

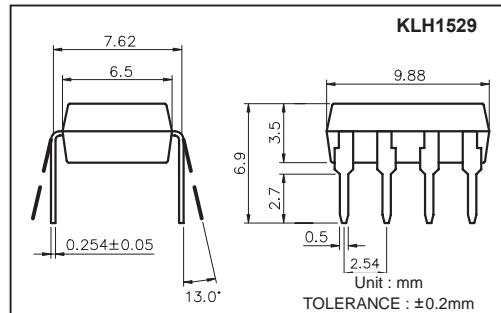
**COSMO**

# High Voltage, Photo Mos Relay Photocoupler **KLH1529/1529A**

UL 1577/ UL 508 (File No.E108430), FI EN60950 (File No.FI13698)

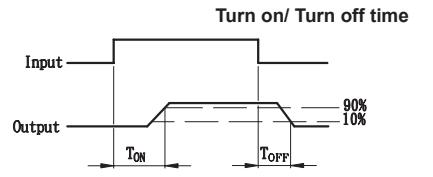
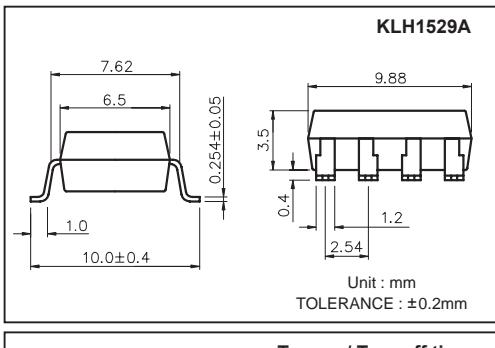
## Features

1. Photo Mos Relay and Optocoupler in One Package
2. Control 350VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 3750VACrms



## Absolute Maximum Ratings

(Ta=25°C)	
Emitter ( Input )	Detector ( Output )
Reverse Voltage.....5.0V	Output Breakdown Voltage .....±350V
Continuous Forward Current .....50mA	Continuous Load Current .....±130mA
Peak Forward Current .....1A	Power Dissipation .....500mW
Power Dissipation .....100mW	
Derate Linearly from 25°C .....1.3mW/°C	
General Characteristics	
Isolation Test Voltage.....3750VACrms	Storage Temperature Range ...-40°C to +125°C
Isolation Resistance	Operating Temperature Range...-30°C to +85°C
Vio=500V, Ta=25°C .....≥10 <sup>10</sup> 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



## Electro-optical Characteristics

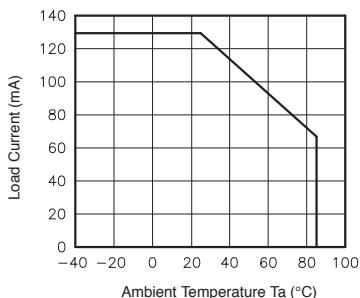
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =10mA		1.2	1.5	V
Operation Input Current	I <sub>FON</sub>	V <sub>L</sub> =±20V, I <sub>L</sub> =100mA, t=10mS		5	5	mA
Recovery Input Current	I <sub>FOFF</sub>	V <sub>L</sub> =±20V, I <sub>L</sub> ≤5μA	0.2			mA
Detector (Output)						
Output Breakdown Voltage	V <sub>B</sub>	I <sub>B</sub> =50μA	350			V
Output Off-State Leakage	I <sub>TOFF</sub>	V <sub>T</sub> =100V, I <sub>F</sub> =0mA	0.2	1	1	μA
I/O Capacitance	C <sub>ISO</sub>	I <sub>F</sub> =0, f=1MHz	6			pF
ON Resistance	R <sub>ON</sub>	I <sub>L</sub> =100mA, I <sub>F</sub> =10mA	20	30	30	Ω
Turn-On Time	T <sub>ON</sub>	I <sub>F</sub> =10mA, V <sub>L</sub> =±20V	0.3	1.0	1.0	ms
Turn-Off Time	T <sub>OFF</sub>	t=10ms, I <sub>L</sub> =±100mA	0.7	1.5	1.5	ms

## Mos Relay Schematic and Wiring Diagrams

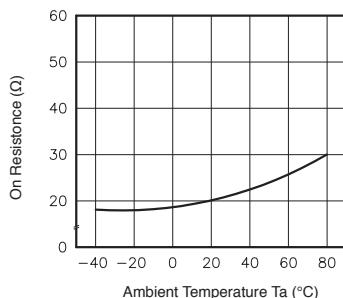
Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KLH1529 & KLH1529A		1a	AC/DC	-	

## Data Curve

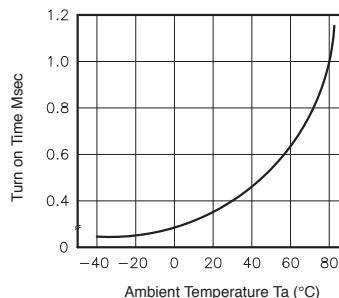
**Fig.1** Load current vs. ambient temperature  
Allowable ambient temperature:  
-40°C to +85°C



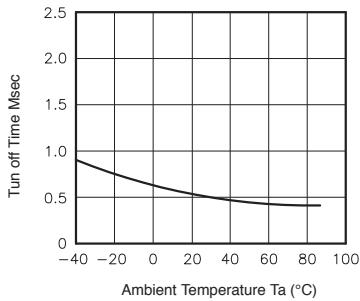
**Fig.2** On resistance vs. ambient temperature  
Across terminals 7 and 8 pin  
LED current: 5mA  
Continuous load current: 130mA(DC)



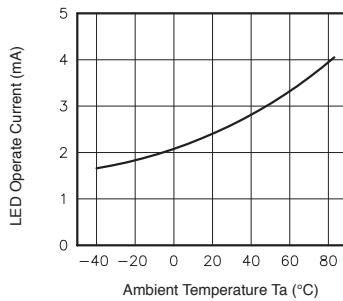
**Fig.3** Turn on time vs. ambient temperature  
Load voltage 350V(DC)  
LED current: 5mA  
Continuous load current: 130mA(DC)



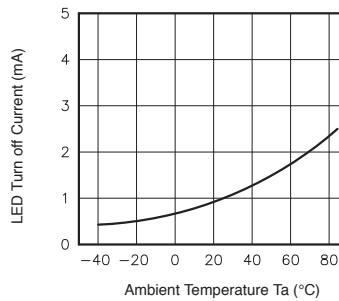
**Fig.4** Turn off time vs. ambient temperature  
LED current: 5mA; Load voltage:  
350V(DC)  
Continuous load current: 130mA(DC)



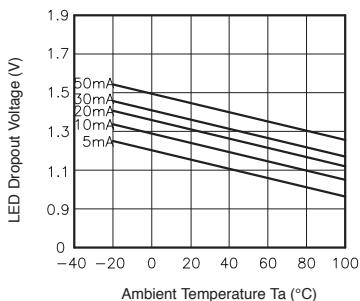
**Fig.5** LED operate vs. ambient temperature  
Load voltage 350V(DC)  
Continuous load current: 130mA(DC)



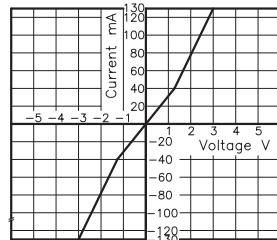
**Fig.6** LED turn off current vs. ambient temperature  
Load voltage 350V(DC)  
Continuous load current: 130mA(DC)



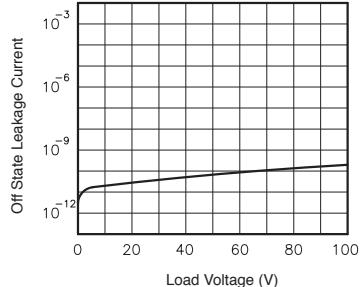
**Fig.7** LED dropout voltage vs. ambient temperature  
LED current: 5 to 50mA



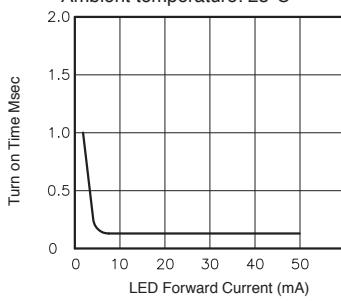
**Fig.8** Voltage vs. current characteristics of output at MOS FET portion  
Measured portion: across terminals 7 and 8 pin  
Ambient temperature: 25°C



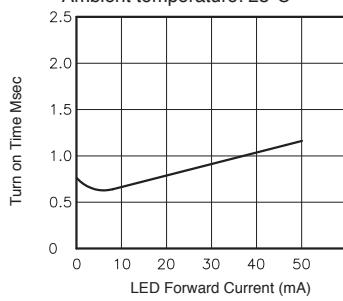
**Fig.9** Off state leakage current  
Across terminals 7 and 8 pin  
Ambient temperature: 25°C



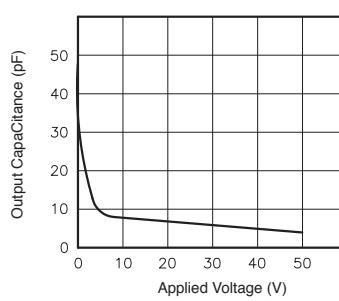
**Fig.10** LED forward current vs. turn on time  
Across terminals 7 and 8 pin;  
Load voltage: 350V (DC);  
Continuous load current: 130mA (DC);  
Ambient temperature: 25°C



**Fig.11** LED forward current vs. turn off time  
Across terminals 7 and 8 pin;  
Load voltage: 350V (DC);  
Continuous load current: 130mA (DC);  
Ambient temperature: 25°C



**Fig.12** Applied voltage vs. output capacitance  
Across terminals 7 and 8 pin  
Frequency: 1MHz  
Ambient temperature: 25°C



**COSMO**

**High Voltage, Photo Mos Relay  
Photocoupler KLH1529/1529A**

**Absolute Maximum Ratings**

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	IF	±50	mA
	Peak forward current	IFM	±1	A
	Power dissipation	PD	70	mW
Output	Collector-emitter voltage	VCEO	60	V
	Emitter-collector voltage	VECO	6	V
	Collector current	Ic	50	mA
	Collector power dissipation	Pc	150	mW
Total power dissipation		Ptot	200	mW
Isolation voltage 1 minute		Viso	1500	Vrms
Operating temperature		Topr	-30 to +100	°C
Storage temperature		Tstg	-55 to +125	°C
Soldering temperature 10 second		Tsol	260	°C

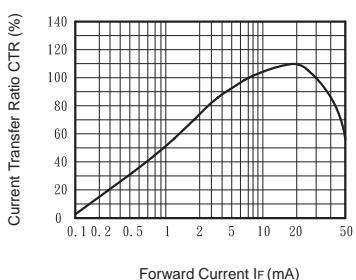
**Electro-optical Characteristics**

(Ta=25°C)

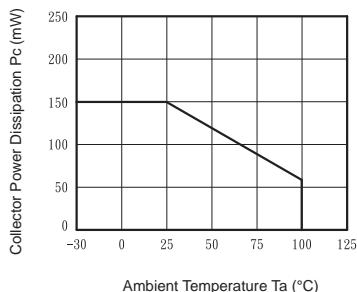
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	VF	IF =± 20mA	—	1.2	1.4	V
	Peak forward voltage	VFM	IFM =± 0.5A	—	—	3.5	V
	Terminal capacitance	Ct	V=0, f=1kHz	—	30	—	pF
Output	Collector dark current	ICEO	VCE =20V, IF =0	—	—	0.1	uA
Transfer characteristics	Current transfer ratio	CTR	IF =± 1mA, VCE =5V	30	100	—	%
	Collector-emitter saturation voltage	VCE (sat)	IF =± 20mA, IC =1mA	—	0.1	0.3	V
	Isolation resistance	Riso	DC500V	5X10 <sup>10</sup>	10 <sup>11</sup>	—	ohm
	Floating capacitance	Cf	V=0, f=1MHz	—	0.6	1.0	pF
	Cut-off frequency	fc	VCC =5V, IC=2mA, RL =100ohm	—	80	—	kHz
	Response time (Rise)	tr	VCE=2V, IC=2mA, RL=100ohm	—	5	20	us
	Response time (Fall)	tf		—	4	20	us

## Data Curve

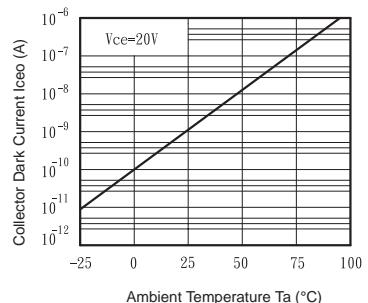
**Fig.1** Current Transfer Ratio vs. Forward Current



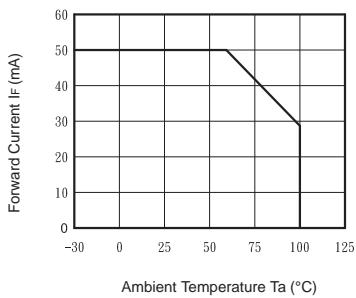
**Fig.2** Collector Power Dissipation vs. Ambient Temperature



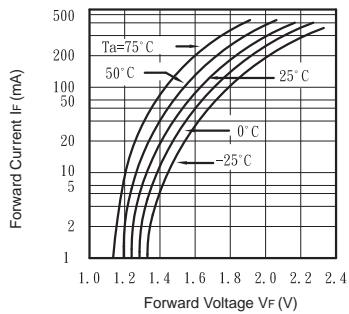
**Fig.3** Collector Dark Current vs. Ambient Temperature



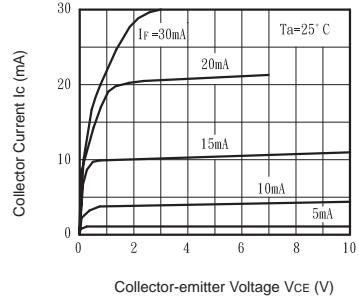
**Fig.4** Forward Current vs. Ambient Temperature



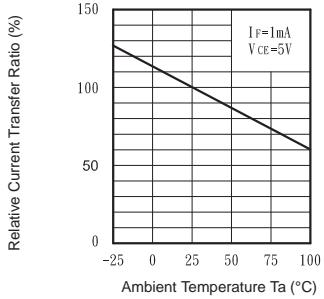
**Fig.5** Forward Current vs. Forward Voltage



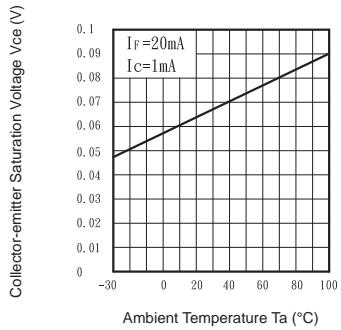
**Fig.6** Collector Current vs. Collector-emitter Voltage



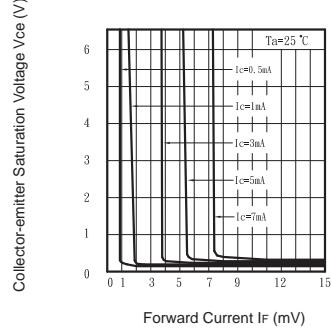
**Fig.7** Relative Current Transfer Ratio vs. Ambient Temperature



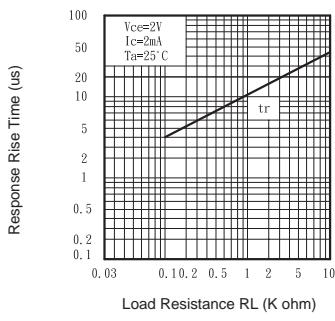
**Fig.8** Collector-emitter Saturation Voltage vs. Ambient Temperature



**Fig.9** Collector-emitter Saturation Voltage vs. Forward Current



**Fig.10** Response Time vs. Load Resistance



**Fig.11** Response Time vs. Load Resistance

