

Features

- Transient protection for high-speed data lines
IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (Air) $\pm 15\text{kV}$ (Contact)
IEC61000-4-5 (Lightning) 6.0A (8/20 μs)
- ESD Protect for 8 high-speed I/O Channels
- Protects four I/O lines
- Low capacitance: 0.55pF(Typical)(I/O-GND)
- Low leakage current: 0.01 μA @VRWM (Maximum)
- Low clamping voltage

Applications

- Portable applications
- Communication systems
- Computers and peripherals
- High speed data lines:
 - USB 2.0/3.0/3.1(Gen 1)
 - HDMI 1.4/2.0
 - eSATA
 - DisplayPort

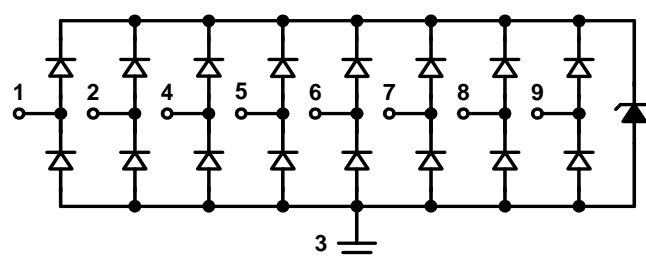
Mechanical Characteristics

- Package: DFN3810-9L
- Marking: Part number
- Packaging: Tape and Reel
- ROHS compliant

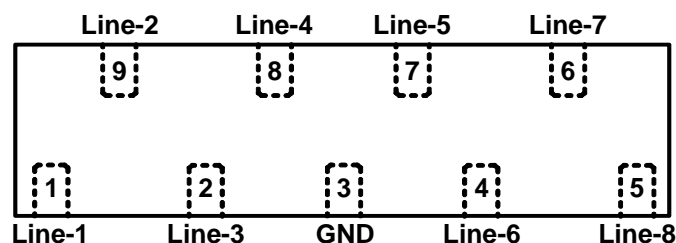
Description

TT0318TWX is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.55pF only, is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC61000-4-5 (Lightning) (6A, 8/20 μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

Circuit Diagram



Pin Configuration



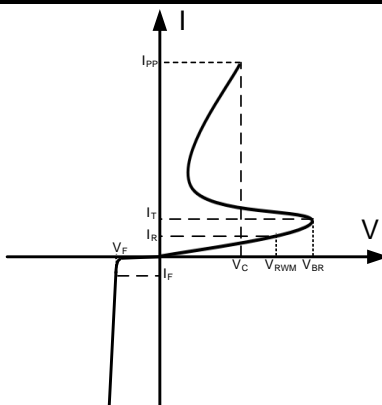
DFN3810-9L

(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	6	A
V_{ESD}	ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	± 15 ± 15	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

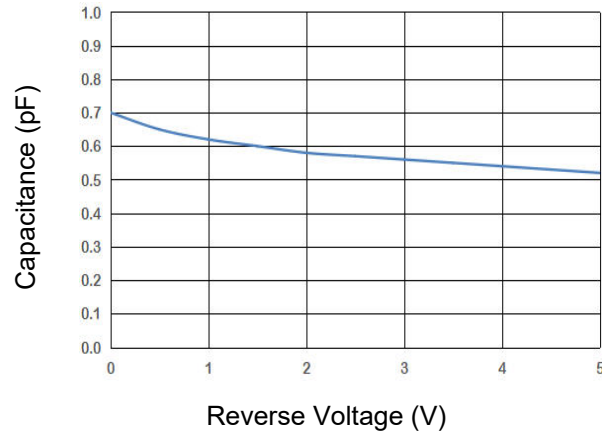
Symbol	Parameter	Diagram
V_{RWM}	Nominal Reverse Working Voltage	
I_R	Reverse Leakage Current @ V_{RWM}	
V_{BR}	Reverse Breakdown Voltage @ I_T	
I_T	Test Current for Reverse Breakdown	
V_C	Clamping Voltage @ I_{PP}	
I_{PP}	Maximum Peak Pulse Current	
C_{ESD}	Parasitic Capacitance	
I_F	Forward Current	
V_F	Forward Voltage @ I_F	

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				3.3	V
I_R	$V_{RWM} = 3.3V, T = 25^\circ C$ Between I/O and GND		10	100	nA
V_{BR}	$I_T = 1mA$ Between I/O and GND	5.0	6.2		V
V_C	$I_{PP} = 6A, t_p = 8/20\mu s$ Between I/O and GND		3.7		V
V_C	$I_{PP} = 8.0A, t_p = 100ns^{(1)}$		4.55		V
	$I_{PP} = 16.0A, t_p = 100ns^{(1)}$		7.10		V
R_{dyn}	$I_{PP} = 12.0A, t_p = 100ns^{(1)}$		0.32		Ω
C_{ESD}	$V_R = 1.65V, f = 1MHz$ Between I/O and GND		0.55	0.65	pF

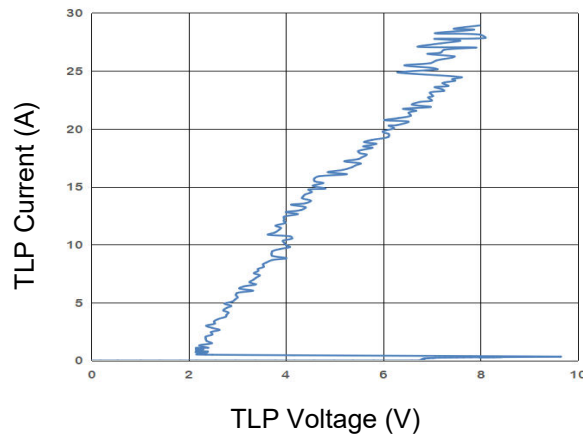
Notes:(1)Measurements performed using a 100ns Transmission Line Pulse(TLP) system,Between I/O and GND.

Typical Performance Characteristics

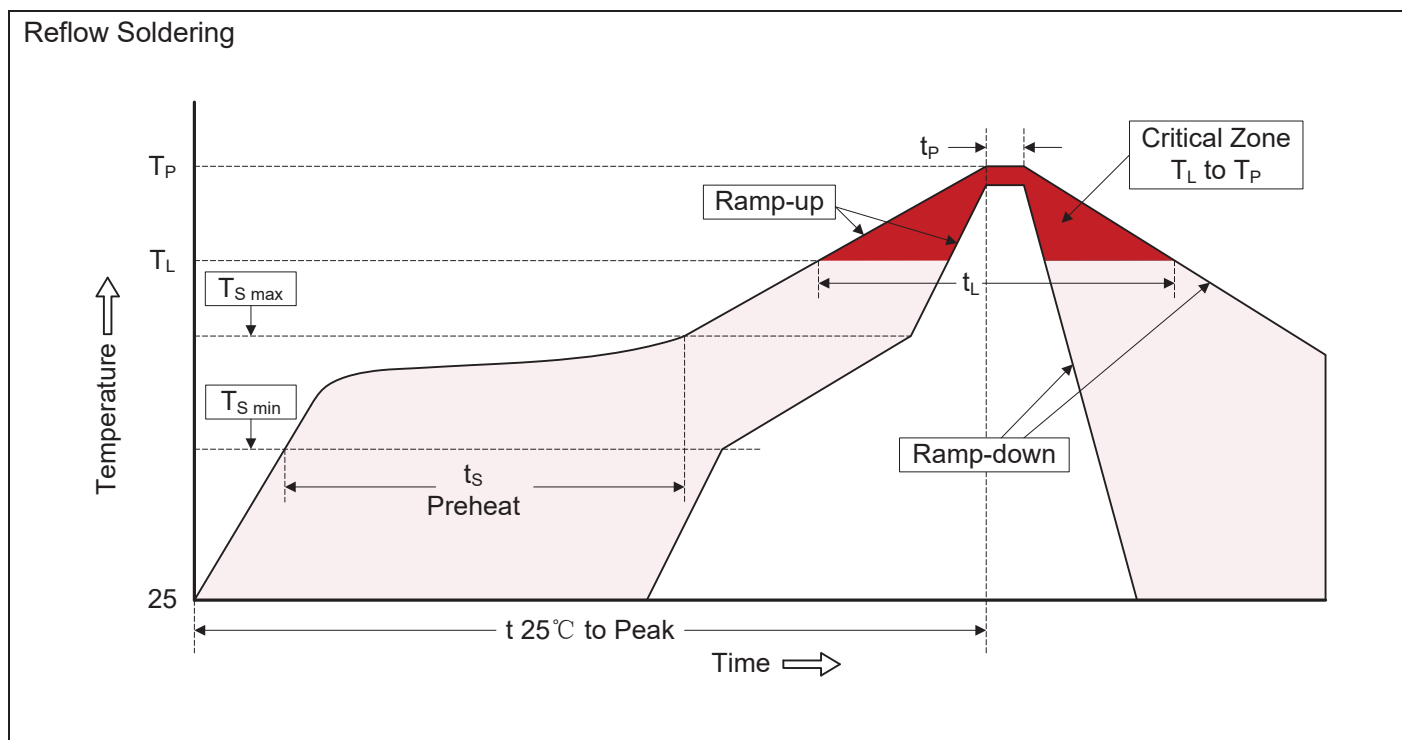
Capacitance vs Reverse Voltage I/O to GND



TLP Measurement of I/O to GND

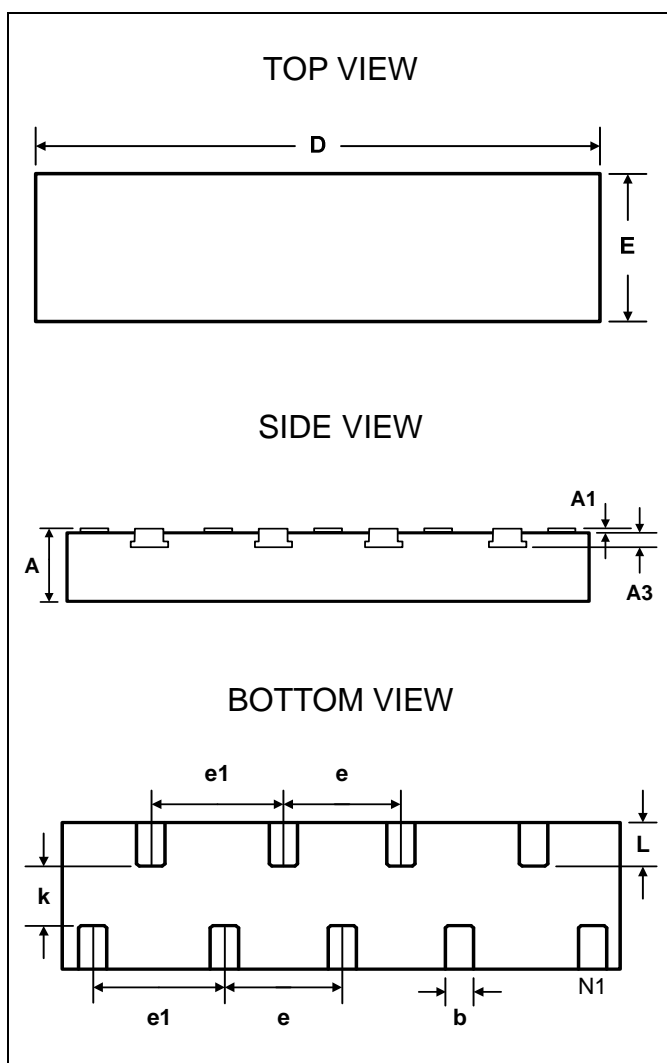


Recommended Soldering Conditions



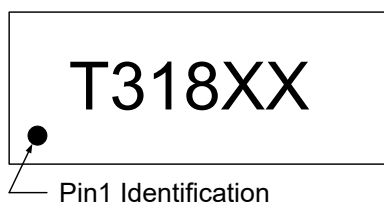
Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s)	150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Package Outline, DFN3810-9L

PACKAGE DIMENSIONS

SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.000	0.050	0.000	0.002
A3	0.110REF.		0.004REF.	
D	3.700	3.900	0.146	0.154
E	0.900	1.100	0.035	0.043
k	0.200MIN.		0.008MIN.	
b	0.150	0.250	0.006	0.010
e	0.800TYP.		0.031TYP.	
e1	0.900TYP.		0.035TYP.	
L	0.250	0.350	0.010	0.014

Marking Codes



Note:

- (1) "T318" is part number, fixed.
- (2) "XX" is the identification number.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0318TWX	3.3V	3,000	7 Inch