

Features

- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Up to 4 lines and one power line protects
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 25\text{kV}$
Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-5 (Lightning) 5A/8A (8/20 μs)
- RoHS Compliant

Applications

- USB Ports
- SIM Ports
- Smart Phones
- Wireless Systems
- Set-top box and digital TV
- Digital video interface (DVI)
- Ethernet 10/100/1000 Base T

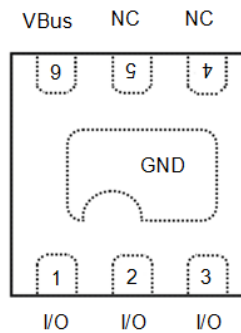
Mechanical Characteristics

- Package: DFN1616-6
- Lead Finish: Lead Free
- UL Flammability Classification Rating 94V-0
- Quantity Per Reel: 3,000 pcs
- Reel Size: 7inch
- Device Marking: 53M

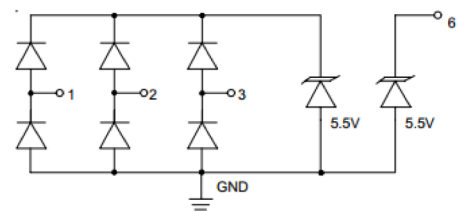
Absolute Maximum Ratings (T_{amb}=25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|------------------|-------------|------|
| DP, DM, USB ID (Pins 1, 2, 3) | | | |
| Peak Pulse Power (8/20 μs) | Ppk | 75 | W |
| Peak Pulse Current (8/20 μs) | I _{PP} | 5 | A |
| ESD per IEC 61000-4-2 (Air) | V _{ESD} | ± 25 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 20 | |
| Operating Temperature Range | T _J | -55 to +125 | °C |
| Storage Temperature Range | T _{stg} | -55 to +150 | °C |
| VBus (Pin 6) | | | |
| Peak Pulse Power (8/20 μs) | Ppk | 100 | W |
| Peak Pulse Current (8/20 μs) | I _{PP} | 8 | A |
| ESD per IEC 61000-4-2 (Air) | V _{ESD} | ± 25 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 20 | |
| Operating Temperature Range | T _J | -55 to +125 | °C |
| Storage Temperature Range | T _{stg} | -55 to +150 | °C |

Dimensions DFN1616-6



Pin Configuration

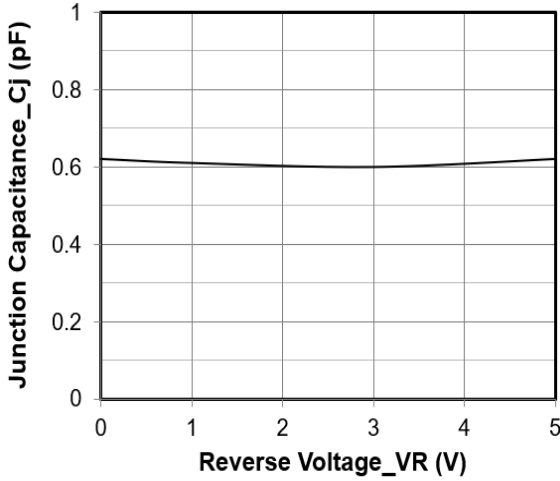


Electrical Characteristics(TA=25°C unless otherwise specified)

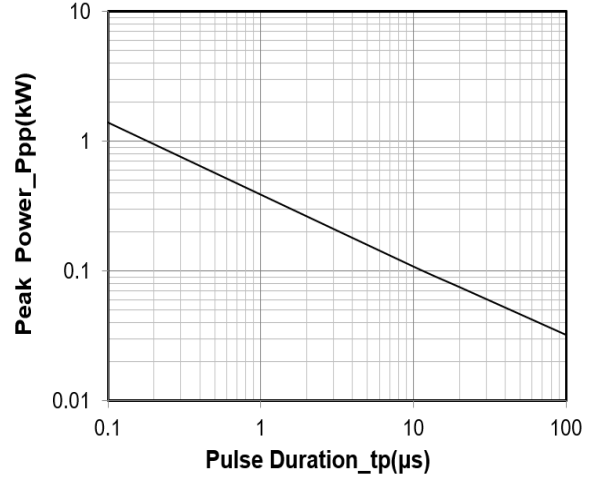
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---------------------------|--------|--|-----|-----|-----|------|
| DP, DM, USB ID TVS | | | | | | |
| Reverse Working Voltage | VRWM | Pin 1, 2, or 3 to ground | | | 5 | V |
| Breakdown Voltage | VBR | IT = 1mA, any I/O pin to ground | 6 | | | V |
| Reverse Leakage Current | IR | VRWM = 5V, any I/O pin to ground | | | 0.5 | μA |
| Clamping Voltage | VC | I _{PP} = 1A (8 x 20μs pulse), any I/O pin to ground | | | 10 | V |
| Clamping Voltage | VC | I _{PP} = 5A (8 x 20μs pulse), any I/O pin to ground | | | 15 | V |
| Junction Capacitance | CJ | VR = 0V, f = 1MHz, between I/O pins | | | 0.4 | pF |
| Junction Capacitance | CJ | VR = 0V, f = 1MHz, any I/O pin to ground | | 0.6 | 0.8 | pF |

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|-------------------------|--------|--|-----|-----|-----|------|
| VBus TVS | | | | | | |
| Reverse Working Voltage | VRWM | Pin 6 to ground | | | 5.5 | V |
| Breakdown Voltage | VBR | IT = 1mA, Pin 6 to ground | 6 | | 8.5 | V |
| Reverse Leakage Current | IR | VRWM = 5.5V, Pin 6 to ground | | | 0.5 | μA |
| Clamping Voltage | VC | I _{PP} = 1A (8 x 20μs pulse), Pin 6 to ground | | | 8 | V |
| Clamping Voltage | VC | I _{PP} = 8A (8 x 20μs pulse), Pin 6 to ground | | | 12 | V |
| Junction Capacitance | CJ | VR = 0V, f = 1MHz, Pin 6 to ground | | 60 | | pF |

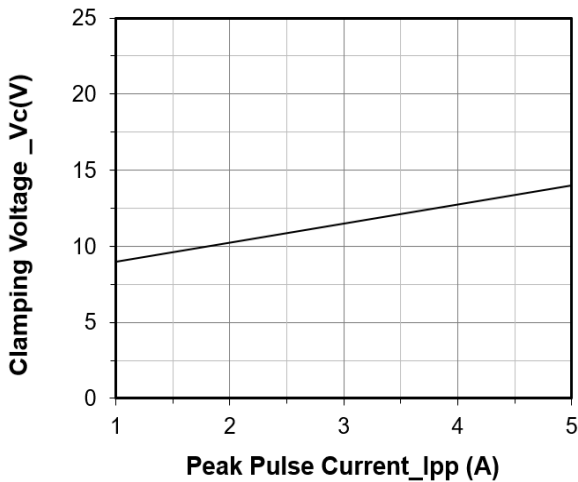
Typical Performance Characteristics(TA=25°C unless otherwise specified)



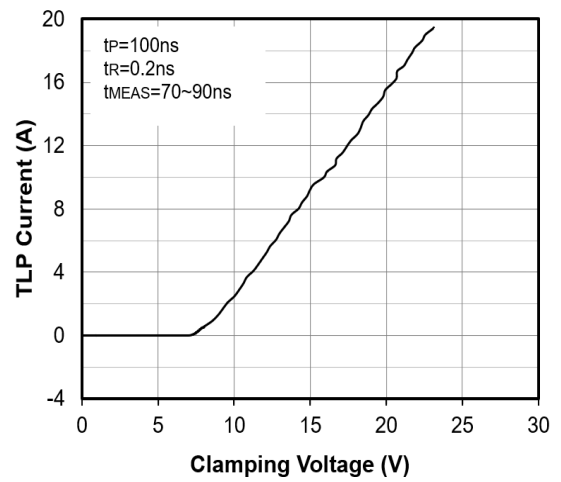
Junction Capacitance vs. Reverse Voltage



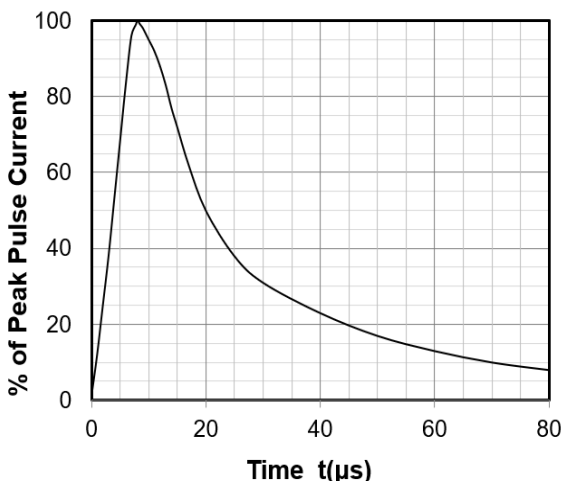
Peak Pulse Power vs. Pulse Time



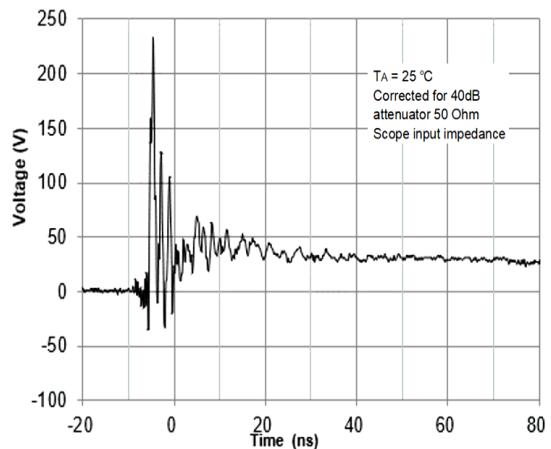
Clamping Voltage vs. Peak Pulse Current



TLP Measurement



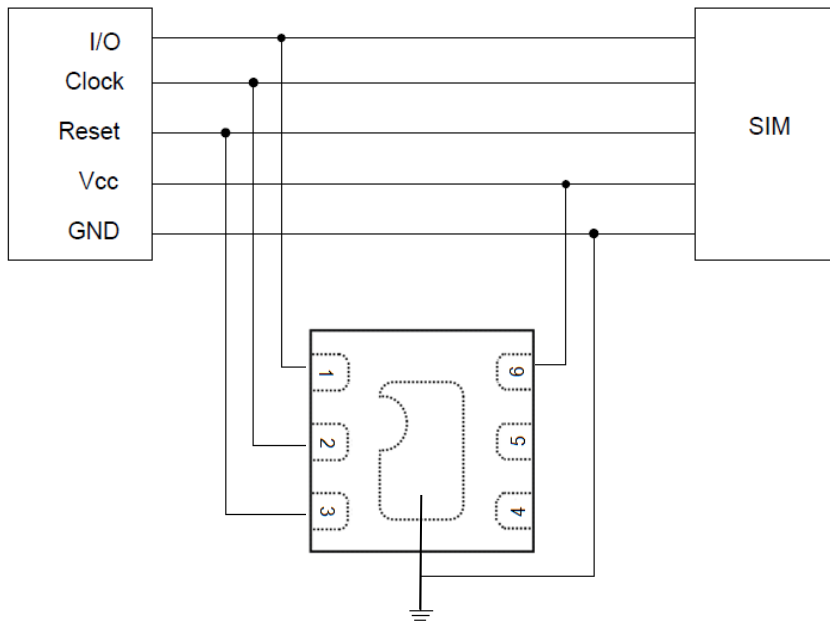
8 X 20μs Pulse Waveform



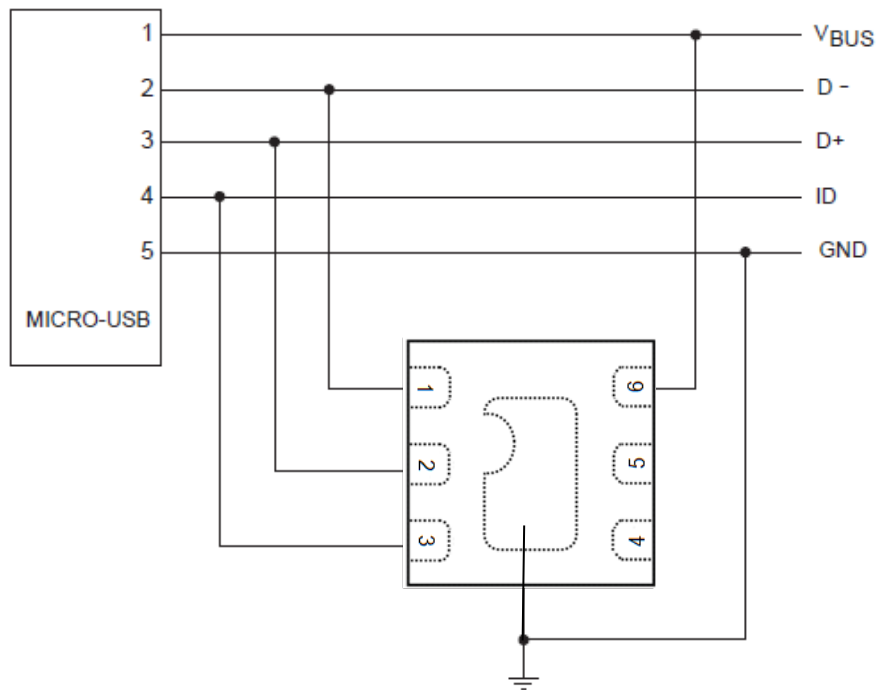
ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

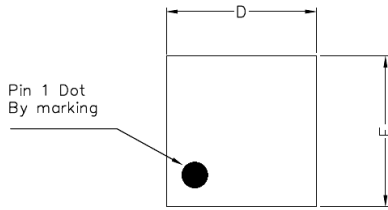
LC0504PL6 on SIM Port Application



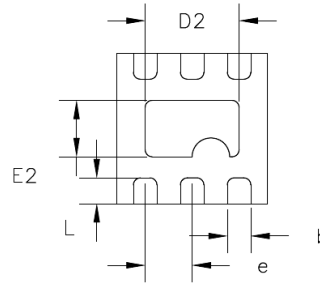
LC0504PL6 on USB Port Application



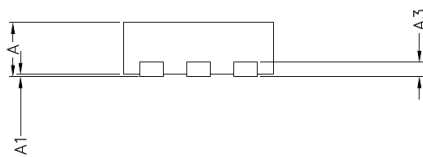
DFN1616-6 Package Outline Drawing



TOP VIEW



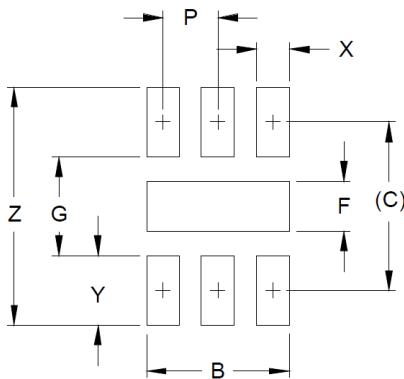
BOTTOM VIEW



SIDE VIEW

| SYM | DIMENSIONS(MM) | | |
|-----|----------------|------|------|
| | MIN | NOM | MAX |
| A | 0.50 | 0.55 | 0.60 |
| A1 | 0.00 | - | 0.05 |
| A3 | 0.15 REF | | |
| D | 1.55 | 1.60 | 1.65 |
| E | 1.55 | 1.60 | 1.65 |
| D2 | 0.85 | 1.00 | 1.10 |
| E2 | 0.45 | 0.60 | 0.70 |
| L | 0.20 | 0.25 | 0.30 |
| b | 0.20 | 0.25 | 0.30 |
| e | 0.50 BSC | | |

Suggested Land Pattern



| SYM | DIMENSIONS | |
|-----|-------------|--------|
| | MILLIMETERS | INCHES |
| B | 1.30 | 0.051 |
| C | 1.52 | 0.060 |
| P | 0.50 | 0.020 |
| F | 0.45 | 0.018 |
| G | 0.89 | 0.035 |
| X | 0.30 | 0.012 |
| Y | 0.63 | 0.025 |
| Z | 2.15 | 0.085 |

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