036N04T-D5

40V N-Channel Super Trench Power MOSFET

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Description

036N04T-D5 is uses Super Trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications

MAIN CHARACTERISTICS

ID	**96A**
VDSS	**40v**
$R_{DS(ON)Typ}$ (at VGS=10V)	**3.0mΩ**

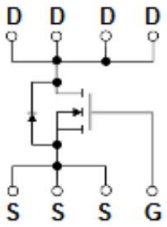
General Features

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

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
036N04T	036N04T-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)		96	A
	Drain Current -continuous(TC=100℃) (1)		61	
I_{DM}	Drain Current-Pulsed (4)		160	A
P_D	Power Dissipation	Tc=25℃	56.8	W
E_{AS}	Single pulsed avalanche energy (5)		93	mJ
T_J, T_{STG}	Operating and Storage Temperature Range		–50~150	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Juction-to-Case	2.2	℃/W
$R_{\theta JA}$	Thermal Resistance, Juction-to-Ambient (3)	45	℃/W

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Electrical Characteristics T_C=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
Static Characteristics						
BV_{DSS}	Drain Source breakdown voltage	V_{GS}=0V,I_D=250uA,T_J=25℃	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V,V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-to-Source Forward Leakage	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.1	-	2.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	-	3.0	3.6	mΩ
		V_{GS}=4.5V, I_D=20A	-	4.0	5.2	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	V_{GS} = 0V V_{DS} = 20V f = 1.0MHz	-	1802	-	pF
Coss	Output Capacitance		-	710	-	pF
Crss	Reverse Transfer Capacitance		-	76	-	pF
SWITCHING Characteristics						
$T_{D(on)}$	Turn-on Delay Time	V_{DD} = 20V V_{GS} = 10V R_G = 3Ω I_D = 20A	-	4	-	ns
T_r	Turn-on Rise Time		-	5	-	ns
$T_{D(off)}$	Turn-off Delay Time		-	20	-	ns
T_f	Turn-off Fall Time		-	5	-	ns
Q_g	Total Gate Charge	V_{DD} = 20V V_{GS} = 10V I_D = 20A	-	22.9	-	nC
Q_{gs}	Gate Source Charge		-	3.1	-	nC
Q_{gd}	Gate Drain Charge		-	4	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain-Source Diode Forward Voltage	I_S = 50A, VGS = 0V	-	-	1.2	V
T_{rr}	Reverse Recovery Time	I_S = 20A, VGS = 0V di/dt = 100A/μs	-	47	-	ns
Q_{rr}	Reverse Recovery Charge		-	36	-	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° C, L = 0.1mH, V_{DD} = 30V, V_{GS} = 10V

6. Pulse width limited by maximum TJ

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

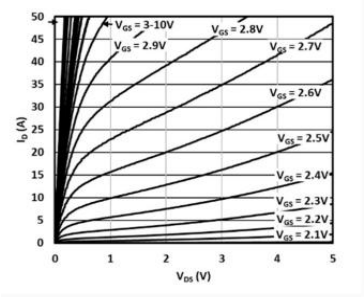


Fig. 1 Output characteristics

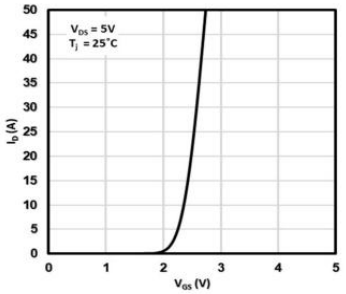


Fig. 2 Transfer characteristics

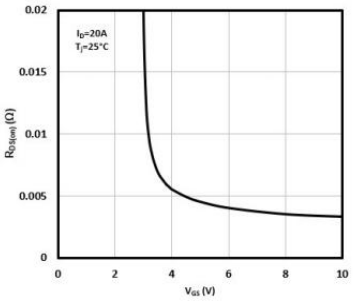


Fig.3 On-resistance vs. gate voltage

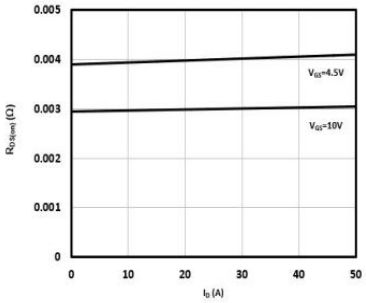


Fig.4 On-resistance vs. drain current

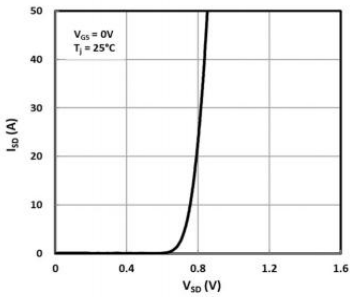


Fig.5 Source-to-drain diode forward characteristics

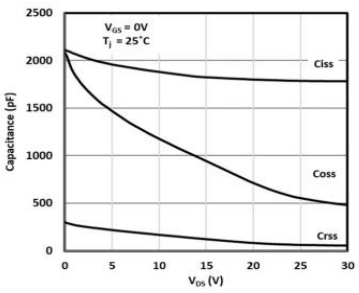


Fig.6 Capacitance vs. drain-to-source voltage

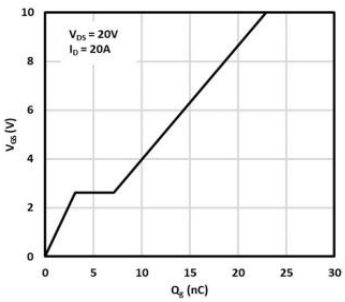


Fig.7 Gate-to-source voltage vs. gate charge

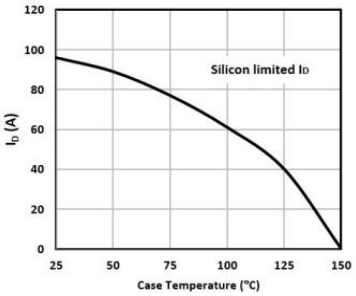


Fig.8 Maximum drain current vs. case temperature

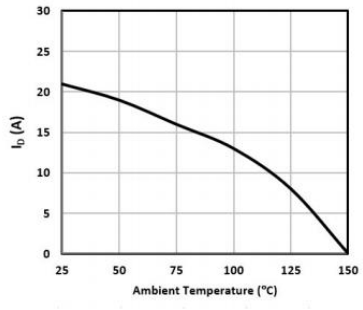
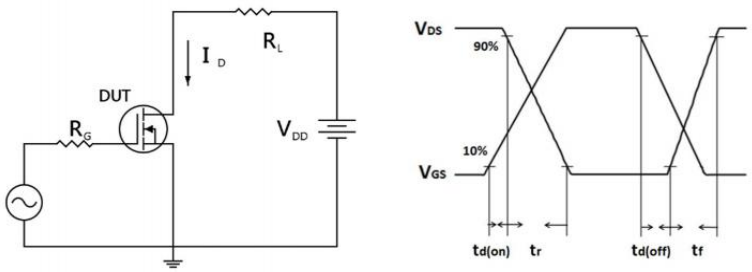
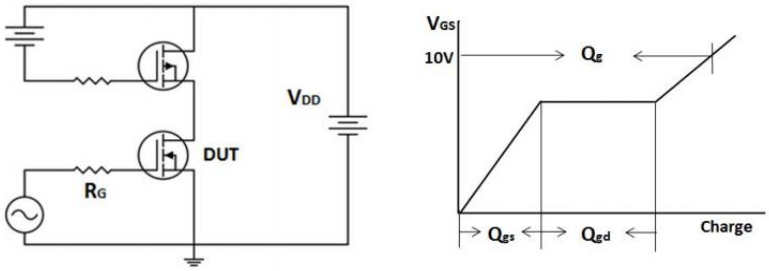


Fig. 9 Maximum drain current vs. ambient temperature

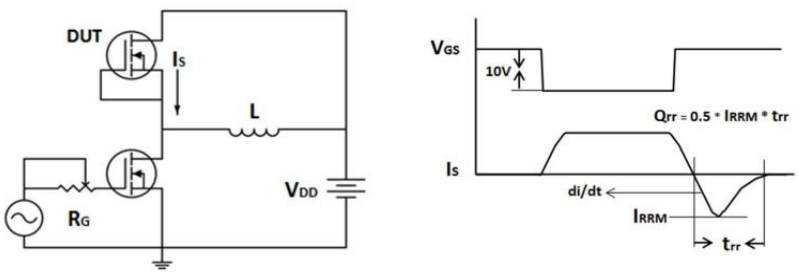
Test Circuits and Waveforms



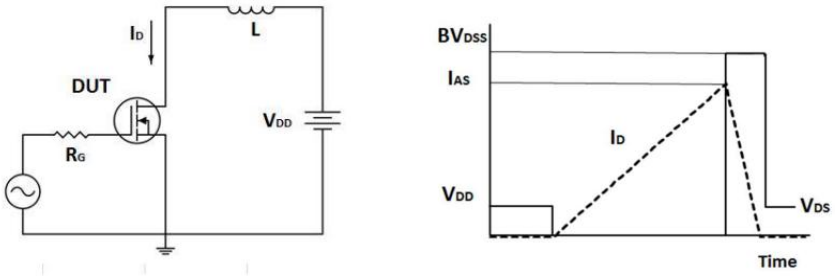
Resistive switching time test circuit & waveforms



Gate charge test circuit & waveform

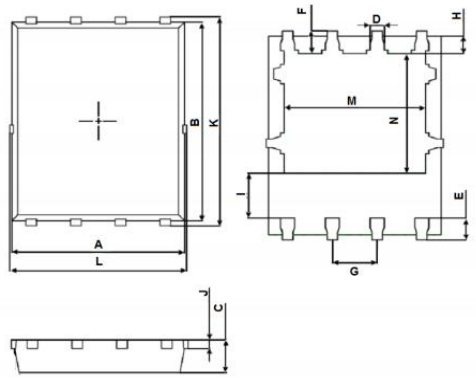


Peak diode recovery dv/dt test circuit & waveforms



Unclamped inductive switching test circuit & waveforms

PDFN5*6-8L Package Information



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