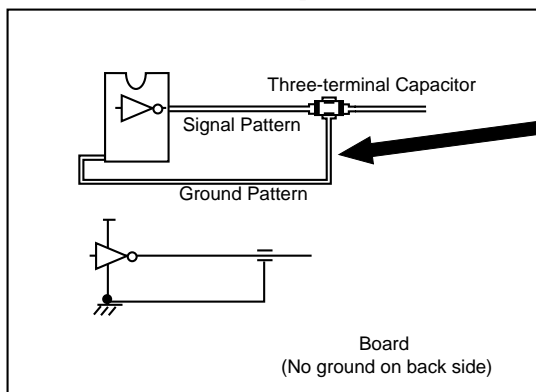
[Good]



Filter's ground terminal is connected via a thru-hole to the back side whose entire surface is grounded.
 • Ground's high-frequency impedance is small
 • The signal pattern-to-ground pattern loop is small



[Poor]



Poor: Impedance between filter's ground and IC's ground terminal is large.
 (Little noise current is returned to the ground.)
 Poor: The signal pattern-to-ground pattern loop is large.
 (Noise may be radiated from this loop.)

Examples of ground patterns for the three terminal capacitor type EMI suppression filter used at the noise source are illustrated above.

[Memo]

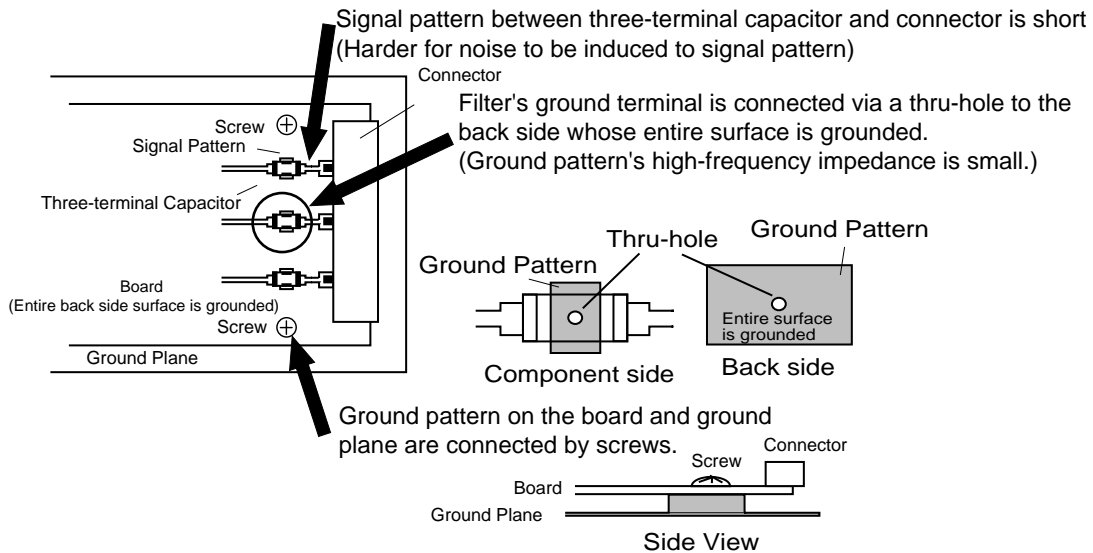
2 Suppressing EMI Noise Emission

2.3 EMI Suppression Filters

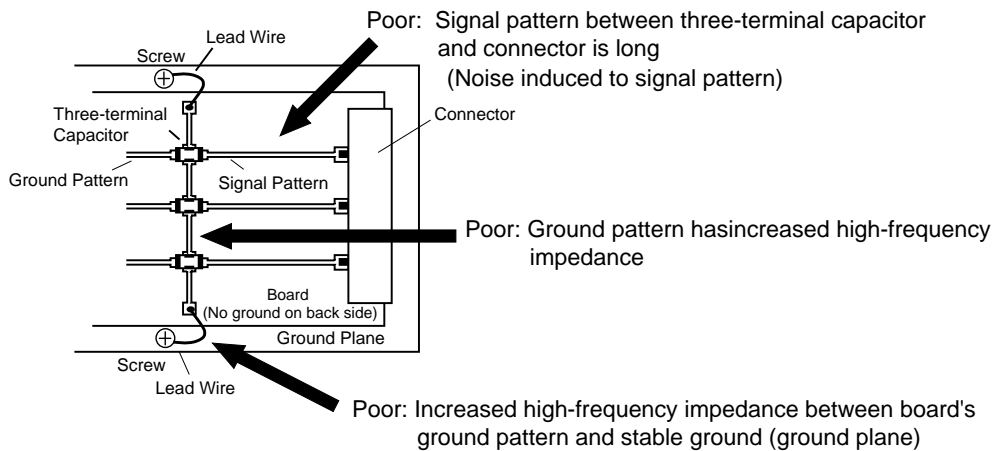
How to Use Capacitor Type EMI Suppression Filter (3)

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[Good]



[Poor]



Examples of ground patterns for capacitor type EMI suppression filters used on conductive noise path are illustrated above.

[Memo]