Description

The DCSMxxM is an uni-directional TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The DCSMxxM complies with the IEC 61000-4-2 (ESD) standard with ±30kV air and ±30kV contact discharge. It is assembled into a lead-free SOT-23 package. It is designed to protect components which are connected to data and transmission lines from voltage surges.

Features

- 250W peak pulse power(8/20μs)
- Protects one bi-directional or two uni-directional lines
- Ultra low leakage：nA level
- Operating voltage：3.3V,5V,8V,12V,15V,24V,36V
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±30kV
    Contact discharge: ±30kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS Compliant

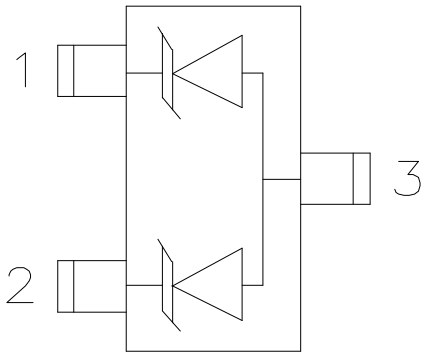
Mechanical Characteristics

- Package: SOT-23
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC

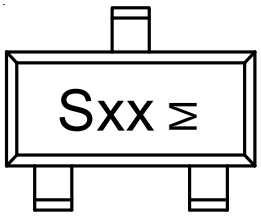
Dimensions and Pin Configuration



SOT23

Circuit and Pin Schematic

Marking Information



SxxM = Device Marking

xx represents the voltage

Ordering Information

Part Number	Marking	Packaging	Reel Size
DCSMxxM	SxxM	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20μs)	Ppk	250	W
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

DCSM03M (Marking Code: S03M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	4			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 3.3V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		5		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		10		V	I_{PP} = 18A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			18	A	t_P=8/20μs
Junction Capacitance	C_J			80	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			40	pF	VR=0, f=1MHz，Pin 1 to Pin 2

DCSM05M (Marking Code: S05M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 5V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		7		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		11		V	I_{PP} = 16A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			16	A	t_P=8/20μs
Junction Capacitance	C_J			60	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			30	pF	VR=0, f=1MHz，Pin 1 to Pin 2

DCSM08M (Marking Code: S08M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			8	V	
Breakdown Voltage	V_{BR}	8.5			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 8V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		10		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		15		V	I_{PP} = 13A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			13	A	t_P=8/20μs
Junction Capacitance	C_J			60	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			30	pF	VR=0, f=1MHz，Pin 1 to Pin 2

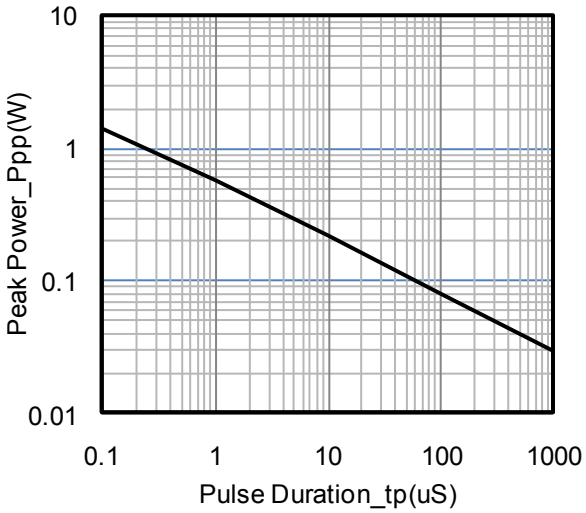
DCSM12M (Marking Code: S12M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 12V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		15		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		24		V	I_{PP} = 10A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			10	A	t_P=8/20μs
Junction Capacitance	C_J			40	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			20	pF	VR=0, f=1MHz，Pin 1 to Pin 2

DCSM15M (Marking Code: S15M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			15	V	
Breakdown Voltage	V_{BR}	16.7			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 15V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		20		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		30		V	I_{PP} = 8A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			8	A	t_P=8/20μs
Junction Capacitance	C_J			30	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			15	pF	VR=0, f=1MHz，Pin 1 to Pin 2

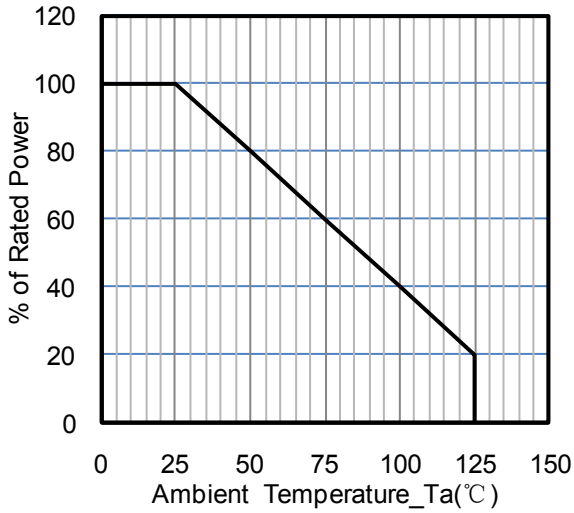
DCSM24M (Marking Code: S24M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	26.7			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 24V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		33		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		45		V	I_{PP} = 3.5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			3.5	A	t_P=8/20μs
Junction Capacitance	C_J			20	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			10	pF	VR=0, f=1MHz，Pin 1 to Pin 2

DCSM36M (Marking Code: S36M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	40			V	I_T = 1mA
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 36V
Forward Voltage	V_F		0.8	1.2	V	I_F = 10mA
Clamping Voltage	V_C		41		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		60		V	I_{PP} = 2A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			2	A	t_P=8/20μs
Junction Capacitance	C_J			20	pF	VR=0, f=1MHz，Pin 1 to Pin 3 or Pin 2 to Pin 3
Junction Capacitance	C_J			10	pF	VR=0, f=1MHz，Pin 1 to Pin 2

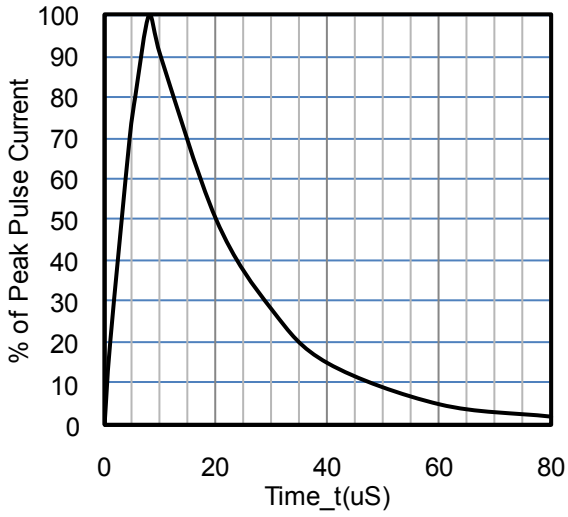
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



Peak Pulse Power vs. Pulse Time

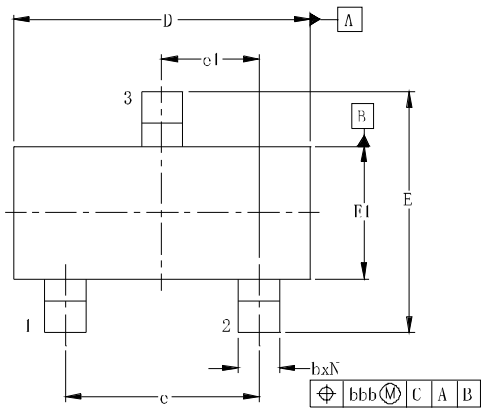


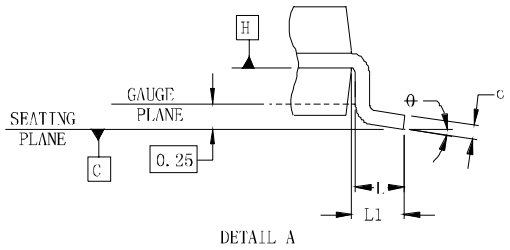
Power Derating Curve

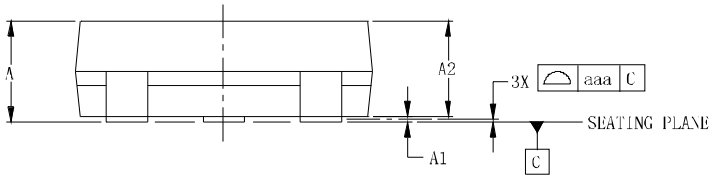


8X 20μs Pulse Waveform

SOT-23 Package Outline Drawing

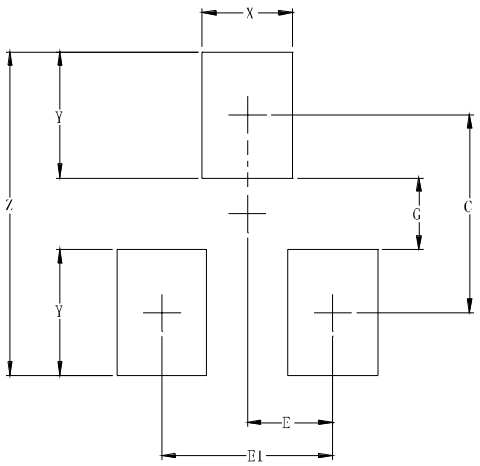






DIMENSIONS						
SYM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	-	0.044	0.89	-	1.12
A1	0.000	-	0.004	0.01	-	0.10
A2	0.035	0.037	0.040	0.88	0.95	1.02
b	0.012	-	0.020	0.30	-	0.51
c	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	0.055	1.20	1.30	1.40
e	0.075			1.90BSC		
e1	0.037			0.95BSC		
L	0.015	0.020	0.024	0.40	0.50	0.60
L1	0.022			0.55		
N	3			3		
θ	0°	-	8°	0°	-	8°
aaa	0.004			0.10		
bbb	0.008			0.20		

Suggested Land Pattern



DIMENSIONS		
SYM	INCHES	MILLIMETERS
C	0.087	2.20
E	0.037	0.95
E1	0.075	1.90
G	0.031	0.80
X	0.039	1.00
Y	0.055	1.40
Z	0.141	3.60

Contact Information

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