



## UESD5V0U4U01

ESD / TVS

### ULTRA LOW CAPACITANCE ESD PROTECTION ARRAY FOR HIGH SPEED I/O PORT

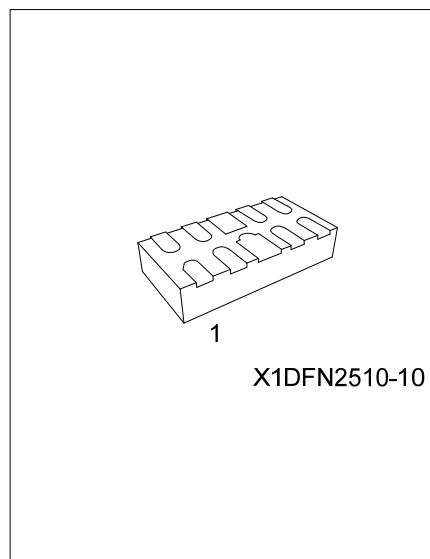
#### DESCRIPTION

The UTC **UESD5V0U4U01** is a design which includes ESD rated diode arrays to protect high speed data interfaces. The AZ1045-04F has been

specifically designed to protect sensitive components which are connected to data and transmission lines from over-voltage caused by Electrostatic Discharging (ESD).

The UTC **UESD5V0U4U01** is a unique design which includes ESD rated, ultra low capacitance steering diodes and a unique design of clamping cell which is an equivalent TVS diode in a single package. During transient conditions, the steering diodes direct the transient to either the internal ESD line or to ground line. The internal unique design of clamping cell prevents over-voltage on the internal ESD line and on the I/O line, which is protecting any downstream components.

The UTC **UESD5V0U4U01** may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge).



#### FEATURES

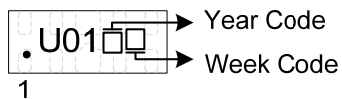
- \* Unidirectional device
- \* ESD Protect for Transition Minimized Differential Signaling (TMDS) channels
- \* Protects four I/O lines
- \* Provide ESD protection for each line to IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 10\text{kV}$  (contact) IEC 61000-4-5 (Lightning) 5.0A (8/20 $\mu\text{s}$ )
- \* For operating voltage of 5V and below
- \* Ultra low capacitance : 0.55pF typical
- \* Fast turn-on and Low clamping voltage
- \* Array of ESD rated diodes with internal equivalent TVS (Transient Voltage Suppression) diode
- \* Simplified layout for HDMI connectors
- \* Solid-state silicon-avalanche and active circuit triggering technology

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UESD5V0U4U01L-KAV-R	UESD5V0U4U01G-KAV-R	X1DFN2510-10	Tape Reel

UESD5V0U4U01G-KAV-R	
(1) Packing Type	(1) R: Tape Reel
(2) Package Type	(2) KAV: X1DFN2510-10
(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

## MARKING



## MARKING INFORMATION

### W: Year Code

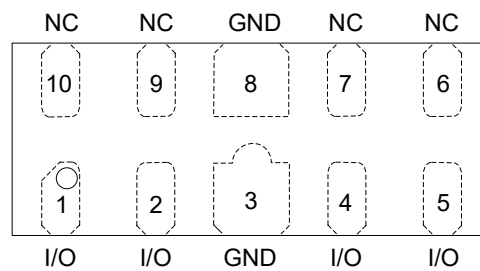
DATE	2XX0	2XX1	2XX2	2XX3	2XX4	2XX5	2XX6	2XX7	2XX8	2XX9
CODE	0	1	2	3	4	5	6	7	8	9

### D: Week Code

Week	1	2	3	4	5	6	7	8	9	10	11	12
CODE	A	B	C	D	E	F	G	H	J	K	L	M
Week	13	14	15	16	17	18	19	20	21	22	23	24
CODE	N	P	Q	R	S	T	U	V	W	X	Y	Z
Week	25	26	27	28	29	30	31	32	33	34	35	36
CODE	5	6	7	8	9	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
Week	37	38	39	40	41	42	43	44	45	46	47	48
CODE	<u>H</u>	<u>J</u>	<u>K</u>	<u>L</u>	<u>M</u>	<u>N</u>	<u>P</u>	<u>Q</u>	<u>R</u>	<u>S</u>	<u>T</u>	<u>U</u>
Week	49	50	51	52	53							
CODE	<u>V</u>	<u>W</u>	<u>X</u>	<u>Y</u>	<u>Z</u>							

Note: Weeks 30 to 53 are marking with underlines.

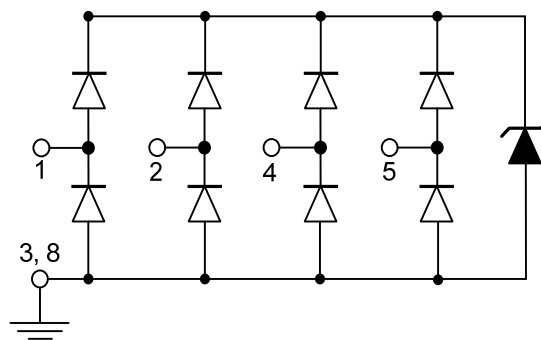
## ■ PIN CONFIGURATION



## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	I/O	Terminal of ESD 1
2	I/O	Terminal of ESD 2
3, 8	GND	Ground
4	I/O	Terminal of ESD 3
5	I/O	Terminal of ESD 4

## ■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

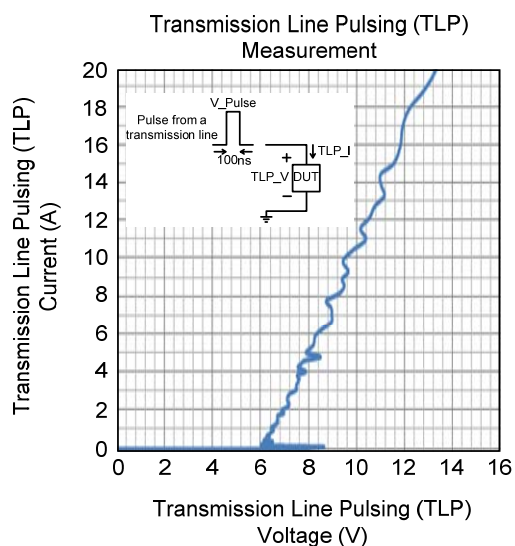
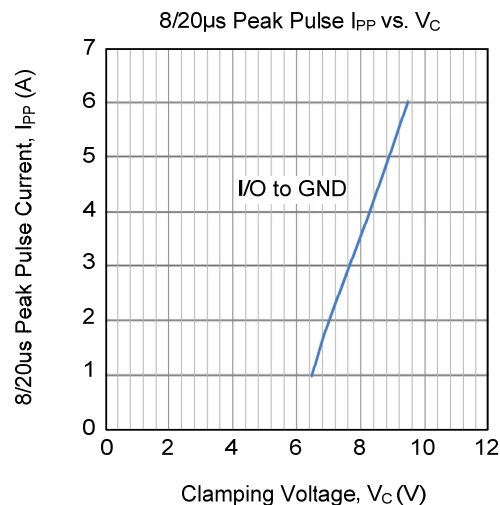
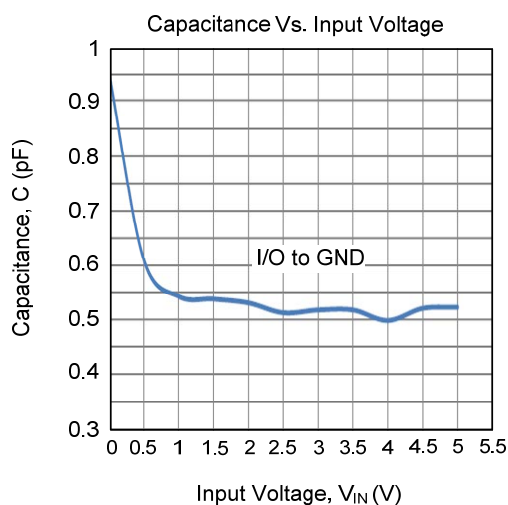
PARAMETER			SYMBOL	RATINGS	UNIT
ESD Discharge	IEC61000-4-2	Air Discharge	V <sub>ESD</sub>	±15	kV
		Contact Discharge		±12	kV
Peak Pulse Current	IEC61000-4-5	t <sub>p</sub> =8/20μs	I <sub>PP</sub>	5	A
Peak Pulse Power			P <sub>PP</sub>	45	W
Operating Junction Temperature			T <sub>J</sub>	-40 ~ +150	°C
Storage Temperature			T <sub>STG</sub>	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reverse Stand-Off Voltage	V <sub>RWM</sub>	Pin 1, 2, 4, 5 to Pin 3, 8			5	V
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>R</sub> =1mA, Pin 1, 2, 4, 5 to Pin 3, 8	6			V
Reverse Leakage Current	I <sub>R</sub>	V <sub>I/O</sub> to GND=5V			1	μA
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =15mA, T <sub>A</sub> =25°C, Pin 3, 8 to Pin 1, 2, 4, 5		0.9	1.1	V
ESD Clamping Voltage	V <sub>clamping</sub>	IEC 61000-4-2 0 ~ +6kV Contact mode, any I/O Pin to Ground		12		V
ESD Dynamic Turn-on Resistance	R <sub>dynamic</sub>	IEC 61000-4-2 0 ~ +6kV Contact mode, any I/O Pin to Ground		0.3		Ω
Channel Input Capacitance	C <sub>IN</sub>	V <sub>Pin 3, 8</sub> =0V, V <sub>IN</sub> =2.5V, f=1MHz, any I/O Pin to Ground		0.55	0.65	pF

## ■ TYPICAL CHARACTERISTICS



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