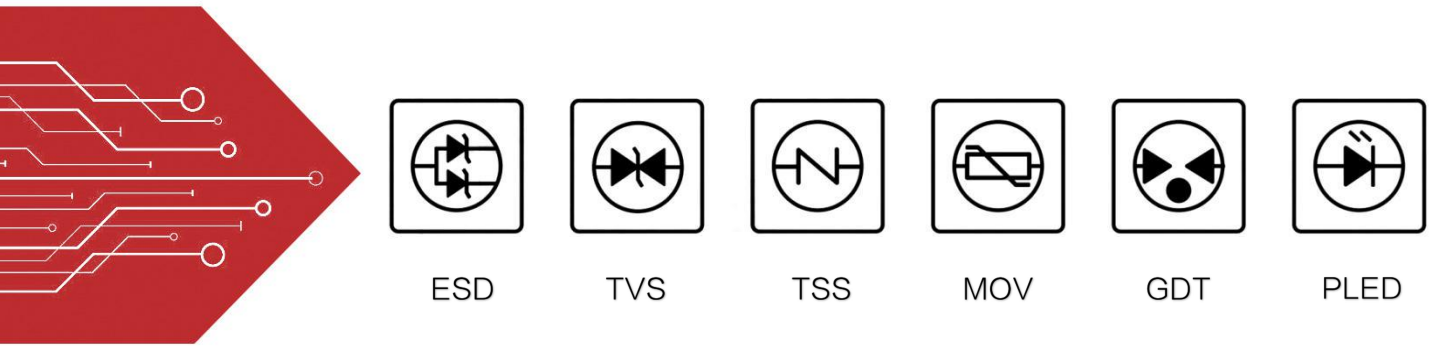
MSKSEMI
SEMICONDUCTOR



Product data sheet

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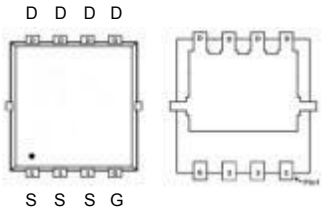
Description

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.



DFN5X6-8L

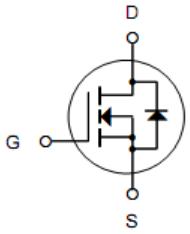
General Features

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



N-Channel MOSFET

Application

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

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	A
I_D	Continuous drain current@VGS=10V	T_C =25°C	80	A
		T_C =100°C	45	A
IDM	Pulse drain current tested ①	T_C =25°C	280	A
EAS	Avalanche energy, single pulsed ②		56	mJ
P_D	Maximum power dissipation	T_C =25°C	37	W
VGS	Gate-Source voltage		±20	V
TSTG TJ	Storage and operating temperature range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.4	°C/W
$R_{\theta JA}$	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℃)	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 Resistance③	V_{GS}=10V, I_D=20A	--	3	4	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	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℃,I_{sd}=20A, V_{GS}=0V di/dt=500A/μs	--	16	--	nS
Q_{rr}	Reverse Recovery Charge			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%.

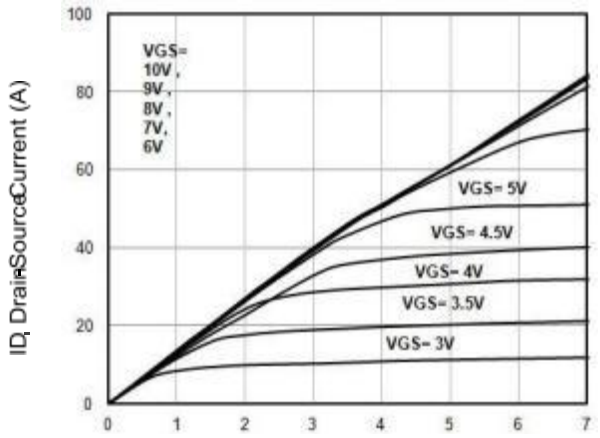


Fig1. Typical Output Characteristics

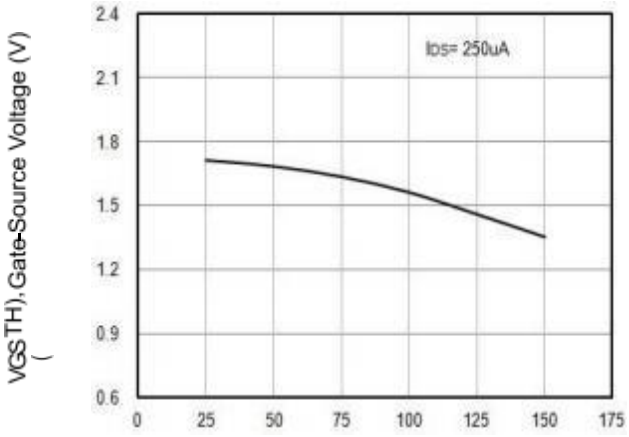


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

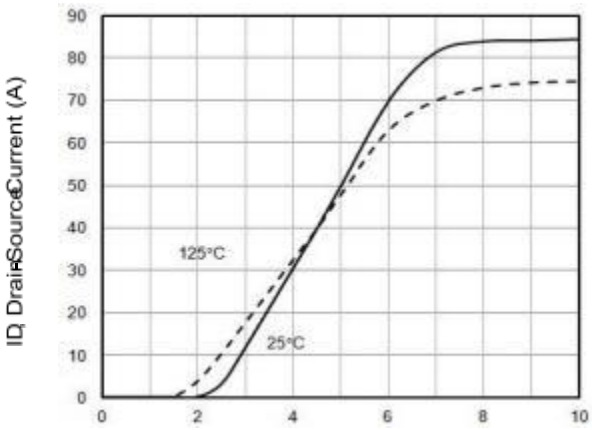


Fig3. Typical Transfer Characteristics

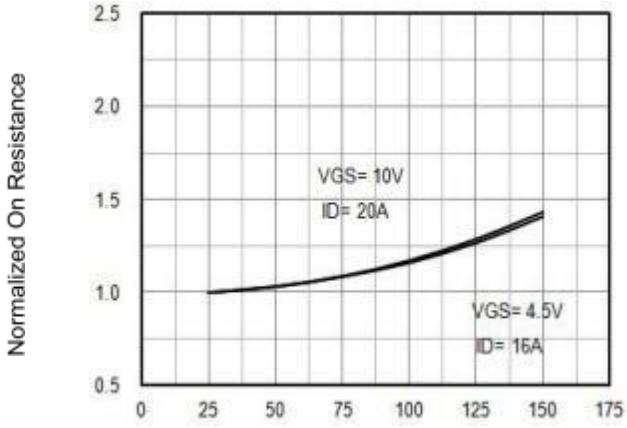


Fig4. Normalized On-Resistance Vs. Tj

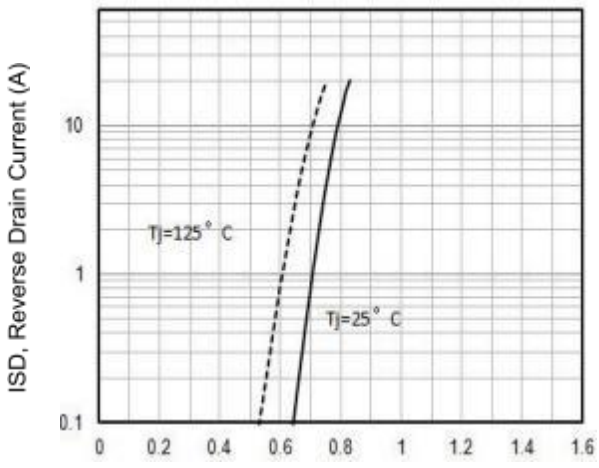


Fig6. Maximum Safe Operating Area Voltage

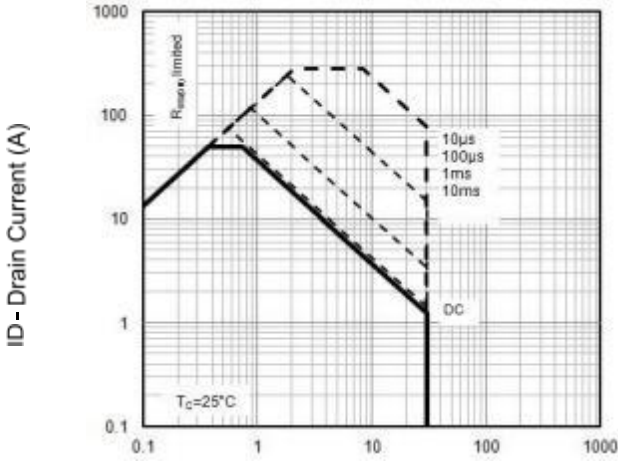
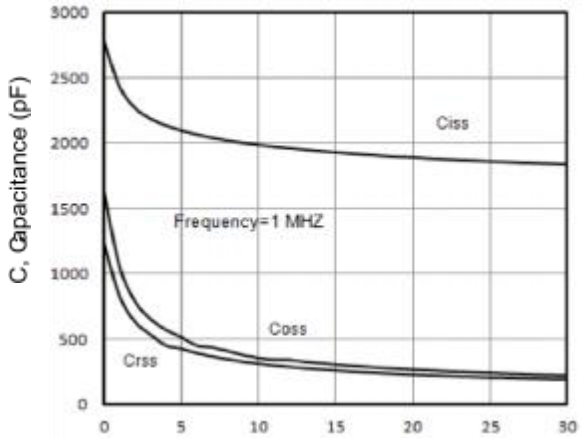
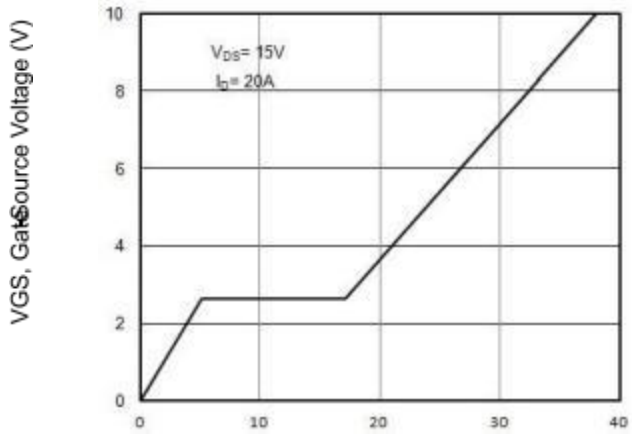


Fig5. Typical Source-Drain Diode Forward



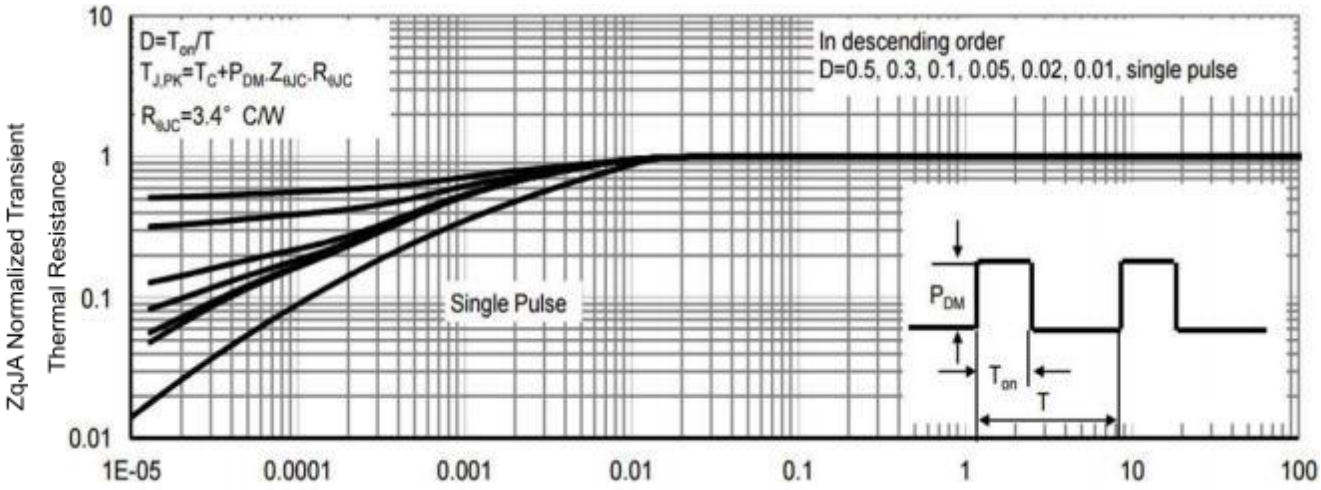
VDS ，Drain-Source Voltage (V)

Fig7. Typical Capacitance Vs.Drain-Source Voltage



Qg -Total Gate Charge (nC)

Fig8. Typical Gate Charge Vs.Gate-Source Voltage



Pulse Width (s)

Fig9. Normalized Maximum Transient Thermal Impedance

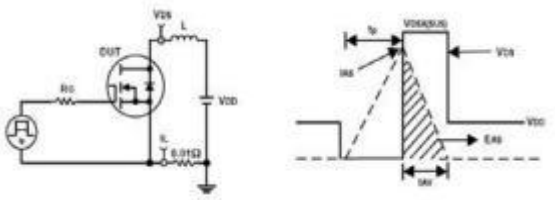


Fig10. Unclamped Inductive Test Circuit and waveforms

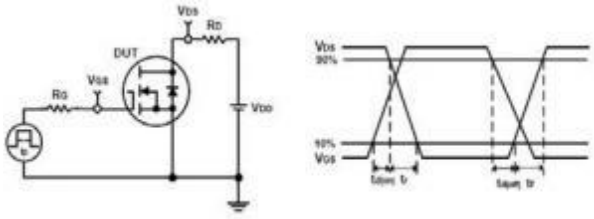
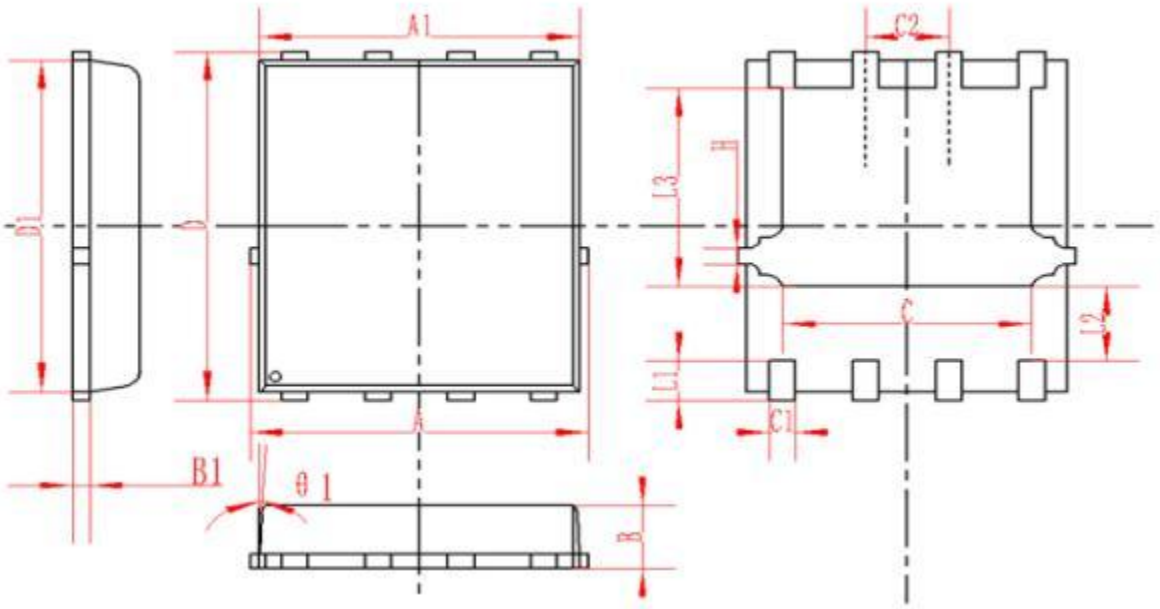


Fig11. Switching Time Test Circuit and waveforms

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		
θ1	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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