

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

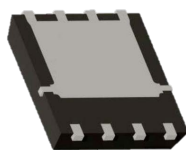
Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th_Typ)}$	1.5	V
$I_D(@V_{GS}=10V)$	90	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	3.8	m Ω
$R_{DS(ON_Typ)}(@V_{GS}=4.5V)$	7.5	m Ω

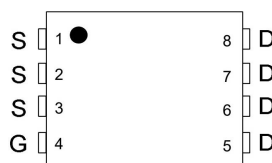
Top View



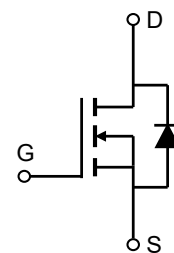
Bottom View



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} = 24V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0	1.5	2.3	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.8	4.8	mΩ
		V _{GS} =4.5V, I _D =15A		7.5	9.0	mΩ
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 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} =3Ω		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℃			30	A
Reverse recovery time	trr	di/dt = 100A/μs, I _F = 30A		22		ns
Reverse recovery charge	Qrr			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

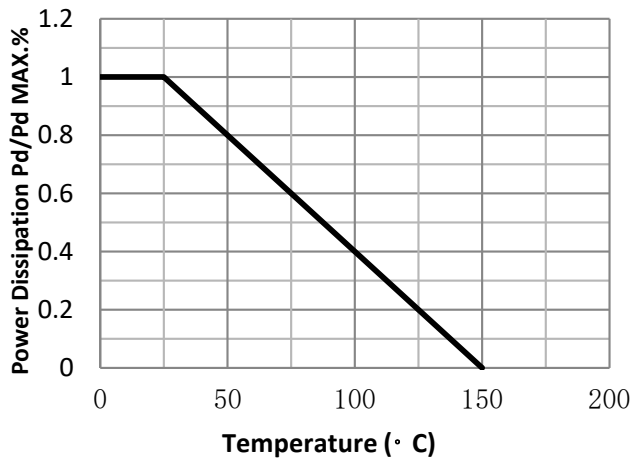


Fig.2 Typical output Characteristics

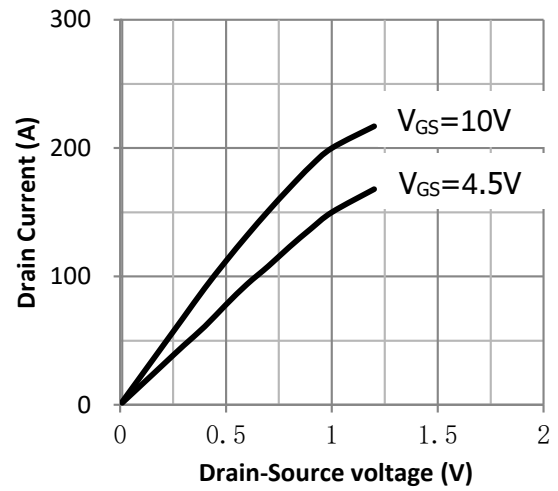


Fig.3 Threshold Voltage V.S Junction Temperature

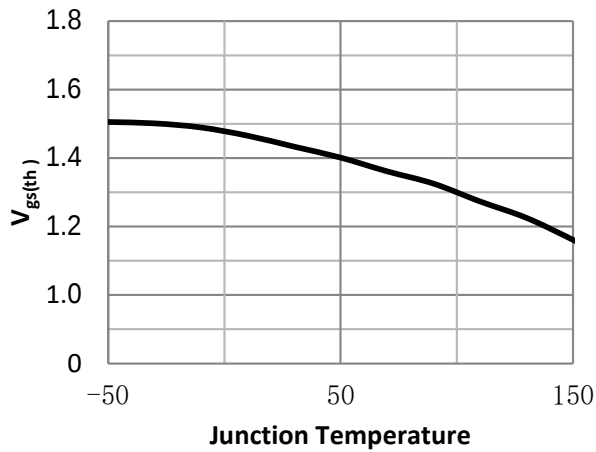


Fig.4 Resistance V.S Drain Current

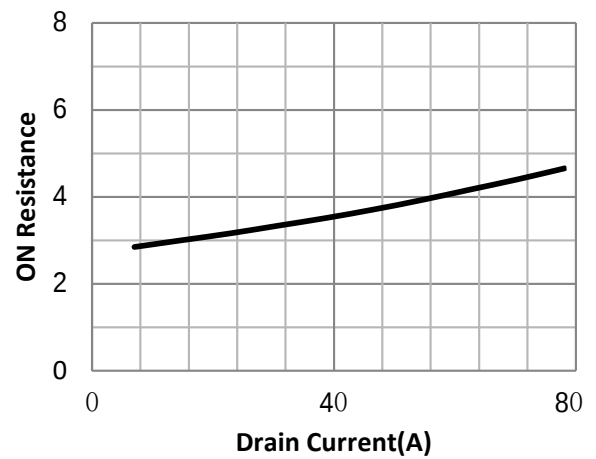


Fig.5 On-Resistance VS Drain Current

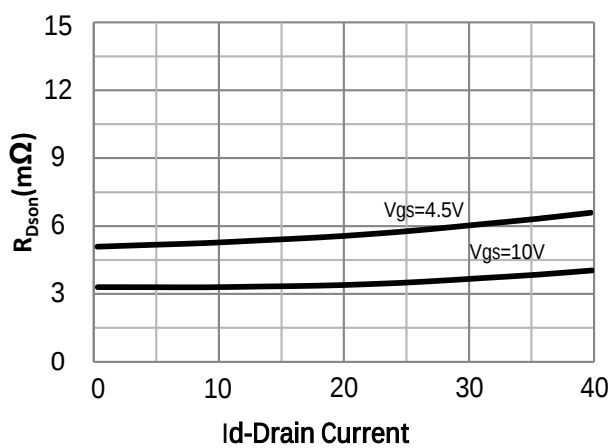


Fig.6 On-Resistance V.S Junction Temperature

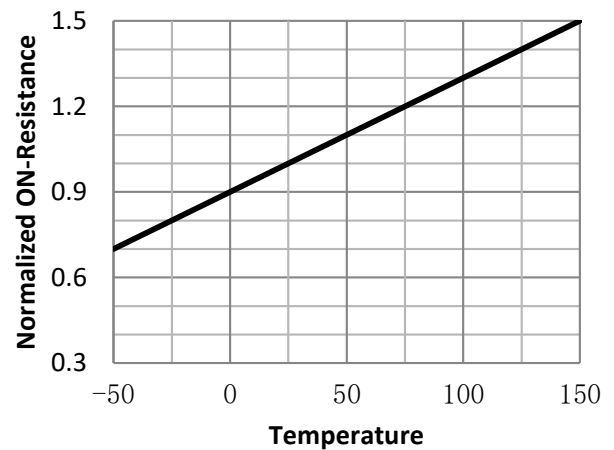


Fig.7 Switching Time Measurement Circuit

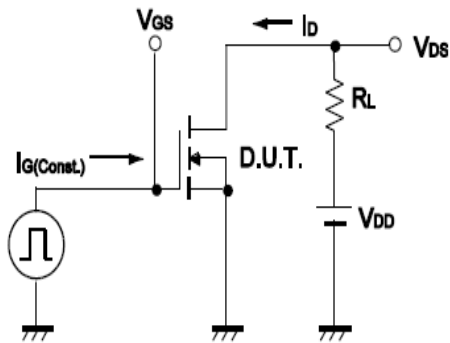


Fig.8 Gate Charge Waveform

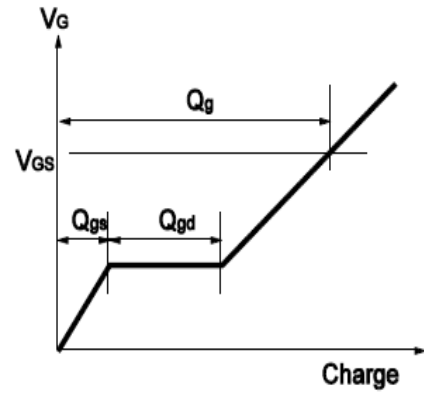


Fig.9 Switching Time Measurement Circuit

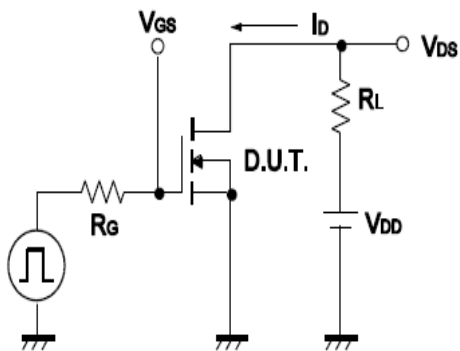


Fig.10 Gate Charge Waveform

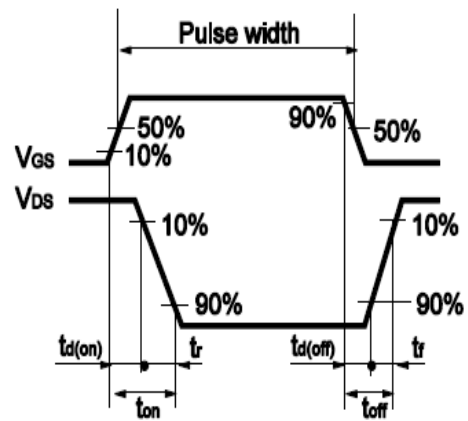


Fig.11 Avalanche Measurement Circuit

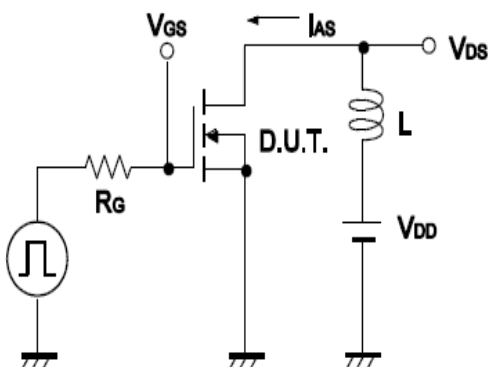
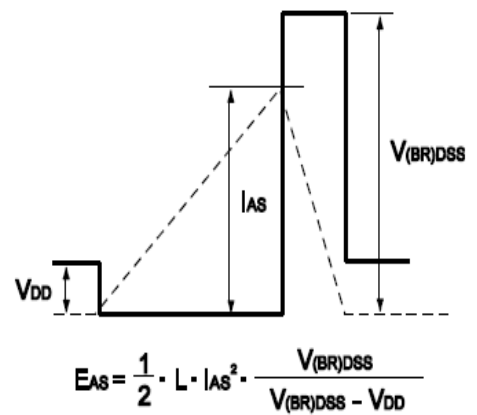
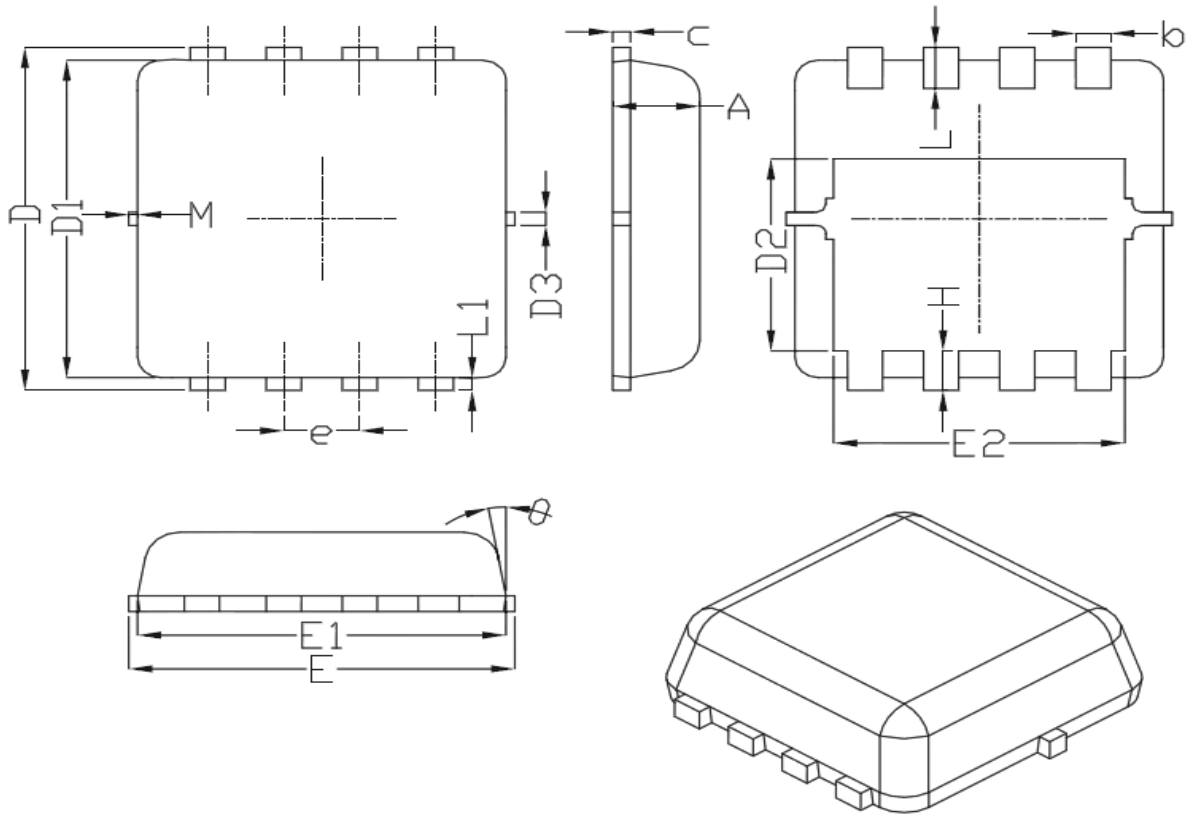


Fig.12 Avalanche Waveform





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							