Description

The DUL05x2S2 is an uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The DUL05x2S2 has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with ±20kV air and ±15kV contact discharge. It is assembled into a lead-free SOT-23 package. The small size, ultra-low capacitance and high ESD surge protection make DUL05x2S2 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Features

- Ultra low capacitance: 0.3pF typical
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- Up to 2-line protects
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±20kV
    Contact discharge: ±15kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lighting) 5A (8/20μs)
- RoHS Compliant

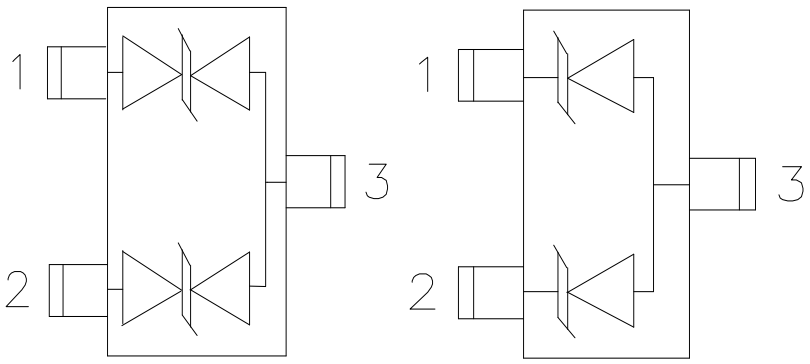
Mechanical Characteristics

- 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
- Display Ports
- MDDI Ports
- USB2.0 and 3.0 Ports
- HDMI 1.3 and 1.4
- Digital Video Interface(DVI)
- PCI Express and Serial SATA Ports
- Notebook Computer
- IEEE 1394

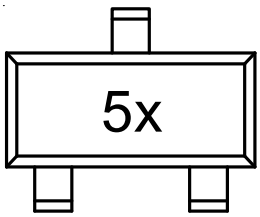
Dimensions and Pin Configuration



DUL0502S2 DUL0512S2

Circuit and Pin Schematic

Marking Information



5x=Device Marking Code

Ordering Information

Part Number	Marking	Packaging	Reel Size
DUL05x2S2	5C/5M	3000/Tape & Reel	7 inch

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

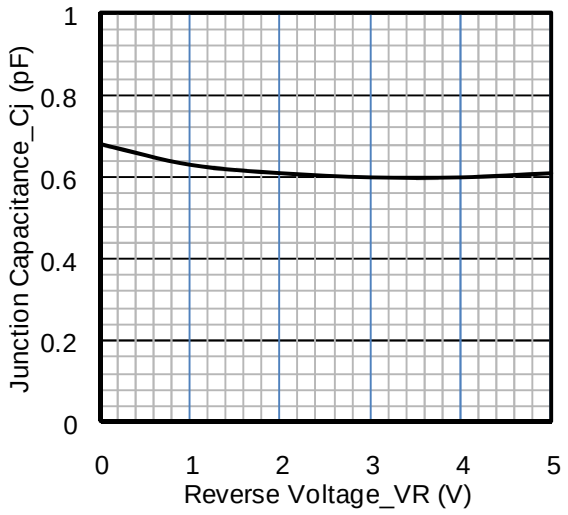
Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20μs)	Ppk	100	W
Peak Pulse Current(8/20μs)	Ipp	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±20 ±15	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

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

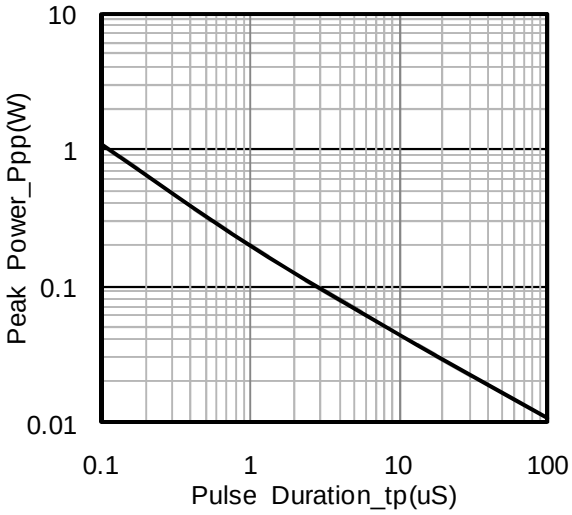
DUL0502S2 (Marking Code: 5C)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			5	V	Pin 1 or pin2 to pin3 and pin3 to pin1 or pin 2
Breakdown Voltage	V_{BR}	6			V	I_T = 1mA, pin 1 or pin2 to pin3 and pin3 to pin1 or pin 2
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 5V, pin1 or pin2 to pin3 and pin3 to pin1 or pin 2
Clamping Voltage	V_C		10	15	V	I_{PP} = 1A (8 x 20μs pulse), pin 1 or pin2 to pin3 and pin3 to pin1 or pin 2
Junction Capacitance	C_J		0.6	1	pF	VR=0, f=1MHz，pin 1 or pin 2 to pin 3

DUL0512S2 (Marking Code: 5M)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			5	V	Pin 1 or pin2 to pin3 and between pin1 and pin2
Breakdown Voltage	V_{BR}	6			V	I_T = 1mA, pin 1 or pin2 to pin3 and between pin1 and pin2
Reverse Leakage Current	I_R		0.01	0.5	μA	V_{RWM} = 5V, pin 1 or pin2 to pin3 and between pin1 and pin2
Clamping Voltage	V_C		10	15	V	I_{PP} = 1A (8 x 20μs pulse), pin 1 or pin2 to pin3
Junction Capacitance	C_J		0.6	0.8	pF	VR=0, f=1MHz，between pin1 and pin2
Junction Capacitance	C_J			1	pF	VR=0, f=1MHz，pin 1 or pin 2 to pin3

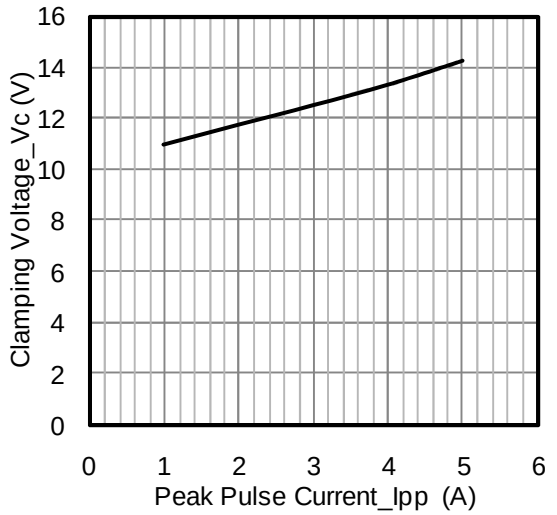
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



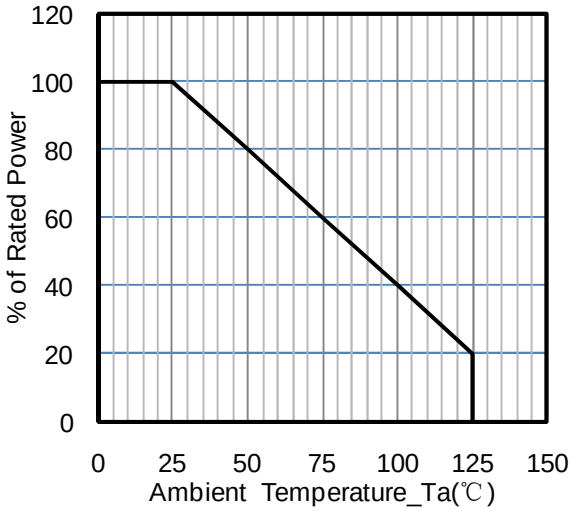
Junction Capacitance vs. Reverse Voltage



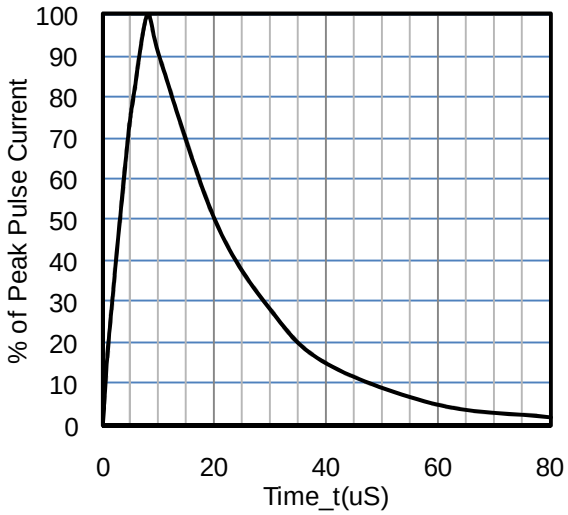
Peak Pulse Power vs. Pulse Time



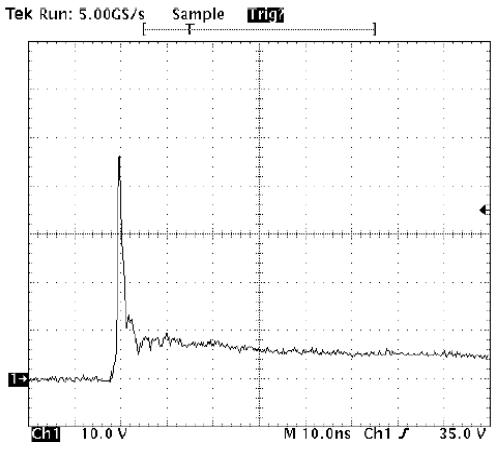
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



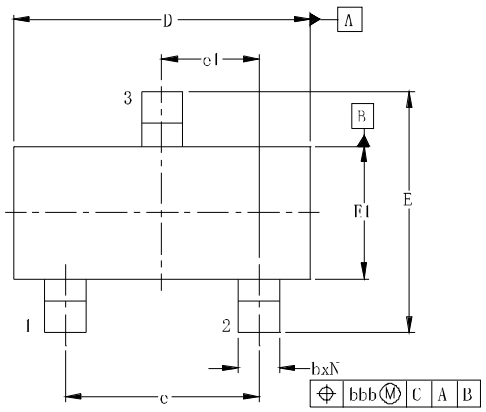
8 X 20uS Pulse Waveform

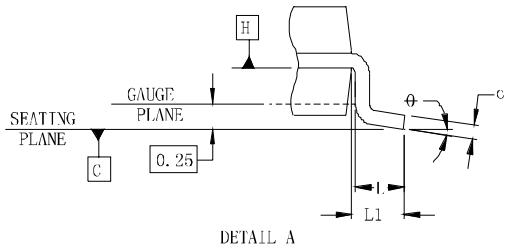


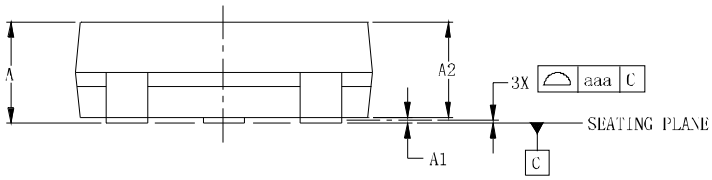
ESD Clamping Voltage

8 kV Contact per IEC61000−4−2

SOT-23 Package Outline Drawing

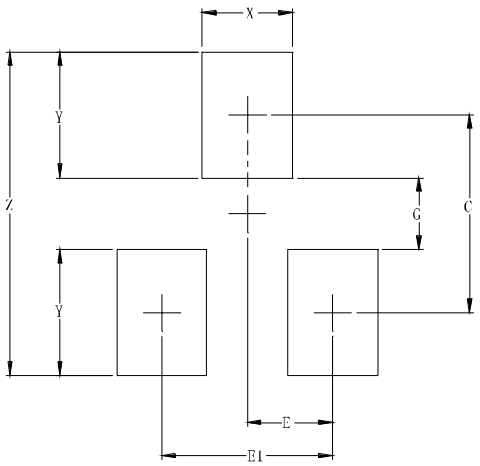






DIMENSIONS						
SYM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	-	0.044	0.89	-	1.12
A1	0.000	-	0.004	0.01	-	0.10
A2	0.035	0.037	0.040	0.88	0.95	1.02
b	0.012	-	0.020	0.30	-	0.51
c	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	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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