Electrostatic Discharged Protection Devices (ESD) Data Sheet

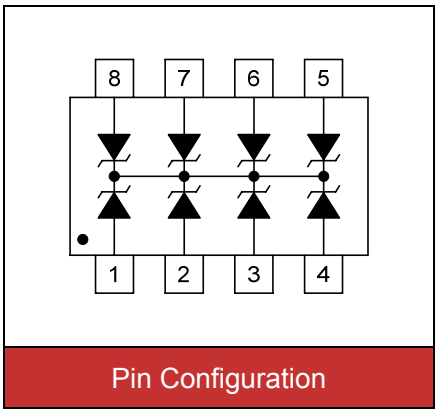
Description

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^2C 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 and 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℃
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020



Pin Configuration

Applications

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

Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20μs waveform)	P_{PP}	300	W
ESD voltage (Contact discharge)	V_{ESD}	±8	kV
ESD voltage (Air discharge)		±15	
Storage & operating temperature range	T_{STG} ,T_J	-55~+150	℃

Electrical Characteristics (T_J=25℃)

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}=1mA	6			V
Reverse leakage current	I_R	V_R=5V each I/O pin			20	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			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}=1mA	13.3			V
Reverse leakage current	I_R	V_R=12V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			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}=1mA	16.7			V
Reverse leakage current	I_R	V_R=15V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			27	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND			75	pF

Electrical Characteristics (T_J=25℃)

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}=1mA	26.7			V
Reverse leakage current	I_R	V_R=24V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			43	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND			50	pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

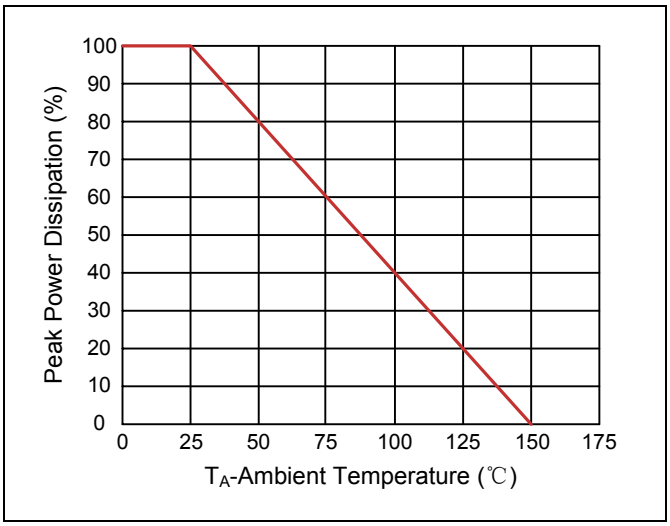


Figure 2. Pulse Waveforms

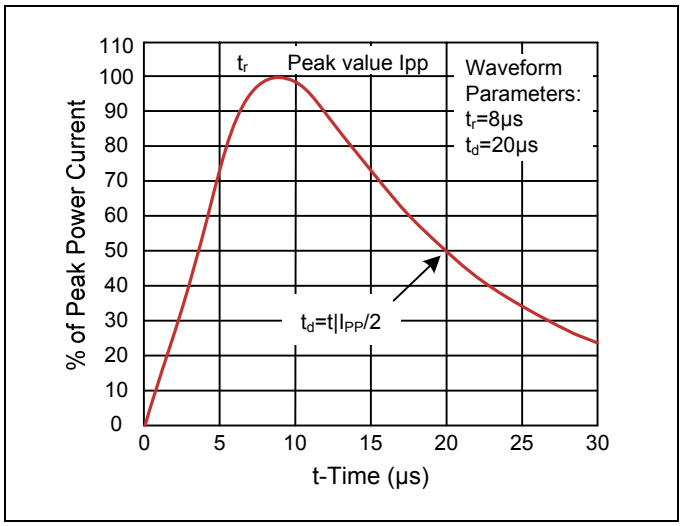
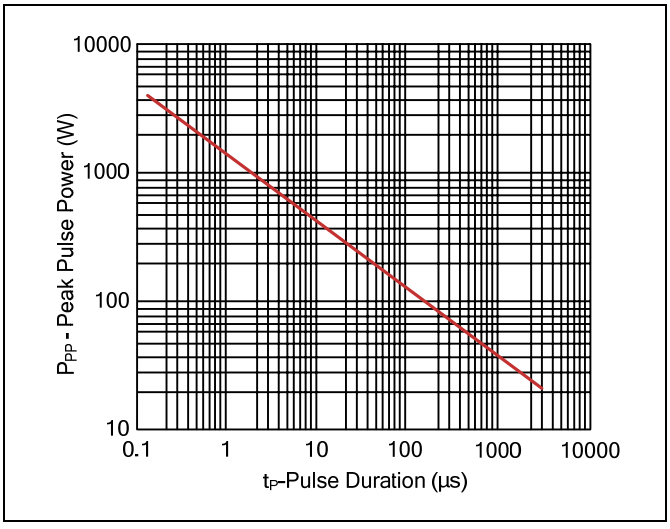
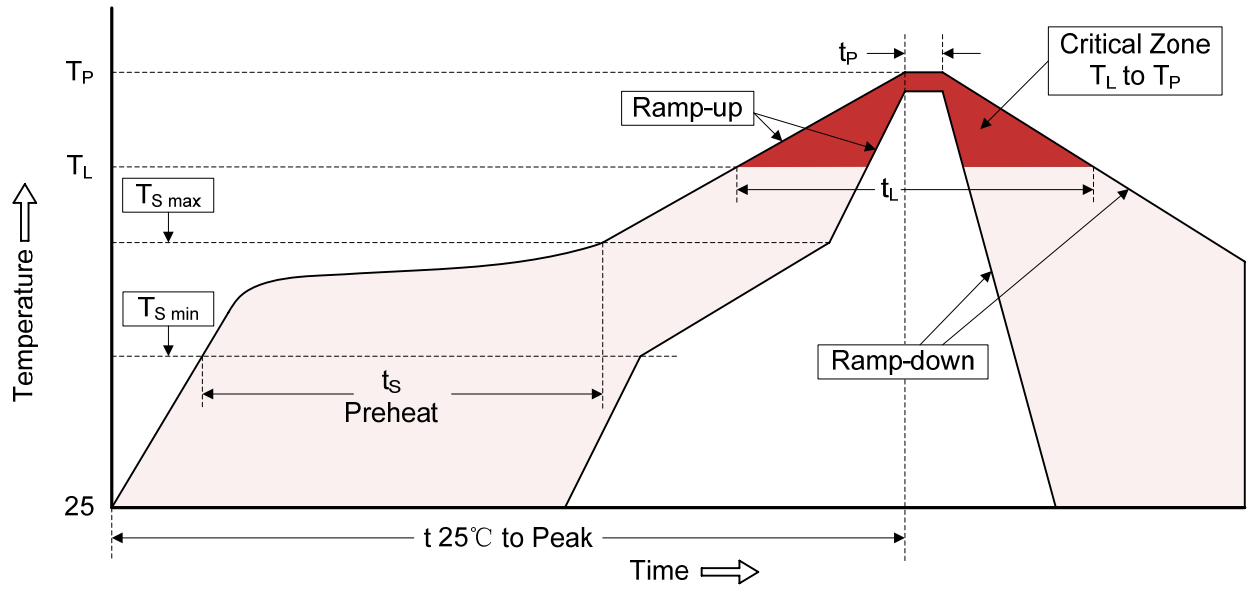


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time



Recommended Soldering Conditions

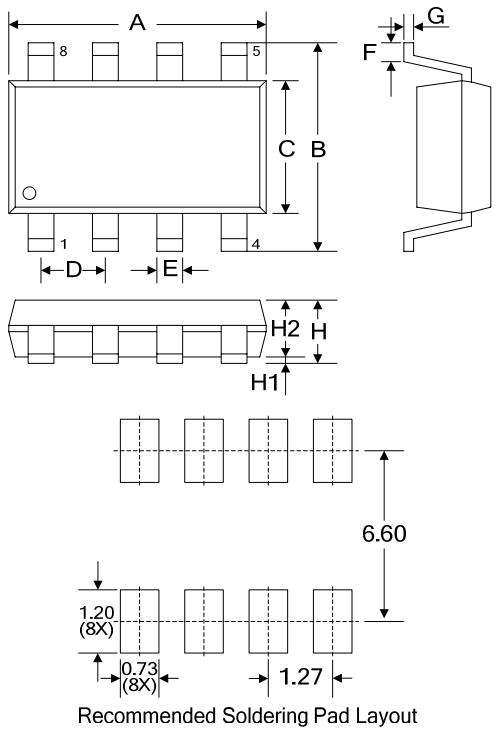
Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/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 (SOIC-08)

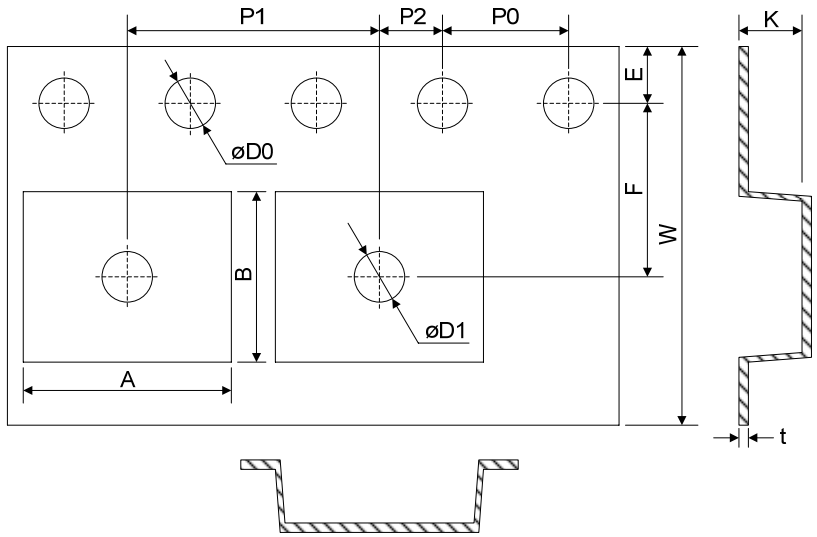


Recommended Soldering Pad Layout

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	

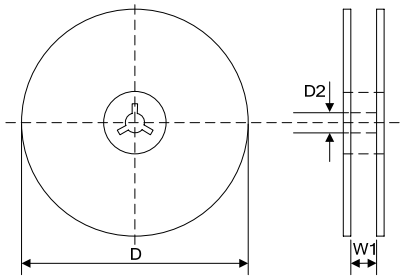
Packaging

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	