



### Features

- Low driver power requirements (TTL/CMOS Compatible)
- Contact form: Normally-Off (1b)
- Load voltage: 60V max.
- On-Resistance: 3Ω max.
- 3750Vrms Input/Output isolation
- Tape & Reel version available

### Applications

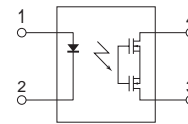
- Telecommunications (PC, Electronic notepad)
- Measuring and Testing equipment
- Industrial control
- Security equipments
- High speed inspection machine



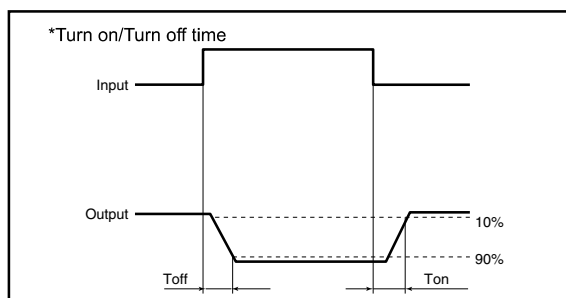
DIP4



SMD4



1. LED Anode
2. LED Cathode
3. Drain (MOSFET)
4. Drain (MOSFET)



### TYPES

Category	Output rating		Package	Part No.	Packing quantity
	Load voltage	Load current			
AC/DC	60V	500mA	DIP4	GAQY412E	50pcs/tube
			SMD4	GAQY412EH	1000pcs/reel

Absolute Maximum Ratings (Ambient Temperature: 25°C)

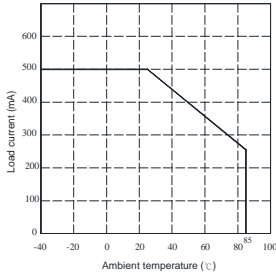
Item		Symbol	Value	Units	Note
Input	Continuous LED Current	I <sub>F</sub>	50	mA	
	Peak LED Current	I <sub>FP</sub>	1000	mA	f=100Hz, duty=1%
	LED Reverse Voltage	V <sub>R</sub>	5	V	
	Input Power Dissipation	P <sub>In</sub>	75	mW	
Output	Load Voltage	V <sub>L</sub>	60	V(AC peak or DC)	
	Load Current	I <sub>L</sub>	500	mA	
	Peak Load Current	I <sub>Peak</sub>	0.6	A	1ms(1 pulse)
	Output Power Dissipation	P <sub>Out</sub>	300	mW	
Total Power Dissipation		P <sub>T</sub>	350	mW	
I/O Breakdown Voltage		V <sub>I/O</sub>	3750	V <sub>rms</sub>	RH=60%, 1min
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	10 sec max.

Electrical Specifications (Ambient Temperature: 25°C)

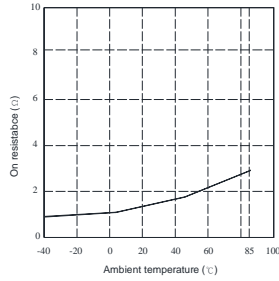
Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	LED Forward Voltage	V <sub>F</sub>		1.2	1.5	V	I <sub>F</sub> =10mA
	Operation LED Current	I <sub>Fon</sub>		0.5	3.0	mA	
	Recovery LED Current	I <sub>Foff</sub>	0.1	0.4		mA	
	Recovery LED Voltage	V <sub>Foff</sub>	0.5			V	
Output	On-Resistance	R <sub>on</sub>		1	3	Ω	I <sub>F</sub> =0mA, I <sub>L</sub> =50mA, Time to flow is within 1 sec.
	Off-State Leakage Current	I <sub>Leak</sub>			1	uA	I <sub>F</sub> =5mA, V <sub>L</sub> =60V
	Output Capacitance	C <sub>out</sub>		165		pF	I <sub>F</sub> =5mA, V <sub>L</sub> =0, f=1MHz
Transmis sion	Turn-On Time	T <sub>on</sub>		0.5	1.5	ms	I <sub>F</sub> =5mA, I <sub>L</sub> =50mA
	Turn-Off Time	T <sub>off</sub>		0.25	2.0	ms	
Coupled	I/O Isolation Resistance	R <sub>I/O</sub>	10 <sup>10</sup>			Ω	DC500V
	I/O Capacitance	C <sub>I/O</sub>		0.8		pF	f=1MHz

## Reference Data

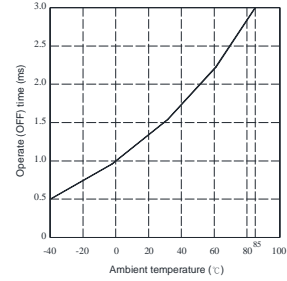
Load current Vs. Ambient temperature



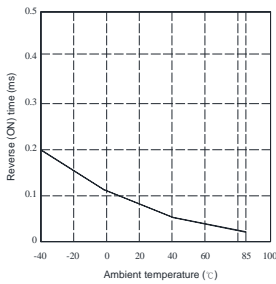
On resistance Vs. Ambient temperature



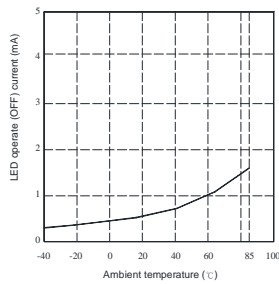
Operate (OFF) time Vs. Ambient temperature



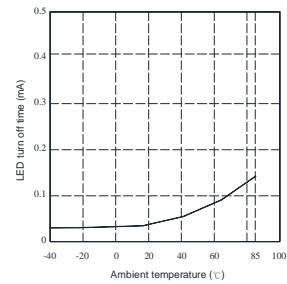
Reverse (ON) time Vs. Ambient temperature



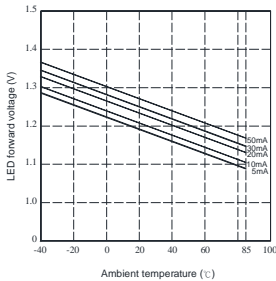
LED operate (OFF) current Vs. Ambient temperature



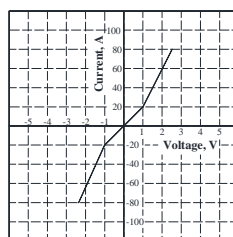
LED turn off current Vs. Ambient temperature



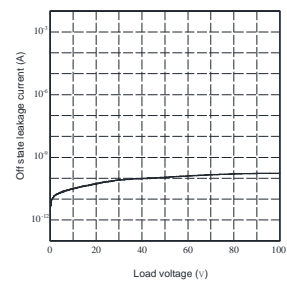
LED forward voltage Vs. Ambient temperature



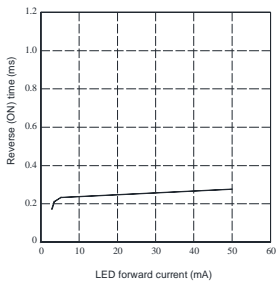
Voltage Vs. current characteristics of output at MOS portion



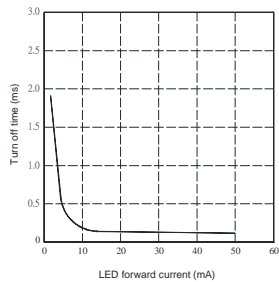
Off state leakage current Vs. Load voltage characteristics



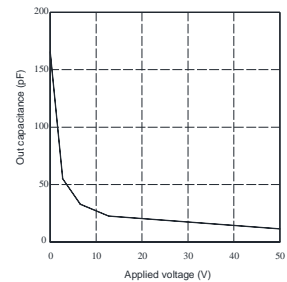
LED forward current Vs. Reverse (ON) time characteristics



LED forward current Vs. Operate (OFF) time characteristics



Applied voltage Vs. output capacitance characteristics

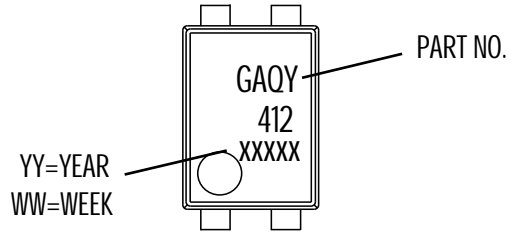


## Dimensions

### 4-DIP



DIP4



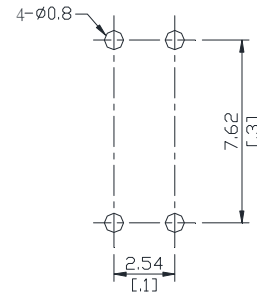
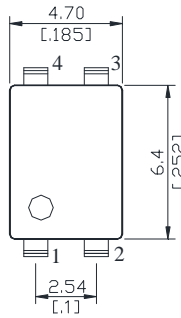
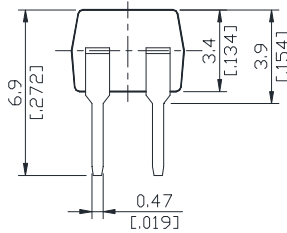
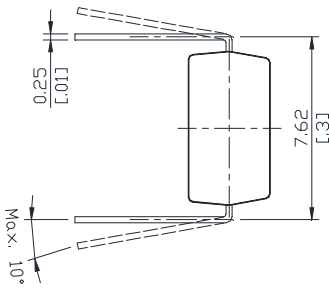
mm inch

### Dimensions

#### Through hole terminal type

#### PC board pattern

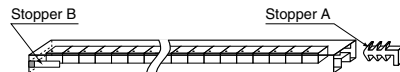
(TOP VIEW)



Unit : mm inch  
Tolerance : +0.2 +.007

### DIP type

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.

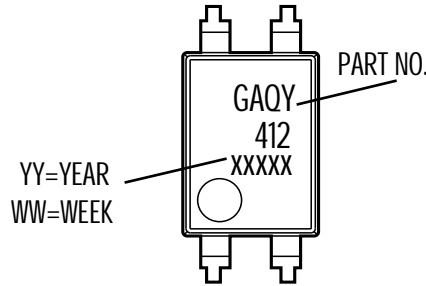


## Dimensions

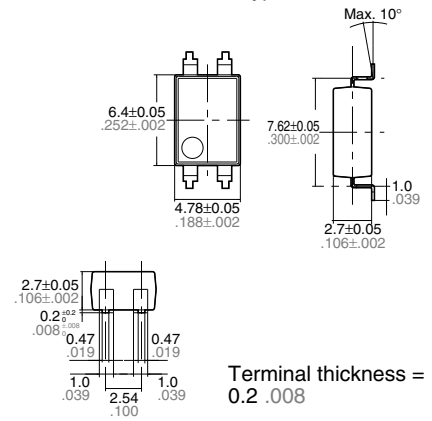
### 4-SMD



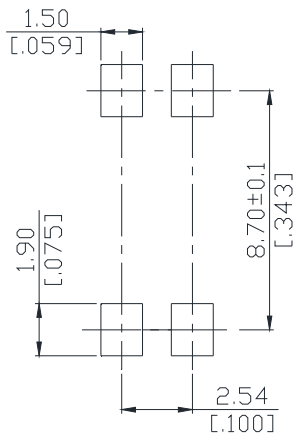
SMD4



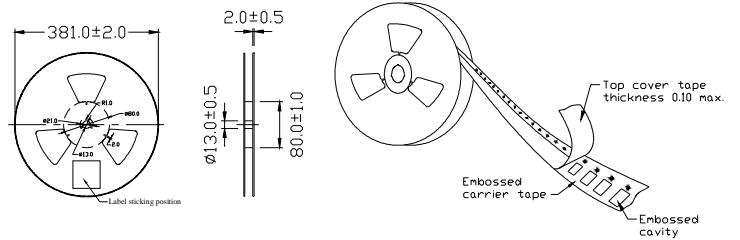
### Surface mount terminal type



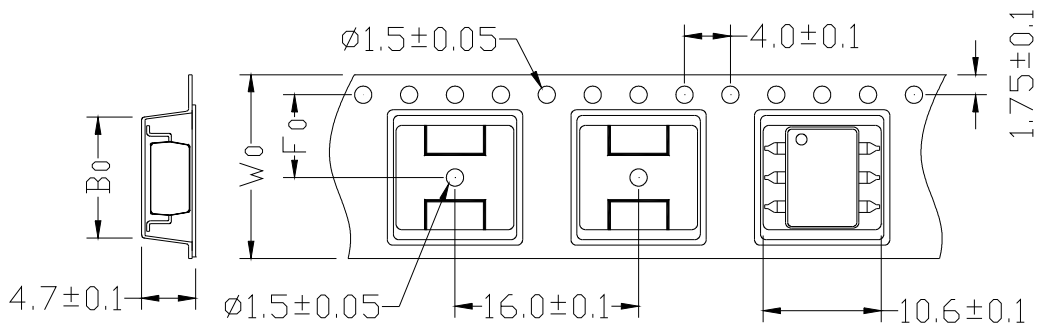
### PC board pattern (Top view)



### Tape dimensions



### Dimensions of tape reel



TYPE	B0±0.1	F0±0.1	W0±0.1	13"REEL/PCS
4P	5.3	7.5	16	1000