

## ULTRA LOW CAPACITANCE STEERING DIODE ARRAY



SO-8 PACKAGE

### DESCRIPTION

The ET721 is a low capacitance and low leakage steering diode array capable of protecting up to six (6) high speed data lines. Its ultra low capacitance allows maintenance of signal integrity for high-speed data lines while protecting the circuit ICs from the damage of severe transients. An extremely low leakage current makes the ET721 suitable for battery powered devices.

The ET721 is available in a SO-8 package. This device meets all the applicable voltage immunity standards, including IEC 61000-4-2 (ESD), 61000-4-4 (EFT) and 61000-4-5 (Surge).

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 12A, 8/20 $\mu$ s - Level 1(Line-Gnd) & Level 2(Line-Line)
- Low Clamping Voltage
- Provides Six Lines of Protection
- Low Leakage Current: <200nA
- Ultra Low Capacitance: 3pF Typical
- RoHS Compliant
- REACH Compliant

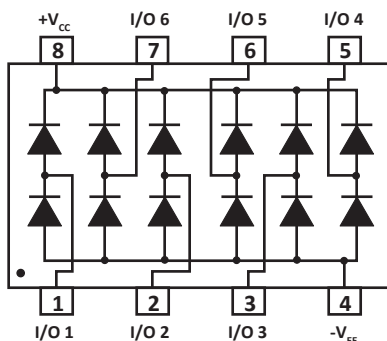
### APPLICATIONS

- Ethernet 10/100/1000 Base T
- SMART Phones
- Set-Top Box Interface
- FireWire & USB Interfaces
- Sensors

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SO-8 Package
- Approximate Weight: 70 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 12mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

### PIN CONFIGURATION



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

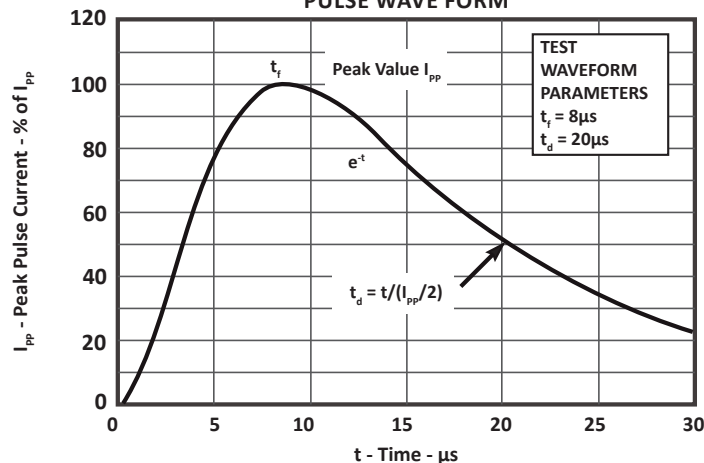
PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_A$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Continuous Power Dissipation	$P_{PC}$	145	mW

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

PART NUMBER	DEVICE MARKING	REPETITIVE PEAK REVERSE VOLTAGE (Note 1) $V_{RRM}$ VOLTS	TYPICAL FORWARD VOLTAGE 8/20 $\mu$ s @ 1A $V_F$ VOLTS	MAXIMUM PEAK PULSE FORWARD CURRENT @ 8/20 $\mu$ s $I_{FM}$ AMPS	MAXIMUM REVERSE LEAKAGE CURRENT (Note 2) $V_{RRM}$ $I_R$ nA	MAXIMUM QUIESCENT SUPPLY CURRENT (Note 3) @ 20V $I_{RQ}$ nA	TYPICAL CAPACITANCE 0V, 1MHz $C_J$ pF
ET721	STA	50	2	12	20	200	3

**NOTE**

- $V_{RRM}$  is  $+V_{CC}$  for pin 8,  $-V_{EE}$  for pin 4.
- +20V from pin 8 to 1, 2, 3, 5, 6 and 7. -20V from pin 4 to 1, 2, 3, 5, 6 and 7.
- +20V from pin 8 to 4.

**FIGURE 1  
PULSE WAVE FORM**


## TYPICAL DEVICE CHARACTERISTICS

FIGURE 2  
NON-REPETITIVE PEAK PULSE CURRENT CAPABILITY

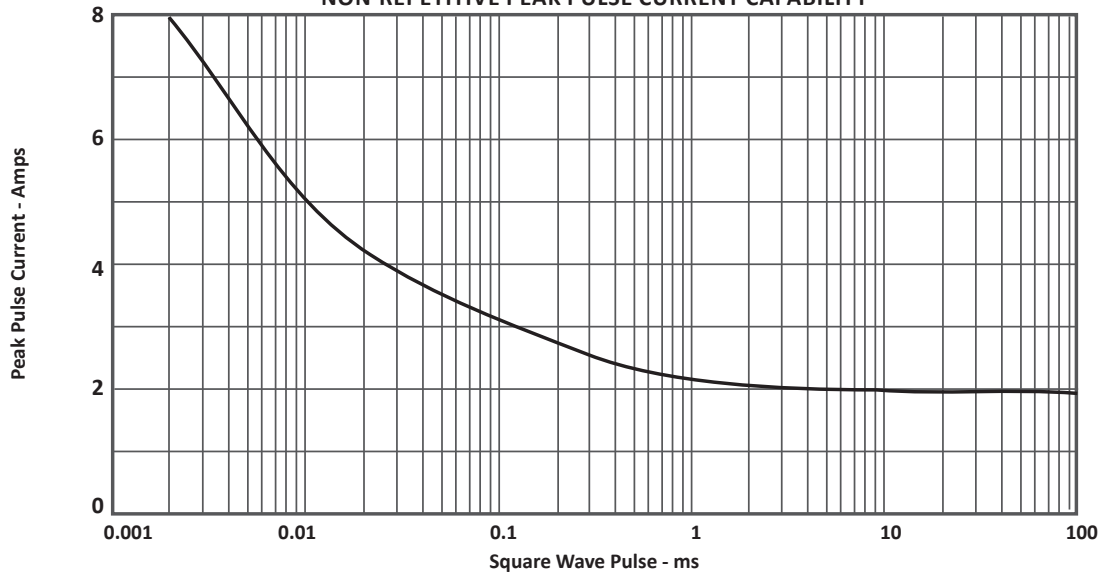


FIGURE 3  
TYPICAL LOW CURRENT FORWARD VOLTAGE DROP

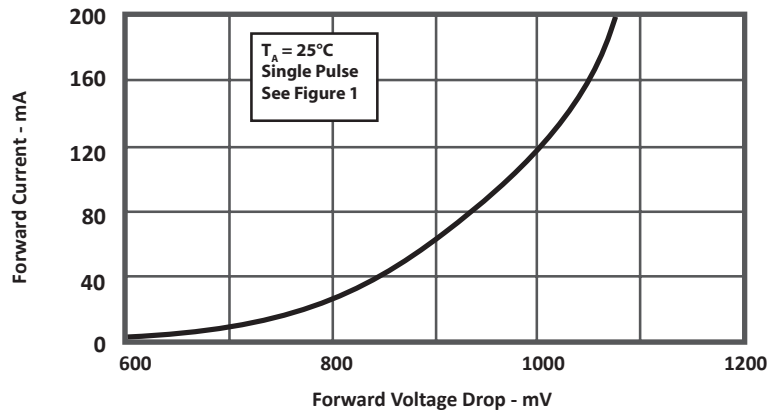
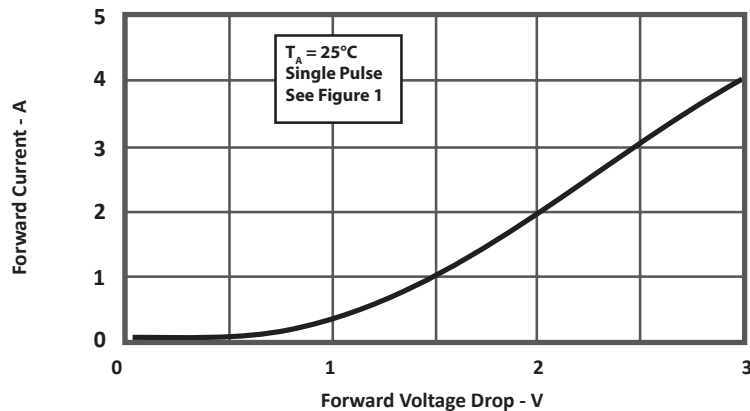
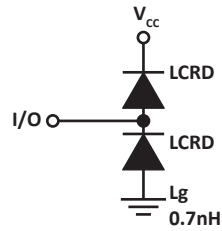


FIGURE 4  
LOW FORWARD CURRENT VS FORWARD VOLTAGE



## SPICE MODEL

FIGURE 1  
SPICE MODEL



LCRD - Low Capacitance Rectifier Diode  
Lg - Lead Inductance

TABLE 1 - SPICE PARAMETERS		
PARAMETER	UNIT	LCRD
BV	V	200
IBV	$\mu\text{A}$	0.01
$C_{jo}$	pF	3
$I_s$	A	1E-13
Vj	V	0.6
M	-	0.33
N	-	1
$R_s$	Ohms	0.31
TT	s	1E-9
EG	eV	1.11

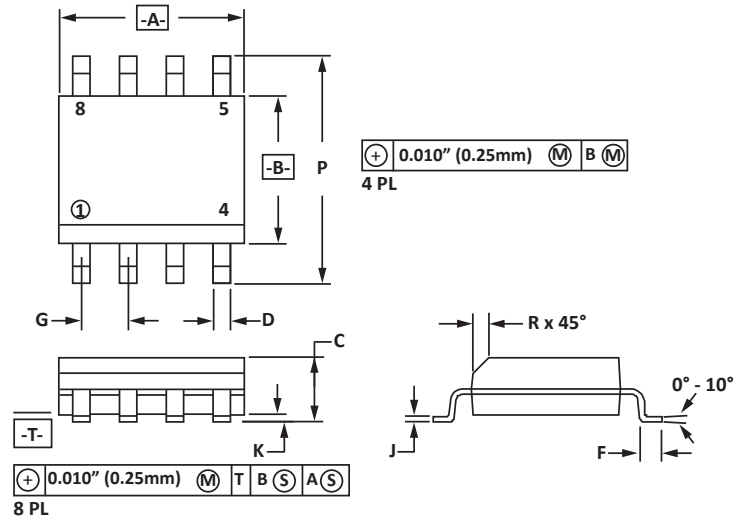
## SO-8 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.05 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.008
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

## NOTES

- T = Seating plane and datum surface.
- Dimensions "A" and "B" are datum.
- Dimensions "A" and "B" do not include mold protrusion.
- Maximum mold protrusion is 0.015" (0.380mm) per side.
- Dimensioning and tolerances per ANSI Y14.5M, 1982.
- Dimensions are exclusive of mold flash and metal burrs.

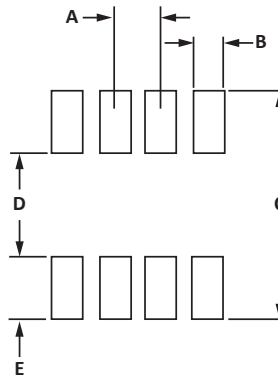


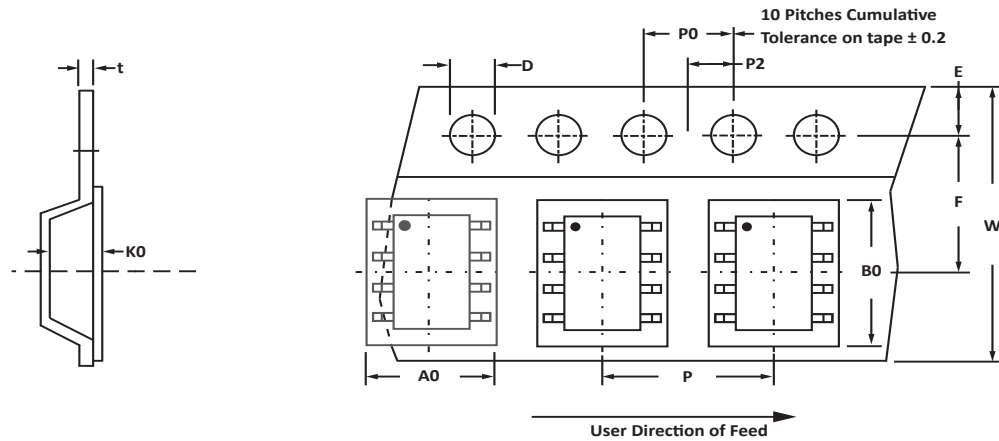
## PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.14	1.40	0.045	0.055
B	0.64	0.89	0.025	0.035
C	6.22	-	0.245	-
D	3.94	4.17	0.155	0.165
E	1.02	1.27	0.040	0.050

## NOTES

- Controlling dimension: inches.



**TAPE AND REEL**

**SPECIFICATIONS**

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	12mm	6.50 ± 0.10	5.40 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30	4.00 ± 0.12	2.00 ± 0.10	4.00 ± 0.10	0.25

**NOTES**

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 1,000 pieces per 12mm tape.
- Suffix - T13 = 13" Reel - 2,500 pieces per 12mm tape.
- Bulk product shipped in tubes of 98 pieces per tube.
- Marking on Part - marking code (see page 2), date code, logo and pin one defined by dot on top of package.

Package outline, pad layout and tape specifications per document number 06009.R3 9/10.

**ORDERING INFORMATION**

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
ET721	-LF	-T7	1,000	7"	98
ET721	-LF	-T13	2,500	13"	98

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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