

Power Magnetics



Transformers

Model	HM31	HM32	HM33	HM41	HM80
Industry Style	Current Sense	Current Sense	Current Sense	Gate Drive	ISDN Isolation
Inductance Range	1.3mH to 195mH	0.2mH to 85mH	180µH to 980µH	138µH to 860µH	2.7mH to 27mH
Turns Ratio	1:25 to 1:300	1:10 to 1:200	1:30 to 1:70	1:0.67 to 1:2	1:0.6 to 1:2.5
Operating Frequency	20KHz plus	20KHz plus	250KHz plus	20KHz to 300KHz	Supports ISDN 192kbps
DC Resistance Range	0.7W to 11.0W	0.2W to 4.5W	1.0W to 4.75W	0.072W to 0.156W	0.9W to 15W
Core Type	Toroid	Toroid	EE	Toroid	Varies
Operating Case Temp. Range	-25°C to +105°C	-25°C to +105°C	-25°C to +105°C	-25°C to +85°C	0°C to +85°C
Packaging Options	Bulk	Bulk	Tape & Reel	Bulk	Tape & Reel/Bulk

Specifications subject to change without notice.

We are capable of any core type.

Custom Capability/Application Summary

	A. Power								B. Data/Telcom	
	Main Line Xfmr		Inductor		EMI Filter		Gate Drive		Current Sense	
	Power	Distrib.	Power	DC-DC Diff	Com.	MdXfmr	(Mosfet)	Ind.	Xfmr	
Application Related										
Line Input (70-400V)	•									
Operating Frequency (20-300KHz)	•	•					•	•	•	
Digital Application										
Internal Safety Standards	•		•				•	•	•	
Core: Material & Configuration										
Ferrite: EE	•	•	•				•			
ETD	•	•								
EC	•	•								
Buckle						•				
PQ	•	•								
POT		•								
RM		•								
UU							•	•		
Slug			•		•					
Drum			•	•	•	•				
Toroid*		•				•	•	•	•	
Powder Iron: Toroid*			•	•	•					
Package										
SMD		•	•	•	•		•		•	
Through-Hole	•	•	•	•	•	•	•	•	•	
Catalog Equivalent (HM, HS, HT)	Custom	11, 12, 13, 15, 76, 77, 78			18	19, 28	41	41	32	91, 92, 93 80, 81, 82, 83

* Also available in molypermalloy powder iron and tape wound amorphous metal materials.

If your circuit performance dictates specific parameters not listed, please contact BI Technologies engineering. We would need the following to assist you in your design:

- Operating frequency
- Turns ratio
- Withstanding voltage
- Output power in watts
- Size/shape restrictions or limits
- Impedances
- Circuit topology
- Duty cycle

Power Magnetics

Surface Mount Inductors and Ferrite Beads



Model	BCL 3225/4532/5650	BML/BMC	BMB/BMB High Current	HM71
Industry Style	1210/1812/2220	0402 to 1206 Inductor	0402 to 1812/0603 to 1812 Chip Beads	Surface Mount Inductor
Inductance Range	0.1μH to 10000μH	1.5mH to 33μH		1.0μH to 1,000μH
Impedance Range			7W to 2,200W / 50W to 600W	0.01W to 13.8W
DC Resistance	0.03W to 150mA	0.10W to 2.75W	0.05W to 1.0W / 0.01W to 0.3W	0.1A to 20A
Current Rating	25mA to 1800mA	1mA to 300mA	50mA to 600mA	0.5A to 6A
Voltage Rating				
Core Type	Drum	Monolithic	Monolithic	Drum
Operating Case Temp. Range	-40°C to +100°C	-40°C to +125°C	-25°C to +85°C	-40°C to +85°C
Packaging Options	Tape & Reel	Tape & Reel	Tape & Reel	Tape & Reel

Through-Hole Inductors



Model	HM11	HM15	HM53	HM55	HM56
Industry Style	Rod Core Inductor	Encapsulated Inductor	Output Inductor	Power Inductor	High current cube Indicator
Inductance Range	0.21μH to 28μH	150μH to 1,000μH	1.4μH to 1000μH	0.4μH to 6.0μH	0.22μH to 1.30μH
DC Resistance	0.9mW to 43mW	0.5W to 1.7W	2.6mW to 680mW		0.60mW to 2.20mW
	5.5A to 31A	0.5A to 1.7A	1.9A to 29.5A	9A to 40A	25A to 80A
Voltage Rating					
Core Type	Ferrite Rod	Toroid	Toroid	Shielded Drum	Composite Ferrite
Operating Case Temp. Range	-25°C to +105°C	-40°C to +125°C	-40°C to +155°C		-40°C to +125°C
Packaging Options	Bulk	Tray	Tray	Tray	Tray

Specifications subject to change without notice. For Custom Applications Please Contact Us.

Selecting Minimum Inductance For A Buck Or Boost Converter:

Example #1, Step-Down (Buck) Converter

Input Voltage (V_{IN}):	+22V to +26V	Output Voltage (V_O):	+5V
Switching Frequency (F):	50KHz		
Maximum DC Output Current ($I_{DC MAX.}$):	2.5A	Minimum DC Output Current ($I_{DC MIN.}$):	0.5A
Voltage Drop Across Switcher (V_{SW}):	0.5V	Voltage Drop Across Diode (V_D):	0.5V

1. Determine the minimum on time of the transistor switch. $T_{ON (MIN)} = \frac{V_O + V_D}{F \times E_{IN (MAX)}} = \frac{5 + 0.5}{50000 \times 26} = 4.23\mu s$
2. Assume the peak to peak ripple current, ΔI_L , equal to twice the min. value of DC output current.
3. Calculate the minimum inductance. $L_{MIN} = \frac{[E_{IN (MAX)} - V_O - V_D] T_{ON (MIN)}}{\Delta I_L} = \frac{(26 - 5 - 0.5) (4.23 \times 10^{-6})}{2 \times 0.5} = 86.7\mu H$
4. Refer to our catalog and select the smallest part meeting min. I_{DC} and inductance requirement.



HM66	HM68	HM72A	HM77	HM78
Surface Mount Inductor	Button Inductor	Surface Mount Inductor	Surface Mount Inductor	Surface Mount Inductor
1μH to 330μH	2.2μH to 47μH	1μH to 1,070μH	10μH to 1,000μH	
0.008w to 1.54w	0.081w to 2.34w	0.55mw to 332mw	4.56mw to 1,480mw	5.2mw to 5.2w
0.22A to 10.0A	0.48A to 1.9A	1.8A to 35A	0.71A to 13.3A	0.2A to 12A
Shielded Drum	Drum	Composite	Shielded Drum Core	
-40°C to +85°C	-40°C to +100°C	40°C to +155°C	-40°C to +105°C	-40°C to +85°C
Tape & Reel	Tape & Reel	Tape & Reel	Tape & Reel	Tape & Reel/Tube



Common
Mode Chokes



HM73	HM67	HM19	HM28
Surface Mount Inductor	Surface Mount C.M.	Toroid Style	Buckle Style
.01μH to 10μH	5μH to 4.7MH	1mH to 16mH	0.45mH to 120mH
0.5M to 23.1mw	5.8mw to 403mw	0.02w to 0.24w	0.08w to 2.7w
5.6A to 40A	0.2A to 1.0A	1.8A to 7.5A	0.5A to 4A
	300V	250V	250V
ER	Toroid	Toroid	Buckle
-40°C to 135°C	-40°C to +125°C	-25°C to +105°C	-25°C to +105°C
Tape & Reel	Tape & Reel	Tray	Tray/Tube

Example #2, Step-Up (Boost) Converter

Input Voltage (V_{IN}):	+12V to +15V	Output Voltage (V_O):	+24V
Switching Frequency (F):	50KHz		
Maximum DC Output Current ($I_{DC\ MAX.}$):	1.5A		
Voltage Drop Across Switcher (V_{SW}):	0.5V	Voltage Drop Across Diode (V_D):	0.5V

1. Assume a maximum ripple current of 12.5% of inductor current. $I_{L(AVE)}$
2. Determine the minimum on time of the switcher. $T_{ON(MIN)} = \frac{[V_O - E_{IN(MAX)} + V_D]}{F V_O} = \frac{24 - 15 + 0.5}{50000 \times 24} = 7.92\mu s$
3. Determine the average current through inductor. $I_{L(AVE)} = \frac{1.05 (V_O + V_D) I_{DC}}{E_{IN}} = \frac{1.05 (24 + 0.5) 1.5}{15} \approx 2.57A$
4. Determine peak to peak ripple current. $\Delta I_L = 2 (P/100) I_{L(AVE)} = 2 \times 12.5\% \times 2.57 = 0.643$
5. Calculate the minimum inductance. $L_{MIN} = \frac{[E_{IN(MAX)} - V_{SW}] T_{ON(MIN)}}{\Delta I_L} = \frac{(15 - 0.5) (7.92 \times 10^{-6})}{0.643} = 179\mu H$
6. Refer to our catalog and select the smallest part meeting Min. L_{DC} and inductance requirement.

Signal Magnetics

LAN/WAN/ISDN



Model	HS91	HS92	HS93
Industry Style	Single Port 100/1000MB	10 Base-T Ethernet AUI Transformer	T1/CEPT/ISDN Transformer
Turns Ratio (Chip to Media Side)	1:1, $\pm 2:1$	1:1, 1ct:2ct	1:1:1, 1:2ct, 1ct:2ct, 1:2
Operating Temp. Range	0°C to +70°C	0°C to +70°C	0°C to +70°C
Insertion Loss	-1.0 Typ. 1 to 100MHz		
Rise Time	2.5ns, Typ.		
Return Loss	-11 to -18dB, 0.1 to 100MHz		
Common Mode Rejection	-35 to -45dB, 0.1 to 100MHz		
Cross Talk	-38 to -40dB, 0.1 to 100MHz		
Insulation Voltage, Minimum	1,500Vrms	2,000Vrms	2,000Vrms
Inductance	350 μ H @ 100KHz	90 μ H to 140 μ H @ 100KHz	1.2mH to 22mH @ 100KHz
Leakage Inductance		0.1 μ H to 0.2 μ H @ 100KHz	0.5 μ H to 11 μ H @ 100KHz
Interwinding Capacitance		10pF to 12pF @ 100KHz	35pF to 100pF @ 100KHz
DC Resistance		0.3 ω to 0.6 ω	0.7 ω to 2.4 ω
Mounting Style	Surface Mount	Surface Mount	Surface Mount/Through-Hole

DSL Coupling Transformer



Model	HT81	HT82	HT83
Industry Style	HDSL Transformer	VDSL Transformer	Common Mode Choke*
Turns Ratio (Chip to Media Side)	1ct, 2ct:1.8ct, 2st	1:1, 1:1:1	
Insertion Loss	1.0dB Max. @ 40KHz	0.5dB to 0.8dB @ .2MHz to 30MHz	
Return Loss	16.5dB to 20dB @ Mid. Band	10dB to 22dB @ .2MHz to 30MHz	
Longitudinal Balance	50dB to 55dB @ 5 to 320KHz	30dB to 40dB @ .2MHz to 3MHz	
THD	-70dB to -75dB	-70dB	
Inductance @ 10KHz	2mH to 3mH	175 μ H to 250 μ H	24 μ H to 4mH
Cross Talk	-38dB to -40dB, 0.1 to 100MHz		
Common Mode Attenuation			20dB to 45dB
Parallel Impedance @ 10KHz			7.5kW
Mounting Style	Through-Hole	Surface Mount/Through-Hole	Surface Mount/Through-Hole

Specifications subject to change without notice.

* For applications up to 25.92 mbs.