CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

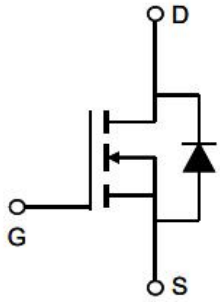
The ZS3080KS combines advanced trench technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance. It can be used in wide variety of application.

Features

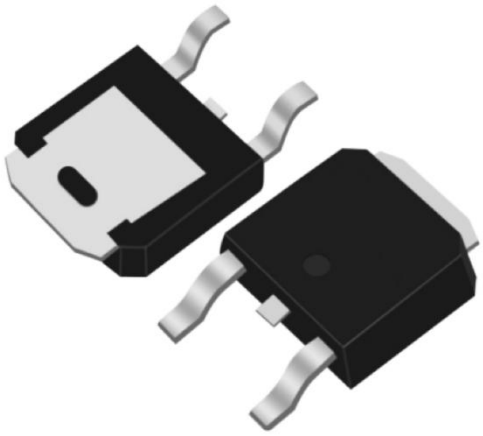
- V_{DS}=30V, I_D=80A
  $R_{DS(ON)typ.}$ =4.0mΩ@V_{GS}=10V
  $R_{DS(ON)typ.}$ =6.0mΩ@V_{GS}=4.5V
- 100% avalanche tested
- Fast switching
- High power and current handing capability
- Termination is Lead-free and RoHS Compliant

Applications

- PWM applications
- Load switch
- Power Management



Schematic Diagram



TO252 Package

Maximum Ratings(T_A=25℃ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D(T_C=25℃)	80	A
	I_D(T_C=100℃)	45	
Pulsed Drain Current[B]	I_{DM}	320	A
Maximum Power Dissipation[A]	P_D	83	W
Single pulse avalanche energy	E_{AS}	306	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance, Junction to Case	R_{QJC}	1.4	℃/W

Electrical Characteristics (T_A=25℃unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Gate-Threshold Voltage	$V_{th(GS)}$	V_{DS}= V_{GS}, I_D=250 uA	1	1.5	2.2	V
Gate-body Leakage	IGSS	V_{DS}=0V, V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	IDSS	V_{DS}=30V, V_{GS}=0V			1	uA
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A		4.0	5.0	mΩ
		V_{GS} =4.5V, I_D =20A		6.0	8.0	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} =0V, F=1MHz		1970		pF
Output Capacitance	C_{oss}			215		
Reverse Transfer Capacitance	C_{rss}			178		
Switching Capacitance						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 15V, R_L=3Ω V_{GS} = 10V, R_{GEN}=3Ω		20		nS
Turn-on Rise Time	t_r			15		nS
Turn-off Delay Time	$t_{d(off)}$			60		nS
Turn-off Fall Time	t_f			10		nS
Total Gate Charge	Q_g	V_{DS} = 15V, I_D=5A, V_{GS} =4.5V		37.3		nC
Gate-Source Charge	Q_{gs}			5.8		nC
Gate-Drain Charge	Q_{gd}			7.7		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} =0V, I_D=5A			1.2	V
Diode Forward Current	Is				80	A

Notes:

A. The Power dissipation P_D is based on $T_{J(MAX)}$=150 ℃ , using≤10s junction-to ambient thermal resistance.

B. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.Ratings are based on low frequency and duty cycles to keep initial T_J=25℃.

C. The Static characteristics in Figures are obtained using ‹300 μs pulses, duty cycle 2% max.

D. EAS condition: TJ=25℃,V_{DD}=15V, V_{GS}=10V, R_G=25Ω, L=0.5Mh。

Typical Electrical and Thermal Characteristics

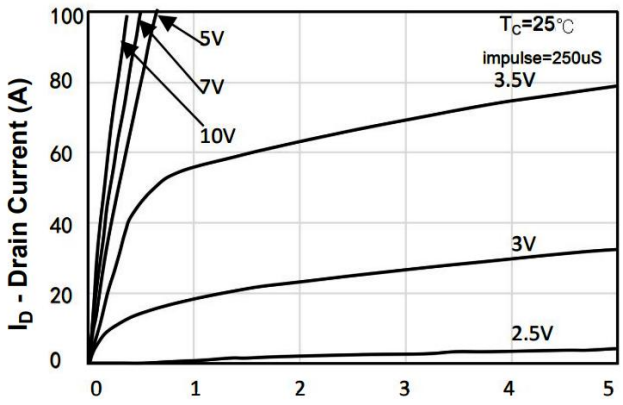


Figure 1. On-Region Characteristics

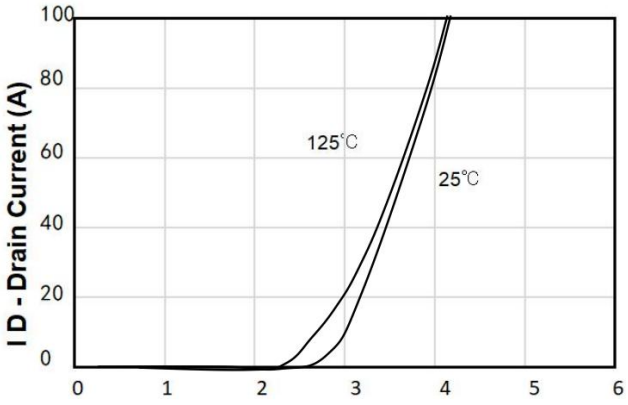


Figure 2. Transfer Characteristics

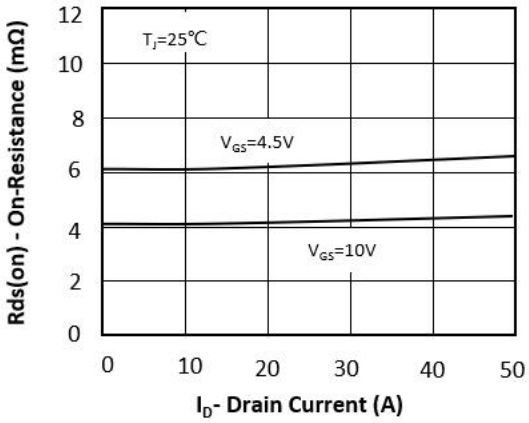


Figure 3. On-resistance vs. Drain Current

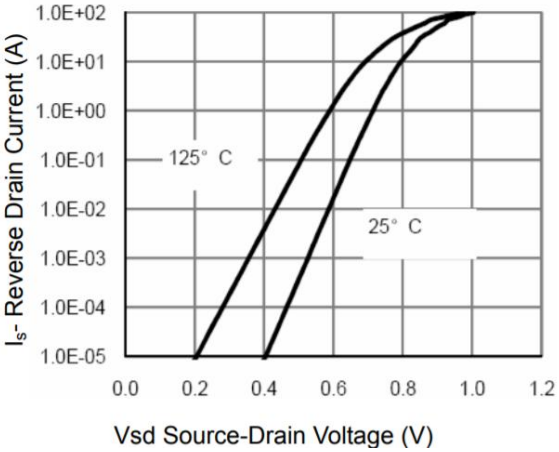


Figure 4. Body Diode Characteristics

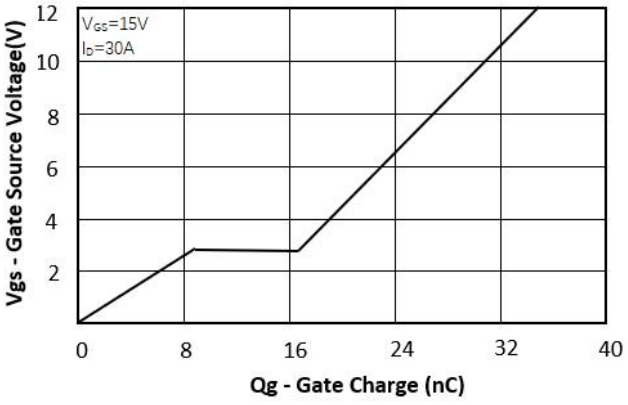


Figure 5. Gate Charge Characteristics

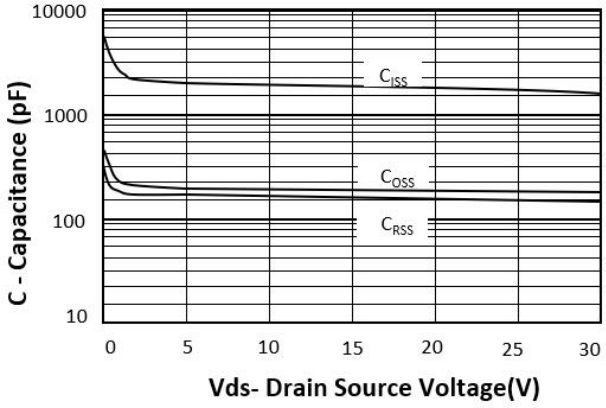


Figure 6. Capacitance Characteristics

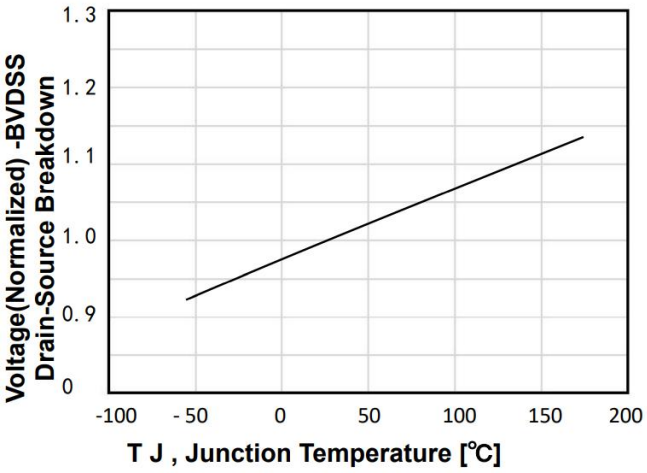


Figure 7. Breakdown Voltage Variation vs Temperature

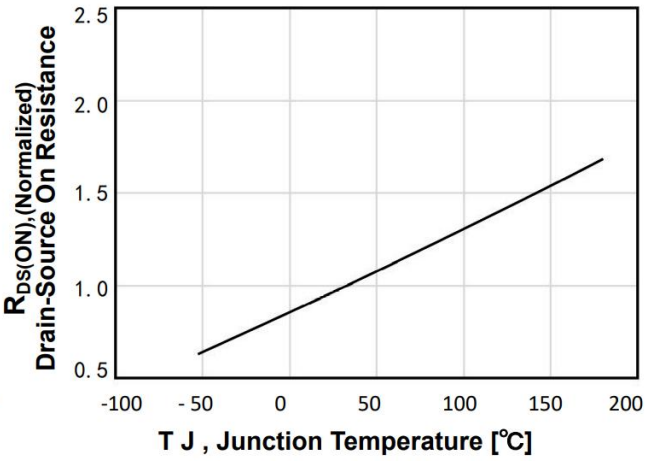


Figure 8. On-Resistance Variation vs Temperature

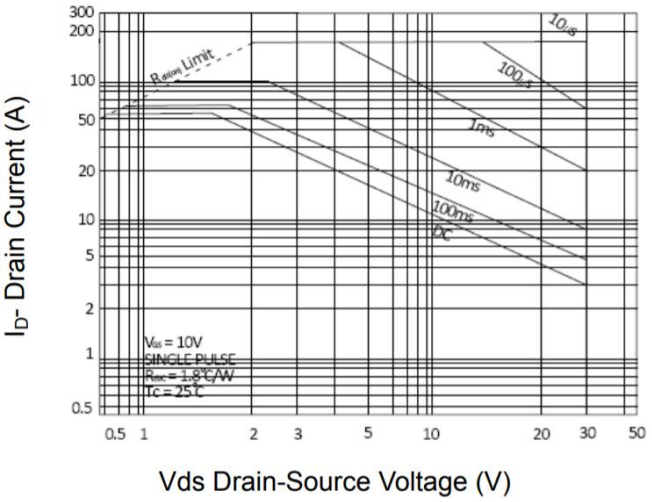


Figure 9. Safe Operation Area

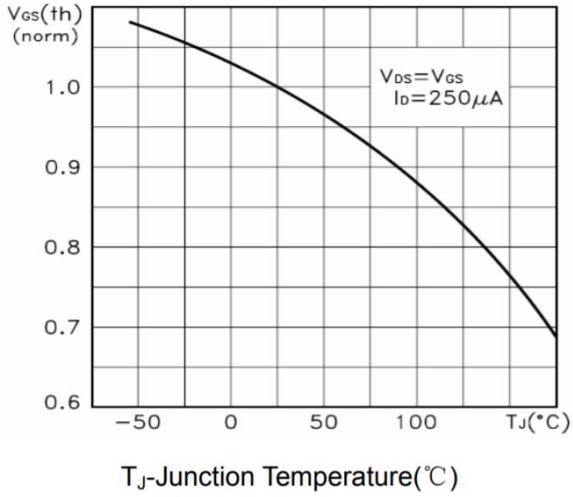


Figure 10. Current – Junction Temperature

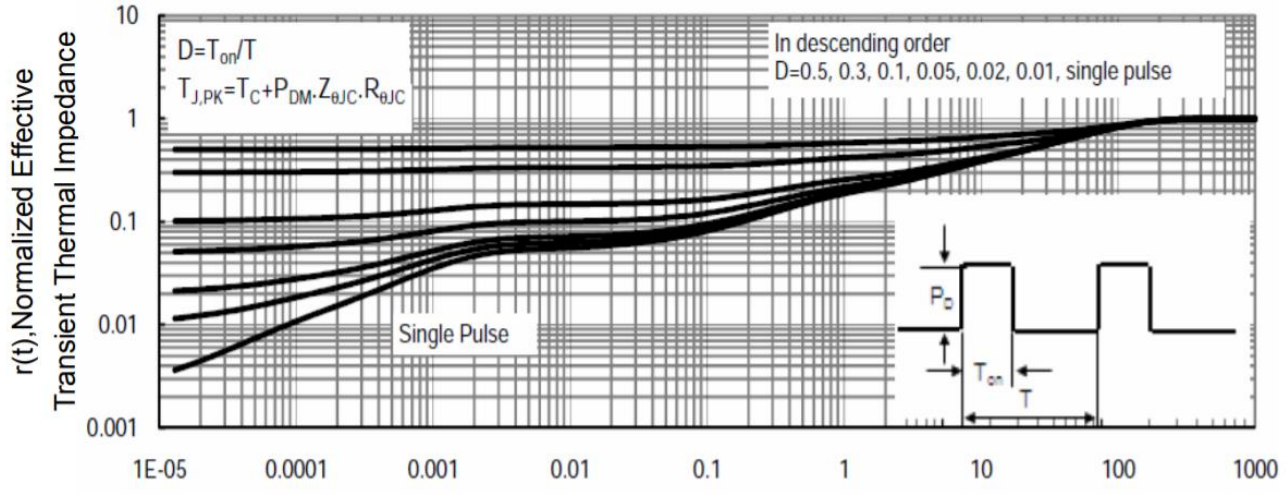
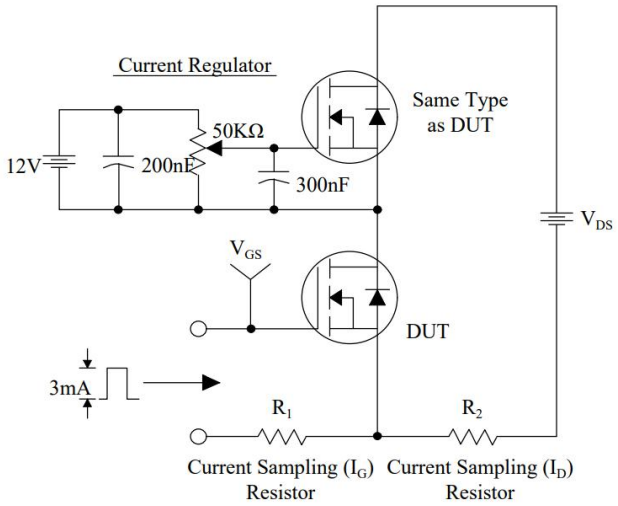
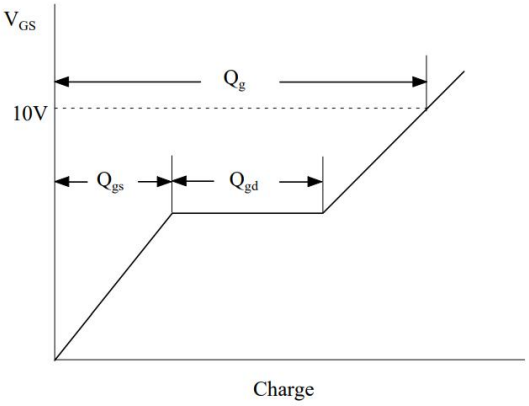


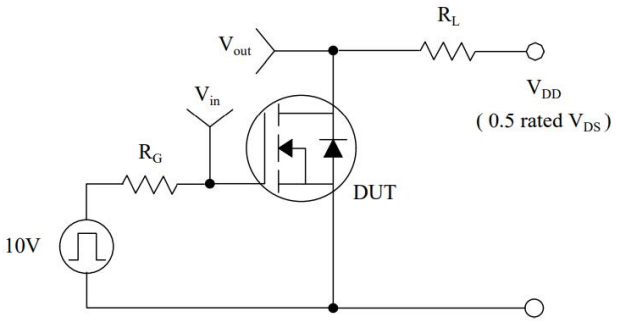
Figure 11 Normalized Maximum Transient Thermal Impedance

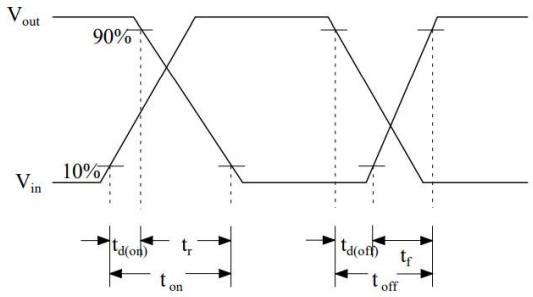
Gate Charge Test Circuit & Waveform



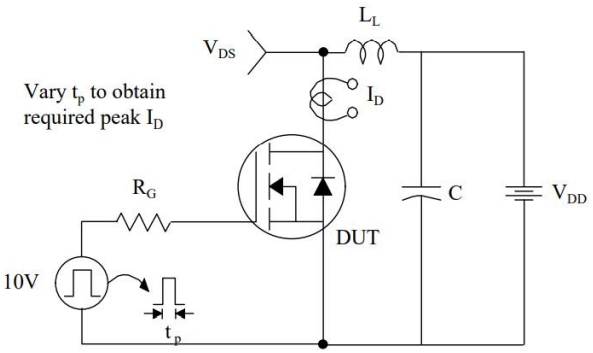


Resistive Switching Test Circuit & Waveforms

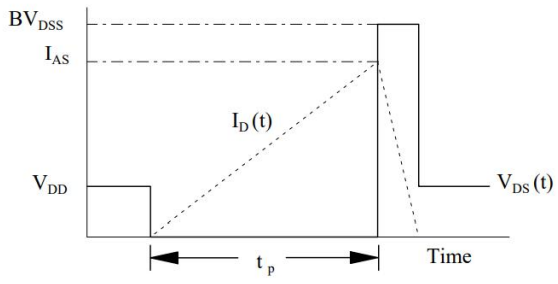




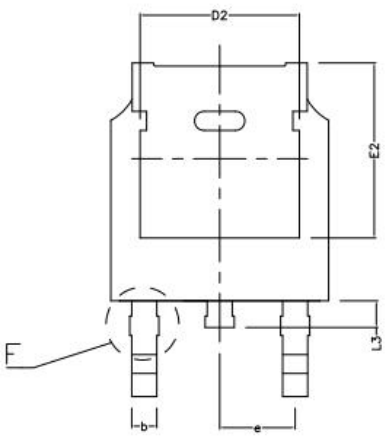
Unclamped Inductive Switching Test Circuit & Waveforms



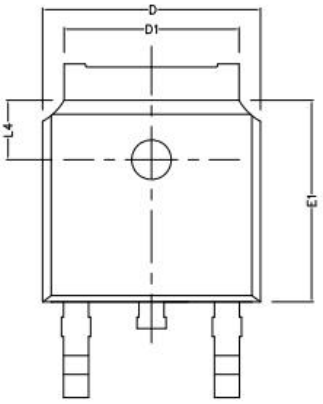
$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$



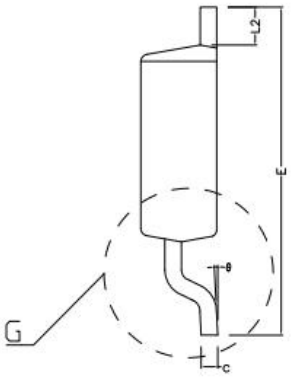
TO252 Package Information



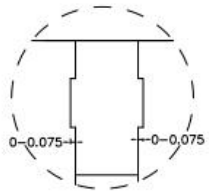
BOTTOM VIEW



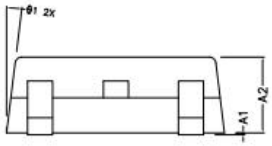
TOP VIEW



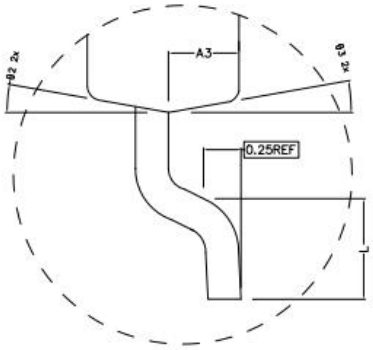
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

	MIN	NORMAL	MAX		MIN	NORMAL	MAX
A1	0.000	0.100	0.150	E2	5.600REF		
A2	2.200	2.300	2.400	e	2.286TYPE		
A3	1.020	1.070	1.120	L	1.400	1.550	1.700
b	0.710	0.760	0.810	L2	1.10REF		
c	0.460	0.508	0.550	L3	0.80REF		
D	6.500	6.600	6.700	L4	1.8REF		
D1	5.330REF			θ	0~8°		
D2	4.830REF			θ1	7° TYPE		
E	9.900	10.100	10.300	θ2	10° TYPE		
E1	6.000	6.100	6.200	θ3	10° TYPE		

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