

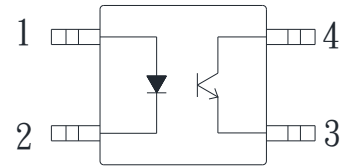
KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● Description

The KPC357 is DC-input single channel which contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin Mini-Flat package. The input-output isolation voltage is rated at 3750 Vrms.

● Schematic



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

● Features

- 1. Pb free and RoHS compliant
- 2. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
- 3. Current transfer ratio
(CTR : Min.50% at $I_F=5\text{mA}$ $V_{ce}=5\text{V}$)
- 4. Isolation voltage between input and output
(Viso : 3750vrms).
- 5. MSL class 1
- 6. Agency Approvals:
 - UL Approved (No. E169586): UL1577
 - c-UL Approved (No. E169586)
 - VDE Approved (No. 40014684): DIN EN 60747-5-5
 - FIMKO Approved: EN62368-1, EN60601-1
 - CQC Approved: GB4943.1-2022

● Applications

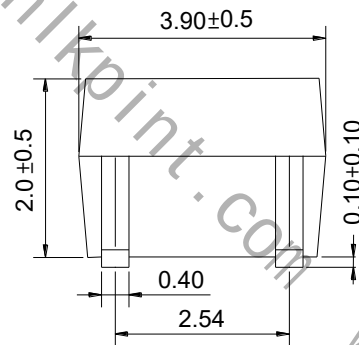
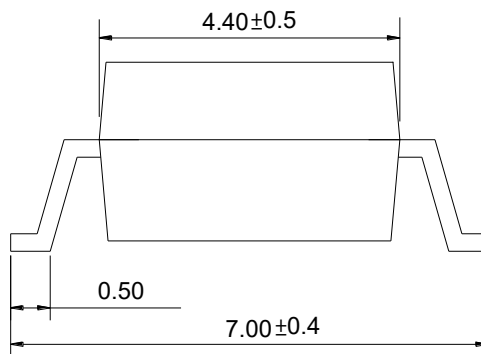
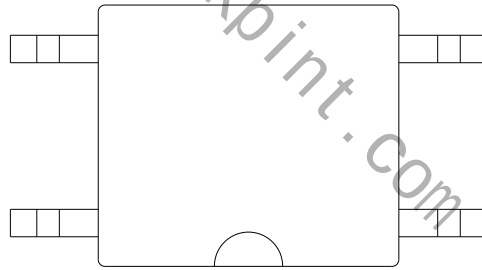
- Hybrid substrates that require high density mounting
- Programmable controllers
- DC-DC converters
- Telecommunication equipments

KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● Outside Dimension

Unit : mm



TOLERANCE: ±0.2mm

● Device Marking



Notes:

Cosmo
357NT
YWW

Y: Year code / WW: Week code



□: CTR rank

KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

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}	80	V
	Emitter-Collector voltage	V _{ECO}	5	V
	Collector current	I _C	50	mA
	Collector power dissipation	P _C	150	mW
Total power dissipation		P _{tot}	170	mW
Isolation voltage 1 minute		V _{iso}	3750	V _{rms}
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	250	pF
Output	Collector dark current	I _{CEO}	V _{CE} =20V, I _F =0	-	-	0.1	uA
	Collector-Emitter breakdown voltage	BV _{CEO}	I _C =100uA, I _F =0	80	-	-	V
	Emitter-Collector breakdown voltage	BV _{ECO}	I _E =100uA, I _F =0	5	-	-	V
Transfer characteristics	Current transfer ratio	CTR	I _F =5mA, V _{CE} =5V	50	-	600	%
			I _F =1mA, V _{CE} =5V	15	-	-	%
	Collector-Emitter saturation voltage	V _{CE(sat)}	I _F =20mA, I _C =1mA	-	0.1	0.3	V
	Isolation resistance	R _{iso}	DC500V, 40 to 60%RH	5x10 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 =2mA, R _L =100 Ω	-	5	20	us
	Response time (Fall)	t _f		-	4	20	us

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Classification table of current transfer ratio is shown below.

CTR Rank.	CTR (%)	Marking of Classification
KPC357NT0A	80 TO 160	A
KPC357NT0B	130 TO 260	B
KPC357NT0C	200 TO 400	C
KPC357NT0D	300 TO 600	D
KPC357NT0E	50 TO 600	Blank,A,B,C,D,E

Fig.1 Current Transfer Ratio vs. Forward Current

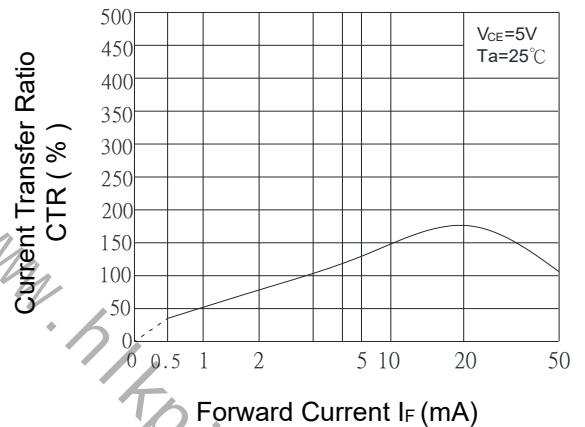


Fig.2 Collector Power Dissipation vs. Ambient Temperature

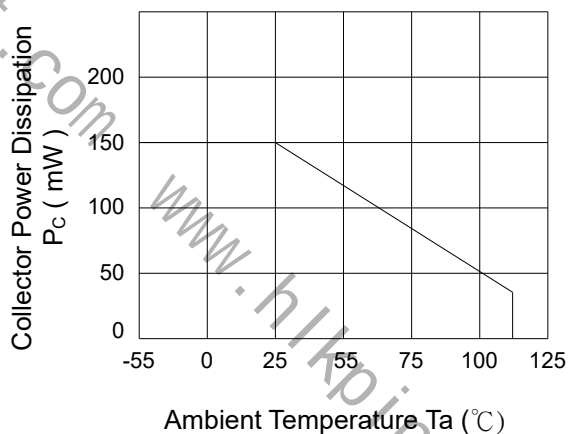


Fig.3 Collector Dark Current vs. Ambient Temperature

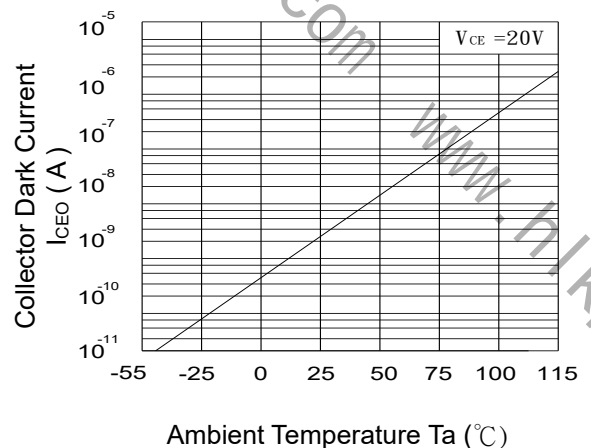


Fig.4 Forward Current vs. Ambient Temperature

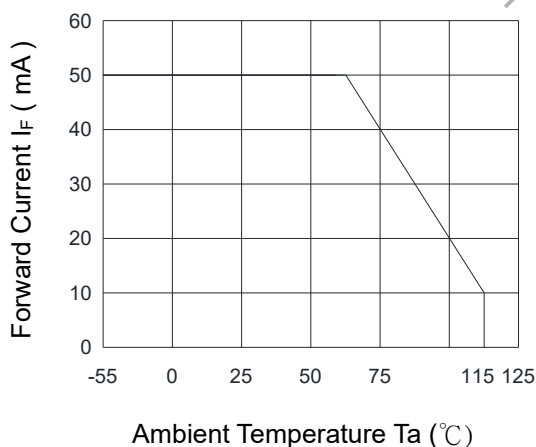
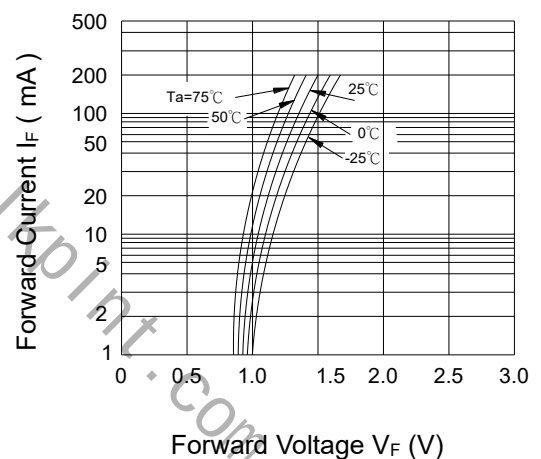


Fig.5 Forward Current vs. Forward Voltage



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4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

Fig.6 Collector Current vs. Collector-Emitter Voltage

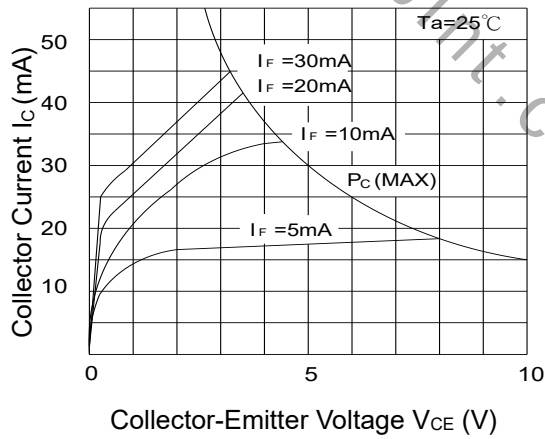


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

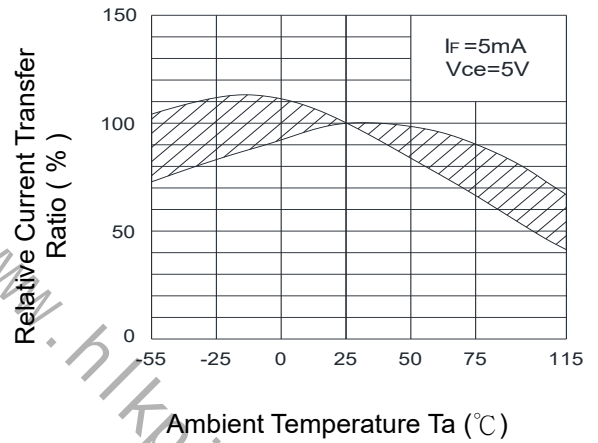


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

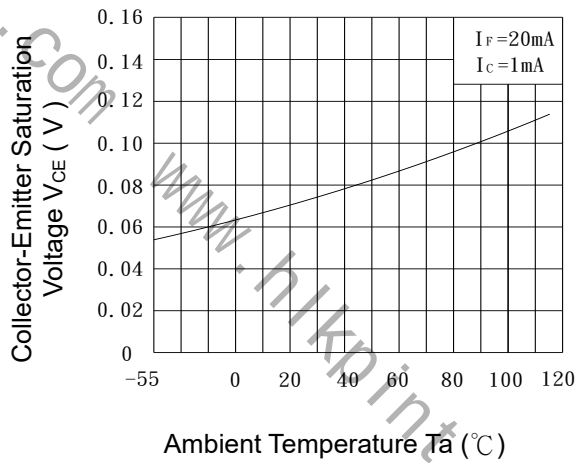


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

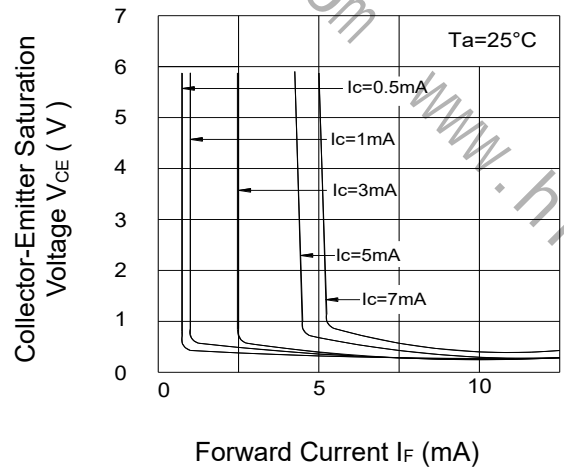


Fig.10 Response Time (Rise) vs. Load Resistance

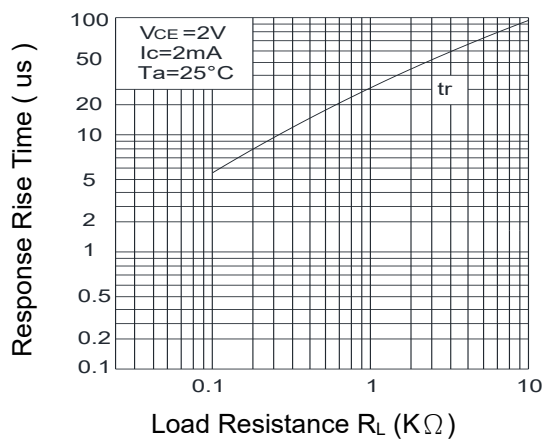
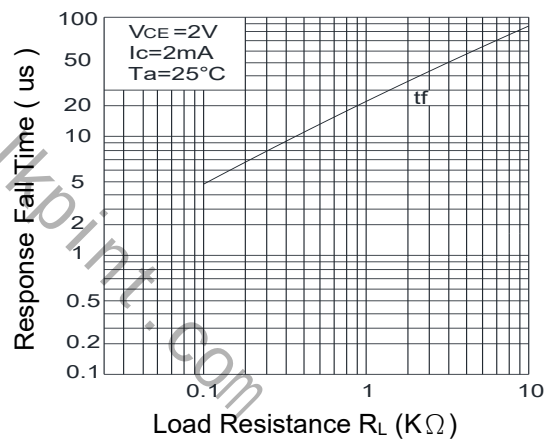


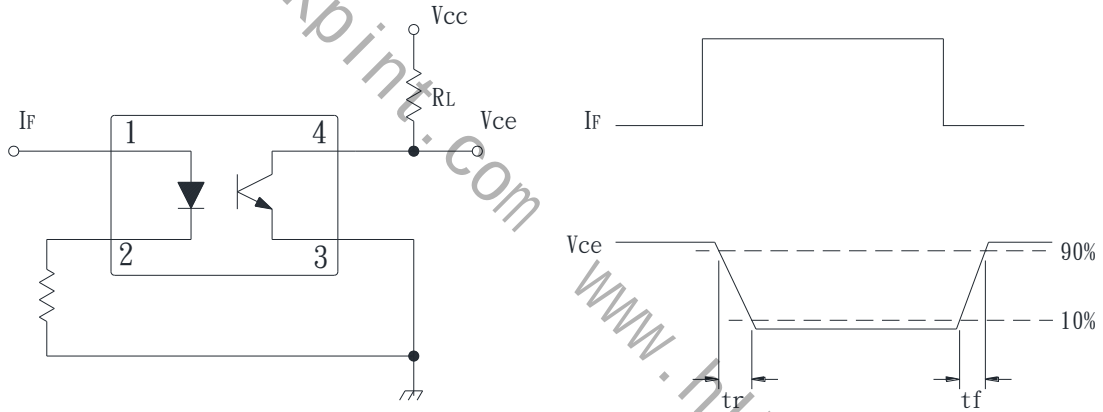
Fig.11 Response Time (Fall) vs. Load Resistance



KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● Test Circuit For Response Time



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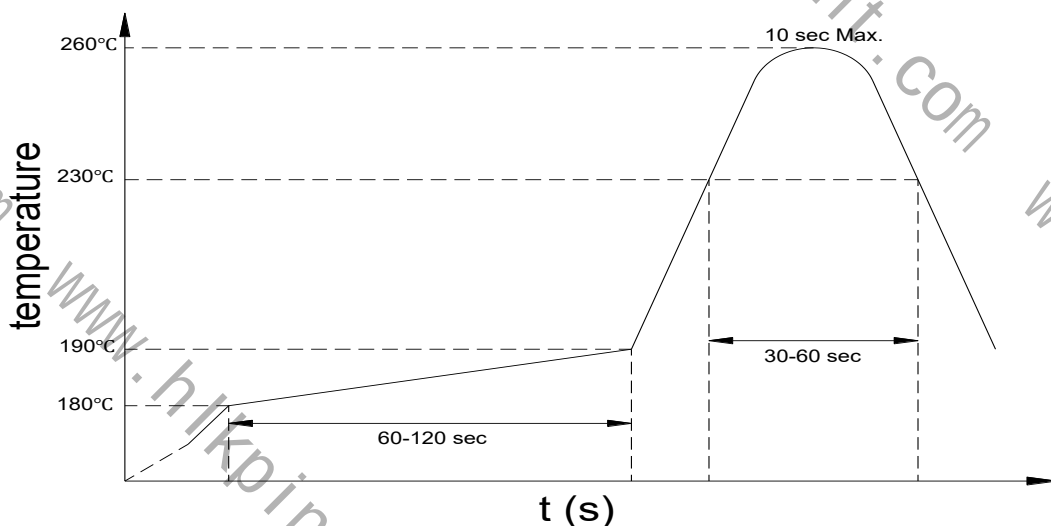
4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● 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.

KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● Numbering System

KPC357NT Y (Z)

Notes:

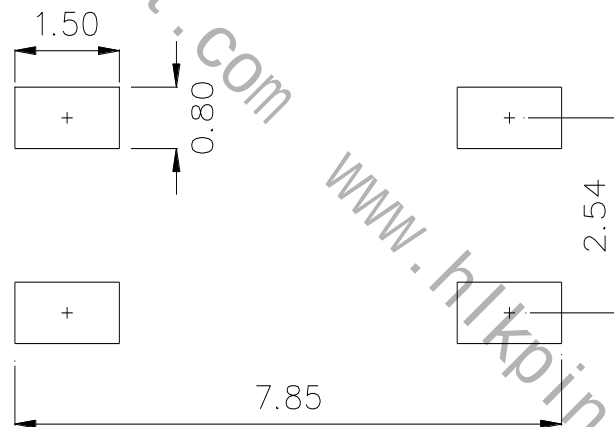
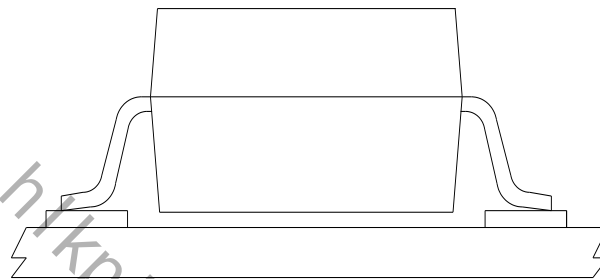
KPC357NT = Part No.

Y = CTR rank option (A ~ 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

- **4-pin Mini-Flat Carrier Tape & Reel**

