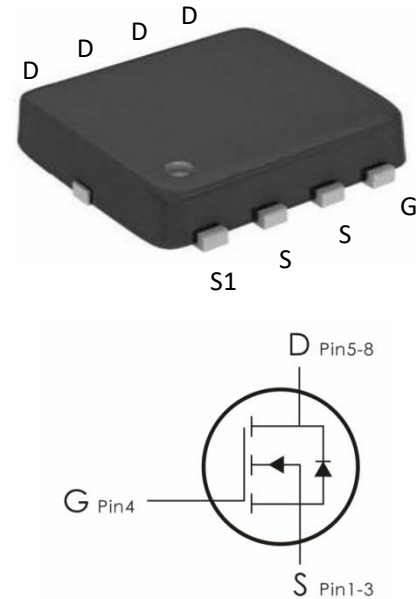


Description:

This N-Channel MOSFET uses advanced trench technology to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features:

- 1) $V_{DS}=20V, I_D=50A, R_{DS(ON)} < 6.5m\Omega$ @ $V_{GS}=4.5V$ (Typ : $4.8m\Omega$)
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current-Continuous- $T_C=25^\circ C$	50	A
	Continuous Drain Current- $T_C=100^\circ C$	32	
I_{DM}	Drain Current – Pulsed ^{note1}	200	A
E_{AS}	Single Pulse Avalanche Energy ^{note2}	40	mJ
P_D	Power Dissipation - $T_C=25^\circ C$	34	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4.4	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOZ50N02	50N02	DFN3*3-8

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	20	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =20V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 12V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.4	0.7	1	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =4.5V, I _D =25A	---	4.8	6.5	m Ω
		V _{GS} =2.5V, I _D =15A	---	6.8	10	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	1800	---	pF
C _{OSS}	Output Capacitance		---	280	---	
C _{rSS}	Reverse Transfer Capacitance		---	265	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =10V , V _{GS} =4.5V , R _{GEN} =3 Ω , I _D =25A	---	15	---	ns
t _r	Rise Time		---	37	---	ns
t _{d(off)}	Turn-Off Delay Time		---	52	---	ns
t _f	Fall Time		---	21	---	ns
Q _g	Total Gate Charge	V _{DS} =10V , V _{GS} =4.5V , I _D =25A	---	23	---	nC
Q _{gs}	Gate-Source Charge		---	4.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	7.3	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	50	A
I _{SM}	Pulsed Source Current		---	---	200	A

V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =30A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I _F =25A, dI/dt=100A/μs	---	25	---	ns
Q_{rr}	Reverse Recovery Charge		---	21	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=10V, V_G=4.5V, L=0.5mH, R_G=25Ω, I_{AS}=13.8A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics: (T_c=25°C unless otherwise noted)

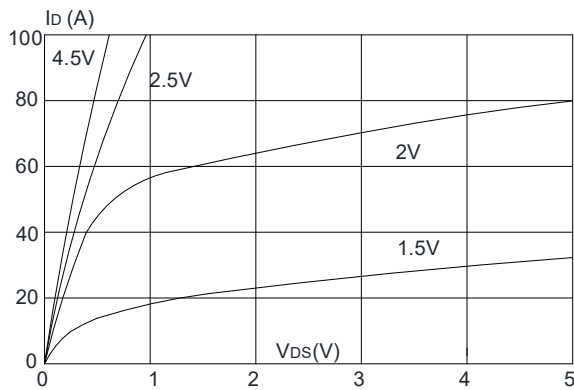


Figure1: Output Characteristics

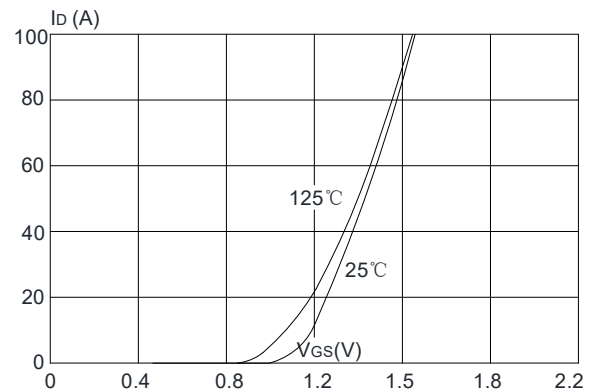


Figure 2: Typical Transfer Characteristics

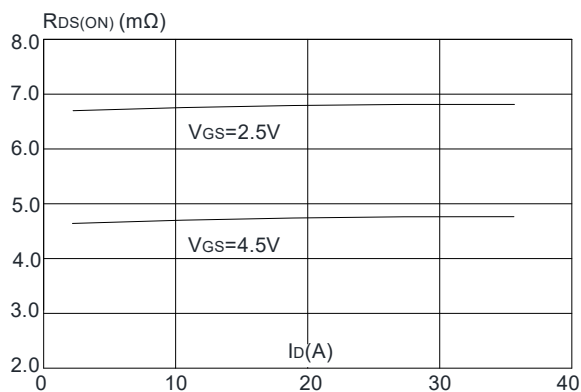


Figure 3: On-resistance vs. Drain Current

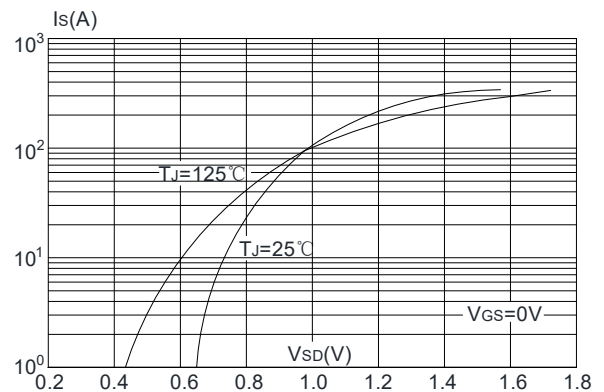


Figure 4: Body Diode Characteristics

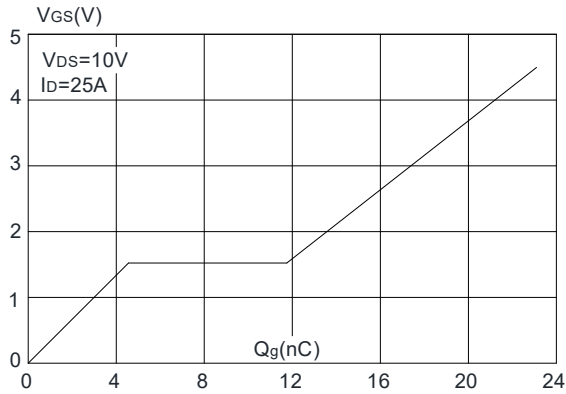


Figure 5: Gate Charge Characteristics

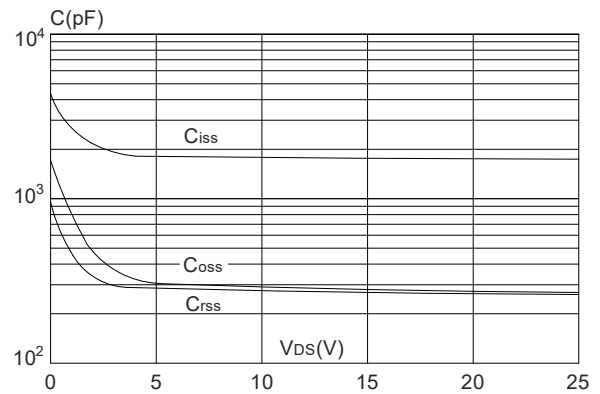


Figure 6: Capacitance Characteristics

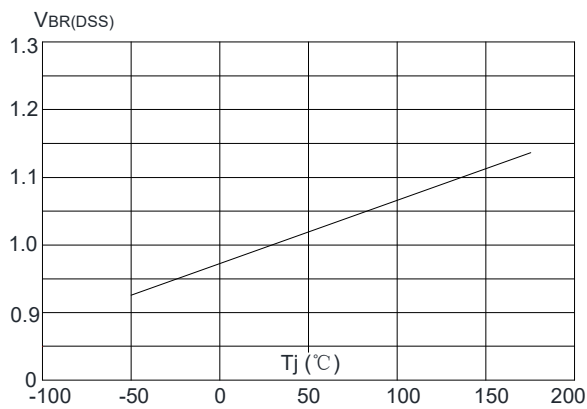


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

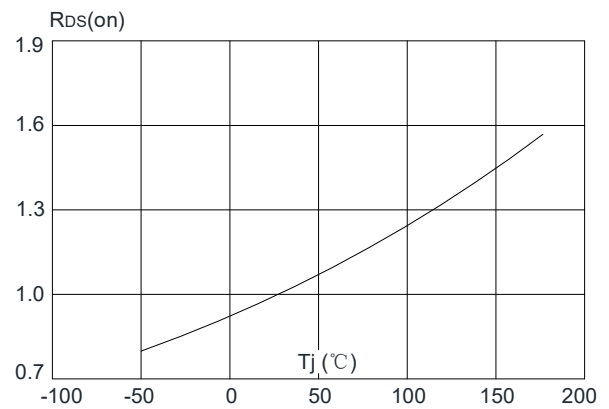


Figure 8: Normalized on Resistance vs. Junction Temperature

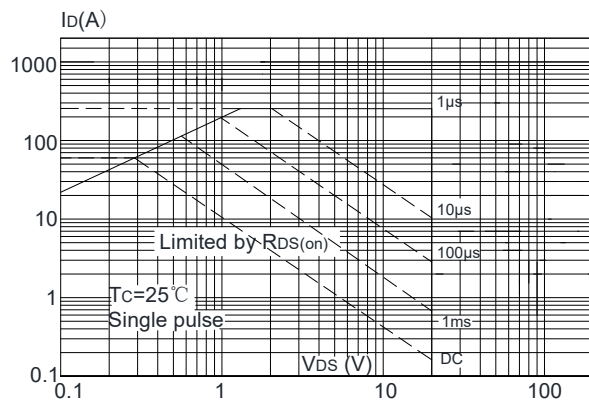


Figure 9: Maximum Safe Operating Area

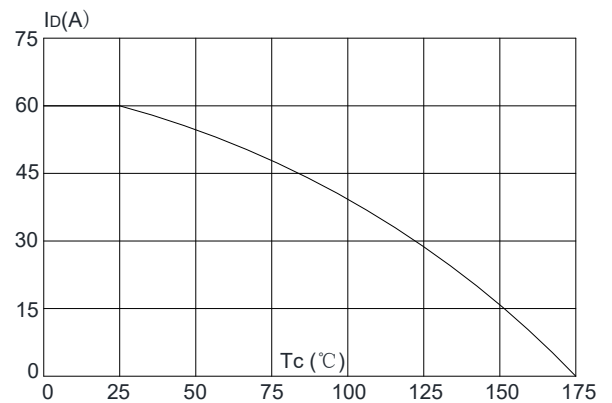


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

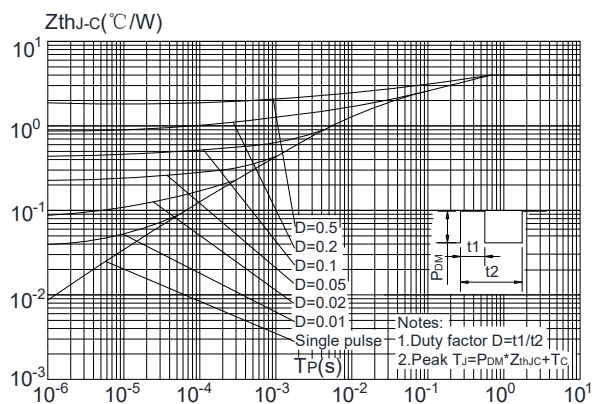


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case