

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

Brightking's SCS08CXXL07 series are designed to protect sensitive electronics from damage or latch-up due to ESD. They are available with operating data and signal lines, such as RS232, I<sup>2</sup>C ports, etc.

The series features transient overvoltage protection for up to seven lines using only one package. The series meet the immunity requirements of IEC61000 Level 4 (15KV air, 8KV contact discharge).

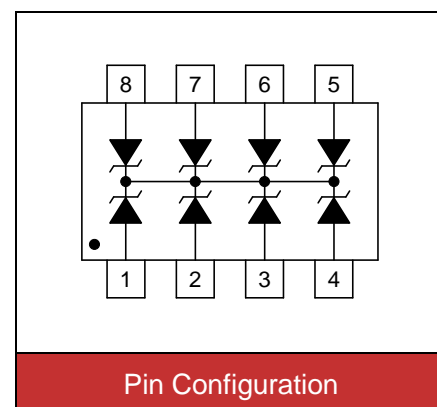


Contact :  $\pm 8\text{kV}$   
Air :  $\pm 15\text{kV}$



### Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOIC-08 surface mount package
- Protects seven I/O lines
- Peak power dissipation of 300W under 8/20 $\mu\text{s}$  waveform
- Working voltage: 5V, 12V, 15V & 24V
- Low leakage current
- Low capacitance and clamping voltage
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020



### Applications

- RS-232 and RS-422 data line protection
- Microprocessor based equipment
- LAN/WAN equipment
- Notebooks, desktops, servers
- I<sup>2</sup>C serial ports
- Set Top Box (STB)
- Serial and Parallel ports
- Instrumentation
- Peripherals

### Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20 $\mu\text{s}$ waveform)	P <sub>PP</sub>	300	W
ESD voltage (Contact discharge)	V <sub>ESD</sub>	$\pm 8$	kV
ESD voltage (Air discharge)		$\pm 15$	
Storage & operating temperature range	T <sub>STG</sub> , T <sub>J</sub>	-55~+150	°C

## Electrical Characteristics (T<sub>J</sub>=25°C)

SCS08C05L07 (Marking: B SM05C-7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				5	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	6			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =5V each I/O pin			20	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			9.8	V
Off state junction capacitance	C <sub>J</sub>	0Vdc,f=1MHz Between I/O pins and GND			350	pF

SCS08C12L07 (Marking: B SM12C-7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				12	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	13.3			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =12V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			19	V
Off state junction capacitance	C <sub>J</sub>	0Vdc,f=1MHz Between I/O pins and GND			120	pF

SCS08C15L07 (Marking: B SM15C-7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				15	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	16.7			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =15V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			27	V
Off state junction capacitance	C <sub>J</sub>	0Vdc,f=1MHz Between I/O pins and GND			75	pF

## Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ )

SCS08C24L07 (Marking: B SM24C-7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				24	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	26.7			V
Reverse leakage current	$I_R$	$V_R=24\text{V}$ each I/O pin			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			43	V
Off state junction capacitance	$C_J$	0Vdc, $f=1\text{MHz}$ Between I/O pins and GND			50	pF

## Typical Characteristics Curves

Figure 1. Power Derating Curve

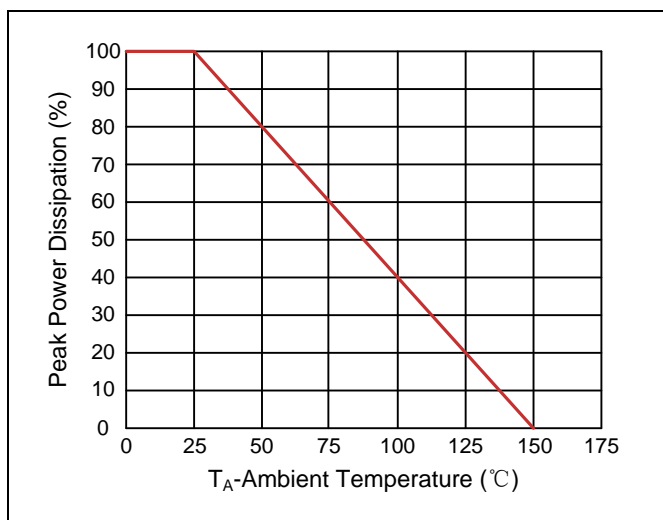


Figure 2. Pulse Waveforms

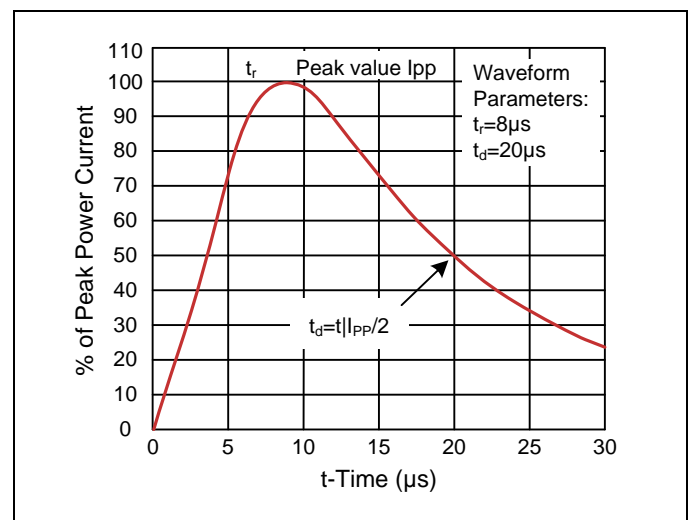
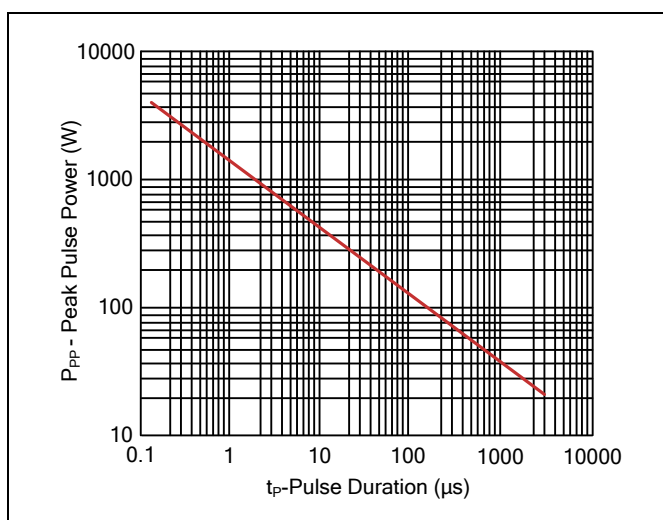
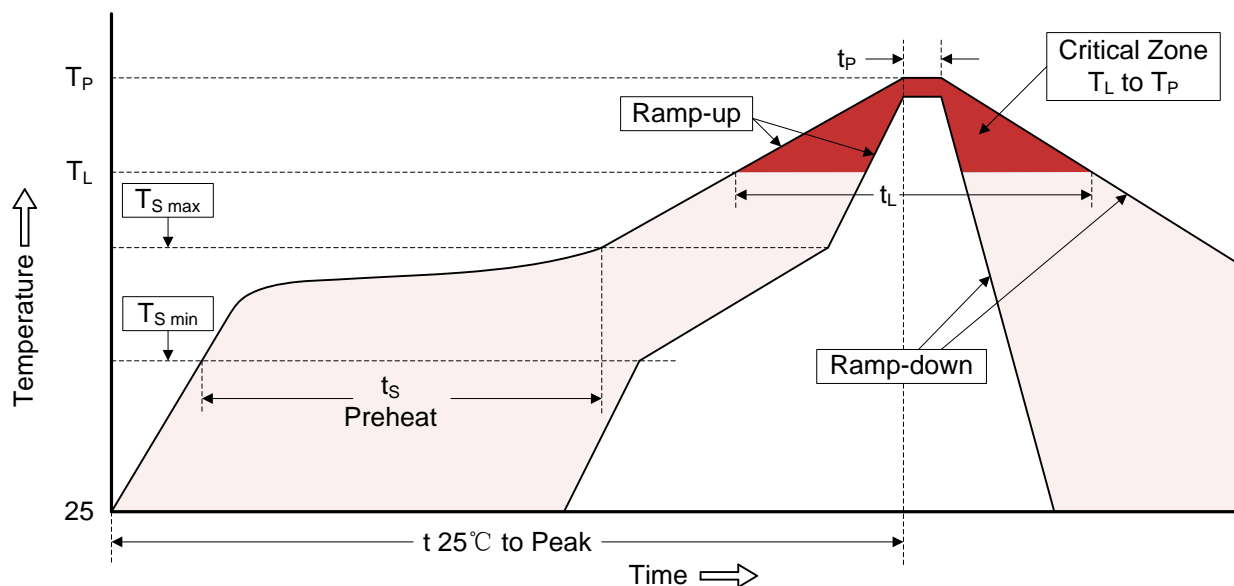


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time



## Recommended Soldering Conditions

### Reflow Soldering



### Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat <ul style="list-style-type: none"> <li>-Temperature Min (<math>T_{S\ min}</math>)</li> <li>-Temperature Max (<math>T_{S\ max}</math>)</li> <li>-Time (min to max) (<math>t_s</math>)</li> </ul>	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ <ul style="list-style-type: none"> <li>-Ramp-up Rate</li> </ul>	3°C/second max.
Time maintained above: <ul style="list-style-type: none"> <li>-Temperature (<math>T_L</math>)</li> <li>-Time (<math>t_L</math>)</li> </ul>	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_P$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

## Dimensions (SOIC-08)

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.80	5.00	0.189	0.197
B	5.80	6.20	0.228	0.244
C	3.80	4.00	0.150	0.157
D	1.27		0.050	
E	0.33	0.51	0.013	0.020
F	0.40	1.27	0.016	0.050
G	0.19	0.25	0.007	0.010
H	1.35	1.75	0.053	0.069
H1	0.10	0.25	0.004	0.010
H2	1.45		0.057	

## Packaging

Tape		Symbol	Dimension (mm)
		W	12.00±0.30
		P0	4.00±0.10
		P1	8.00±0.10
		P2	2.00±0.10
		D0	Φ1.55±0.10
		D1	Φ1.55±0.05
		E	1.75±0.10
		F	5.50±0.10
		A	6.50±0.10
		B	5.40±0.10
		K	2.00±0.10
		t	0.30±0.05
Reel		D	Φ330.0±3.0
		D2	Φ13.0
		W1	13.5
		Quantity: 2500PCS	

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