DESCRIPTION

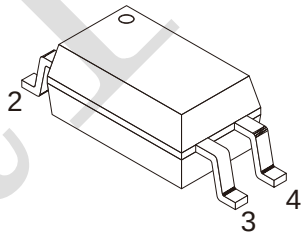
The HK2290 are optically coupled isolators containing two GaAs light emitting diodes connected in inverse parallel and an NPN silicon phototransistor. They are packaged in a 4-pin shrink small outline package(SSOP-4).

FEATURES

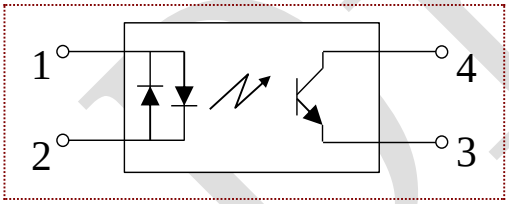
- AC input response
- Current transfer ratio (CTR) : MIN. 20% @ I_F= ±1mA, V_{CE}=5V
- High isolation voltage between input and output (Viso=3750Vrms)
- Minimum BV_{CEO} of 80V guaranteed
- UL approved
- VDE approved
- CQC approved

APPLICATIONS

- AC line monitor
- Programmable controllers
- Telecommunication equipment
- Measuring instruments



BLOCK DIAGRAM AND PACKAGE



Pin Configuration
1 Anode / Cathode
2 Cathode / Anode
3 Emitter
4 Collector

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	±50	mA
	Peak Forward Current (1 μs, pulse)	I_{FM}	1	A
	Power Dissipation	P_D	70	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	6	V

Parameter	Symbol	Rating	Unit
Total Power Dissipation	P_{tot}	200	mW
Isolation Voltage *	V_{iso}	3750	Vrms
Operating Temperature	T_{opr}	-55~+110	℃
Storage Temperature	T_{stg}	-55~+125	℃
Soldering Temperature **	T_{sol}	260	℃

* AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

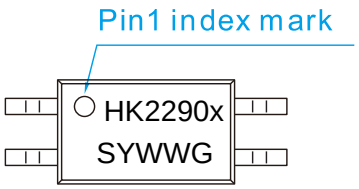
** For 10 seconds.

ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

Parameter			Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage		V_F	I_F=10mA	-	-	1.4	V
	Input Capacitance		C_{in}	V=0, f=1kHz	-	10	-	pF
Output	Collector Dark Current		I_{CEO}	V_{CE}=20V, I_F=0	-	-	100	nA
	Collector-Emitter Breakdown Voltage		BV_{CEO}	I_C=0.1mA, I_F=0	80	-	-	V
	Emitter-Collector Breakdown Voltage		BV_{ECO}	I_E=10μA, I_F=0	6	-	-	V
Transfer Characteristics	Current Transfer Ratio *	HK2290	CTR	I_F=±1mA, V_{CE}=5V	20	-	400	%
		HK2290A			50	-	150	%
		HK2290B			80	-	400	%
	Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_F=±20mA, I_C=1mA	-	0.07	0.2	V
	Isolation Resistance		R_{ISO}	DC500V, 40~60%R.H.	$5x10^{10}$	$1x10^{11}$	-	Ω
	Floating Capacitance		C_f	V=0, f=1MHz	-	0.4	1.0	pF
	Rise Time		T_r	V_{CE}=2V, I_C=2mA, R_L=100Ω	-	7	18	μs
	Fall Time		T_f	V_{CE}=2V, I_C=2mA, R_L=100Ω	-	9	18	μs

* CTR=I_C/I_F x 100%

MARKING



- HK: Company Abbr.
- x: CTR Classification (A, B or none)
- S: subsection SEQUENCE code (A~Z)
- Y: Year
- WW: Work Week
- G: Green

ORDER CODE

HK2290x(Z)-GV

HK = Company Abbr.
x = CTR Classification (A, B or none)
Z = Tape and Reel Option (T1/T2)
G = Green
V = VDE Option (V or None)

For example,

Order Code	Description	Main Marking
HK2290A(T1)-GV	Classification A, Tape T1, Green, VDE approved	HK2290A
HK2290B(T1)-V	Classification B, Tape T1, VDE approved	HK2290B
HK2290B(T2)-G	Classification B, Tape T2, Green	HK2290B
HK2290A(T2)	Classification A, Tape T2	HK2290A

TYPICAL PERFORMANCE CURVES

Fig.1 Forward Current vs. Ambient Temperature

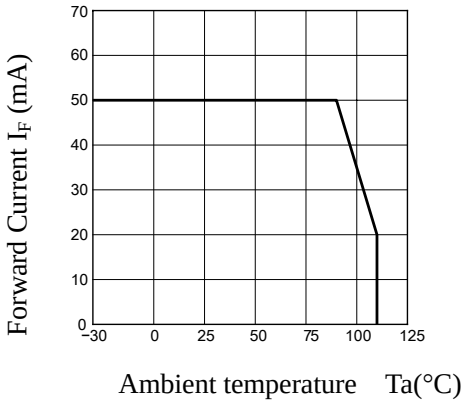


Fig.2 Collector Power Dissipation vs Ambient Temperature

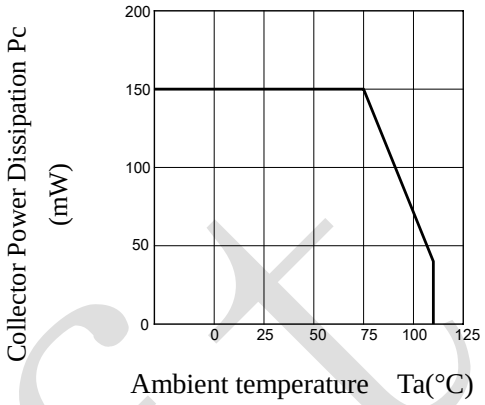


Fig.3 Current Transfer Ratio vs. Forward Current

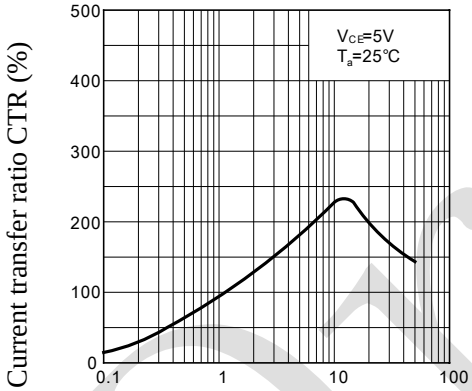


Fig.4 Collector-emitter Saturation Voltage vs. Forward Current

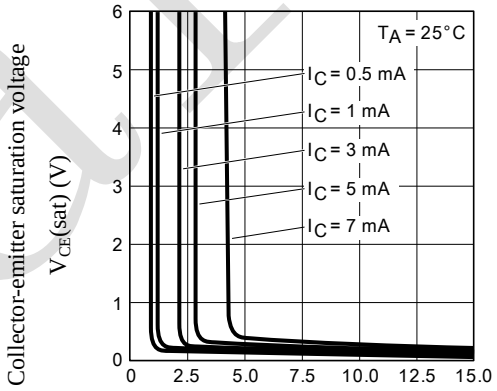


Fig.5 Forward Current vs. Forward Voltage

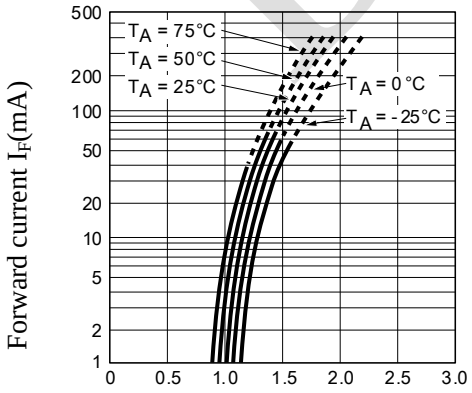


Fig.6 Collector Current vs. ollector-emitter Voltage

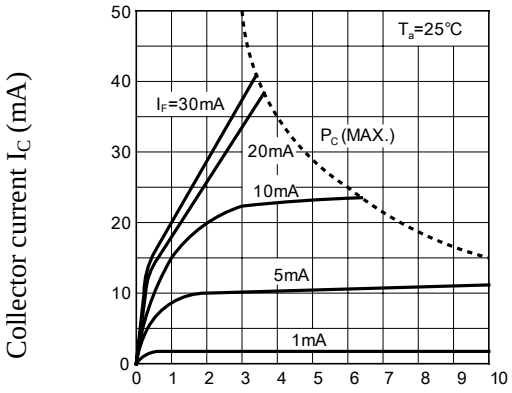


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

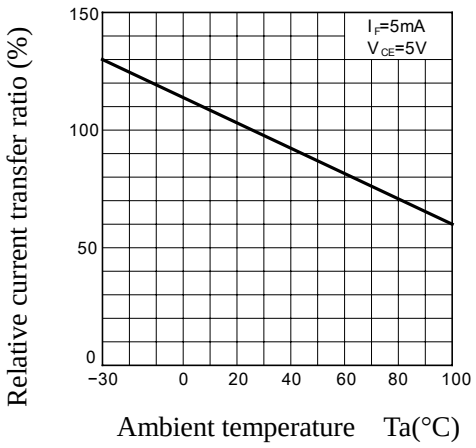


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

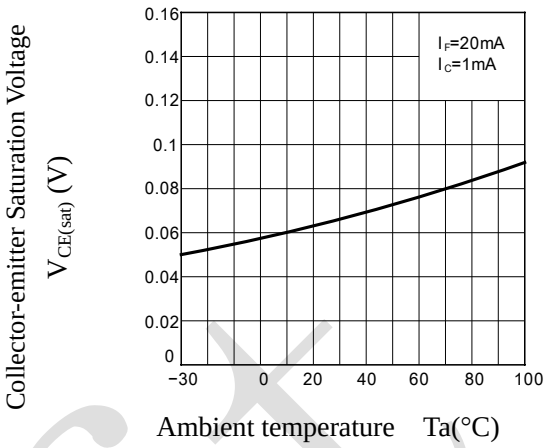


Fig.9 Collector Dark Current vs. Ambient Temperature

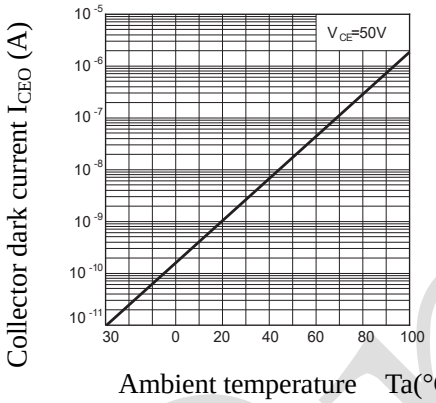
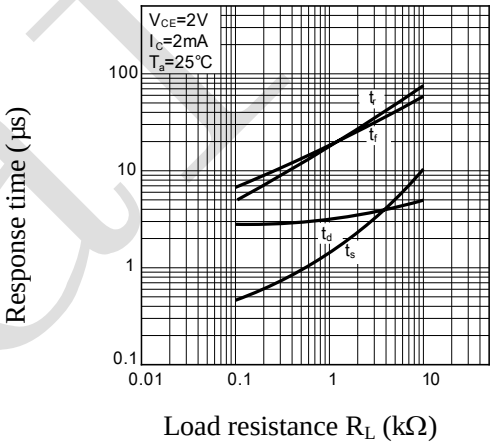


Fig.10 Response Time vs. Load Resistance



TEST CIRCUITS

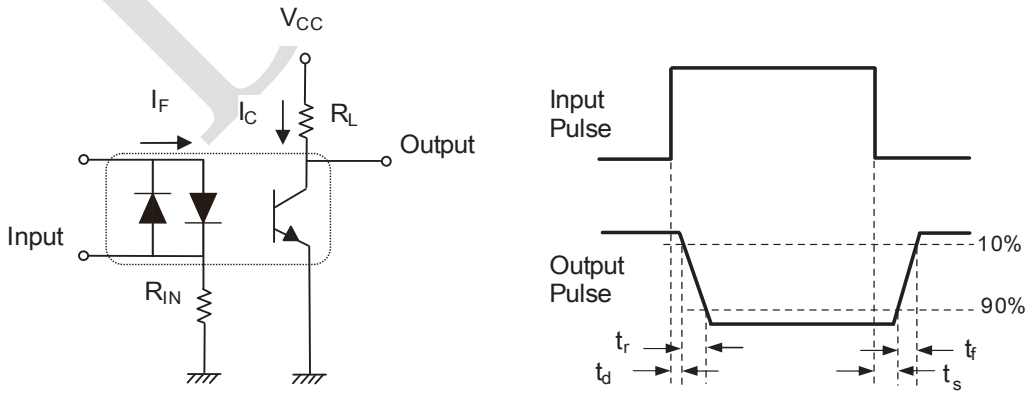
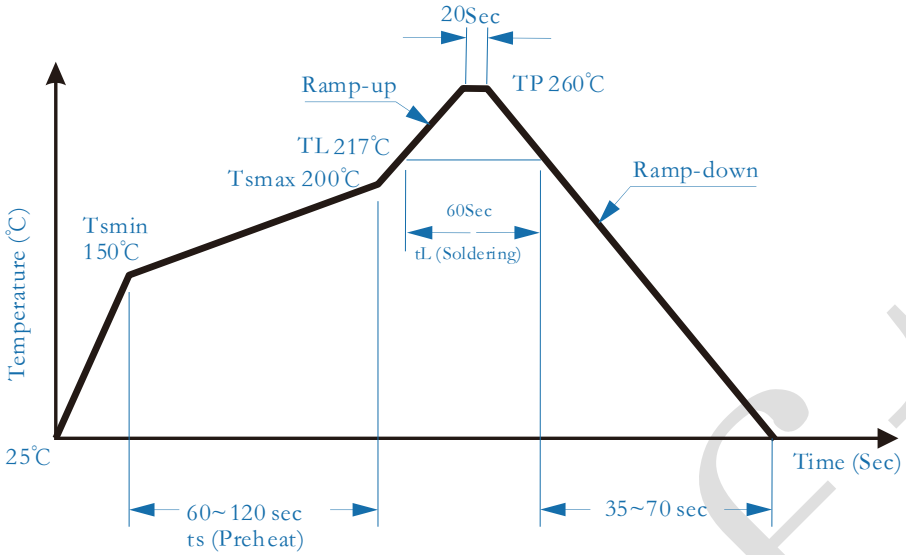
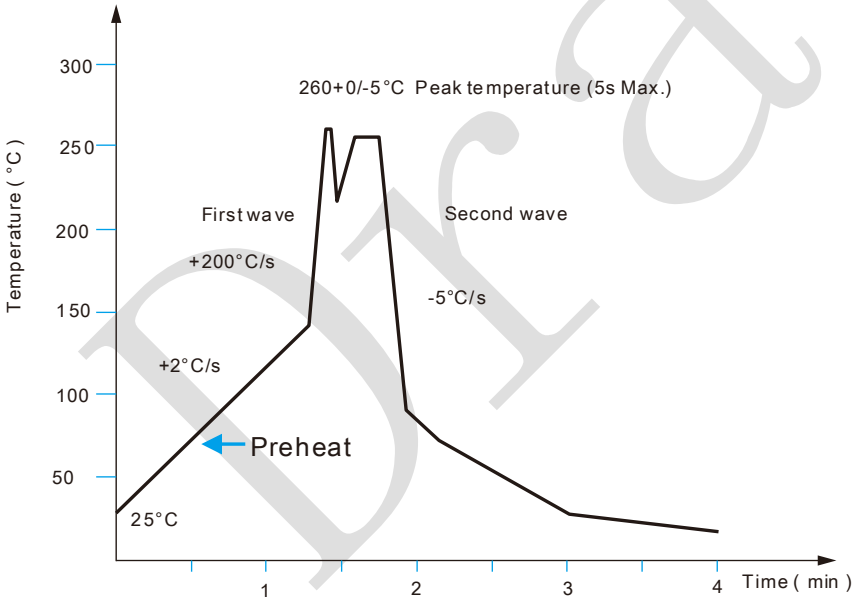


Fig.11 Test Circuit for Response Time and Waveforms

SOLDER REFLOW PROFILE



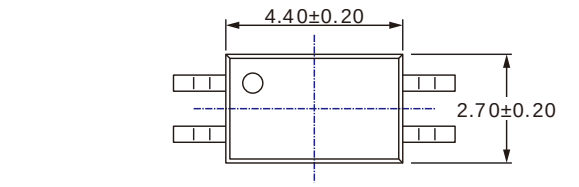
WAVE SOLDERING PROFILE (JEDEC22A111)

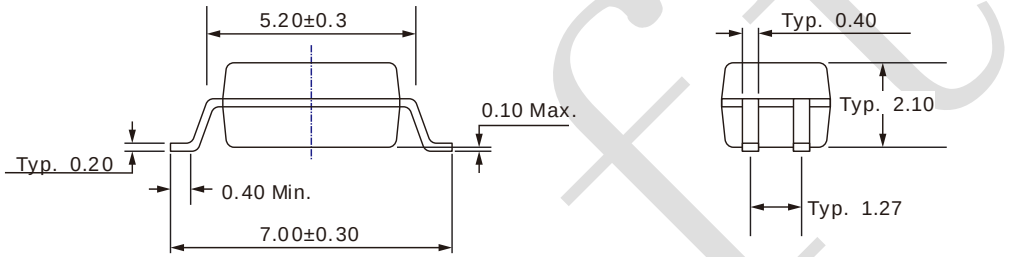


1. Please weld on where more than 1mm away from IC epoxy body.
2. Please avoid immersion of IC epoxy in the tin bath.
3. Please avoid rectifying the position after immersion welding.
4. Do not apply pressure when the lead frame is heated during welding.

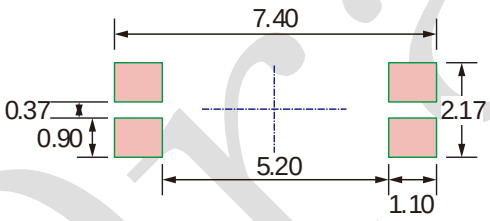
OUTLINE DIMENSIONS

Unit: mm





4-pin SSOP

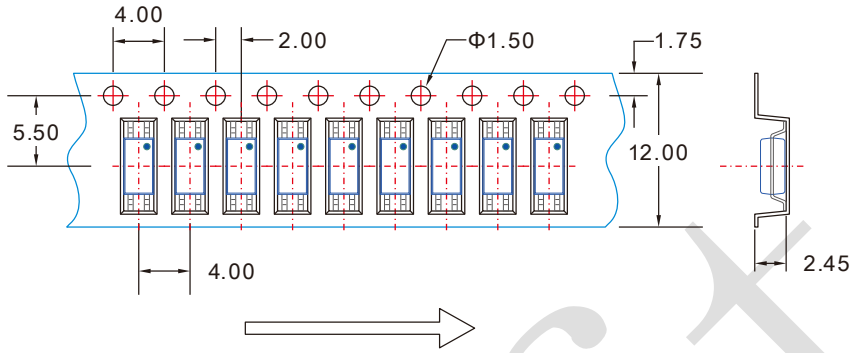


Recommended Solder Mask

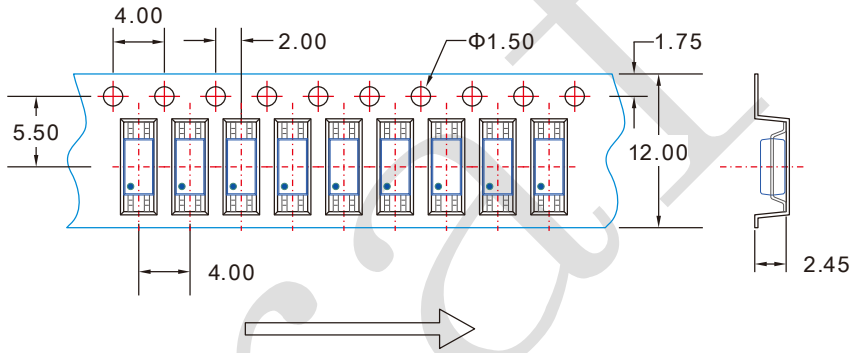
PACKING SPECIFICATIONS

■ Carrier tape specifications (Unit: mm)

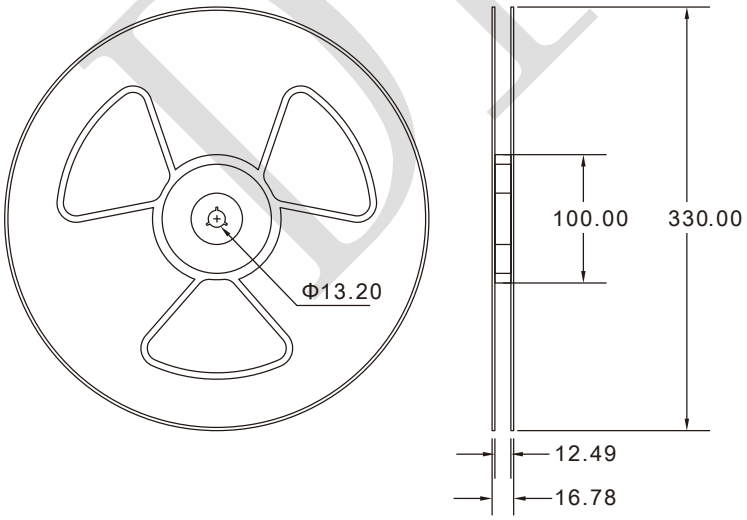
T1



T2



■ Reel dimensions (Unit: mm)



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