

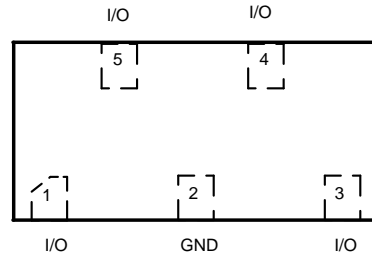
**Description**

The RL20105Q054LC is a low capacitance high power TVS, 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 RL20105Q054LC complies with the IEC 61000-4-2 (ESD) with ±15kV air and ±8kV contact discharge. It is assembled into a 5-pin DFN2010-5 lead-free package. Each device will protect two line pairs high-speed lines. The combination of small size, low capacitance, and high surge capability makes them ideal for use in applications such as USB3.0/USB3.1, Type-C etc.

**Features**

- Stand-off voltage: 5.0V Max.
- Ultra low leakage: nA level
- Operating voltage: 5.0V
- Ultra low clamping voltage
- Protects up to 4 lines
- Complies with following standards:  
IEC 61000-4-2 (ESD) immunity test  
Air discharge: ±15kV  
Contact discharge: ±8kV  
IEC61000-4-5 (Lightning) 3A (8/20µs)
- RoHS Compliant

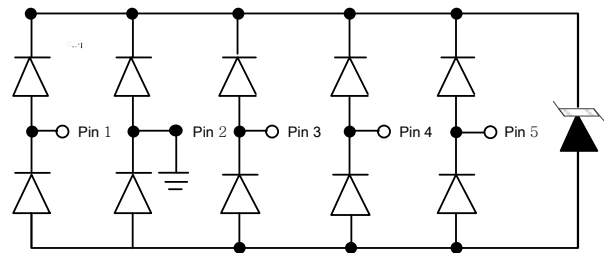
**Pin Configuration**



**Applications**

- USB3.0/USB3.1, Type-C
- HDMI 1.4/2.0, Display Port 1.3
- Unified Display interface
- Digital visual interface

**Circuit Diagram**



**Absolute Maximum Rating**

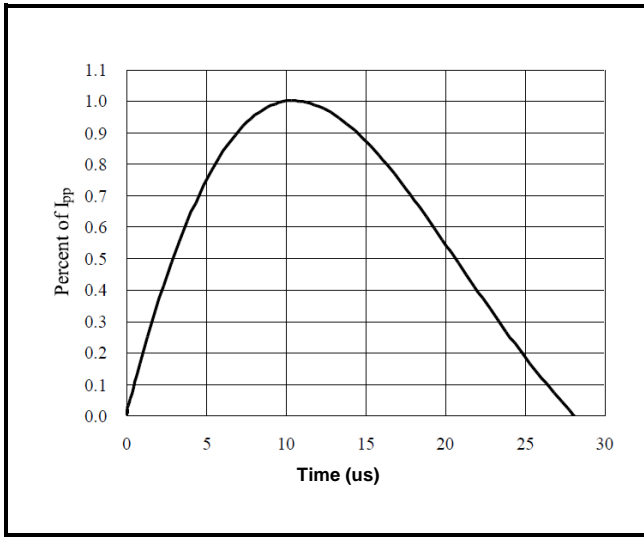
Rating	Symbol	Value	Units
Peak Pulse Power (tp =8/20µs)	P <sub>PP</sub>	30	W
ESD Voltage (Air) ESD Voltage (Contact)	V <sub>ESD</sub>	±15 ±8	kV
Operating Temperature	T <sub>OPT</sub>	-45 to +85	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics (@ 25°C Unless Otherwise Specified)**

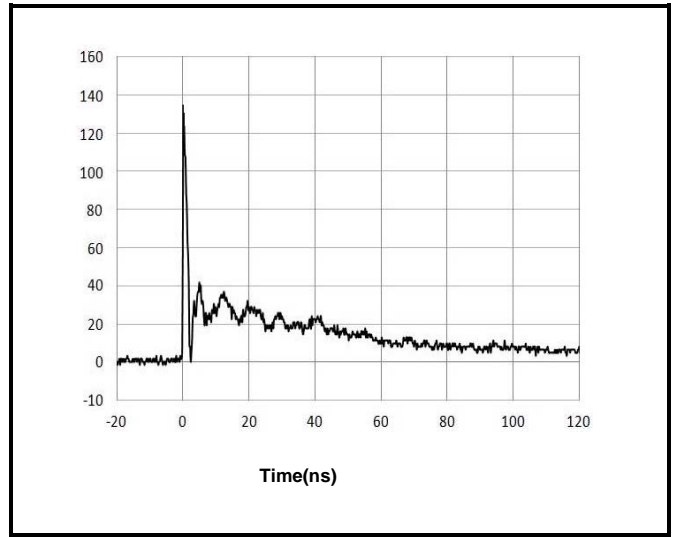
Type Number	Reverse Stand-Off Voltage	Minimum Breakdown Voltage	Peak Pulse Voltage @8/20 µ S	V <sub>C</sub> @8/20µs		Reverse Leakage @V <sub>RWM</sub>	Typ. Capacitance
	V <sub>RWM</sub>	V <sub>BR</sub> @1mA	V <sub>C</sub> @1A	(max.)	@I <sub>PP</sub>	I <sub>R</sub> @V <sub>RWM</sub>	C <sub>J</sub> @ V <sub>R</sub> =0V, f=1MHz
	V	V	V	V	A	µA	pF
RL20105Q054LC	5.0	6.0	8.0	10	3	0.5	0.2

Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)

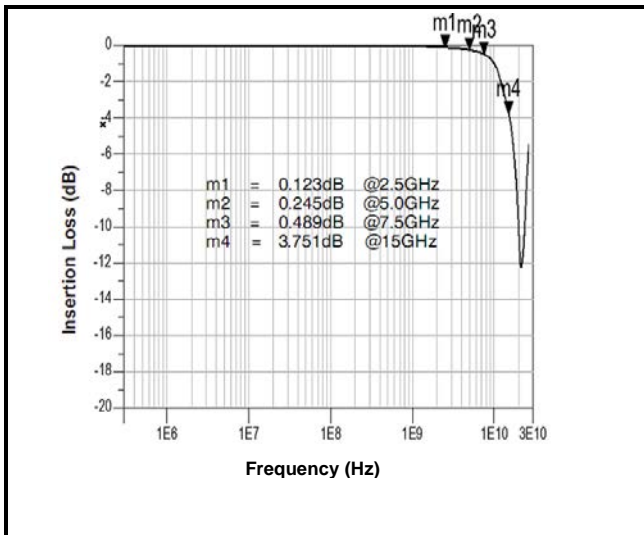
8/20 s Pulse Waveform



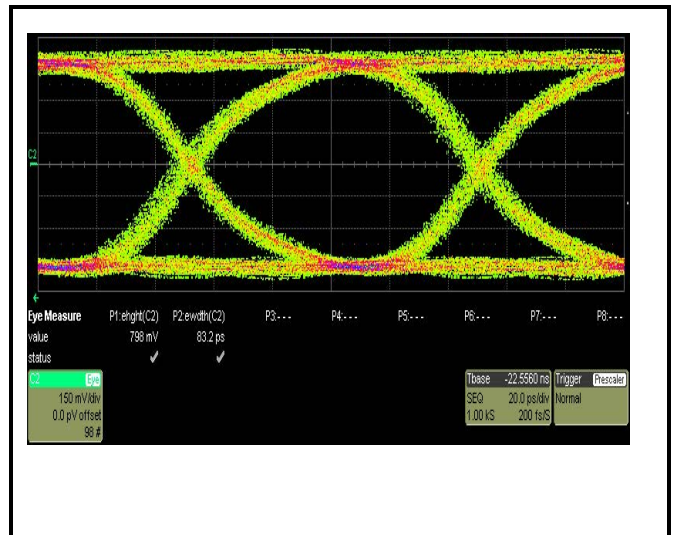
IEC6100-4-2 +8KV ESD Contact Clamping Waveform



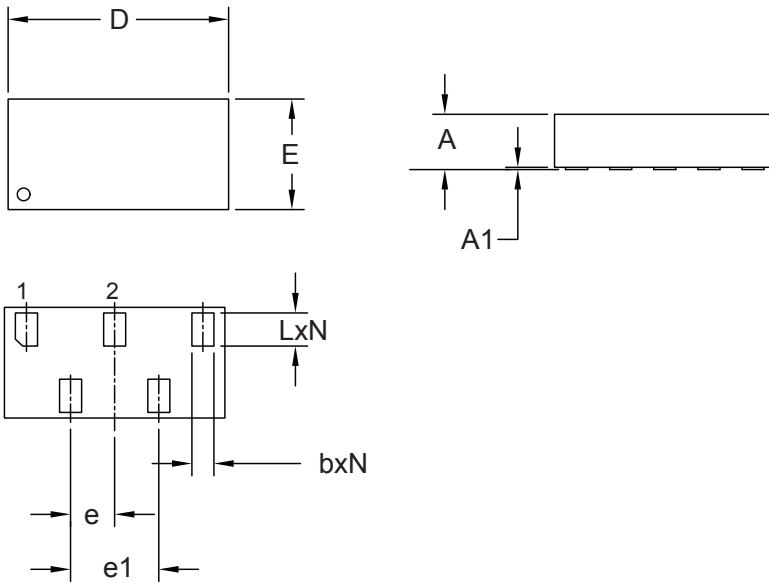
Insertion Loss S21



Eye Diagram USB3.1 at 10Gbps per channel



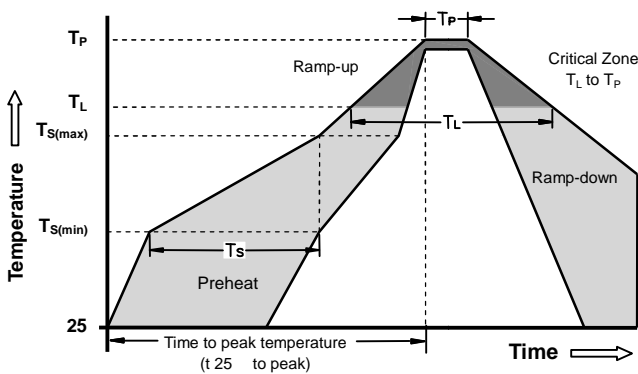
**Dimensions**



DIM	Millimeters		
	Min	Typ	Max
A	0.45	0.50	0.55
A1	0.000	0.02	0.05
e	0.40BSC		
b	0.15	0.20	0.25
D	1.95	2.00	2.05
E	0.95	1.00	1.05
e1	0.80BSC		
L	0.25	0.30	0.35
N	5		

Part Number	Packaging	Quantity	DFN-10L package	Molding compound flammability rating	Lead Finish
RL20105Q054LC	Tape and Reel	3000	2.0×1.0×0.50mm	UL 94V-0	Lead Free

**Soldering Parameters - Reflow Soldering (Surface Mount Devices)**



Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	150°C
	-Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 -180 Seconds
Average ramp up rate ( Liquids Temp $T_L$ to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 -150 Seconds
Peak Temperature ( $T_P$ )		260 +0/-5°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 ( $T_P$ )		8 minutes Max
Do not exceed		280°C