



CM1240

Features

- Four channels of ESD Protection
- ±8kV ESD protection (IEC 61000-4-2, contact discharge)
- ±16kV ESD protection (HBM)
- SOT-563 space-saving package
- RoHS-compliant, lead-free finishing
- 16V clamp on Vcc

Applications

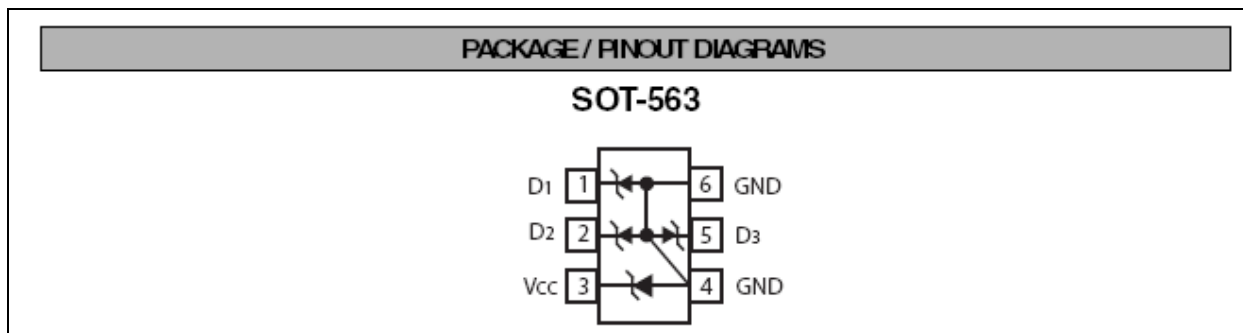
- USB and mini-USB applications
- I/O port protection for mobile handsets
- Wireless handsets

Product Description

The CM1240 is a 4-channel ESD protection array. Three channels of the CM1240 are low voltage (LV) diodes, which have a capacitance of 7pF enabling them to protect high speed I/O ports while providing robust ESD protection. The other channel of the CM1240 is a high voltage (HV) diode which has a capacitance of 25pF enabling it to protect power supply inputs or OLED power rails, etc.

The parts integrate avalanche-type ESD diodes, which provide a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). The ESD protection diodes are designed and characterized to safely dissipate ESD strikes of ±8kV, the maximum requirement of the IEC61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the pins are protected for contact discharges of greater than ±16kV.

This device is particularly well suited for portable electronics (e.g. wireless handsets, PDAs, notebook computers) because of its small package format and easy-to-use pin assignments. In particular, the CM1240 is ideal for protecting USB or mini-USB ports operating at full speed (12Mbps).



Ordering Information

PART NUMBERING INFORMATION			
Leads	Package	Lead-free Finish	
		Ordering Part Number	Part Marking
6	SOT-563	CM1240-F4SE	L40

PIN DESCRIPTIONS		
SOT-563 PIN#	NAME	DESCRIPTION
1	D1	Cathode connection for Low Voltage ESD diode
2	D2	Cathode connection for Low Voltage ESD diode
5	D3	Cathode connection for Low Voltage ESD diode
3	Vcc	Cathode connection for High Voltage ESD diode
–	NC	No connect
–	NC	No connect
–	NC	No connect
–	NC	No connect
4	GND	Anode-side connection for all ESD diodes
6	GND	Anode-side connection for all ESD diodes

Specifications

ABSOLUTE MAXIMUM RATINGS		
PARAMETER	RATING	UNITS
ESD Protection (HBM)	16	kV
Pin Voltages		
Vcc to GND	[GND - 0.3] to +13	V
All other pins to GND	[GND - 0.3] to +5.5	V
Storage Temperature Range	–65 to +150	°C
Lead Temperature (soldering, 10sec)	300	°C

STANDARD OPERATING CONDITIONS

PARAMETER	RATING	UNITS
Operating temperature range	-40 to +85	°C

ELECTRICAL OPERATING CHARACTERISTICS (NOTE 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C_{LV}	LV diode Capacitance at 3Vdc; 1MHz, 30mVac			6		pF
C_{HV}	HV diode Capacitance at 3Vdc; 1MHz, 30mVac			25		pF
I_{LV}	LV Diode Leakage at +3.3V reverse bias voltage			0.01	0.4	μA
I_{HV}	HV Diode Leakage at +11V reverse bias voltage			0.01	0.4	μA
$V_{CL(LV)}$	LV Diode Signal Clamp Voltage: Positive Clamp, 10mA Negative Clamp, -10mA		5.6 -1.5	6.8 -0.8	9 -0.4	V V
$V_{CL(HV)}$	HV Diode Signal Clamp Voltage: Positive Clamp, 10mA Negative Clamp, -10mA		13 -1.5	16 -0.8	19 -0.4	V V
V_{ESD}	In-system ESD withstand voltage: Human Body Model (MIL-STD-883, method 3015) IEC 61000-4-2, contact discharge method	Note 2	±25 ±12			kV kV
$R_{DYN(LV)}$	LV Diode Dynamic Resistance: Positive Negative			2.8 1.2		Ω Ω
$R_{DYN(HV)}$	HV Diode Dynamic Resistance: Positive Negative			1 0.7		Ω Ω

Note 1: Guaranteed at 25°C only

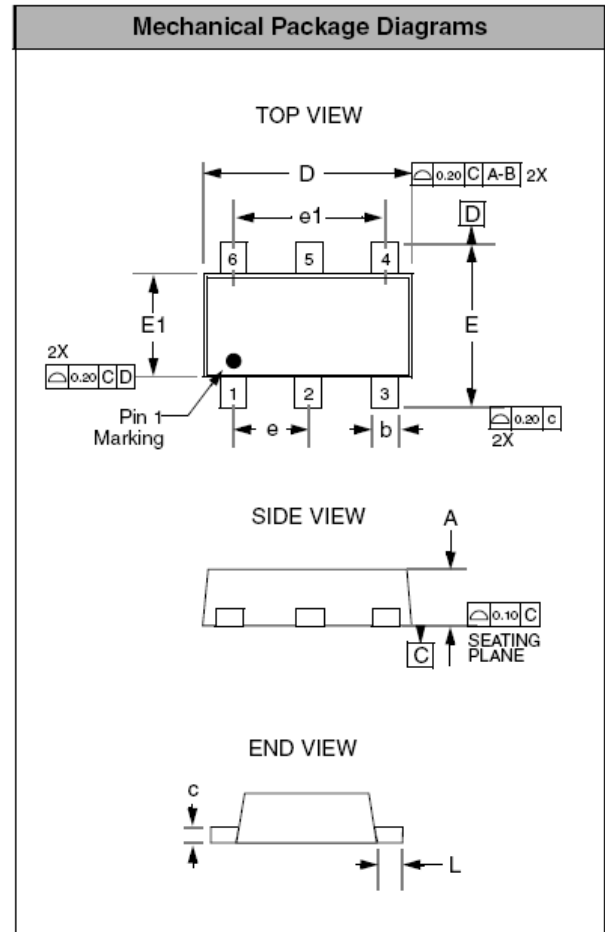
Note 2: ESD applied to input/output pins with respect to GND, one at a time. These parameters are guaranteed by design.

Mechanical Details

SOT-563 Mechanical Specifications

The CM1240-F4SE is supplied in a 6-pin SOT-563 package. Dimensions are presented below.

PACKAGE DIMENSIONS						
Package	SOT-563					
Leads	6					
Dim.	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.50	0.55	0.60	0.020	0.022	0.024
b	0.17	0.22	0.27	0.007	0.009	0.011
c	0.08	0.13	0.18	0.003	0.005	0.007
D	1.60 BSC			0.063 BSC		
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	1.20 BSC			0.047 BSC		
e	0.50 BSC			0.020 BSC		
e1	1.00 BSC			0.040 BSC		
L	0.20 BSC			0.008 BSC		
# per tape and reel	5000 pieces					
Controlling dimension: millimeters						

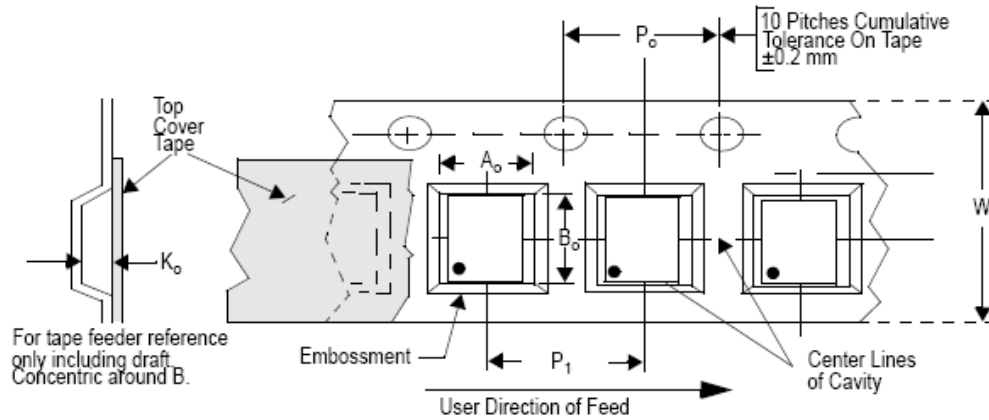



Package Dimensions for SOT-563

CM1240

Tape and Reel Specifications

PART NUMBER	PACKAGE SIZE (mm)	POCKET SIZE (mm) $B_0 \times A_0 \times K_0$	TAPE WIDTH W	REEL DIAMETER	QTY PER REEL	P_0	P_1
CM1240-F4SE	1.60 X 1.60 X 0.55	1.78 X 1.78 X 0.690	8mm	178mm (7")	5000	4mm	4mm



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