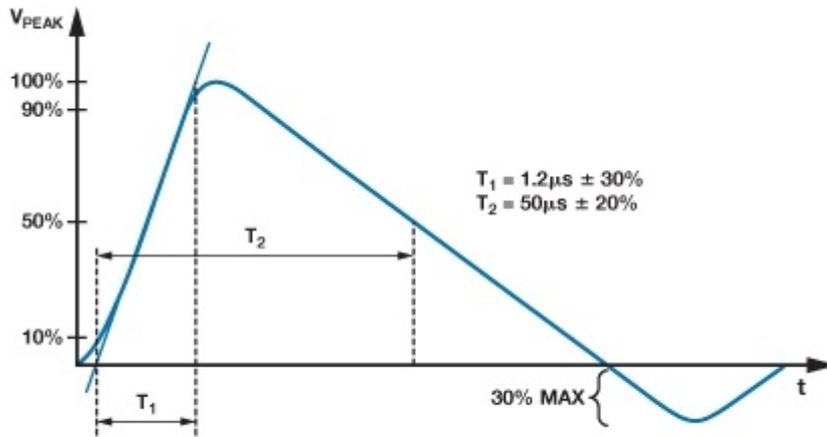


## 浪涌静电防护设计电路

※ 浪涌及防护器件

※ 防护设计电路实例

▶ 雷击浪涌过电压标准波形定义



IEC 61000-4-5电涌1.2/50 μs波形

保护元件

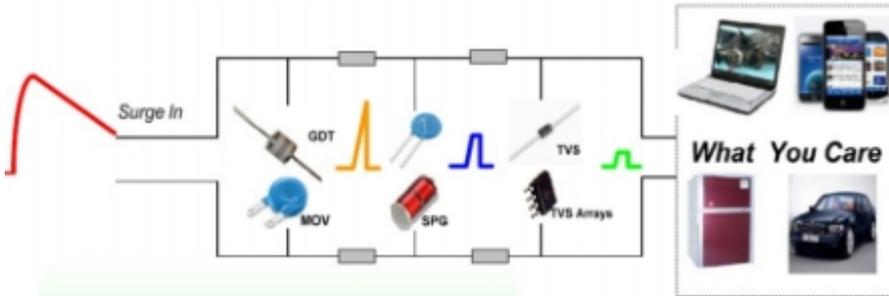
■ 陶瓷气体放电管 ■ 半导体放电管 ■ 玻璃气体放电管

■ 压敏电阻 ■ TVS 二极管

防护器件的参数对比

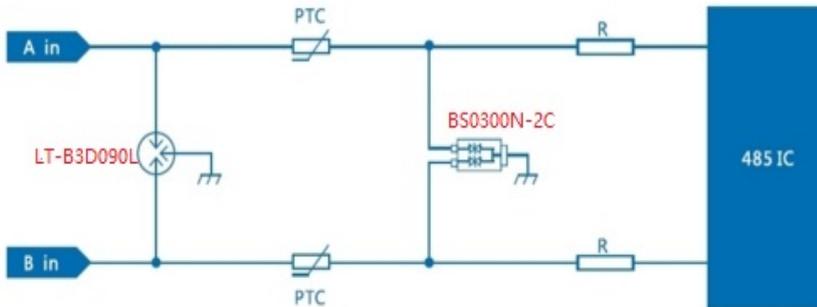
浪拓电子	限压型			开关型		
参数对比						
	瞬态抑制二极管 (TVS)	ESD 保护二极管 (ESD)	压敏电阻 (MOV)	陶瓷气体放电管 (GDT)	玻璃气体放电管 (SPG)	半导体放电管 (TSS)
响应时间	nS	nS	nS	μS	μS	nS
承受能力	几 A ~ 几百 A	几 A ~ 几十 A	70KA	100KA	500A ~ 3KA	30A ~ 200A

► 多级防护电路

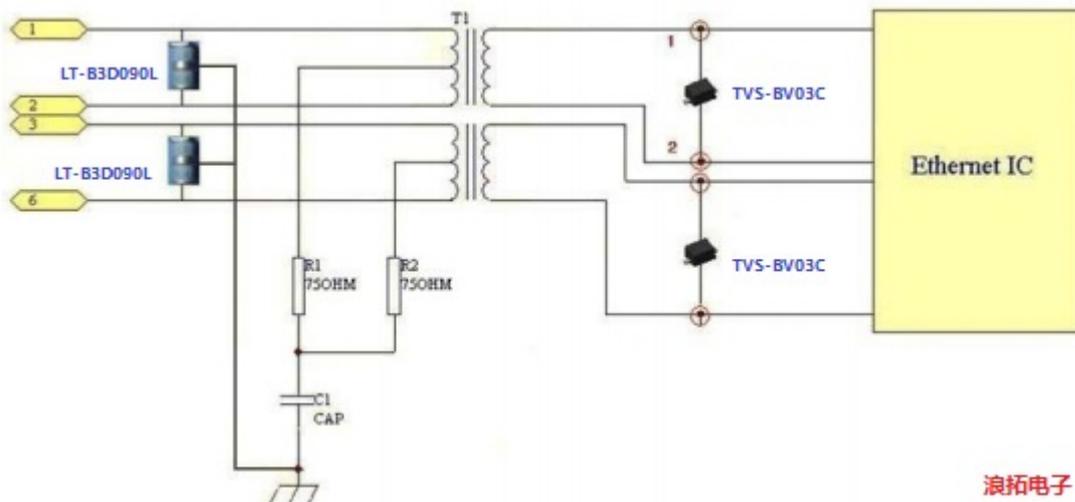


► 防护电路设计实例

● RS485 防护方案

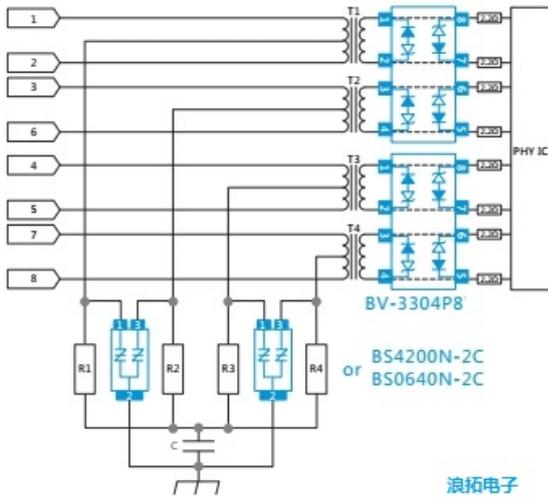


● 百兆以太网端口 (传统两级防护)

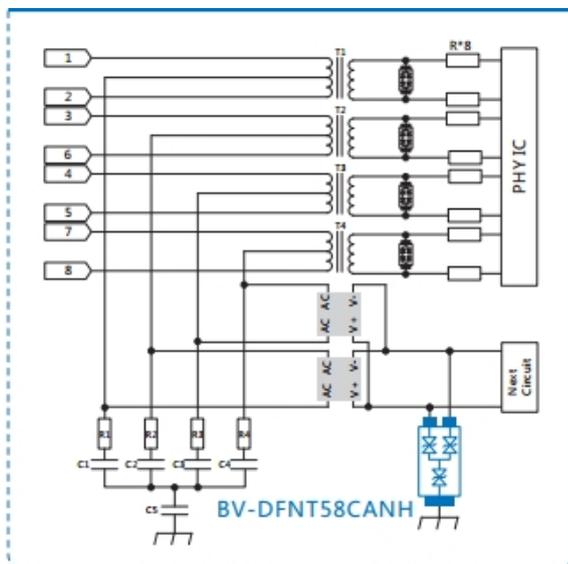
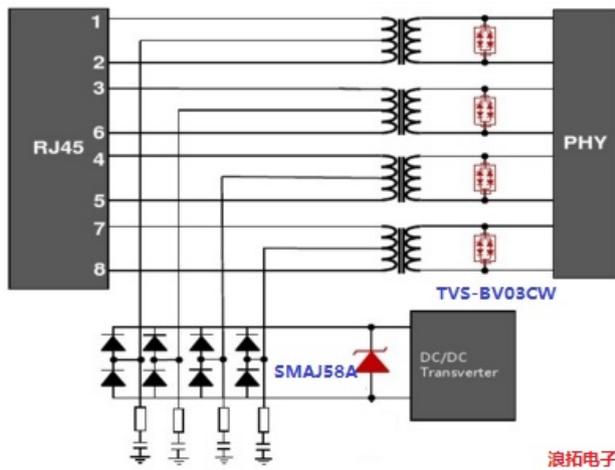


浪拓电子

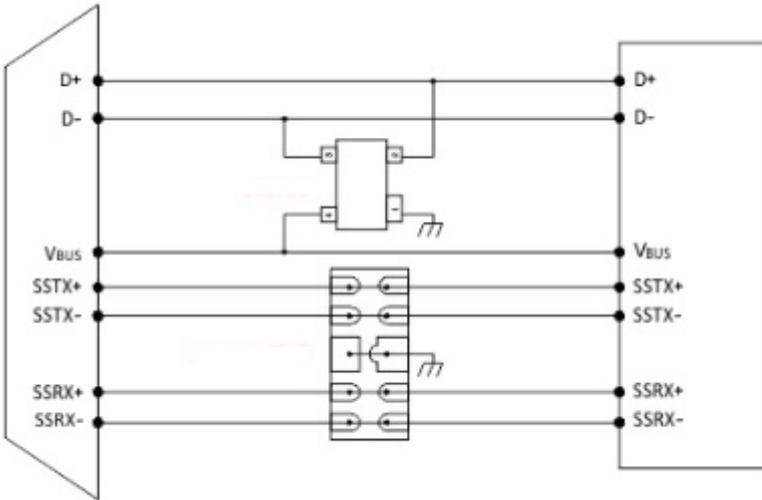
●千兆以太网端口



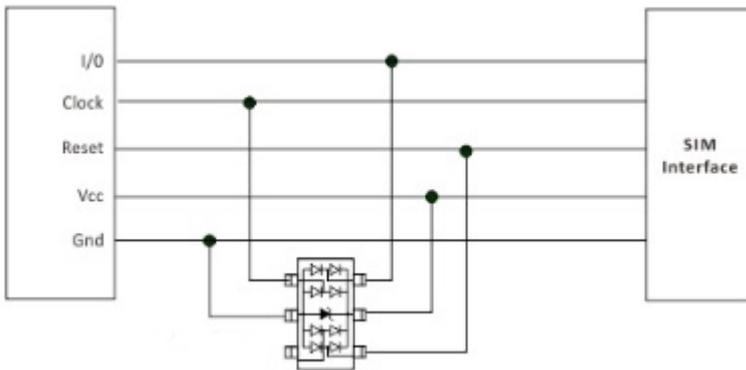
●RJ45 POE 端口防护



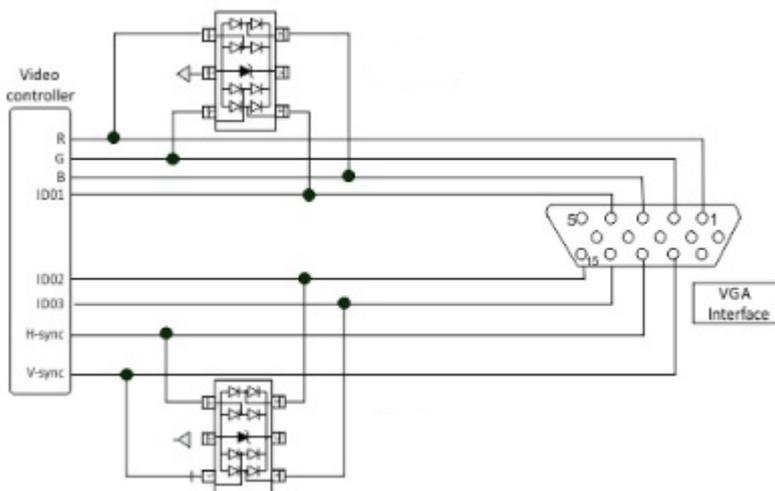
●USB3.0 端口防护



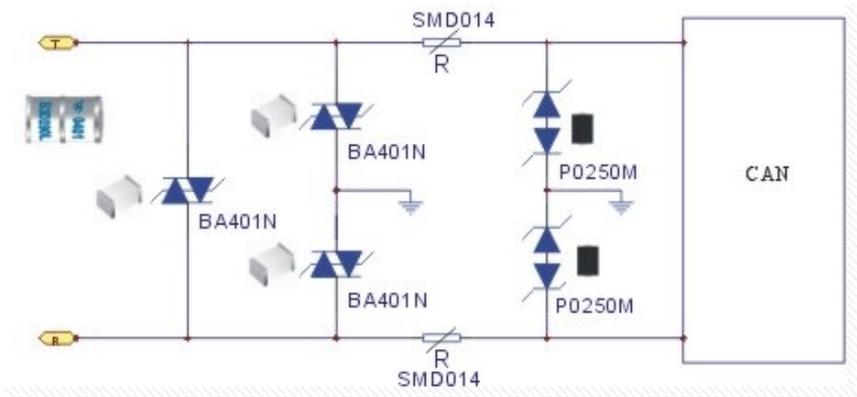
●SIM 防护



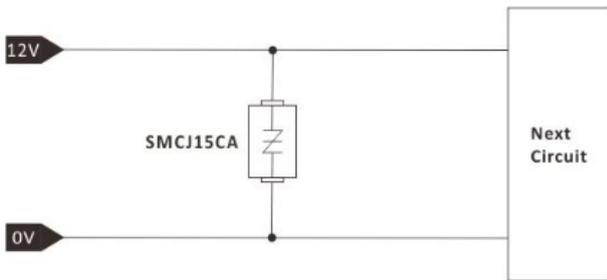
●VGA 防护



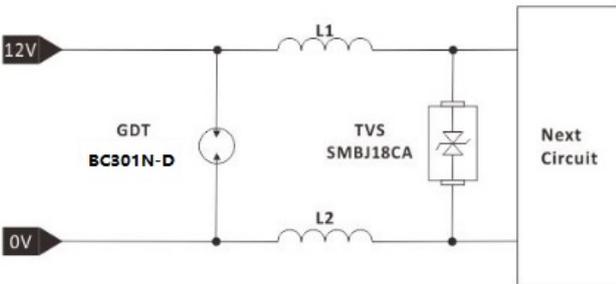
●CAN 总线防护-(4KV)



●DC12V 防护-(2KV)



●DC12V 防护-(4KV)



●AC24V 防护-(4KV)

