

Description

The LYQ10BA05UL is an ultra low capacitance TVS array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. It complies with IEC 61000-4-2 (ESD), $\pm 25\text{kV}$ air and $\pm 20\text{kV}$ contact discharge. It is assembled into a lead-free DFN2510 package. The small size, ultra low capacitance and high ESD surge protection make it an ideal choice to protect HDMI, MDDI, USB 3.0 and other high speed ports.

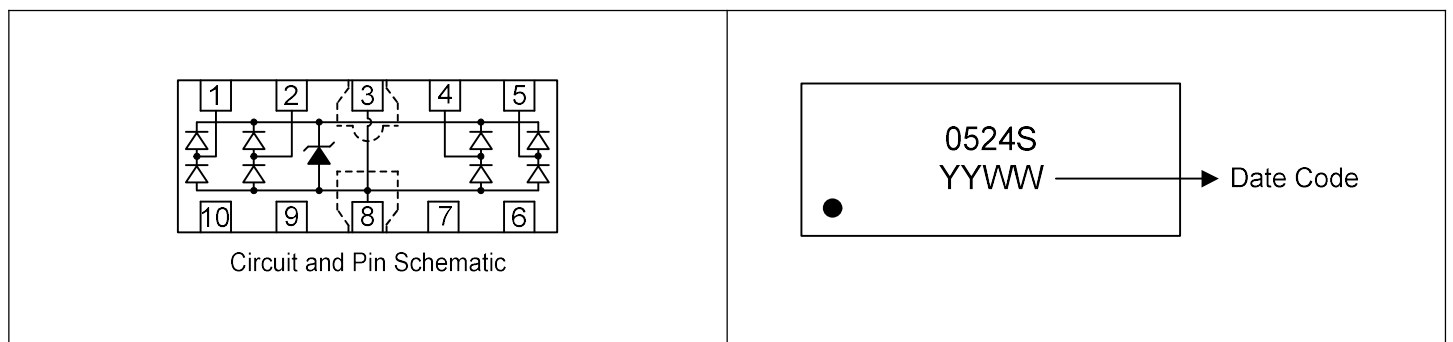
Features

- Low clamping voltage
- Ultra low leakage current
- Operating voltage: 5V
- Protects four I/O lines
- RoHS compliant
- IEC-61000-4-2 ESD $\pm 25\text{kV}$ Air, $\pm 20\text{kV}$ Contact
- Packaging: 7 inch reel, 3000pcs/reel

Applications

- HDMI 1.3, HDMI 1.4, HDMI 2.0
- MDDI ports
- USB 2.0, USB 3.0
- Digital Visual Interface (DVI)
- Notebook Computers
- Video Graphics Cards
- PCI Express and Serial SATA Ports
- Set Top Box and Digital TV

Pin Configuration and Marking



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

Parameter	Symbol	Value
Peak Pulse Power (8/20 μs)	P_{PP}	80W
Peak Pulse Current (8/20 μs)	I_{PP}	5A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	$\pm 25\text{kV}$ $\pm 20\text{kV}$
Ambient Temperature Range	T_A	-55°C to $+125^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55°C to $+150^{\circ}\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.
Reverse Working Voltage	V_{RWM}		-	-	5V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	6V	-	-
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}$	-	-	0.5 μA
Clamping Voltage	V_C	$I_{PP} = 1\text{A}$ (8/20 μs)	-	-	9V
		$I_{PP} = 5\text{A}$ (8/20 μs)	-	-	16V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$, between I/O pins	-	0.3pF	0.4pF
		$V_R = 0\text{V}$, $f = 1\text{MHz}$, any I/O pin to ground	-	-	0.8pF

Typical Characteristic Curves ($T_A=25^{\circ}\text{C}$)

Figure 1. Peak Pulse Power Rating Curve

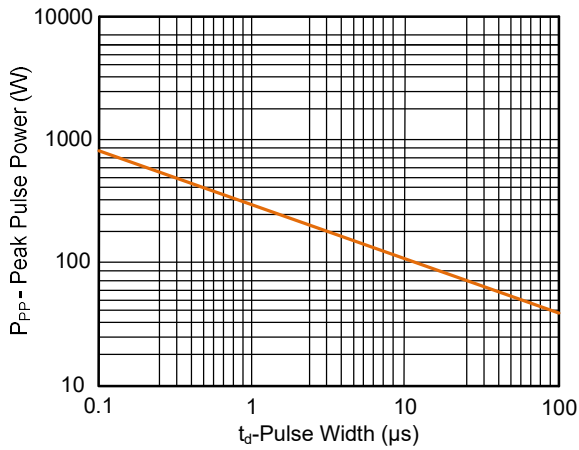


Figure 2. Pulse Derating Curve



Figure 3. Clamping Voltage vs. Peak Pulse Current

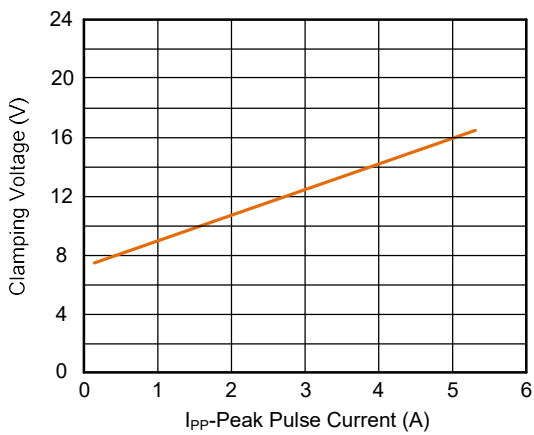


Figure 4. Junction Capacitance vs. Reverse Voltage

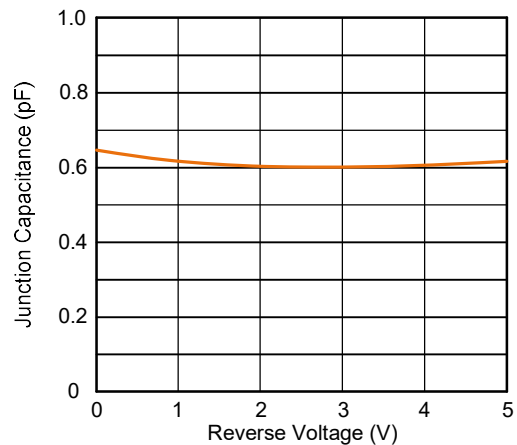


Figure 5. Pulse Waveform (8/20μs)

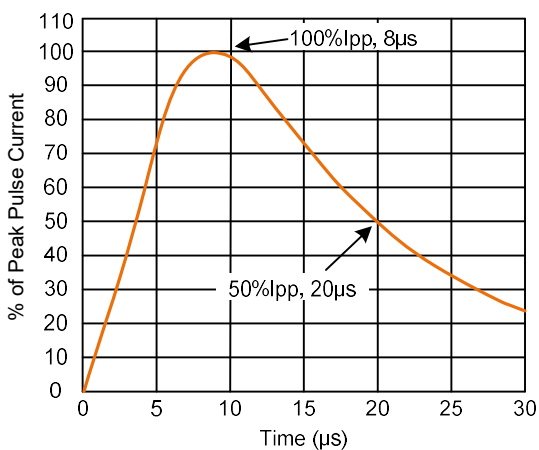
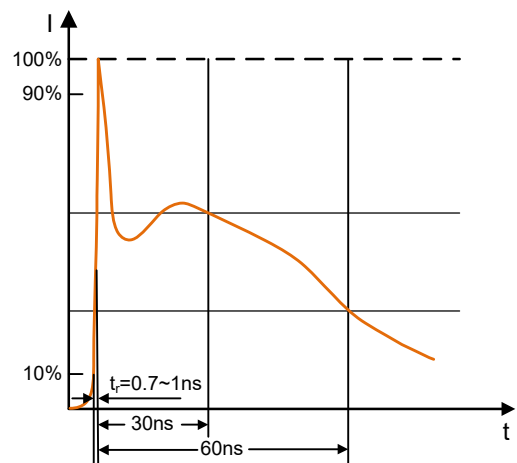


Figure 6. Pulse Waveform (IEC61000-4-2)

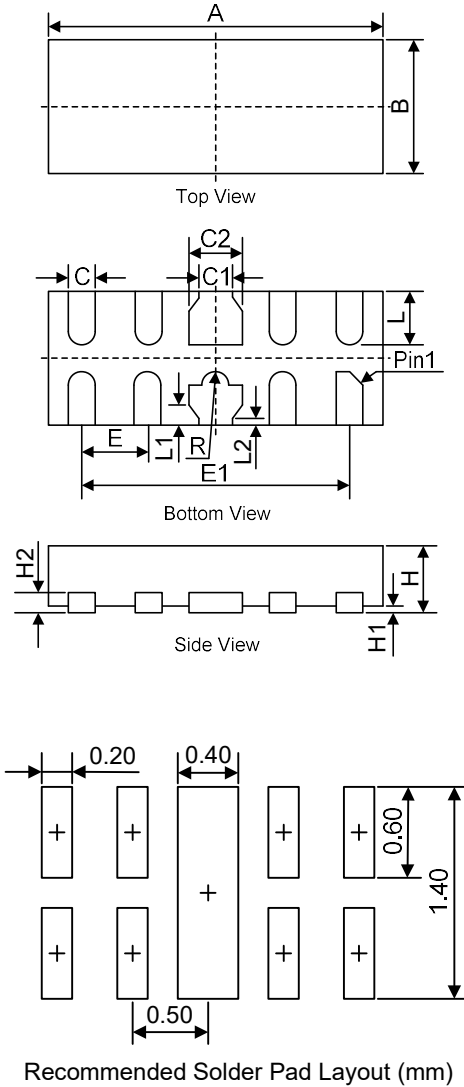


Soldering Parameters



Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s)	150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Dimensions (DFN2510)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.45	2.55	0.098	0.102
B	0.95	1.05	0.038	0.042
C	0.15	0.25	0.006	0.010
C1	0.20	0.30	0.008	0.012
C2	0.35	0.45	0.014	0.018
E	0.50BSC		0.020BSC	
E1	2.00BSC		0.080BSC	
L	0.35	0.45	0.014	0.018
L1	0.075REF		0.003REF	
L2	0.050REF		0.002REF	
R	0.05	0.15	0.002	0.006
H	0.45	0.55	0.018	0.022
H1	0.00	0.05	0.000	0.002
H2	0.10	0.20	0.004	0.008