Etek Microelectronics

ES45DPK

Transient Voltage Suppressor

Features

- Small Body Outline Dimensions: 0.063″x 0.040″(1.6 mm x 1. 0 mm)
- Protects one I/O or power line
- Low Clamping Voltage
- Working Voltage: 4.7V
- Low Leakage Current
- Response Time is Typically < 1 ns

IEC COMPATIBILITY (EN61000-4)

- **IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)**
- **IEC 61000-4-4 (EFT) 40A (5/50ns)**
- **IEC 61000-4-5 (Lightning) 180A (8/20μs)**

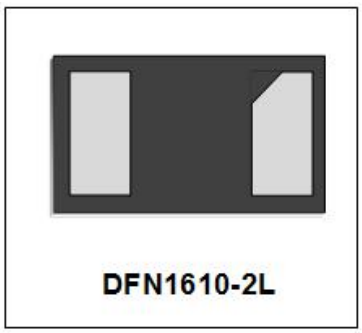
Mechanical Characteristics

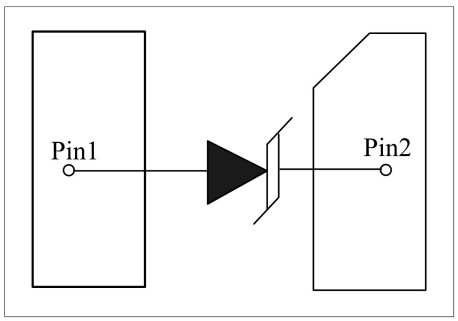
- DFN1610-2L package
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS Compliant
- MSL1

Applications

- Laptop Computers
- Cellular Phones
- Digital Cameras
- Personal Digital Assistants (PDAs)

Schematic & PIN Configuration



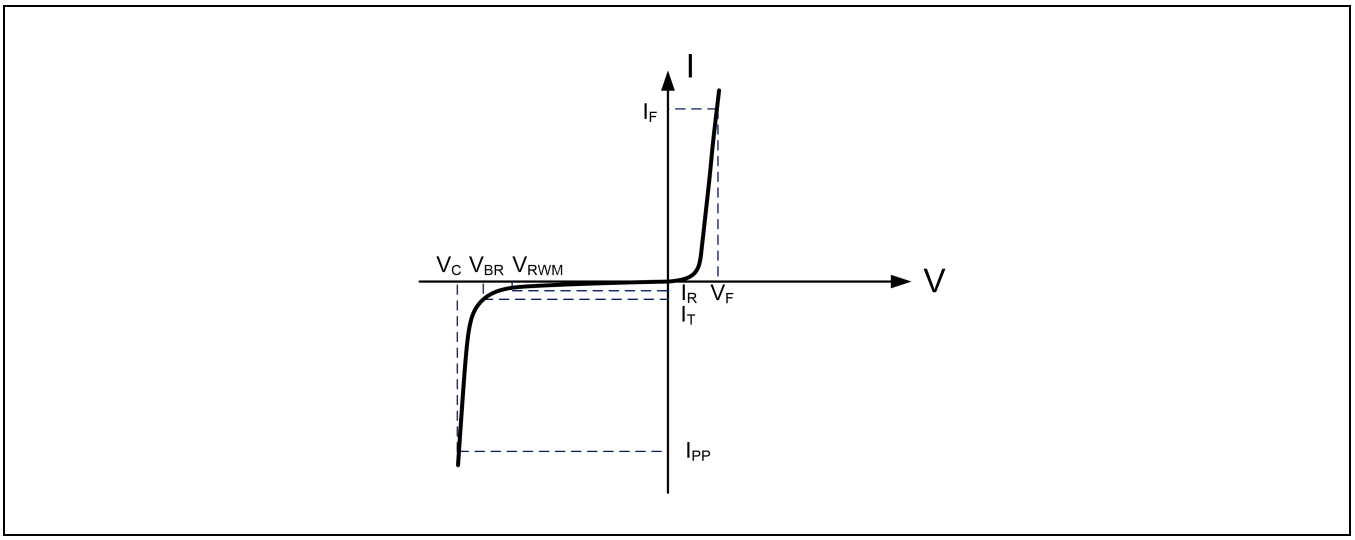


Rating	Symbol	Value	Units
Peak Pulse Power（t_p =8/20μs）	P_{PP}	2700	Watts
Peak Pulse Current（t_p =8/20μs）	I_{PP}	180	A
Operating Temperature	T_J	-55 to + 125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

Absolute Maximum Rating

Electrical Parameters (T=25℃)

Symbol	Parameter
IPP	Reverse Peak Pulse Current
VC	Clamping Voltage @ IPP
VRWM	Reverse Stand-Off Voltage
IR	Reverse Leakage Current @ VRWM
VBR	Breakdown Voltage @ IT
IT	Test Current
IF	Forward Current
VF	Forward Voltage @ IF



Electrical Characteristics

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				4.7	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	5.5	5.9	6.5	V
Forward Voltage	V_F	I_F=10mA	0.6		1.0	V
Reverse Leakage Current	I_R	V_{RWM}=4.7V,T=25℃			100	nA
Clamping Voltage[3]	V_C	I_{PP}=100A,t_p=8/20μs		10	11	V
Clamping Voltage[3]	V_C	I_{PP}=150A,t_p=8/20μs		12	13	V
Clamping Voltage[3]	V_C	I_{PP}=180A,t_p=8/20μs		13	15	V
Dynamic Resistance[1,2,3]	R_{DYN}	TLP=0.2/100ns		0.05		Ω
Junction Capacitance[3]	C_j	V_R=0V, f=1MHz		550	700	pF

Notes: 1. TLP Setting：t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window:t_1=70ns to t_2=90ns.
2. Dynamic resistance calculated from I_{PP}=4A to I_{PP}=16A using “Best Fit”.
3. These specifications are guaranteed by design and characterization. Not FT item.

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

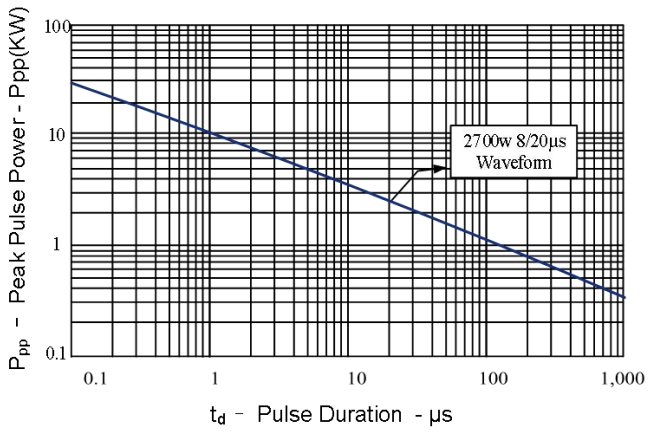


Figure 2: Power Derating Curve

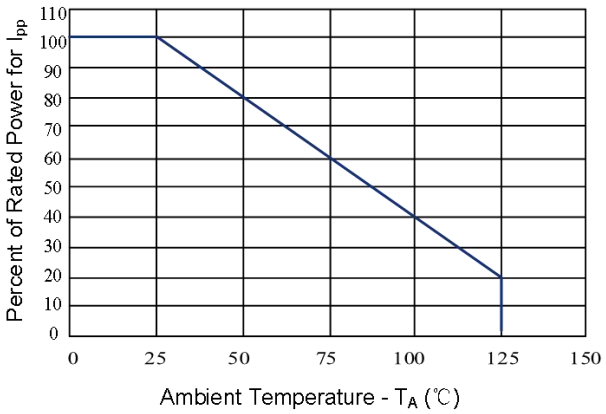


Figure 3: Clamping Voltage vs. Peak Pulse Current

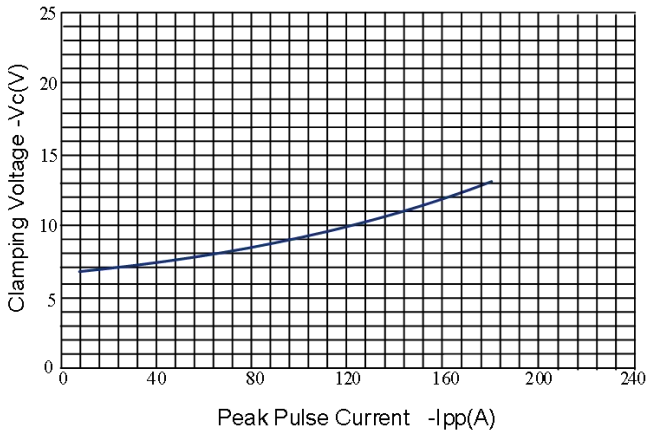


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

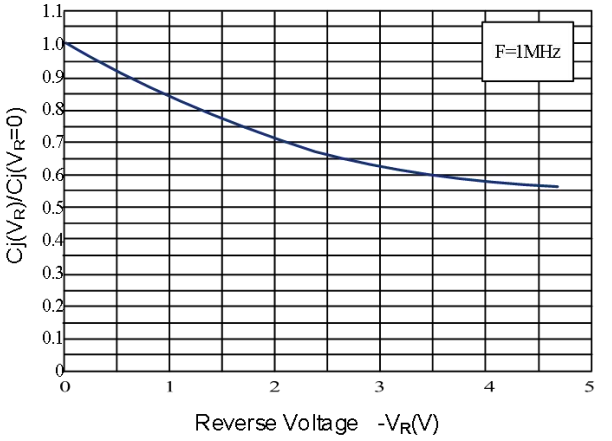


Figure 5: 8/20μs Pulse Waveform

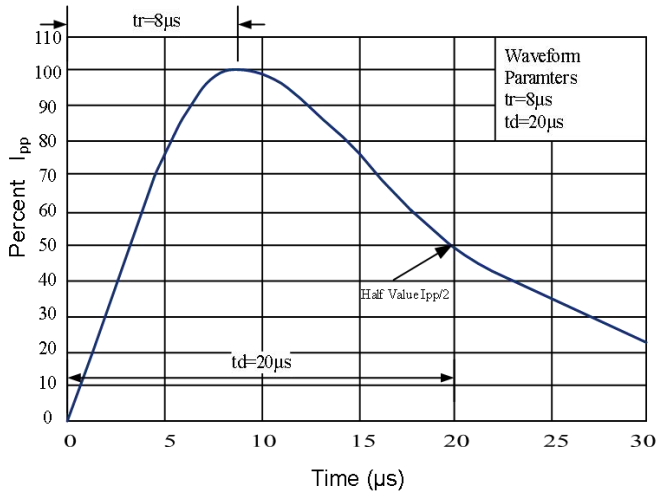
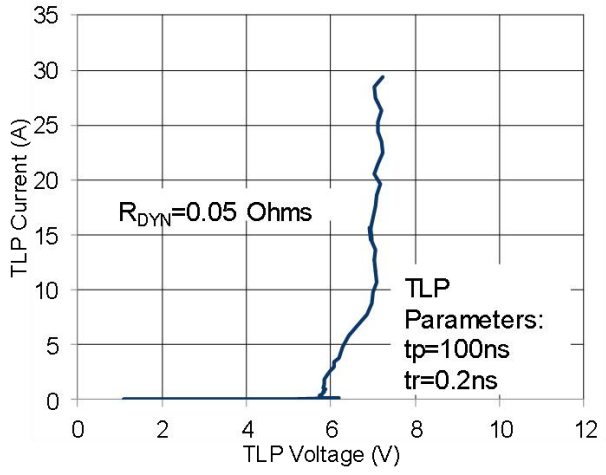
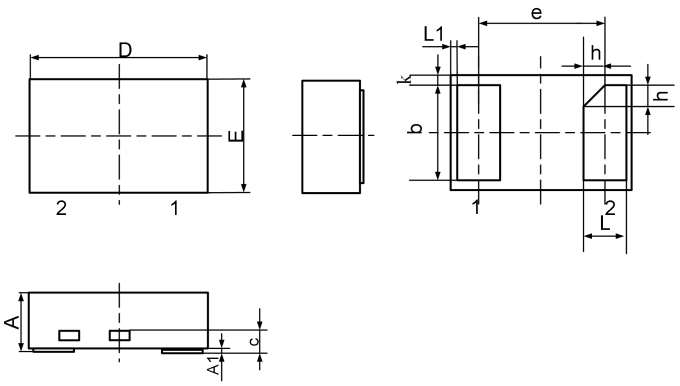


Figure 6: TLP I-V Curve



Outline Drawing –DFN1610-2L

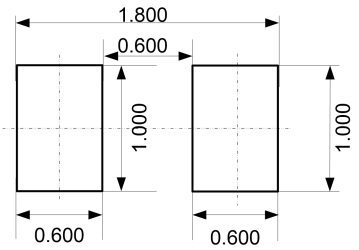
PACKAGE OUTLINE



DIMENSIONS

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.450	0.500	0.550
A1	0.000	0.020	0.050
b	0.750	0.800	0.850
c		0.152REF	
D	1.550	1.600	1.650
e		1.100BSC	
E	0.950	1.000	1.050
L	0.350	0.400	0.450
L1		0.05REF	
h	0.150	0.200	0.250
k	0.050	0.100	0.150

Land Pattern



Marking Codes

Part Number	Marking Code
ES45DPK	Pin2 MX Pin1 M=Specific Device Code X=Month Code

Package Information

Qty：10k/Reel

Revision History

NO.	Version	Date	Revision Item	Confirm
1	1.0	2018-09-17	Released Version	
2	1.1	2020-03-17	Add MSL level	
3	1.2	2020-06-15	Update Package Information	