

### Features

- Transient protection for high-speed data lines to
- **IEC 61000-4-2 (ESD) ±15kV (air), ±8kV (contact)**
- **IEC 61000-4-4 (EFT) 40A (5/50ns)**
- Array of surge rated diodes with internal TVS Diode
- Small package (1.6 x 1.6mm) saves board space
- Protects USB DP, DM, and ID Pin operating up to 5.5V
- Protects USB VBus operating up to 28V
- Low capacitance (**<1pF**) on DP, DM, and ID Pins
- No insertion loss to **2.0GHz**
- Low leakage current
- Low clamping voltage
- Large ground pad for increased ESD performance
- Solid-state silicon-avalanche technology

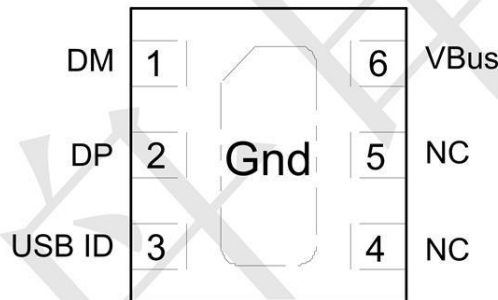
### Mechanical Characteristics

- Package: DFN1616-6
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Shipping Qty :3000pcs/7Inch Tape & Reel

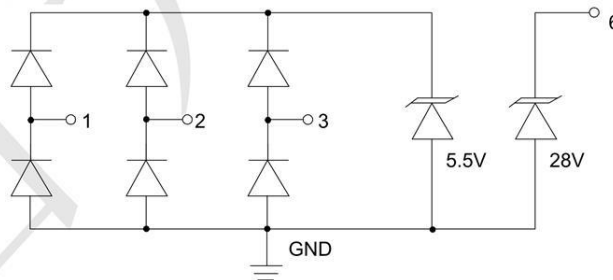
### Applications

- USB 2.0
- USB OTG
- SD Card Interfaces
- SIM Ports
- MDDI Ports
- MPPI Ports

### Dimensions and Pin Configuration



Marking:3654A



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

Rating	Symbol	Value	Units
DP, DM, USB ID (Pins 1, 2, 3)			
Peak Pulse Power ( $t_p = 8/20\mu\text{s}$ )	$P_{pk}$	100	Watts
Peak Pulse Current ( $t_p = 8/20\mu\text{s}$ )	$I_{pp}$	3	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$V_{ESD}$	$\pm 15$ $\pm 8$	kV
Operating Temperature	$T_J$	-55 to +125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$
VBus (Pin 6)			
Peak Pulse Power ( $t_p = 8/20\mu\text{s}$ )	$P_{pk}$	350	Watts
Peak Pulse Current ( $t_p = 8/20\mu\text{s}$ )	$I_{pp}$	4	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$V_{ESD}$	$\pm 15$ $\pm 8$	kV
Operating Temperature	$T_J$	-55 to +125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$

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

DM, DP, USB ID TVS (Pins 1, 2, 3)						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	$V_{RWM}$	Pin 1, 2, or 3 to GND			5.5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_t = 1mA$ , Pin 1, 2, or 3 to GND	6.5	8	10	V
Reverse Leakage Current	$I_R$	$V_{RWM} = 5.5V$ , Pin 1, 2, or 3 to GND		0.100	1	$\mu A$
Forward Voltage	$V_F$	$I_f = 15mA$ GND to Pin 1, 2, or 3	0.6		1.2	V
Clamping Voltage	$V_C$	$I_{pp} = 1A$ , $t_p = 8/20\mu s$ Pin 1, 2, or 3 to GND			15	V
Clamping Voltage	$V_C$	$I_{pp} = 3A$ , $t_p = 8/20\mu s$ Pin 1, 2, or 3 to GND			30	V
Junction Capacitance	$C_J$	$V_R = 0V$ , $f = 1MHz$ , Pin 1, 2, or 3 to GND		0.8	0.95	pF
		$V_R = 0V$ , $f = 1MHz$ , Between I/O pins			0.5	pF

### Typical Performance Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise Specified)

Fig1. 8/20 $\mu\text{s}$  Pulse Waveform

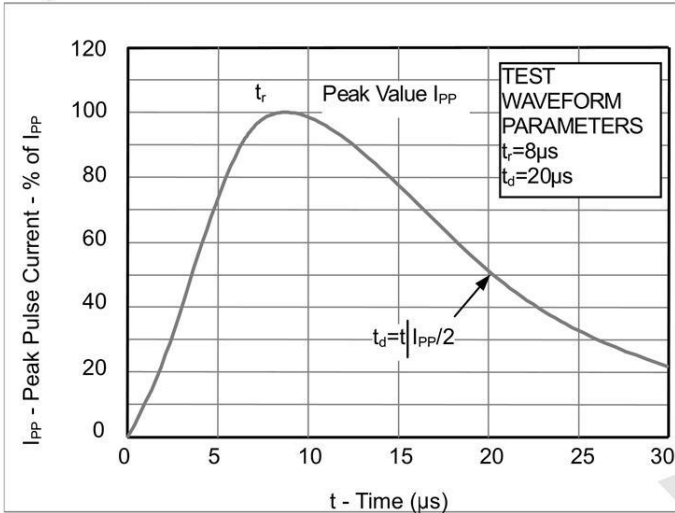


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

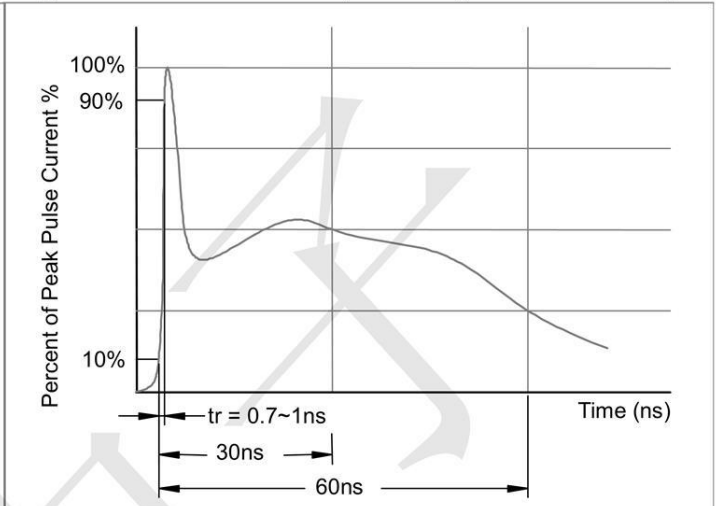
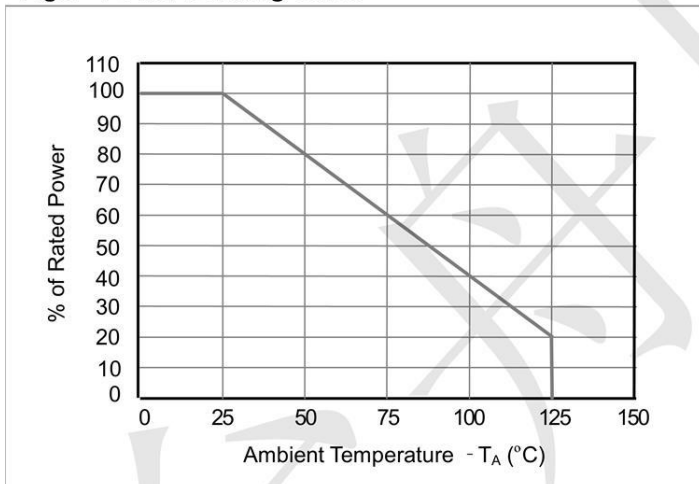
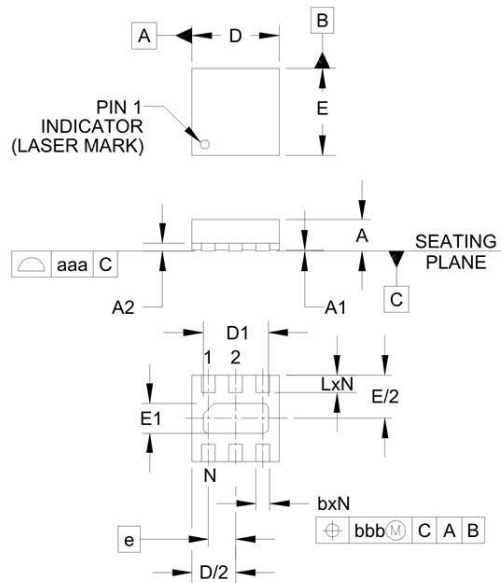


Fig3. Power Derating Curve

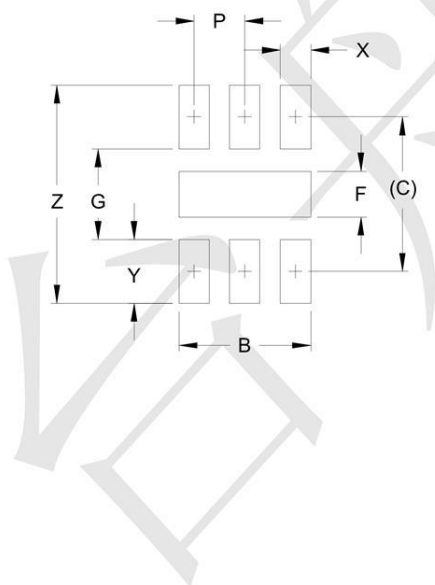


### Outline Drawing -DFN1616-6



DIM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.020	.023	.026	0.50	0.58	0.65
A1	0.00	.001	.002	0.00	0.03	0.05
A2		(.006)			(0.15)	
b	.007	.010	.012	0.20	0.25	0.30
D	.059	.063	.067	1.50	1.60	1.70
D1	.041	.047	.051	1.05	1.20	1.30
E	.059	.063	.067	1.50	1.60	1.70
E1	.016	.022	.026	0.40	0.55	0.65
e		.020 BSC			0.50 BSC	
L	.013	.013	.016	0.25	0.33	0.40
N		6			6	
aaa		.004			0.09	
bbb		.004			0.09	

### Land Pattern -DFN1616-6



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

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