

Features

- Transient protection for high-speed data lines
IEC61000-4-2 (ESD) $\pm 30\text{kV}$ (Air), $\pm 30\text{kV}$ (Contact)
IEC61000-4-4 (EFT) 80A (5/50ns)
IEC61000-4-5 (Lightning) 18.0A (8/20 μs)
- Small package saves board space
- Protects one I/O line (bidirectional)
- Low leakage current: $1\mu\text{A}@V_{\text{RWM}}$ (Maximum)
- Low clamping voltage
- For low operating voltage applications: 5.5V

Applications

- Vbat pin for Mobile Device
- Power Line Protection
- Audio Protection
- Mobile Phones
- Hand Held Portable Applications

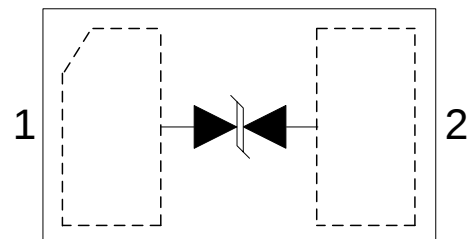
Circuit Diagram



Description

The TS0521LBX is designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. These devices are ideal for situations where board space is at a premium. This series has been specifically designed to protect sensitive components which are connected to power data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

Pin Configuration

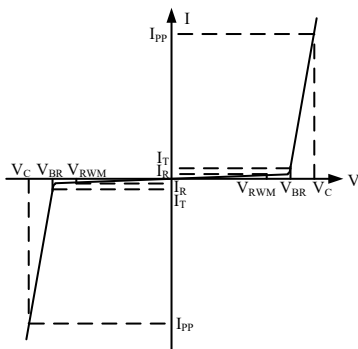


DFN1006-2
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	18	A
P_{PK}	Peak Pulse Power (8/20 μ s)	200	W
V_{DC}	Operating Supply Voltage	5.5	V
V_{ESD}	ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	± 30 ± 30	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C
T_{SOL}	Lead Soldering Temperature	260 (10 sec.)	°C

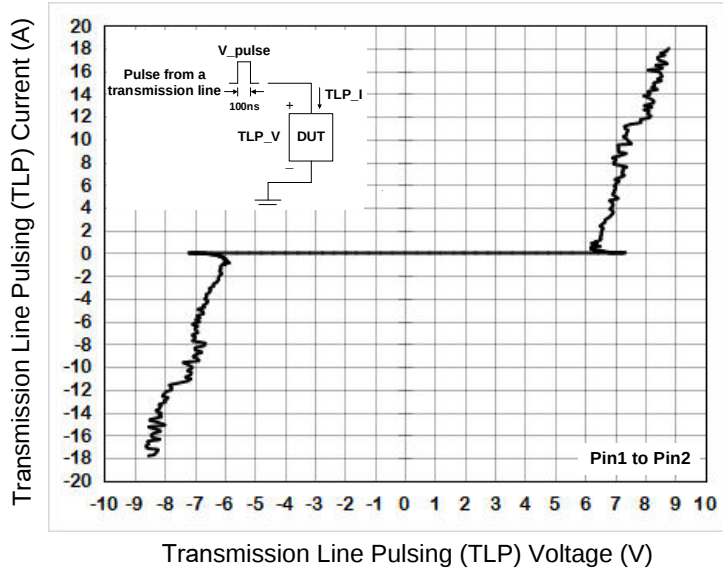
Electrical Characteristics (T = 25°C)

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	

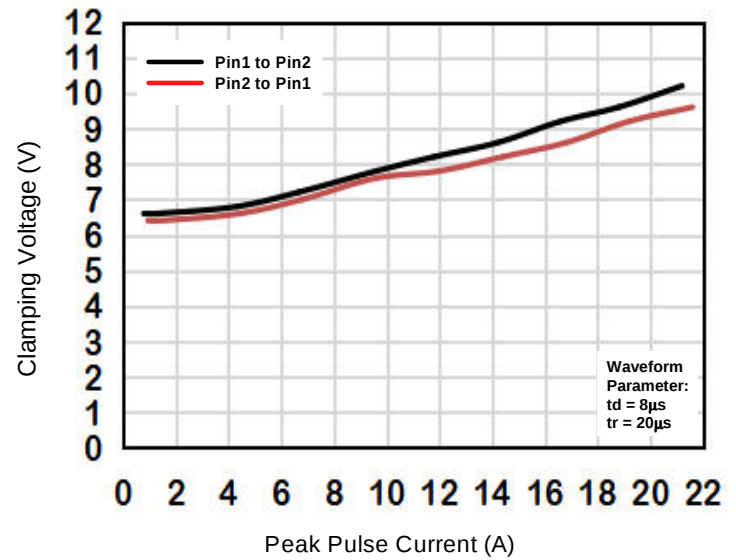
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}		-5.5		5.5	V
I_R	$V_{RWM} = \pm 5.5V$, T = 25°C			1	uA
V_{BR}	$I_T = 1mA$, T=25°C	6.0		9.0	V
V_C	$I_{PP} = 1A$, $t_p = 8/20\mu s$, T=25°C			7.0	V
	$I_{PP} = 5A$, $t_p = 8/20\mu s$, T=25°C			8.0	V
	$I_{PP} = 18A$, $t_p = 8/20\mu s$, T=25°C			10.0	V
R_{dyn}	$I_{PP} = 12.0A$, $t_p = 100ns^{(1)}$		0.19		Ω
C_{ESD}	$V_R = 0V$, f = 1MHz		35	45	pF

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

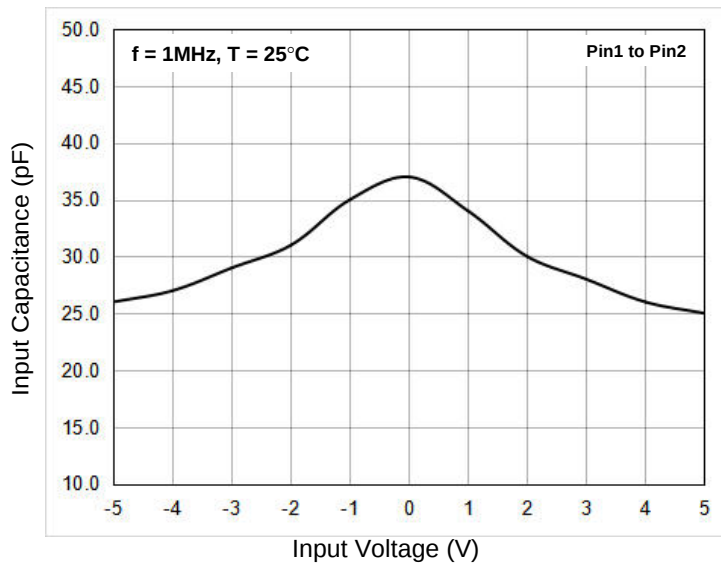
Transmission Line Pulsing (TLP) Measurement



Clamping Voltage vs. Peak Pulse Current

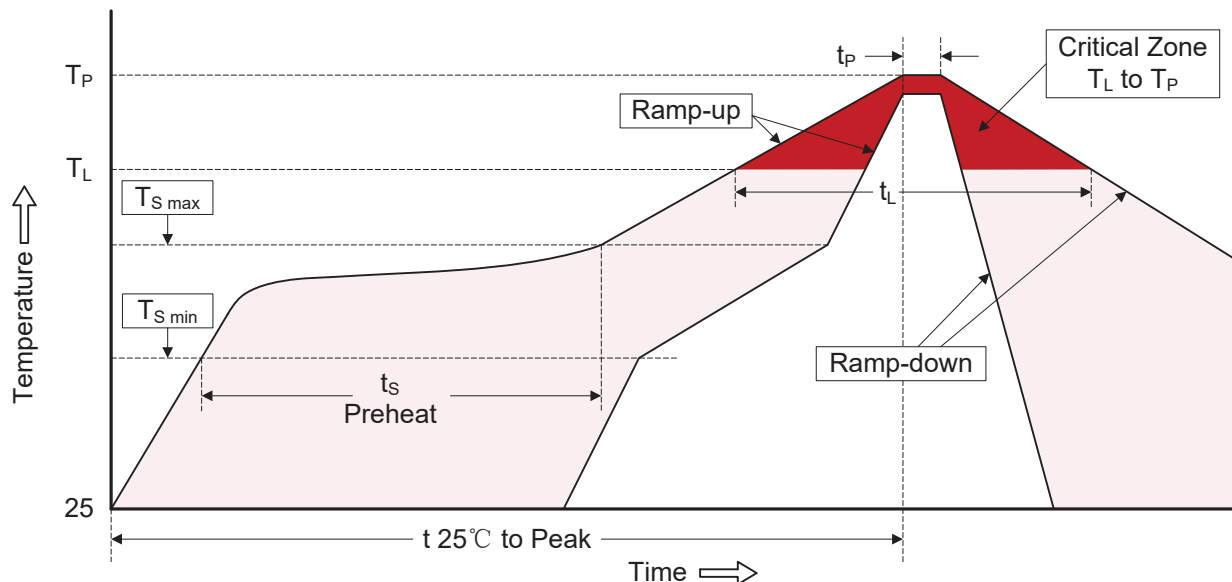


Typical Variation of C_{IN} vs. V_{IN}



Recommended Soldering Conditions

Reflow Soldering

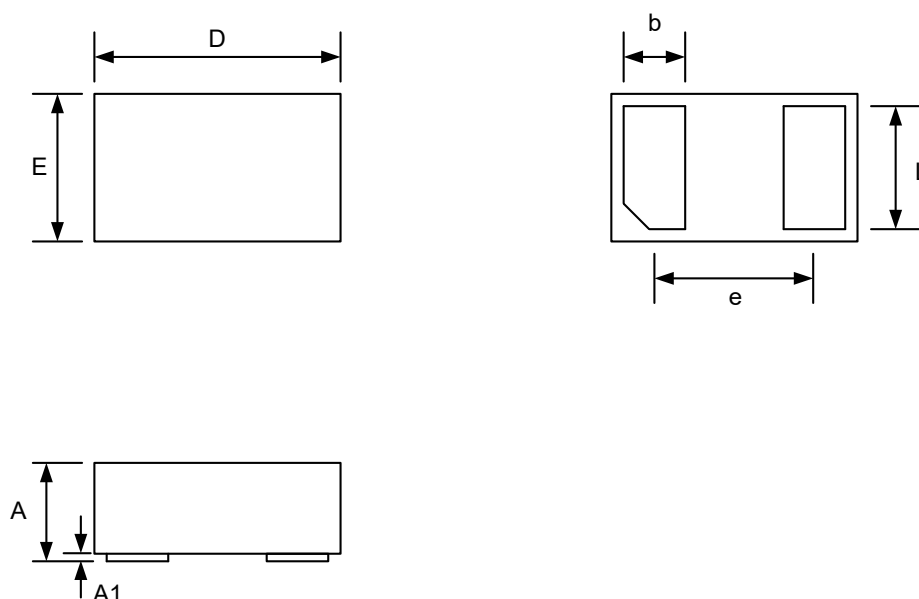


Recommended Conditions

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

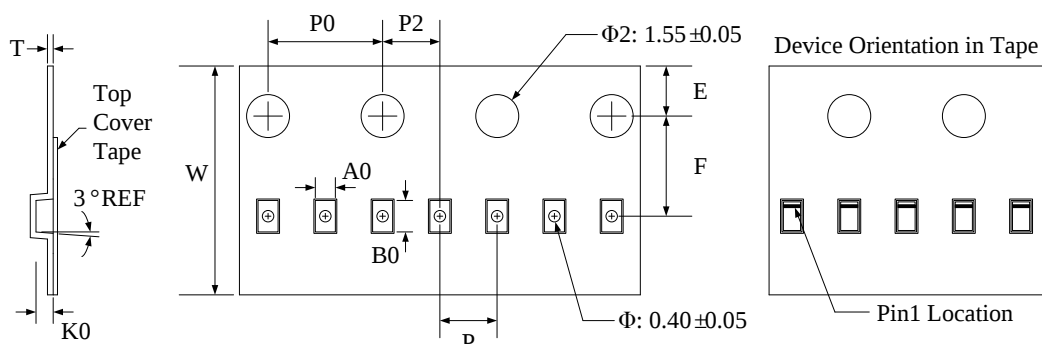
- ❑ DFN1006-2L package
- ❑ 2 leads, very small package
- ❑ MSL-1



Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.450	0.550	0.017	0.022
A1	0.000	0.050	0.000	0.002
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
b	0.200	0.300	0.008	0.012
e	0.650 BSC		0.026 BSC	
L	0.450	0.550	0.018	0.022

Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00 ± 0.1	0.7 ± 0.05	1.15 ± 0.05	0.55 ± 0.05	1.75 ± 0.1	3.5 ± 0.05	2.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	0.2 ± 0.05

Marking Codes



Note:

(1) "S5" is part number.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TS0521LBX	5.0V	10,000	7 Inch