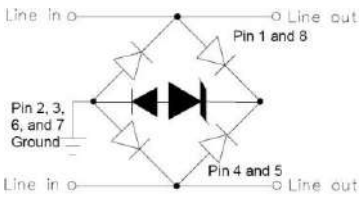
Low Capacitance TVS

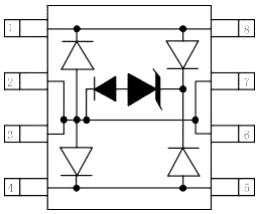
Description:

The KWLC03-6 is a 6V 100A low capacitance TVS arrays, combining a TVS diode with a rectifier bridge to provide both common and differential transient protection in one package, The KWLC03-6 complies with the IEC 61000-4-2 (ESD) with ±30kV air and ±30kV contact discharge. It is assembled into a 8-pin lead-free SO-8 package, the LC03 -6 is rated for GR-1089, intra-building transient immunity requirements for telecommunication installations and pro- vide overvoltage protection for applications such as 10/100/1000 BaseT Ethernet and T3/E3 interfaces.

Dimensions and Pin Configuration



Circuit and Pin Schematic

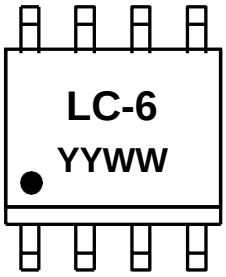


SO-8 Outline

Features:

- Low capacitance for high speed interfaces
- Ultra low leakage: nA level
- Low operating voltage
- Low clamping voltage
- Protects two lines in common and differential mode
- JEDEC SO-8 package
- Complies with following standards:
  - – IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - – IEC61000-4-5 (Lightning) 100A (8/20μs)
- RoHS Compliant

Marking Information



LC-6 = Device Marking Code
YYWW = Date Code
Dot denotes Pin1

Mechanical Data:

- Package: SO-8
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Ordering Information

Part Number	Packaging	Reel Size
KWLC03-6	2500/Tape & Reel	13 inch

Applications:

- T1/E1 Line Cards
- T3/E3 and DS3 Interfaces
- STS-1 Interfaces
- 10/100/1000 BaseT Ethernet
- ISDN Interfaces
- Low Voltage Interfaces

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

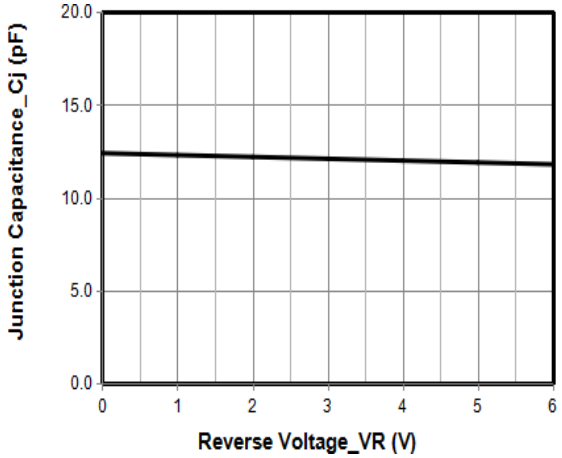
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	2000	W
Peak Pulse Current (8/20μs)	I_{PP}	100	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

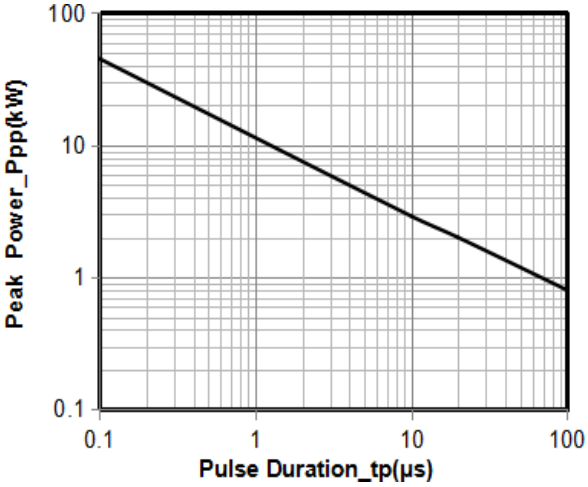
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			6	V	
Breakdown Voltage	V_{BR}	6.8			V	I_T = 1mA
Reverse Leakage Current	I_R			25	μA	V_{RWM} = 6V
Clamping Voltage	V_C			15	V	I_{PP} = 50A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	V_C			20	V	I_{PP} = 100A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	C_J		16	25	pF	VR = 0V, f = 1MHz, between I/O pins and ground
Junction Capacitance	C_J		8	12	pF	VR = 0V, f = 1MHz, between I/O pins

Note 1: I/O pins are Pin 1, 4, 5 and 8

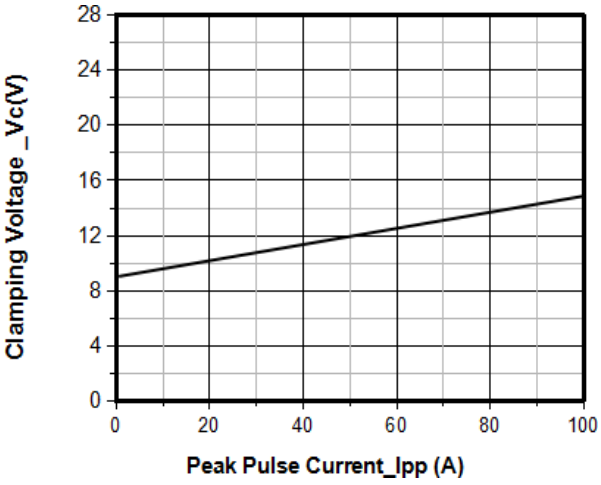
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



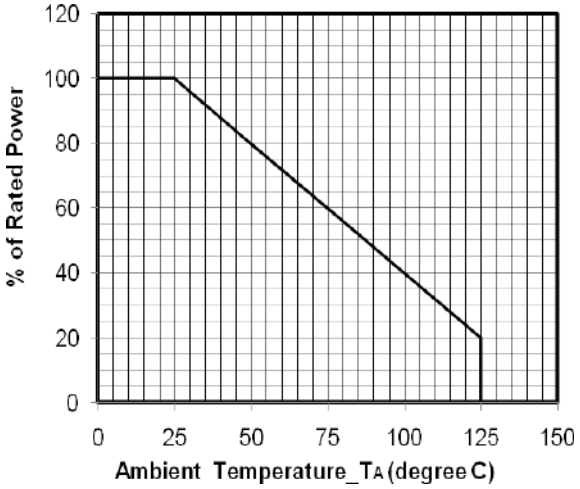
Junction Capacitance vs. Reverse Voltage

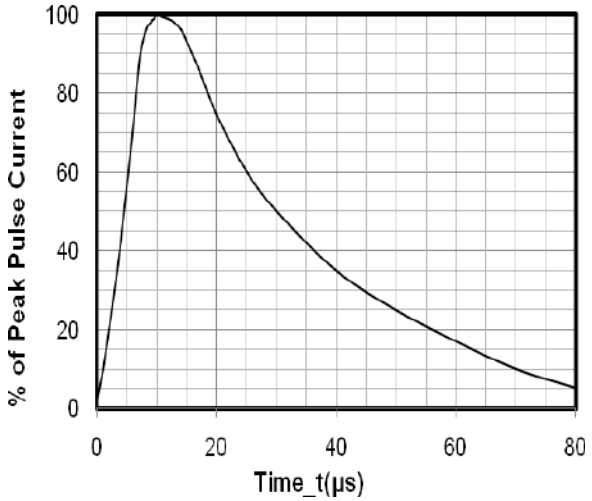


Peak Pulse Power vs. Pulse Time

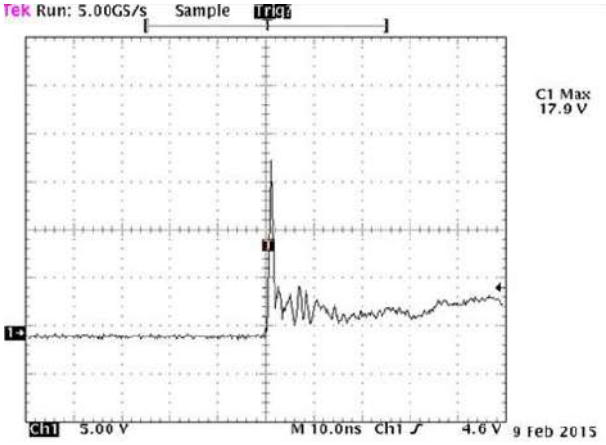


Clamping Voltage vs. Peak Pulse Current (tp = 8/20us)





8 X 20μs Pulse Waveform



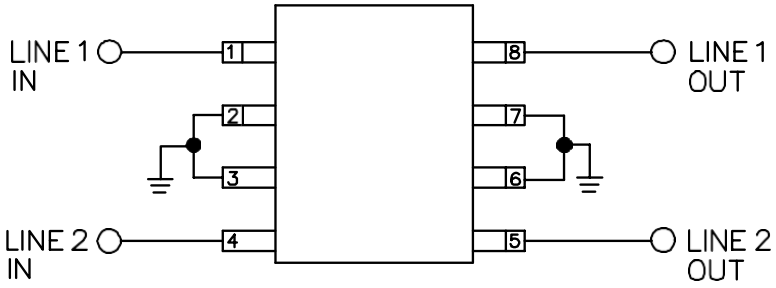
Note：Data is taken with a 10x attenuator

ESD Clamping Voltage

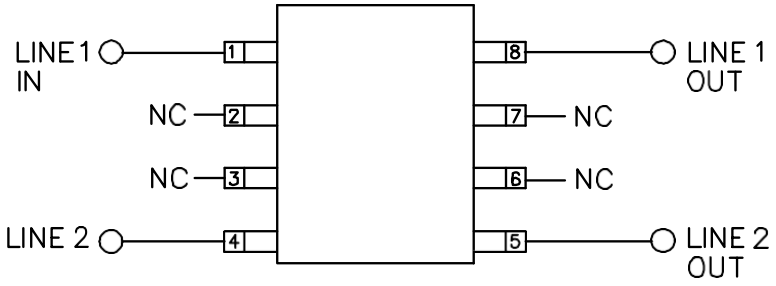
+8 kV Contact per IEC61000−4−2

Typical Application

The KWLC03-6 is designed to protect two high speed data lines (one differential pair) from transient over-voltages which result from lightning and ESD. The device can be configured to protect in differential (Line to Line) and common (Line to Ground) mode. Data line inputs/outputs are connected at pins 1 to 8, and 4 to 5 as shown below. Pins 2, 3, 6, 7 are connected to ground. These pins should be connected directly to a ground plane on the board for the best results, the path length is kept as short as possible to minimize parasitic inductance. In applications where high com- mon voltages are present, differential protection is achieved by leaving pins 2, 3, 6, and 7 not connected.

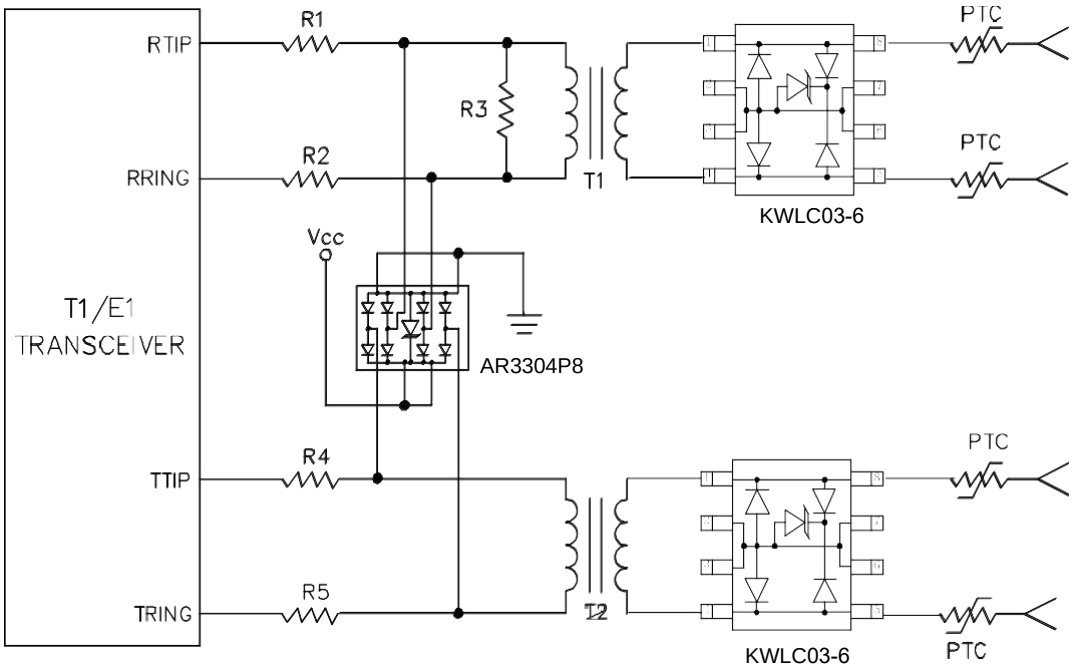


Connection for differential (Line to Line) and common mode protection (Line to Ground)

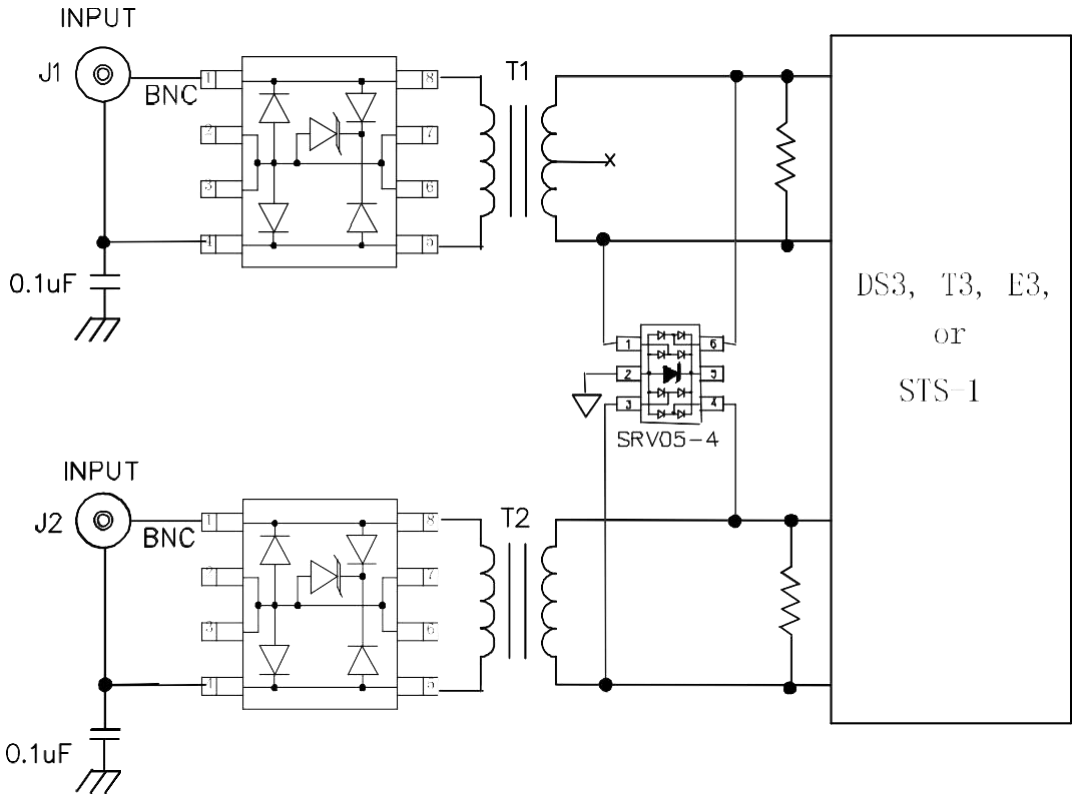


Connection for differential protection (Line to Line)

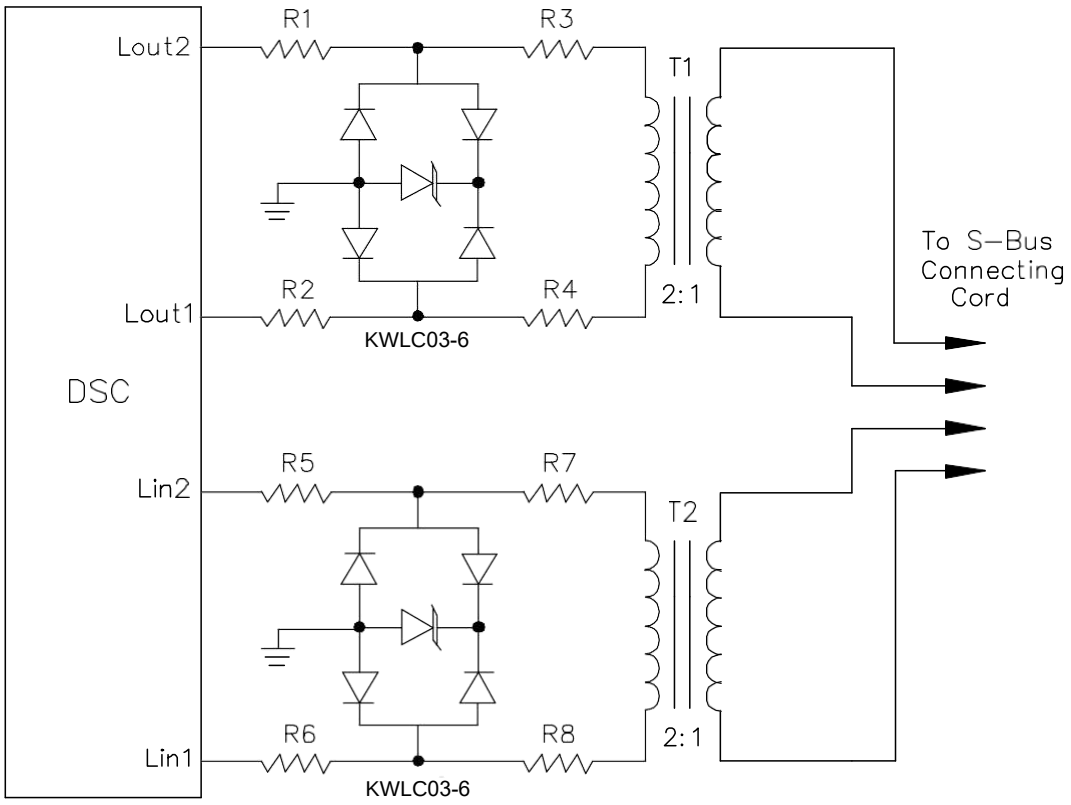
KWLC03-6 on T1 Line Card Application



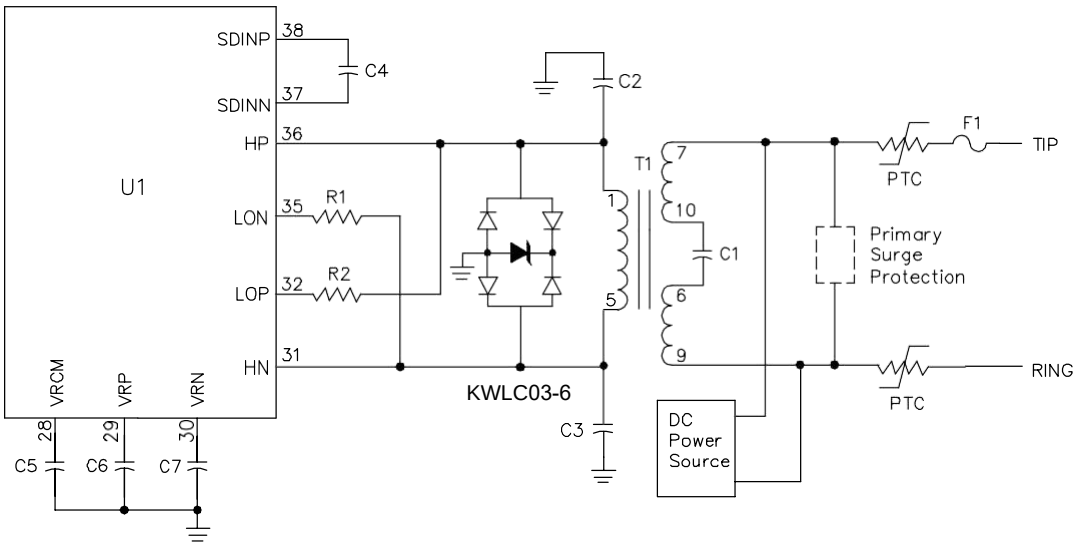
KWLC03-6 on T3/E3 and STS-1 Application



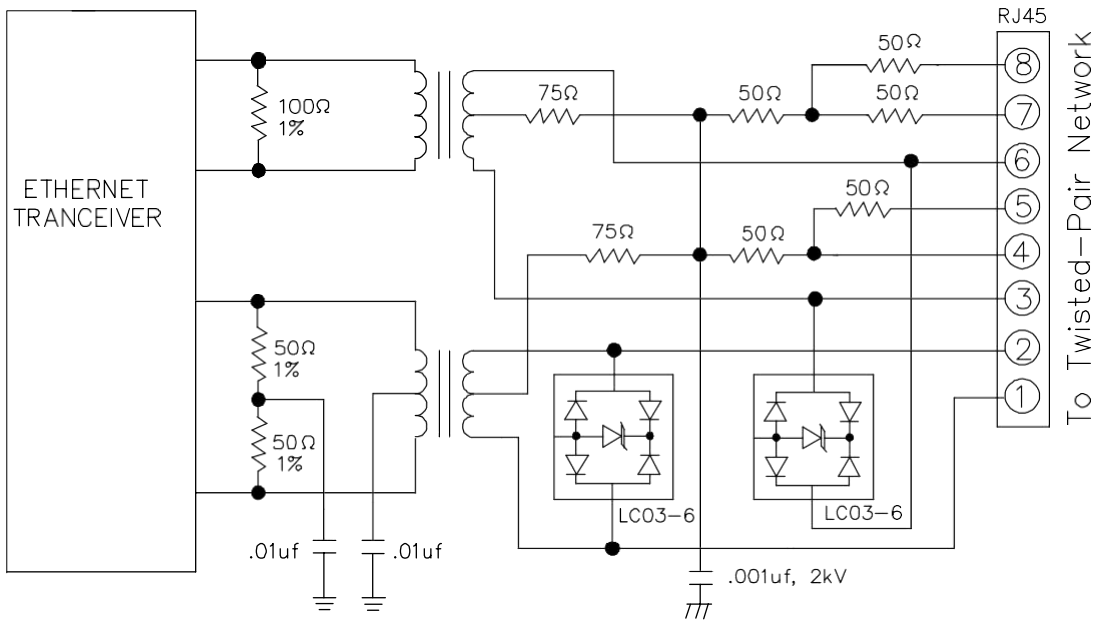
KWLC03-6 on ISDN S-Interface Application



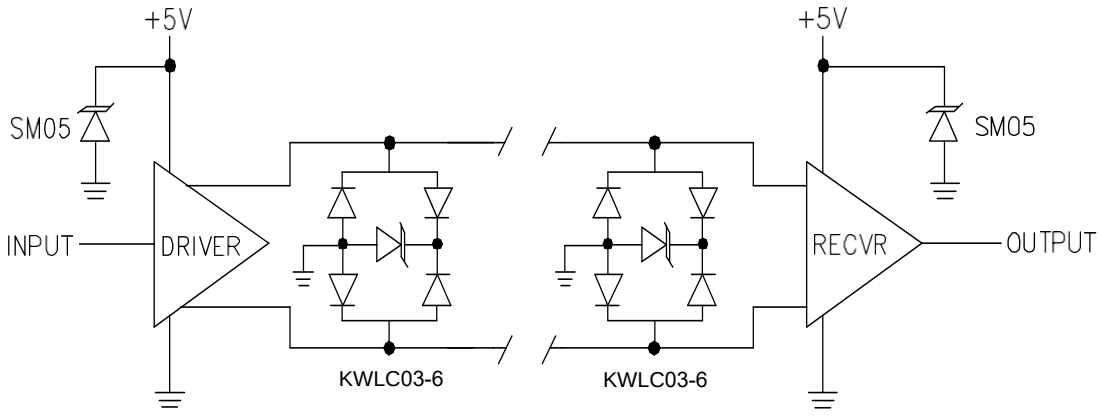
KWLC03-6 on ISDN U-Interface Secondary Application



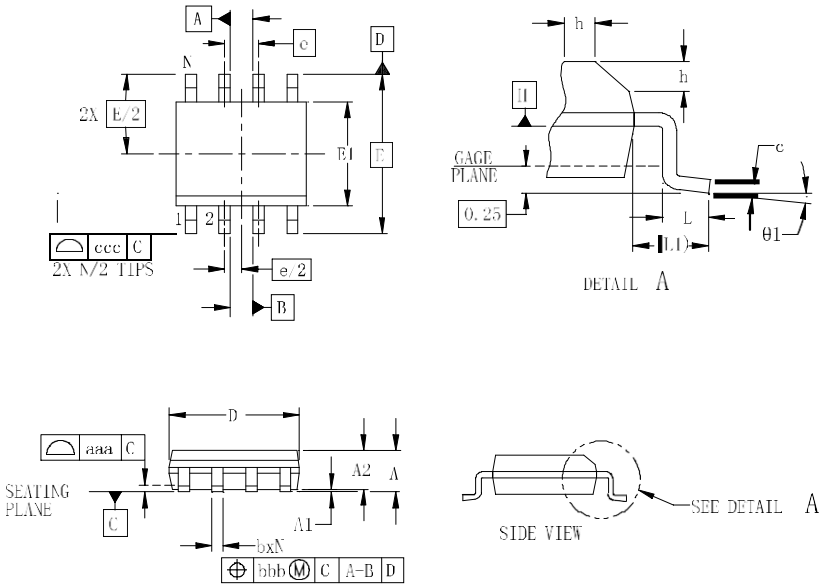
KWLC03-6 on 10/100 Ethernet Application



KWLC03-6 on High Speed Driver/Receiver Application

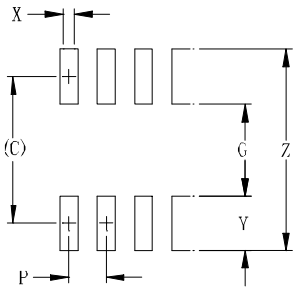


SO-8 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.004		0.010
A2	1.25		1.65	0.049		0.065
b	0.31		0.51	0.012		0.020
c	0.17		0.25	0.007		0.010
D	4.80	4.90	5.00	0.189	0.193	0.197
E1	3.80	3.90	4.00	0.150	0.154	0.157
E	6.00 BSC			0.236 BSC		
e	1.27 BSC			0.050 BSC		
h	0.25		0.50	0.010		0.020
L	0.40	0.72	1.04	0.016	0.028	0.041
L1	(1.04)			(0.041)		
N	8			8		
θ1	0°		8°	0°		8°
aaa	0.10			0.004		
bbb	0.25			0.010		
ccc	0.20			0.008		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	(5.20)	0.205
G	3.00	0.118
P	1.27	0.050
X	0.60	0.024
Y	2.20	0.087
Z	7.40	0.291