ZK60N06DS

Dual 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% ΔVds TESTED!

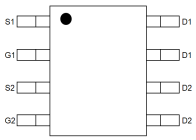
Product Summary

Parameters	Value	Unit
V_{DSS}	60	V
$V_{GS(th)\_Typ}$	1.5	V
I_D(@V_{GS}=10V)	5.8	A
$R_{DS(ON)\_Typ}$(@V_{GS}=10V	32	mΩ

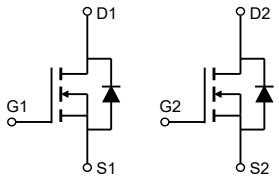
Applications

- Load Switch
- PWM Application
- Power Management

SOP8 Top View



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK60N06DS	60N06D	SOP8	Reel	N/A	N/A	4000

MAXIMUM RATINGS (T_a=25℃ 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°C	I_D	5.8	A
	T_C = 100°C		3.7	
Pulsed Drain Current		I_{DM}	23	A
Single Pulsed Avalanche Energy		E_{AS}	13	mJ
Power Dissipation		P_D	2	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	61	℃/W
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ 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 = 250μA	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	1.0	1.5	2.2	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		32	42	mΩ
		V_{GS} =4.5V, I_D =10A		39	54	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V f =1MHz		958		pF
Output capacitance	C_{oss}			40		
Reverse transfer capacitance	C_{rss}			38		
Switching characteristics						
Total gate charge	Q_g	V_{GS}=0 to 10V V_{DS}=30V, I_D=10A		25		nC
Gate-source charge	Q_{gs}			4		
Gate-drain charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS}=30V,I_D=10A V_{GS}=10V,R_{GEN}=5Ω		7		ns
Turn-on rise time	t_r			3		
Turn-off delay time	$t_{d(off)}$			19		
Turn-off fall time	t_f			3.5		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD}	V_{GS} =0V, I_S=10A			1.2	V
Continuous drain-source diode forward current	I_S				40	A
Pulsed Source Current	I_{SM}				162	A
Reverse recovery time	trr	di/dt = 100A/μs, I_F = 10A		19		ns
Reverse recovery charge	Qrr			0.016		nC

Notes:

1.Repetitive Rating : Drain current limited by maximum junction temperature.
2.EAS condition: TJ =25℃, VDD =50V, VGS =10V, L=0.5mH, IAS = 7A
3.These curves are based on the junction-to-case thermal impedance Rthja, assuming maximum junction temperature is 150℃.These curves provide a single pulse rating.

Typical Characteristics

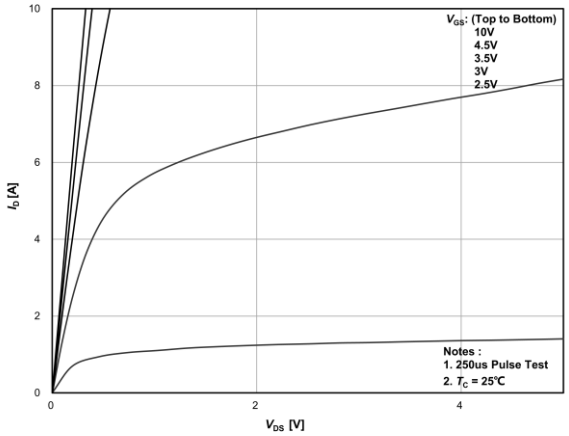


Figure 1. On-Region Characteristics

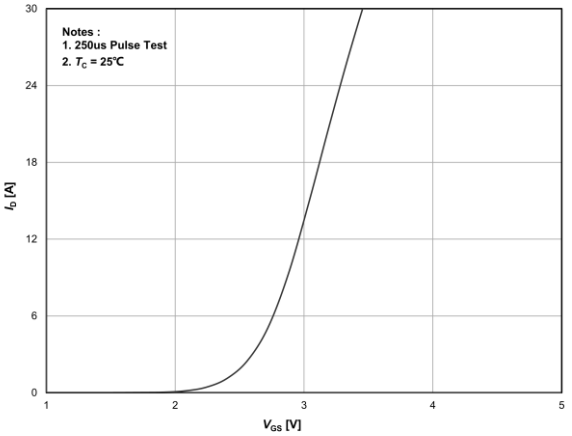


Figure 2. Transfer Characteristics

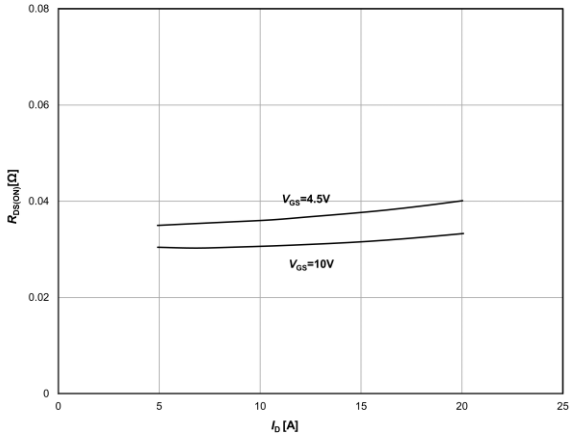


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

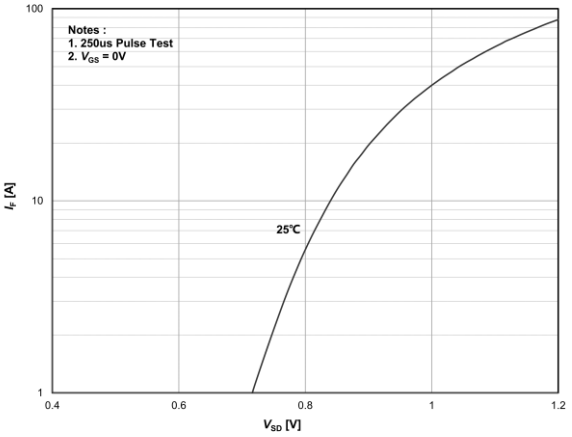


Figure 4. Body Diode Forward Voltage Variation with Current

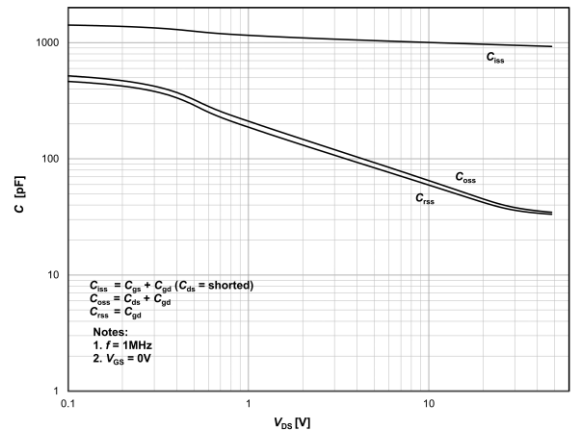


Figure 5. Capacitance Characteristics

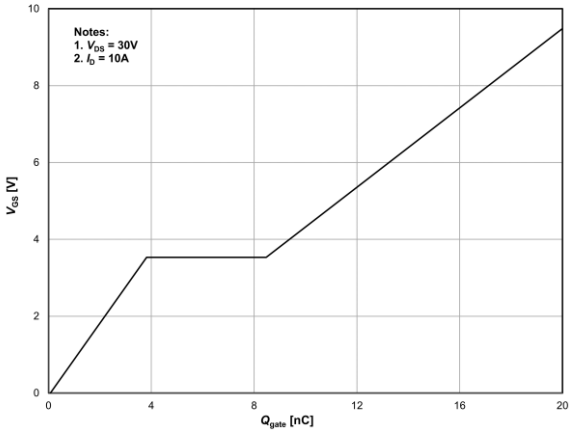


Figure 6. Gate Charge Characteristics

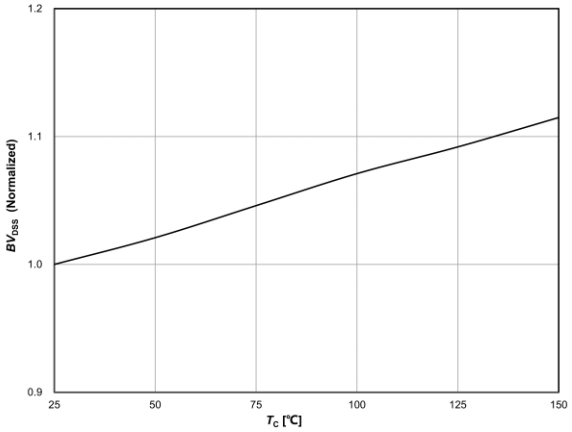


Figure 7. Breakdown Voltage Variation vs Temperature

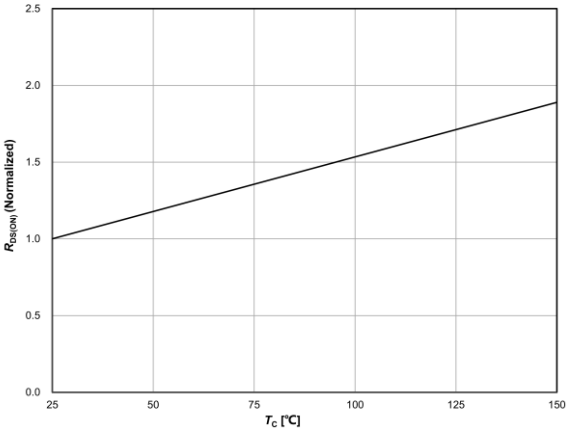


Figure 8. On-Resistance Variation vs Temperature

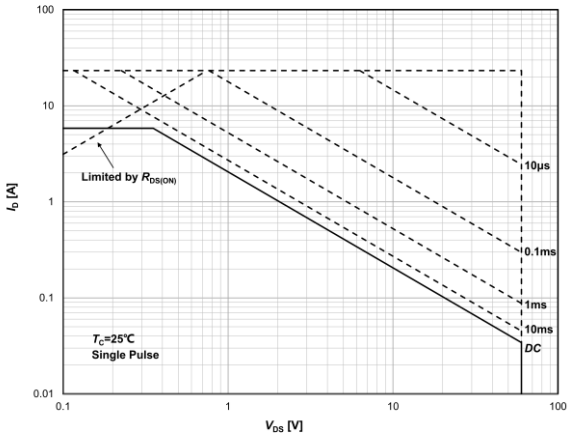


Figure 9. Maximum Safe Operating Area[3)]

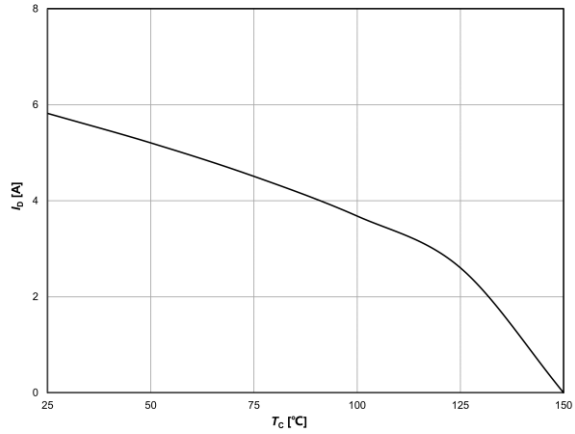


Figure 10. Maximum Drain Current vs Case Temperature

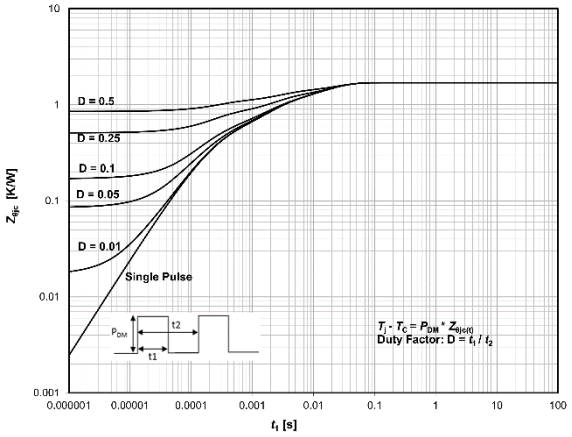
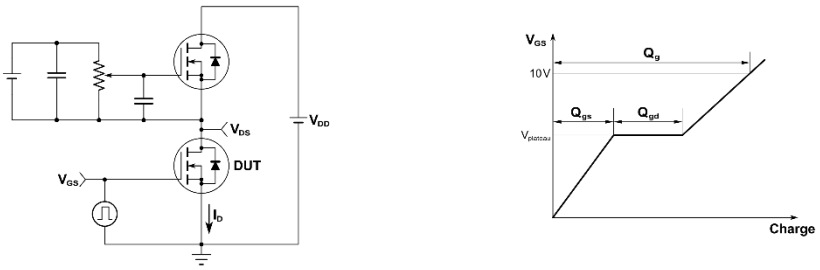
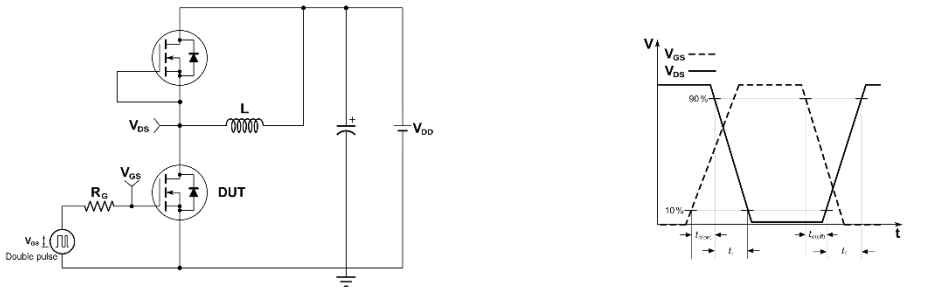


Figure 11. Transient Thermal Response Curve

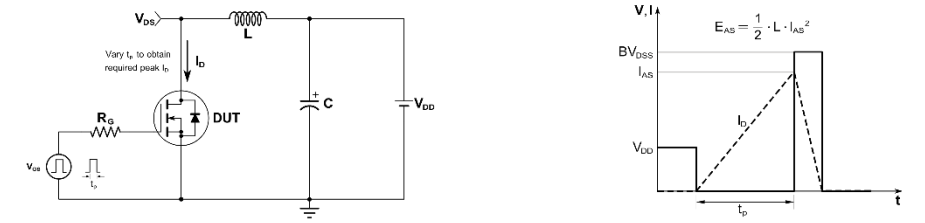
Test Circuits



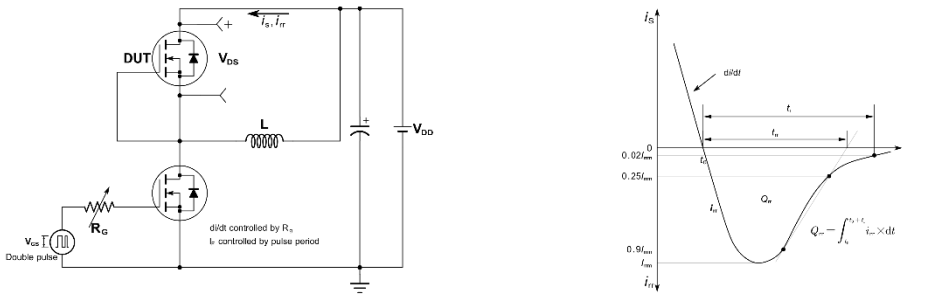
Gate charge test circuit & waveform



Switching times for inductive load test circuit & waveform

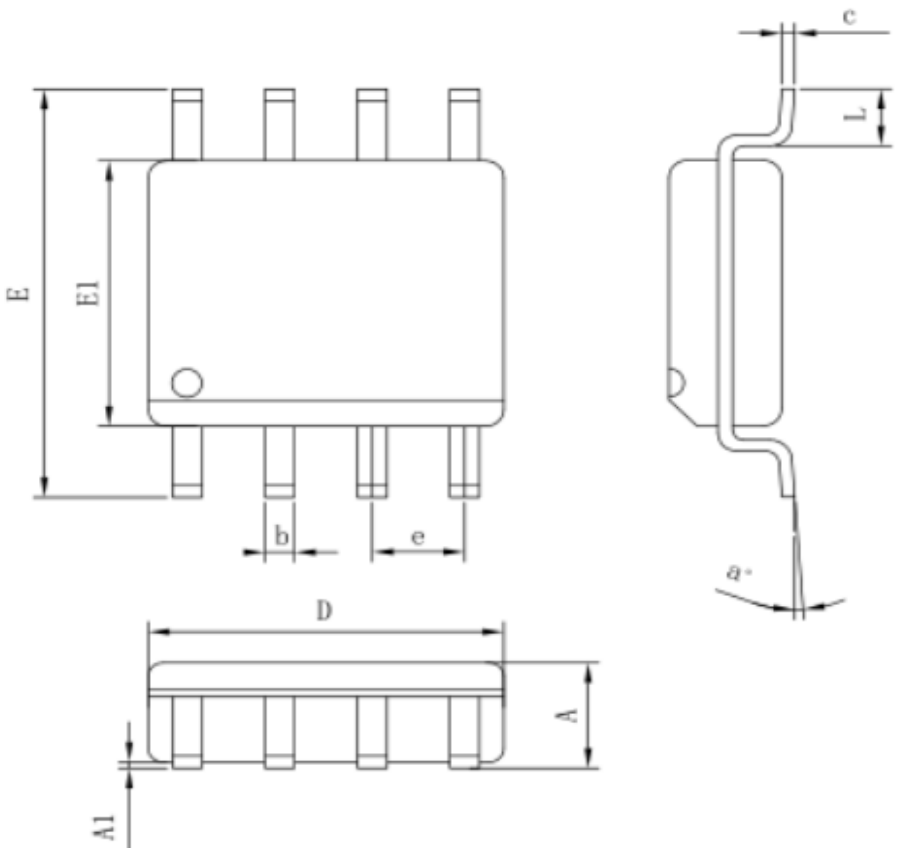


Unclamped inductive load test circuit & waveform



Diode characteristics test circuit & waveform

Package Mechanical Data(SOP-8)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.75
A1	0.10	--	0.23
b	0.35	--	0.48
c	0.19	--	0.25
D	4.70	4.90	5.00
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	--	0.80
a°	0°	--	8°