



# APSEMI

SiC Photo Mos Relay 1 Form A APV278AE\_AEH  
SMD-5/DIP-5 Load Voltage:1800V Load Current:30mA



E534710

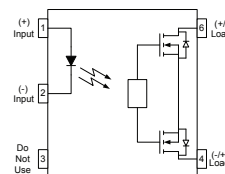
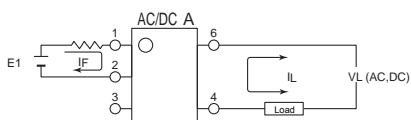
Parameter	Symbol	Rating	Units
Load Voltage	$V_L$	1800	V
Load Current	$I_L$	0.030	A
Leakage Current	$I_{Leak}$	0.1	$\mu A$
Low Out Capacitance	$C_{out}$	8	pF



SMD-5



DIP-5



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

## APSEMI PhotoRelays

APSEMI 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 have voltaic arc, bounce, and noise
- More resistant to vibration and impact
- AC or DC load switching
- Small package size

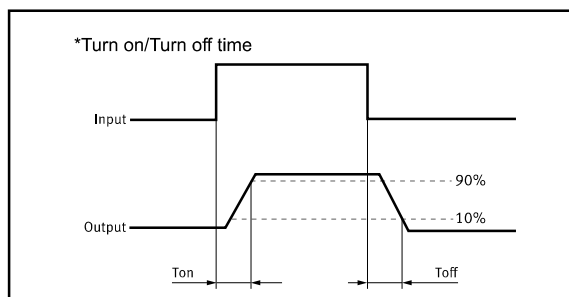
## Applications

These advantages make APSEI 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

## TPYES

Category	Output Rating		Package	Part No.	Packing Quantity
	Load Voltage	Load Current			
AC/DC	1800V	30mA	DIP-5	APV278AE	50pcs /tube
			SMD-5	APV278AEH	1000pcs /reel





## Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Value	Units	Note
Input	Continuous LED Current	I <sub>F</sub>	50	mA
	Peak LED Current	I <sub>FP</sub>	1000	mA
	LED Reverse Voltage	V <sub>R</sub>	5	V
	Input Power Dissipation	P <sub>In</sub>	75	mW
Output	Load Voltage	V <sub>L</sub>	1800	V(AC peak or DC)
	Load Current	I <sub>L</sub>	30	mA
	Peak Load Current	I <sub>Peak</sub>	150	mA
	Output Power Dissipation	P <sub>out</sub>	450	mW
Total Power Dissipation		P <sub>T</sub>	500	mW
I/O Breakdown Voltage		V <sub>I/O</sub>	5000	V <sub>rms</sub>
Operating Temperature		T <sub>opr</sub>	-40 to 85	°C
Storage Temperature		T <sub>stg</sub>	-40 to 100	°C
Pin Soldering Temperature		T <sub>sol</sub>	260	°C

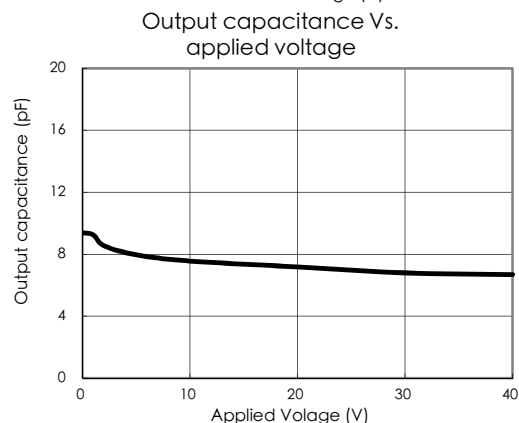
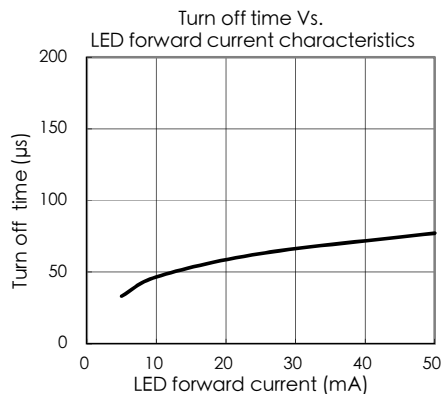
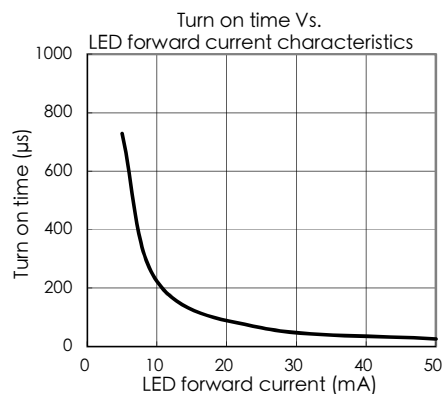
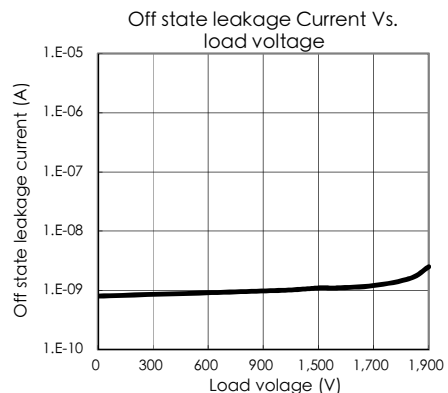
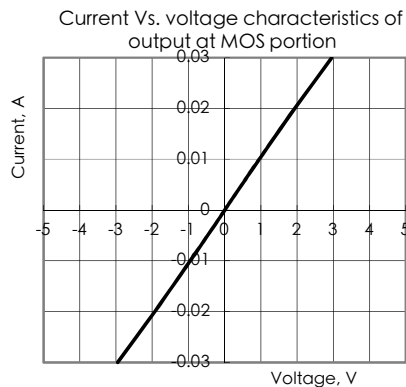
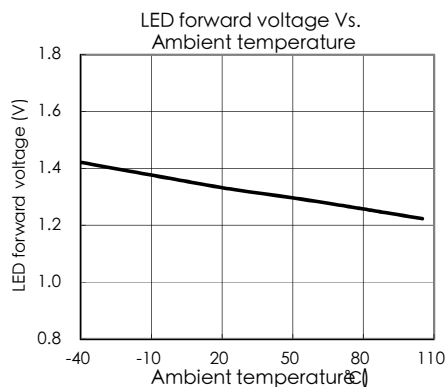
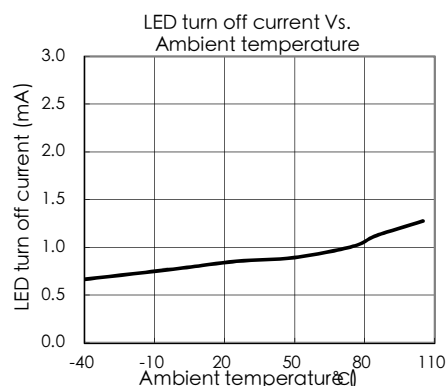
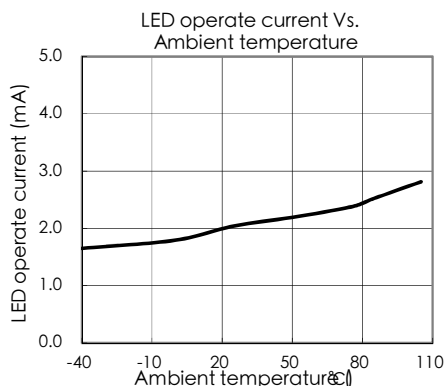
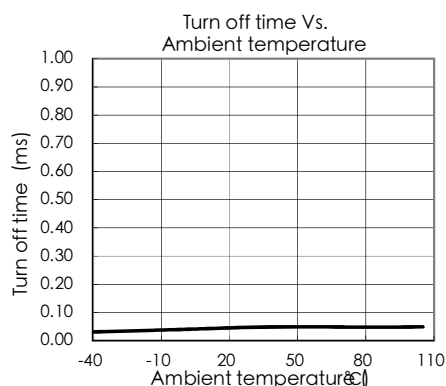
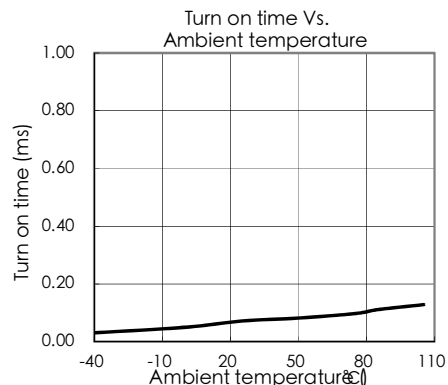
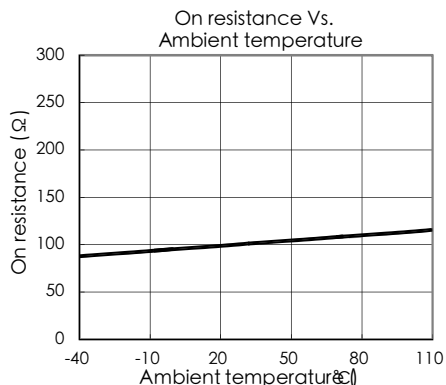
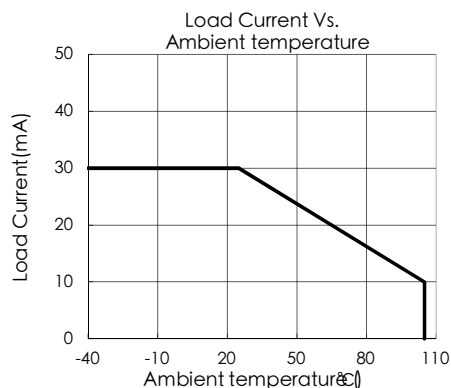
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	LED Forward Voltage	V <sub>F</sub>	1.33	1.5	V	I <sub>F</sub> =10mA
	Operation LED Current	I <sub>Fon</sub>	1.0	2.0	mA	
	Recovery LED Current	I <sub>Foff</sub>	0.35	0.8	mA	
	Recovery LED Voltage	V <sub>Foff</sub>	0.7		V	
Output	On-Resistance	R <sub>on</sub>	84	88	112	Ω
	Off-State Leakage Current	I <sub>Leak</sub>	0.01	0.03	0.10	uA
	Output Capacitance	C <sub>out</sub>	12			pF
Transmis sion	Turn-On Time	T <sub>on</sub>	0.08	0.1	ms	I <sub>F</sub> =10mA, I <sub>L</sub> =Rating
	Turn-Off Time	T <sub>off</sub>	0.05	0.1	ms	
Coupled	I/O Isolation Resistance	R <sub>I/O</sub>	10 <sup>10</sup>			Ω
	I/O Capacitance	C <sub>I/O</sub>	0.8	1.3		pF

Please obey the following conditions to ensure proper device operation and resetting. Input LED current (Recommended value): I<sub>F</sub> ≥5mA and ≤30mA



## Reference Data



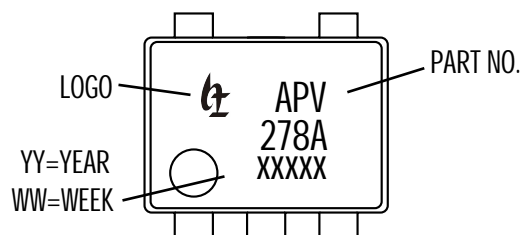


# APSEMI

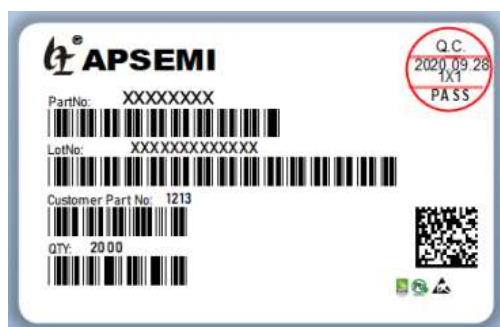
SiC Photo Mos Relay 1 Form A APV278AE\_AEH  
SMD-5/DIP-5 Load Voltage:1800V Load Current:30mA

## Dimensions and DIP-5 Package Unit: mm

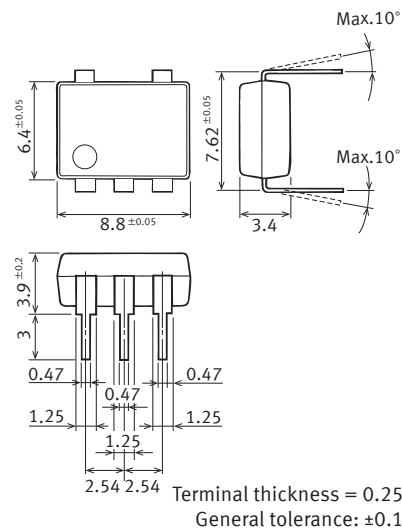
### Marking



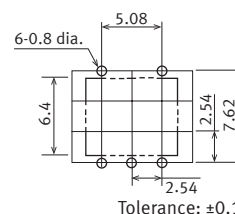
### Lable



### Through hole terminal type

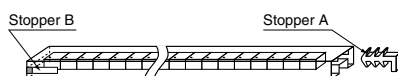


### PC board pattern (Bottom view)



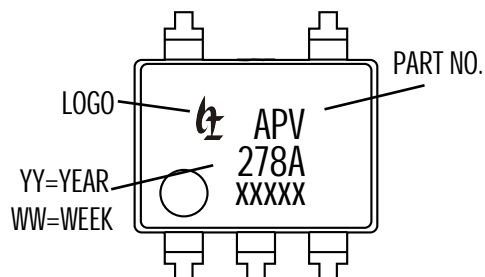
## DIP Tape dimensions Unit : mm

Devices are packaged in a tube so that pin No. 1 is on the stopper B side. Observe correct orientation when mounting them on PC boards.

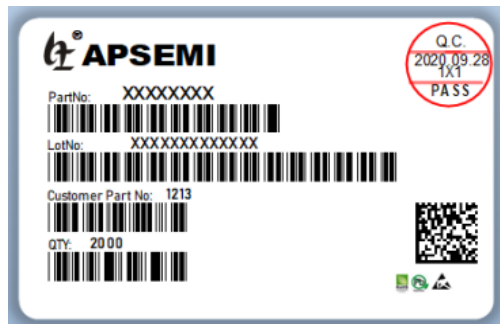


### Dimensions and SMD-5 Package Unit: mm

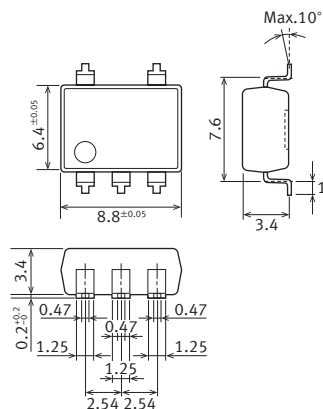
### Marking



## Lable

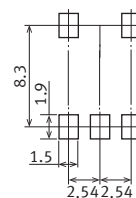


Surface mount terminal type



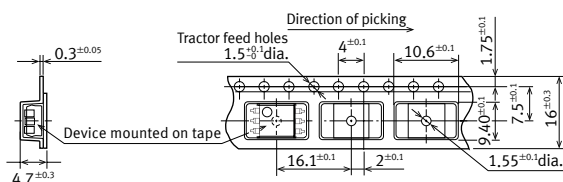
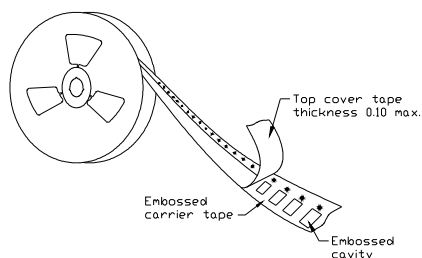
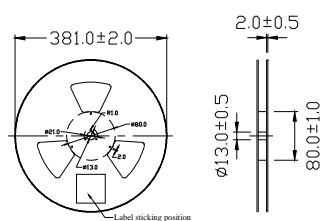
Terminal thickness = 0.25  
General tolerance:  $\pm 0.1$

Recommended mounting pad  
(Top view)



Tolerance:  $\pm 0.1$

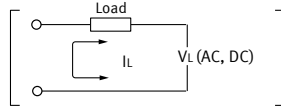
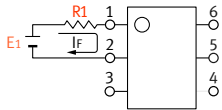
**Tape dimensions ( tape reel )**





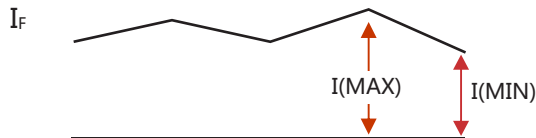
## Using Methods

Examples of resistance value to control LED forward current ( $I_F=5\text{mA}$ )



E1	R1 (Approx)
3.3V	300 $\Omega$
5.0V	600 $\Omega$
12V	1.9K $\Omega$
24V	4.1K $\Omega$

LED forward current must be more than 5mA , at  $I(\text{MIN})$  ,and less than 30mA , at  $I(\text{MAX})$ .



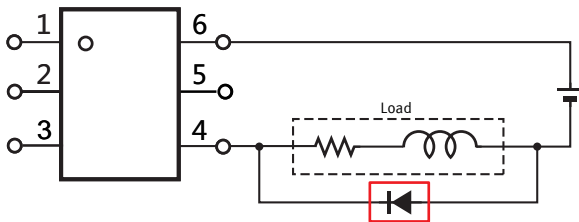
## Recommended Operating Conditions

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

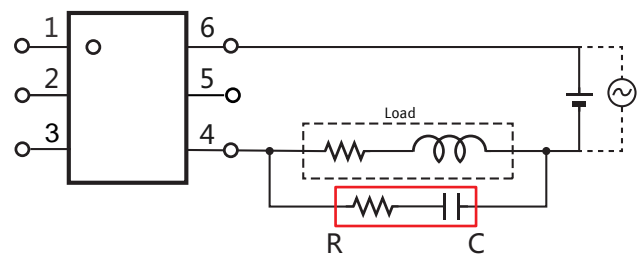
Characteristic	Symbol	Min	Typ.	Max	Unit
Forward current	$I_F$	5.0	7.0	30	mA

## Protection Circuit

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.



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