

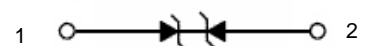
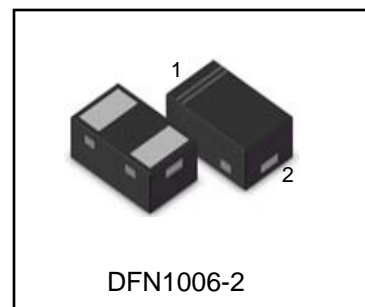


# KNESD5451

## Transient Voltage Suppressors for ESD Protection

### Applications

- Cellular phones
- Portable devices
- Digital cameras
- Power supplies



### Features

- Small Body Outline Dimensions
- Low Body Height
- Peak Power up to 80 Watts @ 8 x 20 $\mu$ s Pulse
- Low Leakage current
- Response Time is Typically < 1 ns
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

### Absolute Ratings (T<sub>amb</sub>=25°C )

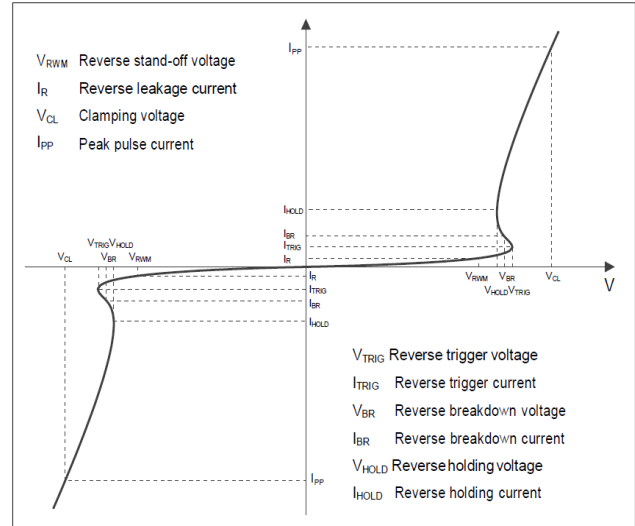
Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (t <sub>p</sub> = 8/20 $\mu$ s)	80	W
T <sub>L</sub>	Maximum lead temperature for soldering during 10s	260	°C
T <sub>stg</sub>	Storage Temperature Range	-55 to +155	°C
T <sub>op</sub>	Operating Temperature Range	-40 to +125	°C
T <sub>j</sub>	Maximum junction temperature	150	°C
	IEC61000-4-2 (ESD) air discharge	$\pm$ 30	KV
	IEC61000-4-4 (EFT) contact discharge	$\pm$ 15	KV
	IEC61000-4-4 (EFT)	40	A
	ESD Voltage Per Human Body Model	16	KV



# KNESD5451

## Electrical Parameter

Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$I_T$	Test Current
$V_{BR}$	Breakdown Voltage @ $I_T$



## Electrical characteristics ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	$V_{RWM}$				$\pm 5.0$	V
Reverse leakage current	$I_R$	$V_{RWM} = 5\text{V}$			100	nA
Reverse breakdown voltage	$V_{BR}$	$I_{BR} = 1\text{mA}$	5.3	6		V
Reverse holding voltage	$V_{HOLD}$	$I_{HOLD} = 50\text{mA}$	5.3	6		V
Clamping voltage <sup>1)</sup>	$V_{CL}$	$I_{PP} = 16\text{A}$ , $t_p = 100\text{ns}$		10.0		V
Dynamic resistance <sup>1)</sup>	$R_{DYN}$			0.2		$\Omega$
Clamping voltage <sup>2)</sup>	$V_{CL}$	$V_{ESD} = 8\text{kV}$		10.0		V
Clamping voltage <sup>3)</sup>	$V_{CL}$	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$			8	V
		$I_{PP} = 6\text{A}$ , $t_p = 8/20\mu\text{s}$			13.4	V
Junction capacitance	$C_J$	$V_R = 0\text{V}$ , $f = 1\text{MHz}$		13	15	pF

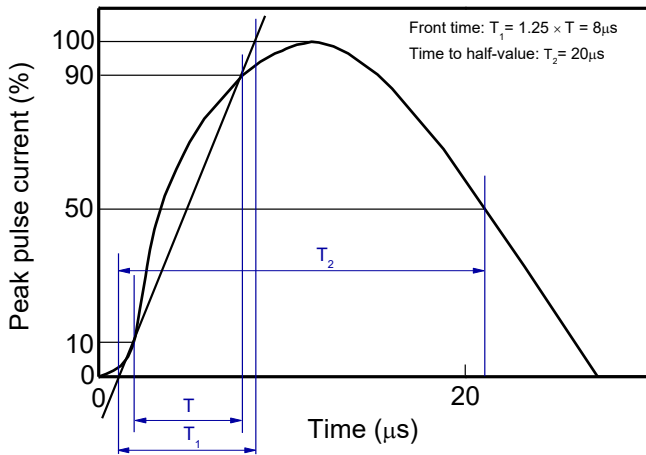
Notes:

1. TLP parameter:  $Z_0 = 50\Omega$ ,  $t_p = 100\text{ns}$ ,  $t_r = 2\text{ns}$ , averaging window from 60ns to 80ns.  $R_{DYN}$  is calculated from 4A to 16A.
2. Contact discharge mode, according to IEC61000-4-2.
3. Non-repetitive current pulse, according to IEC61000-4-5.

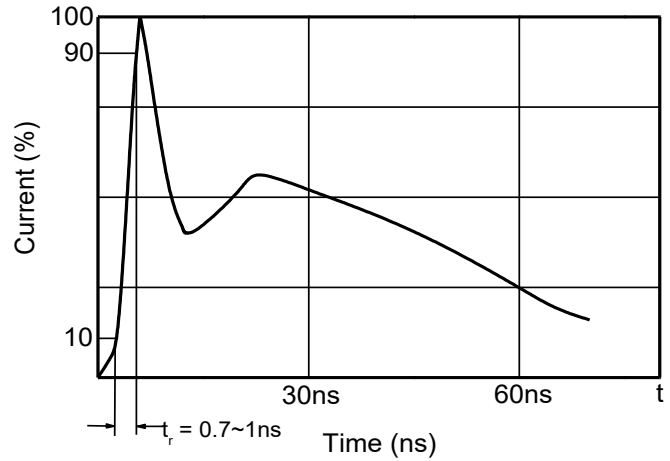


# KNESD5451

## Typical characteristics (TA = 25°C, unless otherwise noted)

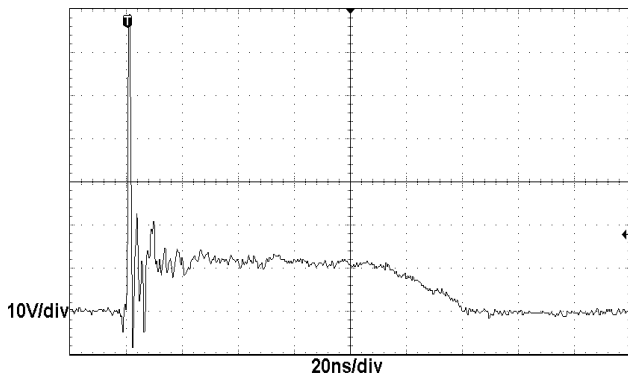


8/20μs waveform per IEC61000-4-5

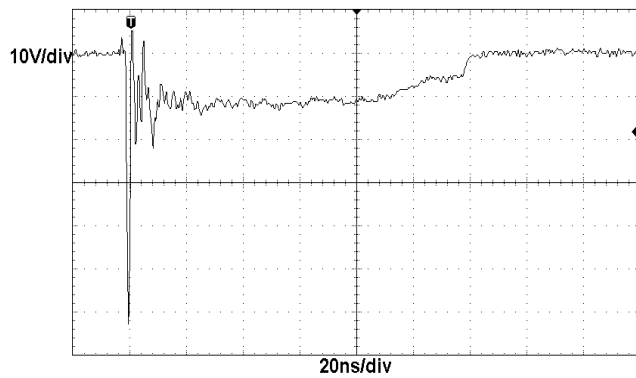


Contact discharge current waveform per IEC61000-4-2

## Typical characteristics (TA = 25°C, unless otherwise noted)



ESD clamping  
(+8kV contact discharge per IEC61000-4-2)



ESD clamping  
(-8kV contact discharge per IEC61000-4-2)



**KNESD5451**

**DIMENSION OUTLINE:**

Unit:mm

