

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

MSK50P03NF

Product specification

Description

The MSK50P03NF uses advanced trench technology excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

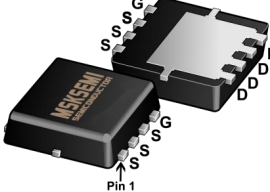
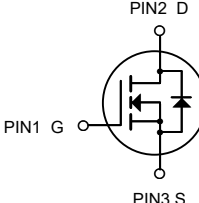
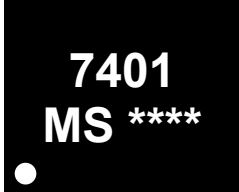
General Features

- $V_{DS} = -30V, I_D = -50A$
- $R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$
- $R_{DS(ON)} < 25m\Omega @ V_{GS} = -4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface mount package

Application

- PWM applications
- Load switch
- Power management

Reference News

PACKAGE OUTLINE	P-Channel MOSFET	Marking
 DFN3X3-8L		

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous ($T_C = 25^\circ C$)	-50	A
	Drain Current-Continuous ($T_C = 100^\circ C$)	-24	
I_{DM}	Drain Current-Pulsed (Note 1)	-80	A
P_D	Maximum Power Dissipation ($T_C = 25^\circ C$)	3	W
	Maximum Power Dissipation ($T_C = 100^\circ C$)	1.3	
EAS	Single pulse avalanche energy (Note 5)	231	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	41.67	$^\circ C/W$

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BVDSS	VGS=0V ID=-250μA	-30	-33	-	V
Zero Gate Voltage Drain Current	IDSS	VDS=-30V, VGS=0V	-	-	-1	μA
Gate-Body Leakage Current	IGSS	VGS=±20V, VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS, ID=-250μA	-1	-1.5	-3	V
Drain-Source On-State Resistance	RDS(ON)	VGS=-10V, ID=-10A	-	9	15	mΩ
		VGS=-4.5V, ID=-7A	-	18	25	mΩ
Forward Transconductance	gFS	VDS=-10V, ID=-10A	-	20	-	S
Input Capacitance	Ciss	VDS=-15V, VGS=0V, F=1.0MHz	-	1750	-	PF
Output Capacitance	Coss		-	215	-	PF
Reverse Transfer Capacitance	Crss		-	180	-	PF
Turn-on Delay Time	td(on)	VDD=-15V, ID=-10A, VGS=-10V, RGEN=1 Ω	-	9	-	nS
Turn-on Rise Time	tr		-	8	-	nS
Turn-Off Delay Time	td(off)		-	28	-	nS
Turn-Off Fall Time	tf		-	10	-	nS
Total Gate Charge	Qg	VDS=-15V, ID=-10A, VGS= - 10V	-	24	-	nC
Gate-Source Charge	Qgs		-	3.5	-	nC
Gate-Drain Charge	Qgd		-	6	-	nC
Diode Forward Current (Note 2)	IS		-	-	-12	A
Diode Forward Voltage (Note 3)	VSD	VGS=0V, IS=-12A	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: Tj=25°C, VDD=-15V, VG=10V, L=0.5mH, Rg=25Ω, IAS=-34A

Typical Characteristics

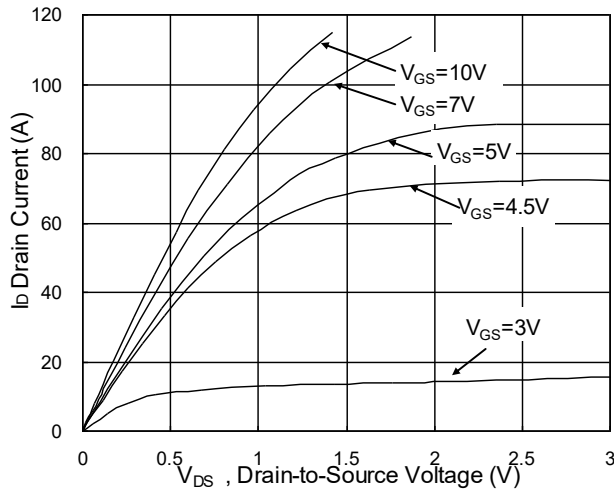


Fig.1 Typical Output Characteristics

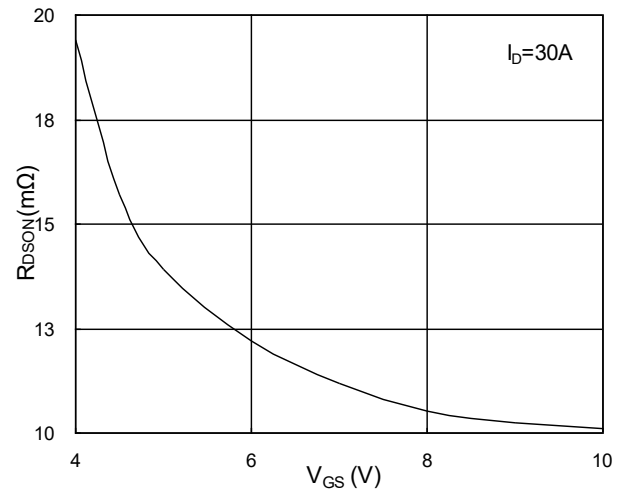


Fig.2 On-Resistance vs. G-S Voltage

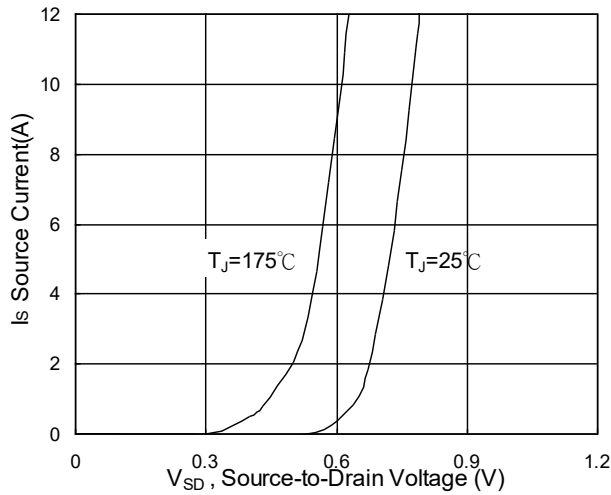


Fig.3 Forward Characteristics of Reverse

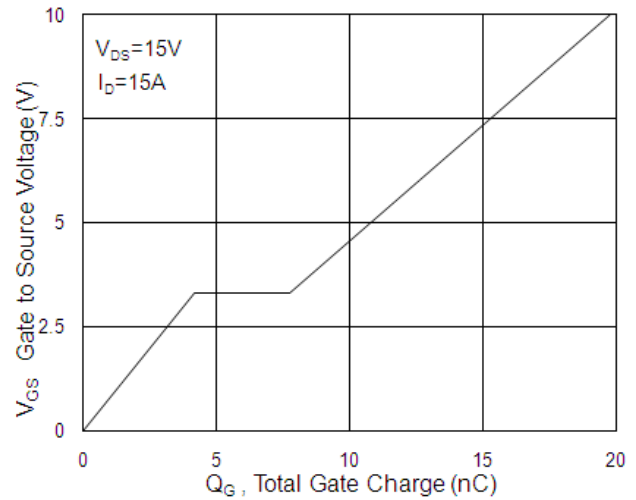


Fig.4 Gate-Charge Characteristics

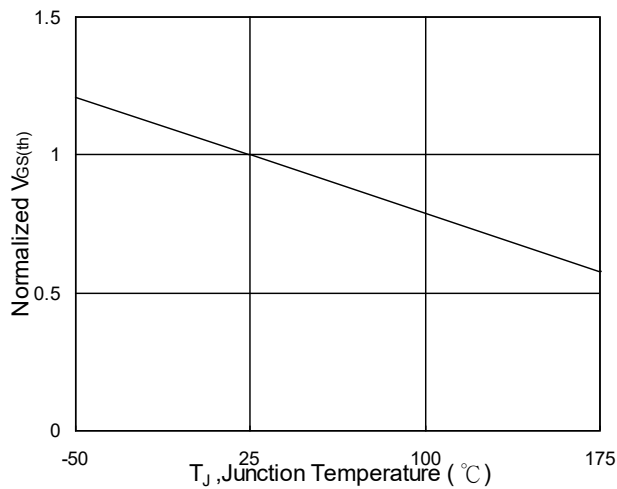


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

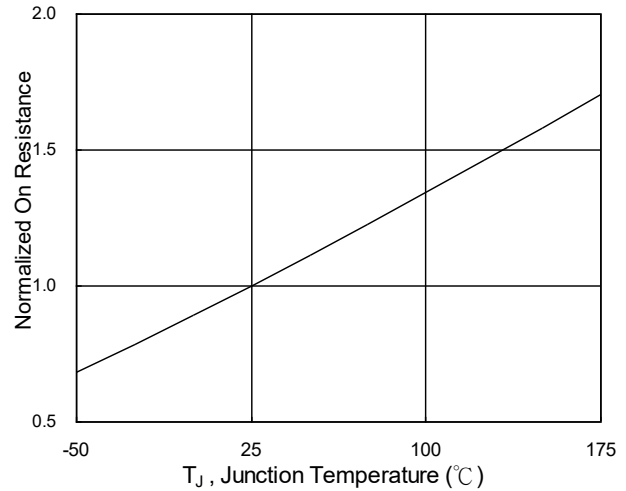


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

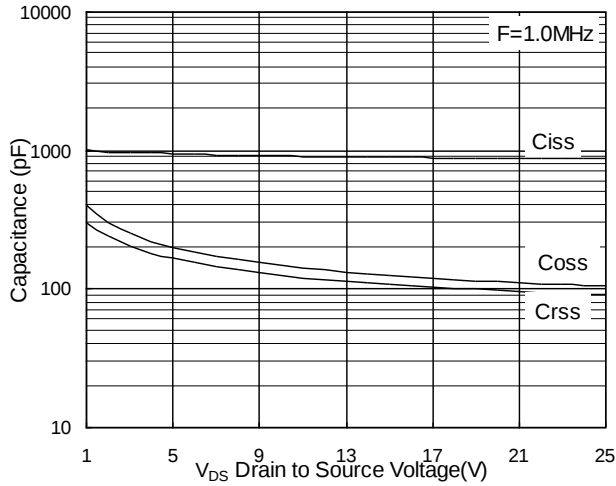


Fig.7 Capacitance

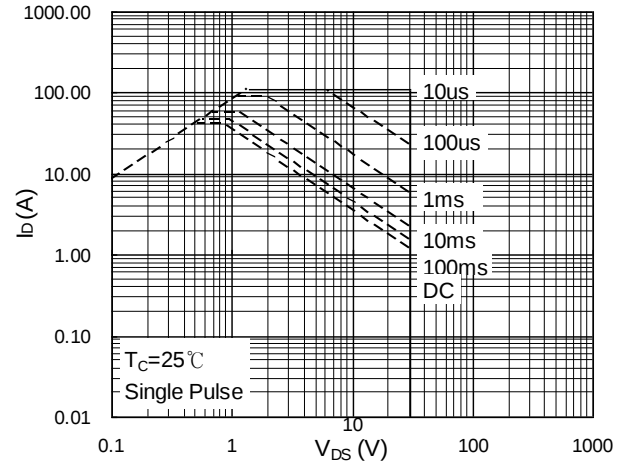


Fig.8 Safe Operating Area

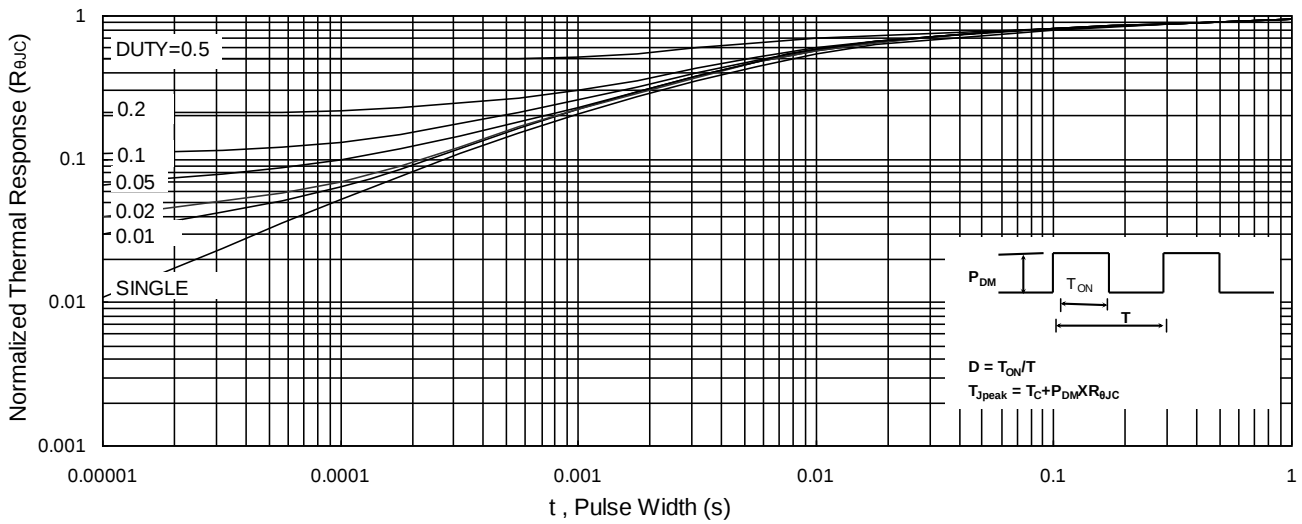


Fig.9 Normalized Maximum Transient Thermal Impedance

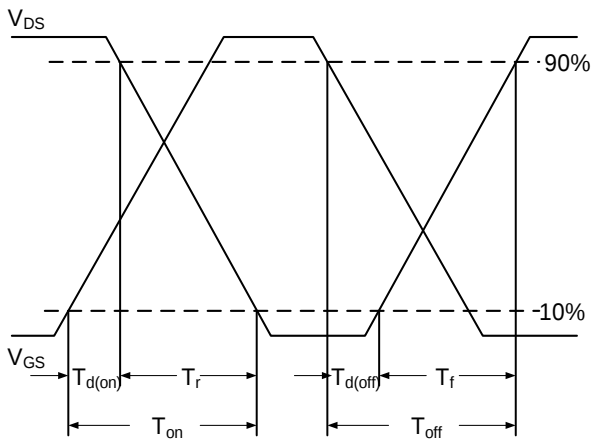


Fig.10 Switching Time Waveform

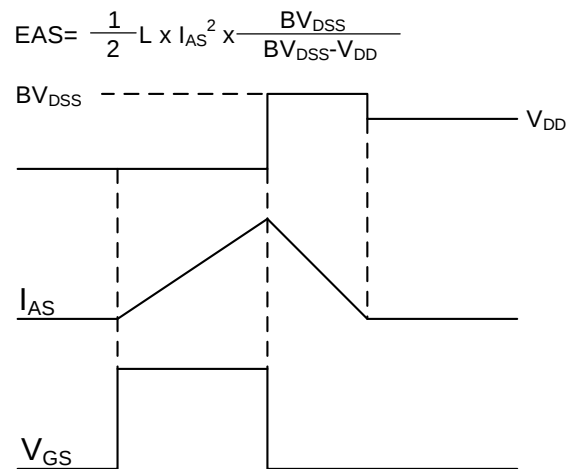
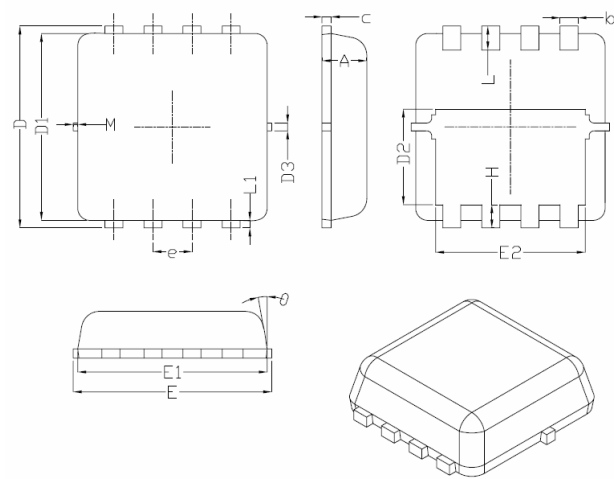


Fig.11 Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10 $^{\circ}$	12 $^{\circ}$

REELSPECIFICATION

P/N	PKG	QTY
MSK50P03NF	DFN3X3-8L	5000

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