



### FEATURES

- ✧ Protects one bi-directional I/O line
- ✧ Low clamping voltage
- ✧ Low operating voltage: 3.3V
- ✧ Low leakage current
- ✧ RoHS compliant

### MAIN APPLICATIONS

- ✧ USB 2.0 and USB 3.0
- ✧ HDMI 1.3,HDMI 1.4 AND HDMI 2.0
- ✧ SATA and eSATA interface
- ✧ DVI
- ✧ Portable electronics and notebooks

### PROTECTION SOLUTION TO MEET

- ✧ IEC61000-4-2 (ESD)  $\pm 20\text{kV}$  (air),  $\pm 15\text{kV}$  (contact)
- ✧ IEC61000-4-4 (EFT) 40A (5/50ns)
- ✧ IEC61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ )

### MECHANICAL CHARACTERISTICS

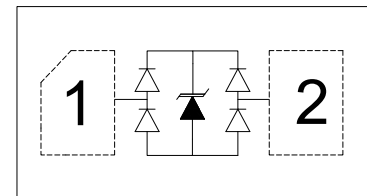
- ✧ DFN1006-2L package
- ✧ Molding compound flammability rating: UL 94V-0
- ✧ Quantity per reel: 10,000pcs
- ✧ Lead finish: lead free
- ✧ Marking code: 3U

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at 8/20 $\mu\text{s}$ waveform	P <sub>PP</sub>	34	W
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	+/- 20	kV
ESD per IEC 61000-4-2 (Contact)		+/- 15	
Lead soldering temperature	T <sub>L</sub>	260 (10 sec.)	°C
Operating junction temperature range	T <sub>J</sub>	-55 to +125	°C
Storage temperature range	T <sub>STG</sub>	-55 to +150	°C



DFN1006-2L(Bottom view)



Pin Configuration(Top view)

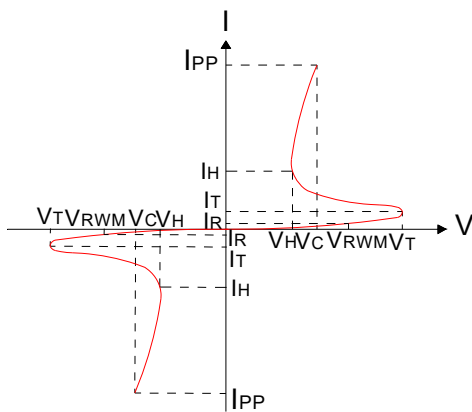
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}C$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse working voltage	$V_{RWM}$				3.3	V
Reverse breakdown voltage	$V_{BR}$	$I_T=1mA$	7.0	10.0		V
Reverse holding voltage	$V_H$	$I_H=50mA$	3.3			V
Reverse leakage current	$I_R$	$V_{RWM}=3.3V$			50	nA
Peak pulse current	$I_{PP}$	$t_P=8/20\mu s$			4	A
Clamping voltage	$V_C^{①}$	$I_{PP} = 16A, t_P=100ns$		9		V
Clamping voltage	$V_C^{②}$	$I_{PP} = 1A, t_P=8/20\mu s$		4.5	5.5	V
		$I_{PP} = 4A, t_P=8/20\mu s$		7	8.5	
Dynamic resistance	$R_{DYN}^{①}$	$t_P=100ns$		0.25		$\Omega$
Junction capacitance	$C_J$	$V_{RWM}=0V, f=1MHz$		0.35	0.5	pF

- ① TLP parameter:  $Z_0=50\Omega, t_P=100ns, tr=2ns$ , averaging window from 60ns to 80ns.  $R_{DYN}$  is calculated from 4A to 16A.
- ② Non-repetitive current pulse, according to IEC61000-4-5.

**RATINGS AND V-I CHARACTERISTICS CURVES** ( $T_A=25^{\circ}C$ , unless otherwise noted)

**FIG.1: V- I curve characteristics (Bi-directional)**



**FIG.2: Pulse waveform (8/20μs)**

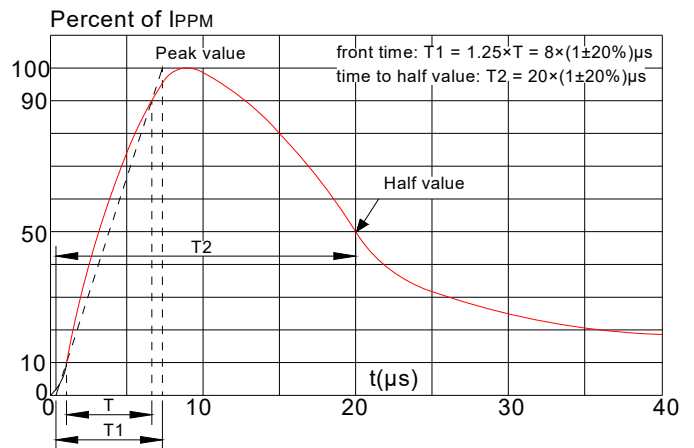


FIG.3: Pulse derating curve

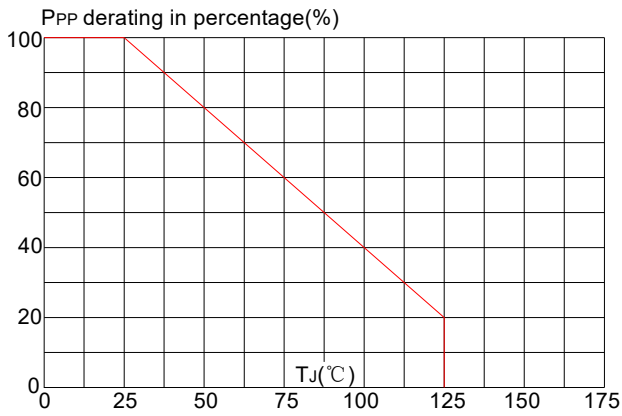


FIG.5: Clamping voltage vs. peak pulse current

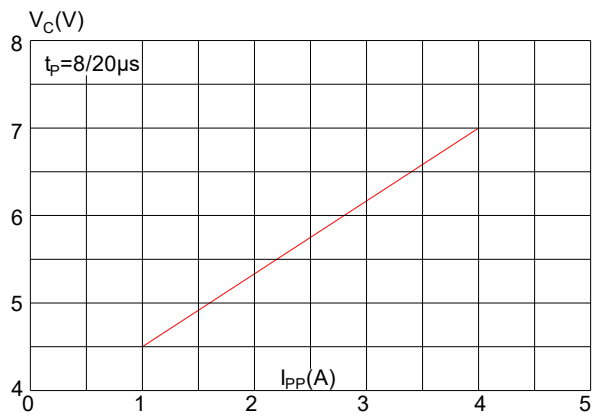


FIG.7: Peak pulse power vs. pulse time

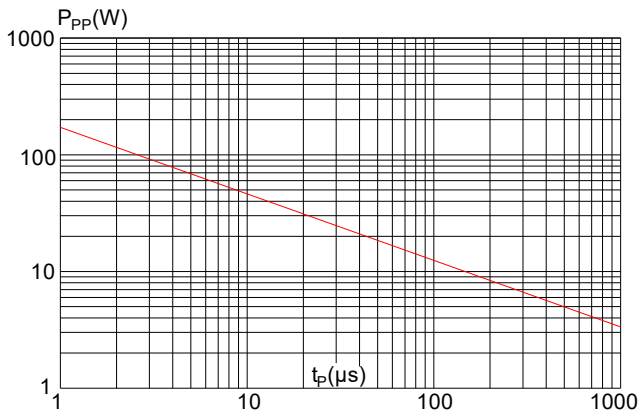


FIG.4: ESD clamping (15kV contact)

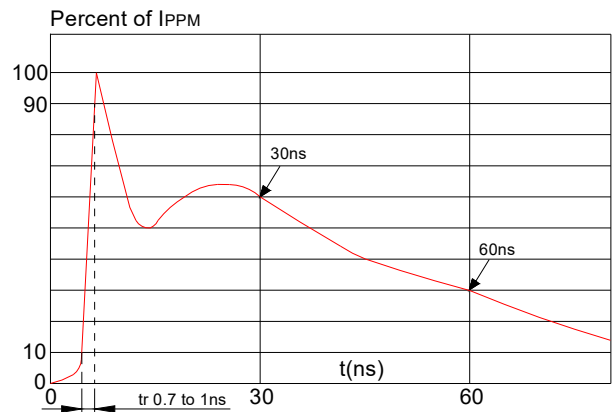


FIG.6: Reverse voltage vs. junction capacitance

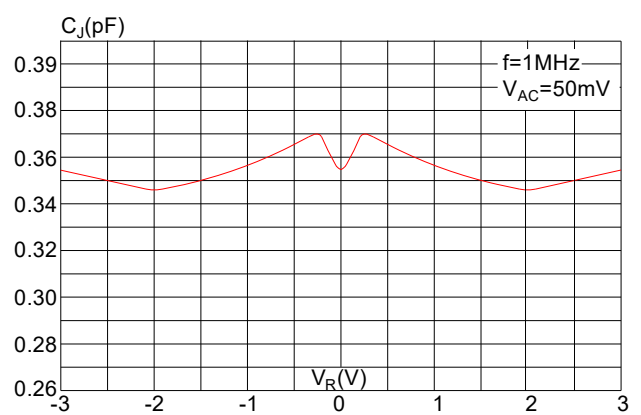


FIG.8: LTP measurement

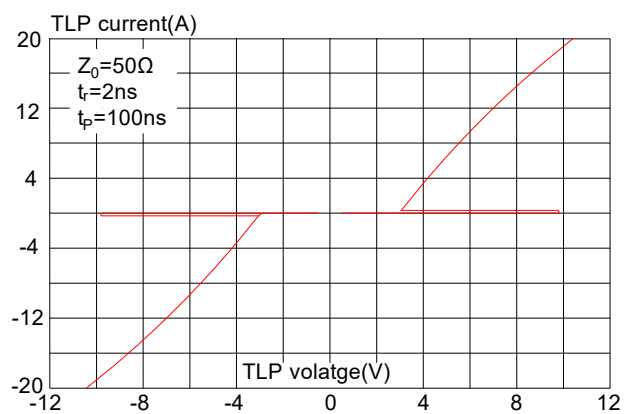


FIG.9:ESD clamping of I/O to GND  
(+8kV contact per IEC 61000-4-2)

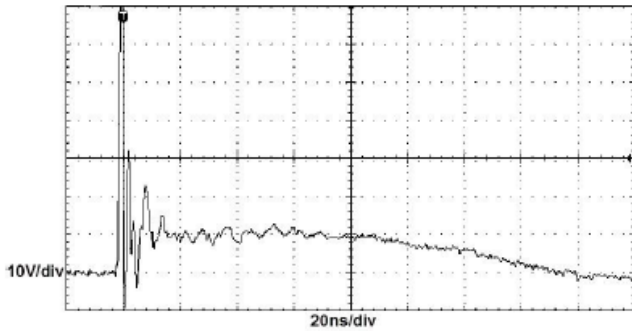
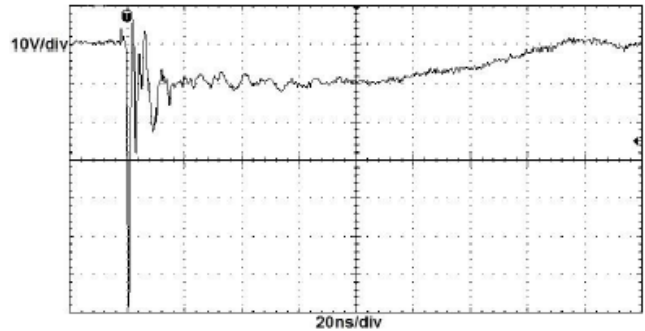
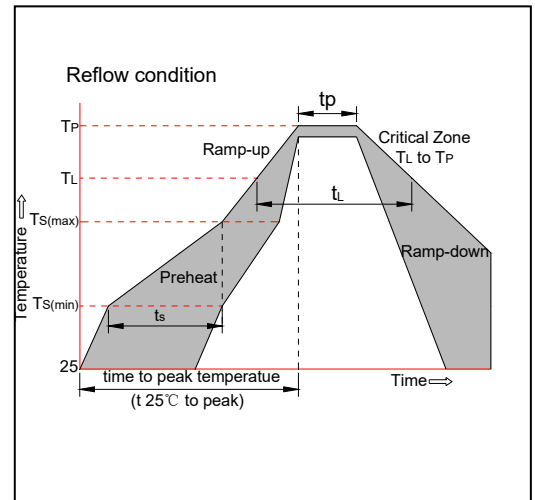


FIG.10:ESD clamping of I/O to GND  
(-8kV contact per IEC 61000-4-2)

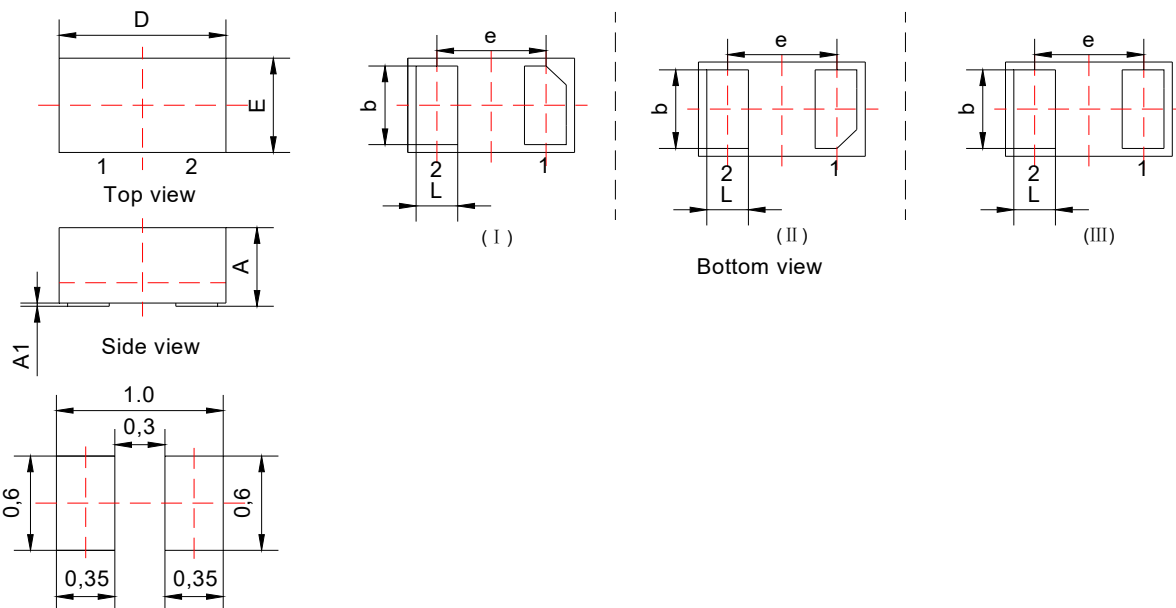


**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) ( $t_s$ )	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ )to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C



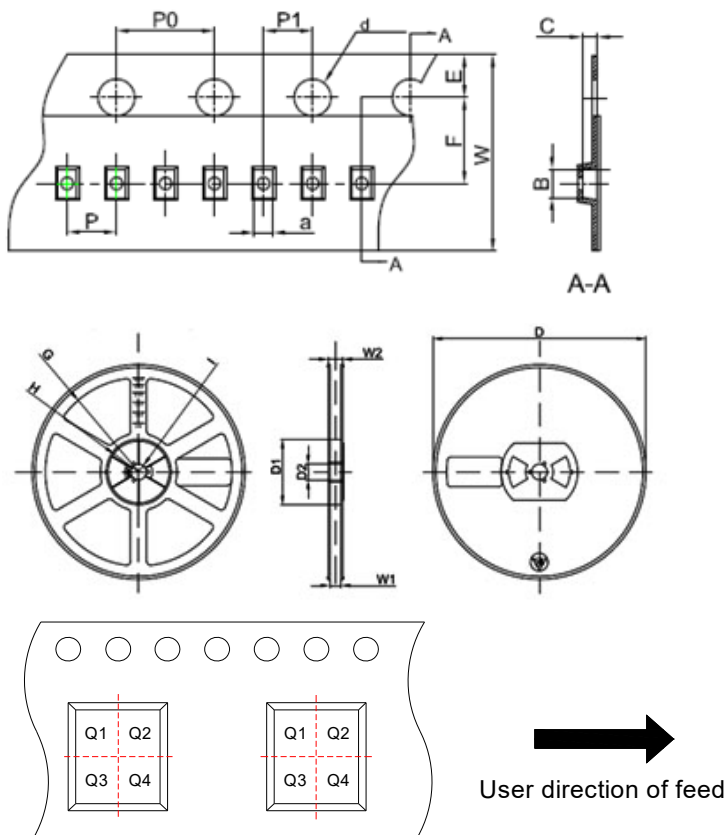
**PACKAGE MECHANICAL DATA**



Recommended soldering footprint(mm)

Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.40	0.50	0.55	0.016	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65BSC			0.026BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012

**TAPE AND REEL INFORMATION-DFN1006-2L**



Pin 1 quadrant:Q1&Q2

**Packaging Description:**

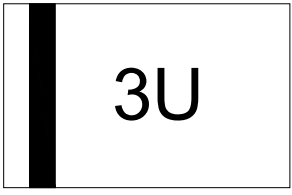
DFN1006-2L parts are shipped in tape. The carrier tape is made from a dissipative(carbon filled) polycarbonate resin. The cover tape is a multilayer film(heat activated adhesive in nature)primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 10,000units per 7" or 17.8cm diameter reel. The reels are clear in color and made of polystyrene plastic(anti-static coated).

Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

**ORDERING INFORMATION**

PART No.	PACKAGE TYPE	QUANTITY(PCS) REEL	DESCRIPTION
JEB03SCDF	DFN1006-2L	10,000	7 inch reel pack

**MARKING CODE**

Part Number	Marking Code
JEB03SCDF	


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