

SSOP4, AC Input, Photo Transistor Coupler**Description**

The TWS3H4 series combine two AlGaAs infrared emitting diodes as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic SSOP4 package

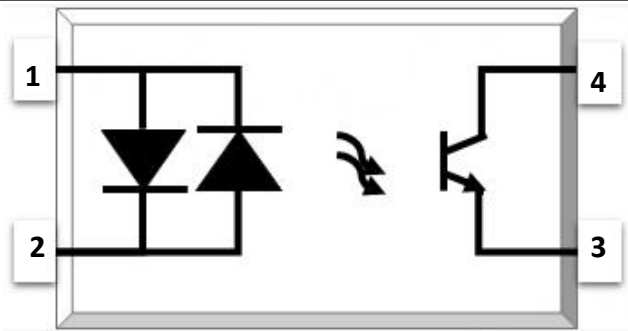
With the robust coplanar double mold structure, TWS3H4 series provide the most stable isolation feature.

Features

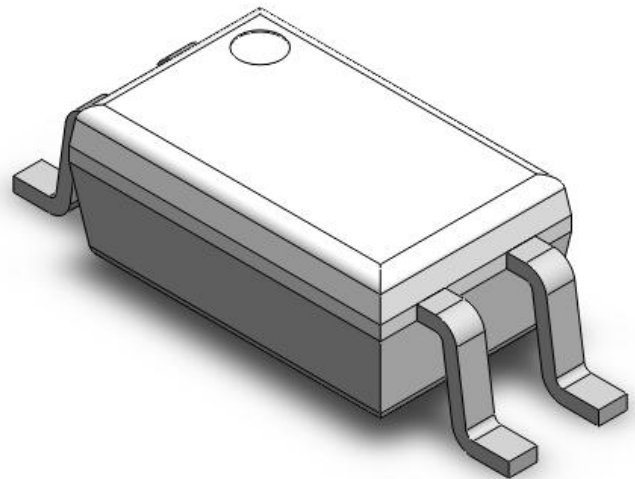
- High isolation 3750 VRMS
- CTR flexibility available see order information
- AC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC - GB4943.1, GB8898

Applications

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

SCHEMATIC**PIN DEFINITION**

1. Anode/ Cathode
2. Cathode/Anode
3. Emitter
4. Collector

PACKAGE OUTLINE

SSOP4, AC Input, Photo Transistor Coupler**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	VALUE	UNIT	NOTE
INPUT				
Forward Current	I_F	± 60	mA	
Peak Forward Current	I_{FP}	± 1	A	1
Input Power Dissipation	P_I	100	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	80	V	
Emitter - Collector Voltage	V_{ECO}	6	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
COMMON				
Total Power Dissipation	P_{tot}	200	mW	
Isolation Voltage	V_{iso}	3750	V _{rms}	2
Operating Temperature	T_{opr}	-55~110	°C	
Storage Temperature	T_{stg}	-55~125	°C	
Soldering Temperature	T_{sol}	260	°C	

Note 1. 100 μ s pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

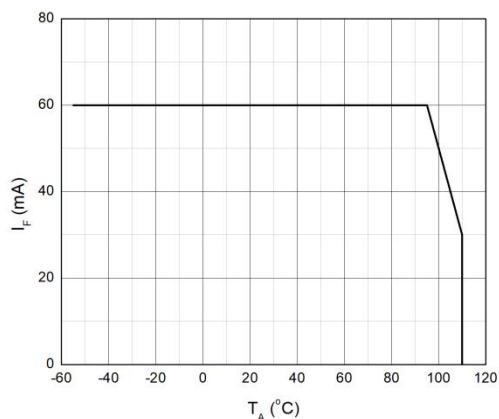
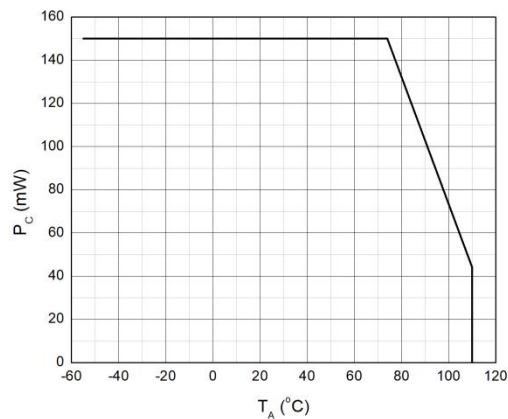
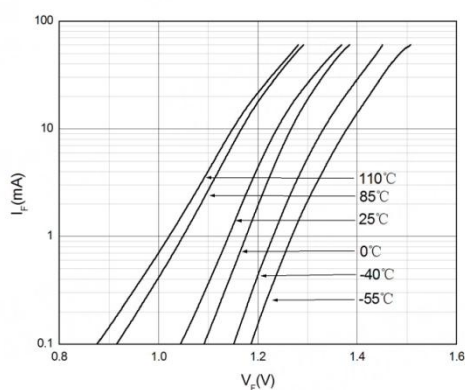
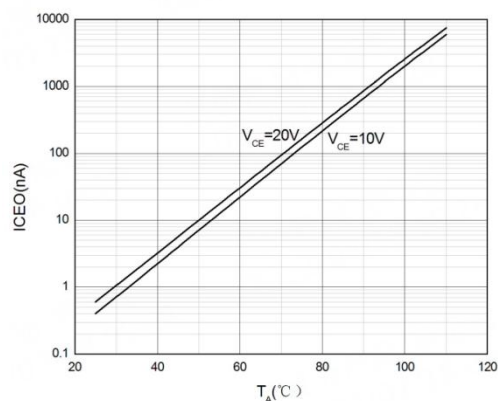
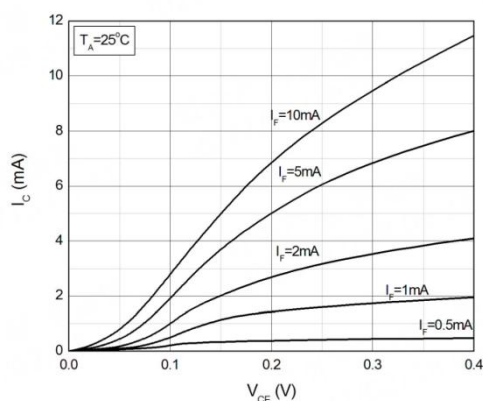
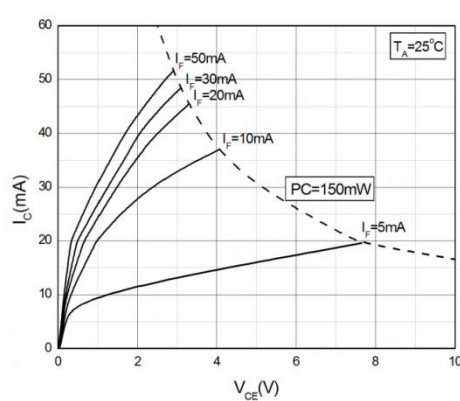
SSOP4, AC Input, Photo Transistor Coupler**ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C**

PARAMETER		SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT								
Forward Voltage		V _F	-	-	1.4	V	IF=10mA	
Input Capacitance		Cin	-	10	-	pF	V=0, f=1kHz	
OUTPUT								
Collector Dark Current		I _{CEO}	-	-	100	nA	VCE=20V, IF=0	
Collector-Emitter Breakdown Voltage		BV _{CEO}	80	-	-	V	IC=0.1mA, IF=0	
Emitter-Collector Breakdown Voltage		BV _{ECO}	6	-	-	V	IE=0.1mA, IF=0	
TRANSFER CHARACTERISTICS								
Current Transfer Ratio	TWS3H4	CTR	20	-	400	%	IF=1mA, VCE=5V	
	TWS3H4A		50	-	150			
	TWS3H4B		80	-	400			
	TWS3H4C		120	-	360			
CTR Symmetry			0.7	-	1.3		IF=±1mA, VCE=5V	
Collector-Emitter Saturation Voltage		V _{CE(sat)}	-	0.07	0.2	V	IF=20mA, IC=1mA	
Isolation Resistance		R _{ISO}	10^12	10^14	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance		C _{IO}	-	0.4	1	pF	V=0, f=1MHz	
Response Time (Rise)		tr	-	7	18	μs	VCE=2V, IC=2mA	3
Response Time (Fall)		tf	-	9	18	μs	RL=100Ω	3

Note 3. Fig.12&13

Note 4. Fig.14

CHARACTERISTIC CURVES

Fig.1 Forward Current
vs. Ambient TemperatureFig.2 Collector Power Dissipation
vs. Ambient TemperatureFig.3 Forward Current
vs. Forward VoltageFig.4 Collector Dark Current
vs. Ambient TemperatureFig.5 Collector Current
vs. Collector-emitter VoltageFig.6 Collector Current
vs. Collector-emitter Voltage

CHARACTERISTIC CURVES

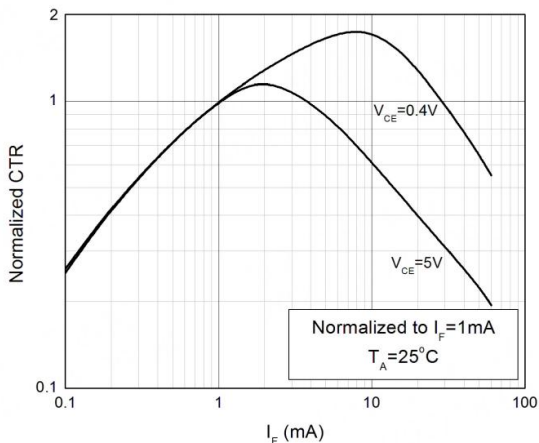
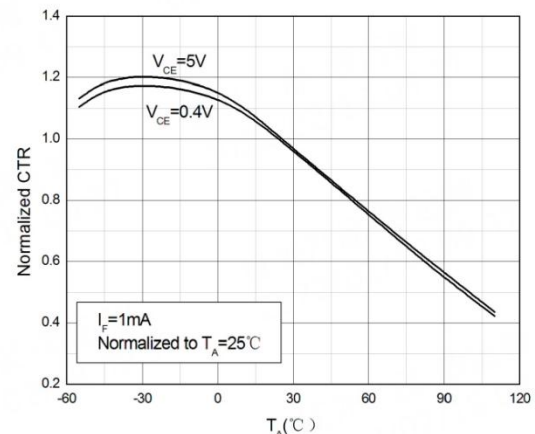
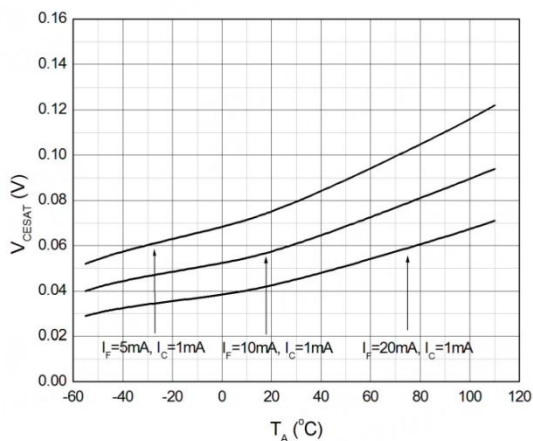
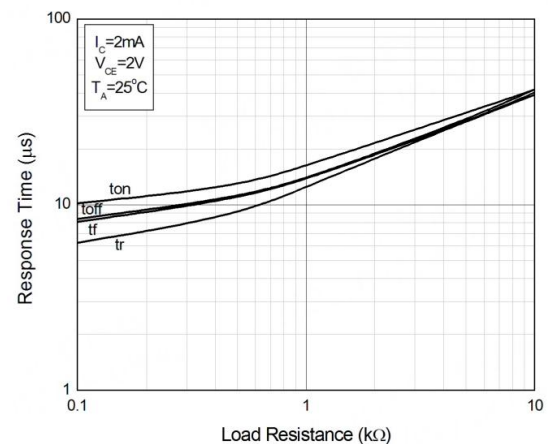
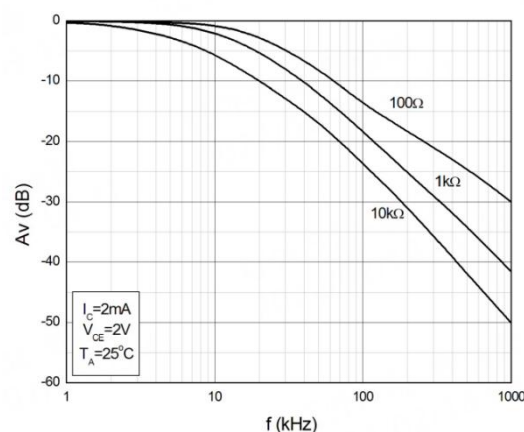
Fig.7 Normalized Current Transfer Ratio
vs. Forward CurrentFig.8 Normalized Current Transfer Ratio
vs. Ambient TemperatureFig.9 Collector-emitter Saturation Voltage
vs. Ambient TemperatureFig.10 Switching Time
vs. Load Resistance

Fig.11 Frequency Response



TEST CIRCUITS

Fig.12 Test Circuits of Response Time

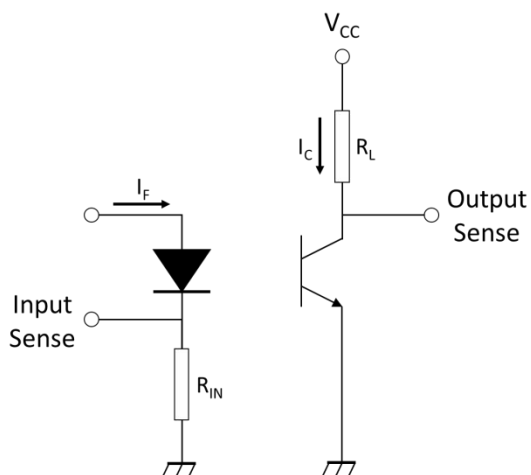


Fig.13 Curves of Response Time

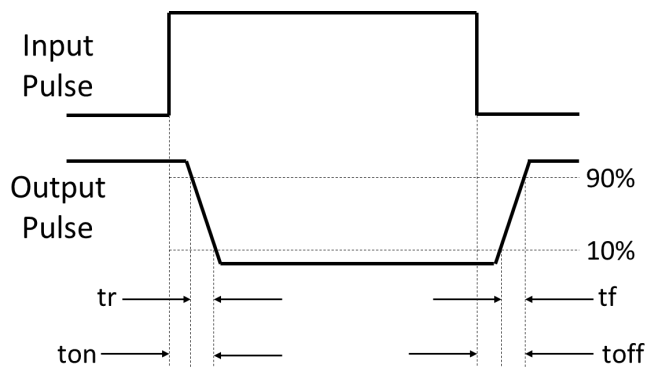
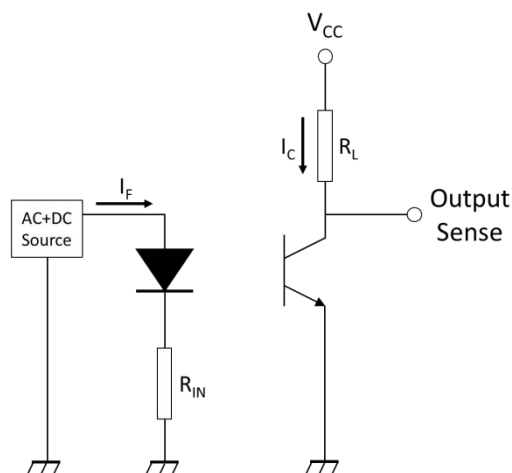
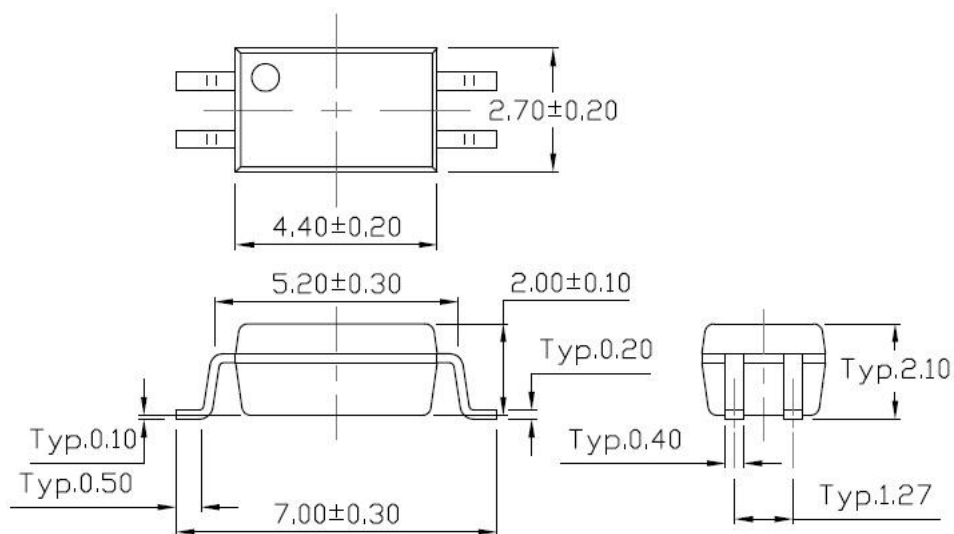
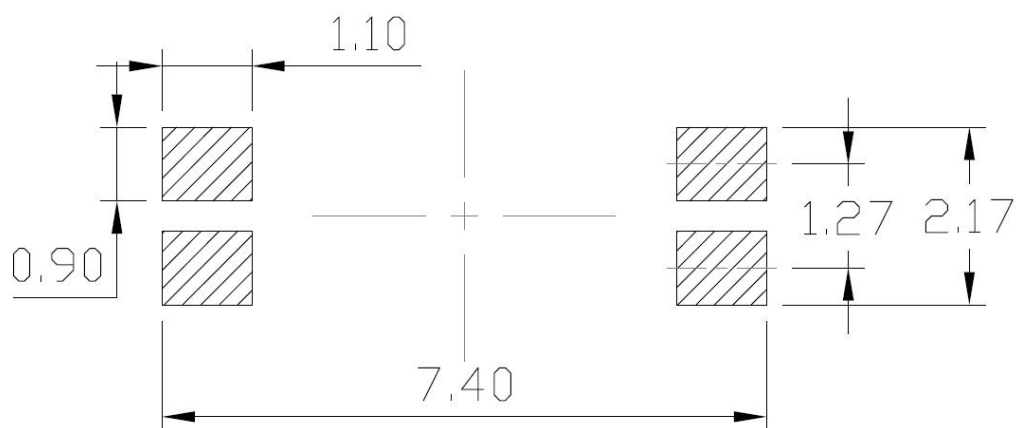
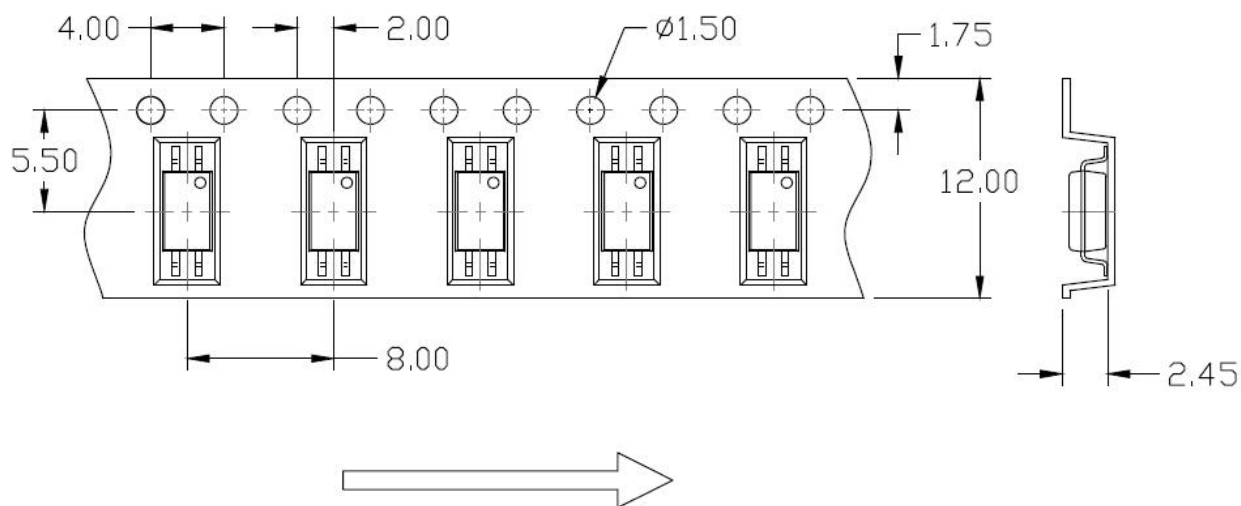
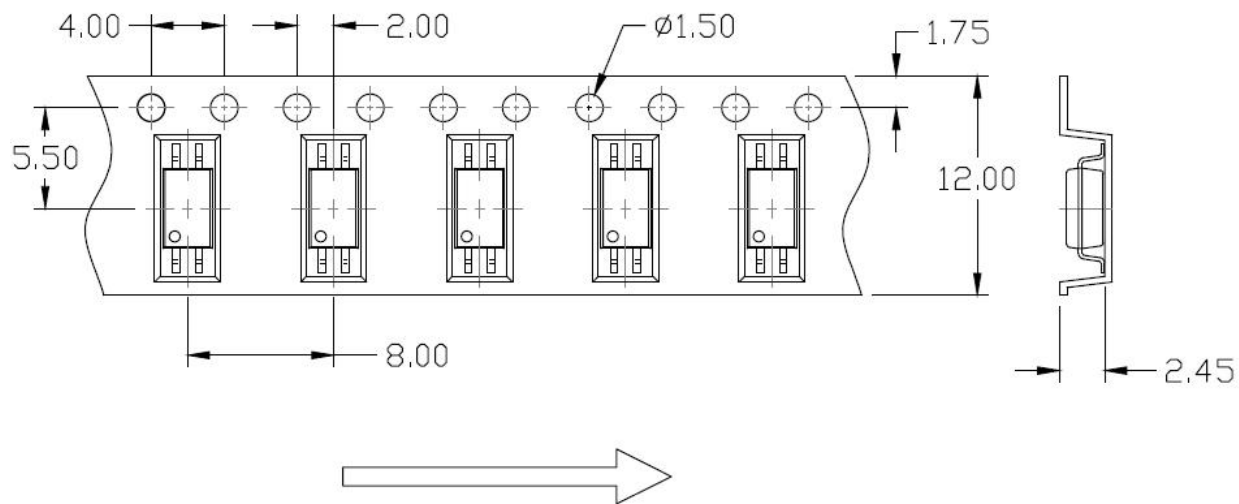
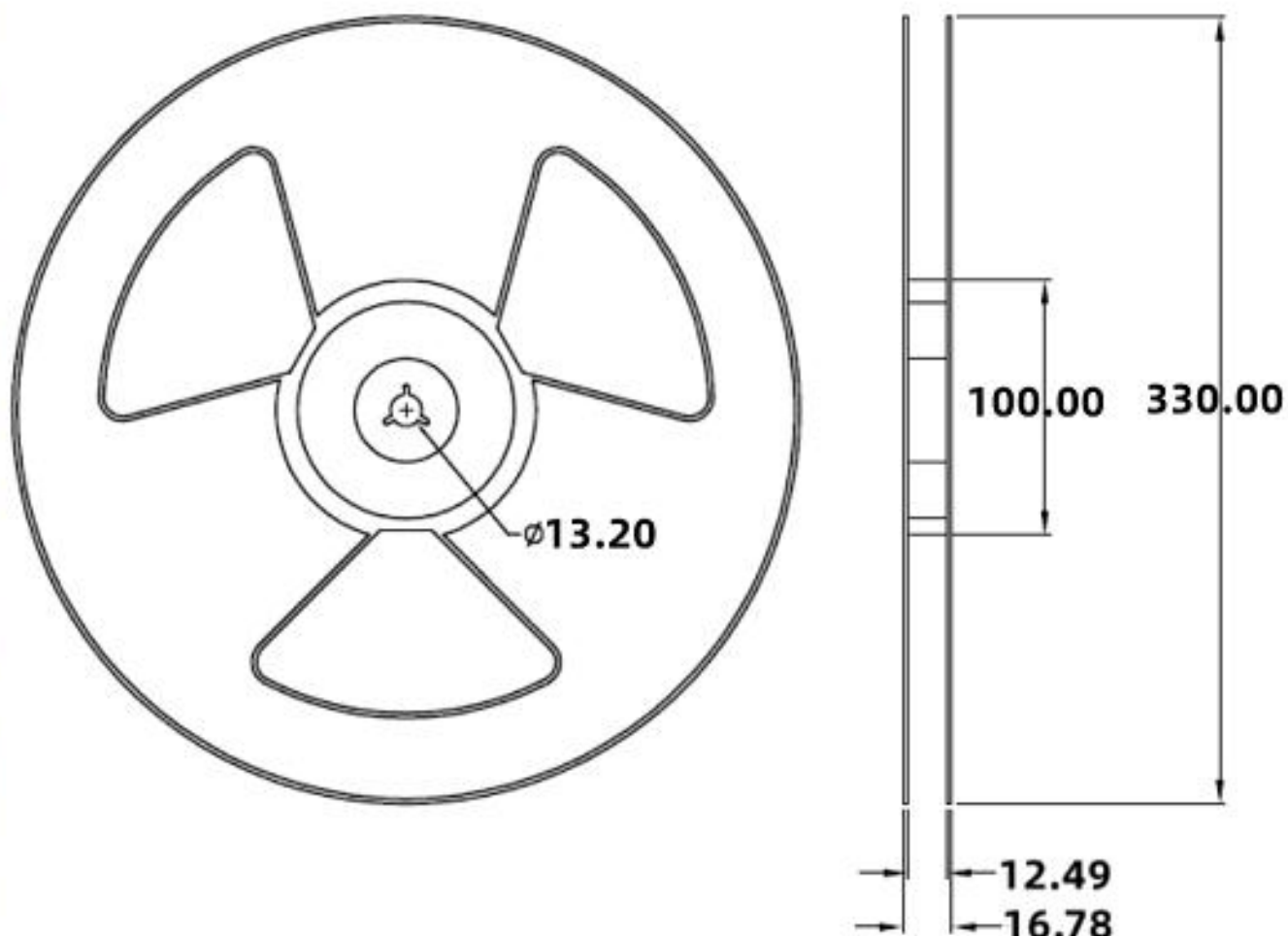


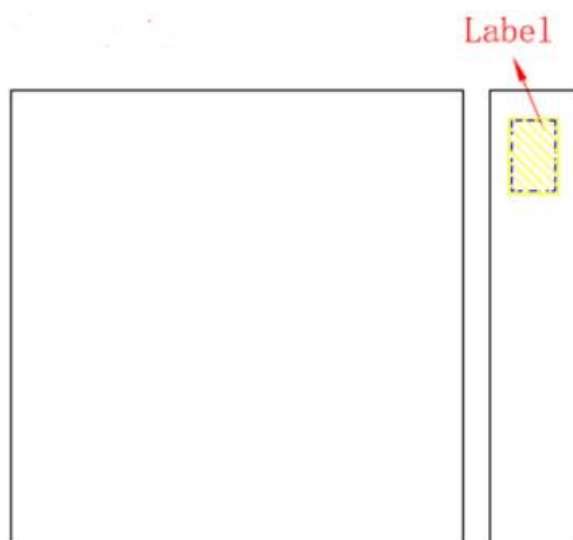
Fig.14 Test Circuits of Frequency Response



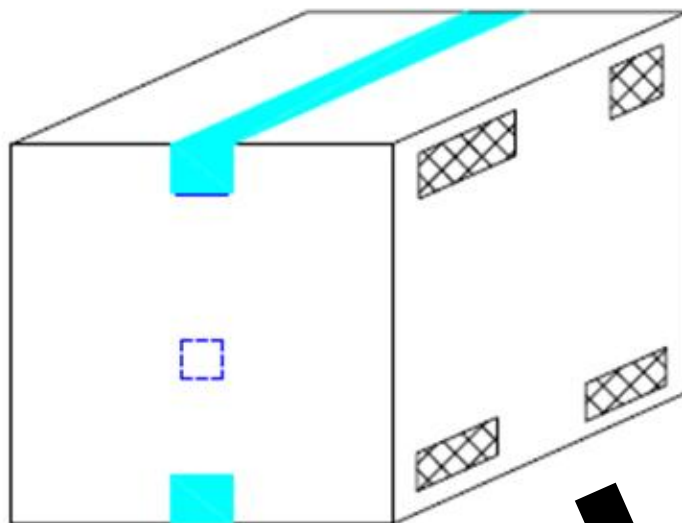
SSOP4, AC Input, Photo Transistor Coupler**PACKAGE DIMENSIONS** (Dimensions in mm unless otherwise stated)**Recommended Solder Mask** (Dimensions in mm unless otherwise stated)

SSOP4, AC Input, Photo Transistor Coupler**CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)****Option T1****Option T2**

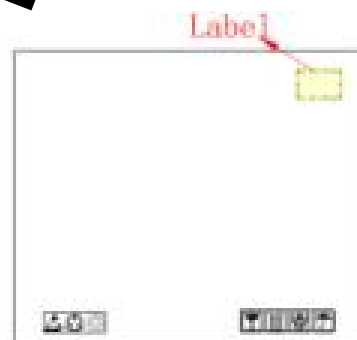
REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)**Option T1 & T2**

BOX SPECIFICATIONS (Reel Type)**Inner Box**

- L x W x H = 36cm x 36cm x 6.9cm

Outer Box

- Option1: L x W x H = 45cm x 38cm x 38cm
- Option2: L x W x H = 39cm x 38cm x 38cm

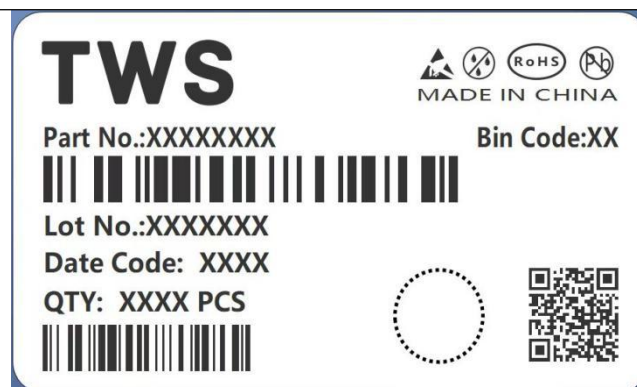


ORDERING AND MARKING INFORMATION**MARKING INFORMATION**

TWS : Company Abbr.
3H4 : Part Number
X : CTR Rank
V : VDE Option
Y : Fiscal Year
WW : Work Week

ORDERING INFORMATION**TWS3H4X(Z)-GV**

TWS – Company Abbr.
 3H4 – Part Number
 X – Rank (A/B or None)
 Z – Tape and Reel Option (T1/T2)
 G – Green
 V – VDE Option (V or None)

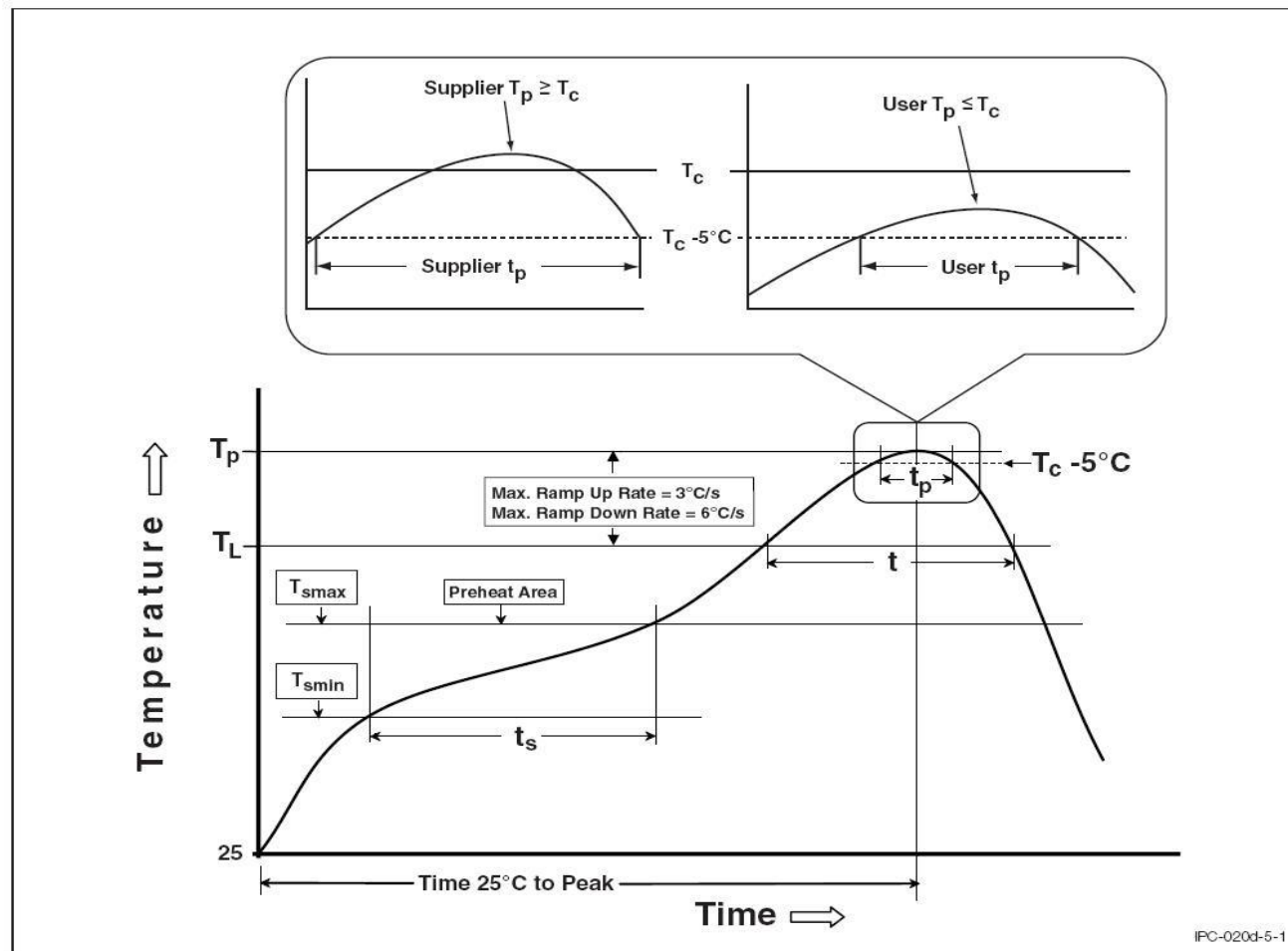
LABEL INFORMATION**PACKING QUANTITY**

Option	Quantity	Quantity – Inner box	Quantity – Outer box
T1	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 45k Units
T2	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 45k Units

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REFLOW INFORMATION

REFLOW PROFILE



IPC-020d-5-1

Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	100	150°C
Temperature Max. (T_{smax})	150	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

SSOP4, AC Input, Photo Transistor Coupler**DISCLAIMER**

- TWS is continually improving the quality, reliability, function and design. TWS reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- The products shown in this publication are designed for the general use in electronic applications such as office automation, equipment, communications devices, audio/visual equipment, electrical application and instrumentation purpose, non-infringement and merchantability.
- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact TWS sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify TWS's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.