1 Characteristics

Table 2: Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter		Value	Unit
V_{PP}	Peak pulse voltage	IEC 61000-4-2: Contact discharge Air discharge	 >30 >30	kV
P_{PP}	Peak pulse power	8/20µs	4800	W
I_{PP}	Peak pulse current	8/20µs	160	A
T_{stg}	Storage junction temperature range		-55 to + 150	°C
T_{op}	Operating junction temperature range		-55 to + 150	

Figure 2: Electrical characteristics (definitions)

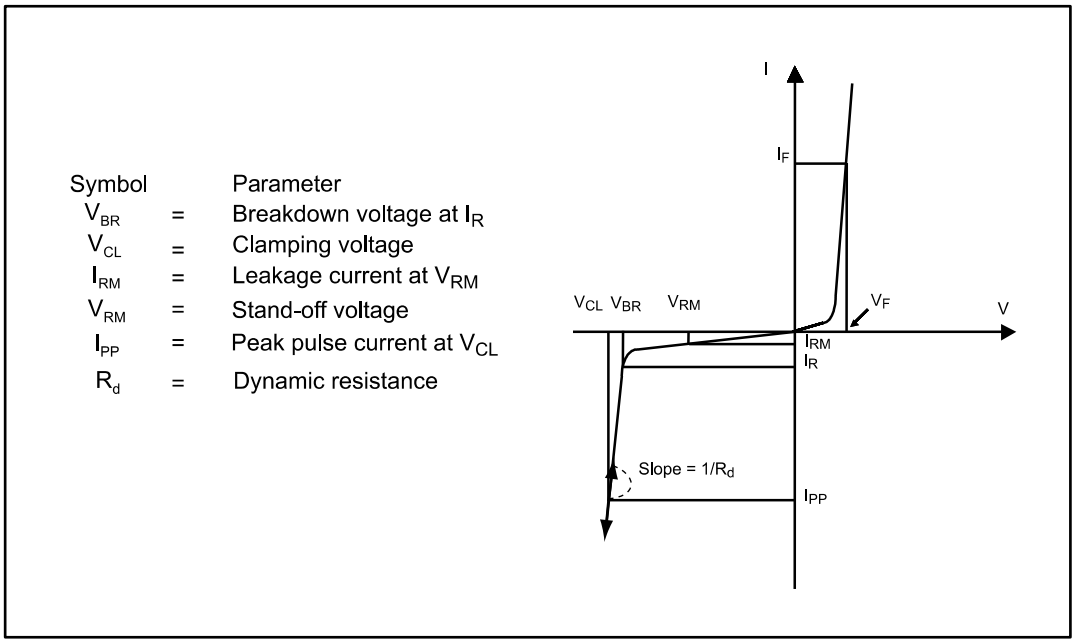


Table 3: Electrical characteristics (T_{amb} = 25 °C)

Symbol	Test condition	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	15.7	16.5	17.7	V
V_{RM}				15	V
I_{RM}	V_{RM} = 12 V			100	nA
I_{RM}	V_{RM} = 15 V			200	nA
R_d	8/20 µs		0.07		Ω
V_{CL}	I_{PP} = 100 A, 8/20 µs		24	26	V
V_{CL}	I_{PP} = 160 A, 8/20 µs		28	30	V
C_{BUS}	V_{BUS} = 0 V, f = 1 MHz, V_{OSC} = 30 mV		1200		pF

1.1 Curves

Figure 3: Peak power dissipation versus initial temperature (typical value)

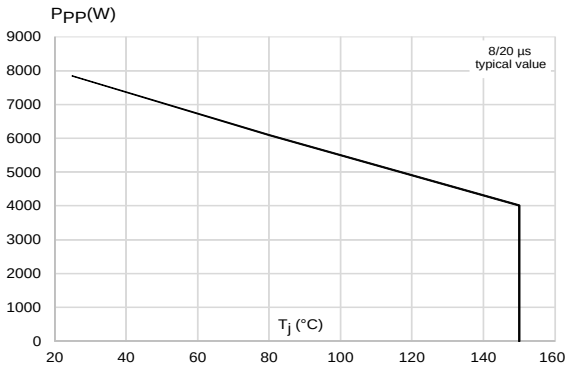


Figure 4: Peak pulse power versus exponential pulse duration (T_j = 25 °C, typical value)

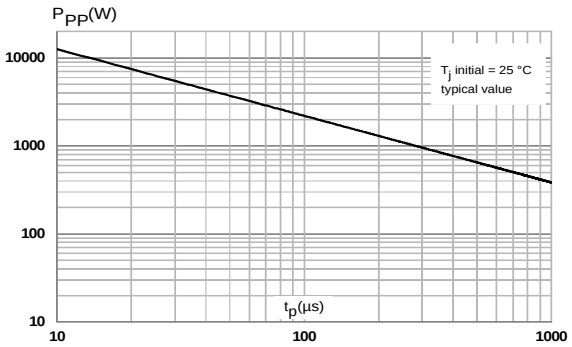


Figure 5: Peak pulse current versus clamping voltage (max. value)

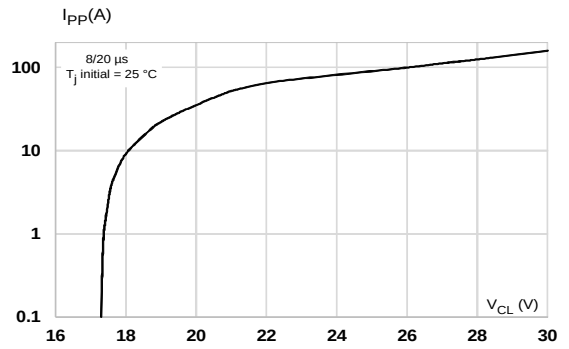


Figure 6: Leakage current versus junction temperature (typical value)

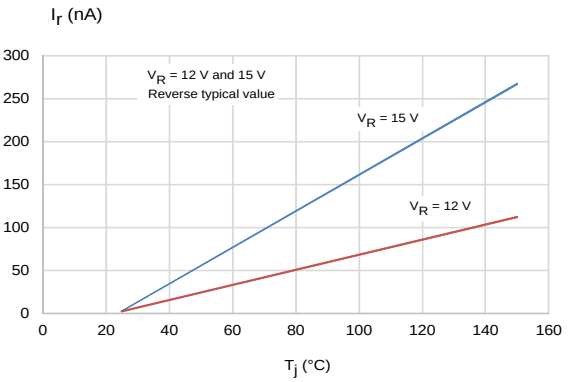


Figure 7: ESD response to IEC 61000-4-2 (+8kV contact discharge)

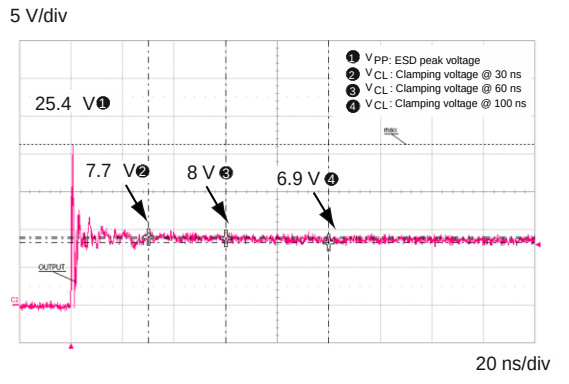
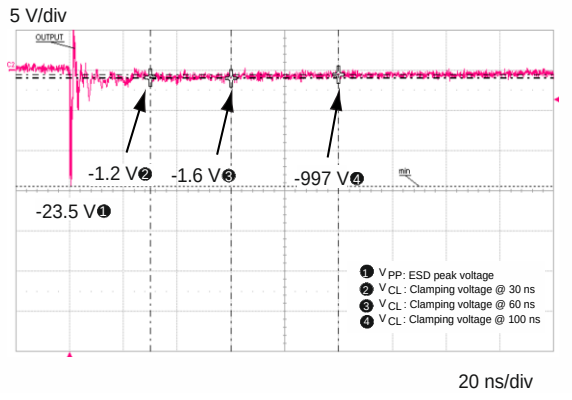


Figure 8: ESD response to IEC 61000-4-2 (-8kV contact discharge)



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: ***www.st.com***. ECOPACK® is an ST trademark.

2.1 QFN1610

Figure 9: µQFN package outline

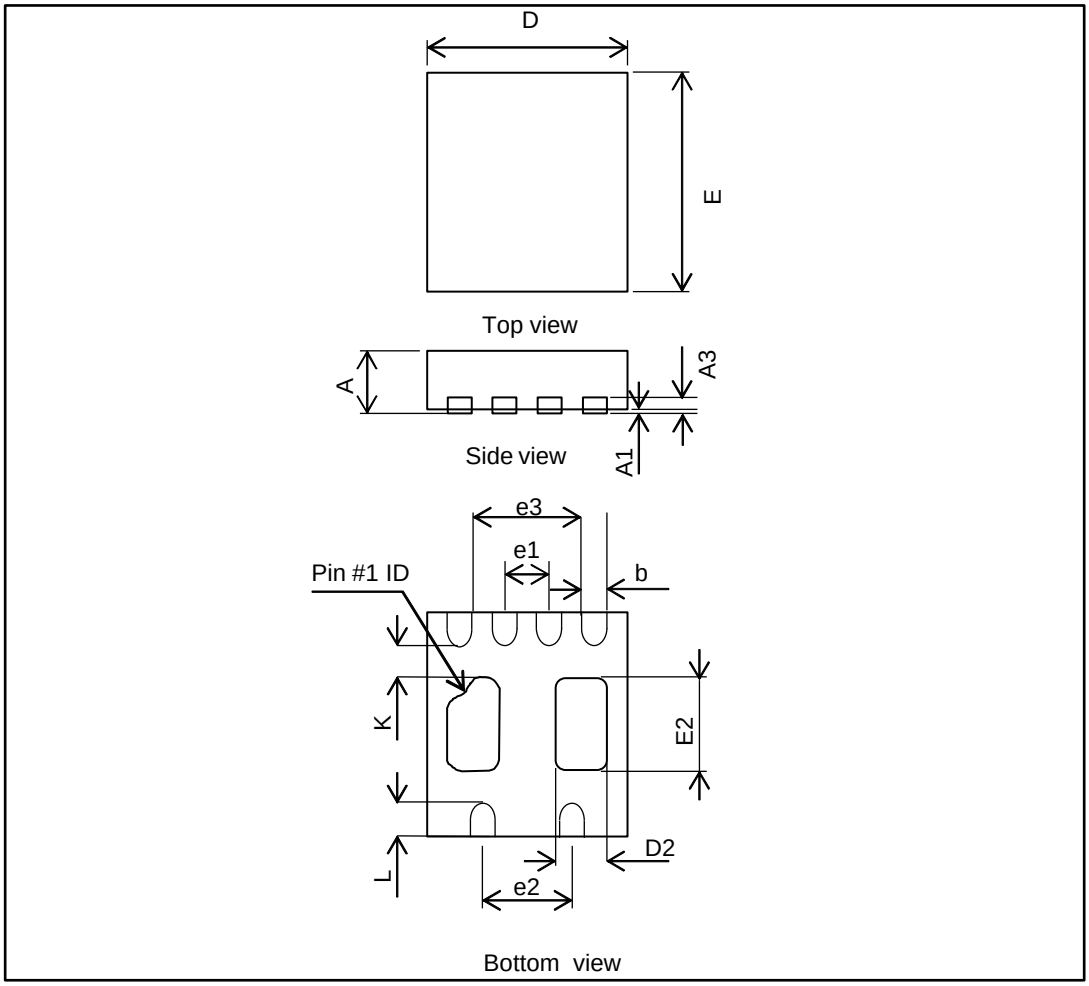


Table 4: µQFN package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.51	0.55	0.60	0.0201	0.0217	0.0236
A1	0.00	0.02	0.05	0.0000	0.0008	0.0020
A3		0.15				
b	0.15	0.20	0.25	0.0059	0.0079	0.0098
D	1.70	1.80	1.90	0.0669	0.0709	0.0748
E	1.90	2.0	2.10	0.0748	0.0787	0.0827
e1		0.4			0.0157	
e2		0.80			0.0315	
D2	0.30	0.45	0.55	0.0118	0.0177	0.0217
E2	0.69	0.84	0.94	0.0272	0.0331	0.0370
e3		0.95			0.0374	
k		0.28			0.0110	
L	0.20	0.030	0.40	0.0079	0.0118	0.0157
N		6.00				

Figure 10: µQFN footprint

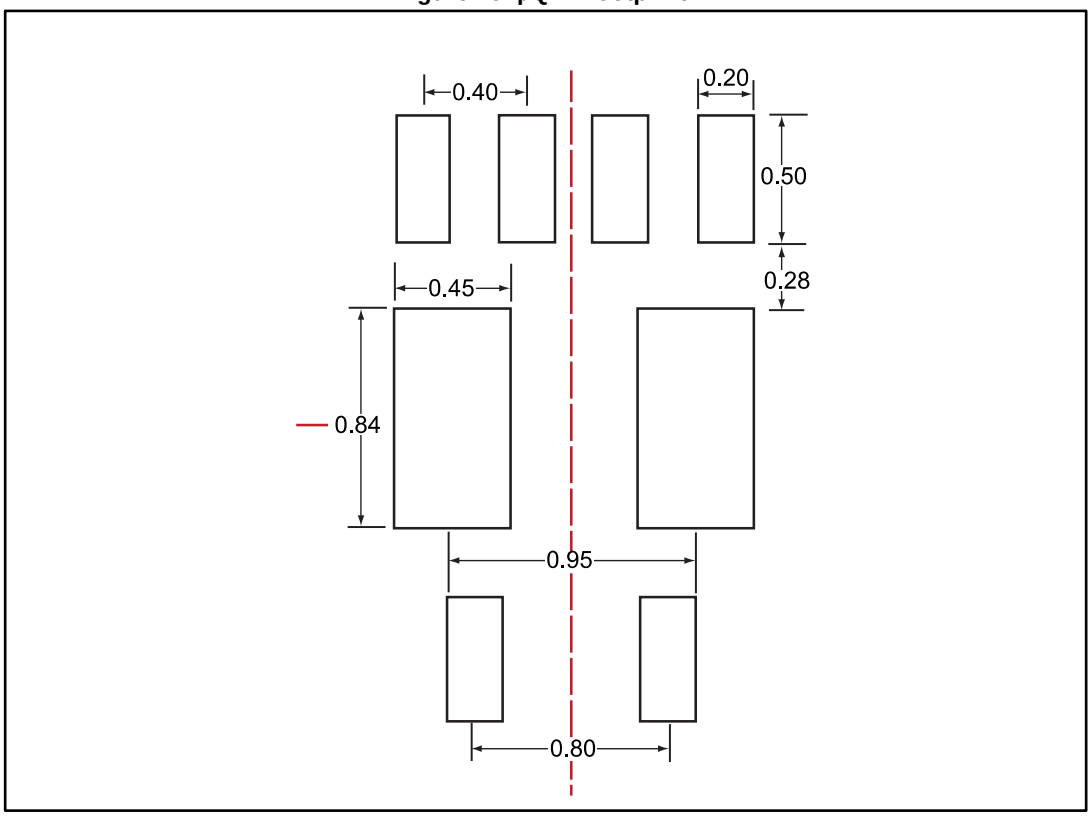
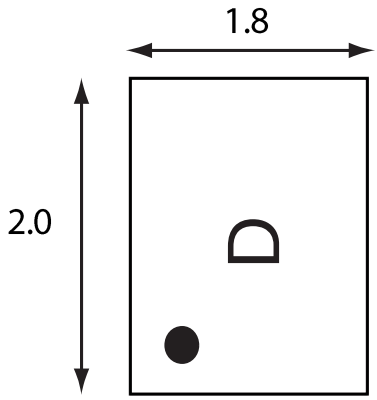
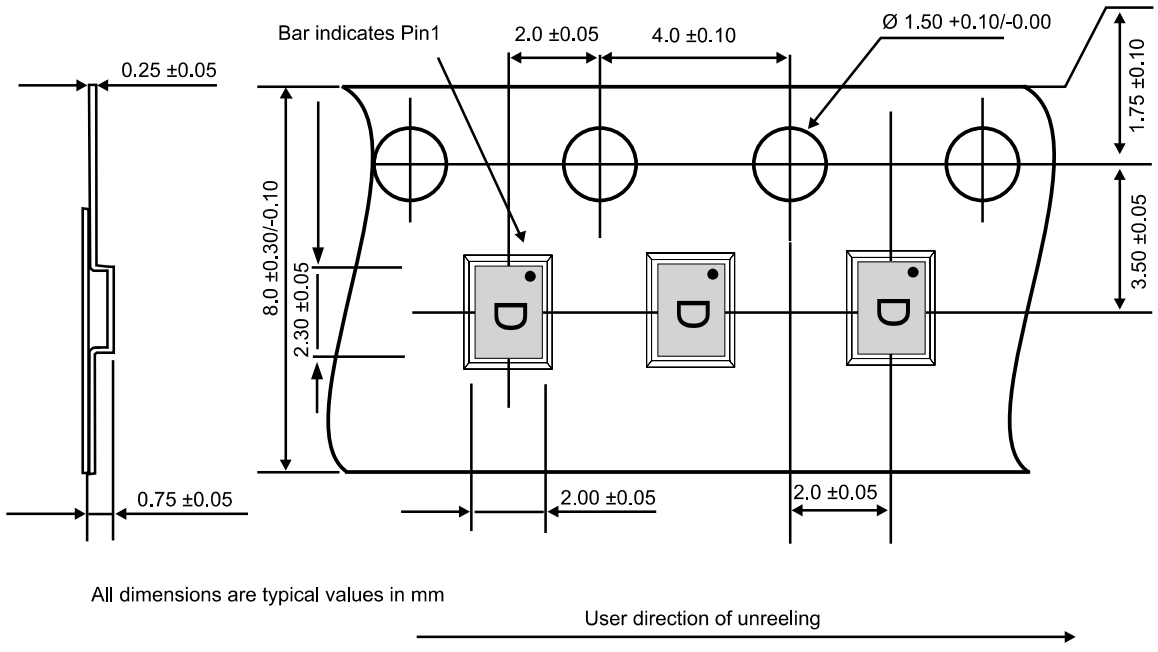


Figure 11: Marking



Product marking may be rotated by multiples of 90° for assembly plant differentiation. In no case should this product marking be used to orient the component for its placement on a PCB. Only pin 1 mark is to be used for this purpose.

Figure 12: Tape and reel specification (in mm)



3 Recommendation PCB

3.1 Stencil opening

1. General recommendation on stencil opening design
   a. Stencil opening dimensions: L (Length), W (Width), T (Thickness).
2. General design rule
   a. Stencil thickness (T) = 75 ~ 125 µm
   b. Aspect ratio = $\frac{W}{T} \geq 1.5$
   c. Aspect area = $\frac{L \times W}{2T(L+W)} \geq 0.66$
3. Reference design
   a. Stencil opening thickness: 100 µm
   b. Stencil opening for leads: Opening to footprint ratio is 90%.

Figure 13: Stencil opening dimensions

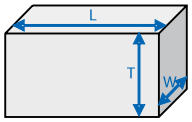
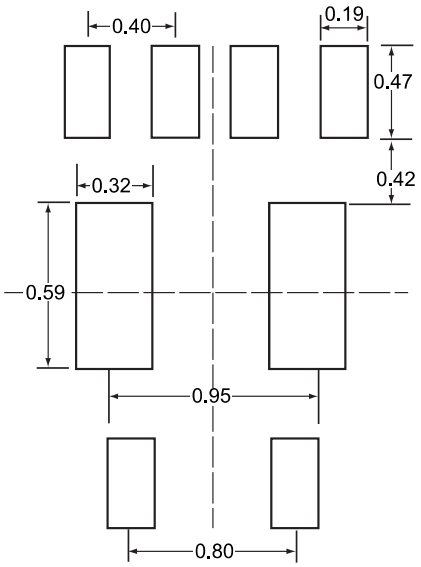


Figure 14: Recommended stencil window position



3.2 Solder paste

1. Use halide-free flux, qualification ROL0 according to ANSI/J-STD-004.
2. “No clean” solder paste is recommended.
3. Offers a high tack force to resist component movement during PCB movement.
4. Solder paste with fine particles: powder particle size is 20-45 µm.

3.3 Placement

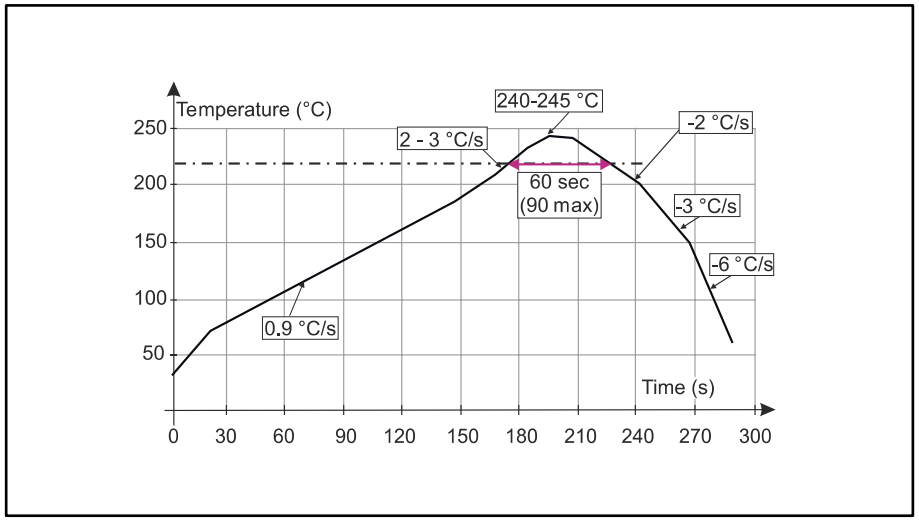
1. Manual positioning is not recommended.
2. It is recommended to use the lead recognition capabilities of the placement system, not the outline centering
3. Standard tolerance of ±0.05 mm is recommended.
4. 3.5 N placement force is recommended. Too much placement force can lead to squeezed out solder paste and cause solder joints to short. Too low placement force can lead to insufficient contact between package and solder paste that could cause open solder joints or badly centered packages.
5. To improve the package placement accuracy, a bottom side optical control should be performed with a high resolution tool.
6. For assembly, a perfect supporting of the PCB (all the more on flexible PCB) is recommended during solder paste printing, pick and place and reflow soldering by using optimized tools.

3.4 PCB design preference

1. To control the solder paste amount, the closed via is recommended instead of open vias.
2. The position of tracks and open vias in the solder area should be well balanced. A symmetrical layout is recommended, to avoid any tilt phenomena caused by asymmetrical solder paste due to solder flow away.

3.5 Reflow

Figure 15: ST ECOPACK® recommended soldering reflow profile for PCB mounting



Minimize air convection currents in the reflow oven to avoid component movement.

4 Ordering information

Figure 16: Ordering information scheme

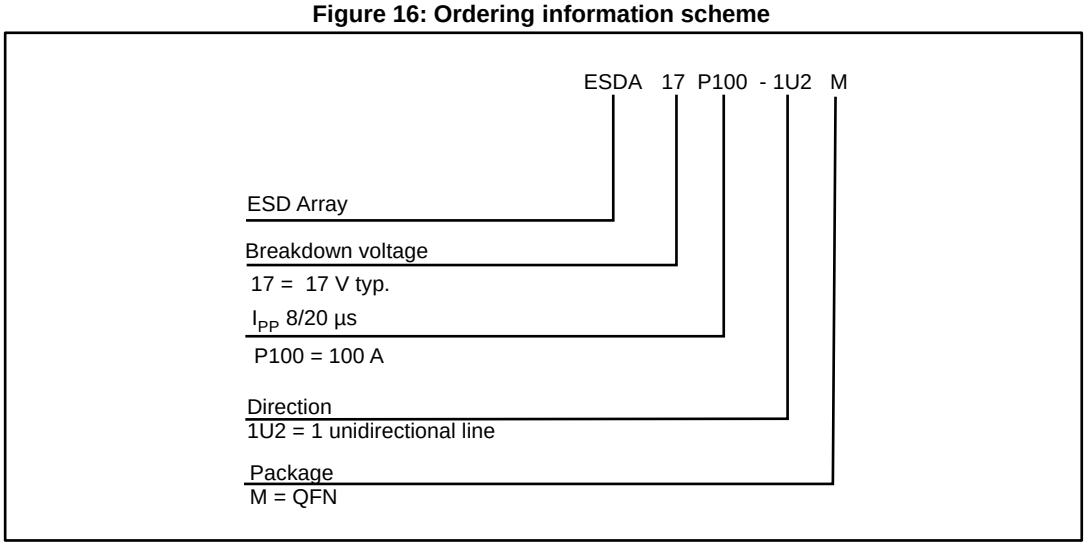


Table 5: Ordering information

Order code	Marking[(1)]	Package	Weight	Base qty.	Delivery mode
ESDA17P100-1U2M	D	µQFN	6 mg	5000	Tape and reel

Notes:

(1)The marking can be rotated by multiples of 90° to differentiate assembly location

5 Revision history

Table 6: Document revision history

Date	Revision	Changes
14-Mar-2017	1	Initial release.

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