



Onda Corporation
 592 Weddell Drive, Suite 7, Sunnyvale, CA 94089
 PH: (408) 745 - 0383 FAX: (408) 745 - 0956

Acoustic Properties of Longitudinal Piezoelectrics

Vendor	Material	Z_3^D MRayl	V_3^D mm/: s	V_3^E mm/: s	Q_m	ρ_{33}	k_t^2	k_p^2	D g/cm ³	tan *	T _C °C	Ref
Crys	Lithium niobate - 36°Y-cut	34.2	7.36		100	39.0	0.240	0.188	4.64	0.001	1150	[5]
Kera	K83 - modlead metaniobate, after poling	25.6	5.95		110	150	0.169	finite	4.3		570	
Kera	K350 - lead zirconate titanate	33.7	4.381		75	790	0.249	0.307	7.7	0.024	360	[8]
Mats	PCM	35.7	4.82		150	270	0.291	strong	7.4	0.006		[5]
Mura	P3 - an inexpensive barium titanate	31.3	5.75		200	885	0.179	0.083	5.45	0.003	110	[5]
Mura	P5 - lead zirconate titanate	31.6	4.33		80	847	0.127	0.125	7.30	0.011	260	[5]
Mura	P6 - lead zirconate titanate	35.1	4.78		70	883	0.240	0.216	7.34	0.014	290	[5]
Mura	P7 - lead zirconate titanate	36.0	4.68		65	1000	0.259	0.315	7.69	0.019	320	[5]
Mura	"surface wave material"	37.4	4.709		1000	240	0.230	0.062	7.95	0.0014	280	[5]
Mura	"surface wave material"	37.2	4.683		1000	230	0.231	0.063	7.95	0.0016	280	[8]
Mura	"surface wave material" after repoling @200°C, 50V/0.001" for 5 min	37.4	4.706		1000	200	0.251	0.062	7.95	0.0016	280	[8]
Tran	LTZ1 - with plain electrode	35.6	4.682		500	640	0.254	0.294	7.6	0.007	350	[8]
Tran	LTZ1 - with wrap around electrode	35.6	4.679		200	600	0.254	0.287	7.6	0.007	350	[8]
Tran	LTZ2 - with plain electrode	35.4	4.717		75	920	0.262	0.301	7.5	0.02	360	[8]
Tran	LTZ2 - with wrap around electrode	34.4	4.583		100	830	0.259	0.290	7.5	0.019	360	[8]



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Tran	LTZ5 - lead zirconate titanate	36.8	4.84		186	450	0.154	0.135	7.6	0.008	350	[5]
Tran	LTZ5 - lead zirconate titanate	36.5	4.803		200	370	0.157	0.130	7.6	0.010	350	[8]
Vern	PZT4 - lead zirconate titanate	36.1	4.82		500	635	0.233	0.219	7.5	0.008	328	[5]
Vern	PZT4 - lead zirconate titanate	34.5	4.60		500	635	0.263	0.336	7.5	0.004	328	[6]
Vern	PZT5A - lead zirconate titanate	34.5	4.445	3.97	75	870	0.240	0.285	7.75	0.023	365	[8]
Vern	PZT5A - lead zirconate titanate	33.7	4.35		75	830	0.236	0.360	7.75	0.02	365	[6]
Vern	PZT5H - lead zirconate titanate	32.6	4.35		50	1260	0.292	0.360	7.5	0.025	193	[5]
Vern	PZT5H - lead zirconate titanate	34.2	4.60		65	1470	0.255	0.423	7.5	0.02	193	[6]
Vern	PZT5H - lead zirconate titanate, pillar mode	27.4	3.66	2.59	65	1450	0.549	n.a.	7.5	0.02	193	[5]
Vern	PZT5H - lead zirconate titanate, array element mode	28.5	3.80	2.81	65	1365	0.502	n.a.	7.5	0.02	193	[5]
Vern	PZT8 - lead zirconate titanate, not as uniform as other Vernitron ceramics, brittle	35.0	4.60		1000	600	0.23	0.260	7.6	0.004	300	[6]
Ferr	Pz 23 - lead zirconate titanate	34.4	4.56		100	900	0.241	0.259	7.55	0.020	350	[5]
Ferr	Pz 24 - lead zirconate titanate	35.9	4.72		2000	310	0.246	0.243	7.6	0.014	330	[5]



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Ferr	Pz 25 - lead zirconate titanate	34.0	4.56		80	975	0.282	0.300	7.45	0.039	280	[5]
Ferr	Pz 26 - lead zirconate titanate	35.2	4.62		1000	790	0.256	0.276	7.6	0.002	320	[5]
Ferr	Pz 27 - lead zirconate titanate	34.8	4.51		60	930	0.257	0.298	7.7	0.024	350	[5]
Ferr	Pz 29 - lead zirconate titanate	33.2	4.49		60	1300	0.296	0.332	7.4	0.03	235	[5]
Ferr	Pz 32 - modified lead titanate	37.1	4.82		1000	250	0.181	0.020	7.7	0.0024	400	[5]
Ferr	Pz 45 - bismuth titanate	34.8	4.83		1000	205	0.016	0!	7.2	0.004	500	[5]
Kera	Nova 7A - lead titanate	35.2	4.61		800	140	0.196	~0	7.63	0.009		[5]
Hita	PC11 - lead titanate	37.2	4.89		800	140	0.223	0!	7.6	0.0035	355	[5]
Hita	PC23 - lead zirconate titanate	35.9	4.68		60	2700	0.224	0.352	7.67	0.035	140	[5]
Hita	PC24 - lead zirconate titanate	36.7	4.76		100	1150	0.277	0.446	7.71	0.017	210	[5]
Hita	PC25 - lead zirconate titanate	37.0	4.64		120	530	0.230	0.455	7.97	0.016	360	[5]
Hita	PC26 - lead zirconate titanate	37.0	4.63		100	700	0.229	0.426	7.98	0.016	315	[5]
EDO	EC64 - lead zirconate titanate, pillar mode	29.4	3.924	3.046	1800	668	0.447	n.a.	7.50	0.0016	320	[5]
EDO	EC64 - lead zirconate titanate, array element mode, PZT4D equivalent	30.5	4.065	3.155	400	650	0.447	n.a.	7.50	0.004	320	[5]
EDO	EC97 - lead titanate	34.0	5.08	4.38	950	188	0.295	0	6.7	0.009	240	[11]



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EDO	EC98 - lead magnesium niobate	33.4	4.26	3.82	70	3230	0.231	0.263	7.85	0.02	170	[11]
EDO	EC69 - lead zirconate titanate, plate	41.5	5.530		80	619	0.265		7.5	0.038	300	[11]
	Quartz - X cut	15.21	5.74		106	4.5	0.0087	0.01	2.65	0.0001	575	[9]
	ZnO, single crystal, hexagonal 6mm Z cut thin film	36.0	6.33			8.8	0.078		5.68	small		[10]
EBL	LT01 - lead titanate, plate mode	37.37	4.854		250	144.5	0.277	small	7.7	0.0033	300	[11]
SEA	SEA3 - lead zirconate titanate	34.94	4.48	4.02	35	1100	0.260	0.52	7.8	0.007	260	RLB
Chan	C5800 pillar mode	30.05	3.981	3.111	7740	500	0.4389		7.55	0.0103	300	AS