

# SYMBOLS AND GLOSSARY

SYMBOL	DEFINITION	UNITS
$\epsilon_{33}^T, \epsilon_{11}^T$	Free Relative Dielectric Constant	
$\epsilon_{33}^S, \epsilon_{11}^S$	Clamping Relative Dielectric Constant	
$\text{tg}\delta$	Dissipation Factor at Low Field	
$\rho$	Density	$\text{g/cm}^3$
$T_c$	Curie Point	$^{\circ}\text{C}$
$V$	Velocity	$\text{m/s}$
$Z_a$	Acoustic Impedance	$\text{Mrayl}$
$K_p, K_{33}, K_t, K_{31}, K_{15}$	Electromechanical Coupling Factors	
$N_p, N_{33}, N_{31}, N_{15}, N_t, N_c$	Frequency Constants	$\text{Hz}\cdot\text{m}$
$d_{33}, d_{31}, d_{15}$	Piezoelectric Strain Constants	$10^{-12} \text{ C/N}$
$d_h$	Hydrostatic Piezoelectric Strain Constants	$10^{-12} \text{ C/N}$
$g_{33}, g_{31}, g_{15}$	Piezoelectric Voltage Constants	$10^{-3} \text{ Vm/N}$
$g_h$	Hydrostatic Piezoelectric Voltage Constants	$10^{-3} \text{ Vm/N}$
$e_{33}, e_{31}, e_{15}$	Piezoelectric Stress Constants	$\text{C/m}^2$
$h_{33}, h_{31}, h_{15}$	Piezoelectric Stiffness Constant	$10^8 \text{ V/m}$
$Q_{\text{pm}}$	Mechanical Quality Factor at Planar mode	
$Q_{\text{tm}}$	Mechanical Quality Factor at Thickness Mode	
$S_{11}^E, S_{12}^E, S_{13}^E, S_{33}^E, S_{55}^E, S_{66}^E$	Elastic Compliance Constant under Short Circuit	$10^{-12} \text{ m}^2/\text{N}$
$S_{11}^D, S_{12}^D, S_{13}^D, S_{33}^D, S_{55}^D, S_{66}^D$	Elastic Compliance Constant under Open Circuit	$10^{-12} \text{ m}^2/\text{N}$
$C_{11}^E, C_{12}^E, C_{13}^E, C_{33}^E, C_{55}^E, C_{66}^E$	Elastic Stiffness Constant under Short Circuit	$10^{10} \text{ N/m}^2$
$C_{11}^D, C_{12}^D, C_{13}^D, C_{33}^D, C_{55}^D, C_{66}^D$	Elastic Stiffness Constant under Open Circuit	$10^{10} \text{ N/m}^2$
$Y_{11}^E, Y_{33}^E$	Young's Modulus under Short Circuit	$10^{10} \text{ N/m}^2$
$Y_{11}^D, Y_{33}^D$	Young's Modulus under Open Circuit	$10^{10} \text{ N/m}^2$
$\sigma$	Poisson Ratio	
$\epsilon_{33}^T$ (% Per Decade)	Aging Rate of Free Relative Dielectric Constant	
$K_p$ (% Per Decade)	Aging Rate of Planar Electromechanical Coupling Factor	
$K_t$ (% Per Decade)	Aging Rate of Coupling Factor at Thickness mode	
$N_p$ (% Per Decade)	Aging Rate of Frequency Constant of Planar Mode	
$N_t$ (% Per Decade)	Aging Rate of Frequency Constant at Thickness Mode	
$\epsilon_{33}^T$ ( $^{\circ}\text{C}$ )	Thermal Stability of Free Relative Dielectric Constant	
<b>GLOSSARY</b>		
<b>BiT</b>	Bismuth Titanate Layer Structure Compound	
<b>PT</b>	Lead Titanate	
<b>BT</b>	Barium Titanate	
<b>Lead Metaniobate</b>	Lead Metaniobate Compound	
<b>Hard PZT</b>	Hard Lead Titanate Zirconate Compound	
<b>Soft PZT</b>	Soft Lead Titanate Zirconate Compound	