TELEDYNE RELAYS
A Teledyne Technologies Company

NEW Series SF

Output to 60A, 600 Vac
(Flatpac) Solid-State Relays

FEATURES/BENEFITS

- Random and zero-cross models available for all applications
- Low zero-cross turn-on voltage
- Input protection and control LED standard
- Connectors for power wiring and heat sinks available
- Designed in conformity with EN60947-4-3 (IEC947-4-3)

CE

Part No.	Load Voltage	Load Current	Control Voltage	Switch Type
SF24D25	12-280 Vac	25A	3-32 Vdc	Zero Cross
SF24R50HE	12-275 Vac	50A	3-32 Vdc	Random
SF60D50HE	24-600 Vac	50A	3.5-32 Vdc	Zero Cross

NOTES

1) Line Voltage (nominal): 24 = 240 Vac; 60 = 600 Vac

2) Switch Type: R= Random turn-on; D = Zero-cross turn-on

3) Feature: HE = High Efficiency Thyristors

I_{max}=64A @ T_{case}=85°C

I_{max}=44A @ T_{case}=100°C

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

	Min	Max	Units
Input Current Range			
All Relays	10	13	mA
Must Turn-Off Voltage	2.0		Vdc
Reverse Voltage Protection (D)		32	V
Clamping Voltage (D)		36	V
Input Immunity (EN61000-4-4)		2	kV
Input Immunity (EN61000-4-5)		2	kV

CONTROL CHARACTERISTICS

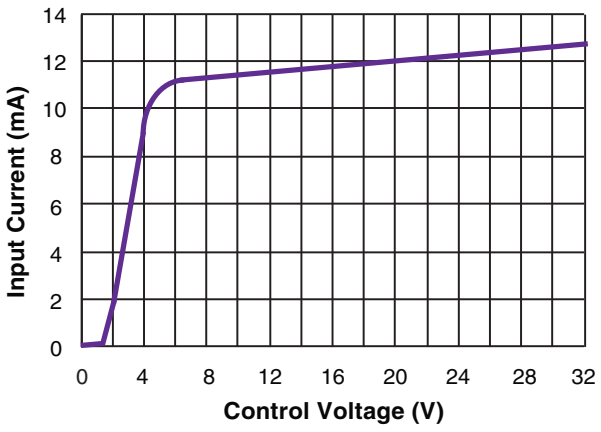
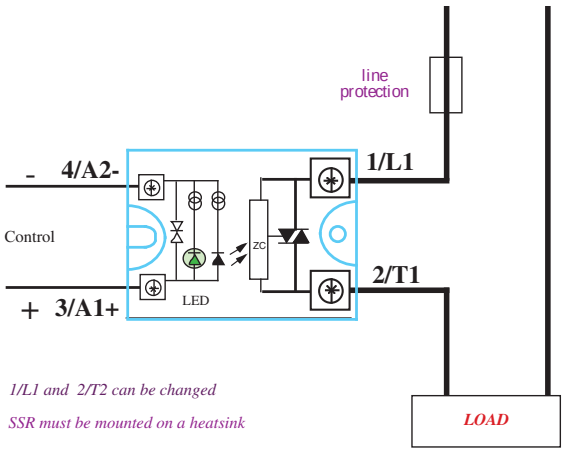


Figure 1

TYPICAL APPLICATION



Typical application: 5 kW resistor (AC-51 load) on 230 VAC

Figure 2a — SF24D25

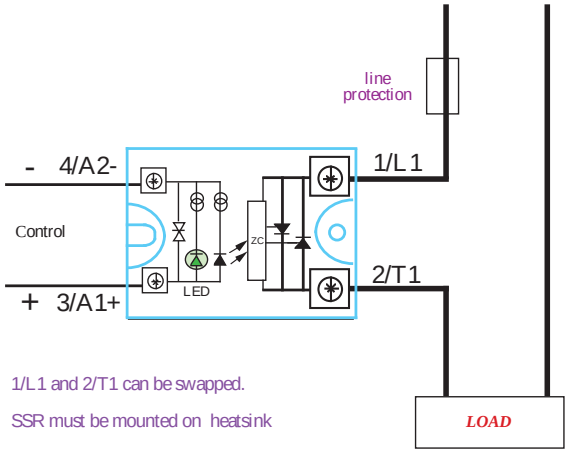


Figure 2a — SF60D50HE & SF24R50HE

ELECTRICAL SPECIFICATIONS
(+25°C ambient temperature unless otherwise specified)

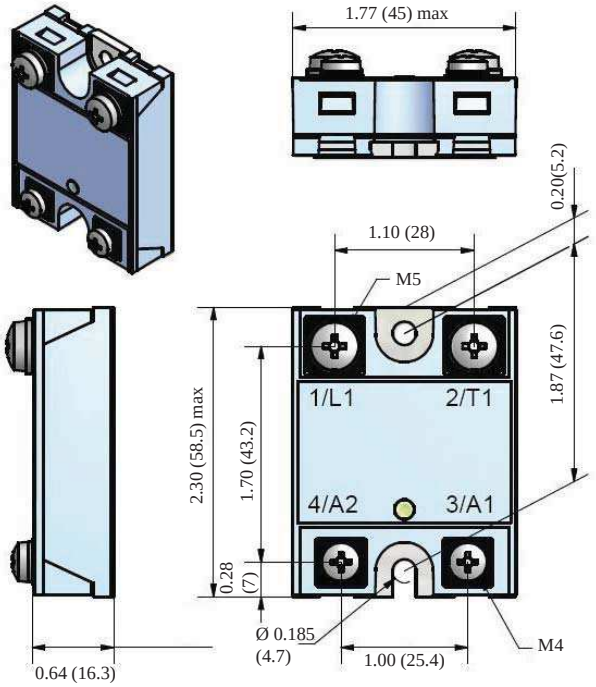
OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Operating Range			
SF24D25	12	280	Vac
SF24R50HE	12	275	Vac
SF60D50HE	24	600	Vac
Peak Voltage (VDR Clamping)			
SF24D25 & SF24R50HE		600	Vpeak
SF60D50HE		1200	Vpeak
Load Currrent Range (Resistive)			
25 output current	.005	25	Arms
50 output current	.005	60	Arms
Maximum Surge Current Rating (Non-Repetitive)			
25 output current		350	A
50 output current		580	A
On-State Voltage Drop		0.85	V
Output Power Dissipation (Max)			
25 output current	0.9 x 0.85 x I + 0.016 x I^2		W
50 output current	0.9 x 0.85 x I + 0.0075 x I^2		W
Zero-Cross Window (Typical)			
SFXXD		±17.5	Vac
Off-State Leakage Current			
All Relays		1	mA
Turn-On Time (60 Hz)			
SFXXD		10	ms
SFXXR		0.05	ms
Turn-Off Time (60 Hz)			
SFXXD		10	ms
Off-State dv/dt		500	V/µs
Maximum di/dt (Non-Repetitive)		50	A/µs

Operating Frequency			
All Relays	0.1	800	Hz
I^2t for fuse matching (<10ms)			
25 output current		600	A^2s
50 output current		1680	A^2s
Junction-Case Thermal Resistance			
25 output current		0.17	°C/W
50 output current		0.55	°C/W

Conducted Immunity Level	
IEC/EN61000-4-4 (bursts)	
SF48	2kV criterion A
IEC/EN61000-4-5 (surge)	
SF48	2kV criterion A with external VDR

MECHANICAL SPECIFICATION



Dimensions in inches (mm)
Weight: 2.29 (65 g)

Figure 3

GENERAL SPECIFICATIONS
(+25°C ambient temperature unless otherwise specified)

ENVIRONMENTAL SPECIFICATIONS

	Min	Max	Units
Operating Temperature			
25A output current	–55	+100	°C
50A output current	–40	+100	°C
Storage Temperature			
25A output current	–55	+125	°C
50A output current	–40	+125	°C
Ambient Humidity		40 to 85	%

Input-Output Isolation	4000		Vrms
Output-Case Isolation			
25A output current	4000		Vrms
50A output current	4000		Vrms
Insulation Resistance @500Vdc	1000		MΩ
Rated Impulse Voltage		4000	V
Vibration (10–55 Hz according to CE168)		1.5	mm
Shock (according to CD168)		30/50	g
Housing Material	PA6 UL94VO		
Baseplate	Aluminum, nickel-plated		

SURGE CURRENT

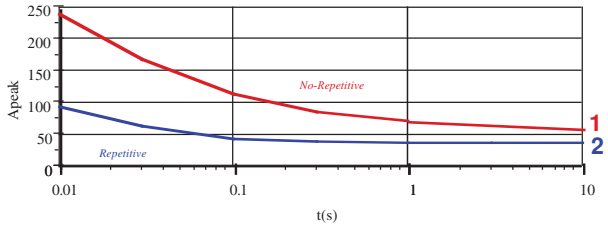


Figure 4a — 25A output current

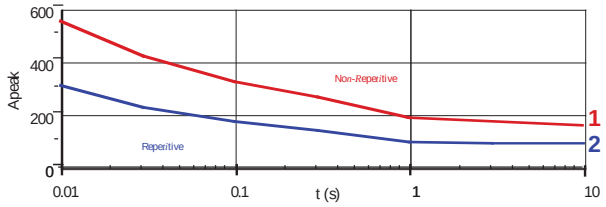


Figure 4b — 50A output current

THERMAL CURVES

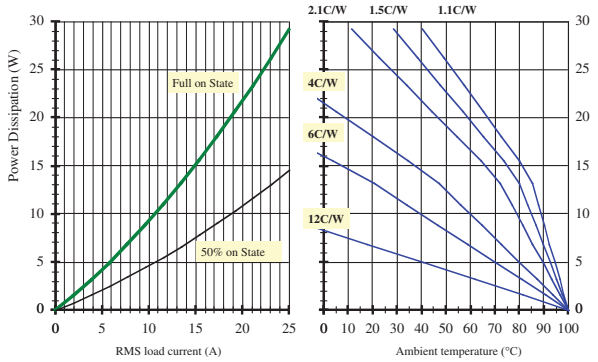


Figure 5a — 25A output power

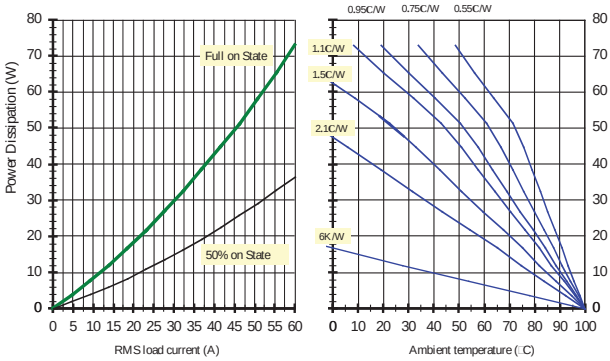


Figure 5b — 50A output power

12°C/W corresponds to a relay without heat sink
6°C/W corresponds to a relay mounted on a DIN-rail adaptor (Teledyne P/N DL12)

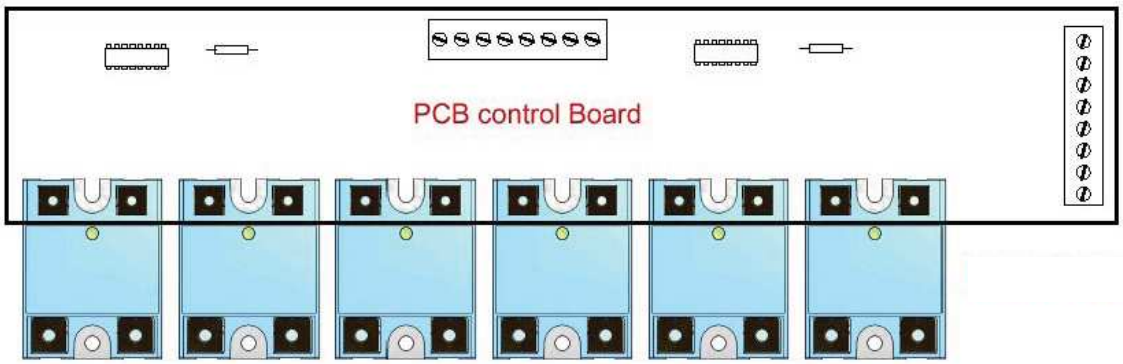
2–2.5°C/W
Teledyne P/N - FW151

1.1°C/W
Teledyne P/N - FW108

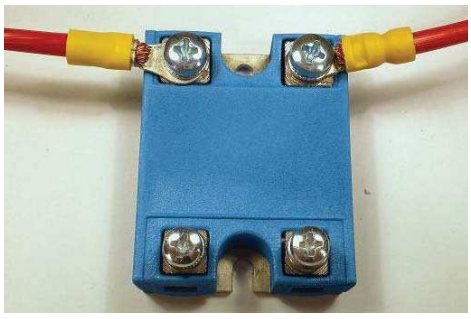
Thermal Pad
Teledyne P/N –12

DIN Rail Adapter
Teledyne P/N - DL12

Applications



Teledyne's new Flatpac is designed to be used in applications where height is limited. Below is an example of 6 solid state relays in-line where controls are directly connected to a PCB.



Teledyne's new Flatpac can be used where power terminals must be in a 90° angle.