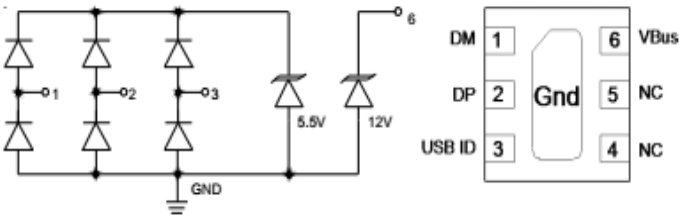
Description

The JLE12URF6-6 is a low capacitance TVS array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The JLE12URF6-6 complies with the IEC 61000-4-2 (ESD) standard with ±25kV air and ±20kV contact discharge. It is assembled into a 6-pin DFN1616-6 lead-free package. The leads are finished with NiPdAu. Each device will protect up to four high-speed lines. The combination of small size, low capacitance, and high surge capability makes them ideal for use in applications such as USB ports.

Features

* 100W peak pulse power (8/20μs)
* Low leakage:nA level
* Operating voltage: 12V
* Low clamping voltage
* Up to 3 lines and one power line protects
* Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±25kV
    Contact discharge: ±20kV
  – IEC61000-4-5 (Lightning) 5A (8/20μs)
* RoHS Compliant
* Package: DFN1616-6

Circuit Diagram

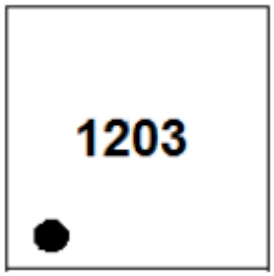


Circuit and Pin Schematic

Applications

* USB2.0
* USB OTG

Marking Diagram



Transparent top view

1203:Device Marking Code

Ordering Information

Part Number	Packaging	Reel Size
JLE12URF6-6	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
DP,DM,USB ID (Pins 1,2,3)			
Peak Pulse Power (8/20μs)	Ppk	100	W
Peak Pulse Current (8/20μs)	IPP	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±25 ±20	kV
Operating Temperature Range	TJ	−55to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C
VBus (Pins 6)			
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	IPP	12	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±25 ±20	kV
Operating Temperature Range	TJ	−55to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

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

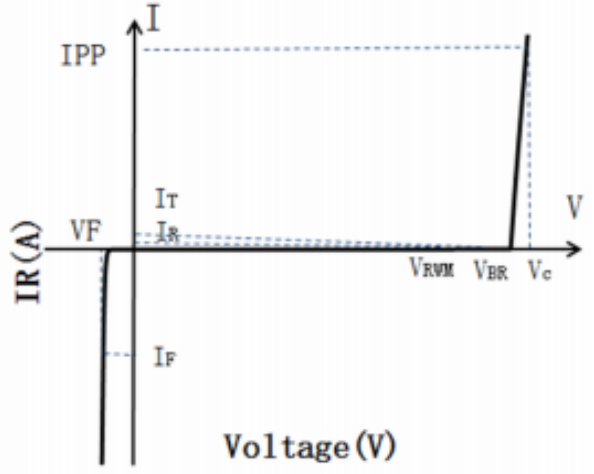
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DP,DM,USB ID TVS						
Reverse Working Voltage	V_{RWM}	Any I/O to ground			5.5	V
Breakdown Voltage	V_{BR}	I_T = 1mA,any I/O to ground	6.5			V
Reverse Leakage Current	I_R	V_{RWM} = 5.5V,any I/O to ground			0.5	uA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse), any I/O pin to ground			10	V
Clamping Voltage	V_C	I_{PP} = 5A (8 x 20μs pulse)， any I/O pin to ground			20	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz,any I/O pins(1,2,3)			0.5	pF
Junction Capacitance	C_J	VR = 0V, f = 1MHz,any I/O pin to ground			0.8	pF

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

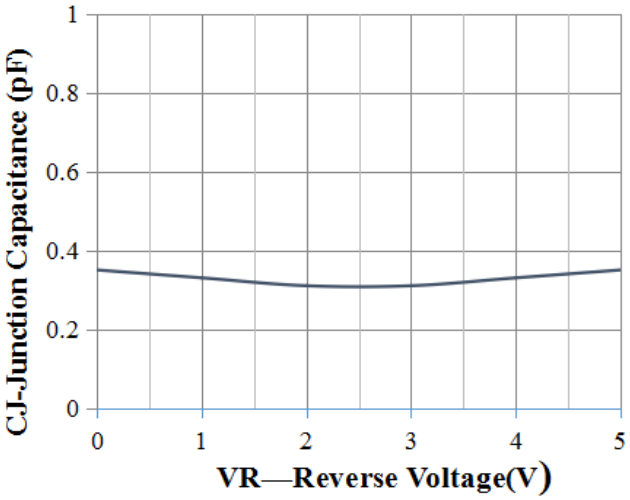
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
VBus TVS						
Reverse Working Voltage	V_{RWM}	Pin 6 to ground			12	V
Breakdown Voltage	V_{BR}	I_T = 1mA,pin 6 to ground	13.3		18	V
Reverse Leakage Current	I_R	V_{RWM} = 5.5V,pin 6 to ground			0.2	uA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse), pin 6 to ground			18	V
Clamping Voltage	V_C	I_{PP} = 8A (8 x 20μs pulse)， pin 6 to ground			25	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz, pin 6 to ground			100	pF

Portion Electronics Parameter

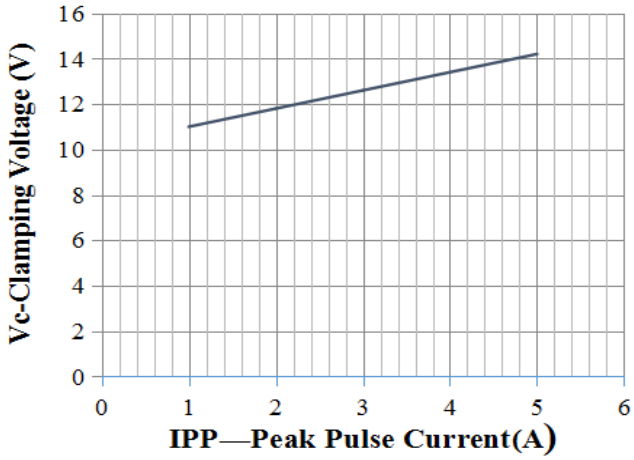
Symbol	Parameter
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
Vc	Clamping Voltage @Ic



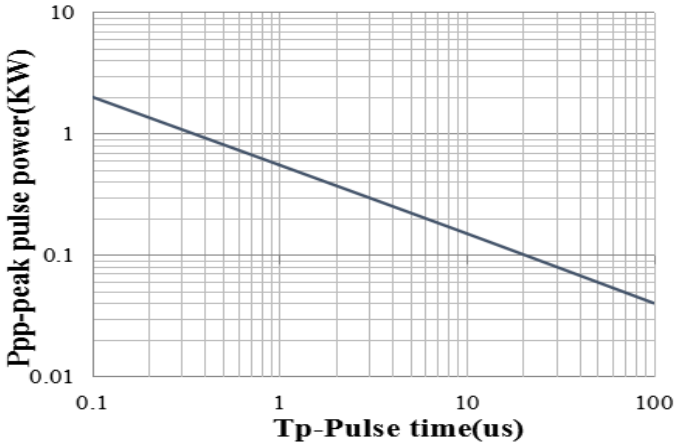
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



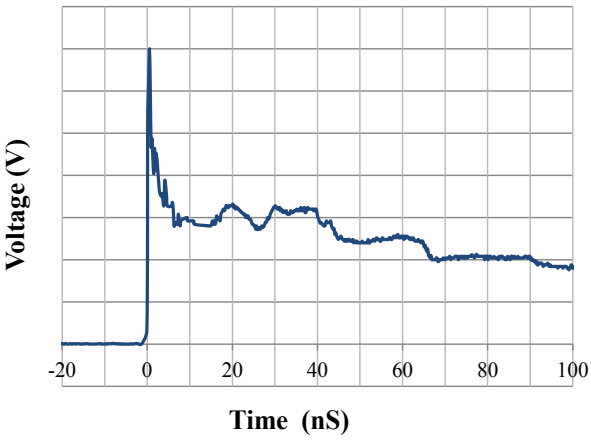
Junction Capacitance vs. Reverse Voltage



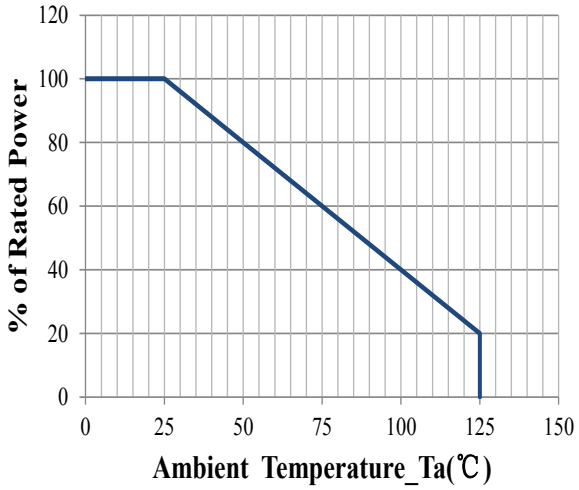
Clamping Voltage vs. Peak Pulse Current



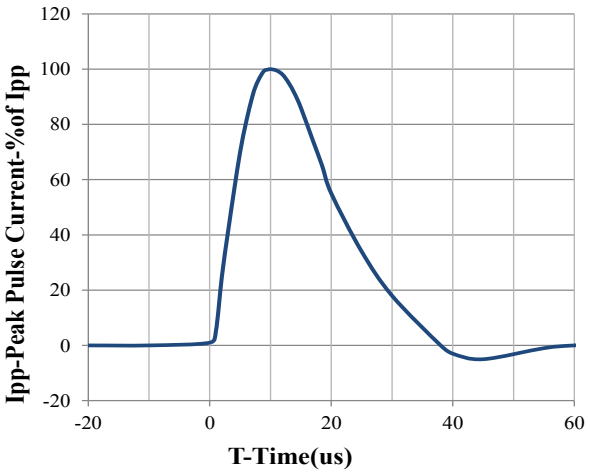
Peak Pulse Power vs. Pulse Time



IEC61000−4−2 Pulse Waveform

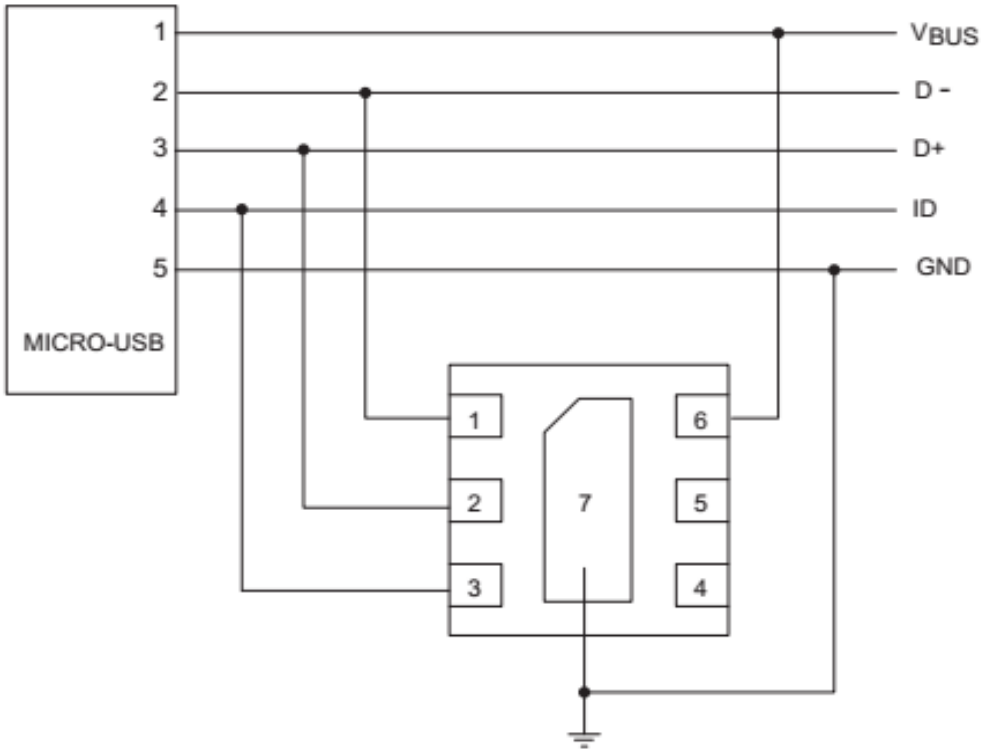


Power Derating Curve

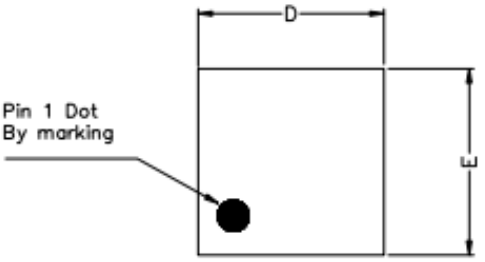


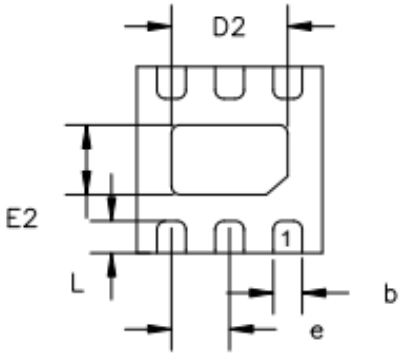
8 X 20us Pulse Waveform

On USB Port Application



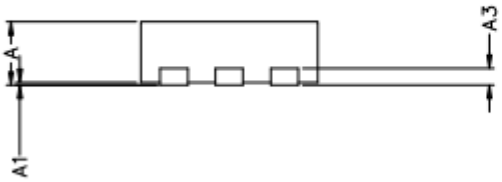
DFN1616-6 Package Outline Drawing (Dimensions in millimeters)





TOP VIEW

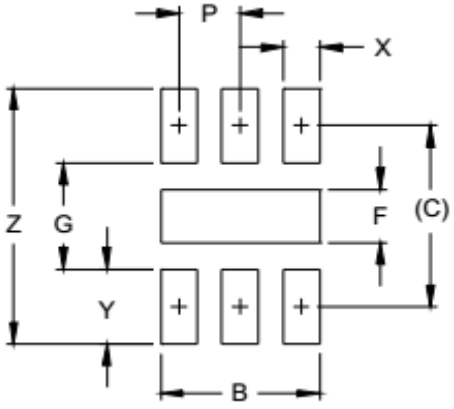
BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS(MM)			
PKG.	UT:ULTRA THIN		
REF.	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



DIMENSIONS		
DIM	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

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