



4-Line TVS for Ethernet Interfaces

Features

- Ultra low capacitance : 1.7pF typical (I/O to I/O)
- Ultra low leakage : nA level
- Operating voltage : 2.5V
- Low clamping voltage
- Protects two line pairs
- Complies with following standards :
 - IEC 61000-4-2(ESD) immunity test
Air discharge : $\pm 30\text{kV}$, Contact discharge : $\pm 30\text{kV}$
 - IEC61000-4-5(Lightning) 40A (8/20us)
- RoHS Compliant

Mechanical Data

- Package : DFN3020-10
- Lead Finish : NiPdAu
- Case Material : "Green" Molding Compound.
- Moisture Sensitivity : Level 3 per J-STD-020
- Terminal Connections : See Diagram Below
- Marking Information: See Below

Applications

- LVDS Interfaces
- 10/100/1000 Ethernet
- Notebooks, Desktops, Servers
- Networking Equipment
- Switching Systems
- Audio/Video Inputs

Marking Information

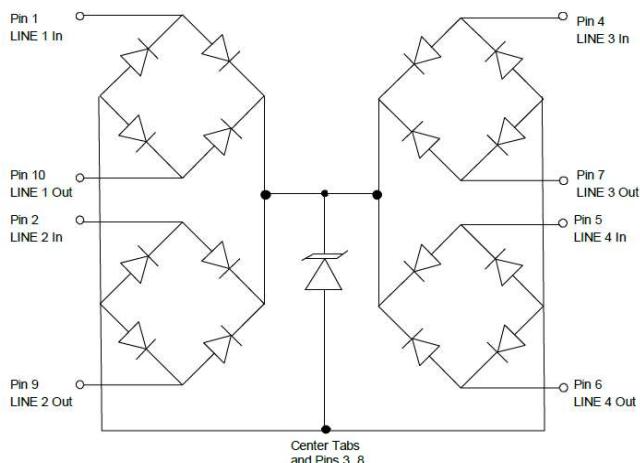
2544
YYWW

2544 = Device Marking Code
YYWW = Date Code
Dot denotes Pin1

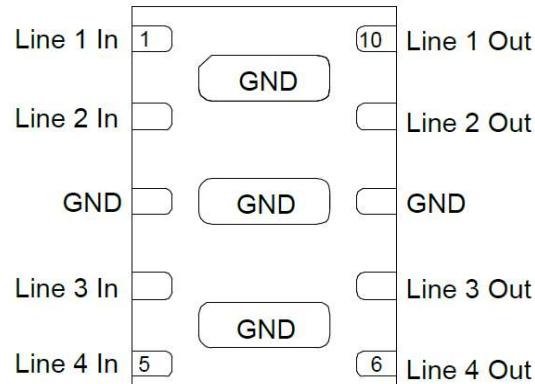
Ordering Information

Part Number	Packaging	Reel Size
AR2504P9	3000/Tape & Reel	7 inch

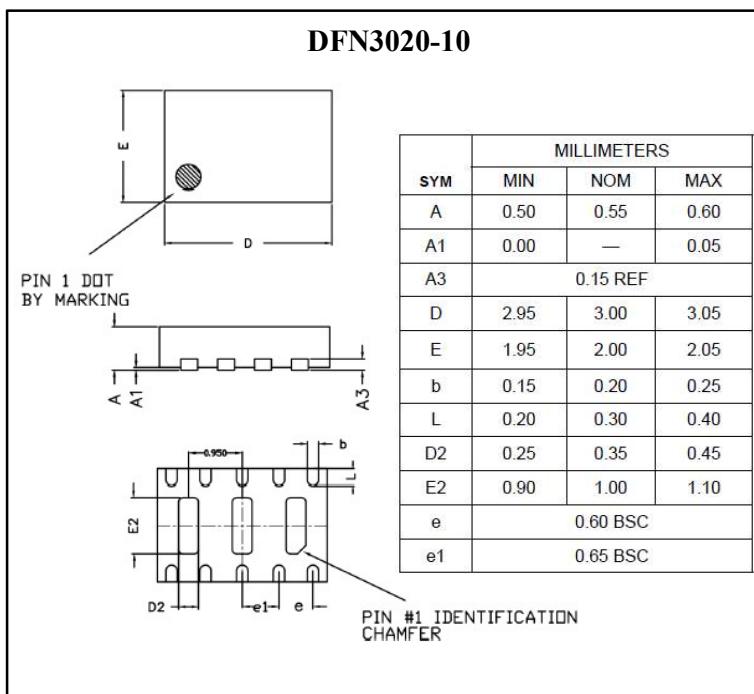
Circuit and Pin Configuration



Circuit Schematic



Pin Schematic





Absolute Maximum Ratings (Ta= 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20us)	Ppk	1000	W
Peak Pulse Current (8/20us)	I _{PP}	40	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	±30 ±30	kV
Operating Junction Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

Electrical Characteristics (Ta= 25°C unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Reverse Working Voltage	V _{RWM}	-	-	2.5	V	
Punch-Through Voltage	V _{PT}	2.7	-	-	V	I _T = 2uA
Snap-Back Voltage	V _{SB}	2.0	-	-	V	I _{SB} = 50mA
Reverse Leakage Current	I _R	-	-	0.2	uA	V _{RWM} = 2.5V
Clamping Voltage (8/20us pulse)	V _C	-	-	4.5	V	I _{PP} =1A, any I/O pin to ground
	V _C	-	-	7.5	V	I _{PP} =10A, any I/O pin to ground
	V _C	-	-	12	V	I _{PP} =25A, any I/O pin to ground
	V _C	-	-	25	V	I _{PP} =40A, line to line (two I/O pins connected together on each line)
Junction Capacitance	C _J	-	1.7	2.5	pF	f=1MHz, V _R =0V, between I/O pins
	C _J	-	3.8	5.0	pF	f=1MHz, V _R =0V, any I/O pin to ground

Ratings and Characteristics Curves (Ta=25°C unless otherwise noted)

Fig.1 Power Derating Curve

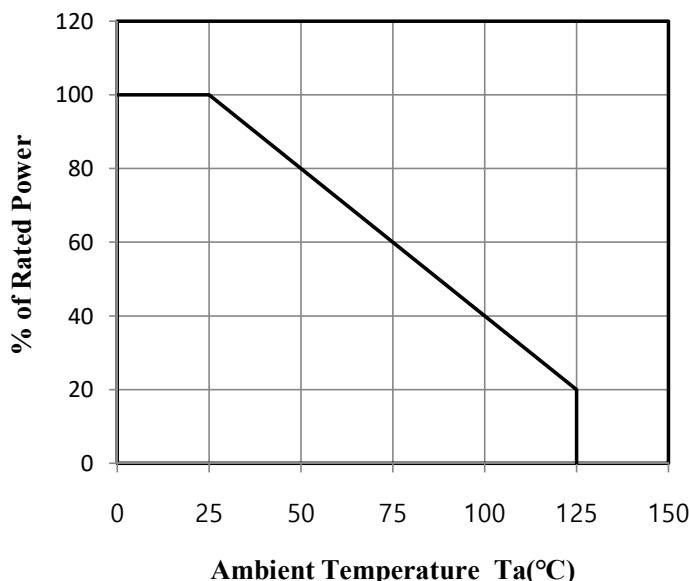


Fig.2 Peak Pulse Power vs. Pulse Time

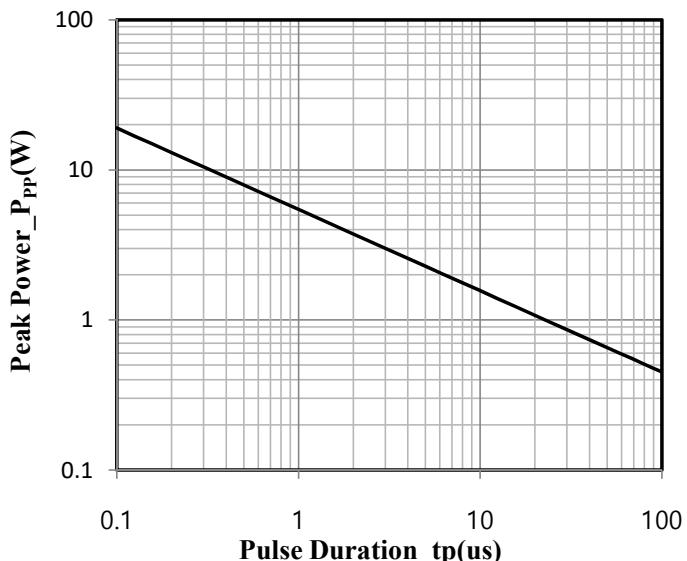


Fig.3 8 × 20us Pulse Waveform

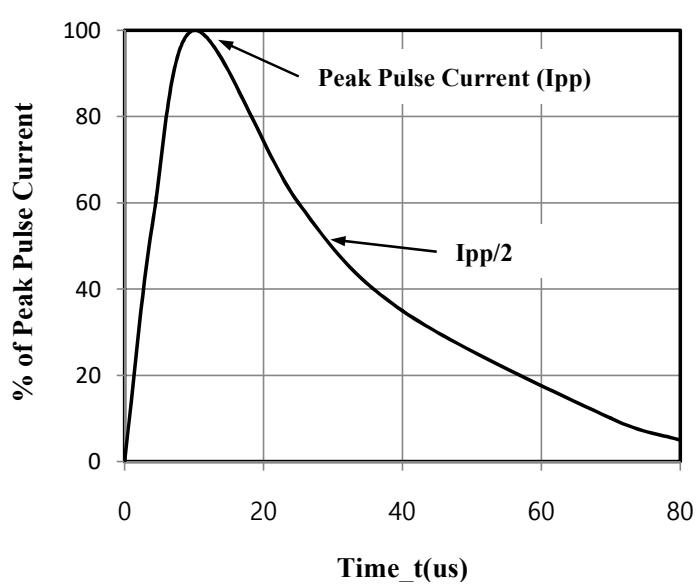
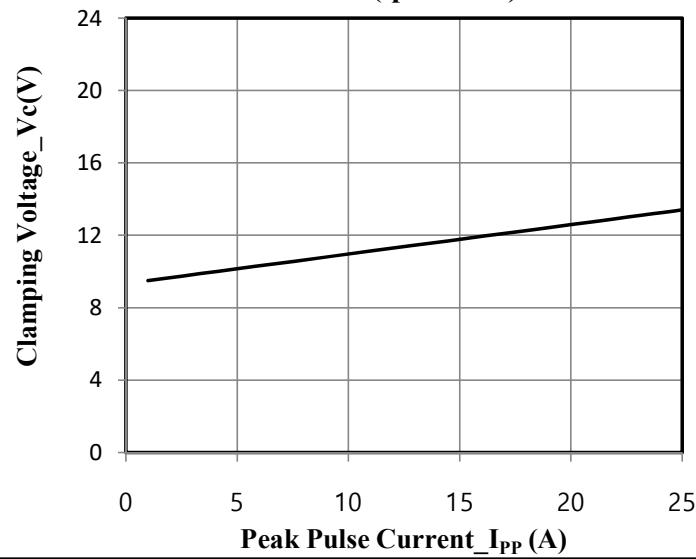
Fig.5 Clamping Voltage vs. Peak Pulse Current ($t_p=8/20\mu s$)

Fig.4 Junction Capacitance vs. Reverse Voltage

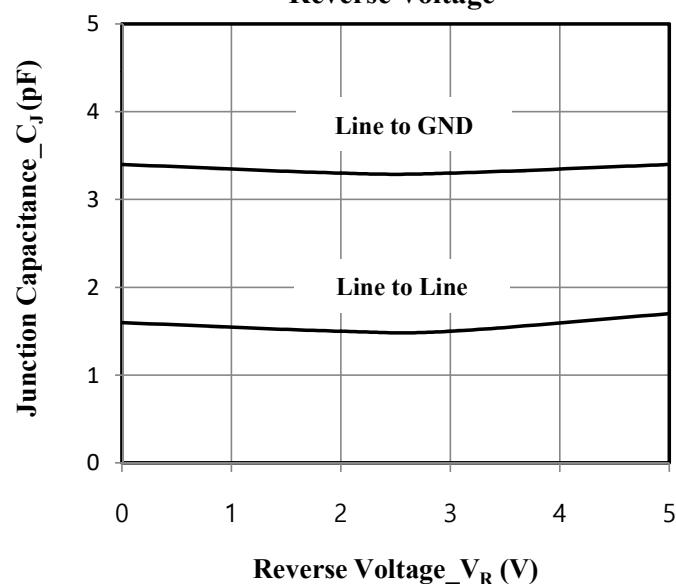
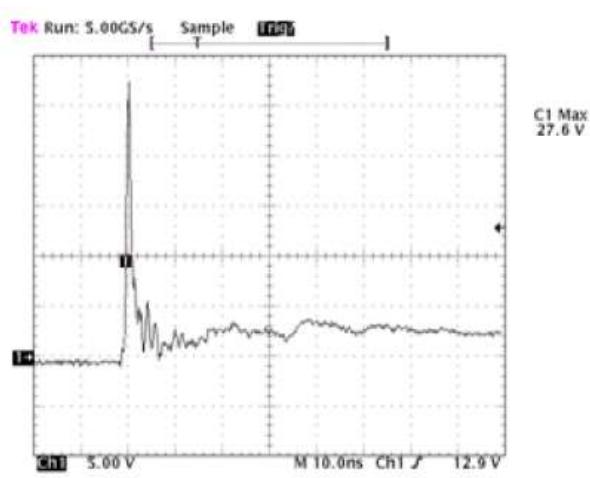


Fig. 6 ESD Clamping Voltage 8kV Contact per IEC61000-4-2



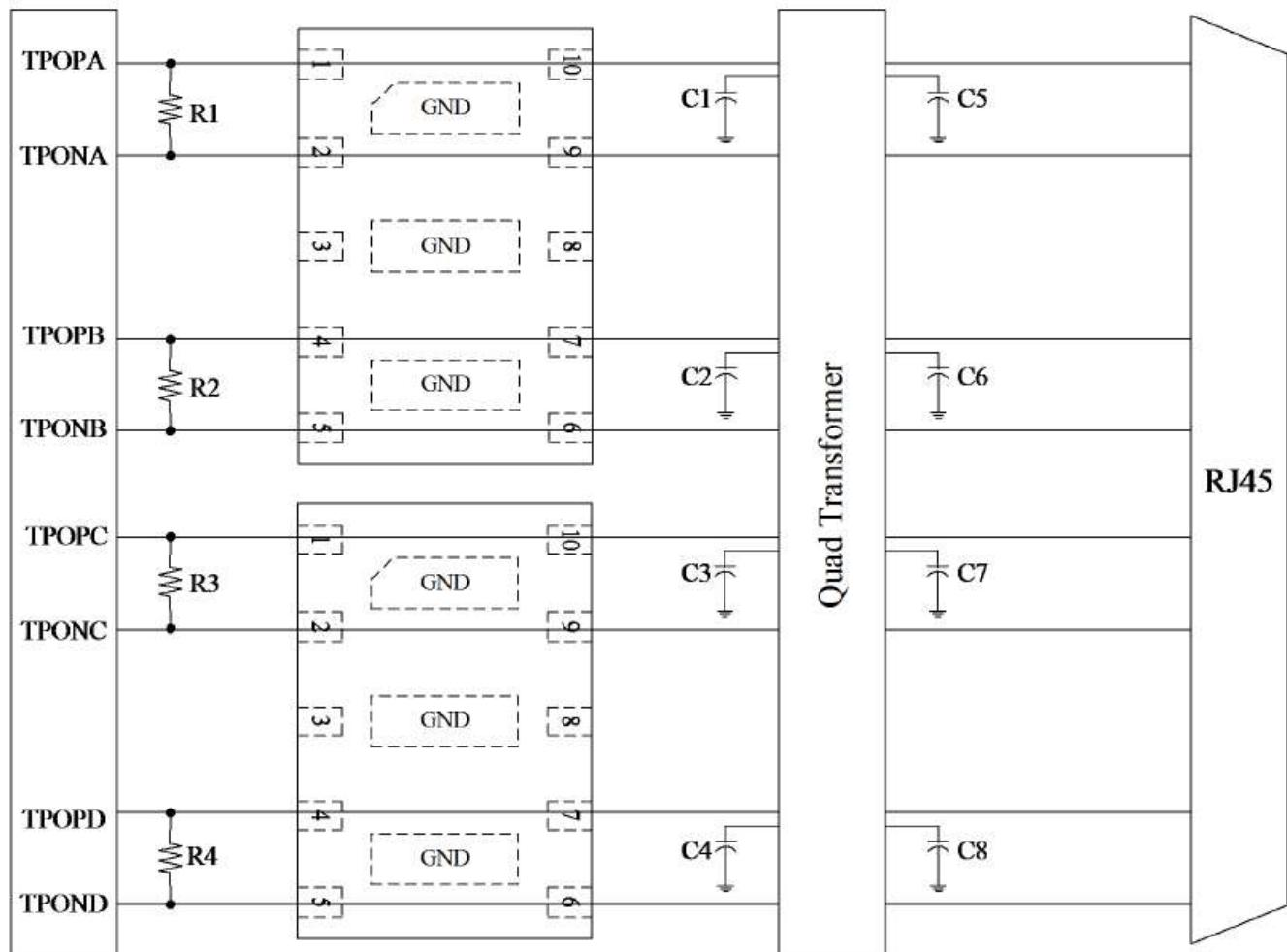
Note: Data is taken with a 10x attenuator



Typical Application

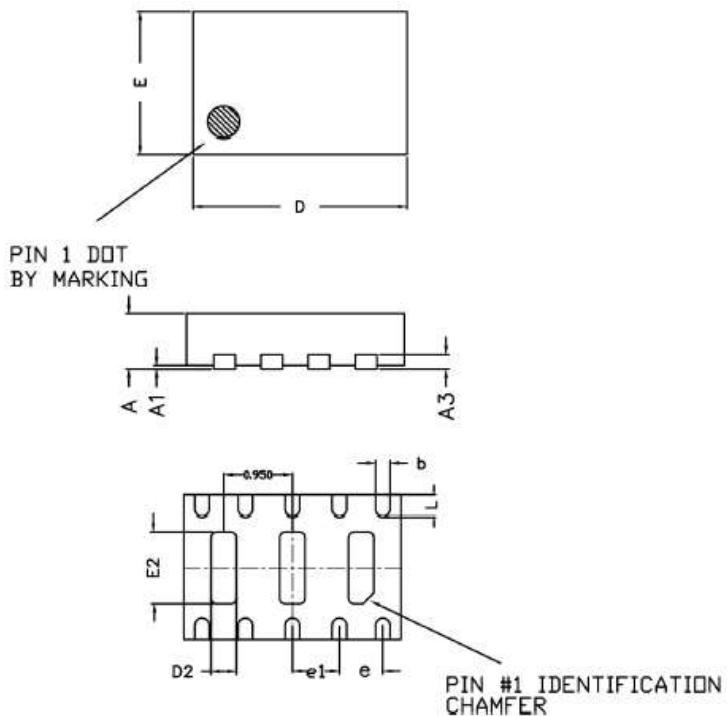
Electronic equipment is susceptible to damage caused by a variety of sources, including Electrostatic Discharge (ESD), Electrical Fast Transients (EFT) and Lightning strikes. The AR2504P9 is designed to protect the sensitive equipment from damage which may be induced by such transient events. This product can be configured in different connections to meet the requirement of common-mode and differential-mode as follows:

AR2504P9 on Gigabit Ethernet Application



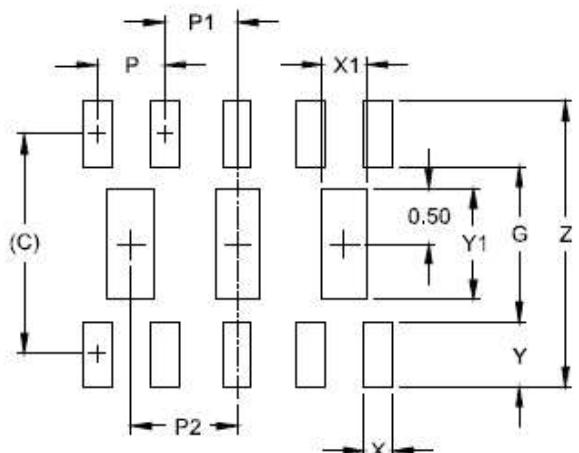


DFN3020-10 Package Outline Drawing



SYM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	—	0.05
A3	0.15 REF		
D	2.95	3.00	3.05
E	1.95	2.00	2.05
b	0.15	0.20	0.25
L	0.20	0.30	0.40
D2	0.25	0.35	0.45
E2	0.90	1.00	1.10
e	0.60 BSC		
e1	0.65 BSC		

Suggested Land Pattern



MILLIMETERS	
C	(1.98)
G	1.40
P	0.60
P1	0.65
P2	0.95
X	0.25
X1	0.40
Y	0.58
Y1	1.00
Z	2.56