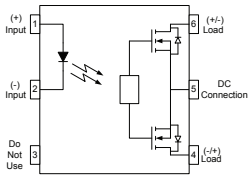
Parameter	Symbol	Rating	Units
Load Voltage	V_L	600	V
Load Current	I_L	0.4	A
On-Resistance	R_{on}	10	Ω
On-Resistance	V/IO	5000	Vrms

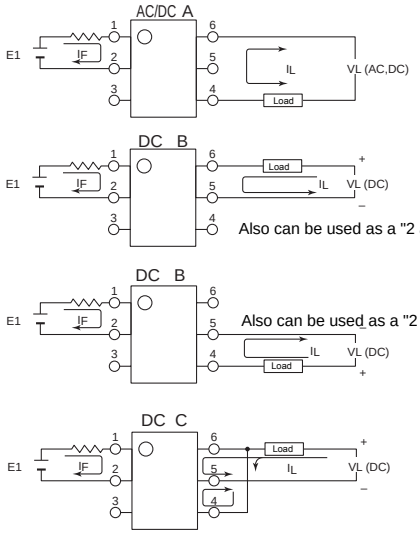
E534710

SMD-6

DIP-6



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

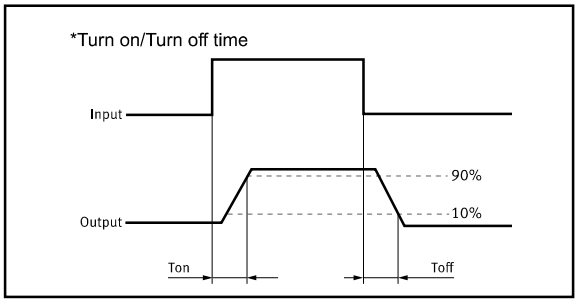
Applications

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	600V	0.4A	DIP-6	APV256BE	50pcs /tube
			SMD-6	APV256BEH	1000pcs /reel



RATING
Absolute maximum ratings

Parameter		Symbol	Min.	Max.	Units	Note
Storage Temperature		T_S	-55	125	°C	
Operating Temperature		T_A	-40	85	°C	
Junction Temperature		T_J		125	°C	
Lead Soldering Cycle	Temperature			260	°C	
	Time			10	sec	
Input Current	Average	I_F		25	mA	
	Surge			50	mA	
	Transient			1000	mA	
Reversed Input Voltage		V_R		5	V	
Input Power Dissipation		P_{IN}		40	mW	
Output Power Dissipation	Connection A	P_O		640	mW	
	Connection B			640	mW	
Average Output Current (T_A=25°C, T_C ≤ 100°C)	Connection A	I_O		0.2	A	
	Connection B			0.4	A	
Output Voltage (T_A=25°C)	Connection A	V_O	- 600	600	V	1
	Connection B		0	600	V	
ESD Human Body Model: MIL-STD-883 Method 3015.7				4	kV	
Solder Reflow Temperature Profile		See Lead Free IR Profile				

Recommended operating conditions
Please use under recommended operating conditions to obtain expected characteristics.

Parameter	Symbol	Min.	Max.	Units	Note
Input Current (ON)	$I_{F(ON)}$	3	20	mA	
Input Voltage (OFF)	$V_{F(OFF)}$	0	0.8	V	
Operating Temperature	T_A	-40	+85	°C	

Electrical characteristics

Electrical Specifications (DC)

Over recommended operating T_A = - 40°C to 85°C, I_F = 5mA to 10mA, unless otherwise specified.

Parameter		Sym.	Min.	Typ.	Max.	Units	Conditions	Fig.	Note
Output Withstand Voltage		$\|V_{O(OFF)}\|$	600	650		V	V_F=0.8V, I_O=250μA, T_A=25°C		
			550			V	V_F=0.8V, I_O=250μA		
Output On-Resistance	Connection A	$R_{(ON)}$		10	16	Ω	I_F=5mA, I_O=0.4A, Pulse ≤30ms, T_A=25°C	3 10	- 6
	Connection B	$R_{(ON)}$		2.5	4	Ω	I_F=5mA, I_O=0.4A, Pulse ≤30ms, T_A=25°C	11	6
Output Leakage Current		$I_{O(OFF)}$		0.001	0.1	μA	V_F=0.8V, V_O=600V, T_A=25°C	5	-
					1	μA	V_F=0.8V, V_O=550V	4	-
Output Off-Capacitance		$C_{(OFF)}$		500		pF	V_F=0.8V, V_O=0V, f=1MHz	6	-
Output Offset Voltage		$\|V_{(OS)}\|$		1		μV	I_F=5mA, I_O=0mA		
Input Reverse Breakdown Voltage		V_R	5			V	I_R=10μA		
Input Forward Voltage		V_F	1.1	1.3	1.7	V	I_F=5mA	7,8	-

Switching Specifications (AC)

Over recommended operating T_A = - 40°C to 85°C, I_F = 5mA to 10mA, unless otherwise specified.

Parameter	Sym.	Min.	Typ.	Max.	Units	Conditions	Fig.	Note
Turn On Time	T_{ON}		0.7	2.5	ms	I_F=5mA, I_O=0.4A, T_A=25°C	12,16	
				5.0	ms	I_F=5mA, I_O=0.4A	13,16	
			0.4	1.5	ms	I_F=10mA, I_O=0.4A, T_A=25°C	12,16	
				3.0	ms	I_F=10mA, I_O=0.4A	13,16	
Turn Off Time	T_{OFF}		0.07	0.5	ms	I_F=5mA, I_O=0.4A, T_A=25°C	14,16	
				1	ms	I_F=5mA, I_O=0.4A	15,16	
			0.06	0.2	ms	I_F=10mA, I_O=0.4A, T_A=25°C	14,16	
				0.5	ms	I_F=10mA, I_O=0.4A	15,16	
Output Transient Rejection	dV_O/dt	1	7		kV/μs	ΔV_O=600V, $R_M \geq$ 1MΩ, C_M=1000pF, T_A=25°C	17	5
Input-Output Transient Rejection	dV_{I-O}/dt	1	20		kV/μs	V_{DD}=5V, ΔV_{I-O}=1000V, R_L=1kΩ, C_L=25pF, T_A=25°C	18	5

Engineering Data

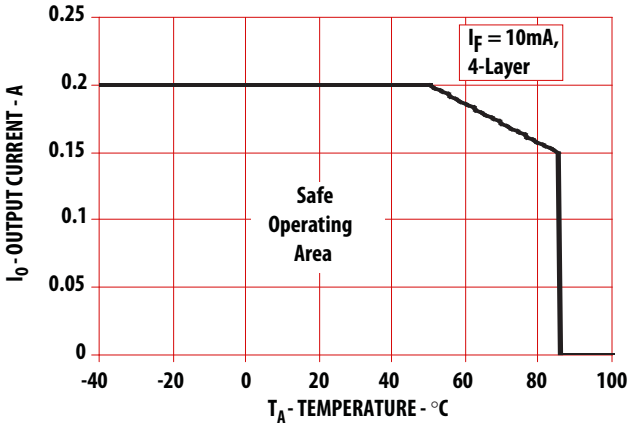


Figure 1. Maximum Output Current Rating vs Ambient Temperature (AC/DC Connection)

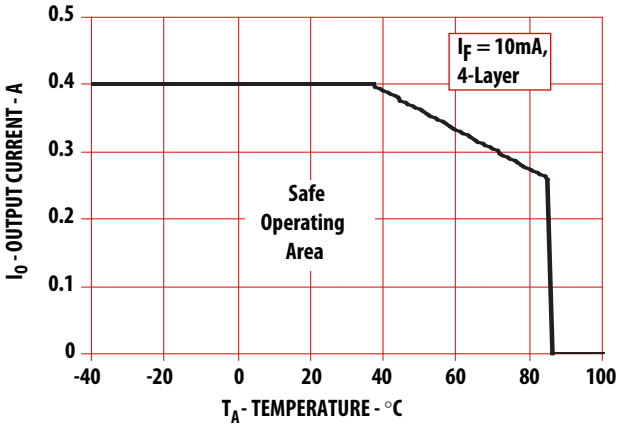


Figure 2. Maximum Output Current Rating vs Ambient Temperature (DC Connection)

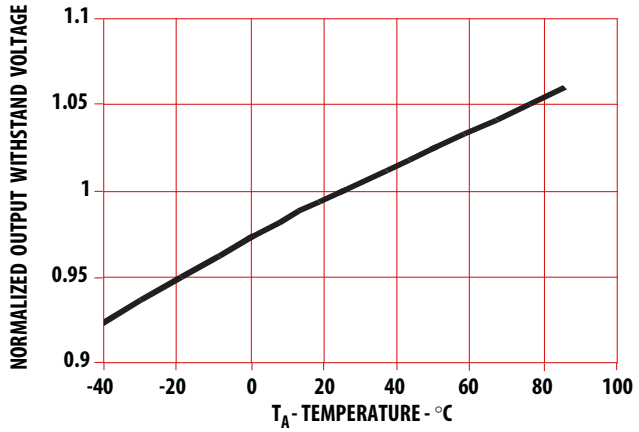


Figure 3. Normalized Typical Outupt Withstand Voltage vs Temperature

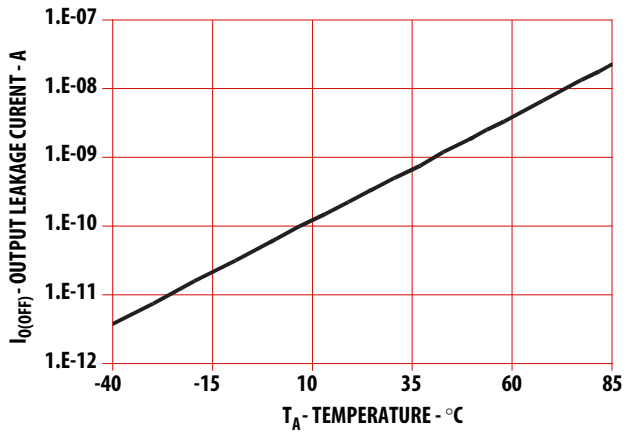


Figure 4. Typical Output Leakage Current vs Ambient Temperature

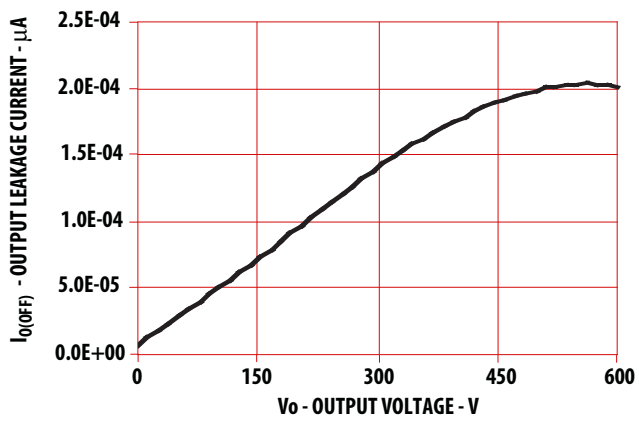


Figure 5. Typical Output Leakage Current vs Output Voltage

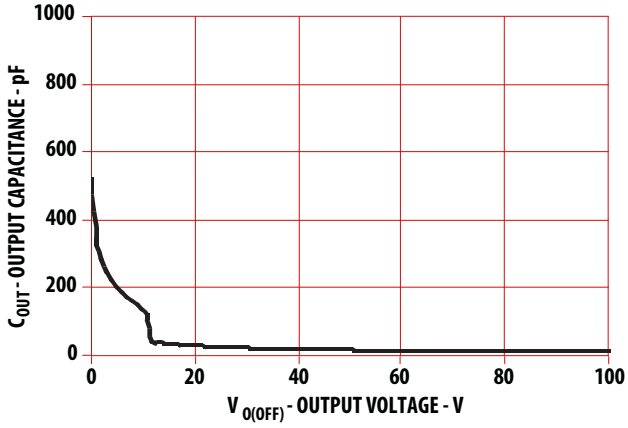


Figure 6. Typical Output Off-State Capacitance vs Output Voltage

Engineering Data

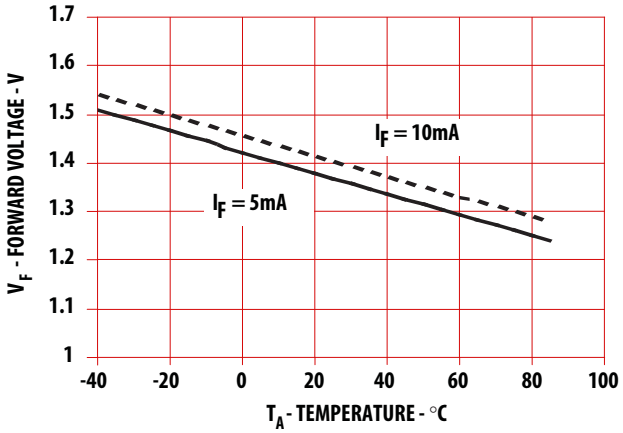


Figure 7. Typical Forward Voltage vs Ambient Temperature

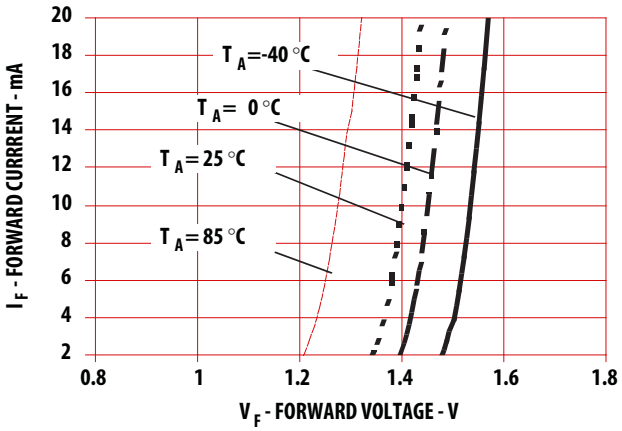


Figure 8. Typical Forward Current vs Forward Voltage

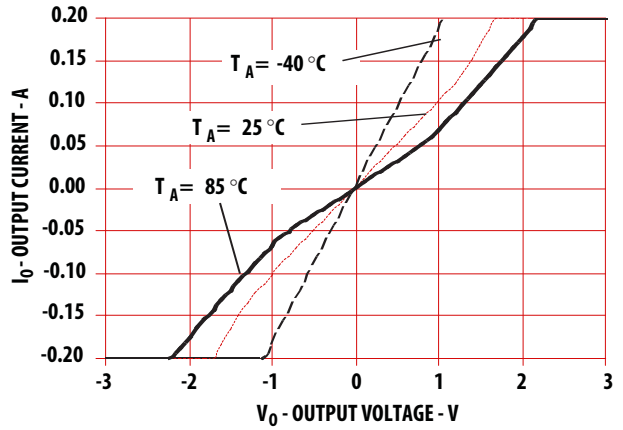


Figure 9. Typical Output Current vs Output Voltage

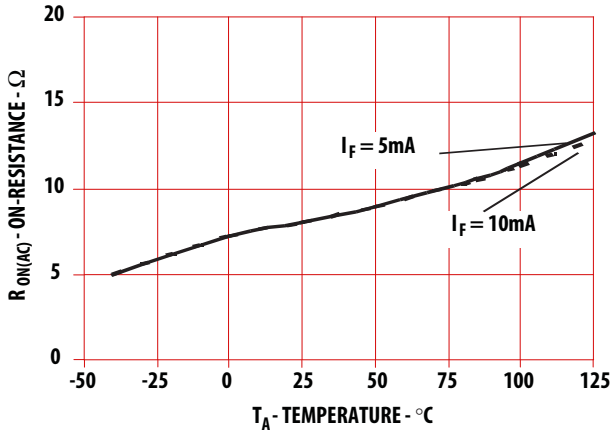


Figure 10. Typical On Resistance (AC/DC Connection) vs Temperature

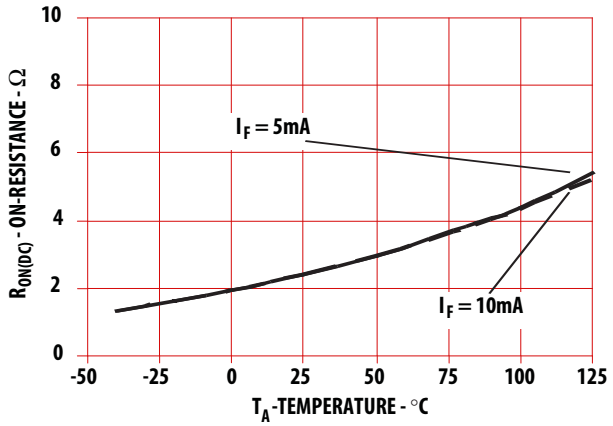


Figure 11. Typical On Resistance (DC Connection) vs Temperature

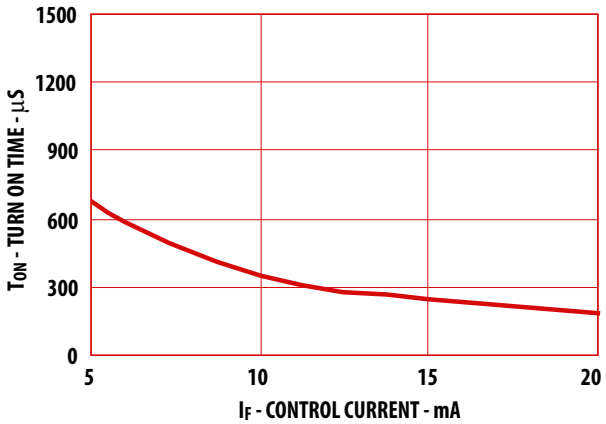
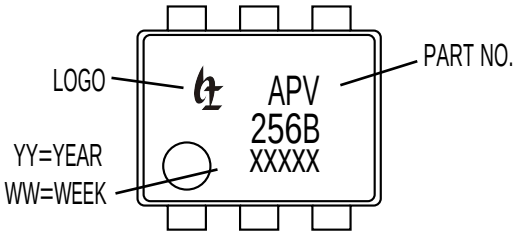


Figure 12. Typical Turn On Time vs Input Current

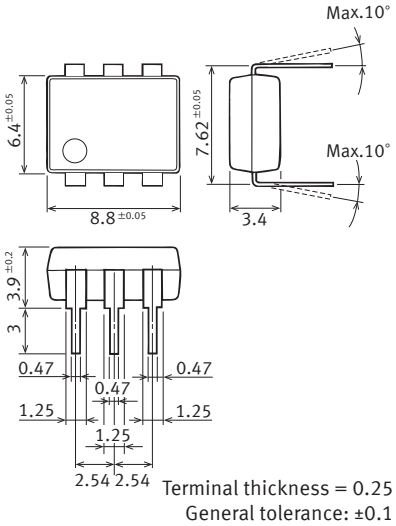
Dimensions and DIP-6 Package

Unit: mm

Marking



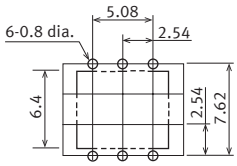
Through hole terminal type



Terminal thickness = 0.25
General tolerance: ±0.1

Lable

PC board pattern (Bottom view)

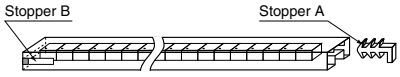


Tolerance: ±0.1

DIP Tape dimensions

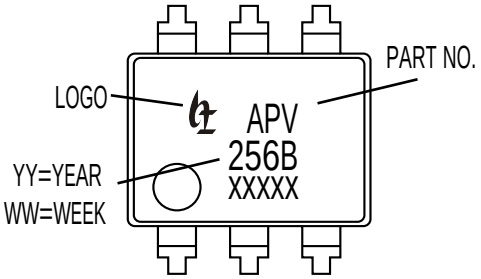
Unit : mm

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.

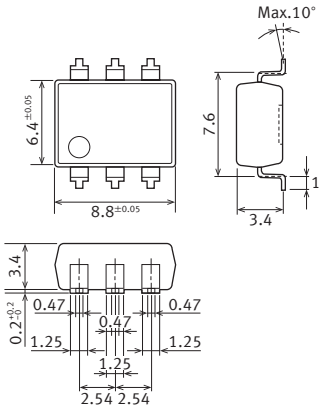


Dimensions and SMD-6 Package Unit: mm

Marking



Surface mount terminal type

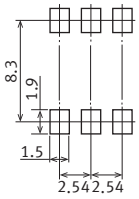


Terminal thickness = 0.25
General tolerance: ±0.1

Lable

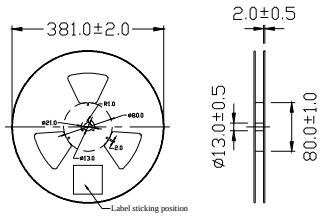
Recommended mounting pad

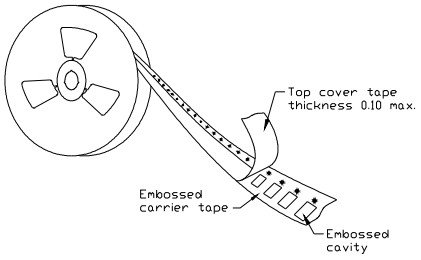
(Top view)

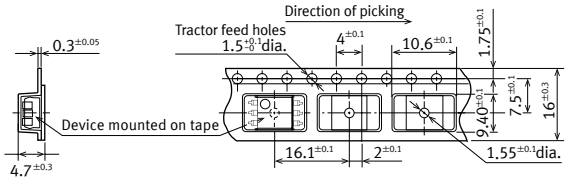


Tolerance: ±0.1

Tape dimensions (tape reel)

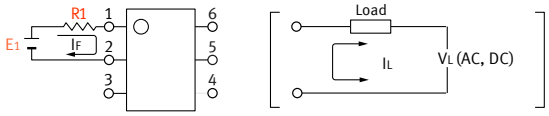






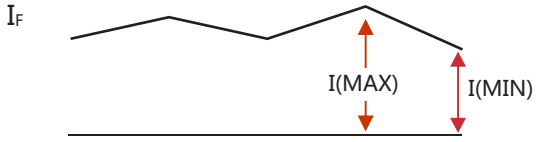
Using Methods

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



E1	R1 (Approx)
3.3V	300 Ω
5.0V	600 Ω
12V	1.9KΩ
24V	4.1KΩ

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



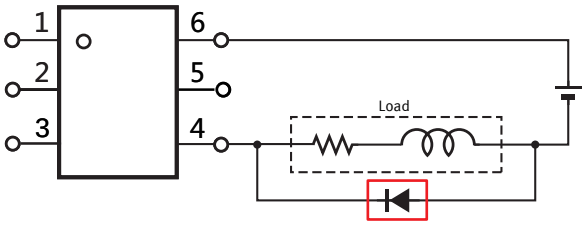
Recommended Operating Conditions

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

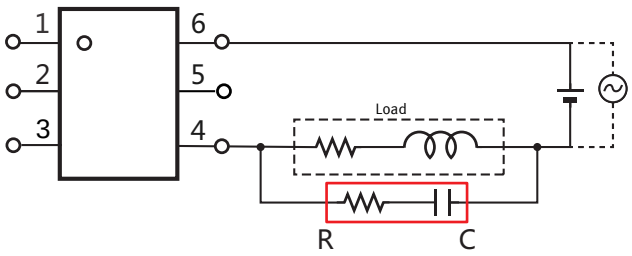
Characteristic	Symbol	Min	Typ.	Max	Unit
Forward current	I_F	5.0	7.0	30	mA

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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