

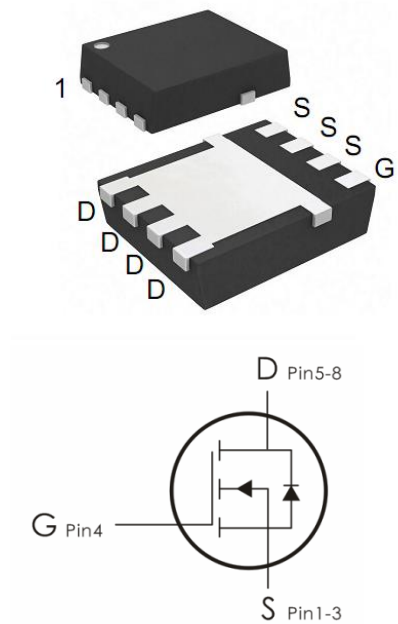
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=60V, I_D=130A, R_{DS(ON)}<3m\Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	130	A
	Continuous Drain Current- $T_C=100^\circ C$	---	
	Pulsed Drain Current ²	390	
E_{AS}	Single Pulse Avalanche Energy ⁵	80	mJ
P_D	Power Dissipation ³	140	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.89	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to mbient ⁴	62	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
ZMS030N06N	ZMS030N06N	DFN5*6

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =20A	---	2.5	3	m Ω
		V _{GS} =4.5V, I _D =10A	---	3	4.5	
Dynamic Characteristics ⁴						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	5377	---	pF
C _{Oss}	Output Capacitance		---	1666	---	
C _{rss}	Reverse Transfer Capacitance		---	77.7	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DD} =30V, I _D =25A, R _G =2Ω V _{GS} =10V	---	22.5	---	ns
t _r	Rise Time		---	6.7	---	ns
t _{d(off)}	Turn-Off Delay Time		---	80.3	---	ns
t _f	Fall Time		---	26.8	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =25A	---	66.1	---	nC
Q _{gs}	Gate-Source Charge		---	10.7	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10.9	---	nC
Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =20A	---	---	1.3	V

LS	Continuous Source Current	$V_{GS} < V_{th}$	---	---	130	A
LSp	Pulsed Source Current		---	---	390	
Trr	Reverse Recovery Time	$I_S = 25\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$	---	68.3	---	NS
Qrr	Reverse Recovery Charge		---	73	---	BC

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25^\circ\text{C}$.
- 5) $V_{DD} = 50\text{ V}$, $R_G = 25\ \Omega$, $L = 0.3\text{ mH}$, starting $T_j = 25^\circ\text{C}$.

Typical Characteristics: ($T_c = 25^\circ\text{C}$ unless otherwise noted)

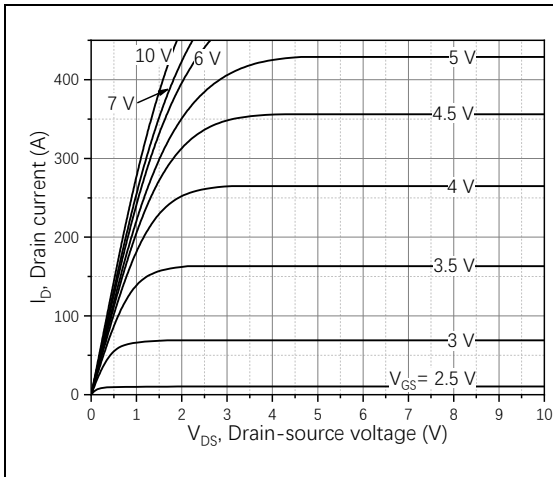


Figure 1, Typ. output characteristics

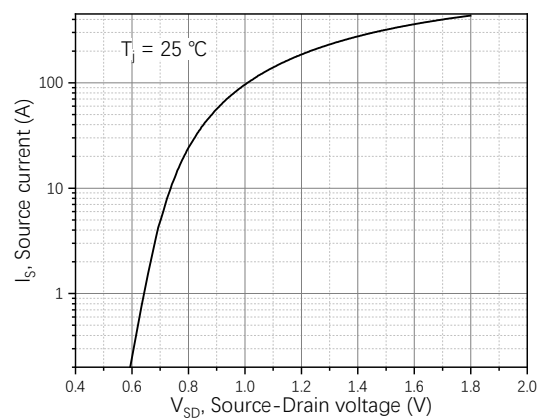


Figure 2, Typ. transfer characteristics

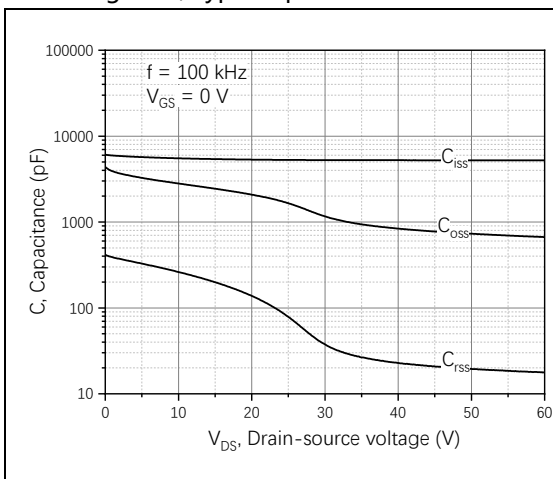


Figure 3, Typ. capacitances

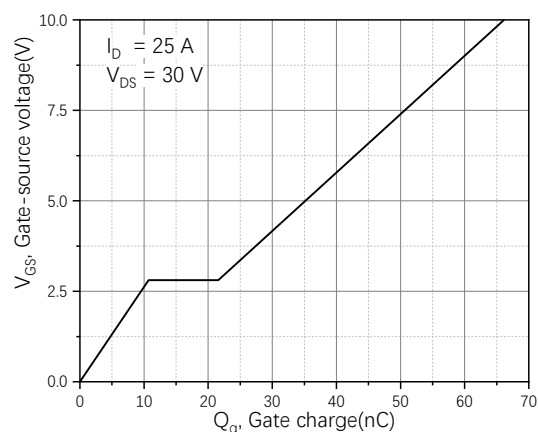


Figure 4, Typ. gate charge

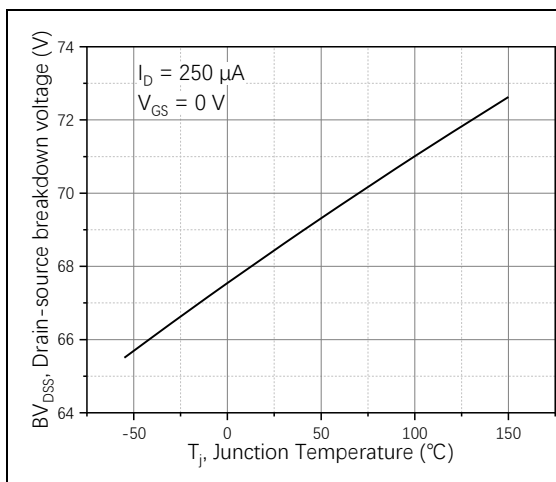


Figure 5, Drain-source breakdown voltage

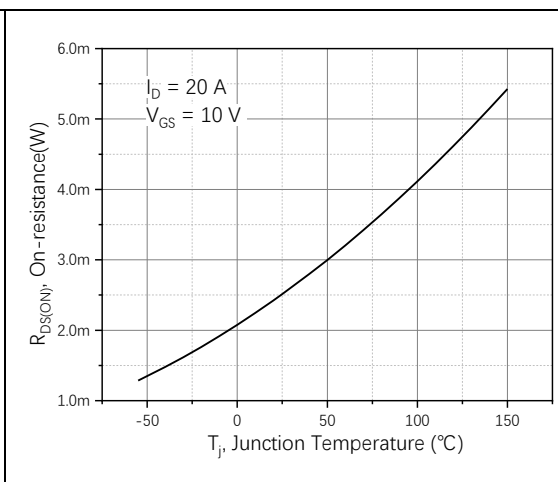


Figure 6, Drain-source on-state resistance

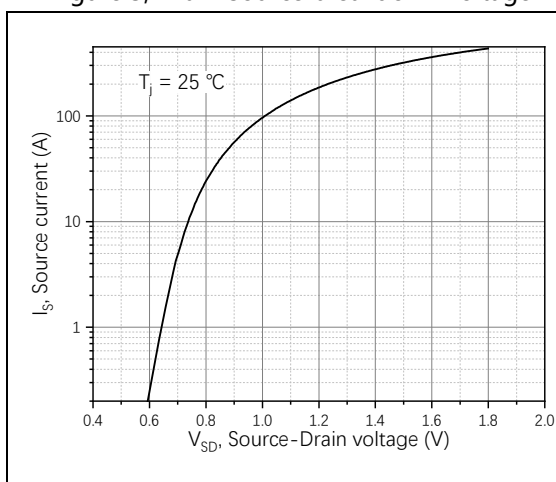


Figure 7, Forward characteristic of body diode

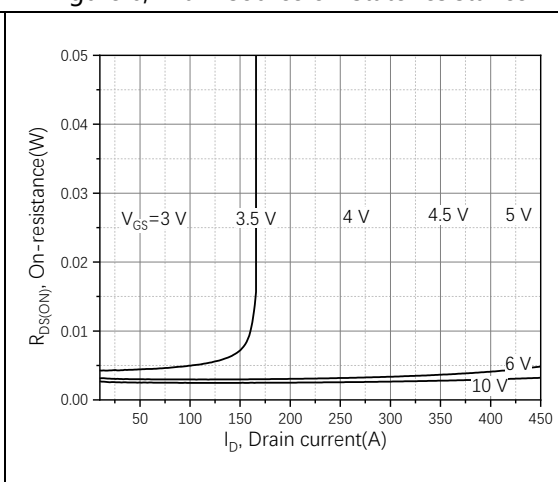


Figure 8, Drain-source on-state resistance

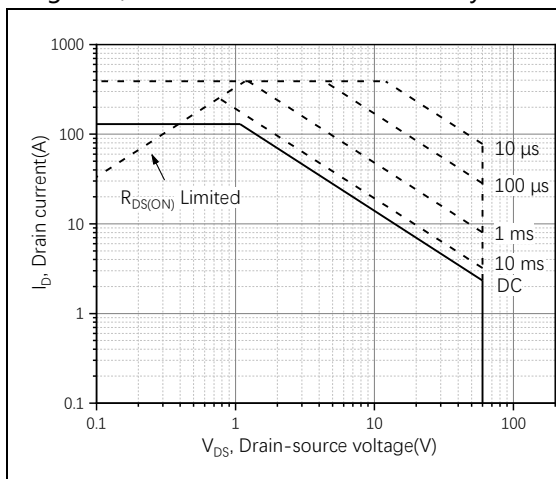


Figure 9, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$