



# PRODUCT SPECIFICATION

**Item : ESD CLAMP**

**Part No. : IECF10054EC060FR**

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## Overview

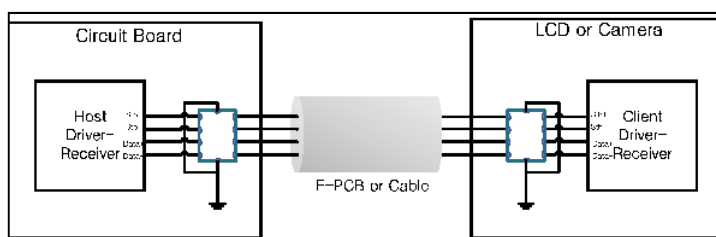
**ESD Clamps** are specifically designed to protect sensitive devices against the threat of electrostatic discharge (ESD) and are well suited for high speed applications where low capacitance is needed. (HDMI and USB port devices using transmission line of high-speed signal) These components are aimed to protect the circuits from electrostatic discharges without any signal distortions.

## Features

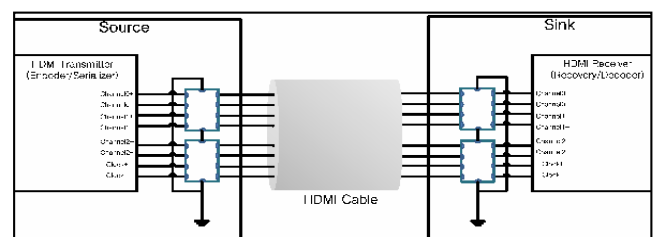
- Ultra-low capacitance
- Bi-directional regardless of polarity
- Excellent characteristics for differential signaling data lines in various digital appliances
- Fast response time
- Very low leakage current
- SMD Type
- Withstands multiple ESD strikes

## Applications

- LVDS Lines in Notebook PC (USB2.0, IEEE1394)
- HDMI (HDTV, STB)
- Computer peripherals (Keyboard, Mouse, Printer, Scanner Data line etc.)
- Portable Device using High Speed Data Lines (PDA, PMP, Navigation)
- MDDI & MIPI Application in Mobile Phone

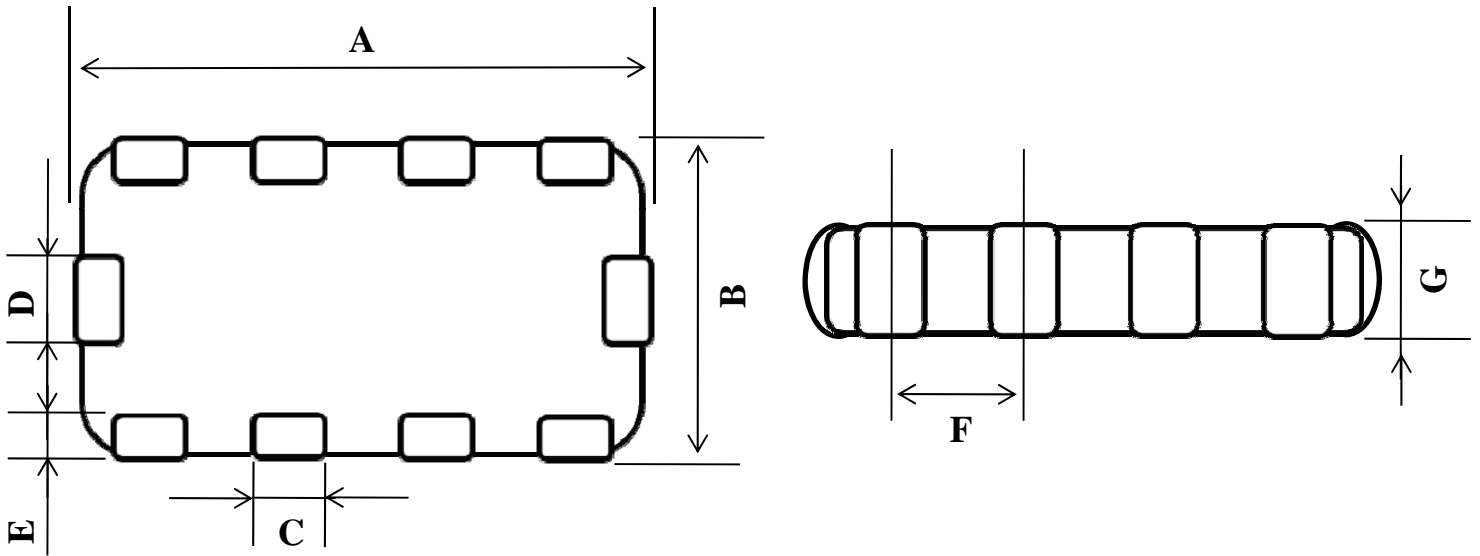


Application (MDDI)



Application (HDMI)

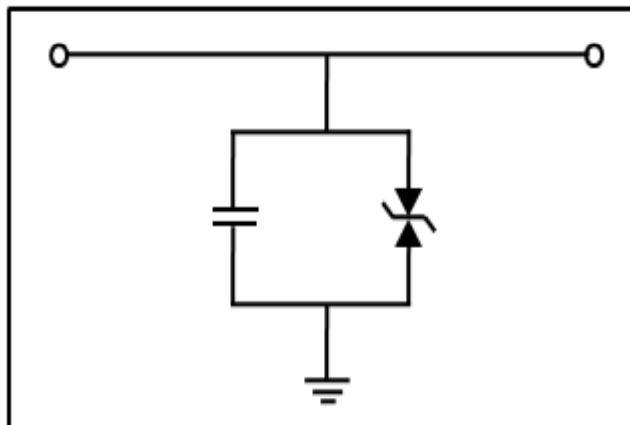
## DIMENSIONS



Unit: [mm]

Symbol	Size	Symbol	Size
A	$1.60 \pm 0.10$	E	$0.10 \pm 0.03$
B	$0.80 \pm 0.10$	F	$0.40 \pm 0.05$
C	$0.20 \pm 0.05$	G	0.50max
D	$0.23 \pm 0.05$	-	-

## EQUIVALENT CIRCUIT



## ■ PART NUMBER CODE

**IECF 10 05 4E C060 F R**  
 ①            ②            ③            ④            ⑤            ⑥            ⑦

### ① Series Name

CODE	PRODUCT NAME
IECF	<b>ICT ESD CLAMP</b> <b>Feed thru type</b>

### ② Size Designator

CODE	SIZE (mm)
10	1.6 * 0.8

### ③ Rated Voltage

CODE	VOLTAGE (Vdc)
05	5

### ④ Number of Line

CODE	Number of Element
4E	4 Element

### ⑤ Typical Capacitance

CODE	Capacitance (pF)@1MHz
C060	0.6

### ⑥ Termination Type

CODE	TYPE
F	Electroplate (Pb-free)

### ⑦ Packaging Type

CODE	TYPE
B	Bulk pack
R	Tape & Reel pack

## SPECIFICATIONS

### ESD CLAMP (IECS)

- Ultra Low capacitance (0.6pF Typ.) is required for very high-speed data transmission or Antenna port.
- Low leakage current ( $I_L$ ) is necessary for battery operated equipment

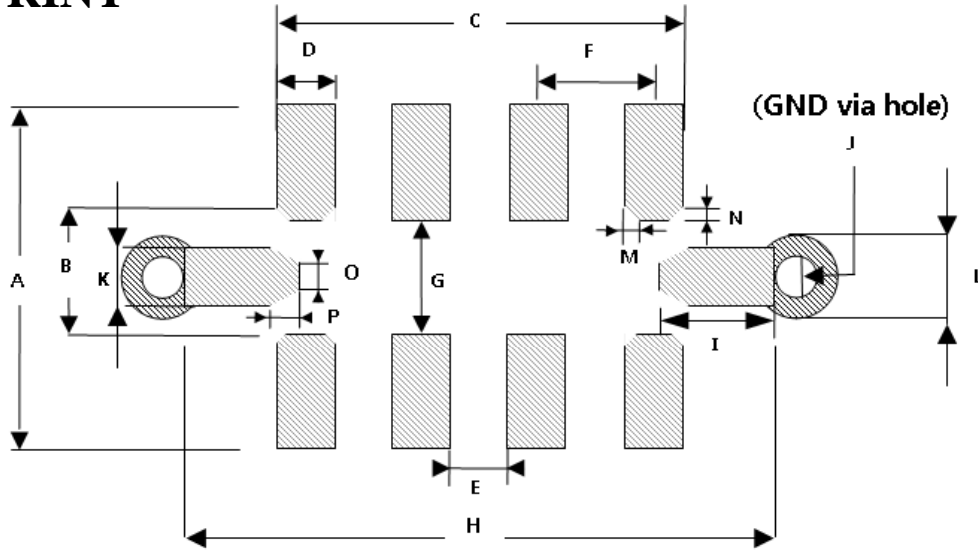
Characteristics	Unit	Typical	Max.
Capacitance, @1MHz ( $C_p$ )	pF	0.6	0.8
Rated Voltage	V	5	-
Leakage current ( $I_L$ )	$\mu$ A	1	10
ESD Clamping Voltage ( $V_c$ )	V	30	100
ESD Trigger voltage ( $V_T$ )	V	500	800
Insertion loss, 0-2GHz	dB	-	0.05
Response time	ns	0.6	1

	TEST CONDITION	WAVEFORM
<p><b>ESD TEST</b> (IEC 61000-4-2,level4)</p>	<ol style="list-style-type: none"> <li>ESD gun (IEC61000-4-2 standard) C=150pF R=330<math>\Omega</math> Used Attenuator 36dB</li> <li>8kV Contact type / 15kV Air type Polarity : + , - Measured a room ambient temperature after placing for 24 hours</li> </ol>	

### TERMINOLOGY

- $V_c$  : Per IEC 61000-4-2, level 4, clamp measurement made 30ns after initiation of pulse, all test in contact discharge mode.
- $C_p$  : Device capacitance measured with zero volt bias 0.5Vrms and 1MHz

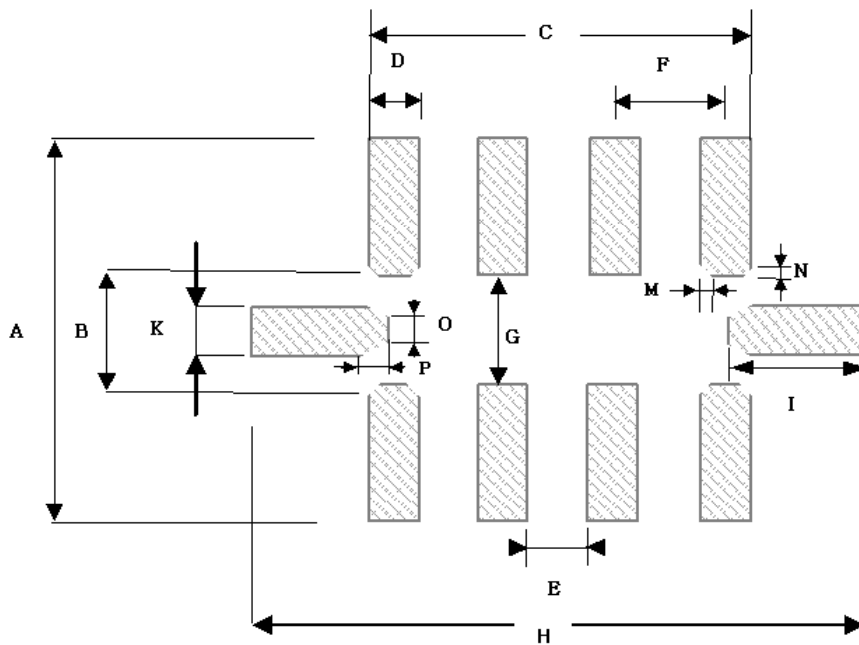
## FOOT PRINT



(Unit: mm)

SIZE	A	B	C	D	E	F	G	H
		1.20	0.50	1.40	0.20	0.20	0.40	0.40
SIZE	I	J	K	L	M	N	O	P
		0.40	0.30	0.17	0.50	0.05	0.05	0.07

## STENCIL MASK



(Unit: mm)

SIZE	A	B	C	D	E	F	G	H
		1.4	0.48	1.38	0.18	0.22	0.40	0.40
SIZE	I	K	M	N	O	P		
		0.50	0.15	0.05	0.04	0.07	0.08	