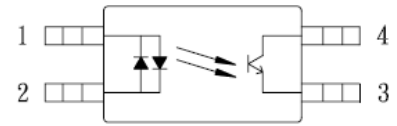


● Description

The KPS2805 series consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a phototransistor detector. They are packaged in a 4-pin SSOP package. The input-output isolation voltage is rated at 3750 Vrms..

● Schematic



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

● Features

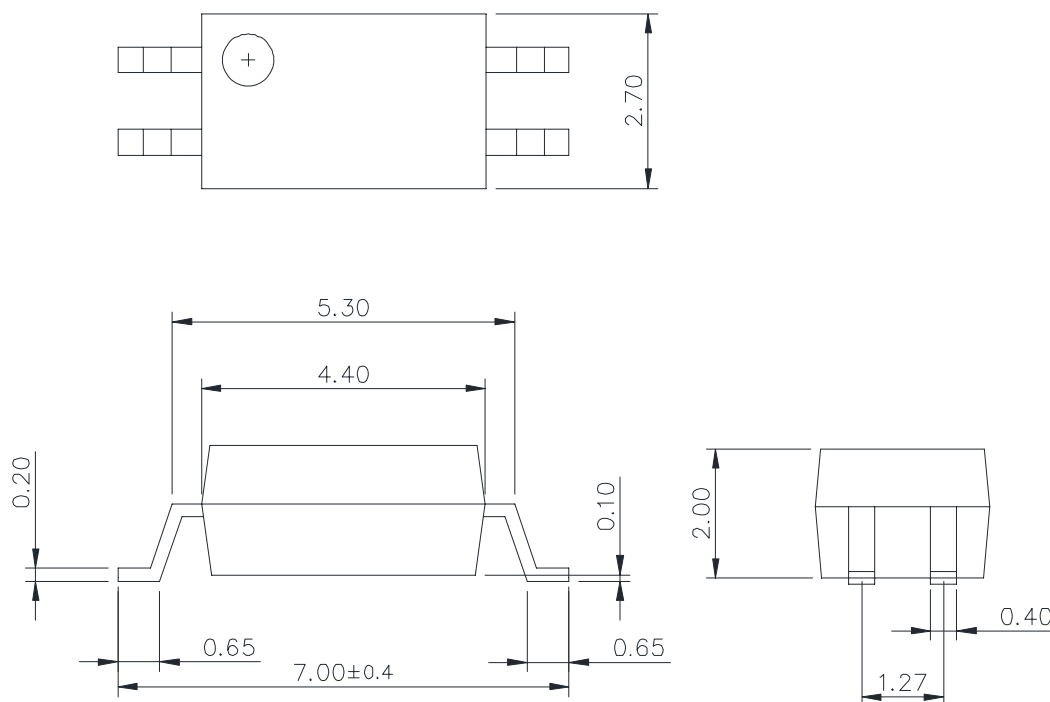
1. Halogen free
2. Pb free and RoHS compliant
3. High isolation voltage ($V_{ISO}=3750V_{rms}$)
4. Small and thin package (4pin SSOP, pin pitch 1.27mm)
5. High collector to emitter voltage ($V_{CEO}=80V$).
6. AC input response
7. High-speed switching $t_r=3\mu s(typ.)$, $t_f=5\mu s(typ.)$
8. Agency Approvals:
 - UL1577 / CUL C22.2 No.1 & NTC No.5, File No. E169586
 - VDE EN 60747, File No.40010469
 - FIMKO EN 60065 , EN 60950, File No.NCS/FI24585 A1
 - CQC GB4943 / GB8898-2011, File No.CQC10001049555 / CQC08001023986

● Applications

- Programmable logic controllers
- Measuring instruments
- Hybrid IC

● Outside Dimension

Unit : mm



TOLERANCE : ±0.2mm

● Device Marking



Notes:

2805

YWW

Y: Year code / WW: Week code

● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	± 50	mA
	Peak forward current(*1)	I_{FP}	± 1	A
	Power dissipation	P_D	60	mW
	Power dissipation derating	$P_D/^\circ\text{C}$	0.6	mW/ $^\circ\text{C}$
Output	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	6	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	160	mW
	Collector power dissipation derating	$P_C/^\circ\text{C}$	1.2	mW/ $^\circ\text{C}$
Isolation voltage 1 minute(*2)		V_{iso}	3750	Vrms
Operating temperature		T_{opr}	-55 to +115	$^\circ\text{C}$
Storage temperature		T_{stg}	-55 to +125	$^\circ\text{C}$

*1 PW=100 μ s,Duty Cycle=1%.

*2 AC voltage for 1minute at T =25 $^\circ\text{C}$,RH=60% between input and output.

● Electro-optical Characteristics

(Ta=25°C)

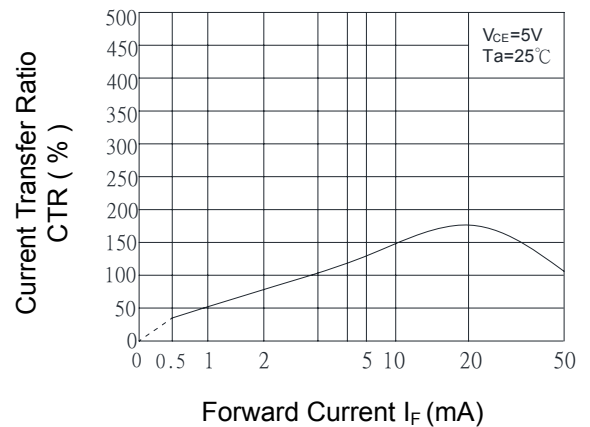
Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	$I_F=\pm 5\text{mA}$	-	1.1	1.4	V
	Terminal capacitance	C_t	$V=0, f=1\text{MHz}$	-	60	-	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=80\text{V}, I_F=0\text{mA}$	-	-	100	nA
Transfer characteristics	Current transfer ratio	CTR	$I_F=\pm 5\text{mA}, V_{CE}=5\text{V}$	50		600	%
	CTR ratio*1	CTR1/CTR2	$I_F=5\text{mA}, V_{CE}=5\text{V}$	0.3	1.0	3.0	
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	$I_F=\pm 10\text{mA}, I_C=2\text{mA}$	-	-	0.3	V
	Isolation resistance	Riso	DC500V	5×10^{10}	10^{11}	-	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	-	0.4		pF
	Response time (Rise) (*3)	t_r	$V_{ce}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega$	-	3	18	μs
	Response time (Fall) (*3)	t_f		-	5	18	μs

*3 Test Circuit for Switching Time

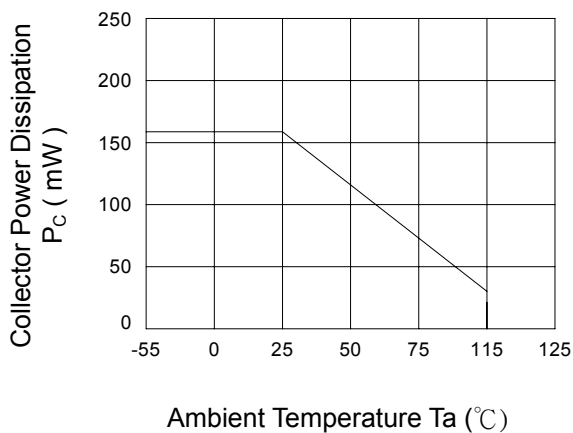
Classification table of current transfer ratio is shown below.

CTR Rank.	CTR (%)
KPS28050E	50 TO 600
KPS28050C	200 TO 400

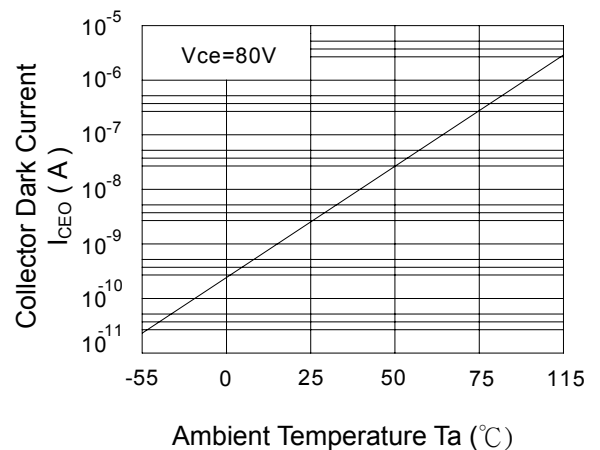
**Fig.1 Current Transfer Ratio
vs. Forward Current**



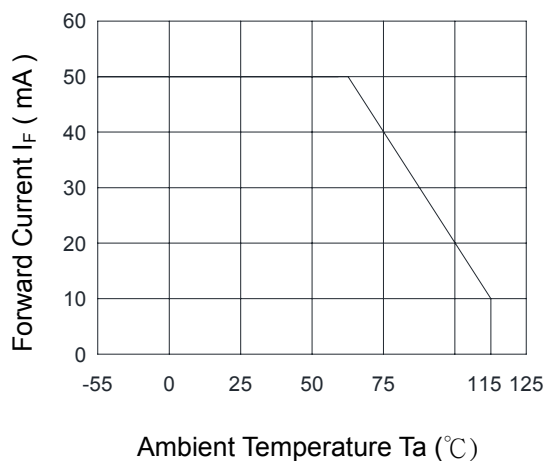
**Fig.2 Collector Power Dissipation
vs. Ambient Temperature**



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



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



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

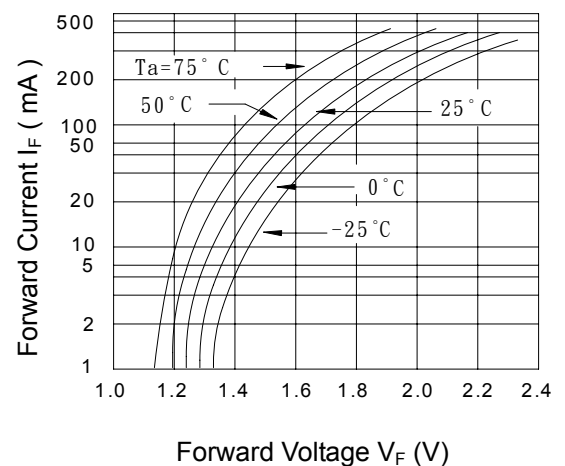


Fig.6 Collector Current vs. Collector-Emitter Voltage

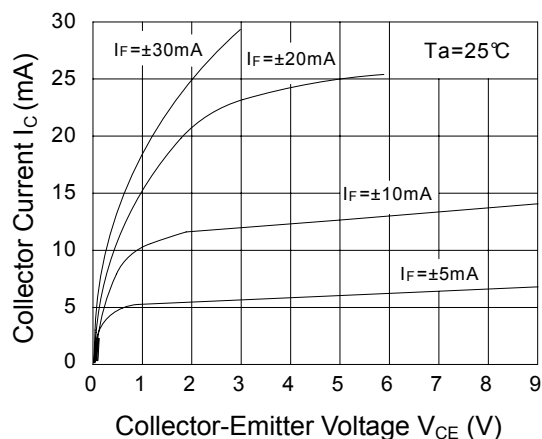


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

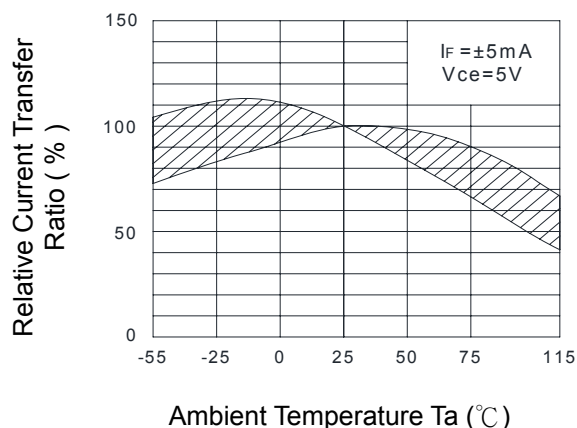


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

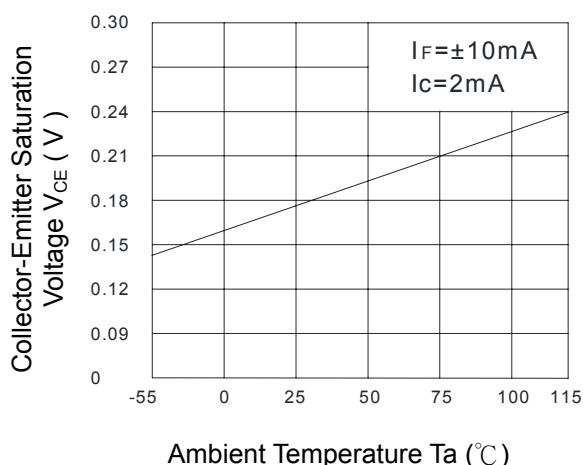


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

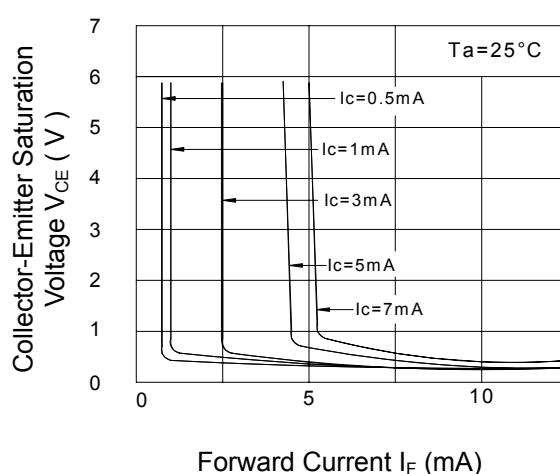


Fig.10 Response Time (Rise) vs. Load Resistance

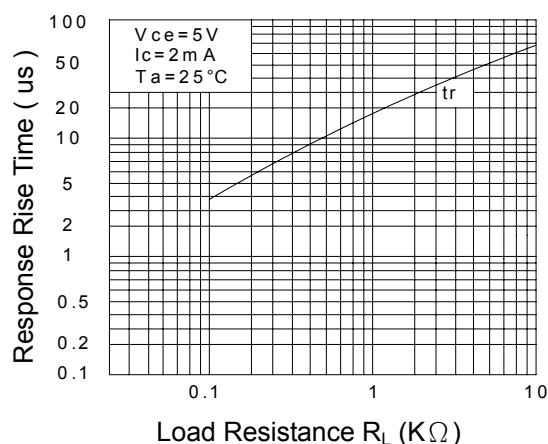
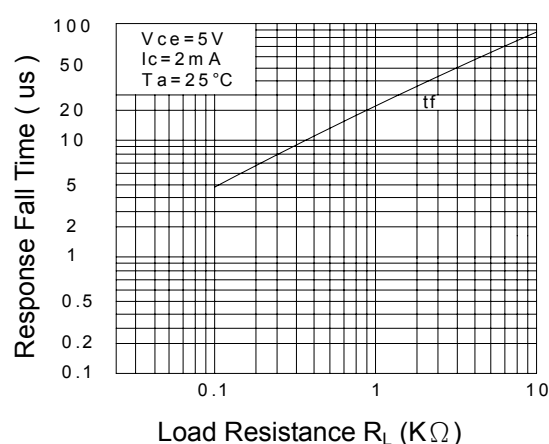
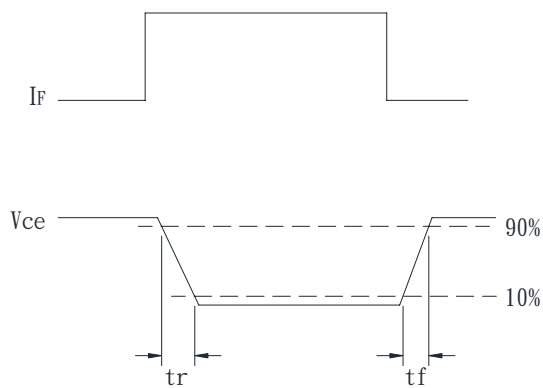
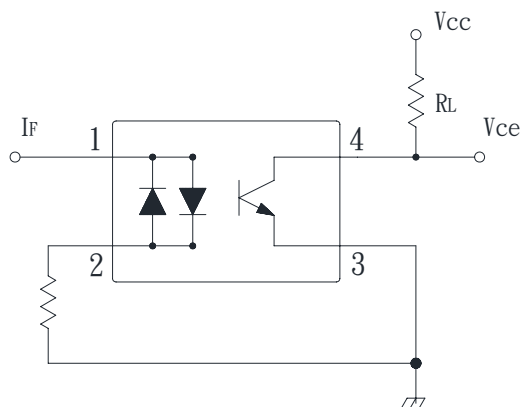


Fig.11 Response Time (Fall) vs. Load Resistance



● Test Circuit for Response Time

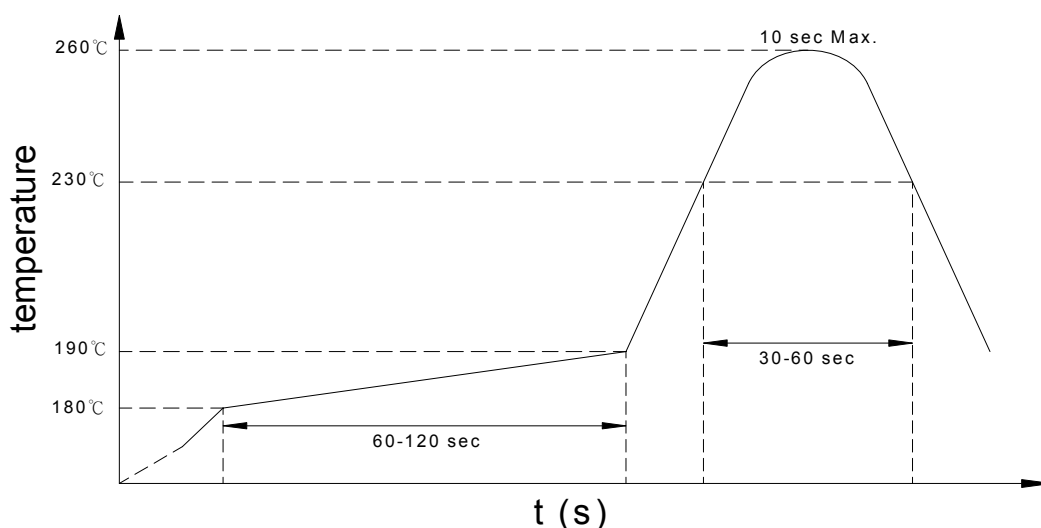


● Recommended Soldering Conditions

(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.

● Numbering System

KPS2805 Y (Z)

Notes:

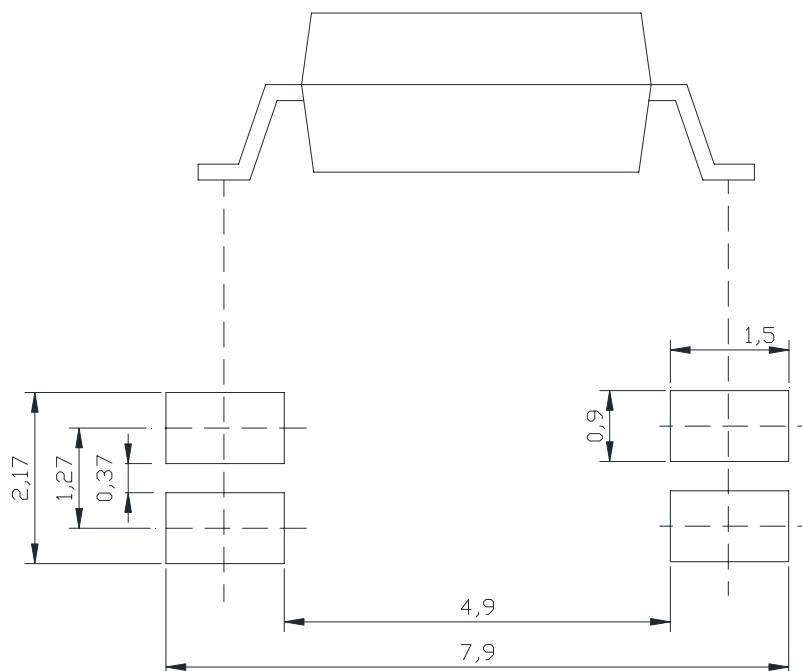
KPS2805 = Part No.

Y = CTR rank option (C 、 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



Unit: mm

2.30

16.0 $+0.30$ -0.10

8°

7.50

7.85

0.32

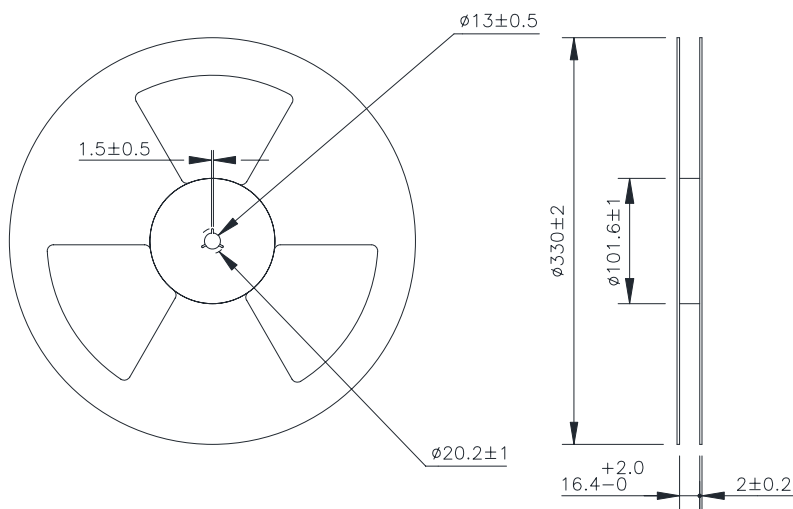
TOLERANCE : $\pm 0.2\text{mm}$

TLD

TRU

Direction of feed from reel

Direction of feed from reel



● Application Notice

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- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

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