



<b>Product Series :</b> GTHW	<b>Brand :</b> GOTREND
<b>File Version :</b> GTHW-SERIES-V4R0	<b>Editor :</b> David Wang
<b>Established Date :</b> 2009.02.24	<b>Description :</b> Common Mode Filter
<b>Latest Edit Date :</b> 2022.02.10	<b>Product Type :</b> <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Customize

## 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.
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- ◆ 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.
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- (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.



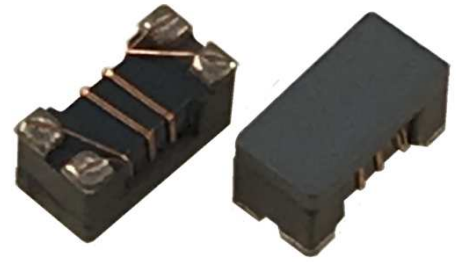
- ◆ It is not recommended to use hot air gun for disassembling of this product. When using of hot air gun to repair other parts, please also take note that long time or high temperature exposure of this product will also damage the inductance device. If you need to use the hot air gun to disassemble 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 :**

- \* Common Mode Filter for high speed signal line
- \* Fit for signal line circuit : USB2.0 / IEEE1394
- \* To help you go pass the CE/FCC standard.
- \* Mobile Device / Handheld Device / LowProfile Device



( Picture for reference only )

**Part No. Example :**

PN	:	<b>GTHW</b>	<b>4532</b>	<b>P</b>	<b>T</b>	<b>L</b>	<b>-</b>	<b>110</b>	<b>T</b>
-----		-----	-----	-----	---	---		-----	---
ID	:	1	2	3	4	5		6	7
1	:	GOTREND Series Code							
2	:	Type Size Code : Length 4.5 mm X Width 3.2 mm							
3	:	P = Pb free < 1000 ppm							
4	:	[ E ] [ T ] [ H ] : Material Code							
5	:	[ L ] Value : Inductance							
6	:	Inductance [uH] @ 100KHz = 11 uH							
7	:	Tolerance T = Typical							

**Basic Information :**

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

**Operating & Storage Condition :**

- \* Operating Temp -40 ~ +125 °C ( Including self - temperature rise )
- \* Storage Temp 1. -10 ~ +45 °C , 50 ~ 60% RH ( Product with taping )  
2. -40 ~ +125 °C ( 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)
- \* Avoid Vibrations or shocks which exceed the specified condition
- \* Avoid Dew condense
- \* Avoid Layout near the edge of PCB
- \* Avoid Over flexure after SMT mounting & PCBA



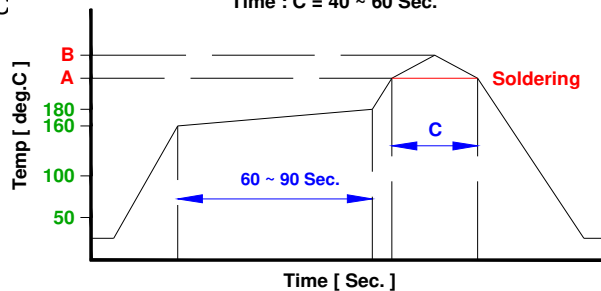
- \* Pin foot or SMD pad solderability: Pb free type is best within 6 months after delivery
- \* Humidity sensitive , IPC/JEDEC J-STD-020 MSL if over Level 1, recommend bake 30mins@150 degree before PCBA
- \* Caution for human life relative applications : PLS contact & consult with GOTREND team in design 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**

Lead Free Solder : A = 217 deg.C , B = 245+/-5 deg.C  
Time : C = 40 ~ 60 Sec.

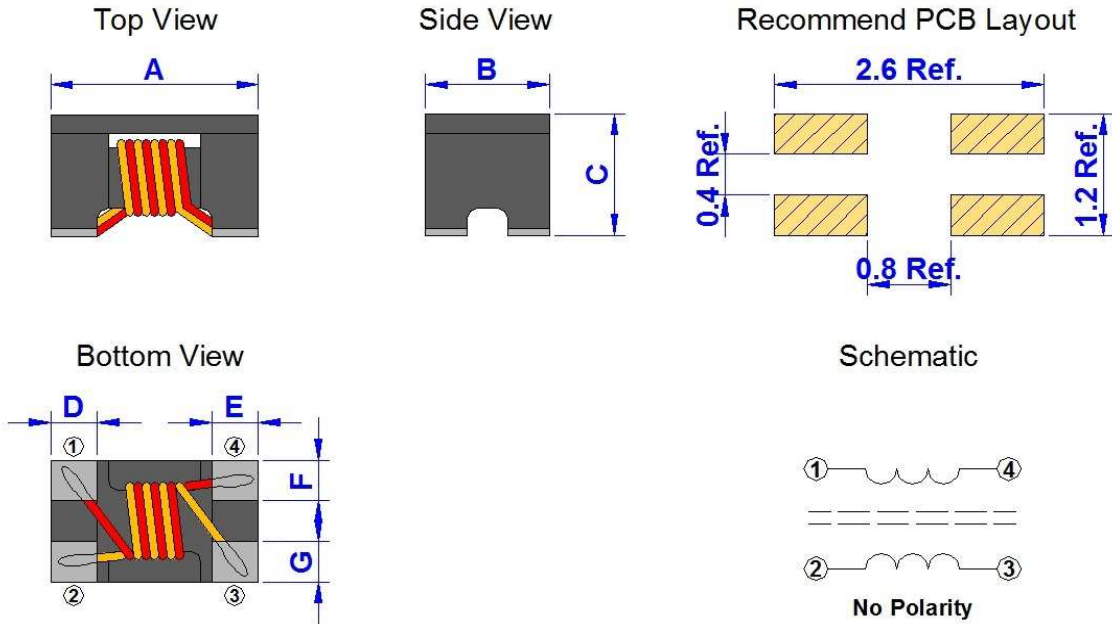


Notice : Iron Soldering , Solder < 30 Watt ,  
Direct touch the terminal x 3 Sec. Max. @ 350 deg.C

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### GTHW2012P-SERIES

Dimension [ mm ] :



TYPE	A	B	C	D	E	F	G
2012	2.0+/-0.2	1.2+/-0.2	1.2+/-0.2	0.4+/-0.2	0.4+/-0.2	0.4+/-0.2	0.4+/-0.2

Electrical Characteristics :

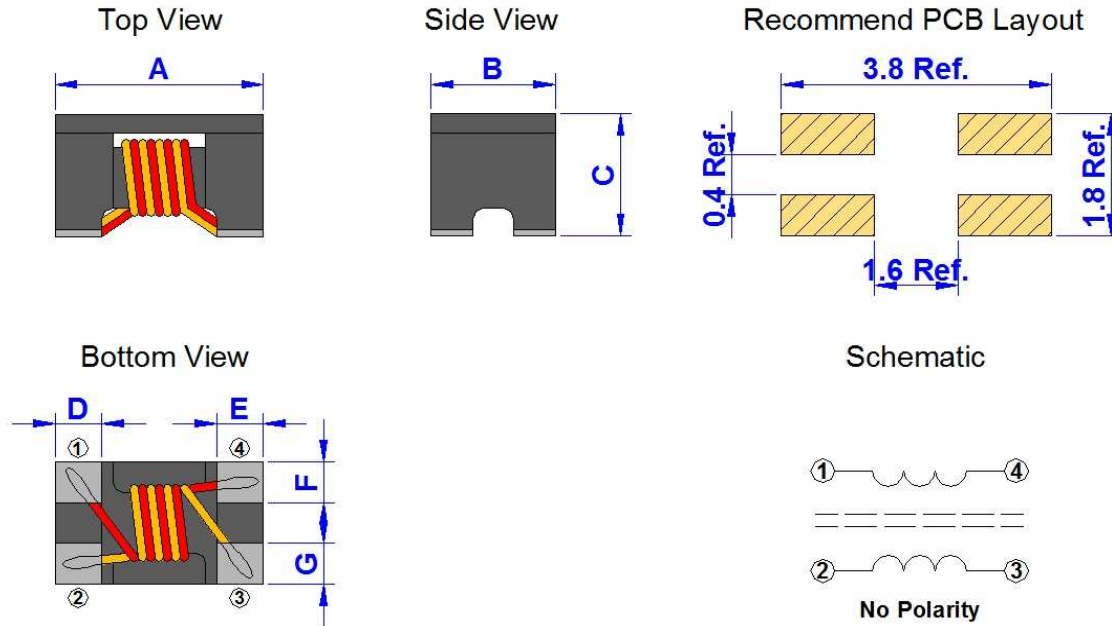
Part No.	Common Mode(Min.) Impedance(Ohm) @100MHz	Common Mode(Typ.) Impedance(Ohm) @100MHz	Rated Voltage / Withstanding Voltage V(DC)	DCR (Ohm) (Max.)	Rated Current (mA) (Max.)	Insulation Res. Min. (M Ohm)
GTHW2012P□- 670T	30	67	50/125	0.25	400	10
GTHW2012P□- 900T	60	90	50/125	0.30	400	10
GTHW2012P□- 121T	95	120	50/125	0.30	370	10
GTHW2012P□- 161T	115	160	50/125	0.35	330	10
GTHW2012P□- 181T	135	180	50/125	0.35	330	10
GTHW2012P□- 221T	145	220	50/125	0.35	330	10
GTHW2012P□- 361T	200	360	50/125	0.40	280	10
GTHW2012P□- 401T	320	400	50/125	0.40	280	10
GTHW2012P□- 601T	450	600	50/125	0.375	250	10
GTHW2012P□- 102T	750	1000	50/125	0.80	100	10

\* Rated Current based on increasing product temperature : Current when temperature of the product reaches +40 °C .

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### GTHW3216P-SERIES

Dimension [ mm ] :



TYPE	A	B	C	D	E	F	G
3216	3.2+/-0.2	1.6+/-0.2	2.0+/-0.2	0.6+/-0.2	0.6+/-0.2	0.6+/-0.2	0.6+/-0.2

### Electrical Characteristics :

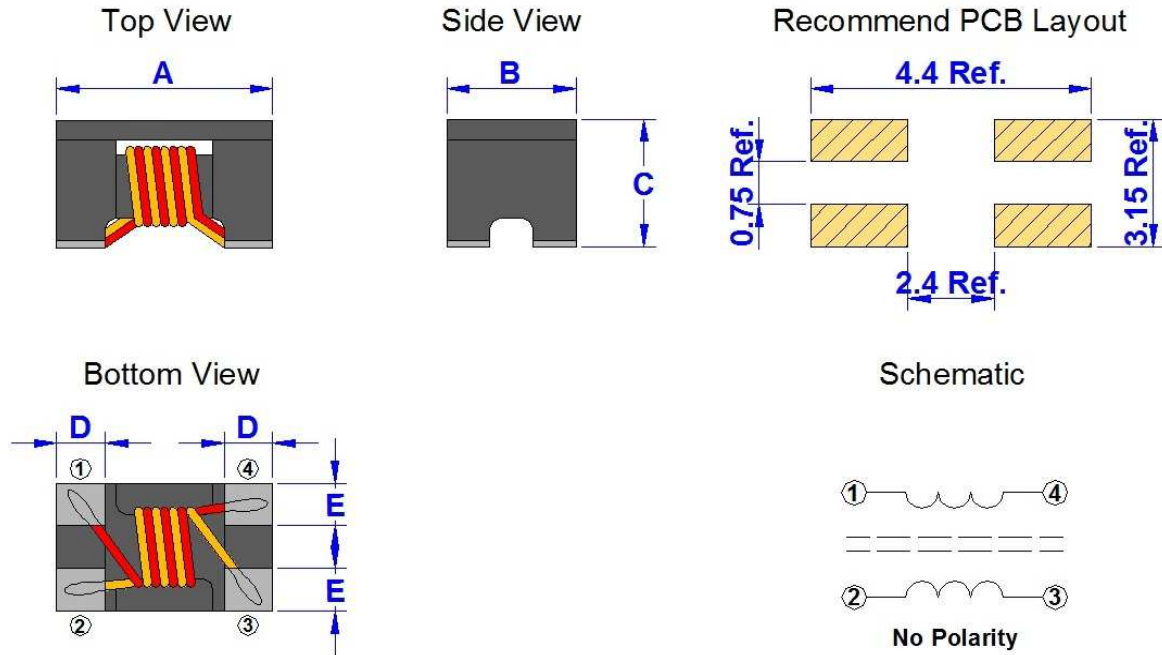
Part No.	Common Mode(Min.) Impedance(Ohm) @100MHz	Common Mode(Typ.) Impedance(Ohm) @100MHz	Rated Voltage / Withstanding Voltage V(DC)	DCR (Ohm) (Max.)	Rated Current (mA) (Max.)	Insulation Res. Min. (M Ohm)
GTHW3216P□- 900T	60	90	50/125	0.30	370	10
GTHW3216P□- 121T	90	120	50/125	0.30	370	10
GTHW3216P□- 161T	115	160	50/125	0.40	340	10
GTHW3216P□- 221T	145	220	50/125	0.50	310	10
GTHW3216P□- 601T	425	600	50/125	0.80	260	10
GTHW3216P□- 102T	700	1000	50/125	1.00	230	10
GTHW3216P□- 222T	1560	2200	50/125	1.20	200	10

\* Rated Current based on increasing product temperature : Current when temperature of the product reaches +40 °C .

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### GTHW4532PHL-SERIES

Dimension [ mm ] :



TYPE	A (+/-0.2)	B (+/-0.2)	C (+/-0.2)	D (Typ.)	E (Typ.)
4532	4.50	3.20	2.80	1.00	1.20

### Electrical Characteristics :

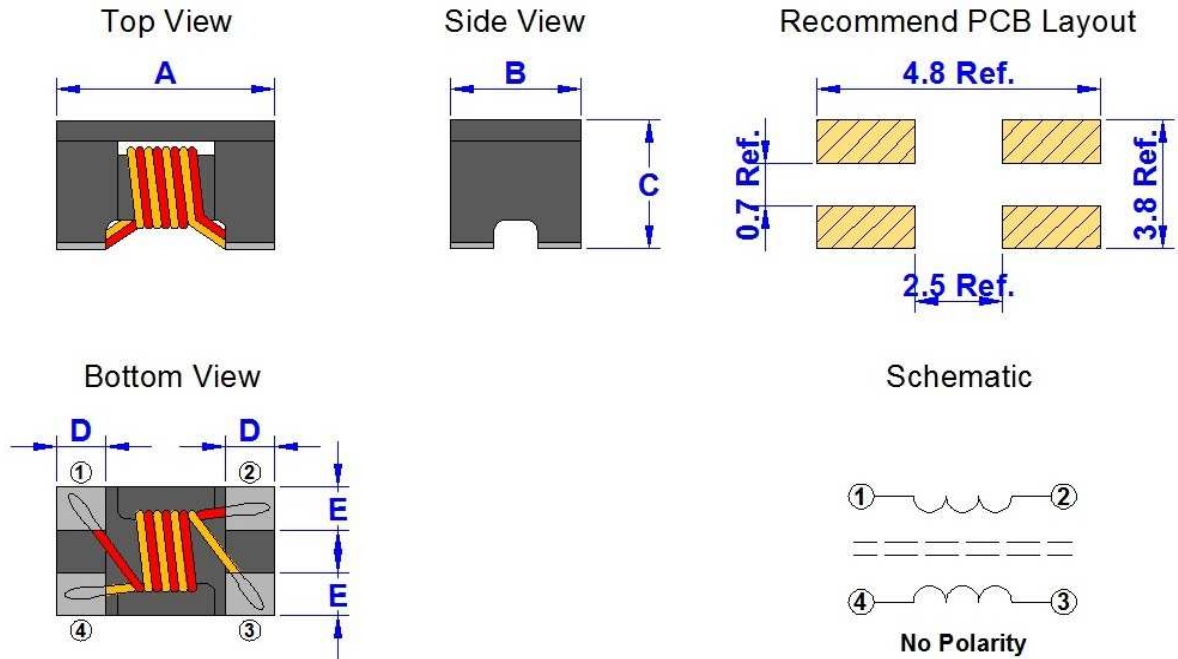
Part No.	Common Mode Impedance(Ohm) @10MHz		Common Mode Inductance(uH) @100KHz	Rated Voltage V( DC )	DCR (Ohm) (Max.)	Rated Current(mA) (Max.)	Insulation Resistance (M Ohm)
	Min.	Typ.	+50% / - 30%				
GTHW4532PHL-110T	300	700	11.0	50 Typ.	0.6	250	10 Min.
GTHW4532PHL-220T	500	1000	22.0	50 Typ.	1.0	200	10 Min.
GTHW4532PHL-510T	1000	2000	51.0	50 Typ.	1.0	200	10 Min.
GTHW4532PHL-101T	2000	5000	100.0	50 Typ.	3.0	150	10 Min.

\* Rated Current based on increasing product temperature : Current when temperature of the product reaches +40 °C .

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### GTHW4532PT-SERIES

Dimension [ mm ] :



TYPE	A (+/-0.2)	B (+/-0.2)	C (+/-0.2)	D (+/-0.1)	E (+/-0.1)
4532	4.50	3.20	2.80	1.00	1.20

### Electrical Characteristics :

Part No.	Common Mode Impedance(Ohm) @100MHz	Rated Voltage V( DC )	DCR (Ohm) (Max.)	Rated Current(mA) (Max.)	Withstand Volt. (VDC)	Insulation Resistance (M Ohm)
GTHW4532PT-800T	80 +/-25%	50 Max.	0.05	3000	125 Max.	10 Min.
GTHW4532PT-900T	90 +/-25%	50 Max.	0.05	3000	125 Max.	10 Min.
GTHW4532PT-121T	120 +/-25%	50 Max.	0.05	3000	125 Max.	10 Min.
GTHW4532PT-201T	200 +/-25%	50 Max.	0.10	1500	125 Max.	10 Min.
GTHW4532PT-601T	600 +/-25%	50 Max.	0.24	1500	125 Max.	10 Min.
GTHW4532PT-801T	800 +/-25%	50 Max.	0.24	1000	125 Max.	10 Min.

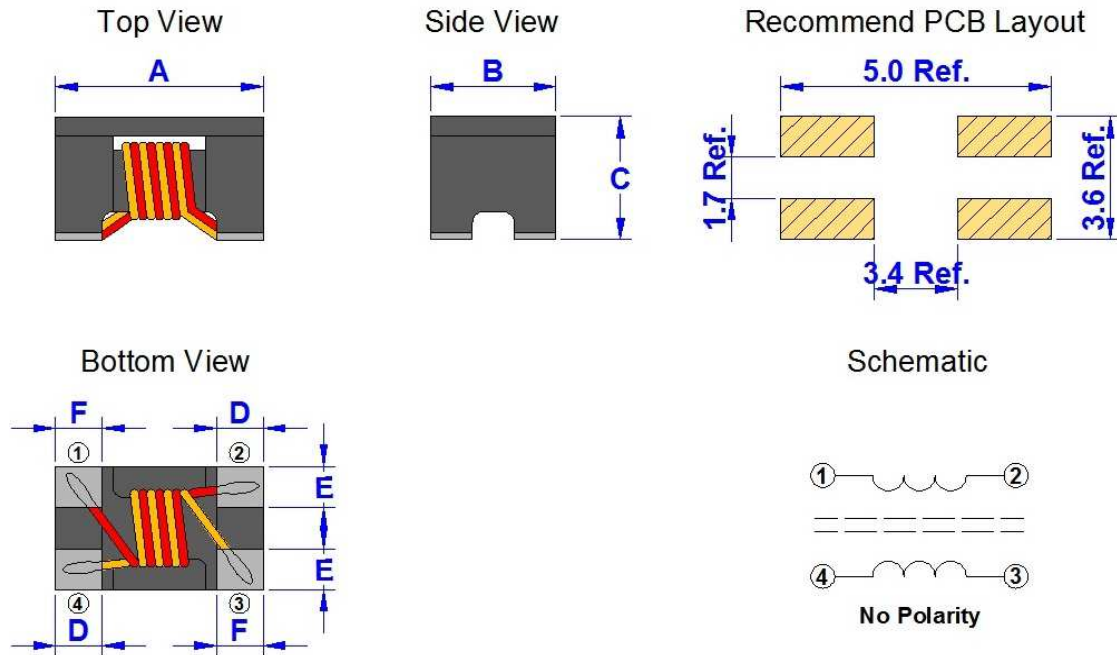
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### GTHW4532PTL-SERIES

Dimension [ mm ] :



TYPE	A (+/-0.2)	B (+/-0.2)	C (+/-0.2)	D (+/-0.2)	E (+/-0.2)	F (+/-0.2)
4532	4.50	3.20	2.80	0.75	0.85	0.60

### Electrical Characteristics :

Part No.	Common Mode Impedance(Ohm) @10MHz		Common Mode Inductance(uH) @100KHz	Rated Voltage V( DC )	DCR (Ohm) (Max.)	Rated Current(mA) (Max.)	Insulation Resistance (M Ohm)
	Min.	Typ.	+50% / - 30%				
GTHW4532PTL-110T	300	600	11.0	50 Typ.	0.6	360	10 Min.
GTHW4532PTL-220T	500	1200	22.0	50 Typ.	1.0	310	10 Min.
GTHW4532PTL-510T	1000	2800	51.0	50 Typ.	1.0	230	10 Min.
GTHW4532PTL-101T	2000	5800	100.0	50 Typ.	2.0	200	10 Min.

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#### 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 : -40 °C 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 -40 ~ +125 °C
- 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 :

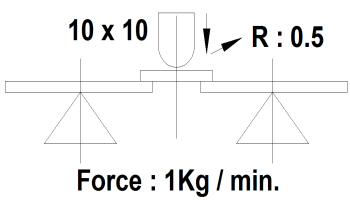
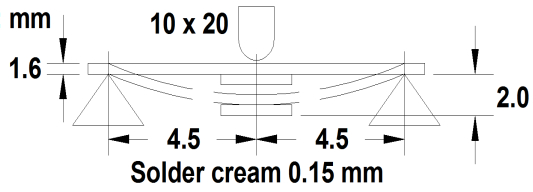
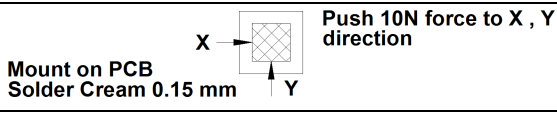
If this product is potted in some compound, coating material of magnet wire might be occasionally damaged. Please ask us if you intend to pot this product.

(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.

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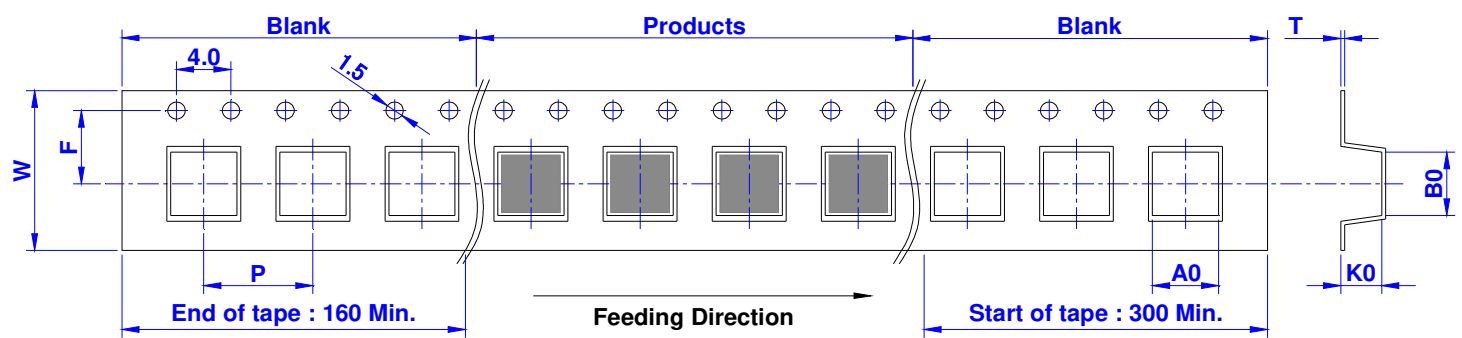
**Reliability :**

SN	Test Item	Test Condition	Specification		
1	<b>Dimension</b>	Actual Size ...	Meet Spec		
2	<b>Thermal Shock (Temperature Cycle)</b>	Temperature : -40 ~ +125 °C kept stabilized for 30 min. each Cycle : 100 Cycles ( power off )	Elec. no variation Appearance no deformation		
3	<b>Humidity Resistance</b>	Humidity : 90% ~ 95% RH Temperature : 60 ± 2 °C , Test Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation		
4	<b>High Temperature</b>	Temperature : 125 ± 2 °C Testing Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation		
5	<b>Low Temperature</b>	Temperature : -40 ± 2 °C Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation		
6	<b>Temperature and Humidity Cycle</b>	Temperature	Humidity	Time	Elec. no variation Appearance no deformation
		25 °C	90% ~ 95% RH	3.0 Hr	
		55 °C	95% ~ 96% RH	5.0 Hr	
		25 °C	90% ~ 95% RH	3.0 Hr	
		Cycle : 20 Cycles			
7	<b>Vibration</b>	Frequency : 10Hz ~ 55Hz , Amplitude : 1.5 mm Direction : X , Y , Z , Time : 2 Hours each	Elec. no variation Appearance no deformation		
8	<b>Solderability</b>	Go through real SMT IR-Reflow .... The profile like our suggest profile. Preheat : 160 ± 10 °C ( 90 sec ) Peak : 245 ± 5 °C Peak Time : 50 Sec. / up 217 °C	Elec. no variation Appearance no deformation		
9	<b>Soldering Heat Resistance</b>	Preheat : 160 ± 10 °C ( 90 sec ) Solder : Sn / Ag / Cu ( Pb Free ) Solder Temp. : 260 ± 5 °C , Time : 3 ± 1 seconds	Elec. no variation Appearance no deformation		
10	<b>Iron Solder Heat Resistance</b>	Solder Temp. : 350 ± 5 °C Flux : Rosin , Time : 3 ± 1 seconds	Elec. no variation Appearance no deformation		
11	<b>Bending Strength</b>	Unit : mm  Force : 1Kg / min.	Elec. no variation Appearance no deformation		
12	<b>Flexure Strength</b>	Unit : mm  Solder cream 0.15 mm	Elec. no variation Appearance no deformation		
13	<b>Terminal Strength</b>	 Mount on PCB Solder Cream 0.15 mm Push 10N force to X , Y direction	Elec. no variation Appearance no deformation		
14	<b>High-Voltage</b>	100 V DC between core & winding	Elec. no variation Appearance no deformation		
15	<b>Load life</b>	Temperature : 25 ± 3 °C Load : Allowed DC Current , Test Time : 96 ± 2 Hours	Elec. no variation Appearance no deformation		

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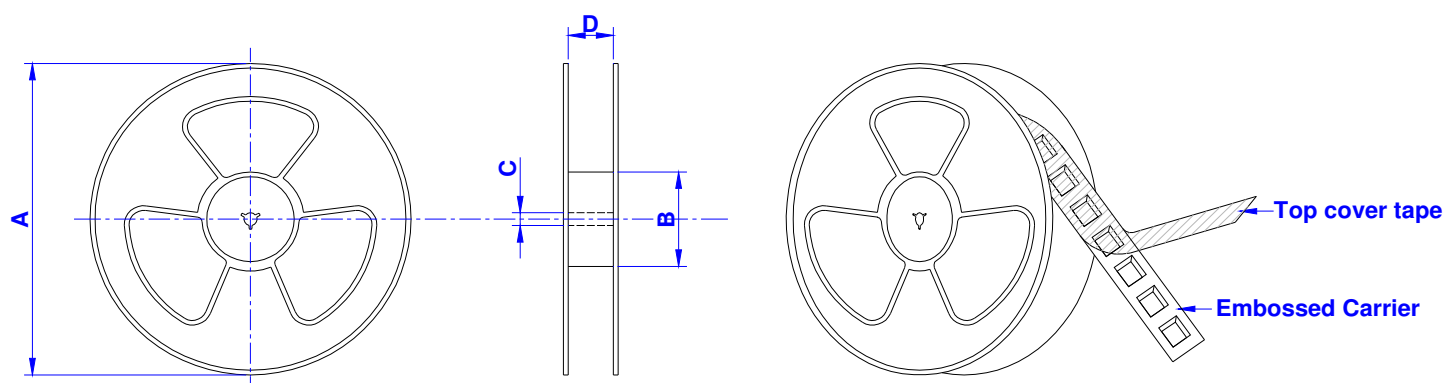
**Packaging Information :**

Tape Dimension ( mm ) :



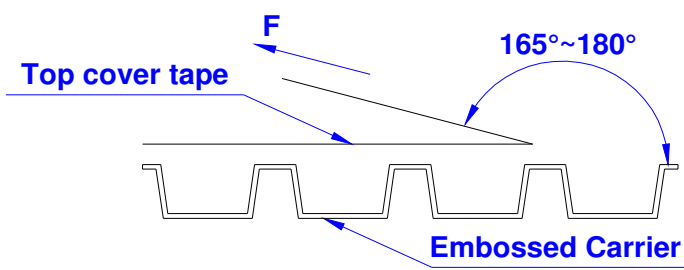
SIZE/mm	W	P	A0	B0	K0	T	F
2012	8.00	4.00	1.54	2.32	1.35	0.23	3.50
3216	8.00	4.00	1.94	3.54	2.10	0.30	3.50
4532	12.0	8.00	3.60	4.90	3.00	0.26	5.50

Reel Dimension ( mm ) :



SIZE/mm	Reel Size	A	B	C	D	QTY / Reel
2012	7" x 8 mm	178	60	13	8.5	2000 PCS
3216	7" x 8 mm	178	60	13	8.5	2000 PCS
4532	7" x 12 mm	178	60	13.5	13.5	500 PCS

Tearing Off Force :



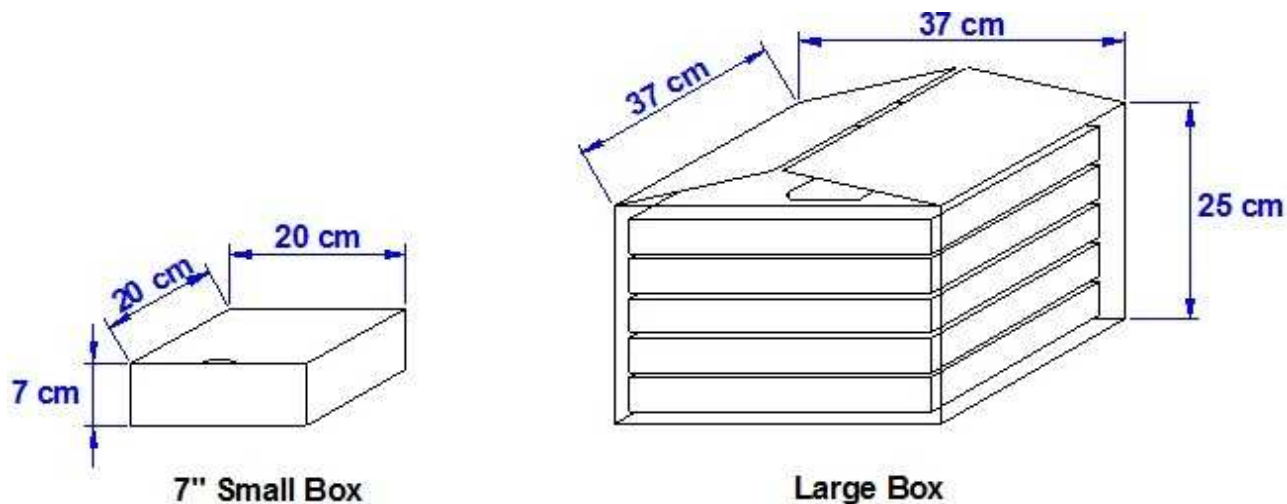
The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions ( referenced ANSI / EIA - 481 - D - 2008 of 4.11 standard ).

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

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**Packaging Information :**

Box Package :



SIZE/mm	Reels in Small Box	Small Box in Large Box
2012	5	8
3216	5	8
4532	5	8