



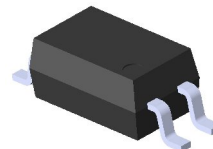
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4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

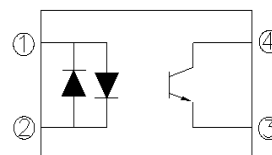
EL3H4-G Series

Features:

- AC input response
- Current transfer ratio
(CTR: Min. 20% at $I_F = \pm 1\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 2021495)



Schematic



Pin Configuration

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

Description

The EL3H4 series contains two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor encapsulated with green compound.

It is packaged in a 4-pin small outline SMD package.

Applications

- AC line monitor
- Programmable controllers
- Telephone line interface
- Unknown polarity DC sensor

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EL3H4-G Series

Absolute Maximum Ratings (T_a=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	±50	mA
	Peak forward current (t = 10μs)	I _{FM}	1	A
	Power dissipation No derating required up to T _a = 100°C	P _D	70	mW
Output	Power dissipation Derating factor (above T _a = 80°C)	P _C	150	mW
			3.7	mW/
	Collector-Emitter voltage	V _{CEO}	80	V
	Emitter-Collector voltage	V _{ECO}	6	V
Total power dissipation		P _{tot}	200	mW
Isolation voltage *1		V _{iso}	3750	V rms
Operating temperature		T _{opr}	-55~+100	°C
Storage temperature		T _{stg}	-55~+125	°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.



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Electrical Characteristics ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V_F	-	1.2	1.4	V	$I_F = \pm 20\text{mA}$
Reverse current	I_R	-	-	10	μA	$V_R = 4\text{V}$
Input capacitance	C_{in}	-	50	250	pF	$V = 0, f = 1\text{KHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	100	nA	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	6	-	-	V	$I_E = 0.01\text{mA}$

Transfer Characteristics ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

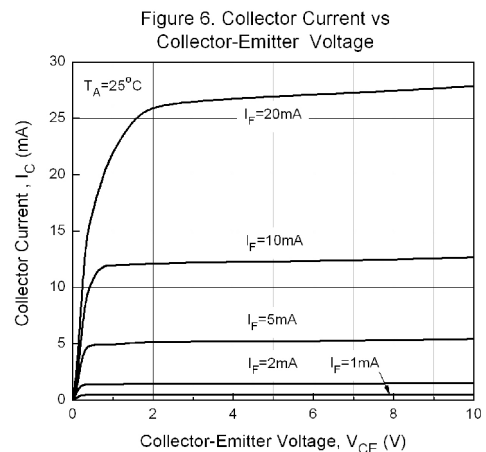
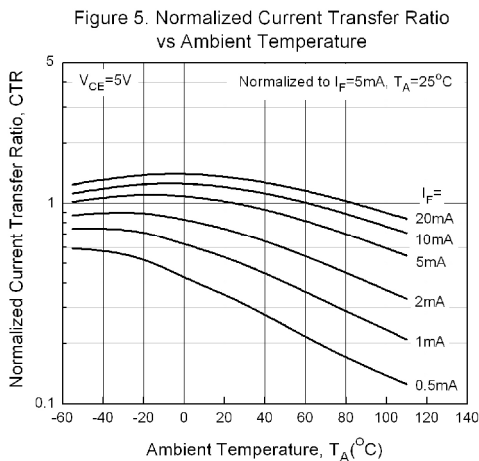
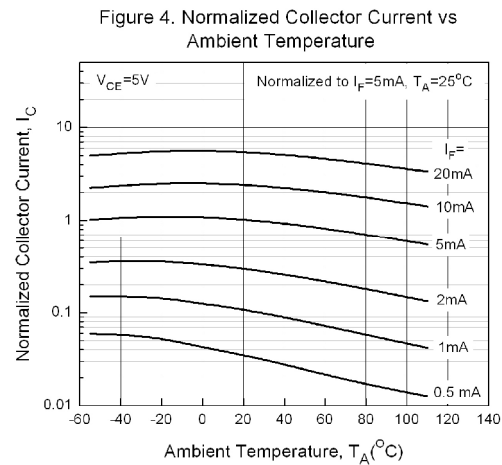
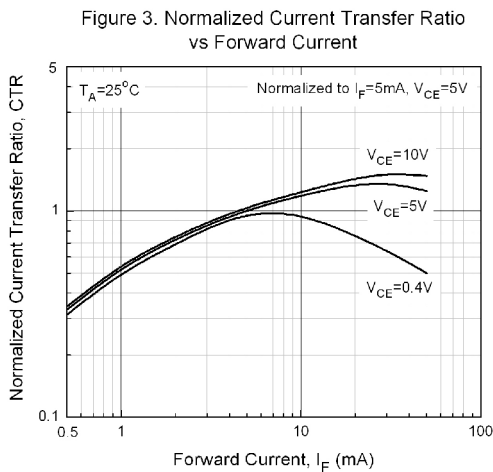
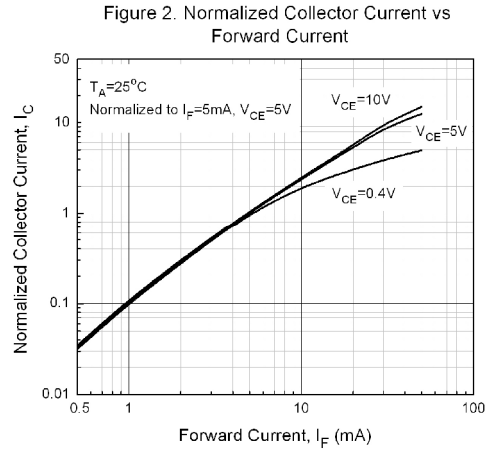
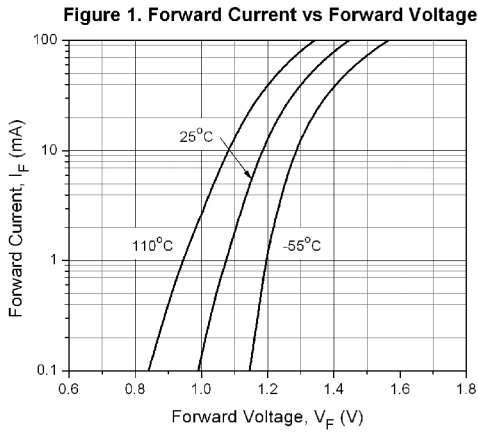
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL3H4	20	-	300	%	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$
	EL3H4A	50	-	150		
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	10^{11}	-	Ω	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{R.H}$
Floating capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Rise time	T_r	-	6	18	μs	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$
Fall time	T_f	-	8	18	μs	

* Typical values at $T_a = 25^{\circ}\text{C}$

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Typical Performance Curves



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Figure 7. Collector Current vs Collector-Emitter Voltage

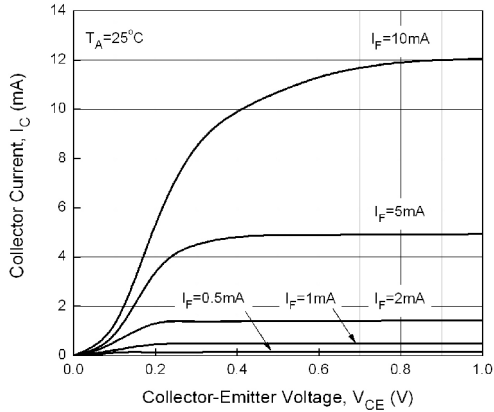


Figure 8. Collector Dark Current vs Ambient Temperature

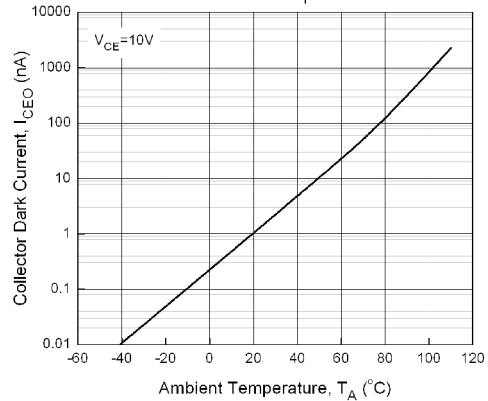


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

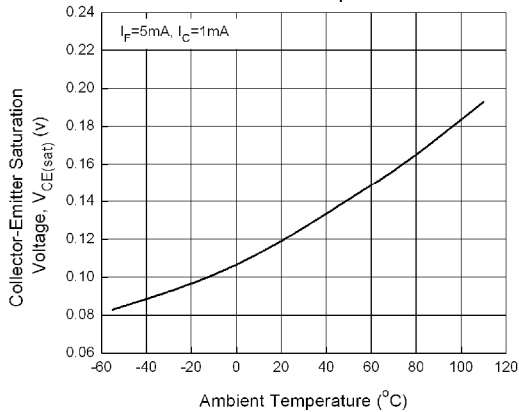


Figure 10. Switching Time vs Load Resistance

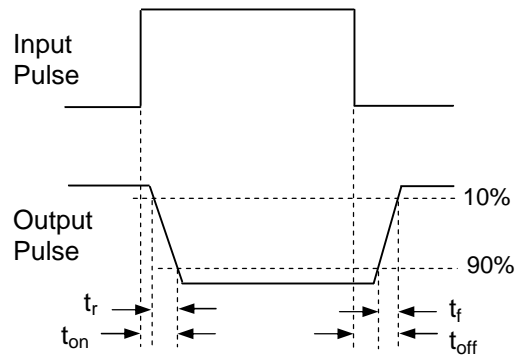
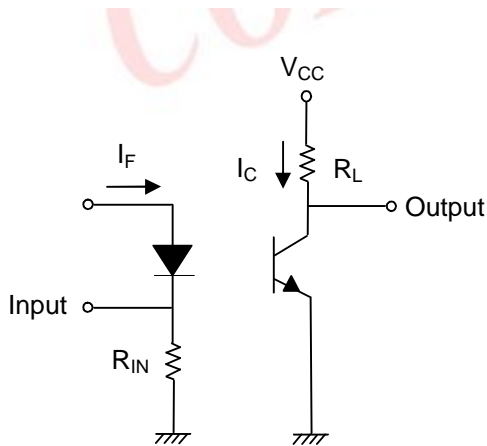
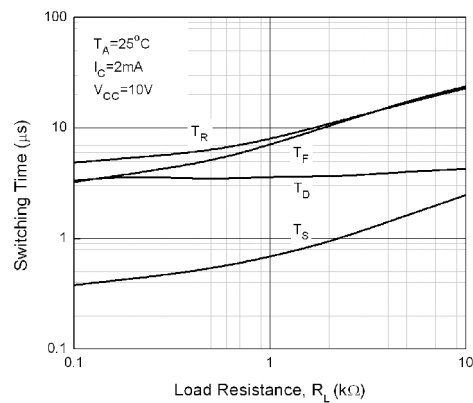


Figure 11. Switching Time Test Circuit & Waveforms



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EL3H4-G Series

Order Information

Part Number

EL3H4(X)(Y)-VG

Note

- 3H4 = Part No.
- X = CTR Rank (A or none)
- Y = Tape and reel option (TA, TB, EA, EB or none).
- V = VDE (optional)
- G = Halogens free

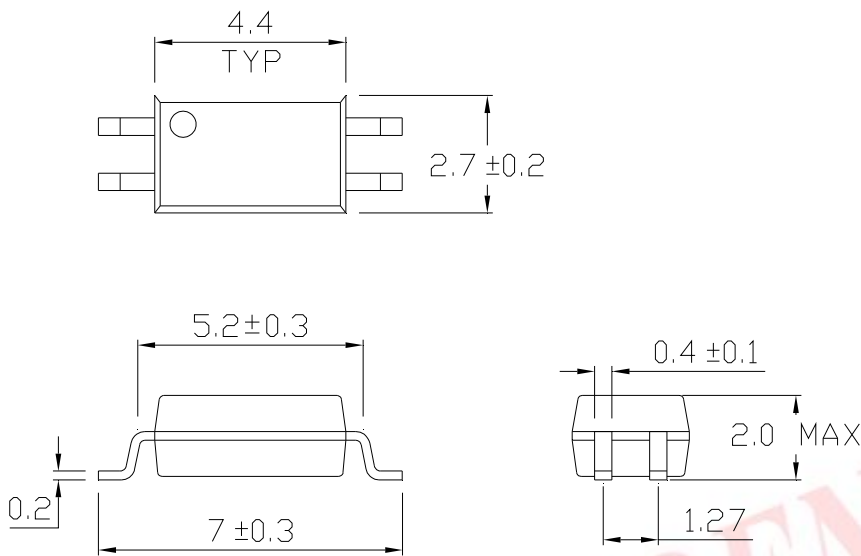
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	5000 units per reel
(TB)	TB Tape & reel option	5000 units per reel
(TA)-V	TA Tape & reel option + VDE	5000 units per reel
(TB)-V	TB Tape & reel option + 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

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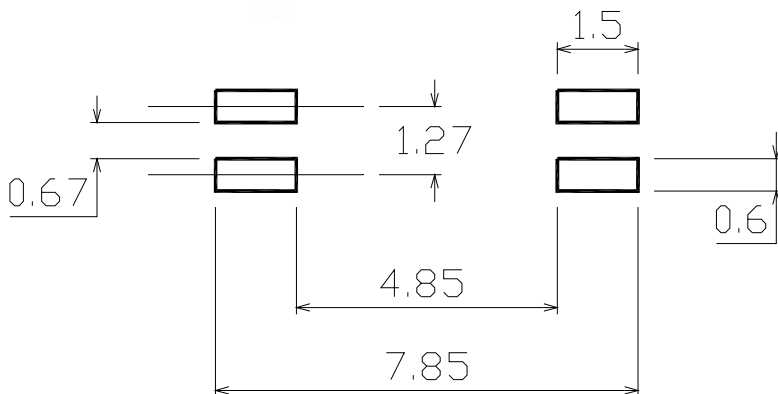
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Package Drawings
(Dimensions in mm)

Package Drawing
(Dimensions in mm)



Recommended pad layout for surface mount leadform





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EL3H4-G Series

Device Marking



Notes

- EL denotes Everlight
- 3H4 denotes Part Number
- R denotes CTR Rank (A or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE approved (optional)

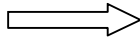
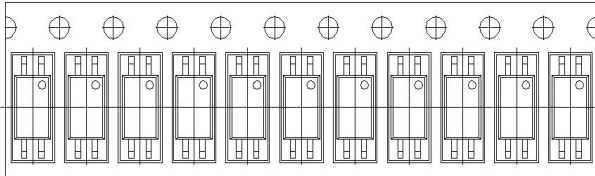
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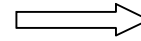
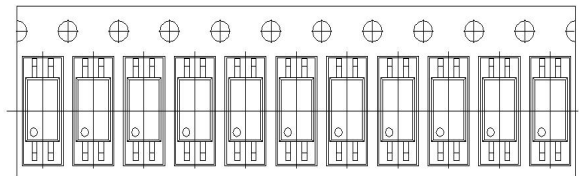
Tape & Reel Packing Specifications

Option TA



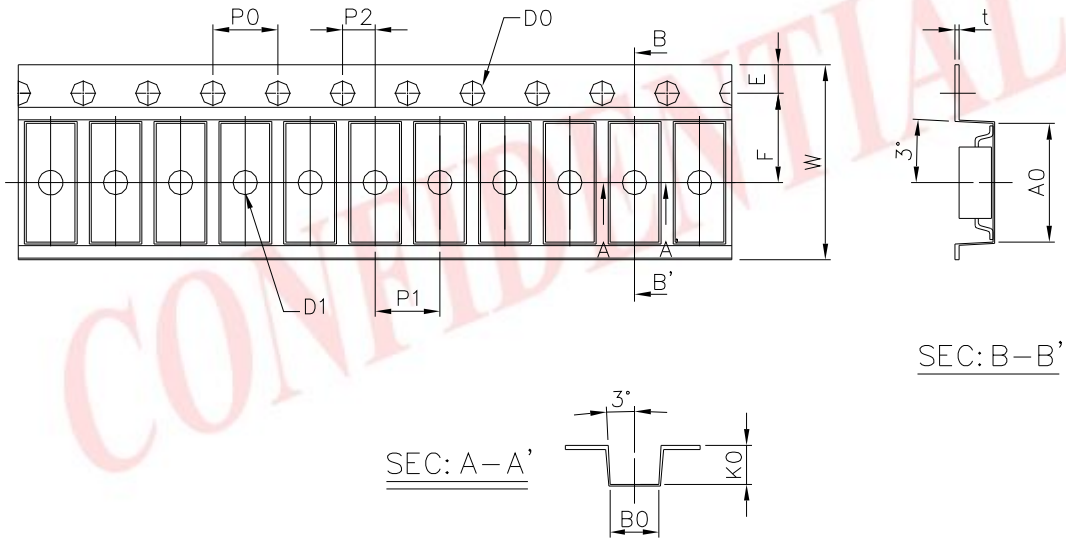
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	3.0 ± 0.1	7.3 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	5.5 ± 0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	4.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	12.0 ± 0.2	2.4 ± 0.1

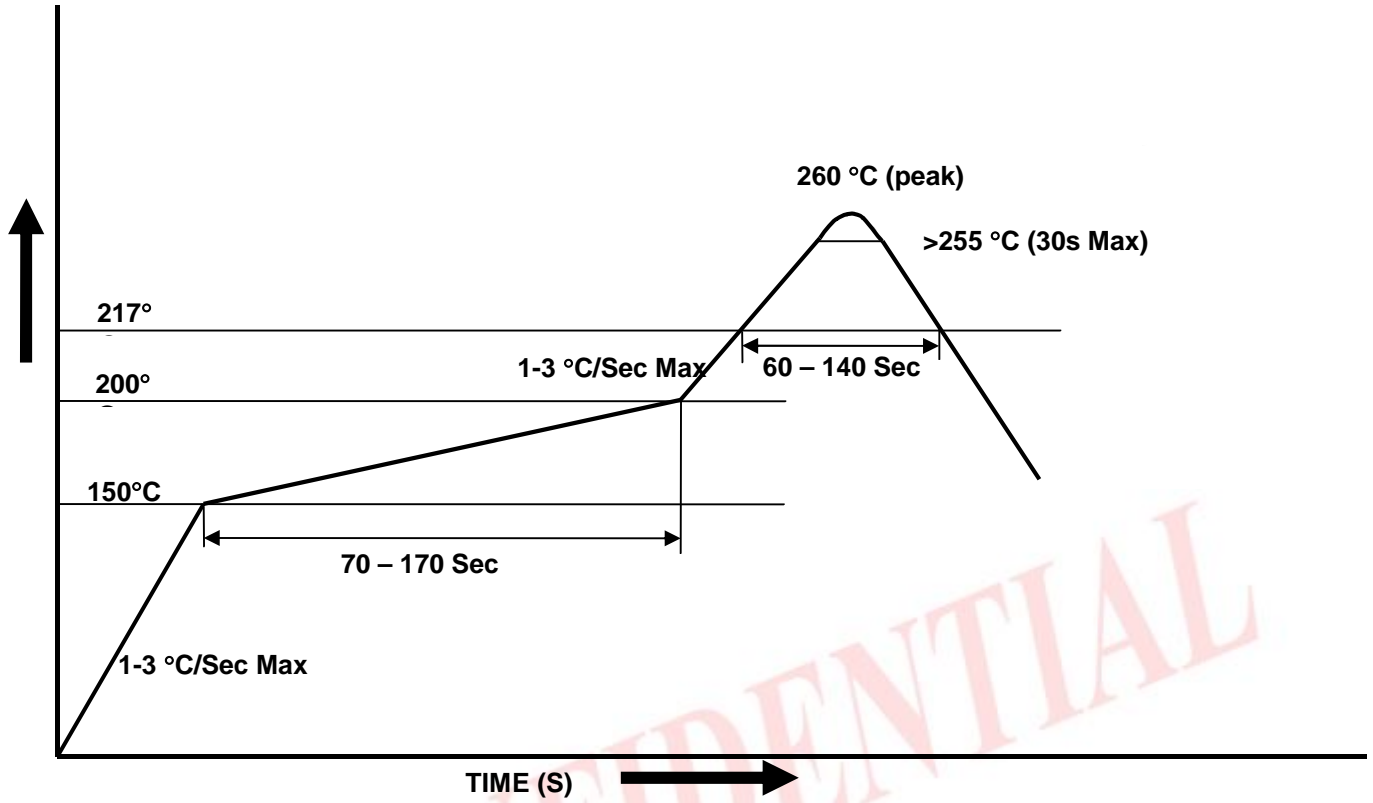


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Solder Reflow Temperature Profile





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EL3H4-G Series

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