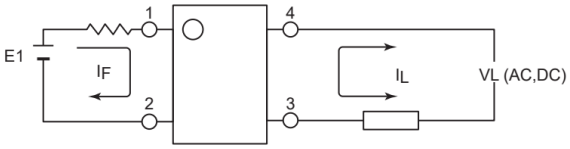
1 Form A OPT1217S

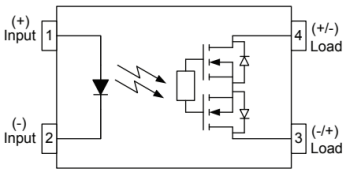
SOP-4 Load Voltage: 200V Load Current: 180mA

Parameter	Symbol	Rating	Units
Load Voltage	VL	200	V
Load Current	IL	0.18	A
On Resistance	Ron	5	Ω
I/O Breakdown Voltage	VISO	2500	Vrms

RoHS | Pb-Free | Halogen-Free | UL E534710



AC/DC



1. LED Anode
2. LED Cathode
3, 4. Drain (MOS FET)

PhotoRelays

Photorelays are the most reliable, technically advanced logic-to-power interface devices. Their basic function is to take a low current signal from a microprocessor to control the switching of both AC and DC loads, while providing an isolation barrier between logic and power. While this function is common to all relays, Photorelays provide distinct advantages over their mechanical counterparts including:

- Long life (No limit on mechanical and electrical lifetime)
- Bounce-free switching
- Higher speed and high frequency switching
- Higher sensitivity (less power consumption)
- Immunity to EMI or RFI
- No voltaic arc, bounce, and noise
- More resistant to vibration and impact
- AC or DC load switching
- Small package size

Function

PhotoRelays operate by taking a low level input current (<5mA) that energizes an input Infrared LED, which is optically-coupled to a Photo-diode array chip. This IC in turn generates a photo voltage that powers two MOSFETs typically connected in a source-to-source configuration, allowing for both AC and DC output loads. Photorelay basically move photons to accomplish their switching function, they incur no mechanical wear and tear, providing consistent reliable switching.

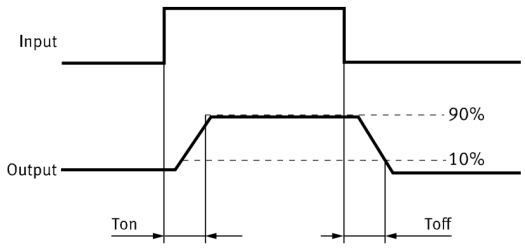
Applications

These advantages make Photorelays the ideal choice for:

- Telecom/Datacom switching
- Multiplexers
- Meter reading systems
- Data acquisition
- Medical equipment
- Battery monitoring
- I/O Sub-Systems
- Robotics
- Aerospace
- Home/Safety security systems
- Process Control
- Energy Management
- Reed Relay EMR Replacement
- Programmable Controllers

TYPES

Category	Output Rating		Package	Part No.	Packing Quantity
	Load Voltage	Load Current			
AC / DC	200V	0.18A	SOP-4	OPT1217S	2000pcs /reel



Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Value	Units	Note
Input	Continuous LED Current	IF	50	mA	
	Peak LED Current	IFP	1000	mA	f=100Hz, duty=1%
	LED Reverse Voltage	VR	5	V	
	Input Power Dissipation	Pin	75	mW	
Output	Load Voltage	VL	200	V(AC peak or DC)	
	Load Current	IL	0.18	A	
	Peak Load Current	IPeak	0.50	A	100ms (1 pulse)
	Output Power Dissipation	Pout	450	mW	
Total Power Dissipation		PT	500	mW	
I/O Breakdown Voltage		VI/O	2500	Vrms	RH=60%, 1min
Operating Temperature		Topr	-40 to 85	°C	
Storage Temperature		Tstg	-40 to 100	°C	
Pin Soldering Temperature		Tsol	260	°C	10 sec max.

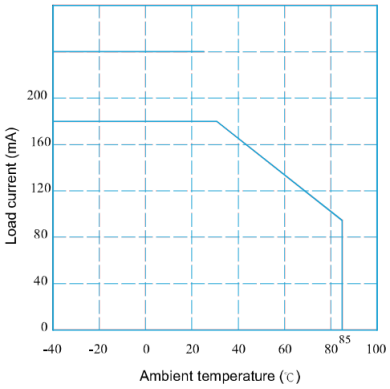
Electrical Characteristics (Ta = 25°C)

Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input *	LED Forward Voltage	VF		1.2	1.4	V	IF=10mA
	Operation LED Current	IFon		0.5	2.0	mA	
	Recovery LED Current	IFoff		0.35	0.5	mA	
	Recovery LED Voltage	VFoff	0.7			V	
Output	On-Resistance	Ron		5	8	Ω	IF=5mA, IL=100mA, within 1 sec.
	Off-State Leakage Current	ILeak	0.01	0.02	0.10	uA	VL=Rating
	Output Capacitance	Cout		70		pF	VL=0, f=1MHz
Transmission	Turn-On Time	Ton		0.4	0.8	ms	IF=5mA, IL=100mA,
	Turn-Off Time	Toff		0.05	0.2	ms	
Coupled	I/O Isolation Resistance	RI/O	10^{10}			Ω	DC500V
	I/O Capacitance	CI/O		0.8	1.5	pF	f=1MHz

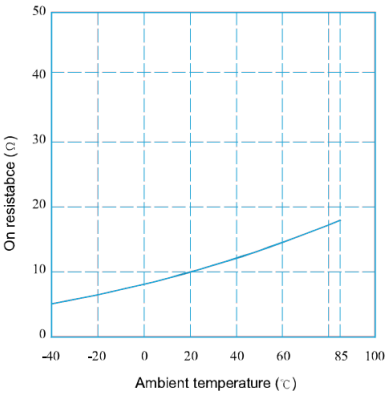
** To ensure satisfactory performance of the device across the temperature range, taking into account both circuit loss and interference, it is recommended to operate when the working condition is: IF (input current) ≥ 5 mA and ≤ 30 mA*

Engineering Data (Typical Characteristics)

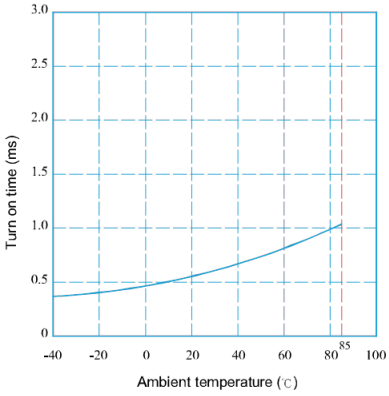
Load current Vs. Ambient temperature



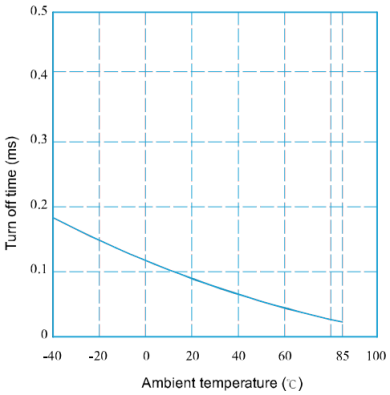
On resistance Vs. Ambient temperature



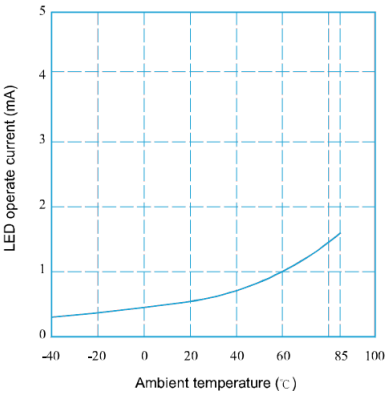
Turn on time Vs. Ambient temperature



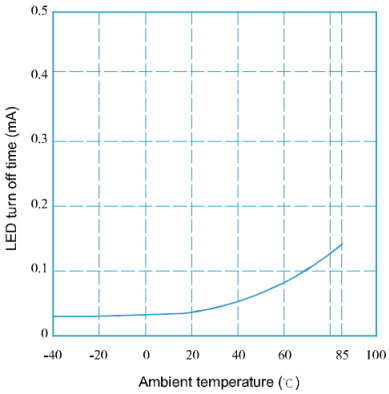
Turn off time Vs. Ambient temperature



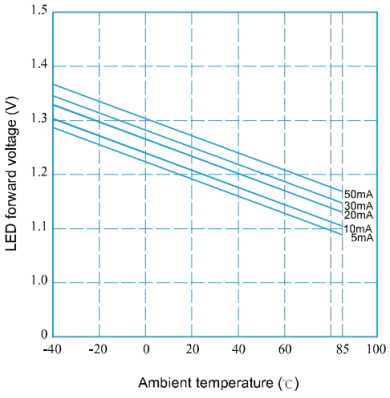
LED operate current Vs. Ambient temperature



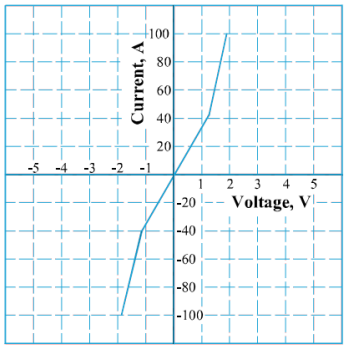
LED turn off current Vs. Ambient temperature



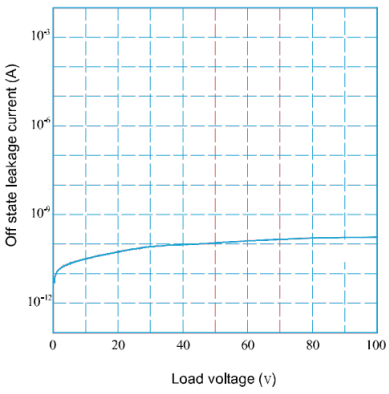
LED forward voltage Vs. Ambient temperature



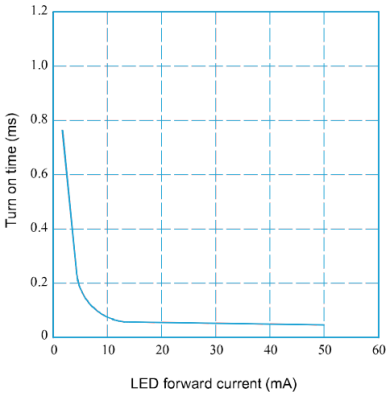
Voltage Vs. currennt characteristics of output at MOS portion



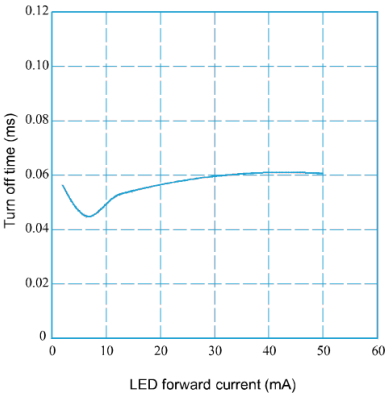
Off state leakage current Vs. Load voltage characteristics



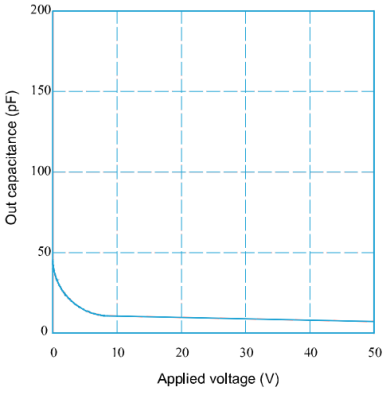
LED foward current Vs. turn on time characteristics



LED foward current Vs. turn off time characteristics



Applied voltage Vs. output capacitance characteristics

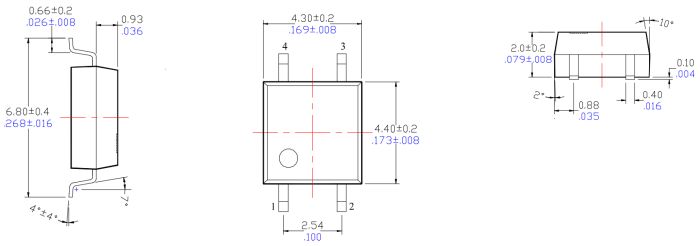


Dimensions and Package

Marking

YY = YEAR
WW = WEEK

Surface mount terminal type



Unit : mm / inch *Tolerance : ±0.1 / ±.004*

Label

OPTOMOS

QC PASS

Part No. **OPT1217S**

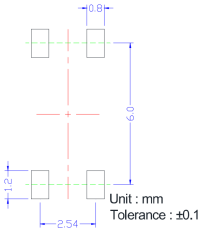
Lot No. XXXXXXXXXX

Customer Part No.

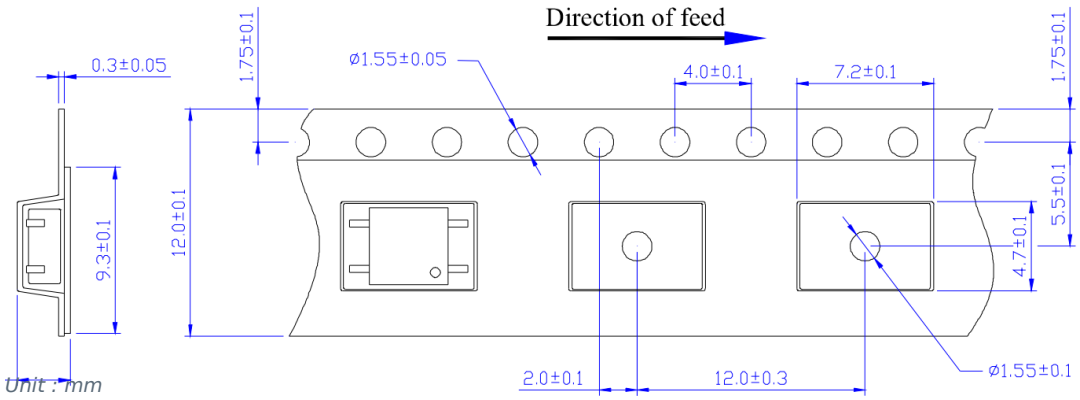
Q'ty **2000 PCS**

WWW.OPTOMOS.COM

Recommended mounting pad (Top view)

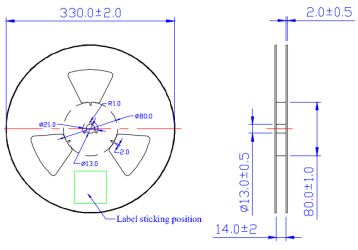


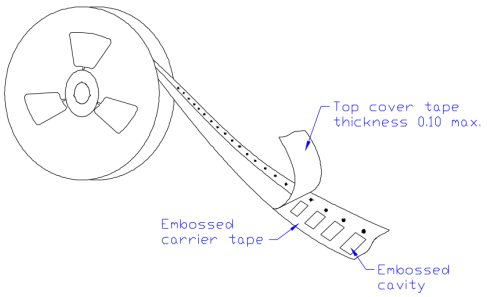
Tape dimensions



Unit : mm

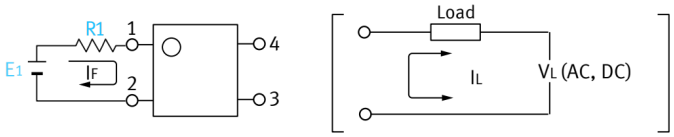
Dimensions of tape reel





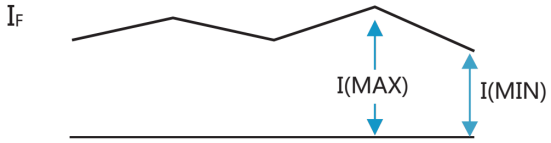
Using Methods

Examples of resistance value to control LED forward current (IF = 5mA)



E1	R1 (Approx)
3.3V	300 Ω
5.0V	600 Ω

LED forward current must be more than 2mA, at IF(MIN), and less than 30mA, at IF(MAX).



Recommended Operating Conditions

Please obey the following conditions to ensure proper device operation and resetting. Input LED current (Recommended value):

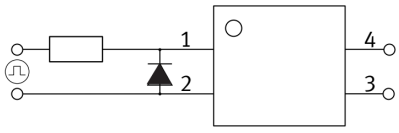
Characteristic	Symbol	Min	Typ.	Max	Unit
Forward current	IF	5.0	7.0	30	mA

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics. Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Characteristic	Symbol	Min	Typ.	Max	Unit
Load voltage (Peak AC)	VL	—	—	440	V

Surge voltages at the input

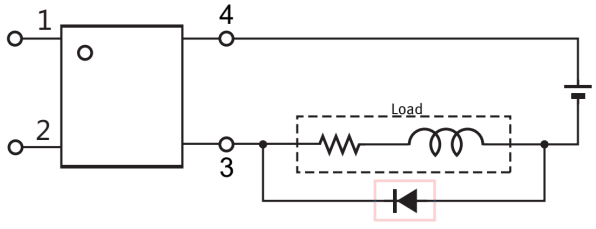
If reverse surge voltages are present at the input terminals, connect a diode in reverse parallel across the input terminals and keep the reverse voltages below the reverse breakdown voltage. Typical circuits are below shown.



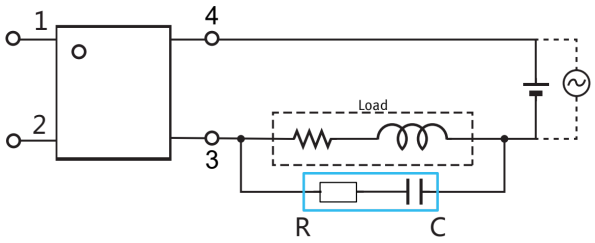
Protection Circuit

Output spike voltages: if an inductive load generates spike voltages which exceed the absolute maximum rating, the spike voltage shall be limited.

Clamp diode is connected in parallel with the load.
Absorb capacity with external diode.



CR Snubber is connected in parallel with the load.
Absorb capacity with buffer capacity.



When adding diodes, buffer circuits (C-R), and other protections, they need to be installed near the MOS RELAY to be effective. Adding protection elements may result in a slow reset time, so adjust them according to the actual situation before use.

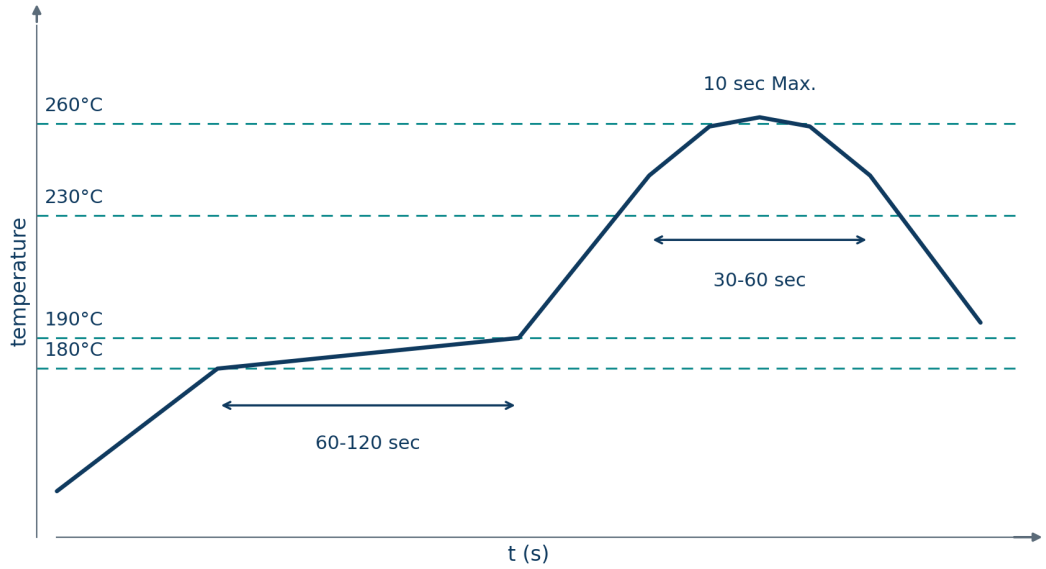
Note: When developing designs using this product, perform the expected performance of the equipment under the operating conditions recommended by the guidelines in this document. Continuous use under heavy loads (including, but not limited to, the application of high temperatures/current/voltage and significant changes in temperature, etc.) may result in deterioration of the reliability of this product.

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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