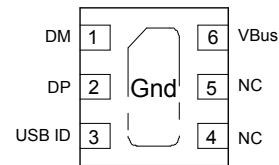


Features

- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 25\text{kV}$
 - Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS Compliant

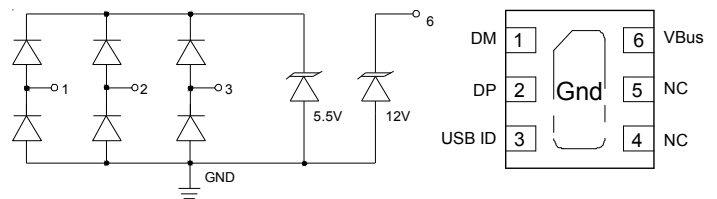
Dimensions DFN1616-6



Applications

- USB 2.0
- USB STG

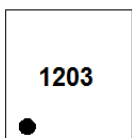
Pin Configuration



Mechanical Characteristics

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

Marking Information



1203 = Device Marking Code
Dot denotes Pin1

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
DP, DM, USB ID (Pins 1, 2, 3)			
Peak Pulse Power (8/20 μs)	Ppk	100	W
Peak Pulse Current (8/20 μs)	I _{PP}	5	A
ESD per IEC 61000-4-2 (Air)	VESD	± 25	kV
ESD per IEC 61000-4-2 (Contact)		± 20	
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$
VBus (Pin 6)			
Peak Pulse Power (8/20 μs)	Ppk	300	W
Peak Pulse Current (8/20 μs)	I _{PP}	12	A
ESD per IEC 61000-4-2 (Air)	VESD	± 25	kV
ESD per IEC 61000-4-2 (Contact)		± 20	
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

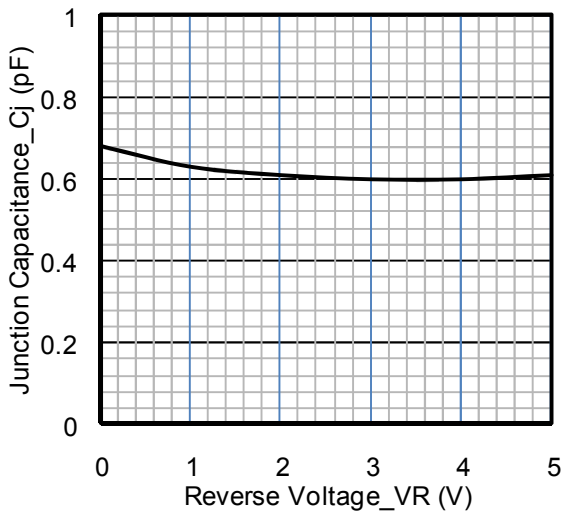
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
DP, DM, USB ID TVS						
Reverse Working Voltage	V _{RWM}			5.5	V	Any I/O to ground
Breakdown Voltage	V _{BR}	6.5			V	I _T = 1mA, any I/O to ground
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5.5V, any I/O to ground
Clamping Voltage	V _C			10	V	I _{PP} = 1A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	V _C			20	V	I _{PP} = 5A (8 x 20 μs pulse), any I/O pin to ground
Junction Capacitance	C _J			0.5	pF	V _R = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C _J			0.8	pF	V _R = 0V, f = 1MHz, any I/O pin to ground

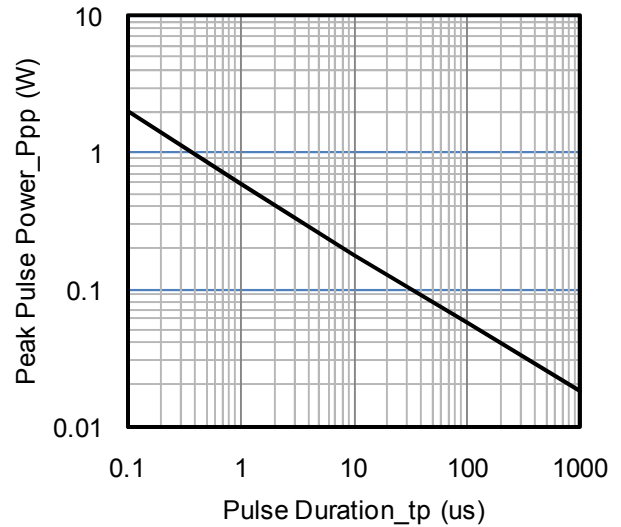
Note: I/O Pins are 1, 2, 3

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
VBus TVS						
Reverse Working Voltage	VRWM			12	V	Pin 6 to ground
Breakdown Voltage	VBR	13.3		18	V	IT = 1mA, pin 6 to ground
Reverse Leakage Current	IR			0.2	μA	VRWM = 12V, pin 6 to ground
Clamping Voltage	VC			18	V	I _{PP} = 1A (8 x 20μs pulse), pin 6 to ground
Clamping Voltage	VC			25	V	I _{PP} = 12A (8 x 20μs pulse), pin 6 to ground
Junction Capacitance	CJ			100	pF	VR = 0V, f = 1MHz, pin 6 to ground

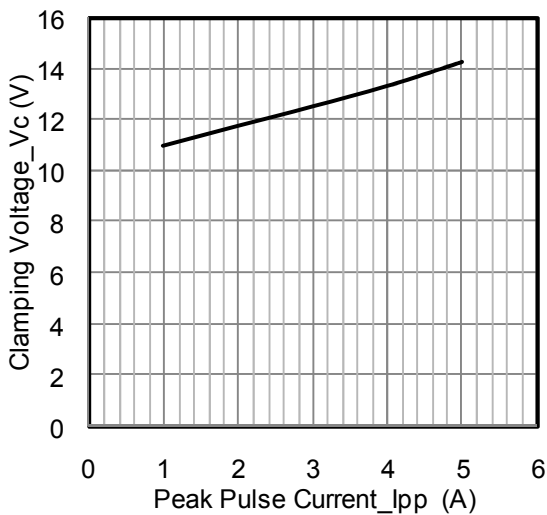
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



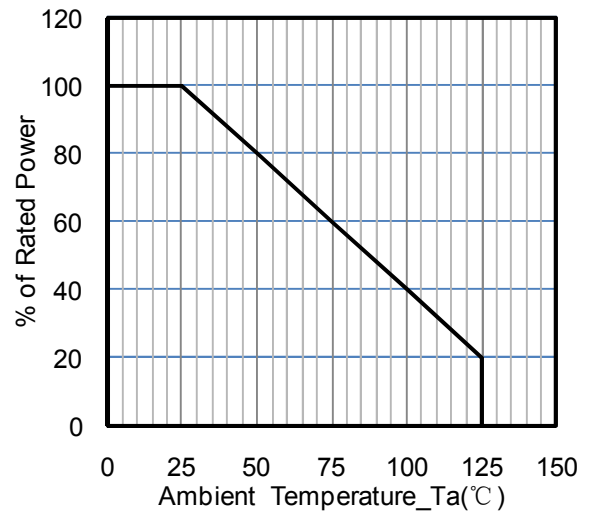
Junction Capacitance vs. Reverse Voltage



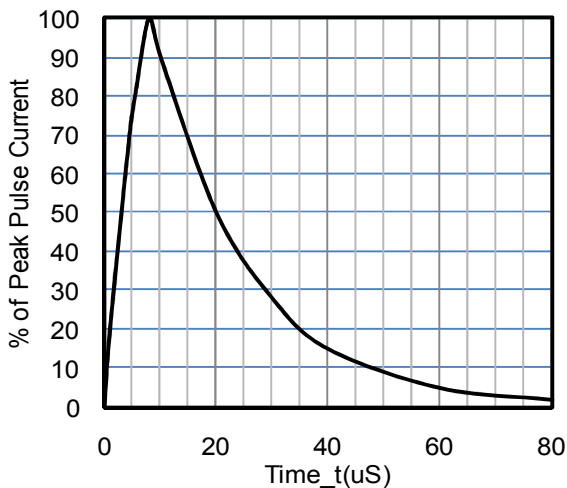
Peak Pulse Power vs. Pulse Time



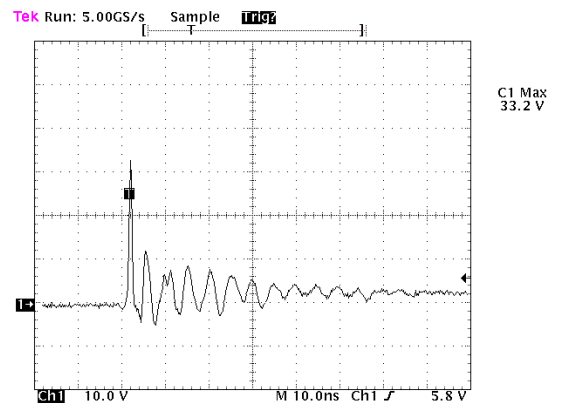
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



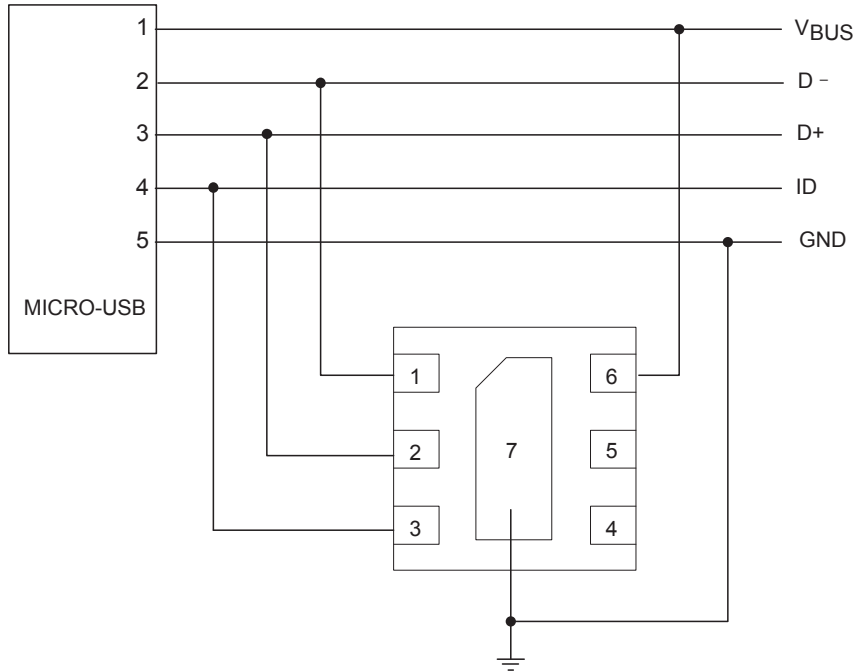
8 X 20us Pulse Waveform



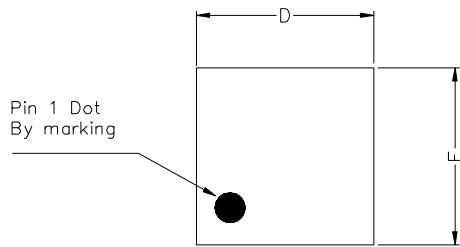
ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

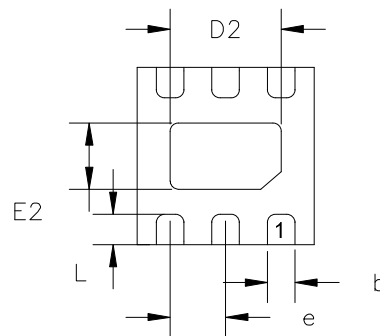
ULC1654N on USB Port Application



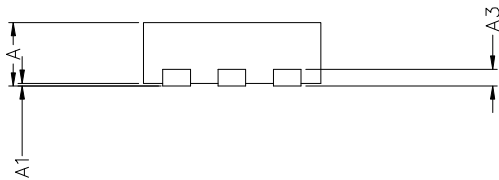
DFN1616-6 Package Outline Drawing



TOP VIEW



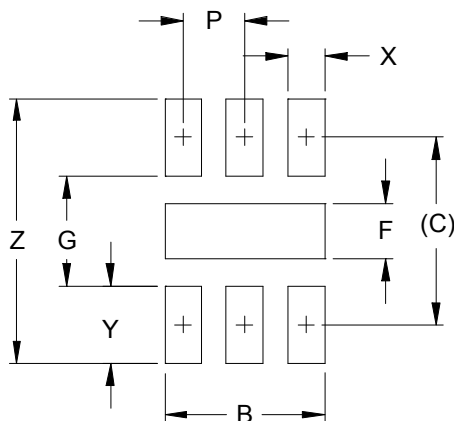
BOTTOM VIEW



SIDE VIEW

PKG. REF.	COMMON DIMENSIONS(MM)		
	UT: ULTRA THIN		
	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	0.90	1.00	1.05
E2	0.50	0.60	0.65
L	0.20	0.25	0.30
b	0.20	0.25	0.30
e	0.50 BSC		

Suggested Land Pattern



DIM	DIMENSIONS	
	INCHES	MILLIMETERS
B	.051	1.30
C	.060	1.52
P	.020	0.50
F	.018	0.45
G	.035	0.89
X	.012	0.30
Y	.025	0.63
Z	.085	2.15