

Opto/SSR-I/O Handbuch



PCI - 16 Optokoppler-Eingänge / 16 SSR-Ausgänge

Taiwan Product Code: APCI16PHOTO/SSR

Artikel-Nr.: OPSSR-16P

Daten

Bus: 32 Bit PCI Karte mit PnP Features

- Digitale I/O Karte mit 16 SSR-Relais und 16 Optokoppler-Eingängen.
- **16 SSR Halbleiterrelais-Ausgänge KAQY212HA:**
- Output Breakdown Voltage $\pm 60V$
- Continuous Load Current $\pm 400mA$
- Peak Forward Current 1A
- Isolation Test Voltage 5000VACrms
- **16 Optokoppler Eingänge**
- 5-30V high
- Isolationsspannung 500 V Spitze
- Anschluß mit DB-37 auf dem Slotblech

Software/Treiber:

- Englisches Handbuch mit Einstellplan, Anschlußplan, Datenblättern und Programmbeispielen. Mit Windows-98/NT/2000/XP/Vista/WIN-7/8, Linux und DOS-Treibern oder Programmierbeispielen.
- Pro Lieferung erhalten Sie eine frisch gebrannte „Decision-Computer Deutschland Service CD“ mit aktuellen Treibern, Handbüchern, Installationsanleitungen und deutschen Zusatzinformationen.
- Der Umfang ist vom Produkt abhängig!

Packungsinhalt:

- PCI-IO Karte, Software/Handbuch-CD

Sicherheitshinweis

Dieses Produkt ist nicht ausfallsicher und darf daher Anwendungen verwendet werden, wo Gefahren für Gesundheit, Leben, und Sachwerte auftreten können! Anschluß und Reparaturen sind nur vom Fachmann zulässig.

Beim Einbau in eine Maschine oder Anlage, ist sicherzustellen, dass nach dem Einbau weiterhin die maßgeblichen Bestimmungen, Vorschriften und Richtlinien eingehalten werden!

Diese Produkte kommen mit elektrischer Spannung in Berührung, daher müssen die gültigen VDE-Vorschriften beachtet werden, insbesondere VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711 und VDE 0860.

Einbauhinweise

Ihr PCI Bus 16 Kanal Opto Isolator / SSR-Adapter kann in jedem freien 32-Bit-PCI-Steckplatz im PC/486, Pentium oder Kompatiblen eingesetzt werden.

Arbeitsablauf:

1. Trennen Sie Ihren Computer und alle Peripheriegeräte von der Stromversorgung.
2. Entfernen Sie die Abdeckung des Computers.
3. Stecken Sie den I/O-Karte in einen freien PCI-Steckplatz und verschrauben das Slotblech. Stellen Sie sicher, dass der Adapter gerade und tief genug im gewählten Slot steckt.
4. Verschließen Sie die Abdeckung des Computers.
5. Schalten den Computers ein. Das PnP System erkennt PCI-I/O-Karte

Problemvermeidung bei der Inbetriebnahme von neuen Karten

Sollte eine neue oder geprüfte, zurückgeschickte Karte trotzdem nicht funktionieren, bitte ich vor einer erneuten Rücksendung um Rücksprache zwecks Problemlösung!

Folgende Probleme können durch Beachtung dieser Hinweise vermieden werden:

Keine Funktion oder teilweise Fehlfunktion bei der Erstinbetriebnahme
Das Karten erscheint nicht im PCI-Device-Listing (Vendor-ID 6666) beim Systemstart.
Der Treiber wird bei Seriellen-Karten nicht oder nicht komplett installiert.
Die Adresse der Karte oder Karte wird nicht erkannt.

Abhilfe:

Durch hohe Luftfeuchtigkeit in Taiwan kann sich gelegentlich ein hauchdünner, isolierender Film auf den Slotkontakten bilden.

Ein Problem sind auch ältere PC aus Nikotinhaltiger Umgebung.

Dieser "Fehler" verschwindet meistens wenn der Slot gewechselt oder die Kontaktleiste gereinigt wird. Bei der Überprüfung funktionieren diese Karten dann problemlos. Bei ISA-Karten tritt das Problem wegen der kräftigeren Kontakte selten auf!

Falls eine Karte nach dem ersten Einstecken nicht funktioniert, bitte erst die Kontakte, unter Vermeidung statische Aufladung, mit einem Papiertuch reinigen.

**Die Karten müssen gerade und tief genug eingesteckt werden!
Schwere Verkabelung darf die Karte nicht im Slot bewegen!**

DIP-Schalter

Der Schalter wird zur Identifizierung der Kartennummer verwendet. Standardeinstellung ist Karte 1. Es gibt zwei Methoden:

a. PnP Modus

PCI-Bus-Adapter in einen Steckplatz einstecken. Das PCI-BIOS wird automatisch die I/O Adresse für jeden Adapter zuteilen und jedem Adapter automatisch eine Kartem-Nummer mit Start von 0 zuweisen. Sie können beliebige Karten-Nummern im PnP Modus festlegen. Zur Unterscheidung der Port-ID benötigen Sie Software-Tools. Fast alle Betriebssysteme können den PnP-Modus ausführen.

b. Manual-Modus

Einstellung der Kartennummer mit dem ID-Schalter. Das PCI-BIOS weist jedem Adapter vorab eine I/O-Adresse zu. Stellen Sie verschiedene Kartennummern für jeden Adapter ein. Die Kartennummer darf nicht doppelt verwendet werden!



	Schalter 1	Schalter 2	Schalter 3	Schalter 4
Karte Nr. 1	aus	aus	aus	aus
Karte Nr. 2	ON	aus	aus	aus
Karte Nr. 3	aus	ON	aus	aus
Karte Nr. 4	aus	aus	ON	aus

Treiber - Software

In der Lieferung finden Sie 2 CD's:

1. Decision Utility Driver CD - gelb - in jeder Produktverpackung

Das aktuelle Softwarepaket mit Treiber und Software für XP, Vista und WIN-7/8 32/64 Handbücher usw aus Taiwan.

2. Decision-Computer Merz - Service CD - weiß - 1 x pro Lieferung

Diese CD ist eine Ergänzung zur CD-1 und soll die neuesten Informationen enthalten. Daher wird diese CD immer frisch gebrannt und kann nur einmal im Paket liegen. Der „alte“, deutsche Dii-1811 Treiber und deutsche Handbücher sind nur auf dieser CD zu finden. Auch die neueste Version der gelben CD ist mit ZIP-Verzeichnissen vorhanden!

Webseiten mit Treibern, Software und Handbüchern

<http://www.decision-computer.de/>

<http://www.smatlab.com/>

I/O Adressen

Das PnP Feature verteilt die I/O Adressen automatisch:

Base Address + 0: SSR output channel 1 to 16

15	14	13	12	11	10	9	8
PBO7	PBO6	PBO5	PBO4	PBO3	PBO2	PBO1	PBO0
7	6	5	4	3	2	1	0
PAO7	PAO6	PAO5	PAO4	PAO3	PAO2	PAO1	PAO0

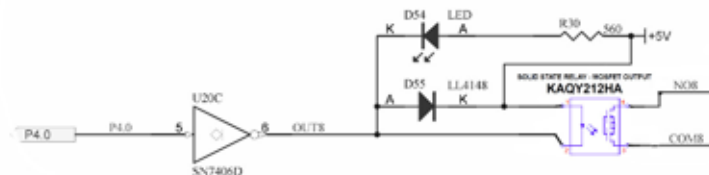
Base Address + 0: Opto isolator input channel 1 to 16

15	14	13	12	11	10	9	8
PBI7	PBI6	PBI5	PBI4	PBI3	PBI2	PBI1	PBI0
7	6	5	4	3	2	1	0
PAI7	PAI6	PAI5	PAI4	PAI3	PAI2	PAI1	PAI0

Anschluss SSR-Relais

DB-37 auf dem Slotblech

Bezeichnung	DB-37	Bit	DB-37	Bezeichnung
Relais-1 NO	1	0	2	Relais-1 COM
Relais-2 NO	3	1	4	Relais-2 COM
Relais-3 NO	5	2	6	Relais-3 COM
Relais-4 NO	7	3	8	Relais-4 COM
Relais-5 NO	9	4	10	Relais-5 COM
Relais-6 NO	11	5	12	Relais-6 COM
Relais-7 NO	13	6	14	Relais-7 COM
Relais-8 NO	15	7	16	Relais-8 COM
NC	17		18	NC
NC	19			
Relais-9 NO	20	8	21	Relais-9 COM
Relais-10 NO	22	9	23	Relais-10 COM
Relais-11 NO	24	10	25	Relais-11 COM
Relais-12 NO	26	11	27	Relais-12 COM
Relais-13 NO	28	12	29	Relais-13 COM
Relais-14 NO	30	13	31	Relais-14 COM
Relais-15 NO	32	14	33	Relais-15COM
Relais-16 NO	34	15	35	Relais-16 COM
NC	36		37	NC

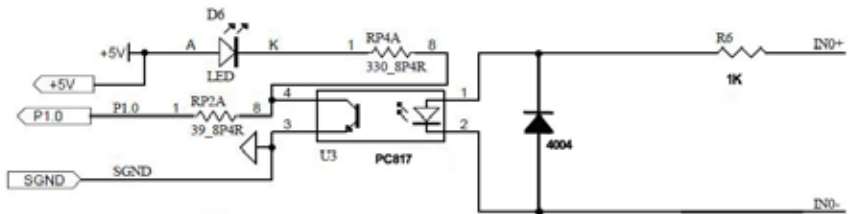


Die verwendeten SSR sind AC und DC tauglich. Durch die am Ausgang parallel geschaltete Diode D1 ... D51 werden die Anschlußmöglichkeiten begrenzt. Da diese Diode normalerweise nur in der Optokopplerversion nötig ist, kann sie entfernt werden. Ab 2015 wird die Platine ohne Dioden im Ausgang produziert.

Eingangsbeschaltung - Optokoppler

Pfostenstecker neben den Optokopplern am Ende der Karte sowie DB-37 am Flachbandadapter

Bezeichnung	40-Pin	DB-37	Bit	DB-37	40-Pin	Bezeichnung
Opto-In 1 +	1	1	0	20	3	Opto-In 1 -
Opto-In 2 +	5	2	1	21	7	Opto-In 2 -
Opto-In 3 +	9	3	2	22	11	Opto-In 3 -
Opto-In 4 +	13	4	3	23	15	Opto-In 4 -
Opto-In 5 +	17	5	4	24	19	Opto-In 5 -
Opto-In 6 +	21	6	5	25	23	Opto-In 6 -
Opto-In 7+	25	7	6	26	27	Opto-In 7 -
Opto-In 8 +	29	8	7	27	31	Opto-In 8 -
NC	33	9		28	35	NC
NC	37	10		29	2	NC
Opto-In 9 +	4	11	8	30	6	Opto-In 9 -
Opto-In 10 +	8	12	9	31	10	Opto-In 10 -
Opto-In 11 +	12	13	10	32	14	Opto-In 11 -
Opto-In 12 +	16	14	11	33	18	Opto-In 12 -
Opto-In 13 +	20	15	12	34	22	Opto-In 13 -
Opto-In 14 +	24	16	13	35	26	Opto-In 14 -
Opto-In 15 +	28	17	14	36	30	Opto-In 15 -
Opto-In 16 +	32	18	15	37	34	Opto-In 16 -
NC	36	19			38	NC
NC	40					

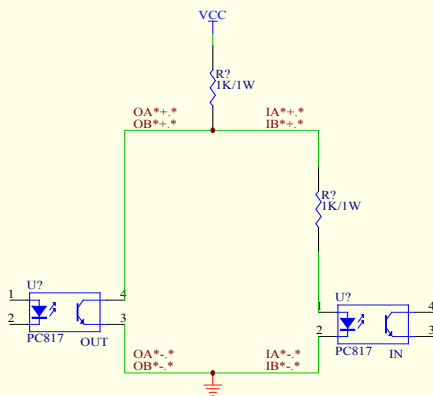


Pin-1 ist am Pfostenstecker auf der Platine oben links!

3.4 Loopback Diagnostic

To test your 16 channel photo isolator input/output card, we recommend you use loopback circuit shown in below. Where IA*+ means input channel+ and IA*- means input channel-, OA*+ means output channel+ and OA*- means output channel-. * means channel number. Please note that, if you use IA2+, you must connect its pair IA2- ... ,otherwise it may short the circuit.

In this experiment, if VCC larger than 10V, then it input HIGH to input channel, otherwise it input LOW; your program can get this digital signal easily. If no VCC voltage input, the output channel will be loopback to input channel, it means when output HIGH then input channel get HIGH, when output LOW then input channel get LOW.



Sonstiges

Starke elektromagnetischen Quellen wie Stromleitungen, großen Elektromotoren, Schaltern oder Schweißmaschinen können starke elektromagnetische Interferenzen verursachen. Auch bei Video-Monitore und -Kabel sind starke Störquellen.

Wenn das Kabel durch einen Bereich mit beträchtlicher elektromagnetischer Störung geführt werden muss, sollten abgeschirmte Leitungen mit Erdung an der Signalquelle verlegt werden.

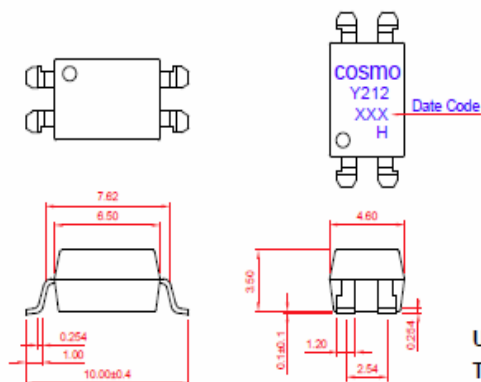
Vermeiden Sie es Ihre Signalkabel parallel zu einer Hochspannungsleitung platzieren! Legen Sie das Signalkabel in rechten Winkel zur Stromleitung um unerwünschte Auswirkungen zu minimieren.

PRODUCT SPECIFICATION

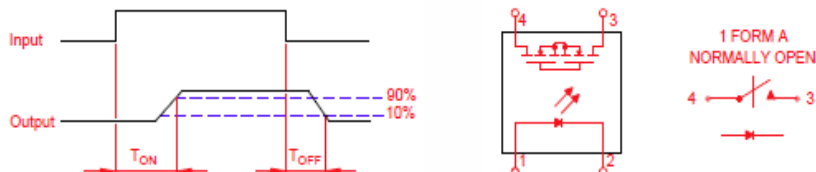
DATE : 02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQY212HA	NO.61M00013	REV. 2
		SHEET 1 OF 7	

● OUTSIDE DIMENSION :



● Turn On / Turn Off time



● Absolute Maximum Ratings

(Ta=25°C)

Emitter (Input)	Detector (Output)
Reverse Voltage 5.0V	Output Breakdown Voltage ± 60V
Continuous Forward Current 50mA	Continuous Load Current ± 400mA
Peak Forward Current 1A	Power Dissipation 500mW
Power Dissipation 100mW	
Derate Linearly from 25°C 1.3Mw/°C	
General Characteristics	
Isolation Test Voltage 5000VACrms	Storage Temperature Range -40°C to +125°C
Isolation Resistance	Operating Temperature Range ... -40°C to +85°C
Vio=500V · Ta=25°C ≥ 10 ¹⁰ Ω	Junction Temperature 100°C
Total Power Dissipation 550mW	Soldering Temperature ·
Derate Linearly from 25°C 2.5mW/°C	2mm from case · 10 sec 260°C

PRODUCT SPECIFICATION

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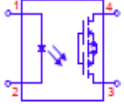
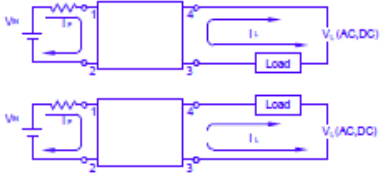
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		SHEET 2 OF 7	

● Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Emitter (Input)						
Forward Voltage	V_F	$I_F=10\text{mA}$		1.2	1.5	V
Operation Input Current	I_{FON}	$V_L=\pm 20\text{V}$, $I_L=100\text{mA}$, $t=10\text{ms}$			5	mA
Recovery Input Current	I_{FOFF}	$V_L=\pm 20\text{V}$, $I_L\leq 5\mu\text{A}$	0.2			mA
Detector (Output)						
Output Breakdown Voltage	V_B	$I_B=50\mu\text{A}$	60			V
Output Off-State Leakage	I_{TOFF}	$V_T=60\text{V}$, $I_F=0\text{mA}$		0.2	1	μA
I/O Capacitance	C_{ISO}	$I_F=0$, $f=1\text{MHz}$		6		pF
ON Resistance	R_{ON}	$I_L=100\text{mA}$, $I_F=10\text{mA}$		0.83	2.5	Ω
Turn-On Time	T_{ON}	$I_F=10\text{mA}$, $V_L=\pm 20\text{V}$		0.2	1.5	ms
Turn-Off Time	T_{OFF}	$t=10\text{ms}$, $I_L=\pm 100\text{mA}$		0.3	1.5	ms

● Schematic and Wiring Diagrams

Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a	AC/DC	-	

PRODUCT SPECIFICATION

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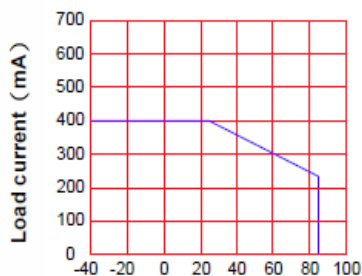
cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQY212HA	NO.61M00013	REV. 2
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● Data Curve

Load current vs. ambient temperature

Allowable ambient Temperature :

-40°C to +85°C



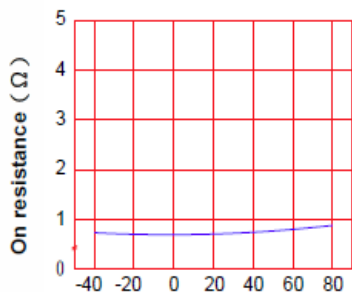
Ambient temperature Ta (°C)

On resistance vs. ambient temperature

across terminals 3 and 4 pin

LED current : 5mA

Continuous load current : 400mA (DC)



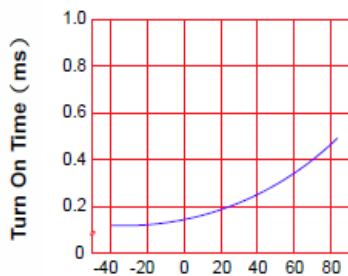
Ambient temperature Ta (°C)

Turn On Time vs. ambient temperature

Load voltage 60V (DC)

LED current : 5mA

Continuous load current : 400mA (DC)



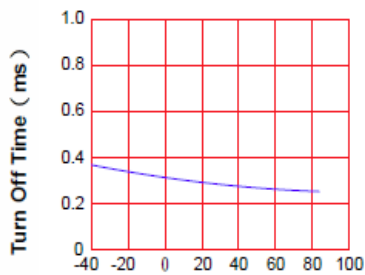
Ambient temperature Ta (°C)

Turn Off Time vs. ambient temperature

Load voltage 60V (DC)

LED current : 5mA

Continuous load current : 400mA (DC)



Ambient temperature Ta (°C)

PRODUCT SPECIFICATION

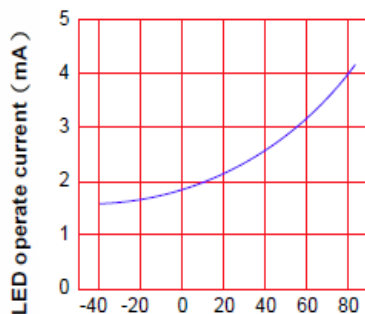
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		SHEET 4 OF 7	

LED operate current vs.
ambient temperature

Load Voltage : 60V (DC)

Continuous load current : 400mA (DC)

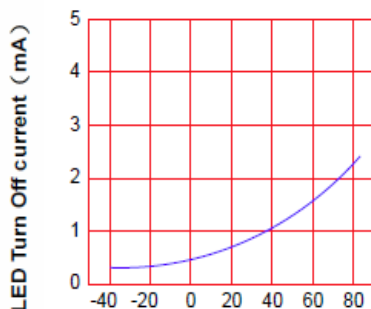


Ambient temperature Ta (°C)

LED Turn Off current vs.
ambient temperature

Load Voltage : 60V (DC)

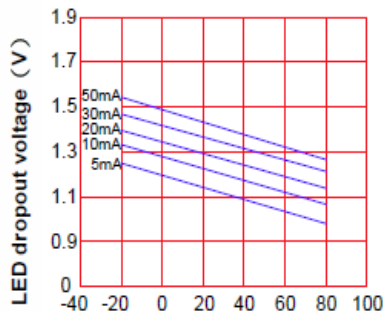
Continuous load current : 400mA (DC)



Ambient temperature Ta (°C)

LED dropout voltage vs.
ambient temperature

LED current : 5 to 50mA



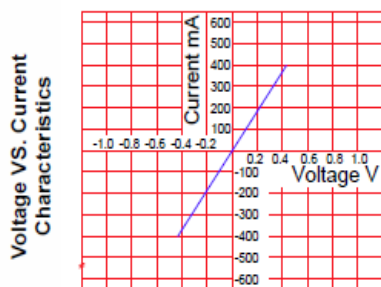
Ambient temperature Ta (°C)

Voltage vs. current characteristics
of output at MOSFET portion

Measured portion : across terminals

3 and 4 pin

Ambient temperature : 25°C



Ambient temperature : 25°C

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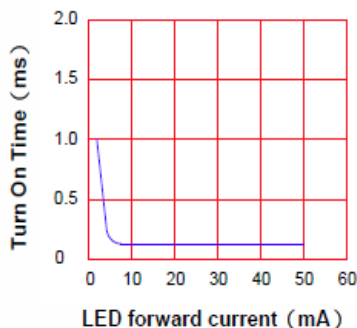
LED forward current vs. Turn On Time

Across terminals 3 and 4 pin

Load voltage : 60V (DC)

Continuous load current : 400mA (DC)

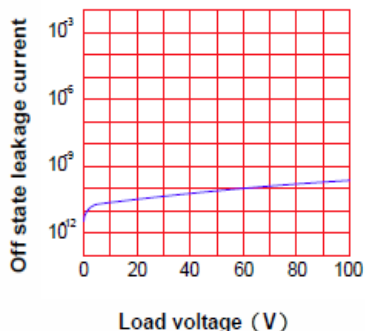
Ambient temperature : 25°C



Off state leakage current

Across terminals 3 and 4 pin

Ambient temperature : 25°C



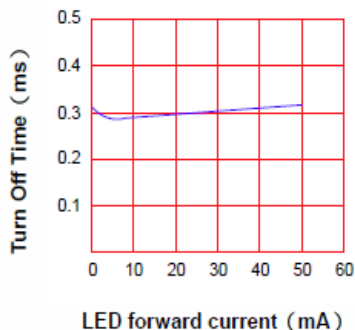
LED forward current vs. Turn Off Time

Across terminals 3 and 4 pin

Load voltage : 60V (DC)

Continuous load current : 400mA (DC)

Ambient temperature : 25°C

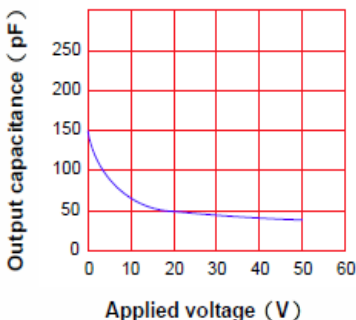


Applied voltage vs. output capacitance

Across terminals 3 and 4 pin

Frequency : 1MHz

Ambient temperature : 25°C



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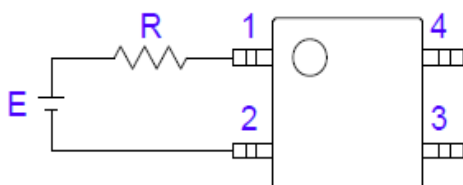
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		SHEET 6 OF 7	

● USING METHODS

Examples of resistance value to control LED forward current (I_F)

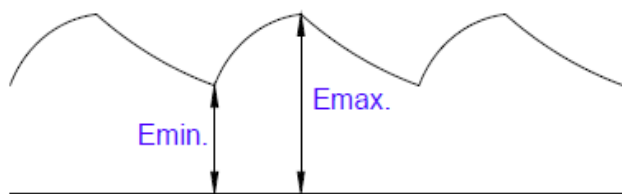
SSR-MOSFET OUTPUT

($I_F=5\text{mA}$)



E	R
3.3V	Approx. 330 Ω
5V	Approx. 640 Ω
12V	Approx. 1.9K Ω
15V	Approx. 2.5K Ω
24V	Approx. 4.1K Ω

- (1) LED forward current must be more than 5mA , at E min.
- (2) LED forward current must be less than 50mA , at E max.



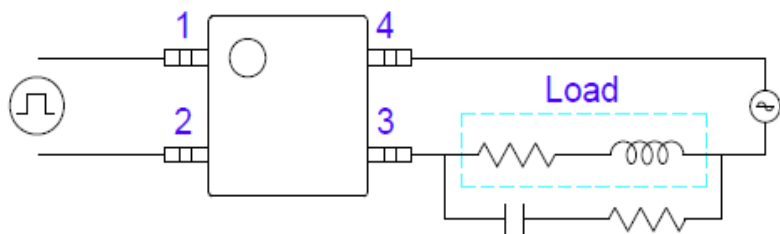
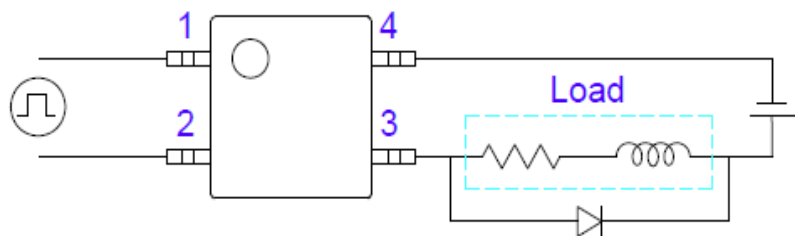
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		SHEET 7 OF 7	

● USING METHODS

Regulate the spike voltage generated on the inductive load as follows :



R-C Snubber

PC817XJ0000F Series

DIP 4pin General Purpose Photocoupler

*4-channel package type is also available.
(model No. **PC847XJ0000F Series**)



■ Description

PC817XJ0000F Series contains an IRED optically coupled to a phototransistor.

It is packaged in a 4pin DIP, available in wide-lead spacing option and SMT gullwing lead-form option.

Input-output isolation voltage(rms) is 5.0kV.

Collector-emitter voltage is 80V and CTR is 50% to 600% at input current of 5mA.

■ Features

1. 4pin DIP package
2. Double transfer mold package (Ideal for Flow Soldering)
3. High collector-emitter voltage (V_{CE0} :80V)
4. Current transfer ratio (CTR : MIN. 50% at $I_F=5$ mA, $V_{CE}=5$ V)
5. Several CTR ranks available
6. High isolation voltage between input and output ($V_{iso(rms)}$: 5.0 kV)
7. Lead-free and RoHS directive compliant

■ Agency approvals/Compliance

1. Recognized by UL1577 (Double protection isolation), file No. E64380 (as model No. **PC817**)
2. Package resin : UL flammability grade (94V-0)

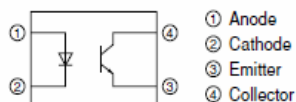
■ Applications

1. I/O isolation for MCUs (Micro Controller Units)
2. Noise suppression in switching circuits
3. Signal transmission between circuits of different potentials and impedances

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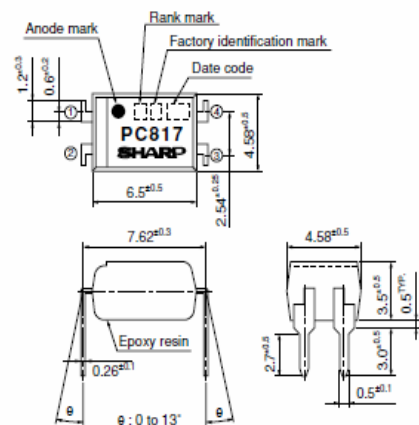
Internal Connection Diagram



Outline Dimensions

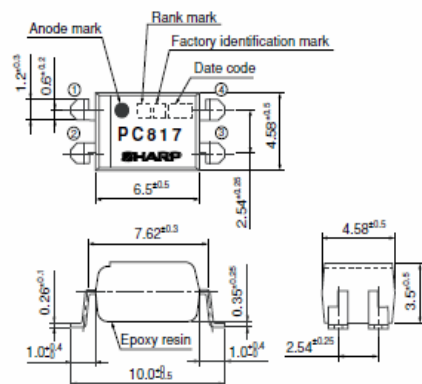
(Unit : mm)

1. Through-Hole [ex. PC817XJ000F]



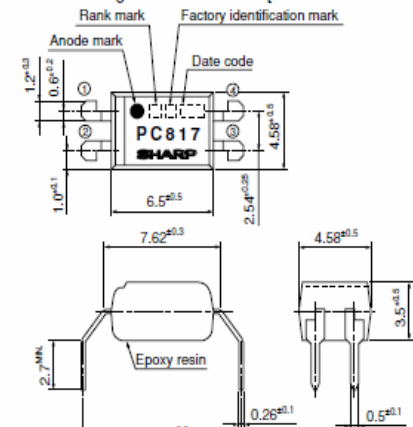
Product mass : approx. 0.23g

2. SMT Gullwing Lead-Form [ex. PC817XJ000F]



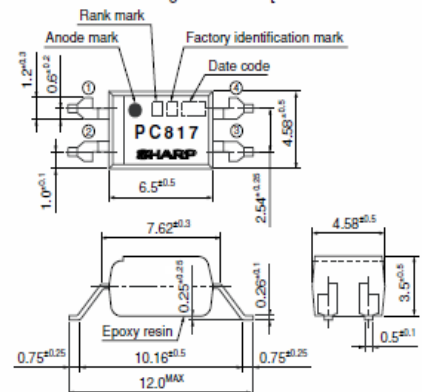
Product mass : approx. 0.22g

3. Wide Through-Hole Lead-Form [ex. PC817XFJ000F]



Product mass : approx. 0.23g

4. Wide SMT Gullwing Lead-Form [ex. PC817XFPJ00F]



Product mass : approx. 0.22g

■ Absolute Maximum Ratings (T_a=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I _F	50	mA
	*1 Peak forward current	I _{FM}	1	A
	Reverse voltage	V _R	6	V
Output	Power dissipation	P	70	mW
	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	150	mW
	Total power dissipation	P _{tot}	200	mW
	*2 Isolation voltage	V _{iso (rms)}	5.0	kV
	Operating temperature	T _{opr}	-30 to +100	°C
	Storage temperature	T _{stg}	-55 to +125	°C
	*3 Soldering temperature	T _{sot}	260	°C

*1 Pulse width≤100μs, Duty ratio : 0.001

*2 40 to 60%RH, AC for 1minute, f=60Hz

*3 For 10s

■ Electro-optical Characteristics (T_a=25°C)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V _F	I _F =20mA	-	1.2	1.4	V	
	Peak forward voltage	V _{FM}	I _{FM} =0.5A	-	-	3.0	V	
	Reverse current	I _R	V _R =4V	-	-	10	μA	
Output	Terminal capacitance	C _t	V=0, f=1kHz	-	30	250	pF	
	Collector dark current	I _{CEO}	V _{CE} =50V, I _B =0	-	-	100	nA	
	Collector-emitter breakdown voltage	BV _{CEO}	I _C =0.1mA, I _B =0	80	-	-	V	
	Emitter-collector breakdown voltage	BV _{ECO}	I _E =10μA, I _B =0	6	-	-	V	
Transfer characteristics	Collector current	I _C	I _B =5mA, V _{CE} =5V	2.5	-	30.0	mA	
	Collector-emitter saturation voltage	V _{CE(sat)}	I _B =20mA, I _C =1mA	-	0.1	0.2	V	
	Isolation resistance	R _{ISO}	DC500V, 40 to 60%RH	5×10 ¹⁰	1×10 ¹¹	-	Ω	
	Floating capacitance	C _f	V=0, f=1MHz	-	0.6	1.0	pF	
	Cut-off frequency	f _c	V _{CE} =5V, I _C =2mA, R _L =100Ω, -3dB	-	80	-	kHz	
	Response time	Rise time	t _r	V _{CE} =2V, I _C =2mA, R _L =100Ω	-	4	18	μs
		Fall time	t _f		-	3	18	μs

Fig.1 Forward Current vs. Ambient Temperature

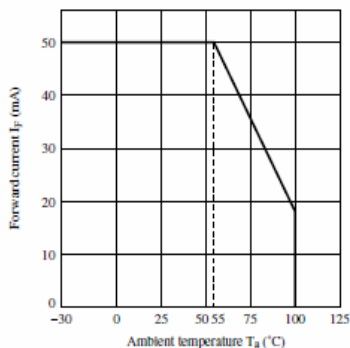


Fig.2 Diode Power Dissipation vs. Ambient Temperature

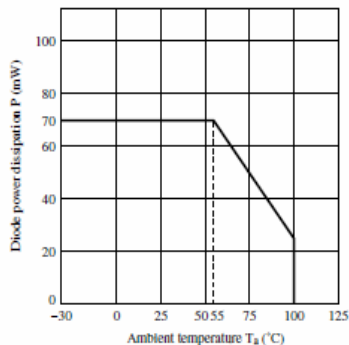


Fig.3 Collector Power Dissipation vs. Ambient Temperature

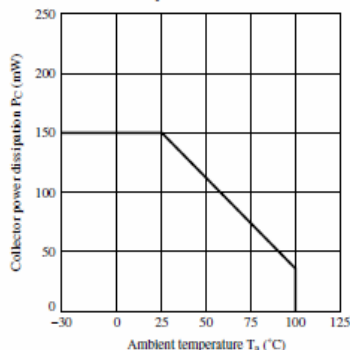


Fig.4 Total Power Dissipation vs. Ambient Temperature

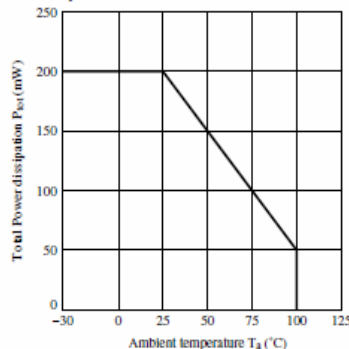


Fig.5 Peak Forward Current vs. Duty Ratio

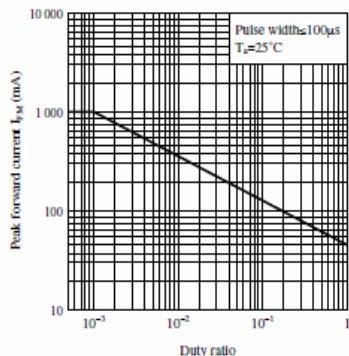


Fig.6 Current Transfer Ratio vs. Forward Current

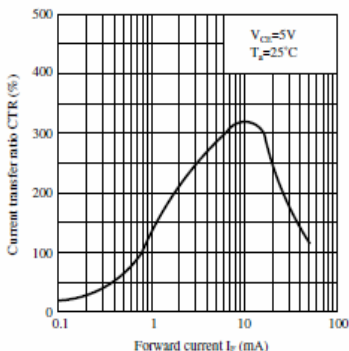


Fig.7 Forward Current vs. Forward Voltage

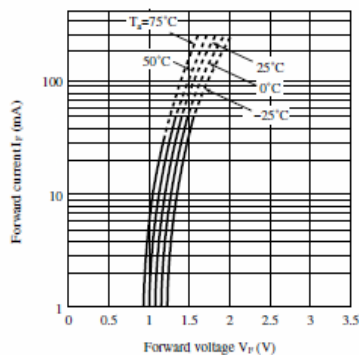


Fig.8 Collector Current vs. Collector-emitter Voltage

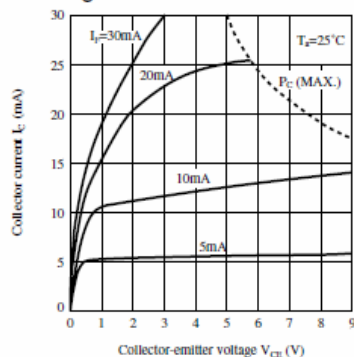


Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature

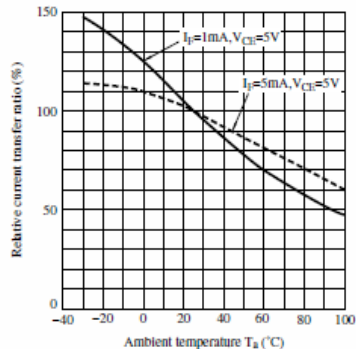


Fig.10 Collector - emitter Saturation Voltage vs. Ambient Temperature

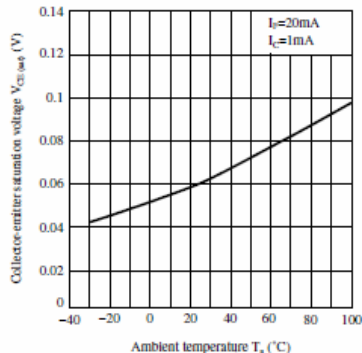


Fig.11 Collector Dark Current vs. Ambient Temperature

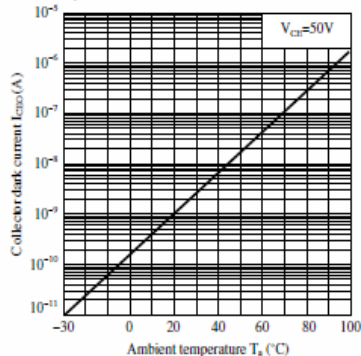


Fig.12 Collector-emitter Saturation Voltage vs. Forward Current

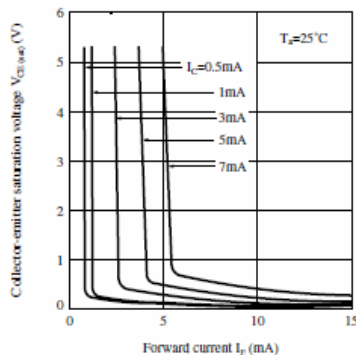


Fig.13 Response Time vs. Load Resistance

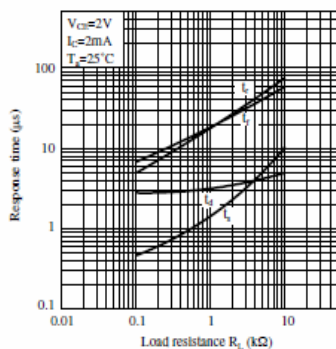
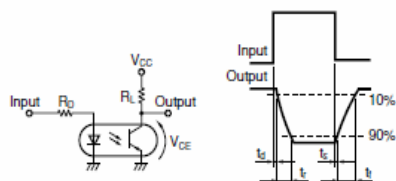


Fig.14 Test Circuit for Response Time



Please refer to the conditions in Fig.13.

Fig.15 Frequency Response

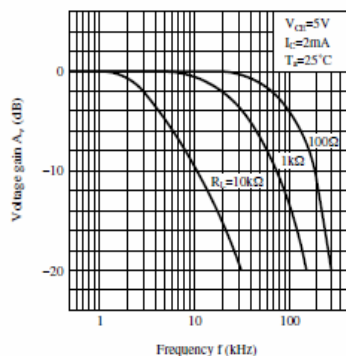
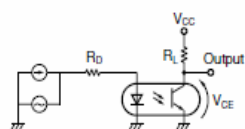


Fig.16 Test Circuit for Frequency Response



Please refer to the conditions in Fig.15.

Remarks : Please be aware that all data in the graph are just for reference and not for guarantee.

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SmartLab reserves the right to determine what constitutes warranty repair or replacement.

Return Authorization: It is necessary that any returned goods are clearly marked with an RA number that has been issued by SmartLab. Goods returned without this authorization will not be attended to.