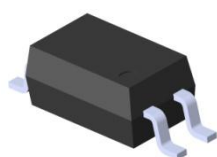
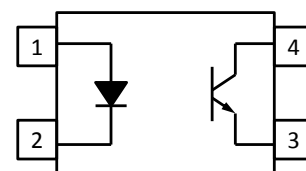


4 PIN SSOP PHOTOTRANSISTOR PHOTOCOUPLER EL3H7H-G Series

Preliminary



Schematic



Pin Configuration

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

Features:

- Halogens free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Current transfer ratio
(CTR: 50~260% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- Operating temperature $-55^\circ\text{C} \sim 125^\circ\text{C}$
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact 4 Pin SSOP with a 2.0 mm profile
- Compliance with EU REACH
- Pb free and RoHS compliant.
- UL and cUL approved(No. E214129)
- VDE pending
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

This is a preliminary specification intended for design purposes and subject to change without prior notice.

Description

The EL3H7H-G series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector encapsulated with green compound.

They are packaged in a 4-pin small outline SMD package.

Applications

- DC-DC Converters
- Programmable controllers
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances

Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Peak forward current (1us, pulse)	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	70	mW
	Derating factor (above $T_a = 60^\circ\text{C}$)		1.27	mW/°C
Output	Power dissipation	P_C	150	mW
	Derating factor (above $T_a = 40^\circ\text{C}$)		2	mW/°C
	Collector current	I_C	50	mA
	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	7	V
Total Power Dissipation		P_{TOT}	200	mW
Isolation Voltage* ¹		V_{ISO}	3750	Vrms
Operating temperature		T_{OPR}	-55 ~ +125	°C
Storage temperature		T_{STG}	-55 ~ +150	°C
Soldering Temperature* ²		T_{SOL}	260	°C

Notes:

*1 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.

*2 For 10 seconds

Electro-Optical Characteristics (T_a=25°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V _F	-	1.2	1.4	V	I _F = 10mA
Reverse current	I _R	-	-	10	μA	V _R = 6V
Input capacitance	C _{in}	-	30	250	pF	V = 0, f = 1kHz

Output

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-Emitter dark current	I _{CEO}	-	-	200	nA	V _{CE} = 48V, I _F = 0mA
Collector-Emitter breakdown voltage	BV _{CEO}	80	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	7	-	-	V	I _E = 0.1mA

Transfer Characteristics (T_a=25°C unless specified otherwise)

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL3H7H	80	-	260	%	I _F = 5mA, V _{CE} = 5V
	EL3H7HA	80	-	160		
	EL3H7HB	130	-	260		
Collector-Emitter saturation voltage	V _{CE(sat)}	-	-	0.3	V	I _F = 10mA, I _C = 1mA
Isolation resistance	R _{IO}	5×10 ¹⁰	-	-	Ω	V _{IO} = 500Vdc, 40~60% R.H.
Floating capacitance	C _{IO}	-	0.3	1.0	pF	V _{IO} = 0, f = 1MHz
Rise time	t _r	-	6	18	μs	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω
Fall time	t _f	-	8	18	μs	

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

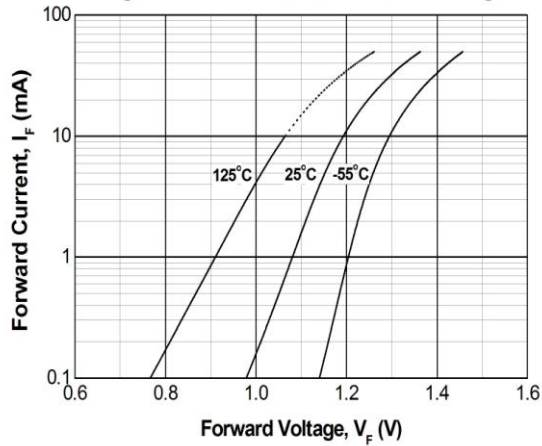


Figure 2. Normalized Current Transfer Ratio vs Forward Current

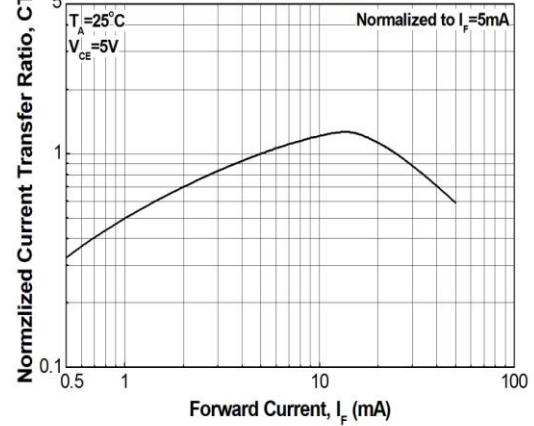


Figure 3. Current Transfer Ratio vs Ambient Temperature

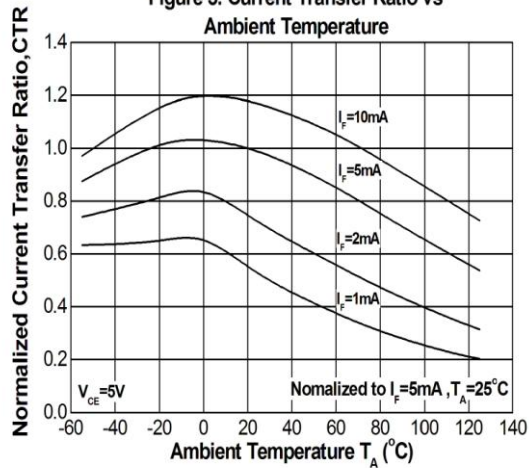


Figure 4. Dark Current vs Ambient Temperature

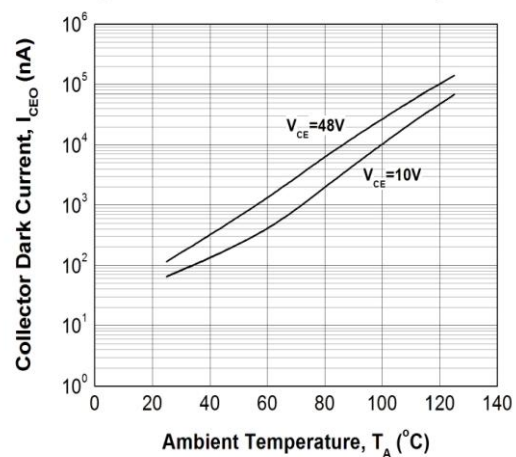


Figure 5. Collector-Emitter Saturation Voltage vs Collector Current

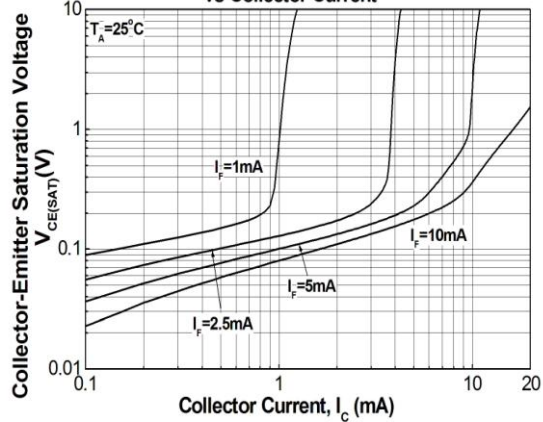
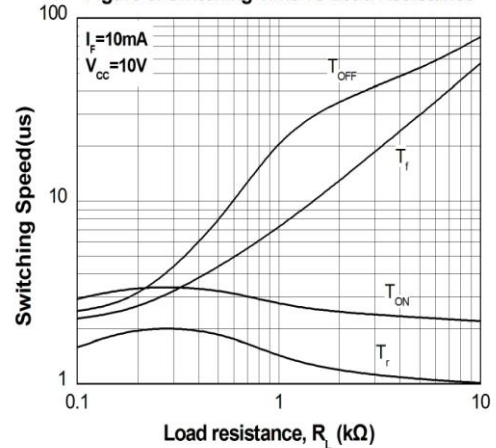


Figure 6. Switching Time vs Load Resistance



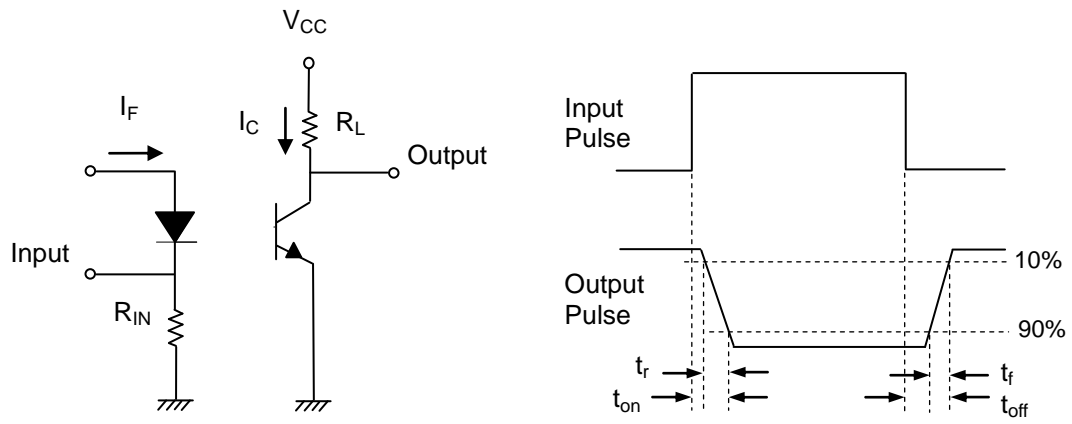


Figure 7. Switching Time Test Circuit & Waveforms

Order Information

Part Number

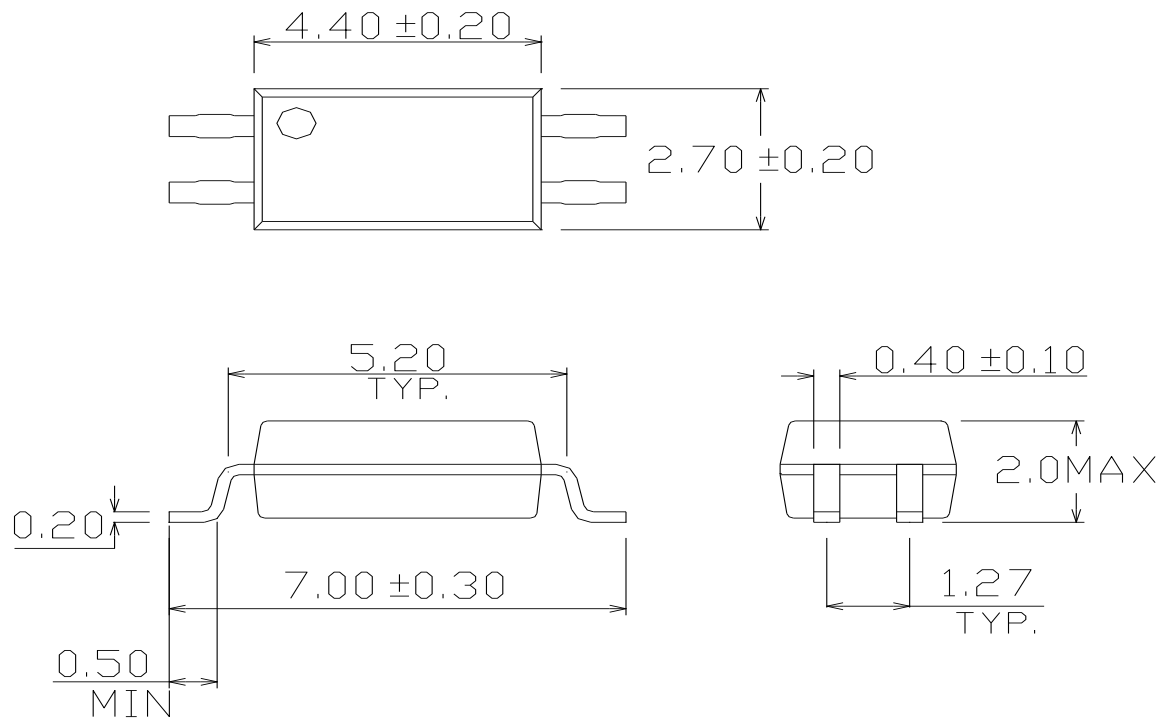
EL3H7H(X)(Y)-VG

Note

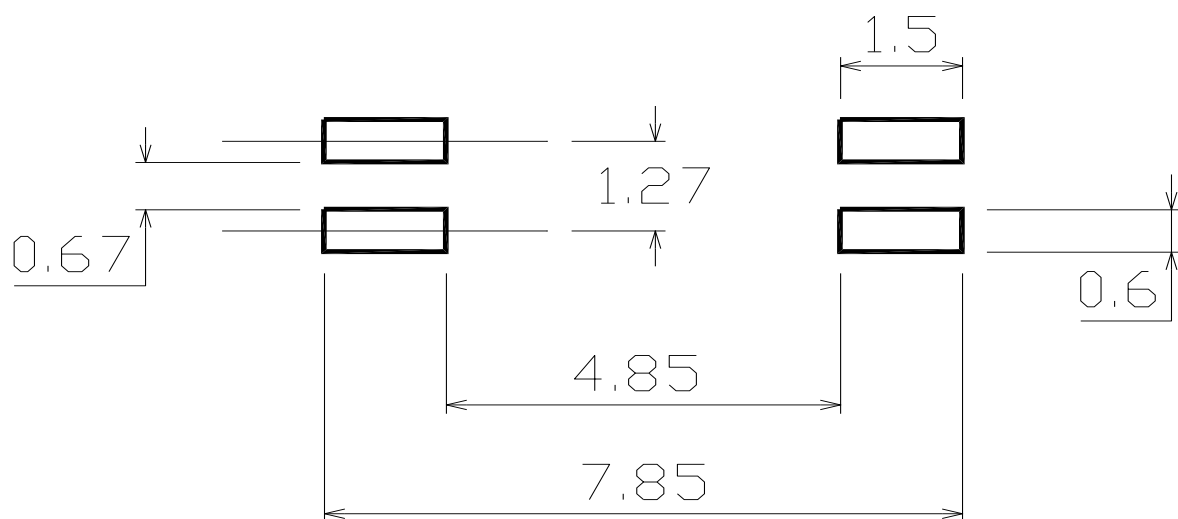
X = CTR Rank (A, B, or none)
H = Operating high temperature
Y = Tape and reel option (TA, TB, EA, EB or none)
V = VDE (optional)
G = Halogens free

Option	Description	Packing quantity
None	Standard SMD option	150 units per tube
-V	Standard SMD option + VDE	150 units per tube
(TA)	TA Tape & reel option	5000 units per reel
(TB)	TB Tape & reel option	5000 units per reel
(TA)-V	TA Tape & reel option + VDE	5000 units per reel
(TB)-V	TB Tape & reel option + VDE	5000 units per reel
(EA)	TA Tape & reel option	1000 units per reel
(EB)	TB Tape & reel option	1000 units per reel
(EA)-V	TA Tape & reel option + VDE	1000 units per reel
(EB)-V	TB Tape & reel option + VDE	1000 units per reel

Package Dimension (Dimensions in mm)



Recommended pad layout for surface mount leadform

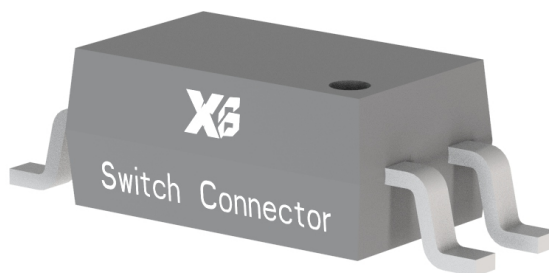


Device Marking



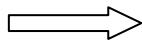
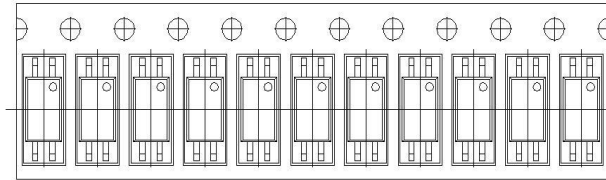
Notes

EL	denotes XI BNANG
3H7	denotes Device Number
H	denotes Operating high temperature
R	denotes CTR Rank (A, B, or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)



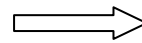
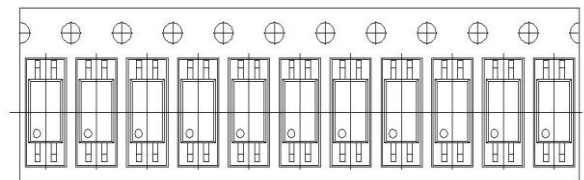
Tape & Reel Packing Specifications

Option TA



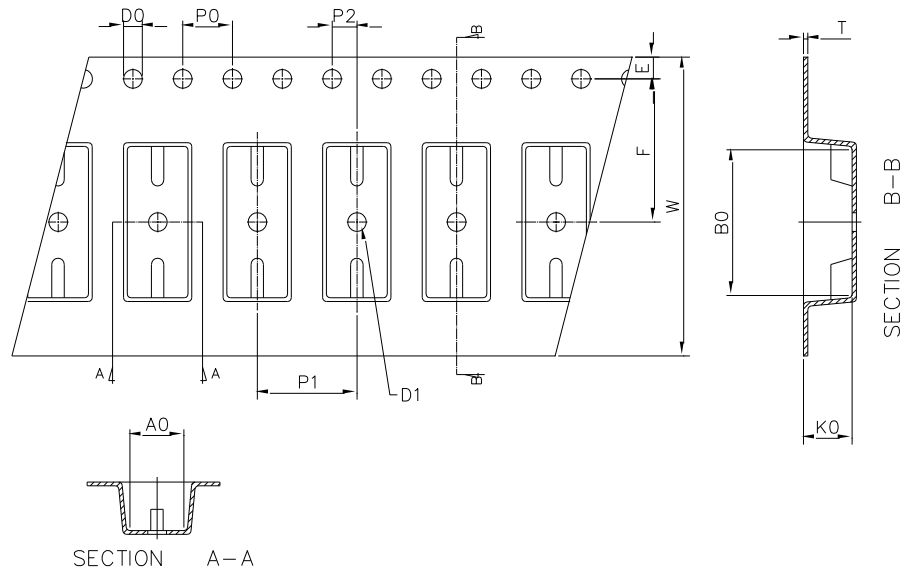
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions

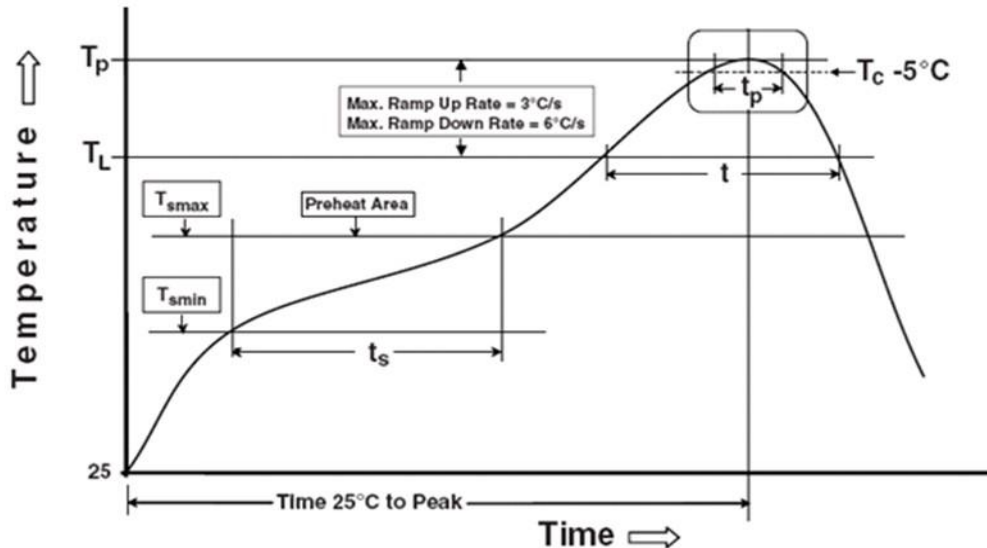


Dimension No.	A0	B0	D0	D1	E	F
Dimension (mm)	3.00 ± 0.10	7.45 ± 0.10	1.50 + 0.1/-0	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.10
Dimension No.	P0	P1	P2	t	W	K0
Dimension (mm)	4.00 ± 0.15	4.00 ± 0.10	2.00 ± 0.10	0.30 ± 0.05	12.1 ± 0.2	2.45 ± 0.1

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

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