

FEATURES/BENEFITS

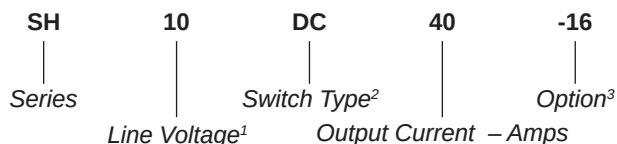
- Latest generation MOSFET technology
- Ultra low on-state resistance
- Low output leakage current
- Built-in overvoltage protection
- Reverse protected triggered control input to avoid linear control risks
- No radiated or conducted disturbances
- IP20 touch-proof flaps



IP20 touch-proof flaps

Part Number	Description
SH10DC40	40A, 100 Vdc Solid-State Relay
SH10DC40-16	40A, 60 Vdc Solid-State Relay
SH20DC15-T1	20A, 200 Vdc Solid-State Relay

Part Number Explanation



NOTES

- 1) Line Voltage (peak): 10 = 100 Vdc
- 2) Switch Type: DC = DC
- 3) Option: Internal Voltage Protection

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

	Min	Max	Units
Control Range	3.5	32	Vdc
Must Turn-Off Voltage	1		Vdc
Reverse Voltage		32	Vdc

CONTROL CHARACTERISTIC

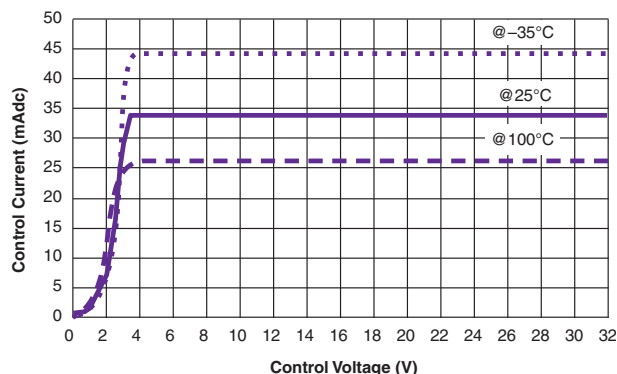
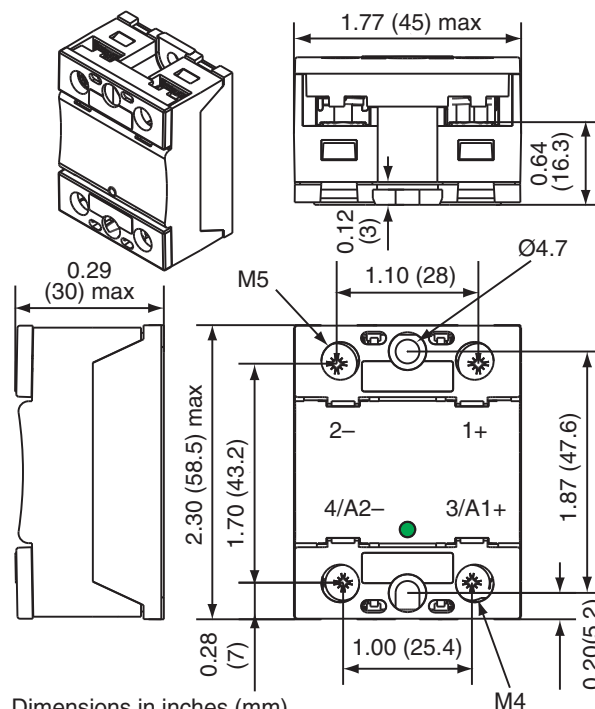


Figure 2

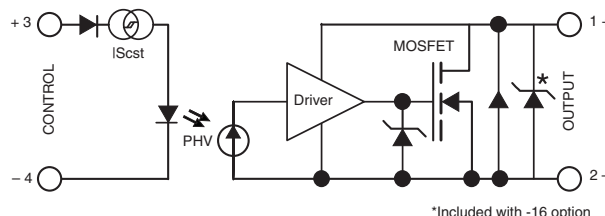
MECHANICAL SPECIFICATION



Dimensions in inches (mm)
 Weight: 2.82 oz. (80g)

Figure 1

BLOCK DIAGRAM



*Included with -16 option

Figure 3

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

OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Operating Range			
SH10DC40	5	100	Vdc
SH10DC40-16	5	60	Vdc
SH20DC20-16	5	110	Vdc
Peak Voltage			
SH10DC40		100	Vdc
SH10DC40-16		100	Vdc
SH20DC20-16		200	Vdc
Overvoltage Protection (Built-In)			
SH10DC40-16		56V (TVS) ¹	
SH20DCXX-16		75V (MOV Size 20) ²	
1) Transient Voltage Suppressor; 2) Metal Oxide Varistor			
Reverse Voltage Drop			
SH10DC40-16		1.3	V
SH20DCXX-16		1.5	V
Nominal Current (Resistive)			
SH10		40	A
SH20DC20-16		20	A
Non-Repetitive Peak Overload Current			
SH10		320	A
SH20DC20-16		160	A

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

OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Leakage Current		3	mA
On-State Resistance	@25 °C	@125 °C	
SH10	15	30	mΩ
SH20DC20-16	45	90	mΩ
Output Capacitance (Typical)			
SH10	0.7		nF
SH20DC20-16	0.6		nF
Junction-Case Thermal Resistance			
SH10		0.9	°C/W
SH20DC20-16		1.2	°C/W
Built-In Heat Sink Thermal Resistance (Vertically Mounted)		10	°C/W
Heat Sink Thermal Time Constant		10	min
Control Inputs/Power Outputs			
Insulation Voltage		2.5	kV
Turn-On Time		20	μs
Turn-On Delay		20	μs
Turn-Off Time		20	μs
Turn-Off Delay		20	μs
On-Off Frequency		1000*	Hz

*For high frequency, take two times the load current to calculate the heat sink.

TIME DIAGRAM

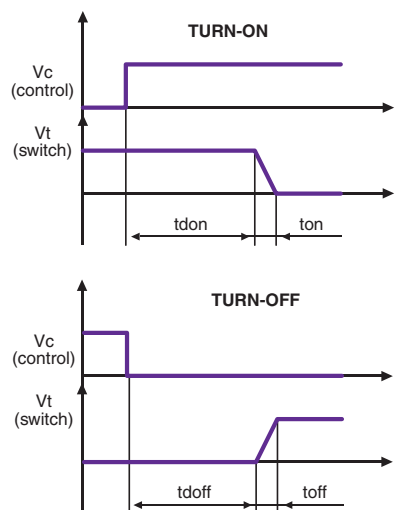
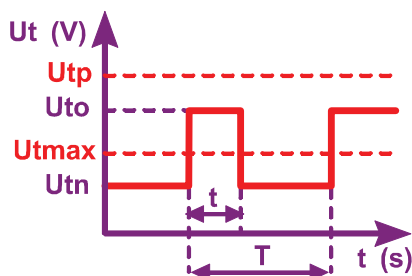


Figure 4

BUILT IN OVERVOLTAGE PROTECTION CHARACTERISTICS



$$U_{to} < U_{tp}$$

$$t_{\max} = \frac{0.75}{(U_{to} - U_{t\max}) \times I_e}$$

$$P_{(\text{protection})} = I W_{\max}$$

$$\Rightarrow \frac{(U_{to} - U_{t\max}) \times I_e \times t}{T} \leq 1$$

I_{elk} : Leakage current of relay
 I_e : User load nominal current
 U_{tp} : Relay max. non repetitive peak voltage
 $U_{t\max}$: Max. nominal voltage of relay

U_{to} : Possible overvoltage above $U_{t\max}$
 U_{tn} : User power supply voltage
 t : Overvoltage duration
 T : Time between 2 overvoltages

SH10DC40-16

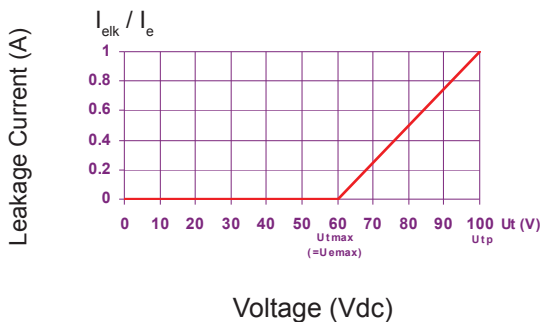


Figure 5a

SH20DC20-16

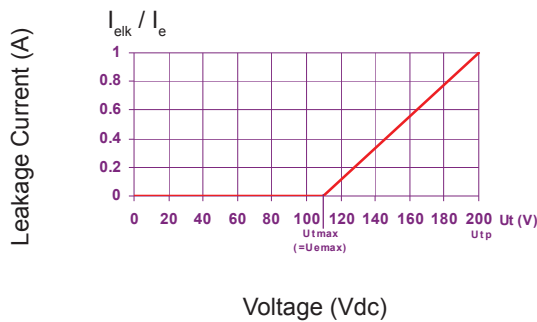


Figure 5b

HIGH SIDE WIRING DIAGRAM (Load Connected to “—”)

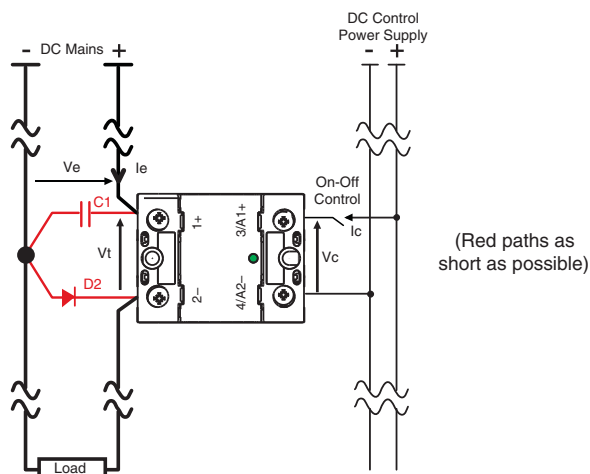


Figure 6a

LOW SIDE WIRING DIAGRAM (Load Connected to “+”)

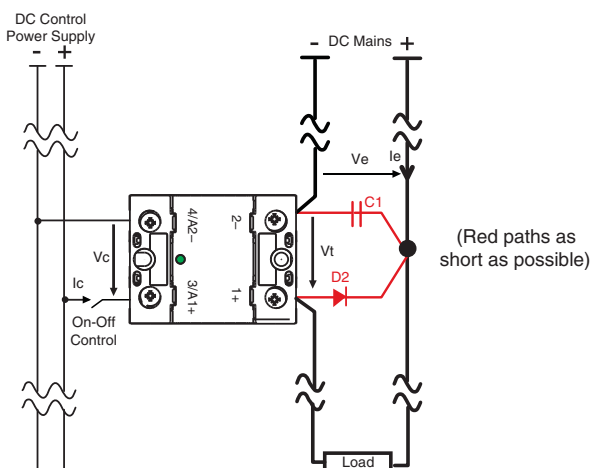


Figure 6b

GENERAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

ENVIRONMENTAL SPECIFICATIONS

	Min	Max	Units
Operating Temperature	-25	+90	°C
Storage Temperature	-40	+100	°C
Input-Output Isolation		2.5	kV
Insulation Resistance	1		GΩ
Insulation Capacitance	8		pF
Junction Temperature			
Steady State		125	°C
Transient		175	°C
Case Temperature		100	°C

CONNECTIONS

	Power	Control
Screwdriver		POZIDRIV2
Tightening Torque	2 N.m	1.2 N.m
Insulated crimp terminals (Round Tabs, Eyelet Type)	M5	M4

MISCELLANEOUS

Display	Green LED (ON)
Housing	UL94V0
Mounting	2 screws (M4x12mm)
Noise Level	No audible noise

GENERAL

Standards	IEC60947-1
Protection Level	IP20
Protection Against Direct Touch	Yes
CE Marking	Yes

E.M.C. EMISSION

Radiated & Conducted Disturbances	Pending
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ACCESSORIES

Faston: Contact Factory



NOTES

1. For additional/custom options, contact factory.

OUTPUT RELAY CHARACTERISTIC CURVES FOR SH10DC40 & SH10DC40-16

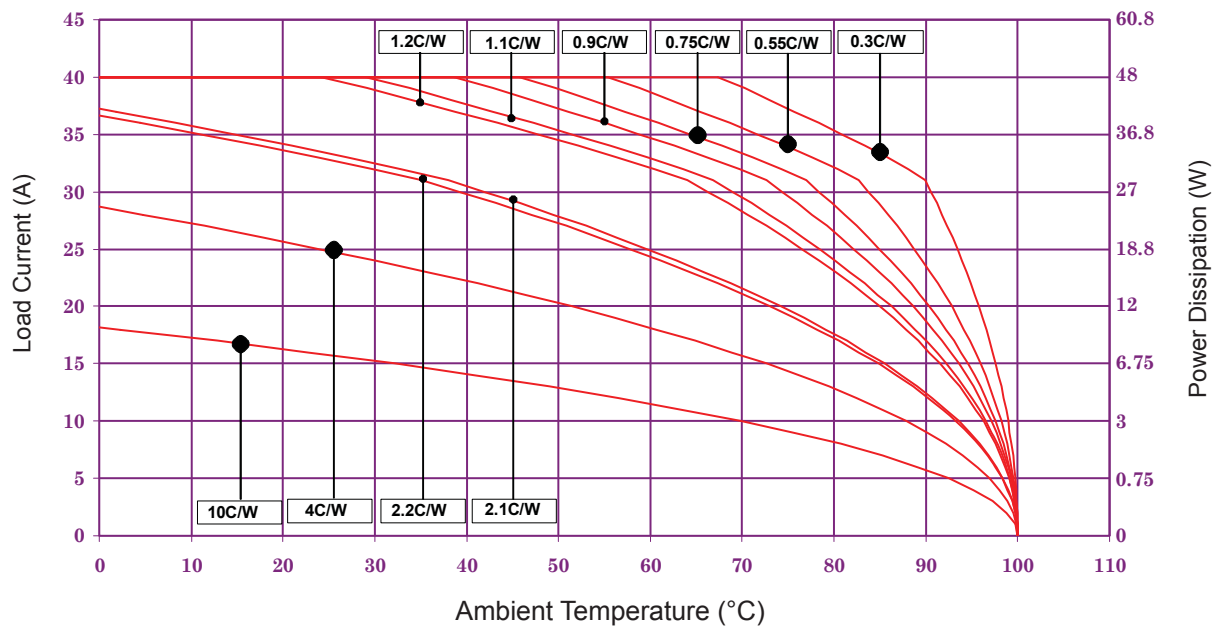
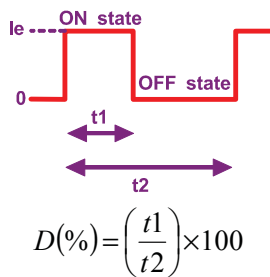


Figure 7a



ON-State Peak Overload Current (Apk)

Pulse Duration (S)

Figure 7b

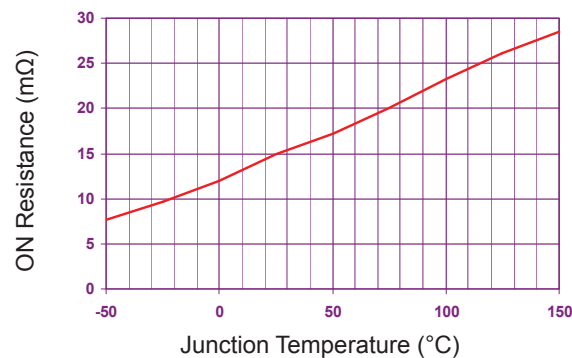


Figure 7c

OUTPUT RELAY CHARACTERISTIC CURVES FOR SH20DC20-16

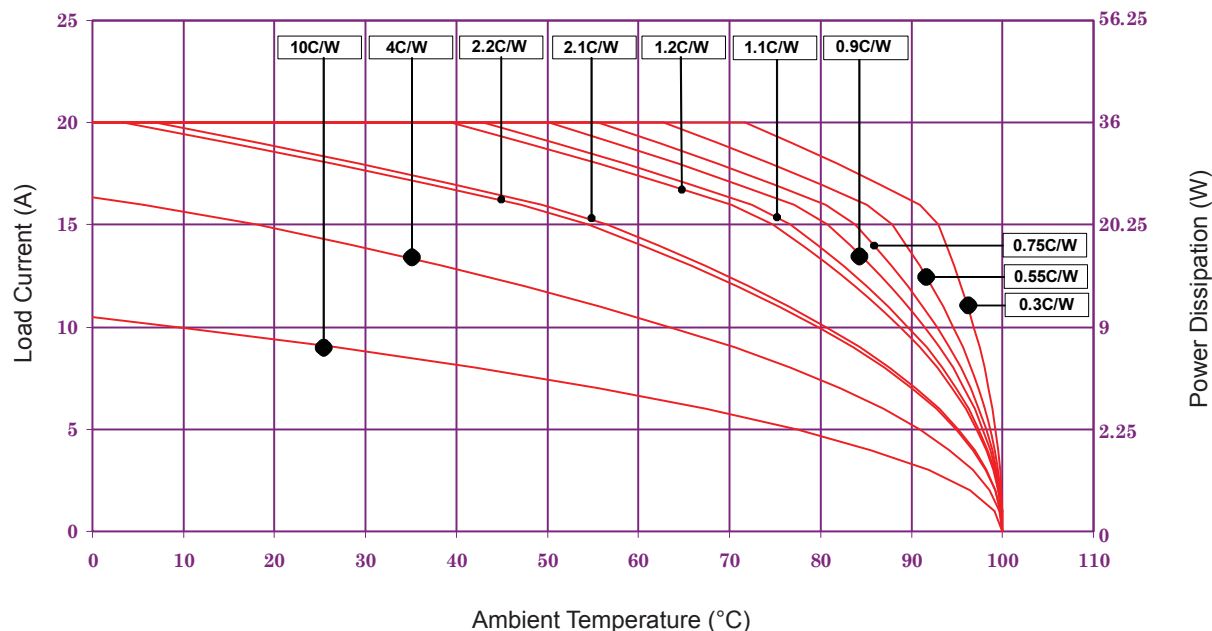


Figure 8a

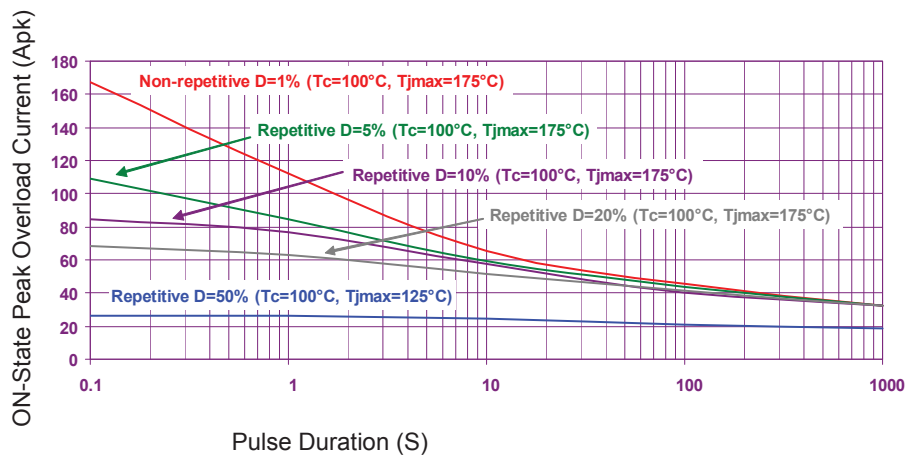
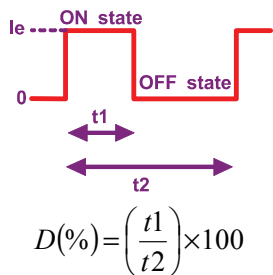


Figure 8b

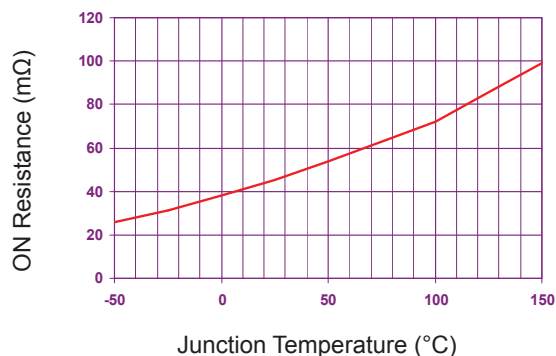


Figure 8c