



## PRODUCT DATA SHEET



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**Datasheet**



**Resources**

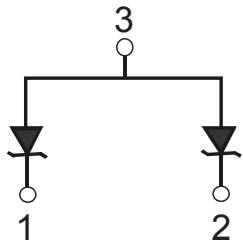
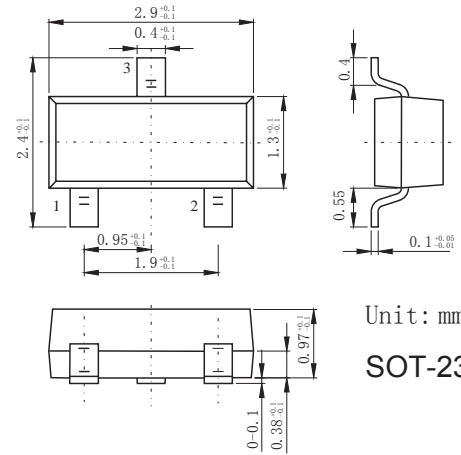


**Samples**

Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at [www.jg-semi.cn](http://www.jg-semi.cn). Please email any questions regarding the system integration to [JINGAO\\_questions@jgsemi.com](mailto:JINGAO_questions@jgsemi.com).

**■ Features**

- 300 Watts Peak Pulse Power ( $t_p = 8/20\mu s$ )
- Transient protection for data & power lines to
  - IEC 61000-4-2 (ESD)  $\pm 15kV$  (air),  $\pm 8kV$  (contact)
  - IEC 61000-4-4 (EFT) 40A (5/50ns)
  - IEC 61000-4-5 (Lightning) 12A (8/20 $\mu s$ )
- Working Voltages: 5V, 12V, 15V, 24 and 36V
- Low clamping voltage


**■ Absolute Maximum Ratings  $T_a = 25^\circ C$** 

Parameter	Symbol	Rating	Unit
Peak Pulse Power ( $t_p = 8/20\mu s$ )	$P_{PK}$	300	W
Thermal Resistance Junction to Ambient *3	$R_{\theta JA}$	556	$^\circ C/W$
Lead Soldering Temperature	$T_L$	260	$^\circ C$
Junction Temperature	$T_J$	125	
Storage Temperature range	$T_{stg}$	-55 to 150	

**■ Electrical Characteristics  $T_a = 25^\circ C$** 

SM05

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1mA$	6			V
Reverse Stand-Off Voltage	$V_{RWM}$				5	
Clamping Voltage	$V_C$	$I_{PP} = 1A, t_p = 8/20\mu s$			9.8	
Reverse Leakage Current	$I_R$	$V_R = 5V$			20	$\mu A$
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu s$			17	A
Junction Capacitance	$C_J$	Pin 1 to 2, $V_R = 0V, f = 1MHz$			350	pF
		Pin 1 to 2 and Pin 2 to 3, $V_R = 0V, f = 1MHz$			400	

**■ Electrical Characteristics Ta = 25°C**
**SM12**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	13.3			V
Reverse Stand-Off Voltage	V <sub>RWM</sub>				12	
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A, t <sub>P</sub> =8/20us			19	
Reverse Leakage Current	I <sub>R</sub>	V <sub>R</sub> =12 V			1	uA
Peak Pulse Current	I <sub>PP</sub>	t <sub>P</sub> =8/20us			12	A
Junction Capacitance	C <sub>J</sub>	Pin 1 to 2 ,V <sub>R</sub> = 0V,f=1MHz			120	pF
		Pin 1 to 2 and Pin 2 to 3 ,V <sub>R</sub> = 0V,f=1MHz			150	

**SM15**

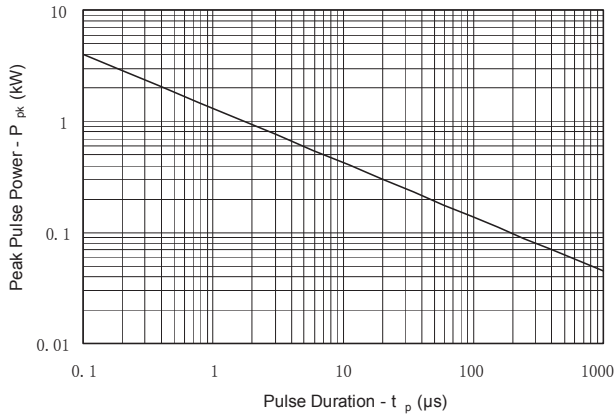
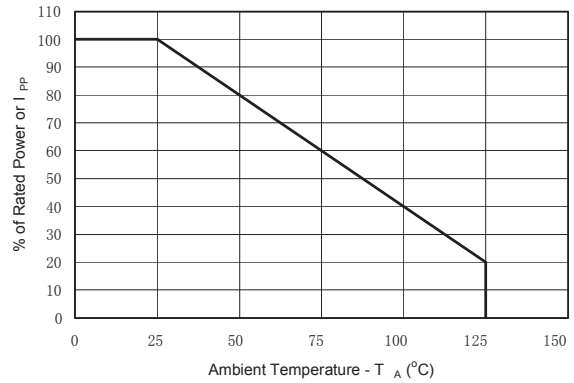
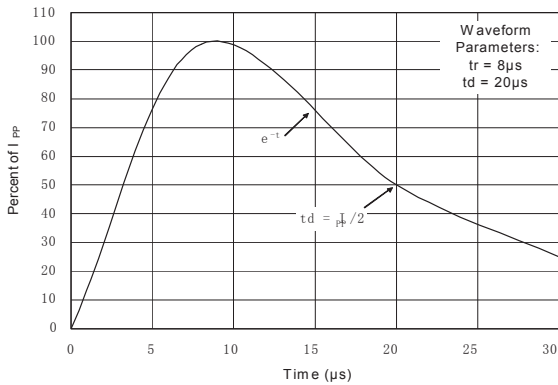
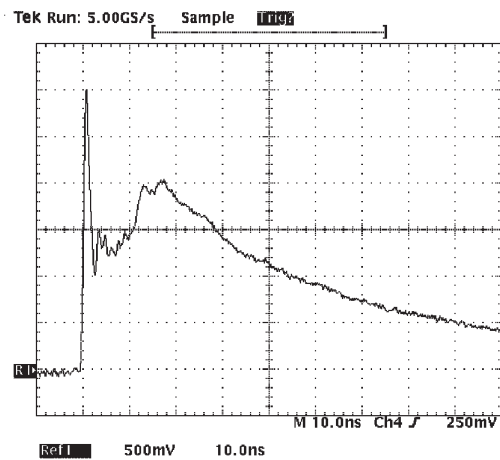
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	16.7			V
Reverse Stand-Off Voltage	V <sub>RWM</sub>				15	
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A, t <sub>P</sub> =8/20us			24	
Reverse Leakage Current	I <sub>R</sub>	V <sub>R</sub> =15 V			1	uA
Peak Pulse Current	I <sub>PP</sub>	t <sub>P</sub> =8/20us			10	A
Junction Capacitance	C <sub>J</sub>	Pin 1 to 2 ,V <sub>R</sub> = 0V,f=1MHz			75	pF
		Pin 1 to 2 and Pin 2 to 3 ,V <sub>R</sub> = 0V,f=1MHz			100	

**SM24**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	26.7			V
Reverse Stand-Off Voltage	V <sub>RWM</sub>				24	
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A, t <sub>P</sub> =8/20us			43	
Reverse Leakage Current	I <sub>R</sub>	V <sub>R</sub> =24 V			1	uA
Peak Pulse Current	I <sub>PP</sub>	t <sub>P</sub> =8/20us			5	A
Junction Capacitance	C <sub>J</sub>	Pin 1 to 2 ,V <sub>R</sub> = 0V,f=1MHz			50	pF
		Pin 1 to 2 and Pin 2 to 3 ,V <sub>R</sub> = 0V,f=1MHz			60	

**SM36**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	40			V
Reverse Stand-Off Voltage	V <sub>RWM</sub>				36	
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A, t <sub>P</sub> =8/20us			60	
Reverse Leakage Current	I <sub>R</sub>	V <sub>R</sub> =36 V			1	uA
Peak Pulse Current	I <sub>PP</sub>	t <sub>P</sub> =8/20us			4	A
Junction Capacitance	C <sub>J</sub>	Pin 1 to 2 ,V <sub>R</sub> = 0V,f=1MHz			40	pF
		Pin 1 to 2 and Pin 2 to 3 ,V <sub>R</sub> = 0V,f=1MHz			45	

**Typical Characteristics**
**Non-Repetitive Peak Pulse Power vs. Pulse Time**

**Power Derating Curve**

**Pulse Waveform**

**ESD Pulse Waveform (Per IEC 61000-4-2)**

**IEC 61000-4-2 Discharge Parameters**

Level	First Peak Current (A)	Peak Current at 30 ns (A)	Peak Current at 60 ns (A)	Test Voltage (Contact Discharge) (kV)	Test Voltage (Air Discharge) (kV)
1	7.5	4	8	2	2
2	15	8	4	4	4
3	22.5	12	6	6	8
4	30	16	8	8	15

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