

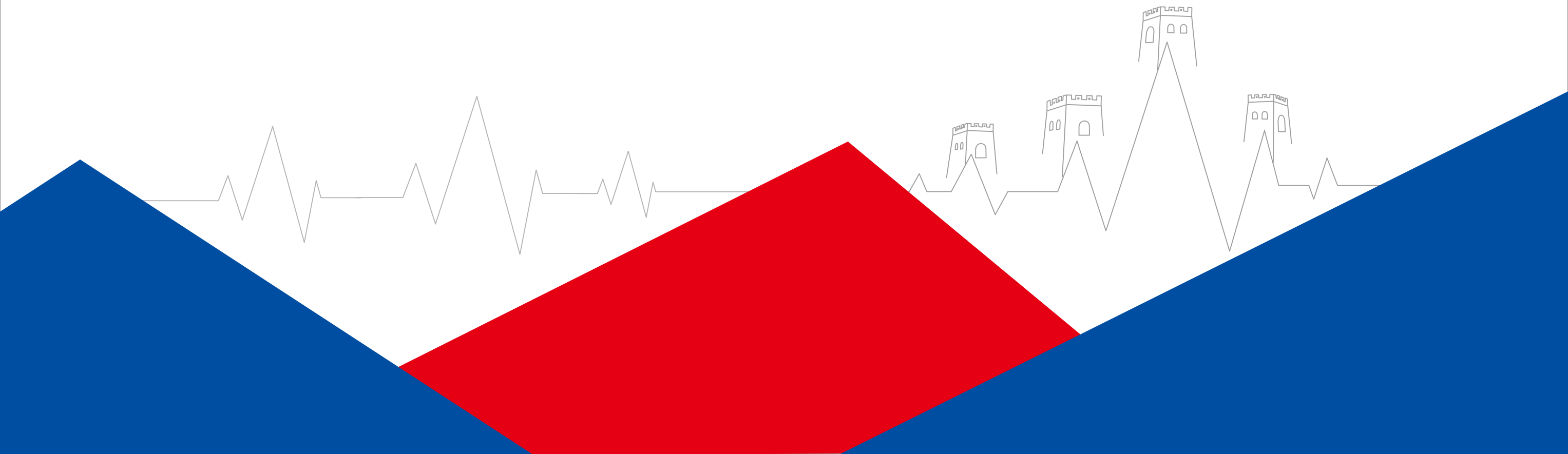
Shenzhen Bencent Electronics Co.,Ltd.

Address: 1 floor, E building, Hongfa science and Technology Park, No.
2035, Song Bai Road, Shiyan street, Baoan District, Shenzhen
Http: // www.bencent.com.cn
Tel: +86-755-26515060



GDT / TSS / TVS / ESD / Hybrid device

V202009



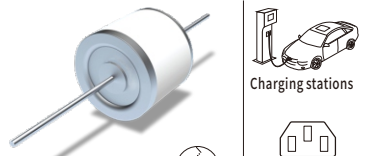


Bencent, founded in 1999, is a professional O.V.P components and innovative solutions provider, with products including GDT, TSS, TVS, ESD and Hybrid devices applied in telecommunication, security, consumer, medical, automobile and new energy industry. Bencent also provides EMC testing, consulting and training services for our customers which make us the first choice of domestic and international well-known companies, such as Huawei, Nokia, Samsung, Hikvision, Lenovo, Foxconn and Panasonic.



What's New?

OGDT

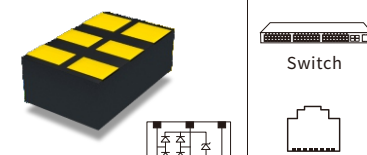


Charging stations

AC POWER

BGO6000A05-LC2
1.2/50-8/20 μ s 10KV-5KA
AC 1A-30A Failsafe $V_{BR} \geq 480V$
 $\Phi 8.0 \times 7.0mm$ Page 71

LOW-C₀ ESD

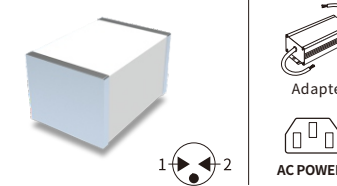


Switch

RJ45-10G

BV-FE03U2A
 $C_0 = 0.25pF @ 1MHz$
IPP > 4A(8/20 μ s)
1.6x1.0x0.55mm Page 61

BN

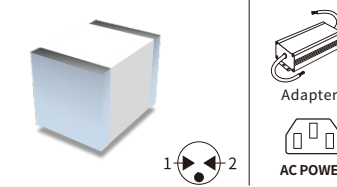


Adapter

AC POWER

BN362M
1.2/50-8/20 μ s 10KV-12N $\pm 40time$
 $V_{BR} \geq 2880V$
5.5x4.0x4.0mm Page 37

BL

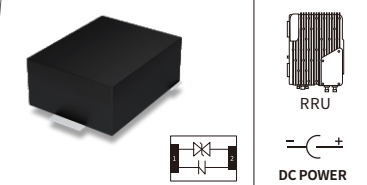


Adapter

AC POWER

BL201N
1.2/50-8/20 μ s 2KV-1KA
H < 2mm $V_{BR} \geq 140V$
2.9x2.1x1.9mm Page 35

BVS

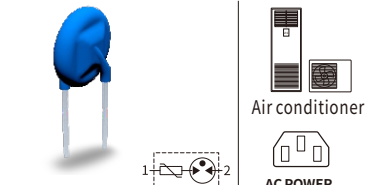


RRU

DC POWER

BVS-SMEJ8685CA
 $I_{PP} \geq 10KA @ 8/20\mu s$ $V_{DRM} \geq 75V$
Pin1 to Pin2 is TVS
Pin2 to Pin1 is TSS
18.3x14.0x7.0mm Page 73

BMG

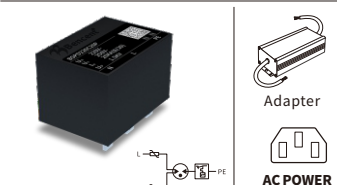


Air conditioner

AC POWER

BMG20D471K801Y
 $I_{PP} \geq 5KA @ 8/20\mu s$
Low Clamping Voltage $V_{BR} \geq 600V$
20x17x9mm Page 73

SPD

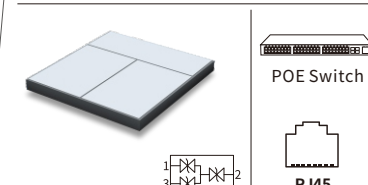


Adapter

AC POWER

BSPD220C20P
 $U_C = 250V$ $I_N = 20KA$ $U_P < 1.5KV$
41x30.5x27.2mm Page 73

BCCSP



POE Switch

RJ45

BCCSP-58C-654K
H = 0.6mm CSP Package
IPP > 4KV(10/700 μ s)
6.5x6.5x0.6mm Page 59



Six—Steps to Success

Environmental Analysis

- ▶ Lightning Protect Zone
 - LPZ0B-1 P1-2
 - LPZ0B-2 P1-2
 - LPZ0B-3 P1-2
 - LPZ1 P1-2
 - LPZ2 P1-2

Choose a Standard

- ▶ Test Standards
 - ITU-T K20 P03
 - ITU-T K21 P05
 - GR1089 P07
 - ISO7637 P09
 - ISO16750 P09
 - IEC61000-4-5 P10
 - IEC61000-4-4 P10
 - IEC61000-4-2 P11
 - UL60950 P11

Application Guide

- ▶ Equipment V Ports P12
- ▶ Ports Circuit Design
 - AC P13-16
 - DC P16-19
 - RJ11 P20-21
 - RJ45 P22-24
 - Coaxial P24-27
 - RS485 P27-28
 - Other P28-32

Select Components

- ▶ V-I curve P33
- ▶ V-t curve P34
- ▶ Datasheet P35-74
 - GDT P35-42
 - TSS P43-46
 - TVS P47-60
 - ESD P61-70
 - Hybrid Device P71-74

System Test

- ▶ Surge Lab P75
- ▶ Test Waveforms
 - Surge P76
 - EFT P77
 - ESD P77
 - Other P77-78

Apply & Optimize

- ▶ Qualification Certisate P79-80
- ▶ Reliability Lab P81
- ▶ Layout
 - Recommended P82

INDEX

P01-P02
Environmental Analysis

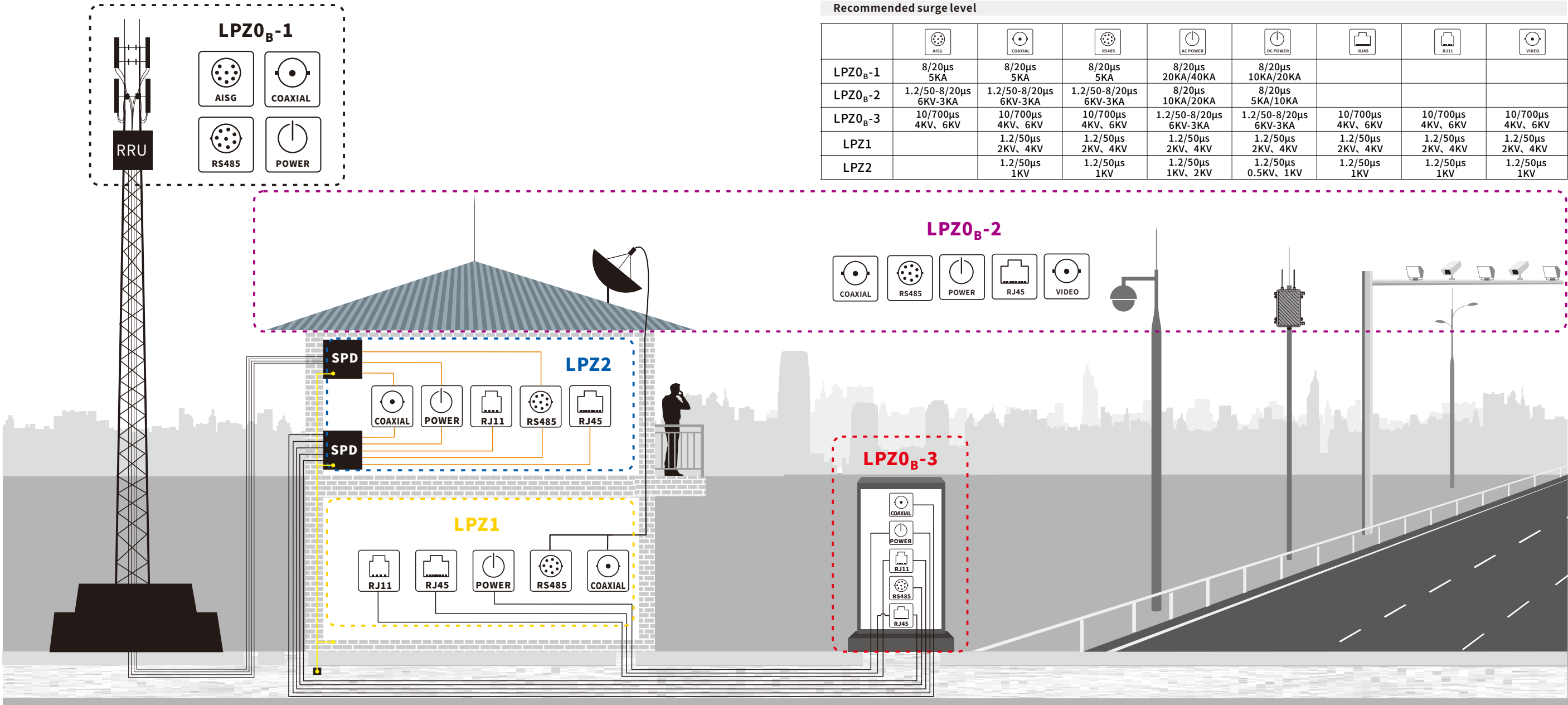
P03-P11
Choose a Standard

P12-P32
Application Guide

P33-P74
Select Components

P75-P78
System Test

P79-P82
Apply & Optimize



LPZ0_B-1

Application environment on telecom transmission tower

LPZ0_B-2

Outdoor cabinet on rooftops (high speed aerial included)

LPZ0_B-3

General outdoors, walls, hanging bars

LPZ1

Other areas inside building except LPZ0_B classification defined, e.g. passageway, weak current wells, switching room, basement, inside room

LPZ2

To be provided with good line-to-ground connection system and the specific room with primary protection, e.g. inside building, generator room or outdoor container-style mini generator room etc.

Table 1a – Applicable tests for external ports										
Test type	No. of pairs simultaneously tested	Test connections	Primary protection	Symmetric port			Co-axial port		Port type	
				Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])
Lightning voltage	Single	Transverse/differential	No	10/700µs 15+250 1kV A.6.1.1 (a and b)	10/700µs 15+250 1.5kV A.6.1.1 (a and b)	1.2/50 – 8/20µs 20 1kV A.6.2.1	1.2/50 – 8/20µs 20 1.5kV A.6.2.1	10/700µs 15+250 1.0kV A.6.3-1 (a and b)	1.2/50µs 20 2.5kV A.6.4-1	1.2/50µs 20 6kV A.6.4-1
		Port to earth	No	10/700µs 15+250 1.0kV A.6.1-2	10/700µs 15+250 1.5kV A.6.1-2	n/a	n/a	10/700µs 15+250 1.0kV A.6.3-2	1.2/50µs 20 2.5kV A.6.4-2	1.2/50µs 20 6kV A.6.4-2
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	1.2/50µs 20 2.5kV A.6.4-3	1.2/50µs 20 6kV A.6.4-3
		Coordination/Port to external port	Yes	10/700µs 15+250 4kV A.6.1-1 (a and b)	10/700µs 15+250 4kV A.6.1-1 (a and b)	11.2/50 – 8/20µs 20 4kV A.6.2-1	11.2/50 – 8/20µs 20 6kV A.6.2-1	10/700µs 15+250 4kV A.6.3-1 (a and b)	1.2/50µs 20 6kV A.6.4-1	1.2/50µs 20 10kV A.6.4-1
Lightning voltage	Multiple	Coordination/Port to earth	Yes	10/700µs 15+250 4kV A.6.1-2	10/700µs 15+250 4kV A.6.1-2	n/a	n/a	10/700µs 15+250 4kV A.6.3-2	1.2/50µs 20 6kV A.6.4-2	1.2/50µs 20 10kV A.6.4-2
		Coordination/Port to external port	Yes	n/a	n/a	n/a	n/a	n/a	1.2/50µs 20 2.5kV A.6.4-3	1.2/50µs 20 6kV A.6.4-3
		Port to earth	No	10/700µs 15+250 1.5kV A.6.1-4	10/700µs 15+250 1.5kV A.6.1-4	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethernet shielded twisted pair (UTPE)	Single	Port to earth	No	1.2/50µs 2+100 2.5kV A.6.7-4	1.2/50µs 2+100 6kV A.6.7-4	1.2/50µs 2+100 1.5kV A.6.7-5	1.2/50µs 2+100 6kV A.6.7-4	n/a	n/a	n/a
		Transverse	No	1.2/50µs 2+100+100 0.6kV A.6.7-5	1.2/50µs 2+100+100 1.5kV A.6.7-5	n/a	n/a	n/a	n/a	n/a
		Voltage impulse test	No	1.2/50µs 2+50 2.5kV A.6.7-3a	1.2/50µs 2+50 6kV A.6.7-3a	n/a	n/a	n/a	n/a	n/a
		Tripower over Ethernet (PoE)	No	1.2/50µs 2+100+100 0.6kV A.6.7-2	1.2/50µs 2+100+100 1.5kV A.6.7-2	n/a	n/a	n/a	n/a	n/a
Ethernet shielded twisted pair (STPE)	Single	Port to earth	No	1.2/50µs 2+100 2.5kV A.6.7-4	1.2/50µs 2+100 6kV A.6.7-4	n/a	n/a	n/a	n/a	n/a
		Shield to earth	No	1.2/50µs 2+50 2.5kV A.6.7-6	1.2/50µs 2+50 6kV A.6.7-6	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	8/20µs A.6.1-2 1kA/wire	8/20µs A.6.1-2 5kA/wire	n/a	n/a	8/20µs A.6.3-2 1kA/wire	n/a	n/a
		Port to external port	No	8/20µs A.6.1-3 1kA/wire	8/20µs A.6.1-3 5kA/wire	n/a	n/a	n/a	n/a	n/a
Lightning current	Single	Transverse/differential	n/a	n/a	n/a	8/20µs A.6.2-1 1kA	8/20µs A.6.2-1 5kA	n/a	n/a	n/a
		Shield to earth	n/a	n/a	n/a	8/20µs A.6.2-2 海上设备 4kA 其他 2kA	8/20µs A.6.2-2 海上设备 20kA 其他 5kA	n/a	n/a	n/a
		Shield to external port	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Port to earth	n/a	8/20µs A.6.1-4 1kA/wire limited 6kA	8/20µs A.6.1-4 5kA/wire limited 30kA	n/a	n/a	n/a	n/a	n/a
Power induction and earth potential rise	Multiple	Port to external port	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Transverse/differential	No	Transverse/differential	Transverse/differential	Understudy	Understudy	AC600V6000 A.6.3-1 (a and b) t=0.2s	n/a	n/a
		Port to earth	No	AC600V6000 A.6.1-1 (a and b) t=0.2s	n/a	n/a	n/a	AC600V6000 A.6.3-2 t=0.2s	5.2.1 under study	
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Neutral potential rise	Single	Coordination Transverse/differential	Yes	AC600V6000 A.6.1-1 (a and b) t=1s	AC1500V2000 A.6.1-1 (a and b) t=2s	Understudy		AC600V6000 A.6.3-1 (a and b) t=1s	AC1500V2000 A.6.3-1 (a and b) t=2s	n/a
		Coordination port to earth	Yes	AC600V6000 A.6.1-2 t=1s	AC1500V2000 A.6.1-2 t=2s	n/a	n/a	AC600V6000 A.6.3-2 t=1s	n/a	n/a
		Coordination port to external port	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	n/a	n/a	n/a	n/a	n/a	AC600V2000 A.6.4-2 t=1s	AC1500V2000 A.6.4-2 t=1s
Mains power contact	Single	Transverse/differential	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	n/a	n/a	n/a	AC600V2000 A.6.4-3 t=1s	AC1500V2000 A.6.4-3 t=1s
		Port to earth	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	n/a	n/a	AC230V10/20/40/80/160/300/600/1000Q A.6.3-2 t=15min	n/a	n/a
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 1b – Lightning test conditions for ports connected to internal cables										
No. of pairs simultaneously tested	Test connection	Primary protection	Unshielded cable			Shielded cable			PoE feed	
			Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])
Single	Shielded cable to earth	No			1.2/50-8/20µs20 1kV A.6.5-2	1.2/50-8/20µs20 1.5kV A.6.5-2	1.2/50-8/20µs20 1.5kV A.6.5-2			
	USB-shielded cable to earth	No			1.2/50-8/20µs20 100V A.6.5-2	1.2/50-8/20µs20 150V A.6.5-2				
	Screen/shield connection high current test	No			1.2/50-8/20µs20+ 50 2.5kV A.6.7-6	1.2/50-8/20µs20+ 50 6kV A.6.7-6				
	Ethernet transverse	No	1.2/50-8/20µs20 2.5kV A.6.7-5	1.2/50-8/20µs20 4kV A.6.7-5	1.2/50-8/20µs20 6kV A.6.7-5	1.2/50-8/20µs20 2.5kV A.6.7-5				
Multiple	Twisted pair port transverse/differential	No	1.2/50-8/20µs20 0.5kV A.6.7-5	1.2/50-8/20µs20 1.5kV A.6.7-5	1.2/50-8/20µs20 1.5kV A.6.7-5	1.2/50-8/20µs20 0.5kV A.6.7-5				
	DC-powered equipment port	No								
	DC power source port	No								
	Unshielded cable with symmetric pairs	No	1.2/50-8/20µs20+ 100 1kV A.6.5-1							
Multiple	Pot hole and surge transverse testing	No								
	UTPE port rated impulse voltage	No	11.2/50-8/20µs20+ 50 2.5kV A.6.7-3a							

ITU-T K.21 (JUL 2019) Resistibility of telecommunication equipment installed in customer premises to voltages and overcurrents

Table 1a - Applicable tests for external ports											
Test type	No. of pairs simultaneously tested	Test connections	Primary protection	Port type							
				Symmetric port		Dedicated power feed port		Mains power port		Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])
				Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clause 7 of [ITU-T K.44])		
Lightning /voltage	Single	Transverse/differential	No	10/700µs 15+250 1.5kV A.6.1-1 (a and b)	1.2/50 – 8/20µs 20 1kV A.6.2-1	10/700µs 15+250 1.5kV A.6.3-1 (a and b)	10/700µs 15+250 1.5kV A.6.3-1 (a and b)	1.2/50µs 20 2.5kV A.6.4-1	1.2/50µs 20 6kV A.6.4-1	1.2/50µs 20 6kV A.6.4-1	1.2/50µs 20 6kV A.6.4-1
		Port to earth	No	10/700µs 15+250 1.5kV A.6.1-2	n/a	10/700µs 15+250 6kV A.6.1-2	10/700µs 15+250 1.5kV A.6.3-2	1.2/50µs 20 2.5kV A.6.4-2	1.2/50µs 20 6kV A.6.4-2	1.2/50µs 20 6kV A.6.4-2	1.2/50µs 20 6kV A.6.4-2
		Port to external port	No	10/700µs 15+250 1.5kV A.6.1-3	n/a	10/700µs 15+250 6kV A.6.1-3	10/700µs 15+250 1.5kV A.6.3-3	1.2/50µs 20 2.5kV A.6.4-3	1.2/50µs 20 6kV A.6.4-3	1.2/50µs 20 6kV A.6.4-3	1.2/50µs 20 6kV A.6.4-3
		Coordination/Transverse/differential	Yes	10/700µs 15+250 4kV A.6.1-1 (a and b)	1.2/50 – 8/20µs 20 4kV A.6.2-1	10/700µs 15+250 4kV A.6.1-1 (a and b)	10/700µs 15+250 4kV A.6.3-1 (a and b)	1.2/50µs 20 6kV A.6.4-1	1.2/50µs 20 10kV A.6.4-1	1.2/50µs 20 10kV A.6.4-1	1.2/50µs 20 10kV A.6.4-1
		Coordination/Port to earth	Yes	10/700µs 15+250 4kV A.6.1-2	n/a	10/700µs 15+250 6kV A.6.1-2	10/700µs 15+250 4kV A.6.3-2	1.2/50µs 20 6kV A.6.4-2	1.2/50µs 20 10kV A.6.4-2	1.2/50µs 20 10kV A.6.4-2	1.2/50µs 20 10kV A.6.4-2
	Multiple	Port to external port	No	10/700µs 15+250 1.5kV A.6.1-4	n/a	10/700µs 15+250 1.5kV A.6.1-4	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	10/700µs 15+250 1.5kV A.6.1-5	n/a	10/700µs 15+250 1.5kV A.6.1-5	n/a	n/a	n/a	n/a	n/a
		Port to earth	Yes	10/700µs 15+250 4kV A.6.1-4	n/a	10/700µs 15+250 6kV A.6.1-4	n/a	n/a	n/a	n/a	n/a
		Port to external port	Yes	10/700µs 15+250 4kV A.6.1-5	n/a	10/700µs 15+250 6kV A.6.1-5	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	1.2/50µs 2+100 2.5kV A.6.7-4	n/a	1.2/50µs 2+100 6kV A.6.7-4	n/a	n/a	n/a	n/a	n/a
Lightning current	Ethernet shielded twisted pair (UTPE)	Transverse/differential	No	1.2/50µs 2+100+100 2.5kV A.6.7-5	1.2/50µs 2+100+100 6kV A.6.7-5	1.2/50µs 2+100+100 6kV A.6.7-5	n/a	n/a	n/a	n/a	n/a
		Voltage impulse test	No	1.2/50µs 2+50 2.5kV A.6.7-3a	1.2/50µs 2+50 6kV A.6.7-3a	1.2/50µs 2+50 6kV A.6.7-3a	n/a	n/a	n/a	n/a	n/a
		Power over Ethernet (PoE)	No	1.2/50µs 2+100+100 2.5kV A.6.7-2	1.2/50µs 2+100+100 6kV A.6.7-2	1.2/50µs 2+100+100 6kV A.6.7-2	n/a	n/a	n/a	n/a	n/a
		Shield to earth	No	1.2/50µs 2+50 2.5kV A.6.7-6	1.2/50µs 2+50 6kV A.6.7-6	1.2/50µs 2+50 6kV A.6.7-6	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	1.2/50µs 2+100 2.5kV A.6.7-4	1.2/50µs 2+100 6kV A.6.7-4	1.2/50µs 2+100 6kV A.6.7-4	n/a	n/a	n/a	n/a	n/a
	Ethernet shielded (STPE)	Port to earth	No	8/20µs A.6.1-2 1kA/wire	8/20µs A.6.1-2 3kA/wire	8/20µs A.6.1-2 3kA/wire	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	8/20µs A.6.1-3 1kA/wire	8/20µs A.6.1-3 5kA/wire	8/20µs A.6.1-3 5kA/wire	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	8/20µs A.6.1-4 1kA/wire limited 10kV A.6.7-3a	8/20µs A.6.1-4 5kA/wire limited 10kV A.6.7-3a	8/20µs A.6.1-4 5kA/wire limited 10kV A.6.7-3a	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	1.2/50µs 2+50 2.5kV A.6.7-6	1.2/50µs 2+50 6kV A.6.7-6	1.2/50µs 2+50 6kV A.6.7-6	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	1.2/50µs 2+100 2.5kV A.6.7-3a	1.2/50µs 2+100 6kV A.6.7-3a	1.2/50µs 2+100 6kV A.6.7-3a	n/a	n/a	n/a	n/a	n/a
Power induction and earth potential rise	Single	Transverse/differential	No	AC600V6000 A.6.1-1 (a and b) t=0.2s	AC600V6000 A.6.1-1 (a and b) t=0.2s	AC600V6000 A.6.1-1 (a and b) t=0.2s	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	AC600V6000 A.6.1-2 t=0.2s	AC600V6000 A.6.1-2 t=0.2s	AC600V6000 A.6.1-2 t=0.2s	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	AC600V6000 A.6.1-3 t=0.2s	AC600V6000 A.6.1-3 t=0.2s	AC600V6000 A.6.1-3 t=0.2s	n/a	n/a	n/a	n/a	n/a
		Coordination/Transverse/differential	Yes	AC600V6000 A.6.1-1 (a and b) t=1s	AC600V6000 A.6.1-1 (a and b) t=2s	AC600V6000 A.6.1-1 (a and b) t=2s	n/a	n/a	n/a	n/a	n/a
		Coordination port to earth	Yes	AC600V6000 A.6.1-2 t=1s	AC600V6000 A.6.1-2 t=2s	AC600V6000 A.6.1-2 t=2s	n/a	n/a	n/a	n/a	n/a
	Multiple	Coordination port to external port	Yes	AC600V6000 A.6.1-3 t=1s	AC600V6000 A.6.1-3 t=2s	AC600V6000 A.6.1-3 t=2s	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Shield to earth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Shield to external port	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Neutral potential rise	Single	Transverse/differential	No	AC600V6000 A.6.1-1 (a and b) t=0.2s	AC600V6000 A.6.1-1 (a and b) t=0.2s	AC600V6000 A.6.1-1 (a and b) t=0.2s	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	AC600V6000 A.6.1-2 t=0.2s	AC600V6000 A.6.1-2 t=0.2s	AC600V6000 A.6.1-2 t=0.2s	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	AC600V6000 A.6.1-3 t=0.2s	AC600V6000 A.6.1-3 t=0.2s	AC600V6000 A.6.1-3 t=0.2s	n/a	n/a	n/a	n/a	n/a
		Coordination/Transverse/differential	Yes	AC600V6000 A.6.1-1 (a and b) t=1s	AC600V6000 A.6.1-1 (a and b) t=2s	AC600V6000 A.6.1-1 (a and b) t=2s	n/a	n/a	n/a	n/a	n/a
		Coordination port to earth	Yes	AC600V6000 A.6.1-2 t=1s	AC600V6000 A.6.1-2 t=2s	AC600V6000 A.6.1-2 t=2s	n/a	n/a	n/a	n/a	n/a
	Multiple	Coordination port to external port	Yes	AC600V6000 A.6.1-3 t=1s	AC600V6000 A.6.1-3 t=2s	AC600V6000 A.6.1-3 t=2s	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Shield to earth	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Shield to external port	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mains power contact	Single	Transverse/differential	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	n/a	n/a	n/a	n/a	n/a
		Transverse/differential	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	n/a	n/a	n/a	n/a	n/a
	Multiple	Port to external port	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	n/a	n/a	n/a	n/a	n/a
		Transverse/differential	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-1 (a and b) t=15min	n/a	n/a	n/a	n/a	n/a
		Port to earth	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-2 t=15min	n/a	n/a	n/a	n/a	n/a
		Port to external port	No	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	AC230V10/20/40/80/160/300/600/1000Q A.6.1-3 t=15min	n/a	n/a	n/a	n/a	n/a
		Ethernet port	No	A.6.7-3 500V DC 大于2MΩ							

Table 1b – Lightning test conditions for ports connected to internal cables

No. of pairs simultaneously tested	Test connection	Primary protection	Unshielded cable			Shielded cable			PoE feed			DC powered equipment			DC power source		
			Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clauses 5 and 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clause 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clause 7 of [ITU-T K.44])	Basic test levels (also see clause 7 of [ITU-T K.44])	Intermediate test levels (also see clause 7 of [ITU-T K.44])	Enhanced test levels (also see clause 7 of [ITU-T K.44])
Single	Shielded cable to earth	No				1.2/50-8/20µs20 2kV A.6.7-5	1.2/50-8/20µs20 1kV A.6.7-5	1.2/50-8/20µs20 1.5kV A.6.7-5	1.2/50-8/20µs20 1.5kV A.6.7-5								
	USB shielded cable to earth	No					1.2/50-8/20µs20 100V A.6.5-2	1.2/50-8/20µs20 150V A.6.5-2	1.2/50-8/20µs20 150V A.6.5-2								
	STPE	No					1.2/50-8/20µs20 50 2.5kV A.6.7-6	1.2/50-8/20µs20 50 4kV A.6.7-6	1.2/50-8/20µs20 50 4kV A.6.7-6								
	Unshielded cable port to earth	No					1.2/50-8/20µs20 2.5kV A.6.7-5	1.2/50-8/20µs20 2.5kV A.6.7-5	1.2/50-8/20µs20 2.5kV A.6.7-5								
	UTPE/STPE transverse	No															
	DC powered equipment port	No															
	DC power source port	No															
	Unshielded cable with symmetric pairs	No															
	PoE Mode A and Mode B transverse testing	No															
	UTPE port rated impulse voltage	No															
Multiple	Shielded cable to earth	No															
	USB shielded cable to earth	No															
	STPE	No															
	Unshielded cable port to earth	No															
	UTPE/STPE transverse	No															
	DC powered equipment port	No															
	DC power source port	No															
	Unshielded cable with symmetric pairs	No															
	PoE Mode A and Mode B transverse testing	No															
	UTPE port rated impulse voltage	No															

First-Level Lightning Surge							Test Connections
Surge Test Number	Port Types	Test Description	Min. Peak Open-Circuit Voltage (Volts)	Min. Peak Short-Circuit Current per Conductor (Amperes)	Surge Maximum Rise/Minimum Decay Time for Voltage and Current(µs)	Value of External Non-Inductive Resistors	
1	1,3,3b/5b,5	Multiport OSP Test	±1000	25	10/360	N/A	Up to 24conductors
1.1	3b/5b	Short Loop OSP Interface	±1000	25	10/360	N/A	5
1.2	3b/5b	Short Loop OSP Interface - with Secondary Protectors	±Vs	25(at 1000 V)	10/360	N/A	5
2	1,3,5	OSP Interface	±100 to ±1000	10(at 100V)to 100(at 1000 V)	10/1000	N/A	5 at each voltage increment
2.1	1,3,5	Extended OSP interface	±100to ±2000	10(at 100V)to 100(at 2000 V)	10/1000	N/A	5 at each voltage increment
2.2	1,3,5	OSP Interface-with SecondaryProtectors	±Vs	100(at 1000V)	10/1000	N/A	5
3	1,3,3b/5b,5	Gas Tube Interaction Test	±4000	SeeFigure 4-6	10/700 voltage 5/310 current	25	(A5 and A6) orB
4	3,5	Inductive Kick-Test for OSP Interfaces	±2500	500	2/10	N/A	See Figure 4-1
5	3,3b/5b,5	Fast Rise Time Test for Remote OSP Interfaces	±1000	200	2/10	N/A	5
6	3,5	Higher Ground Resistancefor Remote OSP interfaces – Longitudinal	±1000	100	10/1000	N/A	A5, A6
7	3,5	High Lightning Exposuretest for Remote OSP Interfaces	±400to ±4000	50 (at 400 V) to 500(at 4000 V)	10/250	N/A	5 at each voltage increment
8	2,3a/5a,4,4a	Intra-Building with up to 2 Pairs per Port (Metallic)	±800	100	2/10	N/A	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
8.1	2,3a/5a,4,4a	Intra-Building with Secondary Protectors up to 2 Pairs per Port (Metallic)	±Vs	100 (at 800 V)	2/10	N/A	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
9	2,4,4a	Intra-Building with up to 2 Pairs per Port (Longitudinal)	±1500	100	2/10	N/A	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
9.1	2,4,4a	Intra-building with Secondary Protectors up to 2 Pairs per Port (Longitudinal)	±Vs	100 (at 1500 V)	2/10	N/A	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
10	2,3a/5a,4,4a	Alternative Intra-Building for up to 2 Pairs per Port (Metallic)	±800	400	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
10.1	2,3a/5a,4,4a	Alternative Intra-Building with Secondary Protectors up to 2 Pairs per Port (Metallic)	±Vs	Vs/2	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
11	2,4,4a	Alternative Intra-Building up to 2 Pairs per Port (Longitudinal)	±1500	750	1.2/50-8/20	10	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
11.1	2,4,4a	Alternative Intra-Building Undervoltage up to 2 Pairs per Port(Longitudinal)	±Vs	Vs/2	1.2/50-8/20	10	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
12	2,3a/5a,4,4a	Intra-Building for 3 or 4 Pairs per Port (Metallic)	±800	400	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
12.1	2,3a/5a,4,4a	Intra-Building with Secondary Protectors, 3 or 4 Pairs per Port (Metallic)	±Vs	Vs/2	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
13	2,4,4a	Intra-Building 3 or 4 Pairs per Port (Longitudinal)	±1500	750	1.2/50-8/20	20	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
13.1	2,4,4a	Intra-Building Undervoltage 3 or 4 Pairs per Port (Longitudinal)	±Vs	Vs/2	1.2/50-8/20	20	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
14	2,3a/5a,4,4a	Intra-Building for >4 Pairs per Port (Metallic)	±800	400	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
14.1	2,3a/5a,4,4a	Intra-Building with Secondary Protectors, >4 Pairs per Port (Metallic)	±Vs	Vs/2	1.2/50-8/20	6	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
15	2,4,4a	Intra-Building for >4 Pairs per Port(Longitudinal)	±1500	750	1.2/50-8/20	40	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
15.1	2,4,4a	Intra-Building with Secondary Protectors for > 4 Pairs per Port(Longitudinal)	±Vs	Vs/2	1.2/50-8/20	40	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
16	2,3a/5a,4,4a	Intra-Building for Paired Shielded Cables	±1500	750	1.2/50-8/20	2	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
17	2,3a/5a,4,4a	Intra-Building for Coaxial	±1500	750	1.2/50-8/20	2	Repetitions each polarity may be 5 on 1 sample, or 1 on 3 samples.
18	4a	Customer Side ONT Interfaces	±1000	100	10/1000	N/A	5
19	6	Antenna Port Test	±600	300	1.2/50-8/20	N/A	Center conductor to shield
19.1	6	Antenna Port with Secondary Protector Test	±Vs	300(at 600V)	1.2/50-8/20	N/A	Center conductor to shield
20	7	AC Power Port Test with External SPD	±2000	1000	1.2/50-8/20	N/A	Phase to neutral, phase to ground, neutral to ground
21	7	AC Power Port Test with External SPD	±6000	3000	1.2/50-8/20	N/A	Phase to neutral, phase to ground, neutral to ground
21.1	7	AC Power Port with Secondary Protector	±Vs	3000(at 6000 V)	1.2/50-8/20	N/A	Phase to neutral, phase to ground, neutral to ground
22	8a	Tower Mounted Transceiver Fed with Remote DC Power Test (Longitudinal)	±6000	Minimum peak short-circuit current per port is 3000 A.	1.2/50-8/20	N/A	See Figure 4-15. Feed and return to shield simultaneously
23	3a/5a,8b	Voltage Limiting for Intra-Site Cell Site Ports (Longitudinal)	±2500	Minimum peak short-circuit current per port is 5000 A.	8/20current	N/A	B
1=CO OSP Cable Ports, 2=CO Intra-building Cable Ports, 3a/5a=Non-CO Intra-Building Ports, 3b/5b=Short Reach OSP Cable Ports, 4=Intra-Cell Site Cable Ports, 4a=Customer-Side Optical Network Terminals (ONTs) and Intelligent Network Interface Devices (INIDs) Cable Ports, 5=OSP Site OSP Cable Ports, 6=Antenna Ports, 7=AC Power Ports, 8a=DC Power to Antenna, 8b=Intra-Cell Site DC Power							

Second-Level Lightning Surge					Test Connections
Surge Test Number	Port Types	Test Description	Min. Peak Open-Circuit Voltage(Volts)	Min. Peak Short-Circuit Current per Conductor (Amperes)	
1	1,3,5	Inductive Kick-Test for OSP Interfaces	±5000	500	See Figure 4-1
2	7	Lightning to AC Power Port	±6000	3000	Phase conductors to neutral, phase conductors to ground, neutral conductor to ground
2.1	7	Lightning to AC Power Port with Secondary Protectors	±Vs	3000(at 6000 V)	Phase conductors to neutral, phase conductors to ground, neutral conductor to ground
1=CO OSP Cable Ports, 3=CO Intra-Building Cable Ports, 5=OSP Site OSP Cable Ports, 7=AC Power Ports,					

ISO7637-2:2011 Road vehicles --Electrical disturbances from conduction and coupling--Part 2: Electrical transient conduction along supply lines only

Examples of test pulse severity levels for nominal 12V and 24V system										
Test pulse ^a	Selected test level ^b	Test pulse severity level,Us ^{c,d} (V)						Min.number of pulses or test time	Burst cycle/pulse repetition tim ^e	
		IV		III		I/II				
		12	24	12	24	12	24		min.	max.
1		-150	-600	-112	-450	-75	-300	500Pulses	0.5s	e
2a		+112	+112	+55	+55	+37	+37	500Pulses	0.2s	5s
2b		+10	+20	+10	+20	+10	+20	10Pulses	0.5s	5s
3a		-220	-300	-165	-220	-112	-150	1h	90ms	100ms
3a		+150	+300	+112	+220	+75	+150	1h	90ms	100ms

a: Test pulses as in 5.6
b: Values agreed between vehicle manufacturer and equipment supplier.
c: The amplitudes are the values of Us as defined for each test pulse in 5.6.
d: The former levels I and II are revised because they did not ensure sufficient immunity in subsequent road vehicles' design.
e: The maximum pulse repetition time shall be chosen such that it is the minimum time for the DUT to be correctly initialized before the application of the next pulse and shall be ≥0.5S.

ISO16750-2:2012 Road vehicles -- Environmental conditions and testing for electrical and electronic equipment -- part 2: electrical loads

Starting profile values for systems with 12V and 24V nominal voltage								
Parameter		Level						
		I		II		III		IV
		12V	24V	12V	24V	12V	24V	12V
Voltage V	U _{s6}	8(-0.2)	10(-0.2)	4.5(-0.2)	8(-0.2)	3(-0.2)	6(-0.2)	6(-0.2)
	U _s	9.5(-0.2)	20(-0.2)	6.5(-0.2)	15(-0.2)	5(-0.2)	10(-0.2)	6,5(-0.2)
Duration ms	t _f	5(±0.5)	10(±1)	5(±0.5)	10(±1)	5(±0.5)	10(±1)	5(±0.5)
	t ₆	15(±1.5)	50(±5)	15(±1.5)	50(±5)	15(±1.5)	50(±5)	15(±1.5)
	t ₇	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)
	t ₈	1000(±100)	1000(±100)	10000(±1000)	1000(±100)	1000(±100)	1000(±100)	10000(±1000)
	t _r	40(±4)	40(±4)	100(±10)	100(±10)	100(±10)	40(±10)	100(±10)
Minimum functional status		A ^a	A ^e	B ^a	B ^e	B ^a	B ^e	A ^a
		A ^b	B ^f	B ^b	C ^f	C ^b	C ^f	B ^b
		B ^c	B ^g	C ^c	C ^g	C ^c	C ^g	C ^c
		B ^d	B ^h	C ^d	C ^h	C ^d	C ^h	C ^d

a: U_s min = 6 V; U_s max = 16 V (see Table 1, Code A).
b: U_s min = 8 V; U_s max = 16 V (see Table 1, Code B).
c: U_s min = 9 V; U_s max = 16 V (see Table 1, Code C).
d: U_s min = 10.5 V; U_s max = 16 V (see Table 1, Code D).
e: U_s min = 10 V; U_s max = 32 V (see Table 2, Code E).
f: U_s min = 16 V; U_s max = 32 V (see Table 2, Code F).
g: U_s min = 22 V; U_s max = 32 V (see Table 2, Code G).
h: U_s min = 18 V; U_s max = 32 V (see Table 2, Code H).

Pulse for test A in systems with 12 V and 24 V nominal voltage			
Parameter	Type of system		Minimum test requirements
	U _N =12V	U _N =24V	
U _s ^a (V)	79≤U _s ≤101	151≤U _s ≤202	10 pulses at 1 min intervals
R _i ^a (Ω)	0.5≤R _i ≤4	1≤R _i ≤8	
t _d (ms)	40≤t _d ≤400	100≤t _d ≤350	
t _d (ms)	10(₅ ⁰)	10(₅ ⁰)	

a: If not otherwise agreed, use the higher voltage level with the higher value for internal resistance, or use the lower voltage level with the lower value for internal resistance.

IEC61000-4-5:2014 Electromagnetic compatibility (EMC) –Part 4-5: Testing and measurement techniques – Surge immunity test

Installation class	Test levels (kV)																			
	AC power supply and a.c. I/O				DC power supply and d.c. I/O				Unsymmetrical operated circuits/lines ^{a,d,e}				Symmetrical operated circuits/lines ^{a,d,e}				Shielded circuits/lines ^{a,d,f}			
	External ports ^g		Internal ports ^{a,d}		External ports ^a		Internal ports ^{a,d}		External port		Internal port		External port		Internal port		External port		Internal port	
	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground	Line to line	Line to ground
0	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1	/	0.5	/	/	/	/	/	/	/	/	/	0.5	/	/	/	0.5	/	/	/	/
2	0.5	1.0	/	/	/	/	/	/	/	/	0.5	1.0	/	/	/	1.0	/	/	/	0.5
3	1.0	2.0	1.0	2.0	/	/	/	/	/	/	1.0	2.0	/	/	/	2.0	/	/	/	2.0
4	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	/	4.0 ^b	/	4.0 ^b	/	4.0 ^b	/	4.0 ^b
5	^{c,b}	^{c,b}	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	2.0 ^b	4.0 ^b	/	4.0 ^b	/	4.0 ^b	/	4.0 ^b	/	4.0 ^b

a: No test is advised if the cable length is shorter than or equal to 10 m.
b: Where the port is always intended to be used with specified primary protection, testing is performed with the primary protection in place to ensure coordination with the protection elements. If primary protection is required to protect the interface but not provided, testing is also performed at the maximum let through level of the specified primary protection and with a typical primary protector.
c: Depends on the class of the local power supply system.
d: The testing of intra-system ports is generally not required.
e: Line-to-line surges (transverse) may occur in networks where SPDs (surge protective devices) with connection to ground are used for protection. Such surges are outside the scope of this standard. This phenomenon can however be simulated by applying common mode surges through the defined primary protection elements.
f: The testing of ports connecting to antennas is outside the scope of this standard.

IEC61000-4-4:2012 Electromagnetic compatibility (EMC) – Part 4-4:Testing and measurement techniques – Electrical fast transient/burst immunity test

Open circuit output test voltage and repetition frequency of the impulses				
Level	Power ports, earth port (PE)		Signal and control ports	
	Voltage peak kV	Repetition frequency kHz	Voltage peak kV	Repetition frequency kHz
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.25	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X ^a	Special	Special	Special	Special

The use of 5 kHz repetition frequency is traditional, however, 100 kHz is closer to reality. Product committeesshould determine which frequencies are relevant for specific products or product types.

With some products, there may be no clear distinction between power ports and signal ports, in which case it is up to product committees to make this determination for test purposes.

a: "X" can be any level, above, below or in between the others. The level shall be specified in the dedicatedequipment specification.

IEC61000-4-2:2008 Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test

Contact discharge		Air discharge	
Level	Test voltage KV	Level	Test voltage KV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
x ^a	Special	x ^a	Special
a: "x" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed.			

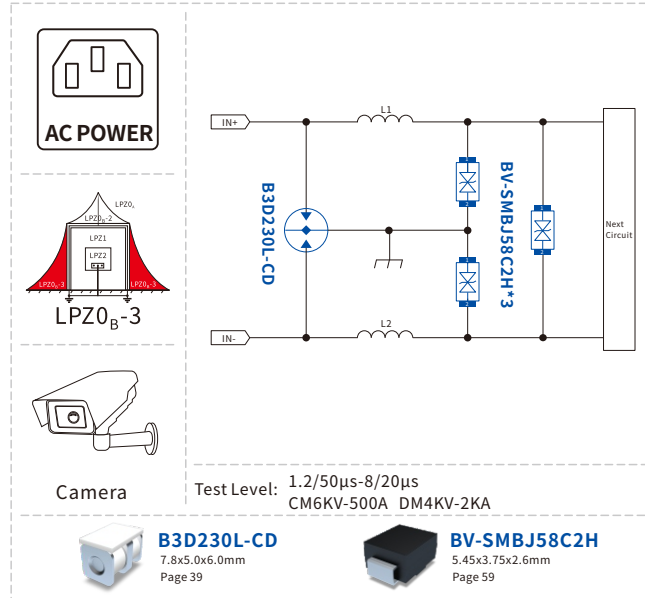
UL60950-1:2013 Information Technology Equipment – Safety – Part 1: General Requirements

Test voltages for electric strength tests based on peak working voltages part 1							
Grade of insulation	Points of application (as appropriate)						
	PRIMARY CIRCUIT to BODY PRIMARY CIRCUIT to SECONDARY CIRCUIT between Parts in PRIMARY CIRCUIT					SECONDARY CIRCUIT to BODY between independent SECONDARY CIRCUITS	
	WORKING VOLTAGE V _{PEAK} OR DC					WORKING VOLTAGE V	
	U ≤ 210V _{peak} or d.c. ²⁾	210V < U ≤ 420V _{peak} or d.c. ³⁾	420 < U ≤ 1.41KV _{peak} or d.c.	1.41KV < U ≤ 10KV _{peak} or d.c. ⁴⁾	10KV < U ≤ 50KV _{peak} or d.c.	U ≤ 42.4V _{peak} or 60V d.c.	42.4V _{peak} or 60Vd.c. < U ≤ 10KV _{peak} or d.c. ⁵⁾
	Test voltage, volts r.m.s.1)						
FUNCTIONAL	1000	1500	See Va in table 5B, Part2	See Va in table 5B, Part2	1.06U	500	See Va in table 5B, Part2
BASIC, SUPPLEMENTARY	1000	1500	See Va in table 5B, Part2	See Va in table 5B, Part2	1.06U	no test	See Va in table 5B, Part2
REINFORCED	2000	3000	3000	See Vb in table 5B, Part2	1.06U	no test	See Vb in table 5B, Part2
1) For WORKING VOLTAGES exceeding 10KV peak or d.c. in SECONDARY CIRCUITS, the same test voltage as for PRIMARY CIRCUITS apply. 2) Use this column for unearthed DC MAINS SUPPLIES up to and including 210V d.c.. 3) Use this column for unearthed DC MAINS SUPPLIES over 210V d.c. up to and including 420V d.c.. 4) Use this column for unearthed DC MAINS SUPPLIES over 420 V d.c.. 5) Use these columns for d.c. derived within the equipment from an AC MAINS SUPPLIES, or for DC MAINS SUPPLIES that are earthed within the same building.							

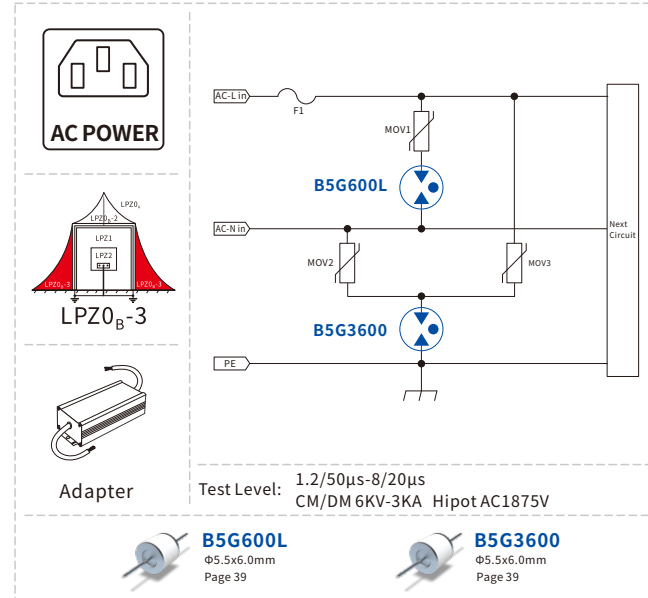
Equipment V Ports

Trade	Equipment	Port								
		RJ11	RJ45	RS485	AC	DC	HDMI	USB	Coaxial	ECGcable
Telecommunication	xDSL moden	●	●			●				
	Cable moden		●			●			●	
	Telephone	●								
	Splitter	●								
	Router		●			●				
	RRU		●	●	●	●				
	Corded Phone	●								
	Cordless Phone	●				●				
	IP Phone	●				●				
	Micro Power Cell Base Station	●	●		●	●				
	VoIP Telephone Adapter	●								
	Wireless LAN Access Point		●		●	●				
	BBU		●	●	●	●				
	Telephone switchboard	●			●					
	Network switch		●		●					
	NXU IAD VOIP PSTN	●	●		●	●				
Consumer Electronics	Television		●		●		●	●	●	
	Personal computer		●		●	●	●	●		
	Printer	●	●		●			●		
	Set top box		●				●	●	●	
	Digital Multimedia Broadcast Receiver				●	●	●	●	●	
	Digital Still and Video Camera				●	●	●	●		
	DVD Player and Recorder				●	●	●	●		
	LCD Projector		●		●	●	●	●		
Industrial	LCD TV		●		●	●	●	●		
	LED driver				●	●				
	POS	●	●			●				
	Parking management		●	●	●	●				
	Outdoor LED Lighting				●					
	Power Line Network			●	●					
	Power Supply				●					
	Satellite Radio				●	●				
	SMPS Embedded				●					
	SMPS External				●					
	Clothes Dryer				●					
	Dishwasher				●					
	Electric Inductive Cooktop				●					
	Electric Range Oven				●					
	Electric Resistive Cooktop				●					
	Gas Cooktop				●					
	Gas Range Oven				●					
	Microwave Oven				●					
	Range Hood				●					
	Refrigerator				●					
Security	Room AC				●					
	Solar Power System (Residential)			●	●					
	Washing Machine				●					
Medical	Camera		●	●	●	●	●	●	●	
	NVR/DVR		●	●	●		●	●	●	
Automobile	ECG monitor				●					●
	Navigator							●		
	Body control system					●				
	Audio and video entertainment system					●	●			
	Automobile air-condition					●				
	Display instrument					●				

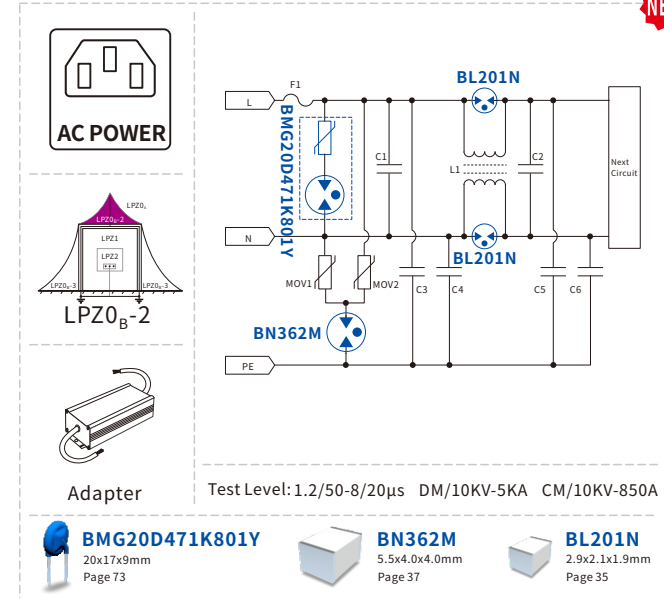
AC24V/DC12V



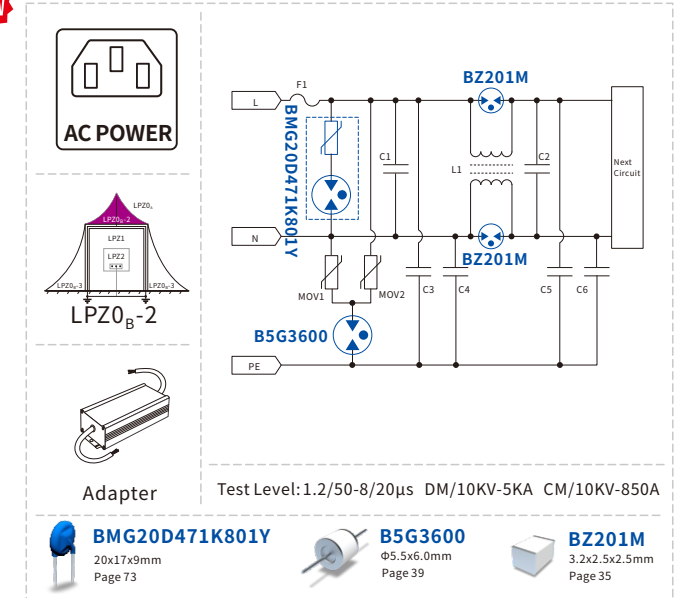
AC90-264V



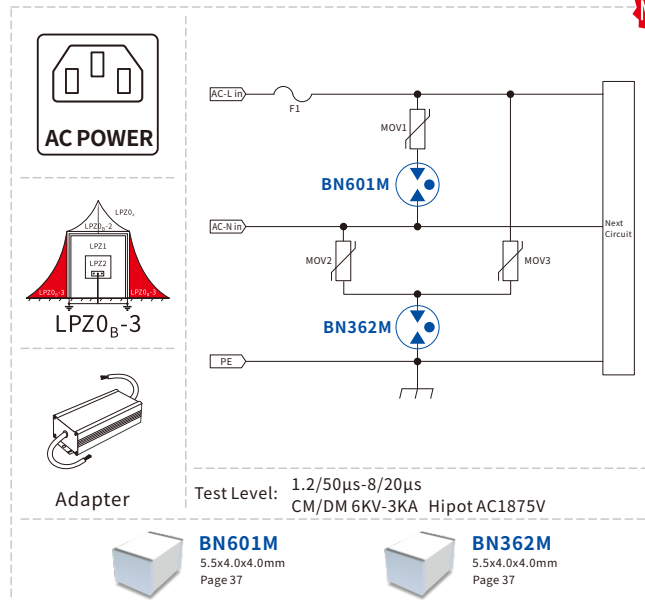
AC 90-260V



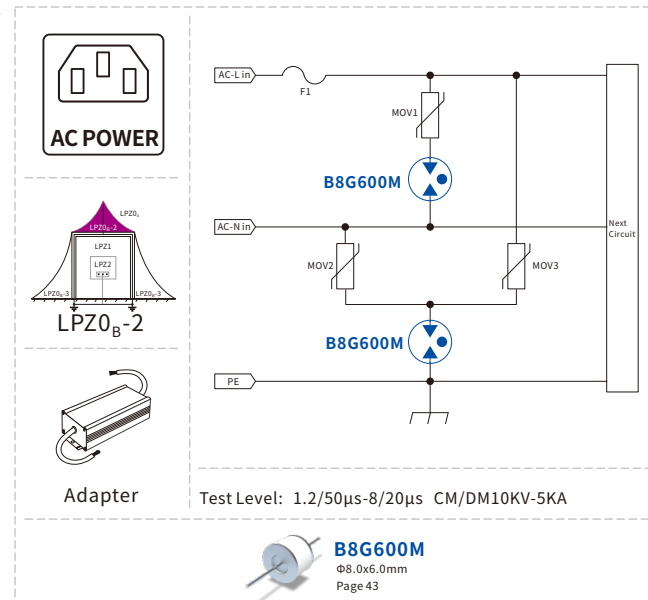
AC 90-260V



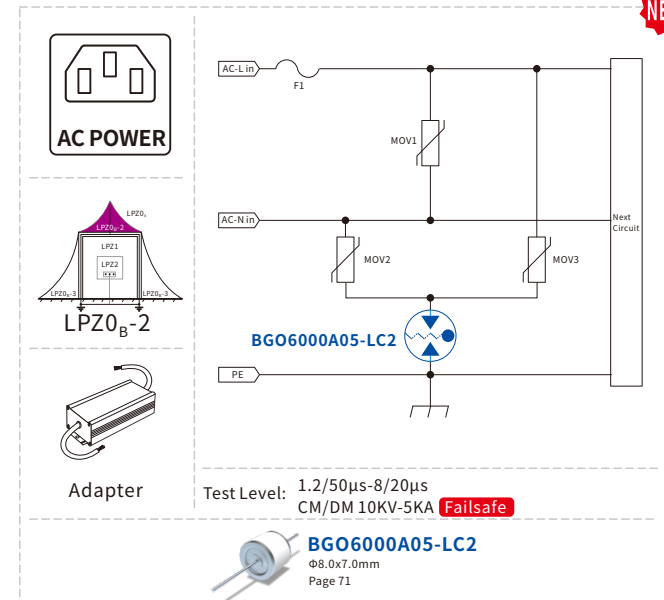
AC90-264V



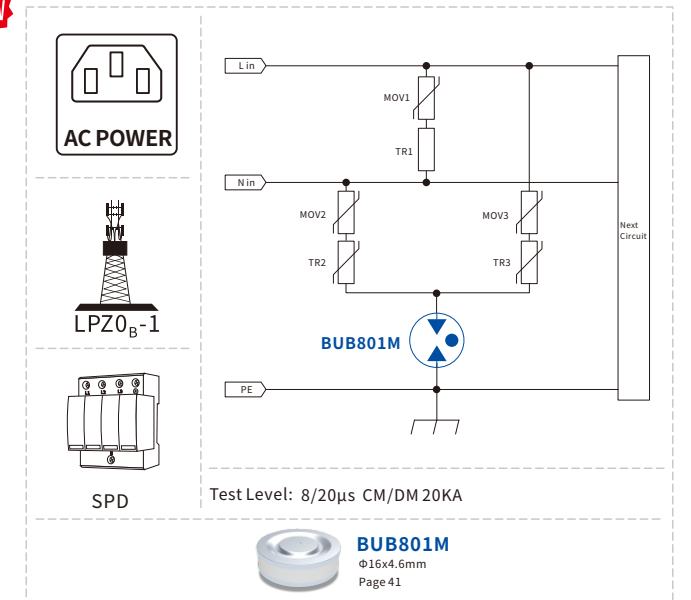
AC90-264V



AC90-264V



SPD AC90-264V



Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

AC90-250V

AC POWER

LPZ0_B-1

Camera

BSPD220C20P-1
41x30.5x27.2mm
Page 73

BM801M
8.3x8.3x6.0mm
Page 39

Test Level: 8/20μs CM/DM 20KA

AC90-300V

AC POWER

LPZ0_B-1

Adapter

BSPD220C20P-1
41x30.5x27.2mm
Page 73

BM801M
8.3x8.3x6.0mm
Page 39

Test Level: 8/20μs CM/DM 20KA

AC90-264V

AC POWER

LPZ0_B-1

Adapter

BSPD220C20P-D
41.5x16x25mm
Page 73

BSPD220C20P-D1
41.5x27x16mm
Page 73

Test Level: 8/20μs CM/DM 20KA

DC 48V

DC POWER

LPZ0_B-1

RRU

BVS-SMEJ8685CA
18.3x14.0x7.0mm
Page 73

Test Level: 8/20μs 10KA

AC90-250V

AC POWER

LPZ0_B-1

Adapter

BSPD220C20P
41x30.5x27.2mm
Page 73

Test Level: 8/20μs CM/DM 20KA

AC90-264V

AC POWER

LPZ0_B-2

Lamp

BSPD220D05L
45x28x20mm
Page 73

Test Level: 8/20μs CM/DM 5KA

DC48V

DC POWER

LPZ1

BBU

BV-SMCT-58CA
8.0x5.9x2.0mm
Page 59

Test Level: 1.2/50μs-8/20μs CM/DM 2KV-1KA

DC48V

DC POWER

LPZ0_B-3

Outdoor AP

BV-SMDJ58CA
8.25x6.15x2.95mm
Page 53

BX091N
4.2x3.5x3.5mm
Page 37

Test Level: 1.2/50μs-8/20μs CM/DM 6KV-3KA

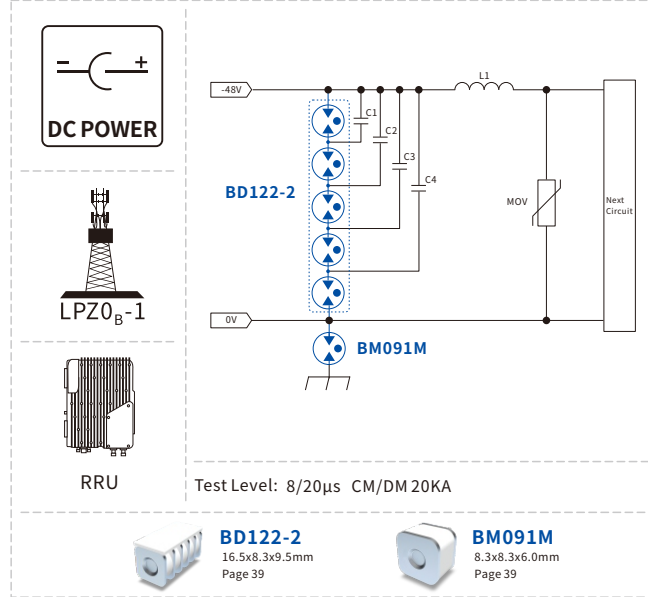
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

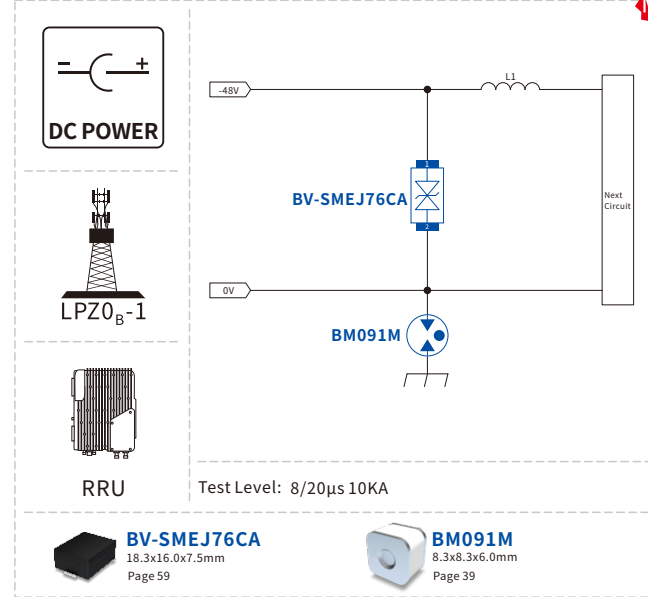
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

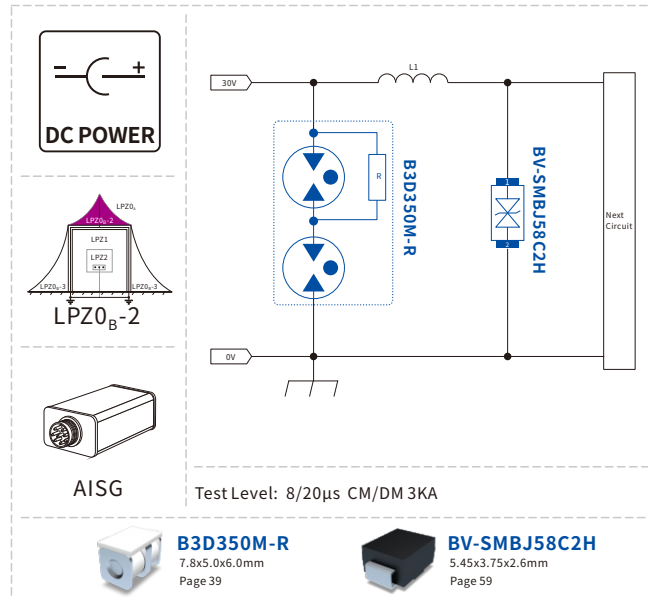
DC48V



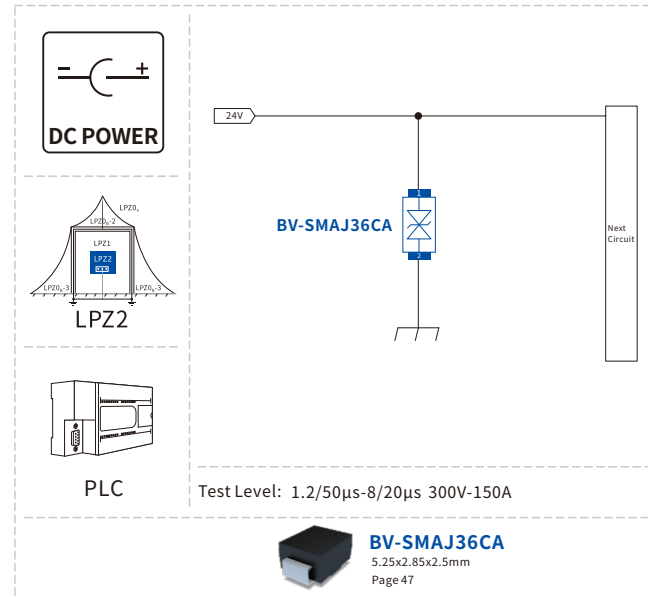
DC 48V



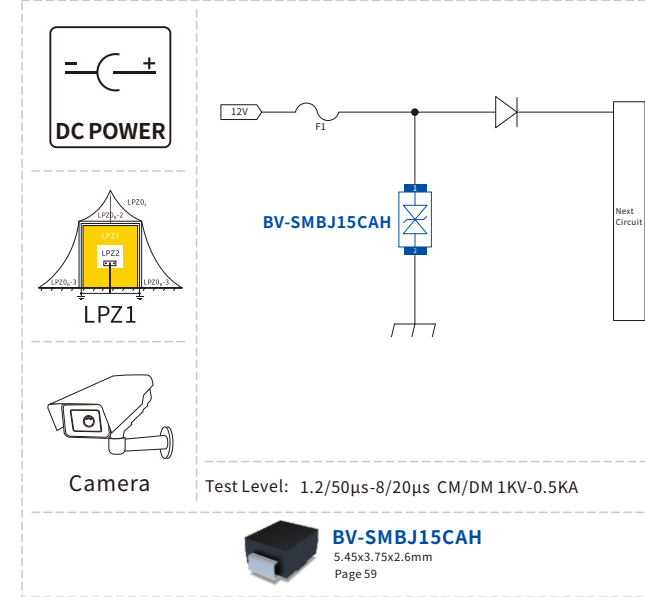
DC30V



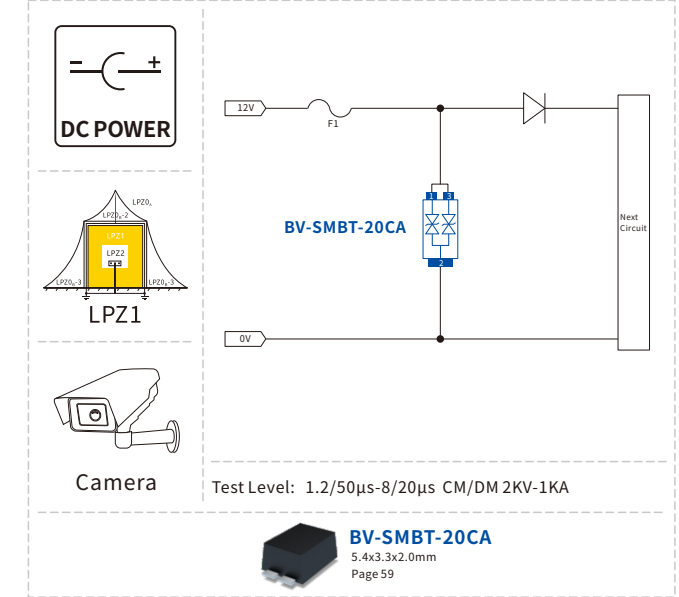
DC24V



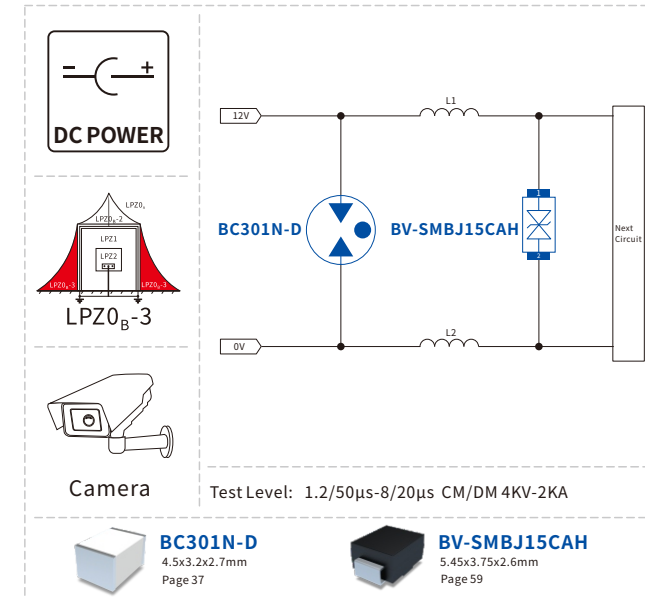
DC12V



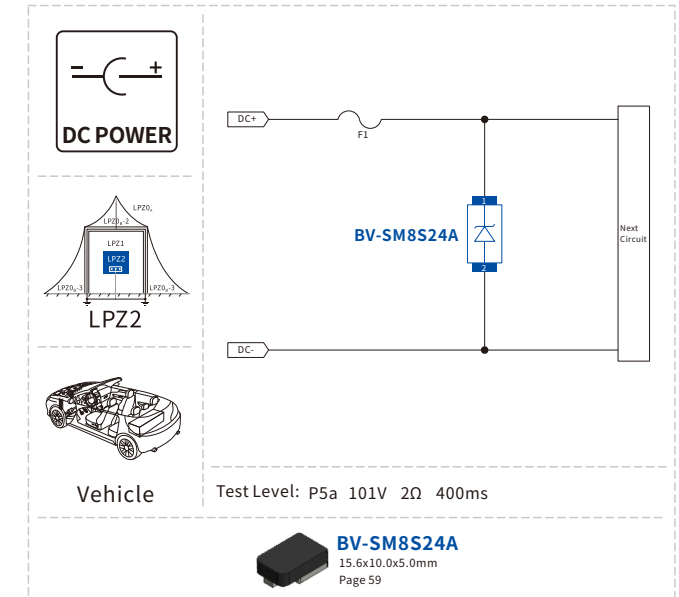
DC12V



DC12V



DC12V IN CAR



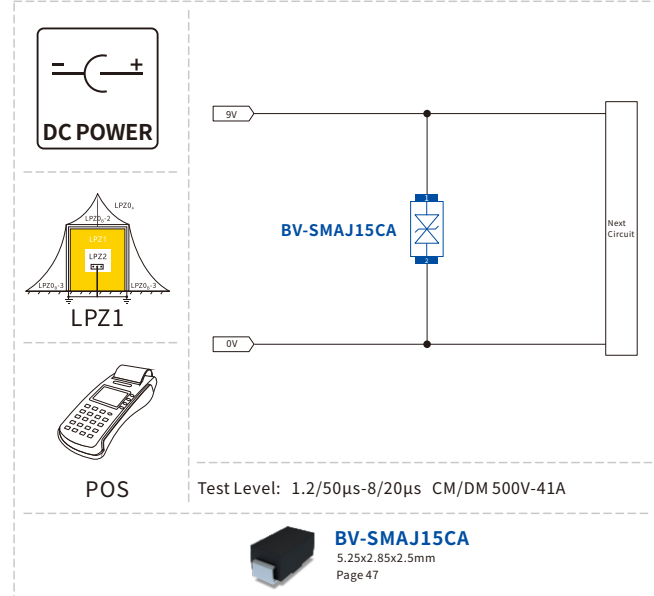
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

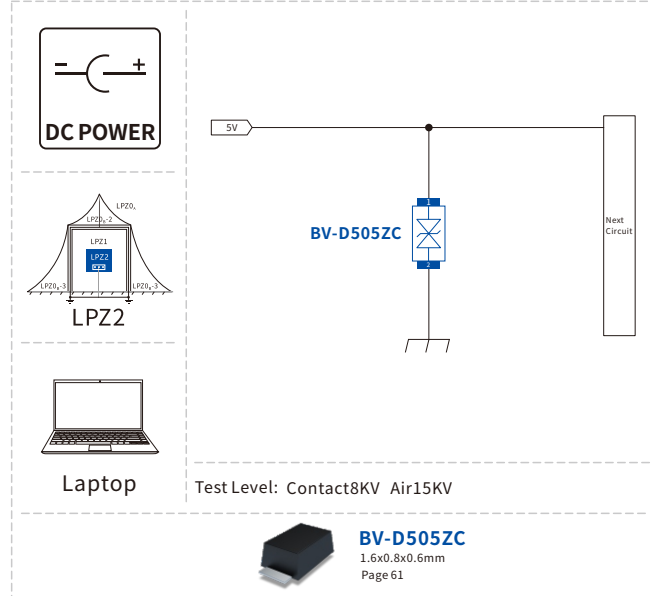
Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

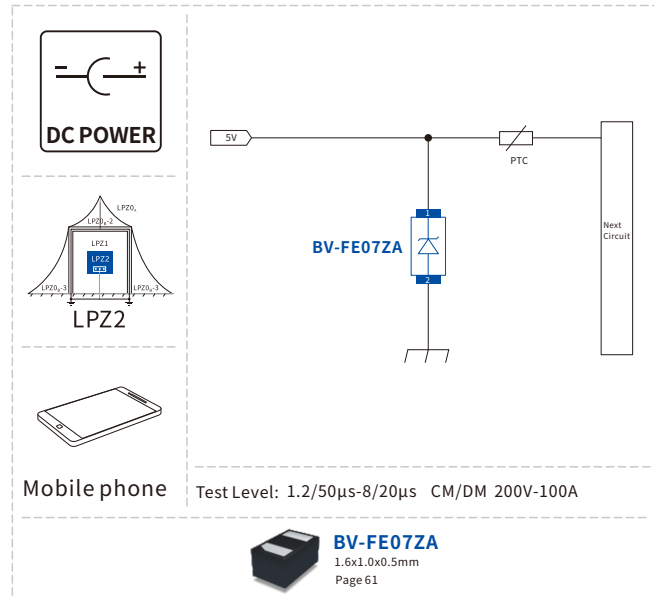
DC9V



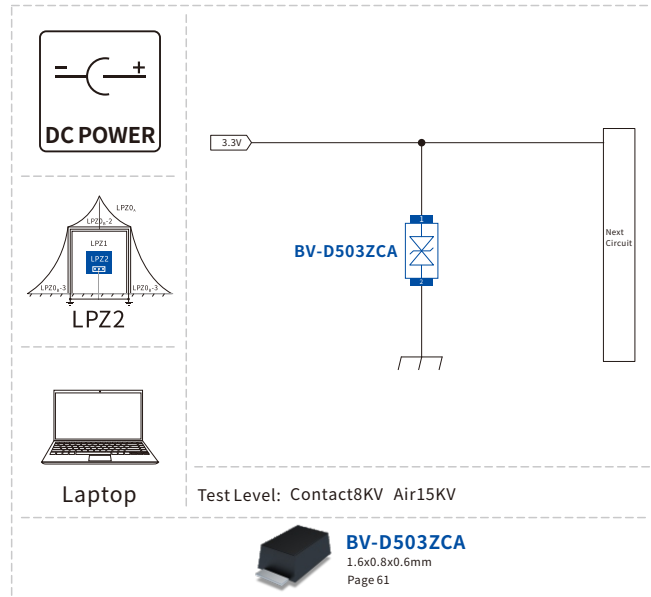
DC5V



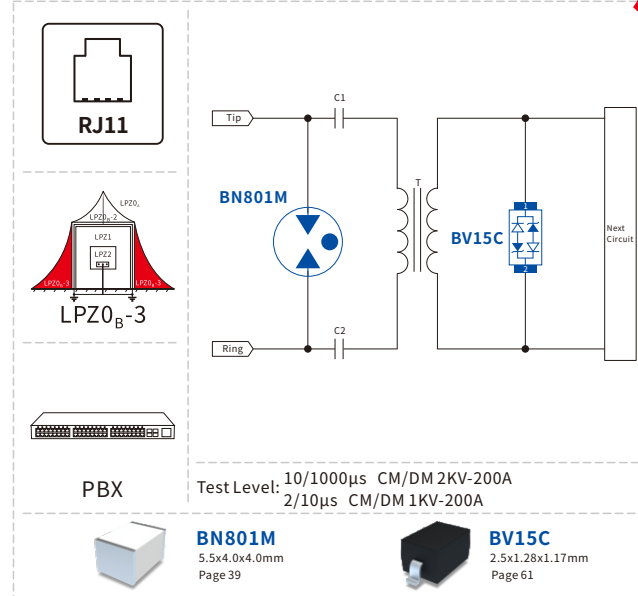
DC5V



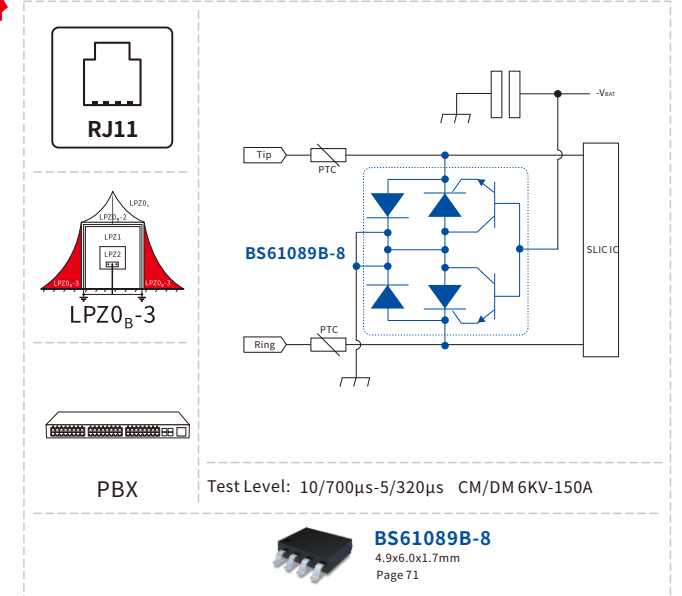
DC3.3V



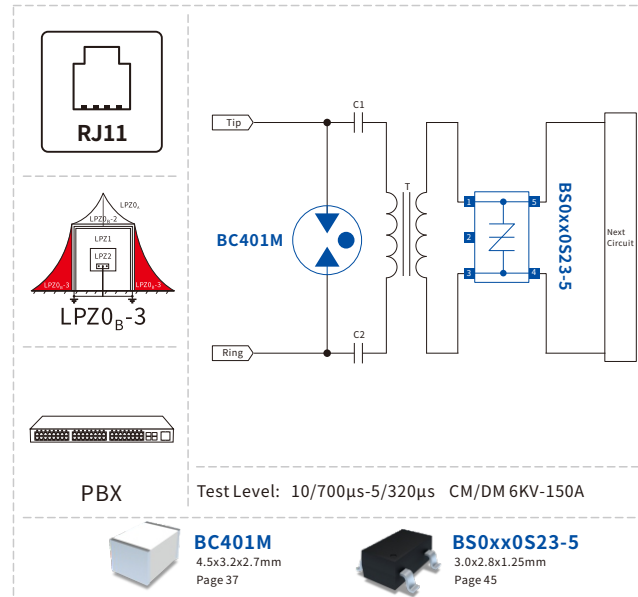
RJ11 G.Fast



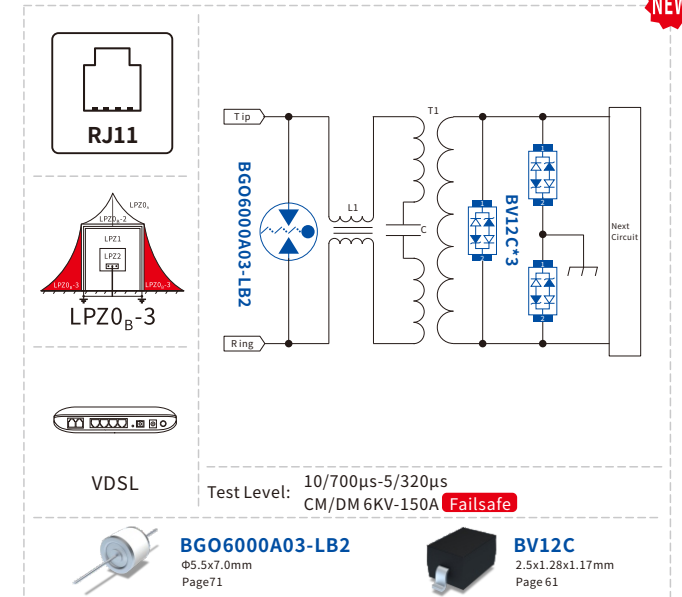
RJ11 SLIC



RJ11 xDSL



RJ11



Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

RJ11

RJ11

LPZ0_B-3

PSTN

B3Y471M
6.2x3.2x2.3mm
Page 39

BS008023-5
3.0x2.8x1.25mm
Page 45

Test Level: 10/700μs-5/320μs CM/DM 6KV-150A

RJ11

RJ11

LPZ1

POS

BS3100N-C-F
5.4x3.3x2.0mm
Page 45

Test Level: 10/700μs-5/320μs CM/DM 6KV-150A

RJ11

RJ11

LPZ0_B-3

Portection Unit

B3D470L-C
7.8x5.0x6.0mm
Page 39

Test Level: 10/700μs-5/320μs CM/DM 6KV-150A

RJ11

RJ11

LPZ0_B-2

PSTN

B3A420
4.2x2.7x3.9mm
Page 39

BV12C
2.5x1.28x1.17mm
Page 61

Test Level: 10/700μs-5/320μs 6KV-150A

RJ45-100M

RJ45

LPZ2

Switch

BV-SRV05-4
2.9x2.8x1.25mm
Page 61

Test Level: Contact 8KV Air 15KV

RJ45-100M

RJ45

LPZ1

Switch

BS4200N-2C
5.4x3.3x2.0mm
Page 45

BV03C-H
2.5x1.28x1.17mm
Page 61

Test Level: 10/700μs-5/320μs CM/DM 4KV-100A

RJ45-1G

RJ45

LPZ1

Switch

BS4200N-2C/BS0640N-2C
5.4x3.3x2.0mm
Page 45

BV03C-H
2.5x1.28x1.17mm
Page 61

Test Level: 10/700μs-5/320μs CM/DM 6KV-330A

RJ45-1G

RJ45

LPZ0_B-3

Outdoor AP

BZ801M
3.2x2.5x2.5mm
Page 35

BV03C-H
2.5x1.28x1.17mm
Page 61

Test Level: 10/700μs-5/320μs CM 6KV-150A
Hi-pot DC500V

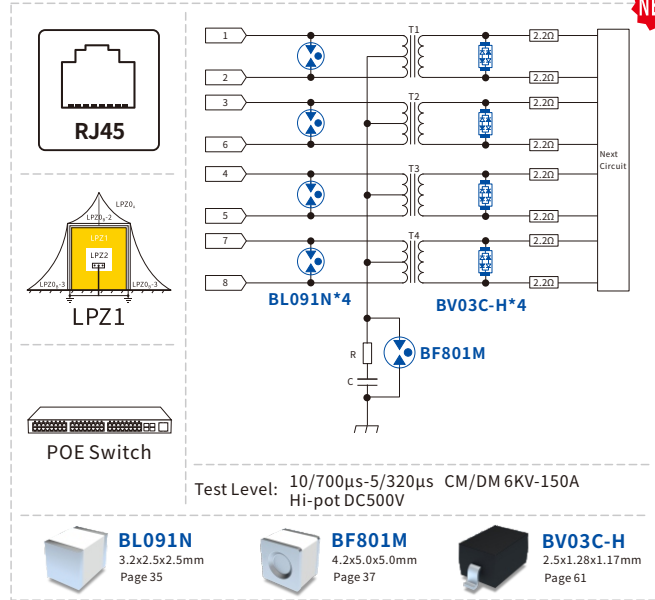
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

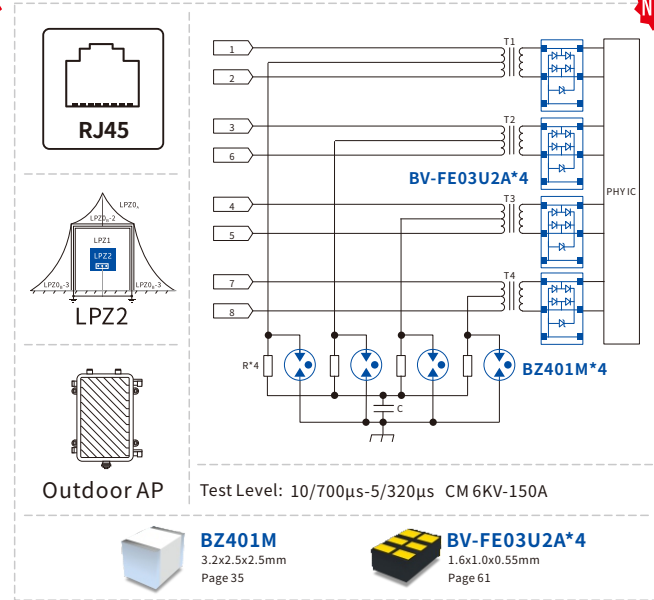
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

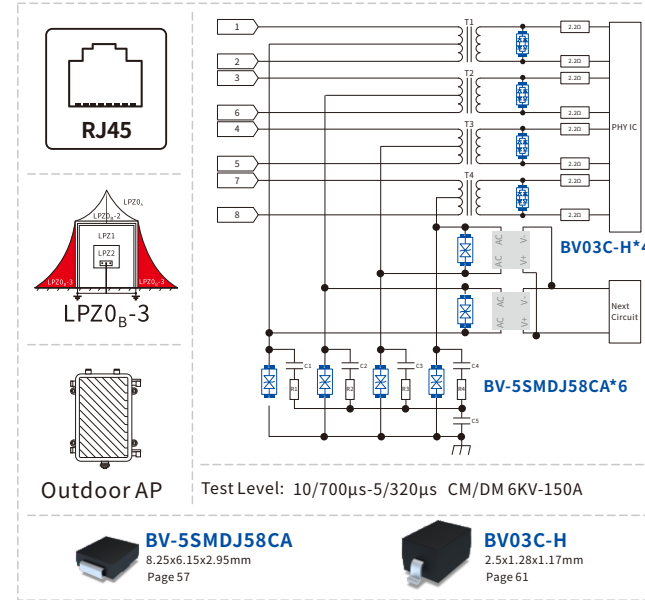
RJ45-1G



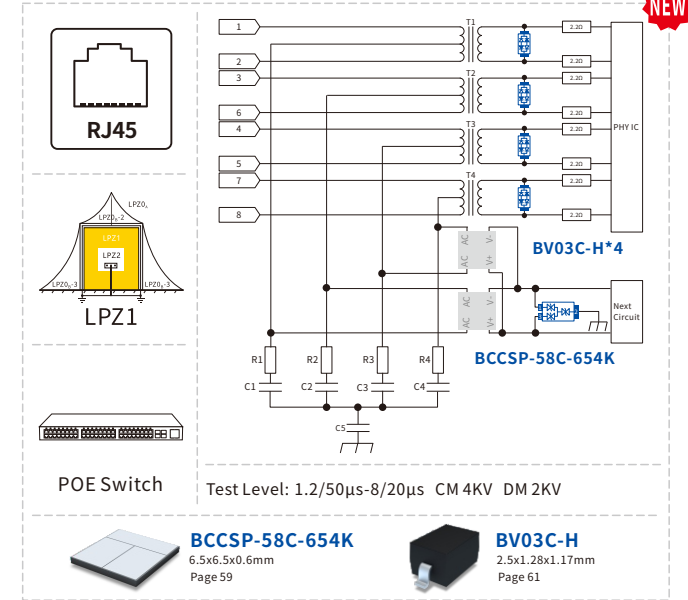
RJ45-10G



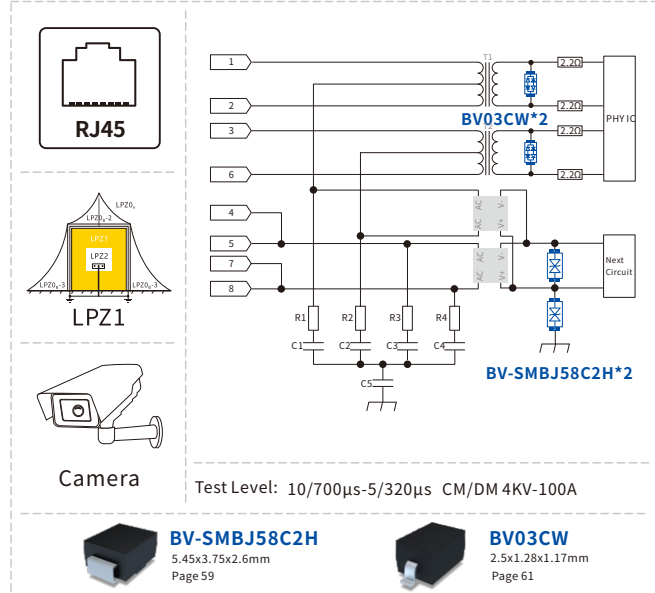
RJ45-1G PD



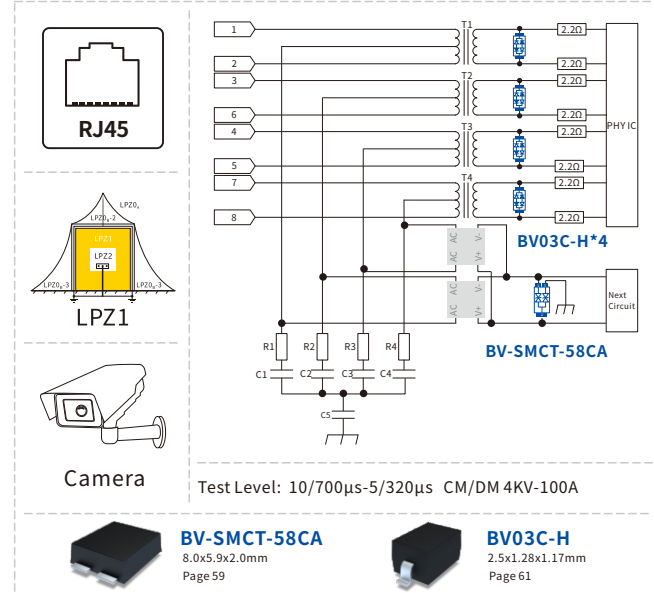
RJ45-1G PD



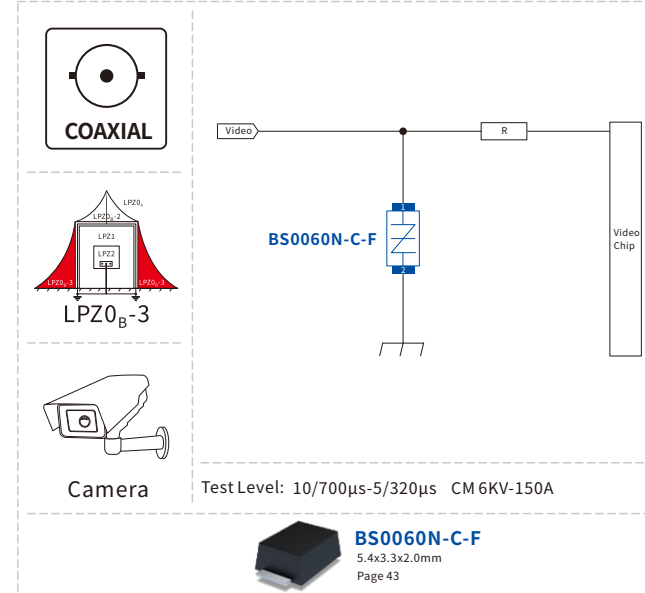
RJ45-100M PD



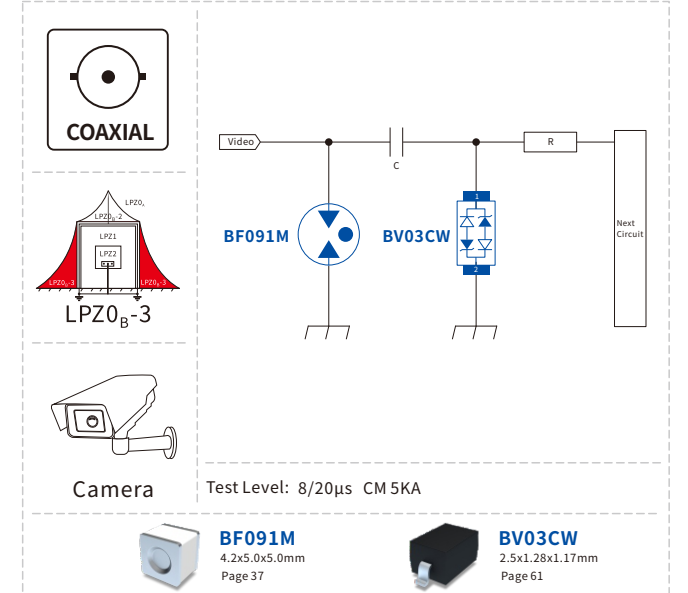
RJ45-1G PD



CVBS



SDI



Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

HD-Analog

COAXIAL

LPZ0_B-3

Camera

BS0060M-3
5.0x2.5x2.3mm
Page 43

Test Level: 1.2/50μs-8/20μs CM4KV-95.2A

HD-Analog

COAXIAL

LPZ1

NVR/DVR

BS0060M-BH
5.0x2.5x2.3mm
Page 43

Test Level: 10/700μs-5/320μs CM/DM 4KV-100A

HD-Analog

COAXIAL

LPZ0_B-3

Camera

BS0060N-C-FS
5.4x3.3x2.0mm
Page 43

Test Level: 10/700μs-5/320μs CM 6KV-150A

Coaxial

COAXIAL

LPZ0_B-3

Set-Top Box

BC091N-H
4.5x3.2x2.7mm
Page 41

BVxxC
2.5x1.28x1.17mm
Page 61

Test Level: 1.2/50μs-8/20μs CM 6KV-3KA

Coaxial

COAXIAL

LPZ0_B-2

LNB

BX091N
4.2x3.5x3.5mm
Page 37

BV05C
2.5x1.28x1.17mm
Page 61

Test Level: 8/20μs CM 3KA

Coaxial

COAXIAL

LPZ0_B-2

LNB

BN091M
5.5x4.0x4.0mm
Page 37

BV-FA05UC
1.0x0.6x0.5mm
Page 63

Test Level: 8/20μs CM 5KA

Coaxial

COAXIAL

LPZ0_B-2

LNB

BW231M
7.0x6.0x6.0mm
Page 43

BV-FA05UC
1.0x0.6x0.5mm
Page 65

Test Level: 8/20μs CM 10KA

SPD Coaxial

COAXIAL

LPZ0_B-3

Coaxial SPD

BN091M
5.5x4.0x4.0mm
Page 41

Test Level: 8/20μs CM 5KA

Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

SPD Coaxial

COAXIAL

LPZ0_B-1

Coaxial SPD

BW231M
7.0x6.0x6.0mm
Page 39

Coaxial connector

Surge port

Protective port

PE

Test Level: 8/20μs CM 10KA

RS485

RS485

LPZ2

RS485 Converter

BV_SM712
2.9x2.4x1.0mm
Page 61

Next Circuit

Test Level: Contact8KV Air15KV

RS485

RS485

LPZ0_B-2

AISG

B3D090M-C
7.8x5.0x6.0mm
Page 39

BV-SMBT-15CA
5.4x3.3x2.0mm
Page 61

Ain

B in

R/PTC

GND

Next Circuit

Test Level: 8/20μs CM/DM 3KA

ALARM

ALARM

LPZ1

Camera

BV-SMBT-15CA
5.4x3.3x2.0mm
Page 59

Ain

B in

R1

R2

GND

Next Circuit

Test Level: 1.2/50μs-8/20μs CM/DM 1KV-500A

RS485

RS485

LPZ0_B-3

RS485 Converter

BS0060N-2C
5.4x3.3x2.0mm
Page 45

A IN

B IN

R1

R2

Next Circuit

Test Level: 10/700μs-5/320μs CM/DM 6KV-150A

RS485

RS485

LPZ0_B-2

AISG

BS0060U-2G-1
8.0x5.9x2.0mm
Page 49

A IN

B IN

R1

R2

Next Circuit

Test Level: 8/20μs CM/DM 3KA

ALARM

ALARM

LPZ0_B-2

Camera

B3D090M-C
7.8x5.0x6.0mm
Page 39

BV-SMBT-15CA
5.4x3.3x2.0mm
Page 59

Ain

B in

R/PTC

GND

Next Circuit

Test Level: 8/20μs CM/DM 3KA

IO

I/O

LPZ0_B-3

I/O module

BS0300N-2C
5.4x3.3x2.0mm
Page 45

A IN

B IN

R1

R2

Next Circuit

Test Level: 10/700μs-5/320μs CM/DM 6KV 150A

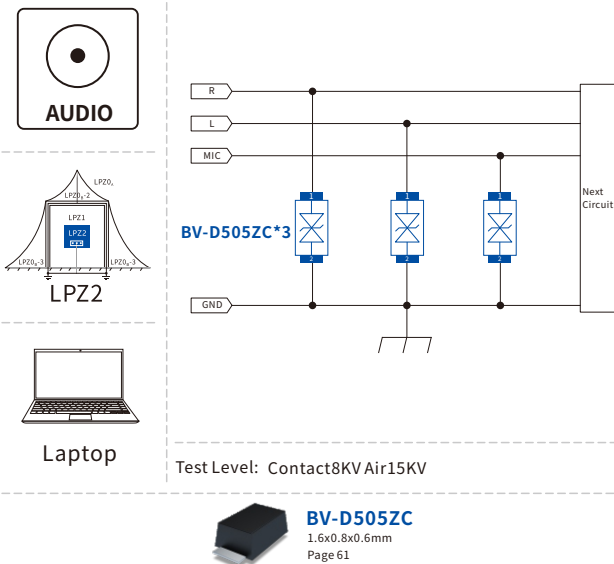
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

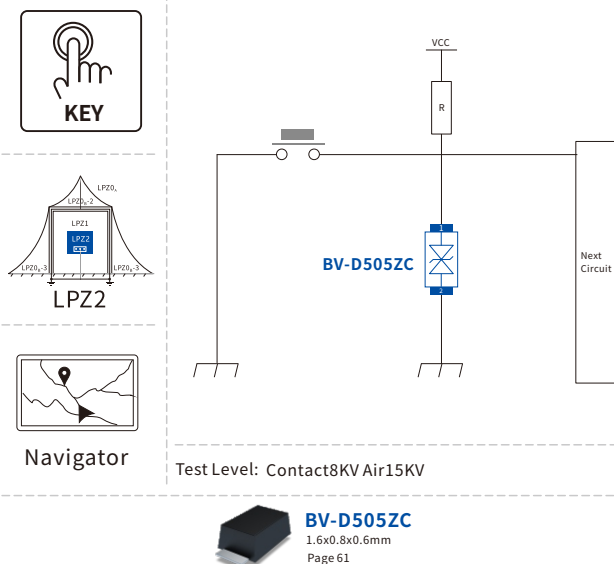
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

AUDIO



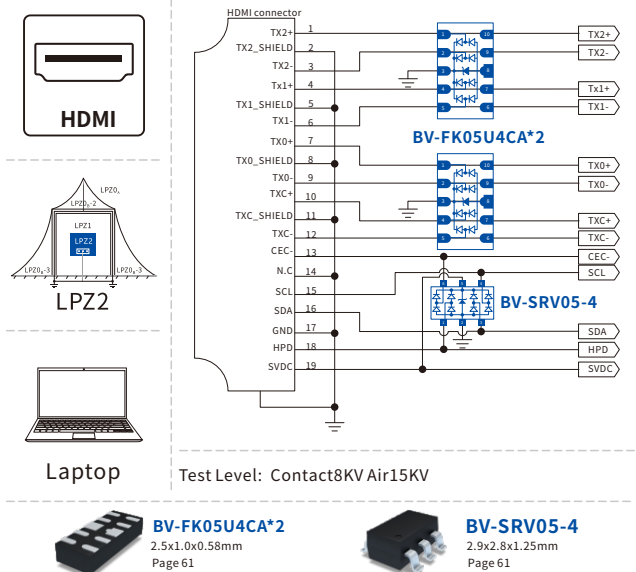
KEY



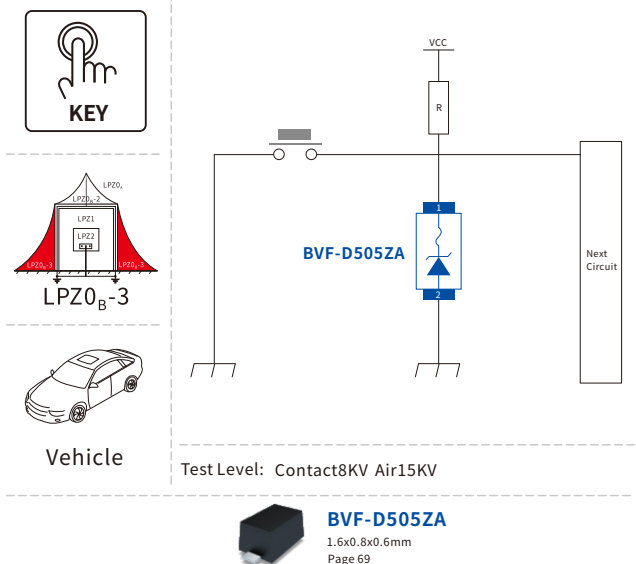
Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

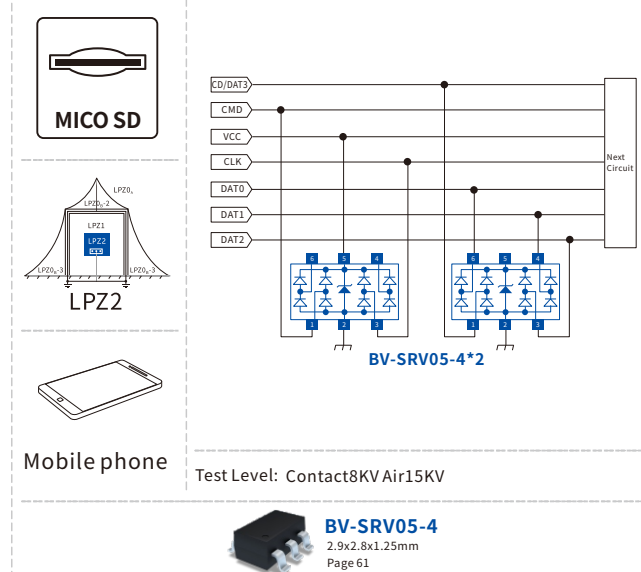
HDMI



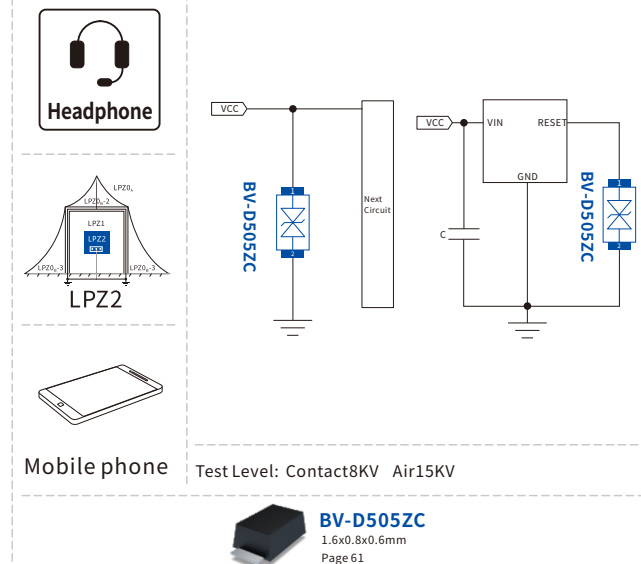
KEY



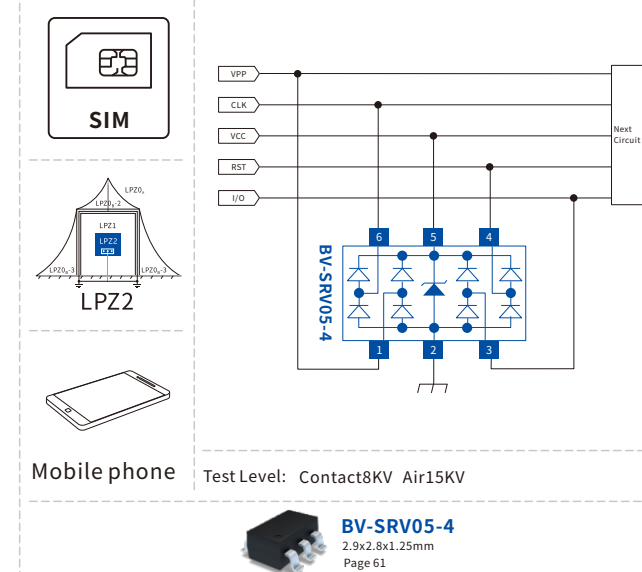
SD



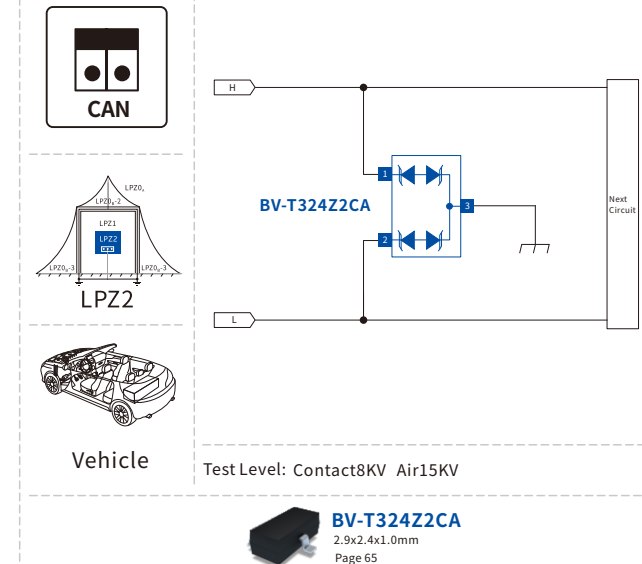
Speaker Headphone and Reset



SIM



CAN BUS



Notes: CM=Common Mode / DM=Differential Mode

Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

USB2.0 2in1

USB2.0

LPZ2

Laptop

BV-SRV05-4
2.9x2.8x1.25mm
Page 61

Test Level: Contact8KV Air15KV

USB2.0

USB2.0

LPZ2

Laptop

BV-SR05
3.0x2.55x1.15mm
Page 61

Test Level: Contact8KV Air15KV

VGA

VGA

LPZ2

Laptop

BV-SRV05-4*2
2.9x2.8x1.25mm
Page 61

Test Level: Contact8KV Air15KV

Touch Screen

Touch Screen

LPZ2

Mobile phone

BV-FK05U4CA
2.5x1.0x0.58mm
Page 61

BV-FA05ZC
1.0x0.6x0.5mm
Page 63

Test Level: Contact8KV Air15KV

USB3.0

USB3.0

LPZ2

Laptop

BV-SR05
3.0x2.55x1.15mm
Page 61

BV-FK05U4CA
2.5x1.0x0.58mm
Page 61

Test Level: Contact8KV Air15KV

USB3.0

USB3.0

LPZ2

Laptop

BV-F603UCA
0.6x0.3x0.3mm
Page 63

Test Level: Contact30KV Air30KV

TYPE-C

TYPE-C

LPZ2

Mobile phone

BV-FK05U4CA
2.5x1.0x0.58mm
Page 61

BV-FE05ZA
1.6x0.8x0.5mm
Page 61

Test Level: Contact8KV Air15KV

ECG Cable

ECG CABLE

LPZ1

ECG monitor

BF091M
4.2x5.0x5.0mm
Page 37

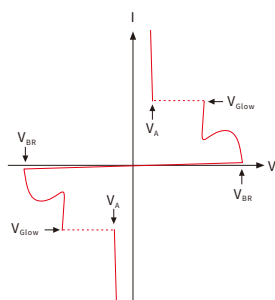
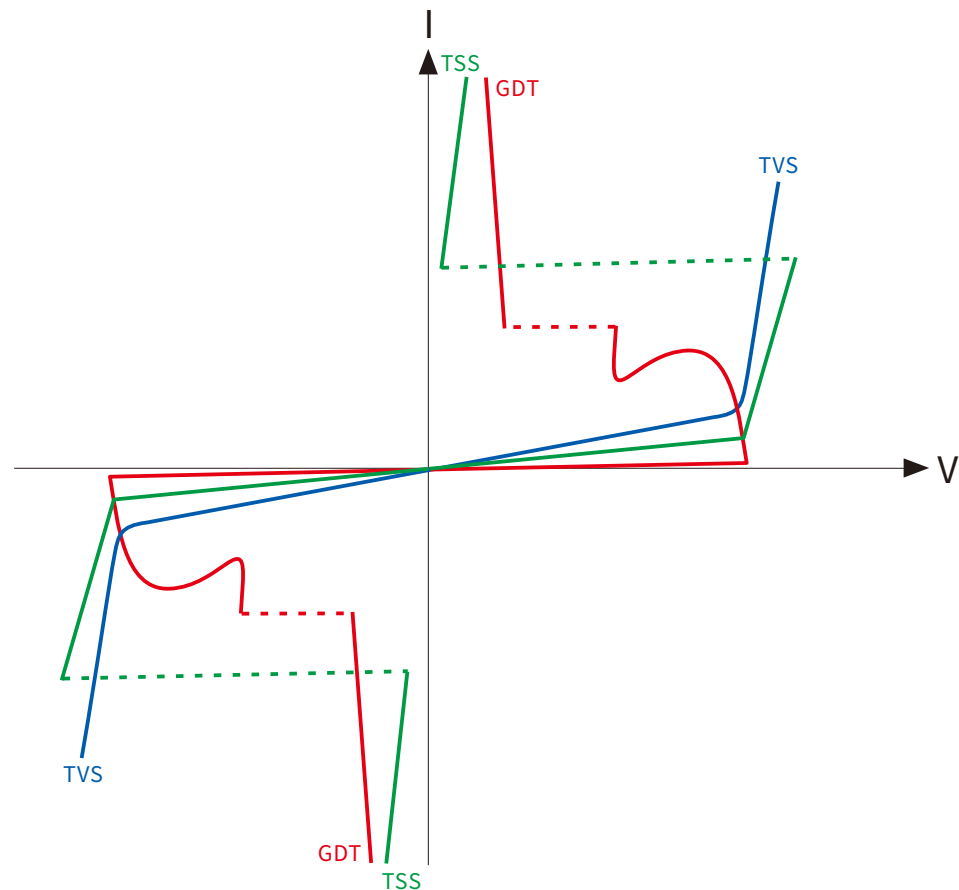
Test Level: AEDS 360J

Notes: CM=Common Mode / DM=Differential Mode

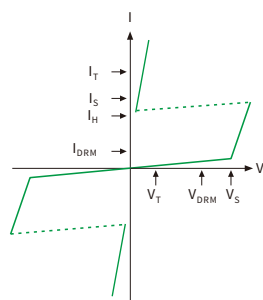
Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.

Notes: CM=Common Mode / DM=Differential Mode

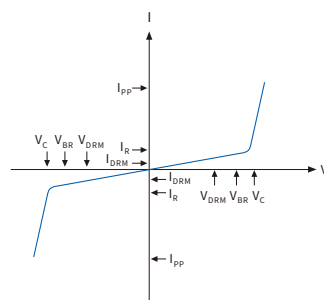
Statement: This solution is only for reference, the final solution will be based on the actual test results. Shenzhen Bencent Electronics Co.,Ltd reserves the right of final explanation.



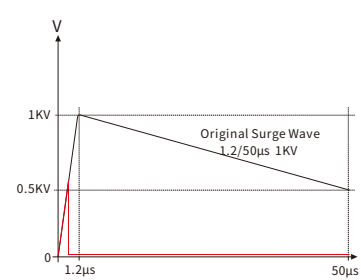
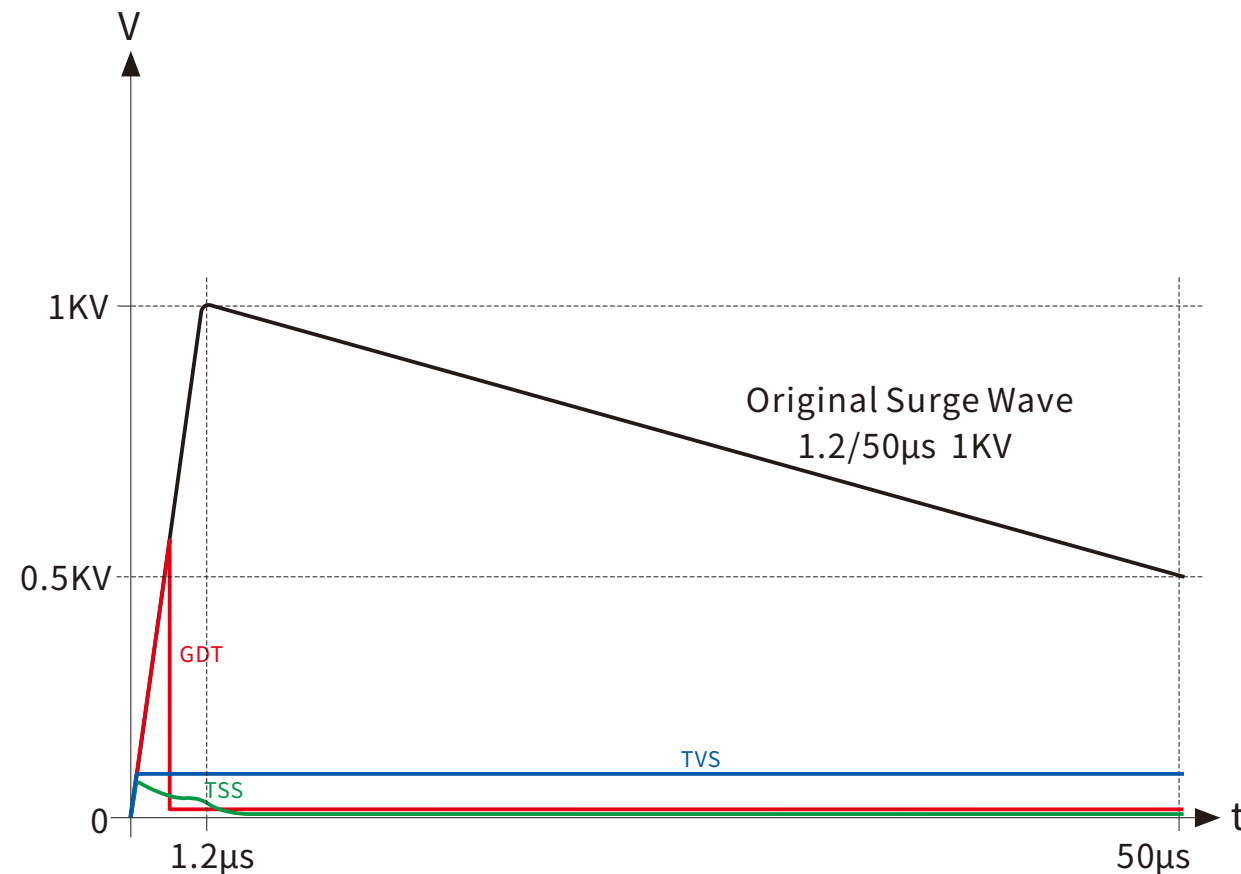
— GDT



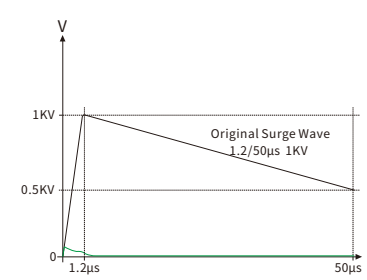
— TSS



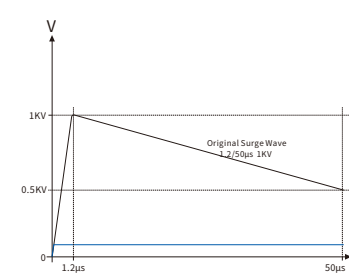
— TVS



— GDT
 $V_{DRM}=90V$



— TSS
 $V_{DRM}=58V$



— TVS
 $V_{DRM}=58V$

Part Number	DC Breakdown Voltage(V _{BR}) 100V/s (V)	Tolerance of V _{BR} (V)	Impulse Spark-over Voltage 1KV/μs (V)	Arc Voltage (V _a) (V)@1A	Impulse Discharge Current 8/20μs (KA)	Insulation Resistance (GΩ) @DC (V)		Capacitance Co(pF) 0.5VDC@1MHz	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
													UL497B	UL1449	New products
BS201N	200	140-260	≤850	~10	0.5	≥1	100	≤0.6	3.2x1.6x1.6	Ethernet					
BS401N	400	280-520	≤1100	~8	0.5	≥1	100	≤0.6	3.2x1.6x1.6	Ethernet					
BZ091N	90	63-117	≤700	~8	1	≥1	50	≤0.5	3.2x2.5x2.5	Coaxial/Internet					
BZ201M	200	160-240	≤800	~8	1	≥1	100	≤0.5	3.2x2.5x2.5	RJ11/RJ45					
BZ301M	300	240-360	≤850	~8	1	≥1	100	≤0.5	3.2x2.5x2.5	RS485/232/422					
BZ401M	400	360-580	≤950	~10	1	≥1	100	≤1.0	3.2x2.5x2.5	Ethernet					
BZ801M	800	640-960	≤1300	~10	1	≥1	100	≤1.0	3.2x2.5x2.5	Ethernet					
BG075N	75	53-977	≤650	~8	1	≥1	25	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG091N	90	63-117	≤650	~10	1	≥1	50	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG151N	150	105-195	≤700	~10	1	≥1	50	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG201N	200	140-260	≤750	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG301N	300	210-390	≤850	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG401N	400	280-520	≤1000	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG601M	600	480-720	≤1200	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG801M	800	640-960	≤1300	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BG102M	1000	800-1200	≤1500	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL075N	75	53-977	≤650	~8	1	≥1	25	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL091N	90	63-117	≤650	~10	1	≥1	50	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL151N	150	105-195	≤700	~10	1	≥1	50	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL201N	200	140-260	≤750	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL301N	300	210-390	≤850	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL401N	400	280-520	≤1000	~10	1	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL601M	600	480-720	≤1200	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL801M	800	640-960	≤1300	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BL102M	1000	800-1200	≤1500	~10	0.5	≥1	100	≤0.5	2.9x2.1x1.9	RS485/232/422					
BA151N	150	105-195	≤750	~8	1	≥1	50	≤1	4.5x3.2x2.7	Coaxial					
BA201N	200	140-260	≤750	~8	1	≥1	100	≤1	4.5x3.2x2.7	RS485/232/422					
BA301N	300	210-390	≤800	~8	1	≥1	100	≤1	4.5x3.2x2.7	RS485/232/422					
BA301N-D	300	210-390	≤750	~15	1	≥1	100	≤1	4.5x3.2x2.7	DC12V/AC24V					
BA401N-D	400	340-550	≤750	~15	1	≥1	100	≤1	4.5x3.2x2.7	xDSL					
BA601N	600	420-780	≤1200	~15	1	≥1	100	≤1	4.5x3.2x2.7	Ethernet					
BC091N	90	63-117	≤650	~8	2	≥1	50	≤1	4.5x3.2x2.7	Coaxial					

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number	DC Breakdown Voltage(V _{BR}) 100V/s (V)	Tolerance of V _{BR} (V)	Impulse Spark-over Voltage 1KV/μs (V)	Arc Voltage (V _a) (V)@1A	Impulse Discharge Current 8/20μs (KA)	Insulation Resistance (GΩ) @DC (V)	Capacitance Co(pF) 0.5VDC@1MHz	Size L*W*H (mm)	Application	Circuit	Outline	Remarks			
												UL497B	UL1449	New products	
BC151N	150	105-195	≤750	~8	2	≥1	50	≤1	4.5x3.2x2.7	Coaxial			●	○	○
BC201N	200	140-260	≤800	~8	2	≥1	100	≤1	4.5x3.2x2.7	RS485/232/422			●	○	○
BC301N-D	300	210-390	≤750	~15	2	≥1	100	≤1	4.5x3.2x2.7	DC12V/AC24V			●	○	○
BC401M	400	360-560	≤950	~15	2	≥1	100	≤1	4.5x3.2x2.7	xDSL			●	○	○
BC601N	600	420-780	≤1200	~15	2	≥1	100	≤1	4.5x3.2x2.7	Ethernet			●	○	○
BC091N-H	90	63-117	≤650	~8	3	≥1	50	≤0.5	4.5x3.2x2.7	Coaxial			●	○	○
BX091N	90	63-117	≤650	~10	3	≥1	50	≤0.6	4.2x3.5x3.5	Coaxial			○	○	○
BX151N	150	105-195	≤650	~10	3	≥1	100	≤0.6	4.2x3.5x3.5	Ethernet			○	○	○
BX201N	200	140-260	≤750	~10	3	≥1	100	≤0.6	4.2x3.5x3.5	Coaxial			○	○	○
BX301N	300	210-390	≤850	~10	3	≥1	100	≤0.6	4.2x3.5x3.5	Ethernet			○	○	○
BX401N-D	400	350-560	≤750	≥18	3	≥1	100	≤0.6	4.2x3.5x3.5	Ethernet			○	○	○
BN075M	75	60-90	≤600	~8	5	≥1	25	≤0.5	5.5x4.0x4.0	RS485/232/422			○	○	●
BN091M	90	72-108	≤600	~8	5	≥1	50	≤0.5	5.5x4.0x4.0	RS485/232/422			○	○	●
BN151M	150	120-180	≤650	~12	5	≥1	100	≤0.5	5.5x4.0x4.0	AC Power/Xdsl			○	○	●
BN301M	300	240-360	≤850	~15	5	≥1	100	≤0.5	5.5x4.0x4.0	DC Power/AC Power			○	○	●
BN401M	400	320-480	≤850	~15	5	≥1	100	≤0.5	5.5x4.0x4.0	Ethernet			○	○	●
BN601M	600	480-720	≤1200	~15	5	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN801M	800	640-960	≤1400	~15	5	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN102M	1000	800-1200	≤1600	~15	5	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN152M	1500	1200-1800	≤2500	~15	3	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN202M	2000	1600-2400	≤3000	~15	3	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN252M	2500	2000-3000	≤3500	~25	3	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN302M	3000	2400-3600	≤4000	~25	3	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BN362M	3600	2880-4320	≤4800	~30	3	≥1	100	≤0.5	5.5x4.0x4.0	AC Power			○	○	●
BF091M	90	72-108	≤650	~8	5	≥1	50	≤1.0	4.2x5.0x5.0	RS485/232/422			●	○	○
BF151M	150	120-180	≤420	~13	5	≥1	100	≤0.8	4.2x5.0x5.0	AC Power/xDSL			●	○	○
BF231M	230	184-276	≤700	~8	5	≥1	100	≤1.0	4.2x5.0x5.0	RS485/232/422			●	○	○
BF351M	350	280-420	≤750	≥15	5	≥1	100	≤1.0	4.2x5.0x5.0	DC12V/AC24V			●	○	○
BF471M	470	376-564	≤850	~15	5	≥1	100	≤0.8	4.2x5.0x5.0	xDSL			●	○	○
BF601M	600	480-720	≤1200	~8	5	≥1	100	≤1.0	4.2x5.0x5.0	AC Power			●	○	○
BF801M	800	640-960	≤1600	~15	3	≥1	100	≤1.0	4.2x5.0x5.0	AC Power/xDSL			●	○	○
BF102M	1000	800-1200	≤1800	~15	3	≥1	100	≤1.0	4.2x5.0x5.0	AC Power			●	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number	DC Breakdown Voltage(V _{BR}) 100V/s (V)	Tolerance of V _{BR} (V)	Impulse Spark-over Voltage 1KV/μs (V)	Arc Voltage (V _a) (V)@1A	Impulse Discharge Current 8/20μs (KA)	Insulation Resistance (GΩ) @DC (V)	Capacitance Co(pF) 0.5VDC@1MHz	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
												UL497B	UL1449	New products
BF122M	1200	960-1440	≤2000	~15	3	≥1	100	4.2x5.0x5.0	AC Power			○	○	○
BW151M	150	120-180	≤700	~12	10	≥1	100	7.0x6.0x6.0	Coaxial			●	○	○
BW231M	230	184-276	≤800	~12	10	≥1	100	7.0x6.0x6.0	Coaxial			●	○	○
BM091M	90	72-108	≤600	~8	20	≥1	50	8.3x8.3x6.0	DC Power			○	●	○
BM351M	350	280-420	≤650	~15	20	≥1	100	8.3x8.3x6.0	DC Power			○	○	○
BM471M	470	376-564	≤850	~15	20	≥1	100	8.3x8.3x6.0	AC Power			○	○	○
BM601M	600	480-720	≤950	~15	20	≥1	100	8.3x8.3x6.0	AC Power			○	○	○
BM801M	800	640-960	≤1200	~15	20	≥1	100	8.3x8.3x6.0	AC Power			○	●	○
BM152M	1500	1200-1800	≤2500	~15	10	≥1	100	8.3x8.3x6.0	AC Power			○	○	○
BM362M	3600	2880-4320	≤5500	~30	5	≥1	100	8.3x8.3x6.0	AC Power			○	○	○
BD122-1	1200	840-1440	≤2300	≥60	20	≥1	100	16.5x9.5x8.3	DC 48V			○	●	○
BD122-2	1200	700-1200	≤2300	≥60@50A	20	≥1.5	100	16.5x9.5x8.3	DC 48V			○	●	○
BD351	1200	280-420	≤950@1.2/50μs 6KV	>80	20	≥1	100	19.9x9.3x8.3	DC 48V			○	●	○
B5G470L	470	376-564	≤850	~15	5	≥1	100	Φ5.5x6.0	AC Power			●	○	○
B5G600L	600	480-720	≤950	~15	5	≥1	100	Φ5.5x6.0	AC Power			●	○	○
B5G800L	800	640-960	≤1600	~15	5	≥1	100	Φ5.5x6.0	AC Power			○	○	○
B5G3600	3600	2880-4680	≤5500@1.2/50μs 6KV	~15	3	≥1	100	Φ5.5x6.0	AC Power			○	●	○
B5G3600-C	3600	2880-4320	≤4800	~30	3	≥1	100	6.0x5.5x5.5	AC Power			○	●	○
B5G3600-7	3600	2880-4320	≤4800	~35	3	≥1	100	Φ5.5x6.0	AC Power			○	●	○
B8G600M	600	480-720	≤1400	~15	10	≥1	100	Φ8.0x6.0	AC Power			●	○	○
B8G800M	800	640-960	≤1600	~15	10	≥1	100	Φ8.0x6.0	AC Power			●	○	○
B8G1500M	1500	1200-1800	≤2700	~15	10	≥1	100	Φ8.0x6.0	AC Power			○	●	○
B8G3600L	3600	2880-4320	≤6000@1.2/50μs 6KV	~15	5	≥1	100	Φ8.0x6.0	AC Power			○	●	○
B3A420	470	360-560	≤950	≥10	2	≥1	100	4.2x2.7x3.9	xDSL			●	○	○
B3Y471M	470	360-540	≤850	~8	1	≥1	100	6.2x3.2x2.3	xDSL			●	○	○
B3Q420	420	360-560	≤950	~20	2	≥1	100	6.8x3.5x3.5	xDSL			●	○	○
B3D090L-C	90	68-112	≤700	~8	5	≥1	50	7.8x5.0x6.0	RS485/232/422			●	○	○
B3D230L-CD	230	200-380	≤800	>15	5	≥1	100	7.8x5.0x6.0	DC12V/AC24V			○	○	○
B3D230L-C	230	184-276	≤800	~8	5	≥1	100	7.8x5.0x6.0	DC12V/AC24V			●	○	○
B3D420L-C	420	336-504	≤950	~8	5	≥1	100	7.8x5.0x6.0	xDSL			●	○	○
B3D470L-C	470	360-560	≤950	~8	5	≥1	100	7.8x5.0x6.0	xDSL			●	○	○
B3D470L-1	470	350-500	≤950	~8	5	≥1	100	7.3x5.0x5.0	xDSL			●	○	○

Part Number	Off state Voltage		Switching Voltage		On state Voltage		Holding Current I _H (mA)	Capacitance Co (pF) 2V@1MHz Max	Surge Waveform (μs)	Surge Peak (KV)	Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
	VDRM (V)	ID (μA) Max	V _s (V) Max	I _s (mA)	V _T (V) Max	I _T (A)											UL497B	UL1449	New products
BS0060D1	6	5	25	800	4	2.2	≥15	80	10/700	1.5	SOD123	3.7x1.6x1.1	B006D-1	video			○	○	○
BS0060D-2	6	5	25	800	4	2.2	≥10	10	1.2/50	3KV(42Ω)	SOD123F	3.7x1.8x1.2	B006D-2	video			○	○	○
BS0060M-2	6	5	25	800	4	2.2	≥10	10	1.2/50	3KV(42Ω)	SMA	5.0x2.5x2.3	B006M-2	video			○	○	○
BS0060M-3	6	5	25	800	4	2.2	≥10	20	1.2/50	4KV(42Ω)	SMA	5.0x2.5x2.3	B006M-3	video			○	○	○
BS0060M	6	5	25	800	4	2.2	≥50	50	10/700	2	SMA	5.0x2.5x2.3	B006M	video			○	○	○
BS0060M-BH	6	5	25	800	4	2.2	≥10	20	10/700	4	SMA	5.0x2.5x2.3	6MLC	video			○	○	○
BS0060M-BC	6	5	15	800	4	2.2	≥15	80	10/700	4	SMA	5.0x2.5x2.3	6MSA	video			○	○	○
BS0080M	6	5	25	800	4	2.2	≥50	60	10/700	3	SMA	5.0x2.5x2.3	B008M	video			○	○	○
BS0060N-C	6	5	25	800	4	2.2	≥15	100	10/700	6	SMB	5.2x3.6x2.3	B006NC	video			●	○	○
BS0300N-C	25	5	40	800	4	2.2	≥50	100	10/700	6	SMB	5.2x3.6x2.3	B03NC	RS485/232/422			●	○	○
BS0640N-C	58	5	77	800	4	2.2	≥150	100	10/700	6	SMB	5.2x3.6x2.3	B06NC	POE			●	○	○
BS1100N1	95	5	130	800	4	2.2	≥120	150	10/700	3	SMB	5.2x3.6x2.3	B11NB1	SLIC			●	○	○
BS1300N-C	120	5	160	800	4	2.2	≥120	85	10/700	6	SMB	5.2x3.6x2.3	B13NC	IPC			○	○	○
BS2300N	190	5	260	800	4	2.2	≥150	80	10/700	4	SMB	5.2x3.6x2.3	B23NB	xDSL/SLIC			●	○	○
BS2300N-C	190	5	260	800	4	2.2	≥150	45	10/700	6	SMB	5.2x3.6x2.3	B23NC	RJ11			●	○	○
BS3100N	275	5	350	800	4	2.2	≥150	60	10/700	4	SMB	5.2x3.6x2.3	B31NB	POS			●	○	○
BS3100N-C	275	5	350	800	4	2.2	≥120	80	10/700	6	SMB	5.2x3.6x2.3	B31NC	RJ45			●	○	○
BS3500N-A	320	5	400	800	4	2.2	≥150	20	10/700	3	SMB	5.2x3.6x2.3	B35NA	xDSL			●	○	○
BS3500N	320	5	400	800	4	2.2	≥150	25	10/700	4	SMB	5.2x3.6x2.3	B35NB	xDSL			●	○	○
BS3500N-C	320	5	400	800	4	2.2	≥150	35	10/700	6	SMB	5.2x3.6x2.3	B35NC	xDSL			●	○	○
BS0060N-C-F	6	5	25	800	4	2.2	≥15	100	10/700	6	SMB-F	5.4x3.3x2.0	B006NC	video			●	○	○
BS0060N-C-FLC	6	5	25	800	4	2.2	≥15	55	10/700	6	SMB-F	5.4x3.3x2.0	6NCLC	video			○	○	○
BS0060N-C-FS	6	5	25	800	4	2.2	≥10	25	10/700	6	SMB-F	5.4x3.3x2.0	6NCS	video			○	○	○
BS0300N-C-F	25	5	40	800	4	2.2	≥50	100	10/700	6	SMB-F	5.4x3.3x2.0	B03NC	RS485/232/422			●	○	○
BS0640N-C-F	58	5	77	800	4	2.2	≥150	100	10/700	6	SMB-F	5.4x3.3x2.0	B06NC	POE			●	○	○
BS1100N-A1-F	95	5	130	800	4	2.2	≥120	100	10/700	3	SMB-F	5.4x3.3x2.0	B11NA1	SLIC			●	○	○
BS1100N-D1	95	5	130	800	4	2.2	≥50	150	8/20	800(A)	SMB-F	5.4x3.3x2.0	B11ND1	SLIC			○	○	○
BS1100N-D1-L	115	5	135	800	4	2.2	≥120	160	8/20	800(A)	SMB-F	5.4x3.3x2.0	B11ND1L	SLIC			○	○	○
BS1300N-C-F	120	5	160	800	4	2.2	≥120	85	10/700	6	SMB-F	5.4x3.3x2.0	B13NC	IPC			○	○	○
BS2300N-A-F	190	1	260	800	4	2.2	≥150	25	10/700	3	SMB-F	5.4x3.3x2.0	B23NA	xDSL			●	○	○
BS2300N-F	190	5	260	800	4	2.2	≥150	80	10/700	4	SMB-F	5.4x3.3x2.0	B23NB	xDSL/SLIC			●	○	○
BS2300N-C-F	190	5	260	800	4	2.2	≥150	45	10/700	6	SMB-F	5.4x3.3x2.0	B23NC	RJ11			●	○	○

Part Number	Off state Voltage		Switching Voltage		On state Voltage		Holding Current I _H (mA)	Capacitance Co (pF) 2V@1MHz Max	Surge Waveform (μs)	Surge Peak (KV)	Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
	VDRM (V)	ID (μA) Max	V _s (V) Max	I _s (mA)	V _T (V) Max	I _T (A)											UL497B	UL1449	New products
BS3100N-F	275	5	350	800	4	2.2	≥150	60	10/700	4	SMB-F	5.4x3.3x2.0	B31NB	POS			●	○	○
BS3100N-C-F	275	5	350	800	4	2.2	≥120	80	10/700	6	SMB-F	5.4x3.3x2.0	B31NC	RJ45			●	○	○
BS3100N-E-F	275	5	350	800	4	2.2	≥50	80	10/1000	200A	SMB-F	5.4x3.3x2.0	B31NE	Ethernet			○	○	○
BS3500N-A-F	320	5	400	800	4	2.2	≥150	20	10/700	3	SMB-F	5.4x3.3x2.0	B35NA	xDSL			●	○	○
BS3500N-F	320	5	400	800	4	2.2	≥150	25	10/700	4	SMB-F	5.4x3.3x2.0	B35NB	xDSL			●	○	○
BS3500N-C-F	320	5	400	800	4	2.2	≥150	35	10/700	6	SMB-F	5.4x3.3x2.0	B35NC	xDSL			●	○	○
BS4200N-C-F	400	5	520	800	4	2.2	≤50	35	10/700	6	SMB-F	5.4x3.3x2.0	B42NC	Ethernet			●	○	○
BS4200N-D-F	400	5	520	800	4	2.2	≤50	35	10/700	8	SMB-F	5.4x3.3x2.0	B42ND	Ethernet			●	○	○
BS4200N-E-F	400	5	520	800	4	2.2	≤50	70	10/1000	200(A)	SMB-F	5.4x3.3x2.0	B42NE	Ethernet			○	○	○
BS7000N-C-F	700	10	850	800	4	2.2	≤50	50	10/700	6	SMB-F	5.4x3.3x2.0	B70NC	G.FAST			○	○	○
BS8000N-C-F	750	10	1000	800	4	2.2	≤50	50	10/700	6	SMB-F	5.4x3.3x2.0	B80NC	Ethernet			○	○	○
BS0060N-2C	6 (Pin1,3-2)	5	25 (Pin1,3-2)	800	4	2.2	≥15	120	10/700	6	SMB-T	5.4x3.3x2.0	B006N2C	video			●	○	○
BS0300N-2C	25 (Pin1,3-2)	5	40 (Pin1,3-2)	800	4	2.2	≥50	100	10/700	6	SMB-T	5.4x3.3x2.0	B03N2C	RS485/232/422			●	○	○
BS0640N-2C	58 (Pin1,3-2)	5	77 (Pin1,3-2)	800	4	2.2	≥150	100	10/700	6	SMB-T	5.4x3.3x2.0	B06N2C	Ethernet			●	○	○
BS4200N-2C	400 (Pin1,3-2)	5	520 (Pin1,3-2)	800	4	2.2	≤50	35	10/700	6	SMB-T	5.4x3.3x2.0	B422NC	Ethernet			●	○	○
BS3500N-2B	320 (Pin1,3-2)	5	400 (Pin1,3-2)	800	4	2.2	≥10	50	10/700	4	SMB-T	5.4x3.3x2.0	B35N2B	Ethernet			●	○	○
BS3500N-2C	320 (Pin1,3-2)	5	520 (Pin1,3-2)	800	4	2.2	≤400	35	10/700	6	SMB-T	5.4x3.3x2.0	B35N2C	Ethernet			●	○	○
BS0060N-2B	6 (Pin1,3-2)	5	25 (Pin1,3-2)	800	4	2.2	≥15	90	10/700	4	SMB-T	5.4x3.3x2.0	B006N2B	RS485			●	○	○
BS1100N-2A1	95 (Pin1,3-2)	5	130 (Pin1,3-2)	800	4	2.2	≥120	100	10/700	2	SMB-T	5.4x3.3x2.0	B11N2A1	SLIC			○	○	○
BS0060U-2G	6 (Pin1,3-2)	5	25 (Pin1,3-2)	800	4	2.2	≥50	500	8/20	3(KA)	SMC-T	8.0x5.9x2.0	B006U2G	RS485/232/422			○	○	○
BS0060U-2G-1	6 (Pin1,3-2)	5	25 (Pin1,3-2)	800	4	2.2	≥50	500	8/20	3(KA)	SMC-T	8.0x5.9x2.0	B006U2G	RS485/232/422			○	○	○
BS4200Q-C	400	5	520	800	4	2.2	50	35	10/700	6	DFN	3.3x3.3x1.0	B420QC	Ethernet			●	○	○
BS0080S23-5	8	5	15	500	4	1	≥20	10	8/20	50(A)	SOT23-5	3.0x2.8x1.25	B008S23-5	xDSL			○	○	○
BS0120S23-5	12	5	20	500	4	1	≥20	10	8/20	50(A)	SOT23-5	3.0x2.8x1.25	B012S23-5	xDSL			○	○	○
BS0180S23-5	18	5	25	500	4	1	≥20	10	8/20	50(A)	SOT23-5	3.0x2.8x1.25	B018S23-5	xDSL			○	○	○
BS0240S23-5	24	5	35	500	4	1	≥20	10	8/20	50(A)	SOT23-5	3.0x2.8x1.25	B024S23-5	xDSL			○	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc @ IPP (V) (A) Max	BI					UNI	BI		UNI	UL497B		UL1449	New products	
BV-SMAJ5CA	BV-SMAJ5A	5	800	7	10	9.2 43.5	10/1000		400	SMA	5.25x2.85x2.5	A5C	A5	DC Power						
BV-SMAJ6CA	BV-SMAJ6A	6	800	7.37	10	10.3 38.8	10/1000		400	SMA	5.25x2.85x2.5	A6C	A6	DC Power						
BV-SMAJ6.5CA	BV-SMAJ6.5A	6.5	500	7.98	10	11.2 35.7	10/1000		400	SMA	5.25x2.85x2.5	A6.5C	A6.5	DC Power						
BV-SMAJ7CA	BV-SMAJ7A	7	200	8.6	10	12 33.3	10/1000		400	SMA	5.25x2.85x2.5	A7C	A7	DC Power						
BV-SMAJ7.5CA	BV-SMAJ7.5A	7.5	100	9.21	1	12.9 31	10/1000		400	SMA	5.25x2.85x2.5	A7.5C	A7.5	DC Power						
BV-SMAJ8CA	BV-SMAJ8A	8	50	9.83	1	13.6 29.4	10/1000		400	SMA	5.25x2.85x2.5	A8C	A8	DC Power						
BV-SMAJ8.5CA	BV-SMAJ8.5A	8.5	20	10.4	1	14.4 27.8	10/1000		400	SMA	5.25x2.85x2.5	A8.5C	A8.5	DC Power						
BV-SMAJ9CA	BV-SMAJ9A	9	10	11.1	1	15.4 26	10/1000		400	SMA	5.25x2.85x2.5	A9C	A9	DC Power						
BV-SMAJ10CA	BV-SMAJ10A	10	5	12.3	1	17 23.5	10/1000		400	SMA	5.25x2.85x2.5	A10C	A10	DC Power						
BV-SMAJ11CA	BV-SMAJ11A	11	1	13.5	1	18.2 22	10/1000		400	SMA	5.25x2.85x2.5	A11C	A11	DC Power						
BV-SMAJ12CA	BV-SMAJ12A	12	1	14.7	1	19.9 20.1	10/1000		400	SMA	5.25x2.85x2.5	A12C	A12	DC Power						
BV-SMAJ13CA	BV-SMAJ13A	13	1	15.9	1	21.5 18.6	10/1000		400	SMA	5.25x2.85x2.5	A13C	A13	DC Power						
BV-SMAJ14CA	BV-SMAJ14A	14	1	17.2	1	23.2 17.2	10/1000		400	SMA	5.25x2.85x2.5	A14C	A14	DC Power						
BV-SMAJ15CA	BV-SMAJ15A	15	1	18.5	1	24.4 16.4	10/1000		400	SMA	5.25x2.85x2.5	A15C	A15	DC Power						
BV-SMAJ16CA	BV-SMAJ16A	16	1	19.7	1	26 15.4	10/1000		400	SMA	5.25x2.85x2.5	A16C	A16	DC Power						
BV-SMAJ17CA	BV-SMAJ17A	17	1	20.9	1	27.6 14.5	10/1000		400	SMA	5.25x2.85x2.5	A17C	A17	DC Power						
BV-SMAJ18CA	BV-SMAJ18A	18	1	22.1	1	29.2 13.7	10/1000		400	SMA	5.25x2.85x2.5	A18C	A18	DC Power						
BV-SMAJ20CA	BV-SMAJ20A	20	1	24.5	1	32.4 12.3	10/1000		400	SMA	5.25x2.85x2.5	A20C	A20	DC Power						
BV-SMAJ22CA	BV-SMAJ22A	22	1	26.9	1	35.5 11.3	10/1000		400	SMA	5.25x2.85x2.5	A22C	A22	DC Power						
BV-SMAJ24CA	BV-SMAJ24A	24	1	29.5	1	38.9 10.3	10/1000		400	SMA	5.25x2.85x2.5	A24C	A24	DC Power						
BV-SMAJ26CA	BV-SMAJ26A	26	1	31.9	1	42.1 9.5	10/1000		400	SMA	5.25x2.85x2.5	A26C	A26	DC Power						
BV-SMAJ28CA	BV-SMAJ28A	28	1	34.4	1	45.4 8.8	10/1000		400	SMA	5.25x2.85x2.5	A28C	A28	DC Power						
BV-SMAJ30CA	BV-SMAJ30A	30	1	36.8	1	48.4 8.3	10/1000		400	SMA	5.25x2.85x2.5	A30C	A30	DC Power						
BV-SMAJ33CA	BV-SMAJ33A	33	1	40.6	1	53.3 7.5	10/1000		400	SMA	5.25x2.85x2.5	A33C	A33	DC Power						
BV-SMAJ36CA	BV-SMAJ36A	36	1	44.2	1	58.1 6.9	10/1000		400	SMA	5.25x2.85x2.5	A36C	A36	DC Power						
BV-SMAJ40CA	BV-SMAJ40A	40	1	49.1	1	64.5 6.2	10/1000		400	SMA	5.25x2.85x2.5	A40C	A40	DC Power						
BV-SMAJ43CA	BV-SMAJ43A	43	1	52.8	1	69.4 5.8	10/1000		400	SMA	5.25x2.85x2.5	A43C	A43	DC Power						
BV-SMAJ45CA	BV-SMAJ45A	45	1	55.3	1	72.7 5.5	10/1000		400	SMA	5.25x2.85x2.5	A45C	A45	DC Power						
BV-SMAJ48CA	BV-SMAJ48A	48	1	58.9	1	77.4 5.2	10/1000		400	SMA	5.25x2.85x2.5	A48C	A48	DC Power						
BV-SMAJ51CA	BV-SMAJ51A	51	1	62.7	1	82.4 4.9	10/1000		400	SMA	5.25x2.85x2.5	A51C	A51	DC Power						
BV-SMAJ54CA	BV-SMAJ54A	54	1	66.3	1	87.1 4.6	10/1000		400	SMA	5.25x2.85x2.5	A54C	A54	DC Power						
BV-SMAJ58CA	BV-SMAJ58A	58	1	71.2	1	93.6 4.3	10/1000		400	SMA	5.25x2.85x2.5	A58C	A58	DC Power						

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc @ IPP (V) (A) Max	BI					UNI	BI		UNI	UL497B		UL1449	New products	
BV-SMAJ60CA	BV-SMAJ60A	60	1	73.7	1	96.8	4.1	10/1000	400	SMA	5.25x2.85x2.5	A60C	A60	DC Power				○	○	○
BV-SMAJ64CA	BV-SMAJ64A	64	1	78.6	1	103	3.9	10/1000	400	SMA	5.25x2.85x2.5	A64C	A64	DC Power				○	○	○
BV-SMAJ70CA	BV-SMAJ70A	70	1	86	1	113	3.5	10/1000	400	SMA	5.25x2.85x2.5	A70C	A70	DC Power				○	○	○
BV-SMAJ75CA	BV-SMAJ75A	75	1	92.1	1	121	3.3	10/1000	400	SMA	5.25x2.85x2.5	A75C	A75	DC Power				○	○	○
BV-SMAJ78CA	BV-SMAJ78A	78	1	95.8	1	126	3.2	10/1000	400	SMA	5.25x2.85x2.5	A78C	A78	DC Power				○	○	○
BV-SMAJ85CA	BV-SMAJ85A	85	1	104	1	137	2.9	10/1000	400	SMA	5.25x2.85x2.5	A85C	A85	DC Power				○	○	○
BV-SMAJ90CA	BV-SMAJ90A	90	1	111	1	146	2.7	10/1000	400	SMA	5.25x2.85x2.5	A90C	A90	DC Power				○	○	○
BV-SMAJ100CA	BV-SMAJ100A	100	1	123	1	162	2.5	10/1000	400	SMA	5.25x2.85x2.5	A100C	A100	DC Power				○	○	○
BV-SMAJ110CA	BV-SMAJ110A	110	1	135	1	177	2.3	10/1000	400	SMA	5.25x2.85x2.5	A110C	A110	DC Power				○	○	○
BV-SMBJ5CA	BV-SMBJ5A	5	800	7	10	9.2	65.3	10/1000	600	SMB	5.45x3.75x2.6	B5C	B5	DC Power				○	○	○
BV-SMBJ6CA	BV-SMBJ6A	6	800	7.37	10	10.3	58.3	10/1000	600	SMB	5.45x3.75x2.6	B6C	B6	DC Power				○	○	○
BV-SMBJ6.5CA	BV-SMBJ6.5A	6.5	500	7.98	10	11.2	53.6	10/1000	600	SMB	5.45x3.75x2.6	B6.5C	B6.5	DC Power				○	○	○
BV-SMBJ7CA	BV-SMBJ7A	7	200	8.6	10	12	50	10/1000	600	SMB	5.45x3.75x2.6	B7C	B7	DC Power				○	○	○
BV-SMBJ7.5CA	BV-SMBJ7.5A	7.5	100	9.21	1	12.9	46.6	10/1000	600	SMB	5.45x3.75x2.6	B7.5C	B7.5	DC Power				○	○	○
BV-SMBJ8CA	BV-SMBJ8A	8	50	9.83	1	13.6	44.2	10/1000	600	SMB	5.45x3.75x2.6	B8C	B8	DC Power				○	○	○
BV-SMBJ8.5CA	BV-SMBJ8.5A	8.5	20	10.4	1	14.4	41.7	10/1000	600	SMB	5.45x3.75x2.6	B8.5C	B8.5	DC Power				○	○	○
BV-SMBJ9CA	BV-SMBJ9A	9	10	11.1	1	15.4	39	10/1000	600	SMB	5.45x3.75x2.6	B9C	B9	DC Power				○	○	○
BV-SMBJ10CA	BV-SMBJ10A	10	5	12.3	1	17	35.3	10/1000	600	SMB	5.45x3.75x2.6	B10C	B10	DC Power				○	○	○
BV-SMBJ11CA	BV-SMBJ11A	11	1	13.5	1	18.2	33	10/1000	600	SMB	5.45x3.75x2.6	B11C	B11	DC Power				○	○	○
BV-SMBJ12CA	BV-SMBJ12A	12	1	14.7	1	19.9	30.2	10/1000	600	SMB	5.45x3.75x2.6	B12C	B12	DC Power				○	○	○
BV-SMBJ13CA	BV-SMBJ13A	13	1	15.9	1	21.5	28	10/1000	600	SMB	5.45x3.75x2.6	B13C	B13	DC Power				○	○	○
BV-SMBJ14CA	BV-SMBJ14A	14	1	17.2	1	23.2	25.9	10/1000	600	SMB	5.45x3.75x2.6	B14C	B14	DC Power				○	○	○
BV-SMBJ15CA	BV-SMBJ15A	15	1	18.5	1	24.4	24.6	10/1000	600	SMB	5.45x3.75x2.6	B15C	B15	DC Power				○	○	○
BV-SMBJ16CA	BV-SMBJ16A	16	1	19.7	1	26	23.1	10/1000	600	SMB	5.45x3.75x2.6	B16C	B16	DC Power				○	○	○
BV-SMBJ17CA	BV-SMBJ17A	17	1	20.9	1	27.6	21.8	10/1000	600	SMB	5.45x3.75x2.6	B17C	B17	DC Power				○	○	○
BV-SMBJ18CA	BV-SMBJ18A	18	1	22.1	1	29.2	20.6	10/1000	600	SMB	5.45x3.75x2.6	B18C	B18	DC Power				○	○	○
BV-SMBJ20CA	BV-SMBJ20A	20	1	24.5	1	32.4	18.6	10/1000	600	SMB	5.45x3.75x2.6	B20C	B20	DC Power				○	○	○
BV-SMBJ22CA	BV-SMBJ22A	22	1	26.9	1	35.5	16.9	10/1000	600	SMB	5.45x3.75x2.6	B22C	B22	DC Power				○	○	○
BV-SMBJ24CA	BV-SMBJ24A	24	1	29.5	1	38.9	15.5	10/1000	600	SMB	5.45x3.75x2.6	B24C	B24	DC Power				○	○	○
BV-SMBJ26CA	BV-SMBJ26A	26	1	31.9	1	42.1	14.3	10/1000	600	SMB	5.45x3.75x2.6	B26C	B26	DC Power				○	○	○
BV-SMBJ28CA	BV-SMBJ28A	28	1	34.4	1	45.4	13.3	10/1000	600	SMB	5.45x3.75x2.6	B28C	B28	DC Power				○	○	○
BV-SMBJ30CA	BV-SMBJ30A	30	1	36.8	1	48.4	12.4	10/1000	600	SMB	5.45x3.75x2.6	B30C	B30	DC Power				○	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc @ IPP (V) (A) Max	BI					UNI	BI		UNI	UL497B		UL1449	New products	
BV-SMBJ33CA	BV-SMBJ33A	33	1	40.6	1	53.3	11.3	10/1000	600	SMB	5.45x3.75x2.6	B33C	B33	DC Power						
BV-SMBJ36CA	BV-SMBJ36A	36	1	44.2	1	58.1	10.4	10/1000	600	SMB	5.45x3.75x2.6	B36C	B36	DC Power						
BV-SMBJ40CA	BV-SMBJ40A	40	1	49.1	1	64.5	9.3	10/1000	600	SMB	5.45x3.75x2.6	B40C	B40	DC Power						
BV-SMBJ43CA	BV-SMBJ43A	43	1	52.8	1	69.4	8.7	10/1000	600	SMB	5.45x3.75x2.6	B43C	B43	DC Power						
BV-SMBJ45CA	BV-SMBJ45A	45	1	55.3	1	72.7	8.3	10/1000	600	SMB	5.45x3.75x2.6	B45C	B45	DC Power						
BV-SMBJ48CA	BV-SMBJ48A	48	1	58.9	1	77.4	7.8	10/1000	600	SMB	5.45x3.75x2.6	B48C	B48	DC Power						
BV-SMBJ51CA	BV-SMBJ51A	51	1	62.7	1	82.4	7.3	10/1000	600	SMB	5.45x3.75x2.6	B51C	B51	DC Power						
BV-SMBJ54CA	BV-SMBJ54A	54	1	66.3	1	87.1	6.9	10/1000	600	SMB	5.45x3.75x2.6	B54C	B54	DC Power						
BV-SMBJ58CA	BV-SMBJ58A	58	1	71.2	1	93.6	6.5	10/1000	600	SMB	5.45x3.75x2.6	B58C	B58	DC Power						
BV-SMBJ60CA	BV-SMBJ60A	60	1	73.7	1	96.8	6.2	10/1000	600	SMB	5.45x3.75x2.6	B60C	B60	DC Power						
BV-SMBJ64CA	BV-SMBJ64A	64	1	78.6	1	103	5.9	10/1000	600	SMB	5.45x3.75x2.6	B64C	B64	DC Power						
BV-SMBJ70CA	BV-SMBJ70A	70	1	86	1	113	5.3	10/1000	600	SMB	5.45x3.75x2.6	B70C	B70	DC Power						
BV-SMBJ75CA	BV-SMBJ75A	75	1	92.1	1	121	5	10/1000	600	SMB	5.45x3.75x2.6	B75C	B75	DC Power						
BV-SMBJ78CA	BV-SMBJ78A	78	1	95.8	1	126	4.8	10/1000	600	SMB	5.45x3.75x2.6	B78C	B78	DC Power						
BV-SMBJ85CA	BV-SMBJ85A	85	1	104	1	137	4.4	10/1000	600	SMB	5.45x3.75x2.6	B85C	B85	DC Power						
BV-SMBJ90CA	BV-SMBJ90A	90	1	111	1	146	4.1	10/1000	600	SMB	5.45x3.75x2.6	B90C	B90	DC Power						
BV-SMBJ100CA	BV-SMBJ100A	100	1	123	1	162	3.7	10/1000	600	SMB	5.45x3.75x2.6	B100C	B100	DC Power						
BV-SMBJ110CA	BV-SMBJ110A	110	1	135	1	177	3.4	10/1000	600	SMB	5.45x3.75x2.6	B110C	B110	DC Power						
BV-SMCJ5CA	BV-SMCJ5A	5	800	7	10	9.2	163.0	10/1000	1500	SMC	8.25x6.15x2.95	C5C	C5	DC Power						
BV-SMCJ6CA	BV-SMCJ6A	6	800	7.37	10	10.3	145.7	10/1000	1500	SMC	8.25x6.15x2.95	C6C	C6	DC Power						
BV-SMCJ6.5CA	BV-SMCJ6.5A	6.5	500	7.98	10	11.2	134.0	10/1000	1500	SMC	8.25x6.15x2.95	C6.5C	C6.5	DC Power						
BV-SMCJ7CA	BV-SMCJ7A	7	200	8.6	10	12	125.0	10/1000	1500	SMC	8.25x6.15x2.95	C7C	C7	DC Power						
BV-SMCJ7.5CA	BV-SMCJ7.5A	7.5	100	9.21	1	12.9	116.3	10/1000	1500	SMC	8.25x6.15x2.95	C7.5C	C7.5	DC Power						
BV-SMCJ8CA	BV-SMCJ8A	8	50	9.83	1	13.6	110.3	10/1000	1500	SMC	8.25x6.15x2.95	C8C	C8	DC Power						
BV-SMCJ8.5CA	BV-SMCJ8.5A	8.5	20	10.4	1	14.4	104.2	10/1000	1500	SMC	8.25x6.15x2.95	C8.5C	C8.5	DC Power						
BV-SMCJ9CA	BV-SMCJ9A	9	10	11.1	1	15.4	97.4	10/1000	1500	SMC	8.25x6.15x2.95	C9C	C9	DC Power						
BV-SMCJ10CA	BV-SMCJ10A	10	5	12.3	1	17	88.3	10/1000	1500	SMC	8.25x6.15x2.95	C10C	C10	DC Power						
BV-SMCJ11CA	BV-SMCJ11A	11	1	13.5	1	18.2	82.5	10/1000	1500	SMC	8.25x6.15x2.95	C11C	C11	DC Power						
BV-SMCJ12CA	BV-SMCJ12A	12	1	14.7	1	19.9	75.4	10/1000	1500	SMC	8.25x6.15x2.95	C12C	C12	DC Power						
BV-SMCJ13CA	BV-SMCJ13A	13	1	15.9	1	21.5	69.8	10/1000	1500	SMC	8.25x6.15x2.95	C13C	C13	DC Power						
BV-SMCJ14CA	BV-SMCJ14A	14	1	17.2	1	23.2	64.7	10/1000	1500	SMC	8.25x6.15x2.95	C14C	C14	DC Power						
BV-SMCJ15CA	BV-SMCJ15A	15	1	18.5	1	24.4	61.5	10/1000	1500	SMC	8.25x6.15x2.95	C15C	C15	DC Power						

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc @ IPP (V) (A) Max	BI					UNI	BI		UNI	UL497B		UL1449	New products	
BV-SMCJ16CA	BV-SMCJ16A	16	1	19.7	1	26	57.7	10/1000	1500	SMC	8.25x6.15x2.95	C16C	C16	DC Power						
BV-SMCJ17CA	BV-SMCJ17A	17	1	20.9	1	27.6	54.4	10/1000	1500	SMC	8.25x6.15x2.95	C17C	C17	DC Power						
BV-SMCJ18CA	BV-SMCJ18A	18	1	22.1	1	29.2	51.4	10/1000	1500	SMC	8.25x6.15x2.95	C18C	C18	DC Power						
BV-SMCJ20CA	BV-SMCJ20A	20	1	24.5	1	32.4	46.3	10/1000	1500	SMC	8.25x6.15x2.95	C20C	C20	DC Power						
BV-SMCJ22CA	BV-SMCJ22A	22	1	26.9	1	35.5	42.3	10/1000	1500	SMC	8.25x6.15x2.95	C22C	C22	DC Power						
BV-SMCJ24CA	BV-SMCJ24A	24	1	29.5	1	38.9	38.6	10/1000	1500	SMC	8.25x6.15x2.95	C24C	C24	DC Power						
BV-SMCJ26CA	BV-SMCJ26A	26	1	31.9	1	42.1	35.7	10/1000	1500	SMC	8.25x6.15x2.95	C26C	C26	DC Power						
BV-SMCJ28CA	BV-SMCJ28A	28	1	34.4	1	45.4	33.1	10/1000	1500	SMC	8.25x6.15x2.95	C28C	C28	DC Power						
BV-SMCJ30CA	BV-SMCJ30A	30	1	36.8	1	48.4	31.0	10/1000	1500	SMC	8.25x6.15x2.95	C30C	C30	DC Power						
BV-SMCJ33CA	BV-SMCJ33A	33	1	40.6	1	53.3	28.2	10/1000	1500	SMC	8.25x6.15x2.95	C33C	C33	DC Power						
BV-SMCJ36CA	BV-SMCJ36A	36	1	44.2	1	58.1	25.9	10/1000	1500	SMC	8.25x6.15x2.95	C36C	C36	DC Power						
BV-SMCJ40CA	BV-SMCJ40A	40	1	49.1	1	64.5	23.3	10/1000	1500	SMC	8.25x6.15x2.95	C40C	C40	DC Power						
BV-SMCJ43CA	BV-SMCJ43A	43	1	52.8	1	69.4	21.7	10/1000	1500	SMC	8.25x6.15x2.95	C43C	C43	DC Power						
BV-SMCJ45CA	BV-SMCJ45A	45	1	55.3	1	72.7	20.6	10/1000	1500	SMC	8.25x6.15x2.95	C45C	C45	DC Power						
BV-SMCJ48CA	BV-SMCJ48A	48	1	58.9	1	77.4	19.4	10/1000	1500	SMC	8.25x6.15x2.95	C48C	C48	DC Power						
BV-SMCJ51CA	BV-SMCJ51A	51	1	62.7	1	82.4	18.2	10/1000	1500	SMC	8.25x6.15x2.95	C51C	C51	DC Power						
BV-SMCJ54CA	BV-SMCJ54A	54	1	66.3	1	87.1	17.3	10/1000	1500	SMC	8.25x6.15x2.95	C54C	C54	DC Power						
BV-SMCJ58CA	BV-SMCJ58A	58	1	71.2	1	93.6	16.1	10/1000	1500	SMC	8.25x6.15x2.95	C58C	C58	DC Power						
BV-SMCJ60CA	BV-SMCJ60A	60	1	73.7	1	96.8	15.5	10/1000	1500	SMC	8.25x6.15x2.95	C60C	C60	DC Power						
BV-SMCJ64CA	BV-SMCJ64A	64	1	78.6	1	103	14.6	10/1000	1500	SMC	8.25x6.15x2.95	C64C	C64	DC Power						
BV-SMCJ70CA	BV-SMCJ70A	70	1	86	1	113	13.3	10/1000	1500	SMC	8.25x6.15x2.95	C70C	C70	DC Power						
BV-SMCJ75CA	BV-SMCJ75A	75	1	92.1	1	121	12.4	10/1000	1500	SMC	8.25x6.15x2.95	C75C	C75	DC Power						
BV-SMCJ78CA	BV-SMCJ78A	78	1	95.8	1	126	11.9	10/1000	1500	SMC	8.25x6.15x2.95	C78C	C78	DC Power						
BV-SMCJ85CA	BV-SMCJ85A	85	1	104	1	137	11.0	10/1000	1500	SMC	8.25x6.15x2.95	C85C	C85	DC Power						
BV-SMCJ90CA	BV-SMCJ90A	90	1	111	1	146	10.3	10/1000	1500	SMC	8.25x6.15x2.95	C90C	C90	DC Power						
BV-SMCJ100CA	BV-SMCJ100A	100	1	123	1	162	9.3	10/1000	1500	SMC	8.25x6.15x2.95	C100C	C100	DC Power						
BV-SMCJ110CA	BV-SMCJ110A	110	1	135	1	177	8.5	10/1000	1500	SMC	8.25x6.15x2.95	C110C	C110	DC Power						
BV-SMDJ5CA	BV-SMDJ5A	5	800	7	10	9.2	326.1	10/1000	3000	SMC	8.25x6.15x2.95	D5C	D5	DC Power						
BV-SMDJ6CA	BV-SMDJ6A	6	800	7.37	10	10.3	291.3	10/1000	3000	SMC	8.25x6.15x2.95	D6C	D6	DC Power						
BV-SMDJ6.5CA	BV-SMDJ6.5A	6.5	500	7.98	10	11.2	267.9	10/1000	3000	SMC	8.25x6.15x2.95	D6.5C	D6.5	DC Power						
BV-SMDJ7CA	BV-SMDJ7A	7	200	8.6	10	12	250.0	10/1000	3000	SMC	8.25x6.15x2.95	D7C	D7	DC Power						
BV-SMDJ7.5CA	BV-SMDJ7.5A	7.5	100	9.21	1	12.9	232.6	10/1000	3000	SMC	8.25x6.15x2.95	D7.5C	D7.5	DC Power						

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc (V) Max	@ IPP (A)					BI	UNI		BI	UNI		UL497B	UL1449	New products
BV-SMDJ8CA	BV-SMDJ8A	8	50	9.83	1	13.6	220.6	10/1000	3000	SMC	8.25x6.15x2.95	D8C	D8	DC Power				○	○	○
BV-SMDJ8.5CA	BV-SMDJ8.5A	8.5	20	10.4	1	14.4	208.3	10/1000	3000	SMC	8.25x6.15x2.95	D8.5C	D8.5	DC Power				○	○	○
BV-SMDJ9CA	BV-SMDJ9A	9	10	11.1	1	15.4	194.8	10/1000	3000	SMC	8.25x6.15x2.95	D9C	D9	DC Power				○	○	○
BV-SMDJ10CA	BV-SMDJ10A	10	5	12.3	1	17	176.5	10/1000	3000	SMC	8.25x6.15x2.95	D10C	D10	DC Power				○	○	○
BV-SMDJ11CA	BV-SMDJ11A	11	1	13.5	1	18.2	164.8	10/1000	3000	SMC	8.25x6.15x2.95	D11C	D11	DC Power				○	○	○
BV-SMDJ12CA	BV-SMDJ12A	12	1	14.7	1	19.9	150.8	10/1000	3000	SMC	8.25x6.15x2.95	D12C	D12	DC Power				○	○	○
BV-SMDJ13CA	BV-SMDJ13A	13	1	15.9	1	21.5	139.5	10/1000	3000	SMC	8.25x6.15x2.95	D13C	D13	DC Power				○	○	○
BV-SMDJ14CA	BV-SMDJ14A	14	1	17.2	1	23.2	129.3	10/1000	3000	SMC	8.25x6.15x2.95	D14C	D14	DC Power				○	○	○
BV-SMDJ15CA	BV-SMDJ15A	15	1	18.5	1	24.4	123.0	10/1000	3000	SMC	8.25x6.15x2.95	D15C	D15	DC Power				○	○	○
BV-SMDJ16CA	BV-SMDJ16A	16	1	19.7	1	26	115.4	10/1000	3000	SMC	8.25x6.15x2.95	D16C	D16	DC Power				○	○	○
BV-SMDJ17CA	BV-SMDJ17A	17	1	20.9	1	27.6	108.7	10/1000	3000	SMC	8.25x6.15x2.95	D17C	D17	DC Power				○	○	○
BV-SMDJ18CA	BV-SMDJ18A	18	1	22.1	1	29.2	102.7	10/1000	3000	SMC	8.25x6.15x2.95	D18C	D18	DC Power				○	○	○
BV-SMDJ20CA	BV-SMDJ20A	20	1	24.5	1	32.4	92.6	10/1000	3000	SMC	8.25x6.15x2.95	D20C	D20	DC Power				○	○	○
BV-SMDJ22CA	BV-SMDJ22A	22	1	26.9	1	35.5	84.5	10/1000	3000	SMC	8.25x6.15x2.95	D22C	D22	DC Power				○	○	○
BV-SMDJ24CA	BV-SMDJ24A	24	1	29.5	1	38.9	77.1	10/1000	3000	SMC	8.25x6.15x2.95	D24C	D24	DC Power				○	○	○
BV-SMDJ26CA	BV-SMDJ26A	26	1	31.9	1	42.1	71.3	10/1000	3000	SMC	8.25x6.15x2.95	D26C	D26	DC Power				○	○	○
BV-SMDJ28CA	BV-SMDJ28A	28	1	34.4	1	45.4	66.1	10/1000	3000	SMC	8.25x6.15x2.95	D28C	D28	DC Power				○	○	○
BV-SMDJ30CA	BV-SMDJ30A	30	1	36.8	1	48.4	62.0	10/1000	3000	SMC	8.25x6.15x2.95	D30C	D30	DC Power				○	○	○
BV-SMDJ33CA	BV-SMDJ33A	33	1	40.6	1	53.3	56.3	10/1000	3000	SMC	8.25x6.15x2.95	D33C	D33	DC Power				○	○	○
BV-SMDJ36CA	BV-SMDJ36A	36	1	44.2	1	58.1	51.6	10/1000	3000	SMC	8.25x6.15x2.95	D36C	D36	DC Power				○	○	○
BV-SMDJ40CA	BV-SMDJ40A	40	1	49.1	1	64.5	46.5	10/1000	3000	SMC	8.25x6.15x2.95	D40C	D40	DC Power				○	○	○
BV-SMDJ43CA	BV-SMDJ43A	43	1	52.8	1	69.4	43.2	10/1000	3000	SMC	8.25x6.15x2.95	D43C	D43	DC Power				○	○	○
BV-SMDJ45CA	BV-SMDJ45A	45	1	55.3	1	72.7	41.3	10/1000	3000	SMC	8.25x6.15x2.95	D45C	D45	DC Power				○	○	○
BV-SMDJ48CA	BV-SMDJ48A	48	1	58.9	1	77.4	38.8	10/1000	3000	SMC	8.25x6.15x2.95	D48C	D48	DC Power				○	○	○
BV-SMDJ51CA	BV-SMDJ51A	51	1	62.7	1	82.4	36.4	10/1000	3000	SMC	8.25x6.15x2.95	D51C	D51	DC Power				○	○	○
BV-SMDJ54CA	BV-SMDJ54A	54	1	66.3	1	87.1	34.4	10/1000	3000	SMC	8.25x6.15x2.95	D54C	D54	DC Power				○	○	○
BV-SMDJ58CA	BV-SMDJ58A	58	1	71.2	1	93.6	32.1	10/1000	3000	SMC	8.25x6.15x2.95	D58C	D58	DC Power				○	○	○
BV-SMDJ60CA	BV-SMDJ60A	60	1	73.7	1	96.8	31.0	10/1000	3000	SMC	8.25x6.15x2.95	D60C	D60	DC Power				○	○	○
BV-SMDJ64CA	BV-SMDJ64A	64	1	78.6	1	103	29.1	10/1000	3000	SMC	8.25x6.15x2.95	D64C	D64	DC Power				○	○	○
BV-SMDJ70CA	BV-SMDJ70A	70	1	86	1	113	26.5	10/1000	3000	SMC	8.25x6.15x2.95	D70C	D70	DC Power				○	○	○
BV-SMDJ75CA	BV-SMDJ75A	75	1	92.1	1	121	24.8	10/1000	3000	SMC	8.25x6.15x2.95	D75C	D75	DC Power				○	○	○
BV-SMDJ78CA	BV-SMDJ78A	78	1	95.8	1	126	23.8	10/1000	3000	SMC	8.25x6.15x2.95	D78C	D78	DC Power				○	○	○

Part Number		Off state Voltage		Breakdown Voltage		Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Max	IR (mA)	Vc @ IPP (V) (A) Max						BI	UNI		BI	UNI		UL497B	UL1449	New products
BV-SMDJ85CA	BV-SMDJ85A	85	1	104	1	137	21.9	10/1000	3000	SMC	8.25x6.15x2.95	D85C	D85	DC Power						
BV-SMDJ90CA	BV-SMDJ90A	90	1	111	1	146	20.5	10/1000	3000	SMC	8.25x6.15x2.95	D90C	D90	DC Power						
BV-SMDJ100CA	BV-SMDJ100A	100	1	123	1	162	18.5	10/1000	3000	SMC	8.25x6.15x2.95	D100C	D100	DC Power						
BV-SMDJ110CA	BV-SMDJ110A	110	1	135	1	177	16.9	10/1000	3000	SMC	8.25x6.15x2.95	D110C	D110	DC Power						
BV-5SMDJ11CA	BV-5SMDJ11A	11	800	13.5	1	18.2	275	10/1000	5000	SMC	8.25x6.15x2.95	5D11C	5D11	DC Power						
BV-5 SMDJ12CA	BV-5 SMDJ12A	12	800	14.7	1	19.9	252	10/1000	5000	SMC	8.25x6.15x2.95	5D12C	5D12	DC Power						
BV-5SMDJ13CA	BV-5SMDJ13A	13	500	15.9	1	21.5	233	10/1000	5000	SMC	8.25x6.15x2.95	5D13C	5D13	DC Power						
BV-5SMDJ14CA	BV-5SMDJ14A	14	200	17.2	1	23.2	216	10/1000	5000	SMC	8.25x6.15x2.95	5D14C	5D14	DC Power						
BV-5SMDJ15CA	BV-5SMDJ15A	15	100	18.5	1	24.4	205	10/1000	5000	SMC	8.25x6.15x2.95	5D15C	5D15	DC Power						
BV-5SMDJ16CA	BV-5SMDJ16A	16	50	19.7	1	26	193	10/1000	5000	SMC	8.25x6.15x2.95	5D16C	5D16	DC Power						
BV-5SMDJ17CA	BV-5SMDJ17A	17	20	20.9	1	27.6	181	10/1000	5000	SMC	8.25x6.15x2.95	5D17C	5D17	DC Power						
BV-5SMDJ18CA	BV-5SMDJ18A	18	10	22.1	1	29.2	172	10/1000	5000	SMC	8.25x6.15x2.95	5D18C	5D18	DC Power						
BV-5SMDJ20CA	BV-5SMDJ20A	20	5	24.5	1	32.4	155	10/1000	5000	SMC	8.25x6.15x2.95	5D20C	5D20	DC Power						
BV-5SMDJ22CA	BV-5SMDJ22A	22	5	26.9	1	35.5	141	10/1000	5000	SMC	8.25x6.15x2.95	5D22C	5D22	DC Power						
BV-5SMDJ24CA	BV-5SMDJ24A	24	2	29.5	1	38.9	129	10/1000	5000	SMC	8.25x6.15x2.95	5D24C	5D24	DC Power						
BV-5SMDJ26CA	BV-5SMDJ26A	26	2	31.9	1	42.1	119	10/1000	5000	SMC	8.25x6.15x2.95	5D26C	5D26	DC Power						
BV-5SMDJ28CA	BV-5SMDJ28A	28	2	34.4	1	45.4	110	10/1000	5000	SMC	8.25x6.15x2.95	5D28C	5D28	DC Power						
BV-5SMDJ30CA	BV-5SMDJ30A	30	2	36.8	1	48.4	103	10/1000	5000	SMC	8.25x6.15x2.95	5D30C	5D30	DC Power						
BV-5SMDJ33CA	BV-5SMDJ33A	33	2	40.6	1	53.3	93.9	10/1000	5000	SMC	8.25x6.15x2.95	5D33C	5D33	DC Power						
BV-5SMDJ36CA	BV-5SMDJ36A	36	2	44.2	1	58.1	86.1	10/1000	5000	SMC	8.25x6.15x2.95	5D36C	5D36	DC Power						
BV-5SMDJ40CA	BV-5SMDJ40A	40	2	49.1	1	64.5	77.6	10/1000	5000	SMC	8.25x6.15x2.95	5D40C	5D40	DC Power						
BV-5SMDJ43CA	BV-5SMDJ43A	43	2	52.8	1	69.4	72.1	10/1000	5000	SMC	8.25x6.15x2.95	5D43C	5D43	DC Power						
BV-5SMDJ45CA	BV-5SMDJ45A	45	2	55.3	1	72.7	68.8	10/1000	5000	SMC	8.25x6.15x2.95	5D45C	5D45	DC Power						
BV-5SMDJ48CA	BV-5SMDJ48A	48	2	58.9	1	77.4	64.7	10/1000	5000	SMC	8.25x6.15x2.95	5D48C	5D48	DC Power						
BV-5SMDJ51CA	BV-5SMDJ51A	51	2	62.7	1	82.4	60.7	10/1000	5000	SMC	8.25x6.15x2.95	5D51C	5D51	DC Power						
BV-5SMDJ54CA	BV-5SMDJ54A	54	2	66.3	1	87.1	57.5	10/1000	5000	SMC	8.25x6.15x2.95	5D54C	5D54	DC Power						
BV-5SMDJ58CA	BV-5SMDJ58A	58	2	71.2	1	93.6	53.5	10/1000	5000	SMC	8.25x6.15x2.95	5D58C	5D58	DC Power						
BV-5SMDJ60CA	BV-5SMDJ60A	60	2	73.7	1	96.8	51.7	10/1000	5000	SMC	8.25x6.15x2.95	5D60C	5D60	DC Power						
BV-5SMDJ64CA	BV-5SMDJ64A	64	2	78.6	1	103	48.6	10/1000	5000	SMC	8.25x6.15x2.95	5D64C	5D64	DC Power						
BV-5SMDJ70CA	BV-5SMDJ70A	70	2	86	1	113	44.3	10/1000	5000	SMC	8.25x6.15x2.95	5D70C	5D70	DC Power						
BV-5SMDJ75CA	BV-5SMDJ75A	75	2	92.1	1	121	41.4	10/1000	5000	SMC	8.25x6.15x2.95	5D75C	5D75	DC Power						
BV-5SMDJ78CA	BV-5SMDJ78A	78	2	95.8	1	126	39.7	10/1000	5000	SMC	8.25x6.15x2.95	5D78C	5D78	DC Power						

```

graph TD
    A[Environmental Analysis] --> B[Choose a Standard]
    B --> C[Application Guide]
    C --> D[Select Components]
    D --> E[System Test]
    E --> F[Apply & Optimize]
  
```

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number	Off state Voltage		Breakdown Voltage		Clamp Voltage		Clamp Voltage		Capacitance Co (pF) 0V@1MHz Max	Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Min	IR (mA)	Vc @ IPP (V) Max	Ipp (A)	Vc @ IPP (V) Max	Ipp (A)										UL497B	UL1449	New products
BV03CW	3	0.5	3.5	1	5.8	1	15	10	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	CA1	Ethernet			○	○	○
BV03C-H	3.3	1	3.8	1	7	1	18.5	19	1.5	8/20μs	350	SOD-323	2.5x1.28x1.0	CC	Ethernet			○	○	○
BV05C	5	5	6	1	9.8	1	18.3	8	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	AC	xDSL			○	○	○
BV08C	8	2	8.5	1	13.4	1	18.5	8	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	BC	xDSL			○	○	○
BV12C	12	1	13.3	1	19	1	28.6	6	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	DC	xDSL			○	○	○
BV15C	15	1	16.7	1	24	1	31.8	5	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	EC	xDSL			○	○	○
BV24C	24	1	26.7	1	43	1	56	3	1.5	8/20μs	150	SOD-323	2.5x1.28x1.0	HC	xDSL			○	○	○
BV-D303UC	3	0.5	3.5	1	5.15	1	13.9	15	1	8/20μs	350	SOD-323	2.5x1.28x1.0	CC.	Ethernet			○	○	○
BV-D32.5UCA	2.5	0.5	2.8	1	5	1	10	10	5	8/20μs	100	SOD-323	2.5x1.28x1.0	ZC	Ethernet			○	○	○
BV-D308UCE	8	1	8.3	1	12.5	1	30	13.5	2	8/20μs	405	SOD-323	2.5x1.28x1.0	D4	xDSL			○	○	○
BV-D312UCE	12	1	13.5	1	18.3	1	34	13.5	2	8/20μs	459	SOD-323	2.5x1.28x1.0	DK	xDSL			○	○	○
BV-D315UCE	15	1	17.3	1	21.7	1	40	10	2	8/20μs	400	SOD-323	2.5x1.28x1.0	D7	xDSL			○	○	○
BV-D324UCE	24	1	27.3	1	34	1	52	6.5	2	8/20μs	338	SOD-323	2.5x1.28x1.0	DA	xDSL			○	○	○
BV-FG03U4CA	3	0.1	3.5	1	7	1	17	12	1.2	8/20μs	200	DFN2010-8L	2.0x1.0x0.38	LC33	Ethernet			○	○	○
BV-3304P8	3.3	0.1	3.5	1	5.8	1	18	25	2	8/20μs	450	SOP-8	4.9x6.0x1.55	LC3304PE8	Ethernet			○	○	○
BV-SM712	7	10	7.5	1	/	/	17	22	55	8/20μs	450	SOT23	2.9x2.4x1.0	M72	RS485			○	○	○
	12	2	13.3	1	/	/	12	26	55											
BV_SRV05-4	5	0.5	6	1	15	1	15	5	1.8	8/20μs	75	SOT23-6	2.9x2.8x1.10	V05	Video			○	○	○
BV-ULC0524PA	5	1	6	1	/	/	25	4	0.6	8/20μs	100	DFN-2510-10	2.5x1.0x0.58	P524	HDMI			○	○	○
BV-FK05U4CA	5	0.5	6	1	15	1	15	3	0.6	8/20μs	45	DFN-2510-10	2.5x1.0x0.50	0524P	HDMI			○	○	○
BV-SR05	5	1	6	1	9.8	1	25	5	1.2	8/20μs	125	SOT143	2.9x2.4x1.00	R05	Video			○	○	○
BV_SD05	5	5	6	1	23	100	15	24	320	8/20μs	350	SOD-323	2.5x1.28x1.0	5U	ADSL2+			○	○	○
BV-D112ZB	12	1	13.3	1	/	/	26	170	1500	8/20μs	4420	SOD123F	3.7x1.8x1.0	BE	DC power			○	○	○
BV-D112ZCB	12	1	13.3	1	/	/	24	170	1000	8/20μs	4000	SOD123F	3.7x1.8x1.0	BE	DC power			○	○	○
BV-FM4.5ZCB	4.5	1	4.8	1	23	100	20	275	1000	8/20μs	6000	DFN2020	2.0x2.0x0.55	45ZB	DC power			○	○	○
BV-FM12ZA	12	1	13	1	/	/	27	150	1500	8/20μs	4050	DFN2020	2.0x2.0x0.55	U12Z	DC power			○	○	○
BV-FM20ZA	20	1	21	1	/	/	37	80	1500	8/20μs	2960	DFN2020	2.0x2.0x0.55	U20Z	DC power			○	○	○
BV-FM24ZD	24	1	25	1	46	70	53	90	1500	8/20μs	4000	DFN2020	2.0x2.0x0.55	U24Z	DC power			○	○	○
BV-FE05ZA	5	1	6	1	9	100	13	140	2000	8/20μs	1800	DFN1610-2L	1.6x1.0x0.5	U5Z	Cell phone			○	○	○
BV-FE07ZA	7	1	7.5	1	12	80	13	100	1000	8/20μs	1300	DFN1610-2L	1.6x1.0x0.5	Z07A	DC power			○	○	○
BV-FE07ZCA	7	1	7.5	1	/	/	13	100	1000	8/20μs	1300	DFN1610-2L	1.6x1.0x0.5	07CA	DC power			○	○	○
BV-FE03U2A	3.3	0.5	4.5	1	24	4	/	/	0.35	8/20μs	100	DFN1610-6L	1.6x1.0x0.5	GA	10G Ethernet			○	○	○
BV-D305ZH	5	1	6	1	11	100	14	130	2000	8/20μs	1820	SOD323	2.5x1.28x1.0	U5H	Cell phone			○	○	○
BV-D503ZCA	3.3	1	4	1	/	/	10	4.5	7.5	8/20μs	50	SOD523FL	1.6x0.8x0.6	5C∞	Audio			○	○	○
BV-D505ZCA	5	1	5.8	1	9.8	1	15	20	35	8/20μs	300	SOD523FL	1.6x0.8x0.6	∞C	Audio			○	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number	Off state Voltage		Breakdown Voltage		Clamp Voltage		Clamp Voltage		Capacitance Co (pF) 0V@1MHz Max	Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
	VDRM (V)	IDRM 25°C(μA) Max	VBR (V) Min	IR (mA)	Vc @ IPP (V) Max	IPP (A)	Vc @ IPP (V) Max	IPP (A)										UL497B	UL1449	New products
BV-D505ZC	5	1	5.6	1	11.6	5	19	8	15	8/20μs	150	SOD523FL	1.6x0.8x0.6	5C∞	Audio			○	○	○
BV-D505ZCB	5	2	5.2	1	9.8	1	16	3	7	8/20μs	50	SOD523FL	1.6x0.8x0.6	LB	Audio			○	○	○
BV-D512ZA	12	0.1	14.1	1	23	3	29	6	100	8/20μs	174	SOD523FL	1.6x0.8x0.6	ZM	DC			○	○	○
BV-FA2.5UCB	2.5	0.5	2.8	1	5	1	10	10	5	8/20μs	100	DFN1006-2	1.0x0.6x0.5	2V5Z	Ethernet			○	○	○
BV-FA05UC	5	1	6	1	12	1	14	2	0.5	8/20μs	25	DFN1006-2L	1.0x0.6x0.5	S	HDMI			○	○	○
BV-FA05UCA	5	0.1	6	1	16	2	24	4	0.4	8/20μs	96	DFN1006-2	1.0x0.6x0.5	5BU	HDMI			○	○	○
BV-FA05UCB	5	0.05	6	1	TYP:8.3	1	TYP:10	4	0.5	8/20μs	40	DFN1006-2	1.0x0.6x0.5	5U	HDMI			○	○	○
BV-FA05UCD	5	0.05	6	1	9	1	11	7	1	8/20μs	77	DFN1006-2	1.0x0.6x0.5	5T	HDMI			○	○	○
BV-FA05ZC	5	1	6	1	11	1	15	4.5	15	8/20μs	75	DFN1006-2L	1.0x0.6x0.5	PB	Cell phone			○	○	○
BV-FA03ZCD	3.3	1	4	1	7.6	1	15	6	15	8/20μs	75	DFN1006-2L	1.0x0.6x0.5	3X	PDA			○	○	○
BV-FA05ZCD	5	0.5	5.6	1	10	1	12	5	18	8/20μs	75	DFN1006-2L	1.0x0.6x0.5	PD	PDA			○	○	○
BV-FA814ZCB	⁸ / ₁₄	¹ / ₁	^{8.5} / _{14.5}	¹ / ₁	/	/	TYP:24 TYP:25.5	³ / ₃	13	8/20μs	100	DFN1006-2L	1.0x0.6x0.5	8E	DC power			○	○	○
BV-FA08ZCA	8	1	8.5	1	11	1	22	10	50	8/20μs	220	DFN1006-2L	1.0x0.6x0.5	D8	DC			○	○	○
BV-FA12ZCA	12	1	13.3	1	17	1	30	6	30	8/20μs	180	DFN1006-2L	1.0x0.6x0.5	DD	DC			○	○	○
BV-FA15ZCA	15	1	16.7	1	21	1	37	5	30	8/20μs	185	DFN1006-2L	1.0x0.6x0.5	DE	DC			○	○	○
BV-FA03ZCB	3.3	1	3.5	1	6	1	10	7	15	8/20μs	70	DFN1006-2L	1.0x0.6x0.5	T	Ethernet			○	○	○
BV-FA05UA	5	1	5.4	1	10	1	20	4	0.8	8/20μs	80	DFN1006-2L	1.0x0.6x0.5	L	DC power			○	○	○
BV-FW05U6CA	5	1	6	1	16	1	/	/	0.35	8/20μs	20	DFN4120-10L	4.1x2.0x0.5	BCN***	HDMI			○	○	○
BV-D305UA	5	1	6	1	10	1	20	4	0.8	8/20μs	80	SOD323	2.5x1.28x1.0	LL	DC power			○	○	○
BV-E505U2A	5	1	6	1	12	1	25	4	0.8	8/20μs	100	SOT523	1.6x1.6x0.75	P5	eSATA			○	○	○
BV-E505U2B	5	0.1	6	1	12	1	15	4	0.8	8/20μs	60	SOT523	1.6x1.6x0.75	52L	eSATA			○	○	○
BV-F603UCA	3.3	0.05	6	1	/	/	12	3.5	0.35	8/20μs	42	DFN0603-2L	0.6x0.3x0.3	JD	USB3.0			○	○	○
BV-D34.5ZCA	4.5	1	4.8	1	13	100	16	160	1500	8/20μs	2200	SOD-323	2.5x1.28x1.0	48D	DC power			○	○	○
BV-D303ZCA	3.3	40	4	1	7.5	1	16	25	200	8/20μs	400	SOD-323	2.5x1.28x1.0	2A	DC power			○	○	○
BV-D305ZCA	5	1	6	1	9.8	1	17	24	200	8/20μs	408	SOD-323	2.5x1.28x1.0	2B	DC power			○	○	○
BV-D308ZCA	8	1	8.5	1	13.4	1	20	18	100	8/20μs	360	SOD-323	2.5x1.28x1.0	2C	DC power			○	○	○
BV-D312ZCA	12	1	13.3	1	20	1	30	11	50	8/20μs	330	SOD-323	2.5x1.28x1.0	2D	DC power			○	○	○
BV-D315ZCA	15	1	16.7	1	25	1	36	9	45	8/20μs	324	SOD-323	2.5x1.28x1.0	2J	DC power			○	○	○
BV-D318ZCA	18	1	19.5	1	30	1	40	8	42	8/20μs	320	SOD-323	2.5x1.28x1.0	2K	DC power			○	○	○
BV-D324ZCA	24	1	26.7	1	45	1	50	5	40	8/20μs	250	SOD-323	2.5x1.28x1.0	2H	DC power			○	○	○
BV-D336ZCA	36	1	40	1	65	1	75	3	25	8/20μs	225	SOD-323	2.5x1.28x1.0	2N	DC power			○	○	○
BV-D303ZB	3.3	40	4	1	8	1	11	18	450	8/20μs	198	SOD-323	2.5x1.28x1.0	03W	DC power			○	○	○
BV-D305ZB	5	10	6	1	9.8	1	18	17	400	8/20μs	306	SOD-323	2.5x1.28x1.0	05W	DC power			○	○	○
BV-D312ZB	12	1	13.3	1	22	1	32	11	130	8/20μs	352	SOD-323	2.5x1.28x1.0	12W	DC power			○	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize


```

graph TD
    A[Environmental Analysis] --> B[Choose a Standard]
    B --> C[Application Guide]
    C --> D[Select Components]
    D --> E[System Test]
    E --> F[Apply & Optimize]
  
```

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

Apply & Optimize

Part Number		Off state Voltage		Breakdown Voltage			Clamp Voltage		Surge Waveform (μs)	Ppp (W)	Package	Size L*W*H (mm)	Mark		Application	Circuit		Outline	Remarks		
BI	UNI	VDRM (V)	IDRM 25°C(μA) Max	min(V)	Max.(V)	(mA)	Vc @ (V)	Ipp (A)					BI	UNI		BI	UNI		UL497B	UL1449	New products
BV-D105ZCF	BV-D105ZF	5	800	6.4	7	10	9.2	21.8	10/1000uS	200	SOD123F	3.7x1.8x1.0	AE	IAE	DC power				○	○	○
BV-D106ZCF	BV-D106ZF	6	800	6.67	7.37	10	10.3	19.4	10/1000uS	200	SOD123F	3.7x1.8x1.0	AG	IAG	DC power				○	○	○
BV-D16.5ZCF	BV-D16.5ZF	6.5	500	7.22	7.98	10	11.2	17.9	10/1000uS	200	SOD123F	3.7x1.8x1.0	AK	IAK	DC power				○	○	○
BV-D107ZCF	BV-D107ZF	7	200	7.78	8.6	10	12	16.7	10/1000uS	200	SOD123F	3.7x1.8x1.0	AM	IAM	DC power				○	○	○
BV-D17.5ZCF	BV-D17.5ZF	7.5	100	8.33	9.21	1	12.9	15.5	10/1000uS	200	SOD123F	3.7x1.8x1.0	AP	IAP	DC power				○	○	○
BV-D108ZCF	BV-D108ZF	8	50	8.89	9.83	1	13.6	14.7	10/1000uS	200	SOD123F	3.7x1.8x1.0	AR	IAR	DC power				○	○	○
BV-D18.5ZCF	BV-D18.5ZF	8.5	20	9.44	10.4	1	14.4	13.9	10/1000uS	200	SOD123F	3.7x1.8x1.0	AT	IAT	DC power				○	○	○
BV-D109ZCF	BV-D109ZF	9	10	10	11.1	1	15.4	13	10/1000uS	200	SOD123F	3.7x1.8x1.0	AV	IAV	DC power				○	○	○
BV-D110ZCF	BV-D110ZF	10	5	11.1	12.3	1	17	11.8	10/1000uS	200	SOD123F	3.7x1.8x1.0	AX	IAX	DC power				○	○	○
BV-D111ZCF	BV-D111ZF	11	3	12.2	13.5	1	18.2	11	10/1000uS	200	SOD123F	3.7x1.8x1.0	AZ	IAZ	DC power				○	○	○
BV-D112ZCF	BV-D112ZF	12	1	13.3	14.7	1	19.9	10.1	10/1000uS	200	SOD123F	3.7x1.8x1.0	BE	IBE	DC power				○	○	○
BV-D113ZCF	BV-D113ZF	13	1	14.4	15.9	1	21.5	9.3	10/1000uS	200	SOD123F	3.7x1.8x1.0	BG	IBG	DC power				○	○	○
BV-D114ZCF	BV-D114ZF	14	1	15.6	17.2	1	23.2	8.6	10/1000uS	200	SOD123F	3.7x1.8x1.0	BK	IBK	DC power				○	○	○
BV-D115ZCF	BV-D115ZF	15	1	16.7	18.5	1	24.4	8.2	10/1000uS	200	SOD123F	3.7x1.8x1.0	BM	IBM	DC power				○	○	○
BV-D116ZCF	BV-D116ZF	16	1	17.8	19.7	1	26	7.7	10/1000uS	200	SOD123F	3.7x1.8x1.0	BP	IBP	DC power				○	○	○
BV-D117ZCF	BV-D117ZF	17	1	18.9	20.9	1	27.6	7.3	10/1000uS	200	SOD123F	3.7x1.8x1.0	BR	IBR	DC power				○	○	○
BV-D118ZCF	BV-D118ZF	18	1	20	22.1	1	29.2	6.9	10/1000uS	200	SOD123F	3.7x1.8x1.0	BT	IBT	DC power				○	○	○
BV-D120ZCF	BV-D120ZF	20	1	22.2	24.5	1	32.4	6.2	10/1000uS	200	SOD123F	3.7x1.8x1.0	BV	IBV	DC power				○	○	○
BV-D122ZCF	BV-D122ZF	22	1	24.4	26.9	1	35.5	5.7	10/1000uS	200	SOD123F	3.7x1.8x1.0	BX	IBX	DC power				○	○	○
BV-D124ZCF	BV-D124ZF	24	1	26.7	29.5	1	38.9	5.2	10/1000uS	200	SOD123F	3.7x1.8x1.0	BZ	IBZ	DC power				○	○	○
BV-D126ZCF	BV-D126ZF	26	1	28.9	31.9	1	42.1	4.8	10/1000uS	200	SOD123F	3.7x1.8x1.0	CE	ICE	DC power				○	○	○
BV-D128ZCF	BV-D128ZF	28	1	31.1	34.4	1	45.4	4.4	10/1000uS	200	SOD123F	3.7x1.8x1.0	CG	ICG	DC power				○	○	○
BV-D130ZCF	BV-D130ZF	30	1	33.3	36.8	1	48.4	4.2	10/1000uS	200	SOD123F	3.7x1.8x1.0	CK	ICK	DC power				○	○	○
BV-D133ZCF	BV-D133ZF	33	1	36.7	40.6	1	53.3	3.8	10/1000uS	200	SOD123F	3.7x1.8x1.0	CM	ICM	DC power				○	○	○
BV-D136ZCF	BV-D136ZF	36	1	40	44.2	1	58.1	3.5	10/1000uS	200	SOD123F	3.7x1.8x1.0	CP	ICP	DC power				○	○	○
BV-D140ZCF	BV-D140ZF	40	1	44.4	49.1	1	64.5	3.1	10/1000uS	200	SOD123F	3.7x1.8x1.0	CR	ICR	DC power				○	○	○
BV-D143ZCF	BV-D143ZF	43	1	47.8	52.8	1	69.4	2.9	10/1000uS	200	SOD123F	3.7x1.8x1.0	CT	ICT	DC power				○	○	○
BV-D145ZCF	BV-D145ZF	45	1	50	55.3	1	72.7	2.8	10/1000uS	200	SOD123F	3.7x1.8x1.0	CV	ICV	DC power				○	○	○
BV-D148ZCF	BV-D148ZF	48	1	53.3	58.9	1	77.4	2.6	10/1000uS	200	SOD123F	3.7x1.8x1.0	CX	ICX	DC power				○	○	○
BV-D151ZCF	BV-D151ZF	51	1	56.7	62.7	1	82.4	2.5	10/1000uS	200	SOD123F	3.7x1.8x1.0	CZ	ICZ	DC power				○	○	○
BV-D154ZCF	BV-D154ZF	54	1	60	66.3	1	87.1	2.3	10/1000uS	200	SOD123F	3.7x1.8x1.0	DE	IDE	DC power				○	○	○
BV-D158ZCF	BV-D158ZF	58	1	64.4	71.2	1	93.6	2.3	10/1000uS	200	SOD123F	3.7x1.8x1.0	DG	IDG	DC power				○	○	○
BV-D160ZCF	BV-D160ZF	60	1	66.7	73.7	1	96.8	2.1	10/1000uS	200	SOD123F	3.7x1.8x1.0	DK	IDK	DC power				○	○	○
BV-D164ZCF	BV-D164ZF	64	1	71.1	78.6	1	103	2	10/1000uS	200	SOD123F	3.7x1.8x1.0	DM	IDM	DC power				○	○	○

Environmental Analysis

Choose a Standard

Application Guide

Select Components

System Test

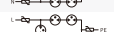
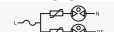
Apply & Optimize

Part Number	DC Breakdown Voltage(V _{BR}) 100V/s (V)	Tolerance of V _{BR} (V)	Impulse Spark-over Voltage 1KV/μs (V)	Arc Voltage (V _a) (V)@1A	Impulse Discharge Current 8/20μs (KA)	Insulation Resistance (GΩ) @DC (V)		Capacitance Co(pF) 0.5VDC@1MHz	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
													UL497B	UL1449	New products
BGO6000A03-LB2	600	≥400	≤1500	/	3	/	/	≤1.5	Φ5.5x7.0	AC Power					
BGO6000A05-LC2	600	≥400	≤1500	/	5	/	/	≤1.5	Φ8.0x7.0	AC Power					
BGO1000A05-LC2	1000	≥1000	≤2500	/	5	/	/	≤1.5	Φ8.0x7.0	AC Power					
BGO6000A10-LC2	600	≥480	≤1500V	~40V	10	≥1	100V	≤1.5pF	φ8x6.0	AC Power					
BGO1001A05-LC2	1000	≥800	≤2000V	~60V	5	≥1	100V	≤1.5pF	φ8x7.0	AC Power					
BGO1001A10-LC2	1000	≥800	≤2500V	~60V	10	≥1	100V	≤1.5pF	φ8x7.0	AC Power					
BGA150FR-A	150	≥150	99%≤850	~10	Pin1or3or4or6-Pin2or5 1KA Pin1&3&4&6-Pin2or5 3.5KA	/	/	≤3.0	8.0x7.0x2.0	Ethernet					
BE091MTW-1	90	72-108	≤600V	~10V		≥1	50V	≤1.5pF	10.3x8.0x2.3	Satelita and CATV & General telecom equipment					
BE701STW-1	700	≥700	99%≤1500	~20		/	/	≤3.0	10.5x8.0x1.6	G.FAST					
BE091STW-1	90	72-108	≤600V	~10V	10	≥1	50V	≤1.5pF	10.5x8.0x1.6	Satelita and CATV & General telecom equipment					

Part Number	Off state Voltage		Switching Voltage		On state Voltage		Holding Current I _H (mA)	Capacitance Co (pF) 2V@1MHz Max	Surge Waveform	Surge Peak	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
	V _{DRM} (V)	I _D (μA) Max	V _s (V) Max	I _s (mA)	V _T (V) Max	I _T (A)									UL497B	UL1449	New products
BSG0060L-H	6	5	11	800	4	2.2	≥90	/	8/20μs	20KA	40.0x27.0x27.0	Pipeline					

Part Number	Off state Voltage V _{DRM} (V)	ID (μA) Max	Switching Trigger		Gate reverse current		forward voltage		Gate trigger Voltage V _{GT} (V) Max	Gate trigger current I _{GT} (mA) Max	Capacitance Co (pF) 2V@1MHZ Max	Surge Waveform (μs)	Surge Peak (KV)	Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
			V _S (V) Max	Waveform	V _{GK} (V)	I _{GA} (μA) Max	V _F (V) Max	I _F (A)												UL497B	UL1449	New products
BS61089B-8	-170	5	-112	2/10μs	-167	5	3	5	2.5	5	100	10/700	1.6	SOP8	4.9x6.0x1.7	B61089B	SLIC					
BS61089D-8	-170	5	-64	10/700μs	-167	5	3	5	2.5	5	100	10/700	1.6	SOP8	4.9x6.0x1.7	B61089D	SLIC					

Part Number	DC Breakdown Voltage(V_{BR}) of GDT 100V/s (V)	Tolerance of V_{DC} (V)	Varistor Voltage @1mA DC	Tolerance of V_{1mA} (V)	Impulse Spark-over Voltage (V)	Impulse Discharge Current 8/20 μ s (KA)	Capacitance Co(pF) 0.5VDC@1KHz	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
												UL497B	UL1449	New products
BMG14D820K091Y	90	>90V	82	74~90V	1kV/ μ s@ $\leq$ 1000	3kA	$\leq$ 10pF	20x17x8	AC Power					
BMG20D471K801Y	700	>650V	470	423~517V	6kV/3kA@ $\leq$ 2000	5kA	$\leq$ 10pF	22.5x23x9.5	AC Power					
BMG14D471K801Y	700	>650V	470	423~517V	6kV/3kA@ $\leq$ 2000	3kA	$\leq$ 10pF	21x17.5x8	AC Power					
BMG14D561K801Y	700	>650V	560	504~616V	6kV/3kA@ $\leq$ 2000	1kA	$\leq$ 10pF	21x17.5x6.5	AC Power					
BMG10D471K801Y	700	>650V	470	423~517V	1kV/ μ s@ $\leq$ 2000	1kA	$\leq$ 10pF	17.5x14x8	AC Power					
BMG10D621K102Y	1000	>800V	620	558~682	4kV/2kA@ $\leq$ 2000	2kA	$\leq$ 10pF	17x14x8.6	AC Power					
BMG7D471K801Y	800	>600V	470	423~517V	1kV/ μ s@ $\leq$ 1700	0.5kA	$\leq$ 10pF	13x9.5x8	AC Power					
BMG20D391K102Y	1000	>800V	390	351~429V	6kV/3kA@ $\leq$ 2000	5kA	$\leq$ 10pF	25x22x8	AC Power					

Part Number	Classification of impact tests	Modes of protection	Nominal working voltage	Maximum continuous operating voltage	Nominal discharge current	Voltage protection level	IP code	Flame Rating	Size L*W*H (mm)	Application	Circuit	Outline	Remarks		
													UL497B	UL1449	New products
BSPD220C20P	T2	L-N,L-PE,N-PE	220VAC	250VAC	20kA	L-N/L-PE:1.5kV,N-PE:2.0kV	Ip20	UI94 V-0	41x30.5x27.2	AC Power					
BSPD220C20P-1	T2	L-PE,N-PE	220VAC	250VAC	20kA	L-PE:1.5kV,N-PE:1.5kV	IP20	UL94 V-0	41x30.5x27.2	AC Power					
BSPD220C20P-2	T2	L-PE,N-PE	220VAC	300VAC	20kA	L-PE:1.5kV,N-PE:1.5kV	IP20	UL94 V-0	41x30.5x27.2	AC Power					
BSPD220C20P-D	T2	L-N,L-PE,N-PE	220VAC	L-N:300VAC,L-PE/N-PE:450VAC	20kA	L-PE/N-PE:2.5kV,L-N:1.8kV	IP65	UL94 V-0	41.8x16.4x25	AC Power					
BSPD220C20P-D1	T2	L-N,L-PE,N-PE	220VAC	L-N:300VAC,L-PE/N-PE:450VAC	20kA	L-PE/N-PE:2.5kV,L-N:1.8kV	IP65	UL94 V-0	41.8x27.5x16.4	AC Power					
BSPD220D05L	T2/T3	L-N,L-PE,N-PE	220VAC	320VAC	5kA	L-N/N-PE:1.35kV,N-PE:2.5kV	Ip66	UL94 V-0	45x28x20	AC Power					

Part Number	Pin	Off state Voltage		Switching Voltage		On state Voltage		Clamp Voltage			Clamp Voltage		Package	Size L*W*H (mm)	Mark	Application	Circuit	Outline	Remarks		
		VDRM (V)	ID (μ A) Max	V_S/V_{BR} (V) Max	I_S/I_R (mA)	V_T (V) Max	I_T (A)	V_{CPE} (V) Max	V_{CPL}	@ I_{PP} (KA) 8/20 μ s	V_C (V) Max	@ I_{PP} (KA) 10/350 μ s							UL497B	UL1449	New products
BVS-SMEJ8685CA	1-2	86	10	105	1	/	/	157	77.4	10	157	0.4	SMEJ	18.3x14.0x7.5	10-8685 BVS YM	DC Power					
	2-1	85	10	100	800	4	2.2	150	/	10	150	0.4									
BVS-SMEJ6665CA	1-2	66	10	105	1	/	/	157	59.4	10	157	0.4	SMEJ	18.3x14.0x7.5	10-8685 BVS YM	DC Power					
	2-1	65	10	120	800	4	2.2	157	/	10	157	0.4									

Surge Lab



GR-1089
Surge Test

2/10μs
0-5000V
0-500A

10/360μs
0-1000V
0-100A



ITU-T K Series
Surge Test

10/700μs
0-6000V
0-400A

1.2/50μs-8/20μs
0-6000V
0-3000A



IEC61643-1
Surge Test

8/20μs
0-160KA

10/350μs
0-50KA



IEC61000-4-5
Surge Test

10/700μs
0-15KV
0-1000A

1.2/50μs-8/20μs
0-15KV
0-7500A



IEC61643-11
TOV Test

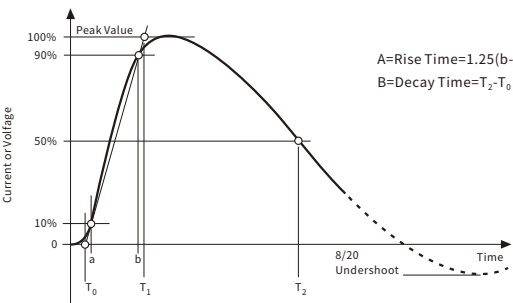
AC1200V
0-300A



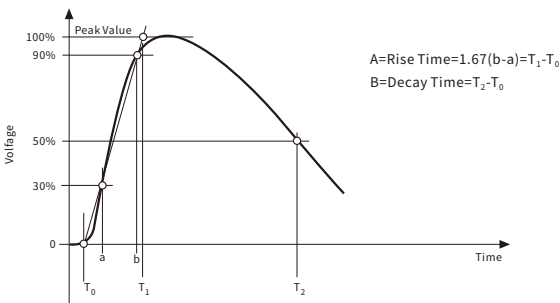
ISO7637-2:2011
&ISO16750:2010
Surge Test

P1/P2a/P2b/P3a/
P3b/P4a/P5a/P5b

GR1089-2:2010 Exponential Voltage/Current Waveform of A/B



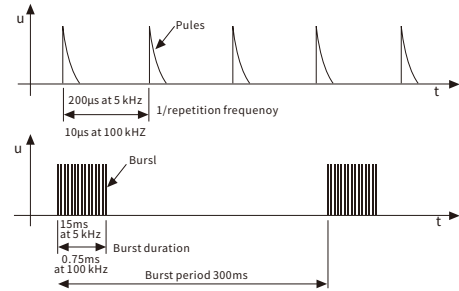
GR1089-2:2010 Double Exponential Voltage/Current Waveform of A/B for 1.2/50 and 10/700 Surges



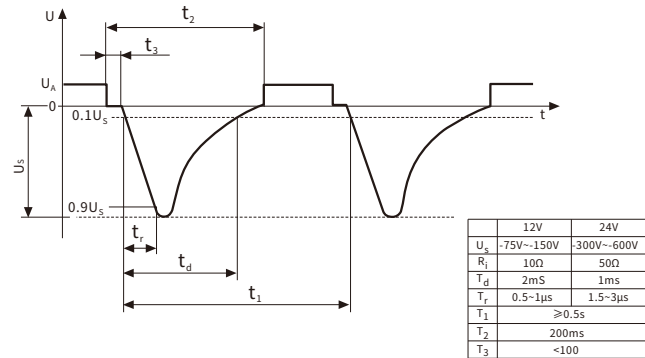
Designation	Condition	Edge	Time and Tolerance	Amplitude
2/10	Open-Circuit Voltage	Rise	2μs+0μs to -1μs	0% to +20%
		Decay	2μs+7μs to -0μs	
	Short-Circuit Current	Rise	2μs+0μs to -1μs	0% to +20%
		Decay	2μs+7μs to -0μs	
1.2/50-8/20 (See Note 1)	Open-Circuit Voltage	Rise	1.2μs±0.36μs	±10%
		Decay	50μs±1.6μs	
	Short-Circuit Current	Rise	8μs±1.6μs	±10% (See Note 2)
		Decay	20μs±4μs	
8/20	Open-Circuit Voltage	Rise	(See Note 3)	(See Note 4)
		Decay	(See Note 3)	
	Short-Circuit Current	Rise	8μs±1.6μs	±10% (See Note 2)
		Decay	20μs±4μs	
10/250	Open-Circuit Voltage	Rise	10μs+0μs to -6.0μs	0% to +16%
		Decay	250μs+150μs to -0μs	
	Short-Circuit Current	Rise	10μs+0μs to -3.0μs	0% to +16%
		Decay	250μs+50μs to -0μs	
10/360	Open-Circuit Voltage	Rise	10μs+0μs to -2.5μs	0% to +15%
		Decay	250μs+108μs to -0μs	
	Short-Circuit Current	Rise	10μs+0μs to -2.5μs	0% to +15%
		Decay	250μs+108μs to -0μs	
10/700 Dual Output Version	Open-Circuit Voltage - Both terminals open	Rise	10μs±3μs	±10%
		Decay	700μs±140μs	
	Open-Circuit Voltage - Other terminal shorted	Rise	5μs±1.5μs	±10%
		Decay	320μs±64μs	
	Short-Circuit Current - Other terminal open	Rise	5μs±1.5μs	±10%
		Decay	320μs±64μs	
	Short-Circuit Current - Both terminals shorted	Rise	4μs±1.2μs	±10%
		Decay	250μs±50μs	
10/1000	Open-Circuit Voltage	Rise	10μs+0μs to -4.0μs	0% to +15%
		Decay	1000μs+500μs to -0μs	
	Short-Circuit Current	Rise	10μs+0μs to -4.0μs	0% to +15%
		Decay	1000μs+500μs to -0μs	

Note 1: Fictive impedance (open-circuit peak voltage value/short-circuit peak current value) 2Ω
Note 2: Undershoot < 30% of the peak short-circuit value.
Note 3: Voltage waveshape not defined.
Note 4: Minimum peak open-circuit voltage defined in test conditions.

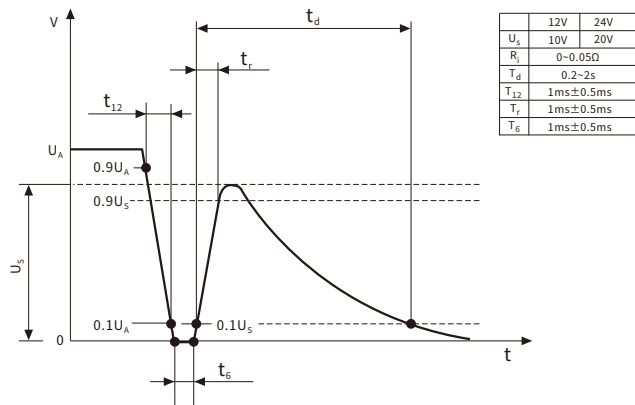
IEC61000-4-4:2012 Representation of an electrical fast transient / burst



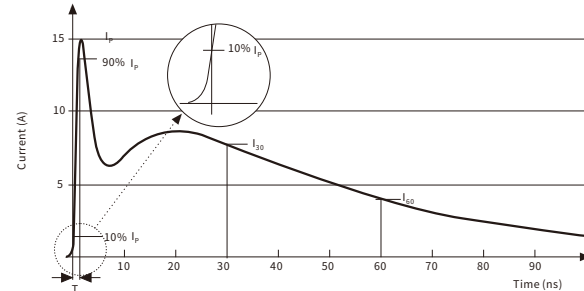
ISO7637-2:2011 Test pulse generator for immunity testing—Test pulse 1



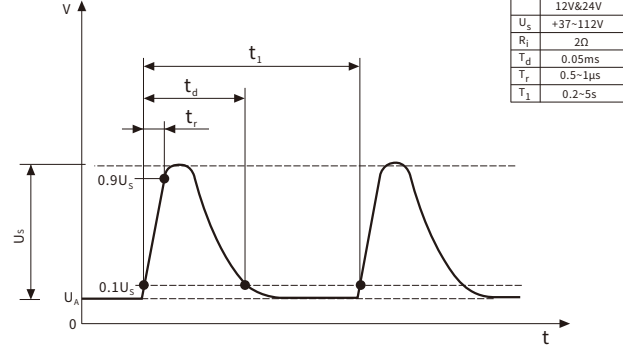
ISO7637-2:2011 Test pulse generator for immunity testing—Test pulse 2b



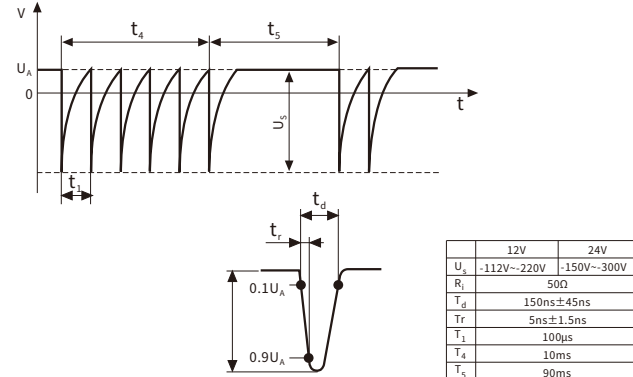
IEC61000-4-2:2008 Ideal contact discharge current waveform at 4 kV



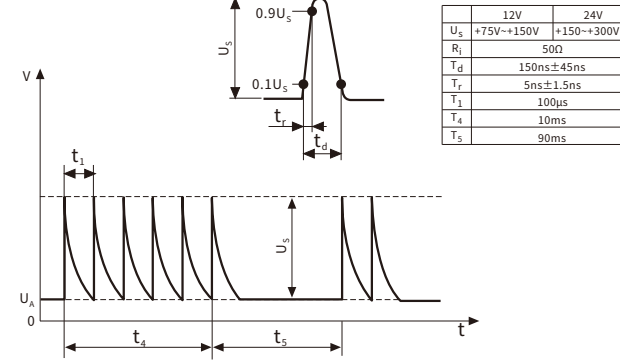
ISO7637-2:2011 Test pulse generator for immunity testing—Test pulse 2a



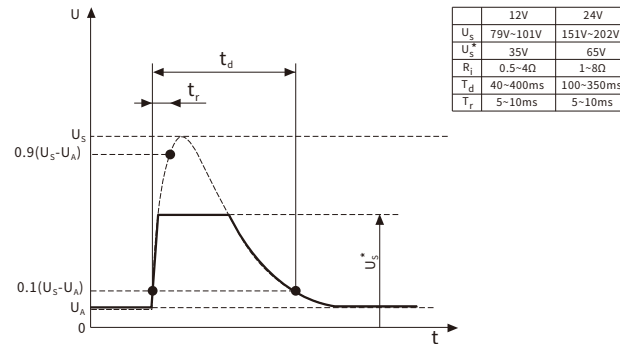
ISO7637-2:2011 Test pulse generator for immunity testing—Test pulse 3a



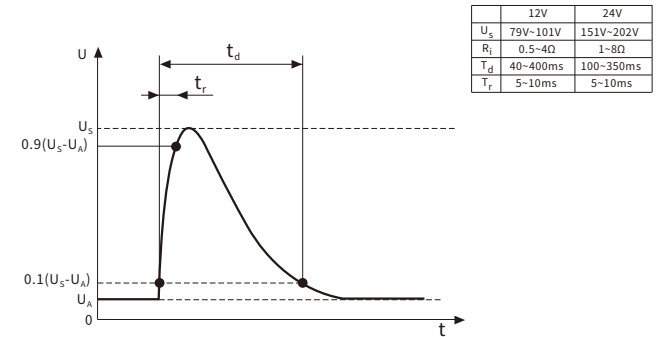
ISO7637-2:2011 Test pulse generator for immunity testing—Test pulse 3b



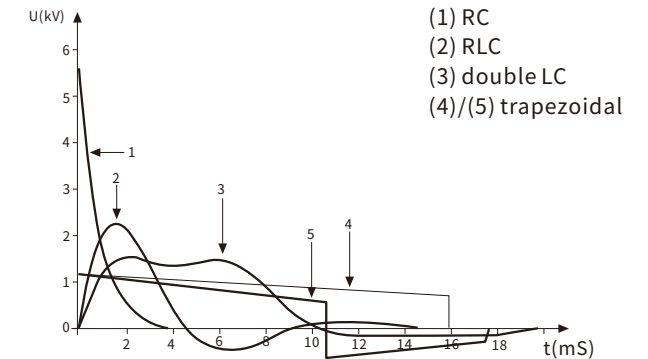
ISO16750-2:2012 Test pulse generator for immunity testing—Test pulse 5b



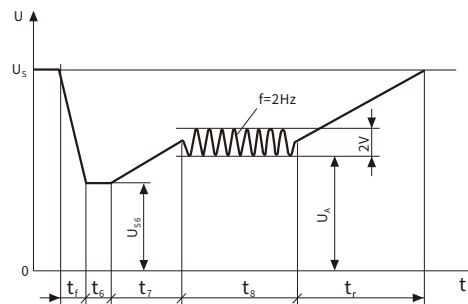
ISO16750-2:2010 Test pulse generator for immunity testing—Test pulse 5a



IEC60601:2008 Response of defibrillator circuits



ISO16750-2:2012 Test pulse generator for immunity testing—Test pulse 4



	I		II		III		IV
	12V	24V	12V	24V	12V	24V	12V
$U_{s6}(V)$	8(-0.2)	10(-0.2)	4.5(-0.2)	8(-0.2)	3(-0.2)	6(-0.2)	6(-0.2)
$U_s(V)$	9.5(-0.2)	20(-0.2)	6.5(-0.2)	15(-0.2)	5(-0.2)	10(-0.2)	6.5(-0.2)
$t_1(ms)$	5(±0.5)	10(±1)	5(±0.5)	10(±1)	5(±0.5)	10(±1)	5(±0.5)
$t_6(ms)$	15(±1.5)	50(±5)	15(±1.5)	50(±5)	15(±1.5)	50(±5)	15(±1.5)
$t_r(ms)$	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)	50(±5)
$t_3(ms)$	1000(±100)	1000(±100)	1000(±1000)	1000(±100)	1000(±100)	1000(±100)	1000(±1000)
$t_4(ms)$	40(±4)	40(±4)	100(±10)	100(±10)	100(±10)	40(±10)	100(±10)



ISO9001:2008



TS16949:2009



C-RoHS



OHSAS 18001:2007

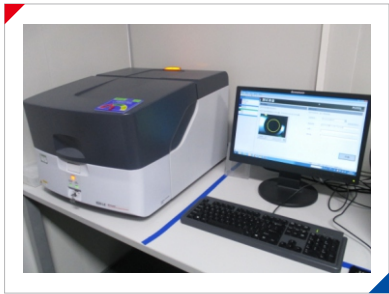


ISO14001:2004



UL-CCIC

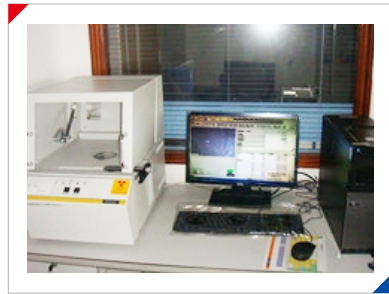
Reliability Lab



RoHS Tester



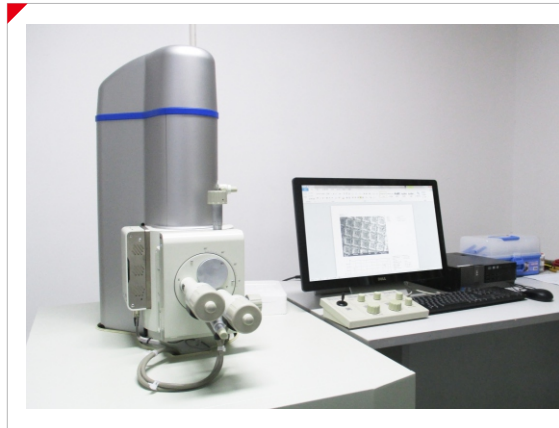
Temperature cycle



Film thickness tester



X-RAY perspective detector



Scanning electron microscope



High-temperature reverse bias



High temperature and humidity



Highly accelerated stress test

Layout Recommended

10/700μs—5/320μs(40Ω) 1KV-6KV

Voltage(KV)	Copper thickness(OZ)	Trace widths@Surface(mil)	Test times
1	1	5	±30
3		8	±30
4		10	±30
5		12	±30
6		15	±30
4	2	5	±30
6		8	±30

8/20μs 0.5KA-10KA(10Z)

Current(KA)	Trace widths @Surface(mil)	Trace widths@Inlayer(mil)	Test times
0.5	12	20	±30
1	30	40	±30
1.5	30	60	±30
2	40	80	±30
2.5	50	100	±30
3	80	100	±30
3.5	80	140	±30
4	80	180	±30
4.5	100	180	±30
5	100	200	±30
5.5	120	240	±30
6	120	250	±30
6.5	200	300	±30
7	200	300	±30
7.5	200	360	±30
8	200	360	±30
8.5	200	360	±30
9	250	360	±30
9.5	250	400	±30
10	250	400	±30

A series of horizontal dotted lines for writing.

