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SEMICONDUCTOR



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Product data sheet

Description

The MSK80N03NF uses advanced trench technology and design to provide excellent RDS(ON) with low gatecharge. It can be used in a wide variety of applications.

General Features

VDS=30V, ID=80A

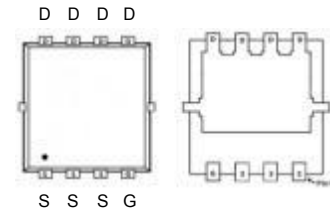
RDS(ON)<5mΩ@ VGS=10V

RDS(ON)<8mΩ@ VGS=4.5V

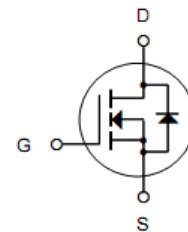
- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high EAS

Application

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply



DFN5X6-8L



N-Channel MOSFET

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter	Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage	30	V
I _s	Diode continuous forward current	T _C =25°C	80
I _D	Continuous drain current@VGS=10V	T _C =25°C	80
		T _C =100°C	45
IDM	Pulse drain current tested ①	T _C =25°C	280
EAS	Avalanche energy, single pulsed ②	56	mJ
P _D	Maximum power dissipation	T _C =25°C	37
VGS	Gate-Source voltage	±20	V
TSTG TJ	Storage and operating temperature range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance-Junction to Case	3.4	°C/W
R _{θJA}	Thermal Resistance Junction-Ambient	30	°C/W

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	0.1	μA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =30V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =10V, I _D =20A	--	3	4	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =4.5V, I _D =16A	--	5.4	8	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	1930	--	pF
C _{oss}	Output Capacitance		--	310	--	pF
C _{rss}	Reverse Transfer Capacitance		--	260	--	pF
R _g	Gate Resistance	f=1MHz	--	0.85	--	
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	38	--	nC
Q _{gs}	Gate-Source Charge		--	5.1	--	nC
Q _{gd}	Gate-Drain Charge		--	12	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =20A, R _G =3, V _{GS} =10V	--	8.5	--	nS
t _r	Turn-on Rise Time		--	9	--	nS
t _{d(off)}	Turn-Off Delay Time		--	31	--	nS
t _f	Turn-Off Fall Time		--	9	--	nS
Source- Drain Diode Characteristics @ T_j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =20A, V _{GS} =0V	--	0.8	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C, I _{SD} =20A, V _{GS} =0V	--	16	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs		42		nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25 , I_{AS} = 15A, V_{GS} = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

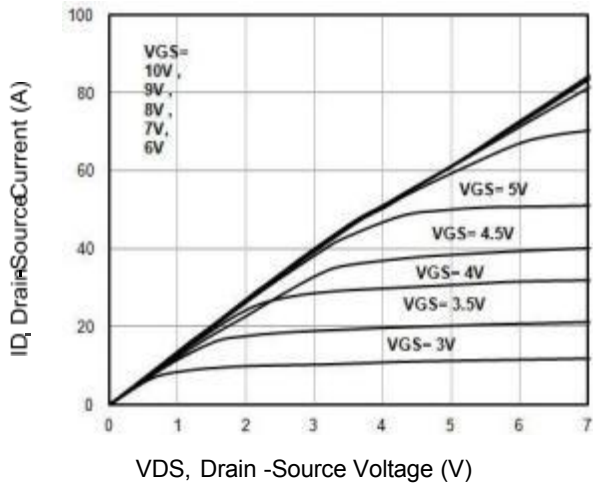


Fig1. Typical Output Characteristics

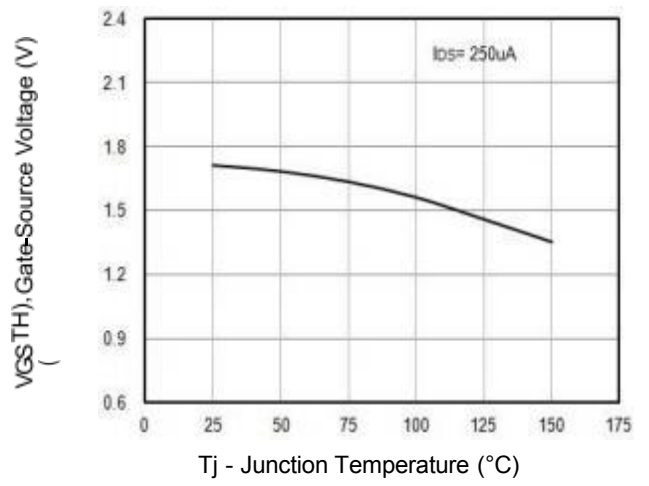


Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

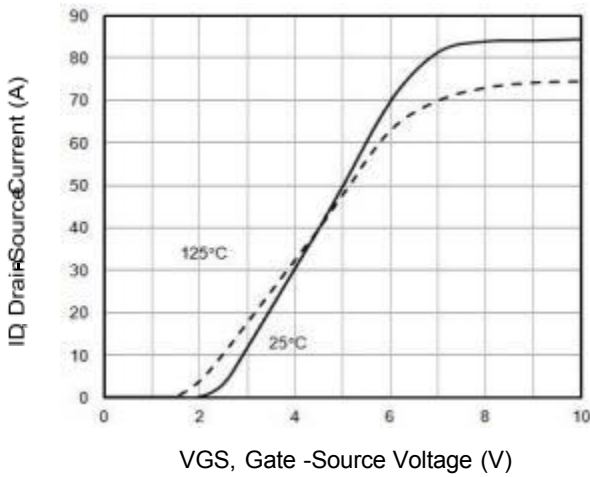


Fig3. Typical Transfer Characteristics

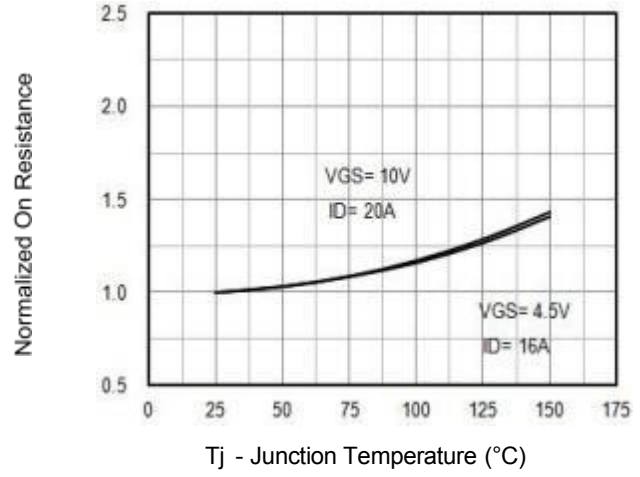


Fig4. Normalized On-Resistance Vs. T_j

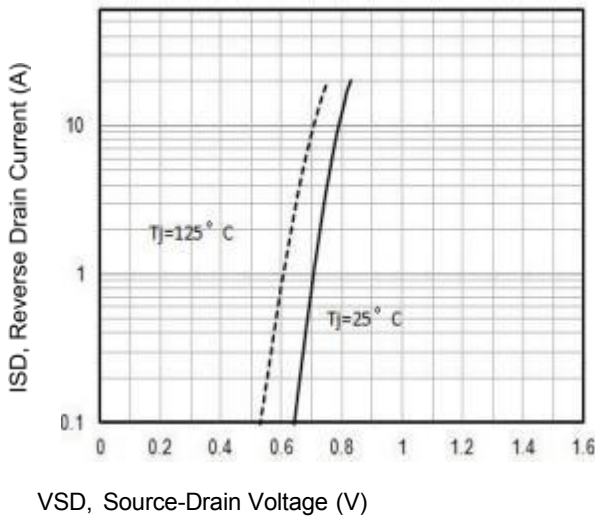


Fig6. Maximum Safe Operating Area Voltage

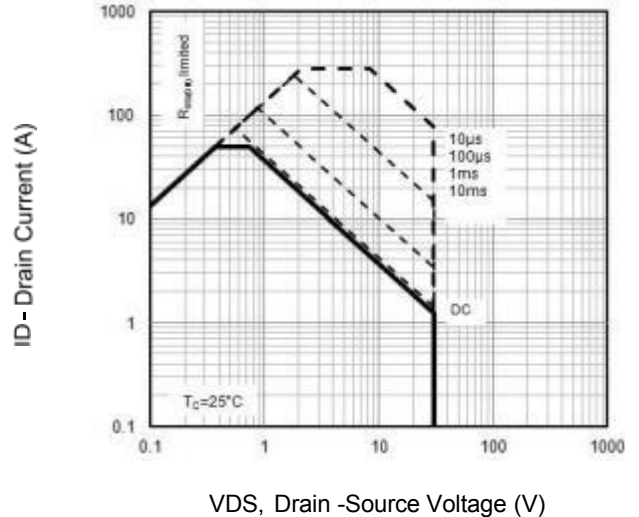


Fig5. Typical Source-Drain Diode Forward

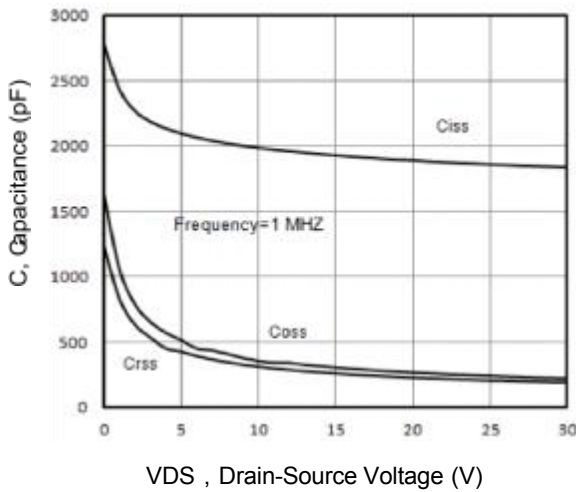


Fig7. Typical Capacitance Vs. Drain-Source Voltage

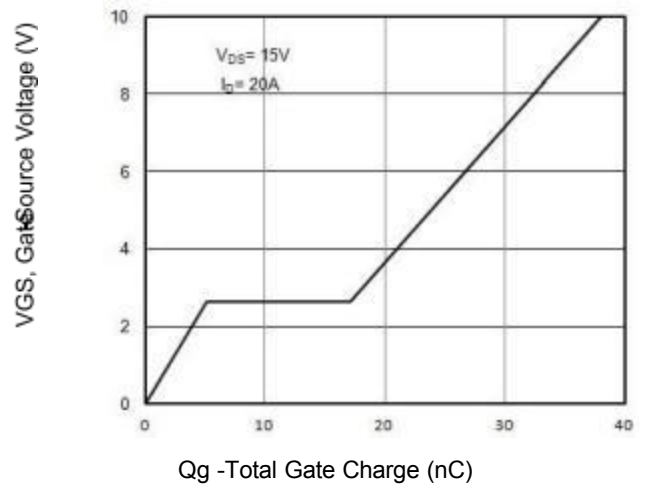


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

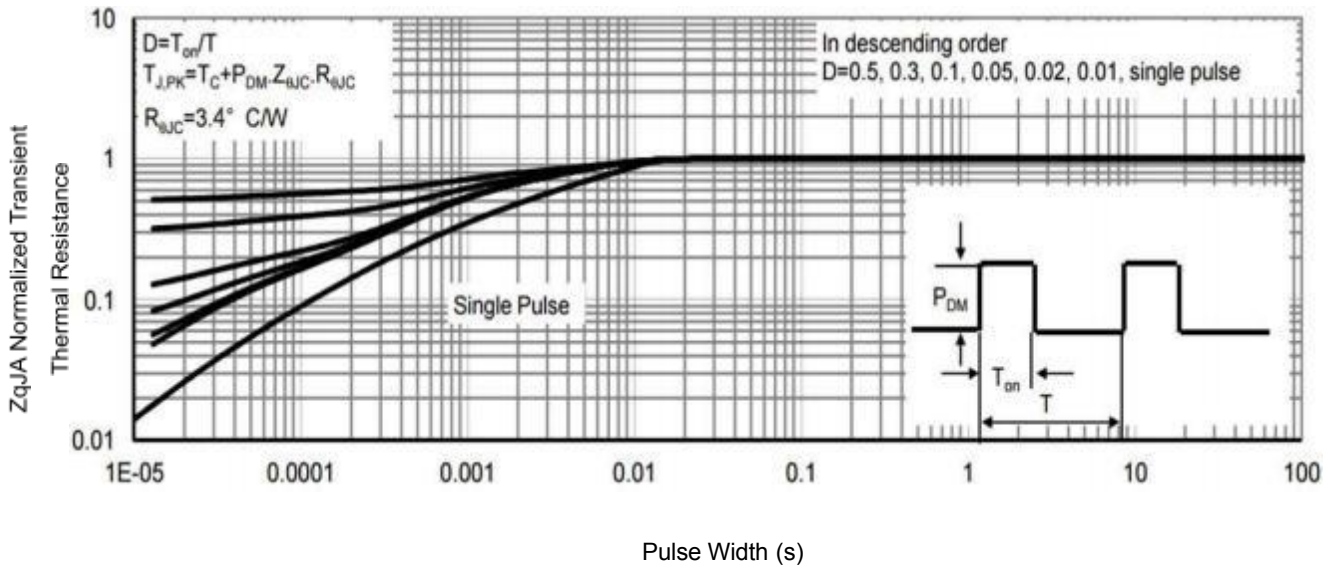


Fig9. Normalized Maximum Transient Thermal Impedance

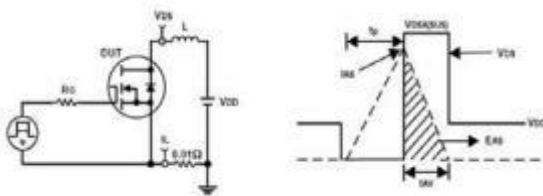


Fig10. Unclamped Inductive Test Circuit and waveforms

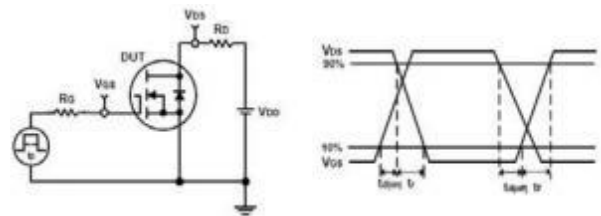
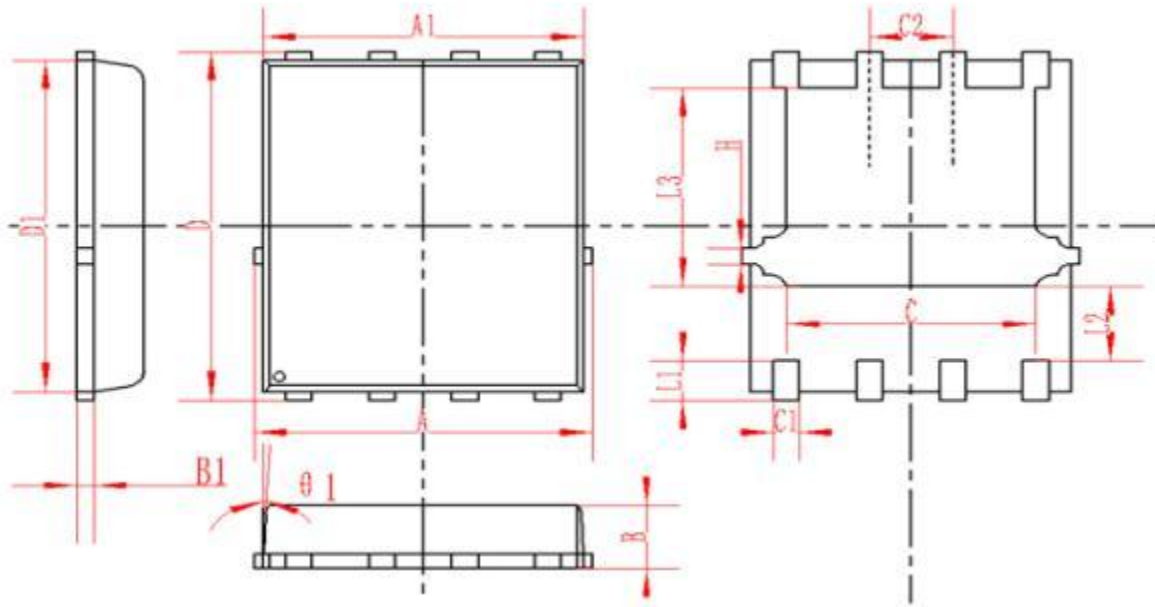


Fig11. Switching Time Test Circuit and waveforms

DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
$\theta 1$	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010

REEL SPECIFICATION

P/N	PKG	QTY
MSK80N03NF	DFN5X6-8L	5000

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