

High cost-performance DIP4&SOP4-pin type with reinforced insulation

FEATURES

1. Reinforced insulation of 5,000 V

More than 0.4 mm internal insulation distance between inputs and outputs.
Con-forms to EN41003, EN60950 (reinforced insulation).

2. Controls low-level analog signals

PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

3. High sensitivity and low on-resistance

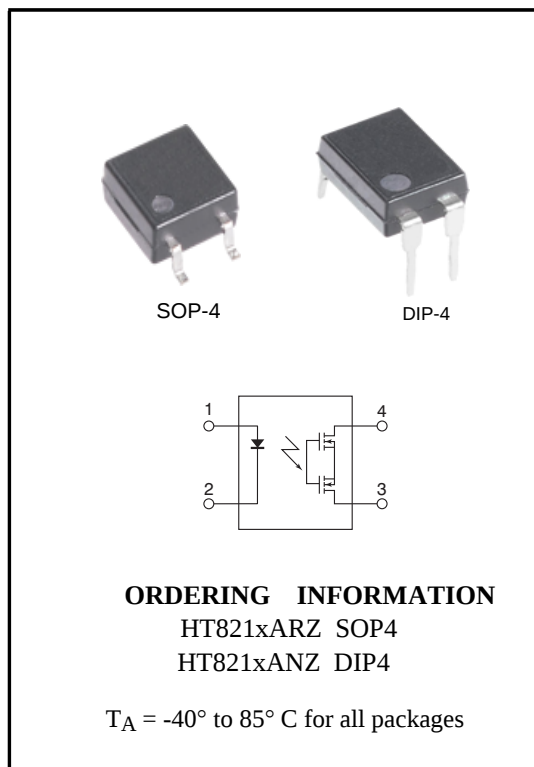
Can control max. 0.13 A load current with 5 mA input current.

Low on-resistance of typ. 25Ω (HT8211A).

4. Low-level off state leakage current of max. 1 μA

TYPICAL APPLICATIONS

- Modem
- Telephone equipment
- Security equipment
- Sensing equipment



RATING

1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

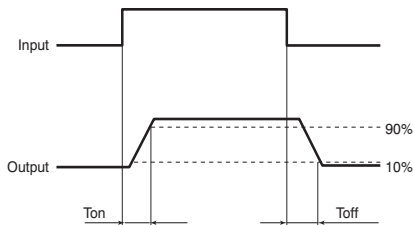
Item		Symbol	HT8211AR(N)	HT8212AR(N)	HT8210AR(N)	HT8214AR(N)	HT8216AR(N)	Remarks
Input	LED forward current	I _F	50mA					
	LED reverse voltage	V _R	5 V					
	Peak forward current	I _{FP}	1 A					f =100 Hz, Duty factor = 0.1%
	Power dissipation	P _{in}	75mW					
Output	Load voltage (peak AC)	V _L	30 V	60 V	350 V	400 V	650 V	
	Continuous load current	I _L	1 A	0.55 A	0.13 A	0.12 A	0.15 A	Peak AC, DC
	Peak load current	I _{peak}	3 A	1.5 A	0.4 A	0.3 A	0.42 A	100 ms (1 shot), V _L = DC
	Power dissipation	P _{out}	500mW					
Total power dissipation		P _T	550mW					
I/O isolation voltage		V _{iso}	5,000 V AC					
Temperature limits	Operating	T _{opr}	-40°C to +85°C -40°F to +185°F					
	Storage	T _{stg}	-40°C to +100°C -40°F to +212°F					Non-condensing at low temperatures

GU-E 1 Form A (HT821xA)

2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	HT8211AR(N)	HT8212AR(N)	HT8210AR(N)	HT8214AR(N)	HT8216AR(N)	Condition
Input	LED operate current	Typical	I _{Fon}	1.2mA					I _L =Max.
		Maximum		3.0mA					
	LED turn off current	Minimum	I _{Foff}	0.4mA					I _L =Max.
		Typical		1.1mA					
	LED dropout voltage	Typical	V _F	1.25 (1.14 V at I _F =5mA)					I _F =50mA
Maximum		1.5V							
Output	On resistance	Typical	R _{on}	0.25Ω	0.85Ω	18Ω	26Ω	45Ω	I _F =5mA
		Maximum		0.5Ω	2.5Ω	25Ω	35Ω	100Ω	I _L =Max. Within 1 s on time
	Off state leakage current	Maximum	I _{Leak}	1μA					I _F =0mA V _L =Max.
Transfer character- istics	Turn on time*	Typical	T _{on}	1.5ms	1ms	0.5ms			I _F =5mA I _L =Max.
		Maximum		5ms	4ms	2.0ms			
	Turn off time*	Typical	T _{off}	0.1ms	0.05ms	0.08ms		0.04ms	I _F =5mA I _L =Max.
		Maximum		1.0ms					
	I/O capacitance	Typical	C _{iso}	0.8pF					f =1MHz V _B =0V
		Maximum		1.5pF					
Initial I/O isolation resistance	Minimum	R _{iso}	1,000MΩ					500V DC	

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper relay operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	I_F	5 to 10	mA

■ Dimensions

■ Schematic and Wiring Diagrams

■ Cautions for Use

■ These products are not designed for automotive use.

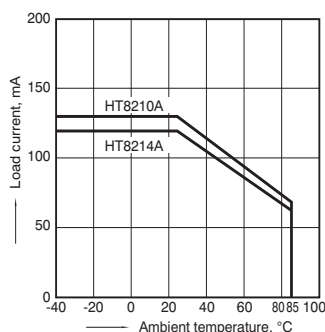
If you are considering to use these products for automotive applications, please contact your local Panasonic technical representative.

Please refer to our information on [PhotoMOS Relays for Automotive Applications](#).

REFERENCE DATA

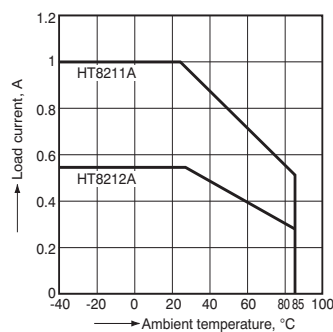
1-(1). Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F



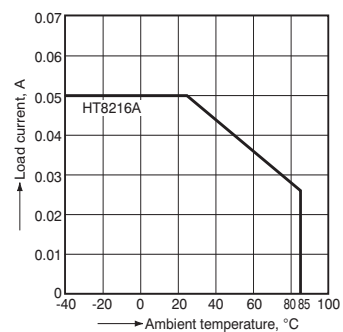
1-(2). Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F



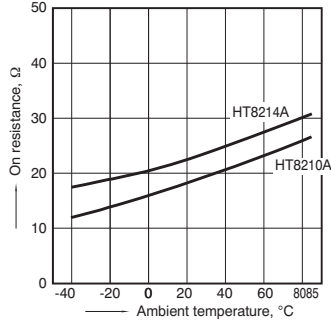
1-(3). Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F

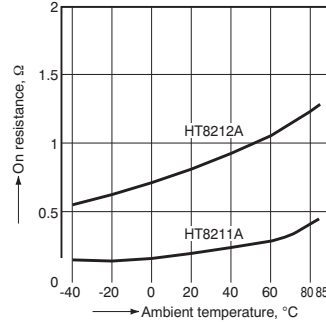


2-(1). On resistance vs. ambient temperature characteristics

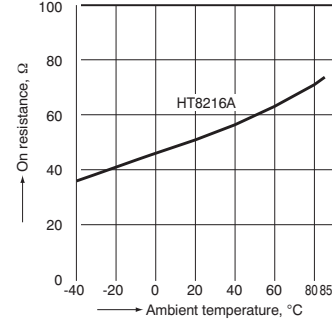
Measured portion: between terminals 3 and 4;
 LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


2-(2). On resistance vs. ambient temperature characteristics

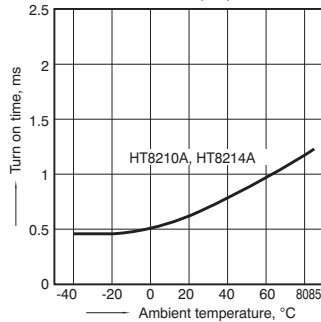
Measured portion: between terminals 3 and 4;
 LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


2-(3). On resistance vs. ambient temperature characteristics

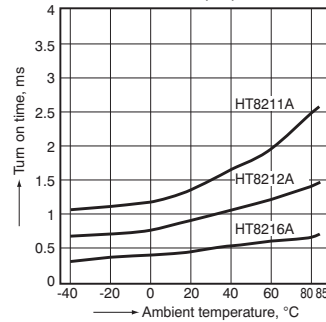
Measured portion: between terminals 3 and 4;
 LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


3-(1). Turn on time vs. ambient temperature characteristics

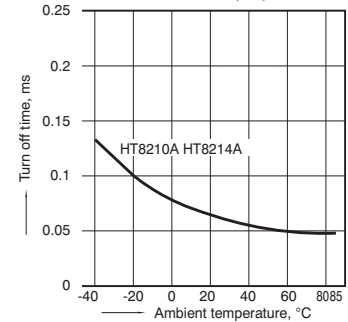
LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


3-(2). Turn on time vs. ambient temperature characteristics

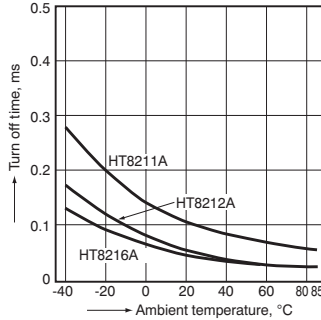
LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


4-(1). Turn off time vs. ambient temperature characteristics

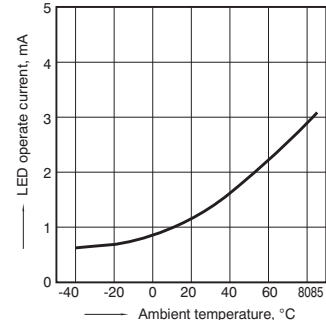
LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


4-(2). Turn off time vs. ambient temperature characteristics

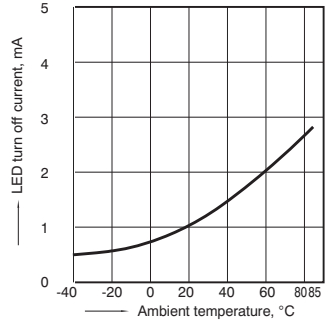
LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


5. LED operate current vs. ambient temperature characteristics

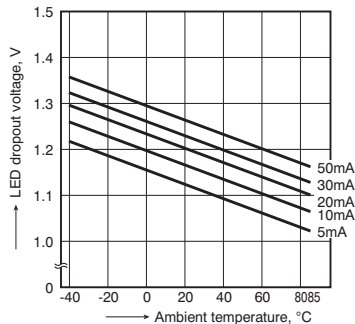
Sample: All types; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


6. LED turn off current vs. ambient temperature characteristics

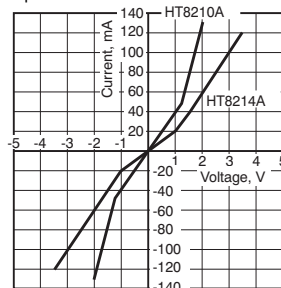
Sample: All types; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)


7. LED dropout voltage vs. ambient temperature characteristics

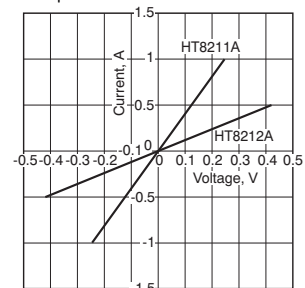
Sample: All types; LED current: 5 to 50 mA


8-(1). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4;
 Ambient temperature: 25°C 77°F

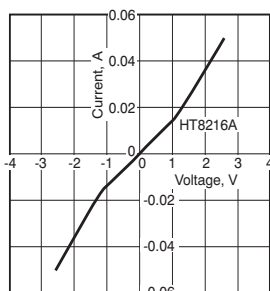

8-(2). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4;
 Ambient temperature: 25°C 77°F



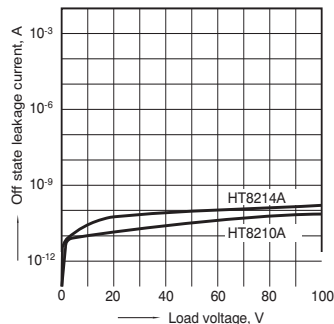
8-(3). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4;
Ambient temperature: 25°C 77°F



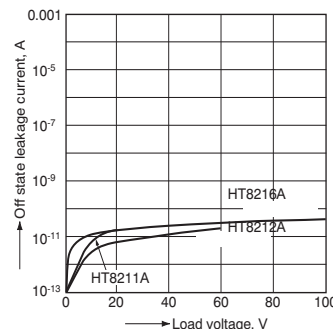
9-(1). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4;
Ambient temperature: 25°C 77°F



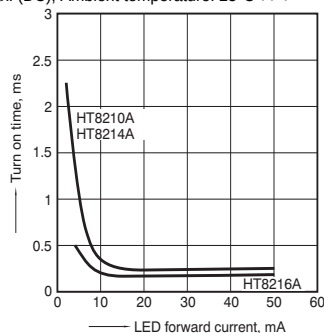
9-(2). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4;
Ambient temperature: 25°C 77°F



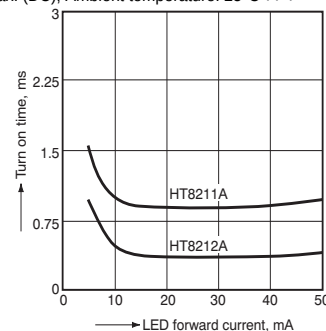
10-(1). Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



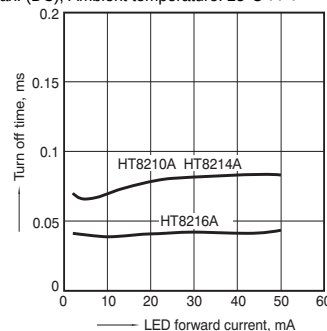
10-(2). Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



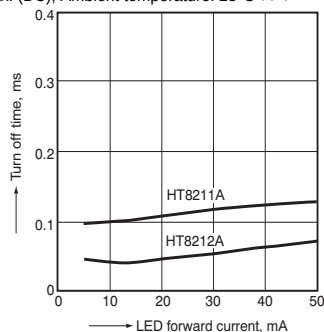
11-(1). Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



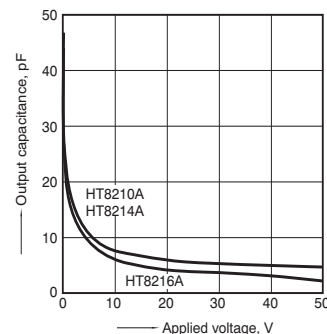
11-(2). Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



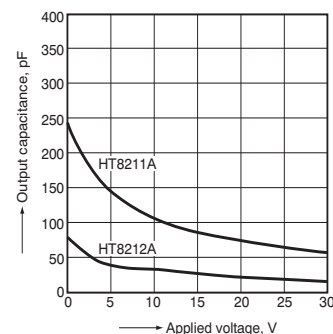
12-(1). Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4;
Frequency: 1 MHz; Ambient temperature: 25°C 77°F



12-(2). Output capacitance vs. applied voltage characteristics

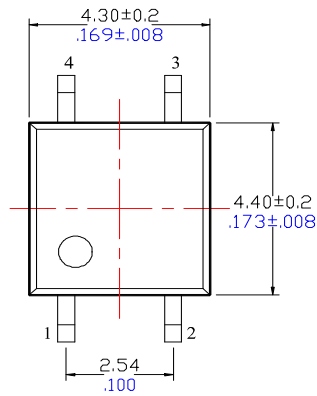
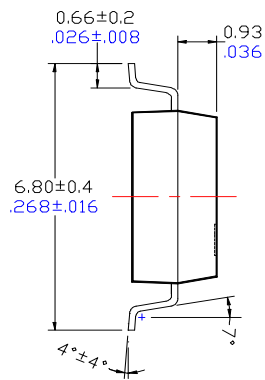
Measured portion: between terminals 3 and 4;
Frequency: 1 MHz; Ambient temperature: 25°C 77°F



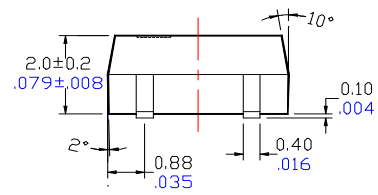
PACKAGE DIMENSIONS

SOP4-2.54mm

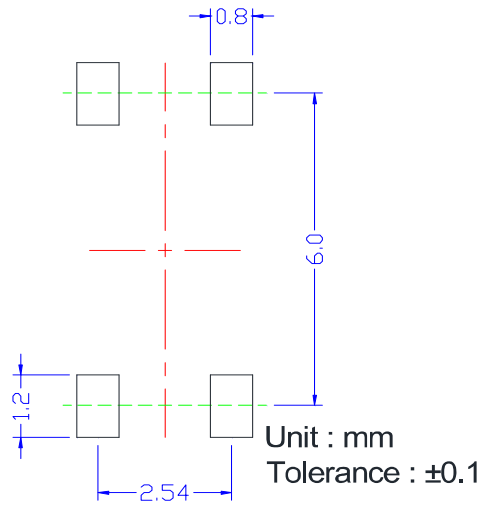
Surface mount terminal type



Unit : mm inch
Tolerance: $\pm 0.1 \pm .004$

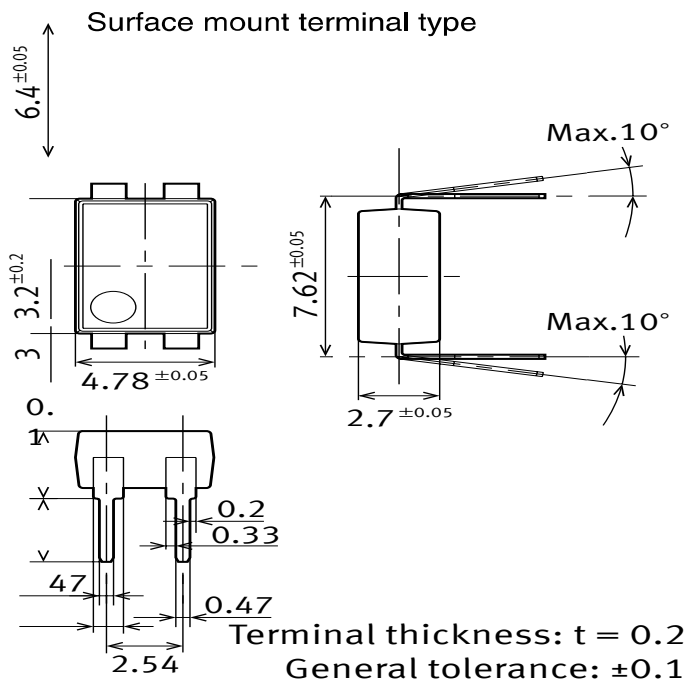


Recommended mounting pad (Top view)

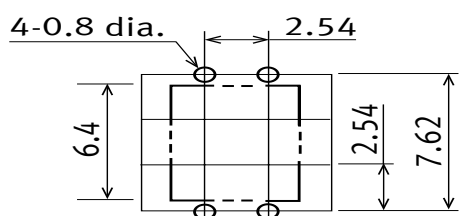


PACKAGE DIMENSIONS

DIP4-2.54mm



**PC board pattern
(BOTTOM VIEW)**



Tolerance: ± 0.1