承认书

SPECIFICATION FOR APPROVAL

客户 Customer	
客户料号 Customer P/N	
安规型号 Safety Model	
品名 Description	**Differential Mode Inductor**
产品型号 Product Model	**T028-125-10uH±15%(Z6210-S)**
图纸编号 Drawing No.	**2025051201**
版本 REV	**A6**

出图 DRAWING		
制作 Prepared	**审核 Checked**	**批准 Approved**
尤标	夏欢	陈林
DATE：2025/9/20		

客户承认 CUSTOMER APPROVE

惠州市长瑞工贸有限公司

（Huizhou Changrui Industry and Trade Co., Ltd.）

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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 1 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

INDEX 目录

Index 目录 …… P1

Change History 变更履历 …… P2

Schematic / Winding Construction / Electrical SPEC 接线图/绕组结构/电性规格…. P3

Dimensions/Definition of Product name/General SPEC 尺寸/产品名称定义/一般规格…. P4

Materials List / Soldering Conditions 材料清单 / 焊锡条件…… P5

Package Specification 包装说明 …… P6

Test Report 测试报告 …… P7

Core Curves 磁芯材质曲线 …… P8

Inductance VS DC Bias Curve 直流叠加特性曲线 …… P9

Impedance Curve 阻抗曲线 …… P10

APPEARANCE TEST DATA 外观尺寸测试数据 …… P11

Electrical Characteristic TEST DATA 电气特性测试数据 …… P12

SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 2 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

CHANGE LIST 变更履历

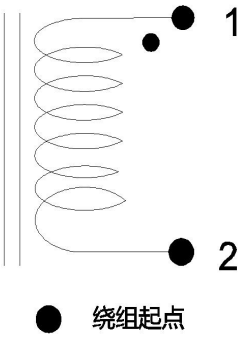
DATE 日期	VERSION 版本	CHANGE CONTENT 修订内容	PREPARED 制定	CHECKED 审核
2025/5/12	A0	Initial release	尤标	夏欢
2025/6/28	A1	增加波峰焊工艺&更新高温回流要求	尤标	夏欢
2025/7/18	A2	E尺寸由3.0±0.5变更为3.0±0.3；增加含浸条件描述	尤标	夏欢
2025/7/29	A3	B尺寸由5.5mmMAX变更为5.8mmMAX	尤标	夏欢
2025/8/15	A4	增加品质因子Q值管控标准；脚长D2.7±0.3mm变更为2.4±0.3mm	尤标	夏欢
2025/8/27	A5	更新直流叠加数据	尤标	夏欢
2025/9/20	A6	更新直流叠加增加5A数据，并更新曲线图；更新阻抗管控标准，Z1由0.3KΩmin变更为0.22KΩmin；Z2由0.7KΩmin变更为0.48KΩmin；Z3由0.95KΩmin变更为0.65KΩmin。	尤标	夏欢

Note: 规格书变更需升级版本.

SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 3 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

1. SCHEMATICS (接线图）：



2. WINDING CONSTRUCTION（绕组结构）：

ORDER	S - F 开始 - 结束	WIRE SIZE 线径	TURNS 圈数	NOTES 说明
N1	1 - 2	UEW-F Φ0.6mm 棕色	12.5Ts	顺绕

Not

3. ELECTRICAL SPECIFICATION (at 25°C) 电性规格

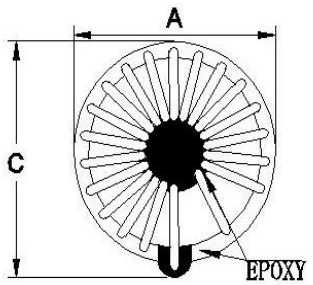
Test Item 测试项目	SPEC 规格	Test Condition 测试条件	Test Instruments 测试仪器
Inductance L 电感	10uH ±15%	1kHz, 0.25V，R100Ω	ZX1373X-12A
DCR 直流阻抗	15mΩ max	at25℃	TH2512B
Layer short 层间短路	1000V REF	波形无异常	2882A-5
Insulation impedance 绝缘阻抗	100MΩ min	500V DC COIL-CORE	ZX9320S-4
Isat 饱和电流	1.5A	L≥60%L0	ZX1373X-12A
impedance Z1 阻抗	0.22KΩmin	10MHz	HP 4395A
impedance Z2 阻抗	0.48KΩmin	30MHz	HP 4395A
impedance Z3 阻抗	0.65KΩmin	100MHz	HP 4395A
Q值 品质因数	28min	100kHz, 0.25V，R100Ω	ZX1373X-12A

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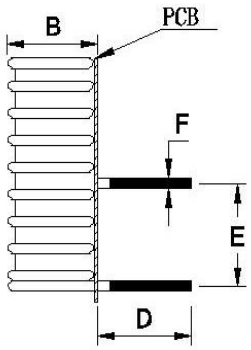
SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 4 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

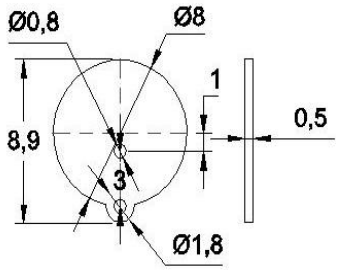
4. DIMENSIONS 尺寸: (Unit:mm)



俯视图



侧视图



底板尺寸

SPEC. (mm)	
A	9.5max
B	5.8max
C	9.5max
D	2.4±0.3
E	3.0±0.3
F	0.6±0.1

Note:绕线密绕，线包置于BASE中间，不可歪斜，须点胶固定，成品需一般含浸10分钟（凡立水稀释剂配比1：1）。

5. DEFINITION OF PRODUCT NAME 产品名称定义:

T	028-125	10uH	±15%			
A	B	C	D	E	F	G

A.产品类型：环形电感
B.磁芯尺寸规格
C.感量
D.公差
E.
F.
G.

6. GENERAL SPECIFICATON :

a. Storage temperature : -25°C ~ 50°C, R.H. : 30% ~ 70%
b. Operating temperature : -40°C ~ +125°C
c. Moisture sensitivity level (MSL) 2 (1 year floor life at <30°C/85% relative humidity)
d. Failures in time(FIT)/Mean time between failures(MTBF) 38 per billiion hours/26,315,789 hours, calculated per Telcordia SR-332

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SPECIFICATION FOR APPROVAL

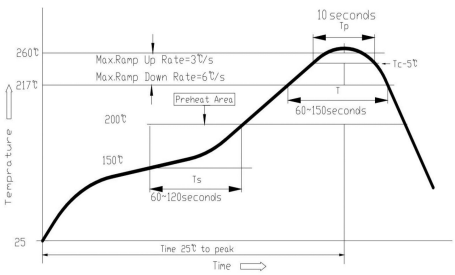
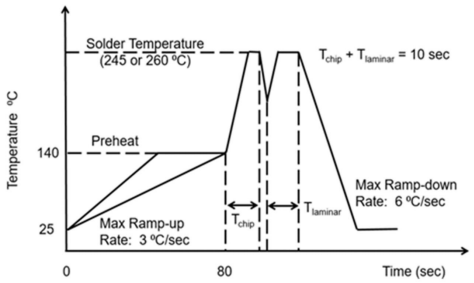
CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 5 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

7. MATERIAL LIST 材料清单:

No.	Item	Material Description 材料描述	Manufacturer 制造商	TEMP 温度	UL File UL档案号	Remark
1	CORE	铁硅铝T028-125	Boluo Chenxing Electronic Technology Co., Ltd.			V
2	WIRE	QZY-X/180 Φ0.6mm 棕色	NINGBO JINTIAN NEW MATERIAL CO.. LTD	180℃	E227047	
		QZY-X/180 Φ0.6mm 棕色	HONGQI GROUP JIANGXI COPPER CO.,LTD.	180℃	E355168	
3	VARNISH	JX-1150(*)	Yueyang GREEN Technology Co., Ltd.	130℃	E303754	
4	Sn	SC07	Guangdong Zhongshi Metal Co., Ltd			
5	PCB	HF-140/FR-4.1	KINGBO ARD LAMINATES HOLDINGS LTD	130℃	E123995	
6	EPOXY	HCJ800	DONG GUAN HONG CHUANG ELECTRONIC MATERIAL CO, LTD		E504240	

Note : Core source marded "V" means design & verify ok. 磁芯打“V” 表示设计验证Ok.

8. SOLDERING CONDITIONS 焊锡条件:

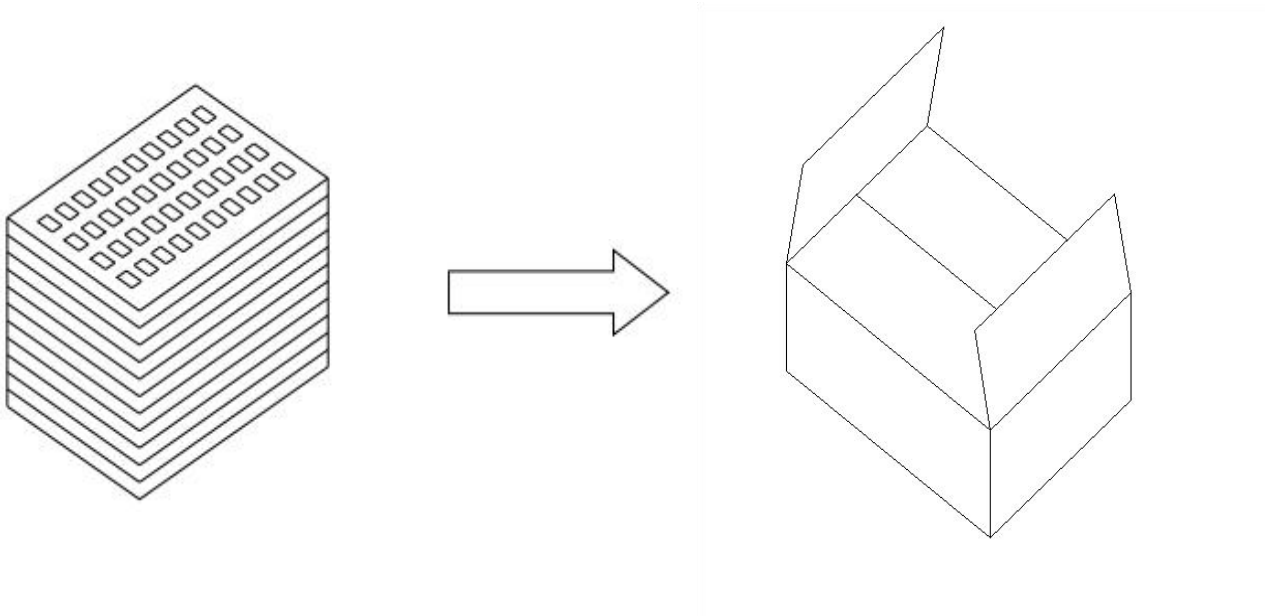
Solding process 焊接工艺	High temperature reflow 高温回流 	Wave soldering 波峰焊 
Resistnace to soldering heat requirements 耐焊接热要求	Soldering times 焊接次数：≥ 1次	Soldering times 焊接次数：≥ 2次
	High temperature reflow heat resistance requirements 高温回流耐热要求: 器件本体满足峰值温度Tp≥260℃，Tp以上时间tp≥150s，且150℃以上时间t≥270s	Wave soldering heat resistance requirements 波峰焊耐热要求: 1> 器件引脚峰值温度≥265℃，265℃以上时间≥10s 2> 器件本体满足峰值温度Tp≥160℃，Tp-5℃以上 时间tp≥30s，且120℃以上时间t≥150s

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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 6 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

9. PACKAGE SPECIFICATION 包装规格:



序号(N0)	包装材料 Packing material	尺寸 Size	材质 Material	数量 Quantity
1	吸塑Plastic uptake	待批量设计	PET	待批量设计
2	外箱Master Carton	待批量设计	K636K	待批量设计

Remark : Weight (REF): 0.8g

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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 7 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

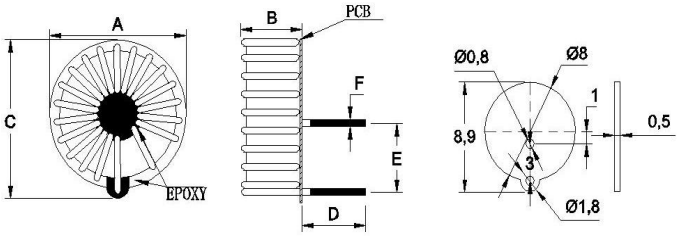
10. TEST DATA FOR PREPRODUCTION SAMPLE 样品测试数据:

Electrical Characteristic 电气特性				Dimensions 尺寸 (mm)								
Item	L	Isat 1.5A	DCR	A	B	C	D	E	F	G	G	I
STD.	10uH ±15%	L≥60%L0	15mΩ max	9.5max	5.8max	9.5max	2.4±0.3	3.0±0.3	0.6±0.1			
1	9.5	68%	10.6	8.75	5.32	9.1	2.42	2.98	0.58			
2	9.8	69%	10.9	8.80	5.45	9.08	2.45	2.99	0.58			
3	10.2	71%	10.6	8.74	5.42	9.12	2.42	3.02	0.59			
4	9.6	68%	10.8	8.89	5.45	9.06	2.43	3.05	0.58			
5	9.7	69%	10.8	8.83	5.38	9.09	2.44	3.03	0.59			
6	9.9	70%	10.6	8.86	5.46	9.06	2.46	2.96	0.58			
7	10.1	67%	10.5	8.81	4.48	9.12	2.43	3.06	0.59			
8	10.2	68%	10.2	8.75	5.41	9.12	2.45	3.04	0.58			
9	9.8	68%	10.3	8.74	5.39	9.11	2.40	3.07	0.59			
10	9.6	70%	10.7	7.71	5.44	9.07	2.41	3.12	0.58			
$\overline{X}$	9.84	68.80%	10.6	8.688	5.32	9.093	2.431	3.032	0.584			

综合判定

√ OK NG

外观尺寸图



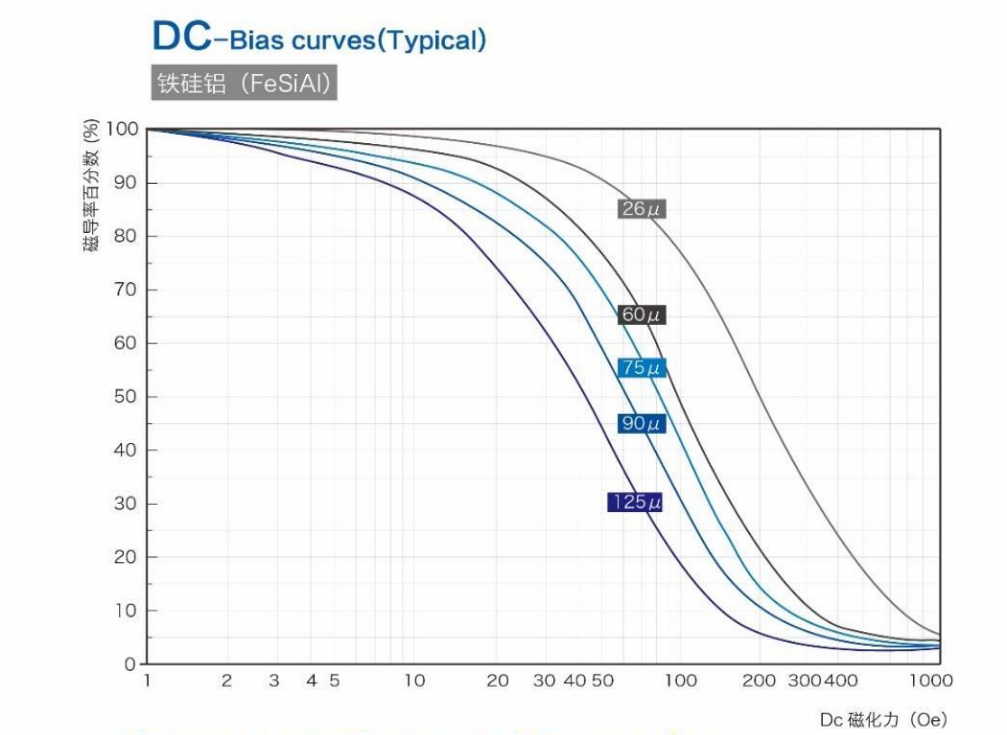
俯视图 侧视图 底板尺寸

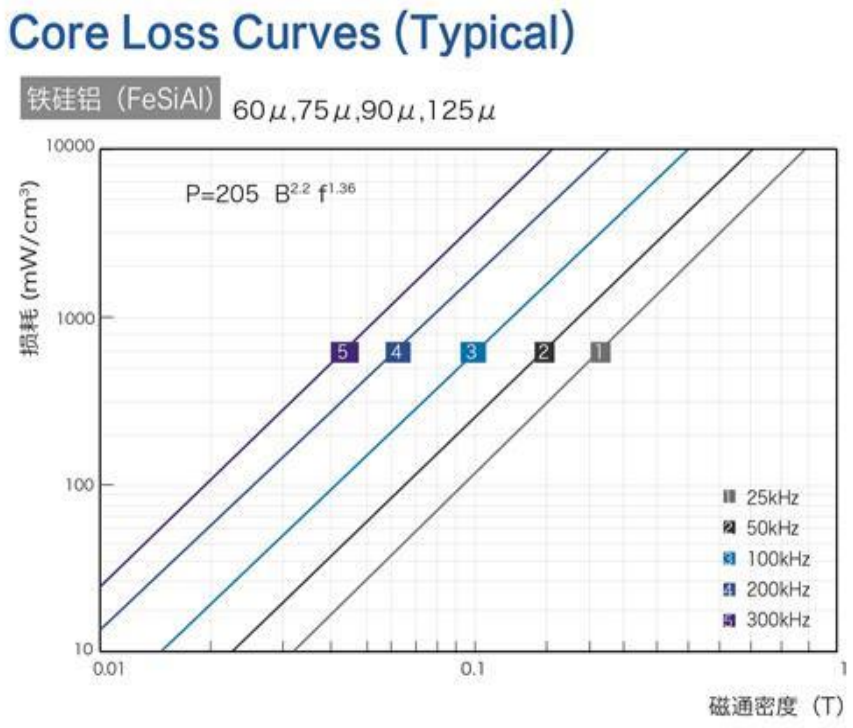
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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 8 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

11. CORE MATERIAL CHARACTERISTIC 磁芯材质特性





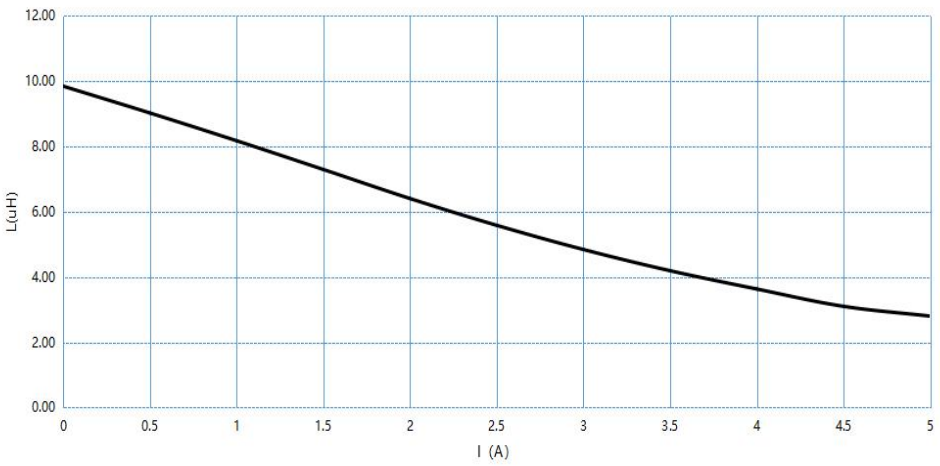
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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 9 OF 12
CUST P/N:		DW NO.	0
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

12. INDUCTANCE VS DC BIAS CURVE 直流叠加特性曲线:

DC BIAS (A)	Inductance (uH) @100kHz, 0.25V		Inductance (uH) @150kHz, 0.25V	
0 A	9.8	100%	9.7	100%
0.5 A	9.2	93.9%	8.9	91.8%
1 A	8.1	82.7%	8	82.5%
1.5 A	7.2	73.5%	7.2	74.2%
2 A	6.4	65.3%	6.3	64.9%
2.5 A	5.5	56.1%	5.5	56.7%
3 A	4.8	49.0%	4.8	49.5%
3.5A	4.2	42.9%	4.1	42.3%
4A	3.6	36.7%	3.5	36.1%
4.5A	3.2	32.7%	3.1	32.0%
5A	2.8	30.4%	2.7	30.3%



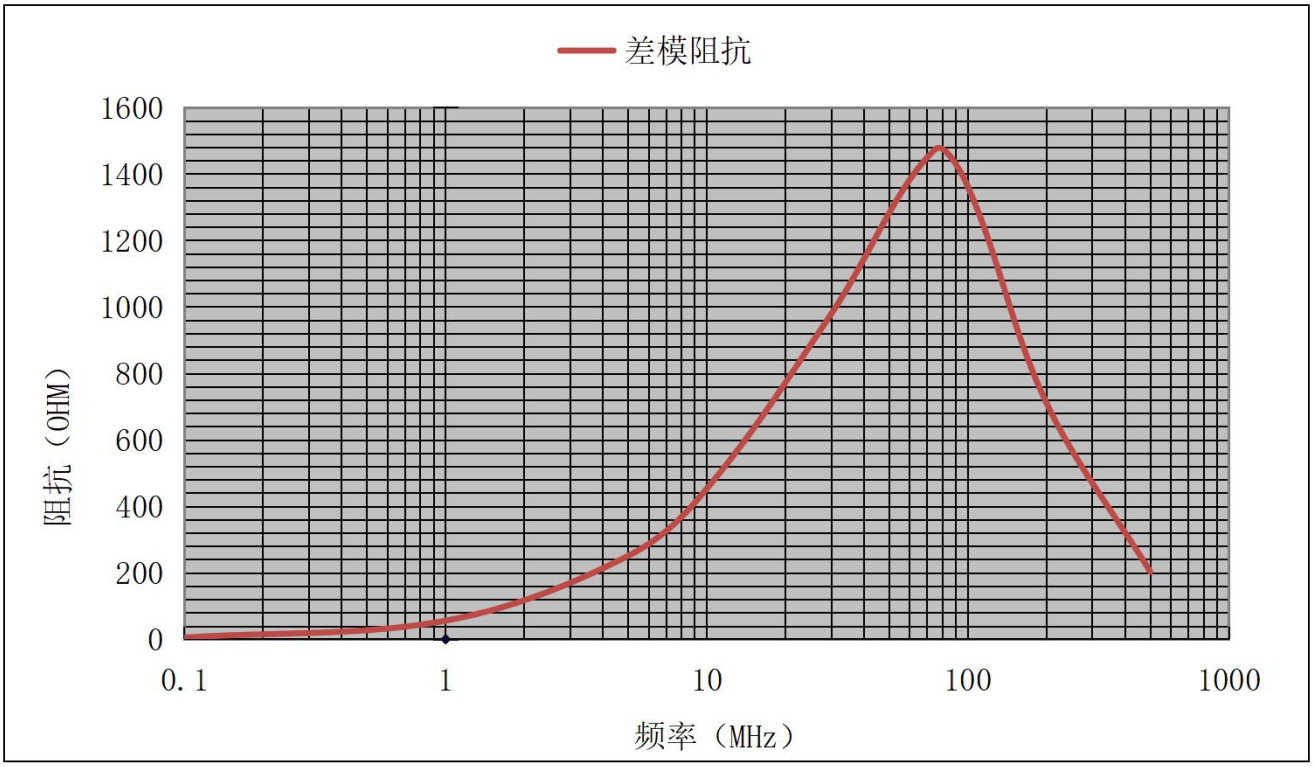
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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 10 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

13. IMPEDANCE CURVE 阻抗曲线:

Fequency (MHz)	0.1	1	5	10.0	30	75	100	200	500			
Impendance (KΩ)	0.01	0.06	0.25	0.45	0.98	1.47	1.16	0.71	0.20			



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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 11 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

15. APPEARANCE TEST DATA 外观尺寸测试数据：(单位：mm)

Item	A	B	C	D	E	F	
STD.	9.5max	5.8max	9.5max	2.4±0.3	3.0±0.3	0.6±0.1	
1	8.69	5.44	8.90	2.39	3.04	0.58	
2	8.87	5.47	9.06	2.17	3.09	0.59	
3	8.68	5.35	9.07	2.55	2.92	0.58	
4	8.72	5.36	8.92	2.58	2.92	0.58	
5	8.68	5.43	8.91	2.62	2.93	0.59	
6	8.90	5.31	8.94	2.64	2.98	0.59	
7	8.93	5.50	9.09	2.16	2.91	0.59	
8	8.85	5.47	9.03	2.57	3.05	0.58	
9	8.69	5.32	9.03	2.43	2.89	0.58	
10	8.66	5.37	9.10	2.20	3.04	0.59	
11	8.90	5.35	9.05	2.64	2.91	0.58	
12	8.91	5.50	9.01	2.56	3.04	0.59	
13	8.81	5.34	8.96	2.65	2.89	0.59	
14	8.77	5.31	9.07	2.63	3.05	0.59	
15	8.71	5.43	9.03	2.52	3.06	0.59	
16	8.91	5.38	9.06	2.54	3.04	0.59	
17	8.95	5.47	8.99	2.20	2.91	0.58	
18	8.78	5.47	9.02	2.63	2.96	0.58	
19	8.99	5.50	8.91	2.39	2.92	0.58	
20	8.82	5.30	8.94	2.50	3.10	0.59	
21	8.82	5.50	8.92	2.55	3.08	0.59	
22	8.93	5.47	8.92	2.70	2.98	0.59	
23	8.87	5.35	9.04	2.11	3.06	0.58	
24	8.71	5.32	9.00	2.22	3.08	0.58	
25	8.88	5.50	8.94	2.56	3.06	0.59	
26	8.84	5.47	8.95	2.40	2.95	0.59	
27	8.87	5.31	9.10	2.47	2.95	0.59	
28	8.72	5.40	9.03	2.44	3.04	0.58	
29	8.70	5.46	9.08	2.30	2.95	0.59	
30	8.99	5.41	9.00	2.20	3.03	0.58	
31	8.68	5.35	9.10	2.26	3.03	0.59	
32	8.99	5.33	8.97	2.19	3.08	0.59	
33	8.99	5.37	9.04	2.58	3.10	0.58	
34	8.70	5.32	8.92	2.60	3.04	0.58	
35	8.97	5.47	8.90	2.48	2.93	0.59	
36	8.68	5.48	9.07	2.18	2.93	0.58	
MIN	8.66	5.3	8.9	2.11	2.89	0.58	
MAX	8.99	5.5	9.1	2.7	3.1	0.59	
$\overline{X}$	8.82	5.41	9.00	2.44	3.00	0.59	

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SPECIFICATION FOR APPROVAL

CUSTOMER		REV NO.	A6
MODEL NO.	Differential Mode Inductor	PAGE NO.	PAGE 12 OF 12
CUST P/N:		DW NO.	2025051201
PART NO.	T028-125-10uH±15%	DATE	2025/9/20

16.Electrical Characteristic TEST DATA 电气特性测试数据

Item	L	Isat 0.8A	DCR	Z1 10MHz	Z2 30MHz	Z3 100MHz	Q值
STD.	10uH ±15%	L≥60%L0	15mΩ max	0.22KΩmin	0.48KΩmin	0.65KΩmin	28min
1	10.18	69.6%	10.44	0.35	0.80	1.05	48
2	10.47	68.5%	10.44	0.33	0.84	1.01	49
3	9.51	68.5%	10.46	0.37	0.79	0.92	45
4	10.02	66.4%	10.17	0.35	0.87	1.03	49
5	9.84	71.0%	10.36	0.36	0.76	1.06	50
6	10.20	71.2%	10.29	0.35	0.90	0.96	50
7	10.25	70.8%	9.95	0.37	0.84	0.91	46
8	9.98	71.5%	10.49	0.33	0.88	0.94	47
9	10.16	71.1%	10.09	0.37	0.85	0.94	46
10	10.24	69.5%	10.39	0.35	0.84	1.04	50
11	9.61	71.1%	10.28	0.37	0.85	0.94	49
12	10.36	70.8%	9.93	0.34	0.83	1.04	49
13	9.54	71.8%	10.36	0.33	0.79	1.10	50
14	10.12	70.0%	10.49	0.37	0.80	1.05	45
15	10.46	72.1%	10.21	0.37	0.82	0.95	50
16	10.23	72.2%	9.95	0.36	0.82	1.00	50
17	10.07	70.2%	10.40	0.33	0.90	0.92	50
18	10.19	68.3%	9.92	0.37	0.89	0.94	50
19	9.71	72.5%	10.34	0.36	0.79	0.90	45
20	10.34	67.4%	10.41	0.34	0.83	1.01	46
21	10.41	71.2%	10.43	0.37	0.80	0.92	49
22	10.46	68.6%	10.18	0.34	0.90	1.10	49
23	9.52	70.4%	10.38	0.33	0.81	1.07	48
24	9.58	67.7%	10.21	0.35	0.83	1.03	46
25	10.15	69.1%	9.98	0.37	0.80	1.07	46
26	9.64	67.4%	9.88	0.33	0.87	0.92	50
27	10.07	69.4%	10.43	0.36	0.89	0.97	49
28	9.71	68.0%	10.34	0.36	0.89	1.09	47
29	9.55	70.3%	9.80	0.33	0.84	1.04	49
30	9.66	68.5%	10.18	0.35	0.89	1.07	45
31	9.92	72.2%	10.48	0.37	0.82	1.02	49
32	9.64	67.4%	9.93	0.34	0.84	1.08	50
33	10.46	66.9%	10.26	0.34	0.89	1.00	50
34	10.35	72.3%	9.82	0.36	0.83	1.01	45
35	9.52	66.9%	10.18	0.36	0.82	0.99	47
36	10.02	72.0%	10.18	0.36	0.85	0.91	49
MIN	9.51	66.4%	9.8	0.36	0.763	0.904	45
MAX	10.47	72.5%	10.49	0.37	0.899	1.096	50
$\overline{X}$	10.00	69.8%	10.22	0.35	0.84	1.00	47.70

PREPARED BY	CHECKED BY	APPROVAL BY
尤标	夏欢	陈林