

N-channel Enhancement Mode Power MOSFET

Features

- Advanced Trench Technology
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

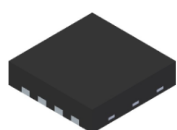
Product Summary

Parameters	Value	Unit
V_{DSS}	60	V
$V_{GS(th)}_{Typ}$	3.0	V
$I_D(@V_{GS}=10V)$	80	A
$R_{DS(ON)}_{Typ} @V_{GS}=10V$	5.3	mΩ

Applications

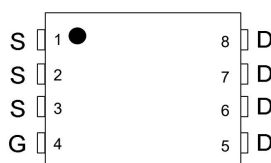
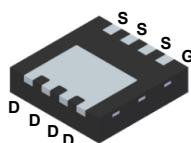
- Load Switch
- PWM Application
- Power management

Top View

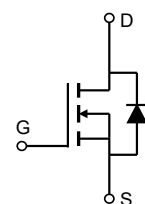


DFN3.3x3.3-8L

Bottom View



Marking



Schematic Diagram

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK60N80Q	60N80	DFN3.3x3.3	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}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	80	A
	$T_C = 100^{\circ}\text{C}$		55	
Pulsed Drain Current		I_{DM}	320	A
Single Pulsed Avalanche Energy		E_{AS}	210	mJ
Power Dissipation		P_D	132	W
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.1	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

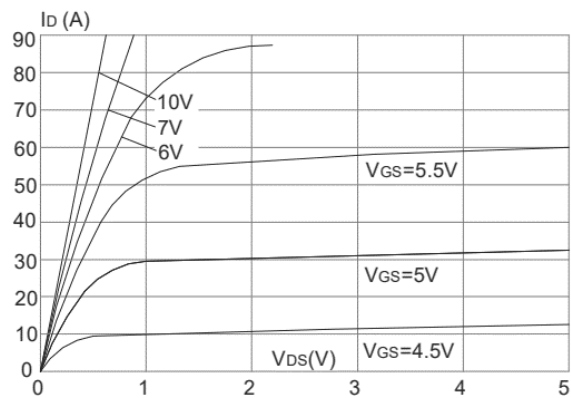
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = 250uA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 60V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.0	3.0	4.0	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		5.3	11	mΩ
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V f =1MHz		3782		pF
Output capacitance	C _{oss}			297		
Reverse transfer capacitance	C _{rss}			218		
Switching characteristics						
Total gate charge	Q _g	V _{GS} =0 to 10V V _{DS} =30V, I _D =30A		77		nC
Gate-source charge	Q _{gs}			21		
Gate-drain charge	Q _{gd}			24		
Turn-on delay time	t _{d(on)}	V _{DS} =30V,I _D =30A V _{GS} =10V,R _{GEN} =1.8Ω		18		ns
Turn-on rise time	t _r			88		
Turn-off delay time	t _{d(off)}			37		
Turn-off fall time	t _f			85		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD}	V _{GS} =0V, I _S =30A			1.2	V
Continuous drain-source diode forward current	I _S	T _C =25℃			80	A
Pulsed drain-source diode forward current	I _{SM}					
Reverse recovery time	t _{rr}					
Reverse recovery charge	Q _{rr}					

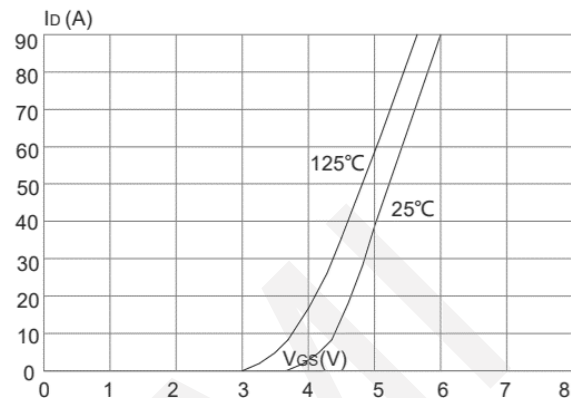
Notes:

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions

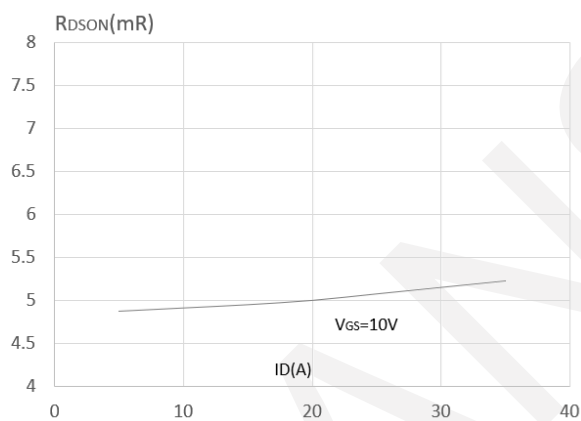
Typical Performance Characteristics



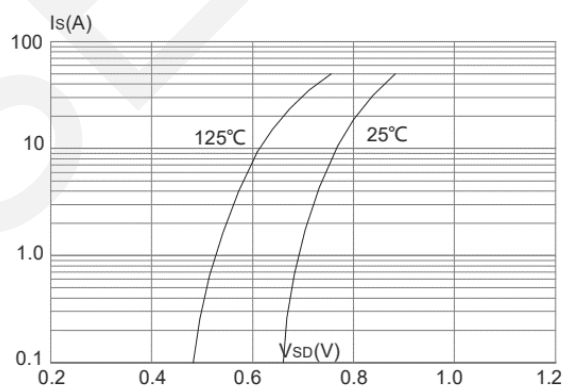
Output Characteristics



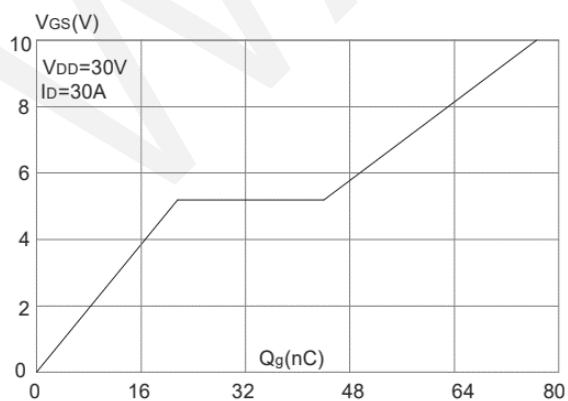
Typical Transfer Characteristics



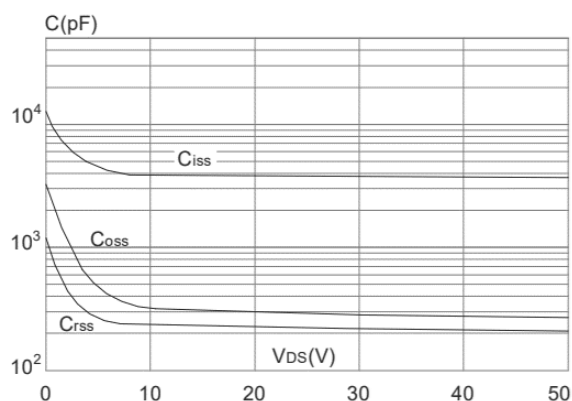
On-resistance vs. Drain Current



Body Diode Characteristics

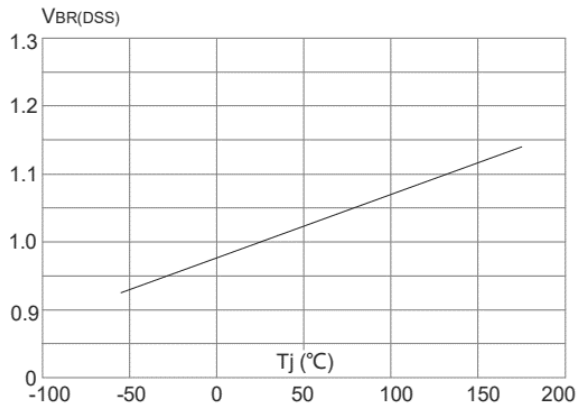


Gate Charge Characteristics

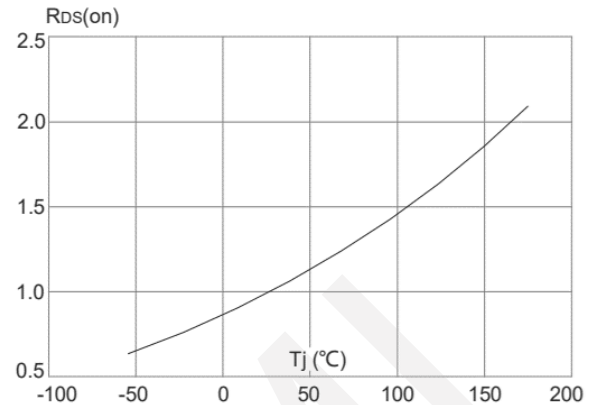


Capacitance Characteristics

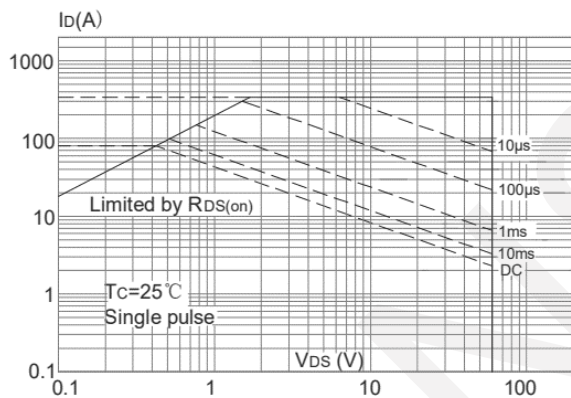
Typical Performance Characteristics



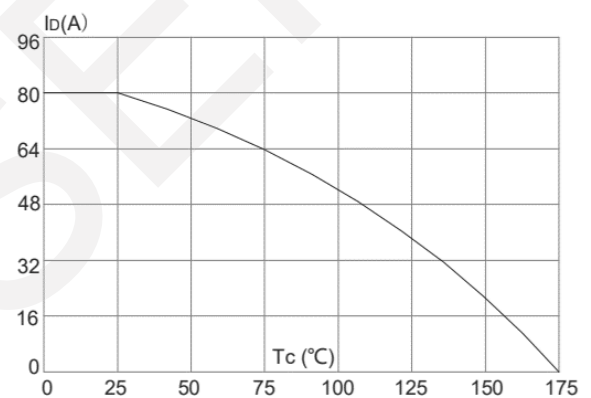
Normalized Breakdown Voltage vs.
Junction Temperature



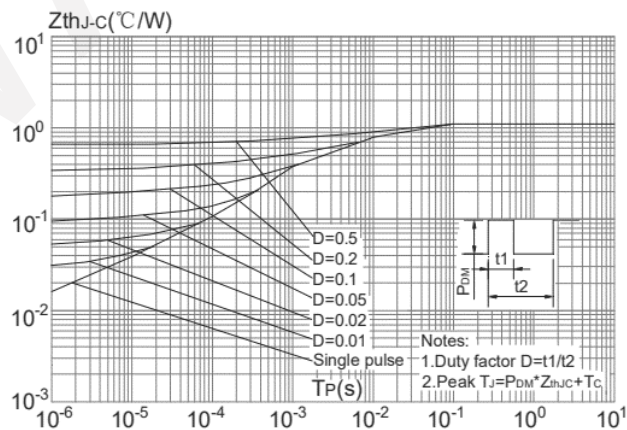
Normalized on Resistance vs.
Junction Temperature



Maximum Safe Operating Area



Maximum Continuous Drain Current vs.
Case Temperature



Maximum Effective Transient

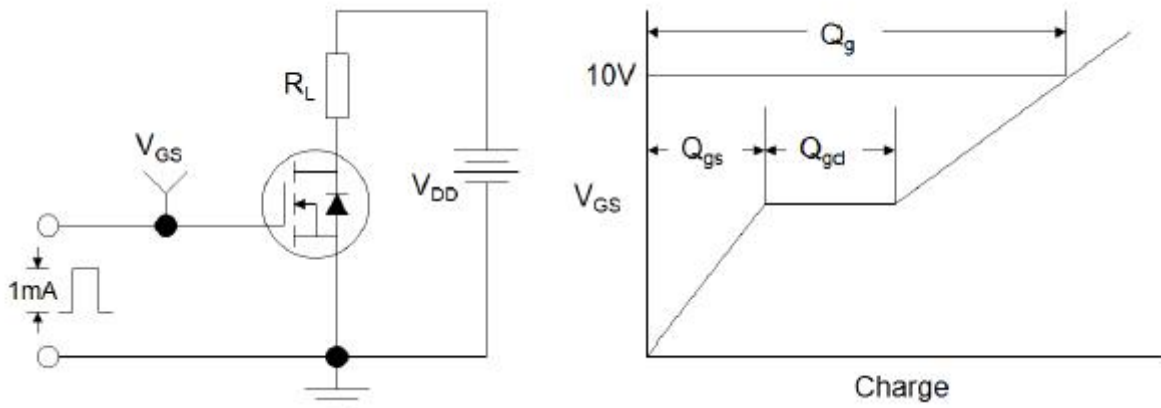


Figure1:Gate Charge Test Circuit & Waveform

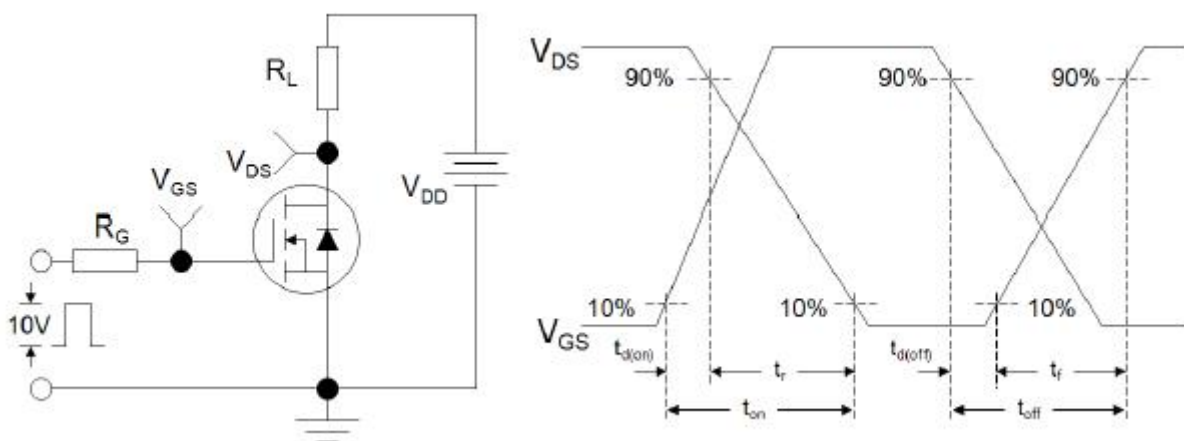
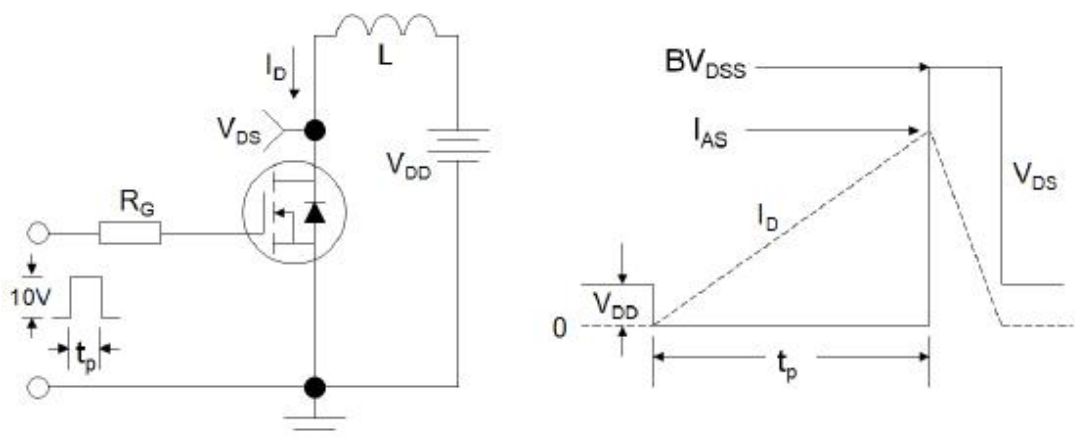
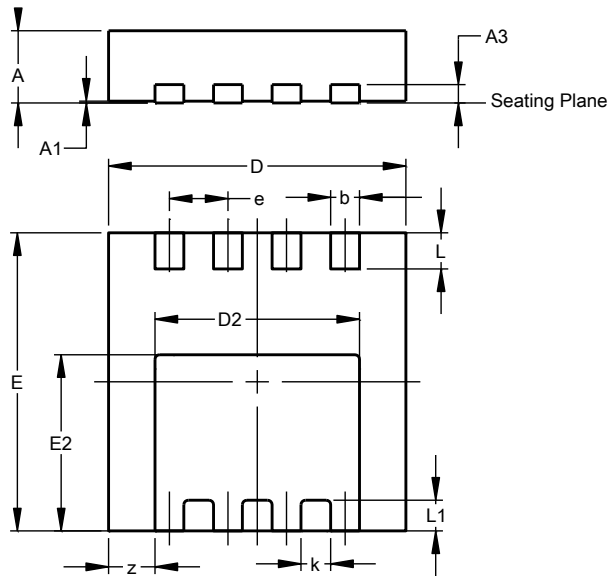


Figure 2: Resistive Switching Test Circuit & Waveforms

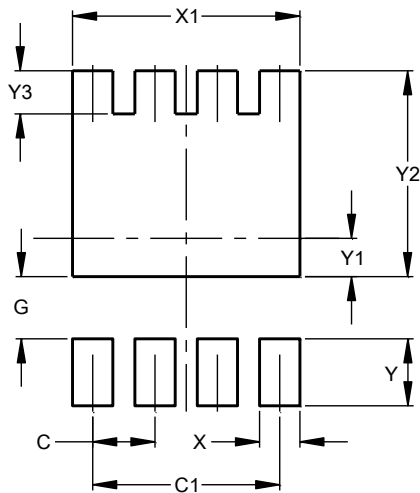


DFN3.3x3.3-8L Package Information



V-DFN3333-8 (Type B)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.27	0.37	0.32
D	3.25	3.35	3.30
D2	2.17	2.37	2.27
E	3.25	3.35	3.30
E2	1.85	2.05	1.95
e	--	--	0.65
k	--	--	0.33
L	0.35	0.45	0.40
L1	--	--	0.34
z	--	--	0.515
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
C1	1.950
G	0.650
X	0.420
X1	2.370
Y	0.700
Y1	0.400
Y2	2.150
Y3	0.450