

018N04TH-D5

40V N-Channel Super Trench Power MOSFET



Description

018N04TH-D5 is uses Super Trench technology and design to provide excellent RDS(ON) and gate charge. It be used can in a wide variety of applications

General Features

- Advanced shielded-gate technology
- Ultra-low on-resistance and gate-charge
- RoHS compliant

MAIN CHARACTERISTICS

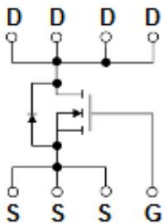
ID	200A
VDSS	40v
R _{DS(ON)Typ} (at VGS=10V)	1.5mΩ

Application

- DC/DC Converter
- Motor controllers
- Battery-driven electronic products, electrical equipment and machines



PDFN5×6-8L



Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
018N04TH	018N04TH-D5	PDFN5×6-8L	5000 pcs/Tape & Reel

Absolute maximum ratings

Symbol	Parameter		Limit	Unit
V _{DSS}	Drain-source voltage		40	V
V _{GSS}	Gate-Source Voltage		±20	V
I _D	Drain Current -continuous(TC=25℃) (1)		200	A
	Drain Current -continuous(TC=100℃) (1)		126	
I _{DM}	Drain Current-Pulsed (4)		800	A
P _D	Power Dissipation	T _c =25℃	114	W
E _{AS}	Single pulsed avalanche energy (5)		500	mJ
T _J , T _{STG}	Operating and Storage Temperature Range		-50~150	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
R _{θJC}	Thermal Resistance, Juction-to-Case	1.1	℃/W
R _{θJA}	Thermal Resistance, Juction-to-Ambient (3)	40	℃/W

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Electrical Characteristics $T_c=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
Static Characteristics						
BV_{DSS}	Drain Source breakdown voltage	$V_{GS}=0V, I_D=250\mu A, T_J=25^{\circ}\text{C}$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-to-Source Forward Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=50A$	-	1.5	2.0	m Ω
R_G	Gate Resistance	$V_{GS}=0V, f=1\text{MHz}$	-	3.9	-	Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=20V$ $f=100\text{kHz}$	-	4987	-	pF
C_{oss}	Output Capacitance		-	1654	-	pF
C_{rss}	Reverse Transfer Capacitance		-	24	-	pF

SWITCHING Characteristics

$T_{D(on)}$	Turn-on Delay Time	$V_{DD}=30V$ $V_{GS}=15V$ $R_G=3.3\Omega$ $I_D=30A$	-	26	-	ns
T_r	Turn-on Rise Time		-	73	-	ns
$T_{D(off)}$	Turn-off Delay Time		-	77	-	ns
T_f	Turn-off Fall Time		-	88	-	ns
Q_g	Total Gate Charge	$V_{DD}=32V$ $V_{GS}=10V$ $I_D=150A$	-	56	-	nC
Q_{gs}	Gate Source Charge		-	29	-	nC
Q_{gd}	Gate Drain Charge		-	6	-	nC

Drain-Source Diode Characteristics and Maximum Ratings

V_{SD}	Drain-Source Diode Forward Voltage	$I_S=50A, V_{GS}=0V$	-	0.8	1.2	V
T_{rr}	Reverse Recovery Time	$I_S=20A, V_{GS}=0V$ $di/dt=100A/\mu s$	-	100	-	ns
Q_{rr}	Reverse Recovery Charge		-	200	-	nC

Notes:

1. Rated according to $R_{\theta JC}$
2. Rated according to $R_{\theta JA}$
3. Surface-mounted on 1 inch² FR4 board, 2 oz Cu
4. Limited by maximum T_J
5. Starting $T_J = 25^{\circ}\text{C}$, $V_{DD} = 30V$, $V_{GS} = 10V$, $L = 0.5\text{mH}$
6. Pulse width limited by maximum T_J

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

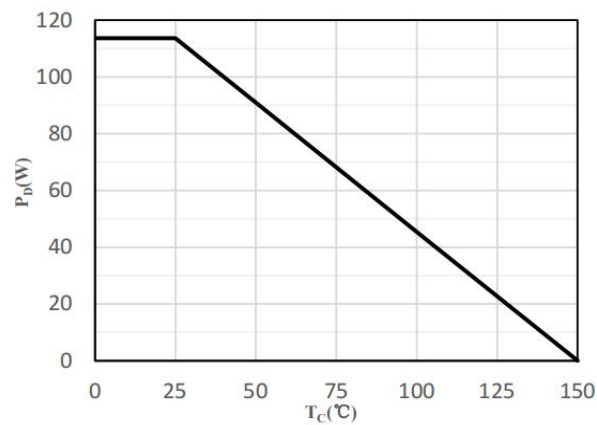


Fig 1 Power Dissipation

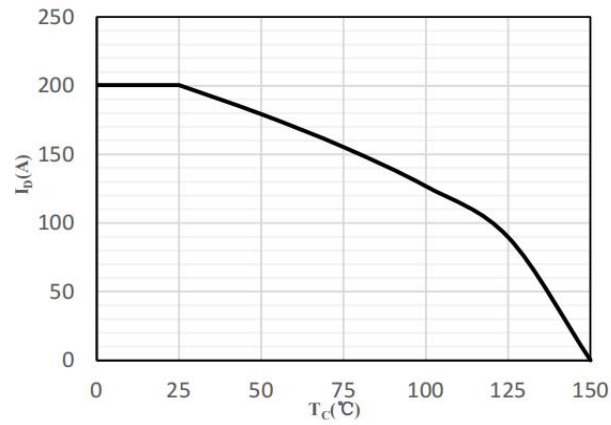


Fig 2 Drain Current

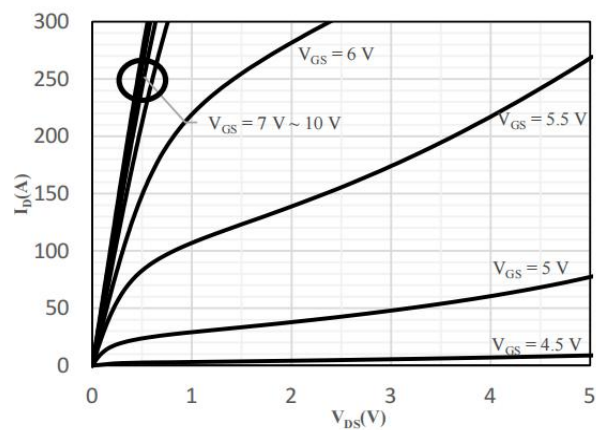


Fig 3 Typical Output Characteristics

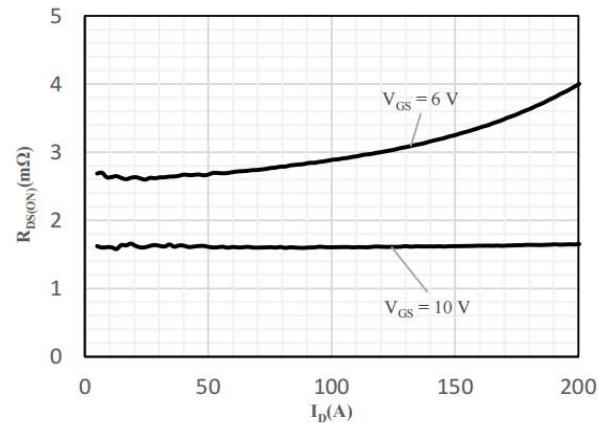


Fig 4 On-Resistance vs. Drain Current
and Gate Voltage

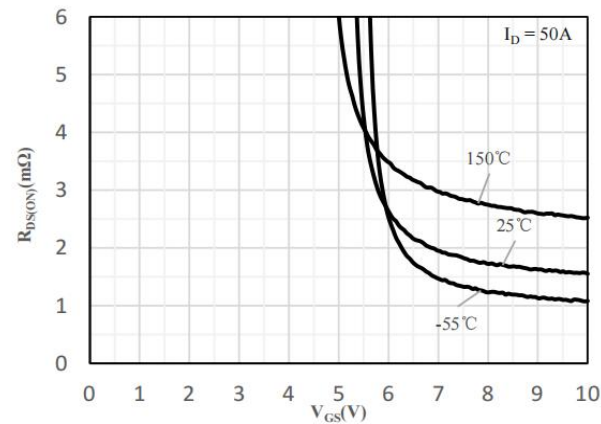


Fig 5 On-Resistance vs. Gate-Source Voltage

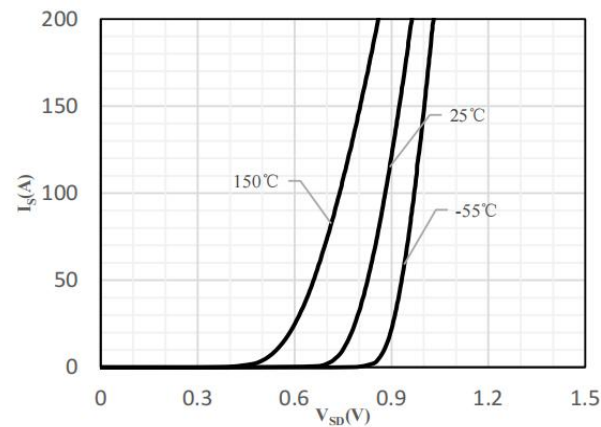


Fig 6 Body-Diode Characteristics

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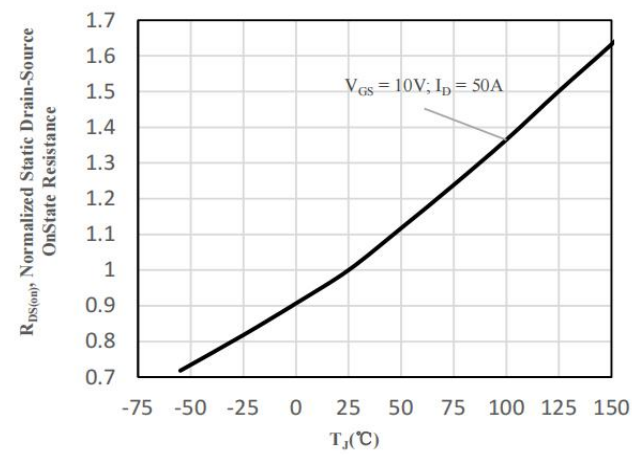


Fig 7 Normalized On-Resistance vs. Junction Temperature

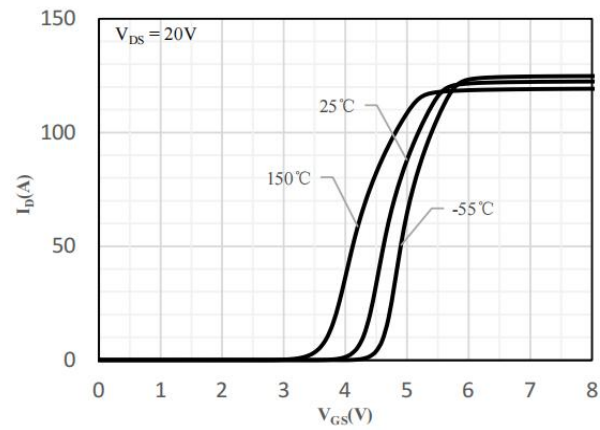


Fig 8 Transfer Characteristics

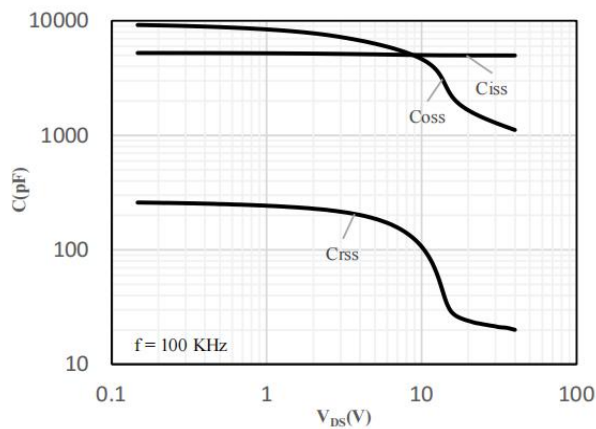


Fig 9 Capacitance Characteristics

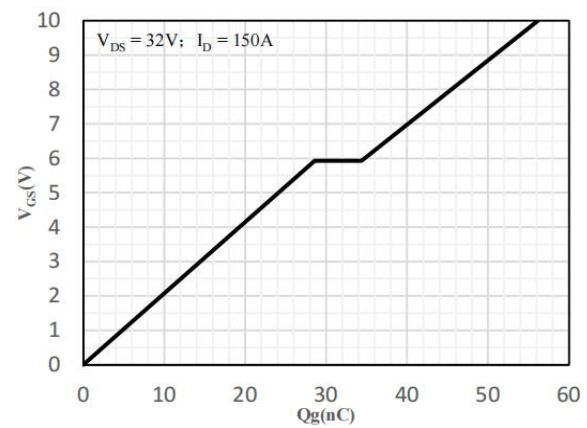


Fig 10 Gate-Charge Characteristics

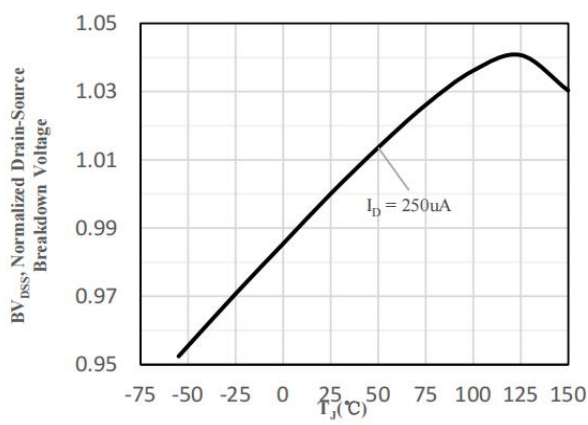


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

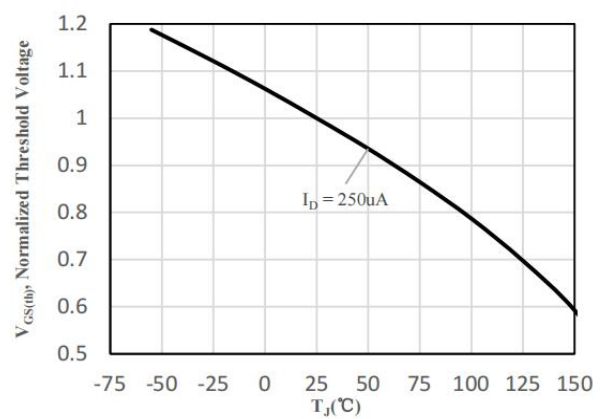


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

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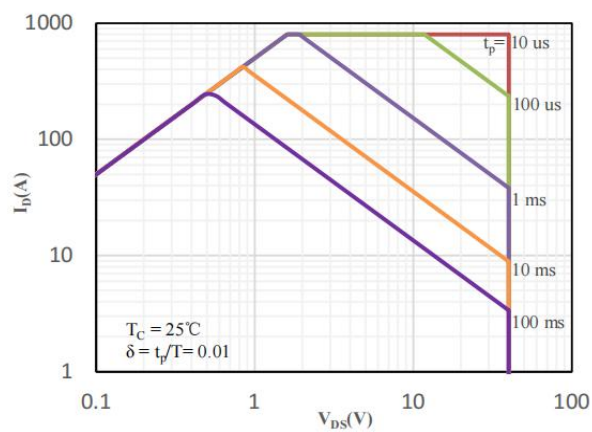


Fig 13 Safe Operation Area

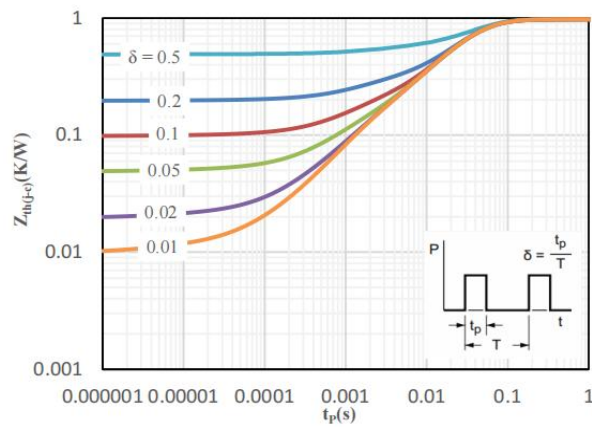
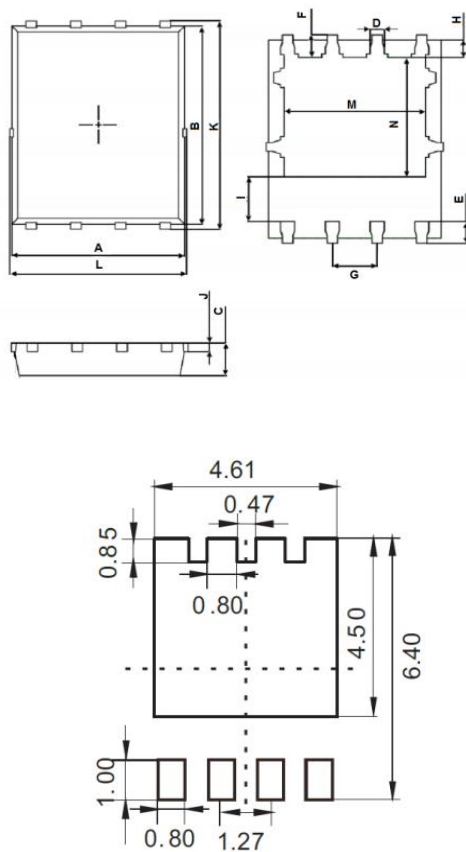


Fig 14 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



PDFN5×6-8L		
Dimension	Min.	Max.
A	4.824	4.976
B	5.674	5.826
C	0.900	1.000
D	0.350	0.450
E	0.559	0.711
F	0.574	0.726
G	1.250	1.290
H	0.424	0.576
I	1.190	1.390
J	0.154	0.354
K	5.974	6.126
L	4.944	5.096
M	3.910	4.110
N	3.375	3.575