

深圳市华升微电子有限公司

HUASHENG SEMICONDUCTOR TECH CO., LTD

PRODUCT FOR APPROVAL

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CUSTOMER :

DESCRIPTION : 100/1000 BASE-T TRANSFORMER POE+ 720mA

PART NUMBER : HSW-HS2148SP

REVISION : A0

CUSTOMER P/N :

ISSUE DATE : 2-Jun-21

PRODUCT PHOTOS :

SINGLE WEIGHT : 5.6g

YIELDLY : Guang Dong Province, China



COMPANY APPROVAL		
PREPARED BY	CHECKED BY	APPROVED BY

CUSTOMER APPROVAL
APPROVED SIGNATURES



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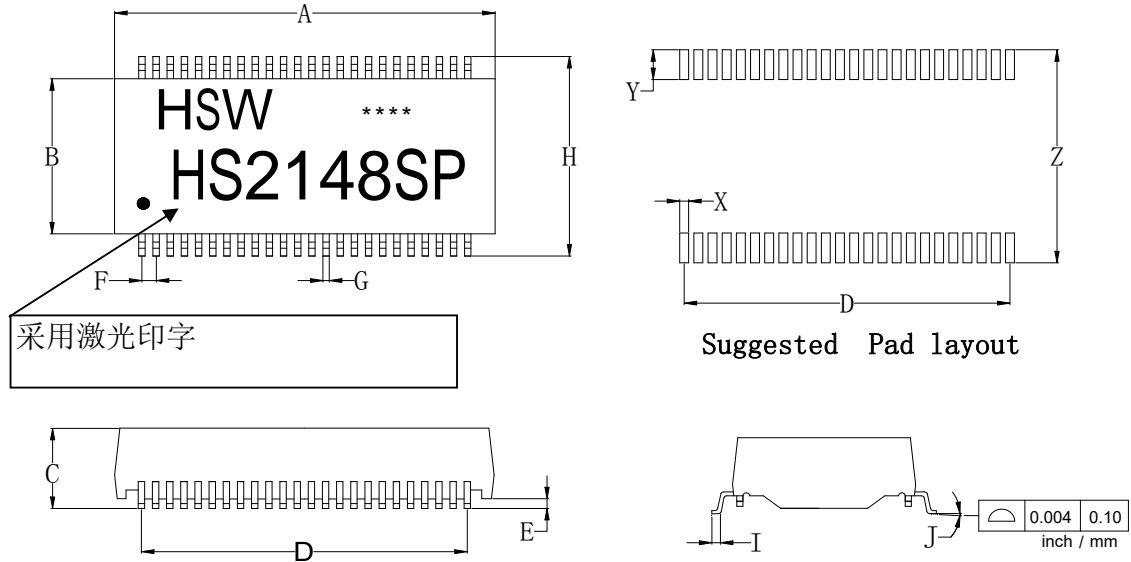


Record of Revision

Rev.	Description of Changes	Date
A0	Initial Release	2021/6/2



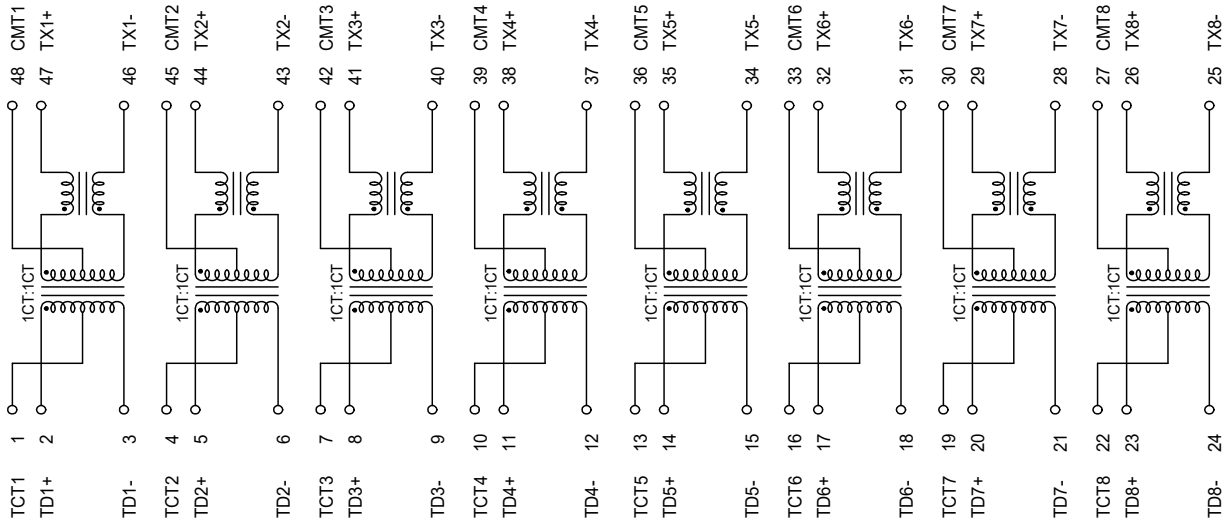
1.Mechanical Drawing:



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	27.70	28.05	1.093	1.112
B	11.95	12.45	0.470	0.490
C	7.50 (max)		0.295 (max)	
D	23.46(Typical)		0.924(Typical)	
E	0.15	0.45	0.006	0.018
F	1.02(Typical)		0.040(Typical)	
G	0.38(Typical)		0.015(Typical)	
H	15.05	15.55	0.593	0.612
I	0.9(Typical)		0.035(Typical)	
J	0°	8°	0°	8°
X	0.64(Typical)		0.025(Typical)	
Y	2.34(Typical)		0.092(Typical)	
Z	16.44(Typical)		0.647 (typical)	



2. Schematic:



3. Electrical Specification @25°C

Inductance OCL:	350uH Min @ 100KHz	0.1V	8mA	DC	BIAS	720mA
Leakage Inductance:	0.50uH Max @ 100KHz	0.1V				
Interwinding Capacitance:	25pF Typ @ 100KHz	0.1V				
DC Resistance:	1.2 Ω	Max				
Turn Ratio:	1CT:1CT±5%					
Polarity:	2-47,5-44,8-41,11-38,14-35,17-32,20-29,23-26 In-Phase					
Insertion Loss :	0.5-100MHz	-1.1dB	Max			
Return Loss :	0.5-40MHz	18dB	Min			
	40.1-100MHz	-12+20log(f/80)	dB	Min		
Cross Talk:	0.5-40MHz	-35dB	Min			
	40.1-100MHz	-33+20log(f/50)	dB	Min		
CMRR:	0.5-100MHz	-30dB	Min			
Isolation HI-POT:	1500VAC	1mA	1S			
Operating Temperature:	0°C to 70°C					
Product tape :	Green Product					

深圳市华升微电子有限公司



SAMPLE TEST DATA

SPEC	1	2	3	4	5
L:(AT 100KHz 0.1V 8mA)					
350uH Min					
2-3	628	615	623	628	635
5-6	628	628	618	645	634
8-9	625	629	616	625	638
11-12	626	628	625	618	615
14-15	629	624	624	623	625
17-18	650	628	628	628	634
20-21	635	629	629	619	618
23-24	628	625	628	622	625
LL:(AT 100KHz 0.1V)					
0.5uH Max					
2-3(47-46 short)	0.26	0.27	0.26	0.22	0.25
5-6(44-43 short)	0.26	0.25	0.23	0.27	0.21
8-9(41-40 short)	0.28	0.29	0.25	0.23	0.25
11-12(38-37 short)	0.28	0.21	0.23	0.25	0.25
14-15(35-34 short)	0.29	0.27	0.21	0.28	0.23
17-18(32-31 short)	0.27	0.29	0.25	0.27	0.23
20-21(29-28short)	0.28	0.28	0.24	0.28	0.25
23-24(26-25 short)	0.26	0.26	0.20	0.23	0.24
Cw/w:(AT 100KHz 0.1V)					
25pF Typ					
2-3 TO 47-46	23.9	19.0	19.4	27.9	18.6
5-6 TO 44-43	19.2	21.4	23.7	19.9	28.1
8-9 TO 41-40	18.4	18.7	19.2	22.1	19.3
11-12 TO 38-37	18.9	20.5	22.1	19.3	21.1
14-15 TO 35-34	20.3	20.6	20.8	19.1	25.1
17-18 TO 32-31	18.1	20.6	22.8	24.9	18.9
20-21 TO 29-28	16.7	27.2	21.4	25.3	21.2
23-24 TO 26-25	18.6	22.3	28.1	22.1	20.0
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					

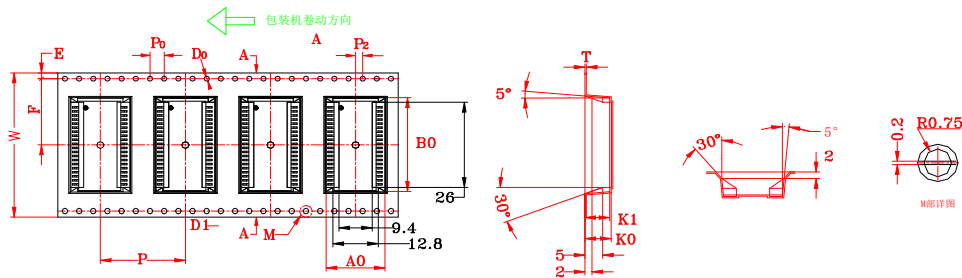


SAMPLE TEST DATA

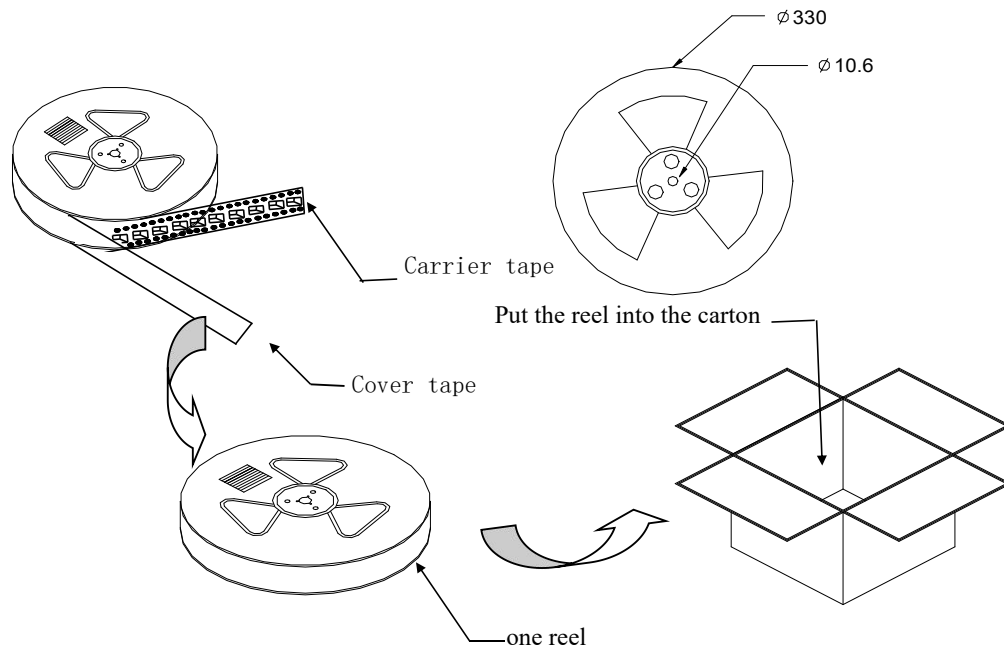
SPEC	1	2	3	4	5
DCR: (AT 25°C)					
1.2 Ω Max					
47-46	0.71	0.72	0.74	0.72	0.74
44-43	0.71	0.73	0.71	0.74	0.73
41-40	0.72	0.74	0.71	0.72	0.74
38-37	0.72	0.72	0.73	0.72	0.76
35-34	0.72	0.74	0.71	0.72	0.73
32-31	0.73	0.74	0.73	0.73	0.76
29-28	0.77	0.75	0.72	0.70	0.76
26-25	0.74	0.74	0.70	0.71	0.74
URNS RATIO:					
(2-3):(47-46)=1CT:1CT±5%	OK	OK	OK	OK	OK
(5-6):(44-43)=1CT:1CT±5%	OK	OK	OK	OK	OK
(8-9):(41-40)=1CT:1CT±5%	OK	OK	OK	OK	OK
(11-12):(38-37)=1CT:1CT±5%	OK	OK	OK	OK	OK
(14-15):(35-34)=1CT:1CT±5%	OK	OK	OK	OK	OK
(17-18):(32-31)=1CT:1CT±5%	OK	OK	OK	OK	OK
(20-21):(29-28)=1CT:1CT±5%	OK	OK	OK	OK	OK
(23-24):(26-25)=1CT:1CT±5%	OK	OK	OK	OK	OK
HI - POT:					
AT:1500VAC 1mA 1S					
2-3 TO 47-46	OK	OK	OK	OK	OK
5-6 TO 44-43	OK	OK	OK	OK	OK
8-9 TO 41-40	OK	OK	OK	OK	OK
11-12 TO 38-37	OK	OK	OK	OK	OK
14-15 TO 35-34	OK	OK	OK	OK	OK
17-18 TO 32-31	OK	OK	OK	OK	OK
20-21 TO 29-28	OK	OK	OK	OK	OK
23-24 TO 26-25	OK	OK	OK	OK	OK
MAIN TEST EQUIPMENT					
<input checked="" 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					

Package Information:

1. Packaging Method is as below:



ITEM	W	A ₀	B ₀	K ₀	K ₁	P	F	E	D ₀	D ₁	P ₀	P ₂	T
DIM	32.00 ^{+0.30} _{-0.30}	17.0 ^{+0.10} _{-0.10}	18.10 ^{+0.10} _{-0.10}	6.70 ^{+0.10} _{-0.10}	6.20 ^{+0.10} _{-0.10}	20.00 ^{+0.10} _{-0.10}	14.2 ^{+0.10} _{-0.10}	1.75 ^{+0.10} _{-0.10}	1.50 ^{+0.10} _{-0.10}	2.00 ^{+0.10} _{-0.10}	4.00 ^{+0.10} _{-0.10}	2.00 ^{+0.10} _{-0.10}	0.40 ^{+0.05} _{-0.05}
ALTERNATE													



2. Package Q'ty:

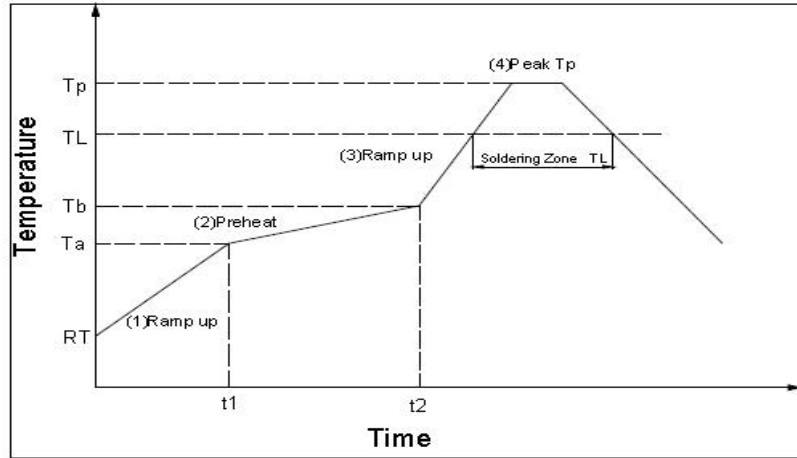
350 units/reel
4 reel/carton
1400 units/carton

3. MSL LEVEL: 3



5. Recommended Reflow Soldering Curve:

IR reflow graph



IR reflow profile

Form-1 (Reference JEDEC J-STD-020C Table 5-2)

IR reflow profile		Sn-Pb	Pb-free
step#	Profile Feature	Condition/Duration	Condition/Duration
step1	Ramp-up rate	1.5-3°C/sec.	1.5-3°C/sec.
step2	Preheat : 100~150°C(Ta-Tb)	t1-t2 : 60~120 sec.	t1-t2 : 60~180 sec.
step3	Ramp-up rate(T _L to T _P)	1.5-3°C/sec.	1.5-3°C/sec.
	Temperature maintained above 183°C(T _L)	T _L :60-150sec.	T _L :80-150sec.
step4	Peak temperature(T _P)	230 +5/-10 °C	260 +0/-5 °C
	Time within 5°C of actual peak temperature	30±10 sec.	30±10 sec.
step5	Ramp-down rate	6°C/sec.Max	6°C/sec.Max
Note1	Subject the samples to 3 cycles of the above defined reflow conditions		Subject the samples to 3 cycles of the above defined reflow conditions
Note2	Time 25°C to peak temperature : 6 minutes max.		Time 25°C to peak temperature : 8 minutes max.
Note3			The time between reflows shall be 5 minutes minimum and 60minutes maximum

SnPb Eutectic Process- "Package Peak Reflow Temperature"

Form-2 (Reference JEDEC J-STD-020C Table 4-1)

产品厚度	产品体积 < 350mm ³	产品体积 ≥ 350mm ³
< 2.5mm	240 +0/-5 °C	225 +0/-5 °C
≥ 2.5mm	225 +0/-5 °C	225 +0/-5 °C

Pb-free Process - "Package Peak Reflow Temperature"

Form-3 (Reference JEDEC J-STD-020C Table 4-2)

产品厚度	产品体积 < 350mm ³	产品体积 350mm ³ -2000mm ³	产品体积 > 2000mm ³
< 1.6mm	260 +0/-5 °C	260 +0/-5 °C	260 +0/-5 °C
1.6mm-2.5mm	260 +0/-5 °C	250 +0/-5 °C	245 +0/-5 °C
> 2.5mm	250 +0/-5 °C	245 +0/-5 °C	245 +0/-5 °C

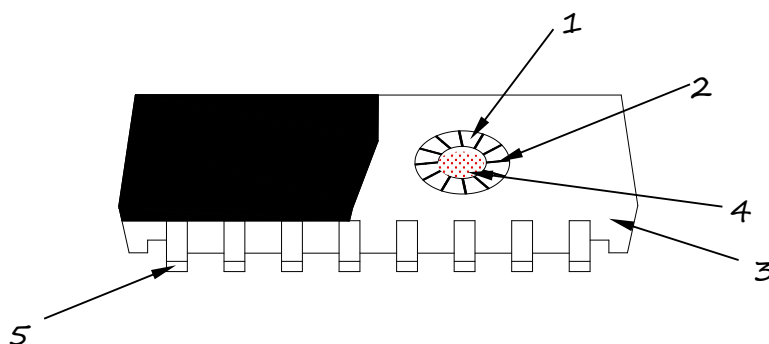


5. Reliability:

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 4).Above 217°C: 60~150 Seconds 5).Peak Temperature-5°C: Over 30 S																					
2	Thermal Shock	IEC68-2-14 Method A	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 Method A	125°C,96Hours																					
4	Low Temperature	IEC68-2-1 Method A	-40°C,96Hours																					
5	Temperature Humidity Cycle	IEC68-2-38	<table border="1"> <thead> <tr> <th>Temp</th> <th>Humidity</th> <th>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>1.5hr</td> </tr> <tr> <td>65°C</td> <td>93+/-3%RH</td> <td>4hr</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	1.5hr	65°C	93+/-3%RH	4hr	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	1.5hr																						
65°C	93+/-3%RH	4hr																						
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 Cycles Per Direction:10 6.Duration: 2 Hours 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 Specification According to Production weight 2).1Corner,3Edges,6Faces .Total Are 10 Times																					
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 Autoclave	JESD22-A102-C	1.Temperature:121°C 2. Humidity: 100% 3. Vapor Pressure: 29.7 Psia or 205KPa 4.Duration:96 hours																					

6. Material List: 材料清单

No. 序号	Item 项目	Base Material 基材	Plate 电镀	Rating 等级	Manufacturer 制造商	UL 安规证书	Remarks 备注
1	Transformer Core磁芯	Mn-Zn锰锌 Ni-Zn镍锌	----	----	YST(研鑫)	N/A	
2	Wire铜线	QPN/180聚胺脂	----	180℃	SUNTEK (松田)	E234867	QPN-H ϕ 0.09
3	Case胶壳	phenolic moulding powder (电木粉)	----	130℃	WAH HONG (华宏新技)	E150608	
4	Varnish 绝缘油	绝缘油E962	----	180℃	Chang Xian (长先)	E335405	
5	Solder 焊料	SnCu锡铜	----	----	Lichuang (力创)	N/A	
6	Flux 助焊剂	Water solubility 水溶性松香	----	----	Hong Tai Zhou (鸿泰洲)	N/A	





UL Info.

WIRE UL



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OBMW2.E234867
Magnet Wire - Component

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Magnet Wire - Component

[See General Information for Magnet Wire - Component](#)

ZHUHAI SUNTEK WIRE CO LTD
62 HANQING RD PINGSHATOWN
JINWAN DISTRICT
ZHUHAI, GUANGDONG 519055 CHINA

E234867

M# Dsg	Mark Dsg	Coat Type		ANSI Type	Temp Class
		BC	OC		
κLEW 180*	(1)	Polyurethane	—	MW82	180
κLEW 155*				MW79#	155
κLEW 130*				MW75#	130
κLEW/NY or QAN/180*	(1)	Polyurethane	Polyamide	MW83	180
κLEW/NY or QAN/155*				MW80#	155
κLEW/NY or QAN/130*				MW28#	130
κSEIW or QZY -w/180*	(1)	Polyesterimide	—	MW77#	180
κSEIW or κPEW/155*	(1)	Polyesterimide	—	MW26#	155
κPEW/130*	(1)	Polyesterimide	—	-#	130

* May be suffixed by LZ, EL or LZL.

LZ - Signifies magnet wires twisted together; EL - signifies base coated magnet wire laid parallel with top coat applied overall; LZL - signifies base coated magnet wire twisted together and covered with top coat overall.

This magnet wire may perform better than rating reflects and hence may not be suitable for an insulation system thermal aging program.

κ May be prefixed by Q, 1, 2, 3 to indicate coating thickness.

- None ANSI Type.

Marking: Company name and material designation or marked designation on package or reel.

Last Updated on 2008-07-02

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Case UL

data

Component - Plastics E150608

Guide Information

WAH HONG INDUSTRIAL CORP
11ST FL-6 235 CHUNG CHENG 4TH RD, KAOHSIUNG 801 TW

WH-9100(G1)(G2)
Diallyl Phthalate (DAP), molding compound, furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.37	V-0	2	0	130	130	130
	0.8	V-0	2	0	130	130	130
	3.0	V-0	0	0	130	130	130

Comparative Tracking Index (CTI): 0
Dielectric Strength (kV/mm): 30
High-Voltage Arc Tracking Rate (HVTR): 0
Dimensional Stability (%): -

Inclined Plane Tracking (IPT) kV: -
Volume Resistivity (10⁸ ohm-cm): 14
High Volt, Low Current Arc Resis (D495): 4

(G1) - The GWIT rating observed from representative Thickness & Color including: Thickness at 0.8mm are 960C (NC); 960C (BK) .

(G2) - The GWFI rating observed from representative Thickness & Color including: Thickness at 0.8mm are 960C (NC); 960C (BK) .

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1998-08-18
Last Revised: 2019-05-15 © 2019 UL LLC

IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.37	V-0 (ALL)
			0.8	V-0 (ALL)
			3.0	V-0 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	°C	0.8	960
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	°C	0.8	960
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	CTI600
		Material Group	-	I
IEC Ball Pressure	IEC 60695-10-2	°C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m ²	-	-
ISO Izod Impact	ISO 180	kJ/m ²	-	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-	-



Varnish UL



ONLINE CERTIFICATIONS DIRECTORY

OBOR2.E335405
Varnishes - Component

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Varnishes - Component

[See General Information for Varnishes - Component](#)

ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD

E335405

Langwan Rd, Fine Chemical Area
Gaolan Port Economic Zone
Zhuhai, Guangdong 519000 CHINA

Varnish Designation	ANSI Type	Thermal Class (°C)		
		Twisted Pair	Helical Coil	Curved Electrode
E962	MW 28-C	130	-	-

Marking: Company name and model designation.

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