



深圳市华升微电子有限公司

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PRODUCT FOR APPROVAL

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CUSTOMER :

DESCRIPTION : 10/100 BASE-T TRANSFORMER

PART NUMBER : HSW-H1688SI

REVISION : A0

CUSTOMER P/N :

ISSUE DATE : 26-Sep-19

PRODUCT PHOTOS :

SINGLE WEIGHT : 0.650g

YIELDLY : Guang Dong Province, China



COMPANY APPROVAL		
PREPARED BY	CHECKED BY	APPROVED BY

CUSTOMER APPROVAL
APPROVED SIGNATURES

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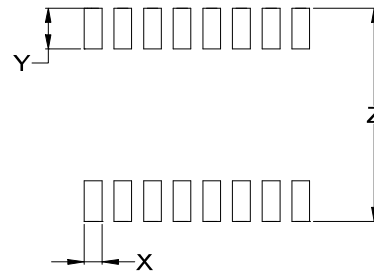
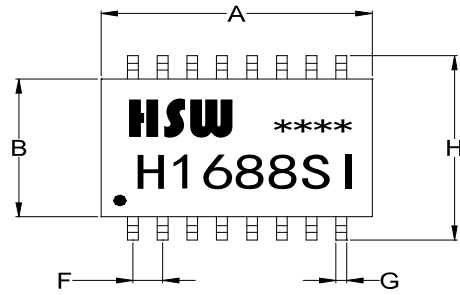
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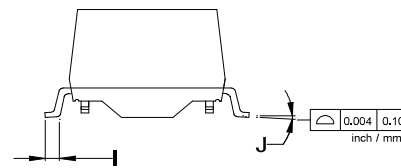
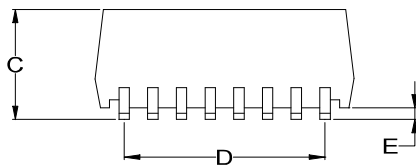
INDEX

1. Index-----	1
2. Record of Revision-----	2
3. Mechanical drawing-----	3
4. Schematic drawing -----	4
5. Sample Test Report-----	5
6. Packing info-----	6
7. Recommended Reflow Soldering curve,Reliability----	7
8. Material Certificate List-----	8
9. UL certification-----	9

1.Mechanical Drawing:



Suggested Pad layout



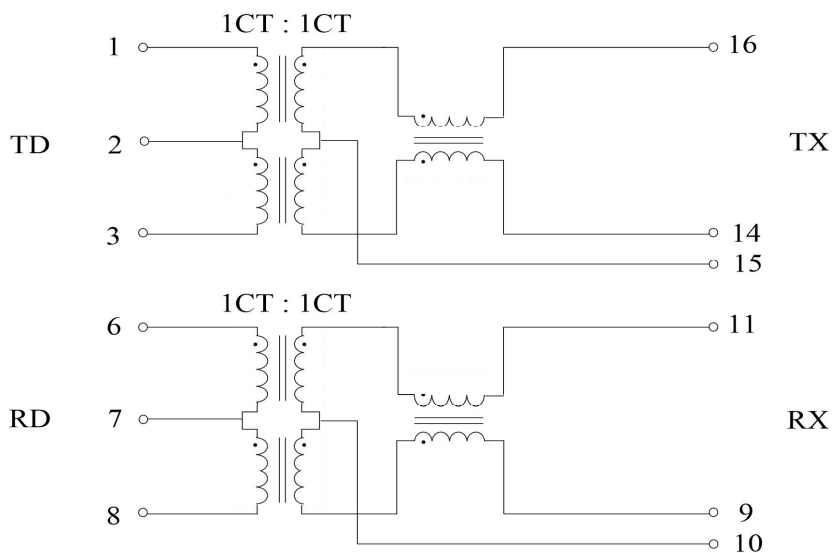
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.55	13.05	0.494	0.514
B	6.65	7.15	0.262	0.281
C	6.20(max)		0.244(max)	
D	8.89(typical)		0.350(typical)	
E	0.12	0.38	0.005	0.015
F	1.27(typical)		0.050(typical)	
G	0.46(typical)		0.018(typical)	
H	9.05	9.55	0.356	0.376
I	0.55	0.85	0.022	0.033
J	0°	8°	0°	8°
X	0.76(typical)		0.024(typical)	
Y	2.03(typical)		0.074(typical)	
Z	10.67(typical)		0.420(typical)	



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2. Schematic:



3. Electrical Specification @25°C

Inductance OCL:	350uH Min @ 100KHz	0.1V 8mA DC BIAS
Leakage Inductance:	0.50uH Max @ 100KHz	0.1V
Interwinding Capacitance:	28pF Max @ 100KHz	0.1V
DC Resistance:	1.2Ω Max (16-14,11-9)	
Turn Ratio:	1CT:1CT(TX)/1CT:1CT(RX)±3%	
Polarity:	1-16,6-11 In-Phase	
Insertion Loss:	0.5-100 MHz	-1.1dB Max
Return Loss	0.5-30 MHz	-18dB Min
	30.1-60MHz	-18+20log(f/30)dB Min
	60.1-80MHz	-12dB Min
Cross Talk:	0.5-40MHz	-35dB Min
	40.1-100MHz	-33+20*log(f/50)dB Min
CMRR:	0.5-100MHz	-30dB Min
Isolation HI-POT:	1500VAC 1mA	1S
Operating Temperatur	-40°C to 85°C	.



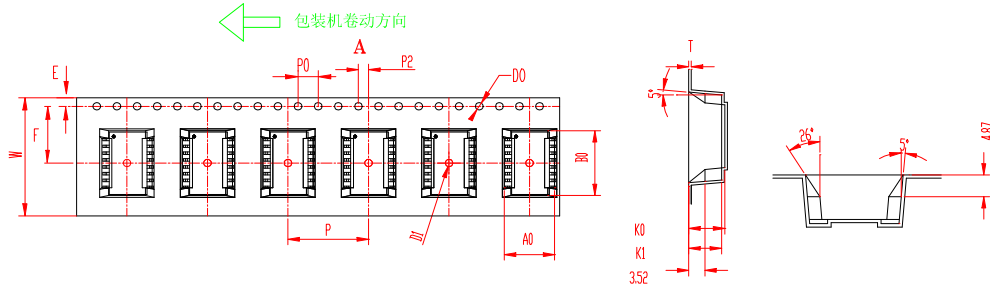
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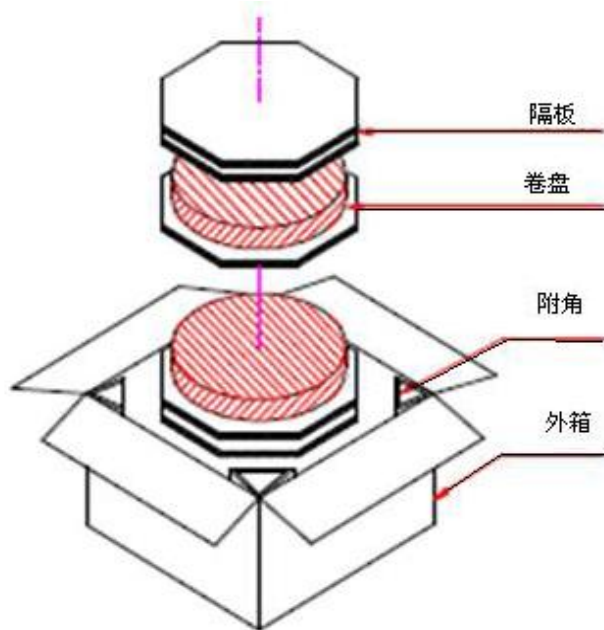
SPEC	1	2	3	4	5
L:(AT 100KHz 0.1V 8mA)					
350uH Min					
1-3	598	596	589	585	592
6-8	589	587	596	596	593
LK:(AT 100KHz 0.1V)					
0.5uH Max					
1-3(16-14 short)	0.19	0.19	0.19	0.17	0.18
6-8(11-9 short)	0.18	0.15	0.15	0.16	0.19
CWW:(AT 100KHz 0.1V)					
28pF Max					
1-3 TO 16-14	15.2	15.4	15.4	15.4	15.3
6-8 TO 11-9	15.2	15.2	15.3	15.2	15.7
DCR:(AT 25°C)					
0.9Ω Max					
1-3	0.45	0.46	0.46	0.45	0.44
6-8	0.45	0.46	0.45	0.46	0.45
1.2Ω Max					
16-14	0.89	0.90	0.89	0.90	0.89
11-9	0.88	0.89	0.90	0.89	0.90
TURNS RATIO:					
(1-3):(16-14)=1CT:1CT±3%	OK	OK	OK	OK	OK
(6-8):(11-9)=1CT:1CT±3%	OK	OK	OK	OK	OK
HI-POT:					
AT:1500VAC 1mA 1S					
1-3 TO 16-14	OK	OK	OK	OK	OK
6-8 TO 11-9	OK	OK	OK	OK	OK

4. 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	24.0 ^{+0.30} _{-0.30}	10.0 ^{+0.10} _{-0.10}	13.10 ^{+0.10} _{-0.10}	5.60 ^{+0.10} _{-0.10}	5.10 ^{+0.10} _{-0.10}	16.0 ^{+0.10} _{-0.10}	11.50 ^{+0.15} _{-0.15}	1.75 ^{+0.10} _{-0.10}	1.50 ^{+0.10} _{-0.10}	1.50 ^{+0.10} _{-0.10}	4.00 ^{+0.10} _{-0.10}	2.00 ^{+0.10} _{-0.10}	0.40 ^{+0.05} _{-0.05}
ALTRNATE													



2. Package Q'ty:

3.MSL LEVEL: 3

600 units/reel

8 reel/carton

4800 units/carton

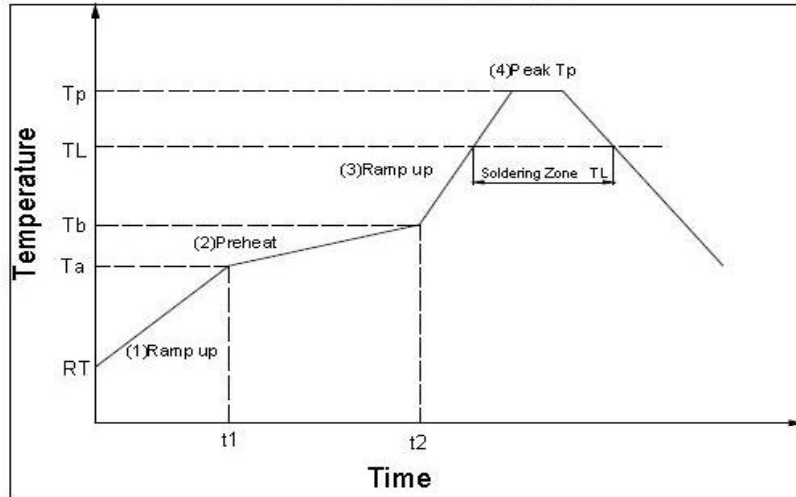


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5. Recommended Reflow Soldering Curve:

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



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5. Reliability:

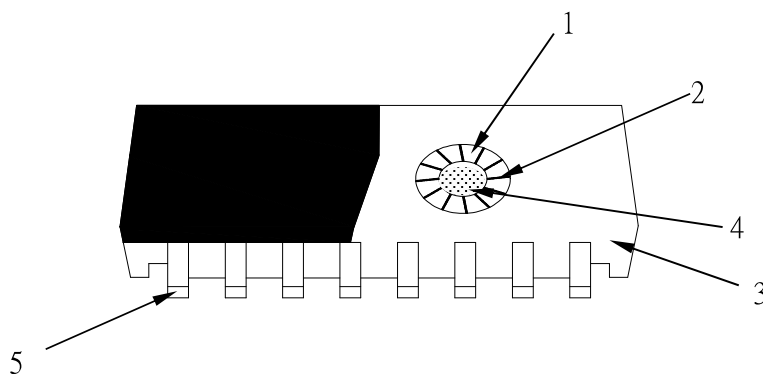
Reliability			
No.	Test Item	Refer To Standard	Test Condition
1	Resistance To Soldering Heat--Convection Reflow	IPC/JEDEC J-STD-020D	1).Peak Temperature: Refer to Specification According to Package Body Thickness And Volume 2).Preheat Temperature and Soak Time: 150~200°C,60~120 Seconds 3).Average Ramp-up 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	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



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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°C	SUNTEK (松田)	E234867	QPN-H ϕ 0.09
3	Case 胶壳	phenolic moulding powder (电木粉)	---	130°C	WAH HONG (华宏新技)	E150608	
4	Varnish 绝缘油	绝缘油E962	---	180°C	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	





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UL Info.

WIRE UL



ONLINE CERTIFICATIONS DIRECTORY

OBMW2.E234867 Magnet Wire - Component

[Page Bottom](#)

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

Mkt 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
κLEW/NY or QAN/155*				MW80#	155
κLEW/NY or QAN/130*				MW28#	130
κSEIW or QZY -κ/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 (10^x 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	-	-



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Varnish UL



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OBOR2.E335405 Varnishes - Component

[Page Bottom](#)

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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