Features

- Monolithic 3-line EMI symmetrical I/O low-pass filter with 1-channel TVS protector
- ESD Protect for input and output of each line
- 0.4mm pin pitch
- Provide ESD protection for each I/O to
  IEC 61000-4-2 (ESD) ±8kV (contact)
  IEC 61000-4-2 (ESD) ±15kV (air)
- For low operating voltage applications: 5V and below.
- Fast turn-on and Low clamping voltage
- Solid-state silicon-avalanche and active circuit triggering technology
- MLPD (Micro Leadframe Package Dual) packaging and small PCB space occupying: ≤ 2.6 mm^2
- High reliability provided by monolithic integration
- *Lead free package*
- *Green Part*

Applications

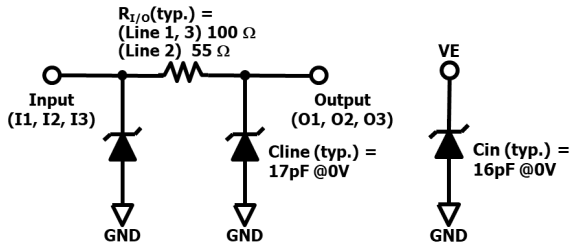
- SIM card data lines of mobile phones
- Hand Held Portable Applications: EMI filtering and ESD protection for I/O ports and keypads

Description

The AZM-SIM02-03F is a 3-line monolithically and highly integrated EMI symmetrical I/O low-pass filter designed to suppress EMI noise in all systems subjected to electromagnetic interferences.

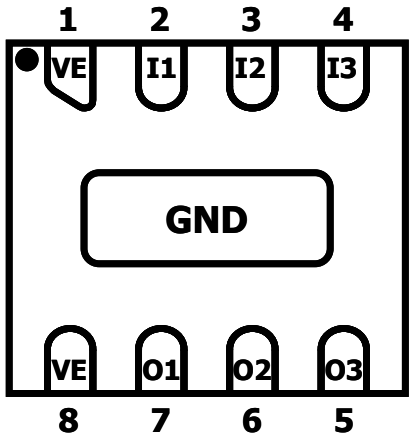
In addition to suppress EMI noise, the AZM-SIM02-03F also includes an ESD protection circuitry at each I/O of each line, which prevents the device from destruction or interference when subjected to ESD stress up to IEC 61000-4-2, Level 4 (±8kV contact, ±15kV air discharge).

Circuit Diagram



The Circuit for One Line

Pin Configuration (Bottom Side)



MLPD1.7×1.5-8LD
(1.7mm x 1.5mm x 0.55mm)

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS			
PARAMETER	**SYMBOL**	**RATING**	**UNITS**
Operating DC Voltage (each I/O to GND)	V_{DC}	5.5	V
Each I/O to GND, ESD per IEC 61000-4-2 (contact) Each I/O to GND, ESD per IEC 61000-4-2 (Air)	V_{ESD}	±8 ±15	kV
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	°C
Operating Temperature	T_{OP}	-40 to +125	°C
Storage Temperature	T_{STO}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS						
PARAMETER	**SYMBOL**	**CONDITIONS**	**MINI**	**TYP**	**MAX**	**UNITS**
Reverse Stand-Off Voltage	V_{RWM}	T=25 °C, each I/O to GND.			5	V
Reverse Leakage Current	I_{Leak}	V_{RWM}= 5V, T=25 °C, each line to GND.			0.2	μA
Reverse Breakdown Voltage	V_{BV}	I_{BV} = 1mA, T=25 °C, each line to GND.	6		9	V
Forward Voltage	V_F	I_F = 15mA, T=25 °C, GND to each I/O.		0.95		V
ESD Clamping Voltage	V_{clamp}	IEC 61000-4-2 +6kV, T=25 °C, Contact mode, each I/O to GND.		11.3		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, each I/O to GND.		0.19		Ω
Series Resistance between Input and Output	$R_{I/O\_Line1,3}$	T=25 °C. Tolerance ± 20%		100		Ω
	R_{I/O_Line2}	T=25 °C. Tolerance ± 20%		55		Ω
Input Capacitance per line (0V)	C_{Line_0V}	V_R = 0V, f = 1MHz, T=25 °C, each line to GND.		17	20	pF
Input Capacitance per line (2.5V)	$C_{Line\_2.5V}$	V_R = 2.5V, f = 1MHz, T=25 °C, each line to GND.		11	14	pF
Input Capacitance of VE pin TVS (0V)	C_{TVS_0V}	V_R = 0V, f = 1MHz, T=25 °C, each line to GND.		16	19	pF

Typical Characteristics

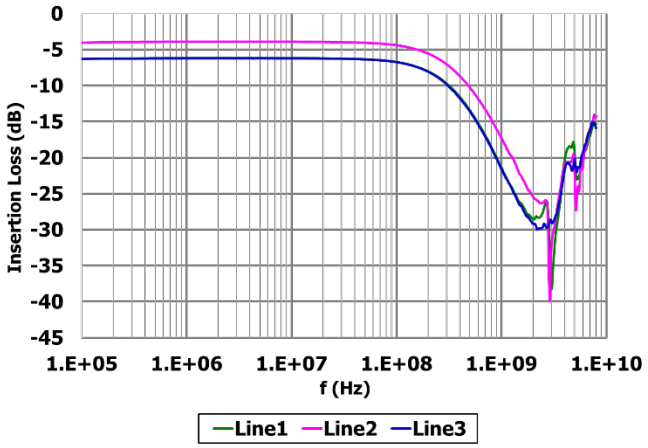


Figure 1. Insertion loss (S21) attenuation measurement.

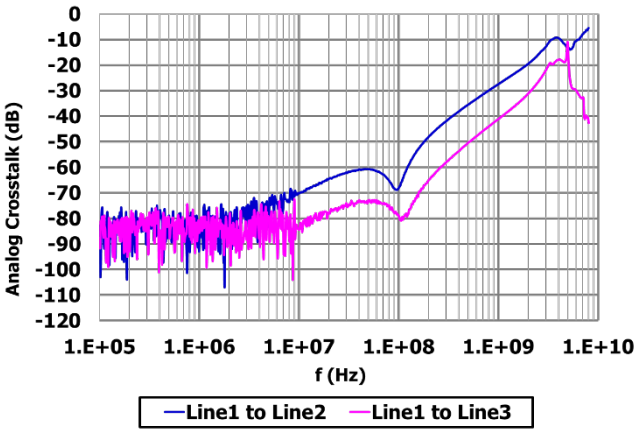


Figure 2. Analog crosstalk measurement.

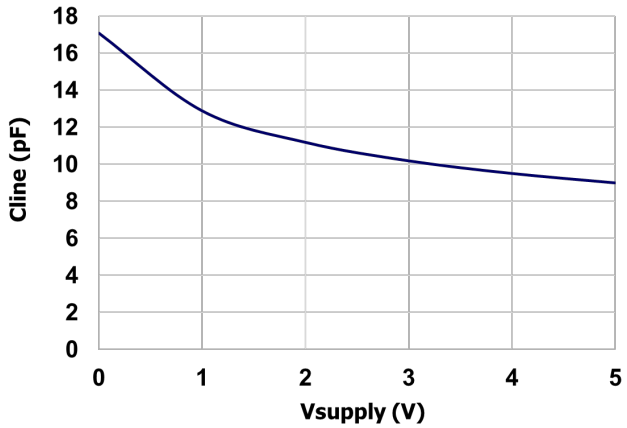


Figure 3. Line capacitance versus applied voltage (typical values).

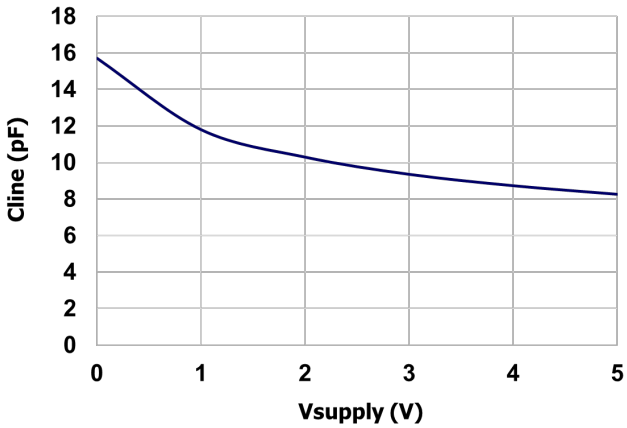


Figure 4. TVS (VE pin) input capacitance versus applied voltage (typical values).

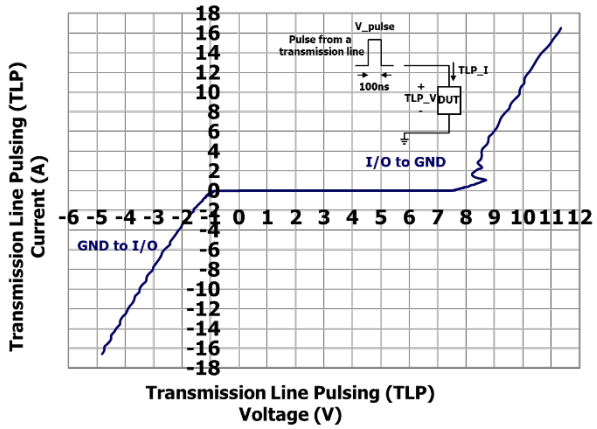


Figure 5. Transmission Line Pulsing (TLP) measurement for each I/O of each line.

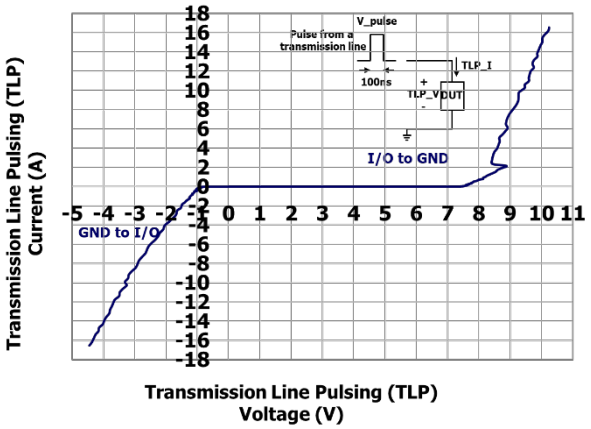
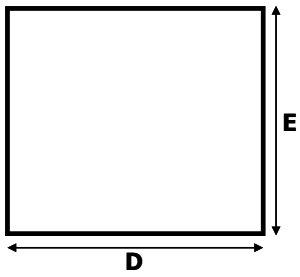


Figure 6. Transmission Line Pulsing (TLP) measurement for the TVS (VE pin).

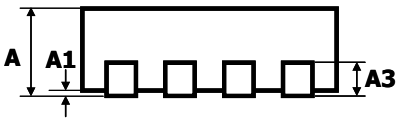
Mechanical Details

MLPD (Micro Leadframe Package Dual) 1.7×1.5-8LD PACKAGE DIAGRAMS

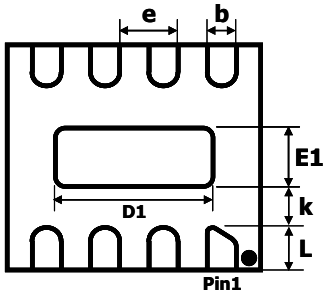
TOP VIEW



SIDE VIEW

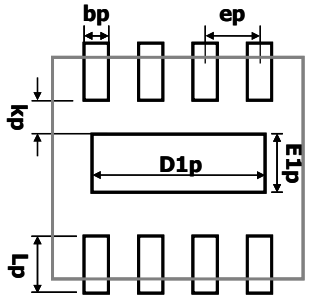


BOTTOM VIEW



Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.51	0.60	0.020	0.024
A1	0.00	0.05	0.000	0.002
A3	0.15 REF		0.006 REF	
D	1.70 BSC		0.067 BSC	
D1	0.85	1.10	0.033	0.043
E	1.50 BSC		0.059 BSC	
E1	0.25	0.50	0.010	0.020
b	0.15	0.25	0.006	0.010
e	0.40 TYP.		0.016 TYP.	
k	0.20 TYP.		0.008 TYP.	
L	0.20	0.40	0.008	0.016

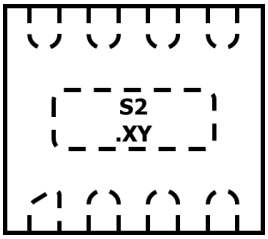
LAND LAYOUT



Symbol	Millimeters	Inches
D1p	1.000	0.039
E1p	0.400	0.016
kp	0.250	0.010
bp	0.200	0.008
ep	0.400	0.016
Lp	0.600	0.024

Notes: This LAND LAYOUT is for reference purposes only. Please consult your manufacturing partners to ensure what your company's PCB design guidelines are met.

Marking Code



. = Pin1 orientation
S2 = Device Code
X = Date Code
Y = Control Code

Part Number	Marking Code
AZM-SIM02-03F.R7G	S2 .XY

Ordering Information

PN#	Material	Package	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZM-SIM02-03F.R7G	Green	DFN1715P8E	T/R	7 inches	3,000/reel	4 reels=12,000/box	6 boxes=72,000/carton

Revision History

Revision	Modification Description
Revision 2023/08/28	Preliminary Release.