



产品承认书

PRODUCT SPECIFICATIONS

客户 :
CUSTOMER

客户料号:
CUSTOMER P/N

产品名称 :
DESCRIPTION

网络变压器

产品型号:
PART NUMBER

HB2005DNL

版本:
REVISION

A0

日期:
ISSUE DATE

2019/10/21

公司承认 COMPANY APPROVAL		
制作 PREPARED BY	审核 CHECKED BY	批准 APPROVED BY
刘子善	 张顺钧	张立华

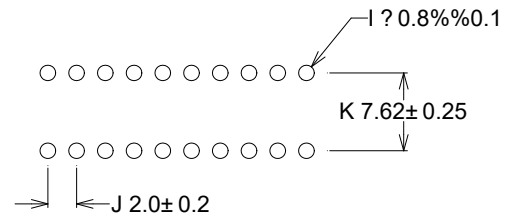
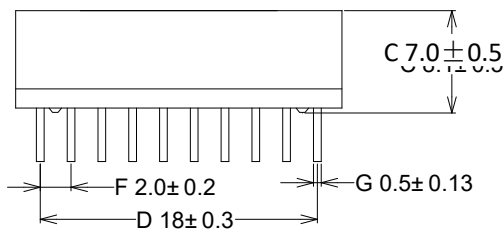
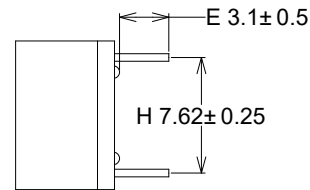
客户承认 CUSTOMER APPROVAL
批准签字 APPROVED SIGNATURES



深圳市格莱尔电子有限公司
Shenzhen Glorious Electronic Co., Ltd.

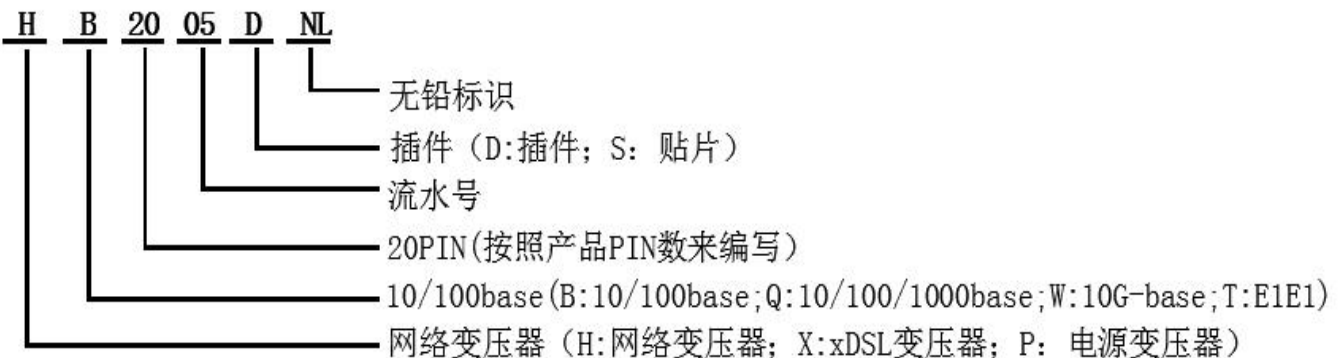
变更记录 Record of Revision		
版本 Rev.	变更说明 Description of Changes	日期 Date
0.0 A0	初版发行	2018/9/12

1. 产品外观尺寸(单位mm)



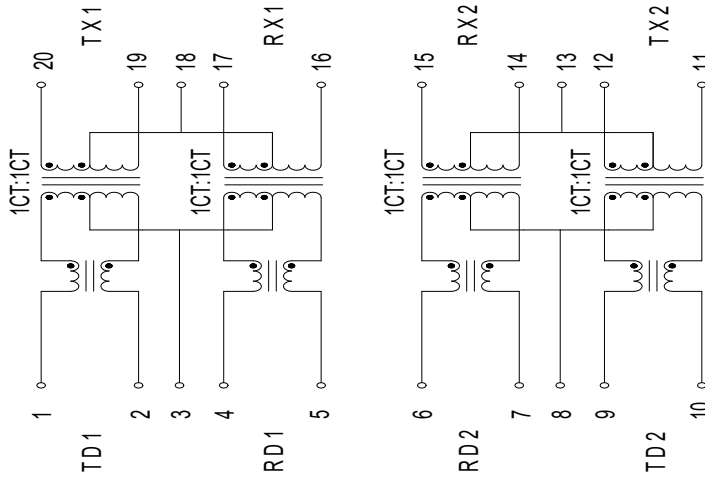
Unless otherwise specified all tolerances are: ± 0.25 in mm

产品编码定义



2. 线路图

Schematic:



3. 产品电性参数@25°C

Electrical Specification @25°C

Inductance OCL:	350uH Min @ 100KHz	0.1V	8mA	DC	BIAS
Leakage Inductance:	0.50uH Max @ 100KHz	0.2V			
Interwinding Capacitance:	28pF Max @ 100KHz	0.2V			
DC Resistance:	0.9 Ω	Max			
Turn Ratio:	1CT:1CT(TX)/1CT:1CT(RX)±5%				
Polarity:	1-16,6-11 In-Phase				
Insertion Loss:	0.5-100 MHz	-1.1dB	Max		
Return Loss	1-30 MHz	-16dB	Min		
	30.1-60MHz	-12dB	Min		
	60.1-80MHz	-10dB	Min		
Cross Talk:	1-60MHz	-42dB	Min		
	60-100MHz	-35dB	Min		
CMRR:	1-30MHz	-40dB	Min		
	60MHz	-35dB	Min		
	80-100MHz	-30dB	Min		
Isolation HI-POT:	1500Vrms	1mA	1S		
Operating Temperature:	0°C to 70°C				
Storage Temperature:	-25°C TO +125°C				
Product Type:	Green Product				



4.SAMPLE TEST DATA

SPEC	1	2	3	4	5
L:(AT 100KHz 0.2V 8mA)					
350uH Min					
1-2	513	584	531	528	481
4-5	526	468	509	503	459
6-7	503	593	529	573	481
9-10	532	539	540	551	466
LL:(AT 100KHz 0.2V)					
0.5uH Max					
1-2(20-19 short)	0.27	0.23	0.23	0.27	0.25
4-5(17-16 short)	0.27	0.25	0.22	0.27	0.29
6-7(15-14 short)	0.22	0.21	0.24	0.29	0.27
9-10(12-11 short)	0.24	0.22	0.22	0.27	0.28
Cw/w:(AT 100KHz 0.2V)					
50PF typ					
1-2 TO 20-19	42.9	40.5	39.9	41.9	42.6
4-5 TO 17-16	42.9	40.5	39.9	41.9	42.6
6-7 TO 15-14	44.2	46.4	39.8	41.9	45.0
9-10 TO 12-11	44.2	46.4	39.8	41.9	45.0
DCR:(AT 25°C)					
1.2Ω Max					
20-19	0.70	0.71	0.72	0.70	0.71
17-16	0.70	0.71	0.72	0.72	0.72
15-14	0.73	0.73	0.71	0.73	0.70
12-11	0.74	0.73	0.71	0.72	0.72
URNS RATIO:					
(1-2):(20-19)=1CT:1CT±5%	OK	OK	OK	OK	OK
(4-5):(17-16)=1CT:1CT±5%	OK	OK	OK	OK	OK
(6-7):(15-14)=1CT:1CT±5%	OK	OK	OK	OK	OK
(9-10):(12-11)=1CT:1CT±5%	OK	OK	OK	OK	OK
MAIN TEST EQUIPMENT					
<input type="checkbox"/> CHANGCHUANG CC2670 WITHSTANDING VOLTAGE TESTER <input type="checkbox"/> JINKAITAI 3250 AUTOMATIC TRANSFORMER TEST SYSTEM <input checked="" type="checkbox"/> TONGHUI TH-2818XB AUTOMATIC TRANSFORMER TEST SYSTEM <input type="checkbox"/> RF NETWORK ANALYZERS 8712ET					



4.SAMPLE TEST DATA

SPEC	1	2	3	4	5
HI-POT:					
AT:1500VAC 1mA 1S					
1-2 TO 20-19	OK	OK	OK	OK	OK
4-5 TO 17-16	OK	OK	OK	OK	OK
6-7 TO 15-14	OK	OK	OK	OK	OK
9-10 TO 12-11	OK	OK	OK	OK	OK
Insertion Loss:					
1.1dB Max(0.5-100MHz)					
TX1(1-2):					
30MHz	0.27	0.27	0.26	0.27	0.26
40MHz	0.35	0.35	0.36	0.37	0.34
50MHz	0.38	0.40	0.40	0.42	0.39
60MHz	0.46	0.45	0.45	0.49	0.44
80MHz	0.48	0.49	0.49	0.53	0.52
100MHz	0.51	0.47	0.46	0.51	0.45
RX1(4-5):					
30MHz	0.22	0.29	0.28	0.28	0.24
40MHz	0.33	0.39	0.37	0.37	0.32
50MHz	0.37	0.48	0.45	0.44	0.39
60MHz	0.44	0.54	0.51	0.49	0.43
80MHz	0.48	0.60	0.58	0.56	0.47
100MHz	0.44	0.59	0.54	0.57	0.45
RX2(6-7):					
30MHz	0.27	0.24	0.26	0.27	0.24
40MHz	0.34	0.32	0.35	0.35	0.31
50MHz	0.35	0.36	0.40	0.42	0.35
60MHz	0.38	0.38	0.42	0.45	0.39
80MHz	0.40	0.43	0.47	0.46	0.40
100MHz	0.37	0.38	0.48	0.45	0.43

MAIN TEST EQUIPMENT

- CHANGCHUANG CC2670 WITHSTANDING VOLTAGE TESTER
- JINKAITAI 3250 AUTOMATIC TRANSFORMER TEST SYSTEM
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- RF NETWORK ANALYZERS 8712ET



4.SAMPLE TEST DATA

SPEC	1	2	3	4	5
TX2(9-10):					
30MHz	0.29	0.27	0.27	0.28	0.26
40MHz	0.37	0.35	0.34	0.38	0.35
50MHz	0.40	0.40	0.41	0.42	0.39
60MHz	0.45	0.45	0.43	0.50	0.44
80MHz	0.49	0.50	0.47	0.59	0.48
100MHz	0.45	0.47	0.44	0.58	0.45
Return Loss:					
0.5-30 MHz 18dB Min					
30.1-60 MHz 18-20log(f/30)dB Min					
60.1-80 MHz 12dB Min					
TX1(1-2):					
30MHz	25.7	24.9	23.9	25.9	25.8
40MHz	22.8	25.3	25.4	22.9	22.8
50MHz	20.9	22.9	23.2	20.9	20.9
60MHz	19.5	21.2	21.7	19.5	19.5
80MHz	19.6	20.5	21.2	19.5	19.4
RX1(4-5):					
30MHz	26.3	25.2	25.1	25.9	25.9
40MHz	23.5	22.0	22.1	22.9	23.0
50MHz	21.6	20.0	20.0	21.0	21.1
60MHz	20.1	18.7	18.7	19.7	19.7
80MHz	19.7	19.0	18.4	20.3	19.7
RX2(6-7):					
30MHz	35.4	31.2	29.6	30.7	38.1
40MHz	30.3	27.4	26.1	27.2	33.0
50MHz	27.0	24.8	23.7	24.9	29.6
60MHz	24.2	22.0	22.0	23.2	26.7
80MHz	20.9	21.4	21.3	21.9	22.5
MAIN TEST EQUIPMENT					
<input type="checkbox"/> CHANGCHUANG CC2670 WITHSTANDING VOLTAGE TESTER <input type="checkbox"/> JINKAITAI 3250 AUTOMATIC TRANSFORMER TEST SYSTEM <input type="checkbox"/> TONGHUI TH-2818XB AUTOMATIC TRANSFORMER TEST SYSTEM <input checked="" type="checkbox"/> RF NETWORK ANALYZERS 8712ET					



4.SAMPLE TEST DATA

SPEC	1	2	3	4	5
TX2(9-10):					
30MHz	29.6	27.9	29.2	25.3	28.8
40MHz	25.8	24.6	25.7	22.4	25.6
50MHz	23.5	22.4	23.6	20.5	23.4
60MHz	21.8	20.9	22.0	19.2	21.8
80MHz	21.5	20.7	21.4	19.3	21.3
Cross Talk:					
0.5-40MHz 35dB Min					
0.1-100MHz 33-20*log(f/50)dB Min					
TX1 TO RX1:					
30MHz	46.2	47.3	46.5	45.9	45.5
60MHz	40.6	44.2	40.9	39.7	39.4
80MHz	38.0	39.6	38.6	37.2	37.0
100MHz	35.6	38.5	35.9	35.3	35.2
RX1 TO RX2:					
30MHz	59.2	69.9	63.4	55.6	69.5
60MHz	53.5	61.5	55.2	49.9	62.4
80MHz	50.1	57.4	51.0	47.2	59.9
100MHz	47.0	53.6	47.2	42.0	55.4
RX2 TO TX2					
30MHz	46.3	46.8	47.6	45.8	49.6
60MHz	45.2	40.6	43.3	43.3	45.6
80MHz	43.3	38.2	42.9	41.8	43.3
100MHz	37.6	36.4	36.5	37.0	39.6

MAIN TEST EQUIPMENT

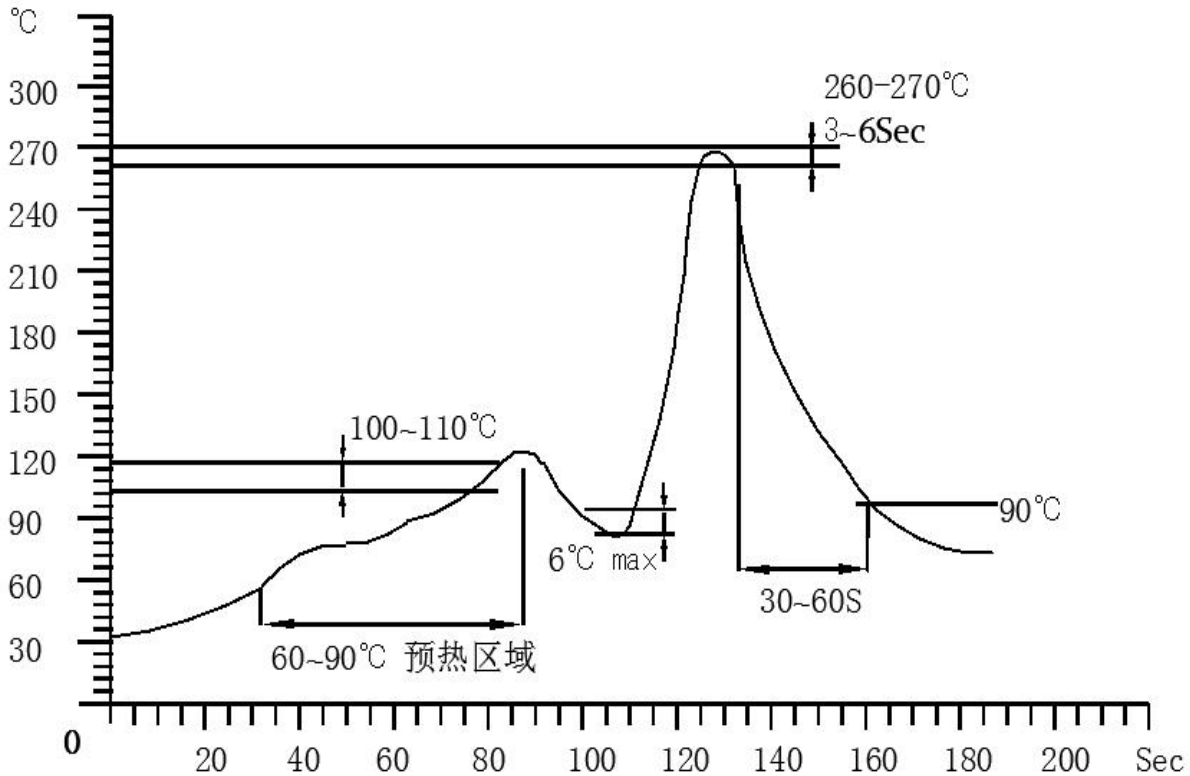
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5. Recommended Reflow Soldering Curve:

一. Condition :

1. Available for all the through hole parts
2. Soldering Method: Wave Soldering
3. Solder: Sn-0.7Cu
4. The recommended wave soldering curve is as below:



二: Moisture Sensitive Level:

1. Level: 1
2. Floor Life: Unlimited
3. Storage Condition: $\leq 30^{\circ}\text{C}/60\% \text{ RH}$



6. Reliability:																								
NO.	Test Item	Refer To Standard	Test Condition																					
1	Resistance To Soldering Heat--Convection Reflow	IPC/JEDEC J-STD-020D	1).Peak Temperature:Refer to Specification According to Package Body Thickness And Volume 2).Preheat Temperature and Soak Time:150~200°C,60~120 Seconds 3).Average Ramp-up Rate:3°C/Second Max																					
2	Thermal Shock	IEC68-2-14 MethodA	1).Low Temperature:-40°C 2).High Temperature:125 3).Dwell Time:30 Minutes 4).Transition Time: Less Than 5Minutes 5).Number of Cycles:10																					
3	High Temperature	IEC68-2-2 MethodA	125°C.96Hours																					
4	Low Temperature	IEC68-2-1 MethodA	-40°C.96Hours																					
5	Temp er ature Humidity Cycle	IEC68-2-38	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Temp</th> <th style="width: 30%;">Humidity</th> <th style="width: 40%;">Soak time</th> </tr> </thead> <tbody> <tr> <td>25~65°C</td> <td>93+/-3%RH</td> <td>1.5 hr</td> </tr> <tr> <td>65°C</td> <td>93+/-3%RH</td> <td>4 hr</td> </tr> <tr> <td>65~25°C</td> <td>80~96%RH</td> <td>2.5 hr</td> </tr> <tr> <td>25~65°C</td> <td>93+/-3%RH</td> <td>1.5 hr</td> </tr> <tr> <td>65°C</td> <td>93+/-3%RH</td> <td>4 hr</td> </tr> <tr> <td>65~25°C</td> <td>80~96%RH</td> <td>2</td> </tr> </tbody> </table>	Temp	Humidity	Soak time	25~65°C	93+/-3%RH	1.5 hr	65°C	93+/-3%RH	4 hr	65~25°C	80~96%RH	2.5 hr	25~65°C	93+/-3%RH	1.5 hr	65°C	93+/-3%RH	4 hr	65~25°C	80~96%RH	2
Temp	Humidity	Soak time																						
25~65°C	93+/-3%RH	1.5 hr																						
65°C	93+/-3%RH	4 hr																						
65~25°C	80~96%RH	2.5 hr																						
25~65°C	93+/-3%RH	1.5 hr																						
65°C	93+/-3%RH	4 hr																						
65~25°C	80~96%RH	2																						
6	Vibration	IEC68-2-6	1).Sine Wave 2).Amplitude:0.75mm 3).Frequence:5~500~5HZ 4).Direction:X.Y.Z 5).Number of Sweep Cydes Per Direction:10 6).Duration:2Hours Each Direction																					
7	Mechanical Shock	MIL-STD-202	1).Half-Sine Wave 2).Peak Acceleration:50G 3).Duration:11mS 4).Direction:X.Y.Z-.X.-Y.-Z 5).Number of Shock Per Direction:3																					
8	Free Drop	ISO4180	1).Height:Refer to Speciflcation According to Production weight																					
9	Solderability	JESD22-B102D	1).Precondition:150±5°C,16±0.5Hours 2).Flux Type:ROL1 3).Immersion Flux Time:5~10 Seconds 4).Solder Temperature:245±5°C 5).Solder Immersion Time:5±0.5 Seconds 6).Solder Immersion/Emersion Speed:25.4±6.4mm/Second																					
10	Accelerated Moisture Resistance---Unbiased Autodave	JESD22-A102-C	1).Temperature:121°C 2).Humidity:100% 3).Vapor Pressure:29.7 Psia or 205KPa 4).Duration:96 hours																					



深圳市格莱尔电子有限公司
Shenzhen Glorious Electronic Co., Ltd.

7.主要材料清单

Material List:

No.	Item	Material	Rating	Supplier of material	UL
1	Transformer Core磁芯	Mn-Zn锰锌 Ni-Zn镍锌	/	YST(研鑫)	NA
2	Wire铜线	QPN/180聚胺脂	180℃	Elektrisola (益利素勒)	E491614
3	Case胶壳	phenolic moulding powder (电木粉)	94V-0	GLORY (格莱瑞)	E150608
4	Varnish 绝缘油	绝缘油1032	180℃	KIWEIAI (格桑)	E213437
5	Solder 焊料	SnCu锡铜	/	YIK SHING TAT (亿诚达)	NA
6	Flux 助焊剂	Water solubility 水溶性松香	/	Tongfang (同方)	NA