



MKP86

中星 MKP86 series

MKP86 型干式直流滤波电容器（定制品）

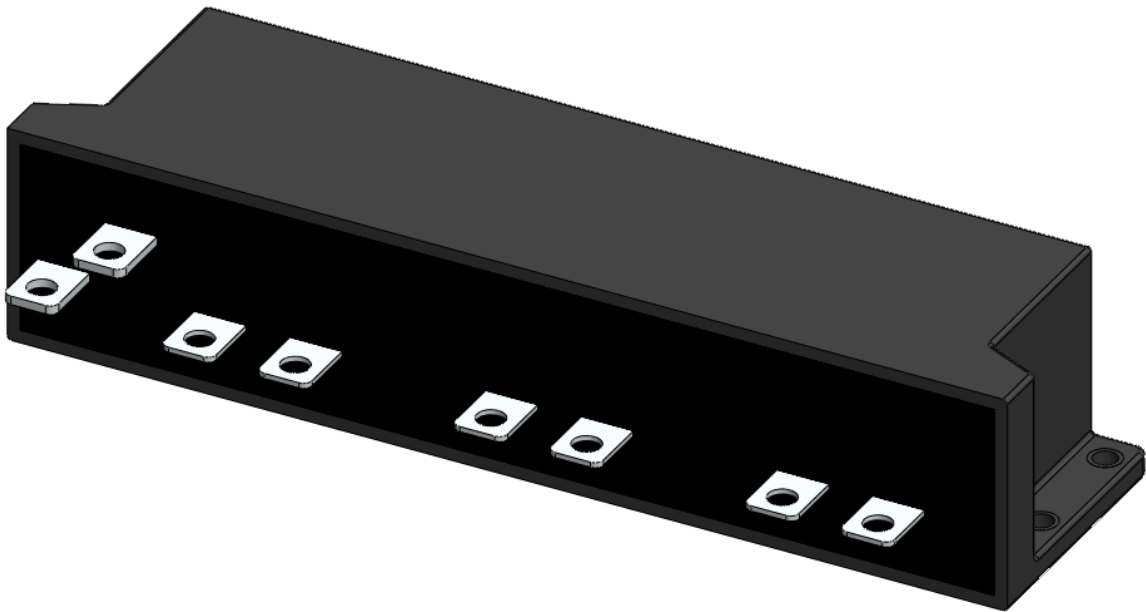
MKP86 Type DC-Link Capacitor (Customized Products)

◆ 特点及用途 Application and Feature

自感小，等效串联电阻小，能承受较大的纹波电流，可用于 DC-Link 直流滤波电路当中或混合动力汽车和电动汽车当中。

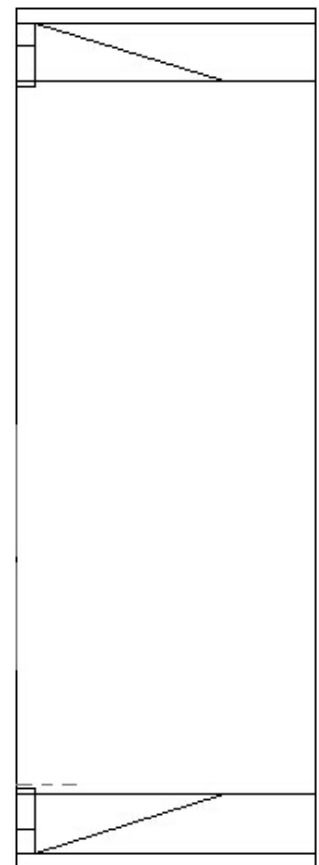
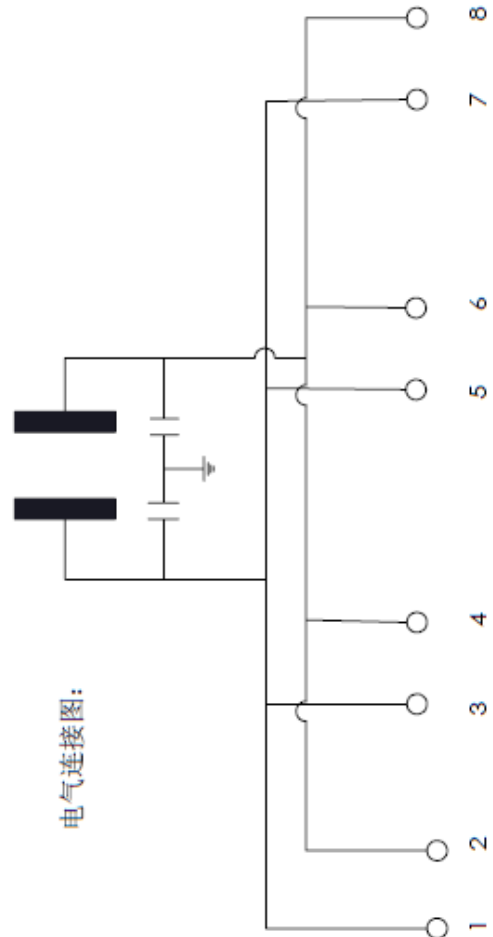
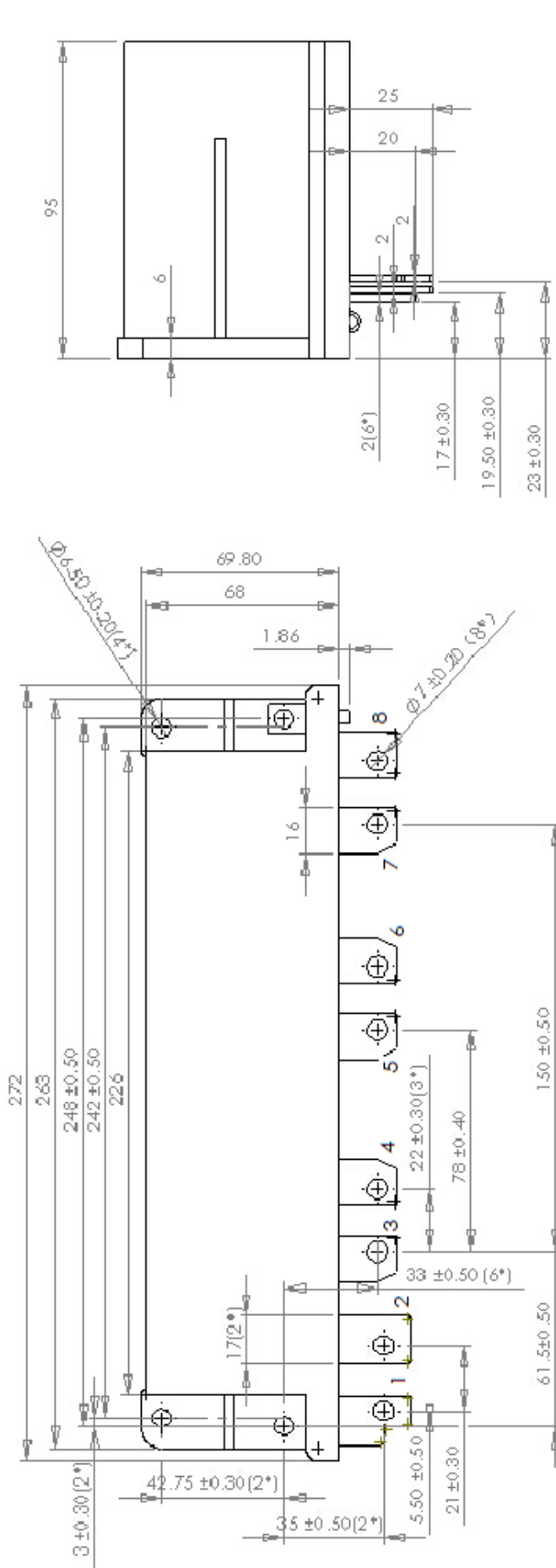
Low inductance, Low ESR, Support high ripple current, especially used in DC-Link filter circuit or Hybrid and electric vehicles.

◆ 外形图 Outline Drawing



◆ 技术要求 Specifications:

参照标准 Reference Standard	IEC 61071、AEC-Q200D-2010	
额定电压 Rated Voltage	$U_{NDC(85^{\circ}C)}$: 750Vdc	
电容量 Capacitance Range	850 μ F (100Hz)	
电容量偏差 Capacitance tolerance	$\pm 10\%$ (K)	
1.主要材质及机械参数		
介质材质 Medium Material	聚丙烯薄膜 Polypropylene Film	
灌封材料 Potting Material	环氧树脂 Epoxy Resin	
外壳材质 Case Material	PPS	
端子材质 Terminal Material	镀锡 t2 紫铜 Tin Plated T2 Copper	
本体尺寸(L×W×H) Body size(L×W×H)	272×69.8×95mm	
安装方式 Installation	安装耳朵	
2.电气参数		
耐电压 Voltage Proof	极间耐压 Between Terminals	$U=1.5U_{NDC}$ (20 °C, 10s)
	极壳耐压 Between Terminals To Case	2500VAC (20 °C, 10s, 50Hz)
过电压能力 Overvoltage Ability	1.1 U_{NDC} (85 °C, 30%负载时间)	
	1.15 U_{NDC} (85 °C, 30 分钟/天)	
	1.2 U_{NDC} (85 °C, 5 分钟/天)	
	1.3 U_{NDC} (85 °C, 1 分钟/天)	
允许最大纹波电流 Maximum Ripple Current	150A	
短时允许最大直流电流有效值 (小于 30s)	200A (环境温度 $\leq 85^{\circ}C$)	
最大峰值电流 Maximum Peak Current	6950A ($t \leq 10\mu s$)	
最大脉冲电流 Maximum Pulse Current	20000A (每次 $T \leq 30ms$, 不超过 1000 次)	
等效串联电阻 ESR Equivalent Series Resistance	$\leq 0.3m\Omega$ (10KHz)	
自感 Ls Self-inductance	$\leq 25nH$	
热阻 (Rth) Thermal Resistance	$\leq 3.0 K/W$ (θ_{hs} to θ_{case})	
电气距离 (端子之间) Electrical Distance (Between Terminals)	8.0mm	
爬电距离 (端子之间) Creep Distance (Between Terminals)	10.0mm	
绝缘电阻 Insulation Resistance	$IR \times C \geq 10000s$ (20 °C, 500Vdc)	
损耗角正切 Dissipation Factor	100Hz: $\tan \delta \leq 0.0010$	
3.环境参数		
工作温度范围 (热点温度) Operation Temperature Range (hotspot)	-40 °C~105 °C (85 °C~105 °C :decreasing factor 1.5% per °C for U_{NDC})	
存储温度范围 Storage Temperature Range	-40 °C~105 °C	



◆ 技术要求 Specifications:

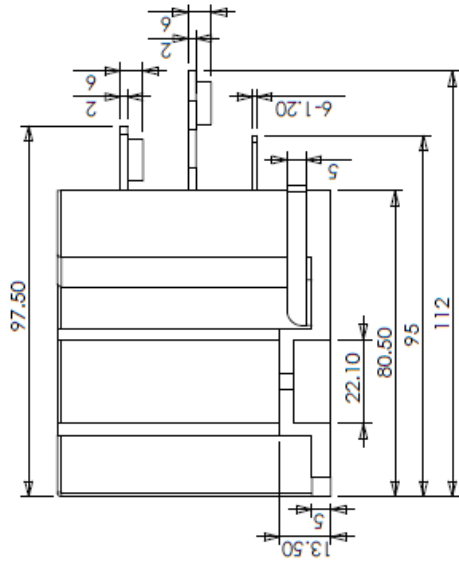
参照标准 Reference Standard	IEC 61071、AEC-Q200D-2010	
额定电压 Rated Voltage	UNDC(85℃): 550Vdc	
电容量 Capacitance Range	450μF (100Hz)	
电容量偏差 Capacitance tolerance	±10% (K)	
1.主要材质及机械参数		
介质材质 Medium Material	聚丙烯薄膜 Polypropylene Film	
灌封材料 Potting Material	环氧树脂 Epoxy Resin	
外壳材质 Case Material	PPS	
端子材质 Terminal Material	镀锡 t2 紫铜 Tin Plated T2 Copper	
本体尺寸(L×W×H) Body size(L×W×H)	230×62×50mm	
安装方式 Installation	安装耳朵	
2.电气参数		
耐电压 Voltage Proof	极间耐压 Between Terminals	U=1.5UNDC (20 °C, 10s)
	极壳耐压 Between Terminals To Case	2500VAC (20 °C, 10s, 50Hz)
过电压能力 Overvoltage Ability	1.1 UNDC (85 °C, 30%负载时间)	
	1.15 UNDC (85 °C, 30 分钟/天)	
	1.2 UNDC (85 °C, 5 分钟/天)	
	1.3 UNDC (85 °C, 1 分钟/天)	
允许最大纹波电流 Maximum Ripple Current	130A	
短时允许最大直流电流有效值 (小于 30s)	200A (环境温度≤85 °C)	
最大峰值电流 Maximum Peak Current	3375A (t≤10μs)	
最大脉冲电流 Maximum Pulse Current	10125A (每次 T≤30ms, 不超过 1000 次)	
等效串联电阻 ESR Equivalent Series Resistance	≤0.4mΩ (10KHz)	
自感 Ls Self-inductance	≤20nH	
热阻 (Rth) Thermal Resistance	≤1.3 K/W (θ _{hs} to θ _{case})	
电气距离 (端子之间) Electrical Distance (Between Terminals)	≥9.0mm	
爬电距离 (端子之间) Creep Distance (Between Terminals)	≥9.0mm	
绝缘电阻 Insulation Resistance	IR×C≥10000s (20°C, 500Vdc)	
损耗角正切 Dissipation Factor	100Hz: Tan δ≤0.0008	
3.环境参数		
工作温度范围 (热点温度) Operation Temperature Range (hotspot)	-40 °C~105 °C (85 °C~105 °C :decreasing factor 1.5% per °C for UNDC)	
存储温度范围 Storage Temperature Range	-40 °C~105 °C	

◆ 技术要求 Specifications:

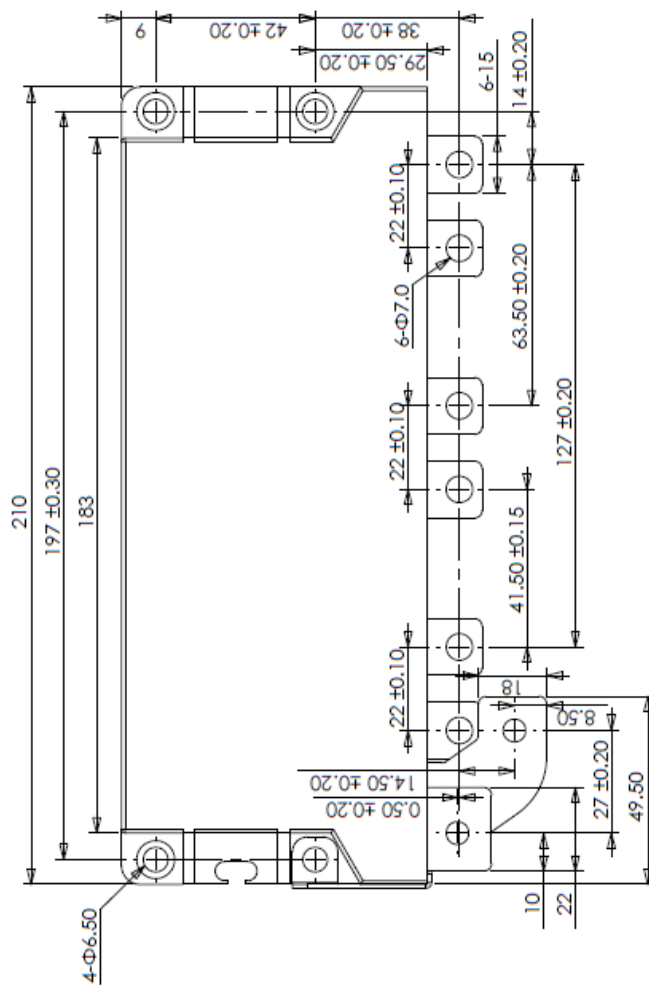
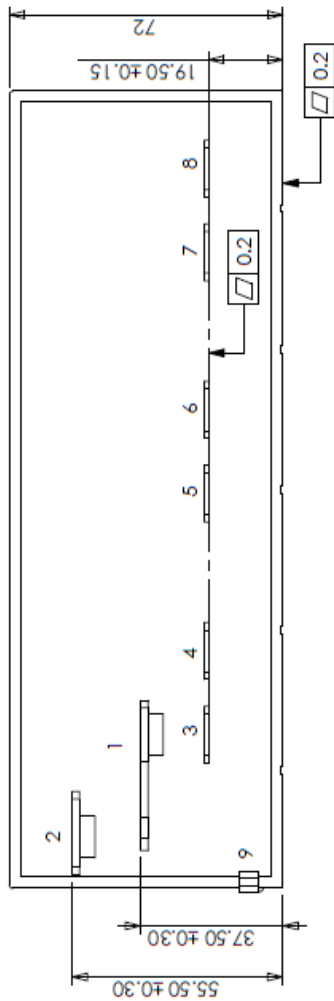
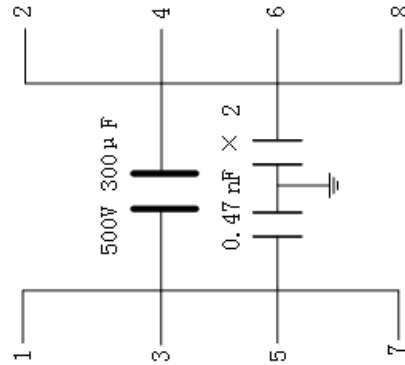
参照标准 Reference Standard	IEC 61071、AEC-Q200D-2010	
额定电压 Rated Voltage	UNDC(85℃): 500Vdc	
电容量 Capacitance Range	1000μF (100Hz)	
电容量偏差 Capacitance tolerance	±10% (K)	
1.主要材质及机械参数		
介质材质 Medium Material	聚丙烯薄膜 Polypropylene Film	
灌封材料 Potting Material	环氧树脂 Epoxy Resin	
外壳材质 Case Material	PPS	
端子材质 Terminal Material	镀锡 t2 紫铜 Tin Plated T2 Copper	
本体尺寸(L×W×H) Body size(L×W×H)	220×80×65mm	
安装方式 Installation	安装耳朵	
2.电气参数		
耐电压 Voltage Proof	极间耐压 Between Terminals	U=1.5UNDC (20 °C, 10s)
	极壳耐压 Between Terminals To Case	2500VAC (20 °C, 10s, 50Hz)
过电压能力 Overvoltage Ability	1.1 UNDC (85 °C, 30%负载时间)	
	1.15 UNDC (85 °C, 30 分钟/天)	
	1.2 UNDC (85 °C, 5 分钟/天)	
	1.3 UNDC (85 °C, 1 分钟/天)	
允许最大纹波电流 Maximum Ripple Current	230A	
短时允许最大直流电流有效值 (小于 30s)	330A (环境温度≤85 °C)	
最大峰值电流 Maximum Peak Current	9000A (t≤10μs)	
最大脉冲电流 Maximum Pulse Current	18000A (每次 T≤30ms, 不超过 1000 次)	
等效串联电阻 ESR Equivalent Series Resistance	≤0.3mΩ (10KHz)	
自感 Ls Self-inductance	≤20nH	
热阻 (Rth) Thermal Resistance	≤1.5 K/W (θ _{hs} to θ _{case})	
电气距离 (端子之间) Electrical Distance (Between Terminals)	7.0mm	
爬电距离 (端子之间) Creep Distance (Between Terminals)	7.0mm	
绝缘电阻 Insulation Resistance	IR×C≥10000s (20 °C, 500Vdc)	
损耗角正切 Dissipation Factor	100Hz: Tan δ≤0.0008	
3.环境参数		
工作温度范围 (热点温度) Operation Temperature Range (hotspot)	-40 °C~105 °C (85 °C~105 °C :decreasing factor 1.5% per °C for UNDC)	
存储温度范围 Storage Temperature Range	-40 °C~105 °C	

◆ 技术要求 Specifications:

参照标准 Reference Standard	IEC 61071、AEC-Q200D-2010	
额定电压 Rated Voltage	U _{NDC(85℃)} : 500Vdc	
电容量 Capacitance Range	330μF (100Hz)	
电容量偏差 Capacitance Tolerance	±10% (K)	
1.主要材质及机械参数		
介质材质 Medium Material	聚丙烯薄膜 Polypropylene Film	
灌封材料 Potting Material	环氧树脂 Epoxy Resin	
外壳材质 Case Material	PPS	
端子材质 Terminal Material	镀锡 T2 紫铜 Tin Plated T2 Copper	
本体尺寸(L×W×H) Body Size(L×W×H)	183×80.5×72mm	
安装方式 Installation	安装耳朵	
2.电气参数		
耐电压 Voltage Proof	极间耐压 Between Terminals	U=1.5U _{NDC} (20 °C, 10s)
	极壳耐压 Between Terminals To Case	2500VAC (20 °C, 10s, 50Hz)
过电压能力 Overvoltage Ability	1.1 U _{NDC} (85 °C, 30%负载时间)	
	1.15U _{NDC} (85 °C, 30 分钟/天)	
	1.2 U _{NDC} (85 °C, 5 分钟/天)	
	1.3 U _{NDC} (85 °C, 1 分钟/天)	
允许最大纹波电流 Maximum Ripple Current	100A (ΔT≤20 °C)	
短时允许最大直流电流有效值 (小于 30s)	200A (环境温度≤85 °C)	
最大峰值电流 Maximum Peak Current	2000A	
最大脉冲电流 Maximum Pulse Current	6000A (每次 T≤30ms, 不超过 1000 次)	
等效串联电阻 E _{sr} Equivalent Series Resistance	≤0.8mΩ (10kHz)	
自感 L _s (F=1mhz 下的典型值) Self-Inductance (Typical Values At 1mhz)	20nH	
热阻 (R _{th}) Thermal Resistance	≤1 K/W (Θ _{hs} To Θ _{case})	
电气距离 (端子之间) Electrical Distance (Between Terminals)	7.0mm	
爬电距离 (端子之间) Creep Distance (Between Terminals)	7.0mm	
绝缘电阻 Insulation Resistance	IR×C≥10000s (20 °C, 500Vdc)	
损耗角正切 Dissipation Factor	100Hz: Tan δ≤0.0008	
3.环境参数		
工作温度范围(热点温度) Operation Temperature Range (hotspot)	-40 °C~105 °C (85 °C~105 °C :decreasing factor 1.5% per °C for U _{NDC})	
存储温度范围 Storage Temperature Range	-40 °C~105 °C	



电气连接图：



◆可靠性 Reliability: IEC 61071 and AEC-Q200D-2010

测试项目 Test	参考标准 Reference	测试条件 Conditions of Test	判定标准 Performance requirements
电器参数 (例行试验) Electrical parameters (Routine test)	IEC 61071	极间耐压试验: $1.5 U_{NDC} * 10s$ Voltage between terminals, $1.5 U_{NDC}$, during 10s 绝缘电阻测试: $20^{\circ}C * 100Vdc * 60s$ Insulation Resistance: $20^{\circ}C * 100Vdc * 60s$ Capacitance, C at 100Hz (room temperature) Dissipation factor, $\tan \delta$ at 1/10kHz (room temperature)	符合规格书 Within specified limits
高温存储 High temperature storage	AEC-Q200-3	在 $105^{\circ}C$ 条件下存储 1000 小时, 不通电。在试验结束 24 ± 4 小时内进行测试。 1000hrs, at $105^{\circ}C$, Unpowered. Measurement at 24 ± 4 hours after test.	无明显外观损伤 No visible damage $ \Delta C \leq 3\%$ $IR \geq 10000s$ $\tan \delta \leq 0.0008$ at 100Hz
冷热冲击 Temperature cycling	AEC-Q200-4	100 个循环 ($-40 \sim 105^{\circ}C$), 每个温度的停留时间不超过 30 分钟, 转换时间不超过 1 分钟; 实验结束 24 ± 4 小时内进行测试。 100cycles ($-40 \sim 105^{\circ}C$), 30min maximum dwell time at each temperature extreme. 1 min maximum transition time. Measurement at 24 ± 4 hours after test conclusion.	无明显外观损伤 No visible damage $ \Delta C \leq 3\%$ $IR \geq 10000s$ $\tan \delta \leq 0.0008$ at 100Hz
潮热实验 Biased humidity	AEC-Q200-7	在 $40^{\circ}C$, 93%RH 的条件下加载额定电压测试 1000h; 实验结束 24 ± 4 小时内进行测试。 $40^{\circ}C * 93\%RH * U_{NDC} * 1000hrs$, Measurement at 24 ± 4 hours after test.	无明显外观损伤 No visible damage $ \Delta C \leq 5\%$ $IR \geq 5000s$ $\Delta \tan \delta \leq 200\%$ of initial δ at 10KHz
寿命测试 Operational life	AEC-Q200-8	$105^{\circ}C * U_{NDC} * 1000h$, 实验结束 24 ± 4 小时内进行测试。 1000hrs or $105^{\circ}C * U_{NDC} * 1000h$, Measurement at 24 ± 4 hours after test.	无明显外观损伤 No visible damage $ \Delta C \leq 5\%$ $IR \geq 5000s$ $ \Delta \tan \delta \leq 0.015$ at 10KHz
外观检测 (例行试验) External visual (Routine test)	AEC-Q200-9	检测器件结构, 标识和工艺质量。不要求电器特性。 Inspect device construction, marking and workmanship. Electrical test not required.	符合规格书 Within specified limits.
尺寸检查 (例行试验) Physical dimension (Routine test)	AEC-Q200-10	按适合的器件详细规格验证物理尺寸。不要求电气测试。 Verify physical dimensions to the applicable device specification. Electrical test not required.	符合规格书 Within specified limits.
溶剂抵抗 Resistance to solvents	AEC-Q200-12	使用 OKEM 清洗剂或其他相同溶剂浸泡环氧树脂面 1 分钟, 不要使用禁止的溶剂。用毛刷反复擦拭 10 次。 Use the OKEM cleaning or equivalent solvent to soak epoxy resin surface for 1 minutes. Don't use banned solvents. Repeated 10 times with a brush.	无粉尘脱落 No powder off
机械冲击 Mechanical shock	AEC-Q200-13	请参照 MIL-STD-202 中方法 213 图表 1, 条件 C。 Refer to MIL-STD-202 method 213, condition C.	无明显外观损伤 No visible damage $ \Delta C \leq 5\%$ $IR \geq 5000s$ $\tan \delta \leq 0.0008$ at 100Hz
振动测试 Vibration	AEC-Q200-14	5g 力的加速度, 扫描周期 20min, 冲击方向 x、y、z, 循环 12 次。 Acceleration of 5g force, scanning period :20min, Impact direction: X, Y, Z, Cycles: 12 times.	无明显外观损伤 No visible damage