

4 PIN SOP HIGH VOLTAGE DARLINGTON PHOTOTRANSISTOR PHOTOCOUPLER

EL452-G Series

Features:

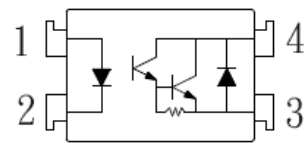
- Halogens free
- High collect-Emitter voltage ($V_{CEO} = 350V$)
- Current transfer ratio
(CTR: Min. 1000% at $I_F = 1mA$, $V_{CE} = 2V$)
- High isolation voltage between input
and output ($V_{iso} = 3750 V_{rms}$)
- Compact 4 Pin SOP with a 2.0 mm profile
- Pb free and RoHS compliant.
- UL approved (Pending)
- VDE approved (Pending)
- SEMKO approved (Pending)
- NEMKO approved (Pending)
- DEMKO approved (Pending)
- FIMKO approved (Pending)
- CSA approved (Pending)



Description

The EL452-G contains an infrared emitting diode, optically coupled to a high voltage darlington phototransistor. It is packaged in a 4-pin small outline SMD package.

Schematic



Pin Configuration

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

Applications

- Telephone set, telephone exchangers
- Sequence controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedance

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Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current ($t = 10\mu\text{s}$)	I_{FM}	1	A
	Power dissipation	P_D	100	mW
Output	Power dissipation	P_C	150	mW
	Collector current	I_C	150	mA
	Collector-Emitter voltage	V_{CEO}	350	V
	Emitter-Collector voltage	V_{ECO}	0.1	V
Total power dissipation		P_{tot}	170	mW
Isolation voltage ^{*1}		V_{iso}	3750	V rms
Operating temperature		T_{opr}	-55~+110	$^{\circ}\text{C}$
Storage temperature		T_{stg}	-55~+125	$^{\circ}\text{C}$
Soldering temperature ^{*2}		T_{sol}	260	$^{\circ}\text{C}$

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	$I_F = 10\text{mA}$
Reverse current	I_R	-	-	10	μA	$V_R = 4\text{V}$
Input capacitance	C_{in}	-	50	-	pF	$V = 0, f = 1\text{KHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	100	nA	$V_{CE} = 200\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	350	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	0.1	-	-	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	CTR	1000	2000	-	%	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	1.2	1.5	V	$I_F = 20\text{mA}, I_C = 100\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	10^{11}	-	Ω	$V_{IO} = 500\text{Vdc}, 40 \sim 60\% \text{R.H}$
Cut-off frequency	f_c	-	7	-	KHz	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega, -3\text{db}$
Floating capacitance	C_{IO}	-	0.6	-	pF	$V_{IO} = 0, f = 1\text{MHz}$
Rise time	T_r	-	80	250	μs	$V_{CE} = 2\text{V}, I_C = 20\text{mA}, R_L = 100\Omega$
Fall time	T_f	-	10	100	μs	

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

Typical Performance Curves

Figure 1. Forward Current vs. Forward Voltage

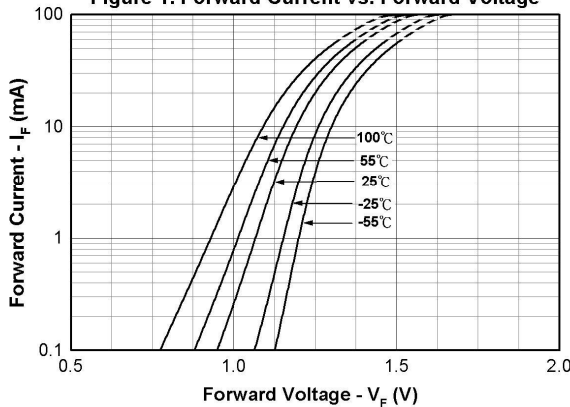


Figure 2. Collector Current vs. Collector Emitter Voltage

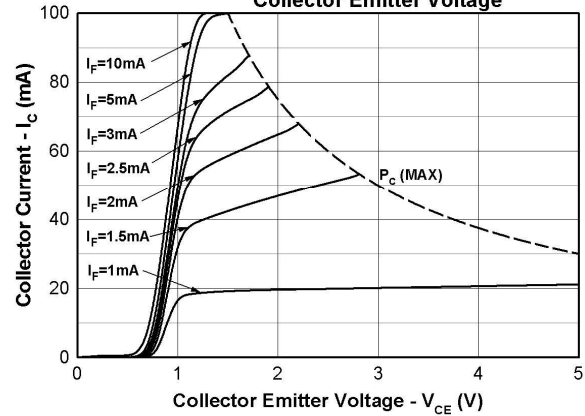


Figure 3. Collector Emitter Saturation Voltage vs. Ambient Temperature

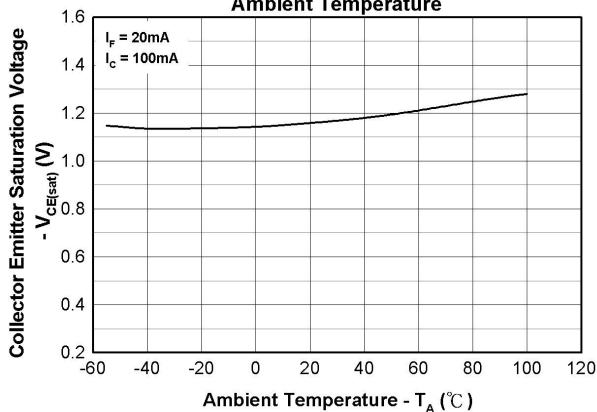


Figure 4. Collector-Emitter Saturation Voltage vs. Forward Current

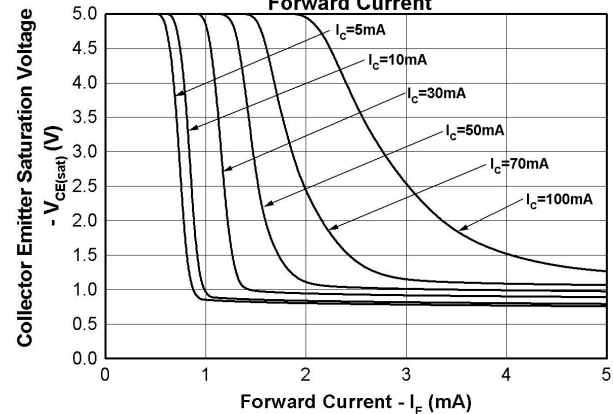


Figure 5. Current Transfer Ratio vs. Forward Current

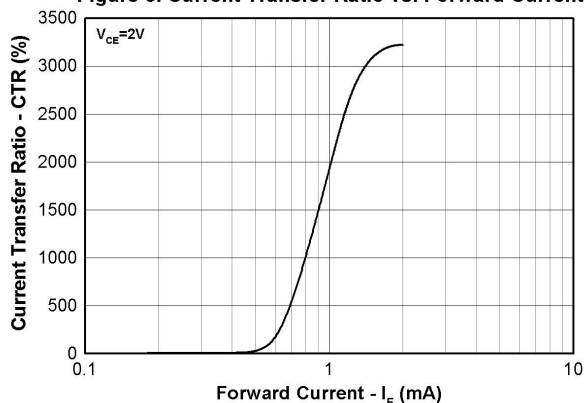
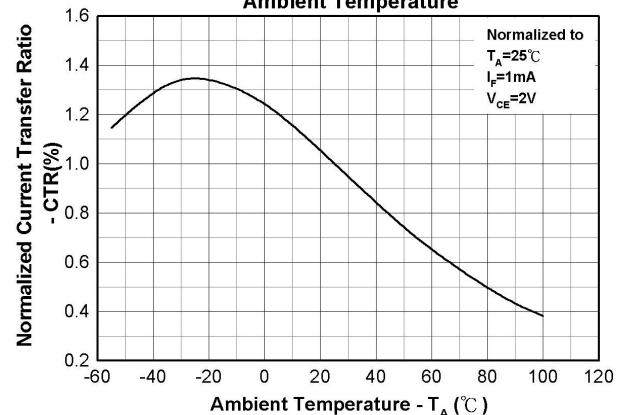


Figure 6. Normalized Current Transfer Ratio vs. Ambient Temperature



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Figure 7. Collector Dark Current vs.
Ambient Temperature

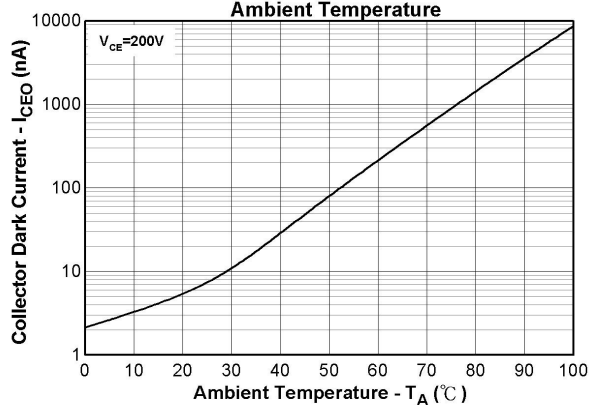


Figure 8. Response Time vs. Load Resistance

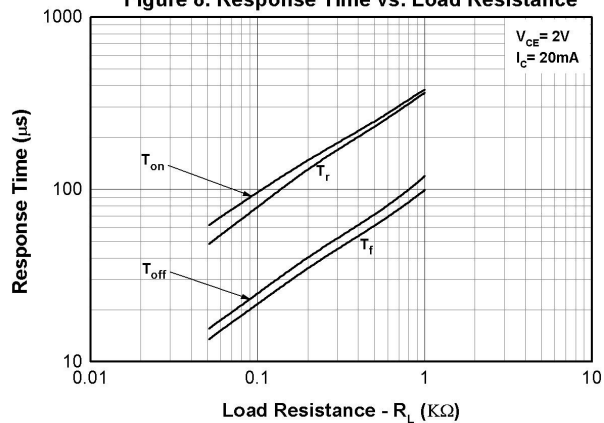
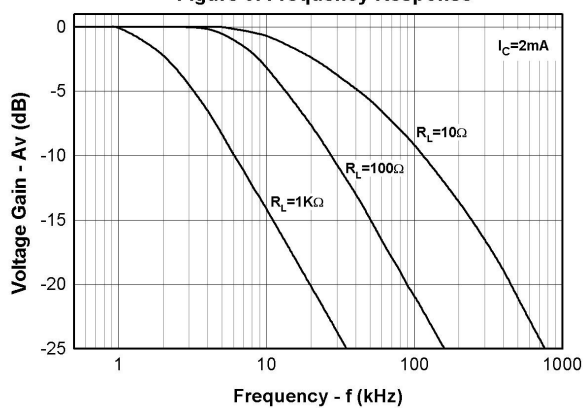


Figure 9. Frequency Response



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Order Information

Part Number

EL452(Y)-VG

Note

Y = Tape and reel option (TA, TB, or none).
V = VDE safety (optional)
G = Halogens free

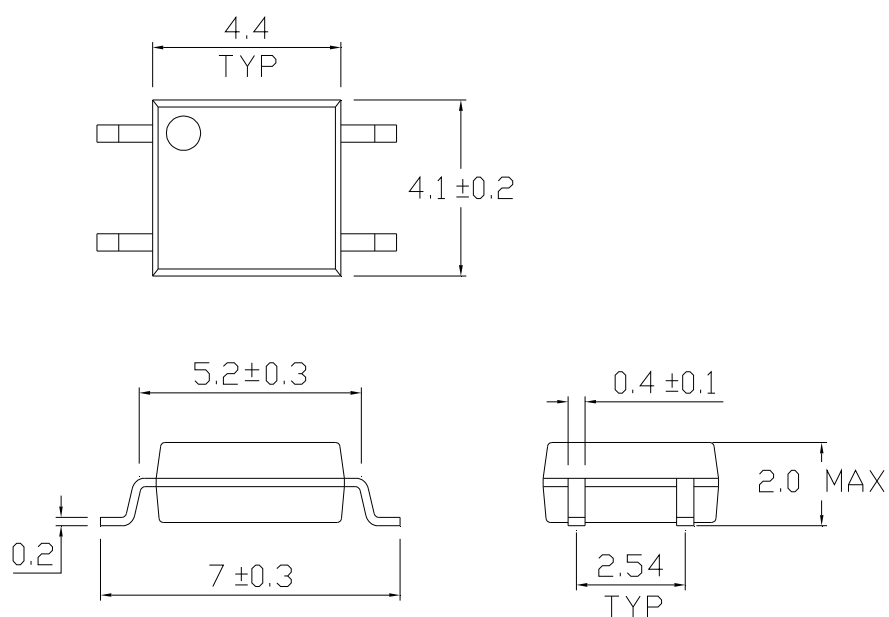
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

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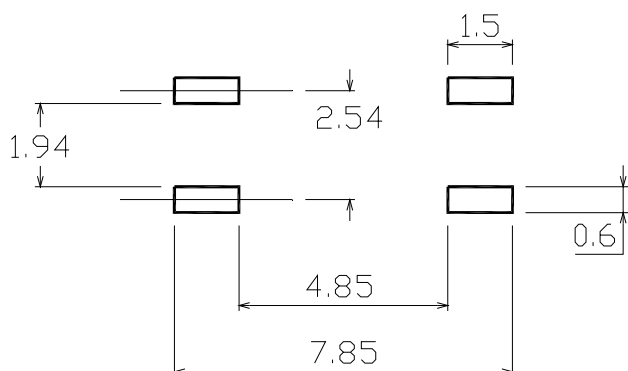
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Package Drawings

(Dimensions in mm)



Recommended pad layout for surface mount leadform



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Device Marking



Notes

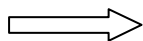
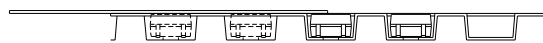
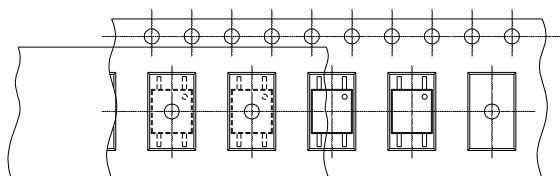
EL	denotes Everlight
452	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE approved (optional)

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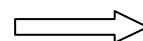
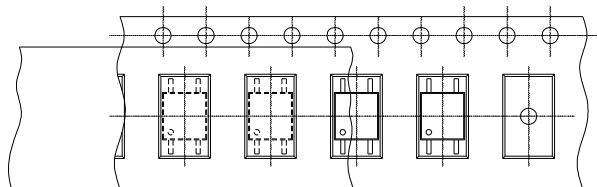
Tape & Reel Packing Specifications

Option TA



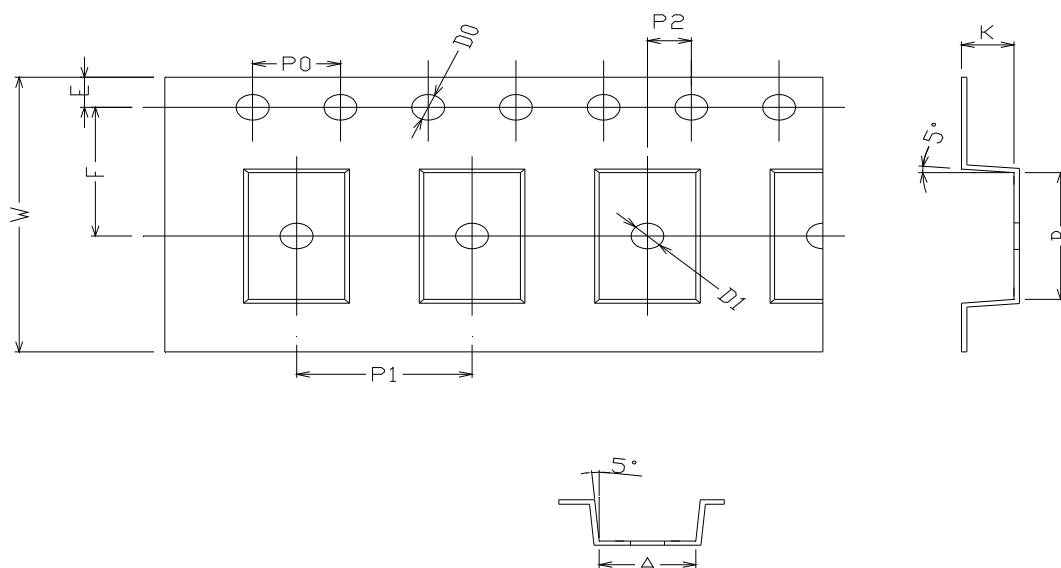
Direction of feed from reel

Option TB



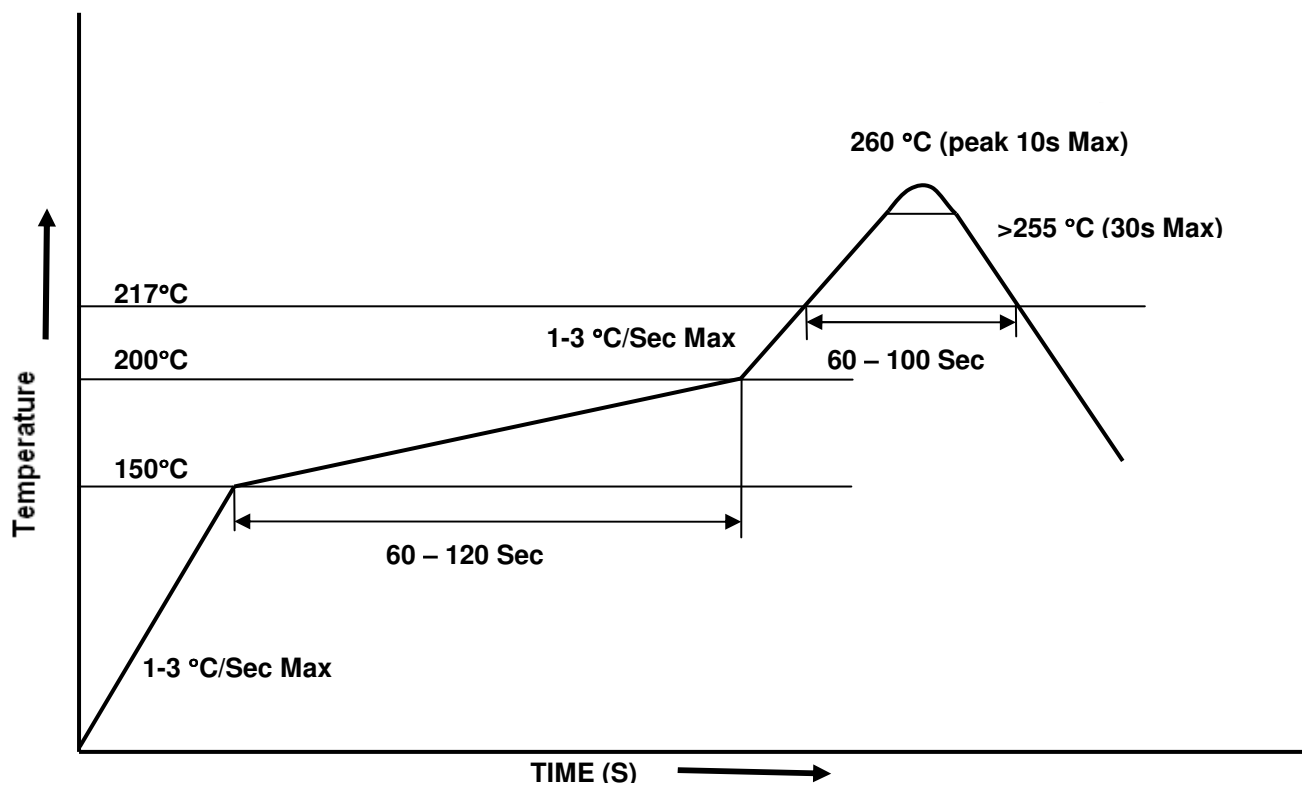
Direction of feed from reel

Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	$1.5 + 0.1/-0$	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

Solder Reflow Temperature Profile



DISCLAIMER

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