

Data Sheet

PZT800 Series

Material	Units	Primary Materials			Custom Materials
		PZT801	PZT802	PZT807	PZT806
Designation		Hard PZT	Hard PZT	Hard PZT	Hard PZT
Navy Type		III	III	III	III
EN 50324-1		100	100	100	100
Curie Temperature	T _c °C	350	300	300	300
Max. Operating Temperature	T _{max} °C	175	150	150	150
Mechanical Properties					
Density	ρ kg/m ³	7750	7500	7650	7600
Poisson's ratio	σ -	0.31			
Compliances	S ^E ₃₃ x 10 ⁻¹² m ² /N	12.50	13.50	15.65	14.70
	S ^E ₁₁ x 10 ⁻¹² m ² /N	11.50	11.50	10.90	11.70
	S ^D ₃₃ x 10 ⁻¹² m ² /N	7.38		8.20	7.40
	S ^D ₁₁ x 10 ⁻¹² m ² /N	10.30	10.10	9.90	10.80
	Y ^E ₃₃ x 10 ¹⁰ N/m ²	8.00	7.40	6.40	6.80
	Y ^E ₁₁ x 10 ¹⁰ N/m ²	8.70	8.70	9.20	8.50
	Y ^D ₃₃ x 10 ¹⁰ N/m ²	13.50		12.20	13.50
	Y ^D ₁₁ x 10 ¹⁰ N/m ²	9.70	9.90	10.10	9.30

Electrical Properties						
Dielectric Constant	K_{T33}	-	1110	1150	1105	1055
	K_{T11}	-	1142	1290	1190	
Dielectric Loss	$\tan\delta$	%	0.17	0.30	0.16	0.30
Coercive Field	E_c	kV/mm	1.6			
Piezoelectric Properties						
Coupling Factors	k_p	-	0.54	0.54	0.55	0.55
	k_{31}	-	0.32	0.30	0.29	0.31
	k_{33}	-	0.64	0.64	0.69	0.71
	k_t	-	0.42		0.47	0.45
	k_{15}	-	0.55	0.55		
Charge or Strain Constants	d_{33}	pC/N or pm/V	275	250	260	280
	d_{31}	pC/N or pm/V	107	97	93	104
	d_{15}	pC/N or pm/V	330	300	294	
Voltage or Stress Constants	g_{33}	$\times 10^{-3}$ V m/N	28.0	9.5	9.5	30.0
	g_{31}	$\times 10^{-3}$ V m/N	10.9	28.9	28.8	11.1
	g_{15}	$\times 10^{-3}$ V m/N	28.9	28.9	28.8	
Frequency Constants	N_p	Hz-m	2304	2285	2320	2155
	N_1	Hz-m	1700	1700		1660
	N_{3t}	Hz-m	2070	2070	2030	2060
	N_5	Hz-m	2004			1780
Mechanical Quality Factor	Q_m	-	982	1000	1200	1200
Time Stability						
Aging Rate - Dielectric	α	% per decade	-5.6	-4.0	-3.5	-4.1
Aging Rate - d constants	α	% per decade	-5.6	-6.3		
Aging Rate - Coupling	α	% per decade	-2.0	-1.5	-1.5	-2.1
Aging Rate - Frequency	α	% per decade	1.1	0.9	0.8	1.1

Typical Values measured at 20°C ±1°C are provided for design information only. Standard tolerances are approximately ±20% of these values. Material properties are measured according to standard IEEE and DOD definitions and measuring techniques.

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