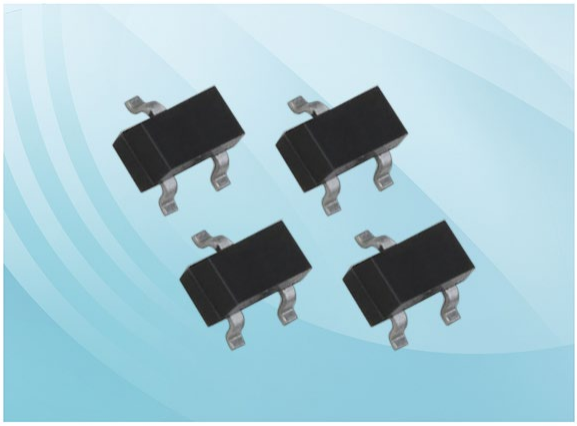
PT712M – ESD Protection Diode

Feature

- 340 Watts peak pulse power (8/20 μs)
- Bidirectional configurations
- Solid state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Protection two data lines
- IEC61000-4-2 (ESD) ±30 kV (Air), ±30 kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning): 12 A (8/20 μs)
- MSL: JEDEC-J-STD-020, Level 1



Applications

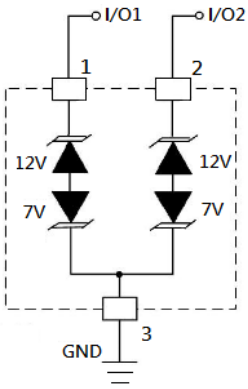
- Data lines
- Automatic Teller Machine
- Networks
- Power lines

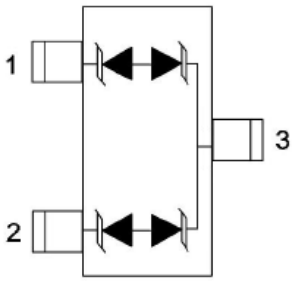
Mechanical Data

- SOT23 package
- Molding compound flammability rating: UL94 V-0
- Tape and Reel Packaging

Regulation	Standard
RoHS	2015/863/EU
Halogen Free	IEC 61249-2-21:2003

Schematic and PIN Configuration





SOT23(Top View)

Maximum Rating

Parameter	Symbol	Limit	Unit
IEC61000-4-2 ESD Voltage – Air Mode	V_{ESD}(1)	±30	kV
IEC61000-4-2 ESD Voltage – Contact Mode		±30	
Peak Pulse Power	P_{PP}(2)	340	W
Peak Pulse Current	I_{PP}(2)	12	A
Maximum Lead Solder Temperature (10 seconds duration)	T_L	260	°C
Junction Temperature	T_J	-55~125	°C
Storage Temperature Range	T_{stg}	-55~125	°C

Note:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of TA = 25°C unless otherwise noted.

新竹市科學工業園區工業東四路 24-1 號 No. 24-1 Industry E. Rd. IV, Hsinchu Science Park, Hsinchu 300, Taiwan.
TEL: +886-3-5643931 FAX: +886-3-5644624 http://www.pttc.com.tw

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Electrical Characteristics

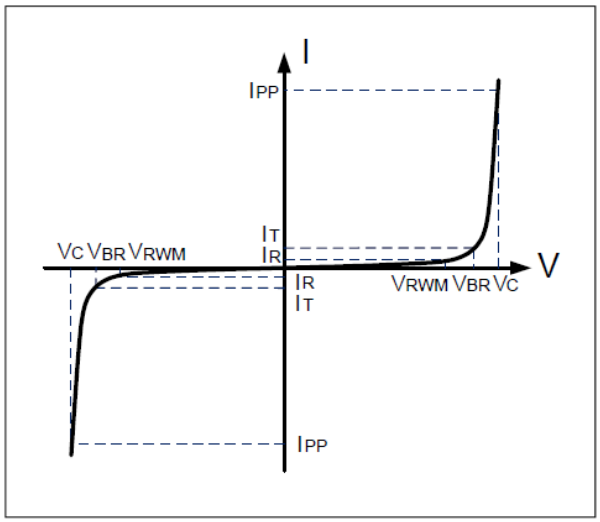
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-off Voltage	V_{RWM}(1)	Pin 1 to 3 and 2 to 3			12	V
		Pin 3 to 1 and 3 to 2			7.0	V
Reverse Breakdown Voltage	V_{BR}	I_T = 1 mA, Pin 1 to 3 and 2 to 3	13.3			V
		I_T = 1 mA, Pin 3 to 1 and 3 to 2	7.5			V
Reverse Leakage Current	I_R	V_{RWM} = 12 V, Pin 1 to 3 and 2 to 3			1.0	μA
		V_{RWM} = 7 V, Pin 3 to 1 and 3 to 2			1.0	μA
Clamping Voltage	V_C(2)	I_{PP} = 12 A, tp = 8/20μs, Pin 1 to 3 and 2 to 3		28	33	V
		I_{PP} = 20 A, tp = 8/20μs, Pin 3 to 1 and 3 to 2		20	25	V
Junction Capacitance	C_J	V_R = 0 V, f = 1 MHz		40	48	pF

Note:

1. Other voltages available upon request.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of T_A = 25°C unless otherwise noted.

Electrical Parameters

Symbol	Parameter
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_R	Reverse Leakage Current @ V_{RWM}
V_{RWM}	Reverse Stand-off Voltage



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Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

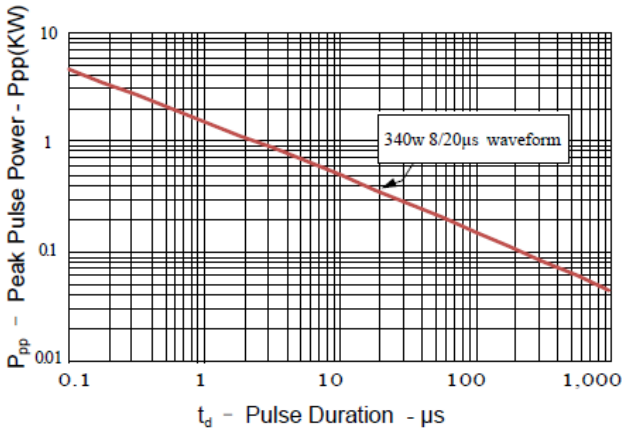


Figure 2: Power Derating Curve

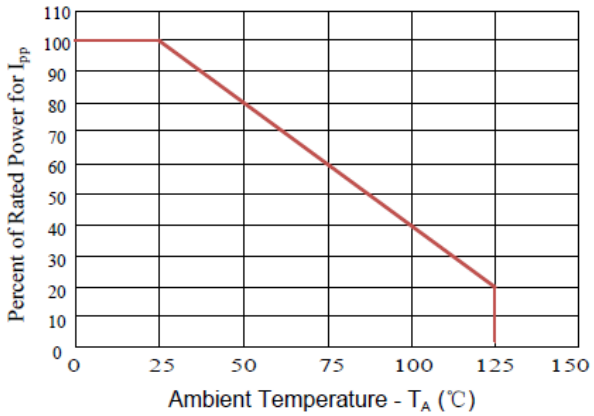


Figure 3: Pulse Waveform

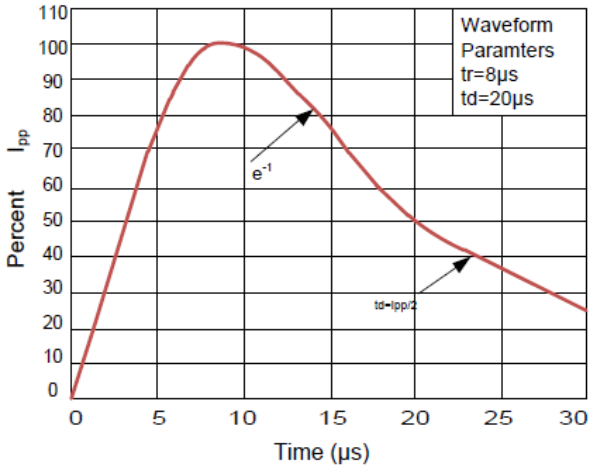


Figure 4: Clamping Voltage vs.Ipp

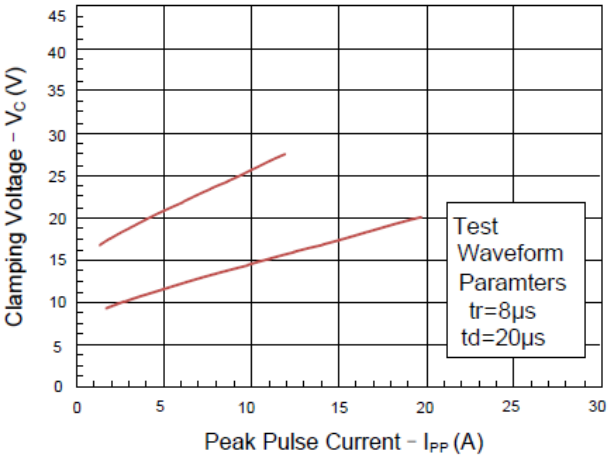


Figure 5: TLP Positive I-V Curve

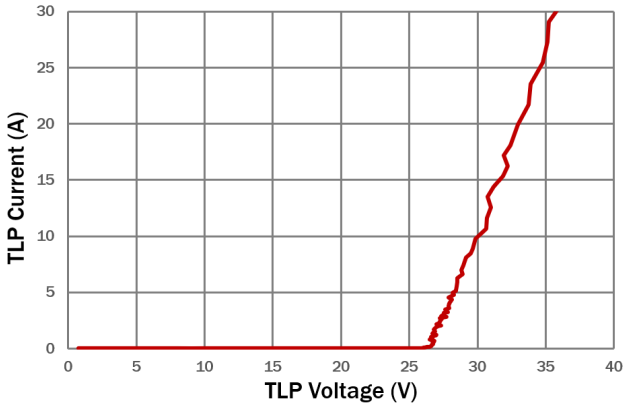
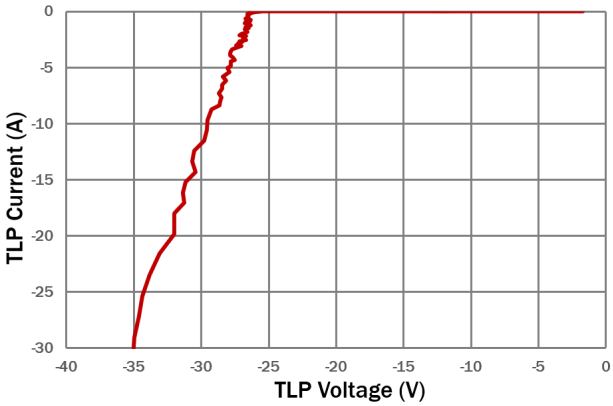


Figure 6: TLP Negative I-V Curve



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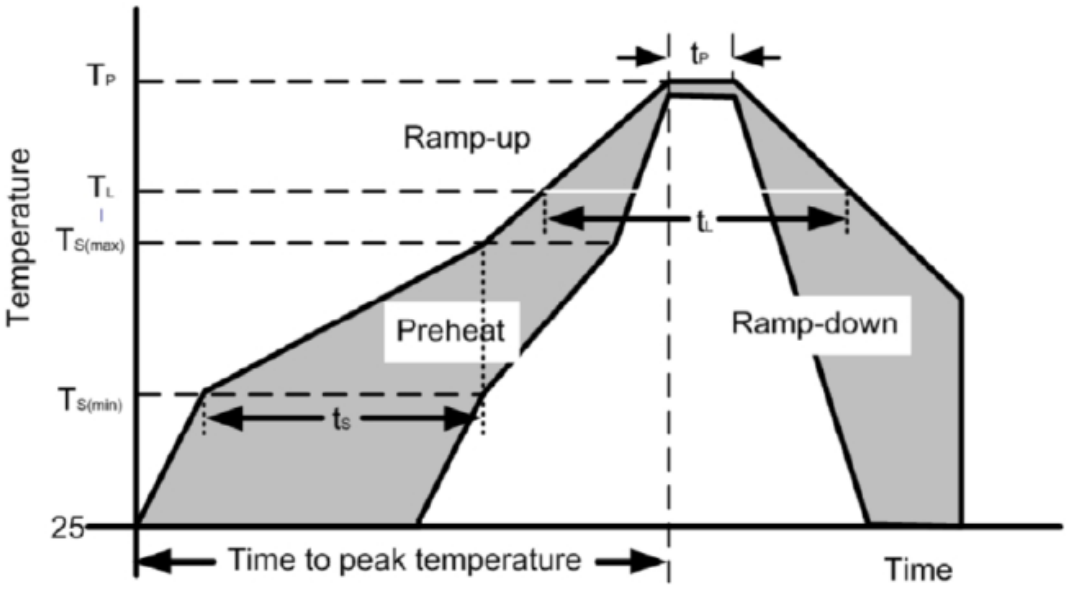
Soldering Parameters



Reflow Condition	Pb-Free assembly
Pre Heat Temperature Min (Ts (min)) 150℃	Temperature Min (Ts (min)) 150℃
Pre Heat Temperature Min (Ts (max)) 200℃	Temperature Min (Ts (max)) 200℃
Pre Heat Time (min to max) (ts) 60-190 secs	Time (min to max) (ts) 60-190 secs
Average ramp up rate (Liquidus Temp) (TL) to peak	5℃/seconds max
Ts(max)to TL—Ramp-up Rate	5℃/seconds max
Reflow Temperature (TL) (Liquidus)	217℃
Reflow Temperature (tl)	60-150 seconds
Peak Temperature (Tp)	260+0/-5℃
Time within actual peak Temperature (tp)	20-40 seconds
Ramp-down Rate	5℃/seconds max
Time 25℃ to peak Temperature (Tp)	8 minutes Max.
Do not exceed	280℃

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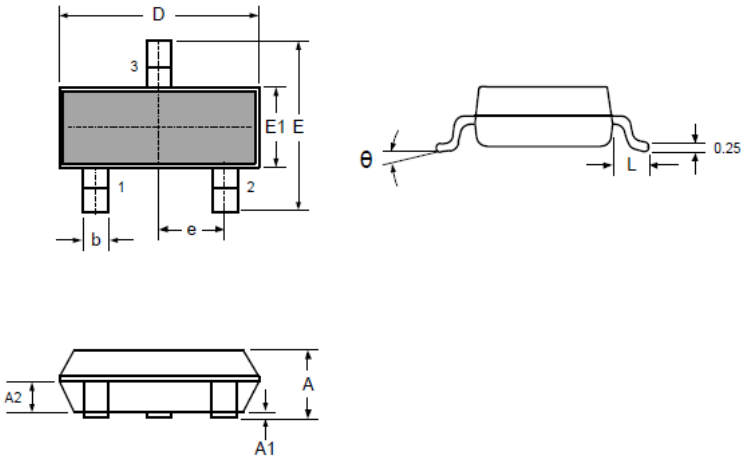
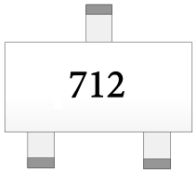
SOT-23 Package Outline Dimensions



Symbol	Dimensions (mm)	
	Min	Max
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
D	2.80	3.00
E	2.25	2.55
E1	1.20	1.40
e	0.95 BSC	
L	0.30	0.50
θ	0°	8°

Marking



Packaging Information

Order Code	Packaging	Reel Size	PCS/Reel
PT712M	SOT-23	7 inch	3,000

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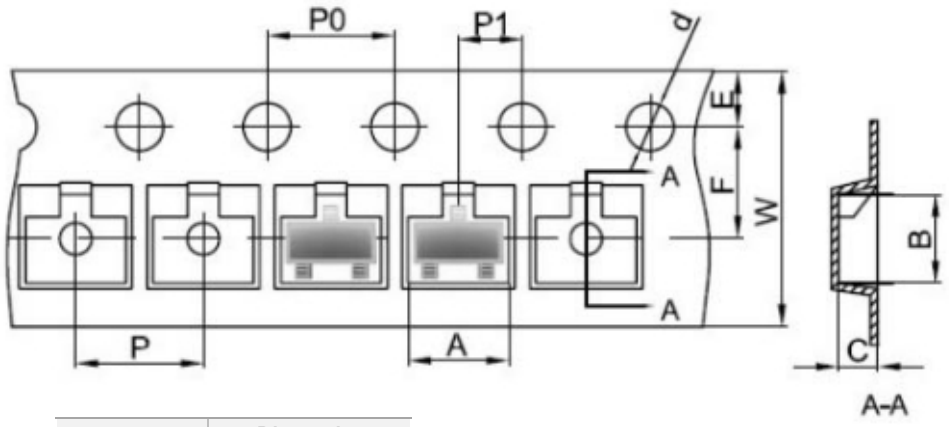
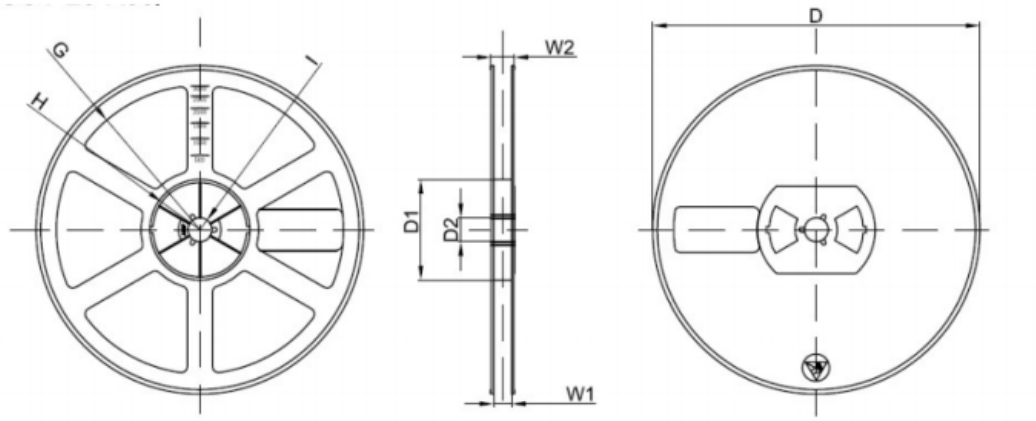
Packaging Information



Symbol	Dimension (mm)
A	3.15±0.1
B	2.77±0.1
C	1.22±0.1
d	Ø1.50±0.1
E	1.75±0.1
F	3.50±0.1
P0	4.00±0.1
P	4.00±0.10
P1	2.00±0.1
W	8.00+0.3/-0.1



Symbol	Dimension (mm)
D	Ø178±2
D1	54.40±1
D2	13.00±1
G	R78.00±1
H	R25.60±1
I	R6.50±1
W1	9.50±1
W2	12.30±1