



DFNWB3×3-8L Plastic-Encapsulate MOSFETS

CJAE9R0SN06AL N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	7.0mΩ@10V	50A
	8.2mΩ@6V	
	10mΩ@4.5V	



DESCRIPTION

The CJAE9R0SN06AL uses SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

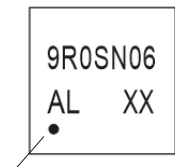
FEATURES

- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

APPLICATIONS

- Battery and loading switching
- Synchronize rectification

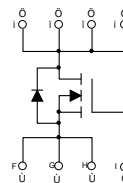
MARKING



9R0SN06AL= Part No.
 Solid dot=Pin1 indicator. X
 XX=Code.

PIN 1

EQUIVALENT CIRCUIT



MAXIMUM RATINGS ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D ①	50	A
Pulsed Drain Current	I_{DM} ①②	200	A
Single Pulsed Avalanche Energy	E_{AS} ③	125	mJ
Power Dissipation	P_D ①	50	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑤	83.3	°C/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$ ①	2.5	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C

MOSFET ELECTRICAL CHARACTERISTICS

$T_J=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Off characteristics							
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V	
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$	$T_J = 25^{\circ}\text{C}$	-	-	1.0	μA
			$T_J = 125^{\circ}\text{C}$	-	-	100	
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
On characteristics ^④							
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.3	1.9	2.5	V	
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	7.0	9.0	m Ω	
		$V_{GS} = 6V, I_D = 15A$	-	8.2	11	m Ω	
		$V_{GS} = 4.5V, I_D = 12A$	-	10	13	m Ω	
Dynamic characteristics							
Input capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1\text{MHz}$	-	1650	-	pF	
Output capacitance	C_{oss}		-	637	-		
Reverse transfer capacitance	C_{rss}		-	38	-		
Gate resistance	R_g	$f = 1\text{MHz}$	-	2.5	-	Ω	
Switching characteristics							
Total gate charge	Q_g	$V_{GS} = 4.5V, V_{DD} = 30V, I_D = 20A$	-	14.4	-	nC	
Total gate charge	Q_g	$V_{GS} = 10V, V_{DD} = 30V, I_D = 20A$	-	29.8	-		
Gate-source charge	Q_{gs}		-	5.8	-		
Gate-drain charge	Q_{gd}		-	7.8	-		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, R_L = 5\Omega, R_g = 10\Omega$	-	12.6	-	ns	
Turn-on rise time	t_r		-	13.6	-		
Turn-off delay time	$t_{d(off)}$		-	51.2	-		
Turn-off fall time	t_f		-	30.6	-		
Drain-Source Diode Characteristics							
Drain-source diode forward voltage	V_{SD} ^④	$V_{GS} = 0V, I_S = 20A$	-	-	1.2	V	
Continuous drain-source diode forward current	I_S ^①		-	-	50	A	
Pulsed drain-source diode forward current	I_{SM} ^{①②}		-	-	200	A	
Reverse recovery time	t_{rr}	$di_S/dt = 100A/\mu s, I_S = 20A, V_{DD} = 30V$	-	40	-	ns	
Reverse recovery charge	Q_{rr}		-	43	-	nC	

Notes:

1. $T_C = 25^{\circ}\text{C}$.

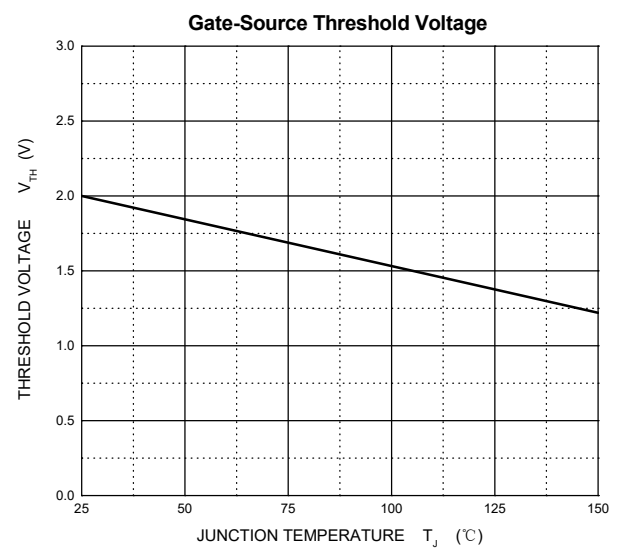
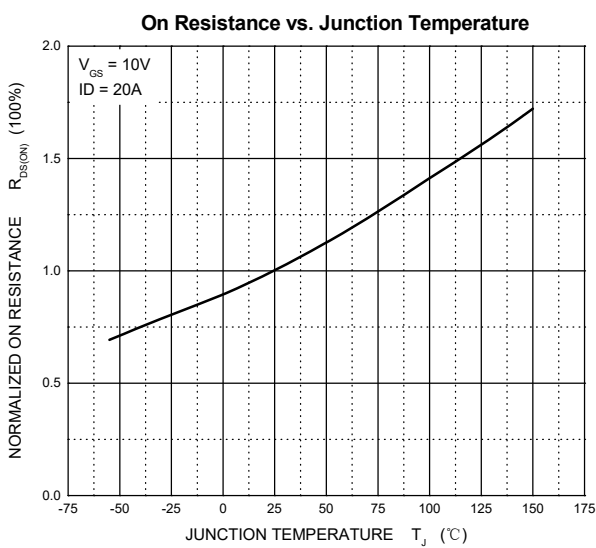
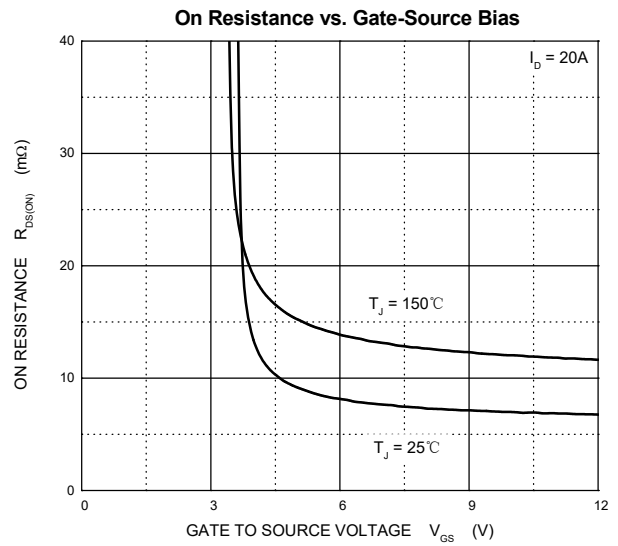
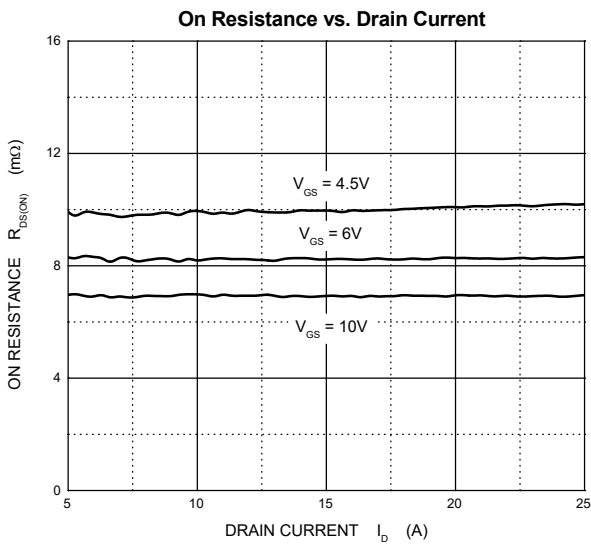
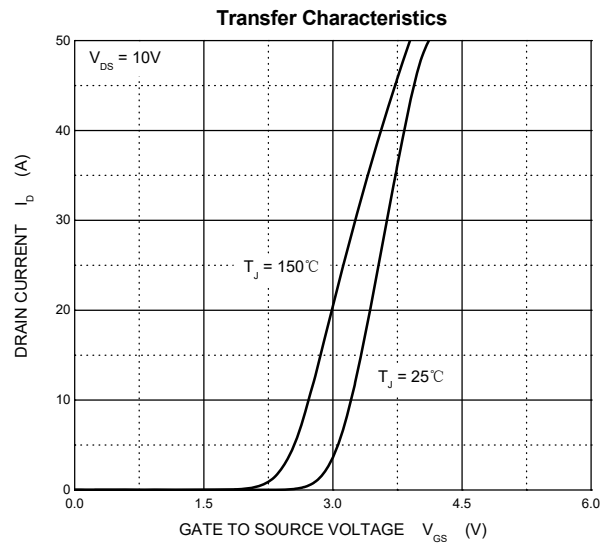
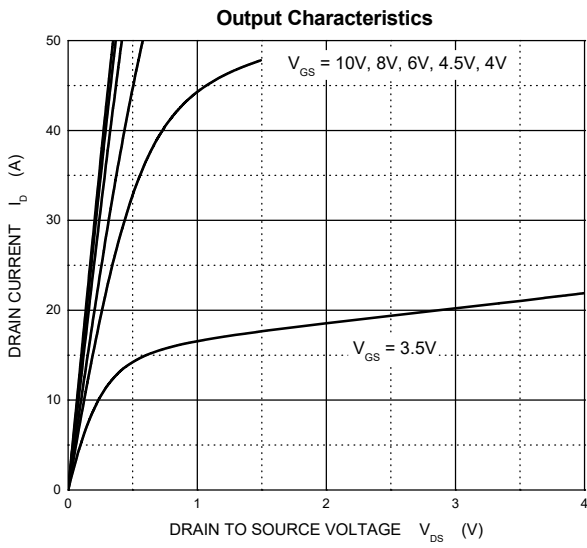
2. Limited only by maximum temperature allowed.

3. $V_{DD} = 30V, V_{GS} = 10V, L = 0.5\text{mH}, R_g = 25\Omega$ Starting $T_J = 25^{\circ}\text{C}$.

4. Pulse Test : Pulse Width $\leq 380\mu s$, duty cycle $\leq 2\%$.

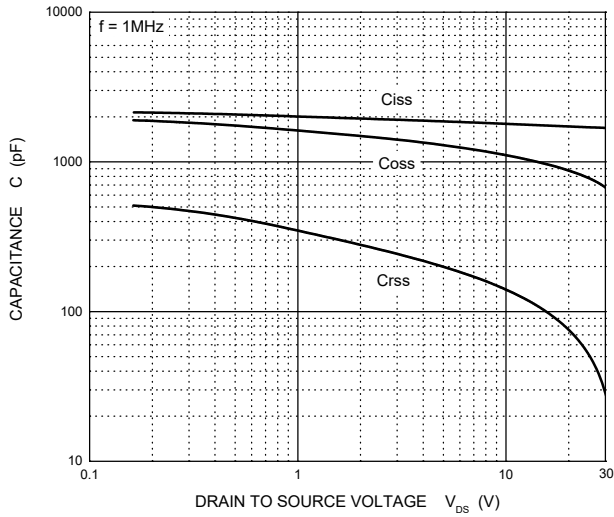
5. Device mounted on 1 in² FR-4 board with 2oz. single-sided Copper, in a still air environment with $T_A = 25^{\circ}\text{C}$.

Typical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

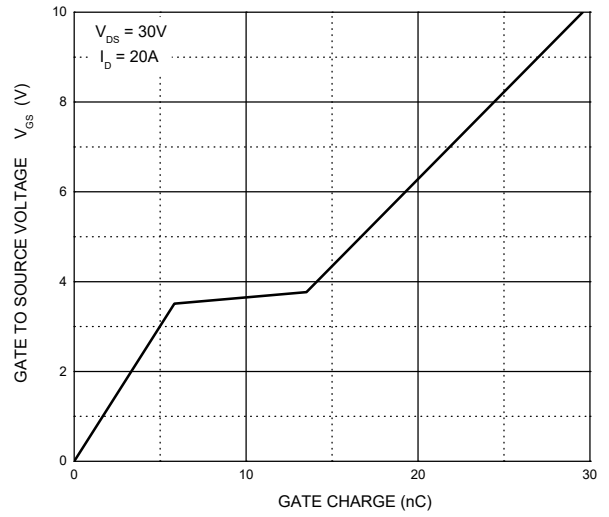


Typical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

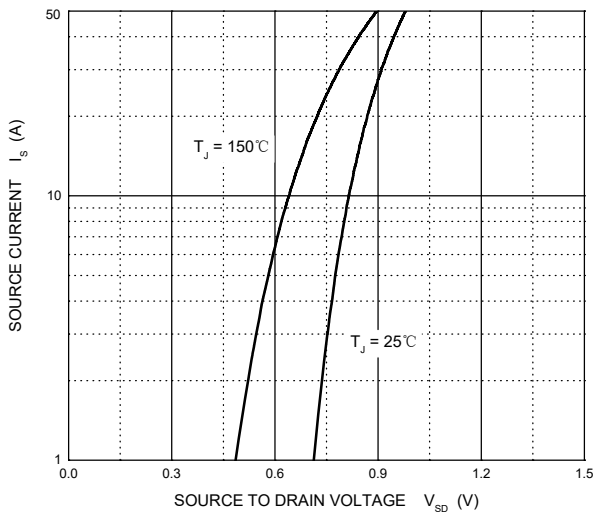
Typical Capacitances



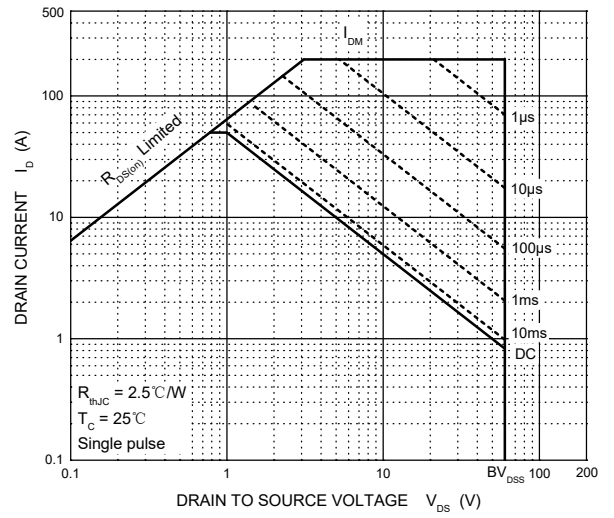
Gate Charge



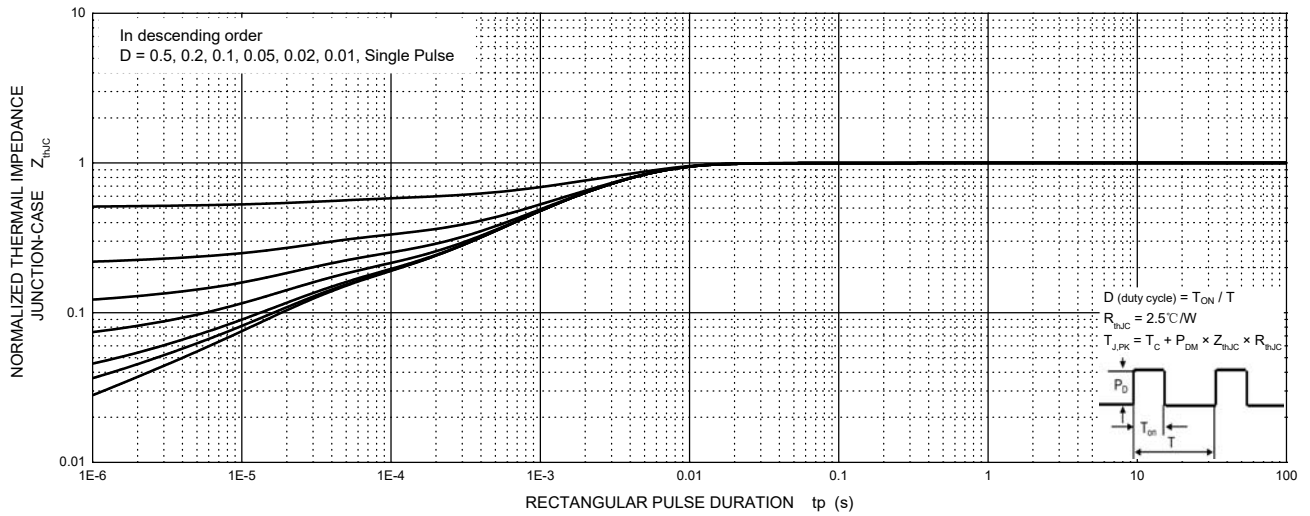
Source-Drain Diode Forward Characteristics



Maximum Safe Operating Area



Transient Thermal Impedance, Junction-Case

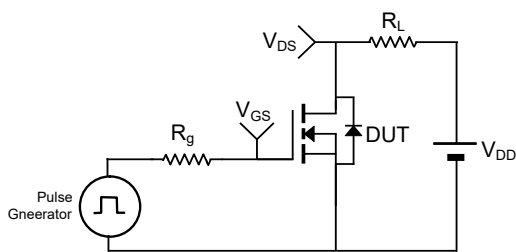


TEST CIRCUIT AND WAVEFORMS

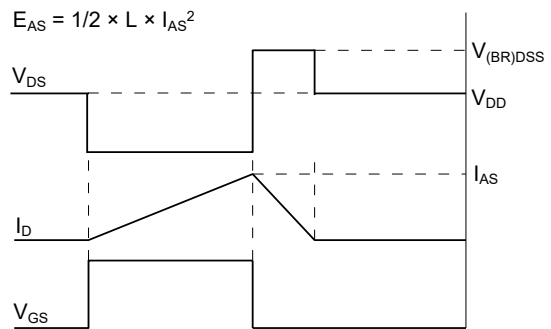
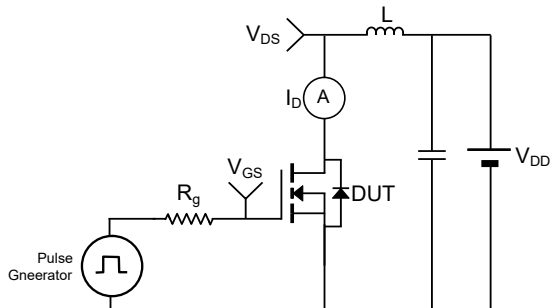
Gate Charge



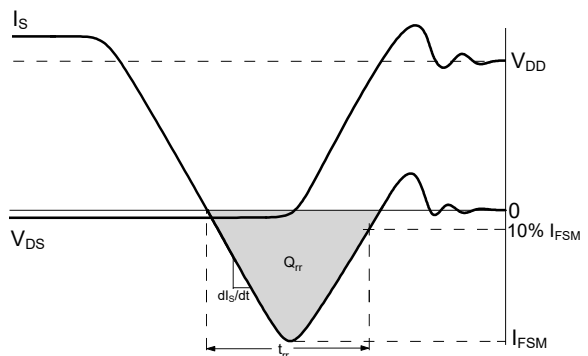
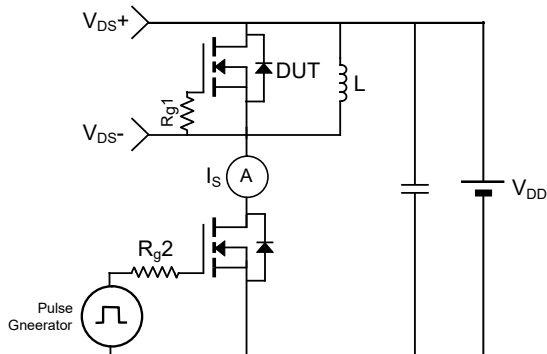
Resistive Load Switching Time



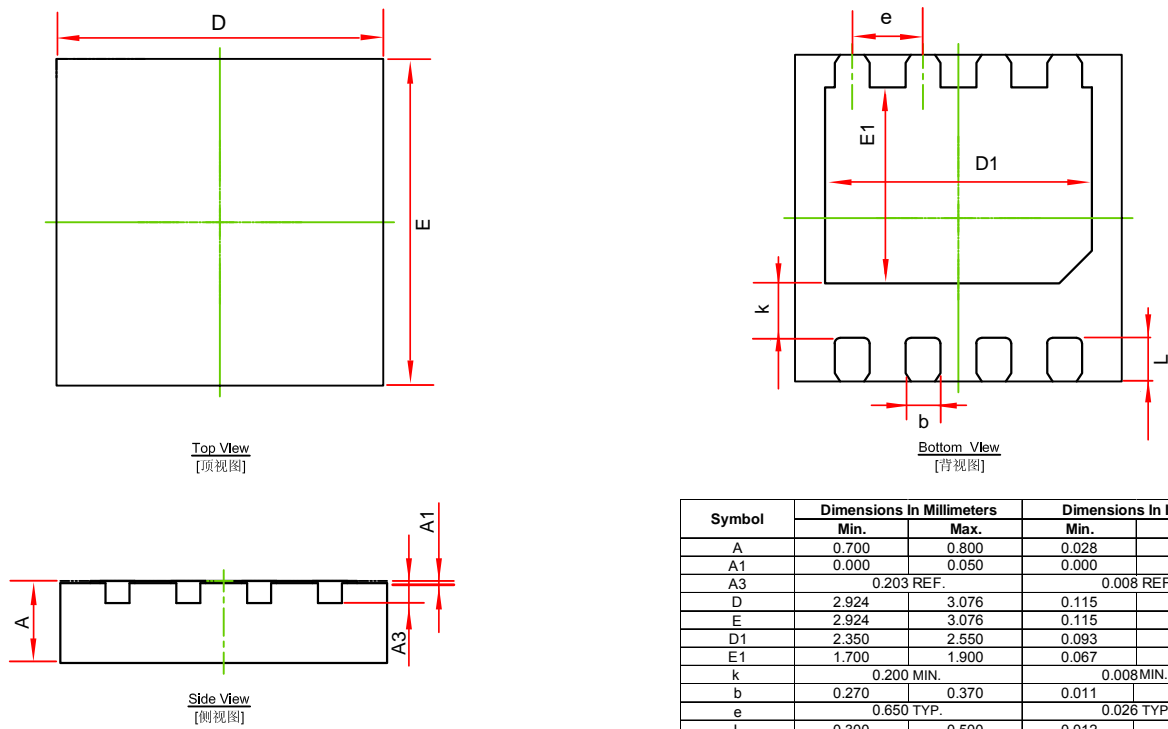
Un-clamped Inductive Load Switching



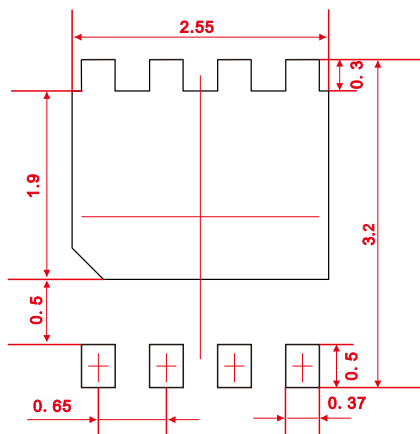
Drain-Source Body Diode Reverse Recovery



DFNWB3×3-8L Package Outline Dimensions



DFNWB3×3-8L Suggested Pad Layout



Note:

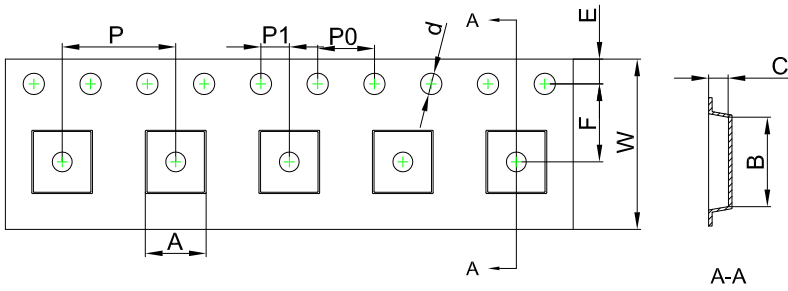
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

DFNWB3×3-8L Tape and Reel

DFNWB3×3-8L Embossed Carrier Tape

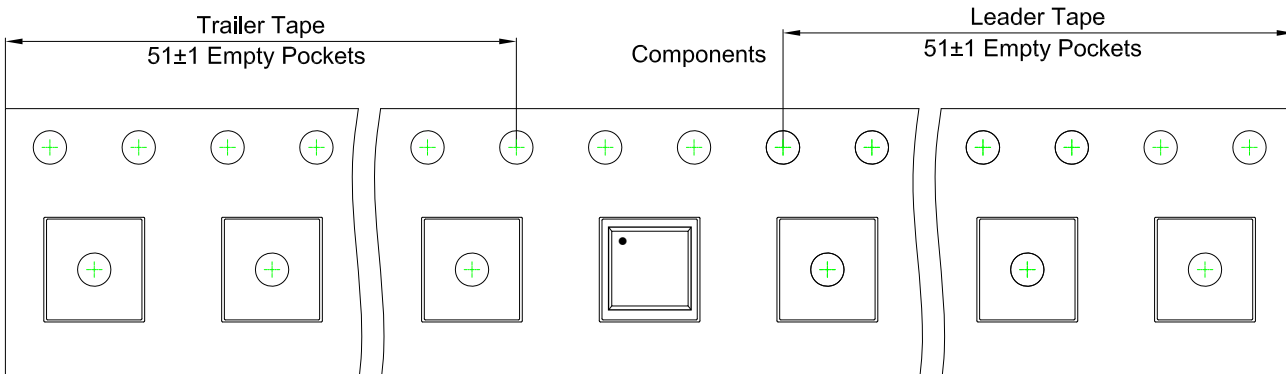


Packaging Description:

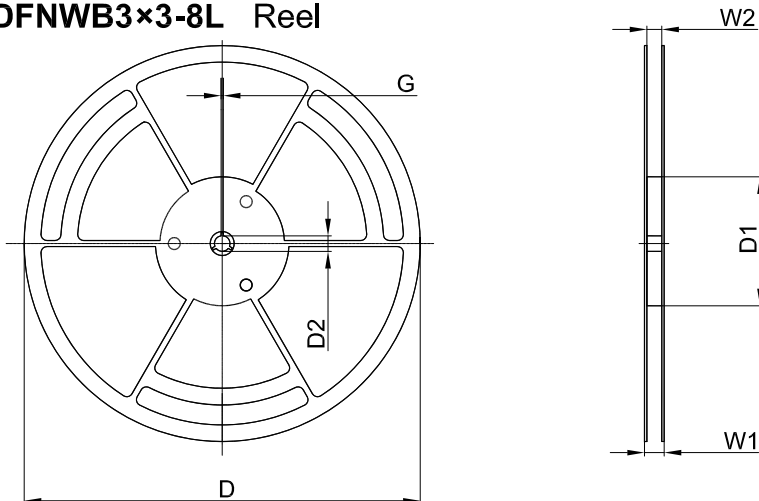
DFNWB3x3-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
DFNWB3×3-8L	3.35	3.35	1.13	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

DFNWB3×3-8L Tape Leader and Trailer



DFNWB3×3-8L Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13" Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 inch	10,000 pcs	360×360×65	50,000 pcs	378×358×382