SEU0524PC

4-Line Ultra-low Capacitance TVS Diode Array

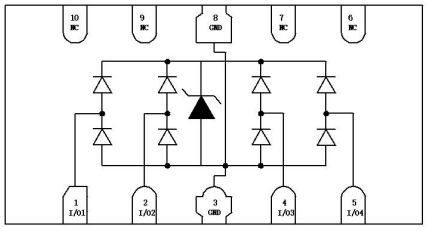
Description

The SEU0524PC 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. The SEU0524PC has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into a 10-pin 2.5x1.0x0.5mm lead-free DFN package. The flow through style package allows for easy PCB layout and matched trace lengths necessary to maintain consistent impedance between high speed differential lines such as USB 3.0 and HDMI. The small size, ultra-low capacitance and high ESD surge protection make SEU0524PC an ideal choice to protect HDMI, MDDI, USB 3.0 and other high speed ports.

Features

- Ultra low capacitance: 0.3pF typical
- No insertion loss to 3.0GHz
- Working voltage: 5V
- Low clamping voltage
- Up to 4 lines protects
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±15kV
    Contact discharge: ±8kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 5A (8/20μs)
- RoHS Compliant

Circuit Diagram



Mechanical Characteristics

- Package: DFN2510-10 (2.5×1.0×0.5mm)
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- HDMI 1.3 & 1.4, USB 2.0 & 3.0 and MDDI ports
- 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

Marking Information

SALLTECH

Details marking code reference specification of approval list

Ordering Information

Part Number	Packaging	Reel Size
SEU0524PC	3000/Tape & Reel	7 inch

Absolute maximum ratings (T_A=25ºC, RH=45%-75%, unless otherwise noted)

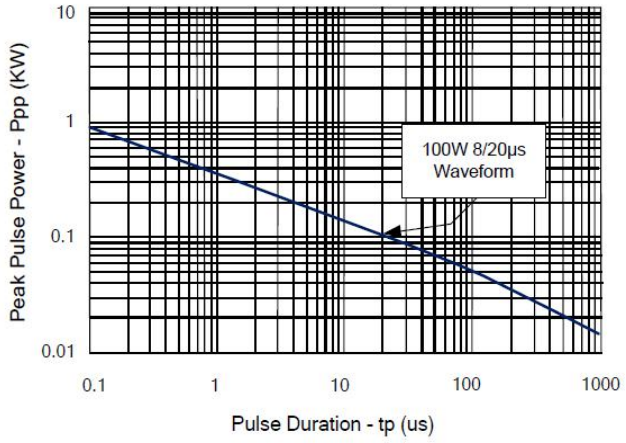
Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)	P_{ppp}	100	W
Peak Pulse Current (8/20μs)	I_{PP}	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±15 ±8	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical characteristics (T_A=25℃)

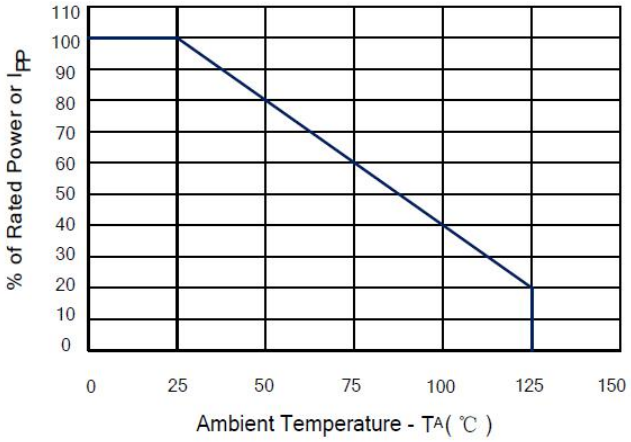
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6		10	V	I_T = 1mA
Reverse Leakage Current	I_R			1	μA	V_{RWM} = 5.0V
Clamping Voltage	V_C			9	V	I_{PP} = 1A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	V_C			15	V	I_{PP} = 5A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	C_J		0.3	0.4	pF	VR = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C_J			0.8	pF	VR = 0V, f = 1MHz, any I/O pin to ground

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

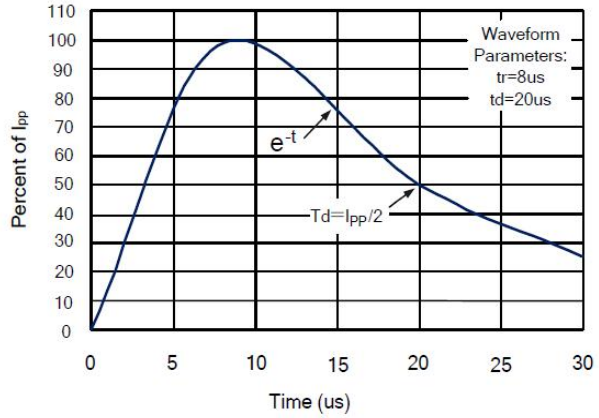
Non-Repetitive Peak Pulse Power vs. Pulse Time



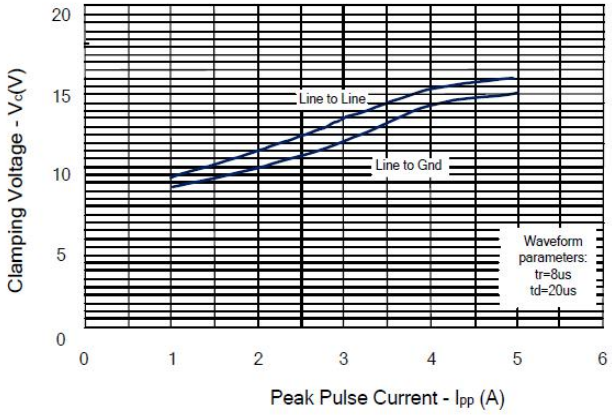
Power Derating curve



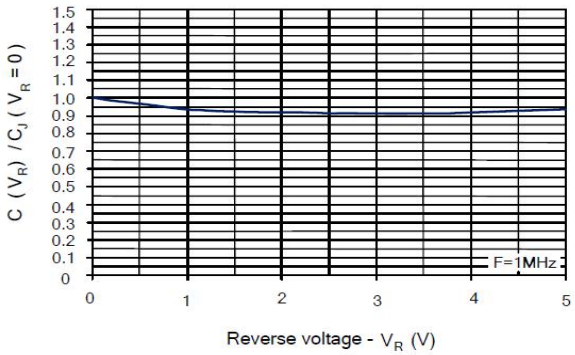
Pulse Waveform



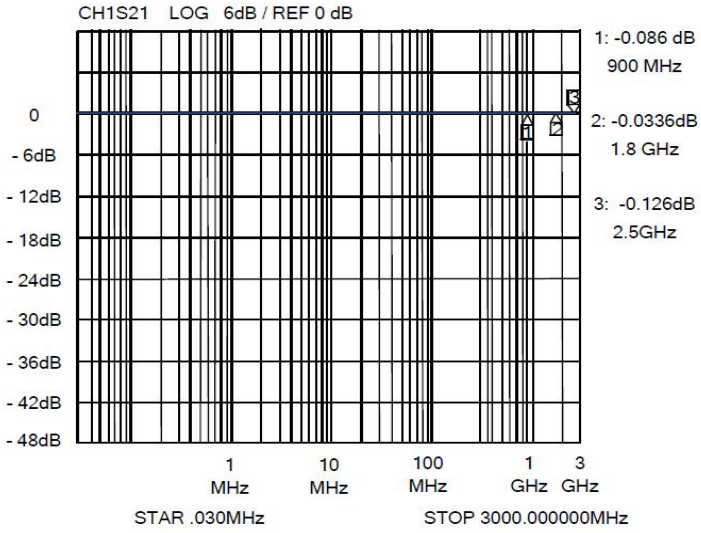
Clamping Voltage vs.Peak Pulse Current



Normalized Capacitance vs. Reverse Voltage

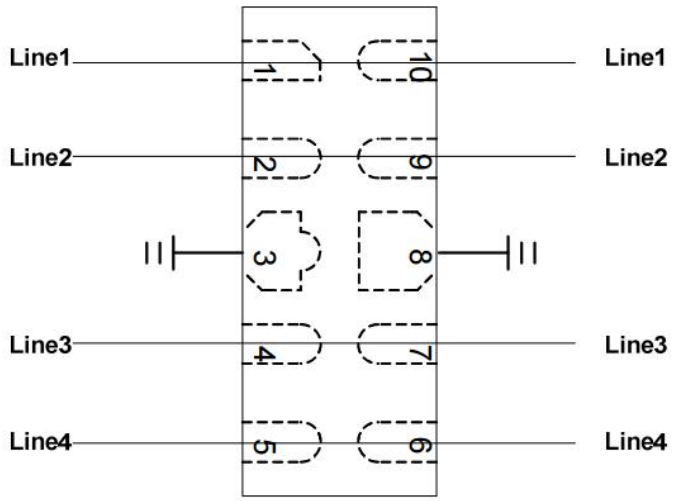


Insertion Loss S21 - I/O to GND

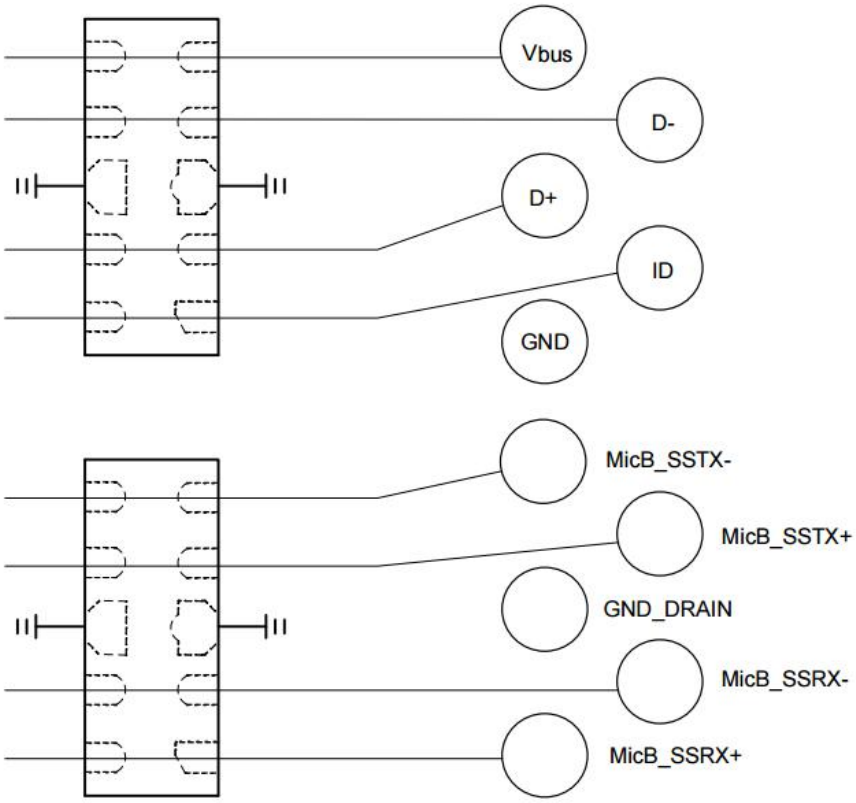


Typical Application

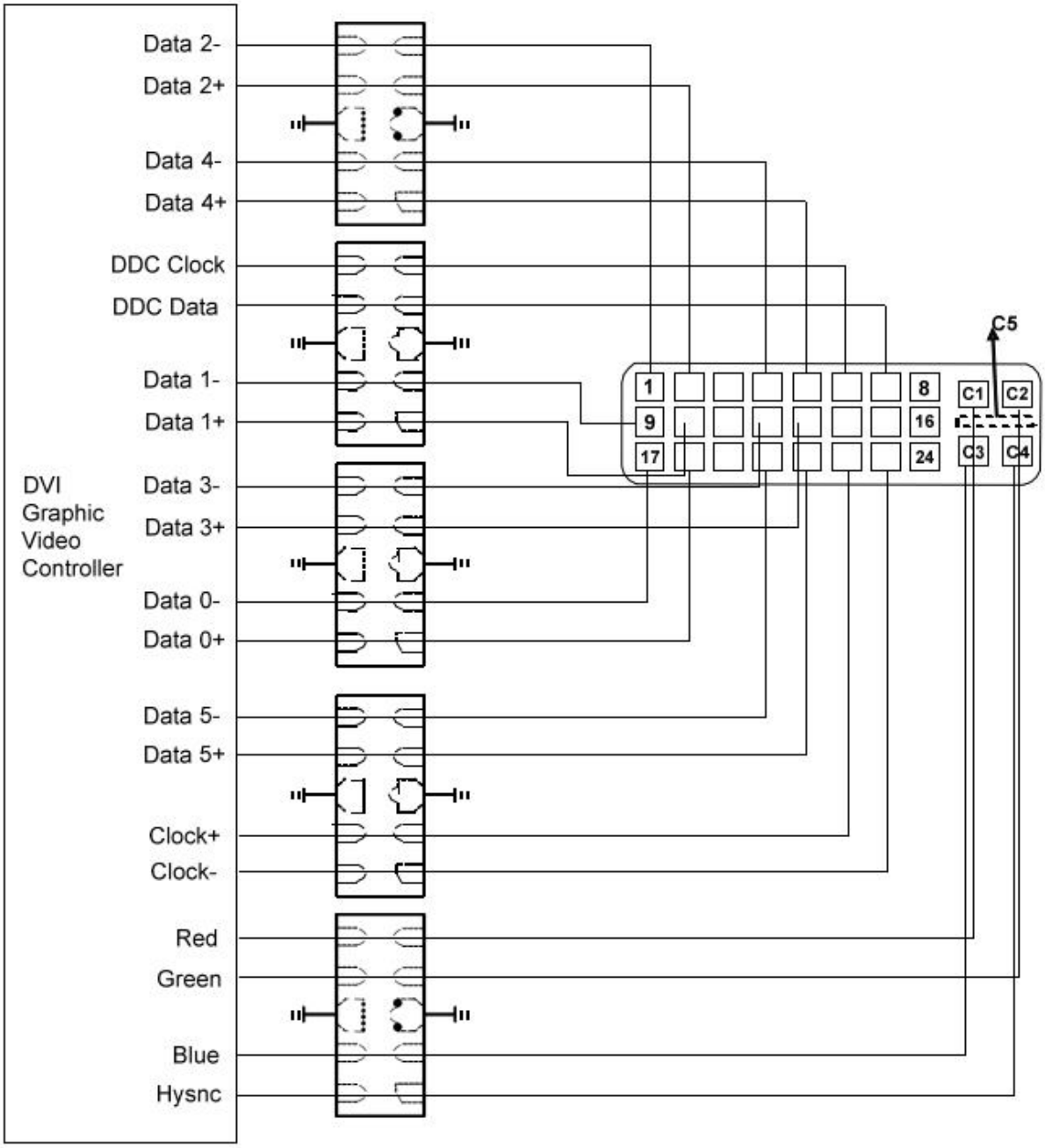
The SEU0524PC is designed for easy PCB layout by allowing the traces to run straight through the device. The PCB traces could be used to connect the pin pairs for each line. For example, line 1 enters at pin 1 and exits at pin 10 and the PCB trace connects Pin 1 and Pin 10 together. Ground is connected at Pin 3 and Pin 8.



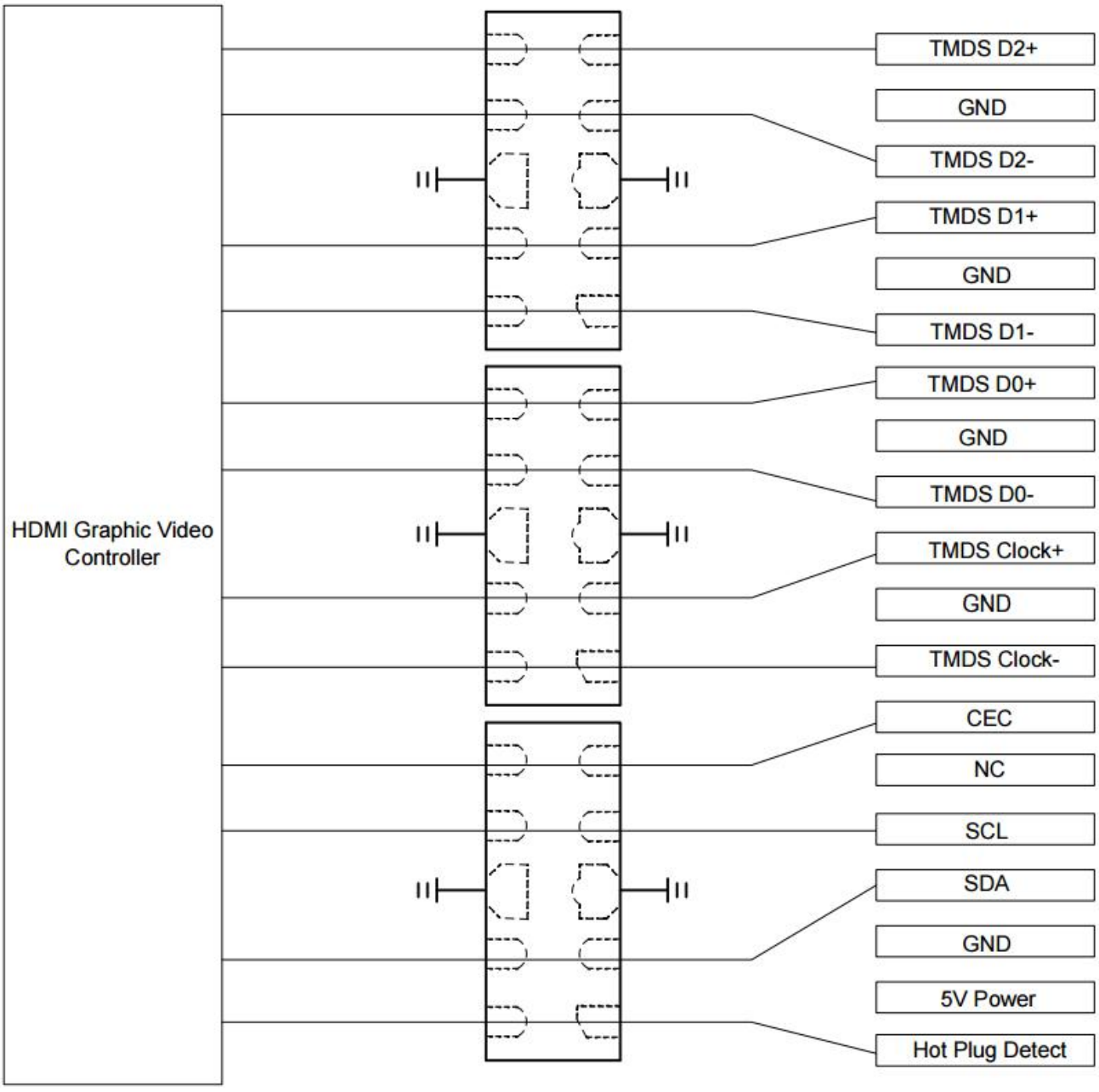
SEU0524PC On USB 3.0 Port Application



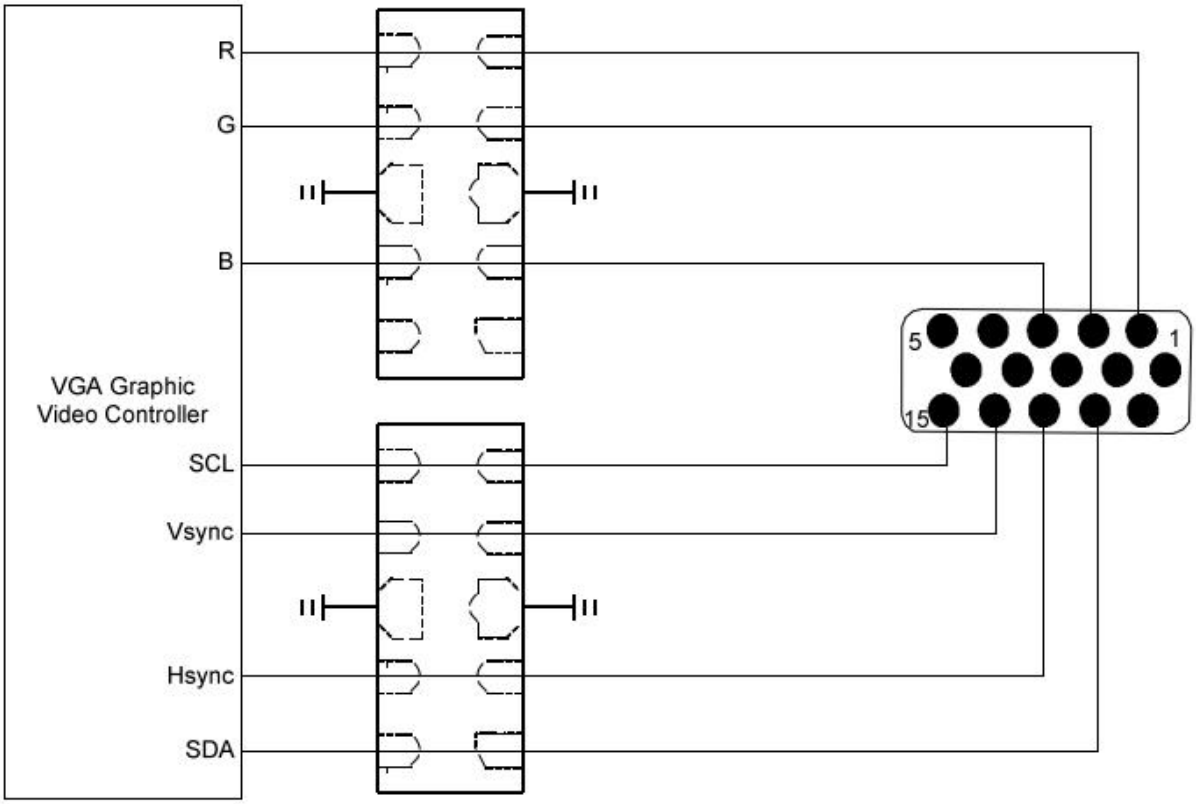
SEU0524PC on DVI Port Application



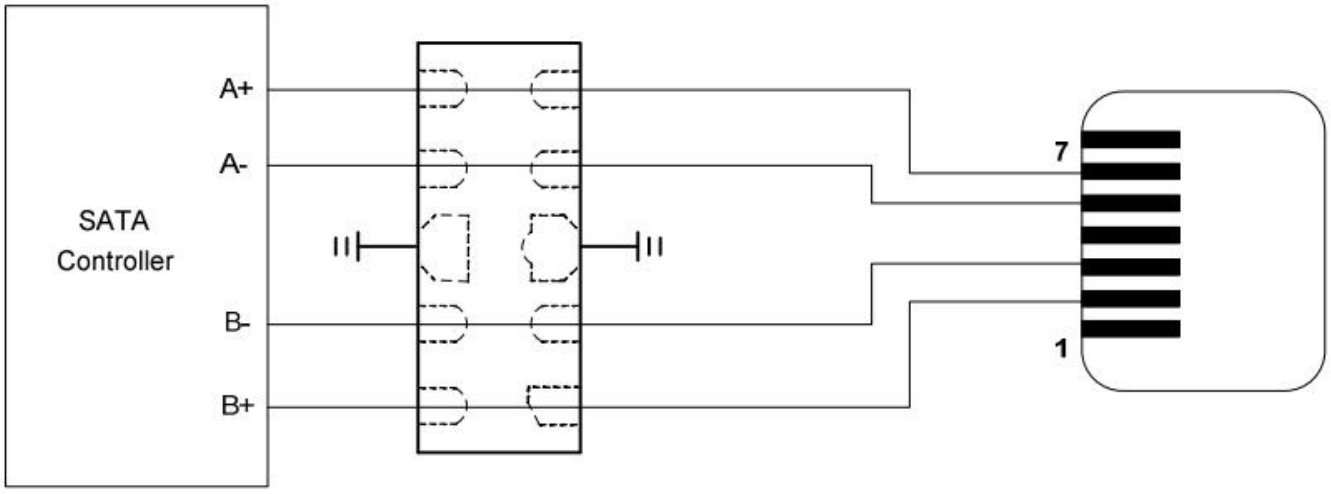
SEU0524PC on HDMI Port Application



SEU0524PC On VGA Port Application

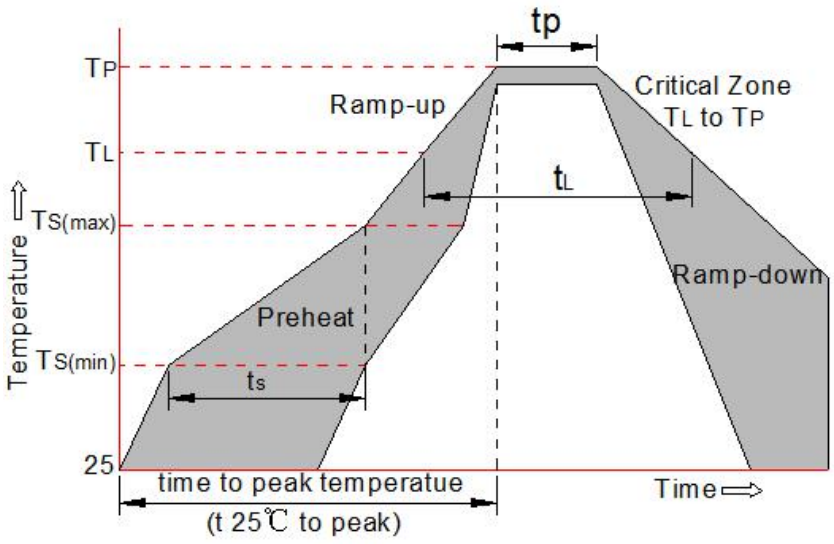


SEU0524PC On eSATA Port Application

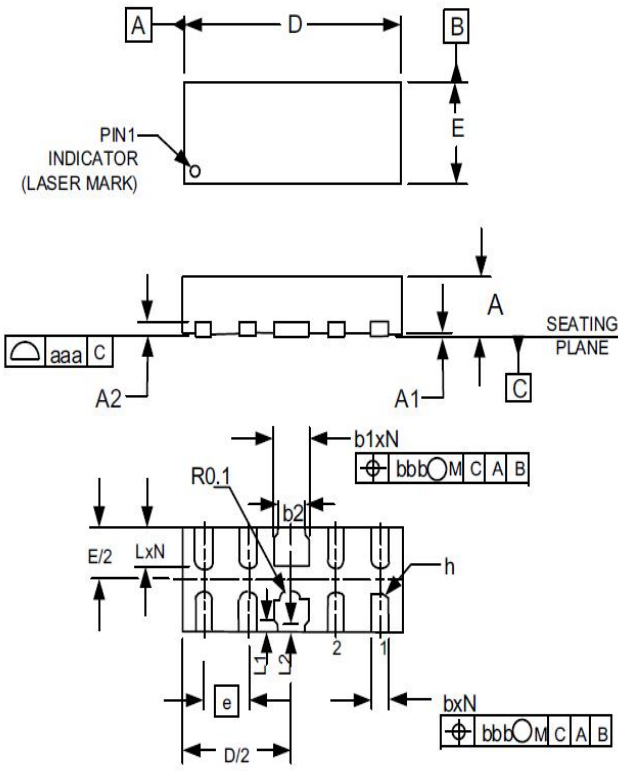


Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

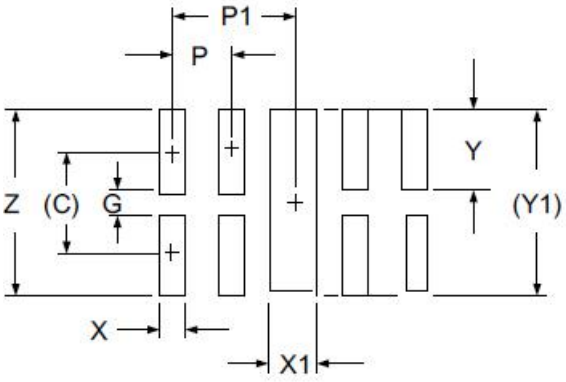


Package mechanical data



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	.017	.020	.022
A1	0.000	0.001	0.002	0.00	0.02	0.05
A2		(0.15)			(.006)	
b	0.10	0.20	0.25	.006	.008	.010
b1	0.35	0.40	0.45	.014	.016	.018
b2	0.20	0.25	0.45	.005	.010	.018
D	2.45	2.50	2.55	.096	.098	.100
E	0.95	1.00	1.05	.037	.039	.041
e		0.50 BSC			.020 BSC	
L	0.35	0.40	0.45	.014	.016	.018
L1	0.00	0.075	0.10	.000	.003	.004
L2	0.00	0.05	0.05	.000	.002	.003
h	0.00	0.12	0.15	.000	.005	.006
h	0.07	0.12	0.17	0.003	0.005	0.007
N		8			8	
aaa		0.08			0.003	
Bbb		0.10			0.004	

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	(0.875)	(.034)
G	0.20	.008
P	0.50	0.02
P1	1.00	.039
X	0.25	.010
X1	0.45	.018
Y	0.675	.027
Y1	(1.55)	(.061)
Z	1.55	.061

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