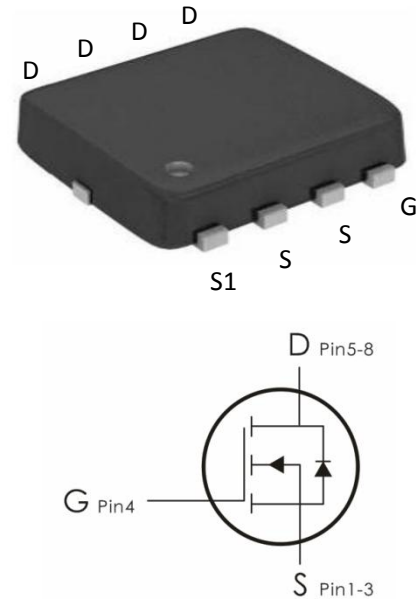


Description:

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) $V_{DS}=40V, I_D=50A, R_{DS(ON)} < 7.5m\Omega @ V_{GS}=10V$
- 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	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-Continuous- $T_c=25^\circ C$	50	A
	Continuous Drain Current-Continuous- $T_c=100^\circ C$	30	A
I_{DM}	Drain Current – Pulsed	160	A
EAS	Single Pulse Avalanche Energy	81	mJ
P_D	Power Dissipation - $T_c=25^\circ C$	21	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	6	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOZ50N04	50N04	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	40	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =40V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.1	1.7	2.4	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =30A	---	5.7	7.5	m Ω
		V _{GS} =4.5V, I _D =20A	---	10	14	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	2399	---	pF
C _{OSS}	Output Capacitance		---	191	---	
C _{rSS}	Reverse Transfer Capacitance		---	164	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =20V , V _{GS} =10V , R _G =3 Ω , I _D =20A	---	11	---	ns
t _r	Rise Time		---	11	---	ns
t _{d(off)}	Turn-Off Delay Time		---	37	---	ns
t _f	Fall Time		---	8	---	ns
Q _g	Total Gate Charge	V _{DS} =20V , V _{GS} =10V , I _D =30A	---	36	---	nC
Q _{gs}	Gate-Source Charge		---	5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	6	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Source Current		---	---	50	A
I _{SM}	Pulsed Source Current		---	---	160	A

V_{SD}	Forward on voltage	$I_S=30A, V_{GS}=0V$	---	---	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$	---	22	---	nS
Q_{rr}	Body Diode Reverse Recovery Charge		---	11	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^{\circ}C$, $V_{DD}=20V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$, $I_{AS}=18A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

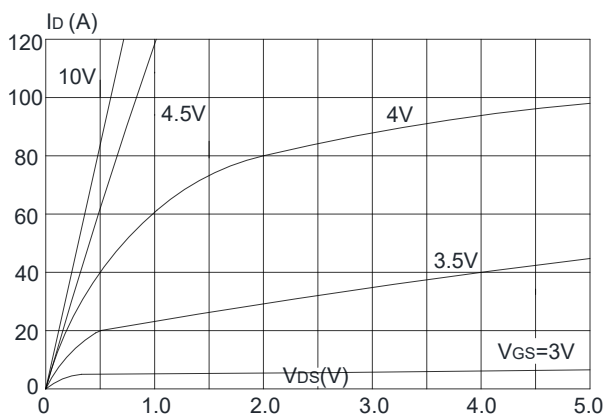


Figure1: Output Characteristics

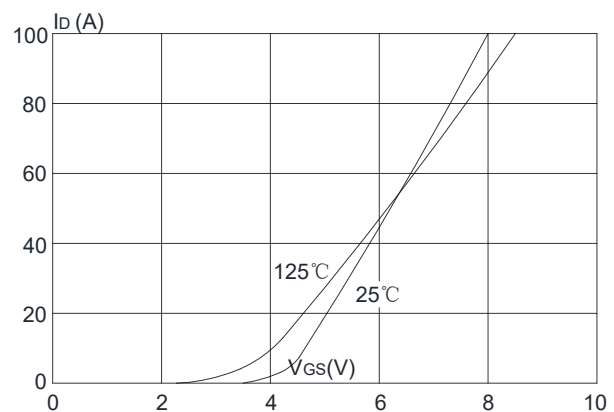


Figure 2: Typical Transfer Characteristics

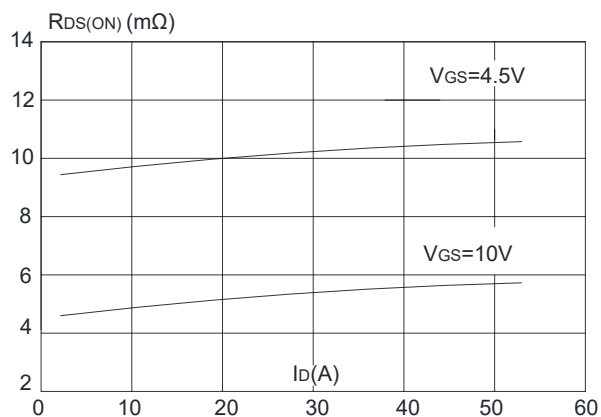


Figure 3: On-resistance vs. Drain Current

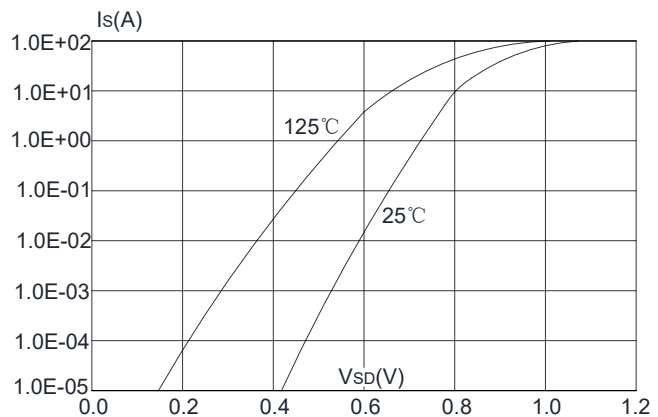


Figure 4: Body Diode Characteristics

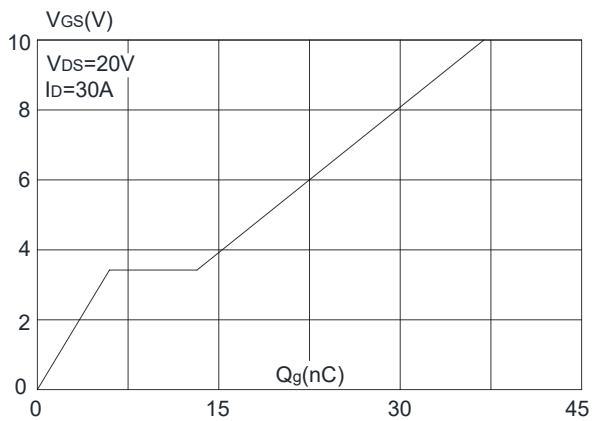


Figure 5: Gate Charge Characteristics

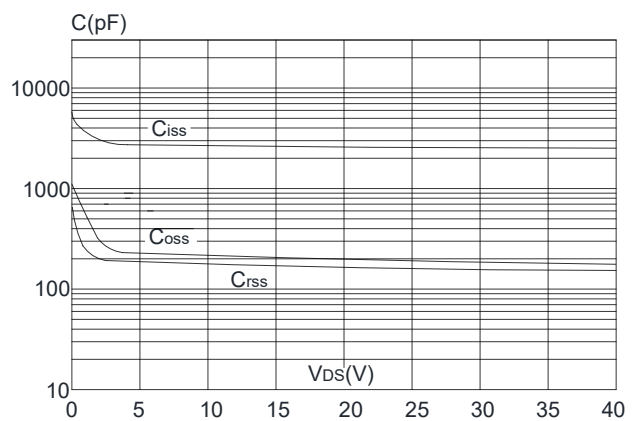


Figure 6: Capacitance Characteristics

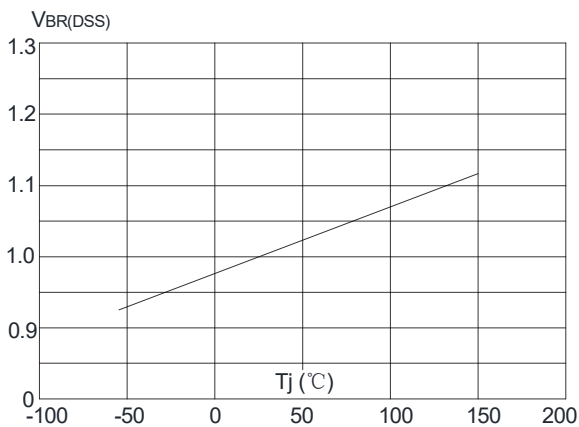


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

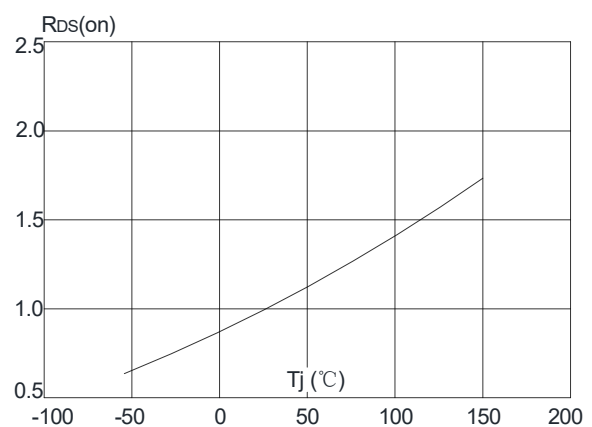


Figure 8: Normalized on Resistance vs. Junction Temperature

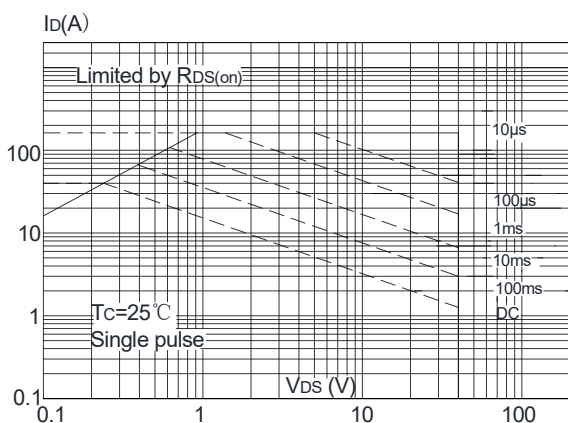


Figure 9: Maximum Safe Operating Area

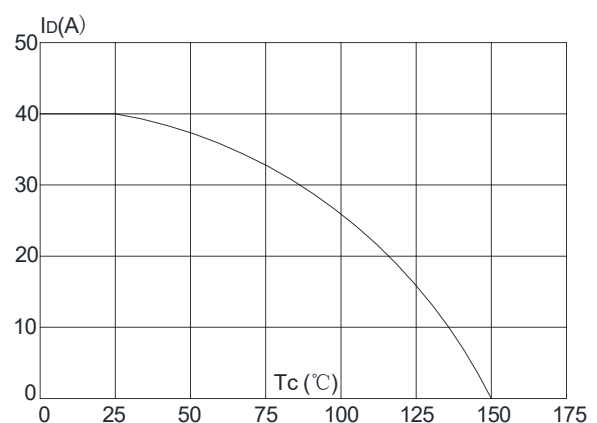


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

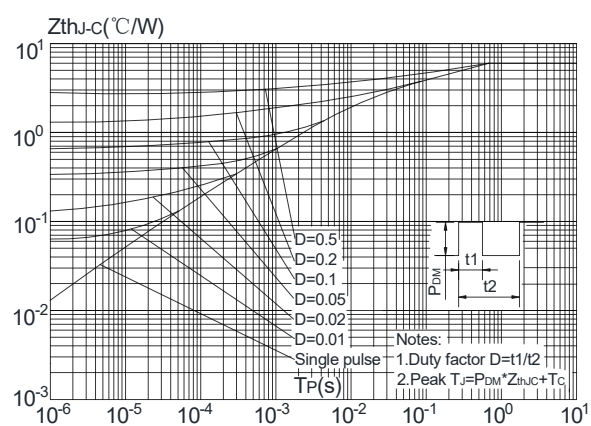


Figure.11: Maximum Effective
Transient Thermal Impedance, Junction-to-Case