Material Characteristics Summary

Material	Initial permeability μ_i	Curie Temperature Tc (°C)	Saturation magnetic flux density Bs (mT)	Electrical resistivity ρ (Ω•cm)
HF	100	> 225	350 [H=800 A/m]	10^8

HF Material Properties

Property	Unit	Symbol	Value
Initial Permeability		μ_i	100
Flux Density	mT [Gauss]	B	350 [3500]
@ Field Strength	A/m [Oe]	H	800 [10]
Residual Field Strength	mT [Gauss]	B_r	150 [1500]
Coersive Strength	A/m [Oe]	H_c	128 [1.6]
Loss Factor @ Frequency	10^{-6} MHz		20 0.1
Curie Temerature		°C	> 225
Resistivity	Ω-cm	ρ	10^8

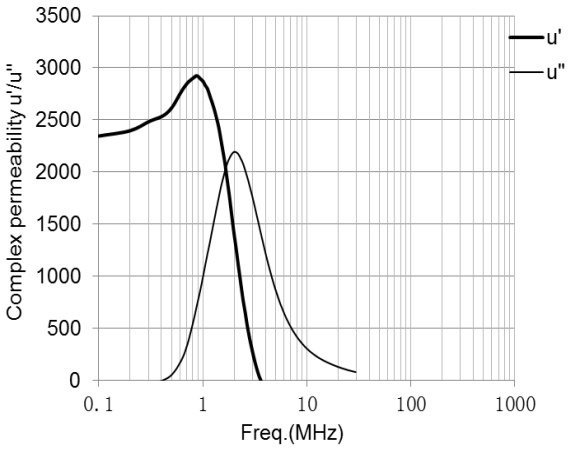
26 MATERIAL PROPERTIES

TYPICAL VALUES			26 Material
PARAMETER	**SYMBOL**	**UNIT**	
Initial Permeability	μi		2000±25%
Saturation Flux Density at Field Density	Bs	Gauss	2950
		mT	295
At Field Intensity	H	Oersteds	30
		A/m	2400
Residual Flux Density	Br	Gauss	1400
		mT	140
Coercive Force	Hc	Oersteds	0.19
		A/m	15
Relative Loss Factor at Frequency	tanS/μi f	10^{-6} MHz	12 0.1
Curie Temperature	Tc	℃	>100
Resistivity	ρ	Ω·m	⩾10^{5}
Density		g/cm^{3}	4.8~5.1

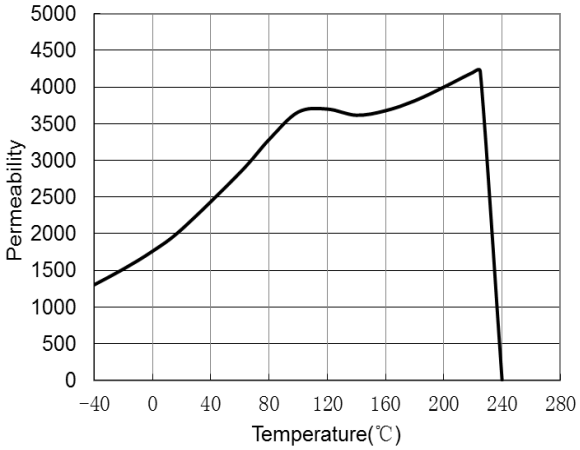
33 Material Characteristics

Property	Unit	Symbol	Value
Initial Permeability		u_i	2300
Flux Density	mT [Gauss]	B	390 [3900]
@ Field Strength	A/m [Oe]	H	800 [10]
Residual Field Strength	mT [Gauss]	B_r	55 [550]
Coercive Strength	A/m [Oe]	H_c	9 [0.1]
Loss Factor @ Frequency	10^{-6} MHz		6 0.1
Curie Temperature		℃	> 200
Resistivity	Ω.cm	ρ	5×10^2

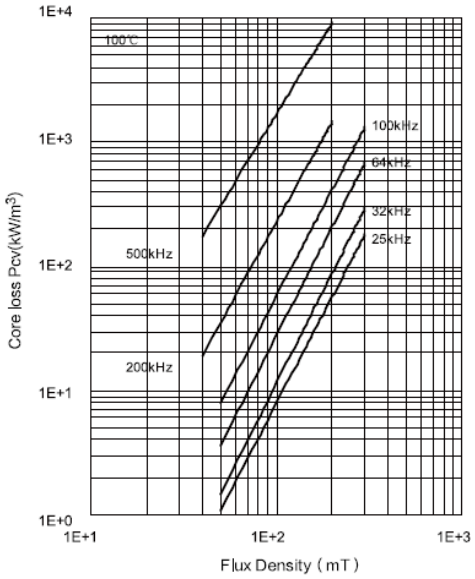
Complex permeability vs. Frequency



Initial Permeability vs Temperature



Pcv-Bm

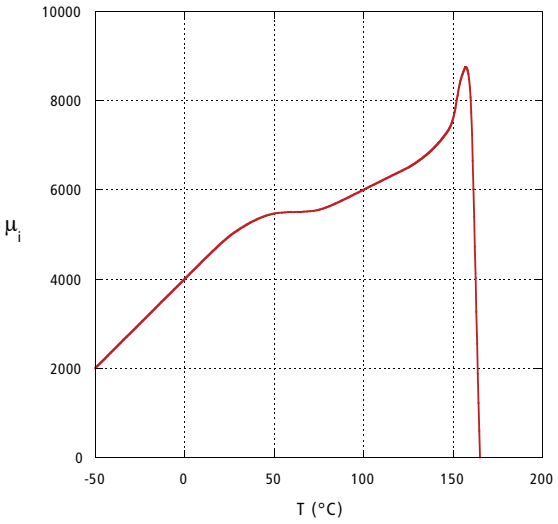


16401 Swingley Ridge Road, Suite 700, Chesterfield, Missouri 63017 Phone: 636.898.6000 Fax: 636.898.6100 | Email: sales@lairdtech.com
Web: www.lairdtech.com

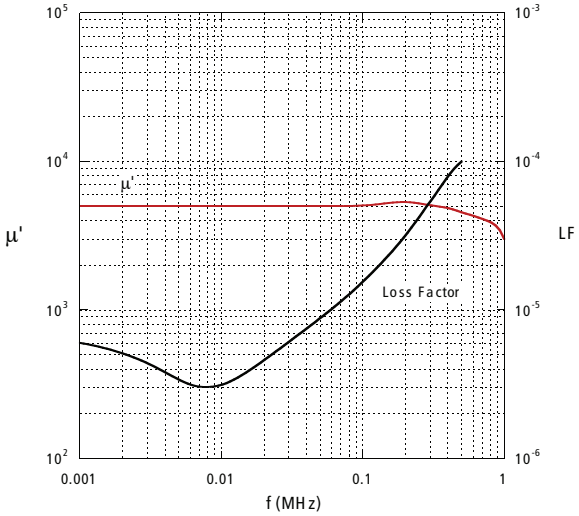
MATERIAL 35
COMMON MODE LOW FREQUENCY

5000 PERMEABILITY

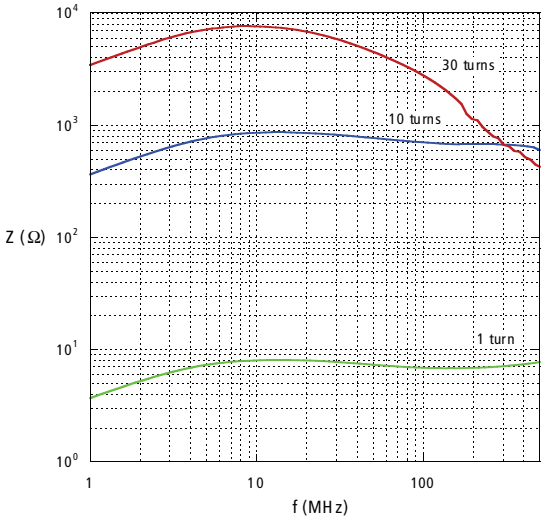
Initial Permeability vs. Temperature



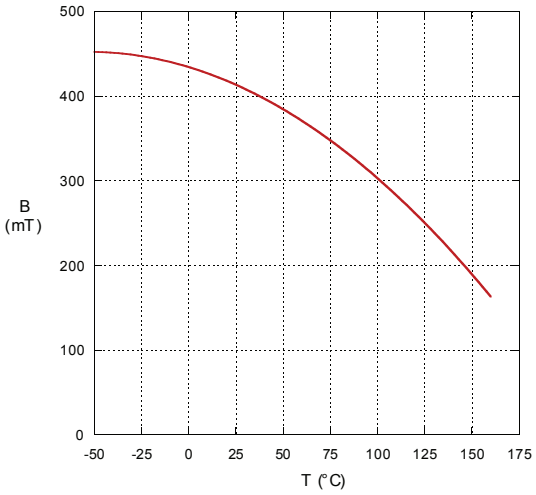
Permeability & Loss Factor vs. Frequency



Comparing Turns - 35T0155-10P



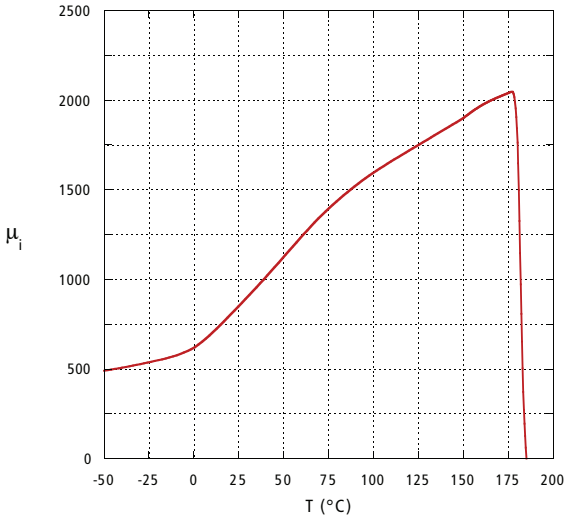
Saturation Flux Density vs. Temperature



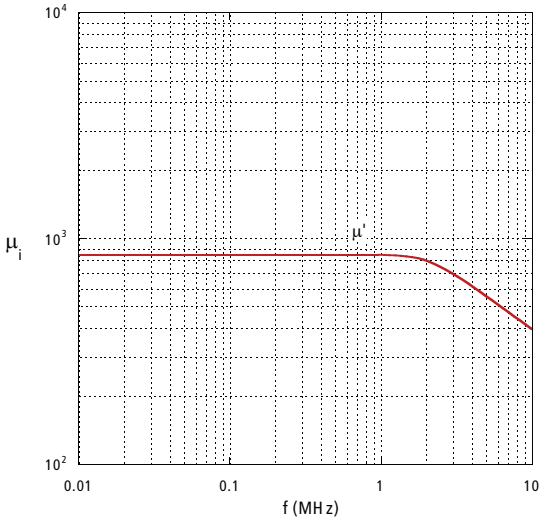
MATERIAL 28
COMMON MODE MID FREQUENCY

850 PERMEABILITY

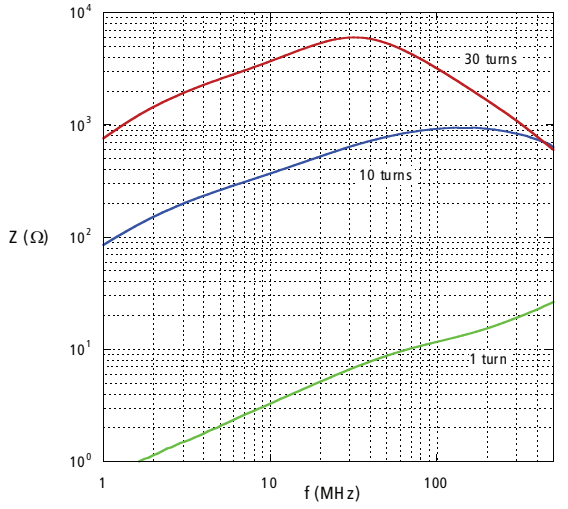
Initial Permeability vs. Temperature



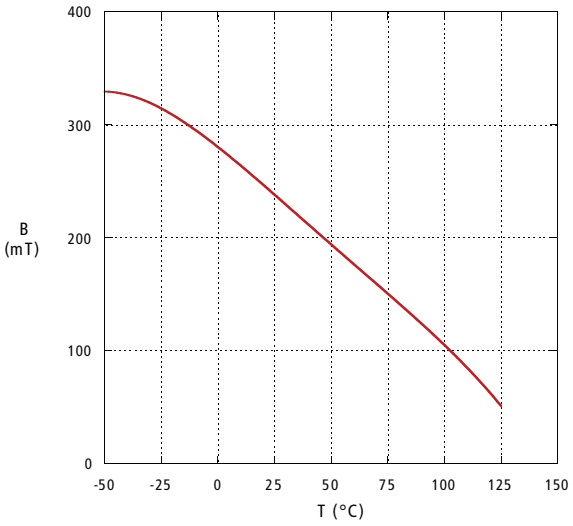
Permeability vs. Frequency



Comparing Turns - 28T0155-10P



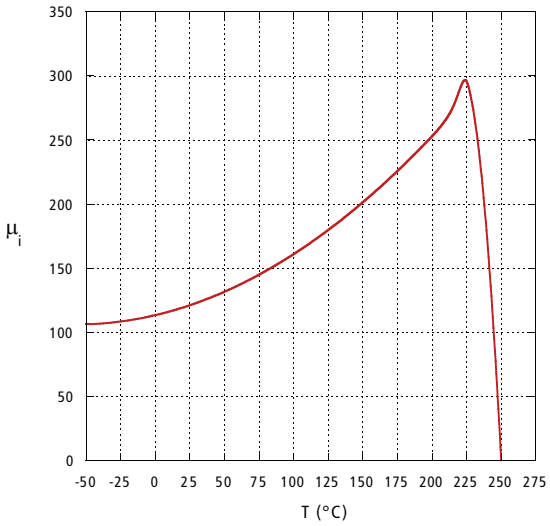
Saturation Flux Density vs. Temperature



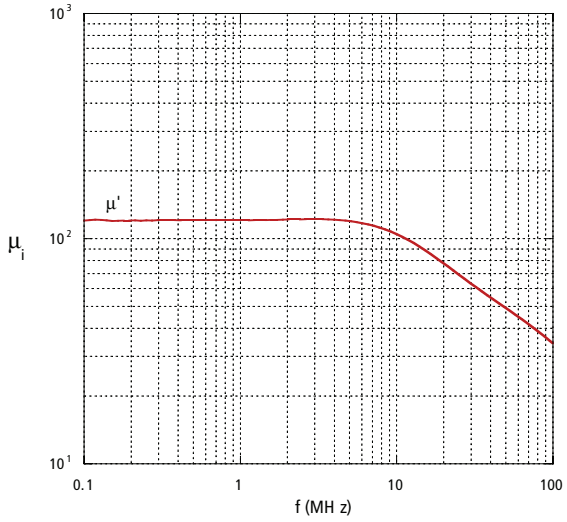
MATERIAL 25
COMMON MODE HIGH FREQUENCY

125 PERMEABILITY

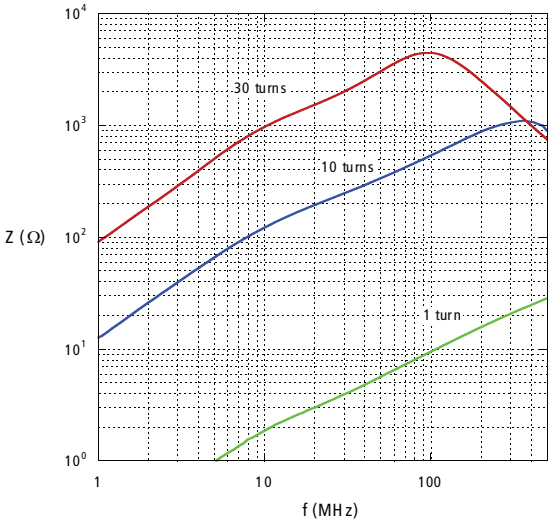
Initial Permeability vs. Temperature



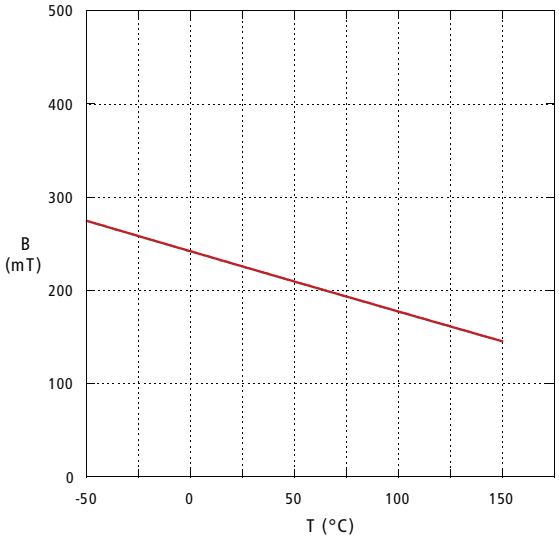
Permeability vs. Frequency



Comparing Turns - 25T0155-10P



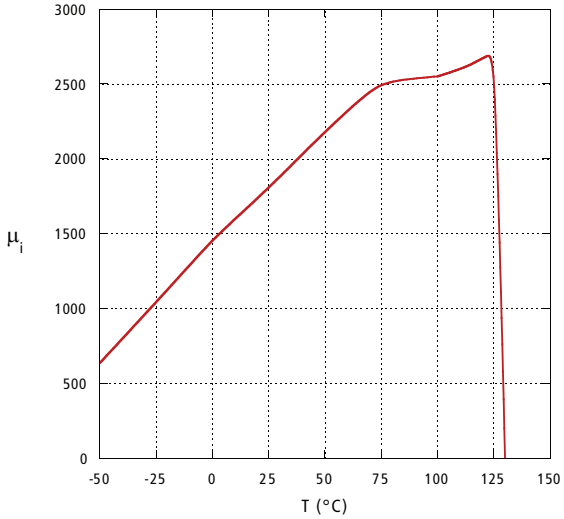
Saturation Flux Denasity vs. Temperature



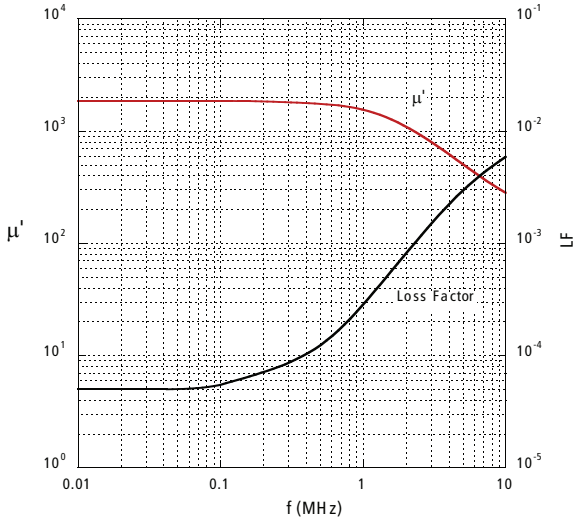
MATERIAL 38
COMMON MODE BROAD FREQUENCY

1,700 PERMEABILITY

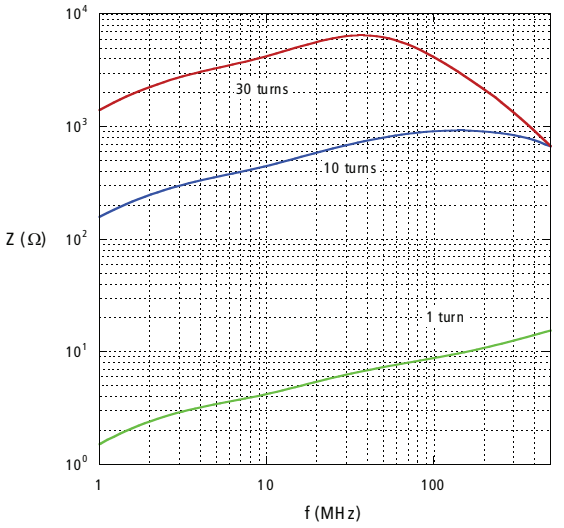
Initial Permeability vs. Temperature



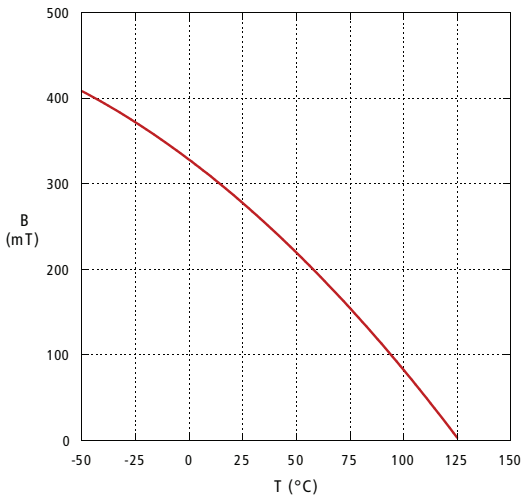
Permeability & Loss Factor vs. Frequency



Comparing Turns - 38T0155-10P



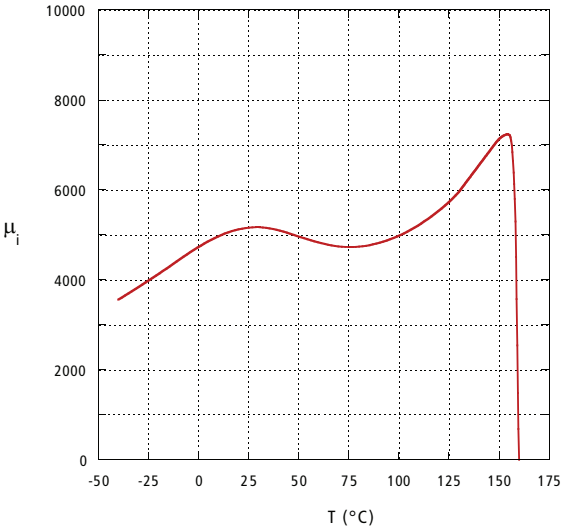
Saturation Flux Density vs. Temperature



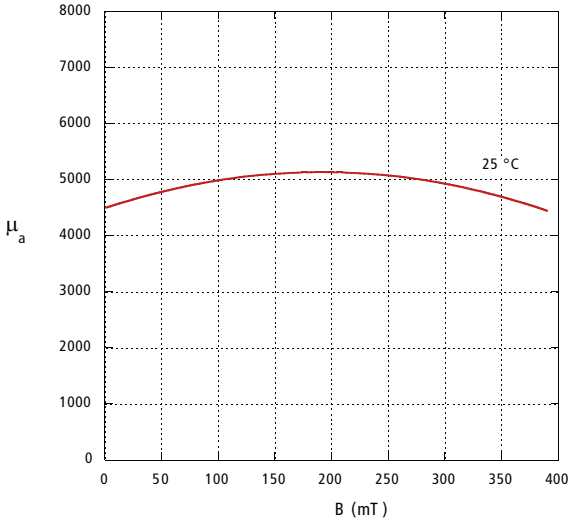
MATERIAL 36
DC BIAS STANDARD TEMPERATURE (0°C TO 70°C)

4,500 PERMEABILITY

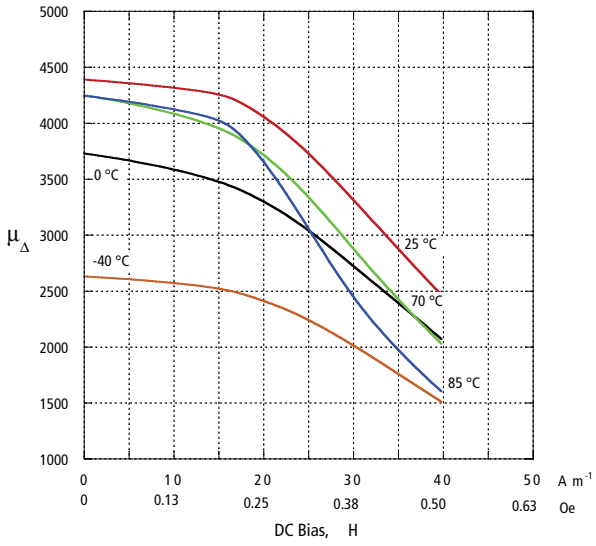
Initial Permeability vs. Temperature



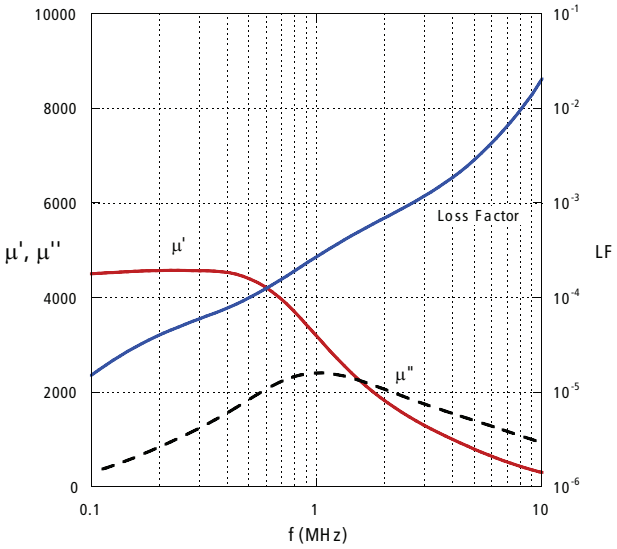
Amplitude Permeability vs. Flux Density



Incremental Permeability vs. Field Intensity



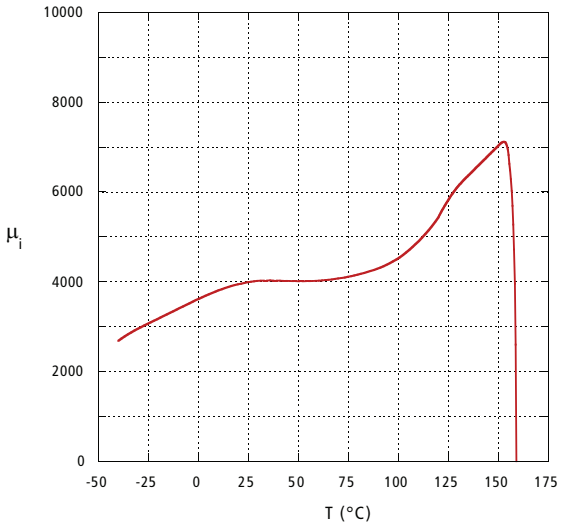
Permeability & Loss Factor vs. Frequency



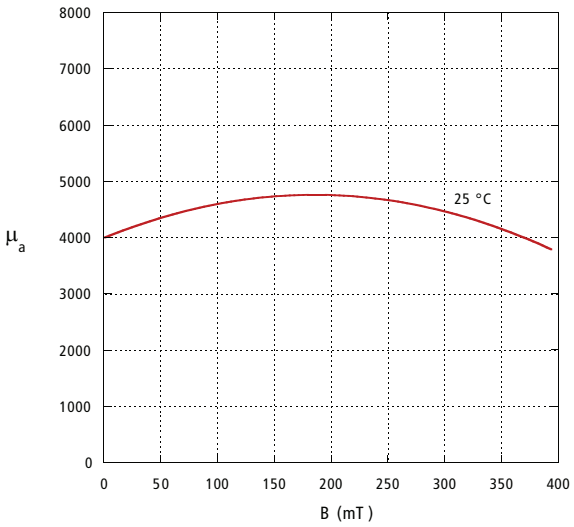
MATERIAL 46
DC BIAS EXTENDED TEMPERATURE (-40°C TO 85°C)

4,000 PERMEABILITY

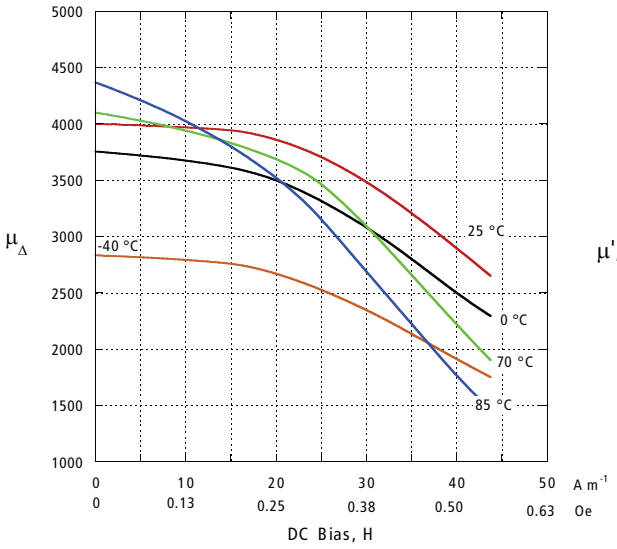
Initial Permeability vs. Temperature



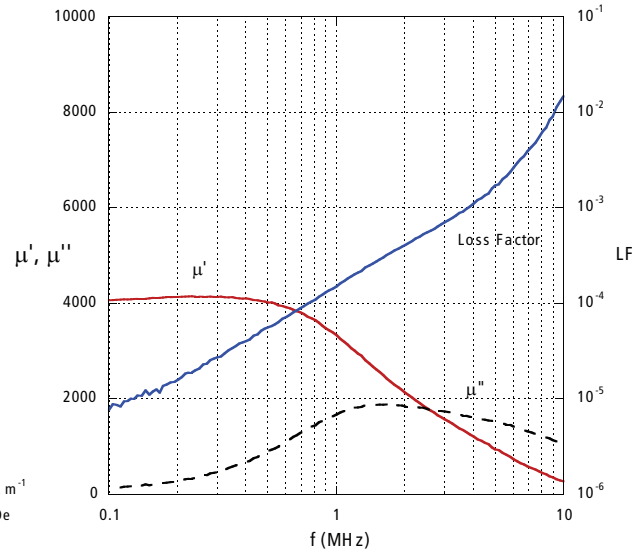
Amplitude Permeability vs. Flux Density



Incremental Permeability vs. Field Intensity



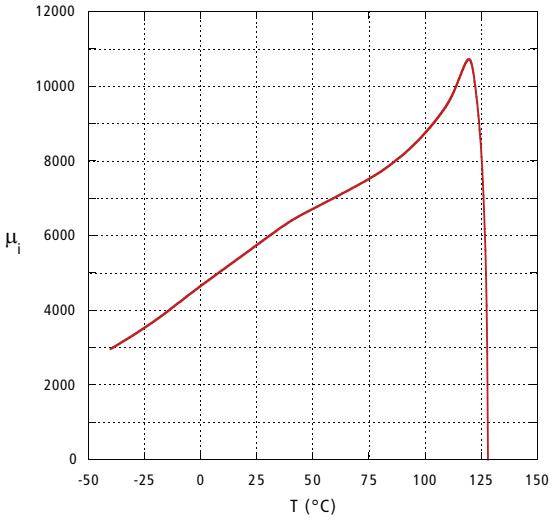
Permeability & Loss Factor vs. Frequency



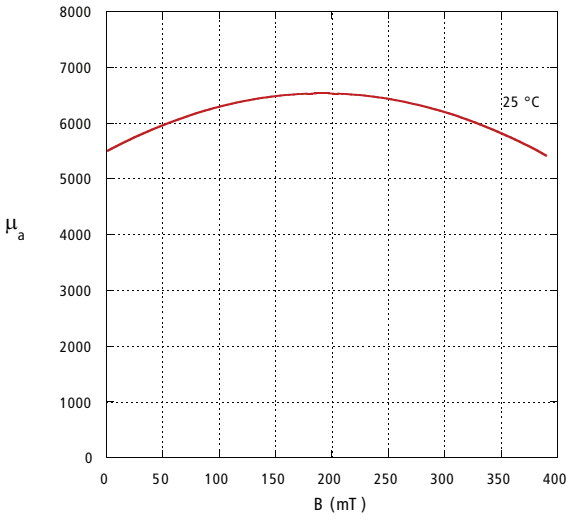
MATERIAL 56
LOW DC BIAS - HIGH PERMEABILITY

5,500 PERMEABILITY

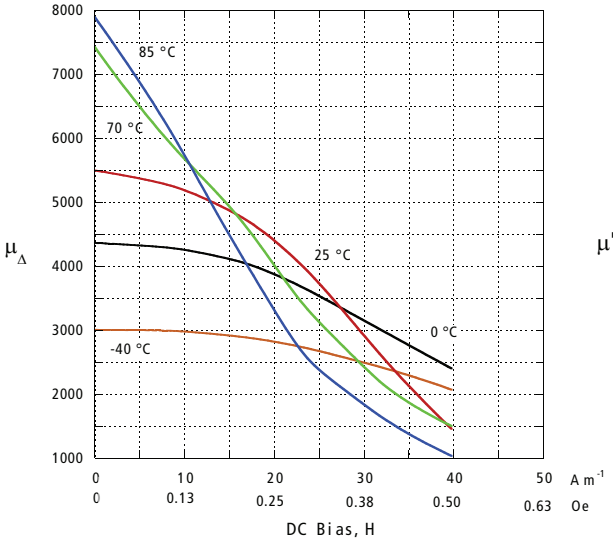
Initial Permeability vs. Temperature



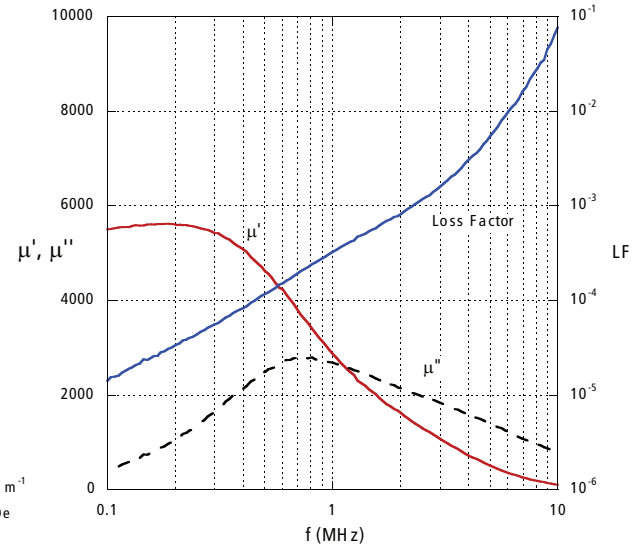
Amplitude Permeability vs. Flux Density



Incremental Permeability vs. Field Intensity



Permeability & Loss Factor vs. Frequency

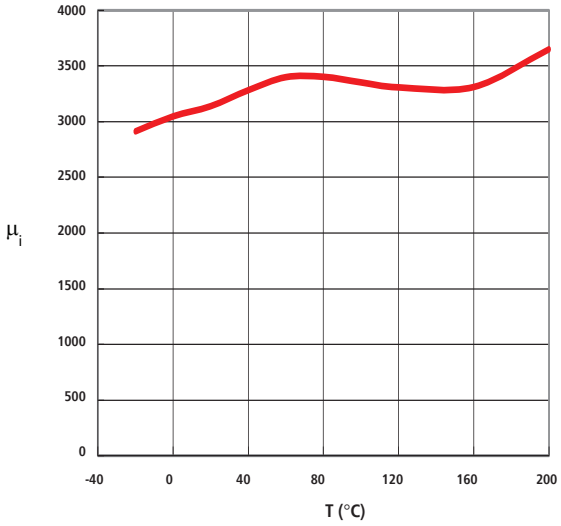


MATERIAL 66

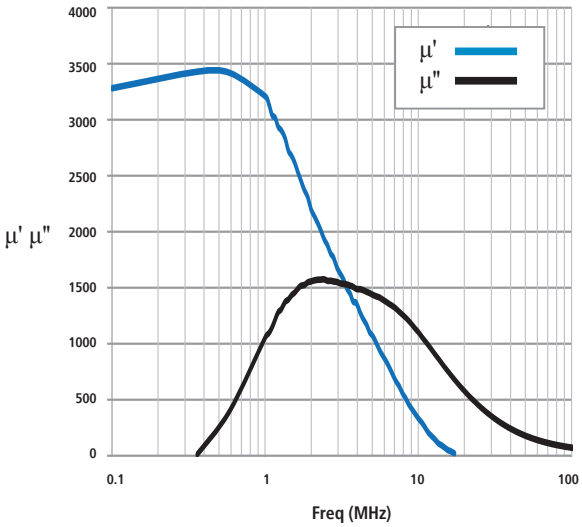
HIGH DC BIAS EXTENDED TEMPERATURE PoE/PoE+ APPLICATION (-40°C TO 85°C)

3,200 PERMEABILITY

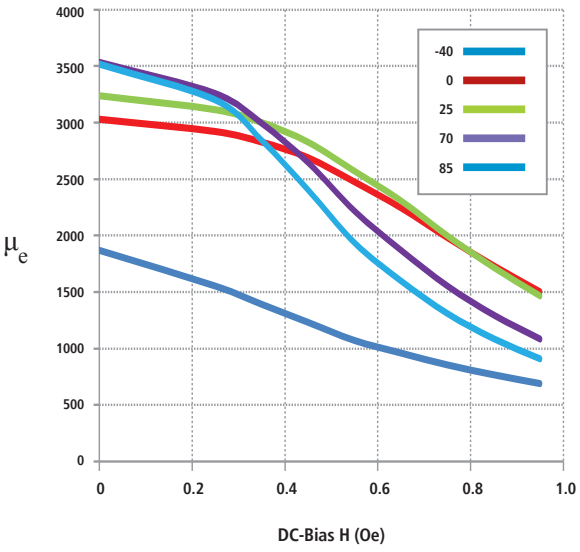
Initial Permeability vs. Temperature



Permeability vs Frequency



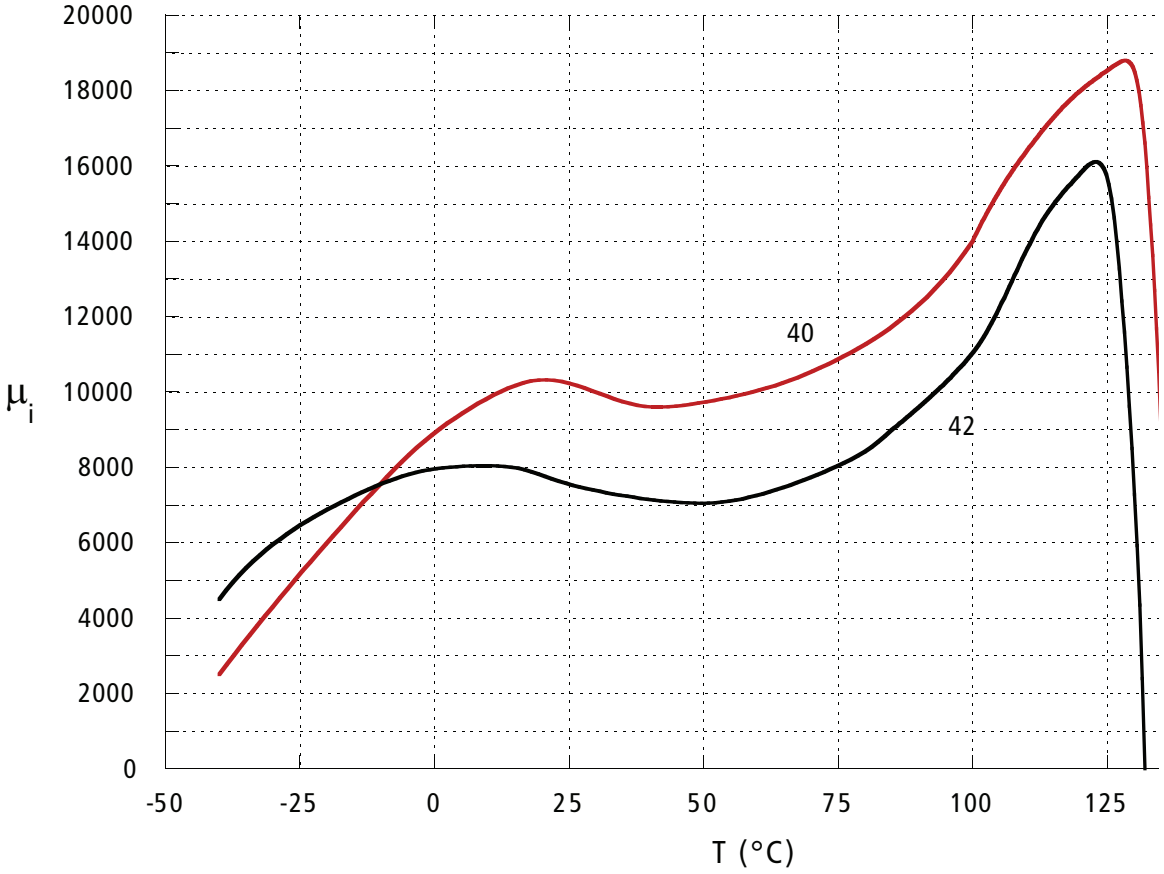
Incremental Permeability vs. Field Intensity



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/cm^3	4.8	4.8

COMPARING MATERIALS
PERMEABILITY VS. TEMPERATURE

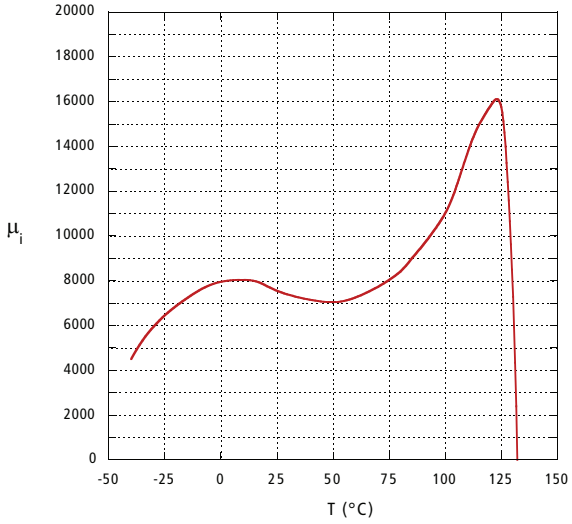


Part Number	Material 40 High Permeability	Material 42 Broad Temperature	
	10,000 Nominal Perm	7500 Nominal Perm	3000 Minimum Perm
	A_L @ 100 KHz (nH/T²)	A_L @ 25°C (nH/T²)	A_L @ -40°C to 85°C (nH/T²)
*T0100-20P	1056	792	317
*T0119-00P	2224	1688	667
*T0135-10P	2703	2027	811
*T0155-00P	2876	2157	863
*T0231-10P	3966	2974	1190
*T0238-00P	4564	3422	1369
*T0301-00P	8361	6270	2508
*T0325-00P	5912	4434	1774

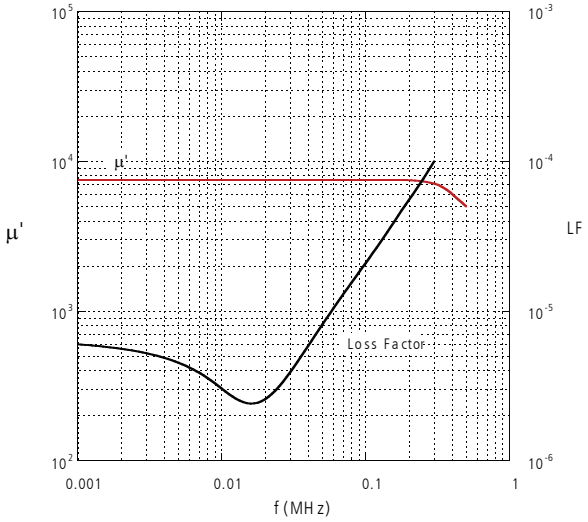
MATERIAL 42
TELECOM BROAD TEMPERATURE

7,500 PERMEABILITY

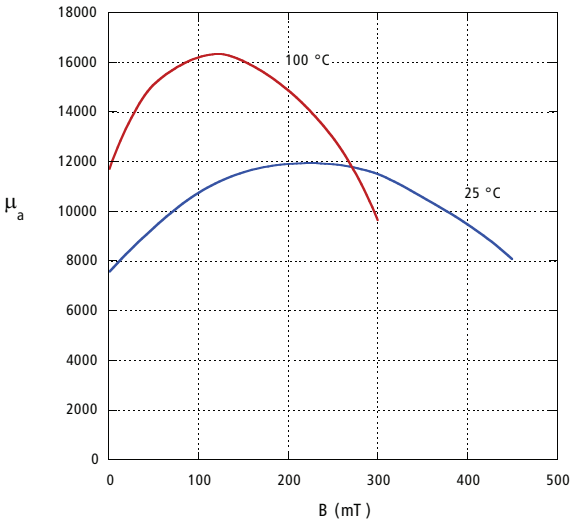
Initial Permeability vs. Temperature



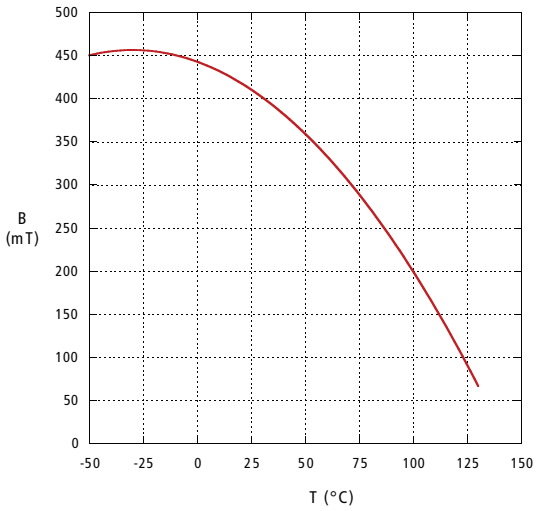
Permeability & Loss Factor vs. Frequency



Amplitude Permeability



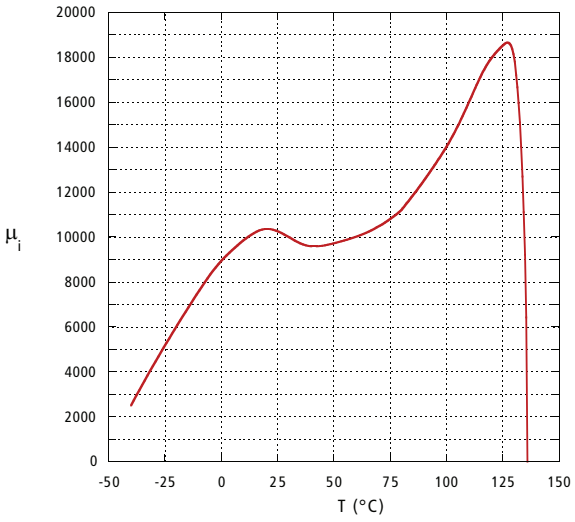
Saturation Flux Density vs. Temperature



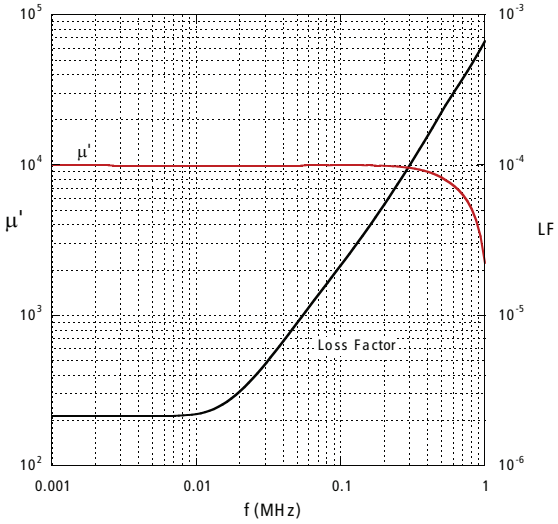
MATERIAL 40
TELECOM HIGH PERMEABILITY

10,000 PERMEABILITY

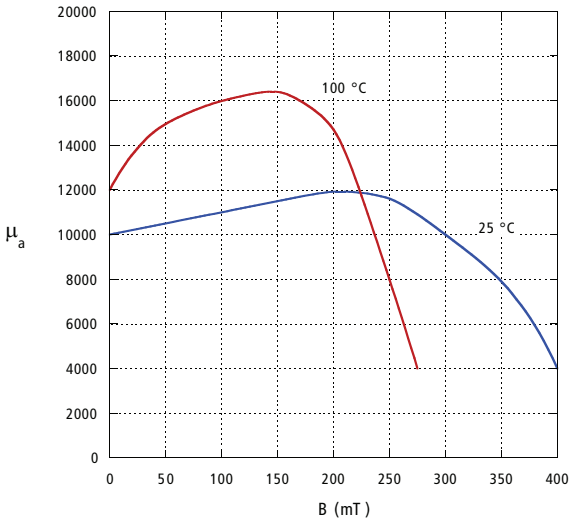
Initial Permeability vs. Temperature



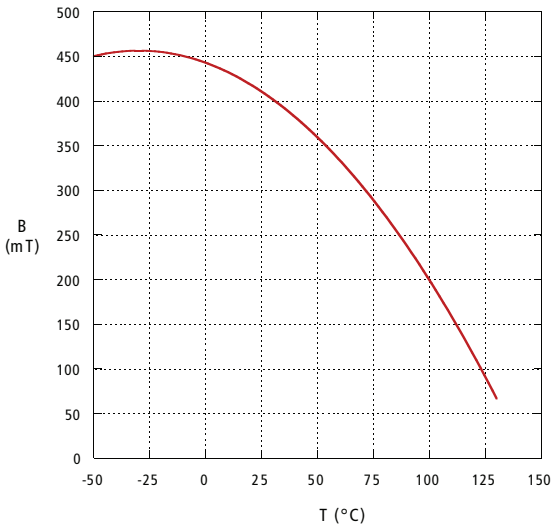
Permeability & Loss Factor vs. Frequency



Amplitude Permeability



Saturation Flux Density vs. Temperature



MATERIALS

Typical Values			Common Mode Materials				DC Bias Materials				High Permeability for Telecom & Low Frequency Filtering		Other Materials	
PARAMETER	SYMBOL	UNIT	35 LOW FREQUENCY	28 MID FREQUENCY	25 HIGH FREQUENCY	38 BROAD FREQUENCY	36 DC BIAS STANDARD TEMP	46 DC BIAS EXTENDED TEMP	56 LOW DC BIAS HIGH PERM	66 HIGH DC BIAS EXTENDED TEMP FOR PoE AND PoE+	42	40	35	39
Relative Initial Permeability	μi		5000	850	125	1700	4500	4000	5500	3200	7500	10000	5000	7000
A_L Tolerance		%	± 20	± 20	± 30	± 30	± 25	± 25	± 25	± 25	± 25	± 30	± 20	± 25
Saturation Flux Density	B_s	Gauss	4500	3250	3600	3000	4500	4500	4500	4800	4100	3800	4500	3800
		mT	450	325	360	300	450	450	450	480	410	380	450	380
at Field Intensity	*H*	Oersteds	10	10	10	10	10	10	10	10	10	10	10	12.5
		A/m	800	800	800	800	800	800	800	800	800	800	800	1000
Residual Flux Density	B_r	Gauss	1000	2000	2600	1500	1000	1000	1000	1300	1100	1400	1000	730
		mT	100	200	260	150	100	100	100	130	110	140	100	73
Coercive Force	H_c	Oersteds	0.10	0.40	1.60	0.20	0.10	0.10	0.10	0.125	0.10	0.04	0.10	0.10
		A/m	8	3	127	16	8	8	8	10	8	3	8	8
Relative Loss Factor	tan δ μ i	10^{-6}	20	91	740	53	10	10	15	2	6	5	20	< 8
at Frequency	f	MHz	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.010	0.10	0.10	0.010
Curie Temperature	T_c	°C	> 150	> 175	> 225	> 120	> 150	> 150	> 130	> 200	> 130	> 120	> 150	> 130
Resistivity	ρ	Ω-cm	10^2	10^5	10^6	10^5	10^2	10^2	10^2	500	10	1	10^2	35
Density		g/cm^3	4.8	4.9	4.9	4.8	4.8	4.8	4.8	4.9	4.8	4.8	4.8	4.9