1. Description

The ESD5485E-6/TR(ES) is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium.

2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±30kV Contact Discharge
  - ±30kV Air Discharge
- 100W Peak pulse Power (8/20us; Pin1,3,4,6 to Pin2)
  400W Peak pulse Power (8/20us; Pin5 to Pin2)
- Working voltage: 5.0V
- Low leakage current
- RoHS compliant
- Protecting 4 unidirectional lines
- Ultra-low capacitance: 0.70pF Typ (IO-GND)
- Low clamping voltage

3. Applications

- USB 2.0
- Monitors and flat panel displays
- 10/100/1000 ethernet
- Notebook computers
- SIM ports
- ATM interface

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
ESD5485E-6/TR(ES)	SOT23-6L	.5485E	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

Table-1 Ordering information

5. Pin Configuration and Functions

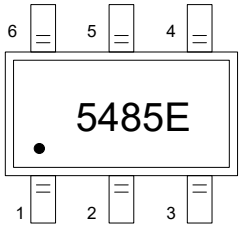
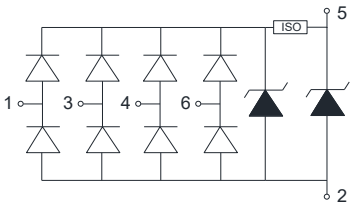
Pin	Name	Description	Outline	Circuit Diagram
1,3,4,6	IO	Connect to IO		
2	GND	Connect to GND		
5	VCC	Connect to VCC		

Table-2 Pin configuration

6. Specification

6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power (tp=8/20us;Pin1,3,4,6 to Pin2)@25℃	P_{pk}	-	100	W
Peak pulse power (tp=8/20us;Pin5 to Pin2)@25℃	P_{pk}	-	400	W
Peak pulse current (tp=8/20us;Pin1,3,4,6 to Pin2)@25℃	I_{PP}		14	A
Peak pulse current (tp=8/20us;Pin5 to Pin2)@25℃	I_{PP}		27	A
ESD (IEC61000-4-2 air discharge) @25℃	V_{ESD}	-	±30	kV
ESD (IEC61000-4-2 contact discharge) @25℃	V_{ESD}	-	±30	kV
Junction temperature	T_J	-	150	℃
Operating temperature	T_{OP}	-40	125	℃
Storage temperature	T_{STG}	-55	150	℃
Lead temperature	T_L	-	260	℃

Table-3 Absolute Maximum rating

6.2. Electrical Characteristics

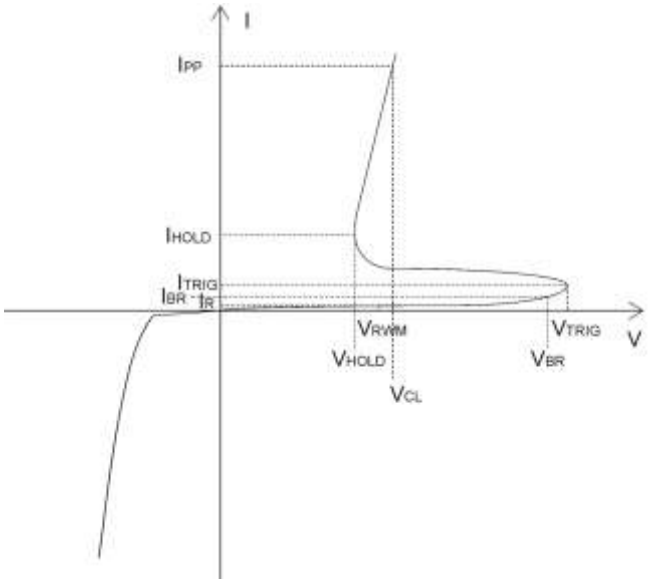
At TA = 25℃ unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	IT=1mA，IO-GND	5.5	7.1		V
		IT=1mA，VCC-GND	5.5	6.9		V
Reverse Leakage Current	I_R	V_{RWM}=5.0V			0.1	uA
Clamping Voltage	V_{CL}	I_{PP}=1A; tp=8/20us; Pin1,3,4,6 to Pin2		1.5	2.5	V
	V_{CL}	I_{PP}=14A; tp=8/20us; Pin1,3,4,6 to Pin2		5.6	6.5	V
	V_{CL}	I_{PP}=1A; tp=8/20us; Pin5 to Pin2		7.5	9.5	V
	V_{CL}	I_{PP}=27A; tp=8/20us; Pin5 to Pin2		12.5	15.0	V
Junction Capacitance	C_J	I/O to GND; V_R=0V; f=1MHz		0.7	1.0	pF
		Between I/O; V_R=0V; f=1MHz		0.3	0.5	
		V_{CC}-GND; V_R=0V; f=1MHz		220	250	

Table-4 Electrical Characteristics

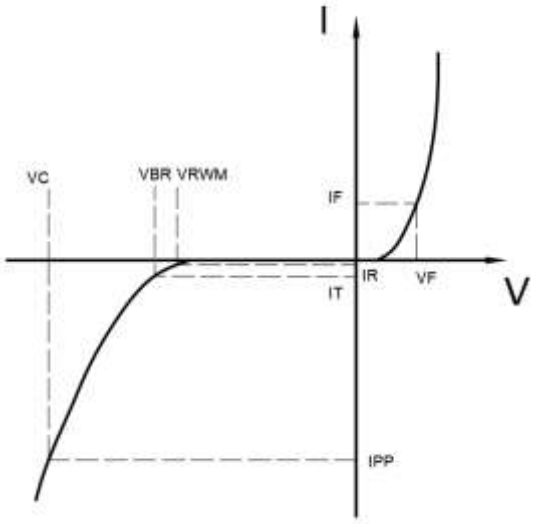
Pin1,3,4,6 to Pin2

Symbol	Parameters
V_{RWM}	Reverse stand-off voltage
I_R	Reverse leakage current
V_{BR}	Reverse breakdown voltage
I_{BR}	Reverse breakdown current
V_{CL}	Clamping voltage
V_{TRIG}	Reverse trigger voltage
I_{TRIG}	Reverse trigger current
V_{HOLD}	Reverse holding voltage
I_{HOLD}	Reverse holding current
I_{PP}	Peak pulse current

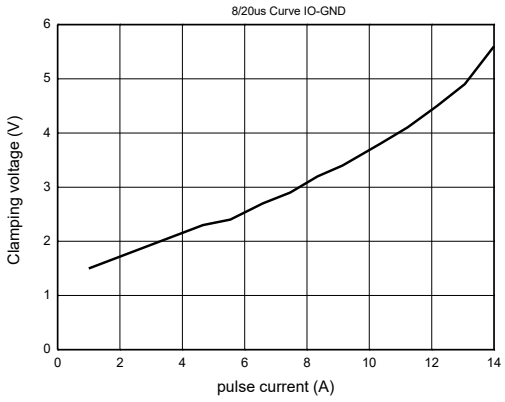


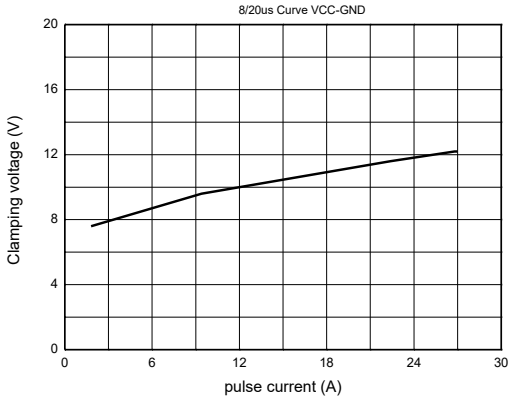
Pin5 to Pin2

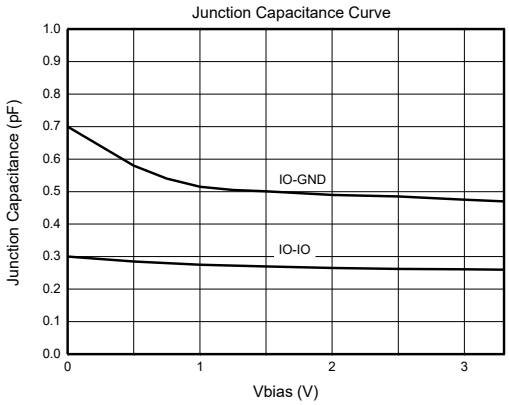
Symbol	Parameters
VRWM	Peak Reverse Working Voltage
IR	Reverse Leakage Current @ VRWM
VBR	Breakdown Voltage @ IT
IT	Test Current
IPP	Maximum Reverse Peak Pulse Current
VC	Clamping Voltage @ IPP
IF	Forward Current
VF	Forward Voltage @ IF

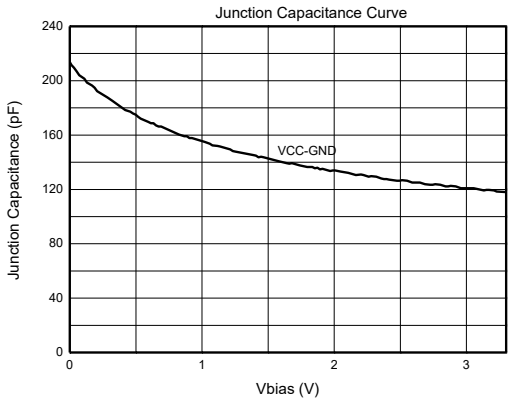


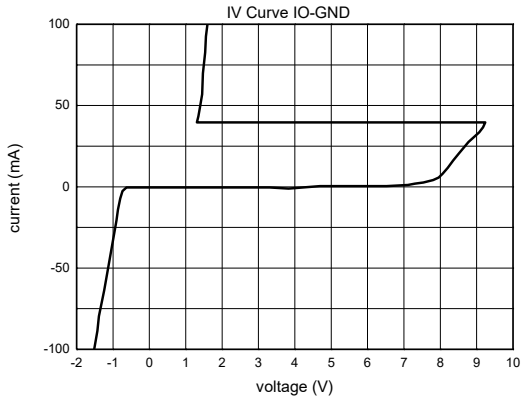
7. Typical Characteristic

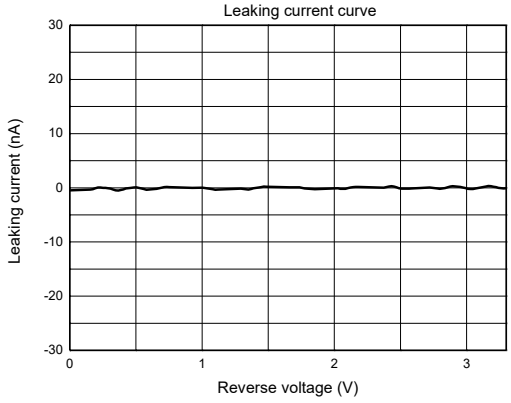


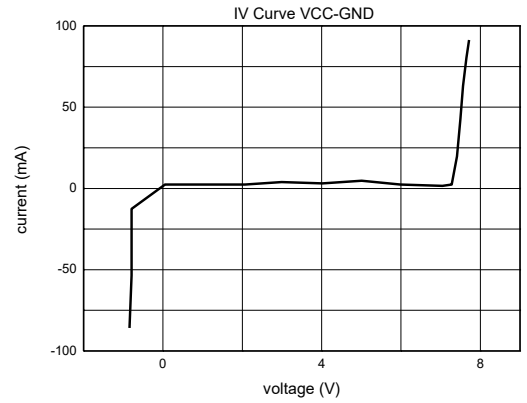




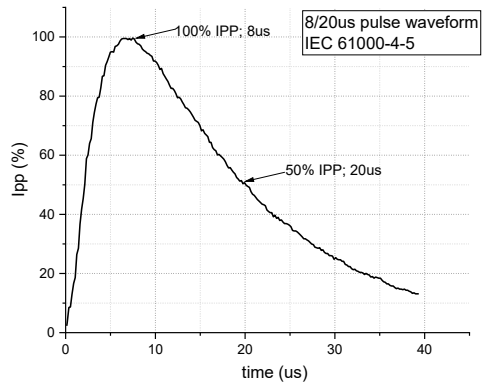


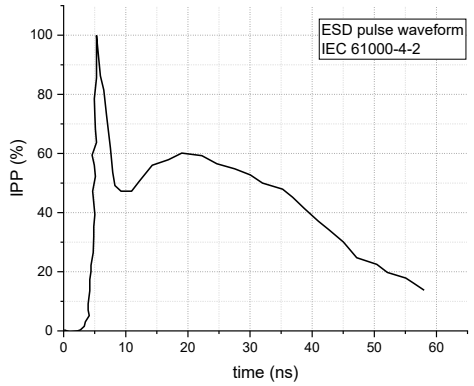






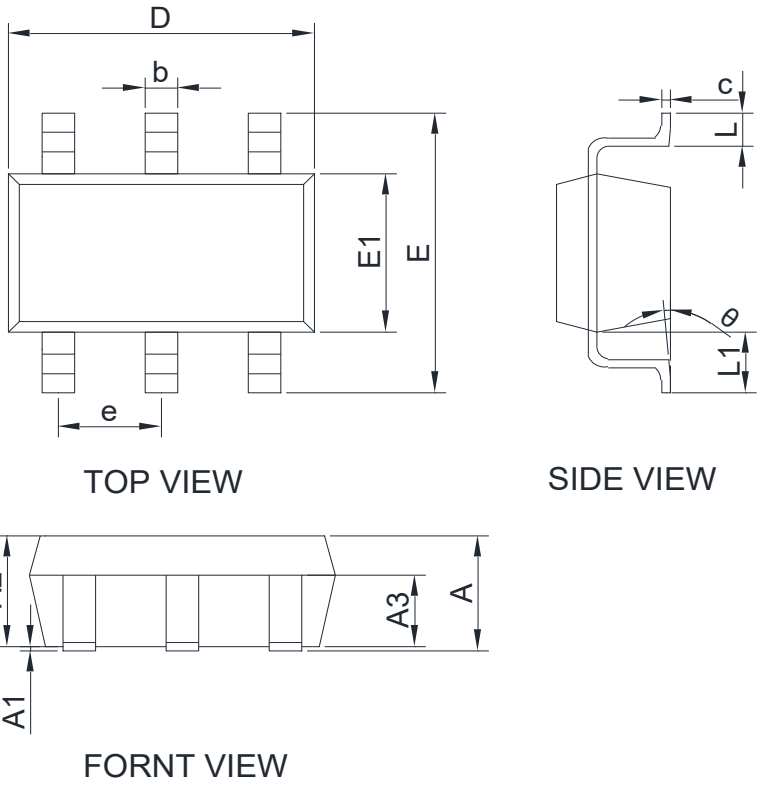
Measurement Wave According to IEC Standard





8. Dimension (SOT-23-6L)

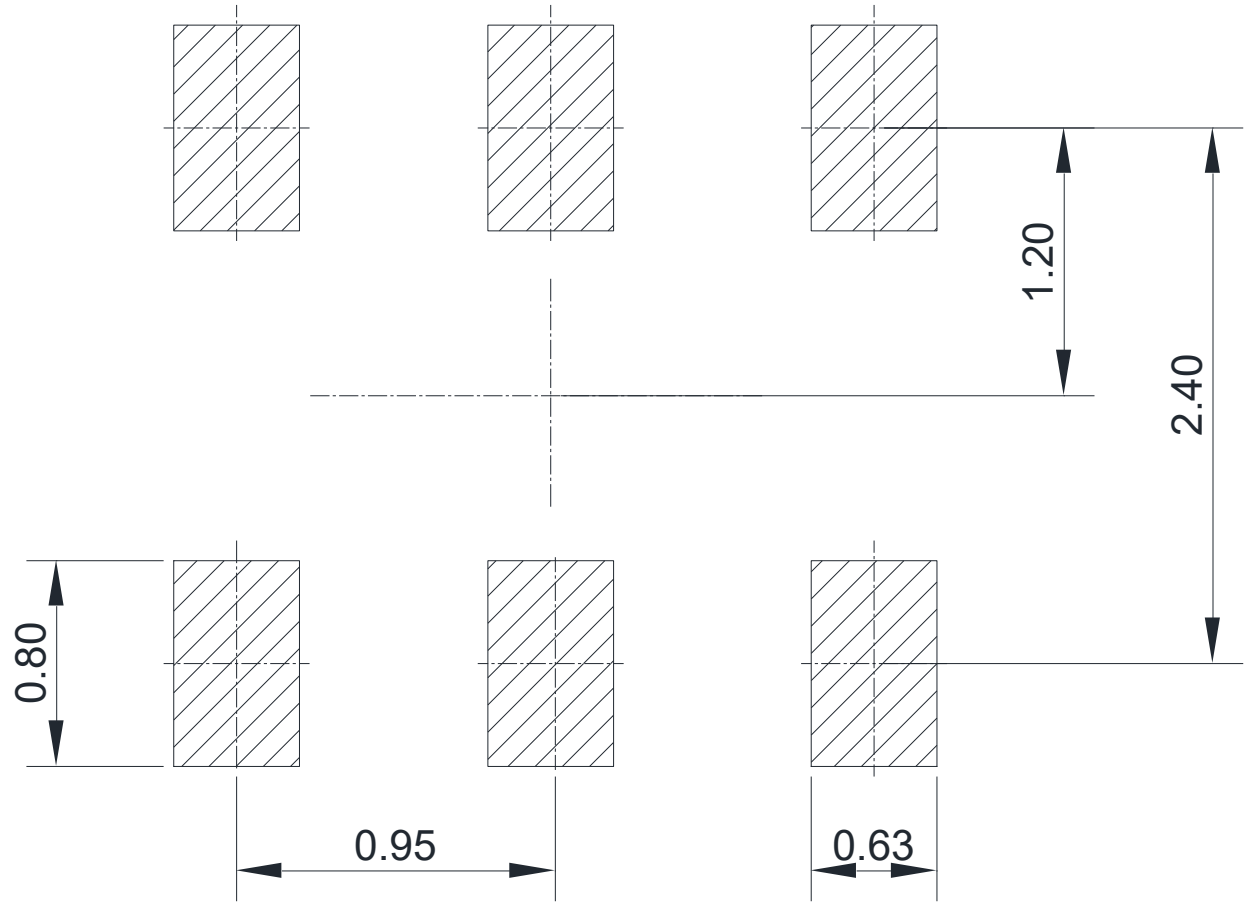
POD(Z)



Unit: mm

Symbol		A	A1	A2	A3	b	c	D
Spec	Min	1.000	0.000	1.000	0.500	0.300	0.100	2.700
	Max	1.300	0.110	1.200	0.800	0.500	0.250	3.100
Symbol		E	E1	e	L	L1	θ	
Spec	Min	2.600	1.500	0.850	0.300	0.550	0°	
	Max	3.000	1.800	1.050	0.600	0.700	8°	

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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