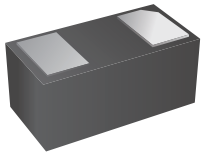
LTE06N05C01LBES

Extreme Low Capacitance ESD Protection Device



Features

- Transient protection for high-speed data line
  IEC 61000-4-2 (ESD)±12kV (Contact)
  IEC 61000-4-2 (ESD) ±15kV (Air)
  Cable Discharge Event (CDE)
- Package optimized for high-speed line
- Ultra-small package (0.6mm×0.3mm×0.3mm)
- Working voltage: 5V
- Snap back featured
- Low capacitance: 0.12pF (Typical)
- Low leakage current
- Low clamping voltage
- Lead free in comply with EU RoHS 2011/65/EU directives

Mechanical Data

- Case:DFN0603
- Flammability Rating: UL 94V-0

Applications

- Thunderbolt 3
- Thunderbolt 4
- USB Type-C
- USB 3.2
- USB 4

Ordering Information

Part Number	Marking	Shipping	Reel
LTE06N05C01LBES-TR10	3B	10000PCS Tape&Reel	7 inchs

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{ESD}	ESD per IEC 61000-4-2 (Contact) ESD per IEC 61000-4-2 (Air)	±12 ±15	kV
P_{PP}	Peak Pulse Power (8/20μs)	39	W
I_{PP}	Peak Pulse Current (8/20μs)	6	A
T_{OPT}	Operating Temperature	-50~125	°C
T_{STG}	Storage Temperature	-55~150	°C

Electrical Characteristics (Tamb=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_{RWM}	Reverse Working Voltage	Pin to Pin			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	5.5			V
I_R	Reverse Leakage Current	V_{RWM} = 5V		1	100	nA
V_H	Holding Reverse Voltage	Pin to Pin		2.1		V
I_H	Holding Reverse Current	Pin to Pin		30		mA
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs		3.04	5	V
		I_{PP} = 6A, t_p = 8/20μs		5.52	6.5	V
V_{CTLP}	TLP Clamping Voltage	TLP I_{PP} = 8A, t_p = 100ns		6		V
		TLP I_{PP} = 16A, t_p = 100ns		8		V
R_{DYN}	Dynamic Resistance	I_{TLP} = 4A to I_{TLP} = 16A		0.4		Ω
C_J	Junction Capacitance	V_R = 0V, f = 1MHz		0.12	0.18	pF

Characteristics Curve

Fig.1 8/20us Waveform per IEC61000-4-5

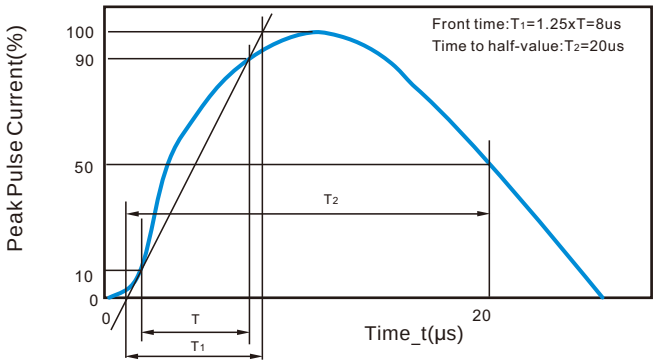


Fig.2 Clamping Voltage vs Peak Pulse Current

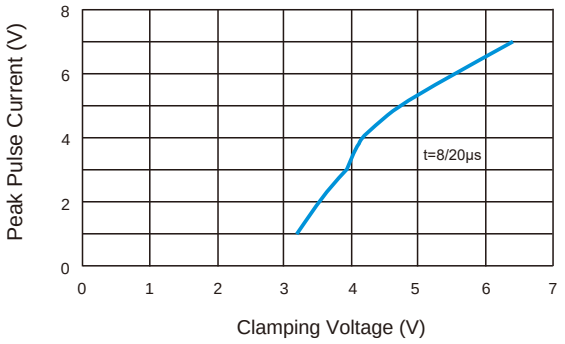


Fig.3 Transmission Line Pulsing (TLP) Measurement

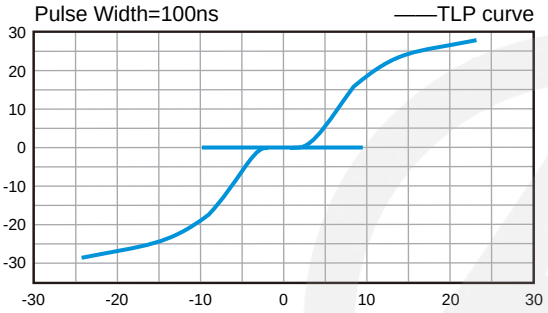


Fig.4 Voltage vs Capacitance

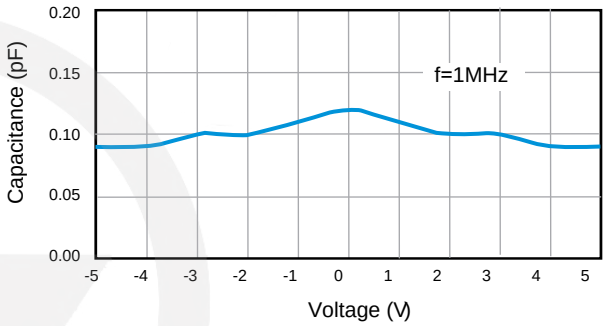


Fig.5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)

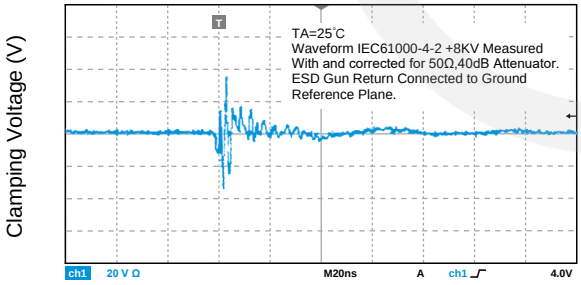
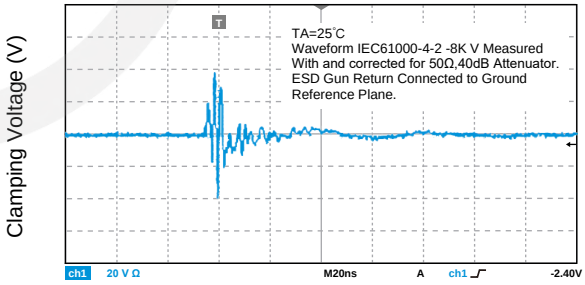
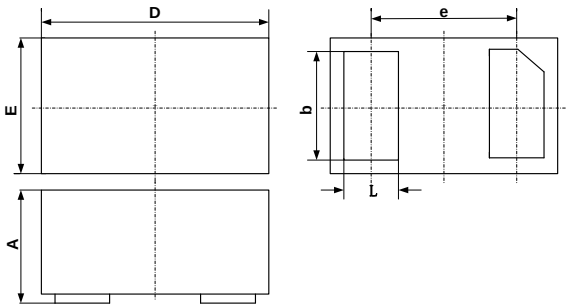


Fig.6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



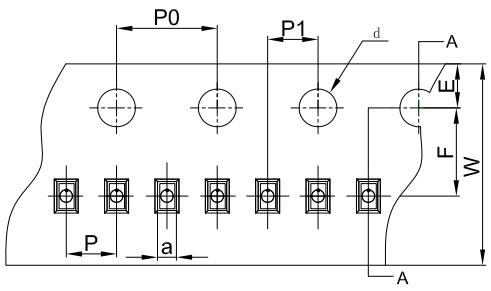
DFN0603 Package Outline

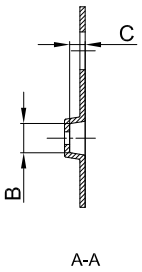


SYM	DIMENSIONS	
	MILLIMETERS	
	MIN	MAX
A	0.230	0.370
b	0.200	0.275
D	0.550	0.670
e	0.360 BSC	
E	0.250	0.370
L	0.120	0.220

Carrier Tape Dimensions

Unit：mm





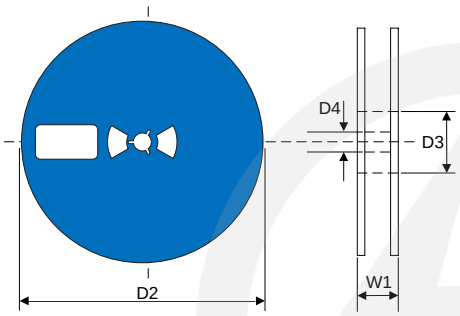
A-A

Symbol	Spec	Symbol	Spec
a	0.41	F	3.50
B	0.70	P0	4.00
C	0.38	P	2.00
d	ø1.50	P1	2.00
E	1.75	W	8.00

Reel Dimensions

Unit：mm

7” Reel

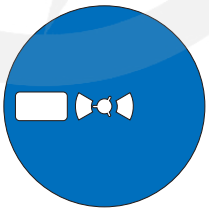


D2	Φ178.0±2.0
D3	Φ50
D4	13.0±0.5
W1	12±0.5
Quantity: 10000PCS	

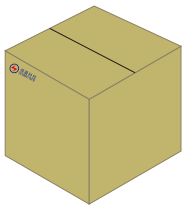
Packaging

DFN0603

10000PCS/Reel

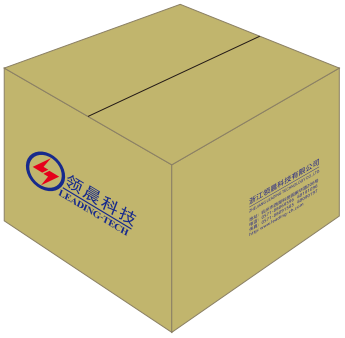


15Reel/Inner Box
150KPCS/Inner Box



Dim(Unit:mm)
210mm*208mm*203mm

4 Boxs per carton
600 KPCS per carton

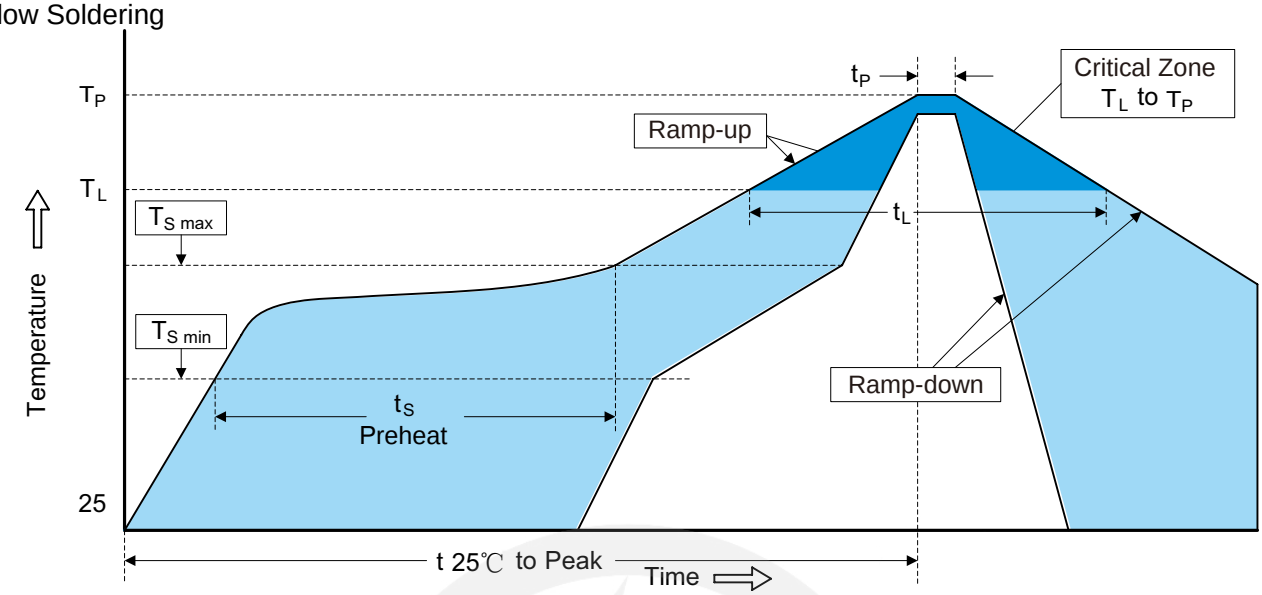


Dim(Unit:mm)
440mm*440mm*230mm

7 inchs Reel

Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

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Version Update Information

Series NO.	Enactment/Revision Date	Effective Date	Version	Revision content	Revision Reason	Revision Person	Note
01	2024.03.16	2024.03.16	3.0	New File	/	Ding	