Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

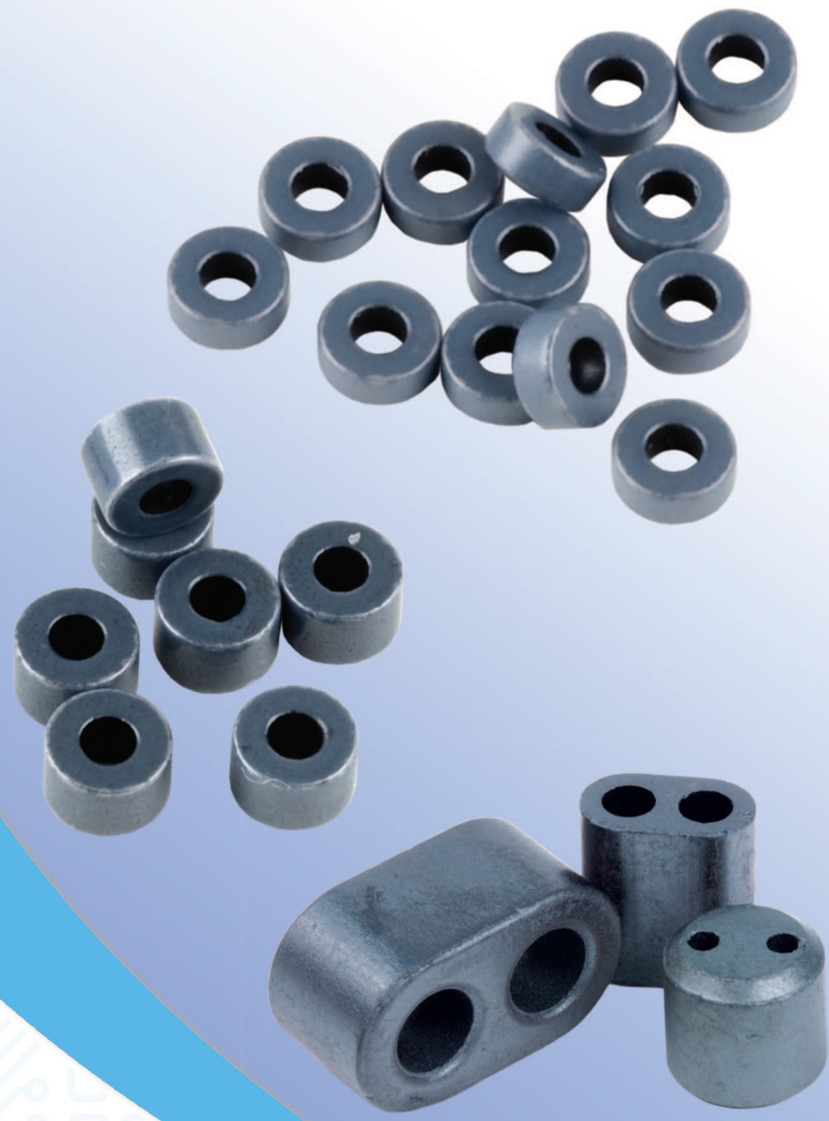
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Toroid & Balun Cores

MASTER CATALOG

www.lairdtech.com



ABOUT **LAIRD TECHNOLOGIES**

Laird Technologies designs and manufactures customized, performance-critical products for wireless and other advanced electronics applications.

The company is a global market leader in the design and supply of electromagnetic interference (EMI) shielding, thermal management products, mechanical actuation systems, signal integrity components, and wireless antennae solutions, as well as radio frequency (RF) modules and systems.

Laird Technologies is the world leader in the design and manufacture of customized, performance-critical products for wireless and other advanced electronics applications. Laird Technologies partners with its customers to customize product solutions for applications in many industries including:

- Network Equipment
- Handsets
- Telecommunications
- Data Transfer & Information Technology
- Computers
- Automotive Electronics
- Aerospace
- Defense
- Medical Equipment
- Consumer Electronics
- Industrial

Laird Technologies offers its customers unique product solutions, dedication to research and development, as well as a seamless network of manufacturing and customer support facilities across the globe.

Laird™

TABLE OF CONTENTS

NOTICE

QUALITY ASSURANCE

QUALITY PHILOSOPHY

Customer focus is paramount in our quality program. Our quality philosophy is outlined as follows:

Laird Technologies is a company committed to continuous improvement. We fulfill this commitment by continually improving the quality of the products and services we provide our customers, both external and internal.

We recognize that our customers define quality. We further recognize that continuous improvement can only result from the fullest development of our people and technologies.

We believe that to pursue this course, we must set unselfish service as our standard for conduct. Building on the values of our history, we will raise our standards of performance through continuous improvement and imagination. In addition, our actions must demonstrate integrity, honesty, excellence and self-discipline.

We believe in teamwork. Our commitment to continuous improvement is fulfilled and maintained by the combined, cohesive efforts of people with a common goal.

QUALITY MEASUREMENT SYSTEM

Laird Technologies' Quality Management Systems have been certified to the ISO 9001:2000 requirements by Ceramic Industry Certification Scheme Ltd.

CICS UKAS QUALITY MANAGEMENT 006 | ISO 9001:2000 QS 9000 Certified

QUALITY TESTING

We test on the following equipment:

Inductance, Loss Factor:	Hewlett-Packard 4274A Multi-Frequency LCR Meter
	Hewlett-Packard 4275A Multi-Frequency LCR Meter
	Hewlett-Packard 4284A Multi-Frequency LCR Meter
Impedance:	Hewlett-Packard 4396B Network/Spectrum Analyzer
	Hewlett-Packard 4991A Network/Spectrum Analyzer

PART IDENTIFICATION

PART NUMBERS

Part numbers use a ten character alphanumeric nomenclature providing:

- The material designation
- The product type (shape)
- A basic size description
- A parts modifier series

PART NUMBERING SYSTEM EXAMPLE

35	T	0100	-0	0	P
Material Type	Product Code	Part Size Code	Part Thickness	Catalog Specification	Parylene Coating

MATERIAL DESIGNATOR

35 __ ______ - __ __ __

A two digit material designator is assigned to materials on the basis of initial permeability.

Typical Application	Material	Initial Permeability
Common Mode Filtering	35	5000
	28	850
	25	125
	38	1700
DC Bias Ethernet Transformers	36	4500
	46	4000
	56	5500
	66	3200
High Perm for Telecom	42	7500
	40*	10000

* 40 material large toroids are mostly used for very low frequency power supply filtering

Other Applications	35	5000
	39	7000

PRODUCT TYPES

35 T ______ - __ __ __

Transformer and Filter Core Division uses two basic shape designators:

T for toroidal cores
  Example: 35T0100-00P
N for balun cores
  Example: 35N0136-00P

BASIC SIZE DESCRIPTION

35 T 0100 - __ __ __

The four digits following the product description provide the largest dimension of the part in thousandths of an inch. For toroids and similar shapes, it usually describes the outside or major diameter of the core.

For other types of parts, it is the largest dimension specified in the part's description.

PARTS MODIFIER SERIES

35 T 0100 - 00P

The first of the three digits following the dash refers to the part thickness. A zero through nine digit refers variations in thickness from the same tool. The second modifying digit relates to a custom requirement (electrical testing or physical specification). The third digit or letter describes a coating or finish.

COATING DESIGNATIONS

P — Parylene
  Hi-Pot Rating 1000 VAC minimum
  Nominal Thickness: 0.0005" / 0.0127 mm

H — Epoxy
  Hi-Pot Rating 1000 VAC minimum
  Nominal Thickness: 0.003" / 0.0762 mm

STANDARD COMPONENTS

Soft Ferrite Typical Physical Constants	
Specific Heat	0.25 cal/g/°C
Thermal Conductivity	10^{-2} cal/sec/cm/°C
Coefficient of Linear Expansion	8-10 x 10^{-6}/°C
Tensile Strength	500 kg/cm^2
Compressive Strength	4200 kg/cm^2
Youngs Modulus	1260 kg/cm^2
Hardness (Knoop)	650
Density	4.6 to 4.9 g/cm^3

Mechanical Tolerances	
OD-ID Tolerances	
mm (inches)	
OD - ID	**Uncoated Tolerance**
< 5.05 (.199)	.127 (.005)
5.08 (.200) - 9.50 (.374)	.152 (.006)
9.53 (.375) - 15.85 (.624)	.254 (.010)
15.88 (.625) - 25.37 (.999)	.381 (.015)
> 25.40 (1.000)	.508 (.020)
HT Tolerances	
HT	**Uncoated Tolerance**
< 6.32 (.249)	.127 (.005)
6.35 (.250) - 7.34 (.289)	.178 (.007)
> 7.37 (.290)	.254 (.010)

TOROIDAL CORE COATINGS

If required by customer applications, smooth, resistive coatings may be provided. Standard dimensions for each toroid are listed in the parts chart, and coating will alter these. Inductance values are as shown for standard sizes and cores are checked after coating to ensure compliance.

PARYLENE

Parylene is ideally suited for core sizes with outside diameters less than 9.5 mm (0.375”). Parylene is a highly conformal coating with uniform thickness even around corners and edges. It is applied by vapor deposition, which prevents clogging of small openings. The addition of Parylene results in very little increase in core size. It has a high resistivity and a low coefficient of friction (close to that of Teflon), which results in low wire insulation abrasion during winding. Parylene’s relatively low dielectric constant is 2.95, resulting in only a small increase of winding-to-core capacitance. After coating, cores are Hi-Pot tested to 1000 VAC volts for single thickness. Higher voltages available upon request via additional coating thicknesses.

EPOXY

Epoxy coating is the choice for cores about 9.5mm (0.375”) diameter or larger. It is applied by spraying. Because of its thickness, epoxy coating provides some cushioning during winding. Epoxy coating provides inherent toughness, corrosion resistance, and very good adhesion. These properties are retained even after long term heat aging. After coating, cores are Hi-Pot tested to 1000 VAC.

COMMON MODE MATERIALS - 35, 28, 25, 38

TYPICAL VALUES			35 Low Frequency	28 Mid Frequency	25 High Frequency	38 Broad Frequency
PARAMETER	SYMBOL	UNIT				
Relative Initial Permeability	μi		5000	850	125	1700
A_L Tolerance		%	± 20	± 20	± 30	± 30
Saturation Flux Density	B_S	Gauss	4500	3250	3600	3000
		mT	450	325	360	300
at Field Intensity	H	Oersteds	10	10	10	10
		A/m	800	800	800	800
Residual Flux Density	B_r	Gauss	1000	2000	2600	1500
		mT	100	200	260	150
Coercive Force	H_C	Oersteds	0.10	0.40	1.60	0.20
		A/m	8	3	127	16
Relative Loss Factor at Frequency	$\tan\delta / \mu i$ f	10^{-6} MHz	20 0.10	91 0.10	740 0.10	53 0.10
Curie Temperature	T_C	°C	> 150	> 175	> 225	> 120
Resistivity	ρ	Ω-cm	100	10^5	10^6	10^5
Density		g/cm³	4.8	4.9	4.9	4.8

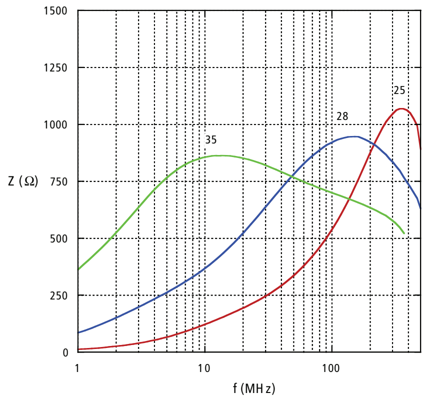
Impedance with 10 Turns Nominal Values				
Part Number	Low Frequency 35 Material @ 10 MHz	Mid Frequency 28 Material @ 150 MHz	High Frequency 25 Material @ 300 MHz	Broad Frequency 38 Material @ 100 MHz
T0100-00	1001	1567	714	966
T0100-20	601	939	434	656
T0119-00	1189	1606	892	1689
T0120-00	878	1268	663	1248
T0135-00	1021	1288	748	1058
T0135-60	1214	1541	895	1269
T0155-10	839	1053	644	911
T0231-00	1109	1409	874	1257

EFFECT OF TURNS ON IMPEDANCE

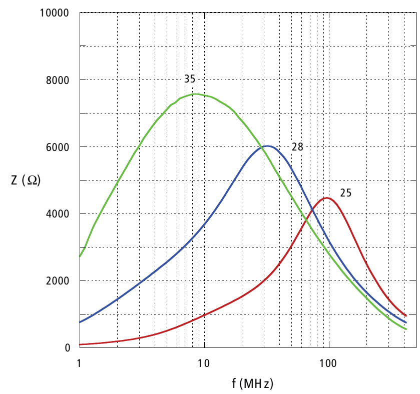
Ideally, impedance would be proportional to frequency and the square of the number of turns regardless of the magnitude of either. This is generally the case at very low frequencies, but becomes less valid as frequency increases. The predominant cause of such behavior is interwinding capacitance. Capacitance is directly proportional to the area of the conductor and inversely proportional to the distance between the conductors. As the number of turns increases, the area of the conductor (the length of the wire) increases and the distance between the conductors (the spacing between turns) decreases. The end result is an LC resonance above which capacitive reactance decreases impedance. The number of turns, their spacing, and the uniformity of their spacing are major factors in the frequency response of wound toroidal filters and must therefore be carefully considered in their assembly.

COMPARING MATERIALS

_ _ T0155-10P @ 10 Turns
"Core Size 3.94 (O.D.) x 2.24 (I.D.) x 1.27 (H.T.)"



_ _ T0155-10P @ 30 Turns
"Core Size 3.94 (O.D.) x 2.24 (I.D.) x 1.27 (H.T.)"



PERFORMANCE OF DIFFERING PERMEABILITY COMMON MODE MATERIALS

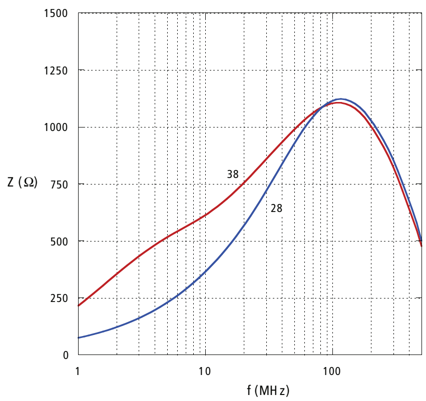
Impedance cores are used to suppress unintended signals on or being emitted from cables or wires. If these signals are not accounted for, they can interfere with electronics and/or cause a failure to meet government emissions standards or susceptibility regulations. The cores suppress unintended signals by acting on the magnetic fields that surround the cable or wire.

When a signal travels through a conductor, a magnetic field is generated around that conductor. A ferrite core, if placed around the conductor, can interact with this magnetic field. The magnetic field activates the ferrite, which, in response to the magnetic field, imposes impedance that reduces the magnitude of the unintended signal.

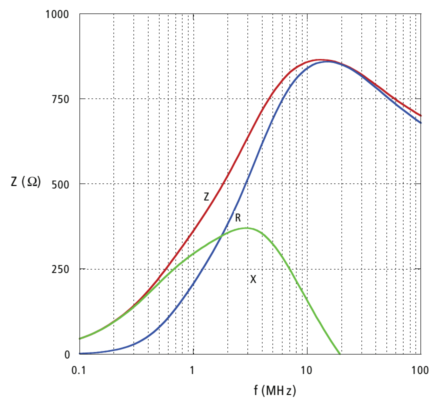
The impedance (Z) that weakens the unintended signal, consists of two components. The first is a reactive component (X). It represents the amount of inductance that exists in the core as a function of frequency. In other words, X = 2 * p * frequency * inductance (L). The second is a resistive component (R). It results from the core's natural tendency to resist an electrical signal, in this case a magnetic field. The resulting impedance is the square root of the sum of the squares of the resistance and reactance, or $\sqrt{Z = (R^2 + X^2)}$, which is measured in ohms.

Laird Technologies low frequency cores have high permeability, resulting in suppression of low frequency signals. As demonstrated in the following chart, the impedance at very low frequencies is principally contributed by the X. At higher frequencies the R predominates.

_ _ T0100-10P @ 10 Turns
"Core Size 2.54 (O.D.) x 1.27 (I.D.) x 1.27 (H.T.)"



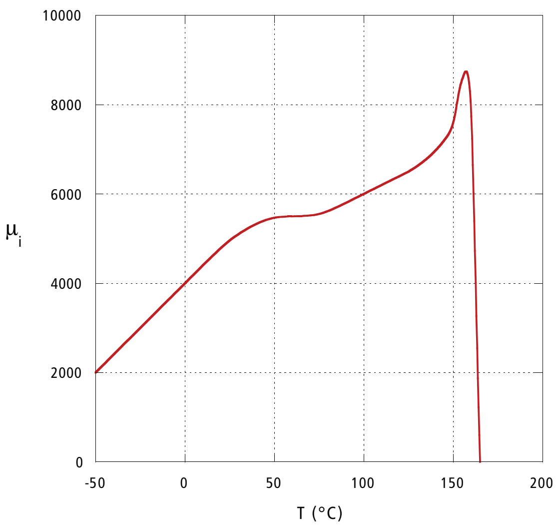
35T0155-00P @ 10 Turns
Z, R, X vs. Frequency



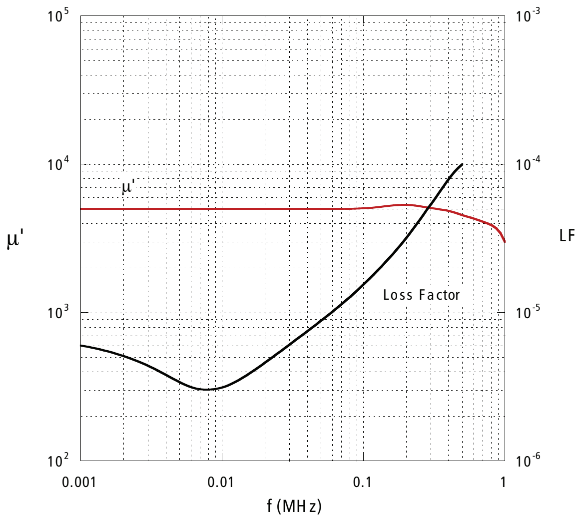
MATERIAL 35
COMMON MODE LOW FREQUENCY

5000 PERMEABILITY

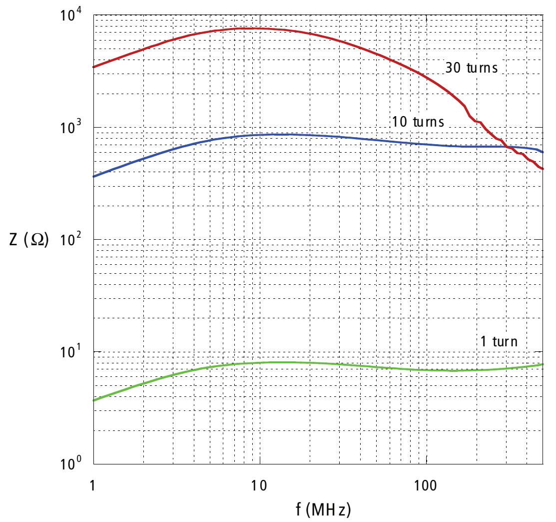
Initial Permeability vs. Temperature



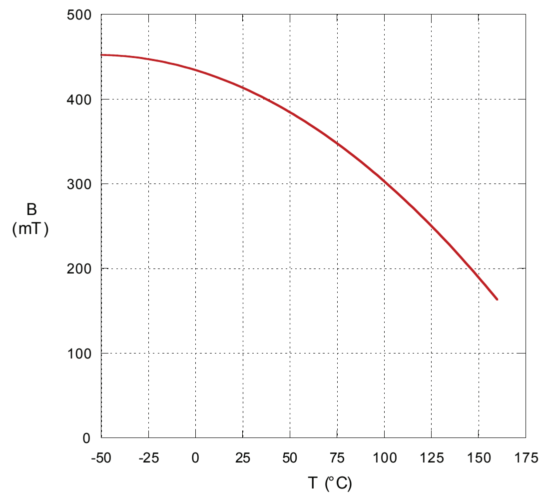
Permeability & Loss Factor vs. Frequency



Comparing Turns - 35T0155-10P



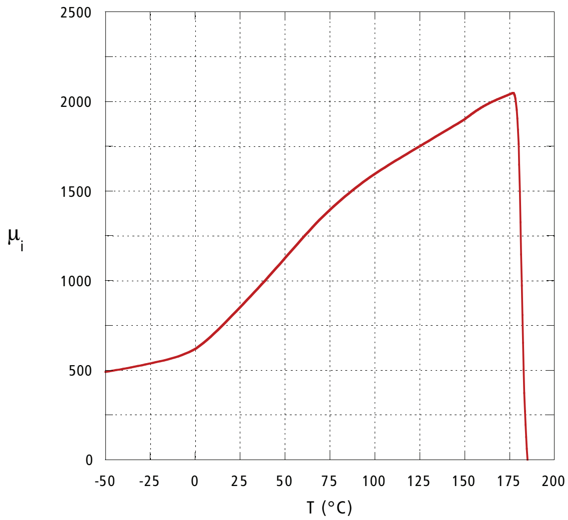
Saturation Flux Density vs. Temperature



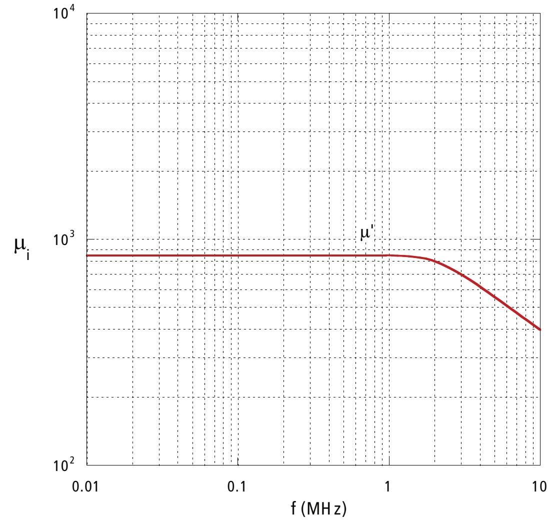
MATERIAL 28
COMMON MODE MID FREQUENCY

850 PERMEABILITY

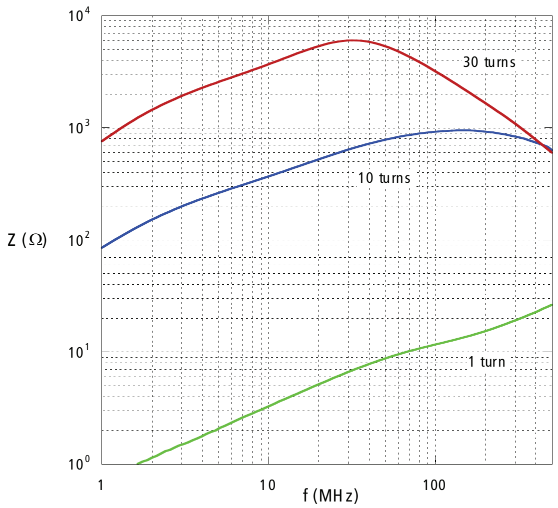
Initial Permeability vs. Temperature



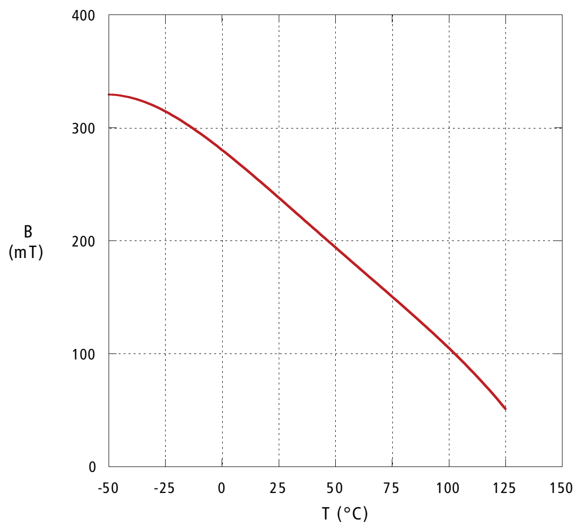
Permeability vs. Frequency



Comparing Turns - 28T0155-10P



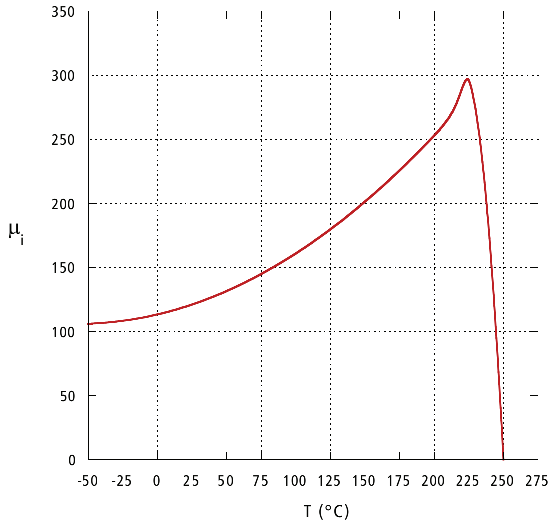
Saturation Flux Density vs. Temperature



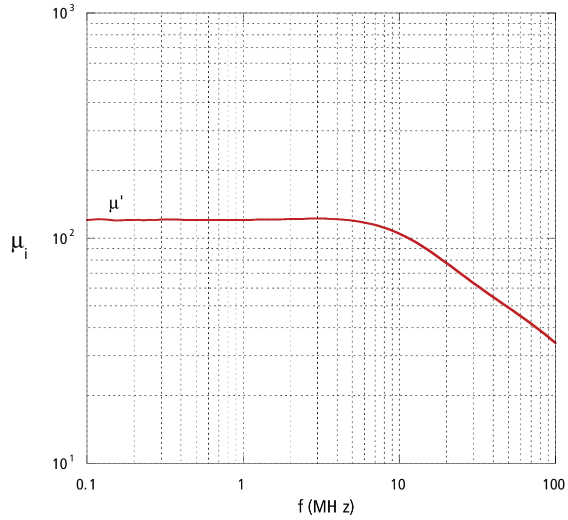
MATERIAL 25
COMMON MODE HIGH FREQUENCY

125 PERMEABILITY

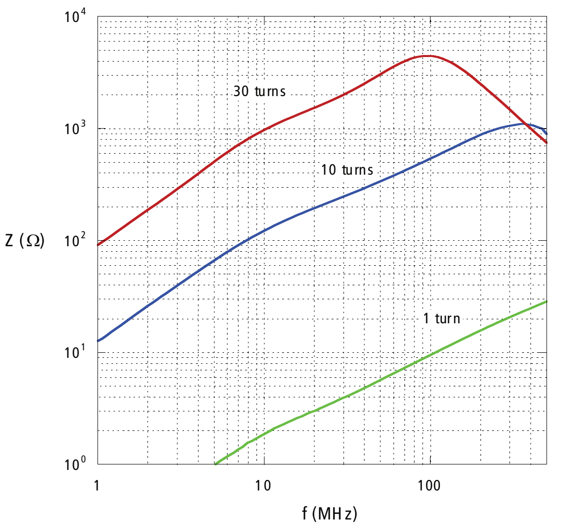
Initial Permeability vs. Temperature



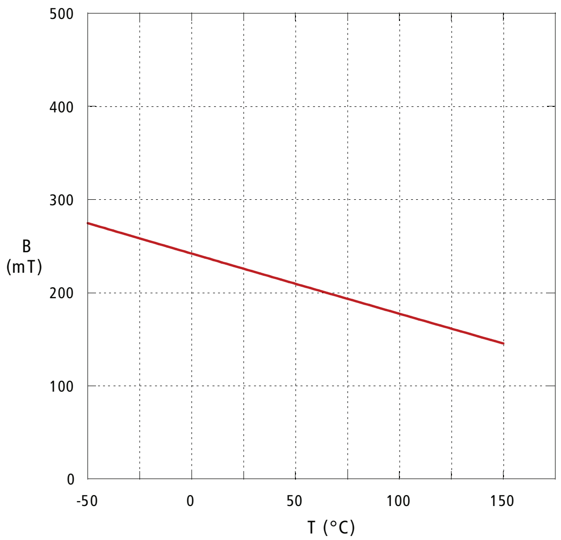
Permeability vs. Frequency



Comparing Turns - 25T0155-10P



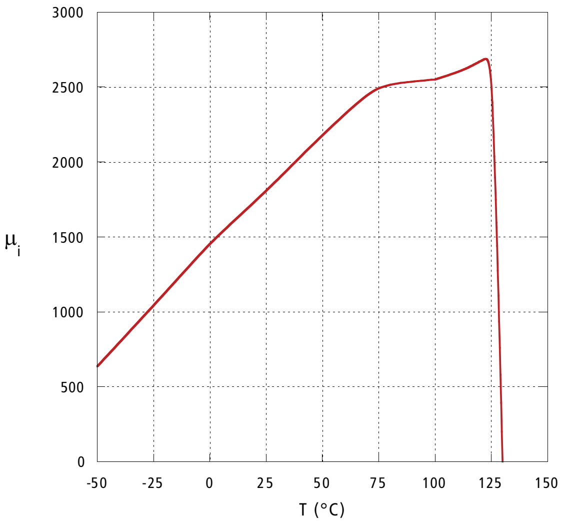
Saturation Flux Denasity vs. Temperature



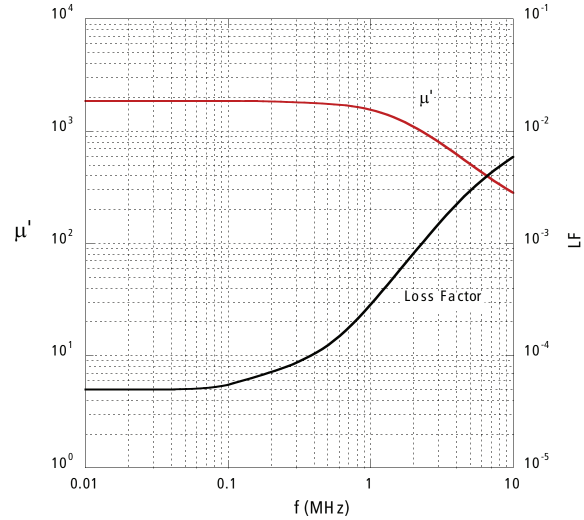
MATERIAL 38
COMMON MODE BROAD FREQUENCY

1,700 PERMEABILITY

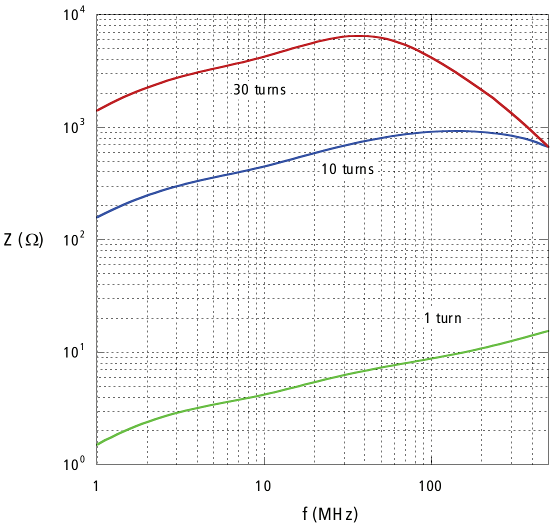
Initial Permeability vs. Temperature



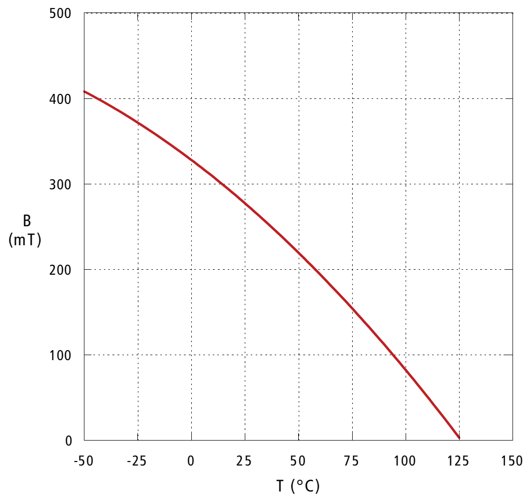
Permeability & Loss Factor vs. Frequency



Comparing Turns - 38T0155-10P



Saturation Flux Density vs. Temperature



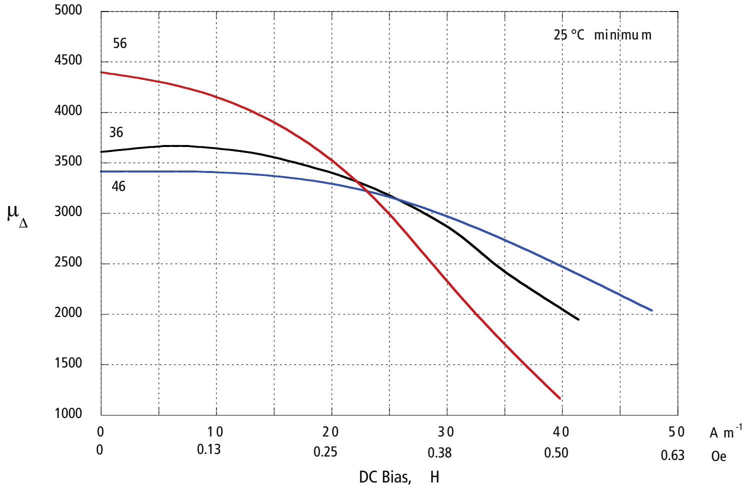
DC BIAS MATERIALS 36, 46, 56, 66

TYPICAL VALUES			DC BIAS MATERIALS			
PARAMETER	SYMBOL	UNIT	36 DC Bias Standard Temp	46 DC Bias Extended Temp	56 Low DC Bias High Perm	66 High DC Bias Extended Temp
Relative Initial Permeability	μi		4500	4000	5500	3200
A_L Tolerance		%	± 25	± 25	± 25	± 25
Saturation Flux Density	B_s	Gauss	4500	4500	4500	4800
		mT	450	450	450	480
at Field Intensity	*H*	Oersteds	10	10	10	10
		A/m	800	800	800	800
Residual Flux Density	B_r	Gauss	1000	1000	1000	1300
		mT	100	100	100	130
Coercive Force	H_c	Oersteds	0.10	0.10	0.10	0.125
		A/m	8	8	8	10
Relative Loss Factor at Frequency	tan d m i f	10^{-6} MHz	10 0.10	10 0.10	15 0.10	2 0.10
Curie Temperature	T_c	°C	> 150	> 150	> 130	> 200
Resistivity	ρ	Ω-cm	10^2	10^2	10^2	500
Density		g/cm³	4.8	4.8	4.8	4.9

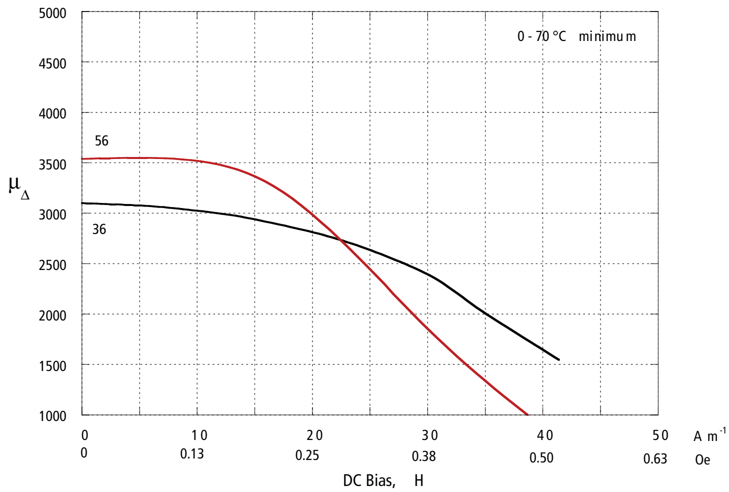
Minimum A_L Values (nH/T²)	DC Bias Standard Temp Material 36			DC Bias Extended Temp Material 46			Low DC Bias High Perm Material 56		
	A_L Target	A_L .35 Oe Bias Min		A_L Target	A_L .35 Oe Bias Min		A_L Target	A_L .125 Oe Bias Min	
Part Numbers	25°C	25°C	0°C to 70°C	25°C	25°C	-40°C to 80°C	25°C	25°C	0°C to 70°C
T0100-40	1188	1063	884	1056	1074	746	1452	1358	1074
T0115-00	703	629	523	625	636	442	860	804	636
T0115-10	955	853	710	848	864	600	1167	1091	863
T0119-40	1501	1342	1117	1334	1358	943	1835	1718	1356
T0120-80	739	661	550	657	668	464	904	846	668
T0122-30	988	883	735	878	894	621			
T0135-10	912	815	679	811	825	573			
T0153-60	818	731	608	727	740	514			

COMPARING MATERIALS

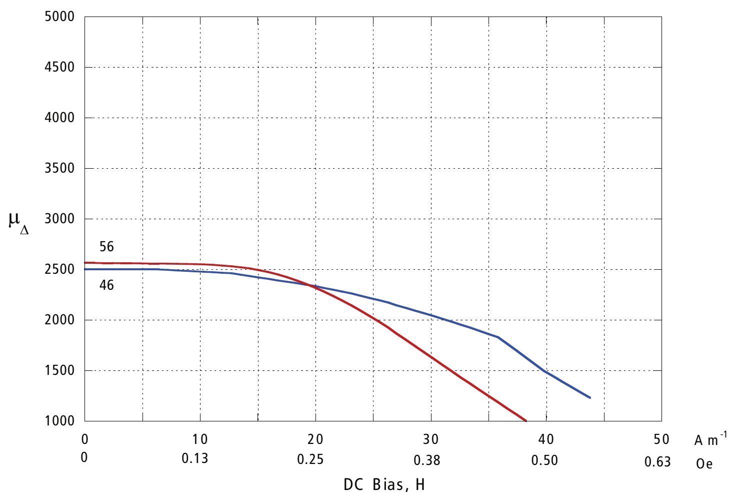
25°C Minimum Permeability



0°C to 70°C Minimum Permeability

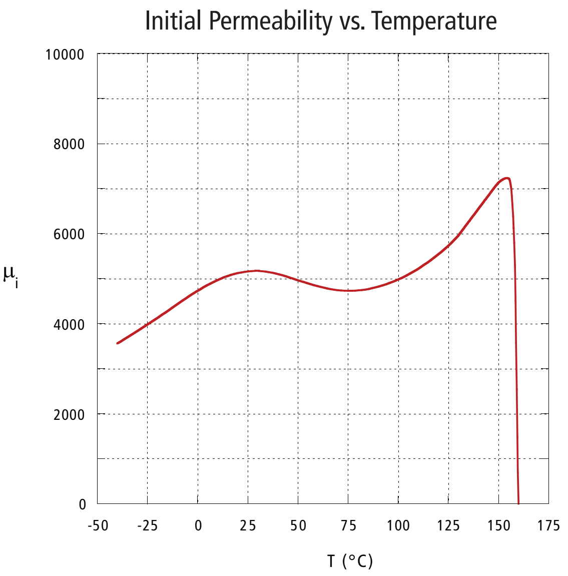


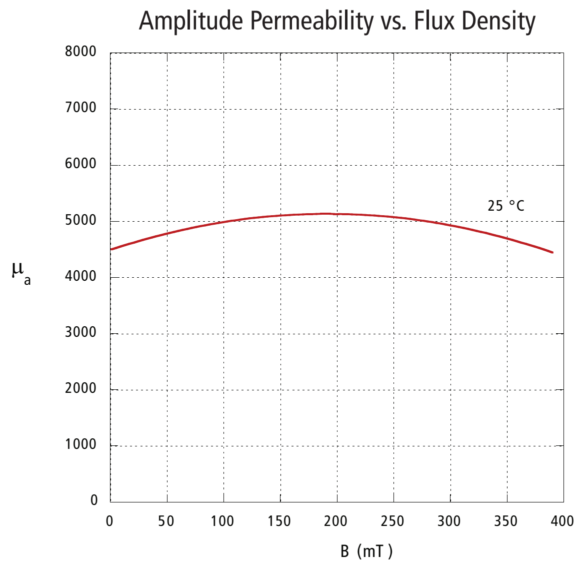
-40°C to 85°C Minimum Permeability

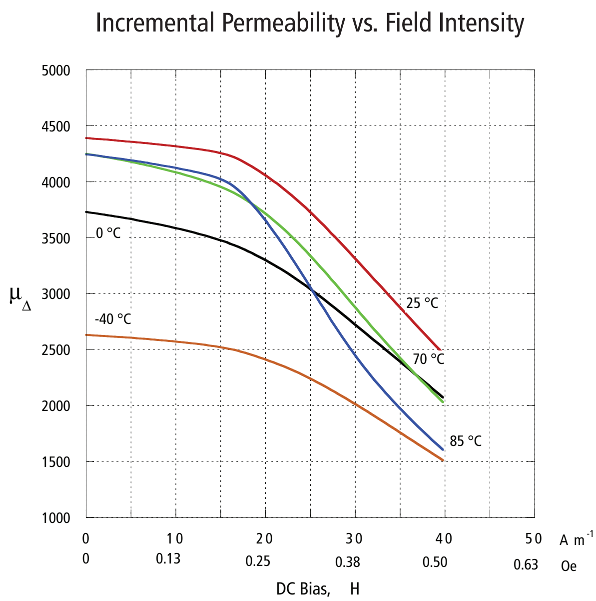


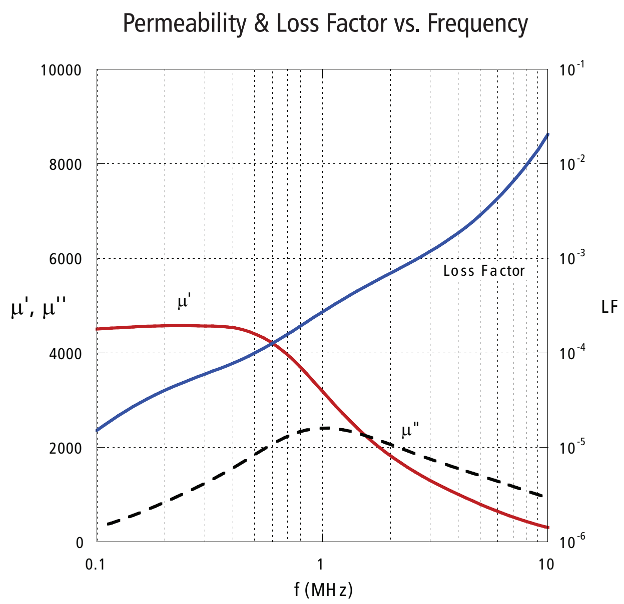
MATERIAL 36
DC BIAS STANDARD TEMPERATURE (0°C TO 70°C)

4,500 PERMEABILITY







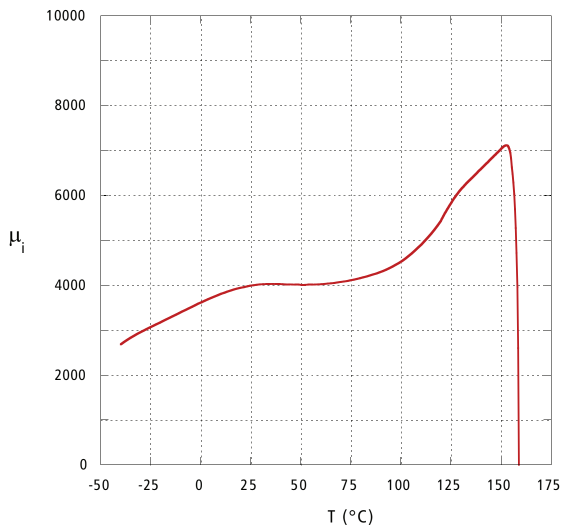


MATERIAL 46

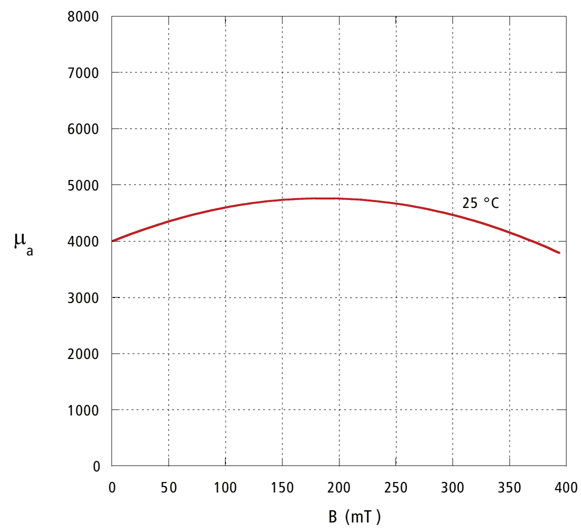
DC BIAS EXTENDED TEMPERATURE (-40°C TO 85°C)

4,000 PERMEABILITY

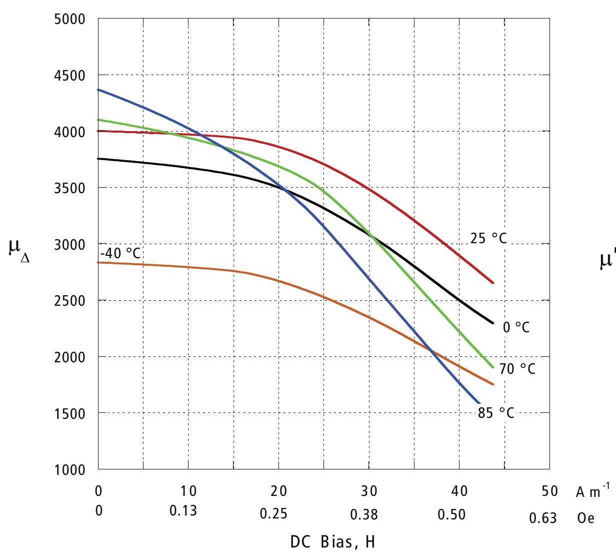
Initial Permeability vs. Temperature



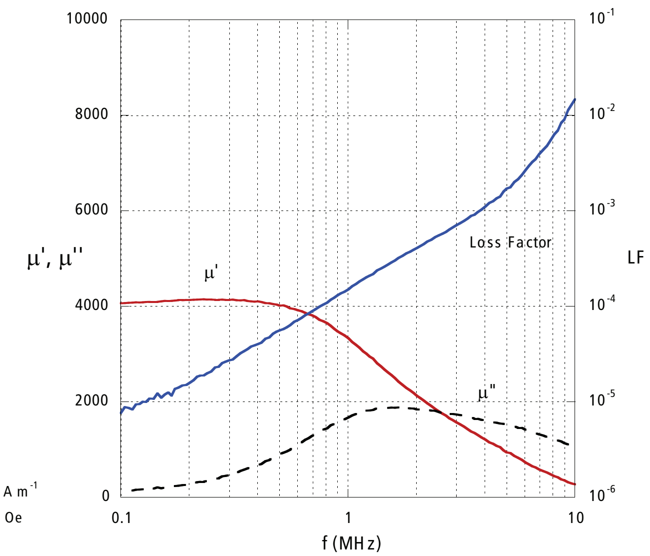
Amplitude Permeability vs. Flux Density



Incremental Permeability vs. Field Intensity



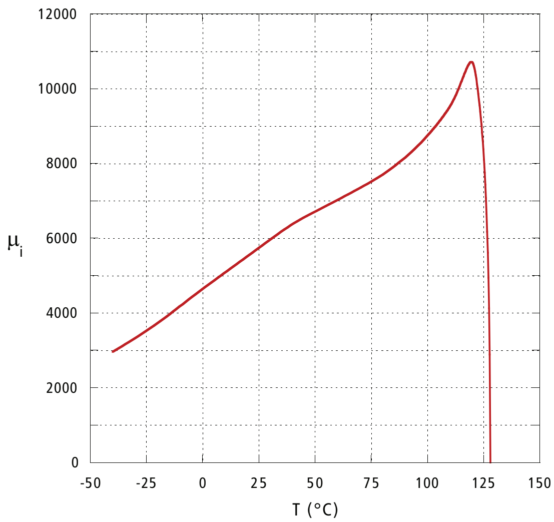
Permeability & Loss Factor vs. Frequency



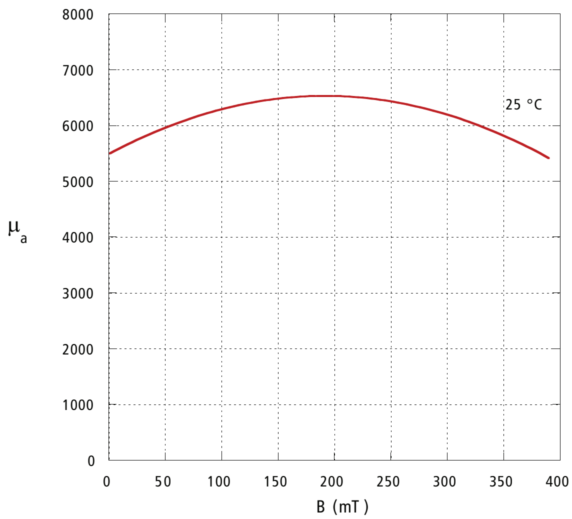
MATERIAL 56
LOW DC BIAS - HIGH PERMEABILITY

5,500 PERMEABILITY

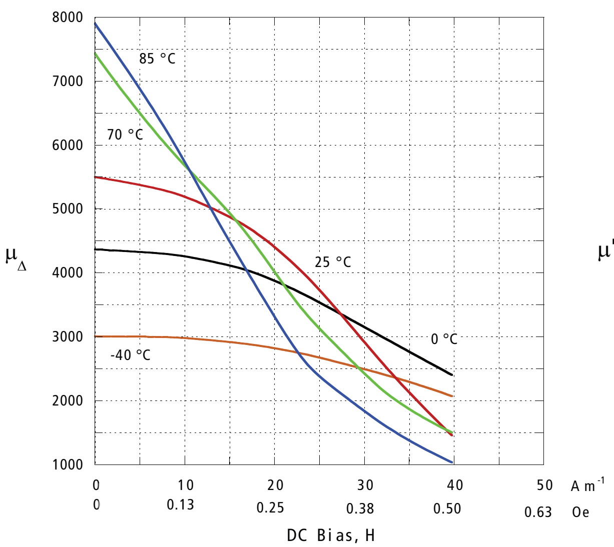
Initial Permeability vs. Temperature



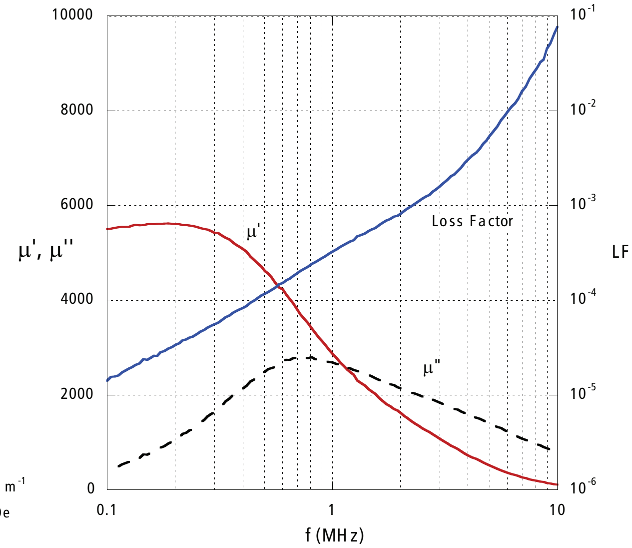
Amplitude Permeability vs. Flux Density



Incremental Permeability vs. Field Intensity



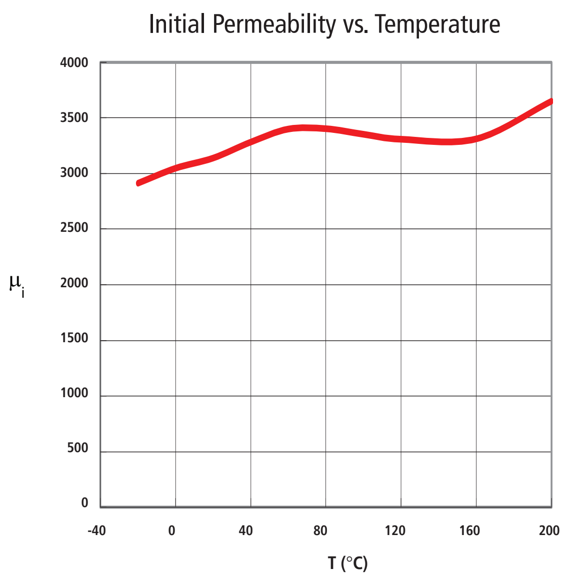
Permeability & Loss Factor vs. Frequency

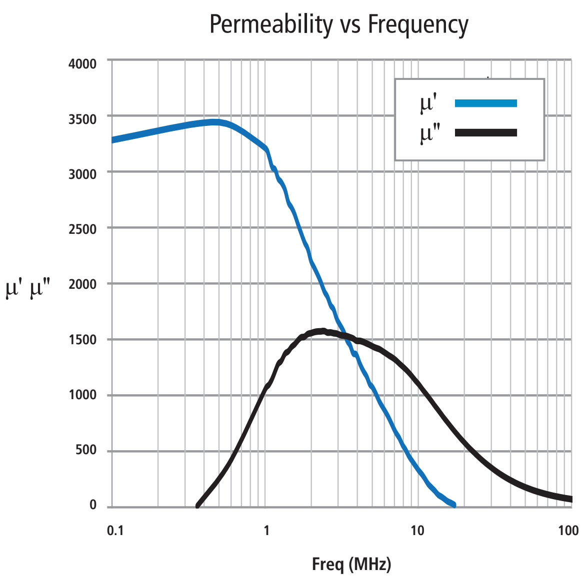


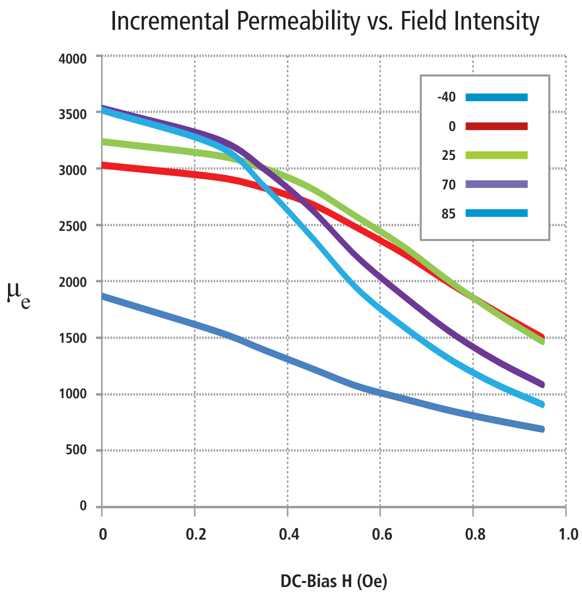
MATERIAL 66

HIGH DC BIAS EXTENDED TEMPERATURE PoE/PoE+ APPLICATION (-40°C TO 85°C)

3,200 PERMEABILITY







MATERIALS 36/46

MINIMUM INDUCTANCE WITH VARIOUS TURNS (8 mA DC BIAS)

Part	16 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C	18 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C
100-2	0.29	89	73	- -	- -	0.33	106	88	- -	- -
100-4	0.29	295	245	291	204	0.33	355	295	356	248
115-0	0.24	183	151	177	125	0.27	226	187	220	155
115-1	0.24	249	206	240	170	0.27	307	254	299	211
119-4	0.27	381	316	372	262	0.30	467	387	461	323
120-8	0.22	195	161	187	133	0.25	242	200	234	166
121-2	0.24	- -	- -	214	152	0.27	- -	- -	267	188
122-3	0.23	259	214	249	177	0.26	321	266	311	220
135-0	0.21	150	124	143	102	0.24	186	152	179	127
135-1	0.21	243	201	232	166	0.24	301	249	290	206
135-2	0.21	102	84	- -	- -	0.24	126	104	- -	- -
135-4	0.21	210	173	- -	- -	0.24	260	215	- -	- -
135-6	0.21	180	149	- -	- -	0.24	223	184	- -	- -
137-0	0.23	109	90	- -	- -	0.26	136	112	- -	- -
145-0	0.21	- -	- -	350	250	0.24	- -	- -	438	310
153-0	0.20	183	151	- -	- -	0.22	228	188	- -	- -
153-4	0.20	365	302	- -	- -	0.22	456	377	- -	- -

Part	20 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C	22 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C
100-2	0.36	125	105	- -	- -	0.40	140	117	- -	- -
100-4	0.36	418	348	427	295	0.40	466	389	493	338
115-0	0.30	270	224	267	187	0.33	314	261	315	219
115-1	0.30	367	304	362	253	0.33	426	354	428	297
119-4	0.34	546	453	551	382	0.37	628	524	646	445
120-8	0.28	290	240	284	200	0.31	339	281	337	235
121-2	0.30	- -	- -	323	226	0.33	- -	- -	381	265
122-3	0.29	384	318	378	265	0.32	447	371	446	311
135-0	0.26	226	187	219	155	0.29	265	219	260	183
135-1	0.26	366	303	355	251	0.29	429	355	422	296
135-2	0.26	154	127	- -	- -	0.29	180	149	- -	- -
135-4	0.26	316	262	- -	- -	0.29	370	307	- -	- -
135-6	0.26	271	224	- -	- -	0.29	318	263	- -	- -
137-0	0.29	162	134	- -	- -	0.32	189	157	- -	- -
145-0	0.27	- -	- -	532	375	0.29	- -	- -	636	446
153-0	0.25	275	228	- -	- -	0.27	327	271	- -	- -
153-4	0.25	551	455	- -	- -	0.27	655	542	- -	- -

Part	24 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C	26 turns H (Oe)	36 25 C	36 0-70 C	46 25 C	46 -40-85 C
100-2	0.44	147	122	- -	- -	0.47	160	131	- -	- -
100-4	0.44	489	407	555	378	0.47	533	436	622	404
115-0	0.36	356	297	364	251	0.39	397	333	413	283
115-1	0.36	484	403	494	341	0.39	539	451	560	385
119-4	0.40	700	585	741	508	0.44	725	603	823	560
120-8	0.33	392	326	394	274	0.36	440	366	449	310
121-2	0.36	- -	- -	441	304	0.39	- -	- -	500	343
122-3	0.35	509	423	517	357	0.38	568	475	587	404
135-0	0.32	303	252	303	211	0.34	346	287	349	242
135-1	0.32	491	407	490	342	0.34	560	466	565	392
135-2	0.32	206	171	- -	- -	0.34	235	195	- -	- -
135-4	0.32	424	352	- -	- -	0.34	484	402	- -	- -
135-6	0.32	364	302	- -	- -	0.34	415	345	- -	- -
137-0	0.35	215	179	- -	- -	0.37	244	203	- -	- -
145-0	0.32	- -	- -	740	515	0.35	- -	- -	844	584
153-0	0.30	377	312	- -	- -	0.32	430	357	- -	- -
153-4	0.30	754	625	- -	- -	0.32	861	715	- -	- -

MATERIALS 36/46

MINIMUM INDUCTANCE WITH VARIOUS TURNS (8 mA DC BIAS)

Part	30 turns					28 turns				
	H	36		46		H	36		46	
	(Oe)	25 C	0-70 C	25 C	-40-85 C	(Oe)	25 C	0-70 C	25 C	-40-85 C
100-2	0.55	- -	- -	- -	- -	0.51	166	133	- -	- -
100-4	0.55	- -	- -	- -	- -	0.51	554	443	674	398
115-0	0.45	442	365	506	343	0.42	418	348	460	314
115-1	0.45	599	496	687	466	0.42	567	472	625	427
119-4	0.50	826	665	994	599	0.47	780	639	911	592
120-8	0.42	504	420	556	379	0.39	484	405	503	345
121-2	0.45	- -	- -	612	416	0.42	- -	- -	557	381
122-3	0.43	651	541	732	499	0.41	607	507	656	448
135-0	0.40	410	343	435	298	0.37	382	319	392	270
135-1	0.40	665	555	704	482	0.37	618	516	636	438
135-2	0.40	279	233	- -	- -	0.37	260	217	- -	- -
135-4	0.40	574	480	- -	- -	0.37	534	446	- -	- -
135-6	0.40	492	411	- -	- -	0.37	458	382	- -	- -
137-0	0.43	275	228	- -	- -	0.40	265	221	- -	- -
145-0	0.40	- -	- -	1062	727	0.37	- -	- -	959	661
153-0	0.37	530	443	- -	- -	0.35	478	397	- -	- -
153-4	0.37	1061	885	- -	- -	0.35	955	795	- -	- -

Part	32 turns					34 turns				
	H	36		46		H	36		46	
	(Oe)	25 C	0-70 C	25 C	-40-85 C	(Oe)	25 C	0-70 C	25 C	-40-85 C
100-2	0.58	- -	- -	- -	- -	0.62	- -	- -	- -	- -
100-4	0.58	- -	- -	- -	- -	0.62	- -	- -	- -	- -
115-0	0.48	465	379	549	348	0.51	483	386	588	348
115-1	0.48	631	514	744	472	0.51	656	525	798	472
119-4	0.54	- -	- -	1051	584	0.57	- -	- -	- -	- -
120-8	0.45	528	437	605	410	0.47	567	464	662	430
121-2	0.48	- -	- -	664	421	0.51	- -	- -	712	421
122-3	0.46	689	567	796	529	0.49	718	582	855	529
135-0	0.42	437	364	481	329	0.45	454	376	520	353
135-1	0.42	708	589	780	533	0.45	736	608	843	572
135-2	0.42	297	247	- -	- -	0.45	309	255	- -	- -
135-4	0.42	612	509	- -	- -	0.45	636	526	- -	- -
135-6	0.42	524	437	- -	- -	0.45	545	451	- -	- -
137-0	0.46	291	239	- -	- -	0.49	303	246	- -	- -
145-0	0.43	- -	- -	1160	790	0.45	- -	- -	1271	862
153-0	0.40	565	472	- -	- -	0.42	597	497	- -	- -
153-4	0.40	1130	944	- -	- -	0.42	1194	994	- -	- -

Part	36 turns					38 turns				
	H	36		46		H	36		46	
	(Oe)	25 C	0-70 C	25 C	-40-85 C	(Oe)	25 C	0-70 C	25 C	-40-85 C
100-2	0.65	- -	- -	- -	- -	0.69	- -	- -	- -	- -
100-4	0.65	- -	- -	- -	- -	0.69	- -	- -	- -	- -
115-0	0.54	- -	- -	623	346	0.57	- -	- -	- -	- -
115-1	0.54	- -	- -	846	470	0.57	- -	- -	- -	- -
119-4	0.60	- -	- -	- -	- -	0.64	- -	- -	- -	- -
120-8	0.50	586	472	705	425	0.53	- -	- -	744	423
121-2	0.55	- -	- -	740	402	0.58	- -	- -	- -	- -
122-3	0.52	739	587	909	527	0.55	- -	- -	956	520
135-0	0.47	484	396	565	367	0.50	497	400	598	360
135-1	0.47	784	642	915	595	0.50	805	648	969	584
135-2	0.47	329	270	- -	- -	0.50	338	272	- -	- -
135-4	0.47	678	555	- -	- -	0.50	696	560	- -	- -
135-6	0.47	581	476	- -	- -	0.50	597	480	- -	- -
137-0	0.52	312	248	- -	- -	0.55	- -	- -	- -	- -
145-0	0.48	- -	- -	1358	862	0.51	- -	- -	1436	849
153-0	0.45	616	510	- -	- -	0.47	653	534	- -	- -
153-4	0.45	1232	1019	- -	- -	0.47	1305	1069	- -	- -

MATERIALS 66

MINIMUM INDUCTANCE WITH VARIOUS TURNS

Part	20 turns (25°C)						20 turns (0-70°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	466	443	421	369	287	- -	439	405	375	312	228	- -
66T0153-40P	397	378	359	314	244	- -	375	346	319	266	194	- -
66T0154-70P	423	399	378	325	- -	- -	397	362	334	272	- -	- -
66T0155-00P	296	285	271	246	202	189	279	270	249	215	166	153
66T0157-00P	281	267	254	229	184	170	265	250	231	198	150	135
66T0175-20P	353	343	329	303	253	238	332	323	309	271	212	195
66T0190-80P	469	457	440	404	346	325	440	430	416	365	292	270
66T0190-70P	702	684	659	606	518	487	659	644	623	548	438	404
66T0220-00P	481	473	464	440	394	379	451	444	436	416	351	332
66T0231-10P	433	427	419	403	365	352	405	400	393	380	331	314
66T0231-70P	610	602	590	567	513	496	571	564	554	535	466	442
66T0238-00P	499	492	482	463	419	405	467	461	452	437	381	361

Part	20 turns (-40-+85°C)						22 turns (25°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	231	215	204	181	152	- -	540	513	479	403	- -	- -
66T0153-40P	197	183	174	154	129	- -	461	438	408	344	- -	- -
66T0154-70P	209	193	183	161	- -	- -	491	458	424	355	- -	- -
66T0155-00P	150	142	132	119	102	97	348	331	314	278	220	- -
66T0157-00P	141	132	123	111	94	89	326	310	295	254	197	- -
66T0175-20P	182	173	163	147	125	120	418	399	382	345	280	258
66T0190-80P	245	232	219	196	170	162	555	532	511	464	383	353
66T0190-70P	366	348	328	294	254	242	832	798	765	695	574	529
66T0220-00P	259	249	239	219	191	184	575	561	549	510	449	423
66T0231-10P	236	227	219	203	177	170	519	509	499	468	419	401
66T0231-70P	333	320	308	286	249	240	731	717	703	659	589	565
66T0238-00P	272	262	251	233	203	196	597	586	571	538	482	461

Part	22 turns (0-70°C)						22 turns (-40-+85°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	497	460	416	332	- -	- -	262	249	233	203	- -	- -
66T0153-40P	423	392	354	283	- -	- -	224	212	198	173	- -	- -
66T0154-70P	449	404	363	288	- -	- -	238	221	207	181	- -	- -
66T0155-00P	328	306	283	237	176	- -	174	161	152	136	115	- -
66T0157-00P	306	283	261	213	155	- -	161	151	143	125	105	- -
66T0175-20P	394	374	350	301	229	207	211	197	185	168	142	135
66T0190-80P	523	503	472	407	316	286	284	265	249	224	192	182
66T0190-70P	783	754	707	610	473	428	425	397	373	336	288	272
66T0220-00P	539	527	518	472	389	359	305	290	278	249	218	207
66T0231-10P	486	478	469	439	369	348	278	267	256	231	202	195
66T0231-70P	684	673	661	619	520	490	391	376	361	325	285	274
66T0238-00P	559	550	537	505	425	400	320	307	292	266	233	224

MATERIALS 66
MINIMUM INDUCTANCE WITH VARIOUS TURNS

Part	24 turns (25°C)						24 turns (0-70°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	616	577	531	437	- -	- -	554	502	449	352	- -	- -
66T0153-40P	525	491	453	372	- -	- -	473	428	383	300	- -	- -
66T0154-70P	554	516	469	383	- -	- -	494	446	392	306	- -	- -
66T0155-00P	400	377	354	303	- -	- -	374	341	310	252	- -	- -
66T0157-00P	376	354	329	277	- -	- -	345	315	284	227	- -	- -
66T0175-20P	482	459	436	379	299	- -	456	422	390	320	238	- -
66T0190-80P	644	613	582	516	409	375	608	569	526	442	329	297
66T0190-70P	965	918	873	773	613	562	910	853	788	662	493	444
66T0220-00P	671	654	633	582	497	467	630	616	599	526	420	388
66T0231-10P	609	594	580	534	472	445	571	558	547	489	408	376
66T0231-70P	858	836	817	752	664	626	804	786	770	688	574	529
66T0238-00P	701	683	667	614	537	512	657	642	629	562	462	433

Part	24 turns (-40-+85°C)						26 turns (25°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	299	280	261	227	- -	- -	692	631	571	- -	- -	- -
66T0153-40P	255	238	222	193	- -	- -	590	538	487	- -	- -	- -
66T0154-70P	268	251	232	202	- -	- -	620	564	509	- -	- -	- -
66T0155-00P	197	183	171	151	- -	- -	451	424	392	328	- -	- -
66T0157-00P	182	171	160	140	- -	- -	422	395	360	295	- -	- -
66T0175-20P	240	223	211	186	157	- -	547	516	488	412	- -	- -
66T0190-80P	323	300	282	252	212	201	731	689	654	563	- -	- -
66T0190-70P	484	450	423	377	318	301	1096	1033	980	843	- -	- -
66T0220-00P	348	330	315	282	244	233	775	749	713	654	542	500
66T0231-10P	321	305	292	259	230	218	704	686	659	606	515	484
66T0231-70P	452	430	411	365	323	307	992	966	928	853	726	682
66T0238-00P	370	351	336	298	262	251	810	789	758	697	586	550

Part	26 turns (0-70°C)						26 turns (-40-+85°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	607	536	471	- -	- -	- -	335	309	287	- -	- -	- -
66T0153-40P	518	457	402	- -	- -	- -	285	263	244	- -	- -	- -
66T0154-70P	540	474	417	- -	- -	- -	300	277	257	- -	- -	- -
66T0155-00P	411	374	336	267	- -	- -	219	205	191	167	- -	- -
66T0157-00P	380	344	303	237	- -	- -	205	192	177	154	- -	- -
66T0175-20P	509	464	427	341	- -	- -	268	250	236	206	- -	- -
66T0190-80P	687	626	577	471	- -	- -	361	334	316	279	- -	- -
66T0190-70P	1029	938	865	705	- -	- -	541	501	474	417	- -	- -
66T0220-00P	730	708	659	577	448	405	396	374	348	316	271	256
66T0231-10P	661	646	622	545	434	401	366	347	327	293	253	242
66T0231-70P	931	910	876	767	611	565	515	488	460	413	357	341
66T0238-00P	761	744	715	627	492	454	421	399	376	338	289	276

MATERIALS 66
MINIMUM INDUCTANCE WITH VARIOUS TURNS

Part	28 turns (25°C)						28 turns (0-70°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	758	688	611	- -	- -	- -	653	574	494	- -	- -	- -
66T0153-40P	646	587	521	- -	- -	- -	556	489	421	- -	- -	- -
66T0154-70P	678	606	537	- -	- -	- -	578	500	431	- -	- -	- -
66T0155-00P	505	466	423	346	- -	- -	452	402	354	276	- -	- -
66T0157-00P	469	427	387	- -	- -	- -	411	363	319	- -	- -	- -
66T0175-20P	614	577	528	442	- -	- -	559	509	451	358	- -	- -
66T0190-80P	820	772	719	604	- -	- -	754	688	621	495	- -	- -
66T0190-70P	1229	1157	1077	905	- -	- -	1130	1031	931	741	- -	- -
66T0220-00P	883	841	799	718	572	534	832	785	725	621	463	426
66T0231-10P	804	770	739	672	554	518	756	729	683	590	457	420
66T0231-70P	1132	1085	1041	946	781	730	1065	1026	962	830	644	592
66T0238-00P	925	887	850	773	638	589	870	838	786	679	526	476

Part	28 turns (-40-+85°C)						30 turns (25°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	370	342	314	- -	- -	- -	830	730	645	- -	- -	- -
66T0153-40P	315	291	268	- -	- -	- -	707	622	550	- -	- -	- -
66T0154-70P	331	304	280	- -	- -	- -	732	642	- -	- -	- -	- -
66T0155-00P	245	227	209	182	- -	- -	553	504	455	- -	- -	- -
66T0157-00P	227	209	194	- -	- -	- -	514	461	415	- -	- -	- -
66T0175-20P	298	279	258	226	- -	- -	681	628	570	466	- -	- -
66T0190-80P	398	374	350	306	- -	- -	910	844	778	639	- -	- -
66T0190-70P	597	560	524	458	- -	- -	1364	1265	1165	958	- -	- -
66T0220-00P	444	413	388	349	294	281	989	933	886	777	604	- -
66T0231-10P	411	384	360	325	278	266	906	863	820	737	587	540
66T0231-70P	578	540	508	457	392	374	1276	1215	1155	1038	827	760
66T0238-00P	473	441	415	374	320	303	1043	993	944	839	676	621

Part	30 turns (0-70°C)						30 turns (-40-+85°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	702	596	513	- -	- -	- -	407	371	341	- -	- -	- -
66T0153-40P	598	508	437	- -	- -	- -	347	316	291	- -	- -	- -
66T0154-70P	612	519	- -	- -	- -	- -	362	330	- -	- -	- -	- -
66T0155-00P	484	426	374	- -	- -	- -	268	247	229	- -	- -	- -
66T0157-00P	444	385	337	- -	- -	- -	250	229	213	- -	- -	- -
66T0175-20P	609	543	477	372	- -	- -	330	305	282	246	- -	- -
66T0190-80P	822	735	657	515	- -	- -	441	409	381	332	- -	- -
66T0190-70P	1232	1102	985	771	- -	- -	661	613	572	497	- -	- -
66T0220-00P	936	854	789	657	480	- -	492	453	429	381	320	- -
66T0231-10P	854	806	744	637	475	429	456	424	398	359	302	286
66T0231-70P	1203	1135	1048	897	669	605	642	598	560	505	425	402
66T0238-00P	983	927	857	722	547	494	525	488	458	409	348	329

MATERIALS 66

MINIMUM INDUCTANCE WITH VARIOUS TURNS

Part	32 turns (25°C)						32 turns (0-70°C)					
	16mA	18mA	20mA	24mA	30mA	32mA	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	887	777	- -	- -	- -	- -	737	625	- -	- -	- -	- -
66T0153-40P	756	662	- -	- -	- -	- -	629	533	- -	- -	- -	- -
66T0154-70P	781	681	- -	- -	- -	- -	642	544	- -	- -	- -	- -
66T0155-00P	601	539	484	- -	- -	- -	517	448	392	- -	- -	- -
66T0157-00P	551	492	435	- -	- -	- -	466	403	347	- -	- -	- -
66T0175-20P	747	673	609	- -	- -	- -	656	569	500	- -	- -	- -
66T0190-80P	1000	917	831	667	- -	- -	886	786	691	527	- -	- -
66T0190-70P	1498	1374	1246	1000	- -	- -	1328	1178	1035	790	- -	- -
66T0220-00P	1089	1035	971	831	- -	- -	1012	935	849	690	- -	- -
66T0231-10P	1006	949	901	791	614	- -	952	869	803	668	489	- -
66T0231-70P	1417	1337	1269	1113	865	- -	1340	1224	1131	941	688	- -
66T0238-00P	1149	1092	1037	910	707	- -	1084	1000	924	769	562	- -

Part	32 turns (-40-+85°C)					
	16mA	18mA	20mA	24mA	30mA	32mA
66T0153-30P	442	403	- -	- -	- -	- -
66T0153-40P	377	344	- -	- -	- -	- -
66T0154-70P	394	359	- -	- -	- -	- -
66T0155-00P	293	268	249	- -	- -	- -
66T0157-00P	271	249	229	- -	- -	- -
66T0175-20P	361	330	307	- -	- -	- -
66T0190-80P	484	448	414	357	- -	- -
66T0190-70P	725	671	621	535	- -	- -
66T0220-00P	533	502	470	414	- -	- -
66T0231-10P	501	461	436	388	325	- -
66T0231-70P	705	649	615	546	458	- -
66T0238-00P	569	530	502	446	374	- -

HIGH PERMEABILITY MATERIALS 42 & 40
FOR TELECOM & LOW FREQUENCY FILTERING

PARAMETER	SYMBOL	UNIT	42	40
Relative Initial Permeability	μi		7500	10000
A_L Tolerance		%	± 25	± 30
Saturation Flux Density	B_S	Gauss	4100	3800
		mT	410	380
at Field Intensity	*H*	Oersteds	10	10
		A/m	800	800
Residual Flux Density	B_r	Gauss	1100	1400
		mT	110	140
Coercive Force	H_C	Oersteds	0.10	0.40
		A/m	8	3
Relative Loss Factor at Frequency	tan δ μ i f	10^{-6} MHz	6 0.10	5 0.10
Curie Temperature	T_C	°C	> 130	> 120
Resistivity	ρ	Ω-cm	10	1
Density		g/cm³	4.8	4.8