Product Series :	**GSFH**	**Brand :**	GOTREND
File Version :	GSFH-SERIES-V1R2	**Editor :**	Qiuyi Wu
Established Date :	2023.06.16	**Description :**	High Current Inductor
Latest Edit Date :	2023.09.27	**Product Type :**	☑ Standard ☐ Customize

Version Information :

SN	Date	Version Code	Modify Description	Editior	Check
01	2023.06.16	V1R0	New version update release	Yinghui Guo	Toby
02	2023.08.02	V1R1	Add more sensibility	Qiuyi Wu	Toby
03	2023.09.27	V1R2	Modify the GSFH201610P&GSFH252012P D dimensions	Qiuyi Wu	

⚠ REMINDERS

- Product information in this catalog is subject to change without notice, and is for reference only. Therefore, please contact GOTREND Technology to check for the latest information before practical application or usage of the products.
- This catalog contains only typical specifications, please contact GOTREND Technology for further details if you can not find special components or information you need in this catalogue. Please also approve our product specifications or transact the approval sheet for product specifications before ordering.
- This catalogue only applies to products purchased through GOTREND Technology or its official agencies. This catalogue does not apply to products that are purchased through other third parties.
- Please read Attention and CAUTION note (for storage, operating, rating, soldering, mounting and handling) in this catalog to ensure product proper usage.
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- Information and data provided in the brochure can and do vary in different applications, and actual performance may vary over time.
- "Delivery Specification" illustrating precautions for the specifications and safety of each product listed in this catalog is available and we strongly recommend to provide these delivery specifications with customers that use these products.
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- Any reproduction or extraction of the contents in this catalog is prohibited without prior permission from GOTREND Technology.
- Products listed in this catalog are intended for general electronic device usage under normal operation and use condition including telecommunication equipment, home appliances, sports equipment AV equipment, industrial machine, office equipment etc. Please take note that our products are not designed, intended or authorized for use in below mentioned applications unless explicitly agreed in writing between the parties to avoid product failure that could result in situation where personal injury or death could occur.

  (1) Aerospace/Aviation equipment
  (2) Atomic energy-related equipment
  (3) Disaster prevention/crime prevention equipment
  (4) Electric heating apparatus, burning equipment
  (5) Medical equipment
  (6) Military equipment
  (7) Power-generation control equipment
  (8) Public information-processing equipment
  (9) Safety equipment
  (10) Seabed equipment
  (11) Transportation control equipment
  (12) Transportation equipment (cars, electric trains, ships, etc.)
  (13) Other applications that are not considered general-purpose applications
- Our manufacturing sites fully compliance with requirement regarding the quality management system in the automotive industry under the IATF 16949 standard. GOTREND Technology respect individual agreements with reference to customer requirements and customer specific requirements (CSR). We will like to emphasize that only requirements mutually agreed upon will in implemented in our Quality Management System taking into consideration that IATF 16949 may appear to support the acceptance of unilateral requirements. We will only legally bind to this individually agreed upon agreement under the IATF 16949 standard.
- The product itself is a powder metallurgy product, so the structure is relatively fragile, and it should not be used for products that are easy to fall. In addition, when this product is assembled, it should avoid collision with the tool or mechanism shell.

- It is not recommended to use hot air gun for disassembling of this product. When using of hot air gun to repair other parts, please also take note that long time or high temperature exposure of this product will also damage the inductance device. If you need to use the hot air gun to disassemble the product, it is recommended to adjust the hot air gun temperature to 380 deg.C±5 deg.C. The blower head of the hot air gun should be perpendicular and at least 1cm away from the product. After heating the product to the tin material melting point, use tweezers to remove the product from the PCB.

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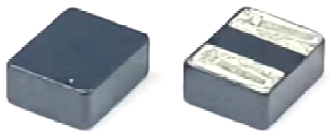
Features & Application :

* High performance (Isat) realized by metal dust core.
* Low loss realized with low DCR
* Capable of corresponing high frequency
* 100% lead (Pb) free meet RoHS standard
* DC / DC converter for CPU in Notebook PC



(Picture for reference only)

Part No. Example :

PN	:	**GSFH**	**201610**	**P**	**-**	**1R0**	**☐**
ID	:	1	2	3		4	5

1 : GOTREND Series : GSFH
2 : Type Size Code :201610 = 2.0x 1.6 x 1.0 mm
3 : P = Pb free < 1000 ppm
4 : [L] Value : Inductance 1R0 = 1.0 uH
5 : [L] Tolerance : M = +/-20%

Basic Information :

Made in	Taiwan / China
Pin Foot	SMD
Shielding	Yes
J-STD-020	MSL Level 1
RoHS	Compliant
REACH	Compliant
Halogen	Free

Operating & Storage Condition :

* Operating Temp -55 ~ +125 ℃ (Including self - temperature rise)
* Storage Temp 1. -10 ~ +45 °C , 50 ~ 60% RH (Product with taping)
  2. -55 ~ +125 ℃ (On board)
* Storage Life Time 6 Month (Less than 40°C and 60% RH)

Attention & Caution :

* Keep out of Splashing water or salt water
* Avoid Toxic Gas (Hydrogen sulfide, Sulfurous acid, Chlorine, Ammonia)
  Vibrations or shocks which exceed the specified condition
  Dew condense
  Layout near the edge of PCB
  Over flexure after SMT mounting & PCBA
* Pin foot or SMD pad solderablility: Pb free type is best within 6 months after delivery
* Humidity sensitive , IPC/JEDEC J-STD-020 MSL if over Level 1, recommend bake 30mins@150 degree before PCBA
* Caution for human life relative applications : PLS contact & consult with GOTREND team in design stage.

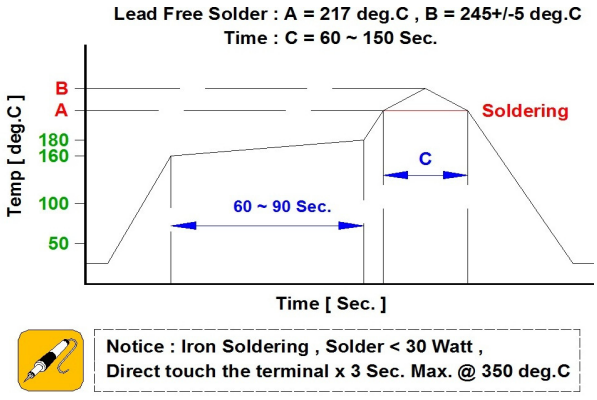
Test Condition :

* Equipment HP4284A , HP42841A - L , Q , DCR , IDC
  HP8753D Network analyzer - SRF

* Standard Atmosphere Conditions:
  Ambient Temperature 20 ± 15 °C
  Humidity RH 65 ± 20%

* If there may be any doubt on the test result ,
  Measurement shall be made within the following limits:
  Ambient Temperature 25 ± 5 °C
  Humidity RH 75 ± 10%

Recommend IR Reflow Curve : GTX-IR-FILE001



Notice : Iron Soldering , Solder < 30 Watt ,
Direct touch the terminal x 3 Sec. Max. @ 350 deg.C

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SMD Power Inductor - GSFH Series Type

Image	Part Name	L (mm) Typ.	W (mm) Typ.	H (mm) Typ.	Inductance Range (uH) M=+/-20% , N=+/-30%	DCR (m Ohm) Max.	Isat (A) Max.	Irms (A) Max.	Page
	GSFH201610P	2.0	1.6	1.0	0.1 ~ 10.0	12.0~580.0	1.1~8.4	0.7~8.0	5-6
	GSFH252012P	2.5	2.0	1.2	0.1 ~ 10.0	10.0~400.0	1.45~12.5	1.05~10.5	7-8

Product Series :	**GSFH**	**Brand :**	GOTREND
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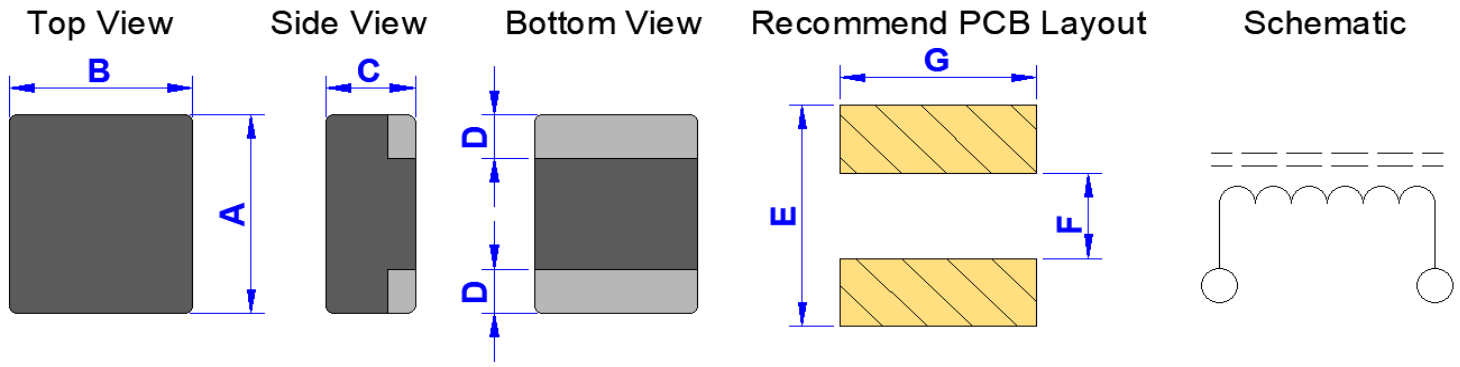
GSFH201610P-SERIES

Dimension [mm] :



Size Code	A (+/-0.2)	B (+/-0.2)	C (Max.)	D (+/-0.2)	E (Ref.)	F (Ref.)	G (Ref.)
201610	2.0	1.6	1.00	0.55	2.1	0.5	1.7

Electrical Characteristics :

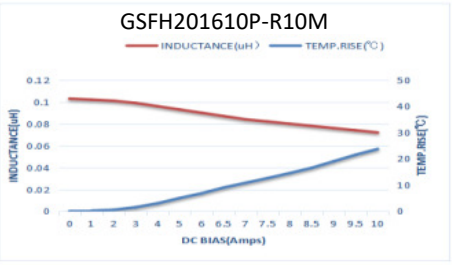
Part No.	Inductance(uH)	Inductance Tolerance	DCR(m Ohm)		Irms(A)		Isat(A)	
			Typ.	Max.	Typ.	Max.	Typ.	Max.
GSFH201610P-R10M	0.10	M	7.00	12.00	8.50	8.00	9.00	8.40
GSFH201610P-R15M	0.15	M	8.00	14.00	7.60	7.00	8.70	8.00
GSFH201610P-R22M	0.22	M	11.00	18.00	6.90	6.30	8.20	7.50
GSFH201610P-R24M	0.24	M	12.00	19.00	6.80	6.20	8.00	7.40
GSFH201610P-R33M	0.33	M	17.00	22.00	5.70	5.30	7.00	6.50
GSFH201610P-R47M	0.47	M	22.00	25.00	5.50	5.00	6.30	5.50
GSFH201610P-R68M	0.68	M	25.00	32.00	4.60	4.30	5.20	4.70
GSFH201610P-1R0M	1.00	M	35.00	43.00	4.50	4.10	4.60	4.20
GSFH201610P-1R5M	1.50	M	80.00	100.00	2.60	2.30	3.20	2.90
GSFH201610P-2R2M	2.20	M	120.00	130.00	2.50	2.10	3.00	2.80
GSFH201610P-3R3M	3.30	M	140.00	170.00	1.70	1.50	2.30	2.00
GSFH201610P-4R7M	4.70	M	190.00	220.00	1.60	1.40	2.00	1.80
GSFH201610P-100M	10.00	M	483.00	580.00	1.00	0.70	1.40	1.10

* **Inductance Test Condition :** @1MHz , 1.0Vrms , 25℃ Ambient
* **Inductance Tolerance :** M = +/-20%
* **Irms :** Rated Current Loading when temperature rise approximately ΔT of 40℃
* **Isat :** Saturated Current measured at the point of L drop approximately 30%
* **The part temperature (ambient + temp rise) :** should not exceed 125℃ under worst case operating conditions. Circuit design, component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
* **The rated current as listed :** is either the saturation current or the heating current depending on which value is lower.

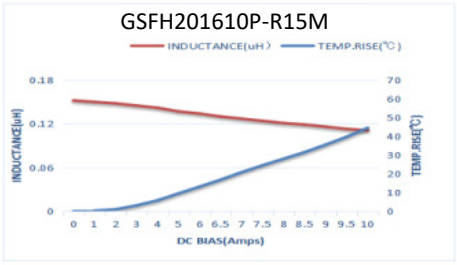
GSFH201610P-SERIES

Typical Performance Curves :

GSFH201610P-R10M



GSFH201610P-R15M



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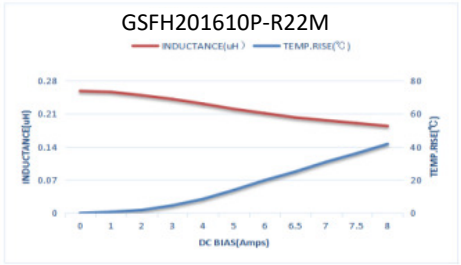

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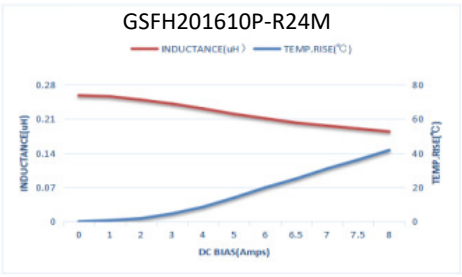

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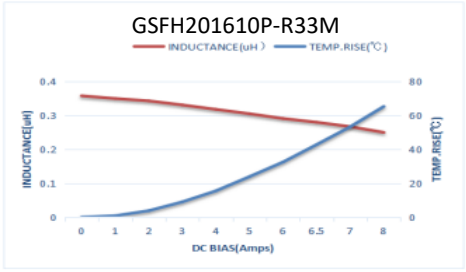

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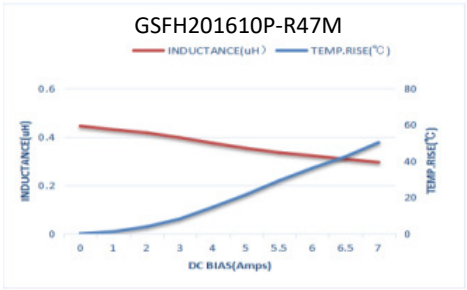

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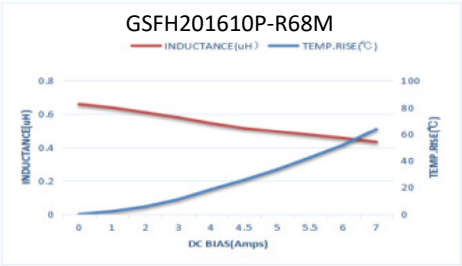
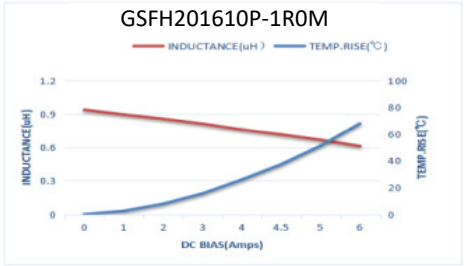
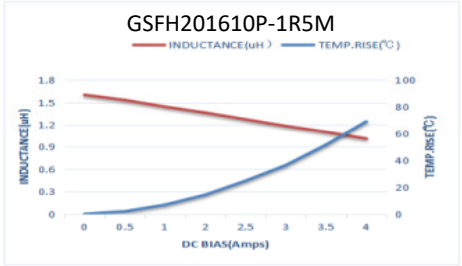


GSFH201610P-1R0M



GSFH201610P-1R5M



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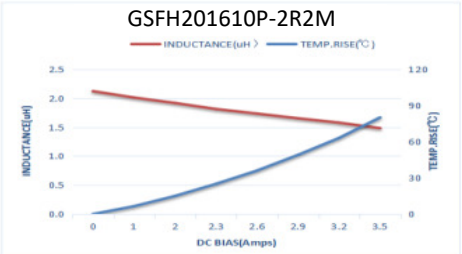

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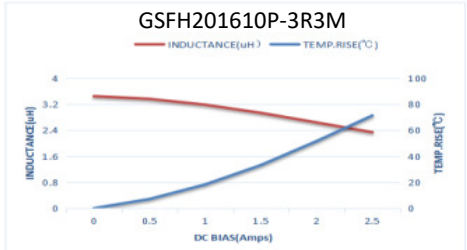
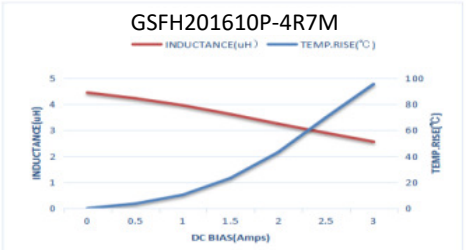
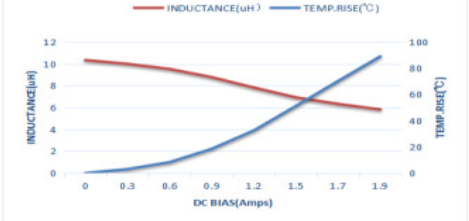


GSFH201610P-4R7M



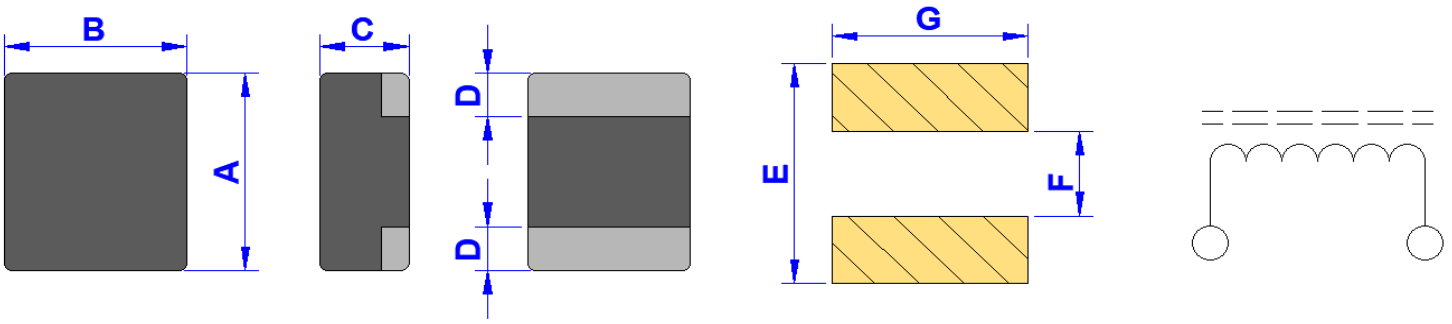
GSFH201610P-100M



GSFH252012P-SERIES

Dimension [mm] :

Top View Side View Bottom View Recommend PCB Layout Schematic



Size Code	A (+/-0.2)	B (+/-0.2)	C (Max.)	D (+/-0.2)	E (Ref.)	F (Ref.)	G (Ref.)
252012	2.5	2.0	1.2	0.75	2.6	0.7	2.1

Electrical Characteristics :

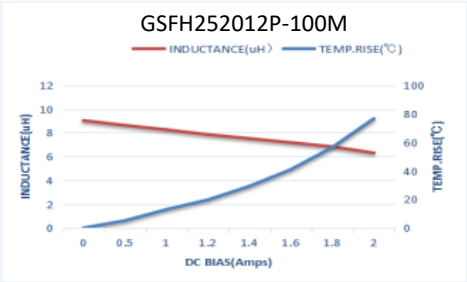
Part No.	Inductance(uH)	Inductance Tolerance	DCR(m Ohm)		Irms(A)		Isat(A)	
			Typ.	Max.	Typ.	Max.	Typ.	Max.
GSFH252012P-R10M	0.10	M	6.00	10.00	12.00	10.50	13.50	12.50
GSFH252012P-R15M	0.15	M	7.00	11.00	11.50	10.00	13.00	12.00
GSFH252012P-R22M	0.22	M	9.00	14.00	8.20	7.60	9.60	9.00
GSFH252012P-R24M	0.24	M	10.00	15.00	8.00	7.50	9.30	8.80
GSFH252012P-R33M	0.33	M	11.00	17.00	6.80	6.40	8.30	7.80
GSFH252012P-R47M	0.47	M	13.00	19.00	6.50	6.00	7.50	7.00
GSFH252012P-R68M	0.68	M	17.00	23.00	6.30	5.50	6.50	6.00
GSFH252012P-R82M	0.82	M	19.00	24.00	5.80	5.30	6.50	5.80
GSFH252012P-1R0M	1.00	M	35.00	42.00	4.00	3.60	5.60	5.00
GSFH252012P-1R5M	1.50	M	44.00	50.00	3.70	3.20	4.50	4.10
GSFH252012P-2R2M	2.20	M	55.00	65.00	3.00	2.70	3.80	3.30
GSFH252012P-3R3M	3.30	M	80.00	97.00	2.30	1.80	3.00	2.70
GSFH252012P-4R7M	4.70	M	150.00	170.00	1.80	1.50	2.40	2.10
GSFH252012P-6R8M	6.80	M	245.00	270.00	1.60	1.40	2.00	1.70
GSFH252012P-100M	10.00	M	330.00	400.00	1.20	1.05	1.60	1.45

* **Inductance Test Condition :** @1MHz , 1.0Vrms , 25℃ Ambient
* **Inductance Tolerance :** M = +/-20%
* **Irms :** Rated Current Loading when temperature rise approximately ΔT of 40℃
* **Isat :** Saturated Current measured at the point of L drop approximately 30%
* **The part temperature (ambient + temp rise) :** should not exceed 125℃ under worst case operating conditions. Circuit design, component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
* **The rated current as listed :** is either the saturation current or the heating current depending on which value is lower.

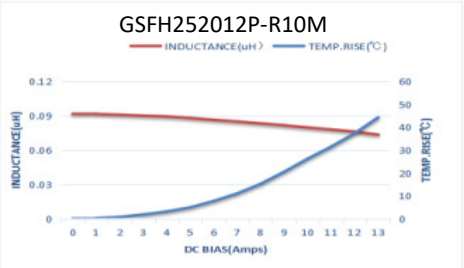
GSFH252012P-SERIES

Typical Performance Curves :

GSFH252012P-100M



GSFH252012P-R10M



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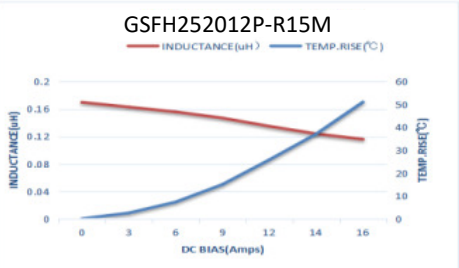

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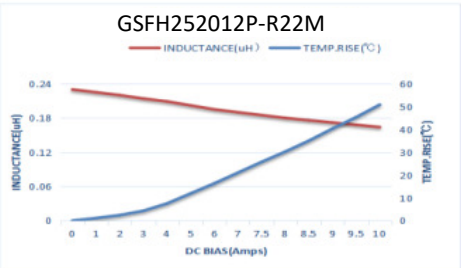
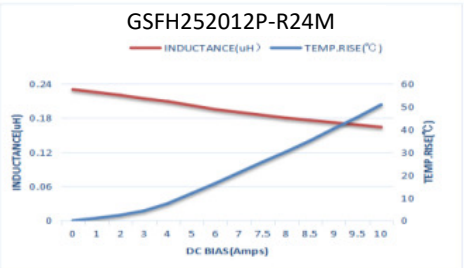


GSFH252012P-R24M



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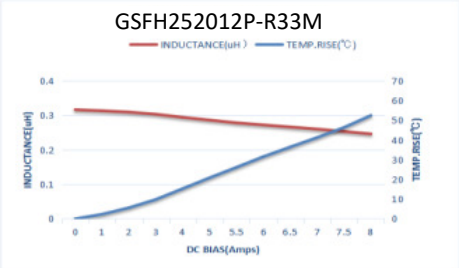

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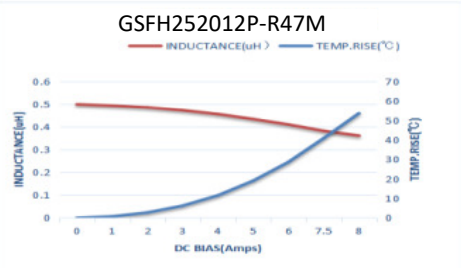
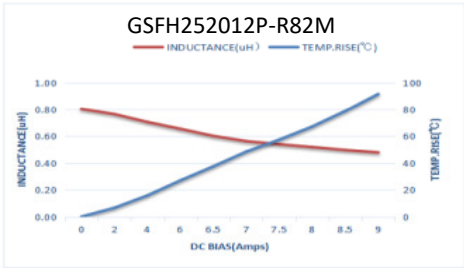
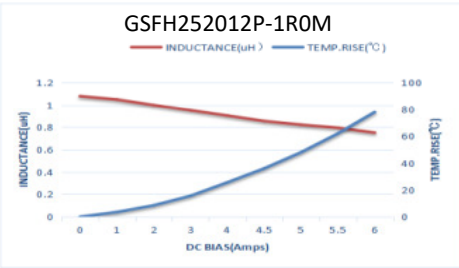


GSFH252012P-R82M



GSFH252012P-1R0M



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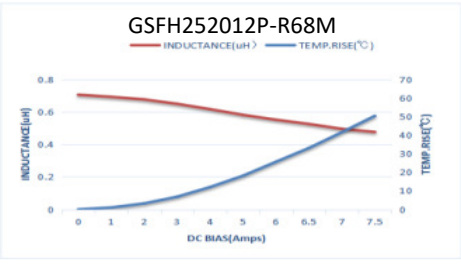

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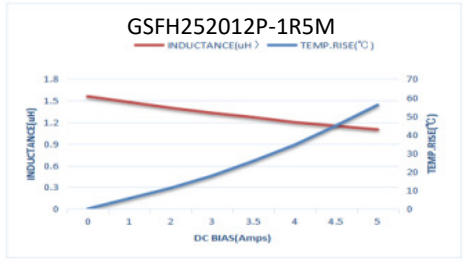
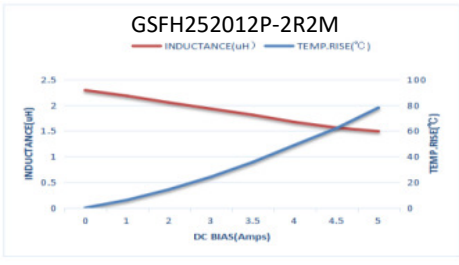
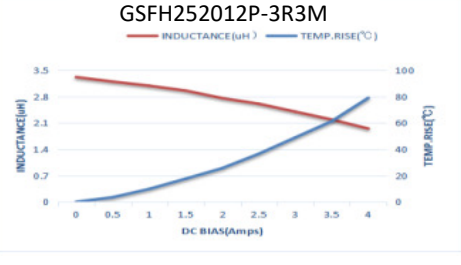


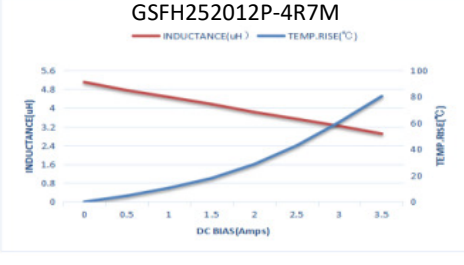
GSFH252012P-2R2M



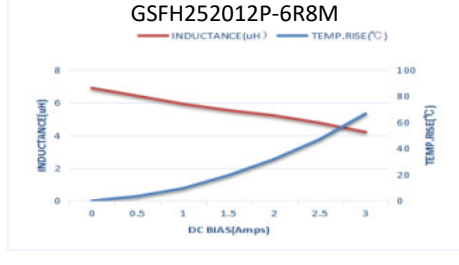
GSFH252012P-3R3M



GSFH252012P-4R7M



GSFH252012P-6R8M



Care note :

Care note for Use :

(1) Storage Condition :

Temperature 25 to 35 °C , Humidity 45 to 60% RH

(2) Use Temperature :

a. Minimum Temperature : -55 ℃ Ambient temperature of this product.

b. Maximum Temperature : +125 °C The value of temperature including ambient and temperature rise of this product.

c. Reliability test temperature range from -55 ~ +125 ℃

d. However, this is not meant as temperature grade guarantee for UL.

(3) Model :

When this product was used in a similar or as new product to the original one, sometimes it might be unable to satisfy the specifications due to difference in condition of usage.

(4) Drop :

If this product suffered mechanical stress such as drop, characteristics may become poor (due to damage on coil / bobbin / ferrite … etc.)

Never use such stressed product.

Care note for Safety :

(1) Provision to Abnormal Condition :

This product itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc.

Therefore, it shall be confirmed from the end product that there is no risk of smoking, fire, dielectric withstand voltage insulation resistance,etc. in abnormal conditions to provide protective devices and /or protection circuit in the end product.

(2) Temperature Rise :

Temperature rise on this product depends on the installation condition on end products.

It shall be confirmed on the actual end product that temperature rise of this product is within the specified temperature class limit.

(3) Dielectric Strength :

Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.

(4) Water :

This product must not be used in wet condition resulted from water, coffee or any liquid contact because insulation strength becomes very low under such condition.

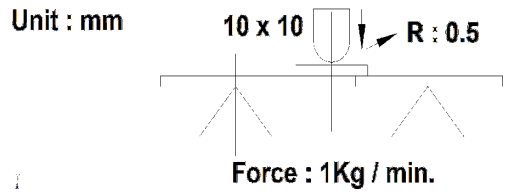
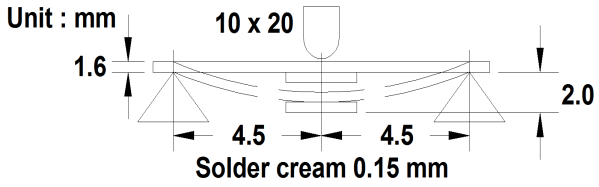
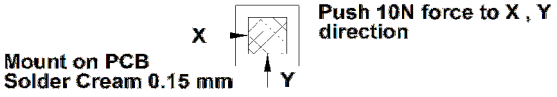
(5) Potting :

If this product is potted in some compound, coating material of magnet wire might be occasionally damaged. Please ask us if you intend to pot this product.

(6) Detergent :

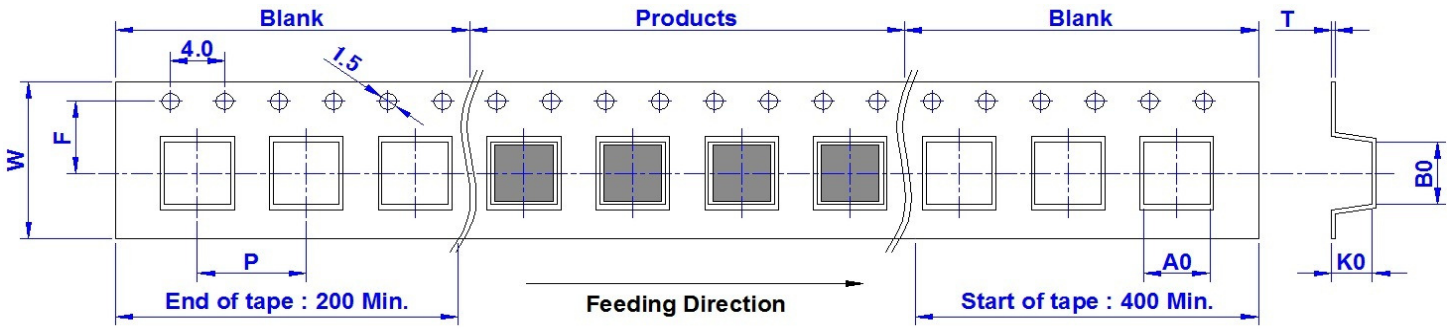
Please consult our company immediately once under such circumstances because product reliability confirmation etc. is needed when this product come in contact with these chemicals.

Reliability :

SN	Test Item	Test Condition	Specification
1	**Dimension**	Actual Size ...	Meet Spec
2	**Thermal Shock (Temperature Cycle)**	Temperature : -55 ~ +125 ℃ kept stabilized for 30 min. each Cycle : 100 Cycles (power off)	Elec. no variation Appearance no deformation
3	**Humidity Resistance**	Humidity : 90% ~ 95% RH Temperature : 60 ± 2 °C, Test Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation
4	**HighTemperature**	Temperature : 125 ± 2 °C Testing Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation
5	**Low Temperature**	Temperature : -55 ± 2 ℃ Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation
6	**Temperature and Humidity Cycle**	Temperature / Humidity / Time 25 deg.C / 90% ~ 95% RH / 3.0 Hr 55 deg.C / 95% ~ 96% RH / 5.0 Hr 25 deg.C / 90% ~ 95% RH / 3.0 Hr Cycle : 20 Cycles	Elec. no variation Appearance no deformation
7	**Vibration**	Frequency : 10Hz ~ 55Hz, Amplitude : 1.5 mm Direction : X, Y, Z, Time : 2 Hours each	Elec. no variation Appearance no deformation
8	**Solderability**	Go through real SMT IR-Reflow .... The profile like our suggest profile. Preheat : 160 ± 10 deg.C (90 sec) Peak : 245 ± 5 deg.C Peak Time : 50 Sec. / up 217 deg.C	Elec. no variation Appearance no deformation
9	**Soldering Heat Resistance**	Preheat : 160 ± 10 deg.C (90 sec) Solder : Sn / Ag / Cu (Pb Free) Solder Temp. : 260 ± 5 deg.C, Time : 3 ± 1 seconds	Elec. no variation Appearance no deformation
10	**Iron Solder Heat Resistance**	Solder Temp. : 350 ± 5 deg.C Flux : Rosin, Time : 3 ± 1 seconds	Elec. no variation Appearance no deformation
11	**Bending Strength**		Elec. no variation Appearance no deformation
12	**Flexure Strength**		Elec. no variation Appearance no deformation
13	**Terminal Strength**		Elec. no variation Appearance no deformation
14	**High-Voltage**	100 V DC between core & winding	Elec. no variation Appearance no deformation
15	**Load life**	Temperature : 25 ± 3 deg.C Load : Allowed DC Current, Test Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation

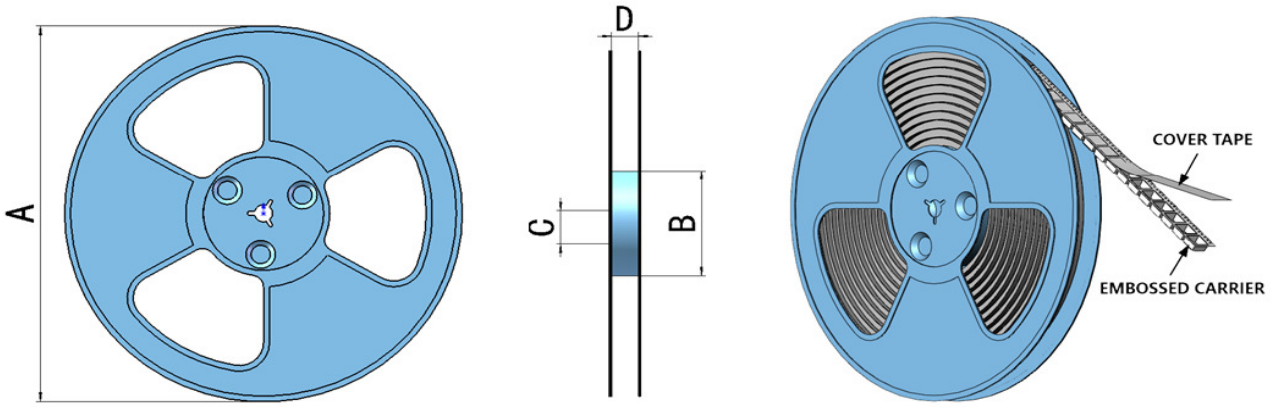
Packaging Information :

Tape Dimension (mm)



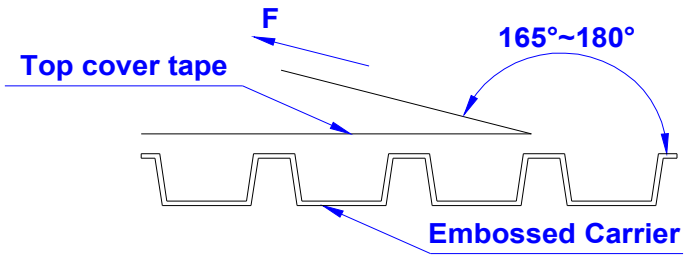
SIZE/mm	W (+/-0.3)	P (+/-0.1)	A0 (+/-0.05)	B0 (+/-0.05)	K0 (+/-0.05)	T (+/-0.05)	F (+/-0.1)
201610	8	4	1.9	2.35	1.2	0.23	3.5
252012	8	4	2.4	2.85	1.4	0.23	3.5

Reel Dimension (mm)



SIZE/mm	REEL SIZE	A (Typ.)	B (+/-2.0)	C (+/-0.5)	D (+/-2.0)	QTY / REEL
201610	7” × 8 mm	178	60	13	8.4	3000 PCS
252012	7” × 8 mm	178	60	13	8.4	3000 PCS

Tearing Off Force



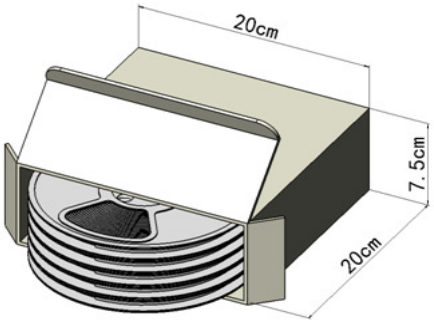
The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions (referenced ANSI / EIA - 481 - D - 2008 of 4.11stadnard).

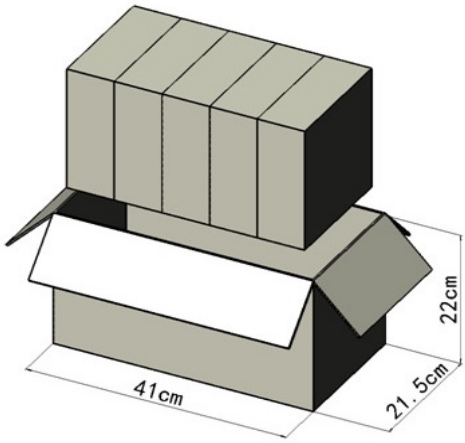
Room Temp. (°C)	Room Humidity (%)	Room Atm. (hPa)	Tearing Speed (mm / min)
5 ~ 35	45 ~ 85	860 ~ 1060	300

Packaging Information :

Box Package

7" Small Box





7" Large Box

SIZE/mm	Reels in Small Box	Small Box in Large Box
201610	5	5
252012	5	5