

MGV High Current Molded SMT Power Inductors MGV 0503Series

FEATURES AND APPLICATIONS

Laird MGV series high current power inductors improve performance, reliability and power efficiency. A lower profile benefits consumer electronics and telecom design. Products feature extremely low DCR with greater efficiency and enable a large current in a small size. Inductors are of magnetic shielding and molded construction and perform in operating temperatures ranging from -40 C to 125 C including self-heating rise in temperature.

FEATURES

- · Magnetic shielded structure
- Low DCR and high efficiency
- Low profile and miniaturization
- High reliability

APPLICATIONS

- DC-DC Converter and Power Suppliers
- LCD TV'S and Gaming Console
- Tablet, Notebooks, Servers and Printers
- Networking and Data storage
- GPS, Set-top-box and Base stations
- Smart meters and Medical instruments



PART NUMBER EXPLANATION



Note: Automotive grade parts are also available, a specific P.N will be assigned upon request. Please contact laird local sales for details.

ELECTRICAL SPECIFICATIONS

- Tolerance: M: ±20% or N: ±30%
- Inductance tested at 100KHz, 1.0V
- Heat Rated Current (Irms) is defined based on temperature rise approximate 40°C without core loss (ambient temperature 25±5°C)
- Saturation Current (Isat) is the DC current at which the inductance drops off approximately 30% from its value without current. (ambient temperature 25±5°C)
- Operating temperature range: -40°C~+125°C (including self-heating temperature rise)
- Storage temperature range (packaging conditions): -10°C~+40°C and RH 60%(MAX.)

Note: Heat Rated Current (Irms) is tested on a typical PCB and apply a constant current in still air.

The temperature rise is dependent on the application system condition including PCB PAD pattern, trace width and thickness and adjacent components etc. It's suggested to verify the temperature rise of the component under the real operation application conditions.



Molded SMT Power Inductors

					www.laird.com	MGV0503	Series	Rev: A
SPECIF	FICATIO	N						
1.MECHA	NICAL & DI	MENSIC	DNS				(U)	NT: mm
						Α	5.50	0±0.50
						В	5.10	0±0.30
						С	3.00	0±0.40
A	001		+-	+ -	+ +	D	1.80	0±0.50
				h		E	1.10	0±0.30
				_	E	L	6.5	50 ref
	В -	-	c	-	D -	G	2.5	50 ref
						Н	1.8	30 ref
					- L	RE	MARK	
					G -			
					н			
	UMBER NO							
	0503	100	М -	1X	D: Inductance Tolerance. (:±30%)	
Α	В	С	D	E	E: "X"=0:Standard catalog			
	oduct Series.				"X"=1-9:Controlled custo	•		
	ries number, p				performance than s		rt. And	"5-9" is
C: Ind	luctance code				for automotive grade	e.		
3.EQUIVA	LENT CIRC	CUIT:						
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				_	3			



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PART NUMBER	INDUCTANCE (uH)	Irms(A) Typ.	Isat(A) Typ.	DCR(mΩ) Typ	DCR(mΩ) Max	REMARK
MGV0503R10N-10	0.10±30%	23.0	27.0	2.5	3.0	
MGV0503R22M-10	0.22±20%	15.5	21.0	3.7	4.4	
MGV0503R33M-10	0.33±20%	14.0	18.0	4.3	5.0	
MGV0503R47M-10	0.47±20%	12.0	16.0	6.4	7.4	
MGV0503R56M-10	0.56±20%	10.0	15.0	8.0	10.0	
MGV0503R68M-10	0.68±20%	8.5	14.0	10.0	12.0	
MGV0503R82M-10	0.82±20%	8.0	12.5	11.5	13.0	
MGV05031R0M-10	1.00±20%	7.0	11.0	13.0	14.0	
MGV05031R2M-10	1.20±20%	6.5	11.0	14.0	16.0	
MGV05031R5M-10	1.50±20%	6.0	10.0	16.0	25.0	
MGV05032R2M-10	2.20±20%	5.5	9.0	25.0	35.0	
MGV05033R3M-10	3.30±20%	5.0	8.0	32.0	38.0	
MGV05034R7M-10	4.70±20%	4.6	6.0	50.0	53.0	
MGV05036R8M-10	6.80±20%	4.0	4.3	68.0	76.2	
MGV0503100M-10	10.0±20%	2.8	3.5	110.0	128.0	
MGV0503150M-10	15.0±20%	2.1	2.6	165.0	190.0	
MGV0503220M-10	22.0±20%	1.9	1.7	220.0	250.0	
MGV0503330M-10	33.0±20%	1.6	1.6	380.0	440.0	

GENERAL SPECIFICATION:

- Tolerance: M: ±20% or N: ±30%
- Inductance tested at 100KHz, 1.0V
- Heat Rated Current (Irms) is defined based on temperature rise approximate 40°C without core loss (ambient temperature 25±5°C)
- Saturation Current (Isat) is the DC current at which the inductance drops off approximately 30% from its value without current. (ambient temperature 25±5°C)
- Operating temperature range: -40°C~+125°C (including self-heating temperature rise)
- Storage temperature range (packaging conditions): -10°C~+40°C and RH 60%(MAX.)



Molded SMT Power Inductors

MGV0503 Series www.laird.com Rev: A **SPECIFICATION Characteristics Curve** MGV0503R10N-10 MGV0503R22M-10 0.30 50 0.15 50 Temperature Rise (°C) 40 40 0.24 0.12 Temperature Rise nductance (uH) Inductance (uH) 30 0.18 0.09 30 0.12 20 0.06 20 0.03 10 0.06 0 0 0 0.00 0 12 18 30 8 16 24 32 40 24 IDC(A) IDC(A) MGV0503R33M-10 MGV0503R47M-10 0.50 0.80 50 50 Temperature Rise (°C) 40 Inductance (uH) Inductance (uH) 0.40 0.64 Temperature Rise 30 0.30 30 0.48 0.20 0.32 20 0.10 0.16 0.00 0.00 0 20 0 15 25 12 IDC(A) IDC(A) MGV0503R56M-10 MGV0503R68M-10 50 1.00 1.00 50 Temperature Rise (°C) Temperature Rise (°C) 0.80 0.80 Inductance (uH) nductance (uH) 0.60 30 0.60 30 0.40 0.40 20 20 0.20 0.20 10 10 0.00 0.00 0 12 20 12 IDC(A) IDC(A)



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MGV0503 Series www.laird.com Rev: A **SPECIFICATION Characteristics Curve** MGV0503R82M-10 MGV05031R0M-10 1.50 1.00 Temperature Rise (°C) Temperature Rise (°C) 1.20 Inductance (uH) 0.80 Inductance (uH) 30 0.90 0.60 0.60 20 0.40 20 0.30 0.20 0.00 0 0.00 0 12 6 12 15 8 16 20 IDC(A) IDC(A) MGV05031R2M-10 MGV05031R5M-10 2.00 50 1.50 Temperature Rise (°C) Temperature Rise (°C) 40 40 1.20 1.60 Inductance (uH) Inductance (uH) 0.90 30 1.20 30 20 0.60 0.80 20 0.30 0.40 0.00 0 0.00 0 15 3 12 15 IDC(A) IDC(A) MGV05033R3M-10 MGV05032R2M-10 5.00 50 2.50 40 40 4.00 2.00 Inductance (uH) Temperature Rise Temperature Rise Inductance (uH) 3.00 30 1.50 30 1.00 20 2.00 20 0.50 10 1.00 0.00 0 0.00 0 3 9 0 2 6 8 10 6 12 15 4 IDC(A) IDC(A)

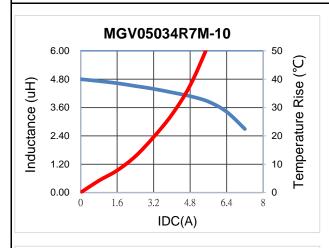


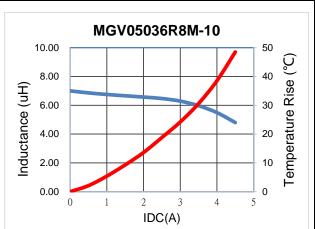
Molded SMT Power Inductors

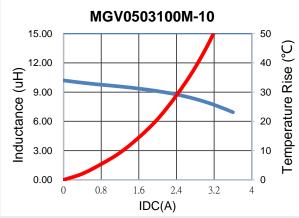
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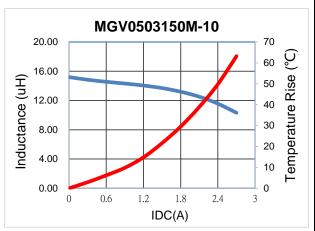
SPECIFICATION

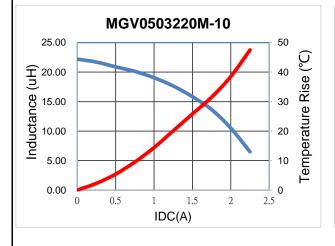
Characteristics Curve

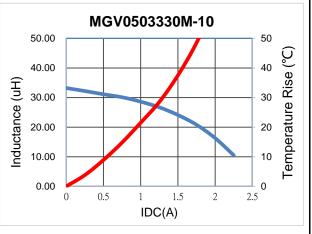














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www.laird.com MGV0503 Series Recommended Soldering Conditions For Lead-Free Application Figure 1 . Re-flow Soldering RECOMMENDED SOLDERING CONDITIONS preheating soldering cooling 255°C MAX:255°C TEMPERATURE 150°C 240°C 20~40sec. Gradual Cooling 90±30sec¦ TIME(SEC.) Reflow times: 3 times max Figure 2 . Hand Soldering PRE-HEATING NATURAL COOLING 280 230 TEMPERATURE C Over 1 min. Gradual Cooling Within 3 sec. Hand solder times: 1 time max



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Reliability and Te	stina Conditions / Pin Type Po	www.laird.com MGVU5U3 Series Rev: A wer Inductors						
SMD series(Consumer)								
Item	Reference	Additional Requirements						
Operating temperature range	-55°C ~ +125°C (Including self-temperature rise)							
Storage temperature and humidity range	-10 $^{\circ}$ C to +40 $^{\circ}$ C , 60% RH Max							
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	85±2℃, 168+24hours						
Temperature Cycling	JESD22 Method JA-104	-40 °C →+85, transforming interval:20s, 100cycles						
Operational Life	MIL-PRF-2	85±℃, 168+24hours Apply maximum rated voltage and current according part drawi						
External Visual	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship. Electrica Test not required.						
Physical Dimension	JESD22 Method JB-100	Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical Test not required						
Vibration	MIL-STD-202 Method 204	10~55Hz,1.5mm, 2 hours in each 3mutually perpendicular directions (total of 6 hours)						
Resistance to Soldering Heat	MIL-STD-202 Method 210	1. Max. 260±5°C,10±1s, 2 times 2.Solder Composition: Sn/3Ag/0.5Cu						
Solderability	J-STD-002	245±5°C, 5±1sec, Solder: Sn/3.0Ag/0.5Cu						
Electrical Characterization	Print Spec	Parametrically test per lot and sample size requirements, summary to show Min, Max, Mean and Standard deviation at room as well as Min and Max Operating temperatures						
Board Flex	AEC-Q200-005	2mm,30±1s						
Terminal Strength(SMD)	AEC-Q200-006	10N, 5S, X,Y direct						

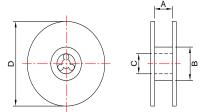


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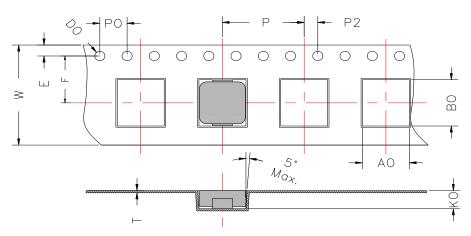
PACKAGING

Reel Dimension



Туре	A(mm)	B(mm)	C(mm)	D(mm)
13'x12	12.4+2/-0	100 ± 2	13+0.5/-0.2	330

Tape Dimension

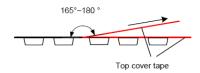


W	Е	F	Р	A0	В0	P2	P0	K0	t	D0
12.0±0.3	1.75±0.1	5.50±0.1	8.00±0.1	5.50±0.1	6.20±0.1	2.0±0.1	4.0±0.1	3.3±0.1	0.35±0.05	1.5Ref.

Packaging Quantity

P/N	Chip/Reel	Inner Box	Outer Box
MGV0503 Series	2000pcs	4000pcs	8000pcs
Size	9	-	-

Peeling Off Force



The force peeling off cove tape is 10 to 100 grams							
in the arrow direction under the following conditions							
Room Temp	Room Temp Room Room atrn Teaming						
(℃)	(℃) Humidity (hPa) Speed						
5~35 45~85 860~1060 300							

%Storage Conditions

- 1. Temperature and humidity conditions: -10-+40 $^{\circ}\mathrm{C}$ and 60% RH.
- Recommended products should be used within 12 month from the time of manufacturing.
- The packaging material should be kept where no chloring or sulfur exists in the air.
- 4. Allowable stacking condition of Packaging box: max height 1.5m or 5 boxes stacking

Mouser Electronics

Authorized Distributor

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Laird Performance Materials:

MGV05031R0M-10 MGV05031R5M-10 MGV05032R2M-10 MGV05033R3M-10 MGV05034R7M-10 MGV0503R22M-10 MGV0503R33M-10 MGV0503R47M-10 MGV0503R68M-10 MGV0503R82M-10 MGV0503100M-10 MGV0503220M-10 MGV05031R2M-10 MGV0503150M-10 MGV05036R8M-10 MGV0503R56M-10 MGV0503330M-10 MGV0503R10N-10