

Features

- ❑ Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air)
 $\pm 30\text{kV}$ (Contact)
IEC 61000-4-4 (EFT) 40A (5/50ns)
IEC 61000-4-5 (Lightning) 7A (8/20us)
- ❑ Protects one I/O line (bidirectional)
- ❑ Low clamping voltage
- ❑ Working voltages : 12.0V
- ❑ Low leakage current
- ❑ Response Time is < 1 ns
- ❑ Green part and RoHS compliant
- ❑ MSL-1

Description

TS1201NBX is an ultra-low capacitance ESD and Surge Protector designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. TS1201NBX is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 30\text{kV}$ air, $\pm 30\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), IEC 61000-4-5 (Surge) (7A, 8/20 μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

TS1201NBX is in DFN1006-2L package. The combined features of ultra-low capacitance and high ESD robustness make TS121NB ideal for applications where arrays are not practical. The low clamping voltage of the TS1201NBX guarantees a minimum stress on the protected IC.

Applications

- ❑ Cell Phone Handsets and Accessories
- ❑ Microprocessor based equipment
- ❑ Personal Digital Assistants (PDA's)
- ❑ Notebooks, Desktops, and Servers
- ❑ Portable Instrumentation
- ❑ Peripherals
- ❑ USB Interface

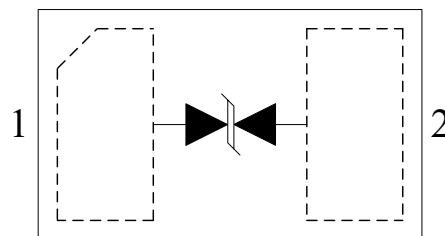
Mechanical Characteristics

- ❑ DFN1006-2L Package
- ❑ Flammability Rating: UL 94V-0
- ❑ Packaging: Tape and Reel
- ❑ High temperature soldering guaranteed: 260°C/10s
- ❑ Reel size: 7 inch

Circuit Diagram



Pin Configuration



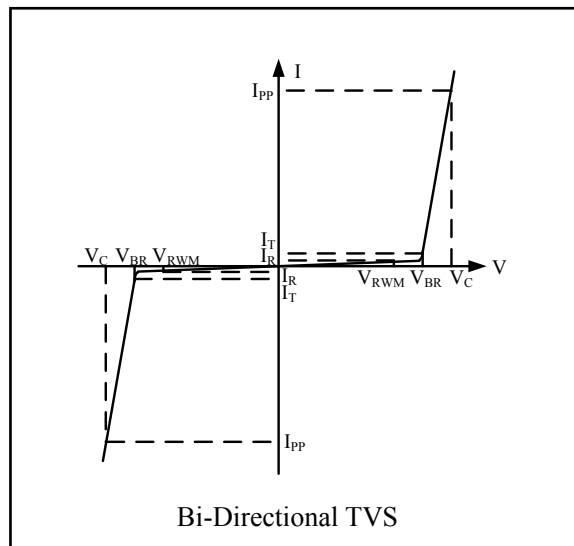
DFN1006-2L
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
P_{pk}	Peak Pulse Power($t_p=8/20\mu s$)	180	W
I_{pp}	Peak Pulse Current($t_p=8/20\mu s$)	7	A
V_{ESD}	ESD per IEC 61000-4-2(Air) ESD per IEC 61000-4-2 (Contact)	± 30 ± 30	kV
T_{OPT}	Operating Temperature	-55/+150	°C
T_{STG}	Storage Temperature	-55/+150	°C

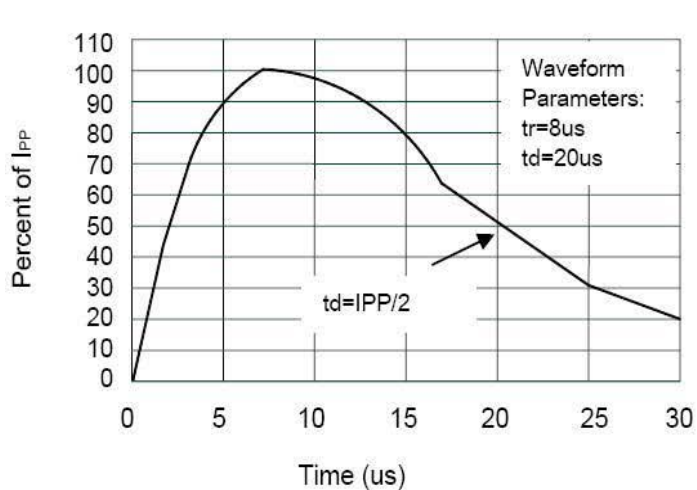
Electrical Characteristics (T = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{tl}	Trigger Voltage
I_{tl}	Trigger Current @ V_{tl}
V_h	Holding Voltage
I_h	Holding Current @ V_h
V_C	Clamping Voltage @ I_{pp}
I_{pp}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
C_Δ	Variation in C_{ESD} with Reverse Bias

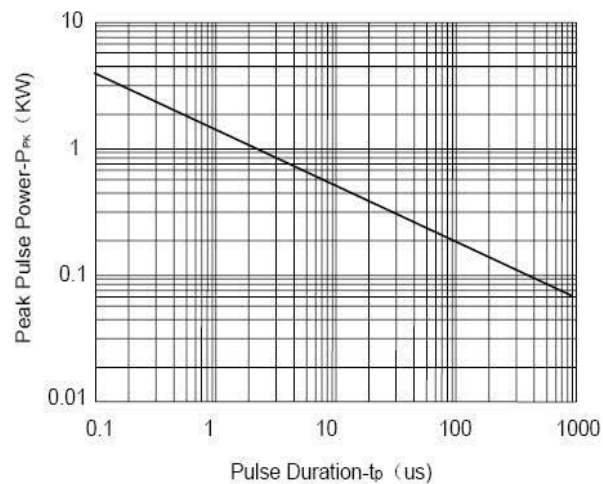


Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				12.0	V
I_R	$V_{RWM} = 12.0V, T = 25^\circ C$		0.1	1.0	μA
V_{BR}	$I_T = 1mA$	13.3		16.7	V
V_C	$I_{pp} = 1A, t_p = 8/20\mu s$		18	20	V
V_C	$I_{pp} = 7A, t_p = 8/20\mu s$		25	30	V
C_{ESD}	$V_R = 0V, f = 1MHz$		18		pF

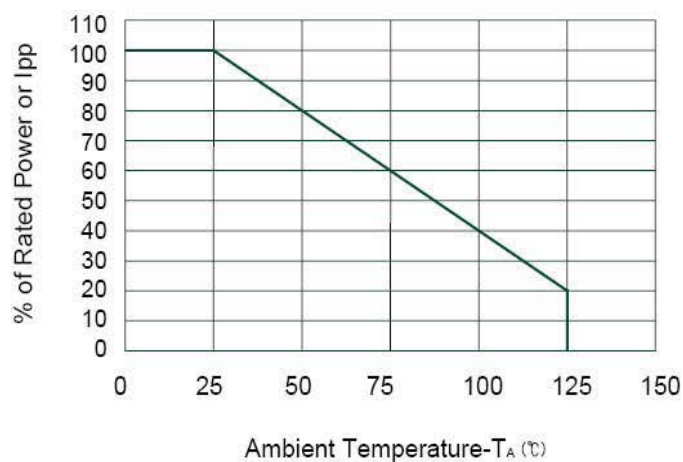
Electrical Characteristics Curve



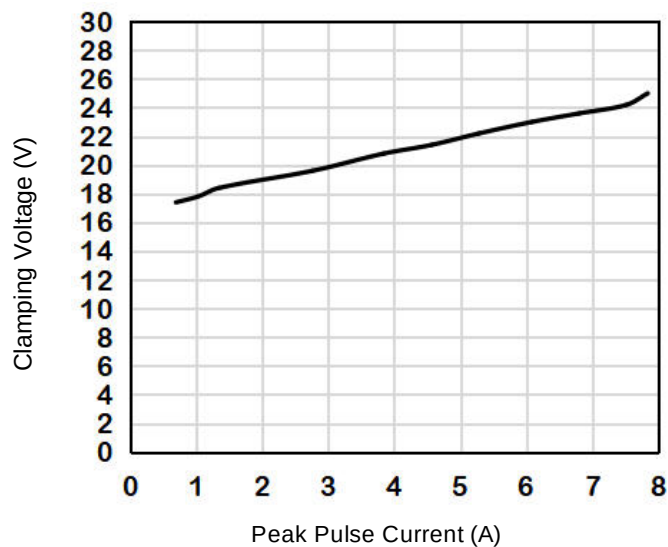
Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time



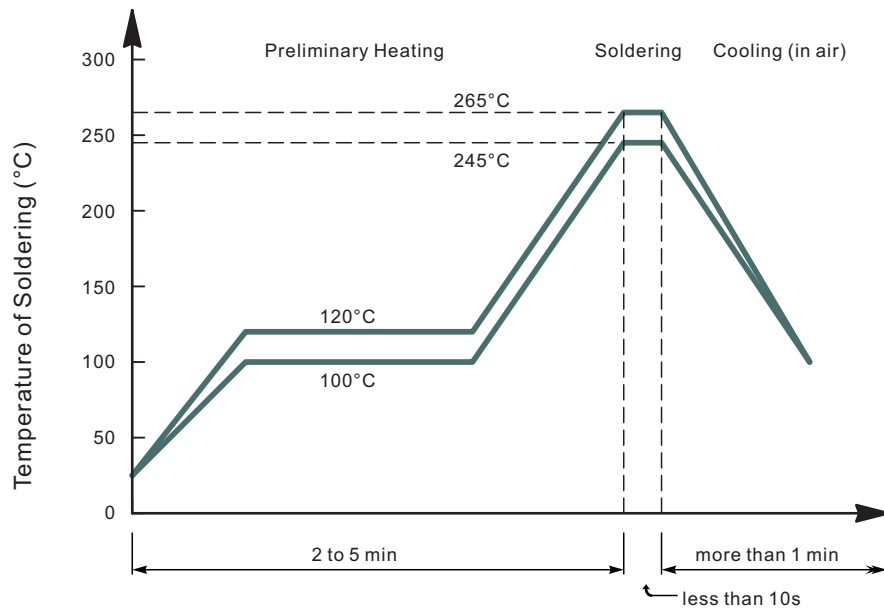
Power Derating Curve



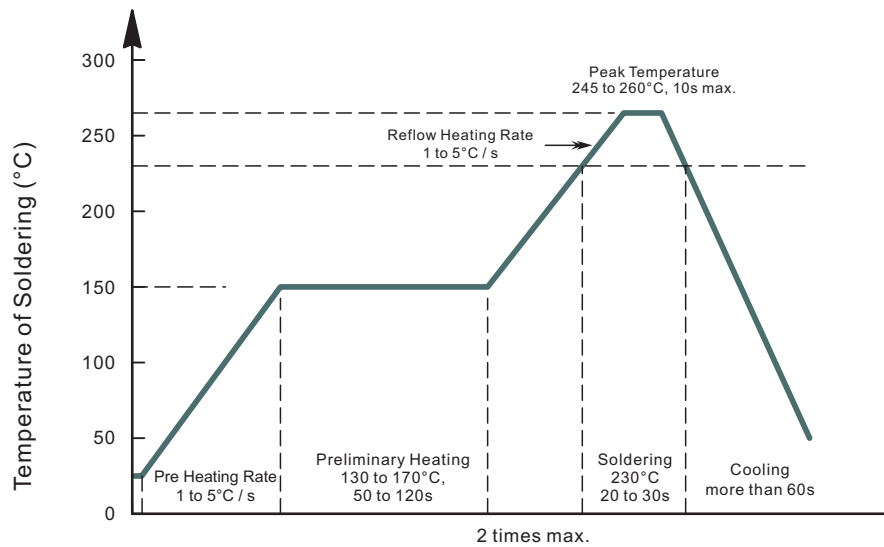
Clamping Voltage vs. Peak Pulse Current



• Recommended condition of flow soldering

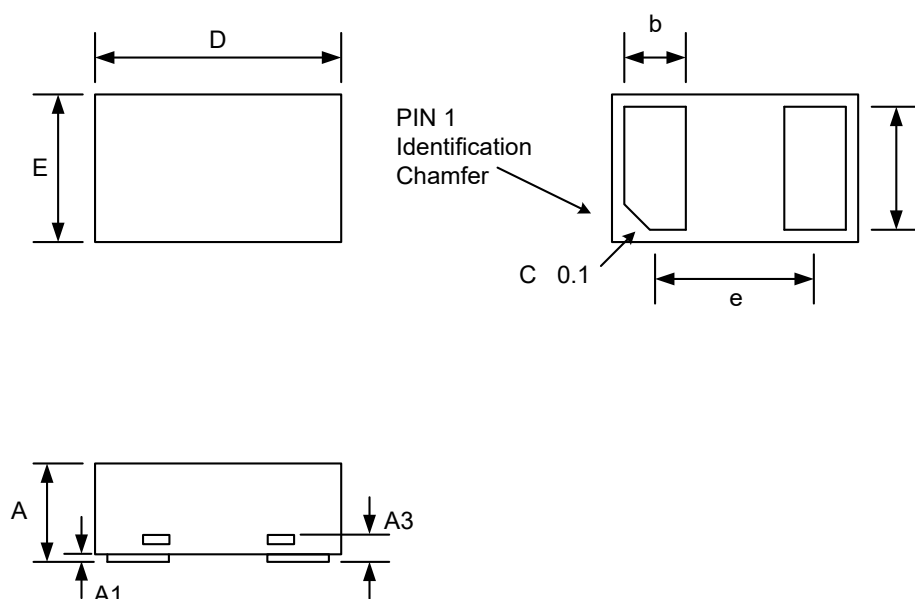


• Recommended condition of reflow soldering



Package Outline

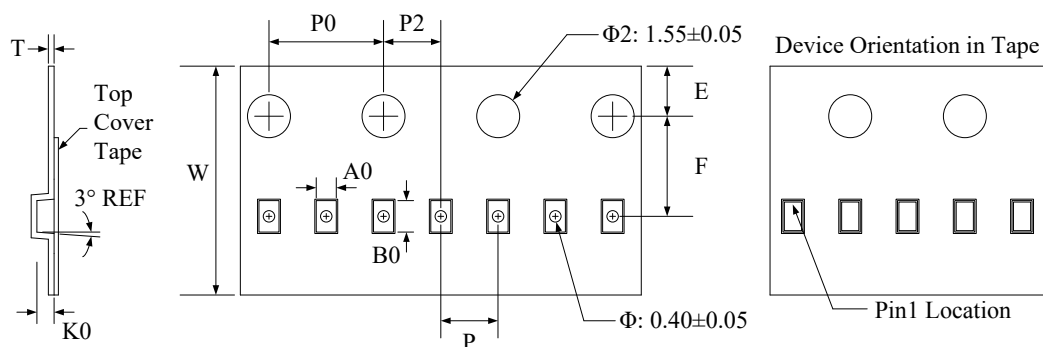
- ❑ DFN1006-2L package
- ❑ 2 leads, very small package
- ❑ MSL-1



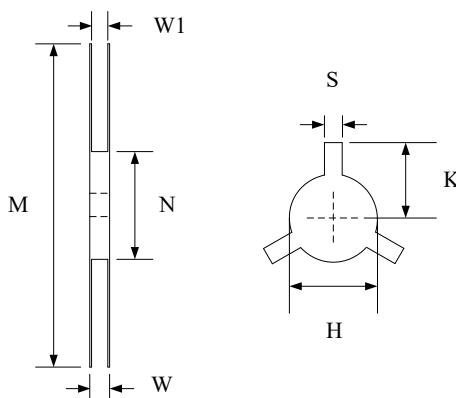
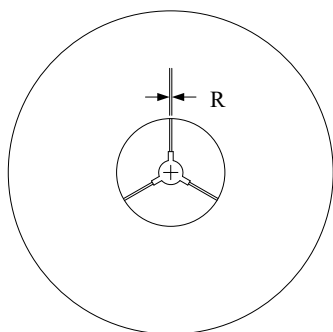
Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.400	0.550	0.016	0.022
A1	0.000	0.050	0.000	0.002
A3	0.125 REF		0.005 REF	
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

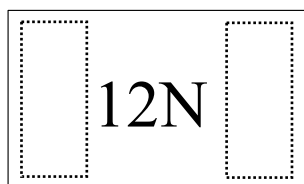


Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00 ± 0.1	0.7 ± 0.05	1.15 ± 0.05	0.55 ± 0.05	1.75 ± 0.1	3.5 ± 0.05	2.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	0.2 ± 0.05



Symbol	Reel Size	M	N	W	W1	H	S	K	R
Dimensions (mm)	$\Phi 178$	178.0 ± 1.0	60.0 ± 1.0	11.5 ± 0.5	9.0 ± 0.5	13.0 ± 0.5	2.0 ± 0.1	11.0 ± 0.2	1.0 ± 0.05

Marking Codes



Note:

(1) "12N" is part number, fixed

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TS1201NBX	12V	10,000	7 Inch