

LL15BT0603

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15V Ultra Low Capacitance Bi-Directional ESD Protection

Features

- Low clamping voltage.
- Complies with following standards:
 - IEC 61000-4-2(ESD) immunity test
 - Air discharge: $\pm 20\text{kV}$.
 - Contact discharge: $\pm 15\text{kV}$.
 - IEC 61000-4-5(Lightning) 2.5A(8/20 μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL15BT0603-H,

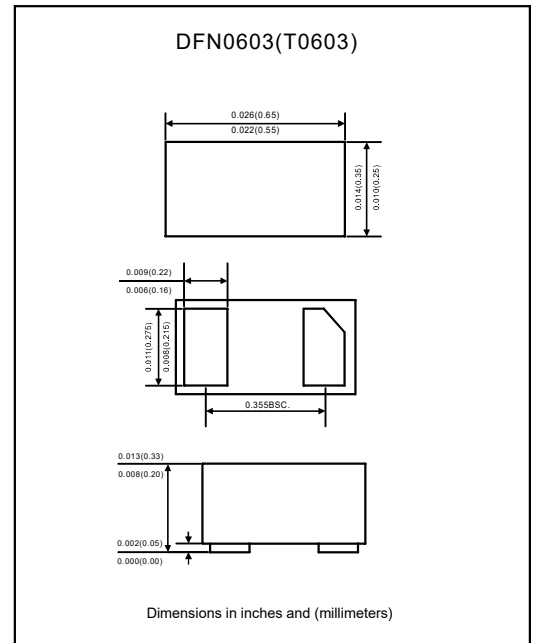
Applications

- Cellular Handsets and Accessories.
- Serial ATA.
- MDDI Ports.
- USB Ports.
- PCI Express and Serial SATA Ports.

Mechanical data

- Epoxy: UL94-V0 rated Flame retardant.
- Case: Molded plastic, DFN0603(T0603).
- Meets MSL level 6, per J-STD-020.
- Terminals: Solder plated, solder able per J-STD-020.
- Mounting Position: Any

Package outline



Maximum ratings (At $T_A=25^\circ\text{C}$ unless otherwise noted)

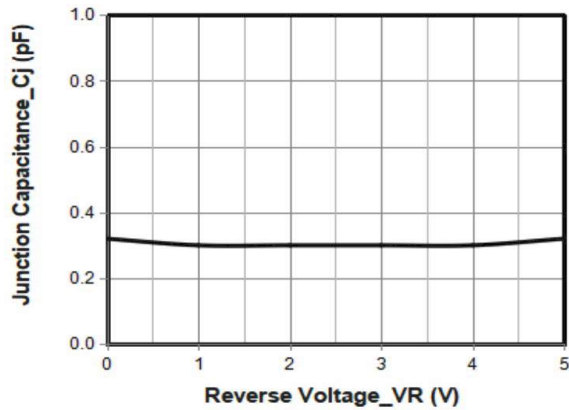
Parameter	Symbol	Value	Units
Peak Pulse Power (8/20 μs)	P_{PK}	90	W
Peak Pulse Current (8/20 μs)	I_{PP}	2.5	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 20	KV
ESD per IEC61000-4-2 (Contact)		± 15	
Operating Temperature range	T_J	-55 to +125	$^\circ\text{C}$
Storage Temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

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

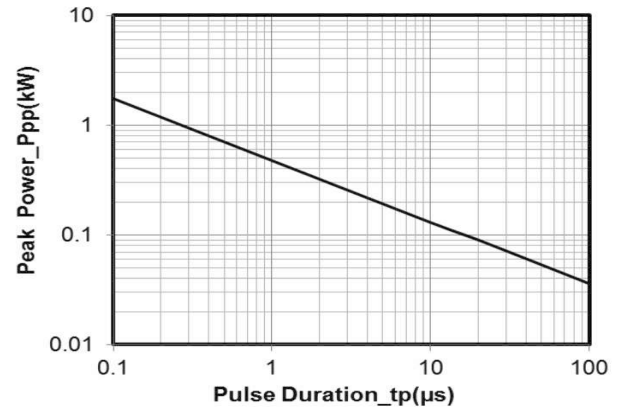
Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Units
Reverse Working Voltage		V_{RWM}			15.0	V
Reverse Breakdown Voltage	$I_T=1\text{mA}$	V_{BR}	16.7			V
Reverse Leakage Current	$V_{RWM}=15\text{V}$	I_R			0.20	μA
Clamping Voltage	$I_{PP}=1\text{A}$ (8/20 μs pulse)	V_C			26	V
	$I_{PP}=2.5\text{A}$ (8/20 μs pulse)				35	
Junction Capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$	C_J		0.3	0.5	pF

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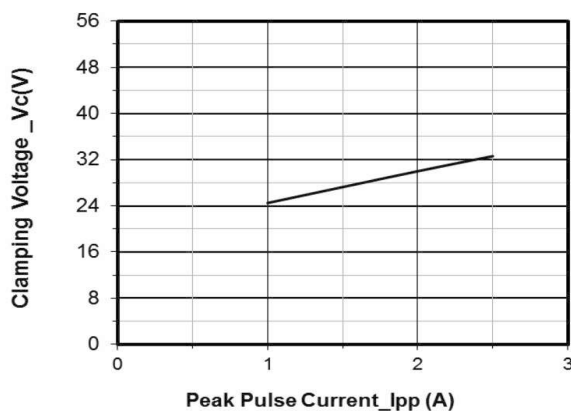
Rating and characteristic curves



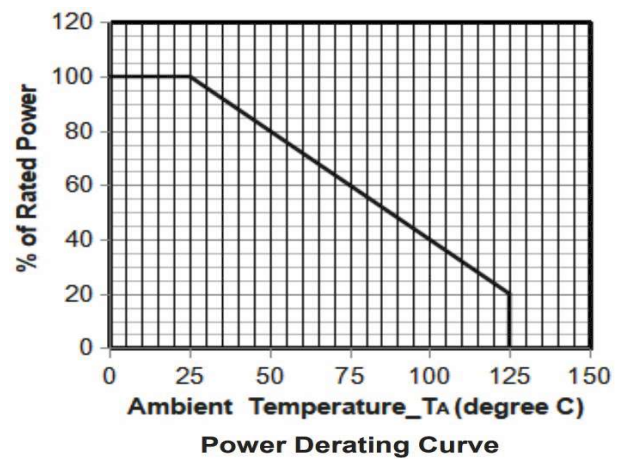
Junction Capacitance vs. Reverse Voltage



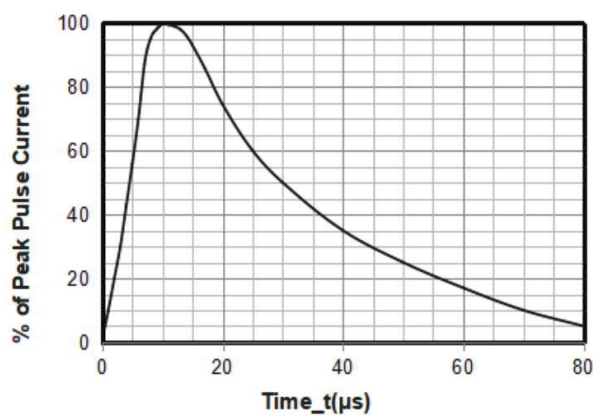
Peak Pulse Power vs. Pulse Time



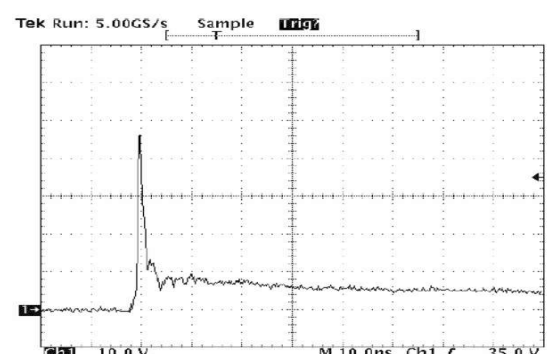
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform



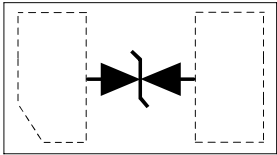
Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

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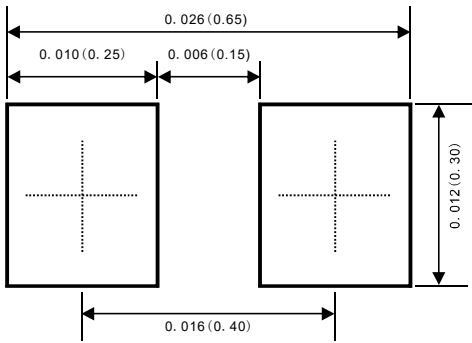
Pinning information

Type Number	Simplified outline	Circuit Diagram
LL18BT0603A		

Marking

Type number	Marking code
LL15BT0603A	HZ

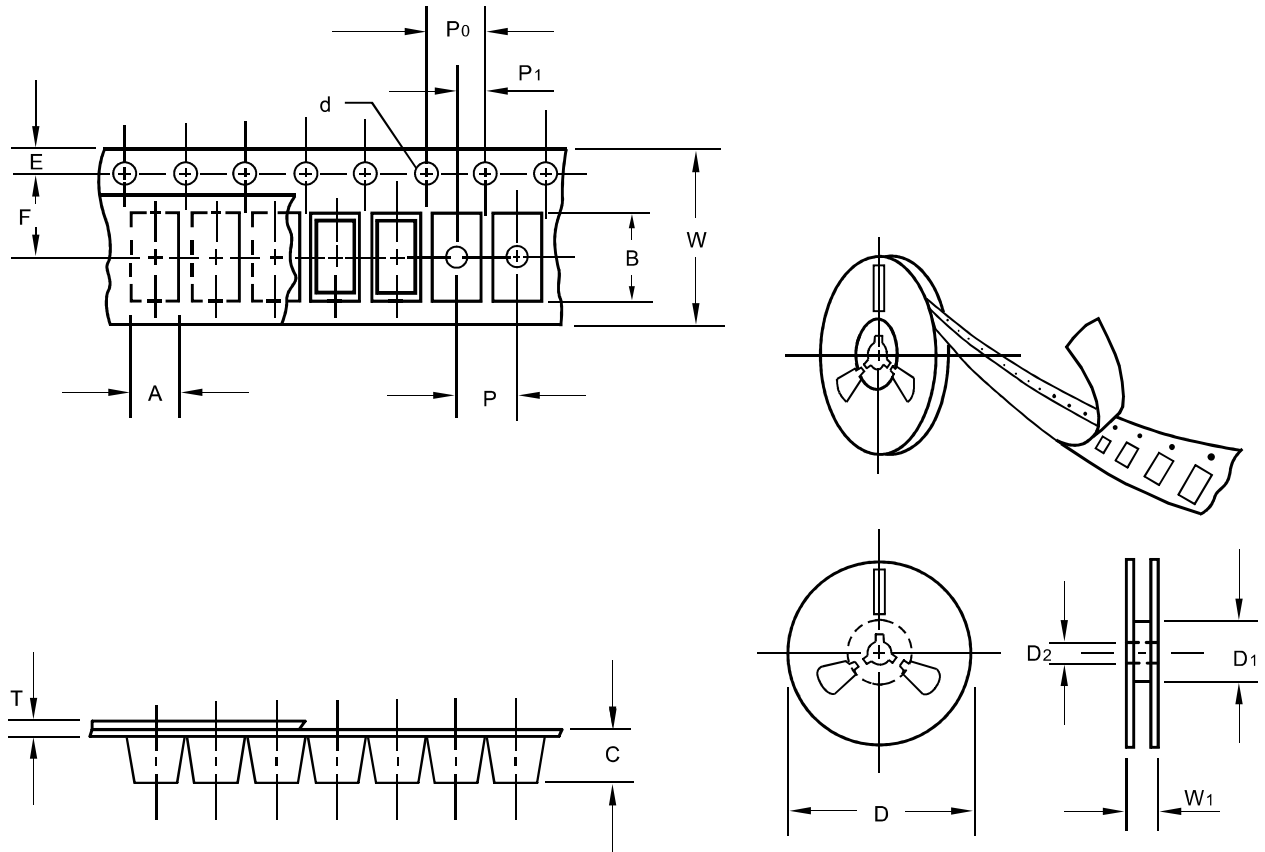
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	T0603
Carrier width	A	0.1	0.37
Carrier length	B	0.1	0.67
Carrier depth	C	0.1	0.32
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	60.00
Feed hole diameter	D2	0.2	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.18
Tape width	W	0.3	8.00
Reel width	W1	1.0	10.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

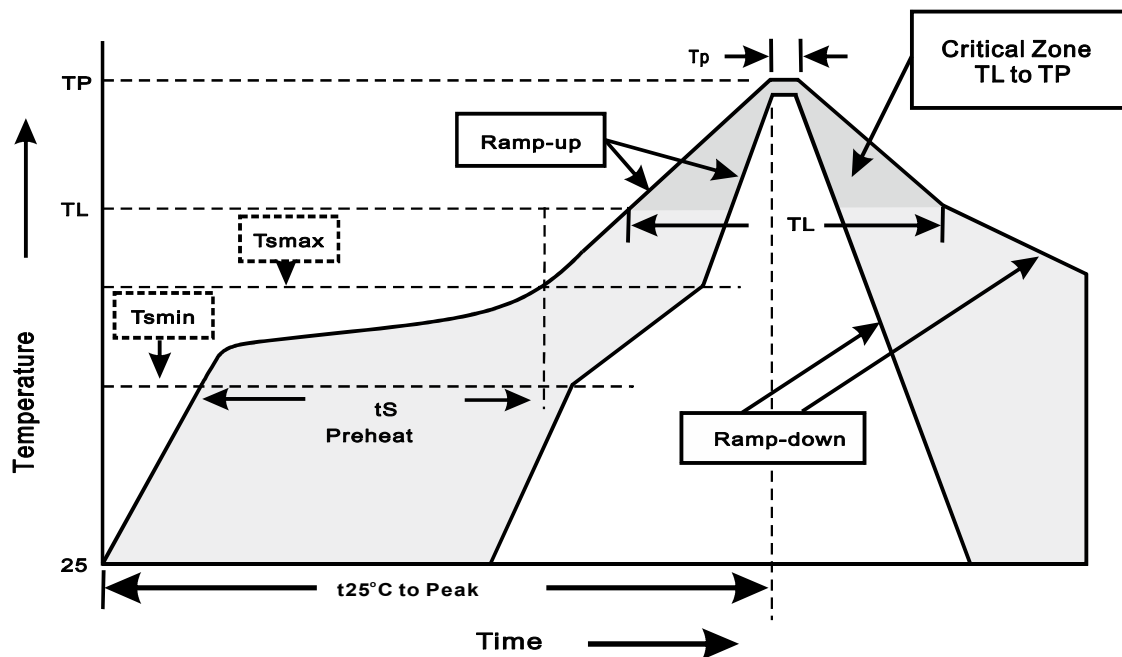
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
T0603	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000	2.6

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smín}) -Temperature Max(T _{smáx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smáx} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes