

## Keyboard/Mouse Port Interface

### Features

- One keyboard or mouse port terminator, EMI filter and transient overvoltage protector in a single surface-mount package
- Compact SOT23-6 package saves board space and lowers manufacturing costs when compared to discrete solutions
- Excellent ESD protection: In-system protection to  $\pm 30\text{kV}$  contact discharge per IEC 61000-4-2 International standard

### Applications

- ESD protection and termination of keyboard and mouse ports

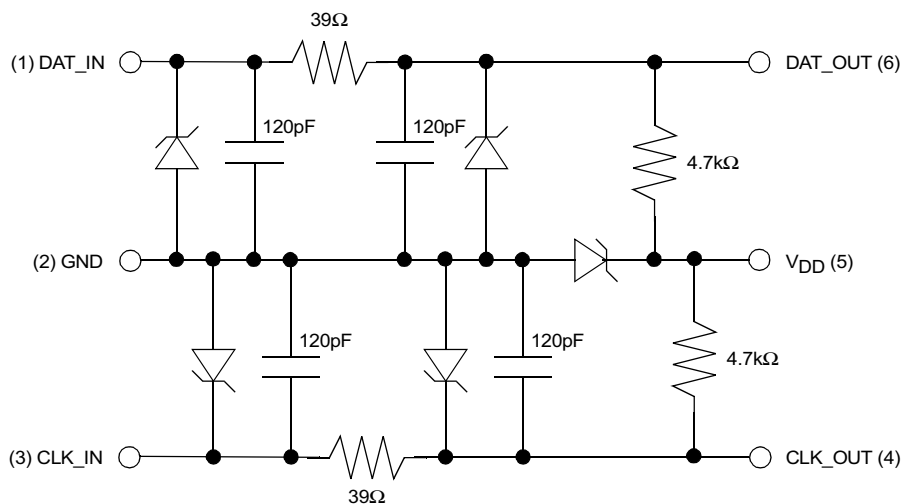
### Product Description

The PACKBME is a dual-channel keyboard or mouse port termination device.

The PACKBME integrates EMI/RFI filter components R1 and C1, and also incorporates two pull-up resistors R2. In addition, it provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). The I/O pins are designed and characterized to safely dissipate ESD strikes of  $\pm 30\text{kV}$ , well beyond the maximum requirements set in the IEC 61000-4-2 international standard.

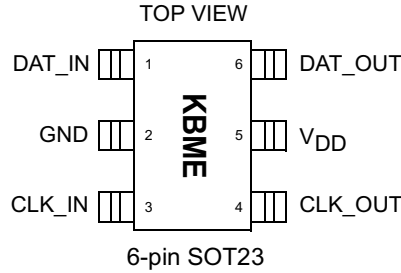
Using the MIL-STD-883D (Method 3015) specification for Human Body Model (HBM) ESD, the I/O pins and the VDD pin are also protected for contact discharges of  $\pm 30\text{kV}$ .

### Electrical Schematic





**PACKAGE / PINOUT DIAGRAM**



Note: This drawing is not to scale.

**PIN DESCRIPTIONS**

PIN	NAME	DESCRIPTION
1	DAT_IN	Data Channel Filter Input
2	GND	Negative supply
3	CLK_IN	Clock Channel Filter Input
4	CLK_OUT	Clock Channel Filter Output
5	V <sub>DD</sub>	Positive supply to internal 4.7kΩ pull-up resistors.
6	DAT_OUT	Data Channel Filter Output

**Ordering Information**

**PART NUMBERING INFORMATION**

Pins	Package	Ordering Part Number <sup>1</sup>	Part Marking
6	SOT23-6	PACKBME/R	KBME

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.



## Specifications

ABSOLUTE MAXIMUM RATINGS		
PARAMETER	RATING	UNITS
Storage Temperature Range	-65 to +150	°C
Supply Voltage [V <sub>DD</sub> - GND]	5.5	V
DC Power per resistor	100	mW
DC Power Package Rating	225	mW

STANDARD OPERATING CONDITIONS		
PARAMETER	RATING	UNITS
Ambient Operating Temperature Range	-40 to +85	°C

ELECTRICAL OPERATING CHARACTERISTICS <sup>1</sup>						
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
R <sub>1</sub>	R1 Resistance		31	39	47	Ω
R <sub>2</sub>	R2 Resistance		3.7	4.7	5.6	kΩ
C <sub>1</sub>	C1 Capacitance	At 0V DC, f=1MHz	96	120	144	pF
V <sub>STANDOFF</sub>	Diode Standoff Voltage	I = 10μA	5.5			V
V <sub>SIG</sub>	Signal Clamp Voltage					
	Positive Clamp	At I = 10mA	5.6	6.8	8	V
	Negative Clamp	At I = 10mA	-0.4	-0.8	-1.2	V
V <sub>ESD</sub>	In-system ESD Withstand Voltage					
	a) Human Body Model per MIL-STD-883, Method 3015	All Pins; Notes 2 & 4	±30			kV
	b) Contact Discharge per IEC 61000-4-2	Pins 1,3,4,6; Notes 2 & 4	±30			kV
	c) Contact Discharge per IEC 61000-4-2	Pin 5; Notes 2 & 4	±25			kV
V <sub>CL</sub>	Clamping Voltage during ESD Discharge per MIL-STD-883, Method 3015	Note 3				
	+8kV Discharge			8.5		V
	-8kV Discharge			-3.0		V

Note 1: Unless otherwise specified, Electrical Operating Characteristics are guaranteed at T<sub>A</sub>=25°C.

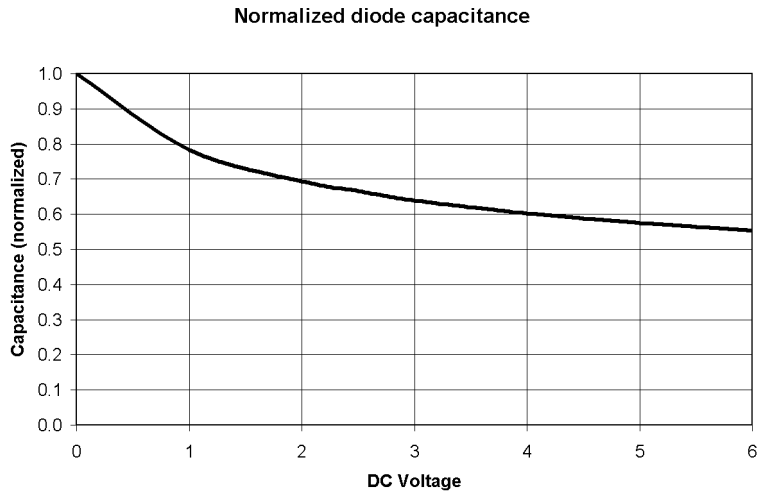
Note 2: ESD is applied to input/output/VDD pins with respect to GND, one at a time.

Note 3: Clamping voltage is measured at the opposite side of the EMI filter to the ESD pin (i.e., if ESD is applied to pin 1, then the clamping voltage is measured at pin 6). Unused pins are left open.

Note 4: These parameters are guaranteed by design and characterization.

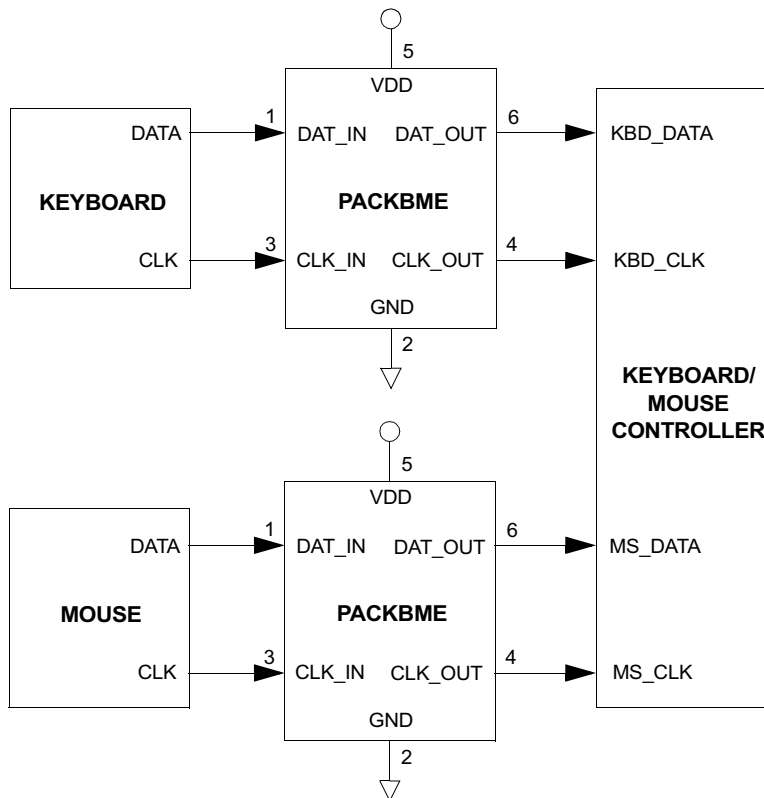
**Performance Information**

**Filter Performance**



**Figure 1. Filter Capacitance vs. Input Voltage**

**Application Information**



**Figure 2. Typical Keyboard/Mouse Application Circuit**

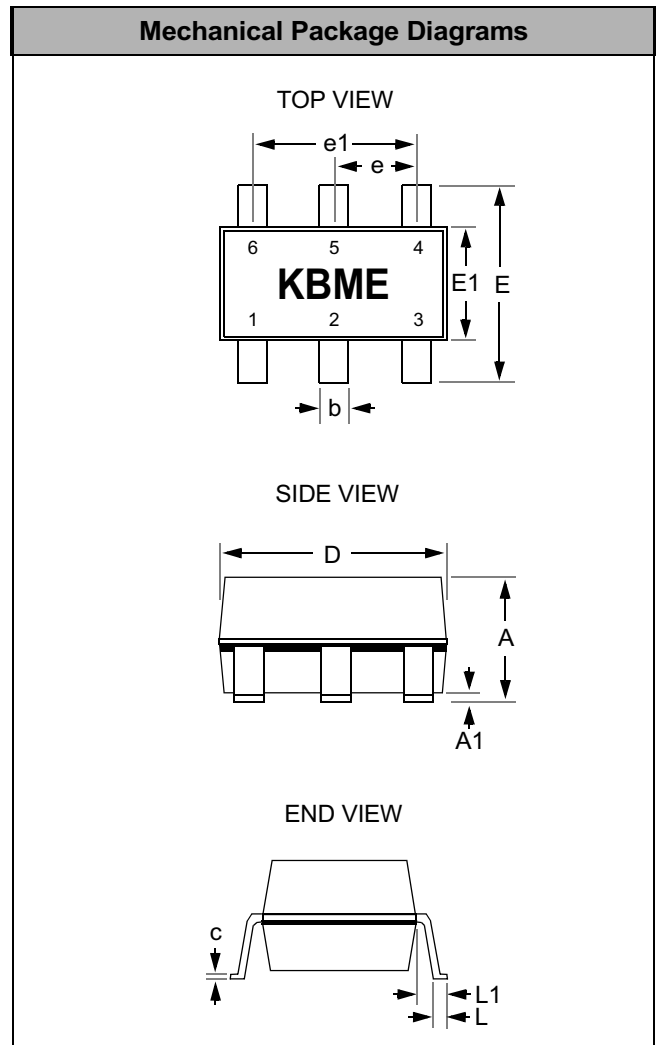
## Mechanical Details

### SOT23-6 Mechanical Specifications:

PACKBME devices are packaged in 6-pin SOT23 packages. Dimensions are presented below.

For complete information on the SOT23-6 package, see the California Micro Devices SOT23 Package Information document.

PACKAGE DIMENSIONS				
Package	SOT23-6 (JEDEC name is MO-178)			
Pins	6			
Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A	--	1.45	--	0.0571
A1	0.00	0.15	0.0000	0.0059
b	0.30	0.50	0.0118	0.0197
c	0.08	0.22	0.0031	0.0087
D	2.75	3.05	0.1083	0.1201
E	2.60	3.00	0.1024	0.1181
E1	1.45	1.75	0.0571	0.0689
e	0.95 BSC		0.0374 BSC	
e1	1.90 BSC		0.0748 BSC	
L	0.30	0.60	0.0118	0.0236
L1	0.60 REF		0.0236REF	
# per tape and reel	3000 pieces			
Controlling dimension: millimeters				



Package Dimensions for SOT23-6.