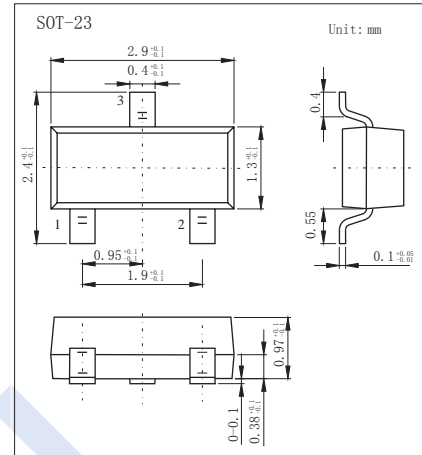
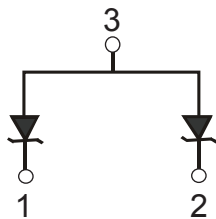


TVS Diodes

SM05 ~ SM36

■ 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 μs)
- 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 ($t_p = 8/20\mu s$)	PPK	300	W
Thermal Resistance Junction to Ambient *3	R θ 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} = 1 A, t _p =8/20us			9.8	
Reverse Leakage Current	I _R	V _R =5 V			20	μA
Peak Pulse Current	I _{PP}	t _p =8/20us			17	A
Junction Capacitance	C _J	Pin 1 to 2, V _R = 0V, f=1MHz			350	μF
		Pin 1 to 2 and Pin 2 to 3, V _R = 0V, f=1MHz			400	

TVS Diodes

SM05 ~ SM36

■ Electrical Characteristics Ta = 25°C

SM12

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V _{BR}	I _T =1mA	13.3			V
Reverse Stand-Off Voltage	V _{RWM}				12	
Clamping Voltage	V _C	I _{PP} = 1 A, t _P =8/20us			19	
Reverse Leakage Current	I _R	V _R =12 V			1	uA
Peak Pulse Current	I _{PP}	t _P =8/20us			12	A
Junction Capacitance	C _J	Pin 1 to 2 ,V _R = 0V,f=1MHz			120	pF
		Pin 1 to 2 and Pin 2 to 3 ,V _R = 0V,f=1MHz			150	

SM15

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V _{BR}	I _T =1mA	16.7			V
Reverse Stand-Off Voltage	V _{RWM}				15	
Clamping Voltage	V _C	I _{PP} = 1 A, t _P =8/20us			24	
Reverse Leakage Current	I _R	V _R =15 V			1	uA
Peak Pulse Current	I _{PP}	t _P =8/20us			10	A
Junction Capacitance	C _J	Pin 1 to 2 ,V _R = 0V,f=1MHz			75	pF
		Pin 1 to 2 and Pin 2 to 3 ,V _R = 0V,f=1MHz			100	

SM24

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V _{BR}	I _T =1mA	26.7			V
Reverse Stand-Off Voltage	V _{RWM}				24	
Clamping Voltage	V _C	I _{PP} = 1 A, t _P =8/20us			43	
Reverse Leakage Current	I _R	V _R =24 V			1	uA
Peak Pulse Current	I _{PP}	t _P =8/20us			5	A
Junction Capacitance	C _J	Pin 1 to 2 ,V _R = 0V,f=1MHz			50	pF
		Pin 1 to 2 and Pin 2 to 3 ,V _R = 0V,f=1MHz			60	

SM36

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V _{BR}	I _T =1mA	40			V
Reverse Stand-Off Voltage	V _{RWM}				36	
Clamping Voltage	V _C	I _{PP} = 1 A, t _P =8/20us			60	
Reverse Leakage Current	I _R	V _R =36 V			1	uA
Peak Pulse Current	I _{PP}	t _P =8/20us			4	A
Junction Capacitance	C _J	Pin 1 to 2 ,V _R = 0V,f=1MHz			40	pF
		Pin 1 to 2 and Pin 2 to 3 ,V _R = 0V,f=1MHz			45	

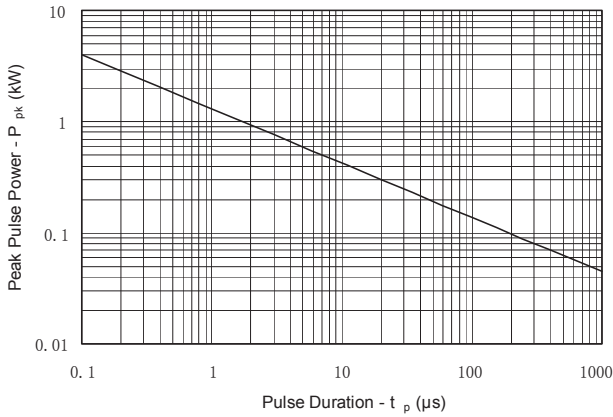
■ Marking

NO	SM05	SM12	SM15	SM24	SM36
Marking	M05	M12	M15	M24	M36

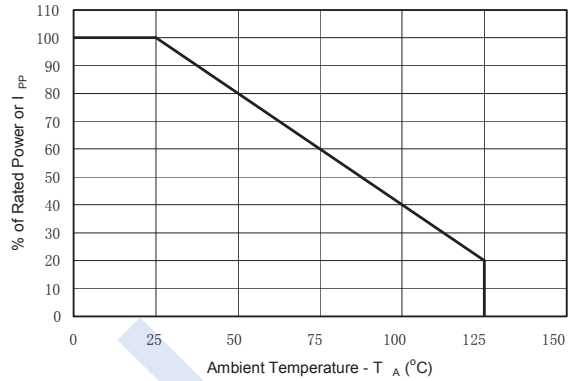
TVS Diodes SM05 ~ SM36

■ Typical Characteristics

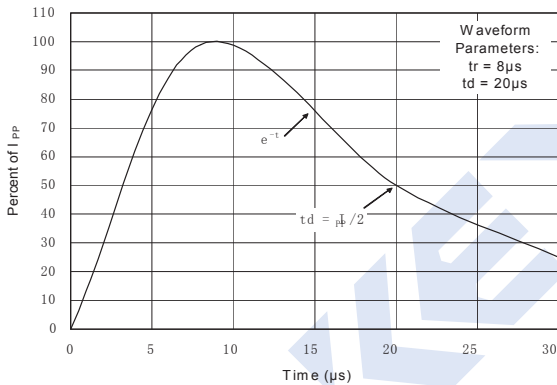
Non-Repetitive Peak Pulse Power vs. Pulse Time



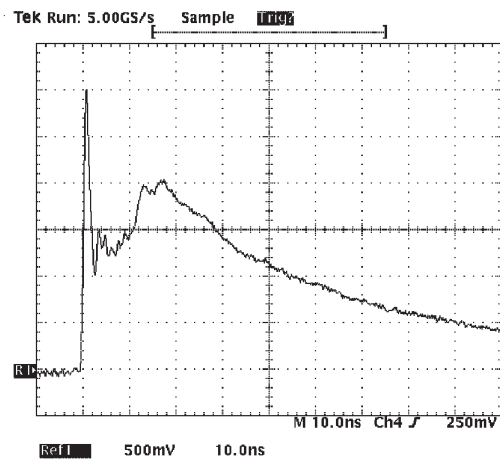
Power Derating Curve



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