

**ECE**<sup>®</sup>

# SSRs

Solid State Relays



General Selection	ESR2 Series							
	AC Output							
	With LED Indicator				Without LED Indicator			
	Max. Load 120 VAC		Max. Load 240 VAC		Max. Load 120 VAC		Max. Load 240 VAC	
	Zero On	Random On	Zero On	Random On	Zero On	Random On	Zero On	Random On
Type (RoHS compliant*)	ESR2001200300Z	ESR2001200301Z	ESR2002400300Z	ESR2002400301Z	ESR2101200300Z	ESR2101200301Z	ESR2102400300Z	ESR2102400301Z
<b>General Characteristics</b>								
Operating Temp. Range	-20°C to +85°C				-20°C to +85°C			
Storage Temp. Range	-40°C to +100°C				-40°C to +100°C			
Dielectric Strength (Input-Output)	2.500 VAC				2.500 VAC			
Insulation Resistance (Input-Output)	100 MOhm / 500 VDC				100 MOhm / 500 VDC			
Capacitance (Input-Output)	10 pF (max.)				10 pF (max.)			
Max. Soldering Temp.	260C / 10s				260C / 10s			
Weight	ca. 18 g				ca. 18 g			
<b>Input Circuit</b>								
Control Voltage Range	4 to 32VDC				3 to 32 VDC			
Control Current	15 mA (max.)				15 mA (max.)			
Min. Turn-Off Voltage	1,5 VDC				1,0 VDC			
Min. Input Impedance	2,0 KOhm				2,2 Kohm			
<b>Output Characteristics (@ 20°C)</b>								
Nom. Load Voltage	120 VAC		240 VAC		120 VAC		240 VAC	
Load Voltage Range	24 to 140 VAC		24 to 280 VAC		24 to 140 VAC		24 to 280 VAC	
Non-Repetitive Max. Peak Voltage	400 VAC		600 VAC		400 VAC		600 VAC	
Max. Load Current	3 A (rms)				3 A (rms)			
Non Repetitive Max. Peak Current	80 A				80 A			
Max. On-State Voltage Drop	1,5 V				1,5 V			
Static Output On-Resistance								
Max. Off-State Leakage Current	5 mA				5 mA			
Minimum Load Current	50 mA				50 mA			
Max. Turn On Time	8,3 ms	100 µs	8,3 ms	100 µs	8,3 ms	100 µs	8,3 ms	100 µs
Max. Turn Off Time	8,3 ms				8,3 ms			
Operating Frequency Range								
Max. Off-State dv/dt	100 V/µs				100 V/µs			

\*) omit "Z" as last letter of type code if Non-RoHS compliant type required

General Selection	AC Output / Random ON						
	Max. Load 240 VAC				Max. Load 100 V		
	Input 5 VDC	Input 12 VDC	Input 24 VDC	Input 5 VDC	Input 12 VDC	Input 24 VDC	Input 48 VDC
	Type (RoHS compliant*)	ESR3D05A20200Z	ESR3D12A20200Z	ESR3D24A20200Z	ESR3D05D10200Z	ESR3D12D10200Z	ESR3D24D10200Z
<b>General Characteristics</b>							
Operating Temp. Range	-20°C to +80°C				-20 to +75 °C		
Storage Temp. Range	-40°C to +100°C				-25 to +80 °C		
Dielectric Strength (Input-Output)	4.000 Vrms / 1 min.				2.500 Vrms / 1 min.		
Max. Soldering Temp.	220°C / 10 sec.				220°C / 10 sec.		
Weight	ca. 4 g				ca. 4g		
<b>Input Circuit</b>							
Nominal Voltage	5 VDC	12 VDC	24 VDC	5 VDC	12 VDC	24 VDC	48 VDC
Control Voltage Range	3 to 10 VDC	7 to 20 VDC	18 to 32 VDC	3 to 10 VDC	7 to 20 VDC	18 to 32 VDC	38 to 58 VDC
Control Current	12 mA	10 mA	7,7 mA	12 mA	10 mA	7,7 mA	4,4 mA
Release Voltage (Min. Turn-Off)	1 VDC			1,8 V			8,3 V
Input Impedance	300 Ohm	1.010 Ohm	3.000 Ohm	320 Ohm	1.070 Ohm	3.000 Ohm	10.800 Ohm
<b>Output Characteristics (@ 20°C)</b>							
Load Voltage	240 Vrms				100 V		
Operating Range	12 to 280 Vrms				0 to 180 V		
Peak Voltage (Clamping V.)	600 VAC				180 V		
Nominal Current	2 A				1 A		
Non Repetitive Overload Current	80 A				6 A		
Peak Power Dissipation					600 W		
On-State Voltage Drop	1,2 V				0,6 V (@ Load 2A)		
Static Output On-Resistance					1 Ohm (@ Load 2A)		
Off-State Leakage Current	< 1,5 mA				< 1 mA		
Minimum Load Current	50 mA				1 mA		
Turn On Time (@ Nom. Volt.)	100 µs				50 µs		
Turn Off Time (@ Nom. Volt.)	1/2 cycle + 1 ms				600 µs		
Operating Switching Frequency	47 to 400 Hz				10 Hz		
Transient Voltage Suppressor					Yes		
Off-State dv/dt	500 V/µs						
RC Snubber	10 nF / 100 Ohm						

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# Guide

DC Output					
With LED	W/O LED	With LED	W/O LED	With LED	W/O LED
Max. Load 380 VAC		Max. Load 60 VDC		Max. Load 24 VDC	
Zero On					
ESR200380030Z	ESR210380030Z	ESR2010600301Z	ESR2110600301Z	ESR2010240701Z	ESR2110240701Z
-20 to +80°C		-20 to +80°C			
-40 to +100°C		-40°C to +100°C		-25°C to +80°C	
4.000 VAC		3.500 VAC		3.750 VAC	
100 MOhm / 500 VDC		100 MOhm / 500 VDC			
10 pF (max.)		10 pF (max.)			
260°C / 10s		260°C / 10s			
ca. 18 g		ca. 18 g			
4 to 32 VDC	3 to 32 VDC	4 to 32 VDC	3 to 32 VDC	4 to 32 VDC	3 to 32 VDC
16 mA (max.)		15 mA (max.)			
1,5 VDC	1,0 VDC	1,5 VDC	1,0 VDC	1,0 VDC	
		2,0 KOhm	2,2 KOhm		
380 VAC		60 VDC		24 VDC	
48 to 415 VAC		3 to 60 VDC		0 to 32 VDC	
800 VAC		60 V			
3 A (rms)		3 A		7 A	
120 A		5 A		30 A	
1,6 V		1,5 V		0,42 V (@ 7A)	
				60 mOhm (@ 7A)	
5 mA		1 mA			
50 mA		10 mA		1 mA	
8,3 ms		50 µs			
8,3 ms		100 µs		600 µs	
47 to 63 Hz					
500 V/µs					

DC Output							
Max. Load 48 V				Max. Load 24 V			
Input 5 VDC	Input 12 VDC	Input 24 VDC	Input 48 VDC	Input 5 VDC	Input 12 VDC	Input 24 VDC	Input 48 VDC
ESR3D05D25100Z	ESR3D12D25100Z	ESR3D24D25100Z	ESR3D48D25100Z	ESR3D05D40050Z	ESR3D12D40050Z	ESR3D24D40050Z	ESR3D48D40050Z
-20 to +80 °C				-20 to +80 °C			
-25 to +80 °C				-25 to +80 °C			
3.750 Vrms / 1 min.				3.750 Vrms / 1 min.			
220°C / 10 sec.				220°C / 10 sec.			
ca. 4g				ca. 4g			
5 VDC	12 VDC	24 VDC	48 VDC	5 VDC	12 VDC	24 VDC	48 VDC
3 to 10 VDC	7 to 20 VDC	18 to 32 VDC	38 to 58 VDC	3 to 10 VDC	7 to 20 VDC	18 to 32 VDC	38 to 58 VDC
12 mA	10 mA	7,7 mA	4,4 mA	12 mA	10 mA	7,7 mA	4,4 mA
1,8 V	3,6 V	8,3 V	8,3 V	1,8 V	3,6 V	8,3 V	8,3 V
320 Ohm	1.070 Ohm	3.000 Ohm	10.800 Ohm	320 Ohm	1.070 Ohm	3.000 Ohm	10.800 Ohm
48 V				24 V			
0 to 60 V				0 to 32 V			
60 V				36 V			
2,5 A				4 A			
6 A				7 A			
600 W				600 W			
0,4 V (@ Load 2A)				0,24 V (@ Load 2A)			
0,2 Ohm (@ Load 2A)				0,12 Ohm (@ Load 2A)			
< 1 mA				< 1 mA			
1 mA				1 mA			
50 µs				50 µs			
600 µs				600 µs			
10 Hz				10 Hz			
Yes				Yes			

General Selection	ESR4 Series					
	AC Output			DC Output		
	Max. Load 240 VAC			Max. Load 24 V		
	Random On					
	Input 5 VDC	Input 12 VDC	Input 24 VDC	Input 5 VDC	Input 12 VDC	Input 24 VDC
Type (RoHS compliant*)	ESR4D05A10001Z	ESR4D12A10001Z	ESR4D24A10001Z	ESR4D05D40*00Z	ESR4D12D40*00Z	ESR4D24D40*00Z
<b>General Characteristics</b>						
Operating Temp. Range	-30°C to +85°C			-20 to +80 °C		
Storage Temp. Range	-40°C to +100°C			-25 to +80 °C		
Dielectric Strength (Input-Output)	2.500 Vrms / 1 min.			3.750 Vrms / 1 min.		
Insulation Resistance (Input-Output)	1.000 MOhm / DC 500 V			1.000 MOhm / DC 500 V		
Max. Soldering Temp.	220°C / 10 sec.			220°C / 10 sec.		
Weight	ca. 3 g			ca.3 g		
<b>Input Circuit</b>						
Nominal Voltage	5 VDC	12 VDC	24 VDC	5 VDC	12 VDC	24 VDC
Control Voltage Range	3 to 10 VDC	7 to 20 VDC	18 to 32 VDC	3 to 10 VDC	7 to 20 VDC	18 to 32 VDC
Control Current	12 mA	10 mA	7,7 mA	12 mA	10 mA	7,7 mA
Release Voltage (Min. Turn-Off)	1,0 VDC			1,0 VDC		
Input Impedance	320 Ohm	1.070 Ohm	3.000 Ohm	320 Ohm	1.070 Ohm	3.000 Ohm
<b>Output Characteristics (@ 20°C)</b>						
Nominal Load Voltage	240 Vrms			24 VDC		
Operating Range	24 to 265 Vrms			0 to 30 VDC		
Minimum Load Current	50 mA			1 mA		
Max. Voltage (Non Repetitive)	600 VAC					
Nom. Load Current	1 A			4 A		
Max. Current (Non Repetitive)	50 A			7 A (10ms)		
Max. On-State Voltage Drop	1,5 V			0,24 V (@ Load 2A)		
Max. Off-State Leakage Current	2,0 mA			< 1 mA		
Max. Turn On Time	1 ms			1 ms		
Max. Turn Off Time	1/2 cycle + 1 ms			100 µs		
Operating Switching Frequency				10 Hz		

\*) omit "Z" as last letter of type  
code if Non-RoHS compliant type  
required

\* => 0 if P-Output (Terminal 1: Plus)  
\* => 1 if N-Output (Terminal 1: Minus)

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**MECHANICAL DATA**

	Dimensions (cm)		
	ESR2	ESR3	ESR4
L	43	28	20
W	10	5	5
H	25	15	17
T	2,54+/-0,3	1,4+/-0,2	1,5
PL	6,00+/-0,5	3,5+/-0,2	3,5
D1	5,08+/-0,3	3,8+/-0,2	2,54
D2	12,7+/-0,3	16,5+/-0,2	7,62
D3	10,16+/-0,3	5,1+/-0,2	7,62
D4	7,62+/-0,3	2,0+/-0,2	1,11
Term.1	DC Output -		DC-P-Type: +
Term.2	DC Output +		DC-N-Type: +
Term.3	Input +	Input +	Input +
Term.4	Input -	Input -	Input -

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