

Description

The CSH712E2B is designed for asymmetrical (12V to -7V) protection in multi-point data transmission standard RS-485 applications. The CSH712E2B can be used to protect devices from transient voltages resulting from electrostatic discharge (ESD), electrical fast transients (EFT), and lightning induced surges.



Mechanical Characteristics

- ◆ SOT-23
- ◆ ROHS/ Compliant
- ◆ Halogen free
- ◆ Molding compound flammability rating: UL 94V-0
- ◆ Marking: Part number
- ◆ Packing: Tape and Reel per EIA 481

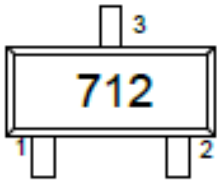
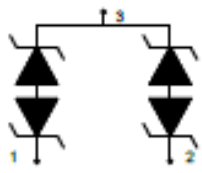
Features

- ◆ IEC 61000-4-2 (ESD)
 - ±30kV Contact Discharge
 - ±30kV Air Discharge
- ◆ IEC 61000-4-5 (Lightning)
 - 17A (8/20us)
- ◆ IEC 61000-4-4 EFT Protection
 - 40A (5/50ns)
- ◆ Halogen free and RoHS compliant
- ◆ Protects two +12V to -7V lines
- ◆ Low clamping voltage
- ◆ Low capacitance
- ◆ Low leakage current

Applications

- ◆ Protection of RS-485 transceivers
 - with extended common-mode range
- ◆ Security systems
- ◆ Automatic Teller Machines
- ◆ FC systems
- ◆ Networks

Dimensions and Pin Configuration

Pin	Name	Description	Outline	Circuit Diagram
1	IO1	Connect to IO		
2	IO2	Connect to IO		
3	GND	Connect to GND		

Ordering Information

Part Number	Package	Marking	Packing	Reel Size
CSH712E2B	SOT-23	712	3000/Tape & Reel	7 inch

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$)@ 25°C	P_{pk}	-	350	W
Peak pulse current ($t_p=8/20\mu\text{s}$)@ 25°C	I_{pp}	-	17	A
ESD (IEC61000-4-2 air discharge) @ 25°C	V_{ESD}	-	± 30	kV
ESD (IEC61000-4-2 contact discharge) @ 25°C	V_{ESD}	-	± 30	kV
Junction temperature	T_J	-	125	$^{\circ}\text{C}$
Operating temperature	T_{OP}	-40	85	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55	150	$^{\circ}\text{C}$
Lead temperature	T_L	-	260	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}	Pin1 or Pin2 to Pin3			12	V
Reverse Stand-off Voltage	V_{RWM}	Pin3 to Pin1 or Pin2			7	V
Reverse Breakdown Voltage	V_{BR}	Pin1 or Pin2 to Pin3; $I_R=1\text{mA}$	13.3			V
Reverse Breakdown Voltage	V_{BR}	Pin3 to Pin1 or Pin2; $I_R=1\text{mA}$	7.5			V
Reverse Leakage Current	I_R	Pin1 or Pin2 to Pin3; $V_{RWM}=12\text{V}$			1	μA
Reverse Leakage Current	I_R	Pin3 to Pin1 or Pin2; $V_{RWM}=12\text{V}$			1	μA
Peak Pulse Current	I_{PP}	Pin1 or Pin2 to Pin3		17		A
Peak Pulse Current	I_{PP}	Pin3 to Pin1 or Pin2		17		A
Clamping Voltage	V_C	Pin1 or Pin2 to Pin3; $I_{PP}=17\text{A}$		26		V
Clamping Voltage	V_C	Pin3 to Pin1 or Pin2; $I_{PP}=17\text{A}$		19		V
Junction Capacitance	C_J	I/O to GND; $V_R=0\text{V}$; $f=1\text{MHz}$		55		pF

Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)

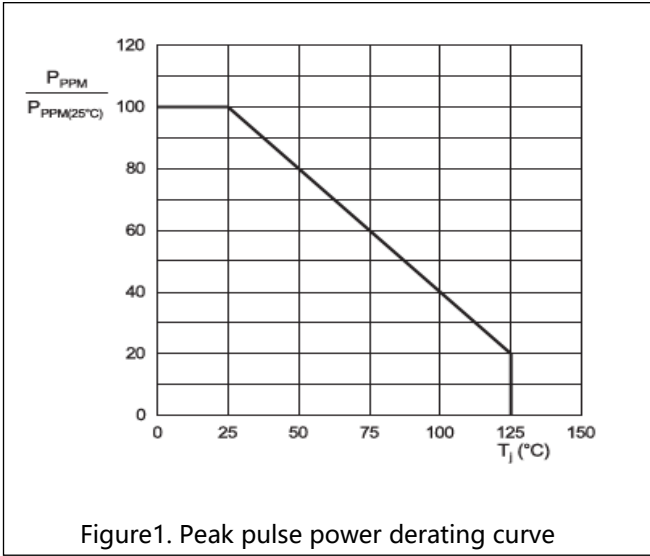


Figure1. Peak pulse power derating curve

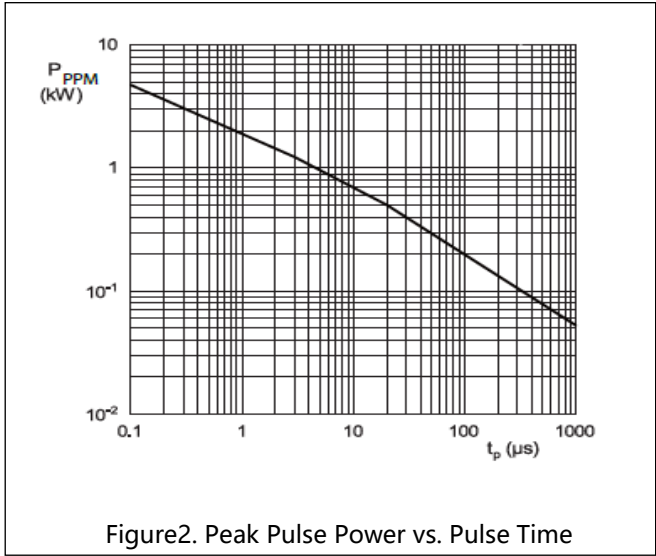


Figure2. Peak Pulse Power vs. Pulse Time

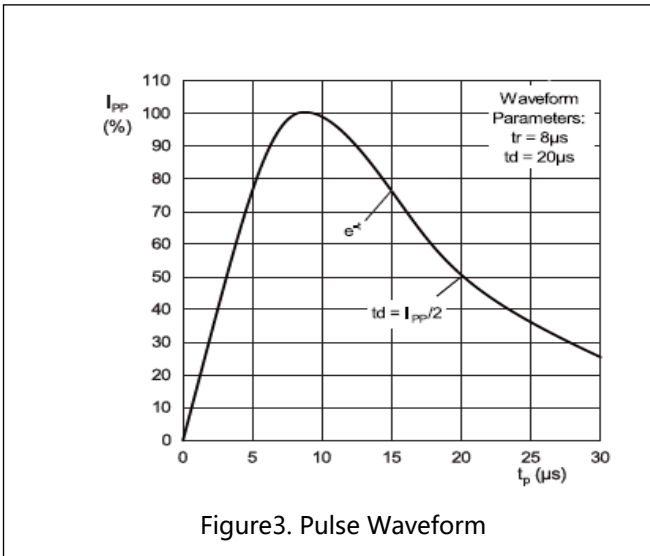


Figure3. Pulse Waveform

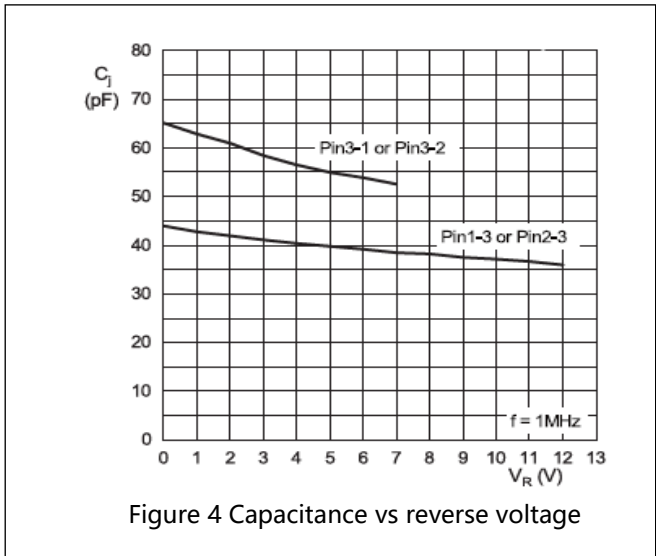


Figure 4 Capacitance vs reverse voltage

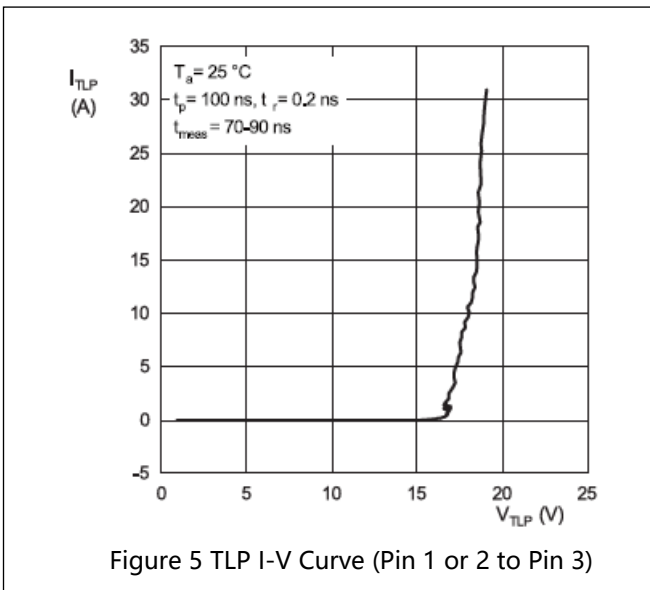


Figure 5 TLP I-V Curve (Pin 1 or 2 to Pin 3)

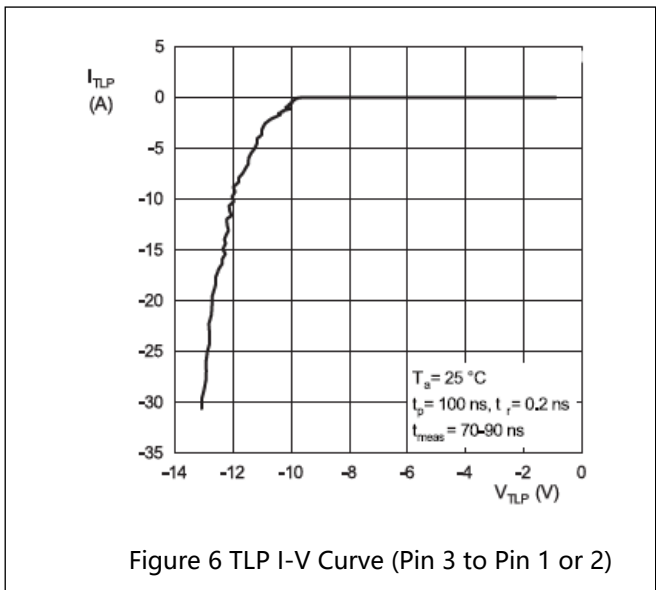
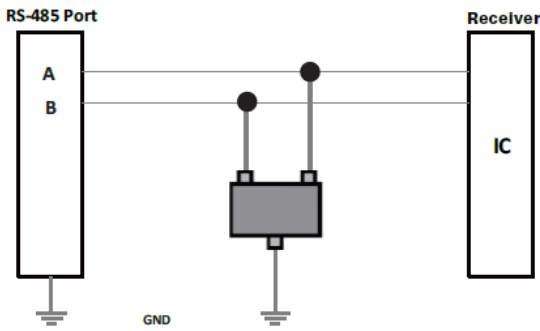


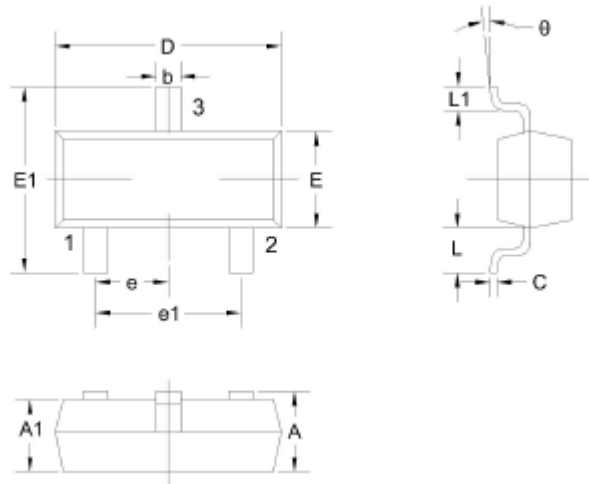
Figure 6 TLP I-V Curve (Pin 3 to Pin 1 or 2)

Applications Information

Typical RS485 Interface Application



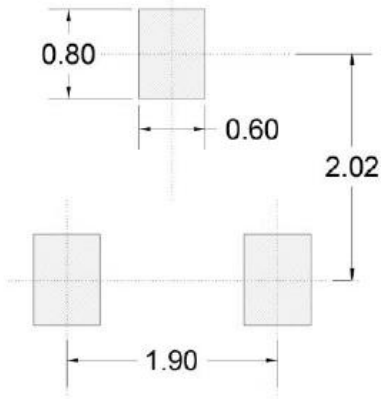
Package Outline Drawing



Units in millimeters

Dimensions in Millimeters					
Symbol	Min.	Max.	Symbol	Min.	Max.
A	0.9	1.15	e1	1.80	2.00
A1	0.9	1.05	L	0.55REF	
b	0.30	0.50	L1	0.30	0.50
C	0.08	0.15	θ	0°	8°
D	2.80	3.00			
E	1.20	1.40			
E1	2.25	2.55			
e	0.95TYP				

Recommended Land Pattern



Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference only

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-Aug-2021