

无铅材料

Lead-free materials

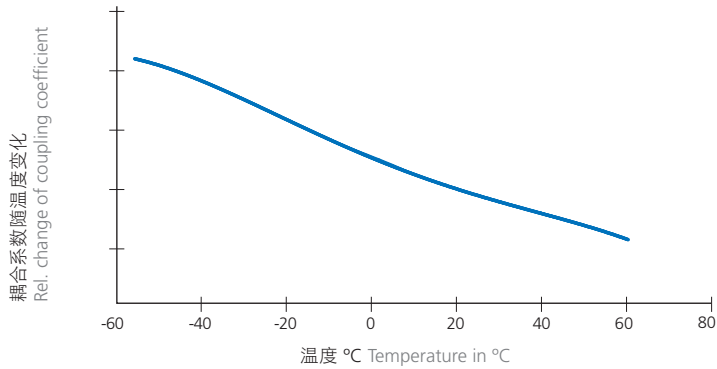
材料 Material		Sonox® P1 LF
介电性能 Dielectric properties		
相对介电常数 ϵ_r Relative permittivity ϵ_r	$\epsilon_{33}^T/\epsilon_0$ $\epsilon_{33}^S/\epsilon_0$ $\epsilon_{11}^T/\epsilon_0$ $\epsilon_{11}^S/\epsilon_0$	1150 830 1330 1140
介质损耗因素 $\tan \delta$ Dielectric dissip. factor $\tan \delta$	10^{-3}	8
居里温度 T_c Curie temperature T_c	°C	115
机电性能 Electromechanical properties		
频率常数 Frequency constant	N_p N_t N_1 N_3	KHz × mm 3180 2640 2300 2330
耦合系数 Coupling coefficient	k_p k_t k_{33} k_{15} k_{31}	0,31 0,45 0,43 0,38 0,18
充电常数 Charge constant	d_{33} d_{31} d_{15}	10^{-12} C/N 135 52 210
电压常数 g_{33} Voltage constant g_{33}	10^{-3} Vm/N	14
机械性能 Mechanical properties		
弹性柔量 Elastic compliance	S_{11}^E S_{33}^E	10^{-12} m ² /N 8,2 8,5
弹性刚度 Elastic stiffness	C_{33}^D C_{55}^D	10^{10} N/m ² 14,6 36,5
密度 ρ Density ρ	10^3 kg/m ³	5,7
机械品质因数 Q_m Mechan. quality factor Q_m		310
稳定性 Stability		
稳定系数 α_k (详细信息见下页) Temperature coefficient α_k (Details see overleaf)	$10^{-4}/K^{-1}$	
老化率* Aging rate*	C_ϵ C_f C_k	%/十倍时间 %/Decade -0,5 0,1

压电性能与温度的关系

Thermal dependency of piezo electric characteristics

耦合系数随温度变化趋势图

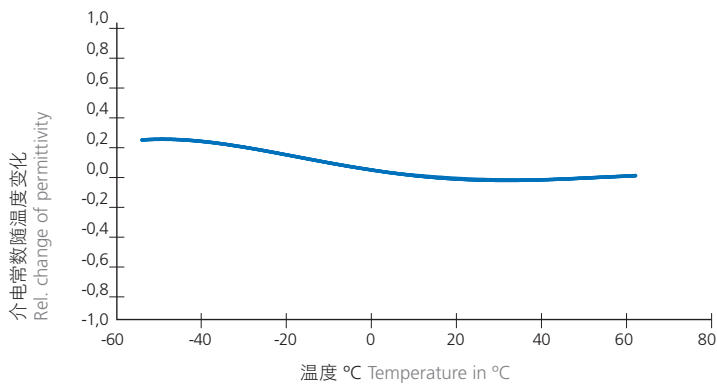
Relative temperature dependence of coupling coefficient



— SONOX® P1 LF

介电常数随温度变化趋势图

Relative temperature dependence of permittivity



串联谐振频率随温度变化趋势图

Relative temperature dependence of serial resonant frequency

