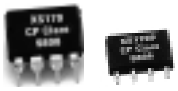
XS170

Multifunction Telecom Switch



	XS170	Units
Load Voltage	350	V
Load Current	100	mA
Max R_{ON}	50	Ω

Description

XS170 is a 350V, 100mA, 50Ω 1-Form-A relay with an optocoupler in a single package. It provides an economical solution for cost sensitive applications.

Features

- Small 8 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- $3750V_{RMS}$ Input/Output Isolation
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

Approvals

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified to:
  - BS EN 60950:1992 (BS7002:1992) Certificate #: 7344
  - BS EN 41003:1993 Certificate #: 7344

Applications

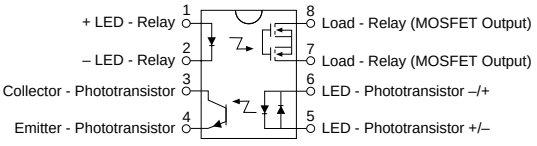
- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

Ordering Information

Part #	Description
XS170	8 Pin DIP (50/Tube)
XS170S	8 Pin Surface Mount (50/Tube)
XS170STR	8 Pin Surface Mount (1000/Reel)

Pin Configuration

XS170 Pinout



Absolute Maximum Ratings (@ 25° C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	50	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800[2]	mW
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature DIP Package	-	-	+260	°C
Flatpack/Surface Mount Package (10 Seconds Max.)	-	-	+220	°C

[1] Derate Linearly 1.33 mw/°C

[2] Derate Linearly 6.67 mw/°C

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.

Electrical Characteristics

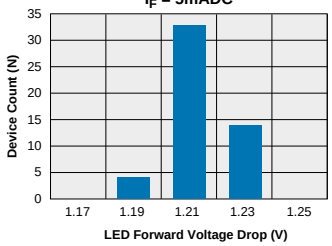
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Relay Portion (Pins 7, 8) Output Characteristics @ 25°C						
Load Voltage (Peak)	-	V_L	-	-	350	V
Load Current (Continuous)	-	I_L	-	-	100	mA
Peak Load Current	10ms	I_{LPK}	-	-	350	mA
On-Resistance	I_L=120mA	R_{ON}	-	33	50	Ω
Off-State Leakage Current	V_L=350V	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	T_{ON}	-	-	5	ms
Turn-Off	I_F=5mA, V_L=10V	T_{OFF}	-	-	5	ms
Output Capacitance	50V; f=1MHz	C_{OUT}	-	25	-	pF
Load Current Limit		I_{CL}	-	-	-	mA
Relay Portion (Pins 1, 2) Input Characteristics @ 25°C						
Input Control Current	I_L=120mA	I_F	2	-	50	mA
Input Dropout Current	-	I_F	0.4	0.7	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Reverse Input Voltage	-	V_R	-	-	5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA

Electrical Characteristics (Continued)

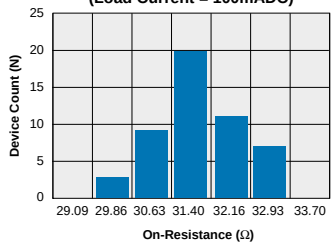
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Detector Portion (Pins 3, 4) Output Characteristics @ 25°C						
Phototransistor Blocking Voltage	I_C=10µA	BV_{CEO}	20	50	-	V
Phototransistor Output Current	V_{CE}=5V, I_F=0mA	I_{CEO}	-	50	500	nA
Saturation Voltage	I_C=2mA, I_F=16mA	V_{SAT}	-	0.3	0.5	V
Current Transfer Ratio	I_F=6mA, V_{CE}=0.5V	CTR	33	100	-	%
Detector Portion (Pins 5, 6) Input Characteristics @ 25°C						
Input Control Current	I_C=2mA, V_{CE}=0.5V	I_F	6	2	100	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Input Current (Detector must be off)	I_C=1µA, V_{CE}=5V	I_F	5	25	-	µA
Input to Output Capacitance (Relay Only)	-	$C_{I/O}$	-	3	-	pF
Capacitance Input to Output	-	-	-	3	-	pF
Input to Output Isolation	-	$V_{I/O}$	3750	-	-	V_{RMS}

PERFORMANCE DATA*

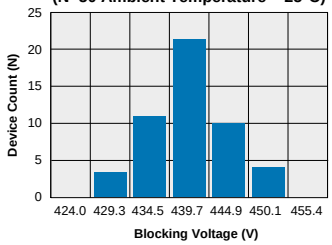
XS170
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
I_F = 5mADC



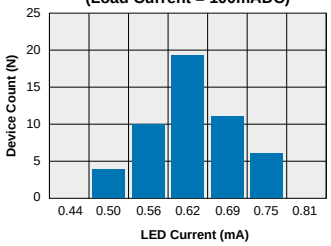
XS170
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



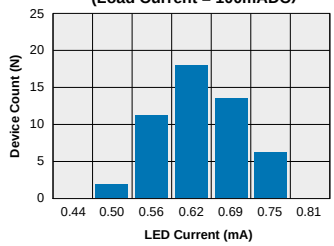
XS170
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



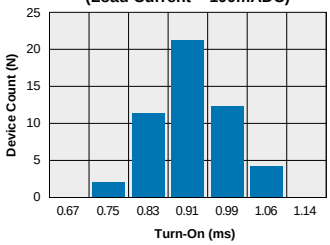
XS170
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



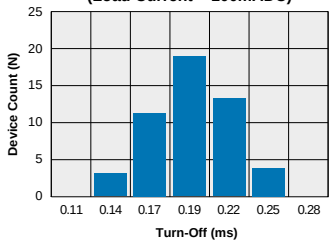
XS170
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



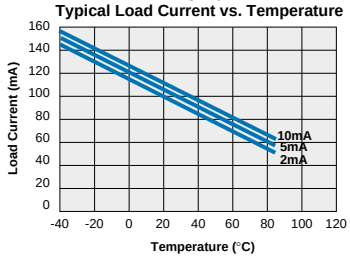
XS170
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



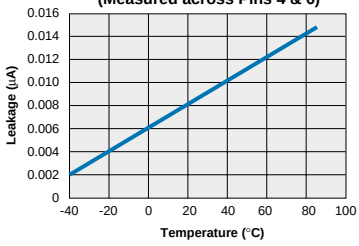
XS170
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



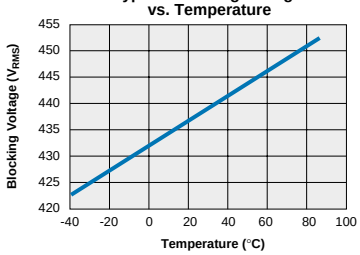
XS170
Typical Load Current vs. Temperature



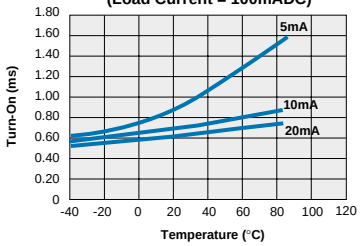
XS170
Typical Leakage vs. Temperature
(Measured across Pins 4 & 6)



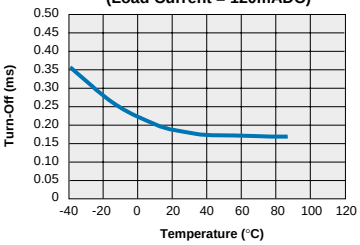
XS170
Typical Blocking Voltage
vs. Temperature



XS170
Typical Turn-On vs. Temperature
(Load Current = 100mADC)



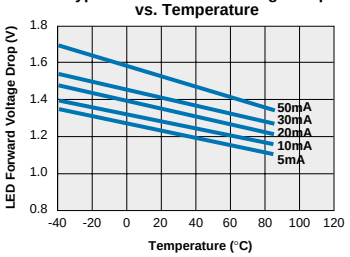
XS170
Typical Turn-Off vs. Temperature
(Load Current = 120mADC)



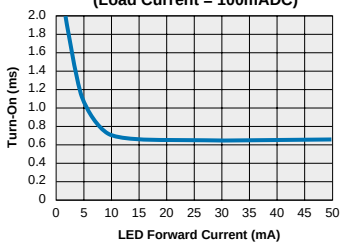
The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

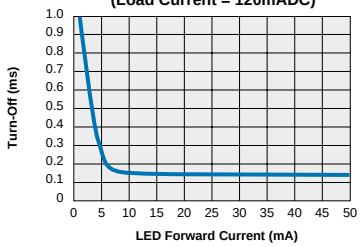
XS170
Typical LED Forward Voltage Drop vs. Temperature



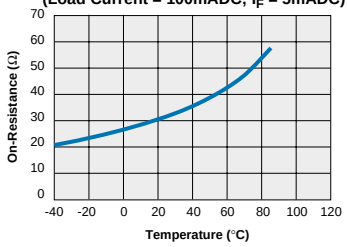
XS170
Typical Turn-On vs. LED Forward Current (Load Current = 100mADC)



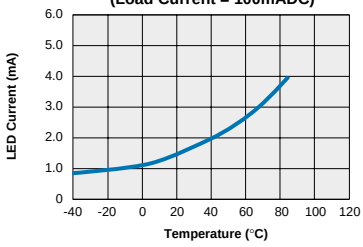
XS170
Typical Turn-Off vs. LED Forward Current (Load Current = 120mADC)



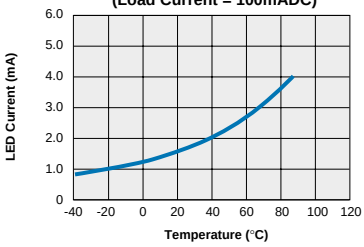
XS170
Typical On-Resistance vs. Temperature (Load Current = 100mADC; I_F = 5mADC)



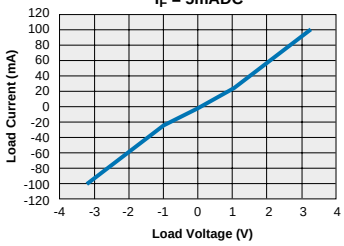
XS170
Typical I_F for Switch Operation vs. Temperature (Load Current = 100mADC)



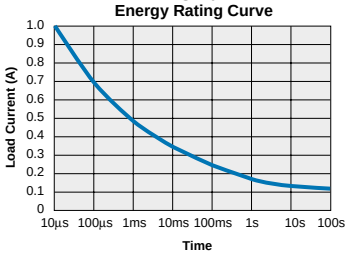
XS170
Typical I_F for Switch Dropout vs. Temperature (Load Current = 100mADC)



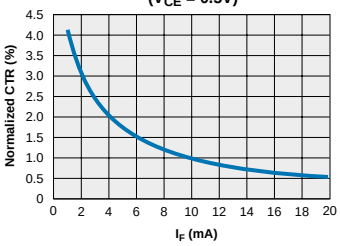
XS170
Typical Load Current vs. Load Voltage (Ambient Temperature = 25°C) I_F = 5mADC



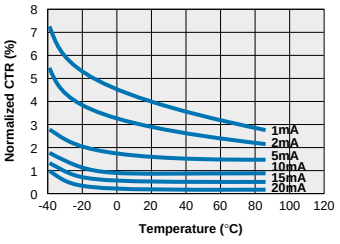
XS170
Energy Rating Curve



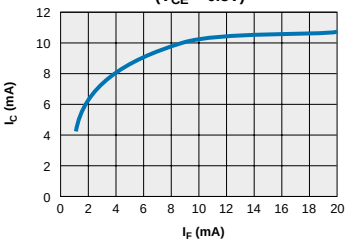
XS170
Typical Normalized CTR vs. Forward Current (V_{CE} = 0.5V)



XS170
Typical Normalized CTR vs. Temperature (V_{CE} = 0.5V)



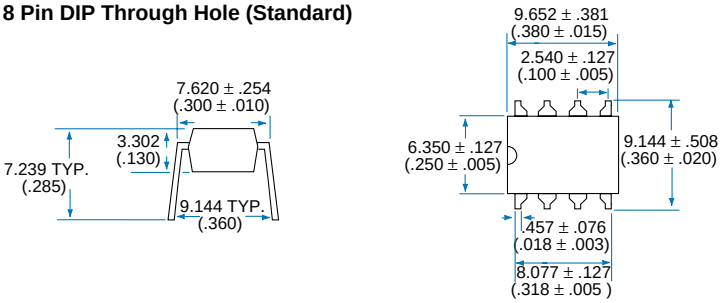
XS170
Typical Collector Current vs. Forward Current (V_{CE} = 0.5V)



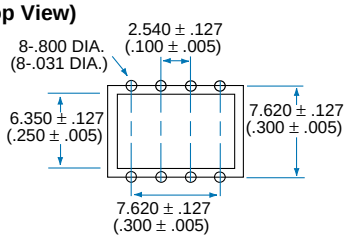
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

Mechanical Dimensions

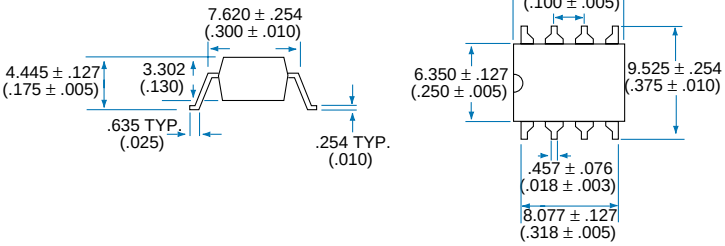
8 Pin DIP Through Hole (Standard)



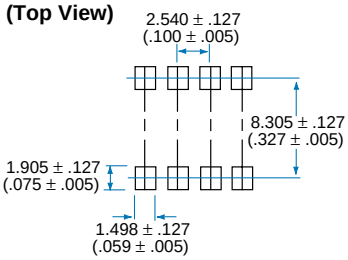
PC Board Pattern (Top View)



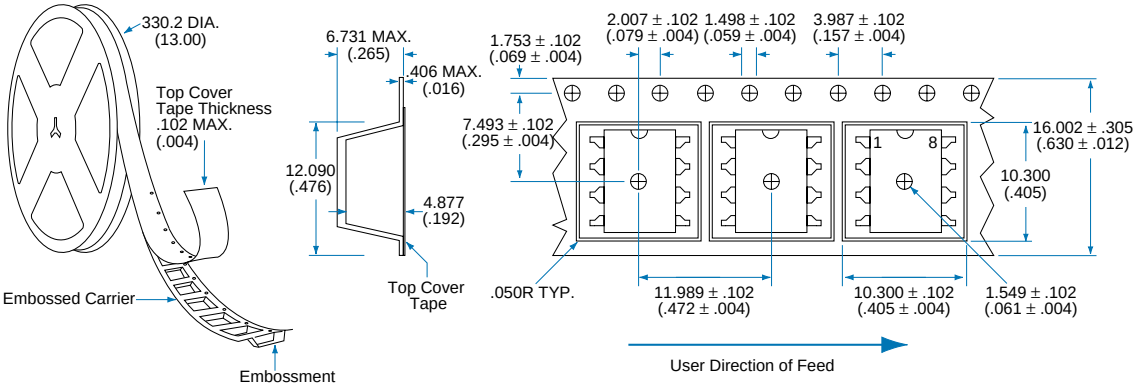
8 Pin DIP Surface Mount ("S" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 8 Pin Surface Mount Package



Dimensions
mm
(inches)

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Specification: DS-XS170-R1

2/20/01