

## SOLID STATE RELAY ESR50/51/52/53 SERIES

### PANEL MOUNT

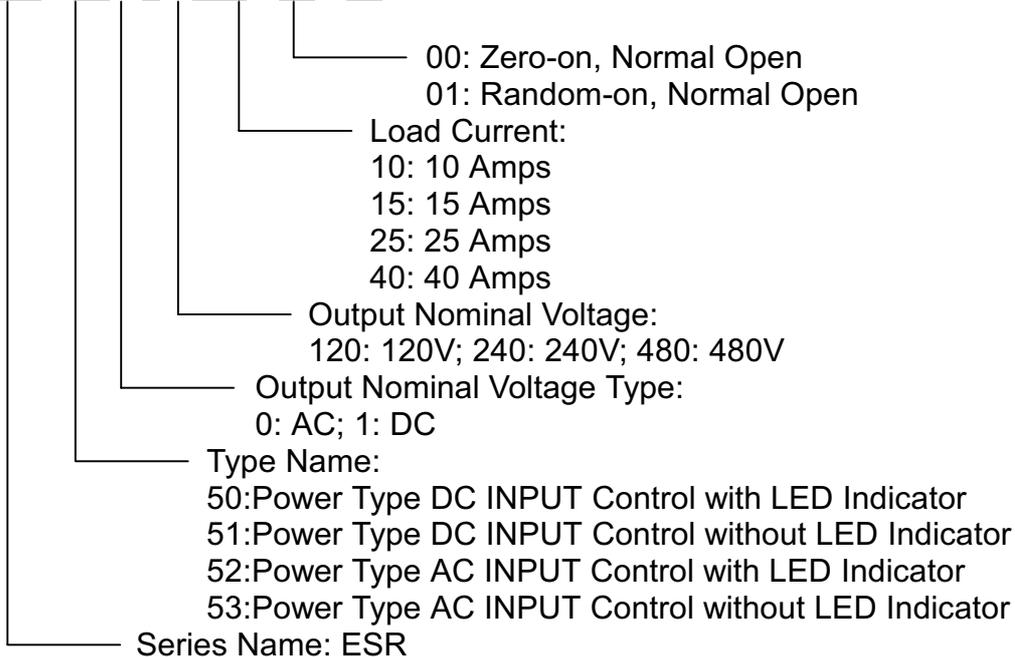
#### ■ FEATURES

- Optically Isolated.
- Input LED Indicator.
- High dv/dt and High Blocking Voltage.
- Low Input Power Consumption.
- TTL and CMOS Compatible.
- Zero Voltage Turn-on, Zero Current Turn-off (minizes EMI/RFI).
- High Surge Rating Allows Lamp and Motor Load Switching.
- Output Snubber Circuit Protection.



#### ■ PART NUMBERING SYSTEM

ESR 50 0 240 25 00

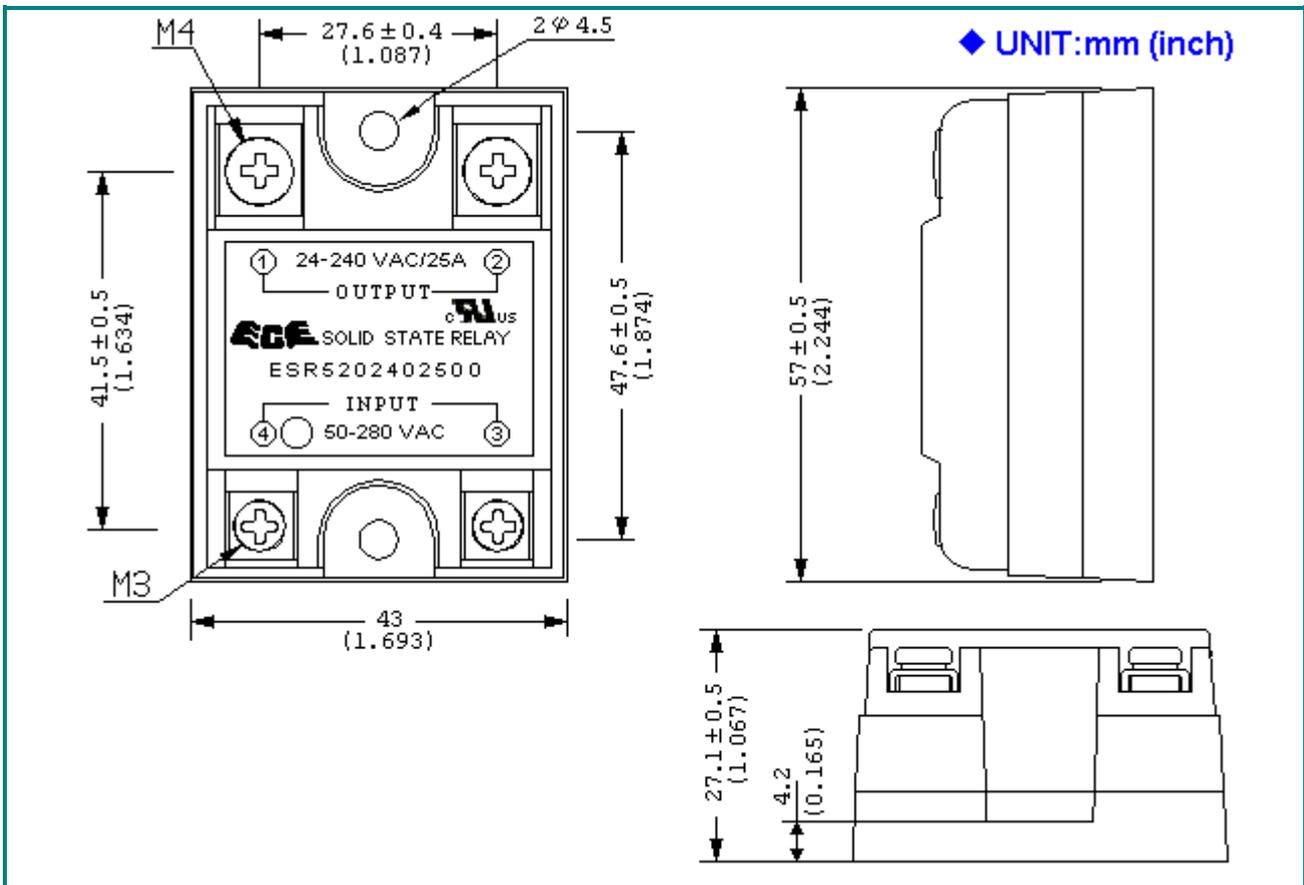


■ **OPTIONS:**

Protective cover: 436-41100

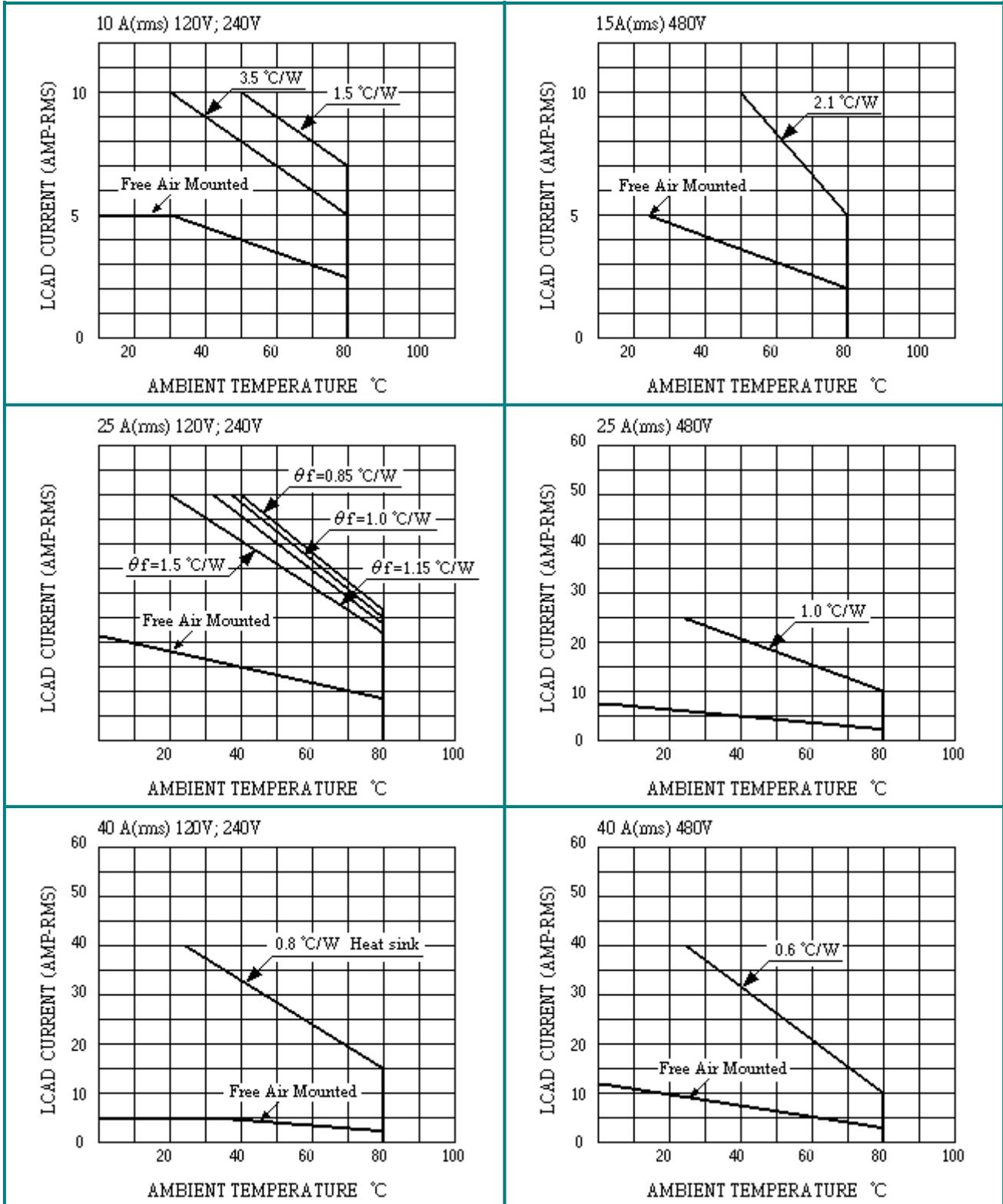


■ **DIMENSIONS**





## TEMPERAURE DERATING CHART



## ■ SPECIFICATIONS

### 1. ESR500/ESR510 SERIES (DC INPUT CONTROL)

- MAX. LOAD CURRENT: 10A(rms) 120V;240V
- MAX. LOAD CURRENT: 25A(rms) 120V;240V
- MAX. LOAD CURRENT: 40A(rms) 120V;240V
- MAX. LOAD CURRENT: 15A(rms) 480V
- MAX. LOAD CURRENT: 25A(rms) 480V
- MAX. LOAD CURRENT: 40A(rms) 480V

### 2. ESR520/ESR530 SERIES (AC INPUT CONTROL)

- MAX. LOAD CURRENT: 10A(rms) 120V;240V
- MAX. LOAD CURRENT: 25A(rms) 120V;240V
- MAX. LOAD CURRENT: 40A(rms) 120V;240V

■ **SPECIFICATIONS ..... (DC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 10A(rms) 120V;240V

DATAS \ TYPES	ESR500				ESR510			
	1201000	2401000	1201001	2401001	1201000	2401000	1201001	2401001
INPUT CIRCUIT								
LED Indicate	YES				NO			
Control Voltage Range	4 - 32 VDC				3 - 32 VDC			
Control Current	15 mA Max.				15 mA Max.			
Min. Turn-off Voltage	1.5 VDC				1 VDC			
Input Impedance	2.0 K $\Omega$ Min.				2.0 K $\Omega$ Min.			
OUTPUT CIRCUIT								
Max. Load Current	10 A (rms)				10 A (rms)			
Nominal load Voltage (VAC)	120	240	120	240	120	240	120	240
Load Voltage Range (VAC)	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600	400	600	400	600
Non-Repetitive Max. Peak Current	125 A							
Max. Off-state Leakage Current	1 mA							
Max. On-state Voltage Drop	1.6 V.							
Min. Load Current	50 mA							
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s							
Operating Frequency Range	47 Hz ~ 63 Hz							
<b>■ GENERAL CHARACTERISTICS</b>								
Zero-on or Random-on	Z		R		Z		R	
Max. Turn -on Time (60 Hz)	8.3 ms		100 $\mu$ s		8.3 ms		100 $\mu$ s	
Max. Turn-off Time (60 Hz)	8.3 ms							
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)							
Dielectric Strength	3.5K VAC(Between Input & Output)							
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)							
Operating Temperature	-20 $^{\circ}$ C ~ +80 $^{\circ}$ C							
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C							
Heatsink	3.5 $^{\circ}$ C/W (Max. Load Current)							

## ■ SPECIFICATIONS ..... (DC INPUT CONTROL)

◆ MAX. LOAD CURRENT: 25A(rms) 120V;240V

DATAS	TYPE	ESR500				ESR510			
		1202500	2402500	1202501	2402501	1202500	2402500	1202501	2402501
<b>■ INPUT CIRCUIT</b>									
LED Indicate	YES				NO				
Control Voltage Range	4 - 32 VDC				3 - 32 VDC				
Control Current	15 mA Max.				15 mA Max.				
Min. Turn-off Voltage	1.5 VDC				1 VDC				
Input Impedance	2.0 K $\Omega$ Min.				2.0 K $\Omega$ Min.				
<b>■ OUTPUT CIRCUIT</b>									
Max. Load Current	25 A (rms)				25 A (rms)				
Nominal load Voltage (VAC)	120	240	120	240	120	240	120	240	
Load Voltage Range (VAC)	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280	
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600	400	600	400	600	
Non-Repetitive Max. Peak Current	260 A								
Max. Off-state Leakage Current	7 mA								
Max. On-state Voltage Drop	1.6 V.								
Min. Load Current	100 mA								
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s								
Operating Frequency Range	47 Hz ~ 63 Hz								
<b>■ GENERAL CHARACTERISTICS</b>									
Zero-on or Random-on	Z		R		Z		R		
Max. Turn -on Time (60 Hz)	8.3 ms		100 $\mu$ s		8.3 ms		100 $\mu$ s		
Max. Turn-off Time (60 Hz)	8.3 ms								
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)								
Dielectric Strength	3.5K VAC(Between Input & Output)								
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)								
Operating Temperature	-20 $^{\circ}$ C ~ +80 $^{\circ}$ C								
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C								
Heatsink	1.5 $^{\circ}$ C/W (Max.Load Current)								

**■ SPECIFICATIONS ..... (DC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 40A(rms) 120V;240V

DATAS	TYPES	ESR500				ESR510			
		1204000	2404000	1204001	2404001	1204000	2404000	1204001	2404001
<b>■ INPUT CIRCUIT</b>									
LED Indicate	YES				NO				
Control Voltage Range	4 - 32 VDC				3 - 32 VDC				
Control Current	15 mA Max.				15 mA Max.				
Min. Turn-off Voltage	1.5 VDC				1 VDC				
Input Impedance	2.0 K $\Omega$ Min.				2.0 K $\Omega$ Min.				
<b>■ OUTPUT CIRCUIT</b>									
Max. Load Current	40 A (rms)				40 A (rms)				
Nominal load Voltage (VAC)	120	240	120	240	120	240	120	240	
Load Voltage Range (VAC)	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280	24 -140	24 -280	
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600	400	600	400	600	
Non-Repetitive Max. Peak Current	315 A								
Max. Off-state Leakage Current	7 mA								
Max. On-state Voltage Drop	1.8 V.								
Min. Load Current	100 mA								
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s								
Operating Frequency Range	47 Hz ~ 63 Hz								
<b>■ GENERAL CHARACTERISTICS</b>									
Zero-on or Random-on	Z		R		Z		R		
Max. Turn -on Time (60 Hz)	8.3 ms		100 $\mu$ s		8.3 ms		100 $\mu$ s		
Max. Turn-off Time (60 Hz)	8.3 ms								
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)								
Dielectric Strength	3.5K VAC(Between Input & Output)								
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)								
Operating Temperature	-20 $^{\circ}$ C ~ +75 $^{\circ}$ C								
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C								
Heatsink	0.8 $^{\circ}$ C/W (Max.Load Current)								

**■ SPECIFICATIONS ..... (DC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 15A(rms) 480V

DATAS	TYPES	ESR500		ESR510	
		4801500	4801501	4801500	4801501
<b>■ INPUT CIRCUIT</b>					
LED Indicate		YES		NO	
Control Voltage Range		4 - 32 VDC		4 - 32 VDC	
Control Current		120 mA Max.		120 mA Max.	
Min. Turn-off Voltage		1.5 VDC		1.5 VDC	
Input Impedance		270Ω Min.		270Ω Min.	
<b>■ OUTPUT CIRCUIT</b>					
Max. Load Current		15 A (rms)		15 A (rms)	
Nominal load Voltage (VAC)		440		440	
Load Voltage Range (VAC)		48-480		48-480	
Non-Repetitive Max. Peak Voltage (VAC)		800		800	
Non-Repetitive Max. Peak Current		200 A			
Max. Off-state Leakage Current		2 mA			
Max. On-state Voltage Drop		1.6 V.			
Min. Load Current		70 mA			
Max. Off-state Slew Rated (dv/dt)		700 V/μs			
Operating Frequency Range		47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>					
Zero-on or Random-on		Z	R	Z	R
Max. Turn -on Time (60 Hz)		8.3 ms	100 μs	8.3 ms	100 μs
Max. Turn-off Time (60 Hz)		8.3 ms			
Insulation Resistance		DC 500V 10 <sup>9</sup> Ω Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength		3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)		15 pF Max. (Between Input & Output)			
Operating Temperature		-20°C ~ +75°C			
Storage Temperature		-40°C ~ +100°C			
Heatsink		2.1°C/W (Max. Load Current)			

## ■ SPECIFICATIONS ..... (DC INPUT CONTROL)

◆ MAX. LOAD CURRENT: 25A(rms) 480V

DATAS	TYPES	ESR500		ESR510	
		4802500	4802501	4802500	4802501
<b>■ INPUT CIRCUIT</b>					
LED Indicate		YES		NO	
Control Voltage Range		4 - 32 VDC		4 - 32 VDC	
Control Current		120 mA Max.		120 mA Max.	
Min. Turn-off Voltage		1.5 VDC		1.5 VDC	
Input Impedance		270Ω Min.		270Ω Min.	
<b>■ OUTPUT CIRCUIT</b>					
Max. Load Current		25 A (rms)		25 A (rms)	
Nominal load Voltage (VAC)		440		440	
Load Voltage Range (VAC)		48-480		48-480	
Non-Repetitive Max. Peak Voltage (VAC)		800		800	
Non-Repetitive Max. Peak Current		250 A			
Max. Off-state Leakage Current		1 mA			
Max. On-state Voltage Drop		1.6 V.			
Min. Load Current		120 mA			
Max. Off-state Slew Rated (dv/dt)		700 V/μs			
Operating Frequency Range		47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>					
Zero-on or Random-on		Z	R	Z	R
Max. Turn -on Time (60 Hz)		8.3 ms	100 μs	8.3 ms	100 μs
Max. Turn-off Time (60 Hz)		8.3 ms			
Insulation Resistance		DC 500V 10 <sup>9</sup> Ω Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength		3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)		15 pF Max. (Between Input & Output)			
Operating Temperature		-20°C ~ +75°C			
Storage Temperature		-40°C ~ +100°C			
Heatsink		1.0°C/W (Max. Load Current)			

**■ SPECIFICATIONS ..... (DC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 40A(rms) 480V

DATAS	TYPES	ESR500		ESR510	
		4804000	4804001	4804000	4804001
<b>■ INPUT CIRCUIT</b>					
LED Indicate		YES		NO	
Control Voltage Range		4 - 32 VDC		4 - 32 VDC	
Control Current		120 mA Max.		120 mA Max.	
Min. Turn-off Voltage		1.5 VDC		1.5 VDC	
Input Impedance		270Ω Min.		270Ω Min.	
<b>■ OUTPUT CIRCUIT</b>					
Max. Load Current		40 A (rms)		40 A (rms)	
Nominal load Voltage (VAC)		440		440	
Load Voltage Range (VAC)		48-480		48-480	
Non-Repetitive Max. Peak Voltage (VAC)		800		800	
Non-Repetitive Max. Peak Current		400 A			
Max. Off-state Leakage Current		1 mA			
Max. On-state Voltage Drop		1.8 V.			
Min. Load Current		120 mA			
Max. Off-state Slew Rated (dv/dt)		900 V/μs			
Operating Frequency Range		47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>					
Zero-on or Random-on		Z	R	Z	R
Max. Turn -on Time (60 Hz)		8.3 ms	100 μs	8.3 ms	100 μs
Max. Turn-off Time (60 Hz)		8.3 ms			
Insulation Resistance		DC 500V 10 <sup>9</sup> Ω Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength		3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)		15 pF Max. (Between Input & Output)			
Operating Temperature		-20°C ~ +75°C			
Storage Temperature		-40°C ~ +100°C			
Heatsink		0.6°C/W (Max. Load Current)			

■ **SPECIFICATIONS ..... (AC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 10A(rms) 120V; 240V

DATAS \ TYPES	ESR520		ESR530	
	1201000	2401000	1201000	2401000
<b>■ INPUT CIRCUIT</b>				
LED Indicate	YES		NO	
Control Voltage Range	50 - 280 VAC		50 - 280 VAC	
Control Current	15 mA Max.		15 mA Max.	
Min. Turn-off Voltage	40 VAC		35 VAC	
Input Impedance	106 K $\Omega$ Min.		106 K $\Omega$ Min.	
<b>■ OUTPUT CIRCUIT</b>				
Max. Load Current	10 A (rms)		10 A (rms)	
Nominal load Voltage (VAC)	120	240	120	240
Load Voltage Range (VAC)	24-140	24-280	24-140	24-280
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600
Non-Repetitive Max. Peak Current	125 A			
Max. Off-state Leakage Current	1 mA			
Max. On-state Voltage Drop	1.6 V			
Min. Load Current	50 mA			
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s			
Operating Frequency Range	47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>				
Zero-on or Random-on	Z		Z	
Max. Turn -on Time (60 Hz)	10 ms		10ms	
Max. Turn-off Time (60 Hz)	20 ms			
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength	3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)			
Operating Temperature	-20 $^{\circ}$ C ~ +80 $^{\circ}$ C			
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C			
Heatsink	3.5 $^{\circ}$ C/W(Max.Load Current)			

## ■ SPECIFICATIONS ..... (AC INPUT CONTROL)

◆ MAX. LOAD CURRENT: 25A(rms) 120V; 240V

DATAS \ TYPES	ESR520		ESR530	
	1202500	2402500	1202500	2402500
<b>■ INPUT CIRCUIT</b>				
LED Indicate	YES		NO	
Control Voltage Range	50 - 280 VAC		50 - 280 VAC	
Control Current	15 mA Max.		15 mA Max.	
Min. Turn-off Voltage	40 VAC		35 VAC	
Input Impedance	106 K $\Omega$ Min.		106 K $\Omega$ Min.	
<b>■ OUTPUT CIRCUIT</b>				
Max. Load Current	25 A (rms)		25 A (rms)	
Nominal load Voltage (VAC)	120	240	120	240
Load Voltage Range (VAC)	24-140	24-280	24-140	24-280
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600
Non-Repetitive Max. Peak Current	260 A			
Max. Off-state Leakage Current	7 mA			
Max. On-state Voltage Drop	1.6 V			
Min. Load Current	100 mA			
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s			
Operating Frequency Range	47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>				
Zero-on or Random-on	Z		Z	
Max. Turn -on Time (60 Hz)	10 ms		10 ms	
Max. Turn-off Time (60 Hz)	20 ms			
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength	3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)			
Operating Temperature	-20 $^{\circ}$ C ~ +80 $^{\circ}$ C			
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C			
Heatsink	1.5 $^{\circ}$ C/W(Max.Load Current)			

**■ SPECIFICATIONS ..... (AC INPUT CONTROL)**

◆ MAX. LOAD CURRENT: 40A(rms) 120V; 240V

DATAS \ TYPES	ESR520		ESR530	
	1204000	2404000	1204000	2404000
<b>■ INPUT CIRCUIT</b>				
LED Indicate	YES		NO	
Control Voltage Range	50 - 280 VAC		50 - 280 VAC	
Control Current	15 mA Max.		15 mA Max.	
Min. Turn-off Voltage	40 VAC		35 VAC	
Input Impedance	106 K $\Omega$ Min.		106 K $\Omega$ Min.	
<b>■ OUTPUT CIRCUIT</b>				
Max. Load Current	40 A (rms)		40 A (rms)	
Nominal load Voltage (VAC)	120	240	120	240
Load Voltage Range (VAC)	24-140	24-280	24-140	24-280
Non-Repetitive Max. Peak Voltage (VAC)	400	600	400	600
Non-Repetitive Max. Peak Current	315 A			
Max. Off-state Leakage Current	7 mA			
Max. On-state Voltage Drop	1.8 V			
Min. Load Current	100 mA			
Max. Off-state Slew Rated (dv/dt)	250 V/ $\mu$ s			
Operating Frequency Range	47 Hz ~ 63 Hz			
<b>■ GENERAL CHARACTERISTICS</b>				
Zero-on or Random-on	Z		Z	
Max. Turn -on Time (60 Hz)	10ms		10 ms	
Max. Turn-off Time (60 Hz)	20 ms			
Insulation Resistance	DC 500V 10 <sup>9</sup> $\Omega$ Min. (Between Input & Output, Input/Output & Case)			
Dielectric Strength	3.5K VAC(Between Input & Output)			
Capacitance (Input to Output)	15 pF Max. (Between Input & Output)			
Operating Temperature	-20 $^{\circ}$ C ~ +75 $^{\circ}$ C			
Storage Temperature	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C			
Heatsink	0.8 $^{\circ}$ C/W(Max.Load Current)			