

JMSL0302PU

Features

- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS Tested
- 100% Vds Tested
- Halogen-free; RoHS-compliant
- Pb-free plating

Applications

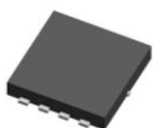
- Load Switch
- PWM Application
- Power Management

Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th_Typ)}$	1.5	V
$I_D(@V_{GS}=10V)$	125	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	1.4	mΩ
$R_{DS(ON_Typ)}(@V_{GS}=4.5V)$	2.0	mΩ



Top View



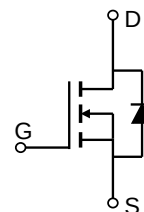
Bottom View



PDFN3x3-8L



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSL0302PU-13	SL0302P	1	Tape&Reel	PDFN3x3-8L	5000	50000

Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	125
		$T_C = 100^\circ\text{C}$	79
I_{DM}	Pulsed Drain Current ⁽¹⁾	Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	294	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	50
		$T_C = 100^\circ\text{C}$	20
T_{J_STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Max	Unit
R	Thermal Resistance, Junction to Ambient ⁽³⁾	43	$^\circ\text{C/W}$
R	Thermal Resistance, Junction to Case	2.5	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} = 0V	-	-	1.0	μ
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.1	1.5	2.2	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 20A	-	1.4	2.0	mΩ
		V _{GS} = 4.5, I _D = 15A	-	2.0	2.6	mΩ
Dynamic Characteristics						
R _g	Gate Resistance	f = 1MHz	-	1.7	-	Ω
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz	-	2936	4403	pF
C _{oss}	Output Capacitance		-	1716	2573	pF
C _{rss}	Reverse Transfer Capacitance		-	50	100	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 15V, I _D = 20A	-	47	-	nC
Q _{gs}	Gate Source Charge		-	8.5	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	8.6	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 15V I _D = 20A, R _{GEN} = 3Ω	-	10	-	ns
t _r	Turn-On Rise Time		-	29	-	ns
t _{d(off)}	Turn-Off DelayTime		-	39	-	ns
t _f	Turn-Off Fall Time		-	11	-	ns
Body Diode Characteristics						
I _S	Maximum Continuous Body Diode Forward Current		-	-	125	A
I _{SM}	Maximum Pulsed Body Diode Forward Current		-	-	500	A
V _{SD}	Body Diode Forward Voltage	V _{GS} = 0V, I _S = 20A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 20A, di/dt = 100A/us	-	49	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	49	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\text{ohm}$, $L = 3\text{mH}$, $I_{AS} = 14\text{A}$, $V_{DD} = 0\text{V}$ during time in avalanche.
 3. R is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
 4. Pulse Test: Pulse Width $\leq$ $\leq 0.5\%$.



Typical Performance Characteristics

Figure 1: Power De-rating

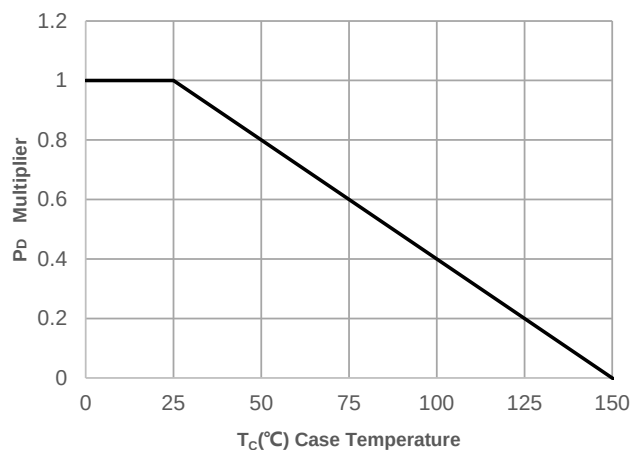


Figure 2: Current De-rating

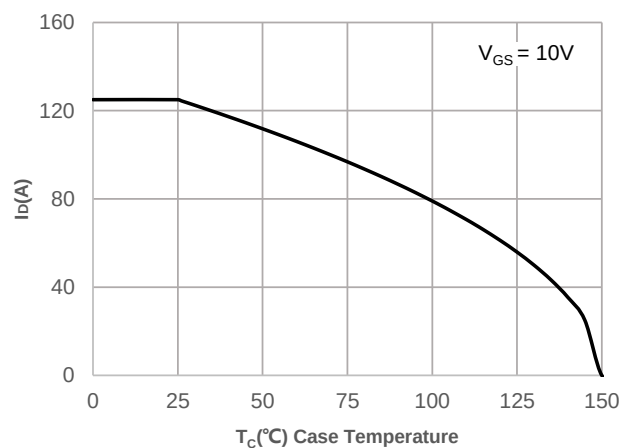


Figure 3: Normalized Maximum Transient Thermal Impedance

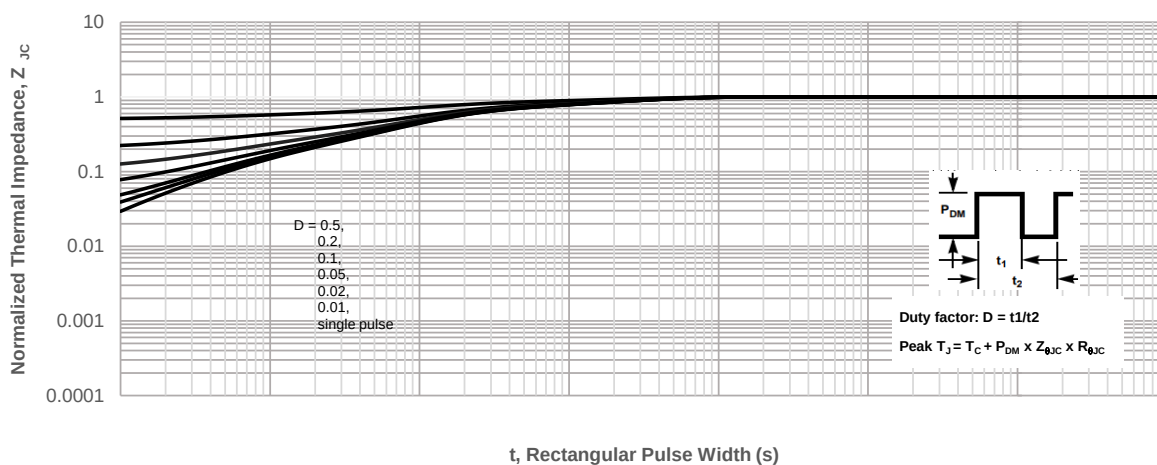
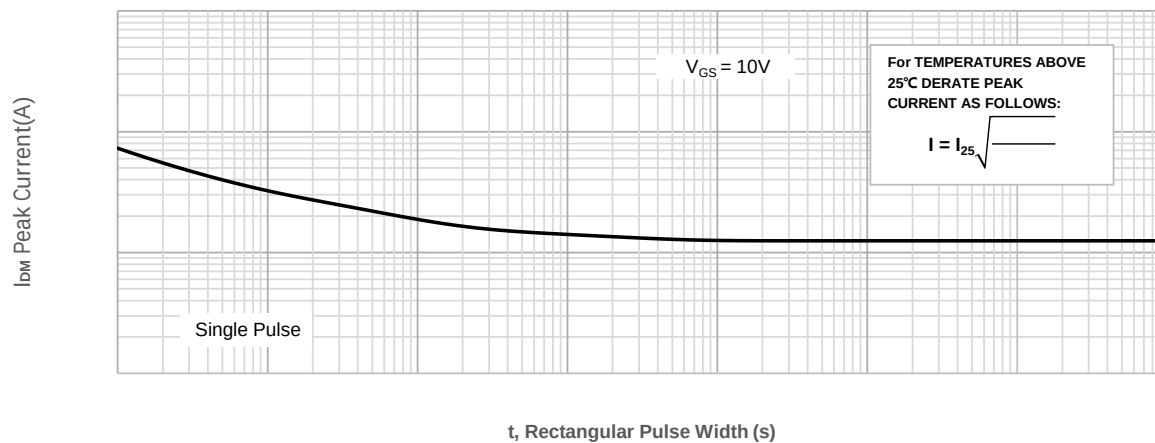
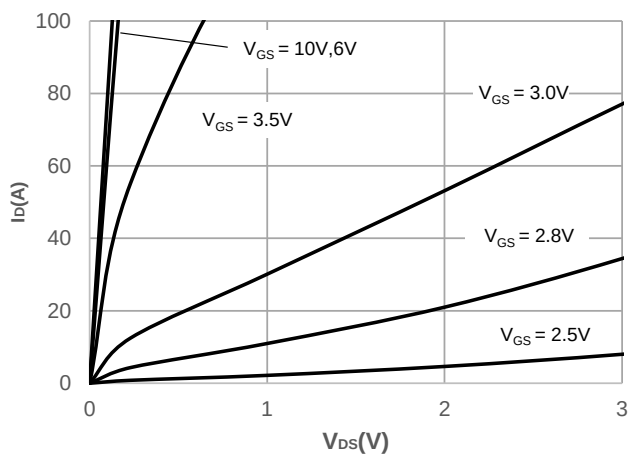
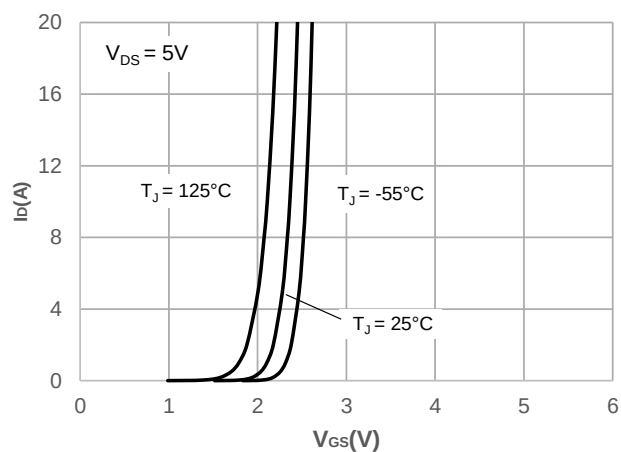
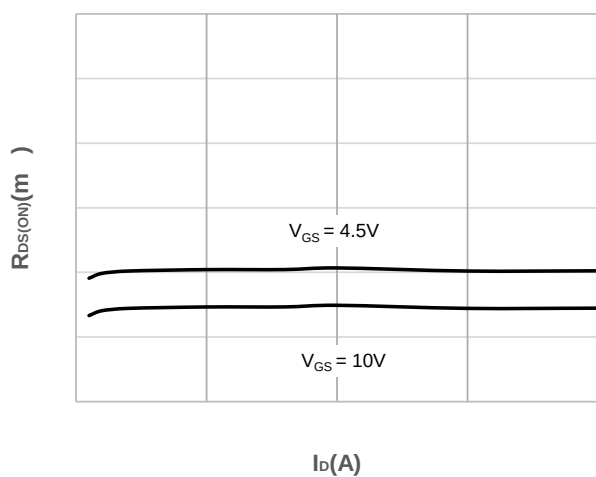
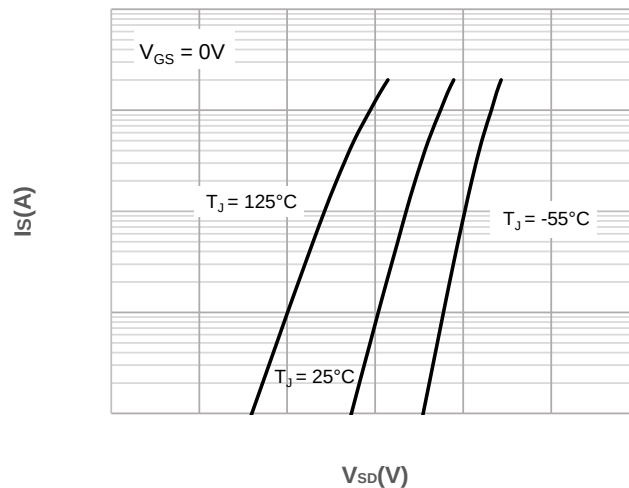
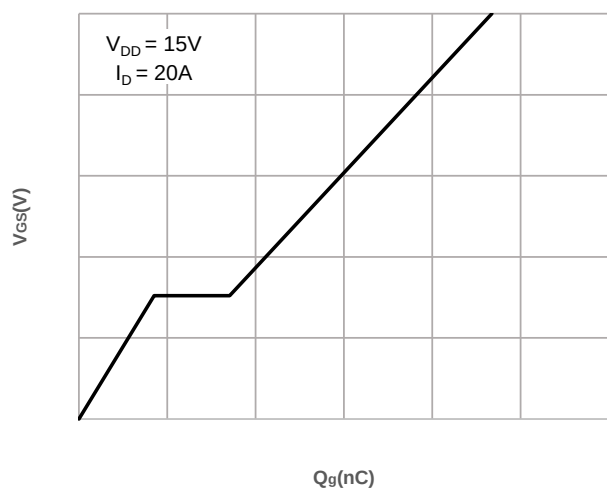
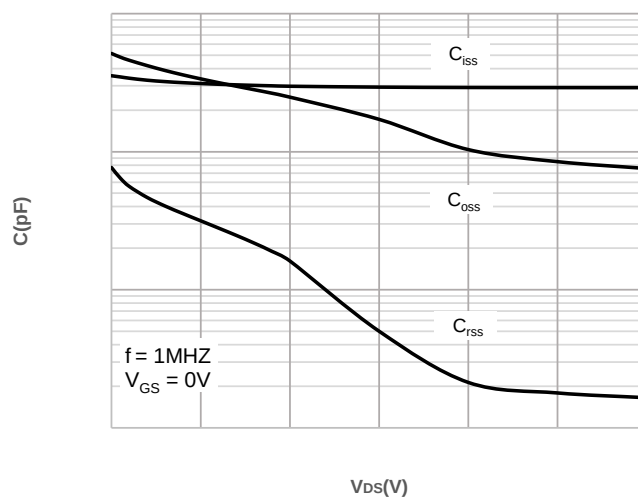


Figure 4: Peak Current Capacity



Typical Performance Characteristics

Figure 5: Output Characteristics

Figure 6: Typical Transfer Characteristics

Figure 7: On-resistance vs. Drain Current

Figure 8: Body Diode Characteristics

Figure 9: Gate Charge Characteristics

Figure 10: Capacitance Characteristics


Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

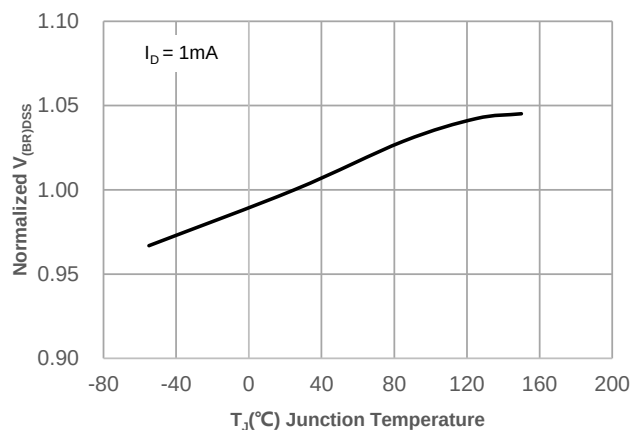


Figure 12: Normalized on Resistance vs. Junction Temperature

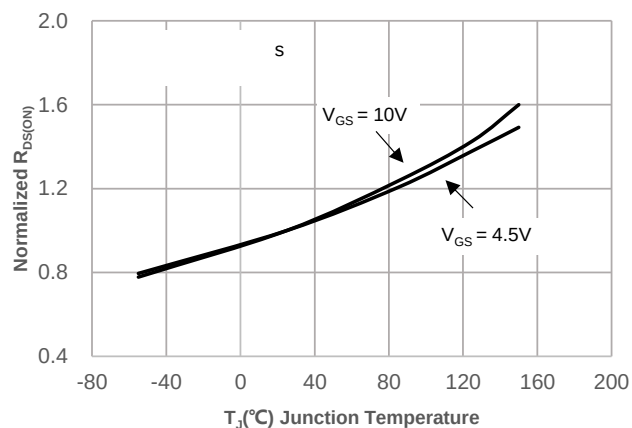


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

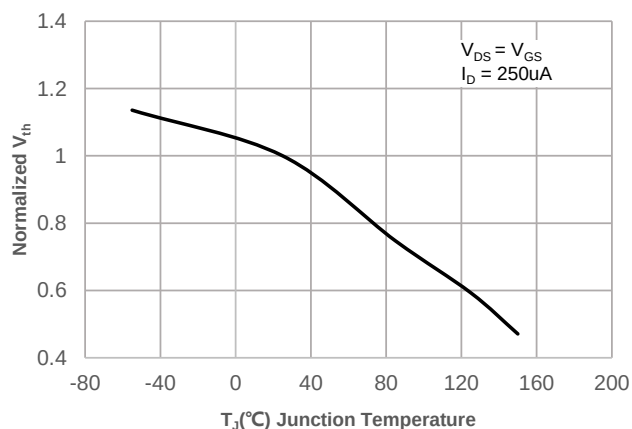


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

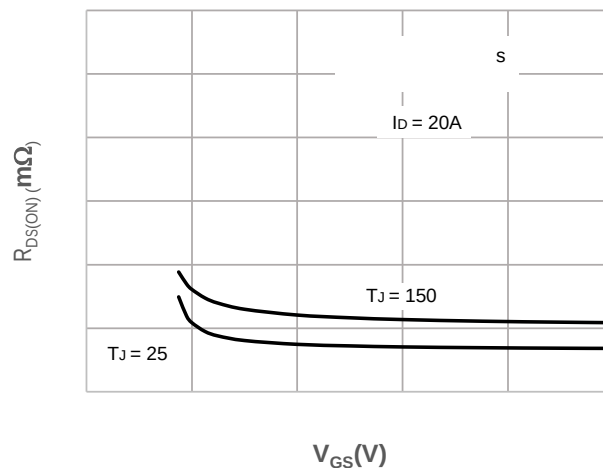
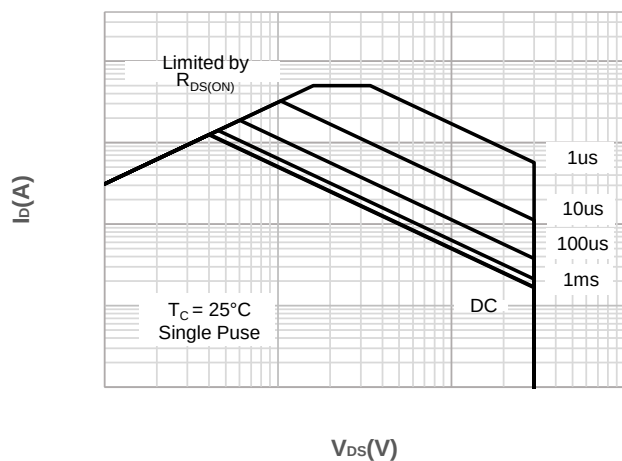


Figure 15: Maximum Safe Operating Area



Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform

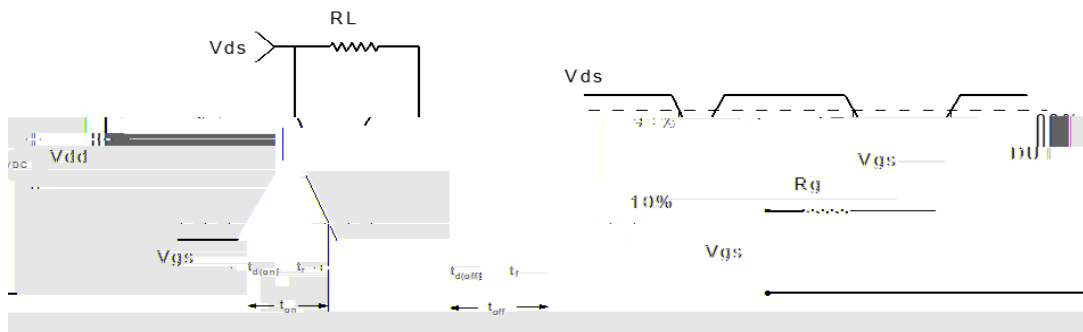


Figure 2: Resistive Switching Test Circuit & Waveform

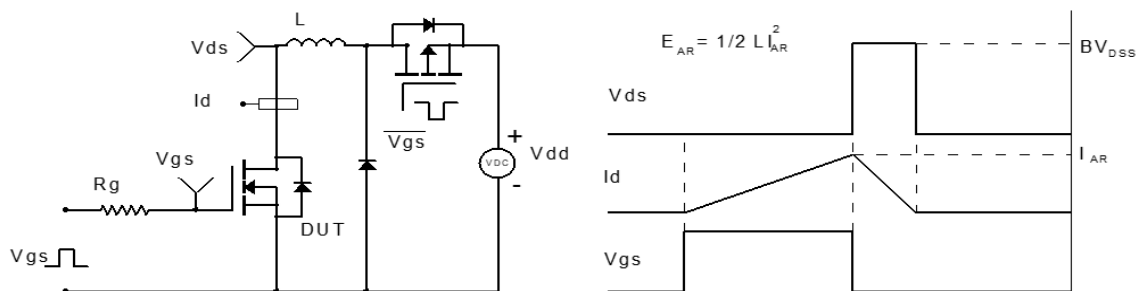


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

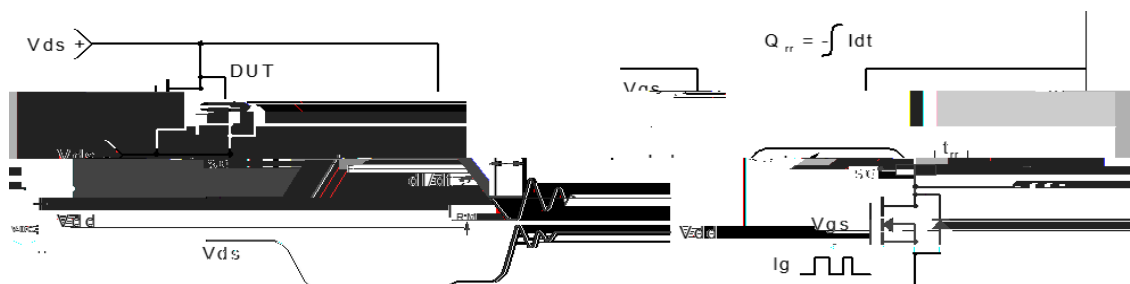


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN3x3-8L)

Package Outline



	DIMENSION IN MM		DIMENSION IN INCHES	
1	3.0	0.12	0.12	0.005
2	3.0	0.12	0.12	0.005
3	3.0	0.12	0.12	0.005
4	3.0	0.12	0.12	0.005
5	3.0	0.12	0.12	0.005
6	3.0	0.12	0.12	0.005
7	3.0	0.12	0.12	0.005
8	3.0	0.12	0.12	0.005
9	3.0	0.12	0.12	0.005
10	3.0	0.12	0.12	0.005
11	3.0	0.12	0.12	0.005
12	3.0	0.12	0.12	0.005
13	3.0	0.12	0.12	0.005
14	3.0	0.12	0.12	0.005
15	3.0	0.12	0.12	0.005
16	3.0	0.12	0.12	0.005
17	3.0	0.12	0.12	0.005
18	3.0	0.12	0.12	0.005
19	3.0	0.12	0.12	0.005
20	3.0	0.12	0.12	0.005
21	3.0	0.12	0.12	0.005
22	3.0	0.12	0.12	0.005
23	3.0	0.12	0.12	0.005
24	3.0	0.12	0.12	0.005
25	3.0	0.12	0.12	0.005
26	3.0	0.12	0.12	0.005
27	3.0	0.12	0.12	0.005
28	3.0	0.12	0.12	0.005
29	3.0	0.12	0.12	0.005
30	3.0	0.12	0.12	0.005
31	3.0	0.12	0.12	0.005
32	3.0	0.12	0.12	0.005
33	3.0	0.12	0.12	0.005
34	3.0	0.12	0.12	0.005
35	3.0	0.12	0.12	0.005
36	3.0	0.12	0.12	0.005
37	3.0	0.12	0.12	0.005
38	3.0	0.12	0.12	0.005
39	3.0	0.12	0.12	0.005
40	3.0	0.12	0.12	0.005
41	3.0	0.12	0.12	0.005
42	3.0	0.12	0.12	0.005
43	3.0	0.12	0.12	0.005
44	3.0	0.12	0.12	0.005
45	3.0	0.12	0.12	0.005
46	3.0	0.12	0.12	0.005
47	3.0	0.12	0.12	0.005
48	3.0	0.12	0.12	0.005
49	3.0	0.12	0.12	0.005
50	3.0	0.12	0.12	0.005
51	3.0	0.12	0.12	0.005
52	3.0	0.12	0.12	0.005
53	3.0	0.12	0.12	0.005
54	3.0	0.12	0.12	0.005
55	3.0	0.12	0.12	0.005
56	3.0	0.12	0.12	0.005
57	3.0	0.12	0.12	0.005
58	3.0	0.12	0.12	0.005
59	3.0	0.12	0.12	0.005
60	3.0	0.12	0.12	0.005
61	3.0	0.12	0.12	0.005
62	3.0	0.12	0.12	0.005
63	3.0	0.12	0.12	0.005
64	3.0	0.12	0.12	0.005
65	3.0	0.12	0.12	0.005
66	3.0	0.12	0.12	0.005
67	3.0	0.12	0.12	0.005
68	3.0	0.12	0.12	0.005
69	3.0	0.12	0.12	0.005
70	3.0	0.12	0.12	0.005
71	3.0	0.12	0.12	0.005
72	3.0	0.12	0.12	0.005
73	3.0	0.12	0.12	0.005
74	3.0	0.12	0.12	0.005
75	3.0	0.12	0.12	0.005
76	3.0	0.12	0.12	0.005
77	3.0	0.12	0.12	0.005
78	3.0	0.12	0.12	0.005
79	3.0	0.12	0.12	0.005
80	3.0	0.12	0.12	0.005
81	3.0	0.12	0.12	0.005
82	3.0	0.12	0.12	0.005
83	3.0	0.12	0.12	0.005
84	3.0	0.12	0.12	0.005
85	3.0	0.12	0.12	0.005
86	3.0	0.12	0.12	0.005
87	3.0	0.12	0.12	0.005
88	3.0	0.12	0.12	0.005
89	3.0	0.12	0.12	0.005
90	3.0	0.12	0.12	0.005
91	3.0	0.12	0.12	0.005
92	3.0	0.12	0.12	0.005
93	3.0	0.12	0.12	0.005
94	3.0	0.12	0.12	0.005
95	3.0	0.12	0.12	0.005
96	3.0	0.12	0.12	0.005
97	3.0	0.12	0.12	0.005
98	3.0	0.12	0.12	0.005
99	3.0	0.12	0.12	0.005
100	3.0	0.12	0.12	0.005

Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co.,Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it. Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement. Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.



is a registered trademark of Jiangsu JieJie Microelectronics Co.,Ltd.