

MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

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

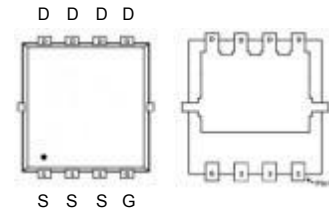
RDS(ON)<5mΩ@ VGS=10V

RDS(ON)<8mΩ@ VGS=4.5V

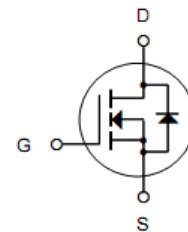
- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high EAS

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%.

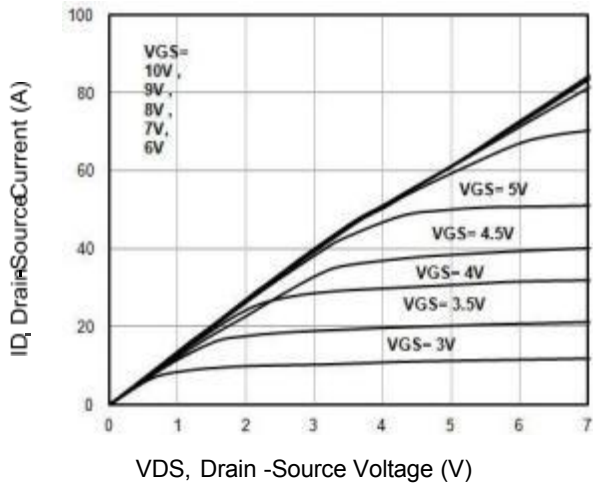


Fig1. Typical Output Characteristics

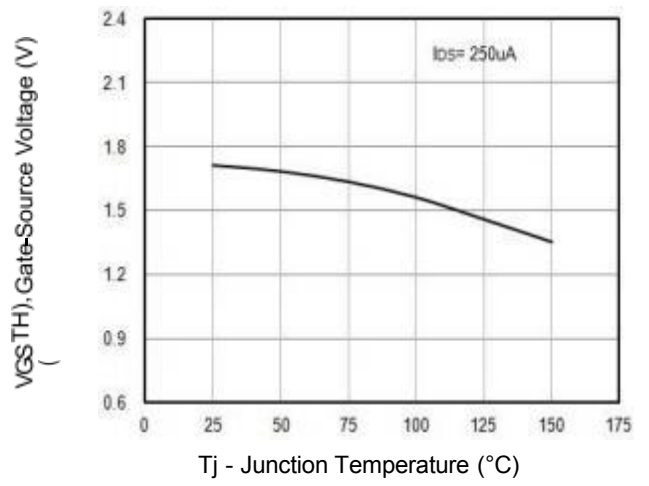


Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

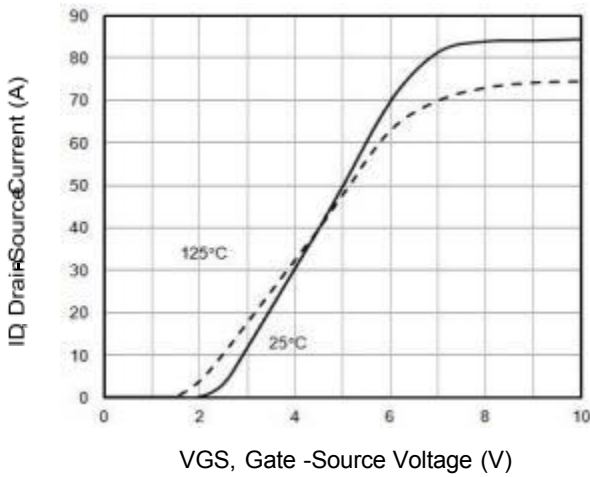
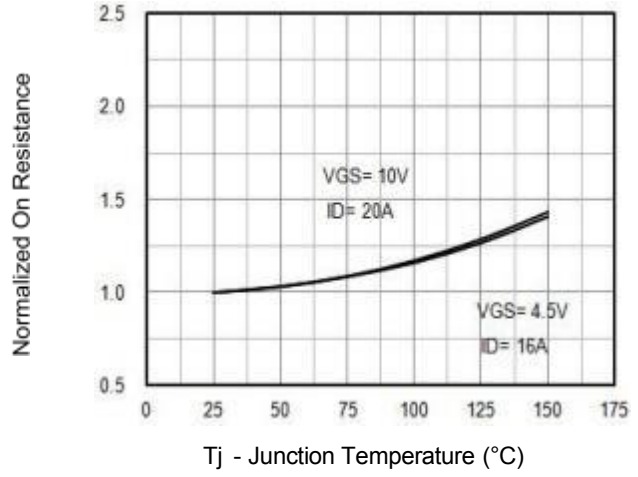
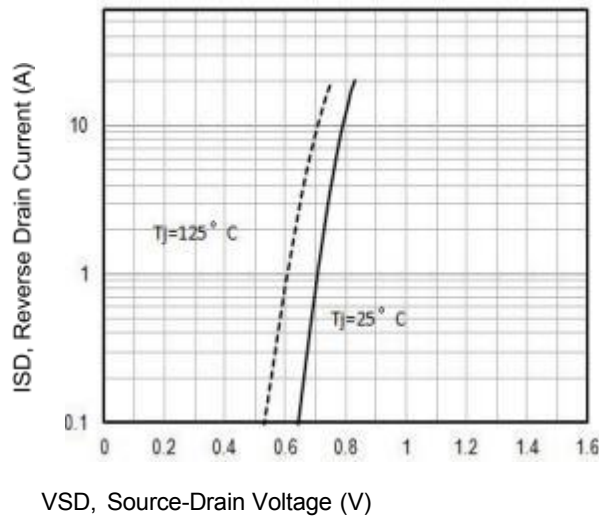


Fig3. Typical Transfer Characteristics



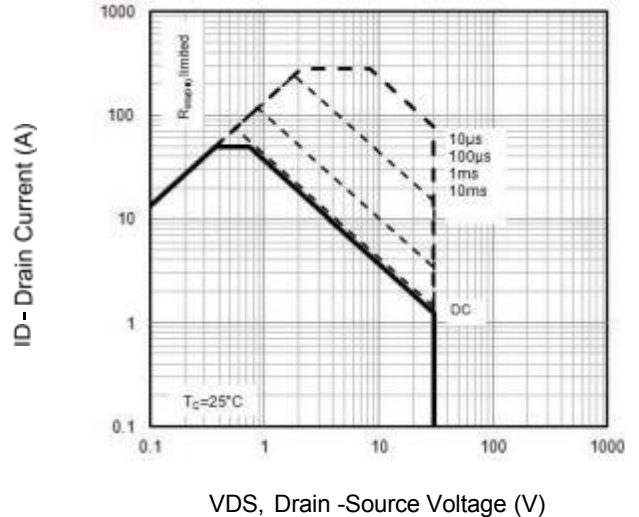
T_j - Junction Temperature (°C)

Fig4. Normalized On-Resistance Vs. T_j



VSD, Source-Drain Voltage (V)

Fig6. Maximum Safe Operating Area Voltage



VDS, Drain-Source Voltage (V)

Fig5. Typical Source-Drain Diode Forward

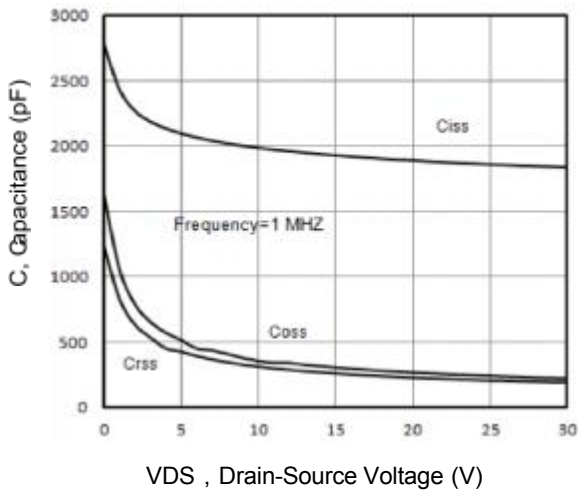


Fig7. Typical Capacitance Vs. Drain-Source Voltage

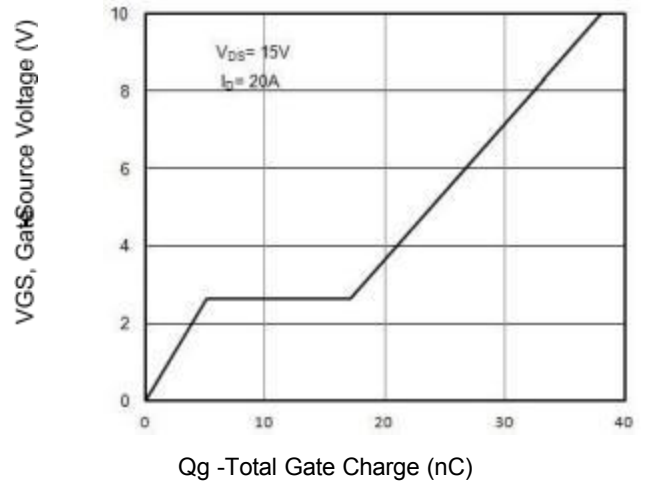


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

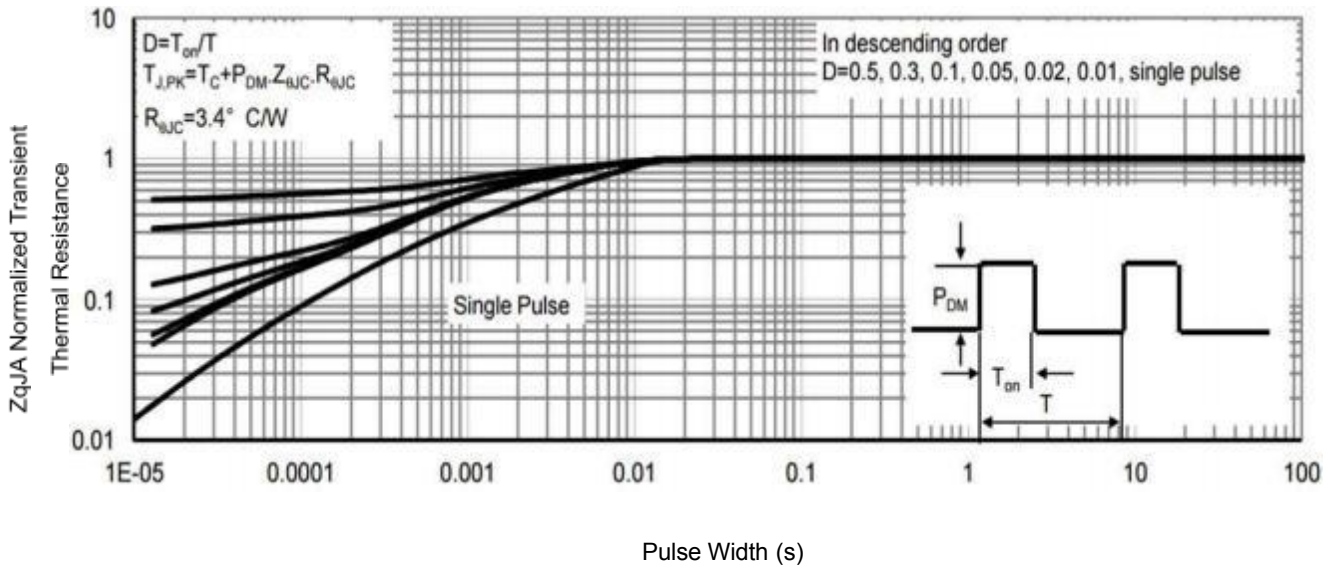


Fig9. Normalized Maximum Transient Thermal Impedance

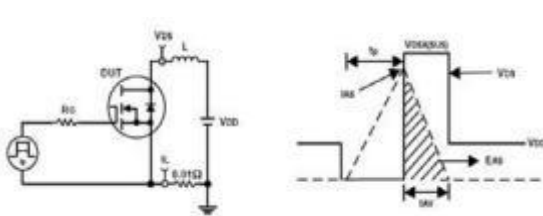


Fig10. Unclamped Inductive Test Circuit and waveforms

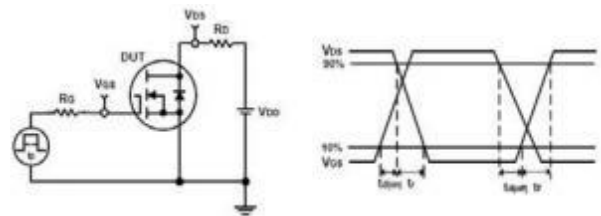
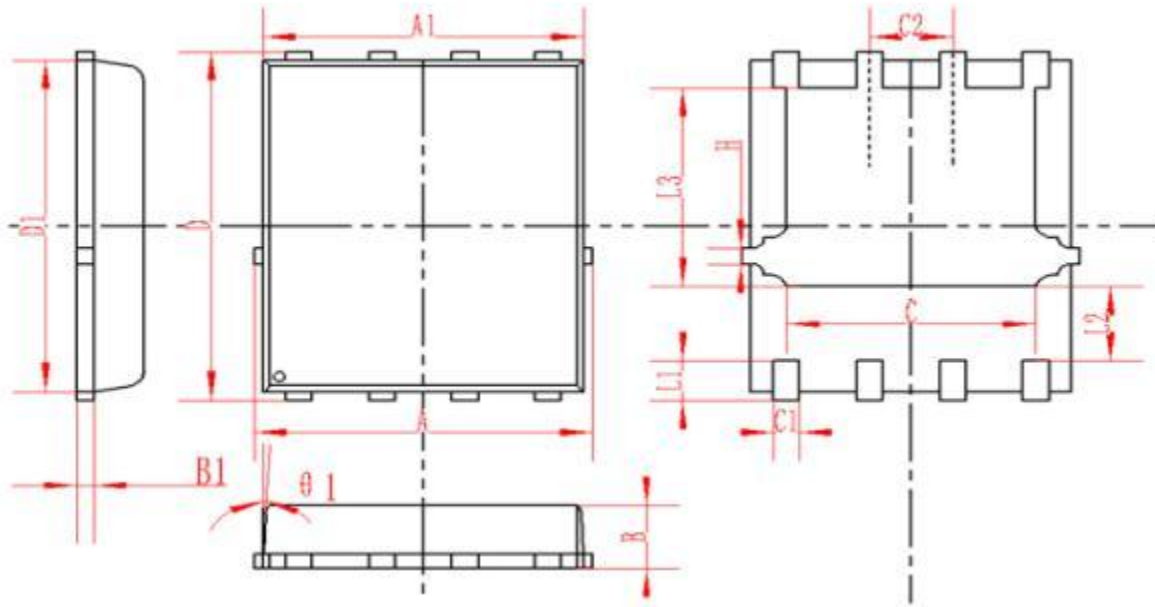


Fig11. Switching Time Test Circuit and waveforms

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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