

4-Line Ultra Low Capacitance Uni-directional TVS Diode

Features

- Ultra low capacitance: 0.25pF typical
- Ultra low leakage: nA level
- Low operating voltage: 7V
- Low clamping voltage
- Up to 4 lines protects
- Leadless flow-through package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 20\text{kV}$
Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 2.5A (8/20 μs)
- RoHS Compliant

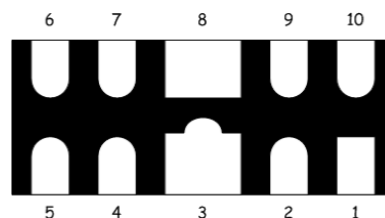
Applications

- HDMI 1.3 & 1.4 & 2.0, USB 2.0 & 3.0 and MDDI ports
- 10/100/1000 Ethernet
- Monitors and flat panel displays
- Set-top box and Digital TV
- Video graphics cards
- Digital Video Interface (DVI)
- Notebook Computers
- PCI Express and Serial SATA Ports

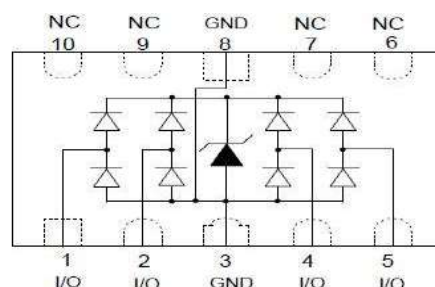
Mechanical Characteristics

- Package: DFN2510P10 (2.5 $\times$ 1.0 $\times$ 0.5mm)
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Terminal Connections: See Diagram Below
- Marking Information: See Below

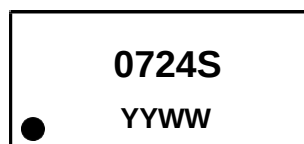
Dimensions DFN2510P10



Pin Configuration



Marking Information



0724S = Device Marking Code
 YYWW = Date Code
 Dot denotes Pin1

Ordering Information

Part Number	Packaging	Reel Size
KWULC0724S	3000/Tape & Reel	7 inch

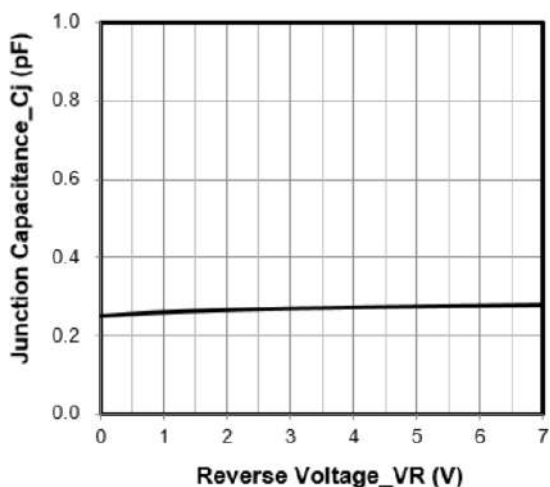
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	30	W
Peak Pulse Current (8/20 μs)	I _{PP}	2.5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	± 20 ± 20	kV
Operating Temperature Range	T _J	-30 to 85	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

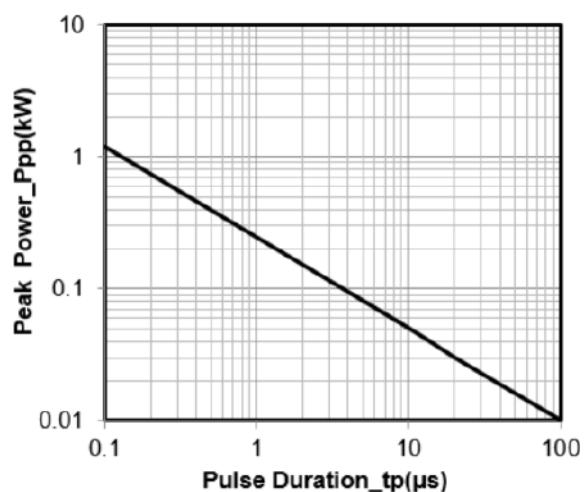
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			7	V	
Breakdown Voltage	V _{BR}		9		V	I _T = 1mA
Reverse Leakage Current	I _R			500	nA	V _{RWM} = 7V
Clamping Voltage	V _C		10		V	I _{PP} = 1A (8 x 20 μs pulse)
Clamping Voltage	V _C		11		V	I _{PP} = 2A (8 x 20 μs pulse)
Clamping Voltage	V _C		12		V	I _{PP} = 2.5A (8 x 20 μs pulse)
Junction Capacitance	C _J		0.25		pF	V _R = 0V, f = 1MHz

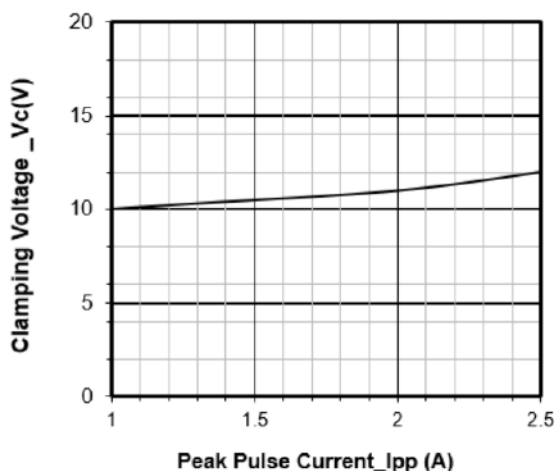
Typical Performance Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise Specified)



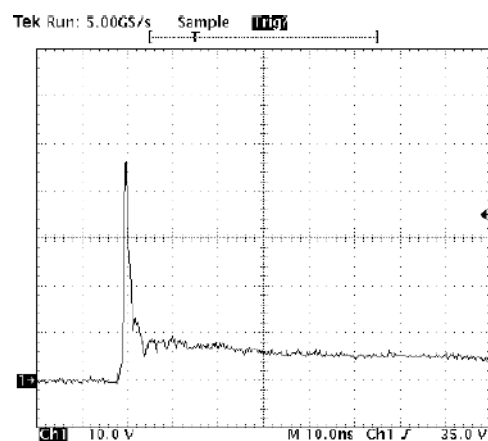
Junction Capacitance vs. Reverse Voltage



Peak Pulse Power vs. Pulse Time



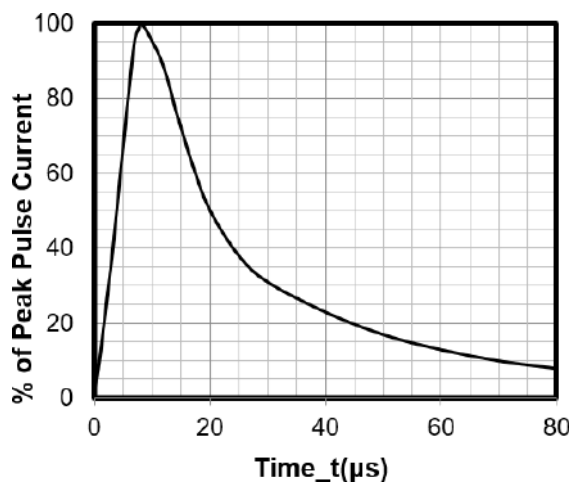
Clamping Voltage vs. Peak Pulse Current



Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

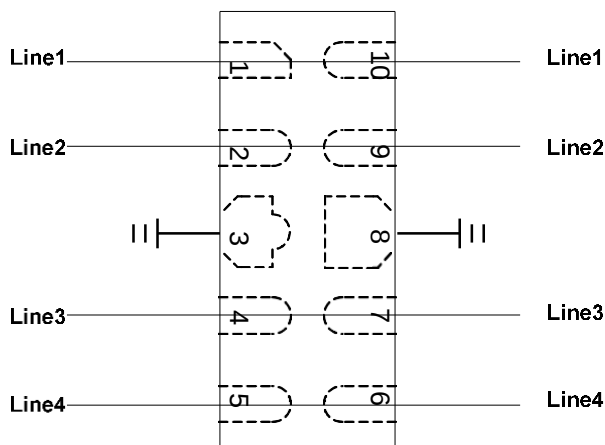
8 kV Contact per IEC61000-4-2



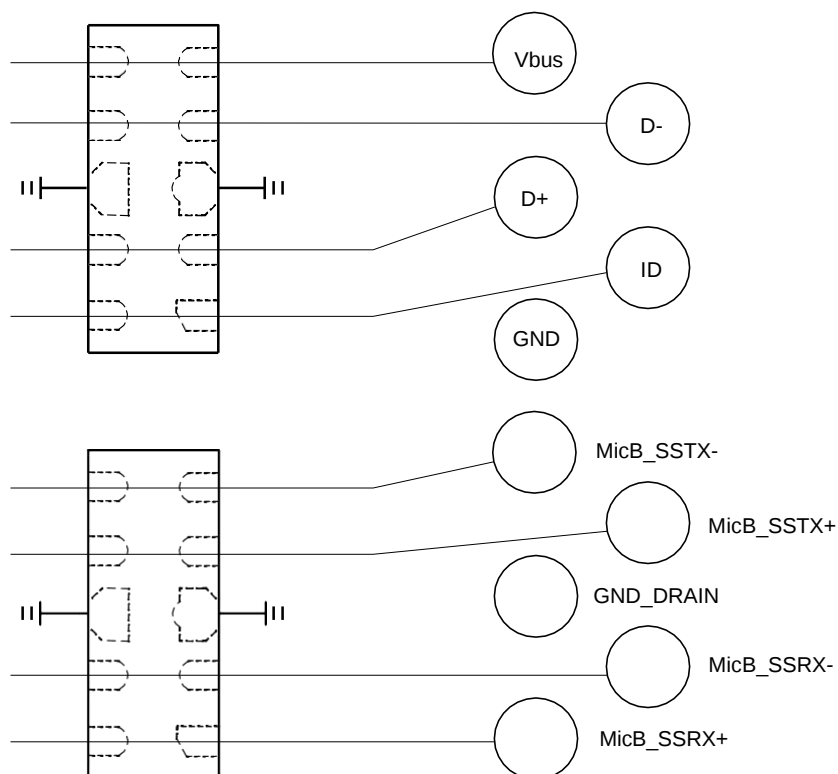
8 X 20 μs Pulse Waveform

Typical Application

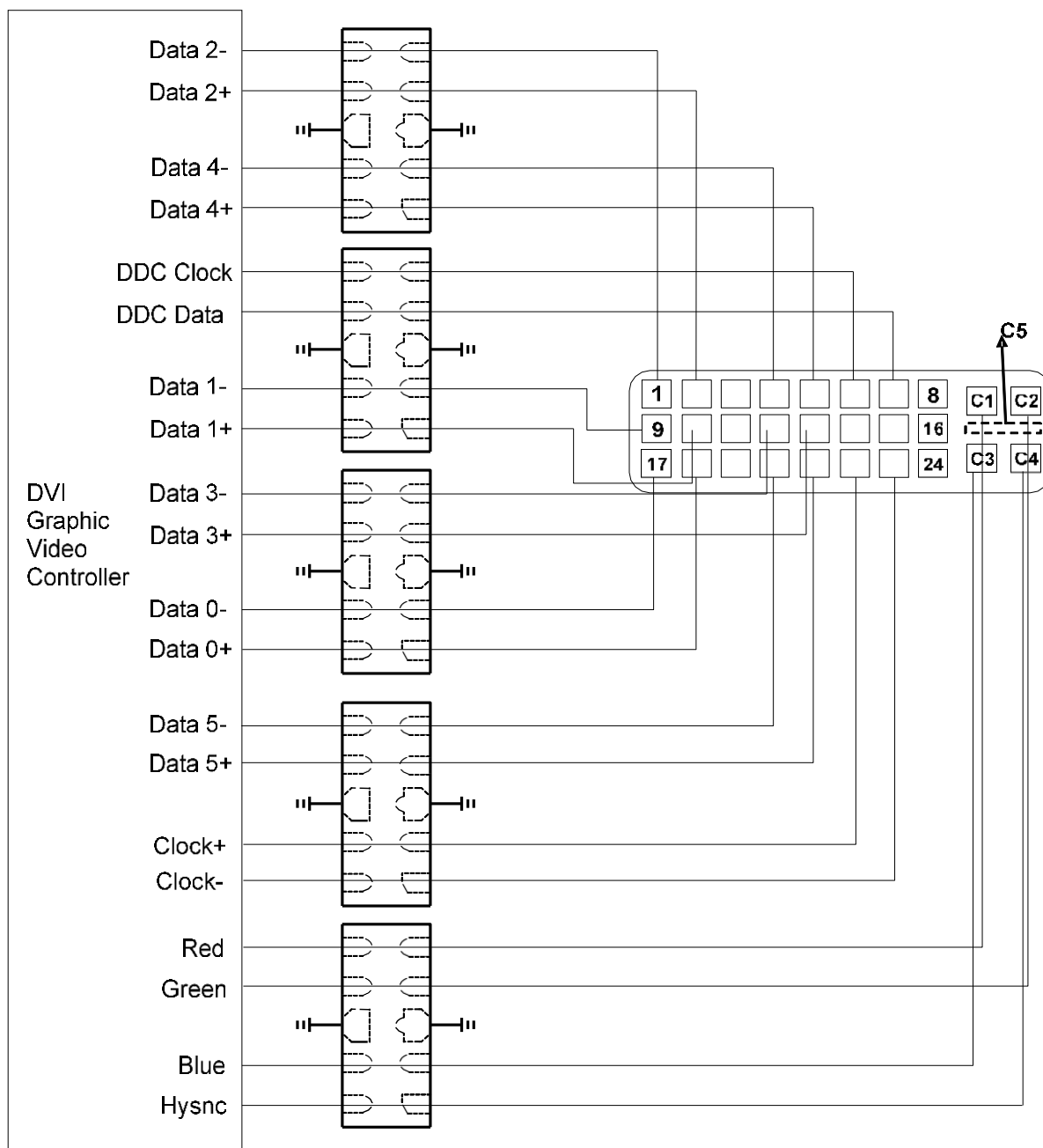
The KWULC0724S is designed for easy PCB layout by allowing the traces to run straight through the device. The PCB traces could be used to connect the pin pairs for each line. For example, line 1 enters at pin 1 and exits at pin 10 and the PCB trace connects Pin 1 and Pin 10 together. Ground is connected at Pin 3 and Pin 8.



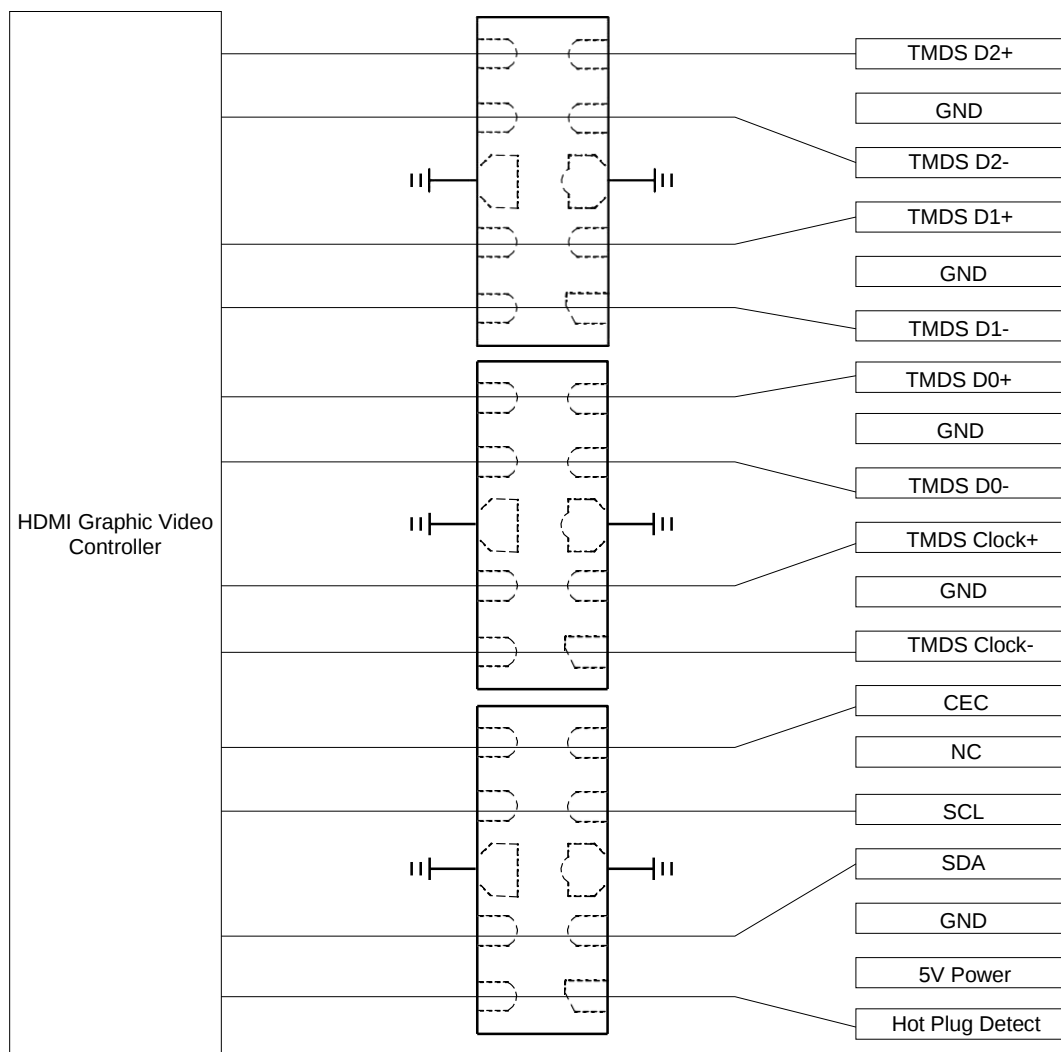
KWULC0724S on USB 3.0 Port Application



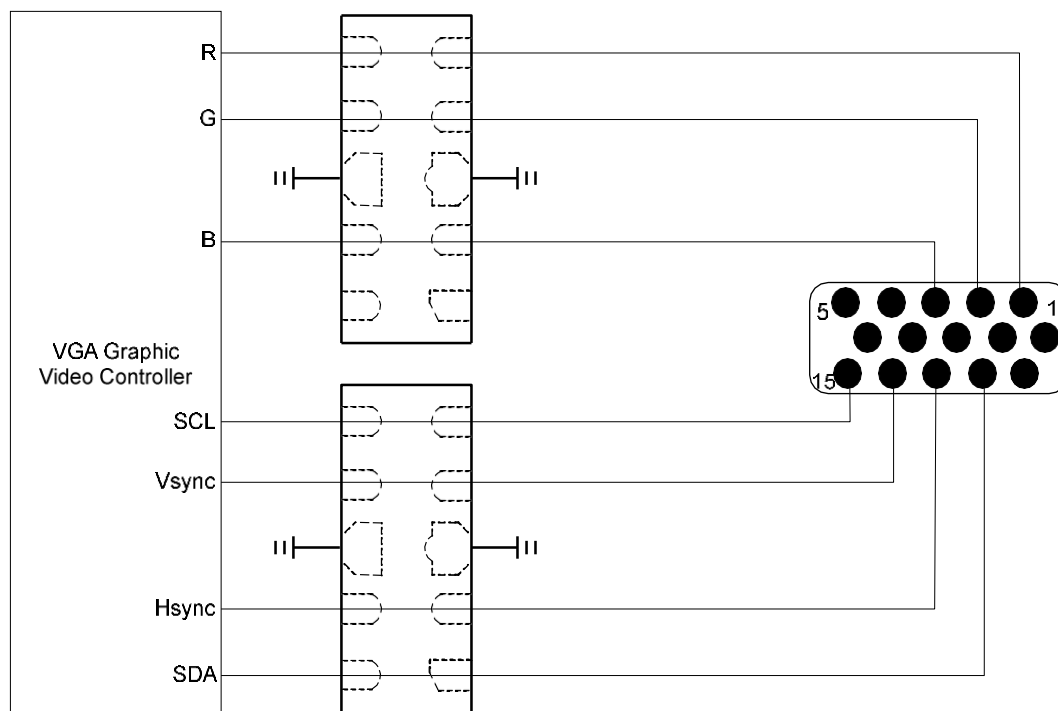
KWULC0724S on DVI Port Application



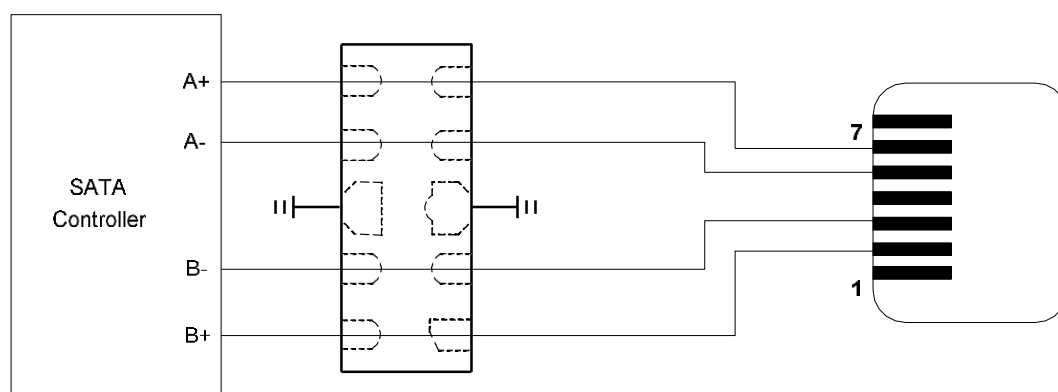
KWULC0724S on HDMI Port Application



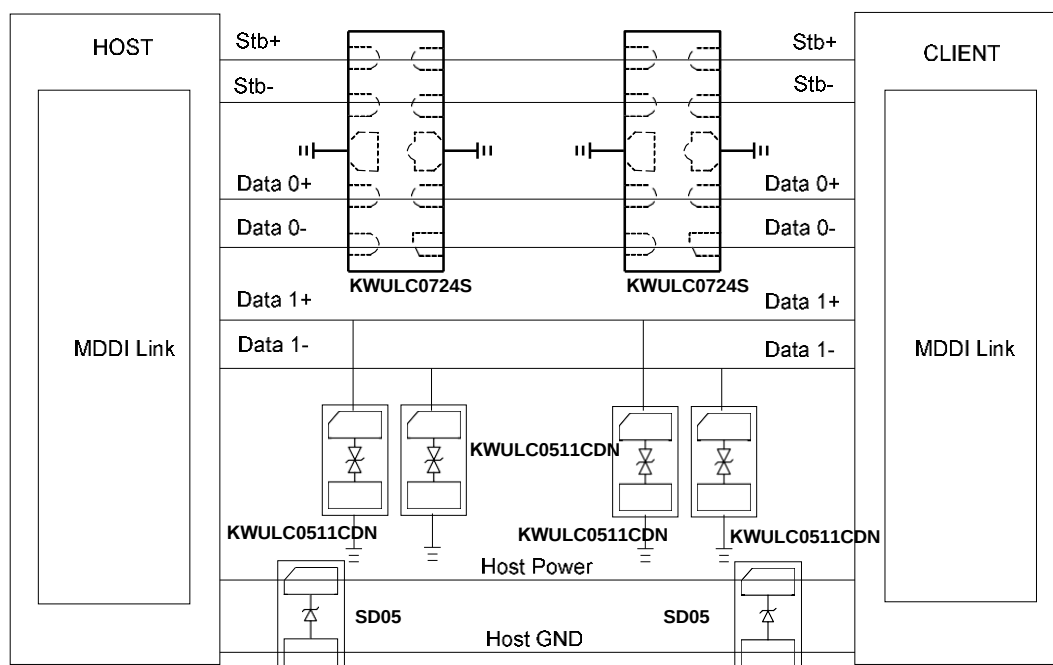
KWULC0724S on VGA Port Application



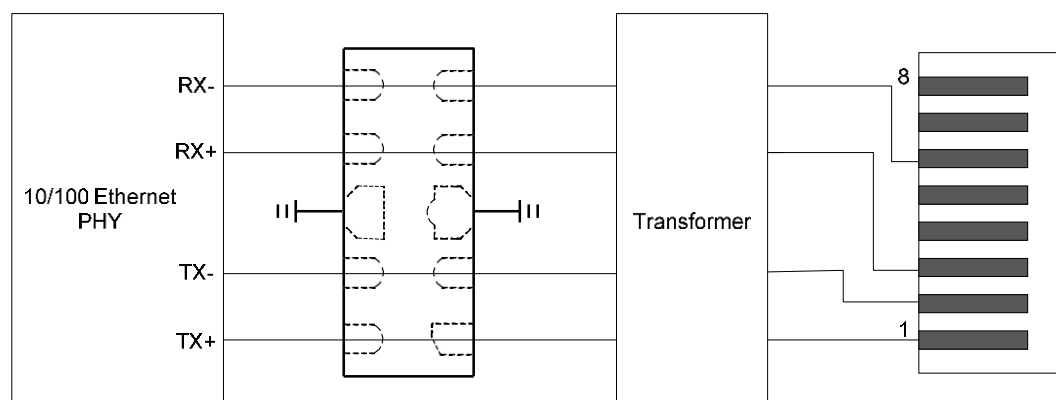
KWULC0724S on eSATA Port Application



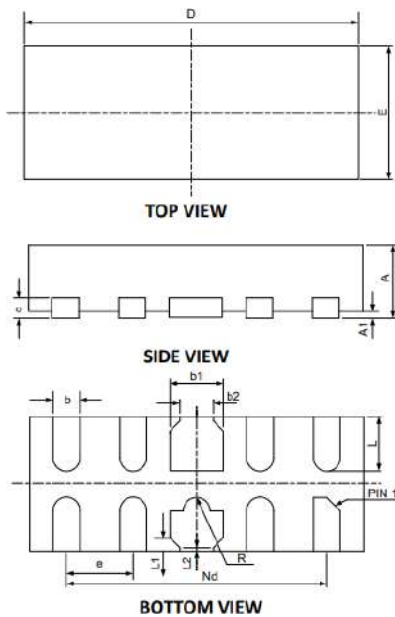
KWULC0724S on MDDI Port Application



KWULC0724S on 10/100 Base Ethernet Port Application

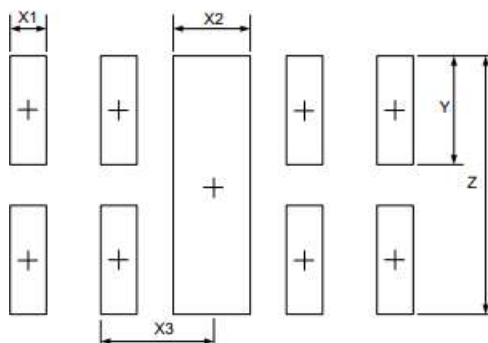


DFN2510P10 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
b1	0.35	0.40	0.45	0.014	0.016	0.018
b2	0.20	0.25	0.30	0.008	0.010	0.012
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.45	2.50	2.55	0.098	0.100	0.102
e	0.50BSC			0.020BSC		
Nd	2.00BSC			0.080BSC		
E	0.95	1.00	1.05	0.038	0.040	0.042
L	0.35	0.40	0.45	0.014	0.016	0.018
L1	0.075REF			0.003REF		
L2	0.050REF			0.002REF		
h	0.08	0.12	0.15	0.003	0.005	0.006
R	0.05	0.10	0.15	0.002	0.004	0.006

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X1	0.200	0.008
X2	0.400	0.016
X3	0.600	0.024
Y	0.600	0.024
Z	1.400	0.056