

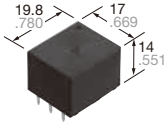
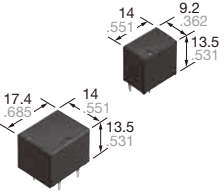

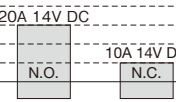
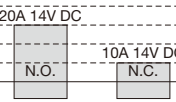

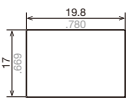
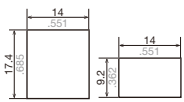

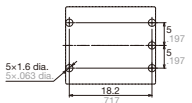
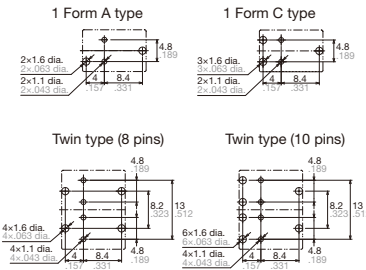
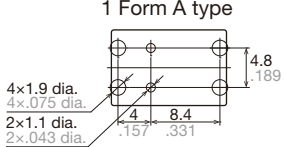
Automotive Relays Selector Chart

Type		Automotive relays					
Product name		CJ RELAYS		CN-H RELAYS		CN-M RELAYS	
Appearance configuration (Standoff height included, Unit: mm inch)							
Part No.		ACJ		ACNH		ACNM	
Features		Compact Slim Twin and Single Type Automotive Relay		High Load Relay for Smart J/B		Middle Load Relay for Smart J/B	
Contact data	Contact arrangement	1 Form C, 1 Form Cx2 (8 pins), 1 Form Cx2 (10 pins)		1 Form A		1 Form A, 1 Form C	
	Contact material	Ag alloy		Ag alloy		Ag alloy	
	Rated switching capacity (resistive)	20A 14V DC, 10A 14V DC, N.O., N.C.		30A 14V DC, N.O.		30A 14V DC, 15A 14V DC, N.O., N.C.	
	Min. switching load (resistive)	1A 14V DC		1A 14V DC		1A 14V DC	
Latching type		-		-		-	
Coil data	Rated coil voltage	12V DC		12V DC		12V DC	
	Rated operating power	640mW	800mW	450mW	640mW	640mW	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 7.2V DC	Max. 6.5V DC	Max. 6.5V DC	Max. 5.5V DC	Max. 7.2V DC	
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 1.0V DC	Min. 0.8V DC	Min. 1.0V DC	Min. 0.8V DC	Min. 1.0V DC	
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)	
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)	
Expected life	Mechanical	Min. 10 ⁷		Min. 10 ⁷		Min. 10 ⁷	
	Electrical	Min. 2 × 10 ⁶ (at 14 V DC, inrush: 25 A, steady: 5 A) Min. 10 ⁶ (at 14 V DC, 25 A Motor lock)		Min. 3 × 10 ⁶ (at 14 V DC, inrush: 84 A, steady: 18 A) Min. 2 × 10 ⁶ (at 14 V DC, 84 A, steady: 12 A Lamp)		Min. 2 × 10 ⁶ (at 14 V DC, inrush: 80 A, steady: 16 A) Min. 10 ⁶ (at 14 V DC, 84 A steady: 12 A Lamp)	
Electric strength	Between open contacts (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.	
	Between contacts and coil (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.	
Ambient temperature		-40 to +85°C -40 to +185°F		-40 to +110°C -40 to +230°F		Standard type: -40 to +85°C -40 to +185°F High heat-resistant type: -40 to +110°C -40 to +230°F	
Protective construction	Dust cover	-		-		-	
	Flux tight	● (PIP type)		-		-	
	Sealed	●		●		●	
External dimensions	Height (mm inch) Included standoff	13.5 .531/13.8 .543 (PIP type)		18.3 .720		14.4 .567 (Surface-mount: 15.1 .594)	
	Foot print (mm inch)						
PC board pattern	Twin type (8-pin)						
	Twin type (10-pin) and 1 Form C type						
Weight (approx.)		6.5 g .23 oz (Twin type), 3.5 g .12 oz (1 Form C type)		9 g .32 oz		5.5 g .19 oz	
Remarks		10 pins and PIP types available		-		-	
Page		47		55		59	

Type		Automotive relays			
Product name		CP RELAYS	CP RELAYS POWER TYPE	CQ RELAYS	
Appearance configuration (Standoff height included, Unit: mm inch)					
Part No.		ACP	ACPP	ACQ	
Features		Compact Flat Size for Automotive Relay	High Carrying Current Type Miniature Low Profile Automotive Relay	1 Form C Automotive Quiet Relay	
Contact data	Contact arrangement	1 Form A, 1 Form C	1 Form A, 1 Form C	1 Form C	
	Contact material	Ag alloy	Ag alloy	Ag alloy	
	Rated switching capacity (resistive)	40A			
		35A			
Min. switching load (resistive)	20A 14V DC				
	10A 14V DC				
Latching type		-	-	-	
Coil data	Rated coil voltage	12V DC	12V DC	12V DC	
	Rated operating power	640mW	450mW 640mW	640mW	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 7.2 V DC	Max. 7.2V DC Max. 6.5V DC	Max. 7.2V DC	
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 1.0 V DC	Min. 1.0V DC	Min. 1.0V DC	
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)	Max. 10ms (without bounce time)	Max. 10ms (without bounce time)	
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)	Max. 10ms (without bounce time) (without diode)	Max. 10ms (without bounce time) (without diode)	
Expected life	Mechanical	Min. 10 ⁷	Min. 10 ⁷	Min. 10 ⁷	
	Electrical	Min. 2 x 10 ⁵ (at 14 V DC, inrush: 25 A, steady: 5 A)	Min. 10 ⁵ (Capacitor load) (at 14 V DC, inrush 60A, Steady 1A)	Min. 3 x 10 ⁵ (at 14 V DC, Inrush 30A, Steady 5A)	
Dielectric strength	Between open contacts (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.	
	Between contacts and coil (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.	
Ambient temperature		-40 to +85°C -40 to +185°F	-40 to +85°C -40 to +185°F	-40 to +85°C -40 to +185°F	
Protective construction	Dust cover	-	-	-	
	Flux tight	-	-	-	
	Sealed	●	●	●	
External dimensions	Height (mm inch) Included standoff	9.5 .374 (Surface mount: 10.5 .413)	9.5 .374	16.6 .654	
	Foot print (mm inch)				
PC board pattern		<p>PC board terminal type</p> <p>Surface mount terminal type</p>			
Weight (approx.)		4g .14 oz	4.5 g .16 oz	6.5g .23 oz	
Remarks		-	-	-	
Page		64	69	73	

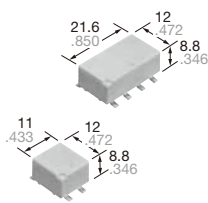
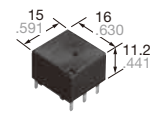
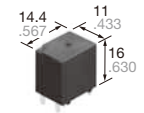
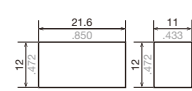

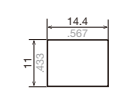
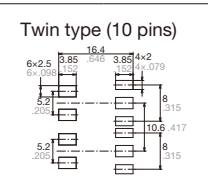
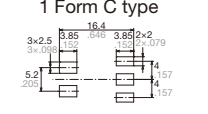
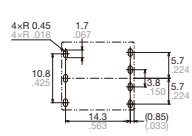
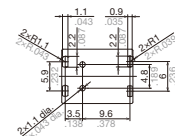
Automotive Relays Selector Chart

Type		Automotive relays		
Product name		CT RELAYS	CT RELAYS POWER TYPE	CW RELAYS
Appearance configuration (Standoff height included, Unit: mm inch)				
Part No.		ACT	ACTP	ACW
Features		Small & Slim Twin/1 Form C type Automotive Relay	High Carrying Current Type Small & Slim Automotive Relay	Automotive Relay for Failsafe Circuits in High Output Motors (EPS)
Contact data	Contact arrangement	1 Form C, 1 Form C x 2 (8 pins) and 1 Form C x 2 (10 pins)	1 Form C, 1 Form C x 2 (8 pins) and 1 Form C x 2 (10 pins)	2 Form A
	Contact material	Ag alloy	Ag alloy	Ag alloy
	Rated switching capacity (resistive)	40A 35A 30A 25A 20A 15A 10A	30A 14V DC	<Max. carrying current> 120A 14V DC 70A 14V DC 45A 14V DC
	Min. switching load (resistive)	20A 14V DC 10A 14V DC 1A 14V DC	10A 14V DC 1A 14V DC	5 s at 20°C (68°F) 1 min. at 85°C (185°F) Continuous at 85°C (185°F) 1A 14V DC
Latching type		-	-	-
Coil data	Rated coil voltage	12V DC	12V DC	12V DC
	Rated operating power	800mW	1,000mW	1.4W
	Operate (Set) voltage at 20°C (68°F) (initial)	Max. 7.2V DC	Max. 7.2V DC	Max. 6.2V DC
	Release (Reset) voltage at 20°C (68°F) (initial)	Min. 1.0V DC	Min. 1.0V DC	Min. 0.5V DC
Operate (Set) time (Rated voltage at 20°C (68°F))		Max. 10ms (without bounce time)	Max. 10ms (without bounce time)	Max. 20ms (without bounce time)
Release (Reset) time (Rated voltage at 20°C (68°F))		Max. 10ms (without bounce time) (without diode)	Max. 10ms (without bounce time) (without diode)	Max. 20ms (without bounce time) (without diode)
Expected life	Mechanical	Min. 10 ⁷	Min. 10 ⁶	Min. 2 x 10 ⁵
	Electrical	Min. 2 x 10 ⁶ (at 14 V DC, inrush: 25 A, steady: 5 A) Min. 10 ⁶ (at 14 V DC, 25 A motor lock condition)	Min. 10 ⁶ (at 14 V DC, inrush: 30 A, steady: 7 A) Min. 5 x 10 ⁴ (at 14 V DC, 30 A motor lock condition)	-
Dielectric strength	Between open contacts (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.
	Between contacts and coil (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.
Ambient temperature		-40 to +85°C -40 to +185°F	-40 to +85°C -40 to +185°F	-40 to +125°C -40 to +257°F
Protective construction	Dust cover	-	-	-
	Flux tight	-	-	-
	Sealed	●	●	●
External dimensions	Height (mm inch) Included standoff	13.5 .531	13.5 .531	19 .748
	Foot print (mm inch)			
PC board pattern	Twin type (8 pins)			
	Twin type (10 pins)			
Weight (approx.)		8 g .28 oz (Twin type), 4 g .14 oz: (1 Form C type)	8 g .28 oz (Twin type), 4 g .14 oz: (1 Form C type)	26 g .92 oz
Remarks		10 pins type available	10 pins type available	Welding terminal
Page		77	83	88

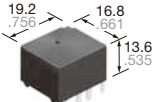

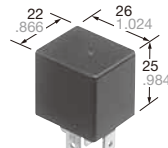
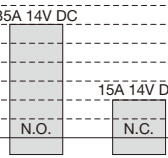
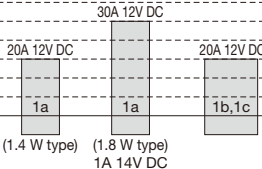
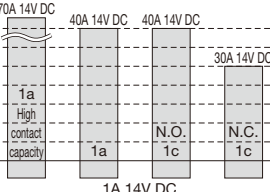
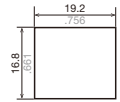
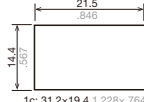
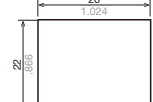
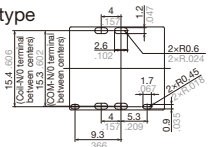
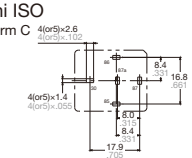
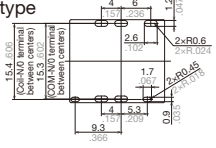
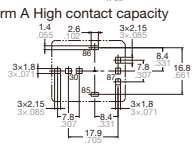
Type		Automotive relays						
Product name		TA RELAYS		TB RELAYS		TB RELAYS POWER TYPE		
Appearance configuration (Standoff height included, Unit: mm inch)								
Part No.		ACTA		ACTB		ACTBP		
Features		1 Form C Automotive Quiet Relay		Miniature PC Board, Twin/1 Form C Type Automotive Relay		High Carrying Current 1 Form A Type Relay for Miniature PC board		
Contact data	Contact arrangement	1 Form C		1 Form A, 1 Form C, 1 Form C x 2 (8 pins) and 1 Form C x 2 (10 pins)		1 Form A		
	Contact material	Ag alloy		Ag alloy		Ag alloy		
	Rated switching capacity (resistive)							
	Min. switching load (resistive)	1A 14V DC		1A 14V DC		1A 14V DC		
Latching type		-		-		-		
Coil data	Rated coil voltage	12V DC		12V DC		12V DC		
	Rated operating power	900mW	640mW	1,440mW	900mW	640mW	480mW	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 6.5V DC		Max. 5.5V DC		Max. 6.5V DC		Max. 7.0V DC
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 0.8V DC		Min. 0.5V DC		Min. 0.8V DC		Min. 0.5V DC
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)		
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)		
Expected life	Mechanical	Min. 10 ⁷		Min. 10 ⁷		Min. 5 x 10 ⁶		
	Electrical	Min. 10 ⁵		Min. 10 ⁵		Min. 10 ⁵		
Dielectric strength	Between open contacts (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.		
	Between contacts and coil (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.		
Ambient temperature		-40 to +85°C -40 to +185°F		Standard type: -40 to +85°C -40 to +185°F High heat-resistant/Pin in Paste compliant type: -40 to +110°C -40 to +230°F		-40 to +110°C -40 to +230°F		
Protective construction	Dust cover	-		-		-		
	Flux tight	-		● (PIP type)		● (PIP type)		
	Sealed	●		●		●		
External dimensions	Height (mm inch) Included standoff	14 .551		13.5 .531/14.0 .551 (PIP type)		14 .551		
	Foot print (mm inch)							
PC board pattern								
Weight (approx.)		8 g .28 oz		Single type: 5 g .176 oz, Twin type: 9.5 g .335 oz		5 g .176 oz		
Remarks		-		10 pins type available		-		
Page		91		95		104		

Automotive Relays Selector Chart

Type		Automotive relays								
Product name		TC RELAYS			TE RELAYS			TG RELAYS		
Appearance configuration (Standoff height included, Unit: mm inch)										
Part No.		ACTC			ACTE			ACTG		
Features		High Load Relay for Smart J/B			Miniature PC Board, Twin Type, 1 Form C Automotive Relay			High Load Relay for Smart J/B		
Contact data	Contact arrangement	1 Form A (Standard type), 1 Form C (Standard type), Double make contact 2 Form A (Standard type) and Double make contact 2 Form A (2 coil latching type)			1 Form C, 1 Form C x 2 (8 pins) and 1 Form C x 2 (10 pins)			1 Form A and 1 Form C		
	Contact material	Ag alloy			Ag alloy			Ag alloy		
	Rated switching capacity (resistive)									
	Min. switching load (resistive)	1A 14V DC			1A 14V DC			1A 14V DC		
Latching type		●			-			-		
Coil data	Rated coil voltage	12V DC			12V DC			12V DC		
	Rated operating power	1,309mW	900mW	640mW	1,920mW	1,309mW	900mW	655mW	640mW	450mW
	Operate (Set) voltage at 20°C (68°F) (initial)	Max. 6.5V DC	Max. 7.0V DC	Max. 7.5V DC	Max. 7.5V DC	Max. 5.5V DC	Max. 6.5V DC	Max. 7.7V DC	Max. 6.5V DC	Max. 7.0V DC
	Release (Reset) voltage at 20°C (68°F) (initial)	Min. 0.5 V DC				Min. 0.6V DC	Min. 0.8V DC		Min. 0.8V DC	
Operate (Set) time (Rated voltage at 20°C (68°F))	Max. 10ms (without bounce time)			Max. 10ms (without bounce time)			Max. 10ms (without bounce time)			
Release (Reset) time (Rated voltage at 20°C (68°F))	Max. 10ms (without bounce time) (without diode)			Max. 10ms (without bounce time) (without diode)			Max. 10ms (without bounce time) (without diode)			
Expected life	Mechanical	Min. 10 ⁷ Min. 10 ⁶ (2 coil latching type)			Min. 10 ⁷			Min. 10 ⁷		
	Electrical	Min. 10 ⁵			Min. 10 ⁵			Min. 10 ⁵		
Dielectric strength	Between open contacts (initial)	500 Vrms for 1 min.			500 Vrms for 1 min.			500 Vrms for 1 min.		
	Between contacts and coil (initial)	500 Vrms for 1 min.			500 Vrms for 1 min.			500 Vrms for 1 min.		
Ambient temperature		Standard type: -40 to +85°C -40 to +185°F High heat-resistant/Pin in Paste compliant type: -40 to +110°C -40 to +230°F			-40 to +110°C -40 to +230°F			-40 to +110°C -40 to +230°F		
Protective construction	Dust cover	-			-			-		
	Flux tight	● (PIP type)			● (PIP type)			-		
	Sealed	●			●			●		
External dimensions	Height (mm inch) Included standoff	16.0 .630/16.4 .646 (PIP type)			13.5 .531/14.0 .551 (PIP type)			18.0 .709		
	Foot print (mm inch)									
PC board pattern										
Weight (approx.)		10 g .35 oz			Single type: 3.5 g .12 oz, Twin type: 6.5 g .23 oz			12 g .42 oz		
Remarks		-			10 pins type available			-		
Page		109			118			126		

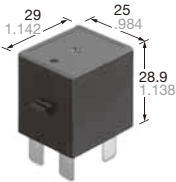
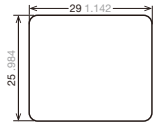
Type		Automotive relays			
Product name		TH RELAYS	TJ RELAYS	TL RELAYS	
Appearance configuration (Standoff height included, Unit: mm inch)					
	Part No.	ACTH	ACTJ	ACTL	
Features		Miniature PC Board, Twin, 1 Form C, Surface-mount Type Automotive Relay	Middle Load Relay for Smart J/B	High Load Relay for Smart Junction Box	
Contact data	Contact arrangement	1 Form C and 1 Form C × 2 (10 pins)	1 Form C	Double make contact 2 Form A	
	Contact material	Ag alloy	Ag alloy	Ag alloy	
	Rated switching capacity (resistive)	40A		30A 14V DC	40A 14V DC
		35A			
Min. switching load (resistive)	20A 14V DC	N.O.	N.O.	N.O.	
	10A 14V DC	N.C.	N.C.		
Latching type		-	-	-	
Coil data	Rated coil voltage	12V DC	12V DC	12V DC	
	Rated operating power	900mW	655mW	450mW	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 6.5V DC	Max. 7.7V DC	Max. 7.0V DC	
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 0.6V DC	Min. 0.8V DC	Min. 0.5V DC	
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)	Max. 10ms (without bounce time)	Max. 10ms (without bounce time)	
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)	Max. 10ms (without bounce time) (without diode)	Max. 10ms (without bounce time) (without diode)	
Expected life	Mechanical	Min. 10 ⁷	Min. 10 ⁷	Min. 5 × 10 ⁶	
	Electrical	Min. 10 ⁵	Min. 10 ⁵	Min. 10 ⁵	
Dielectric strength	Between open contacts (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.	
	Between contacts and coil (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.	
Ambient temperature		-40 to +110°C -40 to +230°F	-40 to +110°C -40 to +230°F	-40 to +110°C -40 to +230°F	
Protective construction	Dust cover	-	-	-	
	Flux tight	●	-	● (PIP type)	
	Sealed	●	●	●	
External dimensions	Height (mm inch) Included standoff	Surface mount: 8.8 .346	11.2 .441	16 .630	
	Foot print (mm inch)				
PC board pattern		<p>Twin type (10 pins)</p>  <p>1 Form C type</p> 			
Weight (approx.)		1 Form C type: 3 g .106 oz, Twin type: 6 g .21 oz	7 g .25 oz	6.5 g .23 oz	
Remarks		-	-	-	
Page		131	136	140	

Automotive Relays Selector Chart

Type		Automotive relays					
Product name		TM RELAYS		CA RELAYS		CB RELAYS	
Appearance configuration (Standoff height included, Unit: mm inch)							
Part No.		ACTM		ACA		ACB	
Features		High Capacity Relay for Smart Junction Box		Small Size, Light Weight Automotive Power Relays		Mini-ISO Automotive Relay	
Contact data	Contact arrangement	1 Form A and 1 Form C		1 Form A and 1 Form B	1 Form C	1 Form A and 1 Form C	
	Contact material	Ag alloy		Ag alloy		Ag alloy	
	Rated switching capacity (resistive)						
	Min. switching load (resistive)	1A 14V DC		(1.4 W type) (1.8 W type) 1A 14V DC		1A 14V DC	
Latching type		-		-		-	
Coil data	Rated coil voltage	12V DC		12, 24V DC		12V DC	24V DC
	Rated operating power	450mW	360mW	1.4W/1.8W	1.8W	Standard: 1.4 W 1 Form A High contact capacity: 1.8 W	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 7.0V DC		12V DC: Max. 8.0V DC 24V DC: Max. 16V DC		3.0 to 7.0V DC	6.0 to 14V DC
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 0.5V DC		12V DC: 0.6 to 6.0V DC 24V DC: 1.2 to 12V DC		12V: Min. 0.6V DC 24V: Min. 1.2V DC	1.2 to 4.2V DC
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)		Max. 15ms (without bounce time)	
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)		Max. 15ms (without bounce time) (without diode)	
Expected life	Mechanical	Min. 5 x 10 ⁶		Min. 10 ⁶	Min. 5 x 10 ⁵	Min. 10 ⁶	
	Electrical	Min. 10 ⁵		Min. 10 ⁵ 1 Form A 1.8 W type: 2 x 10 ⁴ (at 30 A)		Min. 10 ⁵ (Sealed: Min. 5x10 ⁴)	
Electric strength	Between open contacts (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.	
	Between contacts and coil (initial)	500 Vrms for 1 min.		500 Vrms for 1 min.		500 Vrms for 1 min.	
Ambient temperature		-40 to +110°C -40 to +230°F		-30 to +80°C -22 to +176°F		Standard: -40 to +85°C -40 to +185°F Heat resistant: -40 to +125°C -40 to +257°F	
Protective construction	Dust cover	-		●	-	-	
	Flux tight	-		-	●	●	
	Sealed	●		●	●	●	
External dimensions	Height (mm inch) Included standoff	13.6 .535		37 1.457	40 1.575	PC board type: 26 1.024, Plug-in type: 25 .984 Bracket type: 41 1.614	
	Foot print (mm inch)						
PC board pattern	1 Form A type			-		Mini ISO 1 Form C 	
	1 Form C type			-		1 Form A High contact capacity 	
Weight (approx.)		11.6 g .41 oz		Rubber bracket A type: 23 g .81 oz, Screw-mounting type: 19 g .67 oz	31 g 1.09 oz	33 g 1.16 oz	
Remarks		-		Rubber bracket type and screw-mounting type available		PC board type and bracket type available	
Page		145		150		157	

Type		Automotive relays		
Product name		CM RELAYS	CV-N RELAYS	CN-L RELAYS
Appearance configuration (Standoff height included, Unit: mm inch)				
Part No.		ACM	ACVN	ACNL
Features		Micro-ISO Automotive Relay	Low Profile Micro-ISO Automotive Relay	Max. 150 A Continuous Carrying Current Latching Relay
Contact data	Contact arrangement	1 Form A and 1 Form C	1 Form A	1 Form A
	Contact material	Ag alloy	Ag alloy	Ag alloy
	Rated switching capacity (resistive)			
	Min. switching load (resistive)	For rated coil voltage 12 V DC type 1A 14V DC	1A 14V DC	1A 14V DC
Latching type		-	-	●
Coil data	Rated coil voltage	12V DC 24V DC	12V DC	12V DC
	Rated operating power	1.5W 1.8W	800mW	30W
	Operate (Set) voltage at 20°C 68°F (initial)	3.0 to 7.0V DC 6.0 to 14V DC	Max. 7.0V DC	Max. 7.0V DC
	Release (Reset) voltage at 20°C 68°F (initial)	1.2 to 4.2V DC 2.4 to 8.4V DC	Min. 0.5V DC	Max. 7.0V DC
Operate (Set) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time)		Max. 10ms (without bounce time)
Release (Reset) time (Rated voltage at 20°C 68°F)		Max. 10ms (without bounce time) (without diode)		Max. 10ms (without bounce time) (without diode)
Expected life	Mechanical	Min. 10 ⁶ (at 120 cpm)	Min. 10 ⁶ (at 120 cpm)	Min. 3 x 10 ⁵
	Electrical	Min. 10 ⁵ (resistive) (Sealed: Min. 5 x 10 ⁴)	Min. 10 ⁵ (resistive)	Min. 3 x 10 ⁴
Electrical strength	Between open contacts (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.
	Between contacts and coil (initial)	500 Vrms for 1 min.	500 Vrms for 1 min.	500 Vrms for 1 min.
Ambient temperature		-40 to +85°C -40 to +185°F	-40 to +85°C -40 to +185°F	-40 to +125°C -40 to +257°F
Protective construction	Dust cover	-	-	-
	Flux tight	●	-	-
	Sealed	●	●	●
External dimensions	Height (mm inch) Included standoff	PC board type: 23.906, Plug-in type: 22.866	15.7 .618	38.5 1.516
	Foot print (mm inch)			
PC board pattern			-	-
Weight (approx.)		20 g .71 oz	12 g .42 oz	150 g 5.29 oz
Remarks		-	-	-
Page		165	170	174

Automotive Relays Selector Chart

Type	Automotive relays		
Product name	EC-N RELAYS		
Appearance configuration (Standoff height included, Unit: mm inch)			
Part No.	AECN		
Features	Small, High capacity, High voltage DC Plug in Relay		
Contact data	Contact arrangement	1 Form A	
	Contact material	Ag alloy	
	Rated switching capacity (resistive)	40A	-----
		35A	-----
		30A	-----
25A		-----	
20A	-----		
15A	15A 400V DC		
10A	-----		
Min. switching load (resistive)	1A 12V DC		
Latching type	-		
Coil data	Rated coil voltage	12V DC	
	Rated operating power	1.4W	
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 6.8V DC	
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 0.5V DC	
Operate (Set) time (Rated voltage at 20°C 68°F)	Max. 50ms (without bounce time)		
Release (Reset) time (Rated voltage at 20°C 68°F)	Max. 30ms (without bounce time) (without diode)		
Expected life	Mechanical	Min. 2 x 10 ⁵	
	Electrical	15A 400V DC, Min. 100,000 cycles (inrush)	
Dielectric strength	Between open contacts (initial)	2,500 Vrms for 1 min.	
	Between contacts and coil (initial)	2,500 Vrms for 1 min.	
Ambient temperature	-40 to +85°C -40 to +185°F		
Protective construction	Dust cover	-	
	Flux tight	-	
	Sealed	●	
External dimensions	Height (mm inch) Included standoff	28.9 1.138	
	Foot print (mm inch)		
PC board pattern	-		
Weight (approx.)	40 g 1.41 oz		
Remarks	-		
Page	178		

Type	Automotive relays						
Product name	EV RELAYS						
Appearance configuration (Standoff height included, Unit: mm inch)	<p>10A</p>	<p>20A</p>	<p>80A</p>	<p>120A</p>	<p>200A</p>	<p>300A</p>	
Part No.							AEV
Features	Compact and High voltage High capacity DC Cut-off Relays using Capsule Contact Mechanism						
Contact data	Contact arrangement	1 Form A					
	Contact material	Molybdenum	Copper alloy	Tungsten and copper alloy	Copper alloy		
	Rated switching capacity (resistive)	10A 450V DC	20A 400V DC	80A 450V DC	120A 450V DC	200A 450V DC	300A 450V DC
	Min. switching load (resistive)	1A 12V DC	1A 12V DC	1A 12V DC	1A 12V DC	1A 12V DC	1A 24V DC
Latching type	-						
Coil data	Rated coil voltage	12, 24V DC (Please inquire our sales representative for more information about EV20A with nominal coil voltage of 24V DC.)					
	Rated operating power	1.24W	3.9W	4.2W	4.2W	6.0W	12V: 37.9 W (Inrush), 3.6 W (Stable) 24V: 44.4 W (Inrush), 3.8 W (Stable)
	Operate (Set) voltage at 20°C 68°F (initial)	12V: Max. 9V DC, 24V: Max. 18V DC					
	Release (Reset) voltage at 20°C 68°F (initial)	12V: Min. 1.0V DC 24V: Min. 2.0V DC	12V: Min. 0.5V DC	12V: Min. 1.0V DC, 24V: Min. 2.0V DC			12V: Min. 2.0V DC 24V: Min. 4.0V DC
Operate (Set) time (Rated voltage at 20°C 68°F)	Max. 50ms (without bounce time)						Max. 30ms (without bounce time)
Release (Reset) time (Rated voltage at 20°C 68°F)	Max. 30ms						Max. 10ms
Expected life	Mechanical	Min. 10 ⁵	Min. 2 x 10 ⁵				
	Electrical	10A 450V DC, Min. 30,000 cycles (resistive)	20A 400V DC, Min. 3,000 cycles (resistive)	80A 450V DC, Min. 1,000 cycles (resistive)	30A 450V DC, Min. 1,000 cycles (resistive)	200A 450V DC, Min. 3,000 cycles (resistive)	300A 450V DC, Min. 1,000 cycles (resistive)
Electric strength	Between open contacts (initial)	2,500 Vrms for 1 min.					
	Between contacts and coil (initial)	2,500 Vrms for 1 min.					
Ambient temperature	-40 to +80°C -40 to +176°F				-40 to +85°C -40 to +185°F		
Protective construction	Dust cover	-					
	Flux tight	-					
	Sealed	● (Power capsule)					
External dimensions	Height (mm inch) Included standoff	49.7 1.957	48.1 1.894	79 3.110	80 3.150	86.4 3.402	74.7 2.941
	Foot print (mm inch)						
Mounting dimensions							
Weight (approx.)	90 g 3.17 oz	180 g 6.35 oz	400 g 14.11 oz	400 g 14.11 oz	600 g 21.16 oz	750 g 26.46 oz	
Remarks	-						
Page	183						

Automotive Relays Selector Chart

Type	Automotive relays		Automotive safety switches	
Product name	EV RELAYS Quiet Type	EV Relay Compact High Short-circuit Capacity Type	EV SWITCHES	
Appearance configuration (Standoff height included, Unit: mm inch)				
Part No.	AEVS	AEVG	AEVD	
Features	Unique Silencing Technology and Low Operation Noise	Compact and Short Circuit Capacity 4.5kA	High voltage DC Cut-off Switches using Capsule Contact Mechanism	
Contact data	Contact arrangement	1 Form A	1 Form A	
	Contact material	Tungsten and copper alloy	Copper alloy	
	Rated switching capacity (resistive)	200A 120A 100A 80A 60A 20A 10A 60A 450V DC	60A 450V DC	80A 400V DC
	Min. switching load (resistive)	1A 12V DC	1A 12V DC	
Latching type	-	-	-	
Coil data	Rated coil voltage	12V DC	12V DC	-
	Rated operating power	4.5W	5.2W	-
	Operate (Set) voltage at 20°C 68°F (initial)	Max. 9.0V DC	Max. 9.0V DC	-
	Release (Reset) voltage at 20°C 68°F (initial)	Min. 1.0V DC	Min. 0.5V DC	-
Operate (Set) time (Rated voltage at 20°C 68°F)	Max. 50ms (without bounce time)	Max. 50ms (without bounce time)	-	
Release (Reset) time (Rated voltage at 20°C 68°F)	Max. 50ms	Max. 30ms	-	
Expected life	Mechanical	Min. 2 × 10 ⁵	Min. 2 × 10 ⁵	Min. 100
	Electrical	60A 450V DC, Min. 800 cycles (resistive)	30A 450V DC (Inrush resistance), Min. 70,000 cycles	400A 400V DC, 5 times cut-off (L/R ≤ 1ms)
Electric strength	Between open contacts (initial)	Vertical type: 2,500 Vrms for 1 min.	2,500 Vrms for 1 min.	2,500 Vrms for 1 min. (Between contacts and lever surface)
	Between contacts and coil (initial)	Horizontal type: 2,000 Vrms for 1 min.	2,500 Vrms for 1 min.	-
Ambient temperature	-40 to +80°C -40 to +176°F	-40 to +80°C -40 to +176°F	-40 to +80°C -40 to +176°F	
Protective construction	Dust cover	-	-	-
	Flux tight	-	-	-
	Sealed	● (Power capsule)	● (Power capsule)	● (Power capsule)
External dimensions	Height (mm inch) Included standoff	Vertical type: 72.3 2.846 Horizontal type: 37.7 1.484	52.8 2.079	34.6 1.362
	Foot print (mm inch)			
Mounting dimensions	Vertical type			
	Horizontal type			
Weight (approx.)	Vertical type: 250 g 8.82 oz Horizontal type: 240 g 8.47 oz	165 g 5.82 oz	230 g 8.11 oz	
Remarks	-	-	-	
Page		183	201	