IXYS
INTEGRATED CIRCUITS DIVISION



LCB716
Single-Pole, Normally Closed OptoMOS® Relay

Parameter	Rating	Units
Load Voltage	60	V_P
Load Current	500	mA_{rms} / mA_{DC}
On-Resistance (max)	2	Ω

Features

- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 6-Pin Package
- Machine Insertable, Wave Solderable
- Tape & Reel, Surface Mount Version Available

Applications

- Sensor Circuitry
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
- Meters (gas, oil, electric and water)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

Description

LCB716 is a single-pole, normally closed (1-Form-B) solid state relay that uses optically coupled relay technology to provide an enhanced 3750V_{rms} isolation barrier between the input and the output of the relay. The efficient MOSFET output switch uses IXYS Integrated Circuits Division's patented OptoMOS architecture. The optically coupled output is controlled by a highly efficient GaAlAs infrared LED.

Approvals

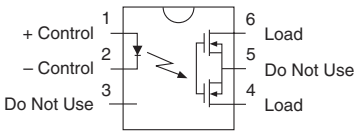
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1175739
- EN/IEC 60950-1 Certified Component: TUV Certificate B 09 07 49410 006

Ordering Information

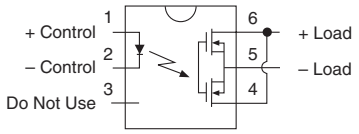
Part #	Description
LCB716	6-Pin DIP (50/Tube)
LCB716S	6-Pin Surface Mount (50/Tube)
LCB716STR	6-Pin Surface Mount (1000/Reel)

Pin Configuration

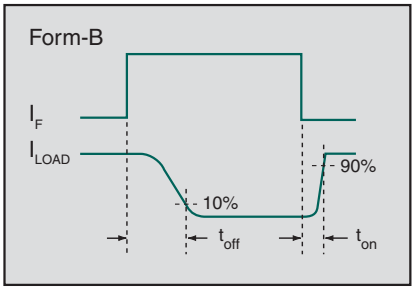
AC/DC Configuration



DC-Only Configuration



Switching Characteristics of Normally Closed Devices



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation [1]	100	mW
Total Power Dissipation [2]	800	mW
Isolation Voltage, Input to Output	3750	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate linearly 1.33 mW / ºC
[2] Derate linearly 6.67 mW / ºC

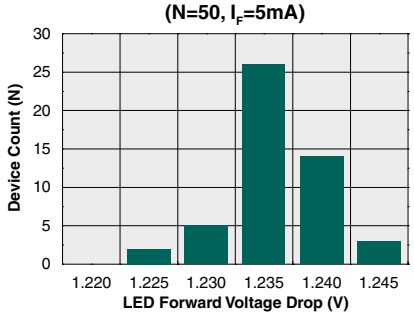
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics @ 25ºC

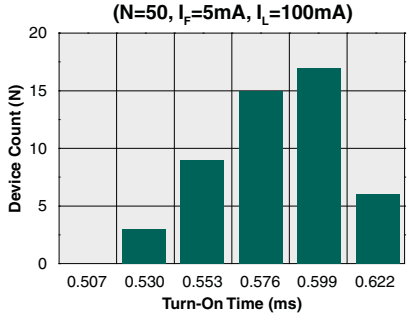
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
AC/DC Configuration, Continuous	-	I_L	-	-	500	mA_{rms} / mA_{DC}
DC Configuration, Continuous	-		-	-	1000	mA_{DC}
Peak	t ≤ 10ms	I_{LPK}	-	-	±1.2	A_P
On-Resistance						
AC/DC Configuration	I_L=500mA	R_{ON}	-	1.63	2	Ω
DC Configuration	I_L=1000mA		-	0.4	0.5	
Off-State Leakage Current	I_F=2mA, V_L=60V	I_{LEAK}	-	-	1	µA
Output Capacitance	I_F=2mA, V_L=50V, f=1MHz	C_{OUT}	-	280	-	pF
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	0.58	3	ms
Turn-Off		t_{off}	-	0.76	3	
Input Characteristics						
Input Control Current to Activate	I_L=500mA	I_F	-	-	2	mA
Input Control Current to Deactivate	-	I_F	0.1	-	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Capacitance, Input to Output	-	$C_{I/O}$	-	3	-	pF

PERFORMANCE DATA* (@25°C Unless Otherwise Noted)

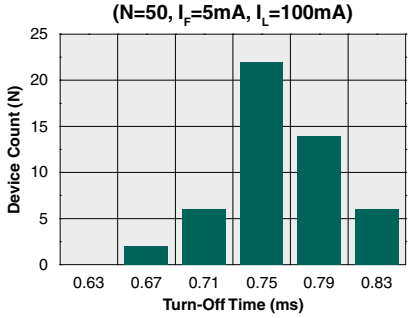
Typical LED Forward Voltage Drop
(N=50, I_F=5mA)



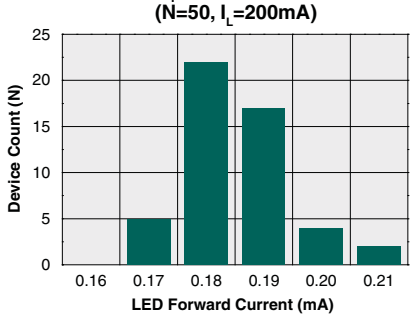
Typical Turn-On Time
(N=50, I_F=5mA, I_L=100mA)



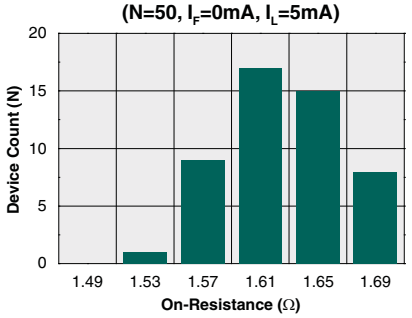
Typical Turn-Off Time
(N=50, I_F=5mA, I_L=100mA)



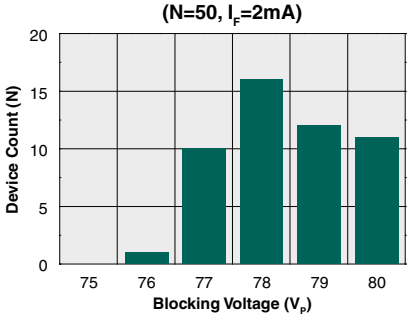
Typical I_F for Switch Operation
(N=50, I_L=200mA)



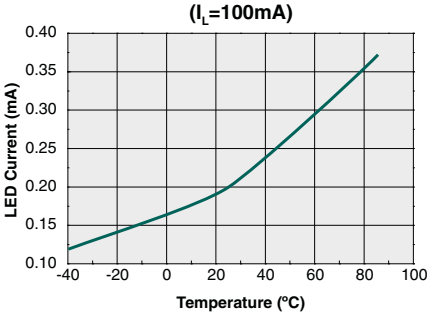
Typical On-Resistance
(N=50, I_F=0mA, I_L=5mA)



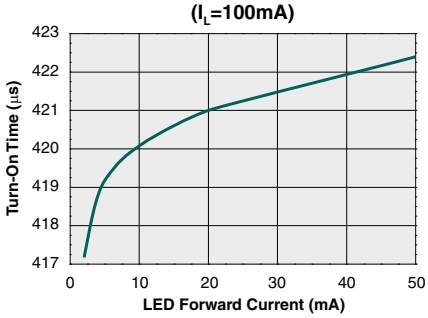
Typical Blocking Voltage
(N=50, I_F=2mA)



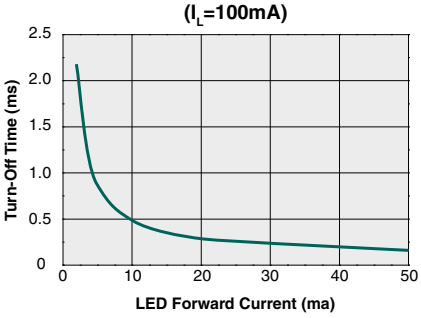
Typical I_F for Switch Operation
vs. Temperature
(I_L=100mA)



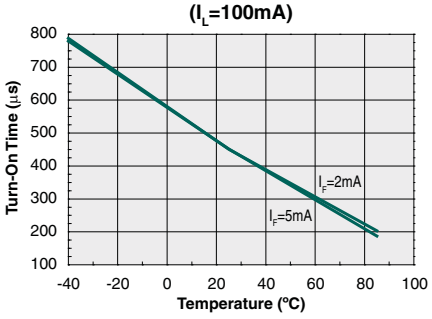
Typical Turn-On Time
vs. LED Forward Current
(I_L=100mA)



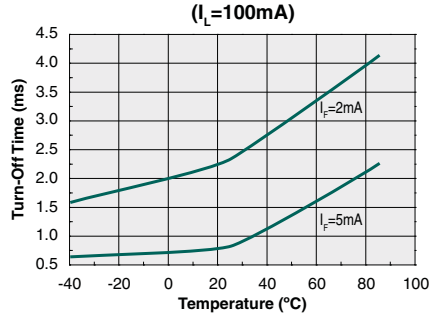
Typical Turn-Off Time
vs. LED Forward Current
(I_L=100mA)



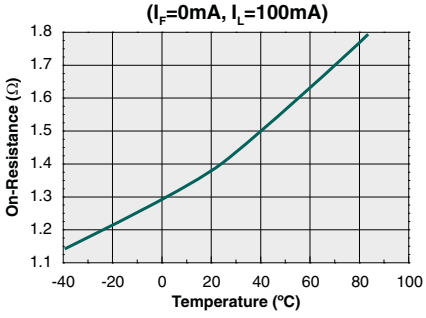
Typical Turn-On Time
vs. Temperature
(I_L=100mA)



Typical Turn-Off Time
vs. Temperature
(I_L=100mA)



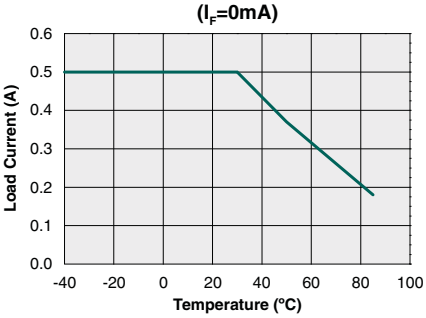
Typical On-Resistance
vs. Temperature
(I_F=0mA, I_L=100mA)



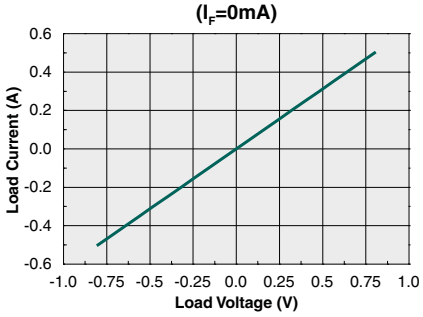
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA* (@25ºC Unless Otherwise Noted)

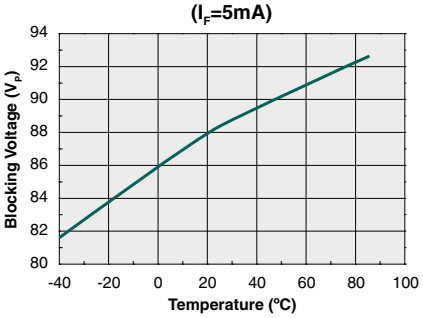
Maximum Load Current vs. Temperature (I_F=0mA)



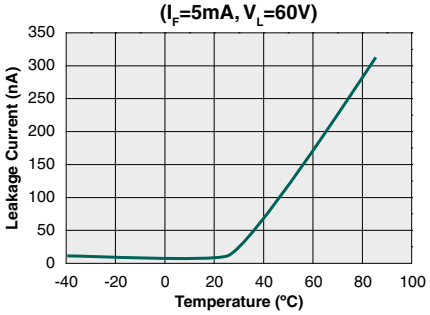
Typical Load Voltage vs. Load Current (I_F=0mA)



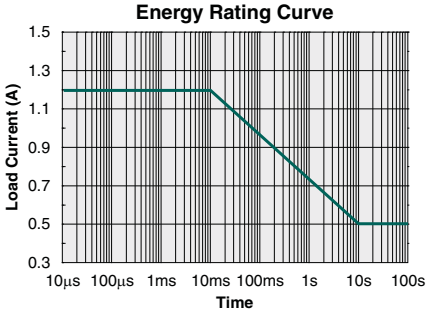
Typical Blocking Voltage vs. Temperature (I_F=5mA)



Typical Leakage vs.Temperature Measured Across Pins 4&6 (I_F=5mA, V_L=60V)



1-Form-B Relay Energy Rating Curve



*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.

Manufacturing Information

Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits Division classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
LCB716 / LCB716S	MSL 1

ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Reflow Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time
LCB716 / LCB716S	250°C for 30 seconds

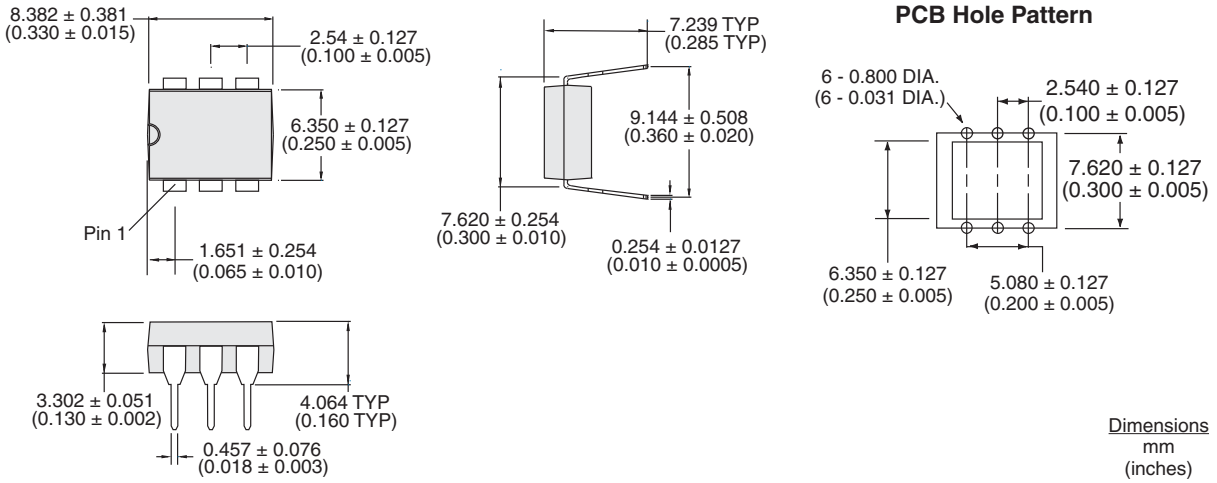
Board Wash

IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake could be necessary if a wash is used after solder reflow processes. Chlorine- or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.



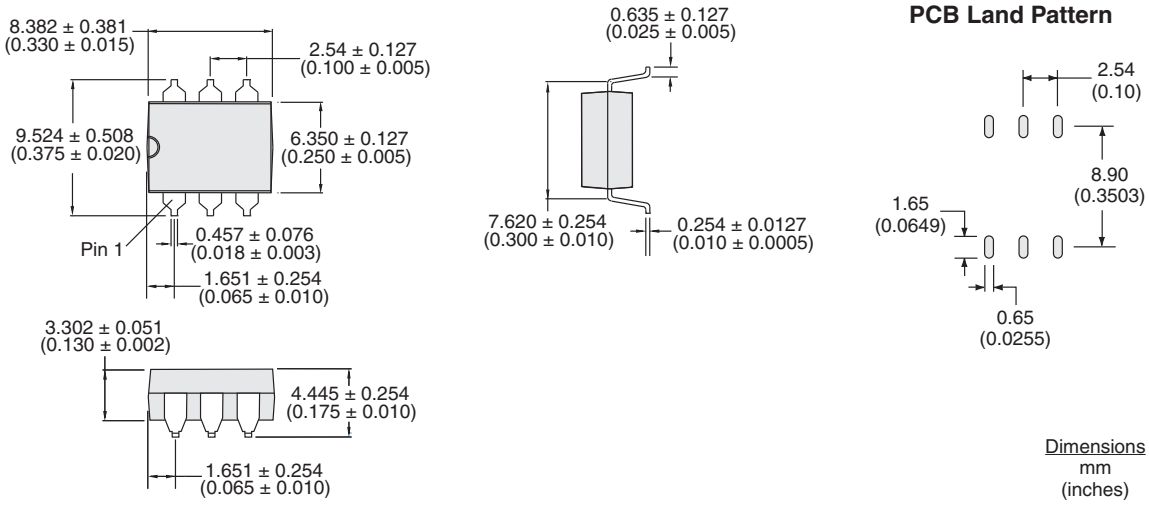
Mechanical Dimensions

LCB716



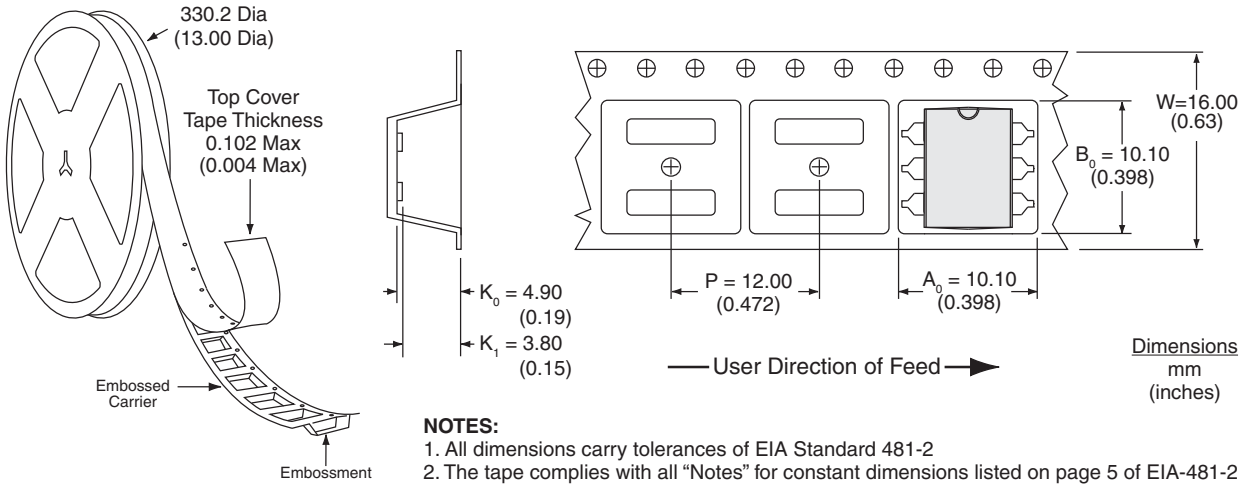
Dimensions
mm
(inches)

LCB716S



Dimensions
mm
(inches)

LCB716STR Tape & Reel



NOTES:
1. All dimensions carry tolerances of EIA Standard 481-2
2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

For additional information please visit our website at: www.ixysic.com

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12/22/2012