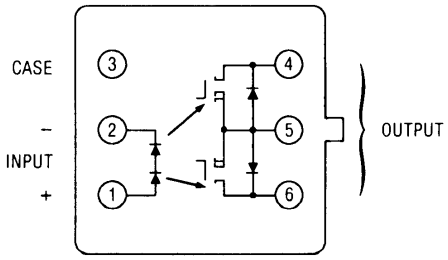
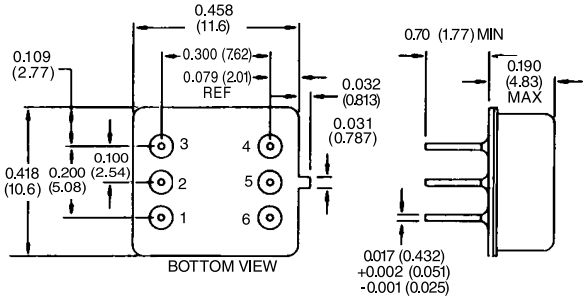
Part Number*	DESC Drawing Number	Relay Description
FB00CDW FB00CDY	89116-006	Solid State Relay ±1.0 A @ ±80 Vdc Output
FB00FCW FB00FCY	89116-002	Solid State Relay ±0.5 A @ ±180 Vdc Output
FB00KBW FB00KBY	89116-004	Solid State Relay ±250 mA @ ±350 Vdc Output

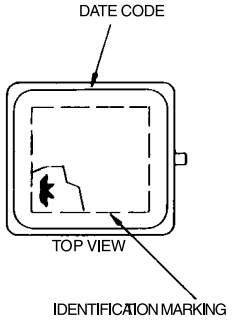
* The Y suffix denotes parameters tested to MIL-PRF-28750 specifications. The W suffix denotes parameters tested to Teledyne specifications.

BLOCK DIAGRAM

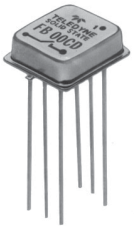


MECHANICAL SPECIFICATIONS





DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)



FEATURES

- High voltage output
- Extremely low leakage current (200 nanoamperes)
- Bi-directional Power FET output
- Optical isolation
- Fast switching speed
- Adjustable turn-on times
- Low profile 6-pin mini-DIP
- Built and tested to the requirements of MIL-PRF-28750

APPLICATIONS

- Ideal for Automatic Test Equipment (ATE)
- Telecommunications applications
- High-voltage instrumentation systems
- High-speed switching with low EMI

DESCRIPTION

The Series FB relay is an advanced solid-state bi-directional relay designed specifically for high-speed switching in A.T.E. systems. These devices utilize Teledyne state-of-the-art solid-state circuit technology and manufacturing techniques to provide high reliability, low life cycle cost and exceptional switch performance. Each device is uniquely characterized by its switching function. The FB00FC is a power instrumentation relay with low ON resistance and leakage current. The FB00KB is a high-voltage instrumentation relay with a quarter ampere current rating. The FB00CD is a power relay with a current rating of 1 ampere and an ON resistance of 0.4 ohm. The FB solid-state relay has very fast turn on times of under 1 msec and can also be controlled and adjusted with the input current for specific requirements. Other features include optical coupling and full military temperature operating range for extreme applications. Optical coupling minimizes EMI generation and isolates and protects delicate input logic circuits from output voltage transients. These devices are packaged and hermetically sealed in a low-profile metal 6- pin mini-DIP with lead spacing on 0.300 centers for standard mounting configurations.

ELECTRICAL SPECIFICATIONS

(-55°C TO 120°C Ambient Temperature Unless Otherwise Noted)

INPUT (CONTROL) SPECIFICATION

(See Note 1)	Min	Typ	Max	Units
Rated Input Current	10		25	mAdc
Input Voltage Drop @ 25 mA			3.25	Vdc
Continuous Input Current				
-55°C < T_A < 105°C	10		50	mAdc
105°C < T_A < 120°C	10		25	mAdc
Reverse Voltage Protection			-5	Vdc
Input Current (Guaranteed Off)			10	μAdc
Input Current (Guaranteed On)	10			mA
Turn-Off Voltage			1.5	Vdc

ENVIRONMENTAL SPECIFICATIONS

	Min	Max	Units
Temperature			
Operating	-55	+120	°C
Storage	-55	+125	°C
Vibration, 100 g	10	2000	Hz
Constant Acceleration		5000	g
Shock, 0.5 ms pulse		1500	g

OUTPUT (LOAD) SPECIFICATIONS
BI-DIRECTIONAL AND AC CONFIGURATIONS (PIN 4 TO PIN 6), SEE NOTE 2

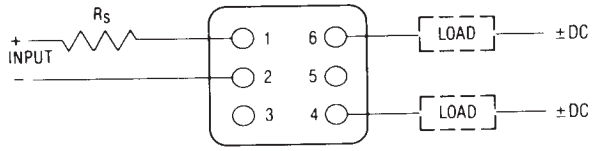
	FB00CD		FB00FC		FB00KB		
	Min	Max	Min	Max	Min	Max	Units
Continuous Load Current (See Fig. 3 & Note 5)		±1.0		±0.5		±0.25	Adc
Leakage Current @ V_{load} = max. operating voltage							
-55°C < T_A < +25°C		±200		±200		±200	nAdc
+25°C < T_A < 120°C		±20		±20		±20	μAdc
Output Voltage Drop		±0.75		±1.0		±2.4	Vdc
Continuous Operating Load Voltage		±80		±180		±350	Vdc
Transient Blocking Voltage (5 s max.)		±90		±180		±360	Vdc
ON Resistance R_{ds} (on) at T_J = 25°C		0.6		1.0		8.0	Ohm
I_{LOAD} = 100 mAdc (See Fig. 4 & Note 6)							
Turn-On Time @ I_{IN} = 25 mA (See Fig. 2 and 5)		800		800		500	μs
Turn-Off Time (See Fig. 5)		500		500		500	μs
dV/dt	100		100		100		V/μs
Load Surge Current (See Note 3)		±3.5		±1.75		±0.875	Adc
DC Offset Voltage		100		100		100	μV
Output Capacitance at 25 Vdc, 1 MHz		325		250		100	pF

OUTPUT (LOAD) SPECIFICATIONS
DC Configuration (Pins 4 and 6 connected together referenced to Pin 5) (See Notes 2 & 7)

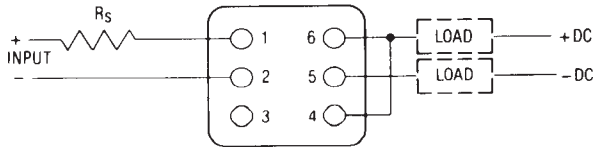
	FB00CD		FB00FC		FB00KB		
	Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Units**
Continuous Load Current (See Fig. 3 & Note 5)		2.0		1.0		0.5	Adc
Leakage Current @ V_{load} = max. operating voltage							
-55°C < T_A < +25°C		400		400		400	nAdc
+25°C < T_A < 120°C		40		40		40	μAdc
Output Voltage Drop		0.4		0.5		1.8	Vdc
Continuous Operating Load Voltage		80		180		350	Vdc
Transient Blocking Voltage (5 s max.)		90		180		360	Vdc
ON Resistance R_{ds} (on) at T_J = 25°C		0.15		0.25		2.0	Ohm
I_{LOAD} = 100 mAdc (See Fig. 4 & Note 6)							
Turn-On Time @ I_{IN} = 25 mA (See Fig. 2 and 5)		800		800		500	μs
Turn-Off Time (See Fig. 5)		500		500		500	μs
Load Surge Current (See Note 3)		7.0		3.5		1.75	Adc
Output Capacitance at 25 Vdc, 1 MHz		650		500		200	pF

OUTPUT (LOAD) SPECIFICATIONS

	FB00CD		FB00FC		FB00KB		
All Configurations	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Units**
Input to Output Capacitance		5		5		5	pF
Dielectric Strength	500		500		500		Vac
Insulation Resistance @ 500 Vdc	10^9		10^9		10^9		Ohm
Output Junction Temperature @ I_{LOAD} = $I_{max\ rated}$		125		125		125	°C
Maximum Junction Temperature (T_J Max.)		150		150		150	°C
Thermal Resistance Junction to Ambient (θ_{JA})		110		110		110	°C/W
Thermal Resistance Junction to Case (θ_{JC})		20		20		20	°C/W

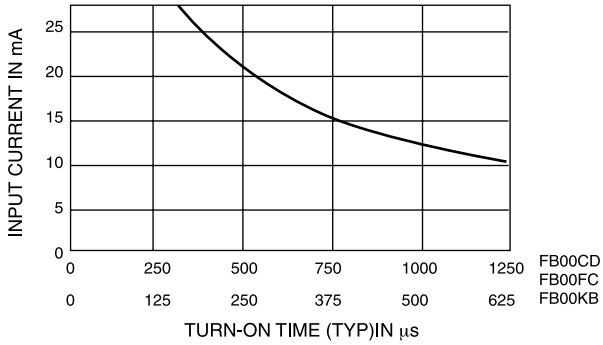


A) BI-DIRECTIONAL AND DC CONFIGURATION (SEE NOTE 4)

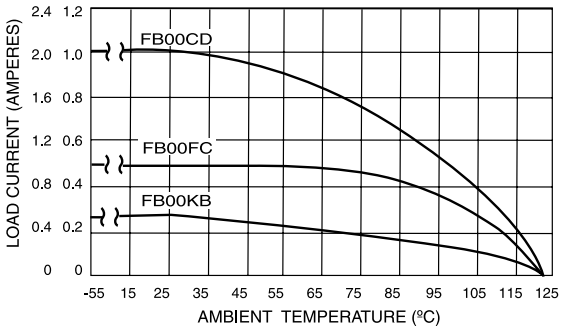


B) DC CONFIGURATION (SEE NOTE 4)

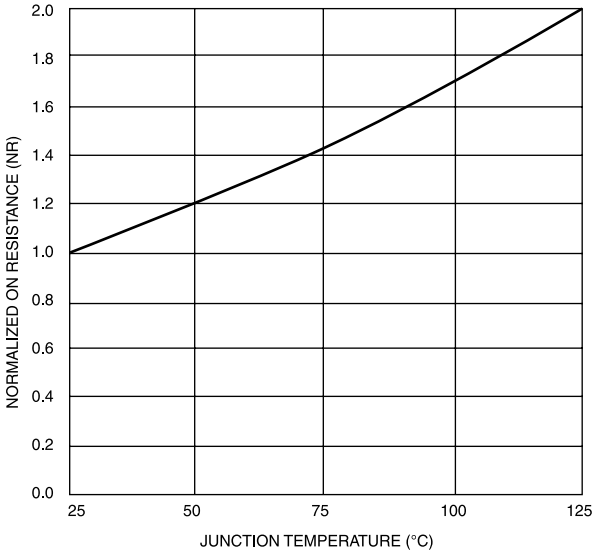
WIRING CONFIGURATIONS
FIGURE 1



INPUT CURRENT VS TURN-ON TIME
FIGURE 2



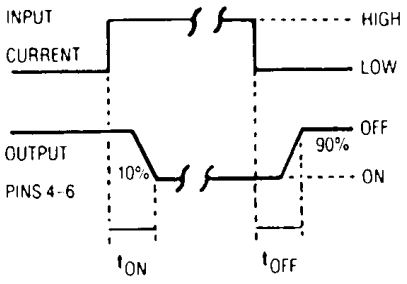
LOAD CURRENT DERATING CURVE
FIGURE 3



NORMALIZED ON RESISTANCE VS JUNCTION TEMPERATURE.
FIGURE 4 (SEE NOTE 6)

NOTES:

1. Series resistor required to limit input current to 50 mA max.
2. The rated input current is 25 mA for all tests unless otherwise specified.
3. Surge current is specified for 25°C, 10 cycles maximum at a 1 Hz repetition rate with 10% duty cycle and 0.1 s. duration.
4. Relays may drive loads connected to either positive or negative referenced power supply lines. Inductive loads must be diode suppressed.
5. Continuous load current is rated under the condition of still air.
6. To calculate the maximum ON resistance for a given junction temperature, find the normalized ON resistance factor (NR) from Figure 4. Calculate the new ON resistance as follows:
   $R_{(ON)} = NR \times R_{(ON)}$ @ 25°C
7. Relays are tested in the bi-directional configuration only.



OUTPUT TURN-ON AND OFF TIMING
FIGURE 5