

DATA SHEET

**ELECTROSTATIC DISCHARGE
PROTECTION DEVICES**

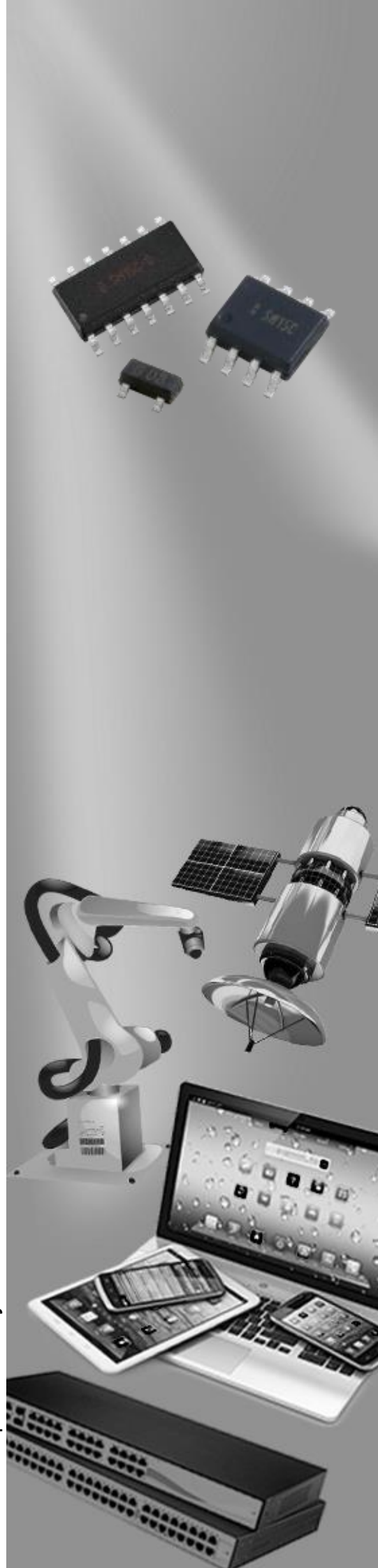
INDUSTRIAL / CONSUMER

SES08CXXL04 SERIES

RoHS compliant & Halogen free



Product specification—June 30, 2023 V.1



Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

Brightking's SES08CXXL04 series are designed to provide bi-directional protection for sensitive electronics from damage or latch-up due to ESD, lightning and other voltage-induced transient events. Each device will protect four data or I/O lines. It use to meet the immunity requirements of IEC61000 Level 4 (30KV air, 30KV contact discharge).

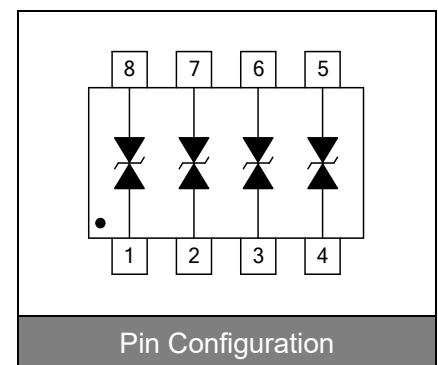


Contact : $\pm 30\text{kV}$
Air : $\pm 30\text{kV}$



Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOIC-08 surface mount package
- Protects four I/O lines
- Peak power dissipation of 500W under 8/20 μs waveform
- Working voltage: 5V, 12V, 15V
- 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 $^{\circ}\text{C}$
- 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
- Audio/Video input protection
- Notebooks, desktops, servers
- Wireless network systems
- Set Top Box (STB)
- Series and parallel ports
- Instrumentation
- Peripherals

Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20 μs waveform)	P_{PP}	500	W
ESD voltage (Contact discharge)	V_{ESD}	± 30	kV
ESD voltage (Air discharge)		± 30	
Storage & operating temperature range	T_{STG}, T_J	-55~+150	$^{\circ}\text{C}$

Electrical Characteristics (T_J=25°C)

SES08C05L04 (Marking: B SM05C)

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
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =10A			13.5	V
Peak Pulse Current(tp=8/20μs)	I _{PP}				10	A
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		300		pF

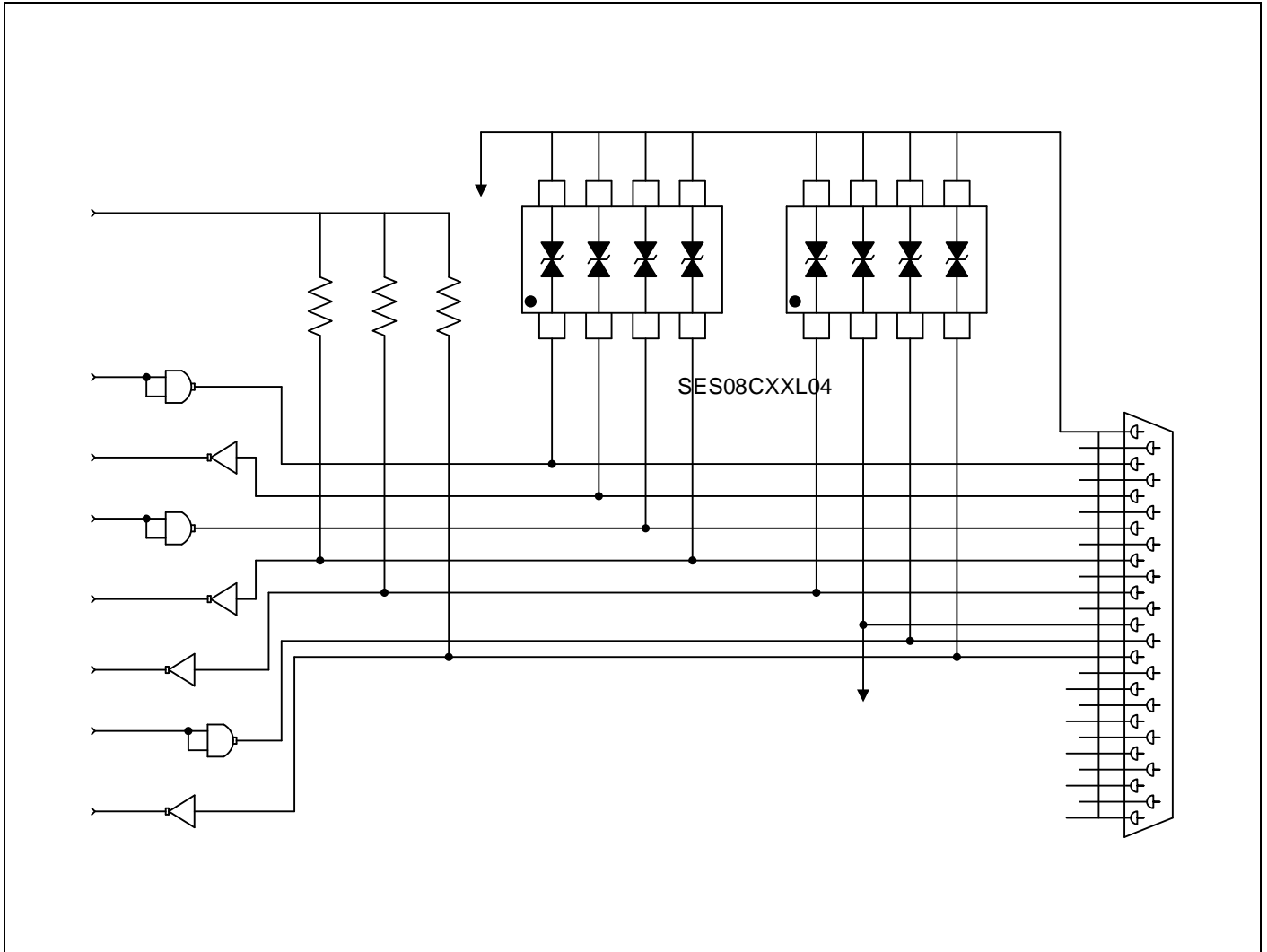
SES08C12L04 (Marking: B SM12C)

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			21	V
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =10A			25.9	V
Peak Pulse Current(tp=8/20μs)	I _{PP}				10	A
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		100		pF

SES08C15L04 (Marking: B SM15C)

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			24	V
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =12A			30	V
Peak Pulse Current(tp=8/20μs)	I _{PP}				12	A
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		80		pF

Applications Information



Typical Characteristics Curves

Figure 1. Power Derating Curve

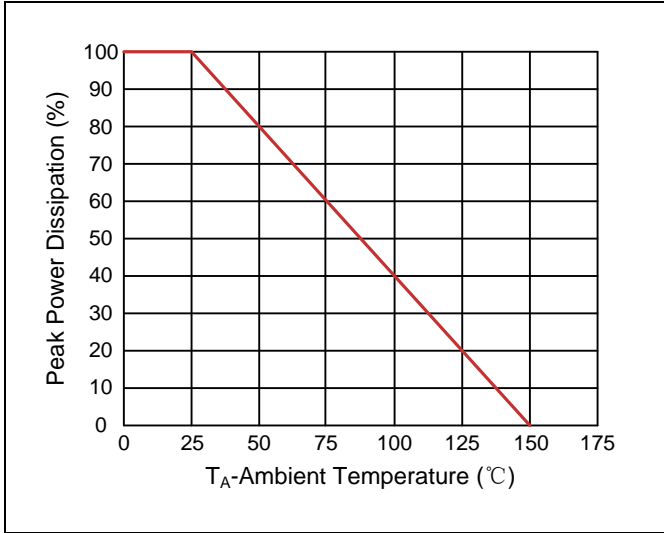


Figure 2. Pulse Waveforms

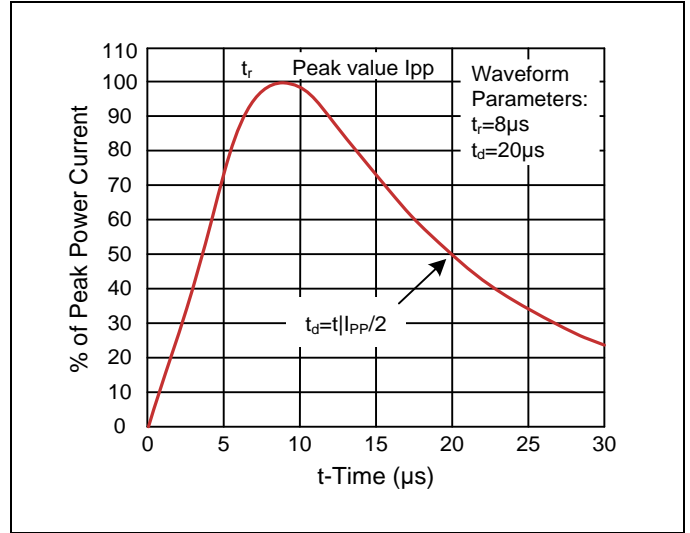
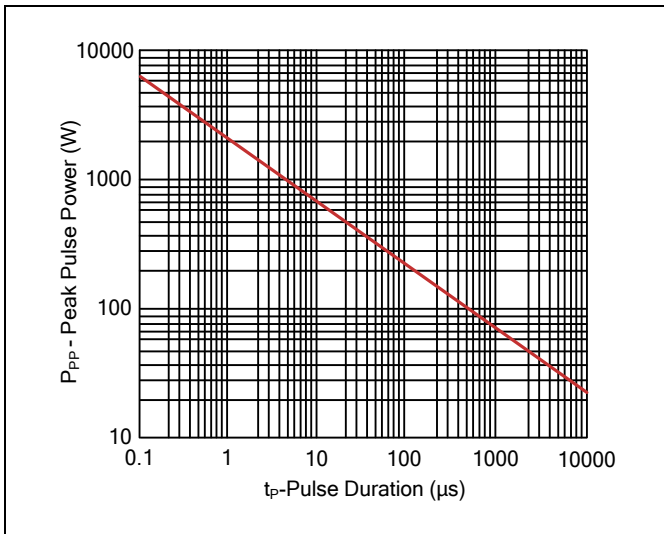
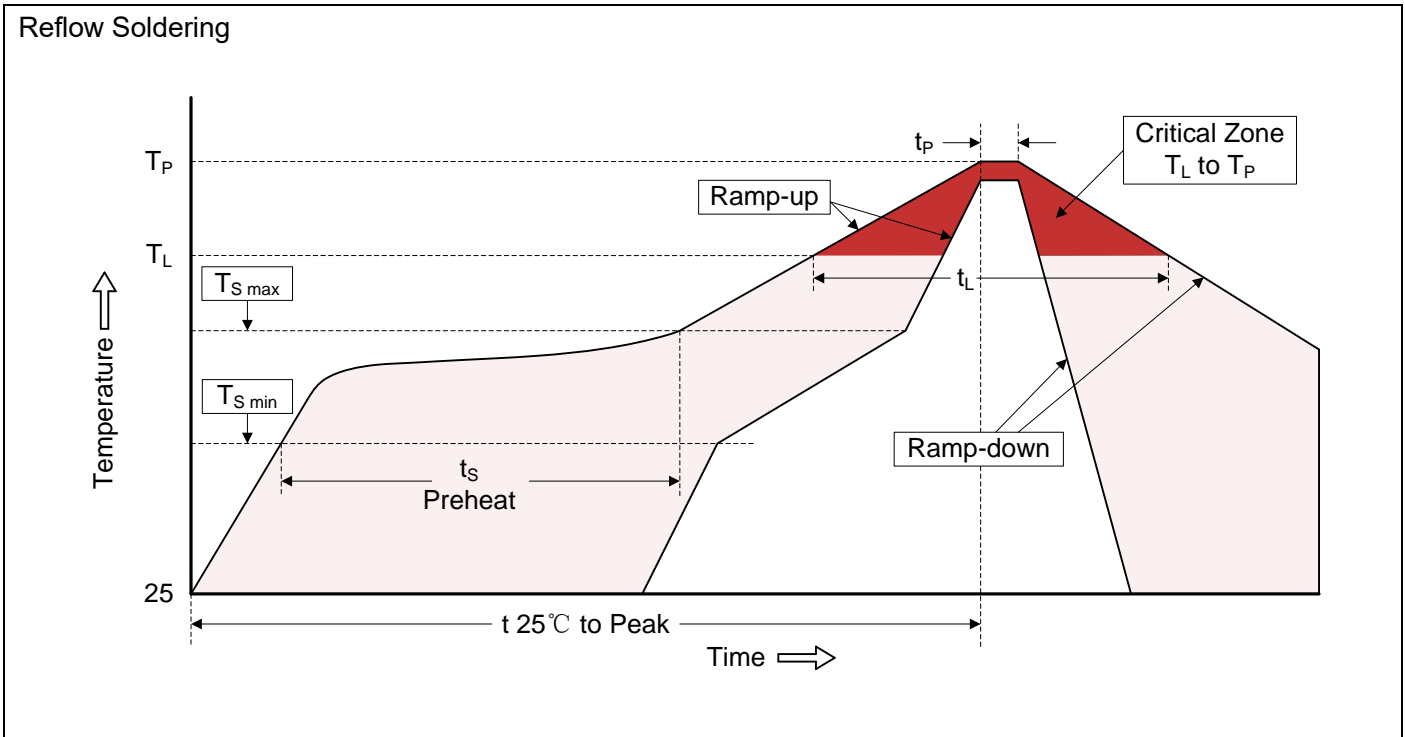


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time



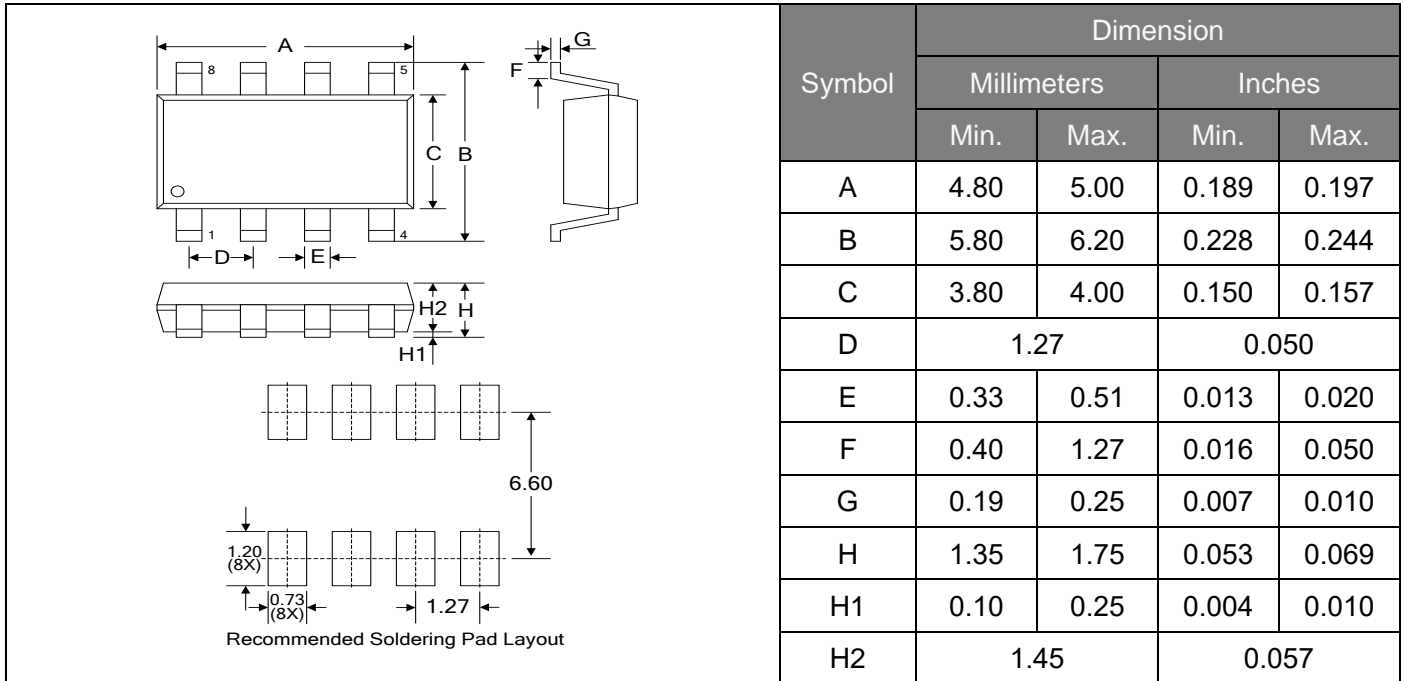
Recommended Soldering Conditions



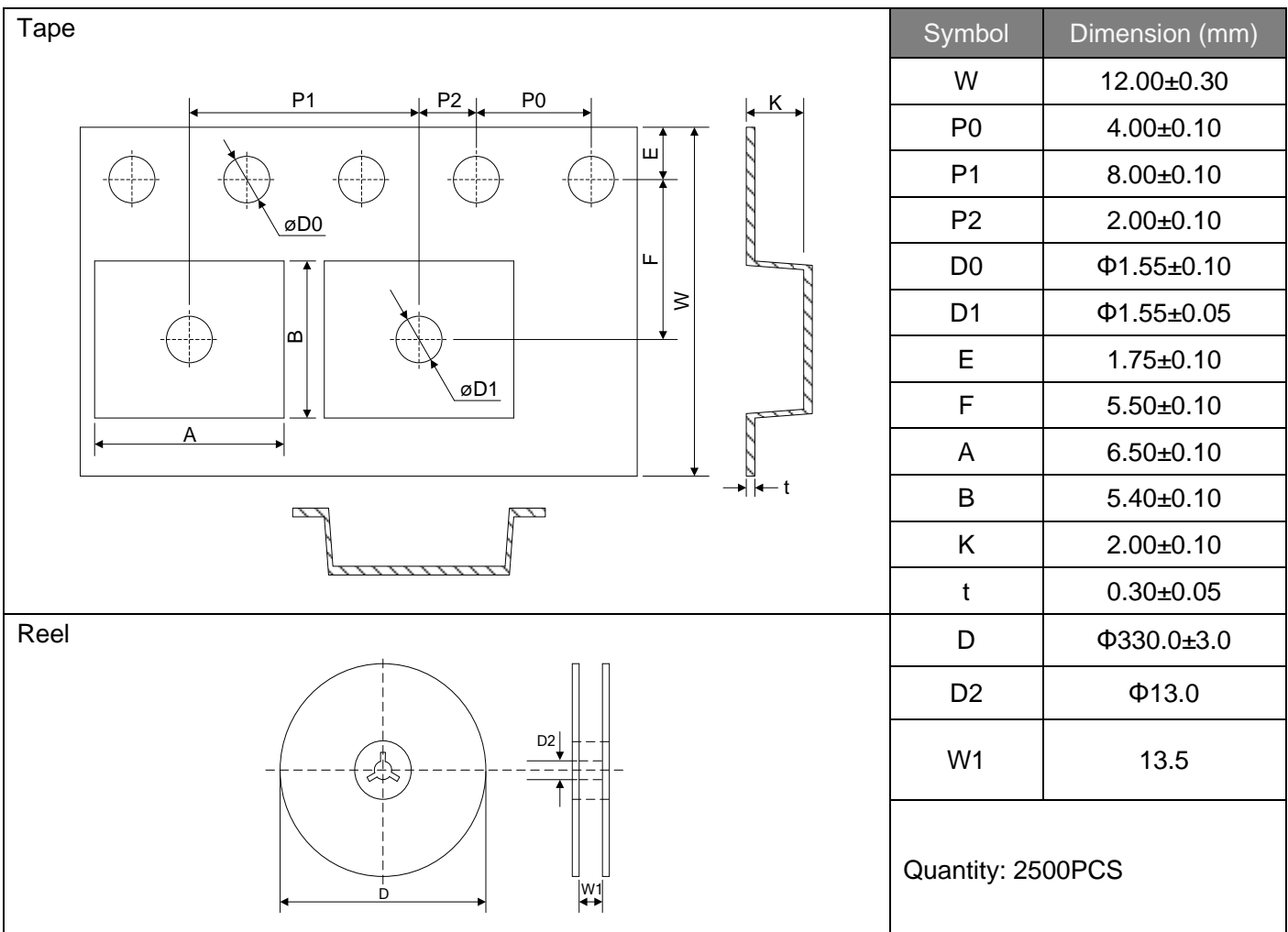
Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	150°C
-Temperature Min ($T_{S\ min}$)	
-Temperature Max ($T_{S\ max}$)	200°C
-Time (min to max) (t_s)	60-180 seconds
$T_{S\ max}$ to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	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)



Packaging



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