



## MIDI (MUSICAL INSTRUMENT DIGITAL INTERFACE) GAME PORT FILTER/PROTECTION CIRCUIT

### Features

- Integrated network contains 15 resistors, 10 capacitors, and ESD diodes.

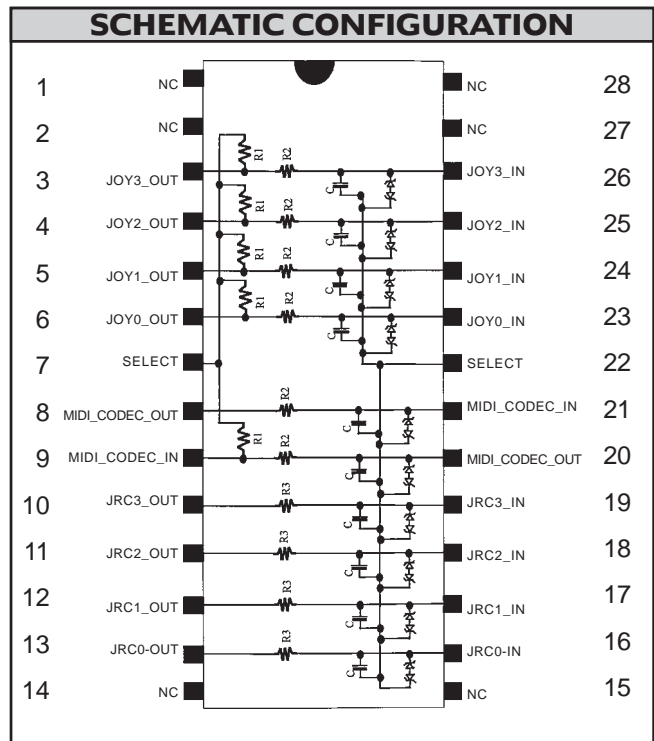
### Application

- EMI/RFI Filtering and ESD protection for MIDI/Game port.

### Product Description

The signals to and from the MIDI/Game-port controller contain high frequency EMI signals that must be reduced before the connector. Likewise, the signals from the Midi/Game-port controller must be protected from any possible external charges such as static electricity. The PAC™ GAME-1 provides filtering and pull-up termination of the Game Port as well as ESD protection.

STANDARD SPECIFICATIONS	
Absolute Tolerance	±10%
Absolute Tolerance	±20%
Operating Temperature Range	0°C to 70°C
ESD Protection	
MIL-STD-883, Method 3015 (Note 1)	>4KV*
In System Protection (Note 2)	>8KV*
Package	28-pin QSOP

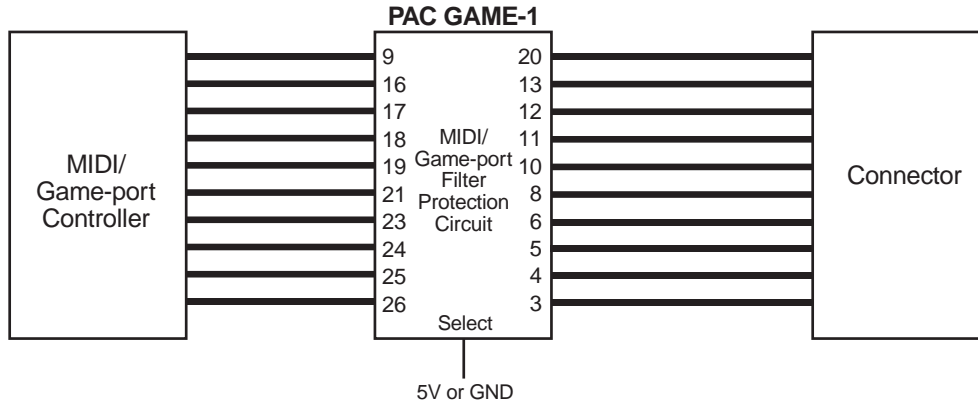


$R_1 = 4.7K$     $R_2 = 47\Omega$     $R_3 = 2.2K$     $C = 470pF$



STANDARD PART ORDERING INFORMATION				
Package		Ordering Part Number		
Pins	Style	Tubes	Tape & Reel	Part Marking
28	QSOP	PACGAME-1Q/T	PACGAME-1Q/R	PACGAME-1Q

**Block Diagram**



ESD SPECIFICATIONS		
	MIN	MAX
ESD Protection*		
Peak Discharge Voltage at any I/O, Human Body Model, Method 3015 (Note 1)	-4KV	+4KV
In System Protection, HBM (Note 2)	-8KV	+8KV
In System Protection, IEC 1000-4-2, Level 3 (Note 2,3)	-4KV	+4KV
Channel Clamp Voltage @ 8KV ESD Pulses, HBM (Note 1,2)	-30V	+30V

\* Guaranteed by design

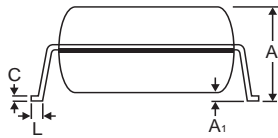
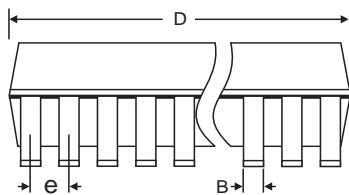
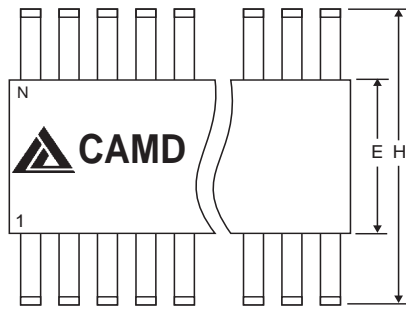
Note 1: Human Body Model per MIL-STD-883, Method 3015  
 $C_{Discharge} = 100pF, R_{Discharge} = 1.5K\Omega$ , pin 7 @ 5V and pin 22 @ ground.

Note 2: Pin 22 grounded, pin 7 to  $V_{CC}$ , all other pins are open. ESD contact discharge between ground and pins 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, one at a time.

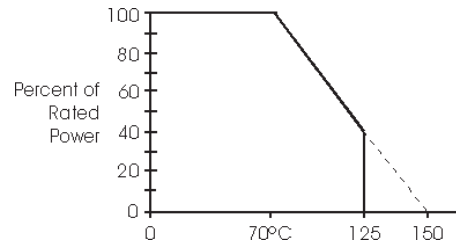
Note 3: Standard IEC 1000-4-2 with  $C_{Discharge} = 150pF, R_{Discharge} = 330\Omega$ , pin 7 @ 5V and pin 22 @ ground.



**QSOP - TOP VIEW**



**POWER DERATING CURVE**



**MECHANICAL SPECIFICATIONS**

Lead Plating	Tin-Lead
Lead Material	Copper Alloy
Lead Coplanarity	0.004" (0.102mm)
Substrate Material	Silicon
Body Material	Molded Epoxy
Flammability	UL94V-0

**PACKAGE DIMENSIONS, POWER DISSIPATION & INFORMATION**

Package	QSOP			
Pins #	28			
JEDEC	MO137			
	mm		inches	
	min	max	min	max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	0.10	0.25	0.004	0.010
B	0.20	0.30	0.008	0.012
C	0.18	0.25	0.006	0.010
D	9.80	9.98	0.386	0.393
E	3.81	3.98	0.150	0.157
e	0.64 BSC		0.025 BSC	
H	5.79	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
P <sub>D</sub> @ 70°C	1.00W			
# / tube	50 pcs			
# / tape & reel	2,500 pcs			