

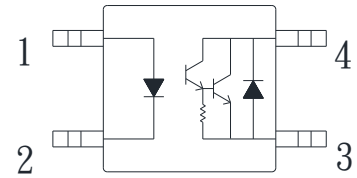
KPC452 Series

4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

● Description

The KPC452 consist of a photo darlington optically coupled to a gallium arsenide infrared-emitting diodes in a 4-pin Mini-Flat package. Collector-emitter voltage is 300V. The input-output isolation voltage is rated at 3750 Vrms..

● Schematic



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

● Features

1. Halogen free
2. Pb free and RoHS compliant
3. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
4. High collector-emitter voltage ($V_{CEO} : 300V$)
5. High current transfer ratio
(CTR : MIN.1000% at $I_F = 1mA, V_{CE} = 2V$)
6. High isolation voltage between input and output (Viso:3750Vrms)
7. Agency Approvals:
 - UL1577, File No. E169586
 - VDE EN 60747-5-2, File No.40014684
 - FIMKO EN 60065, File No. FI 23147 A2
 - FIMKO EN 60950-1, File No. FI 24583 A2
 - CQC GB4943 / GB8898-2011, File No. CQC10001049555 / CQC08001023986

● Applications

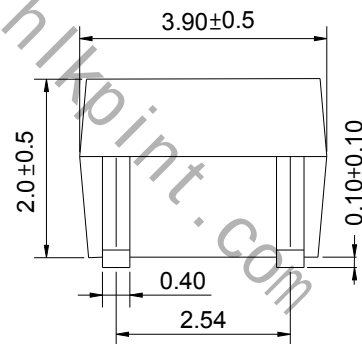
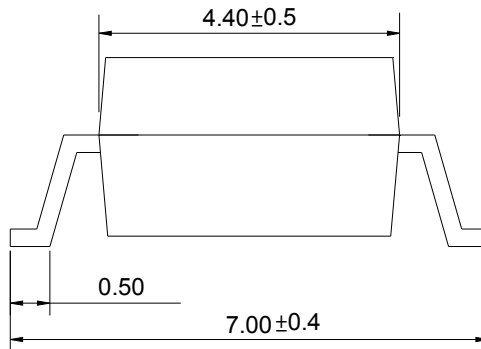
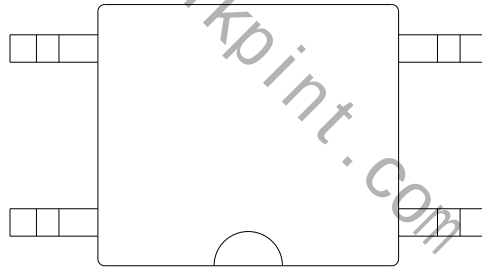
- Telephone sets
- Copiers, facsimiles
- Interfaces with various power supply circuits, power distribution boards
- Hybrid substrates which require high density mounting

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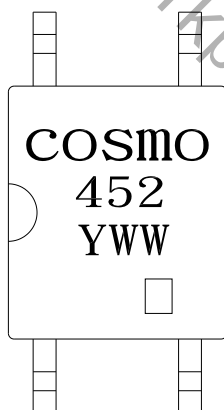
● Outside Dimension

Unit : mm



TOLERANCE : ±0.2mm

● Device Marking



Notes:

Cosmo
452
YWW

Y: Year code / WW: Week code



□: CTR rank

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● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	70	mW
Output	Collector-Emitter voltage	V_{CEO}	300	V
	Emitter-Collector voltage	V_{ECO}	0.1	V
	Collector current	I_C	150	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	170	mW
Isolation voltage 1 minute		V_{iso}	3750	Vrms
Operating temperature		T_{opr}	-55 to +115	°C
Storage temperature		T_{stg}	-55 to +125	°C
Soldering temperature 10 seconds		T_{sol}	260	°C

● Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	$I_F=20mA$	-	1.2	1.4	V
	Reverse current	I_R	$V_R=4V$	-	-	10	uA
	Terminal capacitance	C_t	$V=0, f=1KHz$	-	30	-	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=200V, I_F=0$	-	-	1	uA
	Collector-Emitter breakdown voltage	BV_{CEO}	$I_C=0.1mA, I_F=0$	300	-	-	V
Transfer characteristics	Current transfer ratio	CTR	$I_F=1mA, V_{CE}=2V$	1000	-	-	%
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	$I_F=20mA, I_C=100mA$	-	-	1.5	V
	Isolation resistance	Riso	DC500V, 40 to 60%RH	5×10^{10}	10^{11}	-	Ω
	Floating capacitance	C_f	$V=0, f=1MHz$	-	0.6	1.0	pF
	Response time (Rise)	t_r	$V_{ce}=2V, I_C=20mA, R_L=100\Omega$	-	100	300	us
	Response time (Fall)	t_f		-	20	100	us

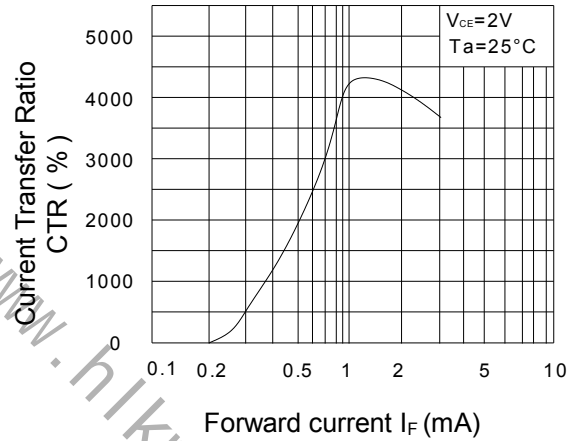
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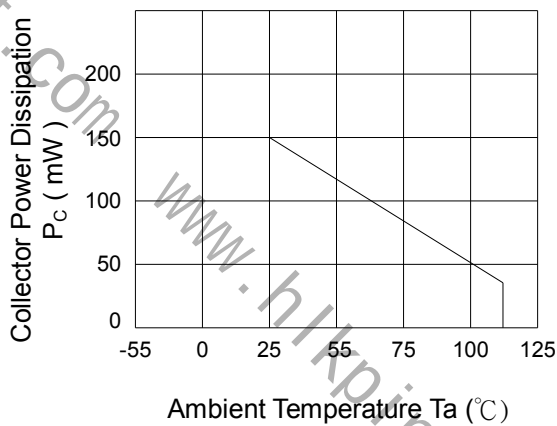
Classification table of current transfer ratio is shown below.

CTR RANK	CTR (%)
KPC4520E	Min.1000

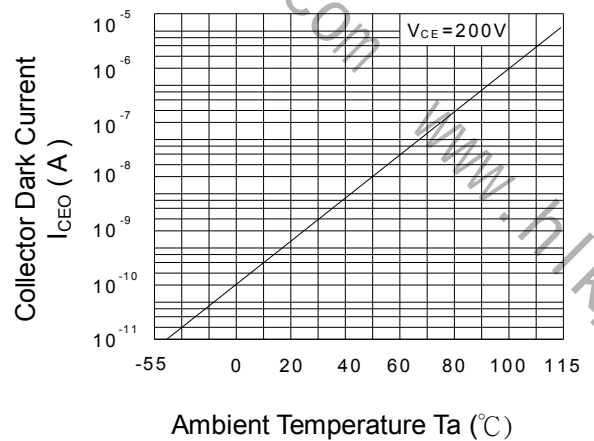
**Fig.1 Current Transfer Ratio
vs. Forward Current**



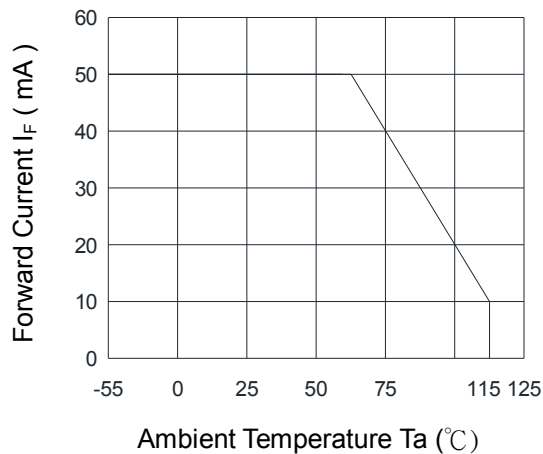
**Fig.2 Collector Power Dissipation
vs. Ambient Temperature**



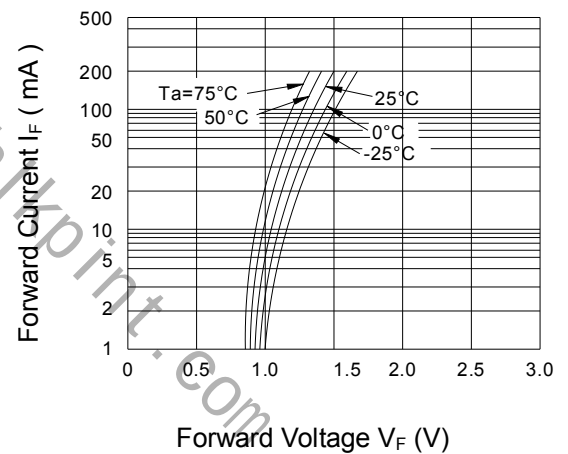
**Fig.3 Collector Dark Current
vs. Ambient Temperature**



**Fig.4 Forward Current
vs. Ambient Temperature**



**Fig.5 Forward Current
vs. Forward Voltage**



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Fig.6 Collector Current vs. Collector-Emitter Voltage

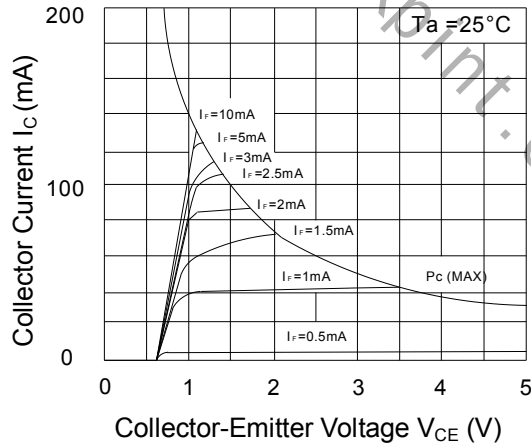


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

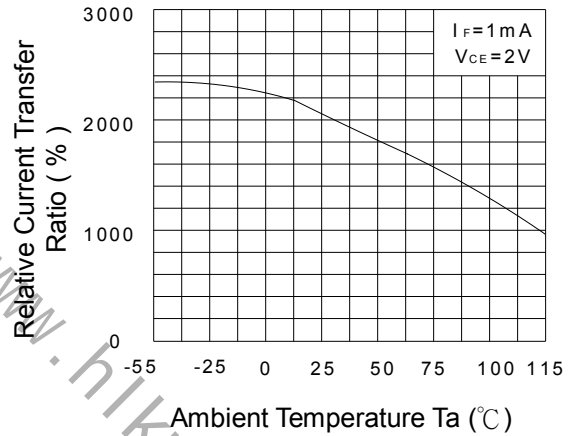


Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current

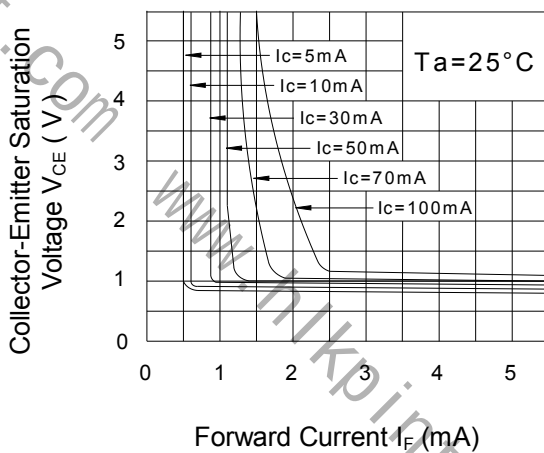
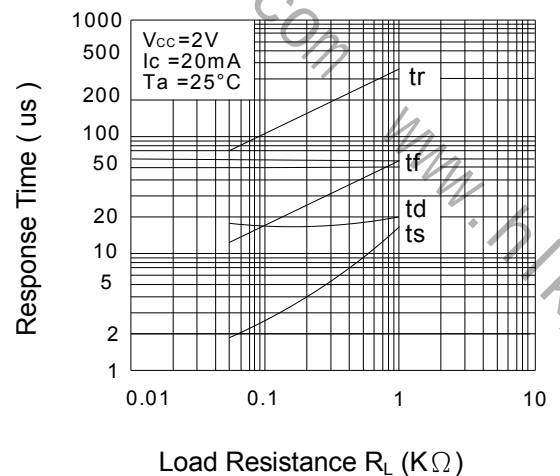


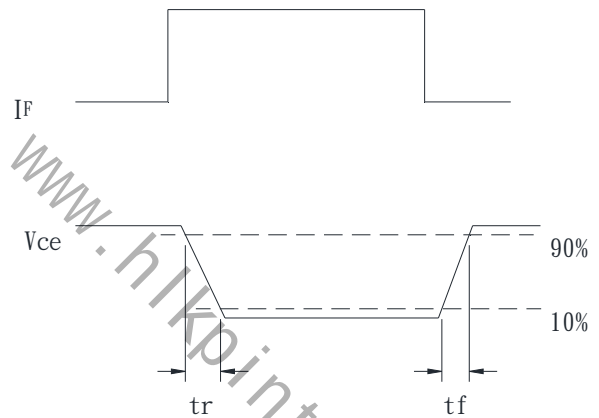
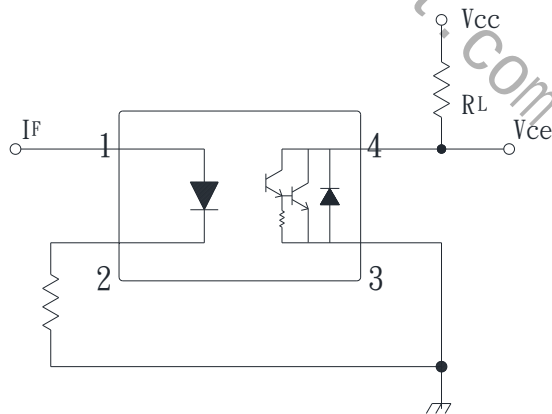
Fig.9 Response Time vs. Load Resistance



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● Test Circuit for Response Time



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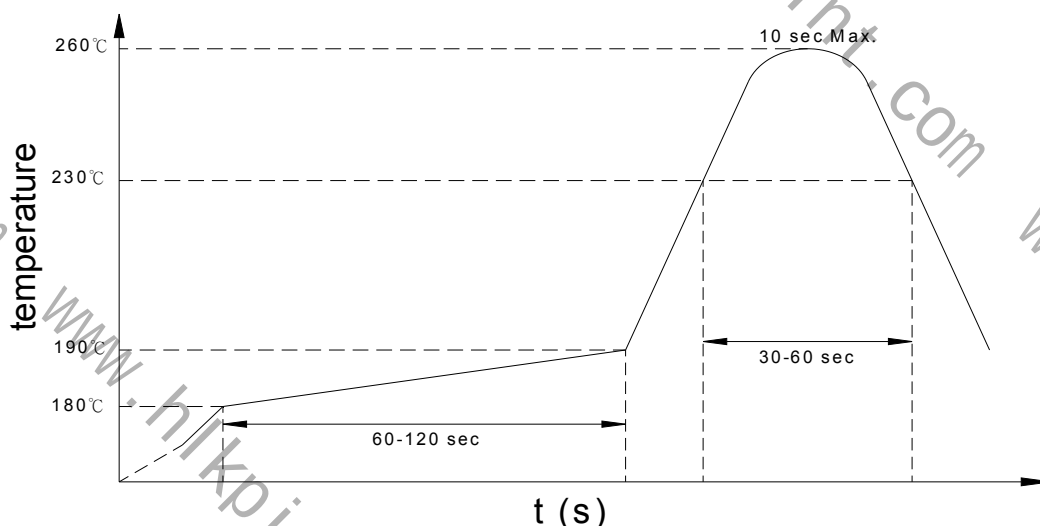
4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

● Recommended Soldering Conditions

(a) Infrared reflow soldering :

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature : 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow



(b) Wave soldering :

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions : 120°C or below (package surface temperature)
- Time(s) of reflow : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) Cautions :

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

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4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

● Numbering System

KPC452 Y (Z)

Notes:

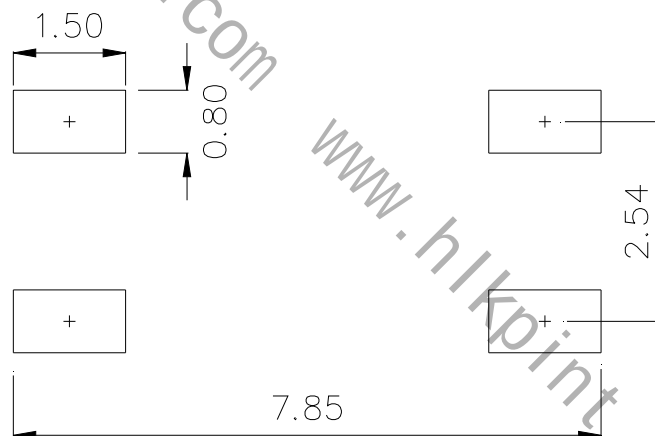
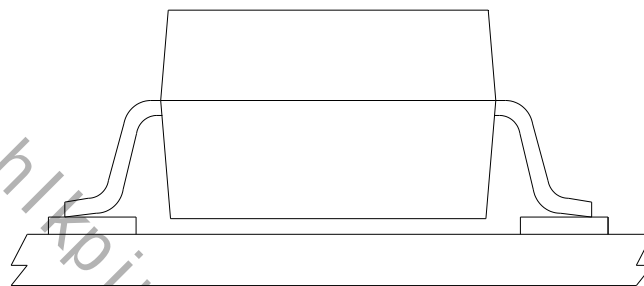
KPC452 = Part No.

Y = CTR rank (E)

Z = Tape and reel option (TLD 、 TRU)

Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

● Recommended Pad Layout for Surface Mount Lead Form



Unit : mm

KPC452 Series

4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

4-pin Mini-Flat Carrier Tape & Reel

