

TVS/ESD Arrays

RLST23A712C Series

TVS/ESD Arrays - RLST23A712C Series

Features

- 600 Watts peak pulse power ($t_p = 8/20\mu s$)
- Transient protection for high speed data 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) 24A (8/20 μs)
- One device protects one unidirectional line
- Two devices protect two high-speed line pairs
- Low leakage current
- Low operating and clamping voltages
- Solid-state EPD TVS process technology



Mechanical Characteristics

- SOT-23 package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel per EIA 481
- Lead Finish: Matte tin
- RoHS Compliant

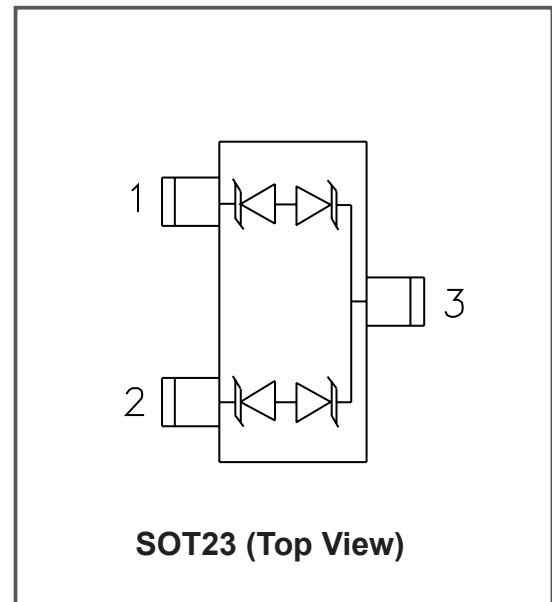
Applications

- 10/100 Ethernet
- WAN/LAN Equipment
- Switching Systems
- Desktops, Servers, Notebooks & Handhelds
- Laser Diode Protection
- Base Stations

Life Support Note

- Not Intended for Use in Life Support or Life Saving Applications
- The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated

Pinout and Functional Block Diagram



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Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{pk}	600	Watts
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{pp}	17	A
Lead Soldering Temperature	T_L	260 (10 sec.)	$^{\circ}C$
Operating Temperature	T_J	-55 to +125	$^{\circ}C$
Storage Temperature	T_{STG}	-55 to +150	$^{\circ}C$

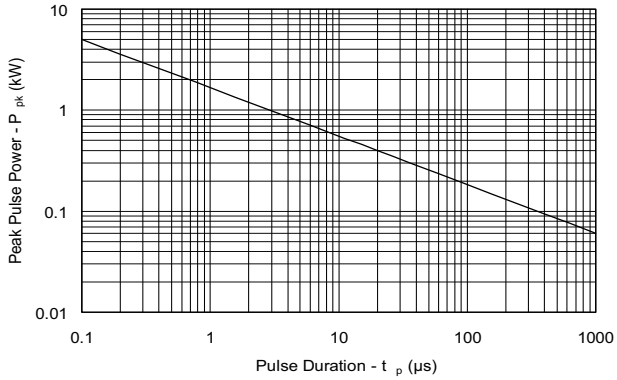
Electrical Characteristics Per Lin (@ 25 $^{\circ}C$ Unless Otherwise Specified)

Parameter	Symbol	Conditions	MIN	TYP	MAX	MIN	TYP	MAX	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 3 to 1 or Pin 2 to 1	-	-	12	-	-	7	V
Reverse Breakdown Voltage	V_{BR}	$I_{pT} = 1mA$	13.3	-	-	7.5	-	-	V
Reverse Leakage Current	I_R	$V_R = V_{RWM}$	-	-	1	-	-	20	μA
Clamping Voltage	V_C	$I_{pp} = 5A, t_p = 8/20\mu s$	-	-	20	-	-	10	V
Clamping Voltage	V_C	$I_{pp} = 17A, t_p = 8/20\mu s$	-	-	26	-	-	12	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$	-	-	75	-	-	75	pF
Junction Capacitance	C_J	$V_R = V_{RWM}, f = 1MHz$	-	45	-	-	45	-	pF

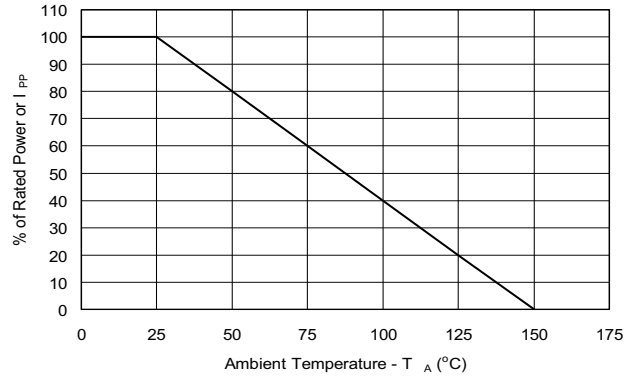
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Typical Characteristics

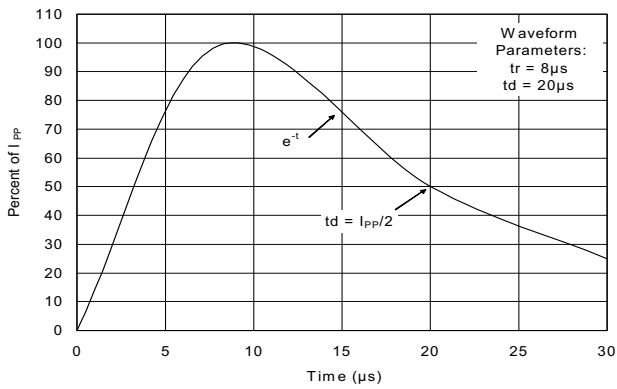
Non-Repetitive Peak Pulse Power vs. Pulse Time



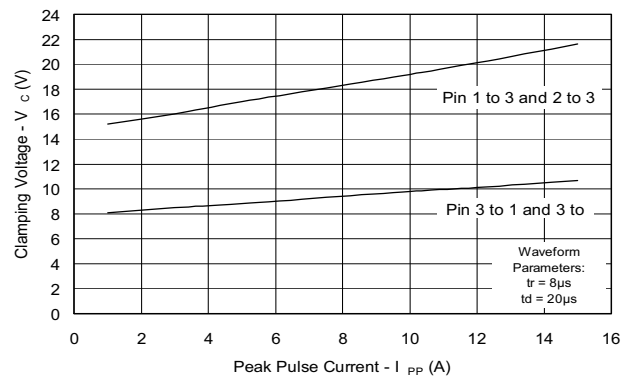
Power Derating Curve



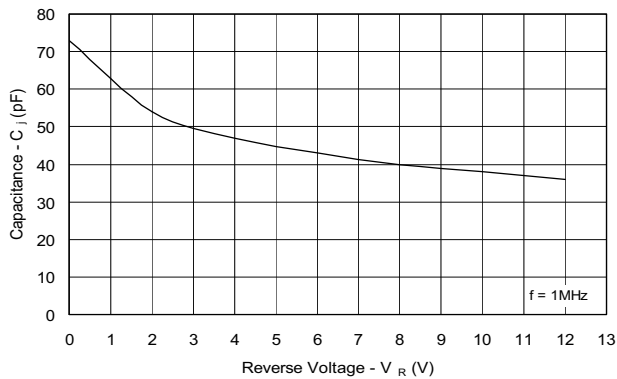
Pulse Waveform



Clamping Voltage vs. Peak Pulse Current



Capacitance vs. Reverse Voltage



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Applications Information

Device Connection for Protection of Two RS-485 Data Lines

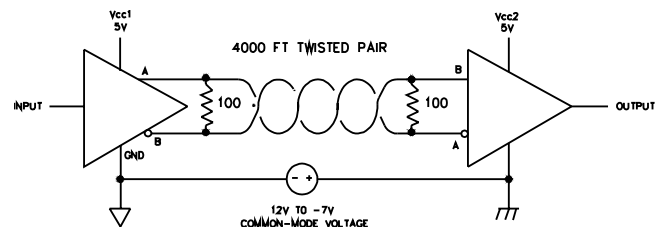
EIA RS-485 specifies a $\pm 7V$ ground difference between devices on the bus. This permits the bus voltage to range from +12V (5V + 7V) to -7V (0 - 7V). The RLST23A712C is designed to protect two RS-485 data lines in extended common mode applications. The RLST23A712C may be used to protect devices from transient voltages resulting from ESD, EFT, and lightning. The device is designed with asymmetrical operating voltages for optimum protection. The TVS diodes at pins 1 and 2 have a working voltage of 12 volts. These pins are connected to the differential data line pairs.

The TVS diodes at pin 3 have a working voltage of 7 volts. Pin 3 is connected to ground. The internal TVS diodes of the RLST23A712C will protect the transceiver input from positive transient voltage spikes greater than 12V and negative spikes greater than 7V.

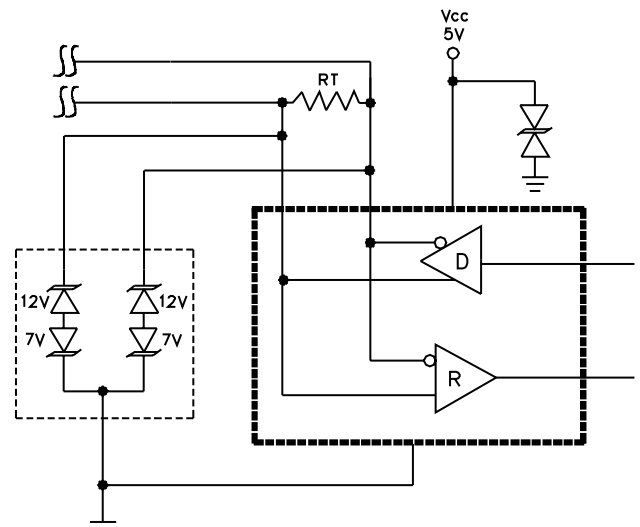
A series current limiting resistor may be added in applications requiring enhanced surge immunity. Circuit Board Layout Recommendations. Good circuit board layout is critical for the suppression of fast rise-time transients such as ESD. The following guidelines are recommended:

- Place the RLST23A712C near the input terminals or connectors to restrict electromagnetic coupling.
- Minimize the path length between the RLST23A712C and the protected line. This minimizes voltage overshoot due to parasitic inductance of board traces.
- Use ground planes whenever possible.
- Long, single trace ground conductors should be avoided. The ground pin (Pin 3) should be connected directly to a ground plane on the circuit board for best results.
- Minimize all conductive loops including power and ground loops.
- Never run critical signals near board edges.

RS-485 Common Mode Voltages

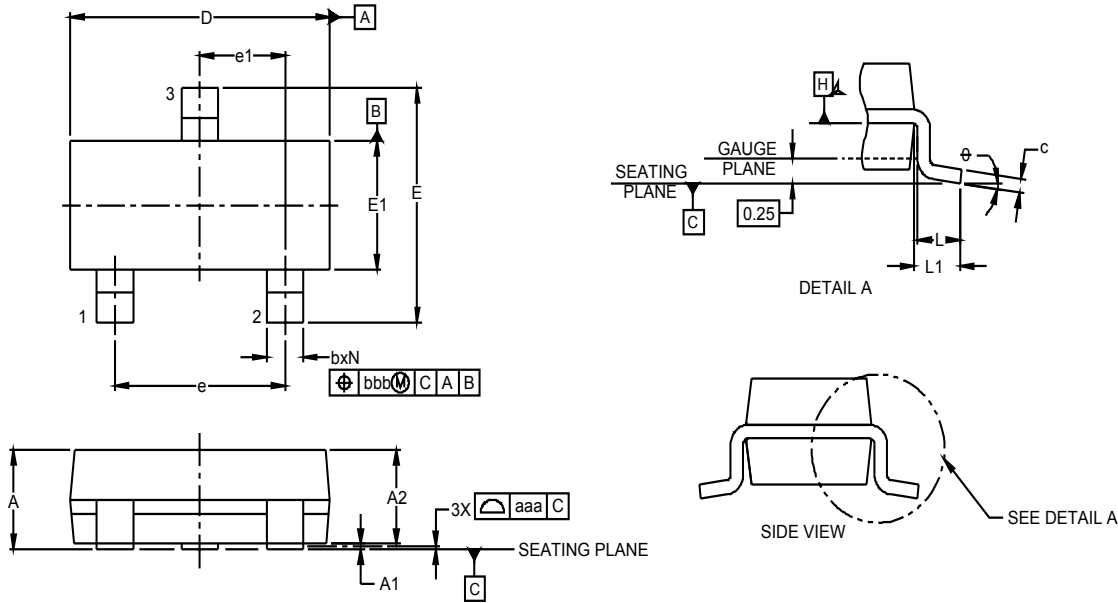


RS-485 Protection Circuit



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Package dimension SOT-23

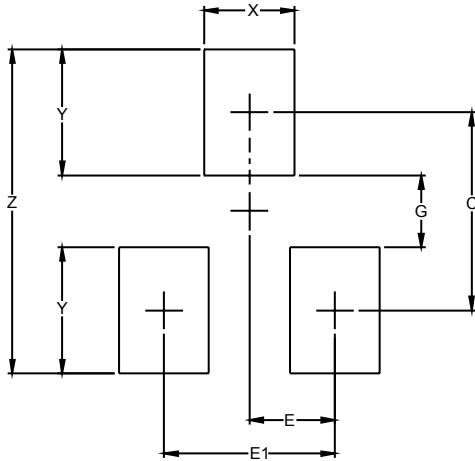


Dimensions

DIM	Inches			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	.035	-	.044	0.89	-	1.12
A1	-	-	.004	0.01	-	0.10
A2	.035	.037	.040	0.01	-	0.10
b	.012	-	.020	0.30	-	0.51
c	.003	-	.007	0.08	-	0.18
D	.110	.114	.120	2.80	2.90	3.04
E	.082	.093	.104	2.10	2.37	2.64
E1	0.47	.051	.055	1.20	1.30	1.40
e		.075			1.90 BCS	
e1		.037			0.95 BCS	
L	.015	.020	.024	0.40	0.50	0.60
L1		.022			(0.55)	
N		3			3	

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Ordering Information

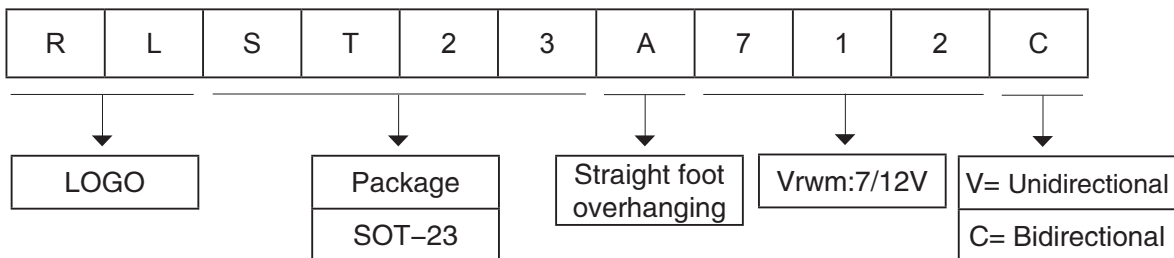


DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(.087)	(2.20)
E	.037	0.95
E1	.075	1.90
G	.031	0.80
X	.039	1.00
Y	.055	1.40
Z	.141	3.60

NOTES:

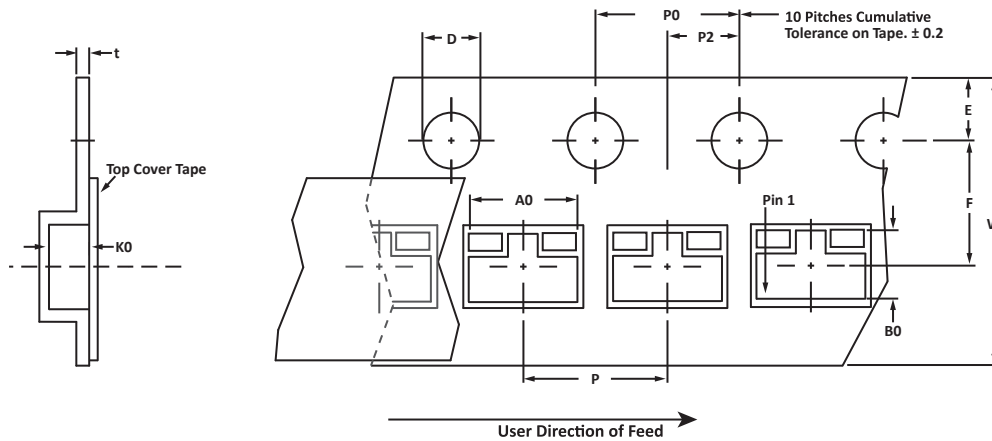
1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY
CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR
COMPANY'S MANUFACTURING GUIDELINES ARE MET.
2. REFERENCE IPC-SM-782A.

Part Number Code



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Ordering Information



SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	3.15 ± 0.10	2.77 ± 0.10	1.30 ± 0.10	1.55 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.228

NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
- Suffix - T13 = 13" Reel - 10,000 pieces per 8mm tape.
- Marking on Part - marking code (see page 2) and date code.

Package outline, pad layout and tape specifications per document number 06012.R2 8/10.

Ordering Information

Part Number	Package	Min. Order Qty.
RLST23A712C	SOT-23	3000pcs

Warehouse Storage Conditions of Products

Storage Conditions:

- Storage Temperature: -10°C~+40°C
- Relative Humidity: ≤75%RH
- Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year

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