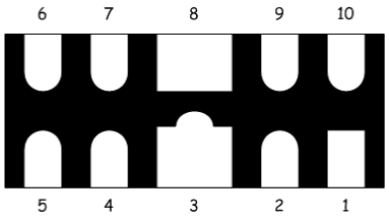
ULC0544P10

ULTRA LOW CAPACITANCE TVS DIODE ARRAY

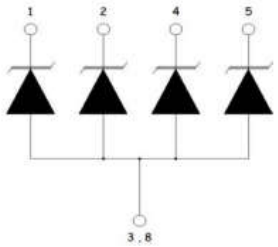
Features

- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Complies with following standards:
  - – IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±15kV
    - Contact discharge: ±10kV
  - – IEC61000-4-4 (EFT) 40A (5/50ns)
  - – IEC61000-4-5 (Lightning) 2.0A (8/20μs)
- RoHS Compliant

Dimensions DFN2510P10



Pin Configuration



Applications

- USB 2.0 power and data line
- Set-top box and digital TV
- Digital video interface (DVI)
- Notebook Computers
- SIM Ports
- 10/100 Ethernet

Mechanical Characteristics

- Package: DFN2510P10
- Lead Finish: Lead Free
- UL Flammability Classification Rating 94V-0
- Quantity Per Reel:3,000pcs
- Reel Size:7 inch

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

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppp	50	W
ESD per IEC 61000−4−2 (Air)	V_{ESD}	±15	Kv
ESD per IEC 61000−4−2 (Contact)		±10	
Operating Temperature Range	T_J	-55 to +125	℃
Storage Temperature Range	T_{STJ}	-55 to +150	℃

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

Part Number	Device Marking	V_{RWM} (V)	V_{BR} (V)	I_T (Ma)	V_C @1A	Vc		I_R Ma (Max)	C (Pf) (Typ.)
						(Max)	(@A)		
ULC0544P10	UL4L	5	6	1	9.8	25	2	1	0.35

Characteristic Curves

Fig1. 8/20μs Pulse Waveform

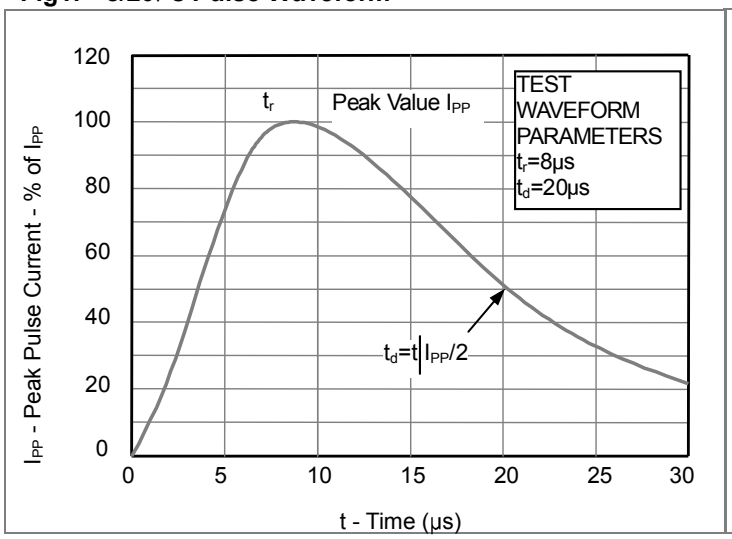


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

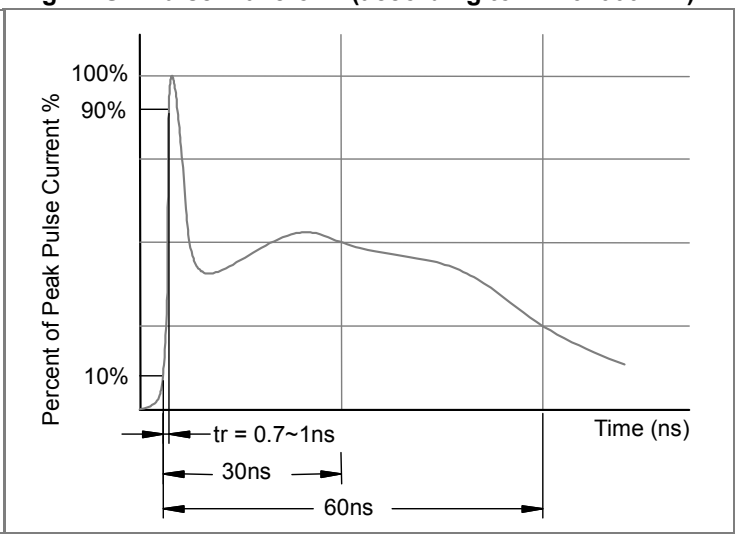
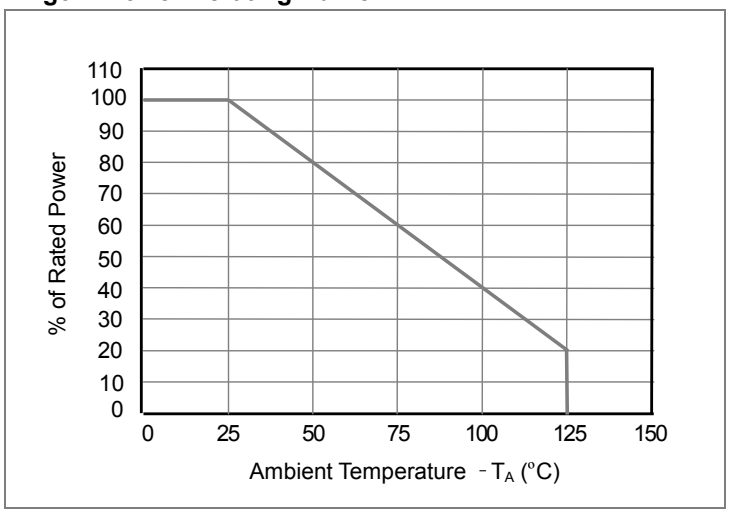
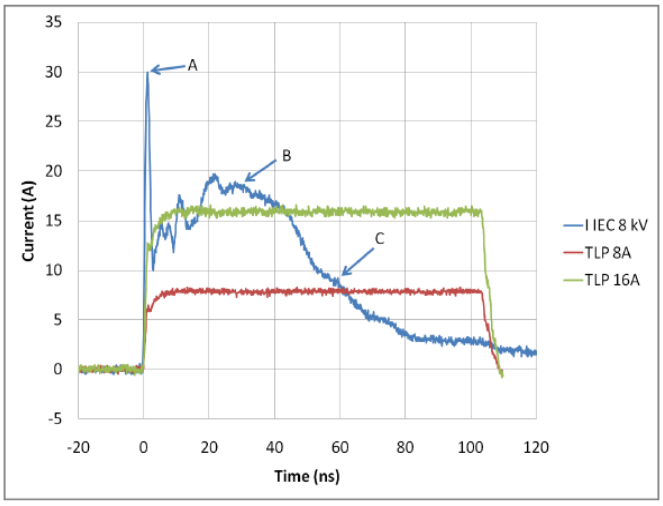


Fig3. Power Derating Curve



Transmission Line Pulse (TLP)

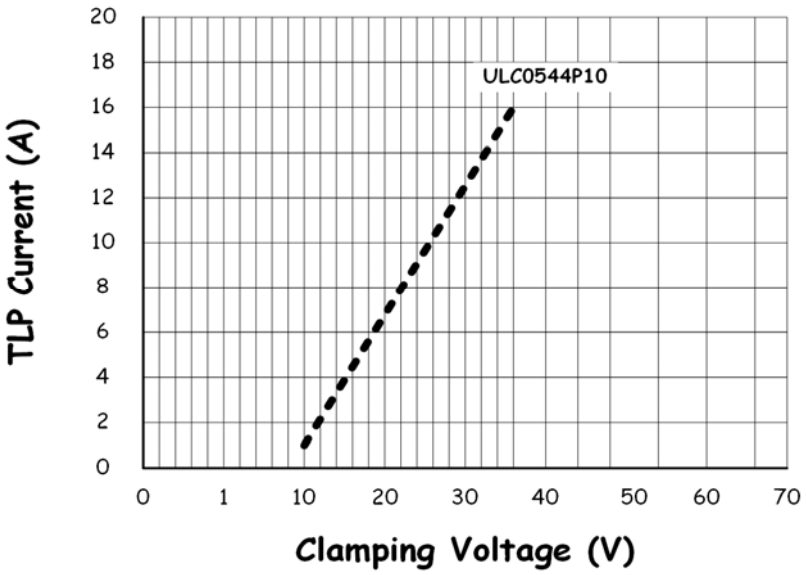
Transmission Line Pulse (TLP) is a measurement technique used in the Electrostatic Discharge (ESD) arena to characterize performance attributes of devices under ESD stresses. TLP is able to obtain current versus voltage (I–V) curves in which each data point is obtained with a 100 ns long pulse, with currents up to 40 A. TLP was first used in the ESD field to study human body model (HBM) in integrated circuits, but it is an equally valid tool in the field of system level ESD. The applicability of TLP to system level ESD is illustrated in Figure 1, which compares an 8 kV IEC 61000–4–2 current waveform with TLP current pulses of 8 and 16 A. The current levels and time duration for the pulses are similar and the initial rise time for the TLP pulse is comparable to the rise time of the IEC 61000–4–2's initial current spike. This application note will give a basic introduction to TLP measurements and explain the datasheet parameters extracted from TLP for Yeashin Technology's protection products.



Comparison of a Current Waveform of IEC 61000–4–2 with TLP Pulses at 8 and 16 A.

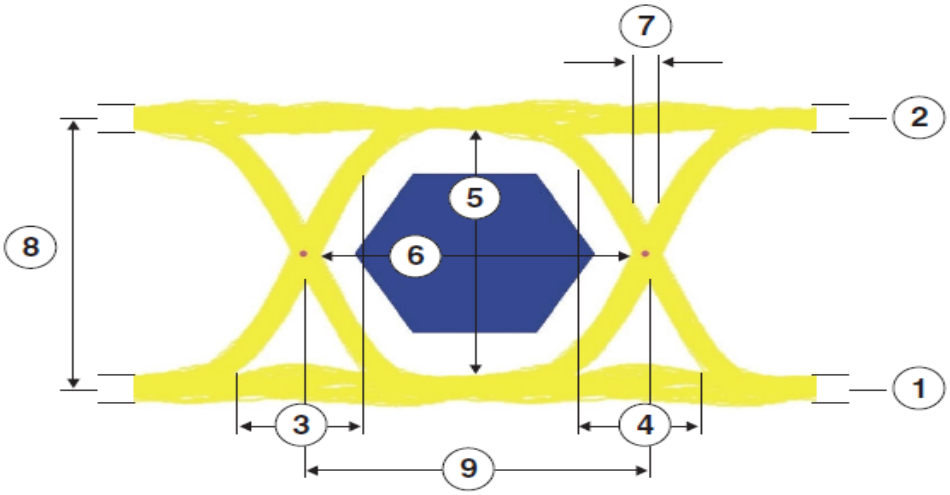
The IEC 61000–4–2 ESD waveforms is true to the Standard and is shown here as captured on an oscilloscope. The points A, B, and C show the points on the waveforms specified in IEC 61000–4–2.

TLP Characteristic

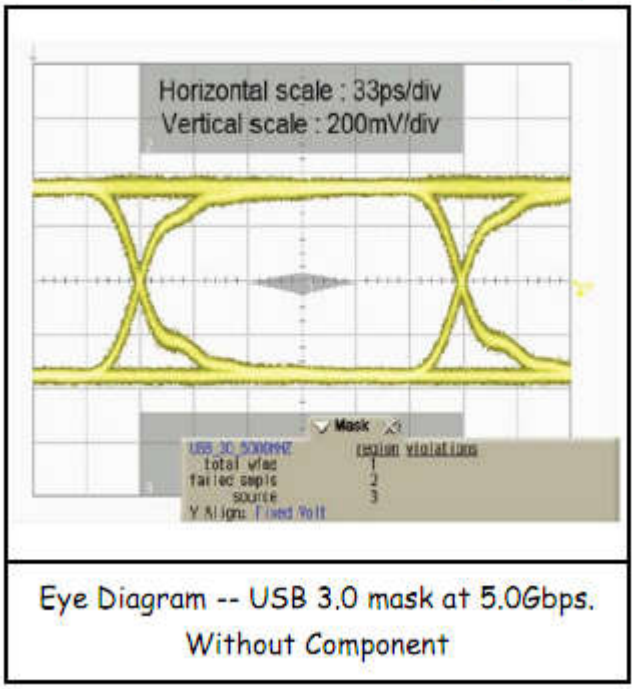


Eye Diagram

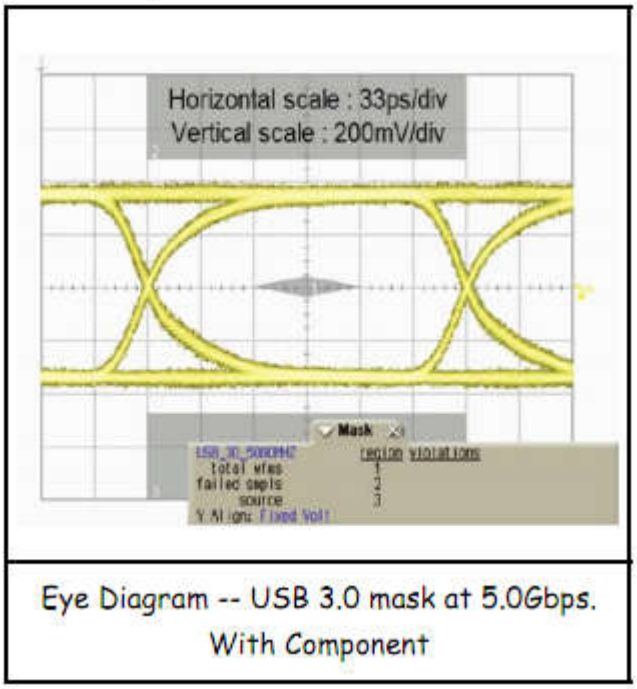
1 Zero Level : measure of the mean value of the logical 0.
2 One Level : measure of the mean value of the logical 1.
3 Rise Time : measure of the transition time of the data from the 10% level to the 90% level on the upward slope.
4 Fall Time : measure of the transition time of the data from the 90% level to the 10% level on the downward slope.
5 Eye Height : measure of the vertical opening. Determine eye closure due to noise.
6 Eye Width : measure of the horizontal opening. Determine influence of jitter on the eye opening.
7 Deterministic Jitter : deviation of a transition from its ideal time caused by reflections relative to other transitions.
8 Eye Amplitude : difference between the logic 0 level and the logic 1 level histogram mean value.
9 Bit Rate : inverse of the bit period.



High Speed Test : 5Gbps

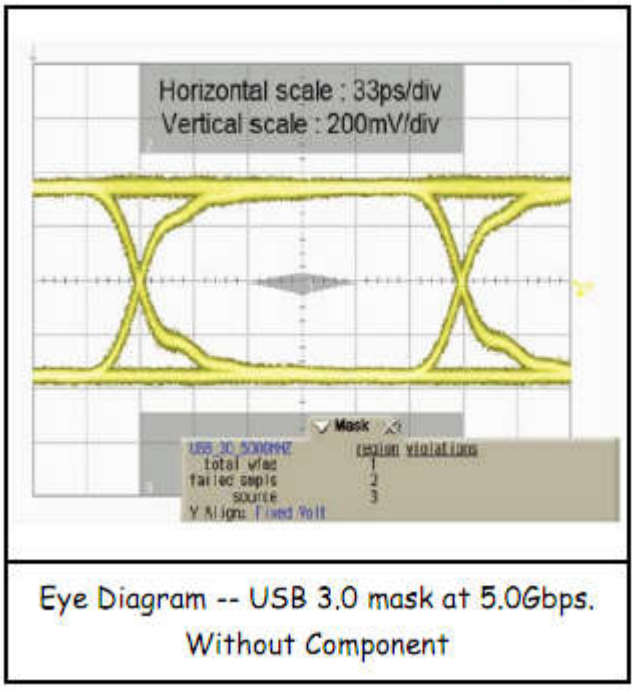


Eye Diagram -- USB 3.0 mask at 5.0Gbps.
Without Component



Eye Diagram -- USB 3.0 mask at 5.0Gbps.
With Component

High Speed Test : 5Gbps



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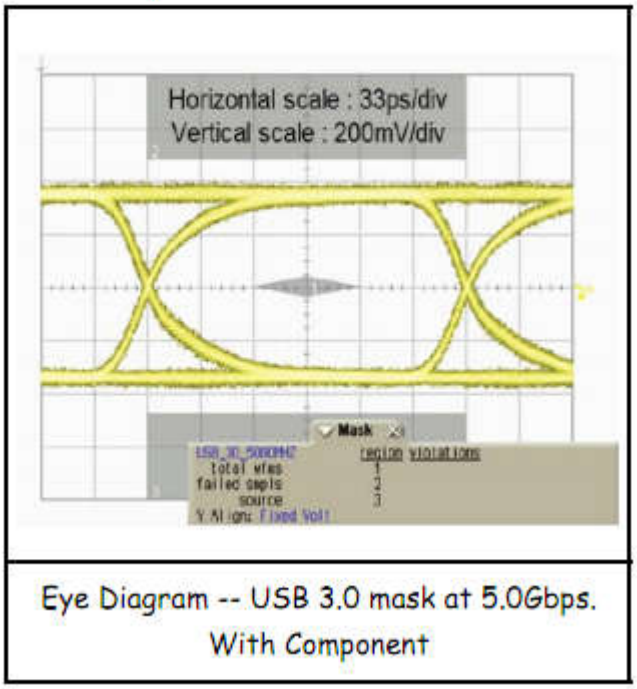
Without Component



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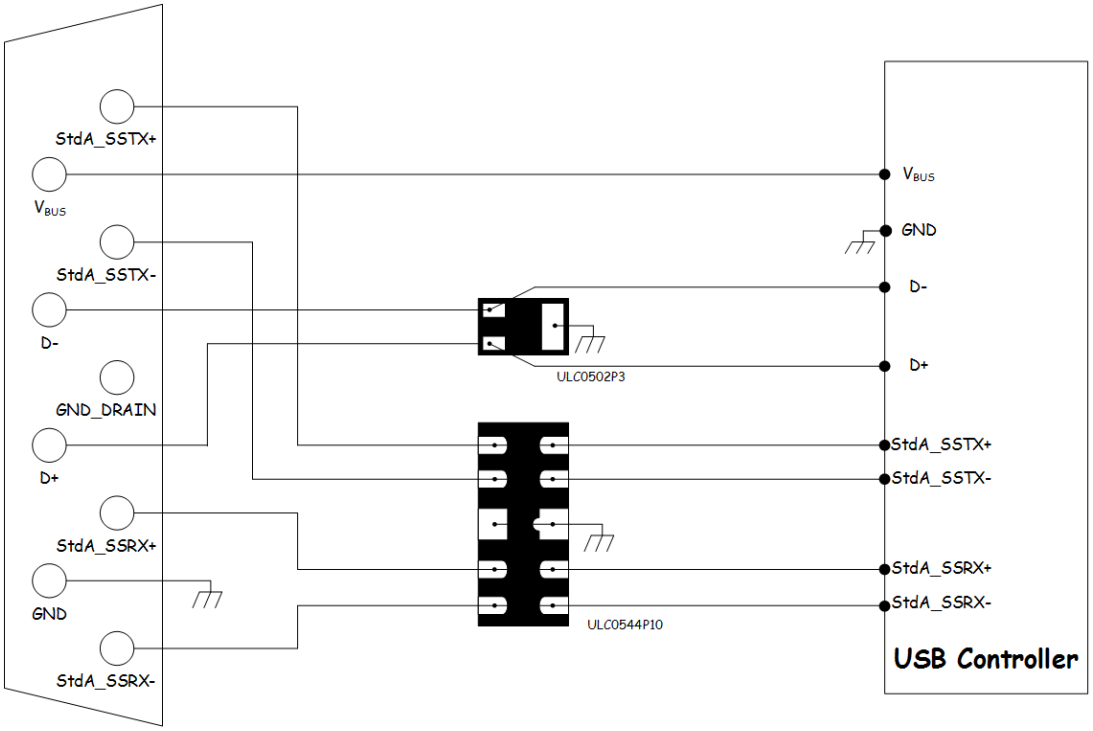


Figure 1. USB 3.1 Layout Diagram

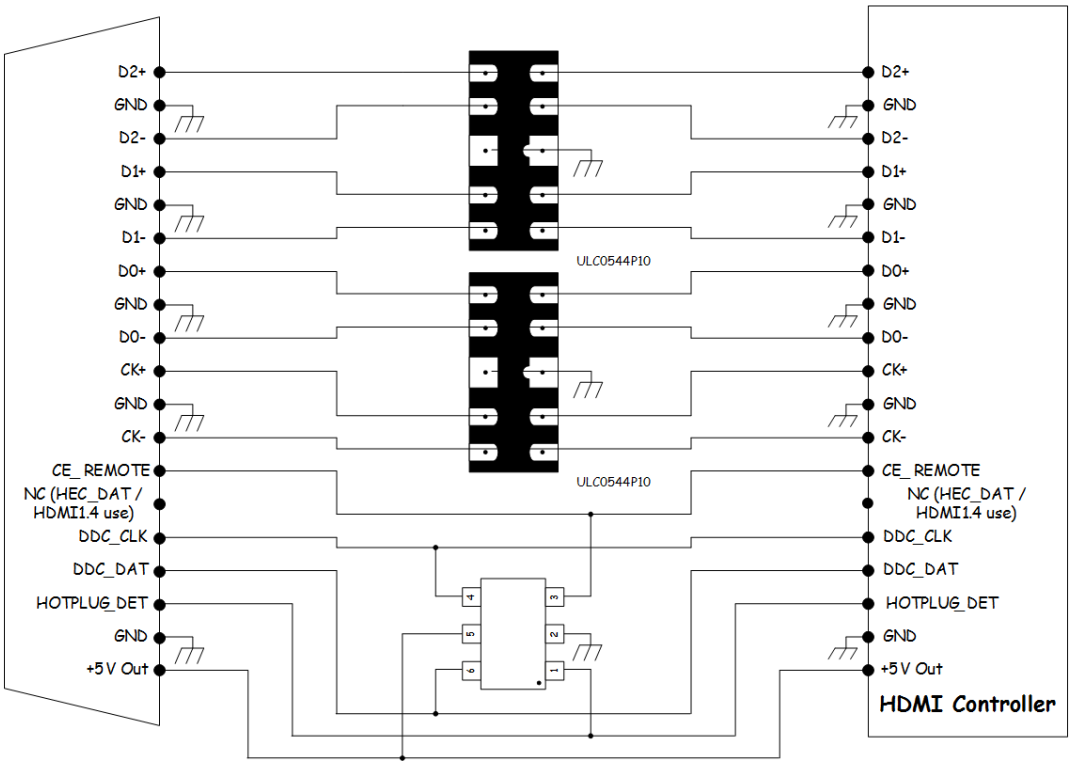
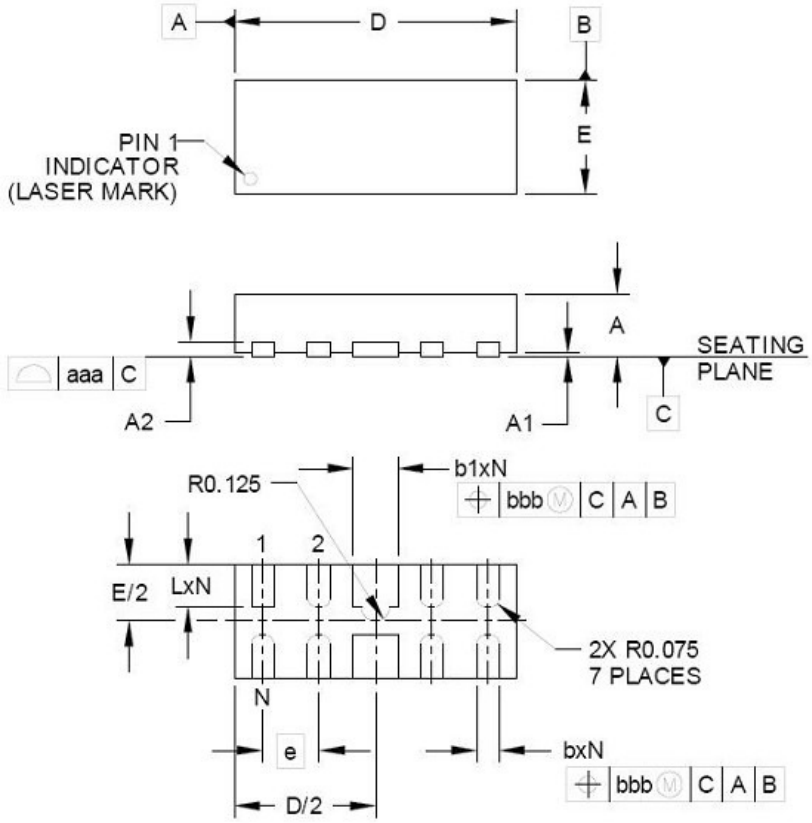


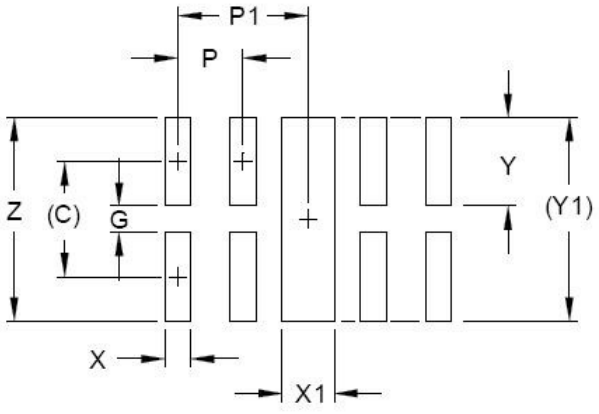
Figure 2. HDMI 2.0 Layout Diagram

DFN2510P10 PACKAGE OUTLINE & DIMENSIONS



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.020	.023	.026	0.50	0.58	0.65
A1	0.00	.001	.002	0.00	0.03	0.05
A2		(.005)			(0.13)	
b	.006	.008	.010	0.15	0.20	0.25
b1	.014	.016	.018	0.35	0.40	0.45
D	.094	.098	.102	2.40	2.50	2.60
E	.035	.039	.043	0.90	1.00	1.10
e		.020 BSC			0.50 BSC	
L	.012	.015	.017	0.30	0.38	0.425
N		10			10	
aaa		.003			0.08	
bbb		.004			0.10	

* SOLDERING FOOTPRINT



DIM	INCHES	MILLIMETERS
C	(.034)	(0.875)
G	.008	0.20
P	.020	0.50
P1	.039	1.00
X	.008	0.20
X1	.016	0.40
Y	.027	0.675
Y1	(.061)	(1.55)
Z	.061	1.55