

Description

The LY563AA05UL is 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 SOT-563 package. The ultra low capacitance array make it an ideal choice to protect USB3.0 and other high speed ports.

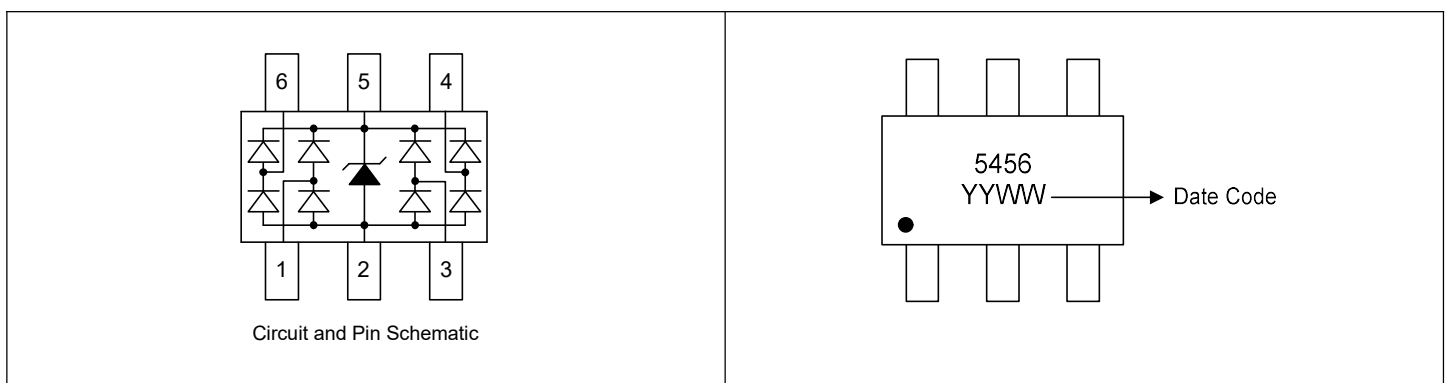
Features

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

Applications

- USB2.0 and USB3.0
- Digital Visual Interface (DVI)
- Gigabit Ethernet
- Monitor and Flat Panel Displays
- PCI Express and Serial SATA Ports
- Consumer Products

Pin Configuration and Marking



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

Parameter	Symbol	Value
Peak Pulse Power (8/20 μs)	P_{PP}	100W
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)	-	-	15V
		$I_{PP} = 5\text{A}$ (8/20 μs)	-	-	20V
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

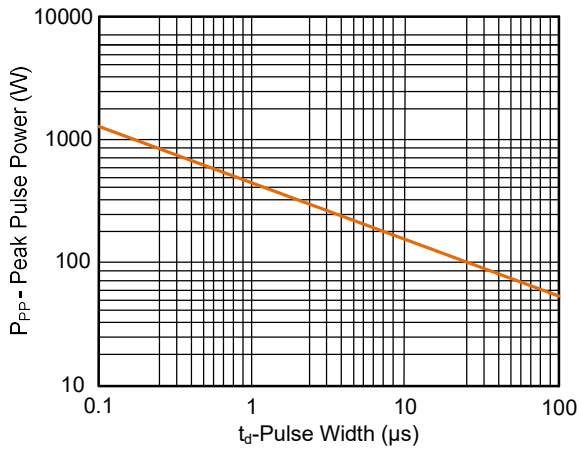


Figure 2. Pulse Derating Curve

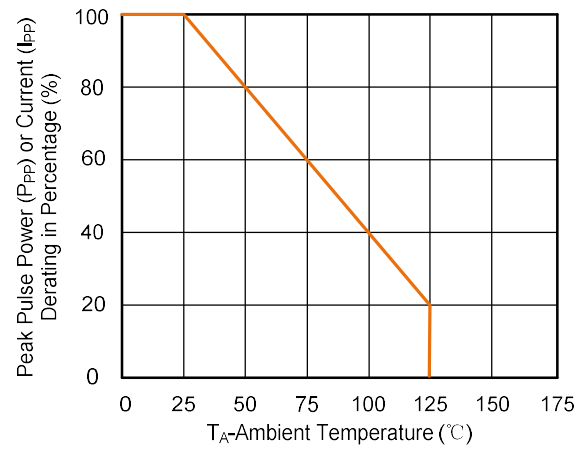


Figure 3. Clamping Voltage vs. Peak Pulse Current

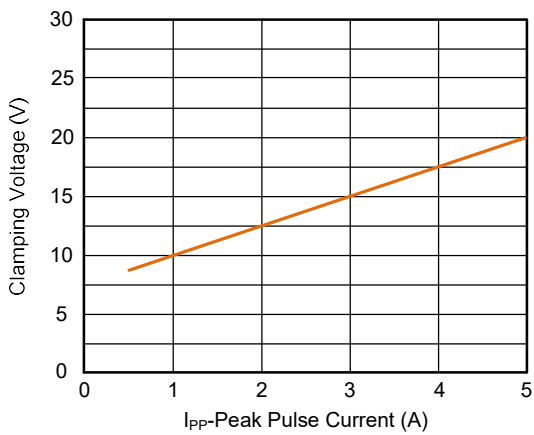


Figure 4. Junction Capacitance vs. Reverse Voltage

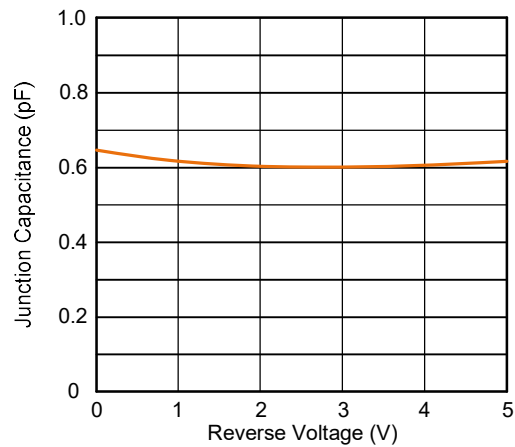


Figure 5. Pulse Waveform (8/20 μs)

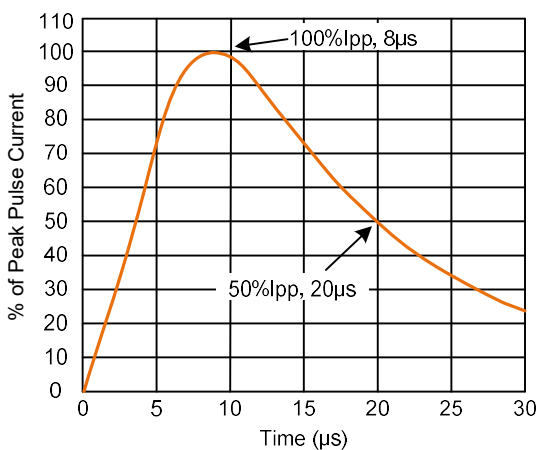
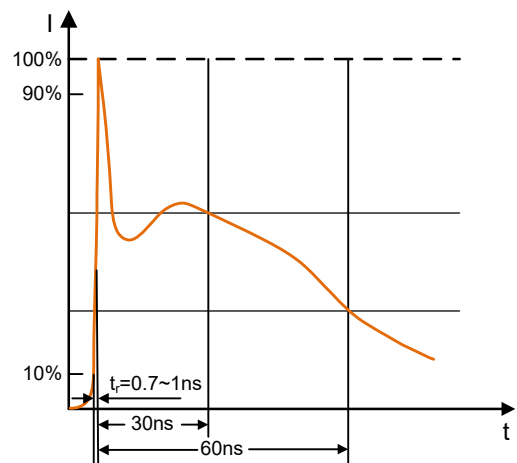
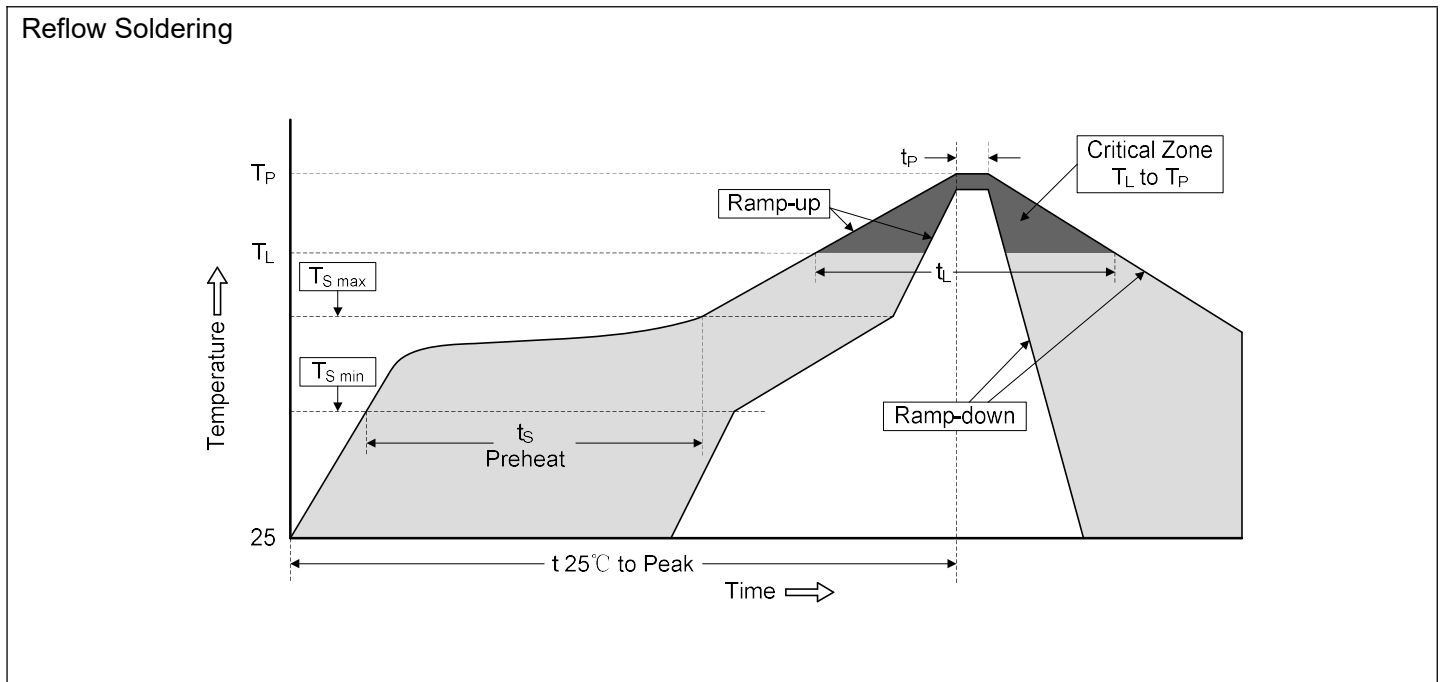


Figure 6. Pulse Waveform (IEC61000-4-2)

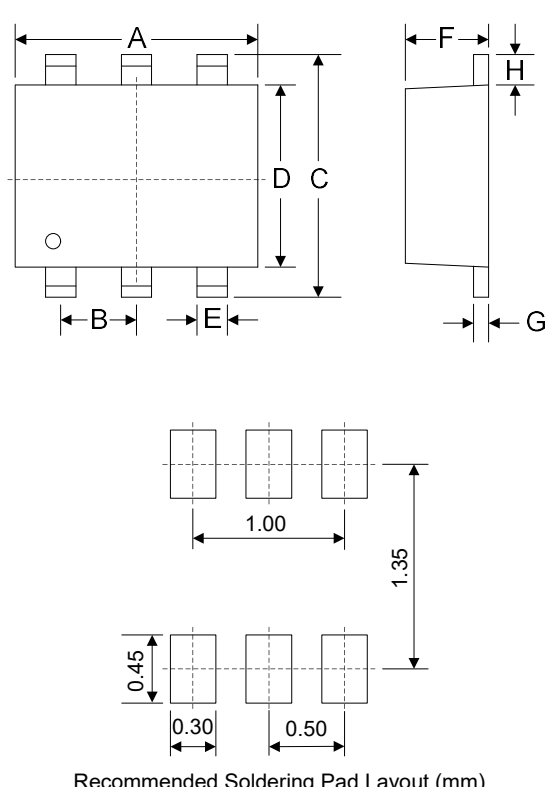


Soldering Parameters



Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat <ul style="list-style-type: none"> -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 <ul style="list-style-type: none"> -Ramp-up Rate 	3°C/second max.
Time maintained above: <ul style="list-style-type: none"> -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 (SOT-563)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.50	1.70	0.059	0.067
B	0.50BSC		0.020BSC	
C	1.50	1.70	0.059	0.067
D	1.10	1.30	0.043	0.051
E	0.17	0.27	0.007	0.011
F	0.50	0.60	0.020	0.024
G	0.08	0.18	0.003	0.007
H	0.10	0.30	0.004	0.012

Recommended Soldering Pad Layout (mm)