

## 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).

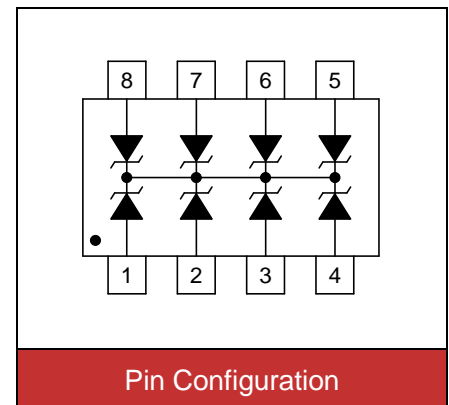


Contact : ±8kV  
Air : ±15kV



### 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 8/20µs 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

- |  |  |
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| <ul style="list-style-type: none"> <li>● RS-232 and RS-422 data line protection</li> <li>● Microprocessor based equipment</li> <li>● LAN/WAN equipment</li> <li>● Notebooks, desktops, servers</li> <li>● I<sup>2</sup>C serial ports</li> </ul> | <ul style="list-style-type: none"> <li>● Set Top Box (STB)</li> <li>● Serial and Parallel ports</li> <li>● Instrumentation</li> <li>● Peripherals</li> </ul> |
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### Maximum Ratings

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

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

SCS08C05L07 (Marking: B SM05C-7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	6			V
Reverse leakage current	$I_R$	$V_R=5\text{V}$ each I/O pin			20	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			9.8	V
Off state junction capacitance	$C_J$	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	$V_{RWM}$				12	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	13.3			V
Reverse leakage current	$I_R$	$V_R=12\text{V}$ each I/O pin			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			19	V
Off state junction capacitance	$C_J$	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	$V_{RWM}$				15	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	16.7			V
Reverse leakage current	$I_R$	$V_R=15\text{V}$ each I/O pin			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			27	V
Off state junction capacitance	$C_J$	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

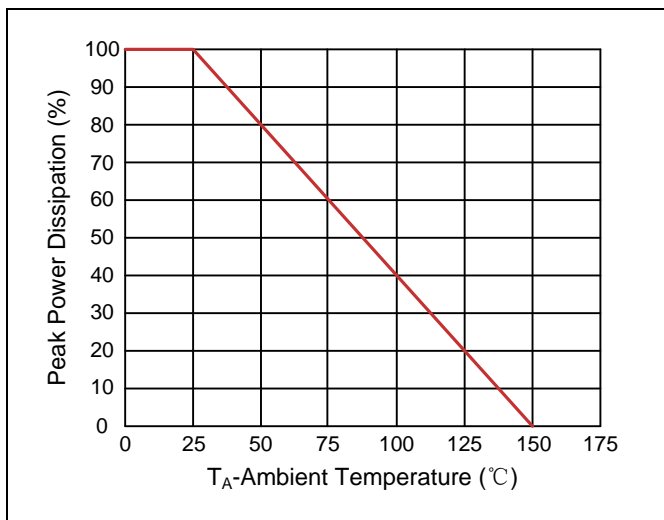


Figure 2. Pulse Waveforms

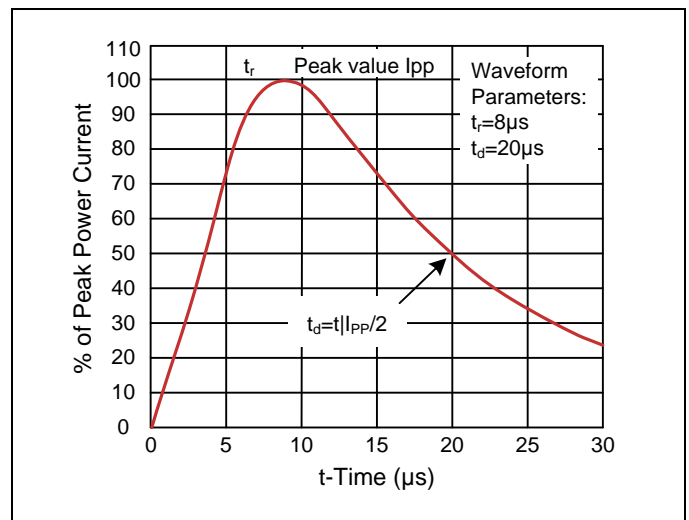
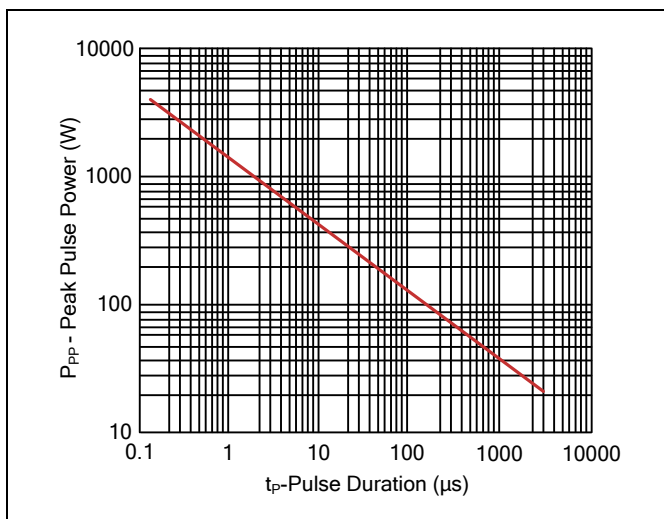
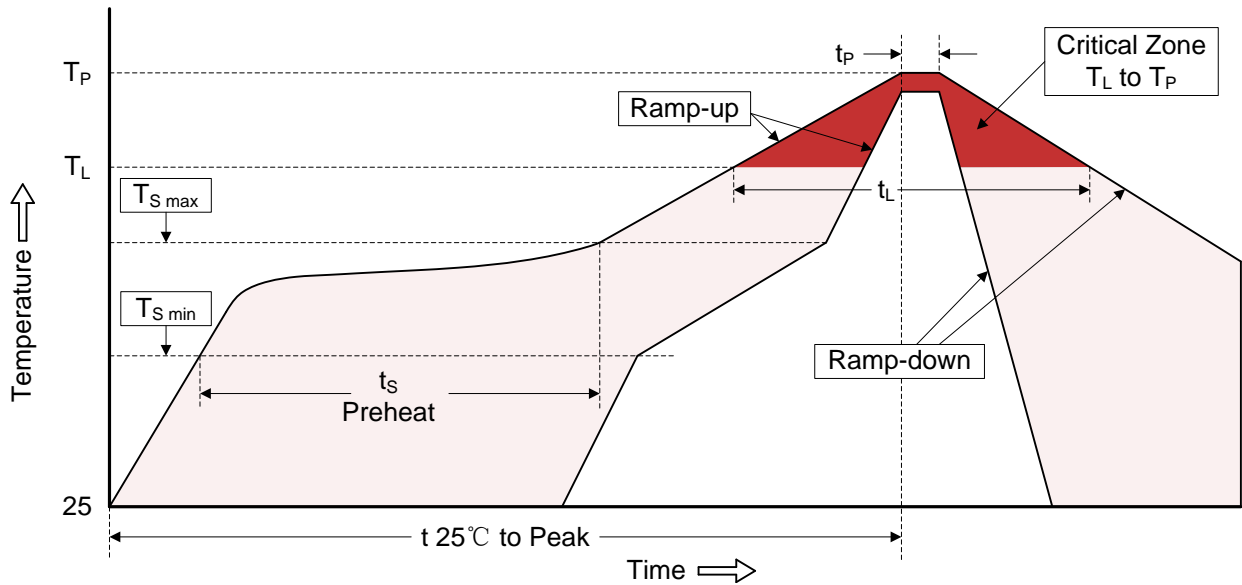


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time



**Recommended Soldering Conditions**

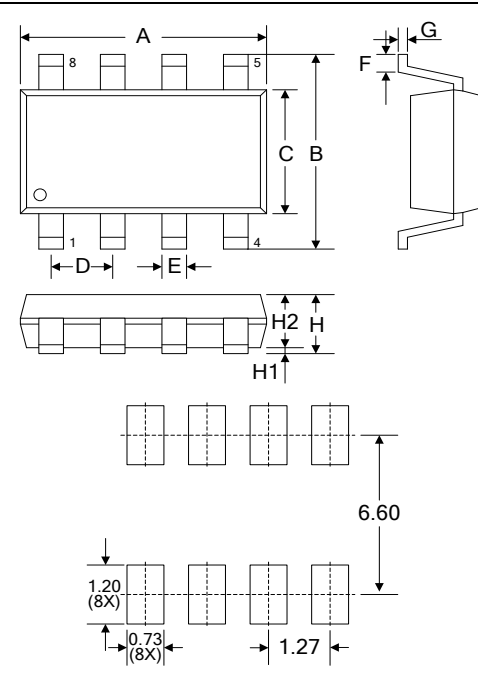
Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature ( $T_L$ ) -Time ( $t_L$ )	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	

Recommended Soldering Pad Layout

**Packaging**

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

Symbol	Dimension (mm)
D	Φ330.0±3.0
D2	Φ13.0
W1	13.5

Quantity: 2500PCS