Electrostatic Discharged Protection Devices (ESD) Data Sheet

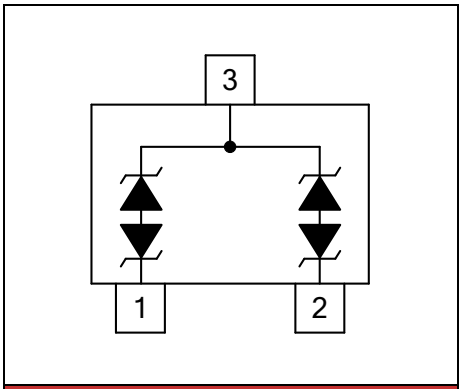
Description

Brightking's SDT23C712L02 component is designed for asymmetrical (12V to -7V) protection in muti-point data transmission standard RS-485 applications. It may be used to protect devices from transient voltages resulting from electrostatic discharge (ESD), electrical fast transients (EFT), and lightning. It features 400W (tp=8/20μs) of power handing capability to accommodate the higher transient voltage levels which may be expected in extended common mode applications.

Contact : ±30kV
Air : ±30kV

Features

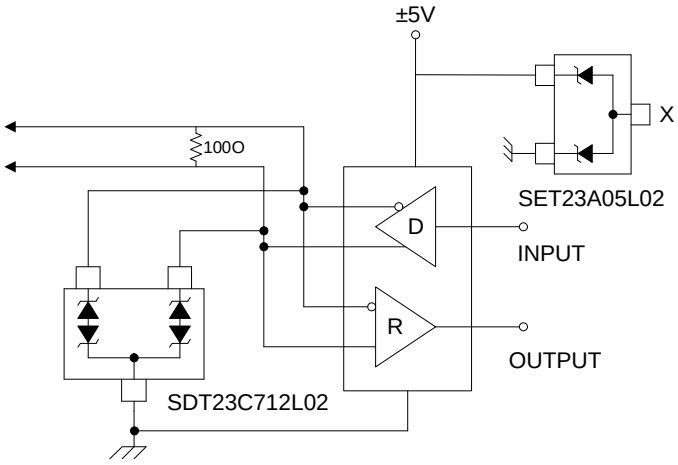
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOT-23 surface mount package
- Protects two +12V to -7V lines
- Peak power dissipation of 400W under 8/20μs waveform
- Low leakage current
- Low clamping voltage
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270℃
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified
- Marking: B 712



Pin Configuration

Applications

- Protection of RS-485 transceiver with extended Common-mode range
- Security Systems
- Automatic Teller Machines
- HFC Systems
- Networks



Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20μs waveform)	P_{PP}	400	W
ESD voltage (Contact discharge)	V_{ESD}	±30	kV
ESD voltage (Air discharge)		±30	
Storage & operating temperature range	T_{STG} ,T_J	-55~+150	℃

Electrical Characteristics (T_J=25℃)

Pin 1 to Pin3 and Pin2 to Pin3

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				12	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	13.3			V
Reverse leakage current	I_R	V_R=12V			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=5A			20	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND			75	pF

Pin 3 to Pin1 and Pin3 to Pin2

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				7	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	7.5			V
Reverse leakage current	I_R	V_R=7V			20	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=5A			10	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND			75	pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

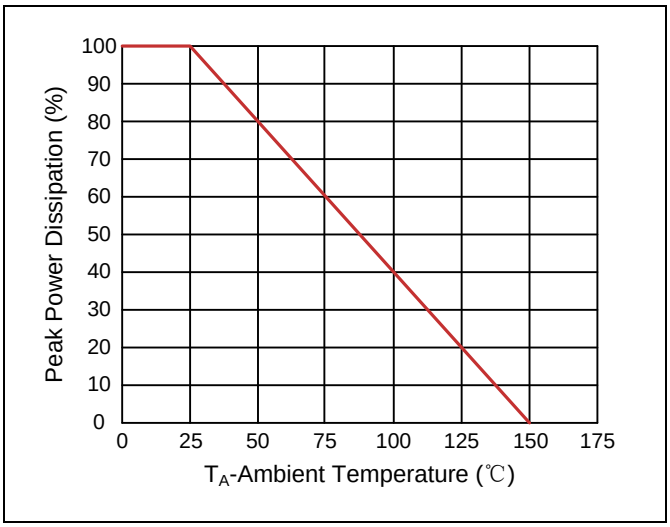


Figure 2. Pulse Waveforms

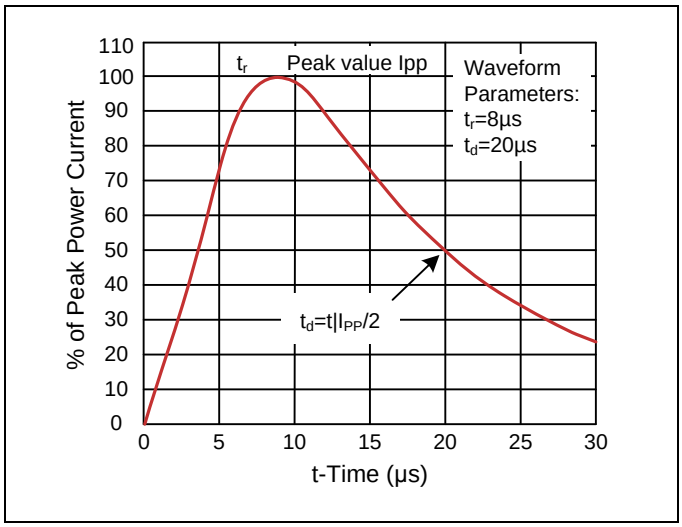


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

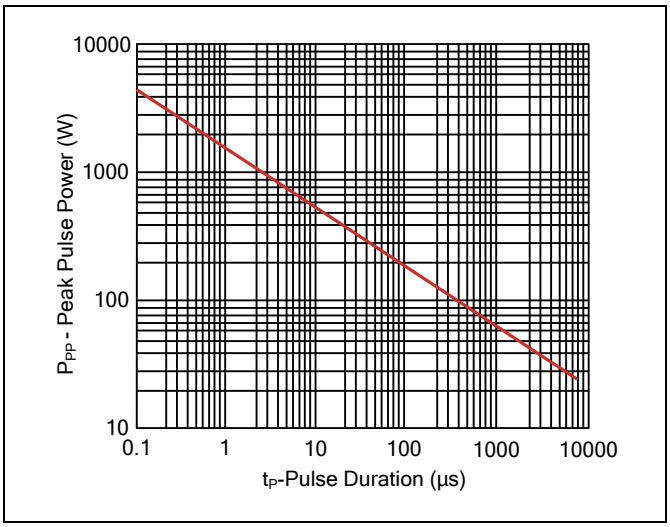
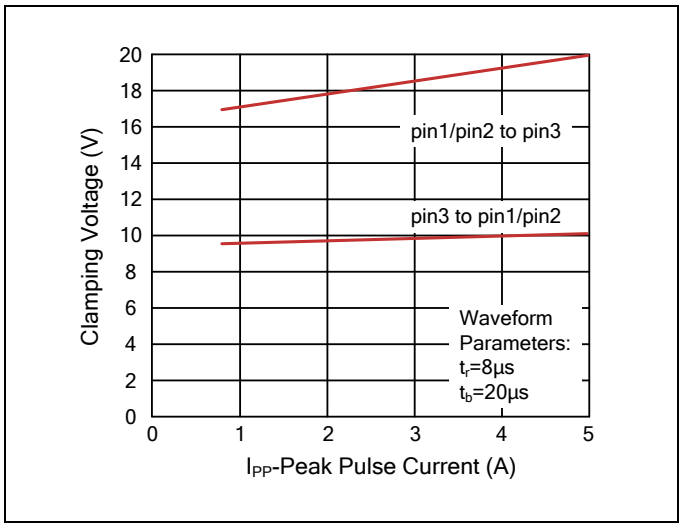
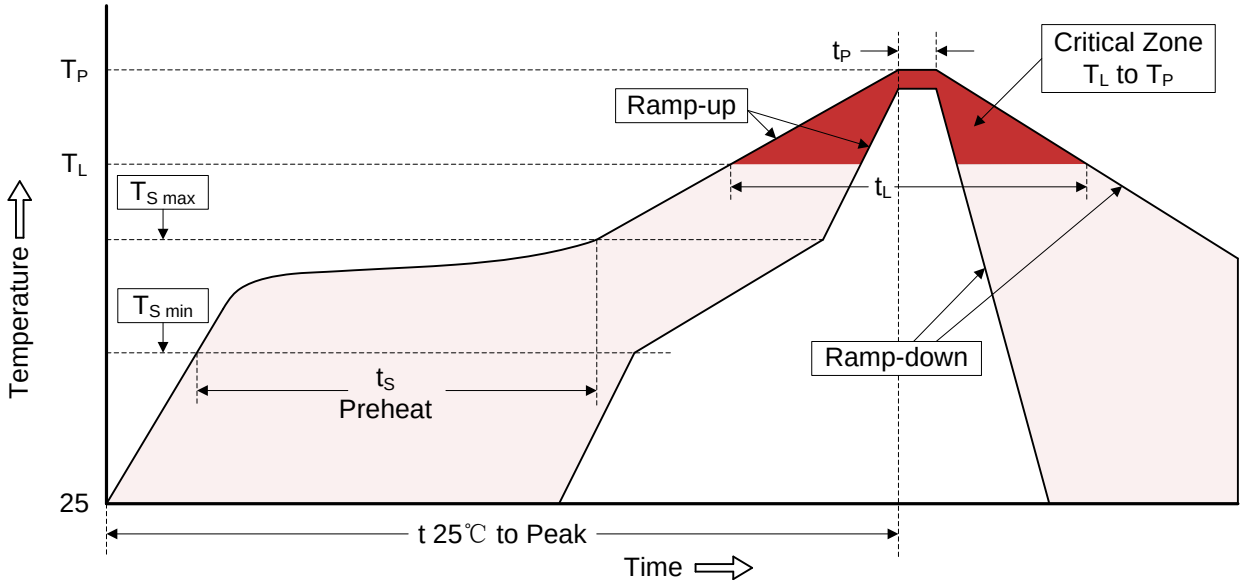


Figure 4. Clamping Voltage vs. Peak Pulse Current



Recommended Soldering Conditions

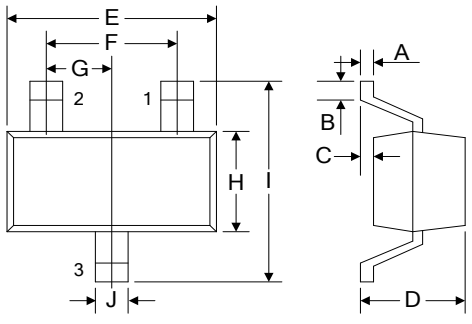
Reflow Soldering

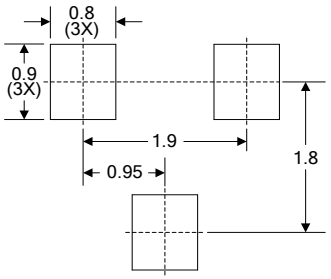


Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (ts)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Dimensions (SOT-23)



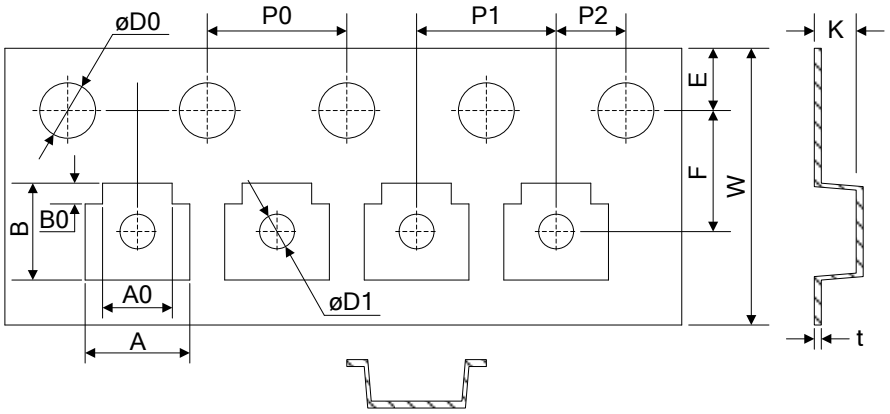


Recommended Soldering Pad Layout

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.08	0.18	0.003	0.007
B	0.15	-	0.006	-
C	-	0.13	-	0.005
D	0.89	1.09	0.035	0.043
E	2.80	3.05	0.110	0.120
F	1.90		0.075	
G	0.95		0.037	
H	1.19	1.40	0.047	0.055
I	2.10	2.49	0.083	0.098
J	0.35	0.50	0.014	0.020

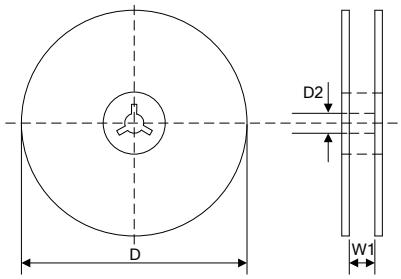
Packaging

Tape



Symbol	Dimension (mm)
W	8.00±0.30
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.10
D1	Φ1.00±0.05
E	1.75±0.10
F	3.50±0.10
A	3.10±0.10
A0	2.10±0.10
B	2.75±0.10
B0	0.65±0.10
K	1.10±0.10
t	0.20±0.05

Reel



D	Φ178.0±2.0
D2	Φ13.0
W1	9.5
Quantity: 3000PCS	