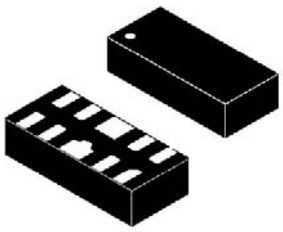
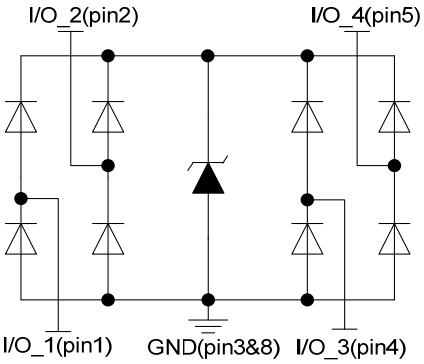
JEU03SC TVS Diode array for ESD Protection Rev.2.4

FEATURES

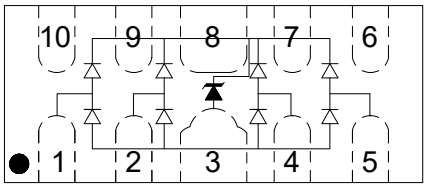
- ✧ Ultra low capacitance: 0.30pF(typical) for each channel
- ✧ Up to four I/O lines of protection
- ✧ Low operating voltage: 3.3V
- ✧ Low leakage current: 0.1μA@V_{RWM} (typical)
- ✧ Low clamping voltage
- ✧ Protects four data lines
- ✧ Low operating and clamping voltage
- ✧ RoHS compliant



DFN2510-10L



Pin configuration



Top view

MAIN APPLICATIONS

- ✧ Serial ATA
- ✧ PCI express
- ✧ Desktops, servers and notebooks
- ✧ MDDI ports
- ✧ USB2.0, 3.0 and 3.1
- ✧ Display ports
- ✧ HDMI 1.3, 1.4 and 2.0
- ✧ Digital visual interfaces (DVI)

PROTECTION SOLUTION TO MEET

- ✧ IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- ✧ IEC61000-4-4 (EFT) 40A (5/50ns)
- ✧ IEC61000-4-5 (Lightning) 6A (8/20μs)

MECHANICAL CHARACTERISTICS

- ✧ DFN2510-10L package
- ✧ Molding compound flammability rating: UL 94V-0
- ✧ Quantity per reel: 3,000pcs
- ✧ Lead finish: lead free
- ✧ Marking code: XaYWA

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at 8/20μs waveform	P_{PP}	40	W
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	+/- 15 +/- 8	kV
Lead soldering temperature	T_L	260(10 sec.)	℃
Operating junction temperature range	T_J	-55 to +125	℃
Storage temperature range	T_{STG}	-55 to +150	℃

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse working voltage	V_{RWM}	I/O to GND			3.3	V
Forward voltage	V_F	GND to I/O I_F=10mA	0.6	0.9	1.2	V
Reverse leakage current	I_R	I/O to GND @V_{RWM}=3.3V		0.1	5	μA
Reverse triggering voltage	V_{t1}	I/O to GND @I_{t1}=1mA	3.7			V
Reverse holding voltage	V_h	I/O to GND @I_h=100mA	0.8	2		V
Clamping voltage	V_C①	I_{PP}=4A,t_P=100ns		3.0		V
		I_{PP}=16A, t_P=100ns		6.5		
Clamping voltage (I/O to GND)	V_C②	I_{PP}=1A,t_P=8/20μs		2	3.5	V
		I_{PP}=6A,t_P=8/20μs		5	7	
Dynamic resistance	R_{DYN}①	t_P=100ns		0.35		Ω
Junction capacitance	C_J	I/O to GND V_{RWM}=3.3V, f=1MHz		0.30	0.6	pF
Junction capacitance		I/O to I/O V_{RWM}=3.3V, f=1MHz		0.15	0.3	

① TLP parameter:Z_0=50Ω,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℃, unless otherwise noted)

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

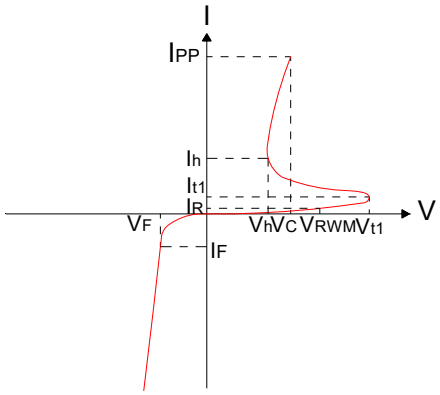


FIG.2: Pulse waveform (8/20μs)

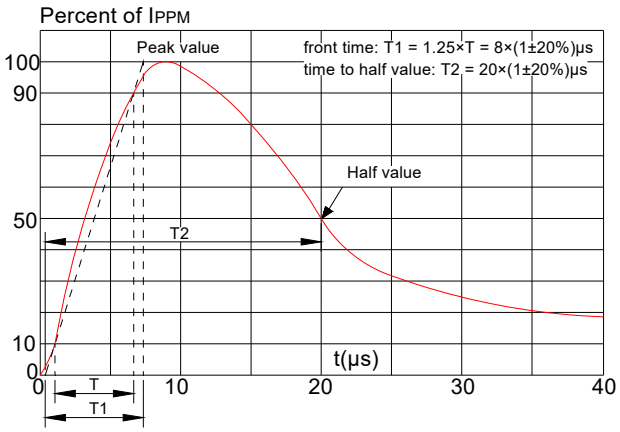


FIG.3: Pulse derating curve

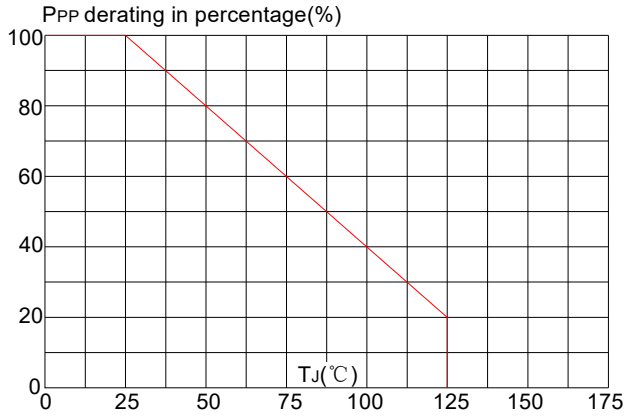


FIG.4: ESD clamping (8kV contact)

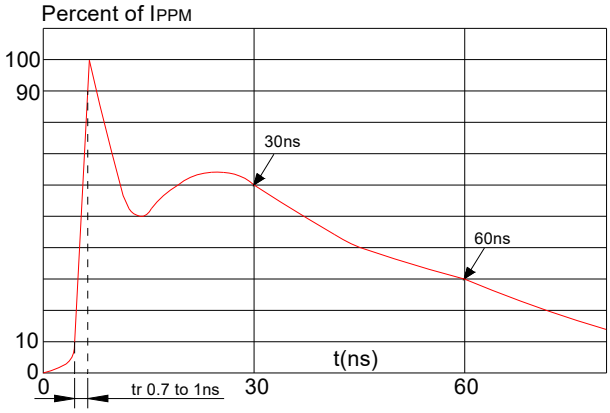


FIG.5:TLP testing of I/O to GND

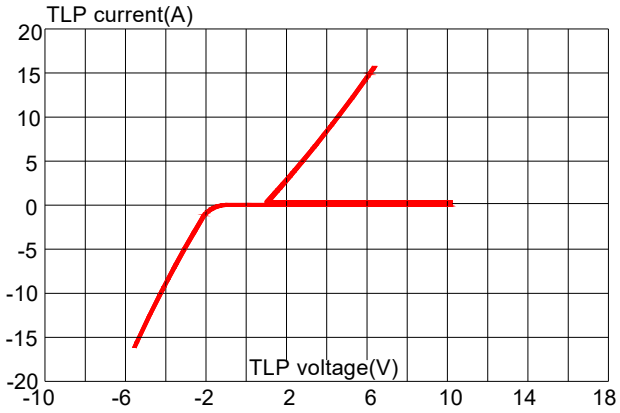


FIG.6: Insertion loss S21 of I/O to GND

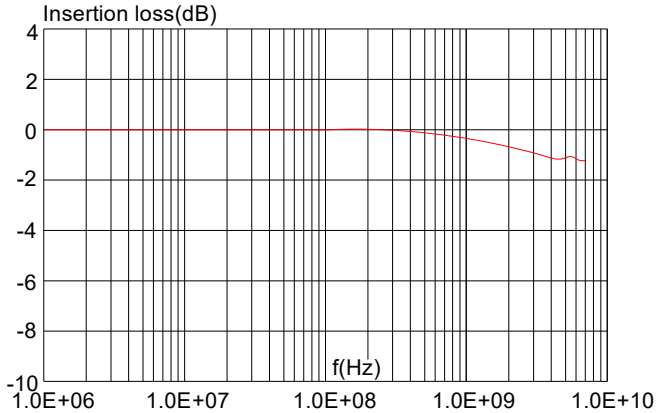


FIG.7:Capapcitance vs.voltage of I/O to GND (f=1MHz)

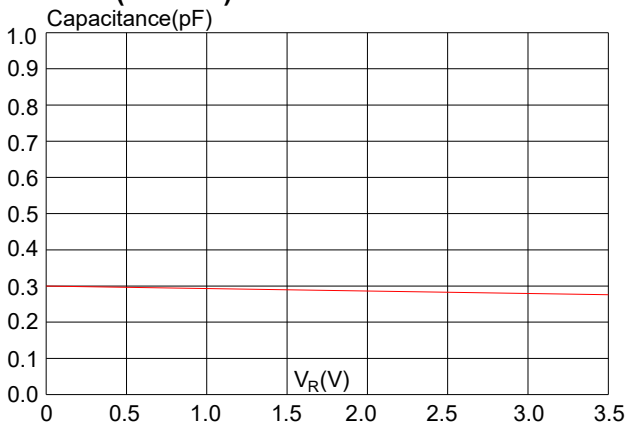


FIG.8: Clamping voltage vs. peak pulse current(8/20μs)

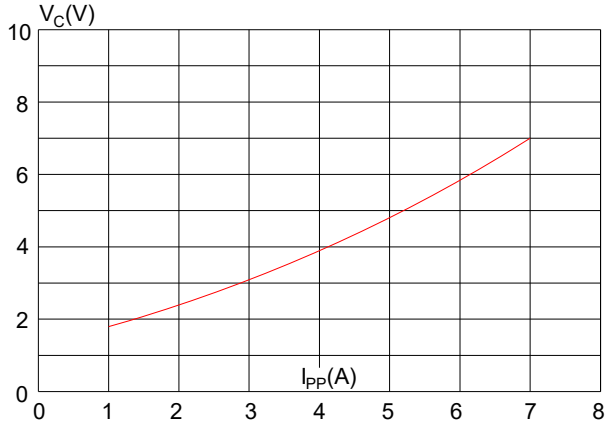


FIG.9:ESD clamping of I/O to GND (+8kV contact per IEC 61000-4-2)

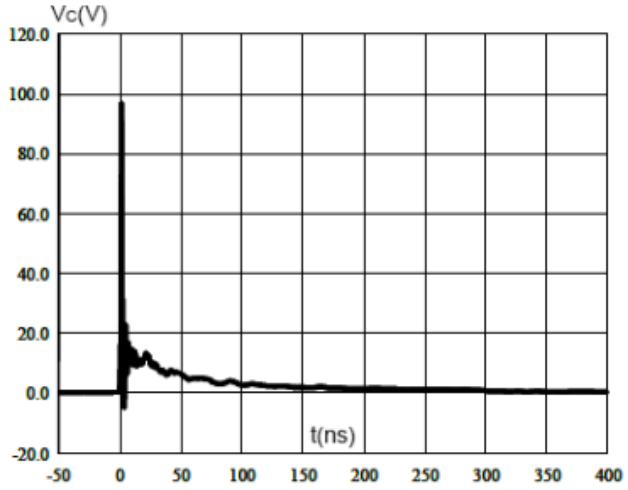
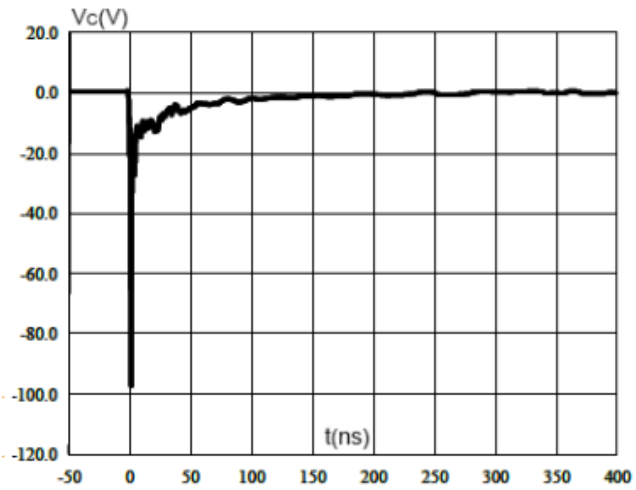
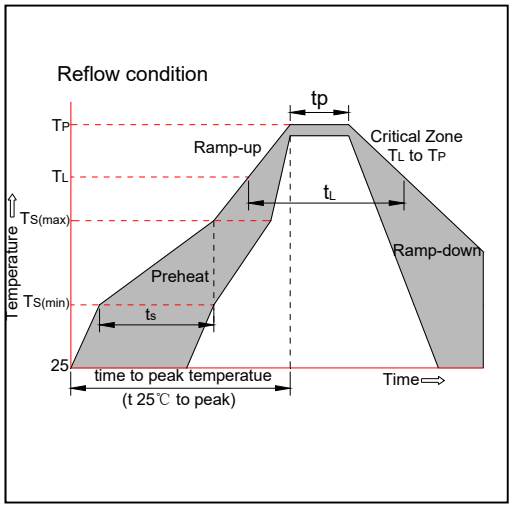


FIG.10:ESD clamping of I/O to GND (-8kV contact per IEC 61000-4-2)

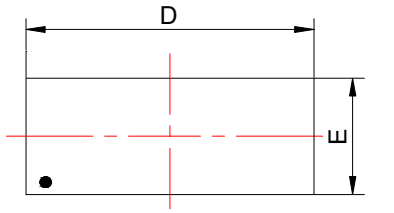


SOLDERING PARAMETERS

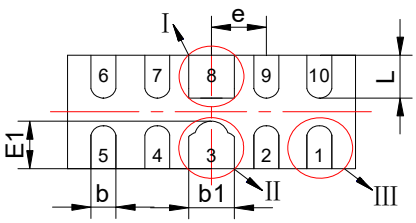
Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)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



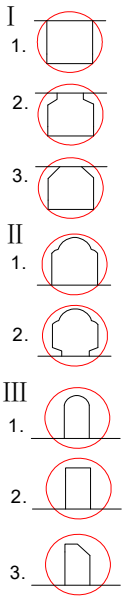
PACKAGE MECHANICAL DATA

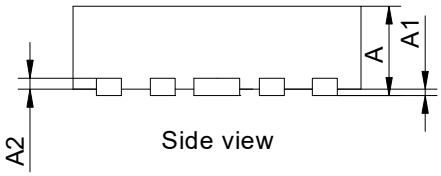


Top view

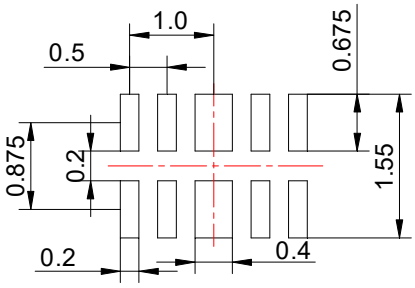


Bottom view





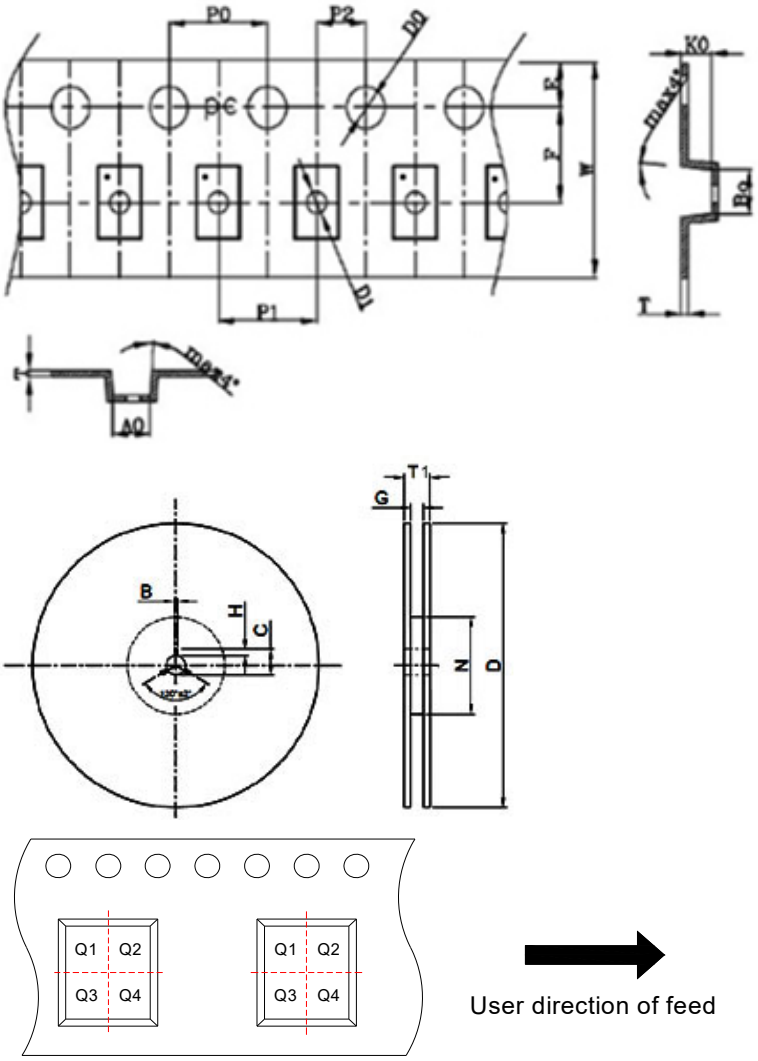
Side view



Recommended soldering footprint

Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.46	0.53	0.60	0.018	0.021	0.024
A1	0.00	0.02	0.05	0.000	0.001	0.002
A2	0.15Ref.			0.006Ref.		
b	0.15	0.20	0.25	0.006	0.008	0.010
b1	0.35	0.40	0.45	0.014	0.016	0.018
D	2.40	2.50	2.60	0.094	0.098	0.102
E	0.90	1.00	1.10	0.035	0.039	0.043
E1	0.30	0.40	0.56	0.012	0.016	0.022
e	0.50BSC			0.020BSC		
L	0.30	0.40	0.45	0.012	0.016	0.018

TAPE AND REEL INFORMATION-DFN2510-10L



Pin 1 quadrant:Q1

Symbol	Dimensions	
	Millimeters	Inches
	Typ.	Typ.
A0	1.20	0.047
B0	2.75	0.108
K0	0.70	0.028
P0	4.00	0.157
P1	4.00	0.157
P2	2.00	0.079
T	0.20	0.008
E	1.75	0.069
F	3.50	0.138
D0	1.55	0.061
D1	0.60	0.024
W	8.0	0.315
B	2.0	0.079
H	4.0	0.157
C	13.0	0.512
G	8.4	0.331
T1	14.9(max)	0.587(max)
N	60.0	2.362
D	178.0	7.000

ORDERING INFORMATION

PART No.	PACKAGE TYPE	QUANTITY(PCS) REEL	DESCIPTION
JEU03SC	DFN2510-10L	3,000	7 inch reel pack

MARKING CODE

Part Number	Marking Code
JEU03SC	 **Note:** (1) "Xa" is the part number of JEU03SC,fixed. (2) "YWA" is data code

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