

N-channel Enhancement Mode Power MOSFET

Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- 100% UIS TESTED!
- 100% ΔV_{ds} TESTED!

Applications

- PWM Application
- Load Switch
- Power Management

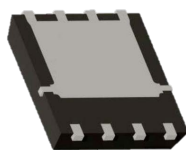
Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th_Typ)}$	1.5	V
$I_D(@V_{GS}=10V)$	90	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	3.6	m Ω
$R_{DS(ON_Typ)}(@V_{GS}=4.5V)$	6.5	m Ω

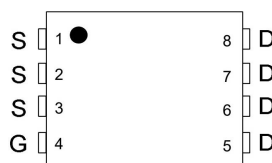
Top View



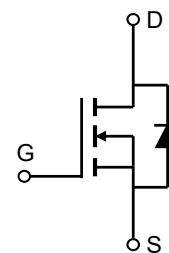
Bottom View



PDFN3x3-8L



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK30N100Q	30N100	DFN3x3	Reel	N/A	N/A	5000

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	90	A
	$T_C = 100^{\circ}\text{C}$		55	
Pulsed Drain Current		I_{DM}	360	A
Single Pulsed Avalanche Energy		E_{AS}	90	mJ
Power Dissipation		P_D	90	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	2.0	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 1mA$	30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1.0	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics ④						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.3	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		3.6	4.8	m Ω
		$V_{GS} = 4.5V, I_D = 15A$		6.5	9.0	m Ω
Dynamic characteristics ④ ⑤						
Input capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1MHz$		2700		pF
Output capacitance	C_{oss}			321		
Reverse transfer capacitance	C_{rss}			245		
Switching characteristics ④ ⑤						
Total gate charge	Q_g	$V_{GS} = 0 \text{ to } 15V$ $V_{DD} = 15V, I_D = 30A$		42		nC
Gate-source charge	Q_{gs}			4.0		
Gate-drain charge	Q_{gd}			14		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 10V, I_D = 30A$ $V_{GS} = 15V, R_{GEN} = 3\Omega$		13		ns
Turn-on rise time	t_r			36		
Turn-off delay time	$t_{d(off)}$			43		
Turn-off fall time	t_f			16		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ④	$V_{GS} = 0V, I_S = 1A$			1.2	V
Continuous drain-source diode forward current	I_S ①	$T_C = 25^\circ C$			30	A
Reverse recovery time	t_{rr}	$di/dt = 100A/\mu s, I_F = 30A$		22		ns
Reverse recovery charge	Q_{rr}			13		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 20V$, $V_G = 10V$, $R_G = 25\Omega$, $L = 0.5mH$,
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Fig.1 Power Dissipation

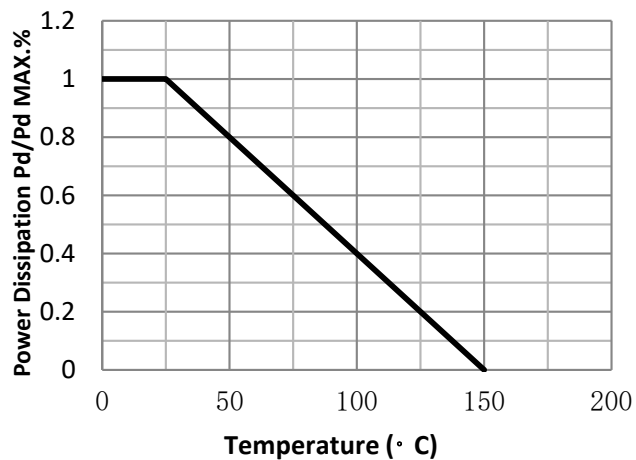


Fig.2 Typical output Characteristics

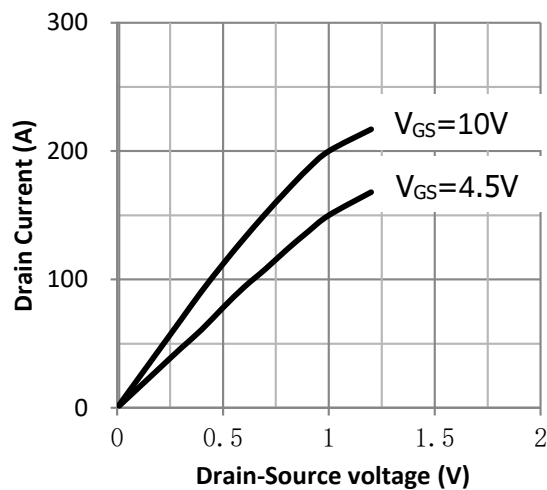


Fig.3 Threshold Voltage V.S Junction Temperature

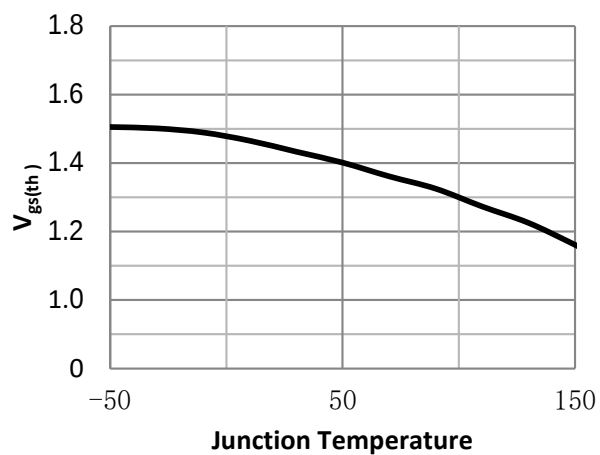


Fig.4 Resistance V.S Drain Current

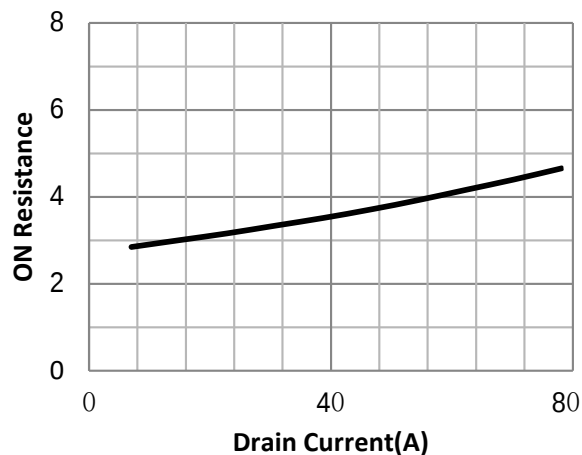


Fig.5 On-Resistance VS Drain Current

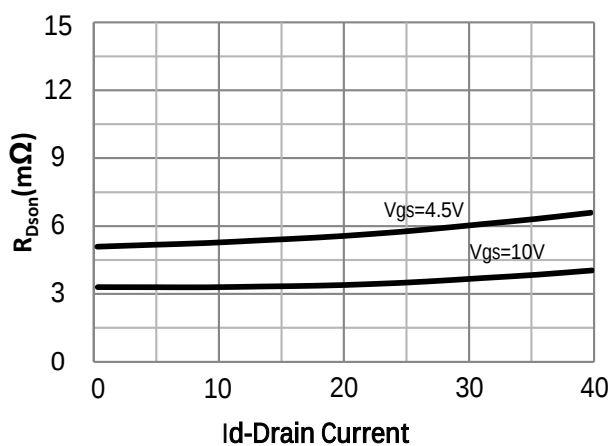


Fig.6 On-Resistance V.S Junction Temperature

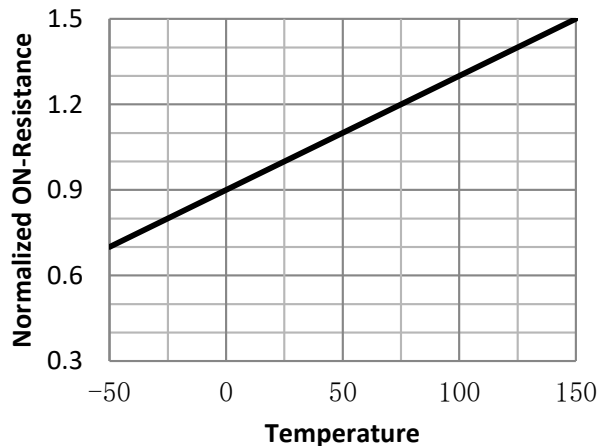


Fig.7 Switching Time Measurement Circuit

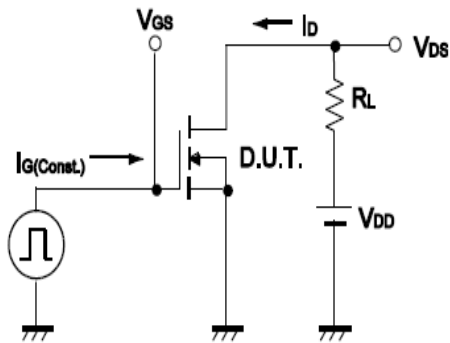


Fig.8 Gate Charge Waveform

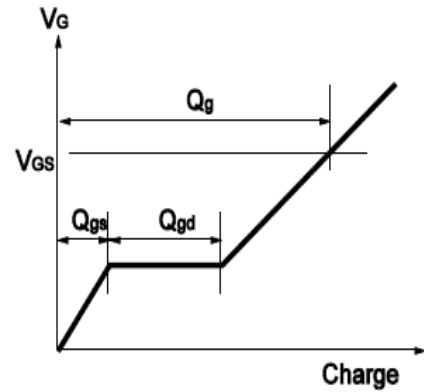


Fig.9 Switching Time Measurement Circuit

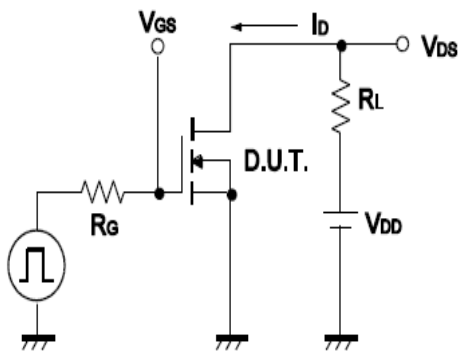


Fig.10 Gate Charge Waveform

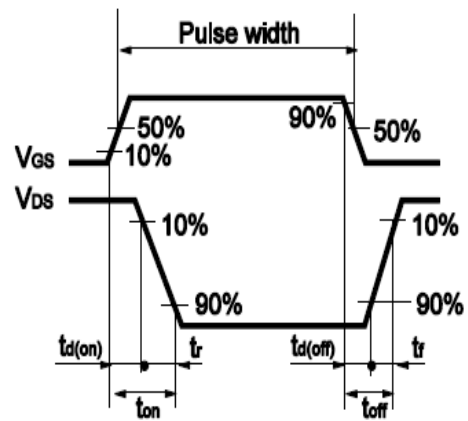


Fig.11 Avalanche Measurement Circuit

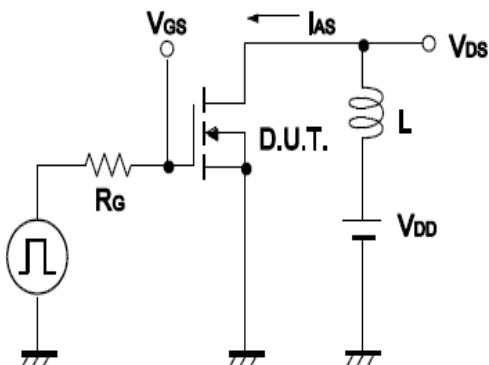
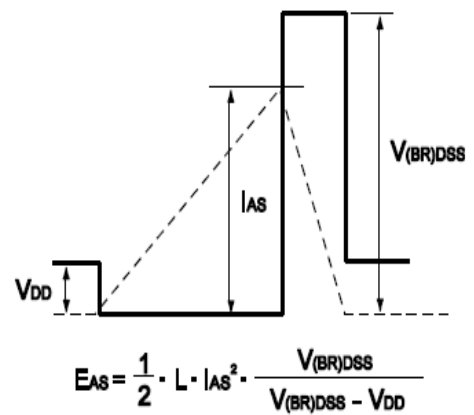
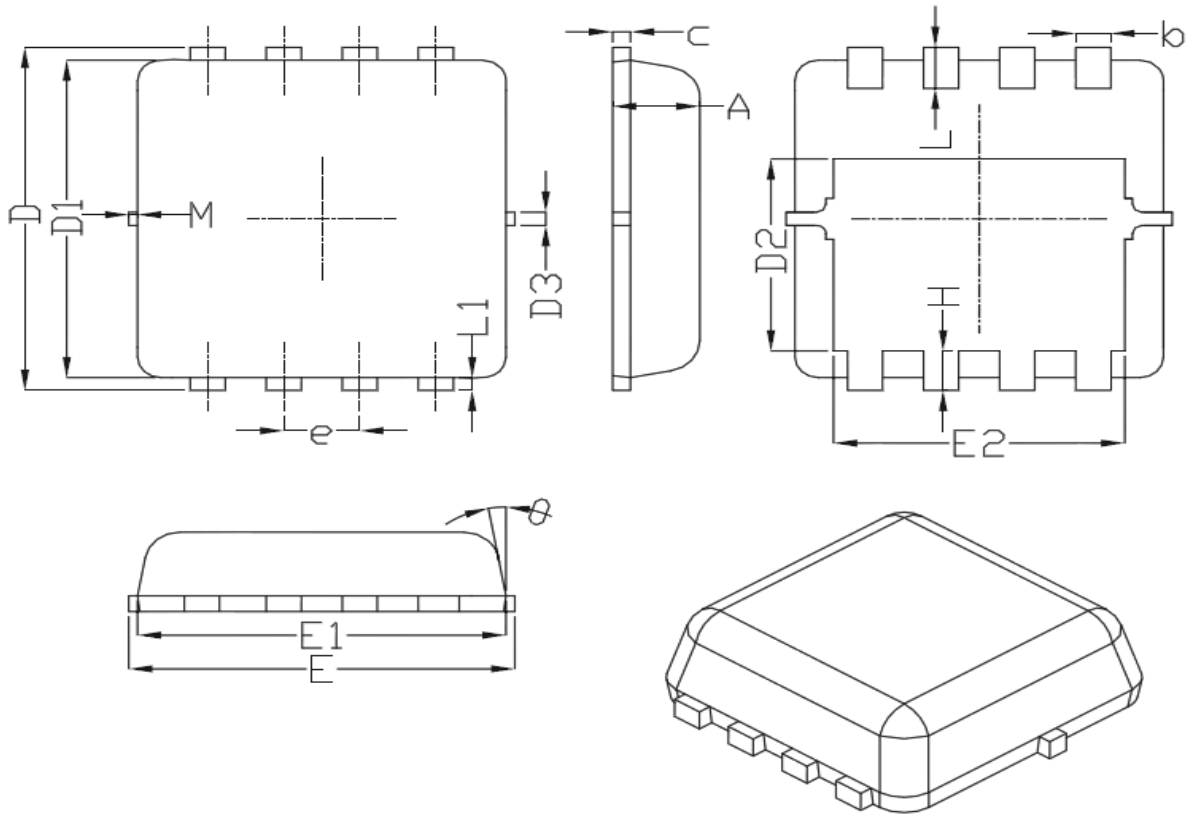


Fig.12 Avalanche Waveform





DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	b	0.25	0.30	0.35
C	0.10	0.15	0.25	D	3.25	3.35	3.45
D1	3.00	3.10	3.20	D2	1.78	1.88	1.98
D3	--	0.13	--	E	3.20	3.30	3.40
E1	3.00	3.15	3.20	E2	2.39	2.49	2.59
e	0.65BSC			H	0.30	0.39	0.50
L	0.30	0.40	0.50	L1	--	0.13	--
θ	--	10°	12°	M	*	*	0.15
*Not specified							