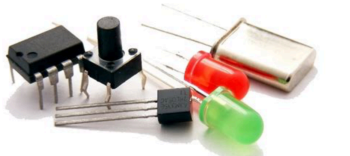


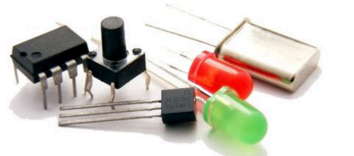
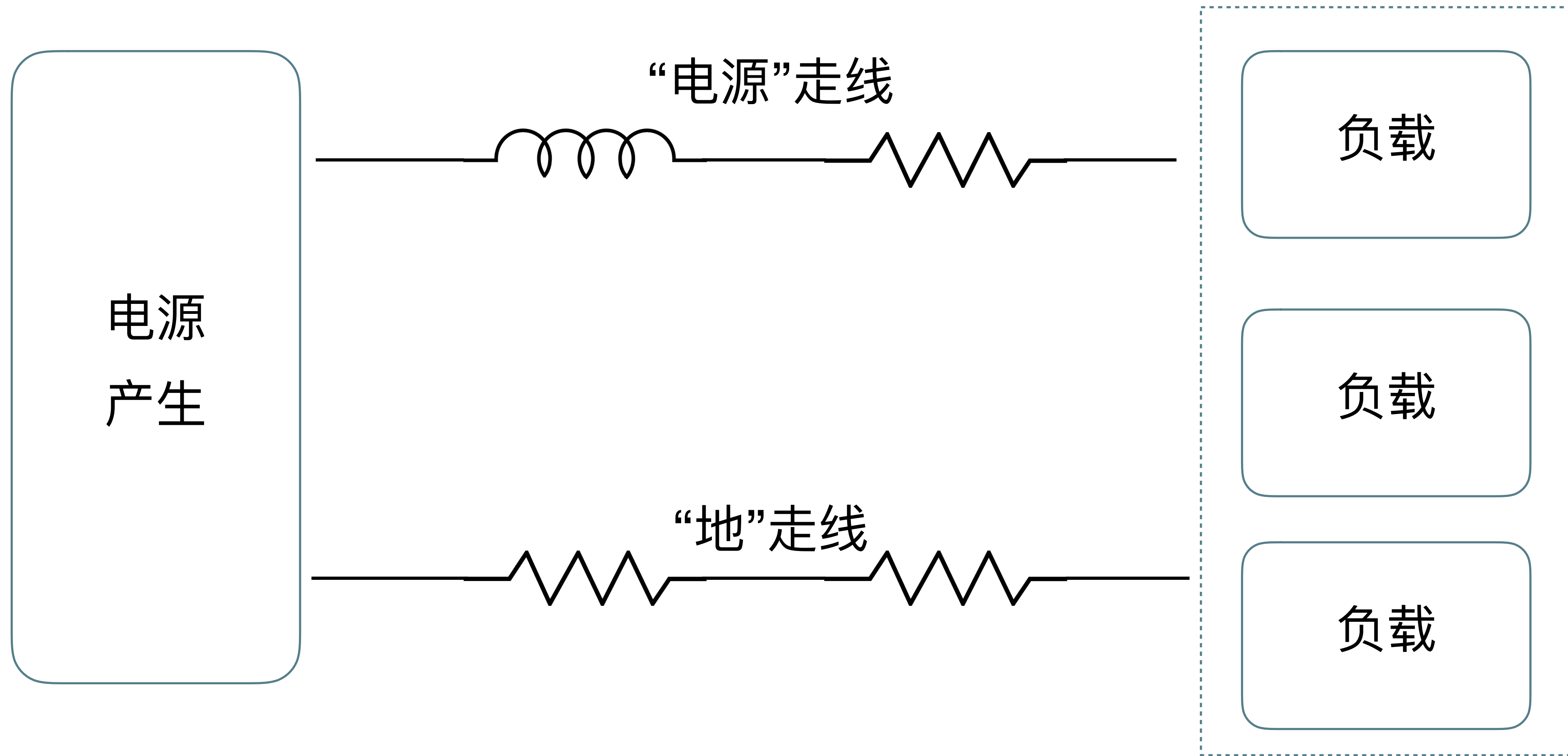
电源、地、去耦电容的使用



电 源

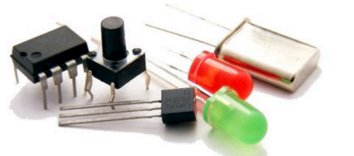
Power Supply

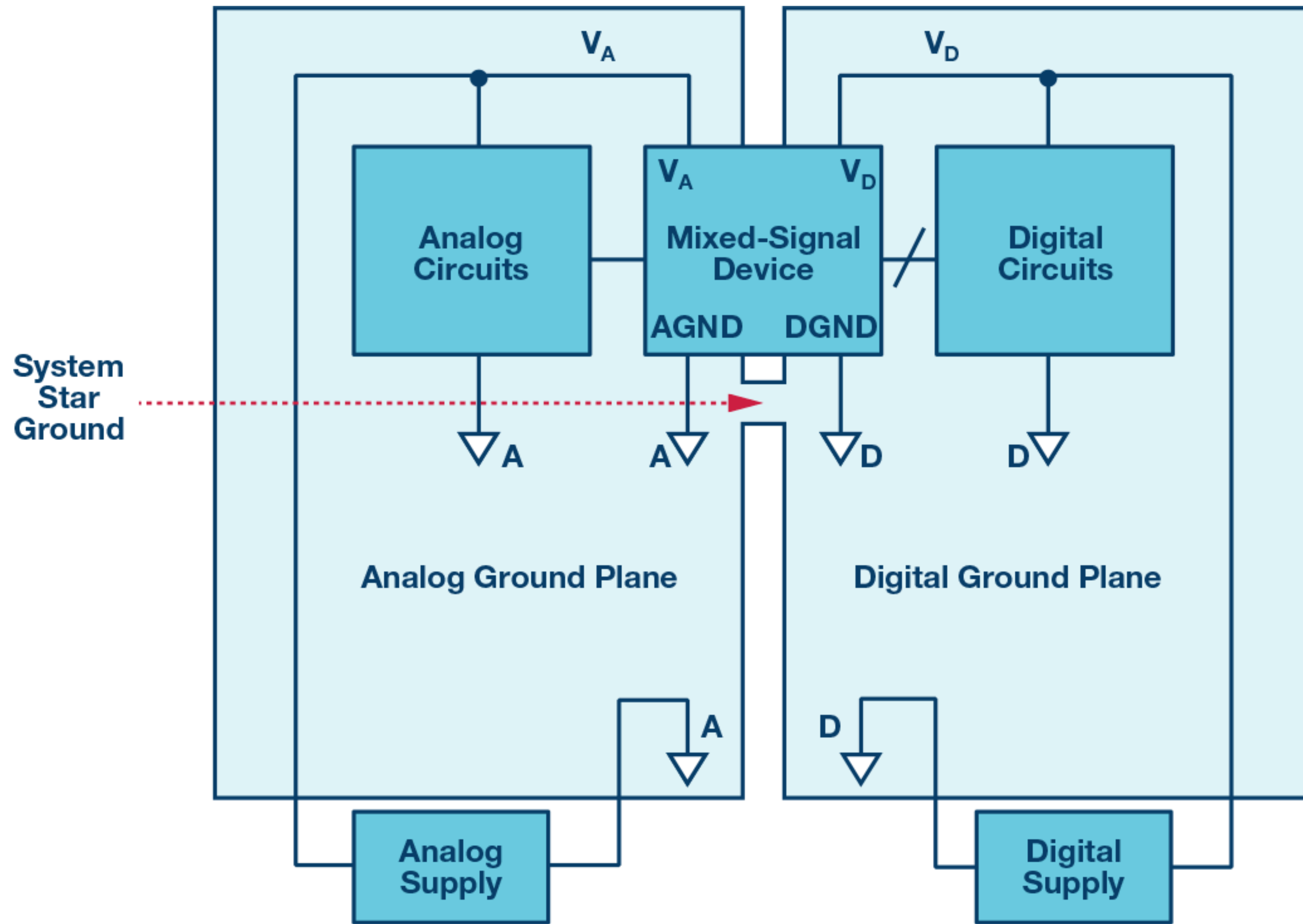




接地要点

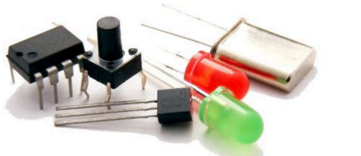
- 地平线、大面积铺地
- 模拟地、数字地分割
- 单点连接 - 地点、方式

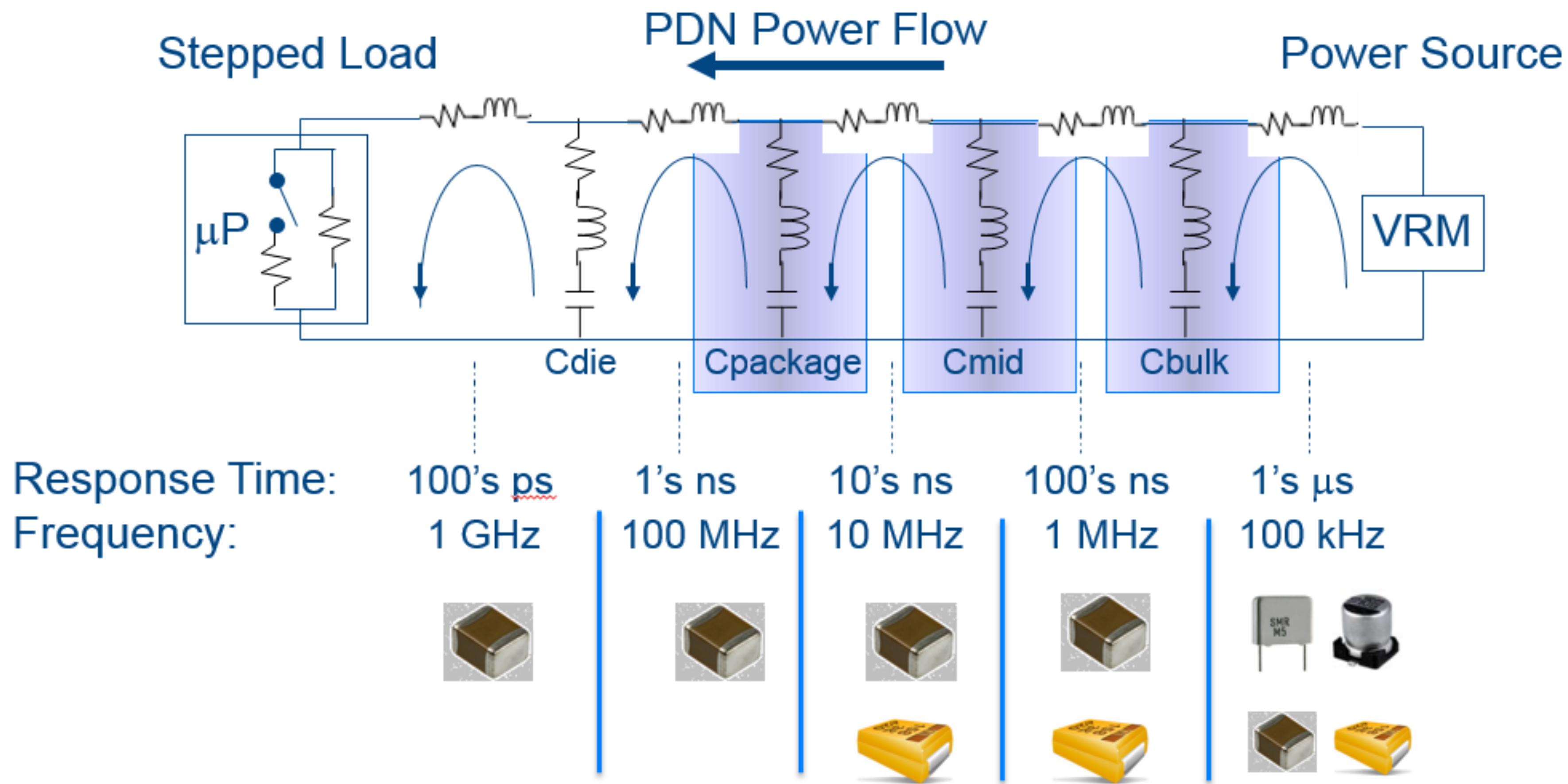




电源走线要点

- 损耗少 - 线、过孔、器件
- 干扰小 - 影响、被影响

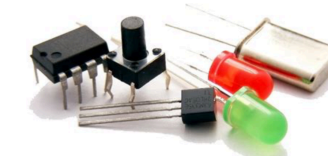
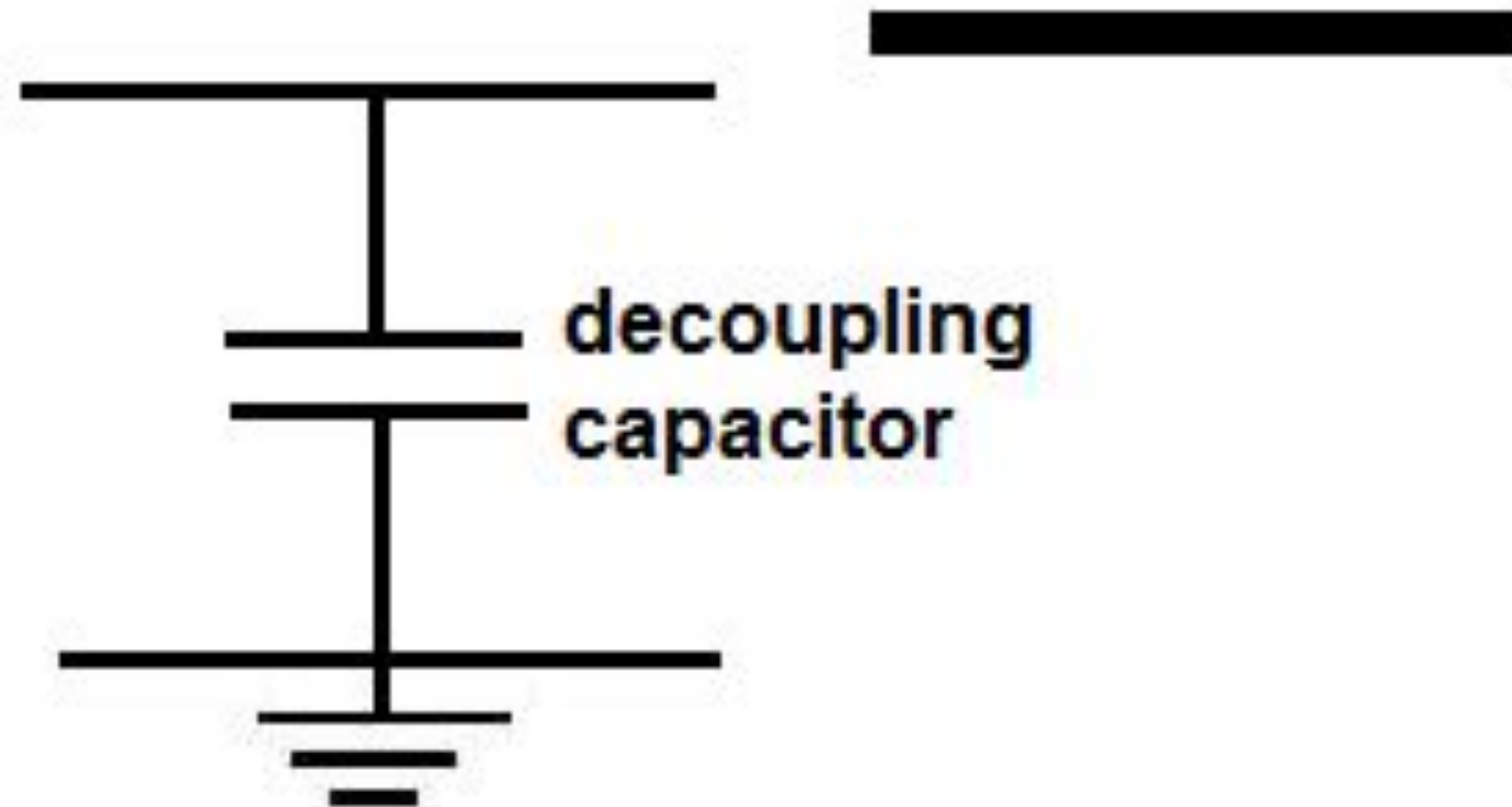




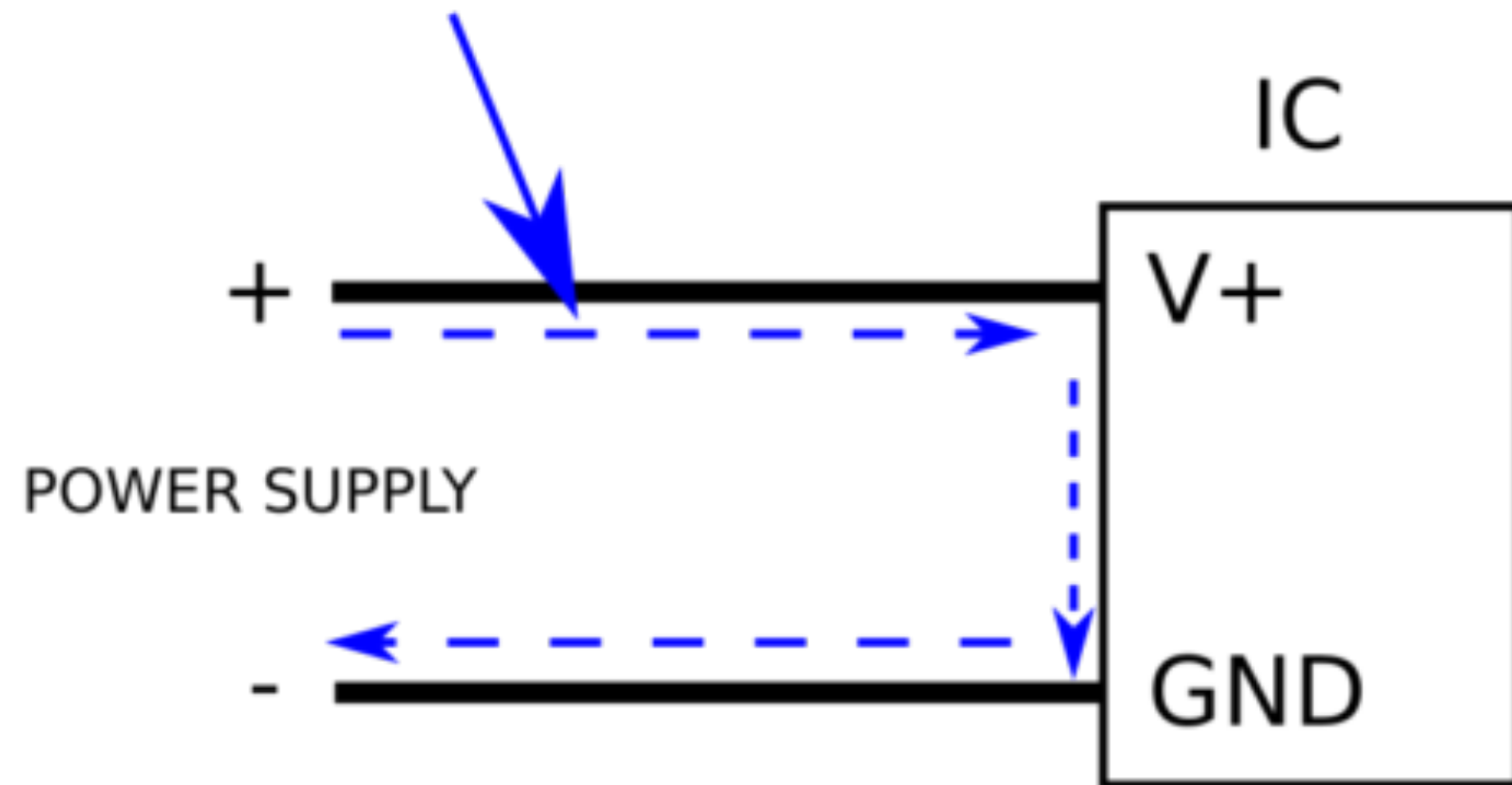
噪声:

- VRM上产生
- 走线的直流电阻和寄生电感
- PCB上内核/IO逻辑状态跳变产生的噪声
- 电源和地平面谐振噪声
- 临近电源网络耦合
- 其它元器件耦合



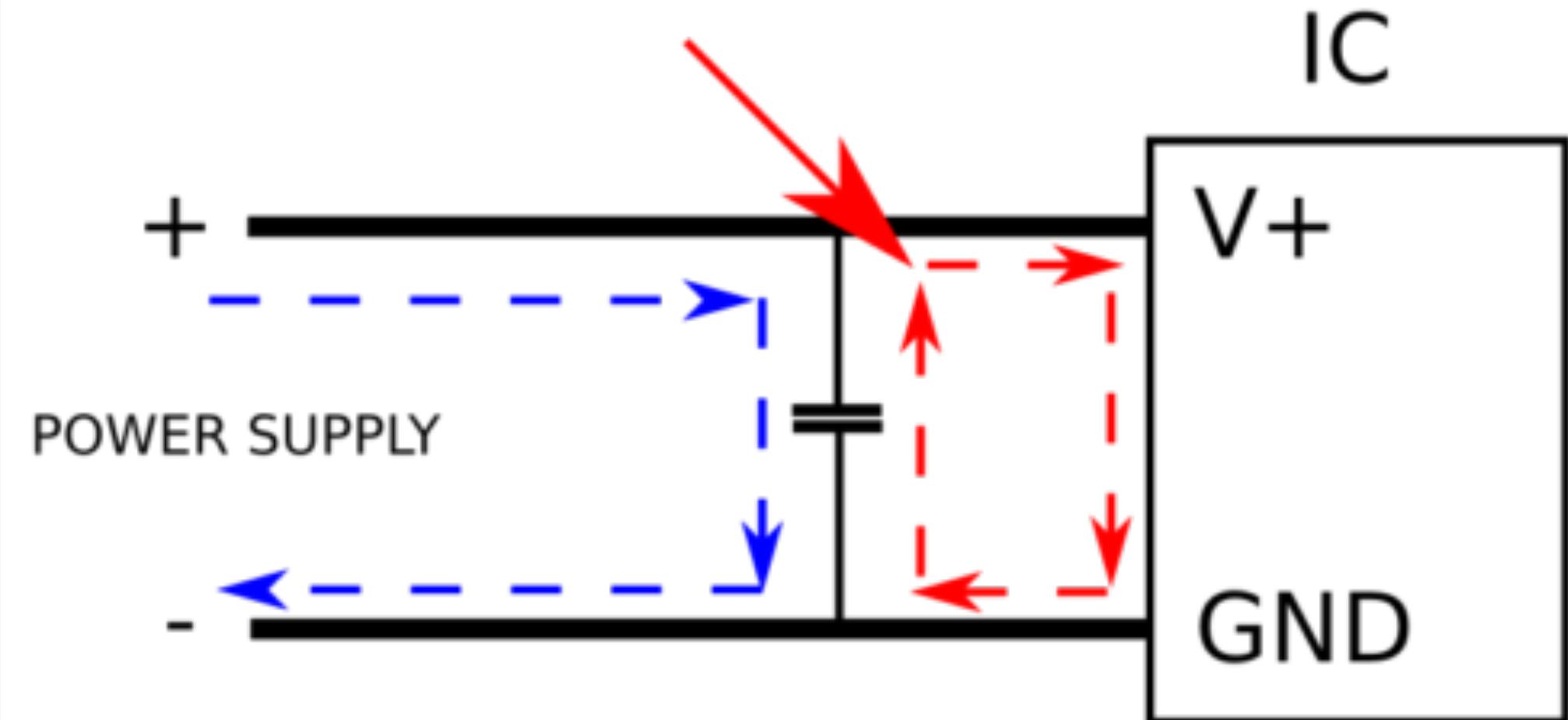


SUPPLY CURRENT INCLUDING TRANSIENTS FLOW IN LOOP

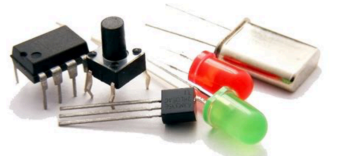


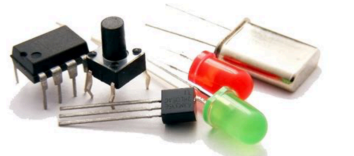
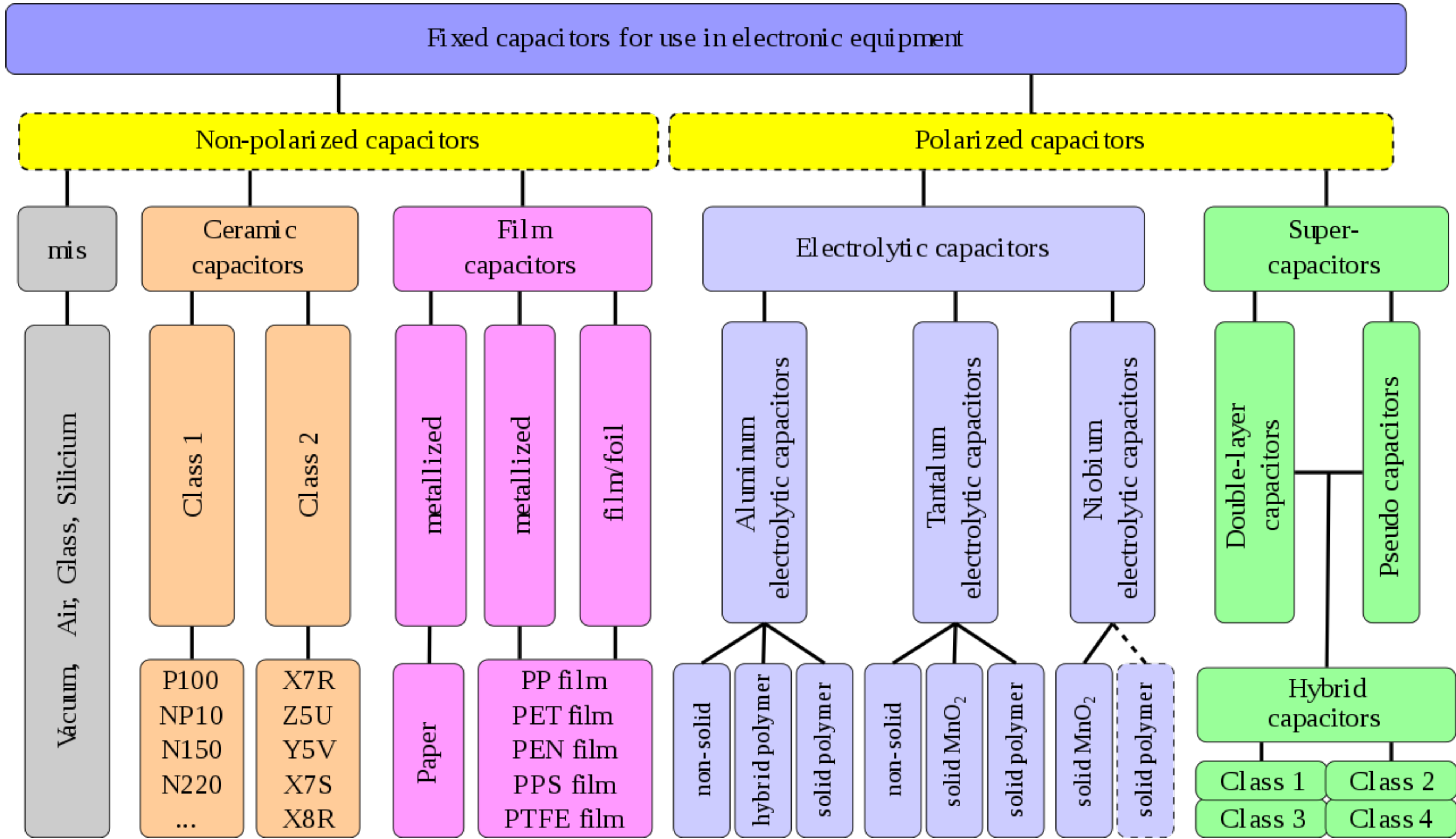
NO BYPASS CAP

BYPASS CAP "DECOUPLES" CURRENT LOOP FOR TRANSIENTS INTO SMALLER LOOP PREVENTING NOISE ON THE POWER SUPPLY TRACES

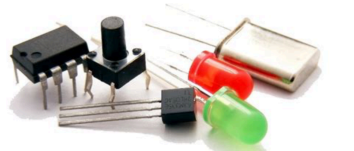


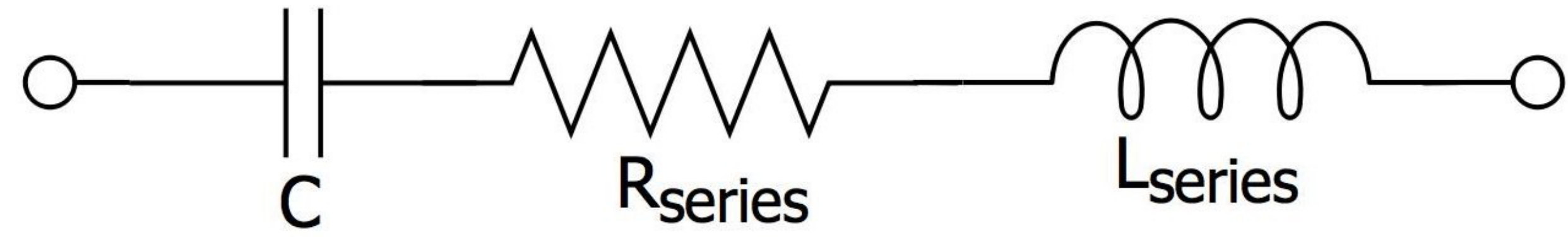
WITH BYPASS CAP



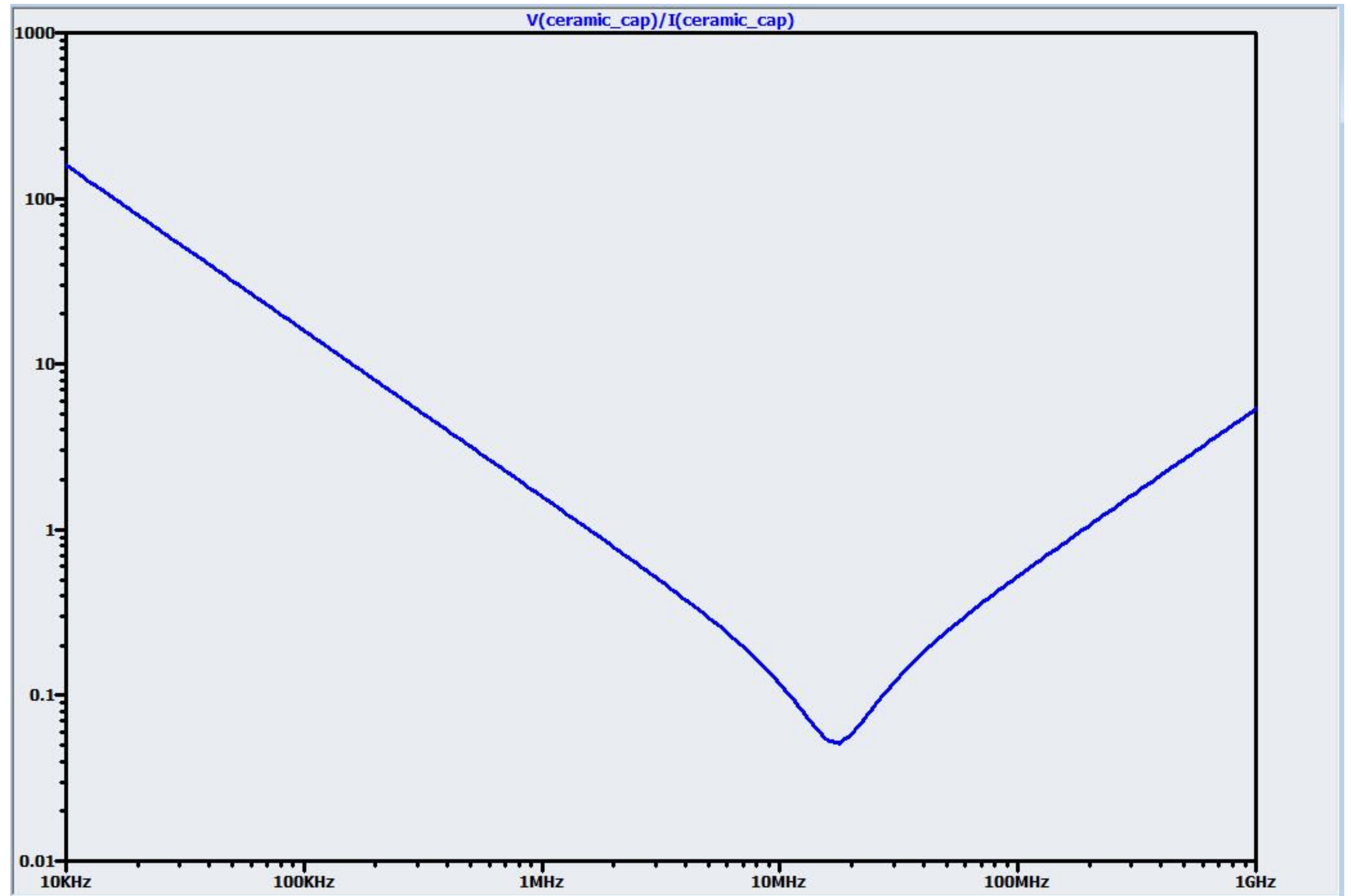


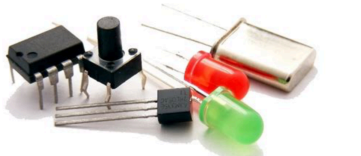
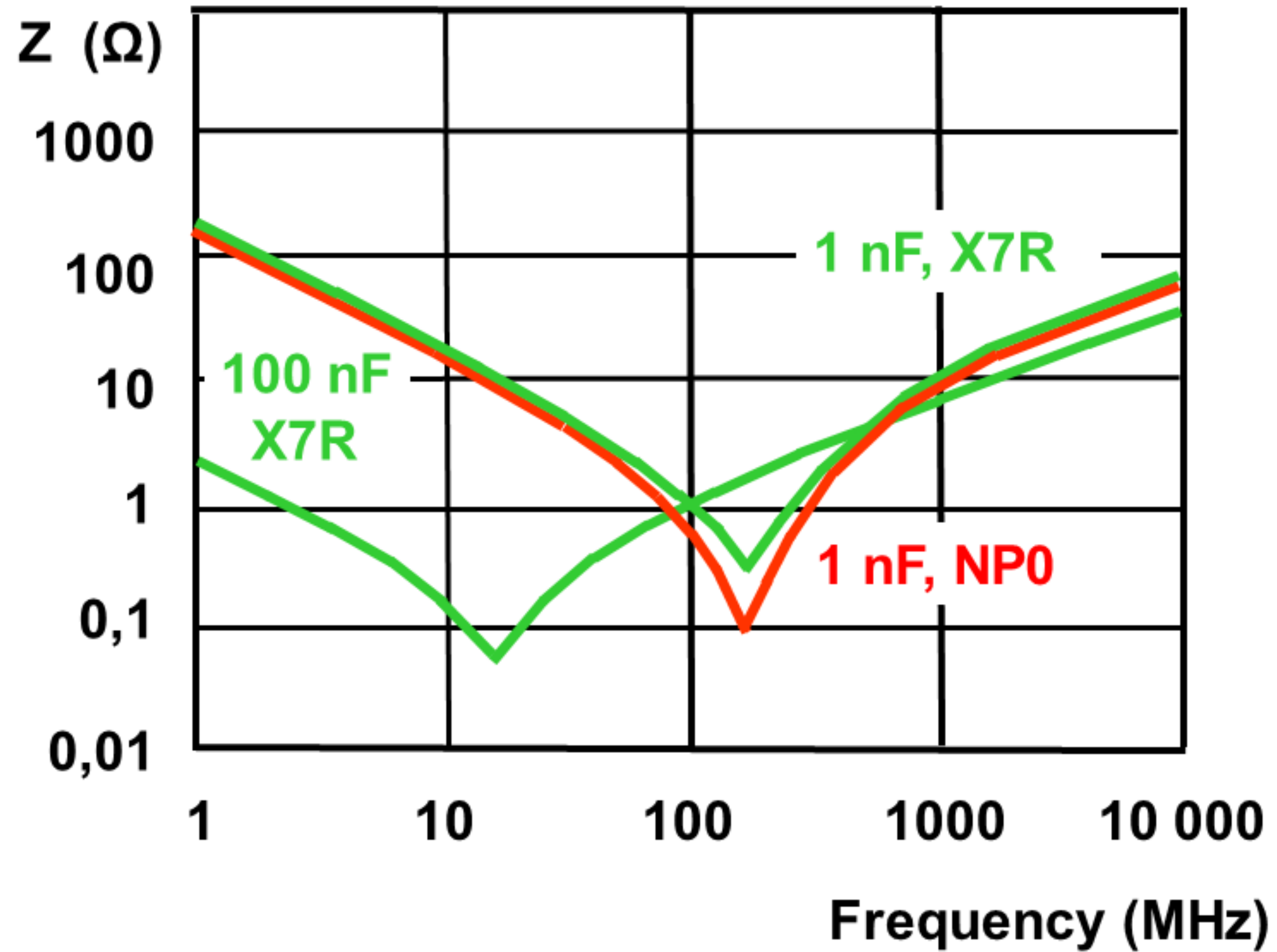
TECHNOLOGY	ADVANTAGES	DISADVANTAGES	APPLICATIONS
Aluminum Electrolytic, Switching Type. Avoid general purpose types	<ul style="list-style-type: none"> • High CV product/cost • Large energy storage • Best for 100V - 400V 	<ul style="list-style-type: none"> • Temperature related wearout • High ESR/size • High ESR @ low temp 	<ul style="list-style-type: none"> • Consumer products • Large bulk storage
Solid Tantalum	<ul style="list-style-type: none"> • High CV product/size • Stable @ cold temp • No wearout 	<ul style="list-style-type: none"> • Fire hazard with reverse voltage • Expensive • Only rated up to 50V 	<ul style="list-style-type: none"> • Popular in military • Concern for tantalum raw material supply
Aluminum-Polymer, Special-Polymer, Poscap, Os-Con	<ul style="list-style-type: none"> • Low ESR • Z stable over temp • Relatively small case 	<ul style="list-style-type: none"> • Rapid degradation above 105°C • Relatively high cost 	<ul style="list-style-type: none"> • Newest technology • CPU core regulators
Ceramic	<ul style="list-style-type: none"> • Lowest ESR, ESL • High ripple current • X7R good over wide temp 	<ul style="list-style-type: none"> • CV product limited • Microphonics • C decreases with increasing voltage 	<ul style="list-style-type: none"> • Excellent for HF decoupling • Good to 1GHz
Film (Polyester, Teflon, polypropylene, polystyrene, etc.)	<ul style="list-style-type: none"> • Hi Q in large sizes • No wearout • High voltage 	<ul style="list-style-type: none"> • CV product limited • Not popular in SMT • High cost 	<ul style="list-style-type: none"> • High voltage, current • AC • Audio





电容简化模型





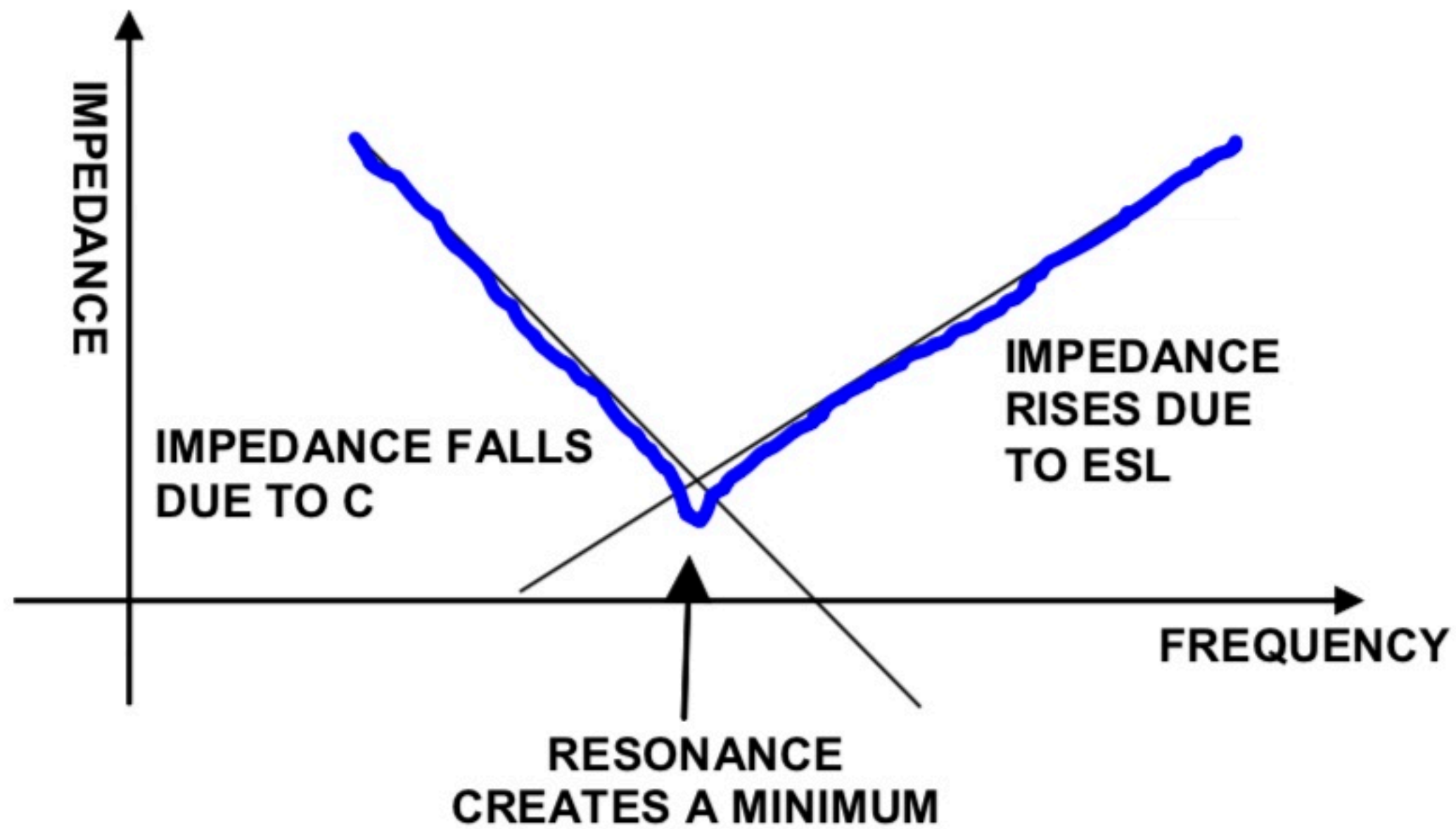


FIGURE 8. IMPEDANCE OF AN ACTUAL CAPACITOR (NON-IDEAL)

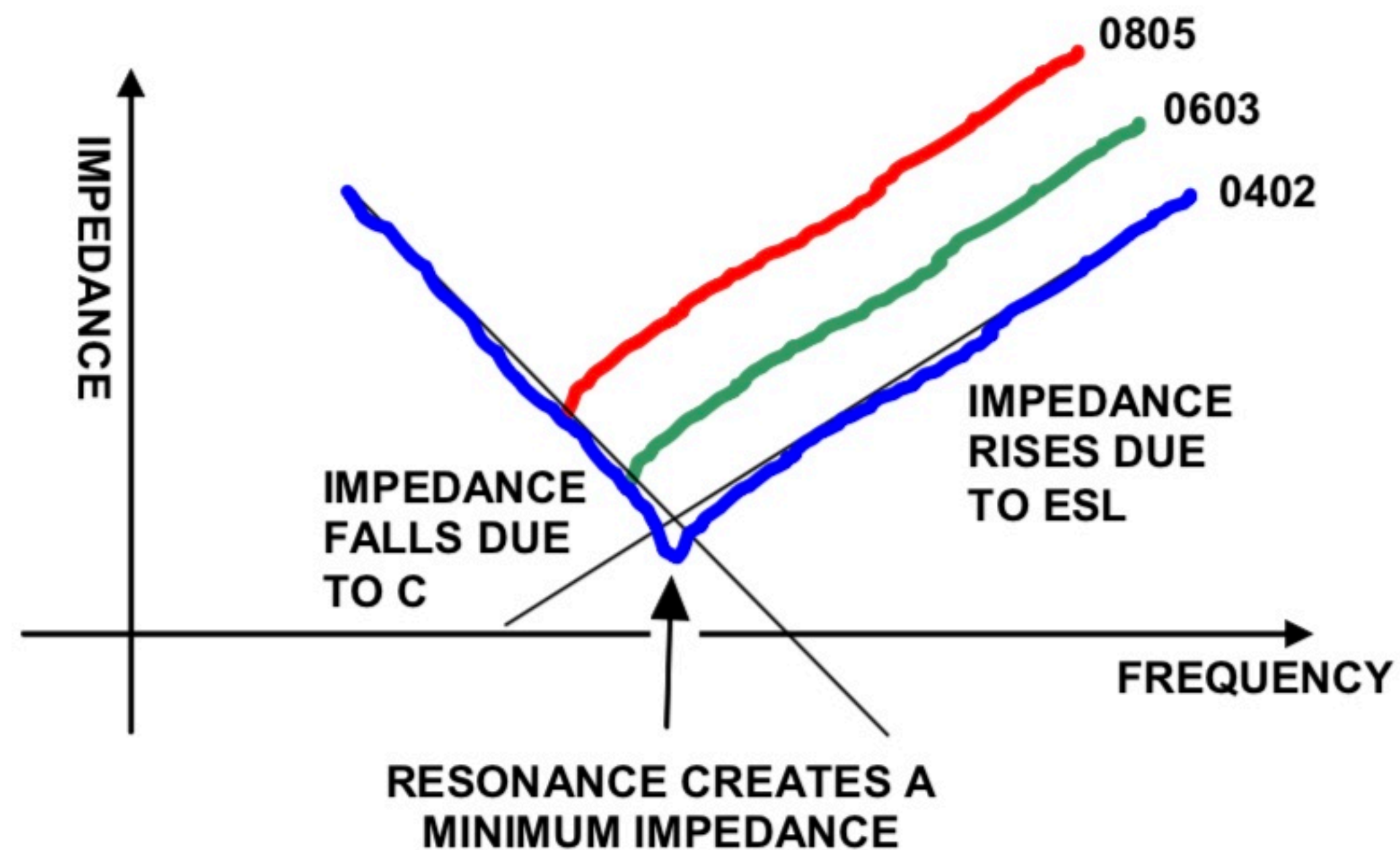


FIGURE 9. IMPEDANCE OF AN ACTUAL CAPACITOR (NON-IDEAL) IN DIFFERENT SURFACE-MOUNT PACKAGES

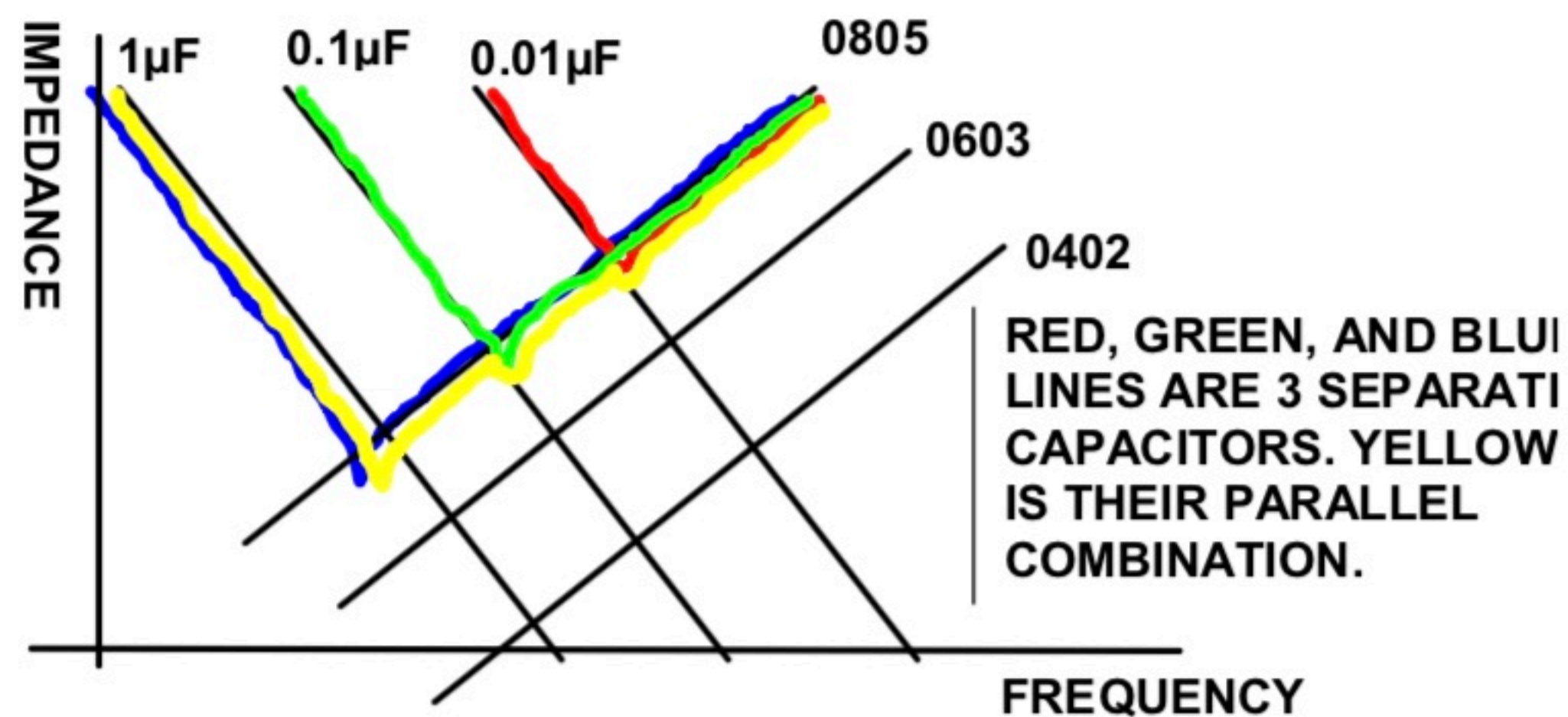


FIGURE 10. IMPEDANCE OF THREE CAPACITORS, THE SAME SURFACE-MOUNT PACKAGES

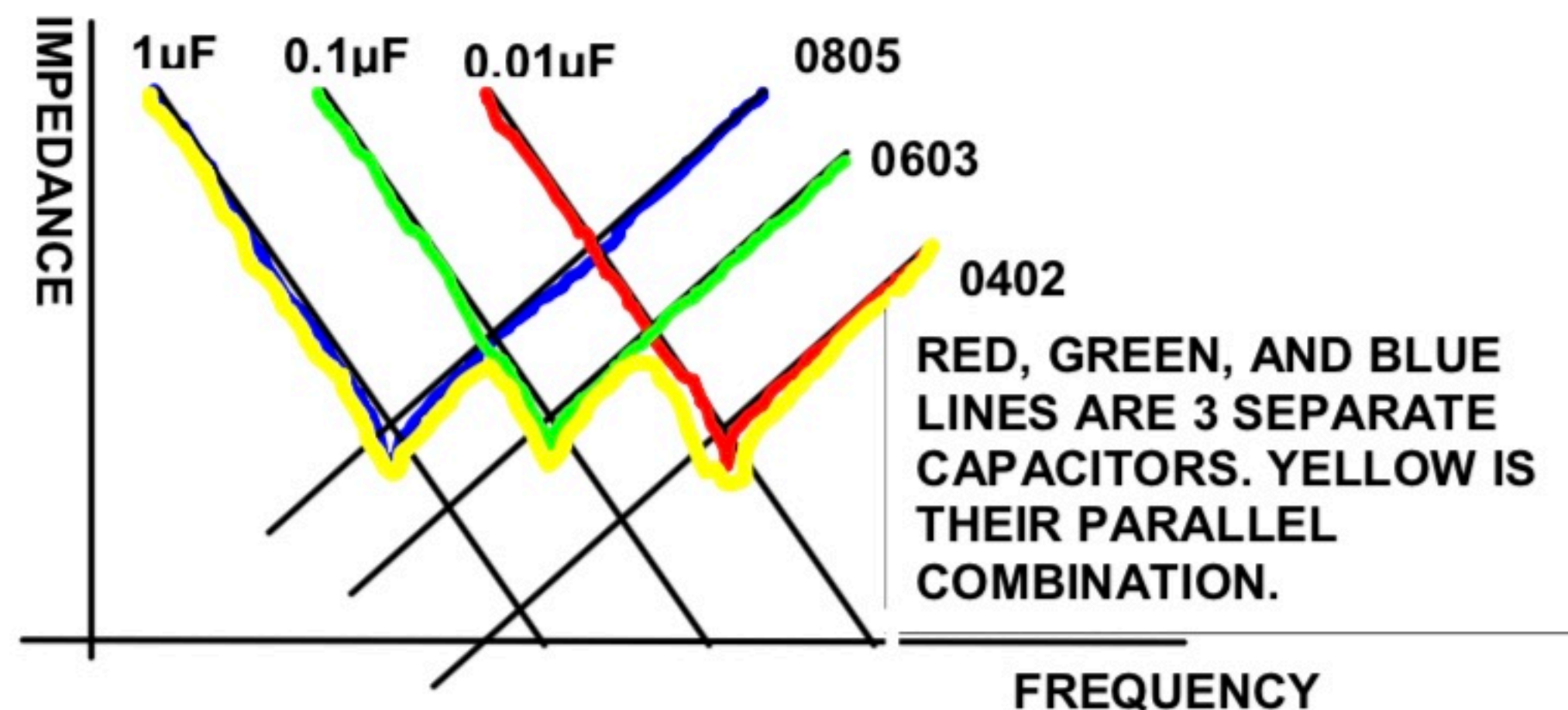
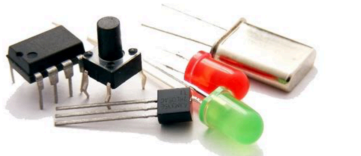
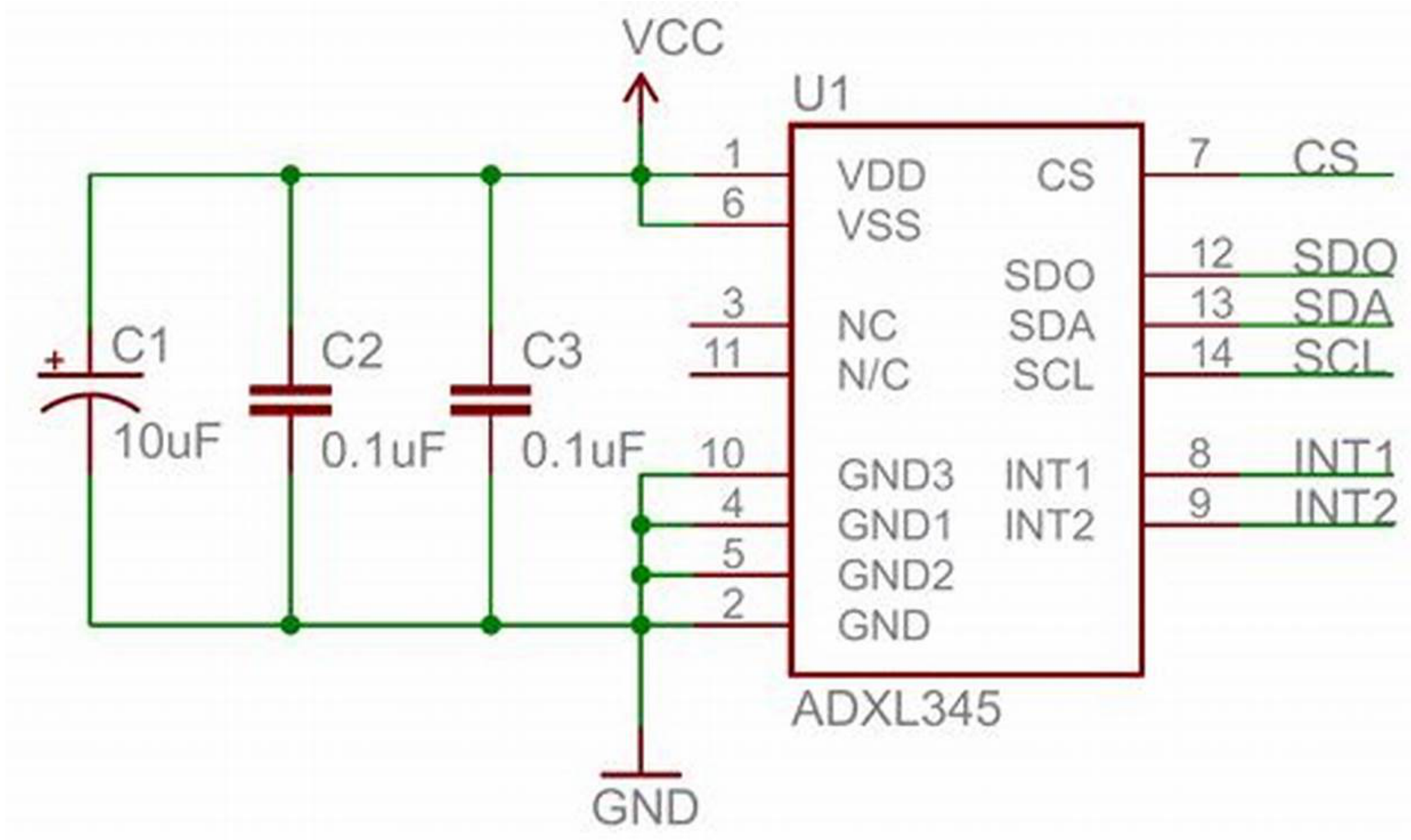
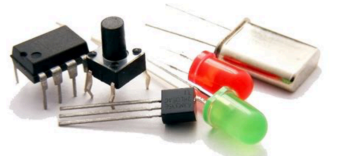
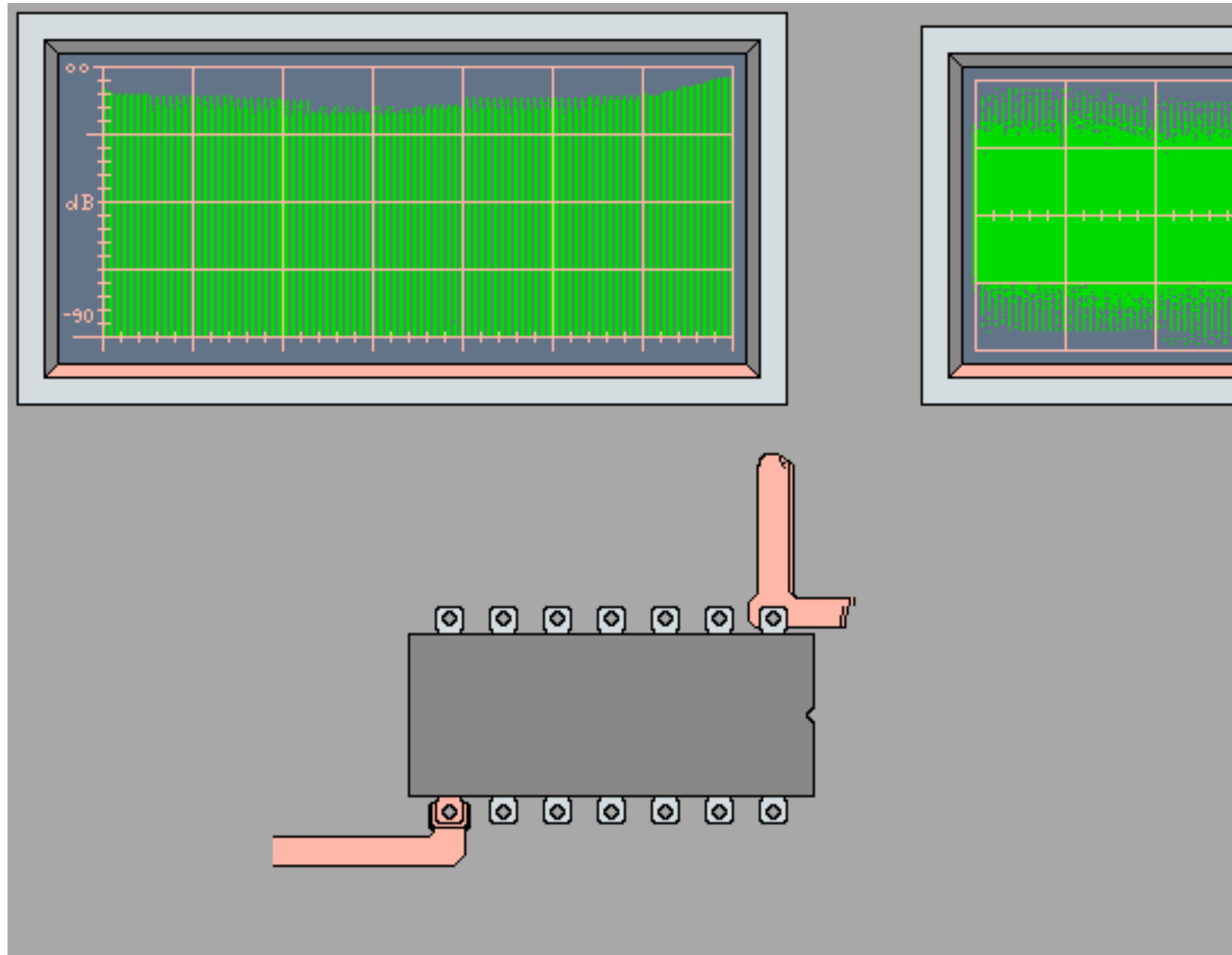
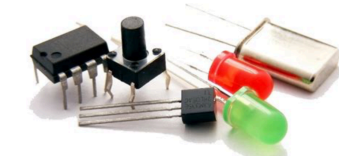
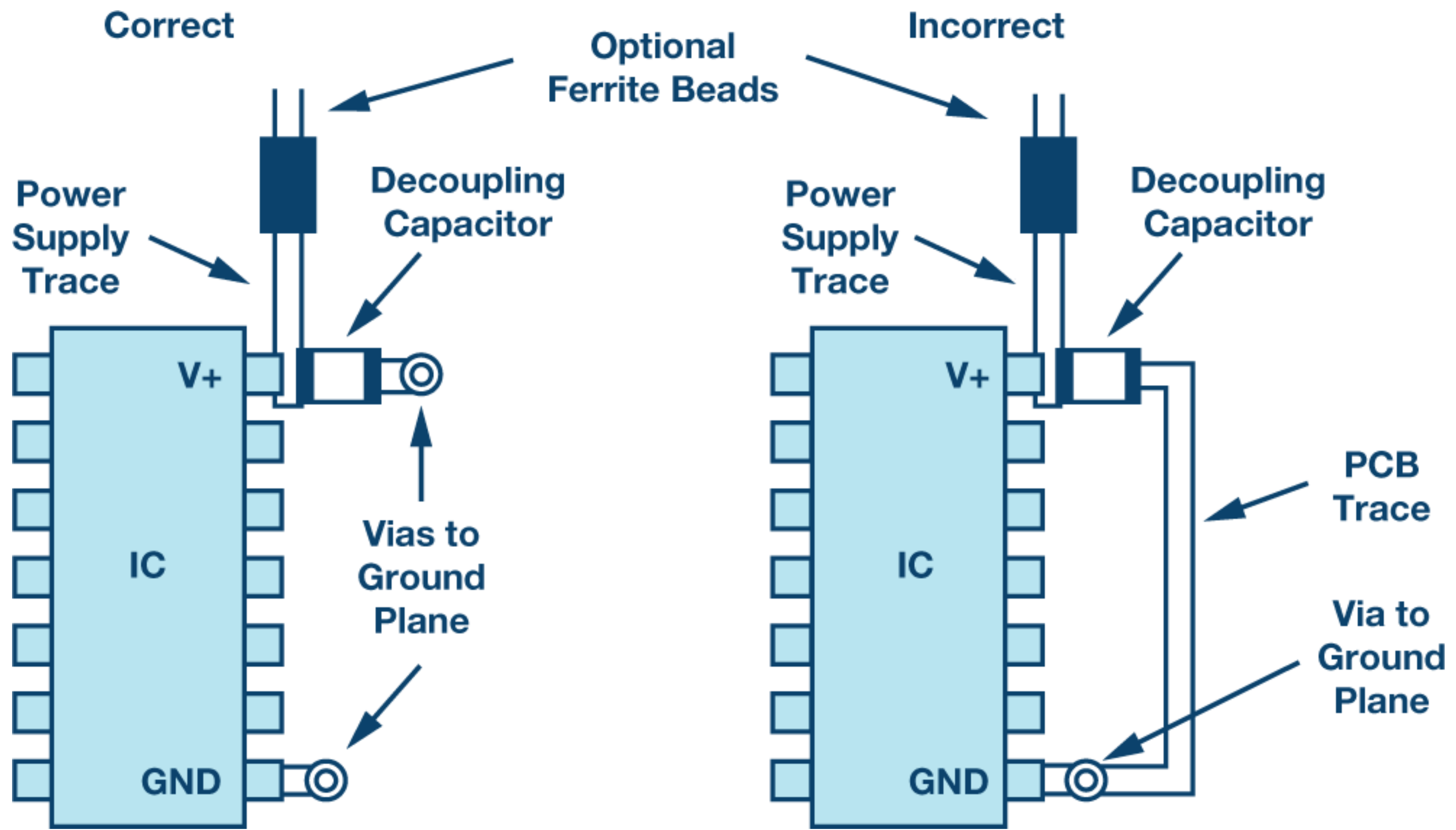


FIGURE 11. IMPEDANCE OF THREE CAPACITORS, SCALED SURFACE-MOUNT PACKAGES







关于贸泽电子 - www.mouser.cn

The screenshot shows the Mouser Electronics website interface. At the top, a blue banner features the slogan '在MOUSER 采购很EASY!' and three key benefits: '数百万产品 一站式购齐', '接受微信支付 付款更简单', and '上海客服 本土支持'. Below this is a navigation bar with the Mouser logo, '联系Mouser (上海) 400-821-6111 | 反馈', and options for '产品', '制造商', '更多', '订单历史', '登录', '注册', and a shopping cart icon. A search bar is located below the navigation bar, with filters for '全部', '物料编号/关键字', '有库存', and 'RoHS'. The main content area includes a '产品类别' sidebar with categories like 'LED照明', '工业自动化', '工具与供应', '工程工具', '无源元件', '内存和数据存储器', '电线与电缆', '电路保护', and '电源'. The central banner promotes '额满免运费*' (Free shipping when order value reaches 175 yuan) and '关注贸泽微信 掌握最新资讯' (Follow Mouser WeChat for the latest news). Below the banner is a '最新产品' (New Products) section featuring logos for Texas Instruments, Infineon, Intel, and Molex.

- 与非网/摩尔吧多年合作伙伴
- 全球领先的电子元器件授权分销商
- 700家原厂/500万现货库存
- 小批量采购，170元免邮费
- 1-2周交货

