Transient Voltage Suppressors Array for ESD Protection

SE12NMP11GN

Features

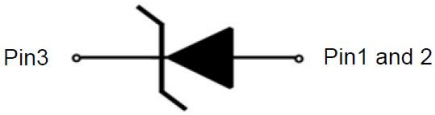
- Working voltage: 12.0V
- Low clamping voltage
- Low leakage current
- RoHS compliant
- Solid-state silicon-avalanche technology

DFN2020-3L

Applications

- Power lines
- Personal digital assistants (PDA's)
- Microprocessors based equipment
- Notebooks, desktops, and servers
- Cell phone handsets and accessories
- Portable electronics
- Peripherals

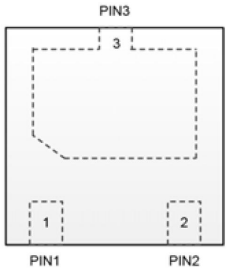
Circuit Diagram



Protection Solution To Meet

- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- IEC61000-4-5 (Lightning) 136A (8/20μs)

PIN Configuration



Mechanical Characteristics

- DFN2020-3L package
- Molding compound flammability rating: UL 94V-0
- Quantity per reel: 3,000pcs
- Lead finish: lead free

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Absolute Maximum Rating (T_A=25℃, RH=45%-75%, unless otherwise noted)

Symbol	Parameter	Value	Units
t_{STG}	Storage Temperature Range	-55 to +150	℃
T_J	Operating Temperature Range	-55 to +125	℃
T_L	Lead soldering temperature	260 (10 sec.)	℃
V_{ESD}	ESD per IEC 61000-4-2(Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	KV

Electrical Characteristics (T_A=25℃)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Unit
Reverse working voltage	V_{RWM}	--	--	--	12.0	V
Reverse breakdown voltage	V_{BR}	I_T = 1mA	13.0	14.5	16.0	V
Reverse leakage current	I_R	V_{RWM}=12V	--	--	1.0	μA
Clamping voltage	V_C	I_{PP}=50A,t_p=8/20 μ s	--	22.0	--	V
		I_{PP}=100A,t_p=8/20 μ s	--	25.0	--	
		I_{PP}=136A, t_p=8/20μs	--	38.0	--	
Junction capacitance	C_J	V_{RWM}=0V, f=1MHZ	--	950	--	pF

Ratings and V-I Characteristics Curves (T_A=25℃, unless otherwise noted)

Fig1. V- I curve characteristics(Uni-directional)

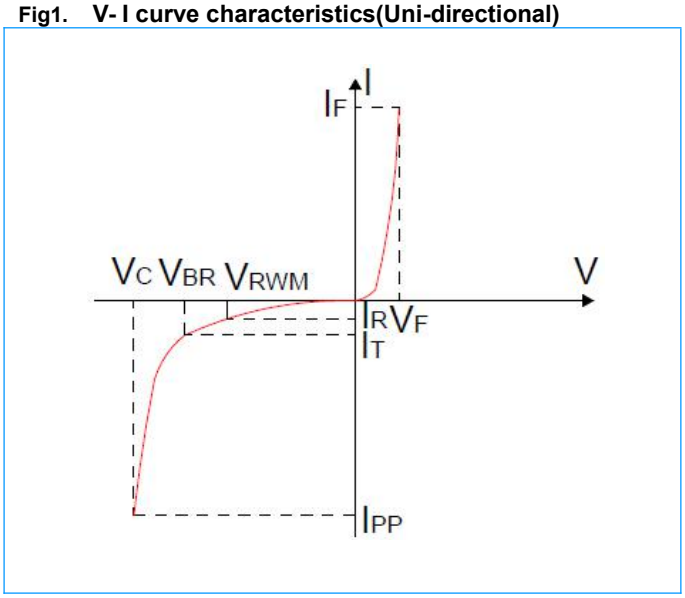
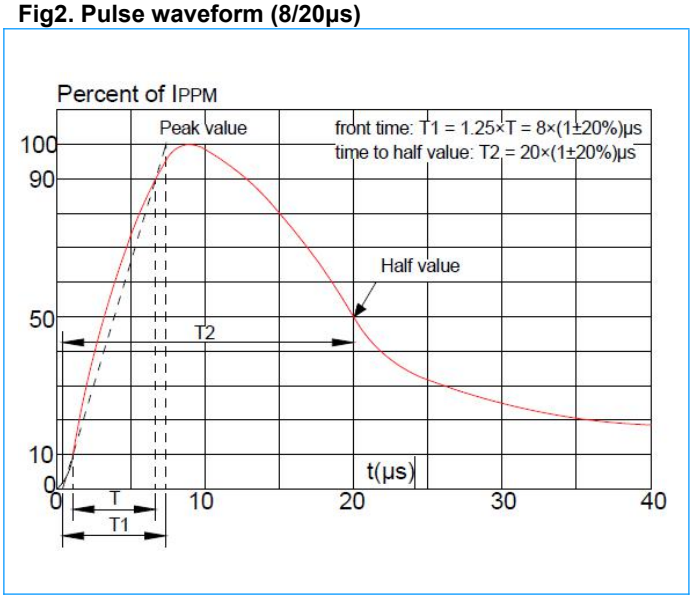


Fig2. Pulse waveform (8/20μs)



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Ratings and V-I Characteristics Curves (T_A=25℃, unless otherwise noted) Continue

Fig3. Pulse derating curve

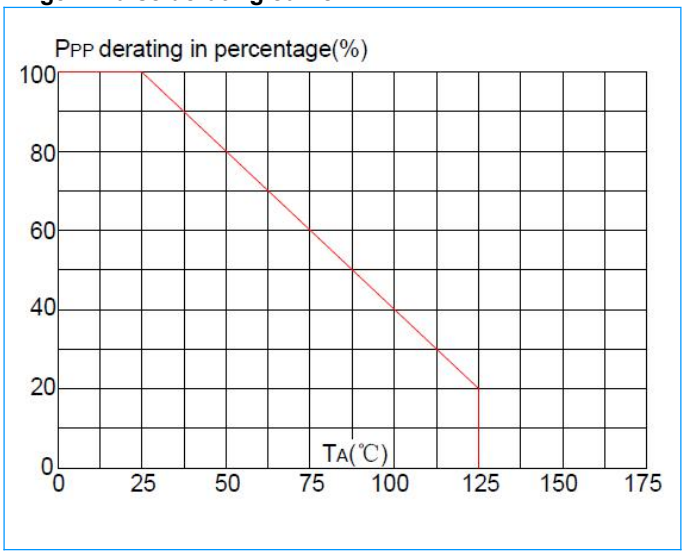


Fig4. ESD clamping (30KV contact)

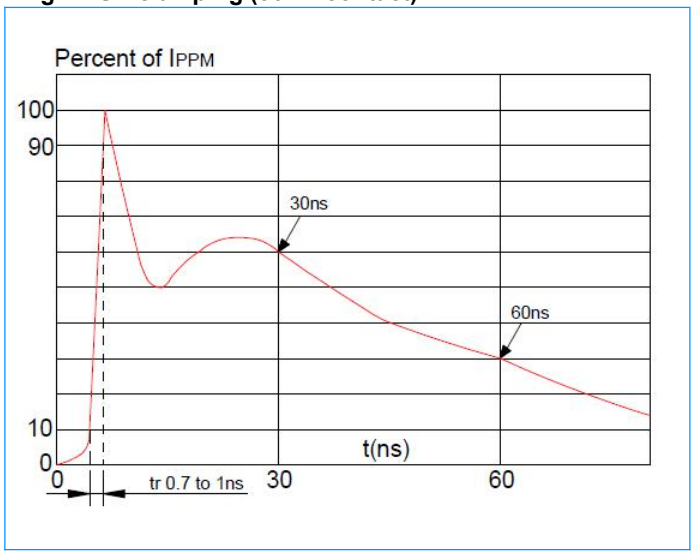


FIG.5:Clamping voltage vs.peak pulse current

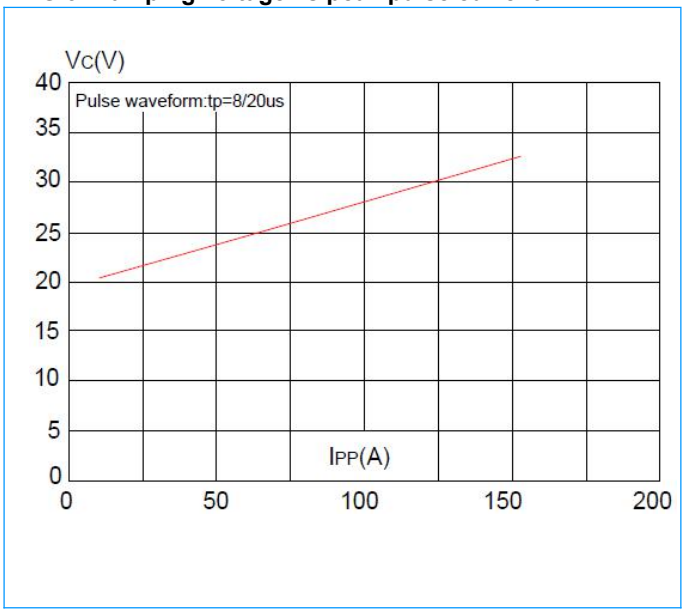
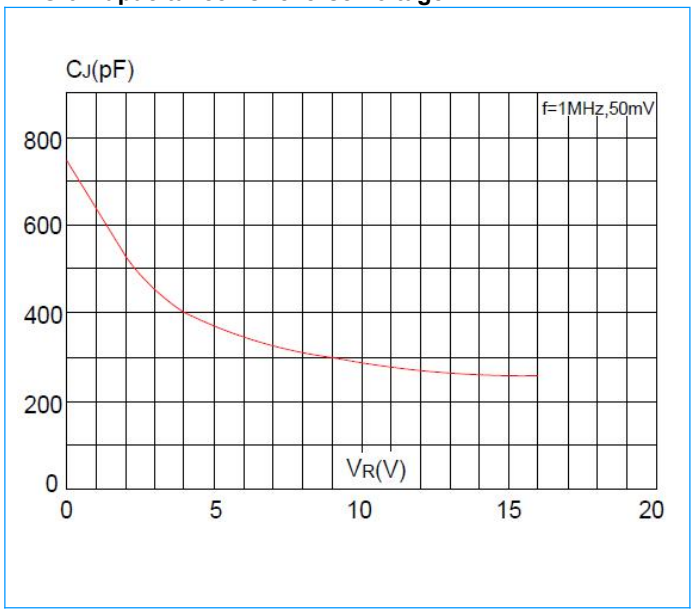


FIG.6:Capacitance vs.reverse voltage



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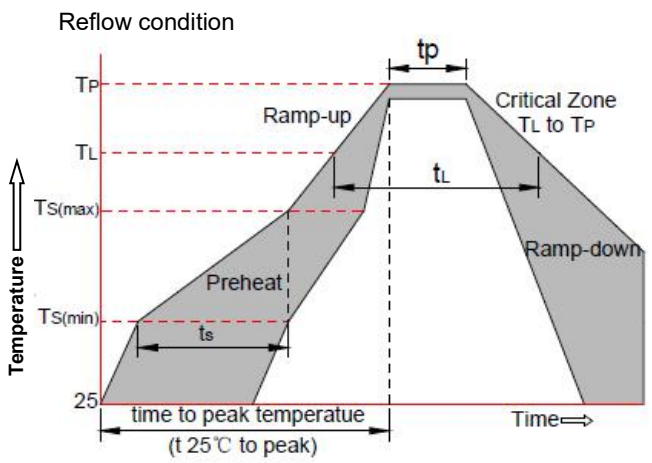
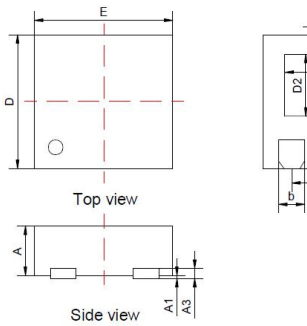
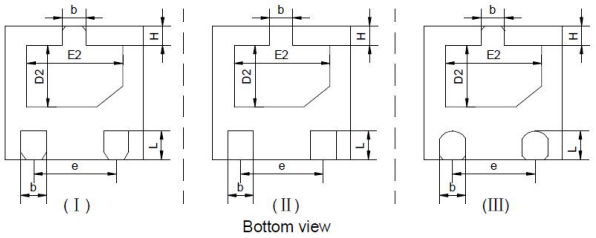
Soldering Parameters

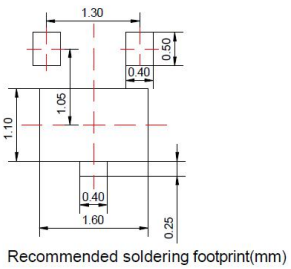


Reflow Condition		Pb-Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max ($T_{s(max)}$)	+200°C
	-Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/Second Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/Second Max
Reflow	- Temperature (T_L) (Liquidus)	+217°C
	-Temperature (t_L)	60 -150 Seconds
Peak Temperature (T_P)		+260(+0/-5)℃
Time within 5°C of actual peak Temperature (t_P)		20-40 Seconds
Ramp-down Rate		6°C/Second Max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		+260℃

Package Mechanical Date







Recommended soldering footprint(mm)

Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.45	0.50	0.60	0.018	0.020	0.024
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.15REF			0.006REF		
b	0.25	0.30	0.35	0.010	0.012	0.014
D	1.90	2.00	2.10	0.075	0.079	0.083
E	1.90	2.00	2.10	0.075	0.079	0.083
D2	0.85	1.05	1.15	0.033	0.041	0.045
E2	1.40	1.50	1.60	0.055	0.059	0.063
e	1.30BSC			0.051BSC		
H	0.20	0.25	0.30	0.008	0.010	0.012
L	0.35	0.40	0.45	0.014	0.016	0.018

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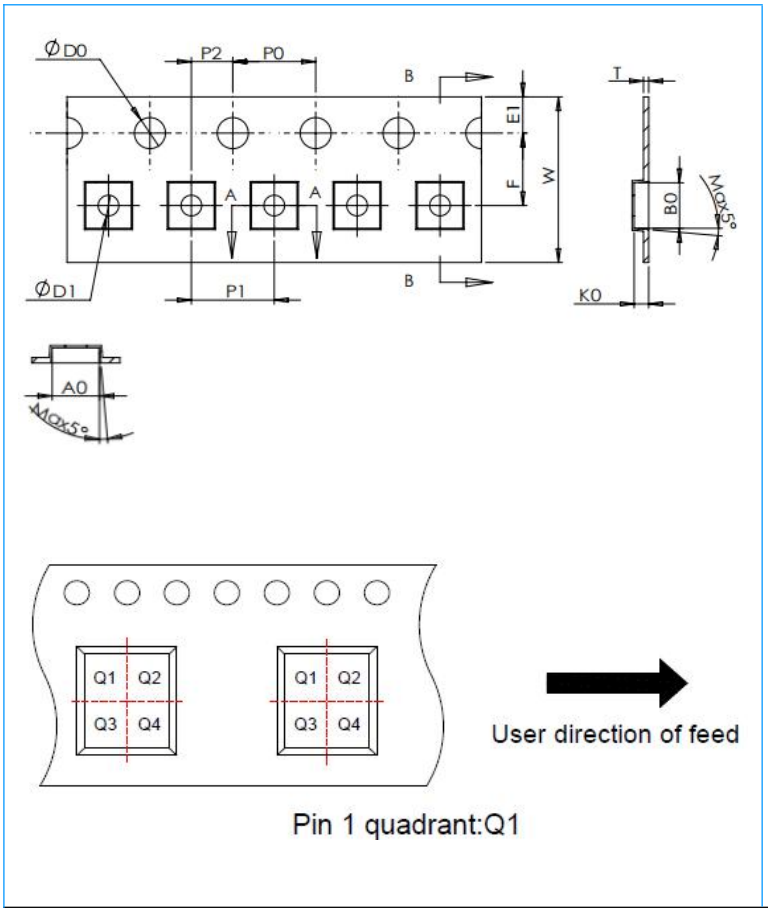
Tape and Reel Information - DFN2020-3L



Symbol	Millimeters	Inches
	Typ.	Typ.
W	8.00	0.315
P1	4.00	0.157
E1	1.75	0.069
F	3.50	0.138
D0	1.55	0.061
D1	1.00	0.039
P0	4.00	0.157
P1	4.00	0.157
P2	2.00	0.079
A0	2.20	0.087
B0	2.20	0.087
K0	0.70	0.028
T	0.23	0.009

Packaging Quantity

Part Number	Packaging Option	Quantity
SE12NMP11GN	Tape & Reel	3000 PCS