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●INDUCTOR 电感

A passive component designed to resist changes in current,inductors are often referred to as"AC Resistor",The ability to resist changes in current and the ability to store energy in its magnetic field, account for the bulk of the useful properties of inductors, Current passing through an inductor will produce a mangetic field,A changing magnetic field induces a voltage which opposes the field-producing current,This property of impeding changes of current is known as inductance,The voltage induced across an inductor by a change of current is defined as:

一被动元件，其作用在抑制电流的变化，电感亦常被称为"交流电阻"，其抑制电流变化的功能及以磁场储存能量的能力为电感最有用的特性，电流流经一电感时会产生磁场，而磁场的变化会在产生电流的反方向感应-电压，这种抑制电流变化的特性被称为电感值，由一电流变化而在电感两端产生感应的电压可被定义成：

$$V=L \, di/dt$$

Thus,the induced voltage is proportional to the inductance value and the rate of current change,(Also see inductance,)

如此，感应电压正比于电感值及电流变化速率。

●COILS线圈

Another common name for inductors,(See inductor)

为电感常用另一名称（参阅电感）

●INDUCTANCE电感值

The property of a circuit element which tends to oppose any change in the current flowing through it ,The inductance for a given inductor is influenced by the core material,core shape and size, the turns count and the shape of the coil, Inductors most often have their inductances expressed in microhenries(μH),The following table can be used to convert units of inductance to microhenries,Thus,47mH would equal 47,000μH.

一电路之特性，能抑制流经之电流的改变，一电感之电感值会受铁芯之材质，铁芯之形状及尺寸，绕线的圈数及线圈的形状所影响，通常用来表示一电感的电感值，其单位为微享利(uH),下列的表格可以用来将电感值的单位换算成微享利，如此，47mH即等□47000μH.

1 henry(H)=106μH	1 millihenry(Mh)=103μH
1 microhenry μH=1μH	1 nanohenry(nH)=10-3μH

通常电感值代码用三位数字表示，前两位数字表示标称电感值有效数字，第三位数字表示0的个数（倍率），如果第三位数是0，则不写；是1，加1个0；是2加两个0；依此类推， "R"表示小数点，标称电感值的单位是μH.

标称写法	标称电感值(μH)	标称写法	标称电感值(μH)	标称写法	标称电感值(μH)

0R1	0.1	220	22	331	330
0R8	0.8	330	33	471	470
1R2	1.2	470	47	102	1000
1R5	1.5	820	82	152	1500
2R0	2.0	101	100	253	25000
100	10	221	220	303	30000

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●INDUCTANCE TOLERANCE 电感值公差

Standard inductance tolerances are typically designated by a tolerance letter,Standard inductance tolerance letters

include:(Also see color Codes.)

标准的电感值公差通常以一公差字母来表示，其字母包含：

LETTER 字母	TOLERANCE
F	±1%
G	±2%
T	±3%
J	±5%
K	±10%
L	±15%
M	±20%
P	±25%
N	±30%

●TEST FREQUENCY测试频率

The frequency at which inductors are tested for either inductance of Q or both.Some test frequencies used widely in

the industry include:

用以测量一电感之电感值或品质系数或两者之频率，工业上常使用的测试频率包括：

COMMON TEST FREQUENCIES 常用之测试频率	
TEST FREQUENCY测试频率	INDUCTOR/VALUE MEASURED电感/量测值
1KHz	Power inductors(wide value range)　　　功率电感（测量范围大）
79.6KHz	Inductors(above 10000μH to 100000μH)　　电感值（10000μH到100000μH）
252KHz	Inductors(above 1000μH to 10000μH)　　电感值（1000μH到10000μH）
796KHz	Inductors(above 100μH to 1000μH)　　电感值（100μH到1000μH）
2.52MHz	Inductors(above 10μH to 100μH)　　电感值（10μH到100μH）
7.96MHz	Inductors(above 1μH to 10μH)　　　电感值（1μH到10μH）
25.2MHz	Inductors(above 0.1μH to 1μH)　　　电感值（0.1μH到1μH）
50MHz	Inductors(above 0.01μH to 0.1μH)　　电感值（0.01μH到0.1μH）

Most of these test frequencies have been designated by military specifications.However,there are some conflicting

frequency assignments among the military specifications.There is a present trend to assign test frequencies that match

the user frequencies.This is particularly true for very low values.These user frequencies do not match those listed

above.

大部份的这些测试频率是依军规所定制的，然而有些测试频率仍和军规有些抵触，现今的趋势是依使用者

频率作为测试频率，特别是对低感值的电感，这些使用频率并不符合上列的表单内的频率。

● NUMBER OF TURNS圈数

The series impedance of a high frequency ferrite device can be increased by running two of more turns of the treated conductor through the ferrite s core.Magnetic theory predicts that the impedance of the device will increase with the square of the number of turns.However,due to the lossy and non-linear nature of EMI suppression ferrites, a ferrite bead with tow turns will yield somewhat less than four times the impedance of an identical part wound with only one turn of the conductor.

一个高频铁氧磁体元件的串联阻抗可藉由将导线于铁氧磁体上缠绕二或更多以上的圈数来增加，磁学理论预测元件的阻抗会随圈数的平方而增加，然而，因为用于电磁波干扰抑制的铁氧磁体损耗及其非线性的本质，一个缠绕二圈导线的铁氧磁体磁珠的阻抗会比一个完全相同但只缠绕一圈导线的四倍还要少一点。

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●Q 品质系数

The Q value of an inductor is a measure of the relative losses in an inductor,The Q is also known as the "quality factor" and is technically defined as the ratio of inductive reactance to effective resistance and is represented by"

电感的品质系数是量测一电感相对损失的指标，这Q值被称为"品质系数"，它的定义为感抗（X_L）对有效电阻（Re）之比，如下所示：

$$Q= \frac{X_L}{R_E} = \frac{2\pi fL}{R_e}$$

SinceX_L and Re are functions of frequency,the test frequency must be given when specifying Q,X_L typically increases with frequency at a faster rate than Re at lower frequencies,and vice versa at higher frequencies,This results in a bell shaped curve for Q vs frequency,Re is mainly comprised of the DC resistance of the wire,the core losses and skin effect of the wire,Based on the above formula,it can be shown that the Q is Zero at the self resonant frequency since the inductance is Zero of this point.

因为感抗及有效电阻都相关于频率，当要确定品质系数时需指定一个频率，在低频时，感抗一般随频率增加的增加速率比有效电阻来的大，在高频时掉的也快，故品质系数对频率的关系形成一种型的曲线，有效电阻主要由绕线的直流电阻，铁损及表面效应所贡献，由上列之公式可看在共振频率时之品质系数为零，因为此时的电感值为零。

●DCR(DC RESISTANCE)直流电阻、

The resistance of the inductor winding measured with no alternating current,The DCR is most often minimized in the design of an inductor,The unit of measure is ohms,and it is usually specified as a maximum rating.

●OHM欧姆

The unit of measurement for resistance and impedance,Resistance is caluculated by ohm's law:

为量测电阻及阻抗单位，电阻可用欧姆定律计算而得，R=V/I

R=resistance	电阻
V=voltage	电压
I=current	电流

●RATED CURRENT额定电流

The level of continuous DC current that can be passed through the inductor,This DC current level is based on a maximum temperature rise of the inductor at the maximum rated ambient temperature,The rated current is related to the inductor's ability to minimize the power losses in the winding by having a low DC resistance.it is also related to the inductor's ability to dissipate this power lost in the winding.Thus,the rated current can be increased by reducing the DC resistance or increasing the inductor size,For low freuency current waveforms,

the RMS current can be substituted for the DC rated current,The rated current is not related to the magnetic properties of the inductor,(Also see Incremental current and Saturation Current.)

允许能通过一电感之连续直流电流强度，此直流电流的强度是基于该电感在最大的额定环境温度中的最大温升，额定电流与一电感通过低的直流电阻降低能量损失的能力有关，亦与电感驱散绕线的能量损失的能力有关，因此，额定电流可通过降低直流电阻或增加电感尺寸来提高，对低频的电流波形，其均方根电流值可以用来代替直流额定电流，额定电流与电感的磁特性并无关连。

●SATURATION CURRENT饱和电流

The DC bias current flowing though the inductor which causes the inductance to drop by a specified amount from the initial zero DC bias inductance value.Common specified inductance drop percentages include 10% and 20%.it is useful to use the 10% inductance drop value for ferrite cores and 20% for powdered iron cores in energy storage applicatios. The cause of the inductance to drop due to the DC bias current is related to the magnetic flux density.Beyond the maximum flux density point,the permeability of the core is reduced.Thus,the inductance is caused to drop.Core saturation does not apply to"air-core"inductors.(Also see incremental current and permeability)

指流经一电感而使其电感值比零直流偏压时之原电感值下降一特定量的直流偏压电流，通常定义的电感值下降的百分比有10%及２０％，在储存能量的应用中，对铁氧磁体铁芯使用10%的电感下降值及对粉状铁芯使用20%的电感下降值是有用处的，因此直流偏压电流而致电感值下降的因素与铁芯的磁性有关，铁芯及其周围的一些空间指可以储存一定量之磁通密度，超过此磁通密度，铁芯的导磁率会降低，因此，电感值会因而下降，铁芯的饱和并不适用于"无铁芯"的电感。

●SRF(SELF-RESONANT FERQUENCY)自谐频率

The frequency at which the inductor's distributed capacitacnce resonates with the inductance.it is at this frequency that the inductance is equal to the capacitance and they cancel each other.The inductor will act purely resistive with a high impedance at the SRF point.The distributed capacitance is caused by the turns of wire layered on top of each other and around the core.This capacitance is in parallel to the inductance.At frequencies above the SRF,the capacitive reactance of the parallel combination will become the dominant component.Also,the Q of the inductor is equal to zero at the SRF point since the inductive reactance is zero.The SRF is specified in MHz and is listed as a minimum value on product data sheets.(Also see Distributed Capacitance.)

指一频率，在此频率下，一电感之分布电容值与电感值产生共振，此时电感值与电容值相等而相互抵消掉电感在自我共振频率显现出具高阻抗值的纯粹阻抗性，分布电容是由于所绕的线圈相互重叠及于铁芯周围所产生，此电容是平行于电感，当频率高于自谐频率时，此平行结合之容抗会主导元件的特性，而且此电感之品质系数于自谐频率时会为零（此时之感抗等于零），自谐振频率以MHz作标记，且在产品的资料表内以最小值登记录。

●IMPEDANCE阻抗值

The impedance of an inductor is the total resistance to the flow of current,including the AC and DC component,The DC component of the impedance is simply the DC resistance of the winding,The AC component of the impedance includes the inductor reactance, The following formula calculates the inductive reactance of an ideal inductor(i.e.,one with no losses)to a sinusoidal AC signal.

一电感的阻抗值是指其在电流下所有的阻抗的总和，包含了交流及直流的部分，直流部分的阻抗值勤仅仅是绕线的直流电阻，交流部分的阻抗值则包括电感的电抗，下列的方程式用来计算一理想电感（没有能量损失）在一正弦波交流讯号下的电抗：

$$Z = X_L = 2\pi fL$$

L is in henries and f is in hertz,This equation indicates that higher impedance levels are achieved by higher inductance values or at higher frequencies,Skin Effect and Core losses also add to the impedance of an inductor,(Also see Skin Effect and Core Losses,)

L的单位为享利而f的单位为赫兹，此方程式说明一较高的阻抗值可由较高的电感值或在较高的频率下得到，

此外，表面效应及铁损亦会增加一电感的阻抗值。

●REACTANCE 电抗

The imaginary part of the impedance.(Also see impedance.)

指一阻抗的虚部部份。（亦参阅阻抗）

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●DISTRIBUTED CAPACITANCE 分布电容值

In the construction of an inductor,each turn of wire or conductor acts as a capacitor plate.The combined

effects of each turn can be represented as a single capacitance known as the distributed capacitance, This capacitance

is in parallel with the inductor,This parallel combination will resonate at some frequency which is called the self-resonant

frequency (SRF).Lower distributed capacitances for a given inductance value will result in a higher SRF value and vice

versa,(Also see SRF.)

在电感的结构中，每一圈的绕线或导体有如电容电板一般的作用，其每圈结合起来的效果，有如单一之电容值，

称之分布电容值，与电感并联的。如此并联的结合使得电感在某频率下会产生谐振，称之自谐频率（SRF），

在一定电感值下。较低的分布电容值会有较高之自我谐振，反之亦然。

●TOROIDAL INDUCTOR环形电感

An inductor constructed by placing a winding(s) on a core that was a donut shapes surface.Toroidal cores are available

in many magnetic core materials with in the four basic types;Ferrite,Powdered Iron,Alloy and High Flux and tape wound.

Characteristics of toroidal inductors include:self shielding(closed magnetic path),effcient energy transfer,high coupling

between windings and early saturation.

一电感其绕线缠绕于一环形的铁芯上，环形铁芯有多种材质可供选择，其本上有四类：铁氧磁体，粉状铁，

合金及高磁通且带封型。环型电感的特性包括：自我遮蔽（封闭的磁路），高效率的能量转换，线圈间的

高耦合及快速饱合.

TOROIDAL INDUCTORS
环形电感

SURFACE MOUNT
表粘著型

THROUGH HOLE
穿孔型
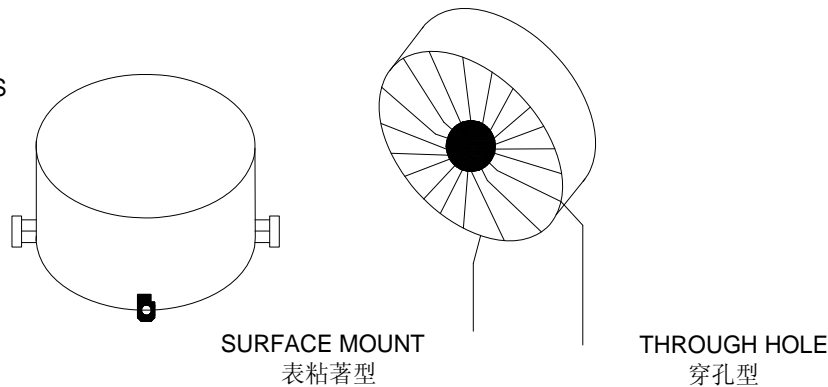
●COLOR CODES色码

Inductors color codes have been standardized,The color marks or bands represent the inductor's value and tolerance,

Following is a table that translates the colors and numbers,

电感的色码是标准化的，其色标或色带代表电感的值及公差，以下表格列出颜色及其代表之数字。

COLOR CODE CHART			
COLOR 颜色	SIGNIFICANT FIGURES OR DECIMAL POINT 有效数字或小数点	MULTIPLIER 位数	INDUCTANCE TOLERANCE 电感值公差

Brown 棕	1	10	±1%
Red 红	2	100	±2%
Orange 橙	3	1000	±3%
Yellow 黄	4	10,000	±4%
Green 绿	5	-	-
Blue 蓝	6	-	-
Violet 紫	7	-	-
Gray 灰	8	-	-
White 白	9	-	-
Black 黑	0	1	±20%
Silver 银	-	0.01	±10%
Gold 金	-	0.1	±5%

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●AXIAL INDUCTOR轴向电感

An inductor constructed on a core with concentric leads on opposite ends of the core.Axial inductors are available for

both power applications and RF applications,and are available in many core materials including the basic phenolic.ferrite

and powdered iron types.Both rod and bobbin shapes are utilized.Axial inductors are very suitable for tape and reel

packaging for auto placement.(Also see inductor.)

建构在一两个端之轴心位置上有金属导线之铁芯的电感，应用于电源及RF,且有多种材质可供选择，如石

碳酸树脂，铁氧磁体及粉状铁等，外形有棒状及线轴状，轴向电感，很适合带装方式以供自动安插。

Axial Leaded inductor
轴向导线电感

●RADIAL INDUCTOR径向电感

An inductor constructed an a core with leads exiting from the same side of the inductor body as to be mounted in the

same plane.Radial inductors most often refer to two leaded devices but technically include devices with more than two

 leads as well. Some common core shapes include rod cores,bobbins and toroids,(Also see inductor.)

指一电感其引出导线位于铁芯本体的同侧以安插至相同平面，径向电感通指具有两引出导线之装置，但技

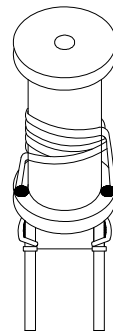术上亦可包含两引出导线上之装置，常见的形式包括棒形铁芯，线轴铁芯及环芯铁芯。（亦参阅电感）

Radial inductor styles
径向电感的形式
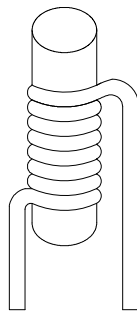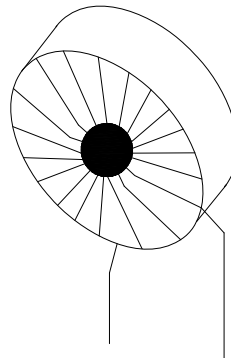
ROD	TOROID	BOBBIN
棒形	环型	绕轴型

●EPOXY COATED INDUCTOR 环氧树脂包覆的电感

Inductors that have been coated with epoxy as opposed to having a molded case, shrink wrapped tubing or left with

an open construction body,Epoxy coated inductors typically have smooth edges and surfaces,The epoxy coat acts as

an insulation,Both radial and axial styles can be found with epoxy coated surfaces.

指电感有著被环氧树脂包覆的结构，而非有一成形的框架或是有伸缩的套管或是开放式的结构体，环氧树

脂包覆之电感通常有平滑的边及表面，环氧树脂层作为绝缘体，有一些径向及轴向型式的电感可以找到有环氧树脂包覆的表面。

●MOLDED INDUCTOR铸型电感

An inductor whose case has been formed via a molding process,Common molding processes include injection and transfer molding,Molded inductors typically have well defined body dimensions which consist of smooth surfaces and sharper corners as compared to other case types such as epoxy coated and shrink wrap coatings,(Also see inductor.)

一外壳以铸型制程所成形之电感，通常铸型制程包括射出及转移铸型两种，与其他型式之电感如环氧树脂包覆的电感及伸缩套管之电感比较起来，铸型电感常有很明确的尺寸，平滑的表面及尖锐气的边角。

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●MULTILAYER INDUCTOR积层电感

An inductor constructed by layering the coil between layers of core material. The coil typically consists of a bare metal material(no insulation),This technology is sometimes referred to as "non-wirewound",The inductance value can be made larger by adding additional layers for a given spiral pattern.

指一电感其线圈分布在铁芯材质的各层上，此种线圈常包含一裸露的金属材料（非绝缘材料），这种技术有时亦叫做"非绕线式"，只要在既有之螺旋电路方式下，插入额外的层数，既可增加电感值。

●SHIELDED INDUCTOR遮蔽式电感

An inductor designed for its core to contain a majority of its magnetic field. Some inductor designs are self shielding. Examples to these are magnetic core shapes which include toroids,pot cores and E-coers.Mangnetic core shapes such as slug cores and bobbins require the application of a magnetic sleeve or similar method to yield a shielded inductor.It should be noted that magnetic shielding is a matter of degree.A certain percentage of the magnetic field will escape the core material.This is even applicable for toroidal cores as lower core peremeabilities will have higer fringing fields than will high permeability toroidal cores.(Aiso See Closed Magnetic Path).

一电感其铁芯能包含绝大部分之磁场称之，有些电感的设计式能自我遮蔽，如像环形，POT形及E形的磁性铁芯形状皆是。磁性铁芯的形状，像是弹丸形铁芯及线轴形需搭配磁性套管或类似的方法来达到遮蔽效果，要特别指出的是所谓磁遮蔽只是程度上的不同，些许百分比的磁场仍会逸出铁芯材料，此甚至适用于环形铁芯，低导磁率的环形铁芯的边缘磁场比高导磁率的环形铁芯来的高。

●RF CHOKE射频扼流圈

Another name for a radio frequency inductor which is intended to filter or choke out signals.(Aiso see inductor)

射频电感的另一称呼，用以过滤或抑制讯号。（亦参阅电感）

●CLOSED MAGNETIC PATH封闭的磁路

Magnetic core shapes designed to contain all of the magnetic flux generated from an excited winding(S).inductors made with these core types are considered to be shielded inductors,shielding ,however,is a matter of degree, Common core shapes that are considered to have closed magnetic paths are toroids ,E-cores and most pot cores.shielded bobbins also offer a high degree of shielding and may be considered to have closed magnetic path for most practical purposes.Common core shapes that are considerd to have open magnetic flux paths are rod cores and unshielded bobbin cores.(also see shielded inductor.)

noted magnetic shielding is a matter of degree.A certain percentage of magnetic field will escape

是程度上的不同，一般上，环形铁芯，E形铁芯及大部分之POT形铁芯都 被认为是具有封闭磁路的铁芯形，遮蔽的线轴亦能提供高程度的遮蔽，在大部分实际的应用上亦被视为具有封闭磁路，一般被认为有开放磁路

的铁芯形状有棒形铁芯及未遮蔽之线轴铁芯。（亦参阅遮蔽式电感）

●EMI电磁波干扰

EMI is an acronym for Electromagnetic interference,it is unwanted electrical energy in any form,EMI is often used interchangeable with"Noise".

EMI是Electromagnetic interference之缩写，为不要之任何形式的电气能量，EMI通常与NOISE（杂讯）互用。

●NOISE杂讯

Unwanted electrical energy in a circuit that is unrelated to the desired signal, Sources of noise are most often generated by some type of switching circuit,Common sources include switching voltage regulators and clocked signals such as digital circuits.

指在-电路中与所要之讯号无关之多余电能，杂讯的来源通常为某些形式的切换电路，常见的杂讯为切换式电压，调整器及时脉讯号，如一些数位电路。

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●DC-DC CONVERTER 直流-直流转换器

A circuit or device that converts a DC input voltage to a regulated output voltage. The output voltage may be lower,

 higher or the same as the input voltage, Switching regulator DC-DC circuit most often require an inductor or

transformer to achieve the regulated output voltage.Switching regulator circuits can achieve a higher level of power

efficiency when compared to non-switching techniques.

指一电路或仪器可将一直流输入电压转换成一调整过的输出电压可为较低，较高或与输入电压相同 。交互式直流

对直流调整电路通常需要一电感或变压器以达到所要之输出电压，交换式调整电路较之非交换式技术，有较高

之功率效率。

●MATCHED IMPEDANCE   匹配的阻抗

The condition that exists when two coupled circuits are adjusted so that the output impedance of one circuit equals the

input impedance of the other circuit connected to the first, There is a minimum power loss between two circuits

指一个存在的条件，当调整两个耦合电路使得其中一电路的输出阻抗与另一电路输入阻抗相等时称之，

当他们连接的阻抗相等时，两电路间的能量损失最低。

●COMMON-MODE NOISE   一般模式杂讯

Noise or electrical interference that is common to both electrical lines in relation to earth ground.

在与接地相关之电路上发生的杂讯或电气干扰。

●DIFFERENTIAL-MODE NOISE 差动模式杂讯

Also known as normal-mode noise, it is electrical interference that is not common to both electrical lines but present

between both electrical lines,

亦称之为正常模式杂讯，此种电气干扰并非发生在电路中而是在电路与电路之间。

●RFI 射频干扰

RFI is an acronym for radio-Frequency interference . It is an older and more restrictive term that is used interchangeably

 with"EMI".(Also see EMI)

RFI为射频干扰之简称，为一较旧及较严重的名词，可和"EMI（电磁波干扰）"互换。（亦参阅电磁波干扰）

●FILTER   滤波器

A circuit or device whose purpose is to control electrical energy at a given frequency or over a range of frequencies,

Groups of passive components are commonly used to construct many types of filters, These passive components

 include resistors, capacitors and inductors,

指一电路或装置其功能是在一特定频率或频带下控制电能，不同种类被动元件常被用来建构不同的滤波器，这些

被动元件包含电阻，电容及电感。

●INPUT LINE FILTER 输入线性滤波器

A power filter placed on the input to a circuit or assembly that attenuates noise introduced from the power bus, The filter is designed to reject noise within a frequency band, Typically these filters are low-pass filters meaning they pass low frequency signals such as the DC power and attenuate higher frequency signals which consist of mainly noise, Band pass or low pass filters are commonly made up of inductor and capacitor combinations,(Also see Noise，EMI.)

指一被置于输入端与一电路或组合电路相接之电源滤波器，用以减低由电源所产生的杂讯，此滤波器被设计成可在一频带内消除杂讯，通常这些滤波器是属于低通滤波器，意思是只让低频带的讯号通过，如直流电源，并减低主要以杂讯为主的高频讯号，带通或低通滤波器通常由电感及电容搭配而成。（亦参阅杂讯及电磁波干扰）

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●INCREMENTAL CURRENT 增量电流

The DC bias current flowing through the inductor which causes an inductance drop of 5% from the initial zero DC bias inductance value,This current level indicates where the inductance can be expected to drop significantly if the DC bias current is increased further,This appiles mostly to ferrite cores in lieu of powdered iron,Powdered iron cores exhibit " soft " saturation characteristics,This means their inductance drop from higher DC levels is much more gradual than ferrite cores,The rate at which the inductance will drop is also a function of the core shape,(Also see Saturation Current,)

指一流经电感的直流偏压电流,而使得电感值较初始无直流偏压下之电感值下降5%,这个电流强度说明电感值在持续增加的直流偏压下将急速的下降,这适用于大部分用来代替粉状铁的铁氧磁体,粉状铁之铁芯具有"软性"的饱和特性,意思是指在较高的直流偏压下,其电感降较铁氧磁体来的缓和,同时,电感值下降的速率亦和铁芯的形状有关。(亦参阅饱和电流)

●TEMPERATURE RISE 温升

The increase in surface temperature of a component in air due to the power dissipation in the component.The power dissipation for an inductor includes both copper and core losses.

在空气中一元件之表面温度因元件内部能量的释放所造成温度的增加量。

●AMBIENT TEMPERATURE 环境温度

The temperature of still air immediately surrounding a component or circuit.A typical method to measure ambient temperature is to record the temperature that is approximately 1/2 inch from the body of the component or circuit.

直接接触元件或电路之静止空气的温度。一般量测环境温度的方法是量取离元件或电路约1/2寸之处的环境。

●OPERATING TEMPERATURE RANGE 操作温度范围

Range of ambient temperatures over which a component can be operated safely,The operating temperature is different from the storage temperature in that it accounts for the component's self temperature rise causde by the winding loss from a given DC bias current,This power loss is referred to as the " copper " loss and is equal to:

指元件可以安全运作的环境温度范围,操作温度与储存温度不同,操作温度需把由直流偏压电流所产生的绕线损失致产生的自我温升列入计算,此能量损失为"铜损"。

$$\text{Power Loss}=(DCR)(I^2dc)$$

This power loss results in an increase to the component temperature above the given ambient temperature, Thus,the maximum,operating temperature will be less than the maximum storage temperature:Maximum Operating Temperature =Storage Temperature-Self Temperature Rise

(Also see Core Losses,)

此值等于此能量损失造成元件温度上升而高于环境测试,因此,最大的操作温度会小于最大的储存温度最大操作温度=储存温度-自我温升。(亦参阅铁损)

STORAGE TEMPERATURE RANGE 储存温度范围

Range of ambient temperatures over which a component can be store safely.(Also see operating temperature)

指一环境温度范围,元件在此温度范围可被安全储存。(亦参阅操作温度范围)

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●SKIN EFFECT表面效应

Skin effect is the tendency for alternating current to flow near the surface of the conductor in lieu of flowing in a manner as to utilize the entire cross-sectional area of the conductor.This phenomenon causes the resistance to the conductor to increase.The magnetic field associated with the current in the conductor causes eddy currents near the center of the conductor which opposes the flow of the main current near the center of the conductor.The main current flow is forced further to the surface as the frequency of the alternating current increase.

表面效应是指交流电流较倾向于导体的表面传导而非流经整个导体截面的趋势，此现象会造成导体的电阻提高，与导体中电流有关之磁场在导体中心部位产涡流电流而阻疑了中心部位的主要电流，当交流电的频率增加时，主要电流的流向会进一步被推挤到导体表面.

●COPPERLOSS铜损

The power lost by current flowing through the winding,The power loss is equal to the square of the current multiplied by the resistance of the wire(I^2R),This power loss is transferred into heat.

电流流经线圈所产生之能量损失，此能量损失等于电流大小的平方乘上线圈的电阻(I^2R)，这此能量损失转换成热能.

●CORE LOSSES铁损

Core losses are caused by an alternating magnetic field in the core material,The losses are a function of the operating frequency and the total magnetic flux swing,The total core losses are made up of three main components:Hysteresis, eddy current and residual losses,These losses vary considerably from one magnetic material to another,Applications such as higher power and higher frequency switching regulators and RF Designs require careful core selection to yield the highest inductor performance by keeping the core losses to a minimum.

铁损是由于在铁芯中的变更磁场所造成，这个损失与操作频率及总流动的磁通量有关，总铁损由三个成份组成，磁滞损，过流损及残留损，这些损失因磁性材料不同而异，在如高功率及高频率切换调整器和RF的设计需要小心选择铁芯种类以降低铁损使电感的表现最佳.

●EDDY CURRENT LOSSES过流损

Eddy current losses are present in both the magnetic core and winding of an inductor,Eddy currents in the winding (or conductor)contribute to two main types of losses:losses due to proximity effects and skin effects,As for the core losses,an electric field arround the flux lines in the magnetic field is generated by alternating magnetic flux,This will result in eddy currents if the magnetic core material has electrical conductivity,Losses result from this phenomenon since the eddy currents flow in a plane that is perpendicular to the magnetic flux lines.

过流损同时会出现在电感中的绕线及磁性铁芯中，在绕线（导体）中的过电流会促进两种形式的损失：邻

近效应之损失及表面效应之损失，至于铁损，可视为在一磁场中之磁力线周围的一电场，是由交互的磁通量所产生，如果此磁性铁芯具有导电性，则形成过流，因过流电流在一垂直于磁力线方向的平面流动，损失因而产生。

●IMPEDANCE ANALYZER阻抗分析仪

Test instrument capable of measuring a wide range of impedance parameters,gain and phase angle,In tesing inductors, impedance analyzers can measure inductance,Q,SRF,insertion loss, impedance and capacitance, They operate in much more automatic fashion in comparison to Q Meters ,Some impedance analyzers have a wider test frequency range than a Q meter.

一测试仪器能够测量一范围之阻抗参数，增益及相位角，阻抗分析仪可量取电感值、品质系数、共振频率、插入损失，阻抗值及电容值，较之品质系数仪，其操作是较为自动化的，部份之阻抗分析仪亦有比品质系数有较大的量测频率范围。

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