知识点Z3.11

单位脉冲序列

主要内容：

1.单位脉冲序列的定义和运算

2.单位脉冲序列的性质

基本要求：

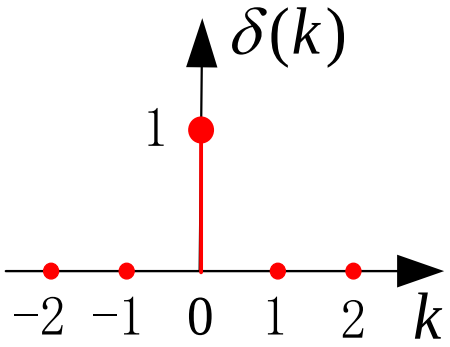
1. 掌握单位脉冲序列的定义和运算规则

2. 掌握单位脉冲序列的取样性质

Z3.11 单位脉冲序列

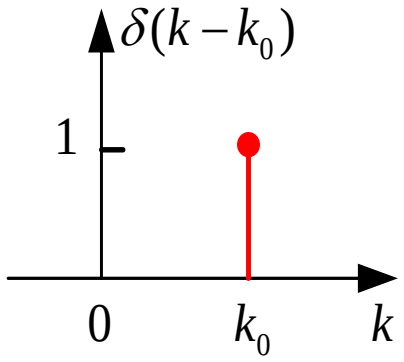
1.单位脉冲序列（单位样值序列/单位取样序列）

$$\delta(k)=\begin{cases}1 & k=0\\ 0 & k\neq 0\end{cases}$$



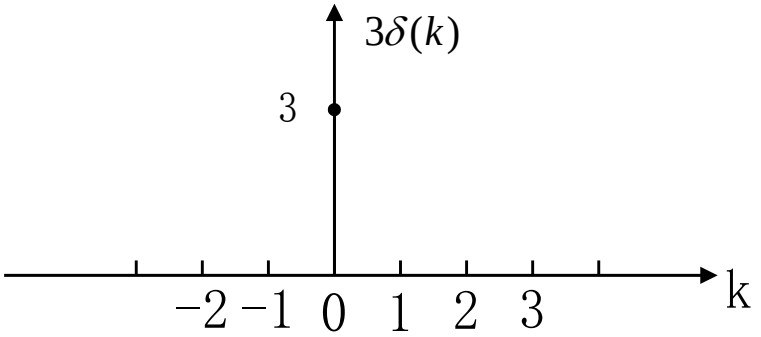
位移单位脉冲序列：

$$\delta(k-k_0)=\begin{cases}1 & k=k_0\\ 0 & k\neq k_0\end{cases}$$



2.运算

加：$\delta(k)+2\delta(k)=3\delta(k)$

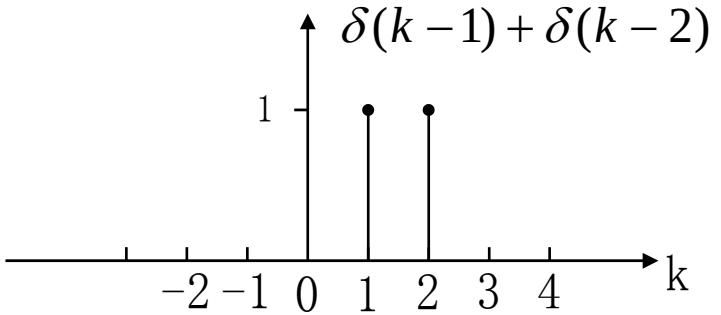


乘：$\delta(k)\cdot\delta(k)=\delta(k)$

延时：

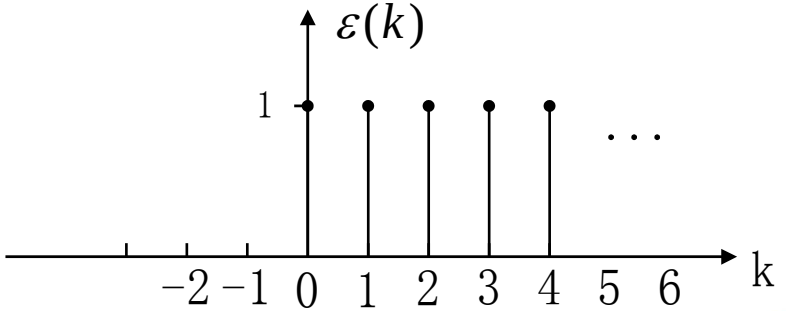
$$\delta(k-1)+\delta(k-2)$$

$$\delta(k-1)\cdot\delta(k-2)=0$$



迭分：$\sum_{i=-\infty}^{k}\delta(i)=\begin{cases}0, & k<0\\ 1, & k\geq 0\end{cases}$

$$=\varepsilon(k)$$



3.取样性质

$$f(k)\delta(k) = f(0)\delta(k)$$

$$f(k)\delta(k-k_0) = f(k_0)\delta(k-k_0)$$

$$\sum_{k=-\infty}^{\infty}\delta(k)=1$$

$$\sum_{k=-\infty}^{\infty}f(k)\delta(k) = f(0)$$

$$\sum_{k=-\infty}^{\infty}f(k)\delta(k-k_0) = f(k_0)$$

4.偶函数 $\delta(k)=\delta(-k)$