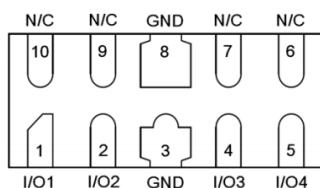


## Transient Voltage Suppressor

### Features

- IEC61000-4-2(ESD) $\pm 21\text{KV}$ (air), $\pm 16\text{KV}$ (Contact)
- IEC61000-4-4(EFT) 40A (5/50nS)
- IEC61000-4-5(Lightning) 6A (8/20uS)
- Working Voltage: 3.3V
- VSB : 4.0V min
- 4 Lines Protection
- Low leakage current
- Moisture sensitivity level: Level 3

### Exterior



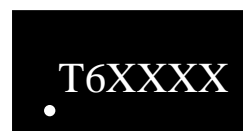
DFN2510



### Application Information

- High Definition Multi-Media Interface (HDMI1.3/1.4/2.0)
- Digital Visual Interface (DVI)
- Display Port Interface
- Serial ATA
- PCI Express
- USB 1.1/2.0/3.0/3.1/OTG


### Package (top view)



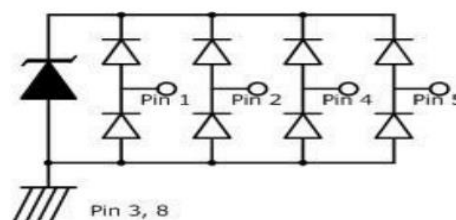
T6:Product Code

XXXX:Date Code

### Agency Approvals

Icon	Description
<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003
	Mean lead free

### Schematic



### Part Number and Electrical Parameter

Part Number	$I_{\text{DRM}}@ V_{\text{DRM}}$		$V_{\text{BR}}^{\text{①}}@ I_{\text{R}}$		$V_{\text{c}}@I_{\text{pp}}^{\text{②}}$ 8/20 $\mu\text{s}$		$R_{\text{DYN}}$ @TLP $^{\text{③}}$	$V_{\text{c}}@I_{\text{pp}}$ TLP $^{\text{③}}$		$C_{\text{o}}^{\text{④}}$	$C_{\text{o}}^{\text{⑤}}$
	$\mu\text{A}$	V	V	mA	V	A	$\Omega$	V	A	pF	pF
	MAX		MIN		MAX		TYP	TYP		MAX	MAX
BV-FK03U4CB	1	3.3	4.0	1	10	5	0.25	9	16	0.45	0.65

Absolute maximum ratings measured at  $T_{\text{A}} = 25^{\circ}\text{C}$  RH = 45%-75% (unless otherwise noted).

① VBR is measured at  $I_{\text{R}} = 1\text{mA}$ , pin1, 2, 4, 5 to pin 3, 8

② Surge Waveform: 8/20 $\mu\text{s}$ , pin1,2,4,5 to pin 3,8

③ TLP parameter:  $Z_0 = 50\Omega$ ,  $t_{\text{p}} = 100\text{ns}$ ,  $t_{\text{r}} = 2\text{ns}$ , averaging window from 60ns to 80ns. RDYN is calculated from 4A to 16A.

④ Off-state capacitance is measured in  $V_{\text{DC}} = 0\text{V}$ ,  $V_{\text{RMS}} = 1\text{V}$ ,  $f = 1\text{MHz}$ , IO to IO

⑤ Off-state capacitance is measured in  $V_{\text{DC}} = 0\text{V}$ ,  $V_{\text{RMS}} = 1\text{V}$ ,  $f = 1\text{MHz}$ , IO to GND.

## Transient Voltage Suppressor

### Part Numbering System

BV FK 03 U 4 C B  
(1) (2) (3) (4) (5) (6) (7)

- (1) Bencent Transient Voltage Suppressor
- (2) Package: DFN2510
- (3) Working Voltage:3.3V
- (4) Low Capacitance
- (5) 4 Lines Protection
- (6) Bi-directional,IO to IO
- (7) Bencent intenal code

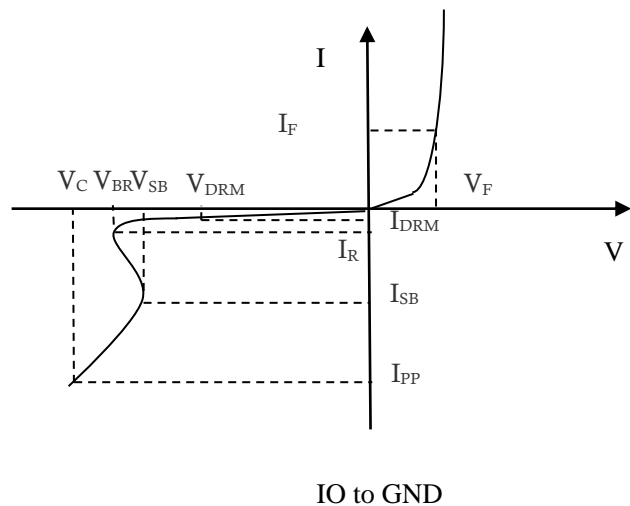
### Mark



T6:Product Code  
XXXX:Date Code

### V-I Curve

Parameters	Definition
VC	Clamping voltage
Ipp	Peak pulse current
VDRM	Stand-off Voltage
VBR	Breakdown Voltage
VSB	Snapback Voltage
IDRM	Reverse Leakage Current
IR	Test current
ISB	Test current
VF	Forward on-state voltage
IF	Forward current
Ppp	Peak Pulse Power Dissipation



### Thermal Consideration

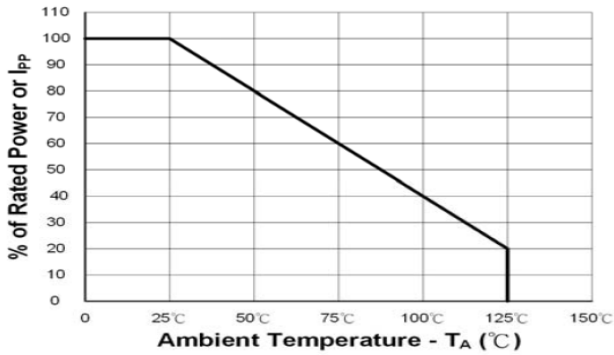
symbol	Parameter	Value	Unit
TJ	Operating Junction Temperature Range	-40 to +125	°C
TS	Storage Temperature Range	-55 to +150	°C

Transient Voltage Suppressor

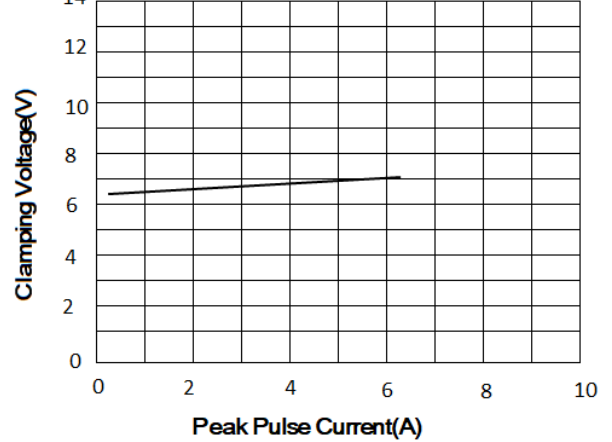
Version: A1 2022-10-26

Typical Characteristics

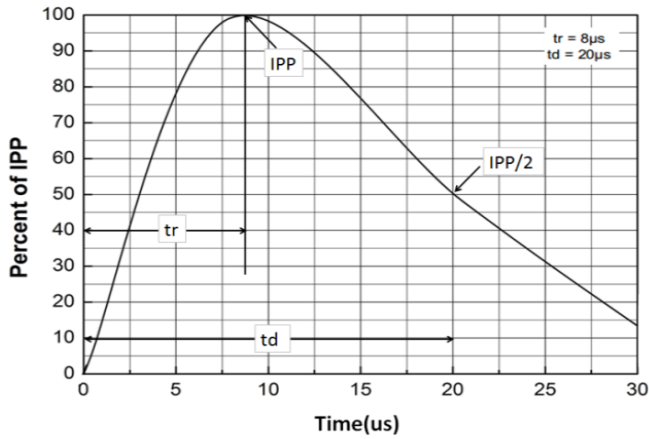
**Power Derating Curve**



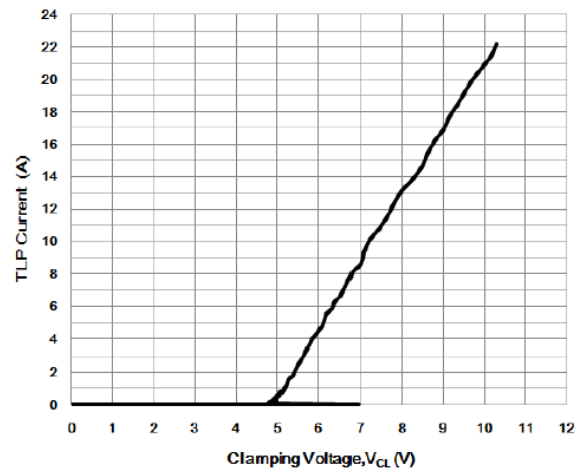
**Clamping Voltage Vs. Peak Pulse Current**



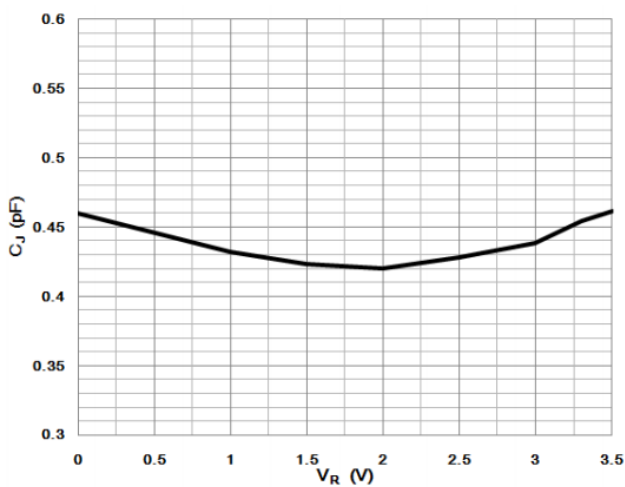
**8/20uS Pulse Waveform**



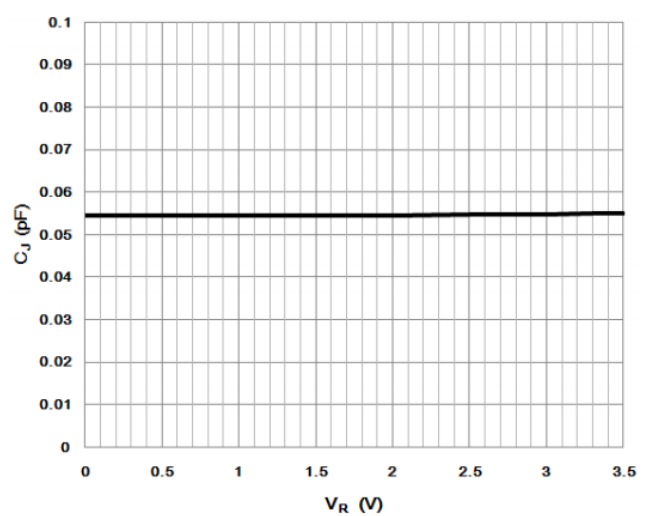
**Positive TLP Clamping Voltage (tperiod=100ns, tr=1ns)**



**Junction Capacitance (I/O Pin to GND)**



**Junction Capacitance (I/O Pin to I/O Pin)**



Transient Voltage Suppressor

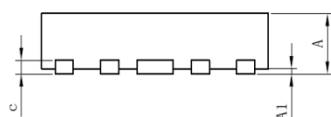
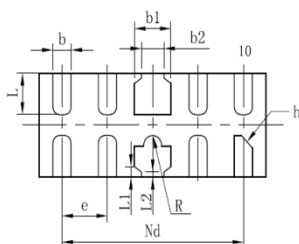
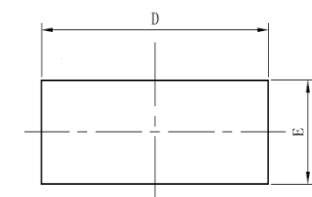
Version: A1 2022-10-26

Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125\pm 3^{\circ}\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time: 168H
High Temperature Life Test	Temperature: $150^{\circ}\text{C}$ Time: 168H
High-low Temperature Cycle test	Temperature: From $-40^{\circ}\text{C}$ to $125^{\circ}\text{C}$ Dwell time: 30min, 10cycles
High Temperature & High Humidity Test	Temperature: $85^{\circ}\text{C}$ Humidity: 85% Time: 168H
Pressure cooker Test	Temperature: $121^{\circ}\text{C}$ , 2atm. Humidity: 100% Time: 24H
Resistance of soldering heat	Temperature: $260\pm 5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

Note: The above testing items can be specified by customer's special request

Product Dimensions

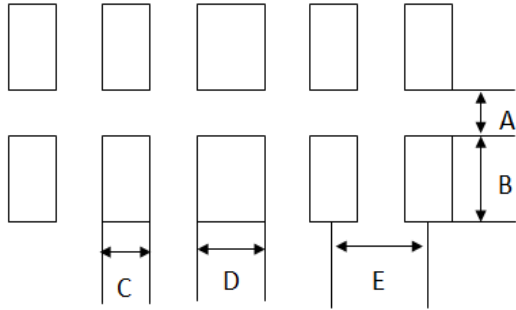


REF	mm	inch
A	0.45~0.55	0.018~0.022
A1	0.00~0.05	0.000~0.002
b	0.15~0.25	0.006~0.01
b1	0.35~0.45	0.014~0.018
b2	0.13~0.3	0.005~0.012
c	0.1~0.2	0.004~0.008
D	2.40~2.60	0.094~0.102
e	0.50BSC	0.020BSC
Nd	2.00BSC	0.079BSC
E	0.90~1.10	0.035~0.043
L	0.30~0.50	0.012~0.020
L1	0.075REF	0.003REF
L2	0.05REF	0.002REF
h	0.08~0.15	0.003~0.006
R	0.05~0.15	0.002~0.006

Transient Voltage Suppressor

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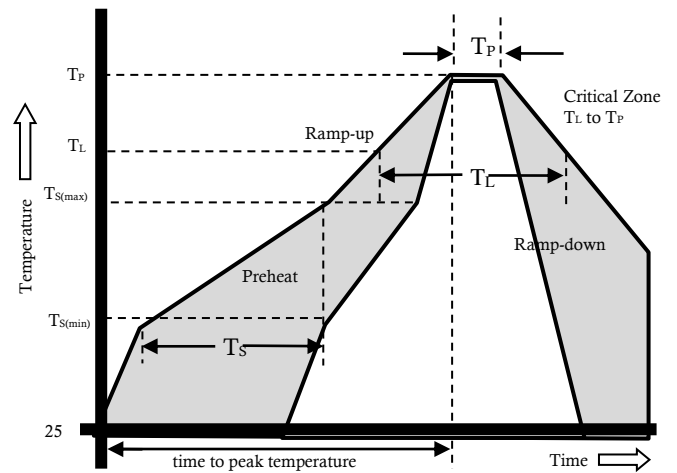
Recommended Soldering Pad



REF	mm	inch
A	0.2	0.008
B	0.6	0.024
C	0.3	0.012
D	0.45	0.018
E	0.5	0.020

Reflow Profile

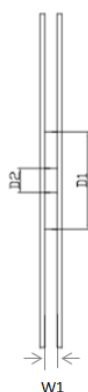
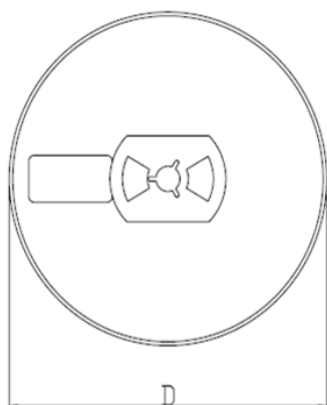
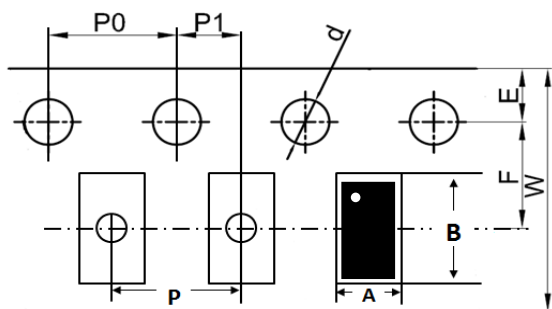
Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid) Tamp (T <sub>L</sub> ) to peak		3°C/s max
T <sub>S(max)</sub> to T <sub>L</sub> - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T <sub>L</sub> ) (Liquid)	217°C
	- Temperature (T <sub>L</sub> )	60 – 150 secs
Peak Temperature (T <sub>P</sub> )		260±0/-5 °C
Time within 5°C of actual peak Temperature (T <sub>P</sub> )		25secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T <sub>P</sub> )		8 mins Max.
Do not exceed		260°C



Transient Voltage Suppressor

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Package Reel Information



REF	mm	inch
A	1.2+/-0.10	0.047+/-0.004
B	2.7+/-0.10	0.106+/-0.004
d	1.50+0.1/-0	0.059+0.004/-0
D	178.00+/-2.00	7.008+/-0.079
D1	55.00+/-3.00	2.165+/-0.118
D2	13.00+/-0.50	0.512+/-0.020
E	1.75+/-0.10	0.069+/-0.004
F	3.50+/-0.20	0.138+/-0.008
P	4.00+/-0.20	0.157+/-0.008
P0	4.00+/-0.20	0.157+/-0.008
P1	2.00+/-0.20	0.079+/-0.008
W	8.00+/-0.20	0.315+/-0.008
W1	9.50+/-1.00	0.374+/-0.039

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	90,000	178	390	370	220

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