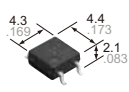
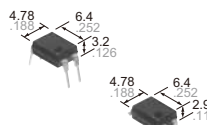
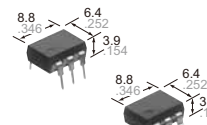
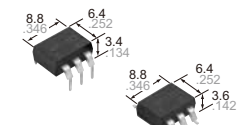
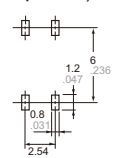
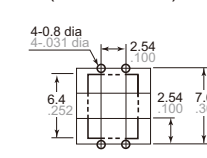
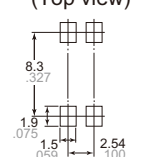
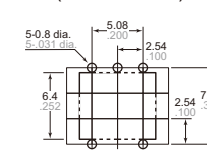
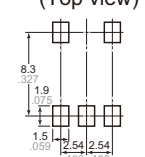
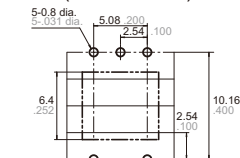
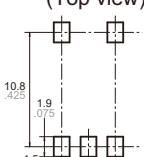









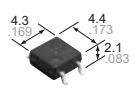
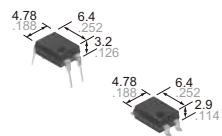
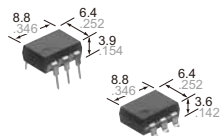
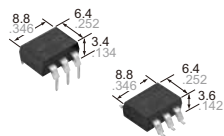
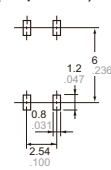
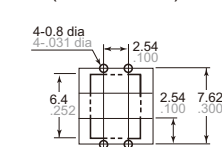
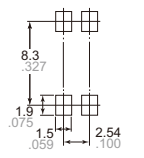
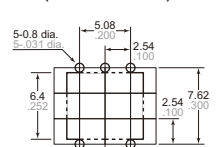
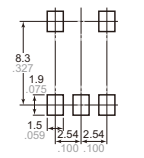
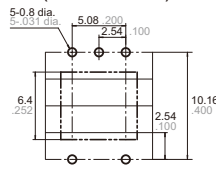
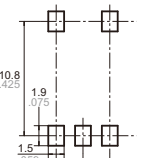
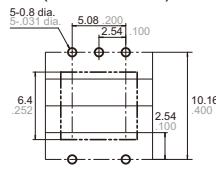
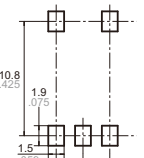











Phototriac Coupler Selector Chart

		APT Phototriac Coupler							
		Phototriac							
		Zero-cross	Random	Zero-cross	Random	Zero-cross	Random	Zero-cross	Random
		0.05 A		0.1 A		0.1 A		0.1 A	
• Type of relay		 SOP 4 pin		 DIP 4 pin		 DIP 6 pin		 DIP 6 pin wide	
• Part No.		APT1211S	APT1221S	APT1211	APT1221	APT1212	APT1222	APT1212W	APT1222W
• Output	Repetitive peak OFF-state voltage	600 V							
	ON-state RMS current	0.05 A		0.1 A		0.1 A		0.1 A	
	Non-repetitive surge current	0.6 A				1.2 A			
	Peak ON-state voltage	Max. 2.5 V							
	Peak OFF-state current	Max. 1 μA							
	• Input	LED forward current	50 mA						
LED reverse voltage		6 V							
Peak forward current		1 A							
LED dropout voltage (IF=20 mA)		Max. 1.3 V							
• Trigger LED current		Max. 10 mA							
• Zero-cross voltage		Max. 50 V	—	Max. 50 V	—	Max. 50 V	—	Max. 50 V	—
• Turn on time		Max. 0.1 ms							
• I/O isolation voltage		3,750 Vrms		5,000 Vrms					
• Ambient temperature	Operating	-40 to +100°C -40 to +212°F							
	Storage	-40 to +125°C -40 to +257°F							
• I/O capacitance	Maximum	1.5 pF							
• I/O isolation resistance		Min. 50 GΩ							
• Terminal layout and recommended PC board pattern		Surface mount terminal (Top view) 	Through hole terminal (Bottom view)  Surface mount terminal (Top view) 	Through hole terminal (Bottom view)  Surface mount terminal (Top view) 	Through hole terminal (Bottom view)  Surface mount terminal (Top view) 	Tolerance: ±0.1 ±.004		Tolerance: ±0.1 ±.004	
• Safety standards		UL/C-UL, VDE*							
• Mounting method									
• Page		71							

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
 * Normal part number is taken UL/C-UL standards. About VDE standard, please contact our sales office.

Phototriac Coupler Selector Chart

		APT Phototriac Coupler			
		Phototriac			
		Zero-cross (Low zero-cross type)			
		0.05 A	0.1 A	0.1 A	0.1 A
• Type of relay					
	mm inch	SOP 4 pin	DIP 4 pin	DIP 6 pin	DIP 6 pin wide
• Part No.		APT1231S	APT1231	APT1232	APT1232W
• Output	Repetitive peak OFF-state voltage	600 V			
	ON-state RMS current	0.4 A			
		0.3 A			
		0.2 A			
		0.1 A	0.05 A		0.1 A
	Non-repetitive surge current	0.6 A			1.2 A
Peak ON-state voltage	Max. 2.0 V				
Peak OFF-state current	Max. 1 μA				
• Input	LED forward current	50 mA			
	LED reverse voltage	6 V			
	Peak forward current	1 A			
	LED dropout voltage (IF=20 mA)	Max. 1.3 V			
• Trigger LED current		Max. 10 mA			
• Zero-cross voltage		Max. 15 V			
• Turn on time		Max. 0.1 ms			
• I/O isolation voltage		3,750 Vrms	5,000 Vrms		
• Ambient temperature	Operating	-40 to +100°C -40 to +212°F			
	Storage	-40 to +125°C -40 to +257°F			
• I/O capacitance	Maximum	1.5 pF			
• I/O isolation resistance		Min. 50 GΩ			
• Terminal layout and recommended PC board pattern	Surface mount terminal (Top view)	Through hole terminal (Bottom view)	Through hole terminal (Bottom view)	Through hole terminal (Bottom view)	Through hole terminal (Bottom view)
		 Surface mount terminal (Top view) 	 Surface mount terminal (Top view) 	 Surface mount terminal (Top view) 	 Surface mount terminal (Top view) 
		Tolerance: ±0.1 ±.004		Tolerance: ±0.1 ±.004	
• Safety standards		UL/C-UL, VDE*			
• Mounting method					
• Page		71			

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
* Normal part number is taken UL/C-UL standards. About VDE standard, please contact our sales office.

Solid State Relays Selector Chart

• Type of relay		AQ-H Relays							
		Phototriac							
		Zero-cross	Random	Zero-cross	Random	Zero-cross	Random	Zero-cross	Random
		0.3 A		0.6 A		0.9 A		1.2 A	
mm inch									
• Part No.		AQH0213	AQH0223	AQH1213	AQH1223	AQH2213	AQH2223	AQH3213	AQH3223
• Out-put	Repetitive peak OFF-state voltage	600 V							
	ON-state RNS current	0.3 A		0.6 A		0.9 A		1.2 A	
	Non-repetitive surge current	3 A		6 A		9 A		12 A	
	Peak ON-state voltage	Max. 2.5 V							
	Peak OFF-state current	Max. 100 μA							
• In-put	LED forward current	50 mA							
	LED reverse voltage	6 V							
	Peak forward current	1 A							
	LED dropout voltage (IF=20 mA)	Max. 1.3 V							
• Trigger LED current		Max. 10 mA							
• Zero-cross voltage		Max. 50 V	—	Max. 50 V	—	Max. 50 V	—	Max. 50 V	—
• Turn on time		Max. 0.1 ms							
• I/O isolation voltage		5,000 Vrms							
• Ambient temperature	Operating	-30 to +85°C -22 to +185°F							
	Storage	-40 to +125°C -40 to +212°F							
• I/O capacitance, Typ.		2.1 pF							
• I/O isolation resistance		Min. 50 GΩ							
• Terminal layout and recommended PC board pattern									
mm inch		Tolerance: ±0.1 ±.004							
• Safety standards		UL/C-UL, VDE							
• Mounting method									
• Page		79							

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting

Solid State Relays Selector Chart

• Types of relay		AQ-G Relays											
		Phototriac						Phototriac					
		Zero-cross						Random					
		1 A			2 A			1 A			2 A		
mm inch													
• Part No.		AQG12105	AQG12112	AQG12124	AQG22105	AQG22112	AQG22124	AQG12205	AQG12212	AQG12224	AQG22205	AQG22212	AQG22224
• Load side	Load voltage	AC 75 to 264 V											
		DC —											
	Max. load current	1 A			2 A			1 A			2 A		
	Off state leakage current, max.	1.5 mA (applied 200 V)											
	Non-repetitive surge current	8 A			30 A			8 A			30 A		
• Input side	Control voltage	4 to 6 V	9.6 to 14.4 V	19.2 to 28.8 V	4 to 6 V	9.6 to 14.4 V	19.2 to 28.8 V	4 to 6 V	9.6 to 14.4 V	19.2 to 28.8 V	4 to 6 V	9.6 to 14.4 V	19.2 to 28.8 V
	Input impedance, approx.	0.3 kΩ	0.8 kΩ	1.6 kΩ	0.3 kΩ	0.8 kΩ	1.6 kΩ	0.3 kΩ	0.8 kΩ	1.6 kΩ	0.3 kΩ	0.8 kΩ	1.6 kΩ
	Pick-up voltage, max.	4 V	9.6 V	19.2 V	4 V	9.6 V	19.2 V	4 V	9.6 V	19.2 V	4 V	9.6 V	19.2 V
	Drop-out voltage, min.	1 V											
• Operate time, max.		1/2 cycle of voltage sine wave +1 ms						1 ms					
• Release time, max.		1/2 cycle of voltage sine wave +1 ms											
• Breakdown voltage		3,000 Vrms											
• Ambient temperature	Operating	-30 to +80°C -22 to +176°F											
	Storage	-30 to +100°C -22 to +212°F											
• Snubber circuit integrated		●											
• LED operation indicator		—											
• Terminal layout													
mm inch													
• Safety standards		UL/C-UL, VDE											
• Mounting method													
• Page		83											

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting

Solid State Relays Selector Chart

• Types of relay		AQ1 Relays			
		Phototransistor, Phototriac			
		Zero-cross*			
		3 A	10 A		
mm inch					
• Part No.		AQ3A2-ZT4/32VDC	AQ3A2-J-ZT4/32VDC	AQ10A2-ZT4/32VDC	
• Load side	Load voltage	AC	75 to 250 V		
		DC	—		
	Max. load current	20 A	—		—
		15 A	—		—
		10 A	—		—
		8 A	—		—
5 A		—		—	
3 A		3 A		10 A	
2 A	—		—		
1 A	—		—		
	Off state leakage current, max.	5 mA		—	
	Non-repetitive surge current	80 A	100 A		
• Input side	Control voltage	4 to 32 V DC		—	
	Input impedance, approx.	—		—	
	Pick-up voltage, max.	4 V		—	
	Drop-out voltage, min.	1.0 V		—	
• Operate time, max.		1/2 cycle of voltage sine wave +1 ms		—	
• Release time, max.		1/2 cycle of voltage sine wave +1 ms		—	
• Breakdown voltage		4,000 Vrms (between input and output) 2,500 Vrms (between input, output and case)		—	
• Ambient temperature	Operating	-30 to +80°C -22 to +176°F		—	
	Storage	-30 to +100°C -22 to +212°F		—	
• Snubber circuit integrated		●		—	
• LED operation indicator		—		—	
• Terminal layout					
mm inch					
• Safety standards		UL/C-UL, VDE		—	
• Mounting method				—	
• Page		87		—	

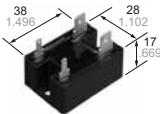
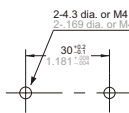

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
 * Random type is also available by custom order.






Solid State Relays Selector Chart

• Types of relay		AQ8 Relays														
		Phototriac														
		Zero-cross						Random								
		2 A			3 A			2 A			3 A					
mm inch																
• Part No.	Input terminal distance: 5.08 mm .200 inch	AQ2A2-C1-ZT5V DC	AQ2A2-C1-ZT12V DC	AQ2A2-C1-ZT24V DC	AQ3A2-C1-ZT5V DC	AQ3A2-C1-ZT12V DC	AQ3A2-C1-ZT24V DC	Input terminal distance: 7.62 mm .300 inch	AQ2A2-C1-T5V DC	AQ2A2-C1-T12V DC	AQ2A2-C1-T24V DC	AQ3A2-C1-T5V DC	AQ3A2-C1-T12V DC	AQ3A2-C1-T24V DC		
	AQ2A2-C2-ZT5V DC	AQ2A2-C2-ZT12V DC	AQ2A2-C2-ZT24V DC	AQ3A2-C2-ZT5V DC	AQ3A2-C2-ZT12V DC	AQ3A2-C2-ZT24V DC	AQ2A2-C2-T5V DC		AQ2A2-C2-T12V DC	AQ2A2-C2-T24V DC	AQ3A2-C2-T5V DC	AQ3A2-C2-T12V DC	AQ3A2-C2-T24V DC			
• Load side	Load voltage	AC	75 to 250 V													
		DC	—													
	Max. load current	20 A													
		15 A													
		10 A													
8 A															
5 A															
1 A		2 A	3 A	2 A	3 A											
Off state leakage current, max.	5 mA															
Non-repetitive surge current	30 A			80 A			30 A			80 A						
• Input side	Control voltage	4 to 6 V	9.6 to 14.4 V	21.6 to 26.4 V	4 to 6 V	9.6 to 14.4 V	21.6 to 26.4 V	4 to 6 V	9.6 to 14.4 V	21.6 to 26.4 V	4 to 6 V	9.6 to 14.4 V	21.6 to 26.4 V			
	Input impedance, approx.	0.18 kΩ	0.55 kΩ	1.4 kΩ	0.18 kΩ	0.55 kΩ	1.4 kΩ	0.3 kΩ	0.8 kΩ	1.8 kΩ	0.3 kΩ	0.8 kΩ	1.8 kΩ			
	Pick-up voltage, max.	4 V	9.6 V	21.6 V	4 V	9.6 V	21.6 V	4 V	9.6 V	21.6 V	4 V	9.6 V	21.6 V			
	Drop-out voltage, min.	0.5 V	1.2 V	2.4 V	0.5 V	1.2 V	2.4 V	0.5 V	1.2 V	2.4 V	0.5 V	1.2 V	2.4 V			
• Operate time, max.	1/2 cycle of voltage sine wave +1 ms						1 ms									
• Release time, max.	1/2 cycle of voltage sine wave +1 ms															
• Breakdown voltage	3,000 Vrms															
• Ambient temperature	Operating	-30 to +80°C -22 to +176°F														
	Storage	-30 to +100°C -22 to +212°F														
• Snubber circuit integrated	●															
• LED operation indicator	—															
• Terminal layout	Bottom view						Bottom view									
	Between input terminal 5.08mm .200inch						Between input terminal 7.62mm .300inch									
mm inch																
• Safety standards	UL, CSA, TÜV*															
• Mounting method																
• Page	93															

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
 * Normal part number is taken UL, CSA standards. About TÜV standard, please contact our sales office.

Solid State Relays Selector Chart

• Types of relay		AQ-J Relays									
		Phototriac									
		Zero-cross*1									
		10 A			15 A			25 A			
mm inch											
Input terminal: #110 type Output terminal: #250 type											
• Part No.		AQJ112V	AQJ119V	AQJ116V	AQJ212V	AQJ219V	AQJ216V	AQJ412V	AQJ419V	AQJ416V	
• Load side	Load voltage	AC	75 to 264 V								
		DC	—								
	Max. load current	40 A	*2 (Heat sink/Panel heat)			*3 (Heat sink/Panel heat)			*4 (Heat sink)		
		20 A	10 A			15 A			25 A		
		10 A	8 A			5 A			3 A		
8 A		5 A			3 A			2 A			
5 A	3 A			2 A			1 A				
3 A	2 A			1 A			1 A				
2 A	1 A			1 A			1 A				
1 A	1 A			1 A			1 A				
Off state leakage current, max.	5 mA										
Non-repetitive surge current	100 A			150 A			250 A				
• Input side	Control voltage	4 to 6 V	10 to 18 V	18 to 28 V	4 to 6 V	10 to 18 V	18 to 28 V	4 to 6 V	10 to 18 V	18 to 28 V	
	Input impedance, approx.	0.26 kΩ	0.8 kΩ	1.6 kΩ	0.26 kΩ	0.8 kΩ	1.6 kΩ	0.26 kΩ	0.8 kΩ	1.6 kΩ	
	Pick-up voltage, max.	4 V	10 V	18 V	4 V	10 V	18 V	4 V	10 V	18 V	
	Drop-out voltage, min.	1 V									
• Operate time, max.		1/2 cycle of voltage sine wave +1ms									
• Release time, max.		1/2 cycle of voltage sine wave +1ms									
• Breakdown voltage		3,000 Vrms between input and output 2,500 Vrms between input, output and case									
• Ambient temperature	Operating	-30 to +80°C -22 to +176°F									
	Storage	-30 to +100°C -22 to +212°F									
• Snubber circuit integrated		●									
• LED operation indicator		—									
• Terminal layout	Top view 										
	mm inch										
• Safety standards		UL/C-UL, TÜV									
• Mounting method											
• Page		100									

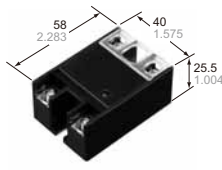
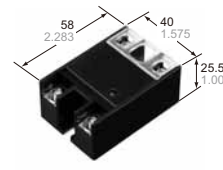
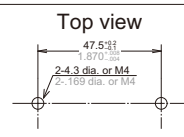

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
 *1 Random type is available by custom order. *2 When mounting a standard heat sink (AQP-HS-J10A) or when mounting on 100 × 100 × t1.6 (mm) iron plate
 *3 When mounting a standard heat sink (AQP-HS-J10A) or when mounting on 200 × 200 × t2 (mm) iron plate *4 When mounting a standard heat sink (AQP-HS-J25A)






Solid State Relays Selector Chart

• Types of relay		AQ-J Relays																						
		Phototriac																						
		Zero-cross*																						
		10 A (Output arrangement: 1a)			20 A (Output arrangement: 1a)			10 A (Output arrangement: 1a×2)			15 A (Output arrangement: 1a×2)													
mm inch		<p>Input terminal: #110 type Output terminal: #250 type</p>						<p>Input terminal: #110 type Output terminal: #250 type</p>																
		<table border="1"> <tr> <th>Part No.</th> <td>AQJ112VY</td><td>AQJ119VY</td><td>AQJ116VY</td><td>AQJ412VY</td><td>AQJ419VY</td><td>AQJ416VY</td> <td>AQJ112VW</td><td>AQJ119VW</td><td>AQJ116VW</td><td>AQJ412VW</td><td>AQJ419VW</td><td>AQJ416VW</td> </tr> </table>												Part No.	AQJ112VY	AQJ119VY	AQJ116VY	AQJ412VY	AQJ419VY	AQJ416VY	AQJ112VW	AQJ119VW	AQJ116VW	AQJ412VW
Part No.	AQJ112VY	AQJ119VY	AQJ116VY	AQJ412VY	AQJ419VY	AQJ416VY	AQJ112VW	AQJ119VW	AQJ116VW	AQJ412VW	AQJ419VW	AQJ416VW												
• Load side	Load voltage	AC	75 to 264 V																					
		DC	—																					
	Max. load current	40 A	10 A			20 A			10 A			15 A												
		25 A																						
	20 A																							
	15 A																							
	10 A																							
	5 A																							
	2 A																							
	1 A																							
	Off state leakage current, max.	5 mA																						
	Non-repetitive surge current	100 A			250 A			100 A			250 A													
• Input side	Control voltage	4 to 6 V	10 to 18 V	18 to 28 V	4 to 6 V	10 to 18 V	18 to 28 V	4 to 6 V	10 to 18 V	18 to 28 V	4 to 6 V	10 to 18 V	18 to 28 V											
	Input impedance, approx.	0.26 kΩ	0.8 kΩ	1.6 kΩ	0.26 kΩ	0.8 kΩ	1.6 kΩ	0.26 kΩ	0.8 kΩ	1.6 kΩ	0.26 kΩ	0.8 kΩ	1.6 kΩ											
	Pick-up voltage, max.	4 V	10 V	18 V	4 V	10 V	18 V	4 V	10 V	18 V	4 V	10 V	18 V											
	Drop-out voltage, min.	1 V																						
• Operate time, max.		1/2 cycle of voltage sine wave +1ms																						
• Release time, max.		1/2 cycle of voltage sine wave +1ms																						
• Breakdown voltage		3,000 Vrms between input and output 2,500 Vrms between input, output and case																						
• Ambient temperature	Operating	-30 to +80°C -22 to +176°F																						
	Storage	-30 to +100°C -22 to +212°F																						
• Snubber circuit integrated		●																						
• LED operation indicator		—																						
• Terminal layout																								
	mm inch																							
• Safety standards		—																						
• Mounting method																								
• Page		100																						

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
* Random type is available by custom order.

Solid State Relays Selector Chart

• Types of relay		AQ-A Relays (AC output type)			AQ-A Relays (DC output type)		
		Phototriac			—		
		Zero-cross*1			—		
		15 A	25 A	40 A	30 A	10 A	
mm inch							
• Part No.		AQA211VL	AQA411VL	AQA611VL	AQAD551DL	AQAD171DL	
• Load side	Load voltage	AC			—		
		DC			100 V	600 V	
• Load side	Max. load current	40 A		*4 (Heat sink) 40 A	*5 (Heat sink) 30 A		
		35 A					
		30 A		*3 (Heat sink) 25 A			
		25 A					
		20 A					
		15 A	*2 (Heat sink) 15 A				
		5 A					*6 (Heat sink) 10 A
	Off state leakage current, max.	10 mA			100 μA		
	Non-repetitive surge current	150 A	250 A	400 A	—		
	Peak load current	—	—	—	90 A (100 ms)	20 A (100 ms)	
• Input side	Control voltage	4 to 32 V					
	Input impedance, approx.	—					
	Pick-up voltage, max.	4 V					
	Drop-out voltage, min.	1 V					
• Operate time, max.		1/2 cycle of voltage sine wave +1 ms			10 ms	5 ms	
• Release time, max.		1/2 cycle of voltage sine wave +1 ms			3 ms	1 ms	
• Breakdown voltage		4,000 Vrms between input and output/ 2,500 Vrms between input, output and case					
• Ambient temperature	Operating	-20 to +80°C -4 to +176°F					
	Storage	-20 to +85°C -4 to +185°F					
• Snubber circuit integrated		●			—		
• Reverse connection prevention diode		—			●		
• LED operation indicator		●					
• Terminal layout							
mm inch		UL/C-UL, VDE			UL/C-UL, VDE		
• Safety standards		UL/C-UL, VDE			UL/C-UL, VDE		
• Mounting method							
• Page		108			113		

Note: Meaning of symbol marks : PC board terminal; : Plug-in; : Top-mounting; : Top-mounting with PC board terminals; : Surface-mounting
 *1 Random type is available by custom order. *2 When mounting a standard heat sink (AQP-HS-J10A or AQP-HS-SJ20A) *3 When mounting a standard heat sink (AQP-HS-J10A/40A)
 *4 When mounting a standard heat sink (AQP-HS-J25A) *5 When mounting a standard heat sink (AQP-HS-J25A) *6 When mounting a standard heat sink (AQP-HS-SJ20A)