

TDK Multilayer Chip Inductors

MLF SERIES

TDK Multilayer Chip Inductors use magnetic materials and multilayer technology in producing revolutionary inductors which do not use any wire windings. Ferrite paste and electric conductor paste are alternately layered and sintered into a completely monolithic structure to form an inductor with a perfectly closed magnetic circuit and an excellent magnetic shield.

FEATURES

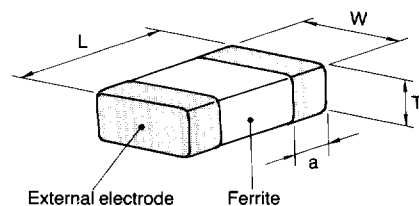
- Smallest inductor possible.
- No cross coupling between inductors due to magnetic shield. Ideal for high density installation.
- Perfect shape for mounting, with no directionality.
- Excellent solderability and high heat resistance for either flow or reflow soldering.
- Monolithic structure for high reliability.

PRODUCT IDENTIFICATION

MLF 1608 A 1R0 K ○ □□□
 (1) (2) (3) (4) (5) (6) (7)

- (1) Product symbol
- (2) Dimensions (1.6 × 0.8mm [.063 × .031 inches])
- (3) Material code
- (4) Inductance (1R0: 1.0μH)
- (5) Tolerance (K: ± 10%)
- (6) Packaging style
 T: Tape and reel B: Bulk
- (7) TDK internal code

SHAPES AND DIMENSIONS



Type	Dimensions in mm [inches]			
	L	W	T	a
MLF1608	1.6 ± 0.15 [.063 ± .006]	0.8 ± 0.15 [.031 ± .006]	0.8 ± 0.15 [.031 ± .006]	0.3 ± 0.2 [.012 ± .008]
			1.2 ± 0.15 [.048 ± .006]	
MLF2012	2.0 ^{+0.3} _{-0.1} [.079 ^{±.012} _{±.004}]	1.25 ± 0.2 [.049 ± .008]	0.85 ± 0.2 [.033 ± .008]	0.5 ± 0.3 [.020 ± .012]
			1.25 ± 0.2 [.049 ± .008]	
MLF3216	3.2 ± 0.2 [.126 ± .008]	1.6 ± 0.2 [.063 ± .008]	0.6 ± 0.2 [.024 ± .008]	0.5 ± 0.3 [.020 ± .012]
			1.1 ± 0.3 [.043 ± .012]	
MLF3225	3.2 ± 0.2 [.126 ± .008]	2.5 ± 0.2 [.098 ± .008]	1.1 ± 0.3 [.043 ± .012]	0.5 ± 0.3 [.020 ± .012]
			2.5 ± 0.3 [.098 ± .012]	

PACKAGING

Packaging style and quantity

Type	Chip's thick. (mm) [inches]	Bulk	Tape and reel
MLF1608	0.8 [.031]	✓	2000 pcs.
	1.2 [.047]	✓	2000
MLF2012	0.85 [.033]	✓	4000
	1.25 [.049]	✓	2000
MLF3216	0.6 [.024]	✓	4000
	1.1 [.043]	✓	2000
MLF3225	1.1 [.043]	✓	2000
	2.5 [.098]	✓	1000

Tape dimensions

Paper carrier tape

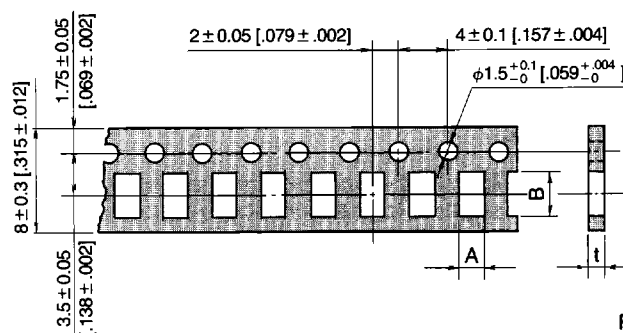


Fig. 1

Embossed carrier tape

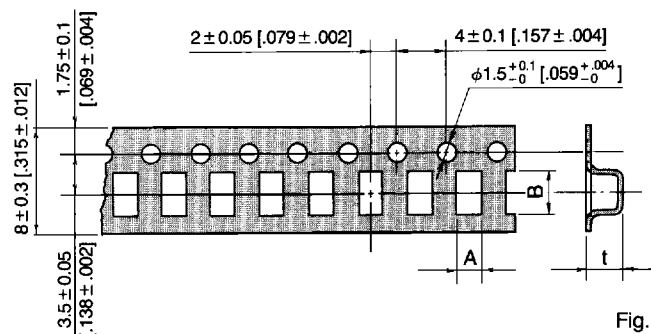


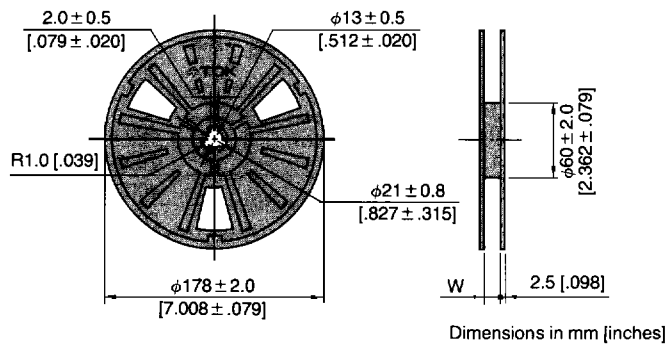
Fig. 2

Type	Dimensions in mm [inches]				
	A	B	t max.	T*	Fig.
MLF1608	1.1 ± 0.2 [.043 ± .008]	1.9 ± 0.2 [.075 ± .008]	1.5 [.059]	0.8 ± 0.15 [.031 ± .006]	2
			2.0 [.079]	1.2 ± 0.15 [.048 ± .006]	2
MLF2012	1.5 ± 0.2 [.059 ± .008]	2.3 ± 0.2 [.091 ± .008]	1.5 [.059]	0.85 [.033]	2
			2.0 [.079]	1.25 [.049]	2
MLF3216	2.0 ± 0.2 [.079 ± .008]	3.6 ± 0.2 [.142 ± .008]	1.1 [.043]	0.6 [.024]	1
			2.0 [.079]	1.1 [.043]	2
MLF3225	2.9 ± 0.2 [.114 ± .008]	3.6 ± 0.2 [.142 ± .008]	2.0 [.079]	1.1 [.043]	2
			3.0 [.118]	2.5 [.098]	2

*T: Chip's thickness.

TDK Multilayer Chip Inductors

Reel dimensions



Tape width	W
8mm [.315 inches]	10 ± 1.5 [.394 ± .059]
12mm [.472 inches]	14 ± 1.5 [.551 ± .059]

• Reel material: Polystyrene

RELIABILITY

Due to TDK Chip Inductor manufacturing technology, no special care is required for these inductors to operate as ceramic chip capacitors or chip resistors. Detailed reliability test data are available upon request.

TDK Multilayer Chip Inductors

ELECTRICAL CHARACTERISTICS MLF1608 TYPE

Part No.	Product's thickness (mm) [inches]	Inductance (μH)	Q min.	L, Q test frequency (MHz)	Self-resonant frequency (MHz) min.	DC resistance (Ω) max.	Rated current (mA) max.	Weight (mg)
MLF1608D47N*1□○*2	0.8 [.031]	0.047 \pm 20%	10	50	260	0.30	50	4
MLF1608D68N□○	0.8 [.031]	0.068 \pm 20%	10	50	250	0.30	50	4
MLF1608D82N□○	0.8 [.031]	0.082 \pm 20%	10	50	245	0.30	50	4
MLF1608DR10□○	0.8 [.031]	0.10 \pm 20% or \pm 10%	15	25	240	0.50	50	4
MLF1608DR12□○	0.8 [.031]	0.12 \pm 20% or \pm 10%	15	25	205	0.50	50	4
MLF1608DR15□○	0.8 [.031]	0.15 \pm 20% or \pm 10%	15	25	180	0.60	50	4
MLF1608DR18□○	0.8 [.031]	0.18 \pm 20% or \pm 10%	15	25	165	0.60	50	4
MLF1608DR22□○	0.8 [.031]	0.22 \pm 20% or \pm 10%	15	25	150	0.80	50	4
MLF1608DR27□○	0.8 [.031]	0.27 \pm 20% or \pm 10%	15	25	136	0.80	50	4
MLF1608DR33□○	0.8 [.031]	0.33 \pm 20% or \pm 10%	15	25	125	0.85	35	4
MLF1608DR39□○	0.8 [.031]	0.39 \pm 20% or \pm 10%	15	25	110	1.00	35	4
MLF1608DR47□○	0.8 [.031]	0.47 \pm 20% or \pm 10%	15	25	105	1.35	35	4
MLF1608DR56□○	0.8 [.031]	0.56 \pm 20% or \pm 10%	15	25	95	1.55	35	4
MLF1608DR68□○	0.8 [.031]	0.68 \pm 20% or \pm 10%	15	25	80	1.70	35	4
MLF1608DR82□○	0.8 [.031]	0.82 \pm 20% or \pm 10%	15	25	75	2.10	35	4
MLF1608A1R0□○	0.8 [.031]	1.0 \pm 20% or \pm 10%	35	10	70	0.60	25	4
MLF1608A1R2□○	0.8 [.031]	1.2 \pm 20% or \pm 10%	35	10	60	0.80	25	4
MLF1608A1R5□○	0.8 [.031]	1.5 \pm 20% or \pm 10%	35	10	55	0.80	25	4
MLF1608A1R8□○	0.8 [.031]	1.8 \pm 20% or \pm 10%	35	10	50	0.95	25	4
MLF1608A2R2□○	0.8 [.031]	2.2 \pm 20% or \pm 10%	35	10	45	1.15	15	4
MLF1608A2R7□○	0.8 [.031]	2.7 \pm 20% or \pm 10%	35	10	40	1.35	15	4
MLF1608A3R3□○	0.8 [.031]	3.3 \pm 20% or \pm 10%	35	10	38	1.55	15	4
MLF1608A3R9□○	0.8 [.031]	3.9 \pm 20% or \pm 10%	35	10	36	1.70	15	4
MLF1608A4R7□○	0.8 [.031]	4.7 \pm 20% or \pm 10%	35	10	33	2.10	15	4
MLF1608E5R6□○	0.8 [.031]	5.6 \pm 20% or \pm 10%	35	4	22	1.55	5	4
MLF1608E6R8□○	0.8 [.031]	6.6 \pm 20% or \pm 10%	35	4	20	1.70	5	4
MLF1608E8R2□○	0.8 [.031]	8.2 \pm 20% or \pm 10%	35	4	18	2.10	5	4
MLF1608E100□○	1.2 [.047]	10.0 \pm 20% or \pm 10%	35	2	17	2.55	5	6
MLF1608E120□○	1.2 [.047]	12.0 \pm 20% or \pm 10%	35	2	15	2.75	5	6
MLF1608C150□○	0.8 [.031]	15.0 \pm 20% or \pm 10%	20	1	14	1.70	1	4
MLF1608C180□○	0.8 [.031]	18.0 \pm 20% or \pm 10%	20	1	13	1.85	1	4
MLF1608C220□○	0.8 [.031]	22.0 \pm 20% or \pm 10%	20	1	11	2.10	1	4
MLF1608C270□○	1.2 [.047]	27.0 \pm 20% or \pm 10%	20	1	10	2.75	1	6
MLF1608C330□○	1.2 [.047]	33.0 \pm 20% or \pm 10%	20	1	9	2.95	1	6

*1. 47N means for 47nH (0.047 μH).

*2. □ : Please specify the inductance tolerance, M(\pm 20%) or K(\pm 10%). M: for general purpose

○ : Means packaging style. See page 81, "Product identification".

TDK Multilayer Chip Inductors

MLF2012 TYPE

Part No.	Product's thickness (mm) [inches]	Inductance (μ H)	Q		L, Q test frequency (MHz)	Self-resonant frequency (MHz)		DC resistance (Ω)		Rated current (mA) max.	Weight (mg)
			min.	nominal		min.	nominal	max.	nominal		
MLF2012D47N ^{*1} □○ ^{*2}	0.85 [.033]	0.047 ± 20%	15	25	50	320	400	0.20	0.11	300	10
MLF2012D68N□○	0.85 [.033]	0.068 ± 20%	15	25	50	280	350	0.20	0.11	300	10
MLF2012D82N□○	0.85 [.033]	0.082 ± 20%	15	25	50	255	320	0.20	0.11	300	10
MLF2012DR10□○	0.85 [.033]	0.10 ± 20% or ± 10%	20	30	25	235	300	0.30	0.16	250	10
MLF2012DR12□○	0.85 [.033]	0.12 ± 20% or ± 10%	20	30	25	220	280	0.30	0.16	250	10
MLF2012DR15□○	0.85 [.033]	0.15 ± 20% or ± 10%	20	30	25	200	250	0.40	0.21	250	10
MLF2012DR18□○	0.85 [.033]	0.18 ± 20% or ± 10%	20	30	25	185	230	0.40	0.21	250	10
MLF2012DR22□○	0.85 [.033]	0.22 ± 20% or ± 10%	20	30	25	170	220	0.50	0.26	250	10
MLF2012DR27□○	0.85 [.033]	0.27 ± 20% or ± 10%	20	30	25	150	200	0.50	0.26	250	10
MLF2012DR33□○	0.85 [.033]	0.33 ± 20% or ± 10%	20	30	25	145	180	0.55	0.31	250	10
MLF2012DR39□○	0.85 [.033]	0.39 ± 20% or ± 10%	25	35	25	135	170	0.65	0.36	200	10
MLF2012DR47□○	1.25 [.049]	0.47 ± 20% or ± 10%	25	35	25	125	160	0.65	0.36	200	14
MLF2012DR56□○	1.25 [.049]	0.56 ± 20% or ± 10%	25	35	25	115	150	0.75	0.41	150	14
MLF2012DR68□○	1.25 [.049]	0.68 ± 20% or ± 10%	25	35	25	105	135	0.80	0.46	150	14
MLF2012DR82□○	1.25 [.049]	0.82 ± 20% or ± 10%	25	35	25	100	125	1.00	0.56	150	14
MLF2012A1R0□○	0.85 [.033]	1.0 ± 20% or ± 10%	45	55	10	75	105	0.40	0.21	50	10
MLF2012A1R2□○	0.85 [.033]	1.2 ± 20% or ± 10%	45	55	10	65	95	0.50	0.26	50	10
MLF2012A1R5□○	0.85 [.033]	1.5 ± 20% or ± 10%	45	55	10	60	85	0.50	0.26	50	10
MLF2012A1R8□○	0.85 [.033]	1.8 ± 20% or ± 10%	45	55	10	55	78	0.60	0.31	50	10
MLF2012A2R2□○	0.85 [.033]	2.2 ± 20% or ± 10%	45	60	10	50	70	0.65	0.36	30	10
MLF2012A2R7□○	1.25 [.049]	2.7 ± 20% or ± 10%	45	60	10	45	64	0.75	0.41	30	14
MLF2012A3R3□○	1.25 [.049]	3.3 ± 20% or ± 10%	45	60	10	41	58	0.80	0.46	30	14
MLF2012A3R9□○	1.25 [.049]	3.9 ± 20% or ± 10%	45	60	10	38	53	0.90	0.51	30	14
MLF2012A4R7□○	1.25 [.049]	4.7 ± 20% or ± 10%	45	60	10	35	48	1.00	0.56	30	14
MLF2012E5R6□○	1.25 [.049]	5.6 ± 20% or ± 10%	50	60	4	32	44	0.90	0.51	15	14
MLF2012E6R8□○	1.25 [.049]	6.8 ± 20% or ± 10%	50	60	4	29	40	1.00	0.56	15	14
MLF2012E8R2□○	1.25 [.049]	8.2 ± 20% or ± 10%	50	60	4	26	36	1.10	0.61	15	14
MLF2012E100□○	1.25 [.049]	10.0 ± 20% or ± 10%	50	60	2	24	33	1.15	0.66	15	14
MLF2012E120□○	1.25 [.049]	12.0 ± 20% or ± 10%	50	60	2	22	30	1.25	0.71	15	14
MLF2012C150□○	1.25 [.049]	15.0 ± 20% or ± 10%	30	40	1	19	27	0.80	0.46	5	14
MLF2012C180□○	1.25 [.049]	18.0 ± 20% or ± 10%	30	40	1	18	25	0.90	0.51	5	14
MLF2012C220□○	1.25 [.049]	22.0 ± 20% or ± 10%	30	40	1	16	22	1.10	0.61	5	14
MLF2012C270□○	1.25 [.049]	27.0 ± 20% or ± 10%	30	40	1	14	20	1.15	0.66	5	14
MLF2012C330□○	1.25 [.049]	33.0 ± 20% or ± 10%	30	40	0.4	13	18	1.25	0.71	5	14

*1 47N means for 47nH (0.047 μ H).

*2 □: Please specify the inductance tolerance, M (\pm 20%) or K (\pm 10%). M: for general purpose

○: Means packaging style. See page 81, "Product Identification".

TDK Multilayer Chip Inductors

MLF3216, MLF3225 TYPE

Part No.	Product's thickness (mm) [inches]	Inductance (μ H)	Q		L, Q test frequency (MHz)	Self-resonant frequency (MHz)		DC resistance (Ω)		Rated current (mA) max.	Weight (mg)
			min.	nominal		min.	nominal	max.	nominal		
MLF3216D47N*1□○*2	0.6±0.2 [.024±.008]	0.047±20%	20	30	50	320	400	0.15	0.08	300	13
MLF3216D68N□○	0.6±0.2 [.024±.008]	0.068±20%	20	30	50	280	330	0.25	0.13	300	13
MLF3216DR10□○	0.6±0.2 [.024±.008]	0.10±20% or ±10%	20	30	25	235	280	0.25	0.13	250	13
MLF3216DR12□○	0.6±0.2 [.024±.008]	0.12±20% or ±10%	20	30	25	220	260	0.30	0.18	250	13
MLF3216DR15□○	0.6±0.2 [.024±.008]	0.15±20% or ±10%	20	30	25	200	240	0.30	0.18	250	13
MLF3216DR18□○	0.6±0.2 [.024±.008]	0.18±20% or ±10%	20	30	25	185	220	0.40	0.23	250	13
MLF3216DR22□○	0.6±0.2 [.024±.008]	0.22±20% or ±10%	20	30	25	170	200	0.40	0.23	250	13
MLF3216DR27□○	0.6±0.2 [.024±.008]	0.27±20% or ±10%	20	30	25	150	180	0.50	0.28	250	13
MLF3216DR33□○	0.6±0.2 [.024±.008]	0.33±20% or ±10%	20	30	25	145	170	0.60	0.34	250	13
MLF3216DR39□○	1.1±0.3 [.043±.012]	0.39±20% or ±10%	25	35	25	135	160	0.50	0.28	200	25
MLF3216DR47□○	1.1±0.3 [.043±.012]	0.47±20% or ±10%	25	35	25	125	145	0.60	0.34	200	25
MLF3216DR56□○	1.1±0.3 [.043±.012]	0.56±20% or ±10%	25	35	25	115	135	0.70	0.39	150	25
MLF3216DR68□○	1.1±0.3 [.043±.012]	0.68±20% or ±10%	25	35	25	105	125	0.80	0.44	150	25
MLF3216DR82□○	1.1±0.3 [.043±.012]	0.82±20% or ±10%	25	35	25	100	115	0.90	0.50	150	25
MLF3216A1R0□○	0.6±0.2 [.024±.008]	1.0±20% or ±10%	45	60	10	75	90	0.40	0.23	100	13
MLF3216A1R2□○	0.6±0.2 [.024±.008]	1.2±20% or ±10%	45	60	10	65	80	0.50	0.28	100	13
MLF3216A1R5□○	1.1±0.3 [.043±.012]	1.5±20% or ±10%	45	60	10	60	70	0.50	0.28	50	25
MLF3216A1R8□○	1.1±0.3 [.043±.012]	1.8±20% or ±10%	45	60	10	55	66	0.50	0.28	50	25
MLF3216A2R2□○	1.1±0.3 [.043±.012]	2.2±20% or ±10%	45	60	10	50	58	0.60	0.34	50	25
MLF3216A2R7□○	1.1±0.3 [.043±.012]	2.7±20% or ±10%	45	60	10	45	53	0.60	0.34	50	25
MLF3216A3R3□○	1.1±0.3 [.043±.012]	3.3±20% or ±10%	45	65	10	41	49	0.70	0.39	50	25
MLF3216A3R9□○	1.1±0.3 [.043±.012]	3.9±20% or ±10%	45	65	10	38	45	0.80	0.44	50	25
MLF3216A4R7□○	1.1±0.3 [.043±.012]	4.7±20% or ±10%	45	65	10	35	41	0.90	0.50	50	25
MLF3216E5R6□○	1.1±0.3 [.043±.012]	5.6±20% or ±10%	50	65	4	32	38	0.70	0.39	25	25
MLF3216E6R8□○	1.1±0.3 [.043±.012]	6.8±20% or ±10%	50	65	4	29	34	0.80	0.44	25	25
MLF3216E8R2□○	1.1±0.3 [.043±.012]	8.2±20% or ±10%	50	65	4	26	31	0.90	0.50	25	25
MLF3216E100□○	1.1±0.3 [.043±.012]	10.0±20% or ±10%	50	65	2	24	28	1.00	0.55	25	25
MLF3216E120□○	1.1±0.3 [.043±.012]	12.0±20% or ±10%	50	65	2	22	26	1.05	0.60	15	25
MLF3216C150□○	1.1±0.3 [.043±.012]	15.0±20% or ±10%	35	45	1	19	23	0.70	0.39	5	25
MLF3216C180□○	1.1±0.3 [.043±.012]	18.0±20% or ±10%	35	45	1	18	21	0.70	0.39	5	25
MLF3216C220□○	1.1±0.3 [.043±.012]	22.0±20% or ±10%	35	45	1	16	19	0.90	0.50	5	25
MLF3216C270□○	1.1±0.3 [.043±.012]	27.0±20% or ±10%	35	45	1	14	17	0.90	0.50	5	25
MLF3216C330□○	1.1±0.3 [.043±.012]	33.0±20% or ±10%	35	45	0.4	13	16	1.05	0.60	5	25
MLF3225C390□○	1.1±0.3 [.043±.012]	39.0±20% or ±10%	35	45	0.4	12.5	14.0	1.20	0.70	5	43
MLF3225C470□○	1.1±0.3 [.043±.012]	47.0±20% or ±10%	35	45	0.4	10.0	11.5	1.30	0.80	5	43
MLF3225C560□○	1.1±0.3 [.043±.012]	56.0±20% or ±10%	35	45	0.4	9.5	10.5	1.50	0.90	5	43
MLF3225E680□○	2.5±0.3 [.098±.012]	68.0±20% or ±10%	55	70	2	9.5	10.5	3.10	1.75	10	86
MLF3225E820□○	2.5±0.3 [.098±.012]	82.0±20% or ±10%	55	70	2	9.0	10.0	3.40	1.95	10	86
MLF3225E101□○	2.5±0.3 [.098±.012]	100.0±20% or ±10%	55	70	1	8.0	9.0	3.80	2.20	10	86
MLF3225C121□○	2.5±0.3 [.098±.012]	120.0±20% or ±10%	35	45	0.2	6.0	7.0	2.30	1.30	5	86
MLF3225C151□○	2.5±0.3 [.098±.012]	150.0±20% or ±10%	35	45	0.2	5.5	6.5	2.60	1.50	5	86
MLF3225C181□○	2.5±0.3 [.098±.012]	180.0±20% or ±10%	35	45	0.2	5.0	6.0	2.80	1.65	5	86
MLF3225C221□○	2.5±0.3 [.098±.012]	220.0±20% or ±10%	35	45	0.2	5.0	5.5	3.10	1.75	5	86

*1 47N means for 47nH (0.047 μ H).

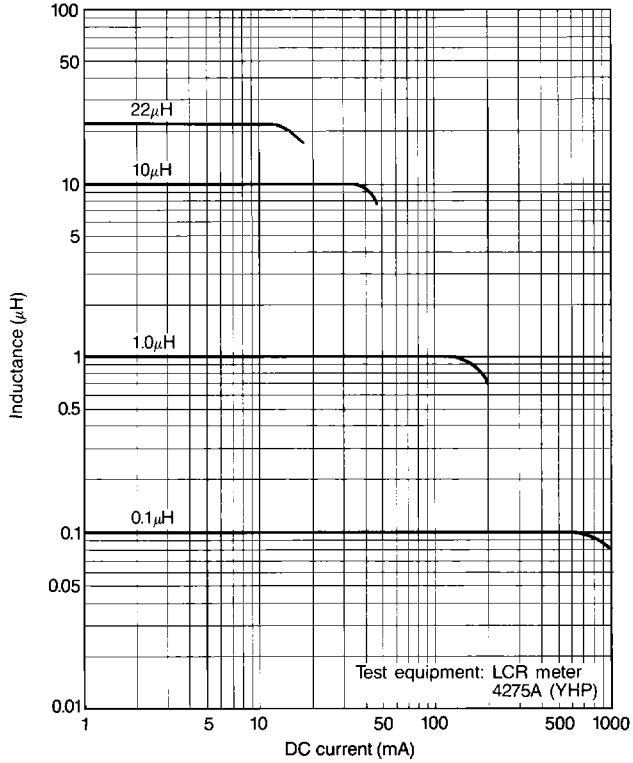
*2 □: Please specify the inductance tolerance, M (\pm 20%) or K (\pm 10%). M: for general purpose

○: Means packaging style. See page 81, "Product Identification".

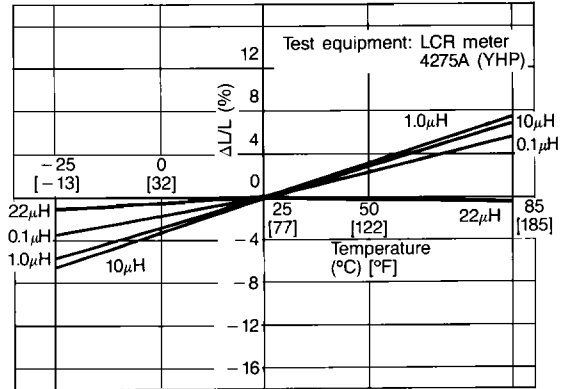
TDK Multilayer Chip Inductors

TYPICAL ELECTRICAL CHARACTERISTIC MLF2012 TYPE

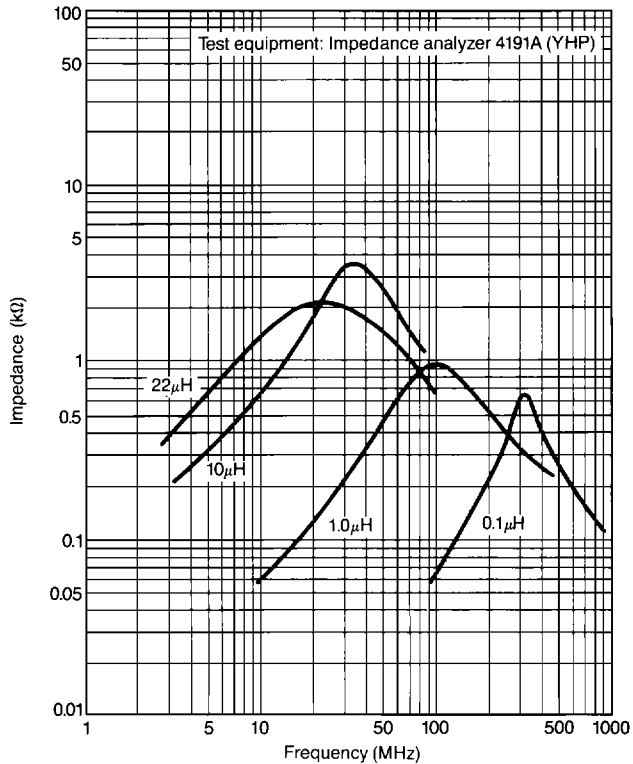
Inductance vs. DC superposition characteristics



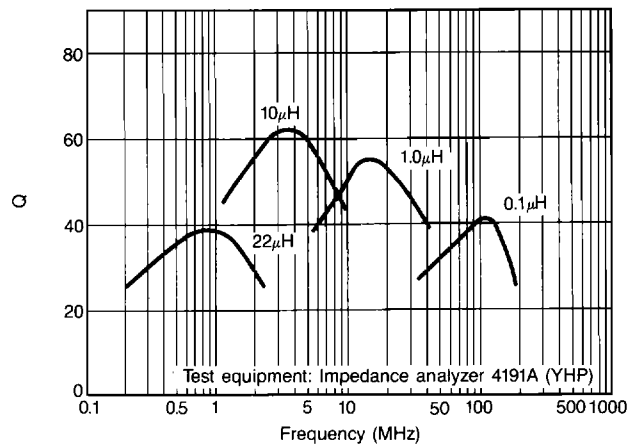
Inductance vs. temperature characteristics



Impedance vs. frequency characteristics



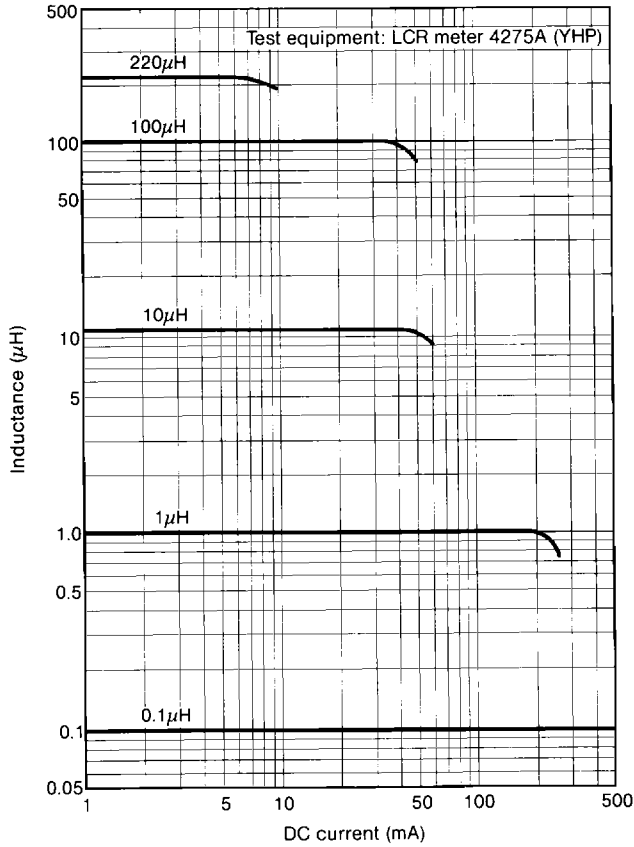
Q vs. frequency characteristics



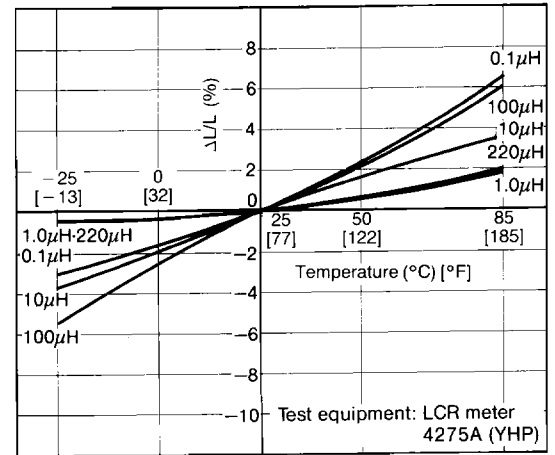
TDK Multilayer Chip Inductors

MLF3216, MLF3225 TYPE

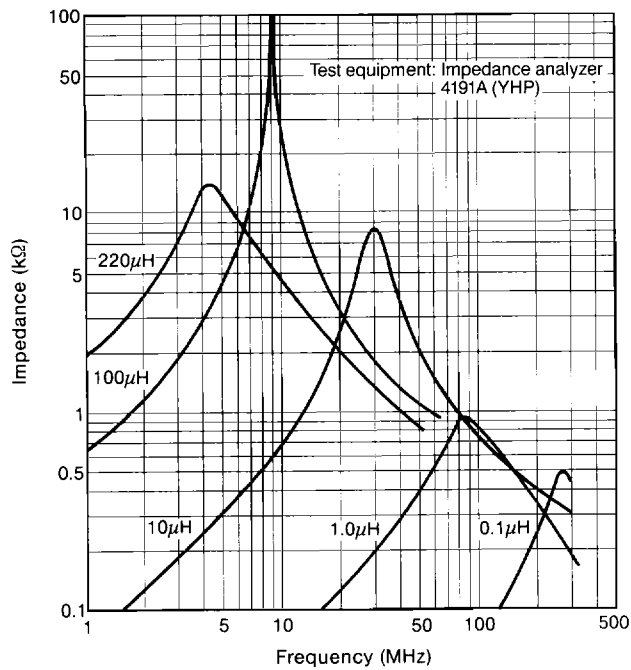
Inductance vs. DC superposition characteristics



Inductance vs. temperature characteristics



Impedance vs. frequency characteristics



Q vs. frequency characteristics

